Part two

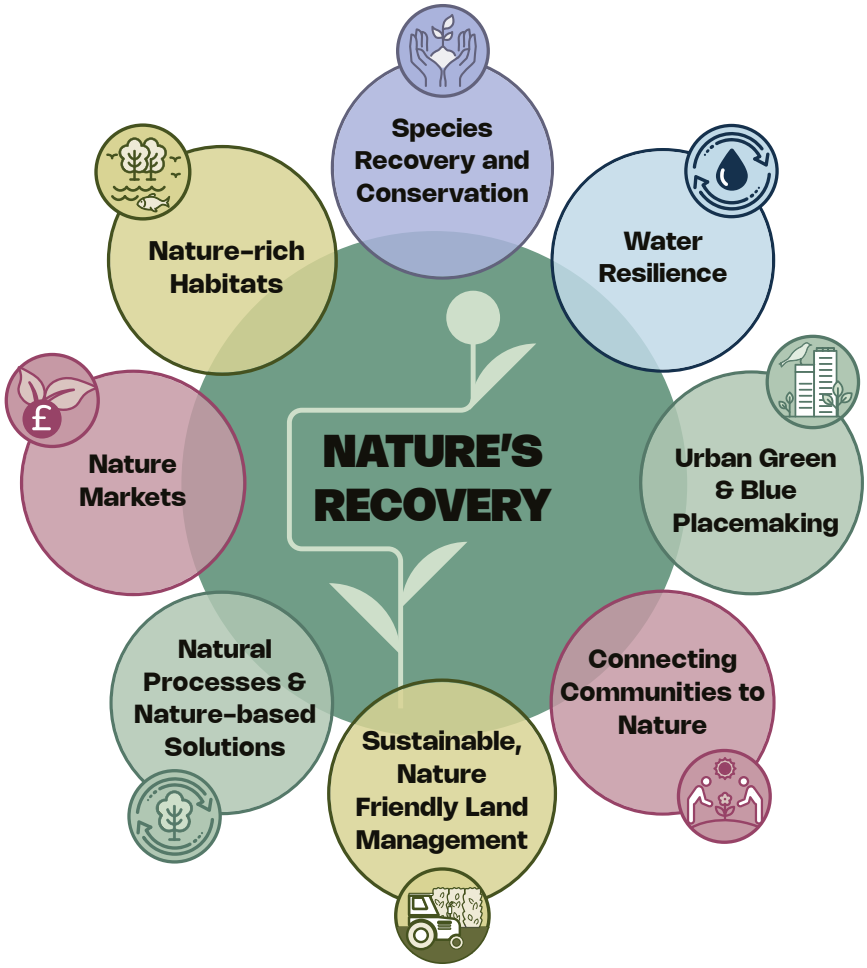
Overarching Themes

The Warwickshire LNRS is built upon a set of Overarching Themes designed to guide collective efforts where all members of society ("we") can take actions to conserve and enhance the natural environment and deliver the LNP Vision:

"The natural, historic, urban, and farmed environments are in a vibrant condition that enables the economy, nature and people to thrive. A place where everyone is empowered to reverse wildlife losses and create beneficial connections with nature and where nature can flourish in a stable climate."

These themes are the key opportunities for nature improvement in Warwickshire. They serve as the foundation for priorities, actions and initiatives, ensuring a cohesive and effective approach to nature recovery. By adhering to these themes and their priorities, the aim is to address existing problems for nature in Warwickshire and create a resilient and thriving natural landscape that supports biodiversity, mitigates climate change, and enhances the well-being of our communities whilst supporting strong business growth. The Warwickshire LNRS Overarching Themes are:

Figure 1: *Warwickshire LNRS's Overarching Themes*



The Overarching Themes and their Priorities to be taken forward by the actions within the strategy are as followed:

Nature-rich Habitats

Warwickshire can make meaningful and significant contributions to support the international and government 30 by 30 targets1 plus those in the Environmental Improvement Plan (EIP). We already celebrate and value existing nature rich habitat be it on designated sites, temporary incentivised management prescriptions, gardens and farms having comprehensively collated and mapped assets since 1997. From this data, scientific modelling and local knowledge we have identified and mapped opportunities for biodiversity to grow the essential building blocks that will enable nature to thrive in an ecologically connected landscape. For example, our connectivity modelling has and can be used to identify green bridges and underpasses at critical locations to defragment road and rail infrastructure at specific locations. We will also look to safeguard these habitats, through the promotion of biosecurity measures to prevent and control invasive species as well as appropriate, meaningful and proportional policies and strategies. We will also look to create nature rich habitats to enhance and strengthen and extend ecological corridors, both at the local levels, for examples, through hedgerow networks, and at the landscape scale, such as reinforcing and maintaining the environmental integrity of the 'Meriden Gap', which functions as an essential ecological and strategic green buffer separating Coventry from Solihull. Its recognition is essential to sustaining landscape permeability, supporting species movement, and delivering LNRS spatial priorities.

Priorities: Warwickshire will identify, conserve, create, restore, enhance and maintain nature-rich habitats at scale to strengthen ecological resilience and secure long-term connectivity.

Species Recovery and Conservation

Through extensive amateur and professional expert engagement we have identified key and species priorities that need more than well managed nature rich habitat to thrive, i.e. species that require specific actions or requirements. These species could be ones that are holding on in the county, special to Warwickshire or have recently moved in. We will also enable a 'warm welcome' to those species that are at our boundaries and support any reintroductions within neighbouring Local Nature Recovery Strategies or national programmes. Within Warwickshire we will look to support those species reintroduction programs listed in this strategy. We have and will continue to map specific action areas through existing Nature Improvement Area responsibilities and created Species Action Areas where more direct actions will be targeted.

Priorities: Warwickshire will identify bespoke opportunities and actions in combination with the nature-rich habitat actions to support the recovery, establishment or re-establishment of species priorities and those that have the potential for reintroduction.

Water resilience

Warwickshire faces growing flood risk, poor water quality, and biodiversity loss driven by land use pressures, ageing infrastructure, and climate change. While flooding is the immediate concern, future climate-driven drought and water shortages could threaten food security and economic growth. These impacts hinder sustainable development, harm public health, and degrade quality of life and natural habitats. Without a functioning hydrological system on all watercourses as well as maximising rainwater harvesting techniques Warwickshire will continue to experience human, plant and animal health issues that will significantly affect the local and national economy.

Priorities: Warwickshire will deliver a catchment that is resilient to climate and nature-related water risks delivering tangible benefits for Nature, People, and the Economy. It will identify sustainable and holistic land and water management interventions which tackle water security challenges including flooding, water quality and water availability across the catchment.

Urban Green and Blue Placemaking

Nature plays an integral role in shaping and defining where and how we live. The Warwickshire Director of Public Health Annual Report 20242 focused on the built and natural environment and recommended promoting the health and wellbeing benefits of the natural environment to improve community access and use of rural and urban green spaces across Warwickshire. Having biodiversity on our doorstep and accessible nature-rich greenspace within 15 minutes of stepping out of our homes is vital to our health and wellbeing[3]. These spaces also help combat climate change and urban heat island effects. In addition, watercourses and canals also play important roles in shaping our towns and villages, evident as namesakes, e.g. Royal Leamington Spa and Stratford-on-Avon. Often integrated with parks and nature reserves, these blue infrastructure features enhance urban environments, support biodiversity, and bring vitality to community spaces.

Priorities: Warwickshire will promote access for all to nature through existing greenspace to address health inequalities. We will identify areas of nature deficiency and encourage new areas of green spaces in urban and peri-urban areas. We will map green and blue corridors to connect urban green spaces together as well as the wider countryside to encourage wildlife into our urban fabric and conurbations over the border. We will also promote nature-friendly developments and projects that seek nature-based solutions such as the reopening of culverts be they voluntarily or mandatorily through appropriate, meaningful and proportional policies within spatial strategies.

Connecting Communities to Nature

A population that has a close relationship with nature and recognises their shared futures will greatly improve our ability to take meaningful action on the climate and improve the future for wildlife. Nature needs people and organisations that take the challenge of transforming the human relationship with nature seriously. Benefits of being connected with nature include, improved mental wellbeing, more pro-environmental behaviours, greater vitality and happiness, more pro-nature conservation behaviours, more satisfied with life and a greater meaning and purpose in life[4]. The Warwickshire Director of Public Health Annual Report 2024[5] recommended that community-based services and amenities actively tackle social isolation, improve social connectivity and enable individuals and groups to take an active part in society. Another way for communities to connect with nature is social accountability by having an active role in decision making and the future of the nature that surrounds them.

Priorities: Warwickshire will advocate putting social accountability at the heart of decision-making by actively involving existing and future local communities in nature recovery projects. We will promote the environmental education, events and practical activities to raise awareness about the importance of nature recovery and the benefits it gives us to help us reach our targets and we will facilitate and support citizen science initiatives to help us monitor them. We will enable and empower local nature groups and organisations to assist in this role. We will build on the new and existing partnerships with universities, local authorities, environmental Non-Government Organisations, farm clusters, and other relevant stakeholders to foster a collaborative approach to nature's recovery. We will promote active involvement of businesses in practical support through social responsibility and through engaging with local community projects.

Sustainable, Nature Friendly Land Management

Sustainable farming practices that enhance soil health and biodiversity with minimising environmental impacts is critical for Warwickshire's nature recovery. This includes increasing habitat and features for pollinators and wider farmland bird assemblages. As farming is critical to the county's economy all biodiversity priorities must be considered alongside food security, production and profitability. Environmental farm advisors cover the whole of the county who promote and encourage the establishment of farm clusters to enable landowners to share good practice and attract significant green investment.

Priorities: Warwickshire will support farmers and landowners to adopt and advocate good soil health, the importance of biosecurity, pollinators and other good farm and farmyard management practices, such as pollution pathway management, to support biodiversity. We will encourage sustainable riparian management along watercourses. Warwickshire will also promote the research, investment and use of new innovative technological advances that has demonstrable environmental benefits encouraging sustainable intensification alongside increased biodiversity. We will work with the Warwickshire RuralHUB and environment farm advisors plus other existing partnerships and organisations that support sustainable farm practices to enhance farmland for nature recovery.

Natural Processes and nature-based solutions

Enabling Warwickshire's landscape to function naturally, such as through natural colonisation and regeneration, has been demonstrated as the most successful mechanism to deliver nature-rich habitats. While these approaches may take time and often conclude once the desired habitat is achieved, they support long-term ecological resilience. Natural processes like hydrological flow and nutrient cycling can be enhanced through nature-based solutions, such as allowing floodplains to flood or planting woodlands in upper catchments to retain water. These interventions help restore the landscape's natural balance and functionality. Wherever possible, nature-based solutions should be prioritised over hard engineering, offering more sustainable and adaptive outcomes.

Priorities: Warwickshire will advocate naturally functioning landscapes through by restoring natural processes and utilising nature-based solutions to support resilience against both ecological and for projected climate change impacts.

Nature Markets

The previous funding models have failed to recover nature, and the cost of inaction is clear, for example flooding has significant immediate and long-term economic costs and undermines economic growth. A new approach is required to complement the existing grants, incentives and philanthropic mechanisms to deliver nature projects in Warwickshire. Establishing Nature Markets through the blending of public and private finance through green investment is this new approach. Warwickshire has gained extensive knowledge and experience of establishing nature markets through implementing Biodiversity Net Gain since 2012. A regulated Carbon Market is forming, and water markets are being explored within a Nature4Water project.[6] The blending of regulatory markets with voluntary markets and environmental rewarding corporate responsibility partnerships is essential to support nature's recovery.

Priorities: Warwickshire will encourage the 'scaling up' of high integrity green investment to enact the actions detailed in this strategy and other nature recovery projects. We will build upon the Local Authorities Natural Capital Investment Strategy, environmental net gain policies and support the establishment of other partnerships to attract investment and encourage corporate environmental responsibility – benefiting both wildlife and the businesses, particularly farming.

Climate Change Adaptation, Mitigation and Resilience

Organisations across Warwickshire have acknowledged a climate change emergency is upon us and made pledges to reduce their carbon impacts. The biodiversity emergency, which this strategy looks to address, is complementary and requires similar pledges and commitments from individuals, organisations and businesses across the county.

The themes, priorities and actions, and data modelling used to produce the maps have all been carefully developed with consideration for climate change addressing both mitigation and adaptation. Thereby, all supporting sectorial guidance documents to be produced to enhance this strategy will also be in consideration to the effects that climate change is having on our species and habitats.

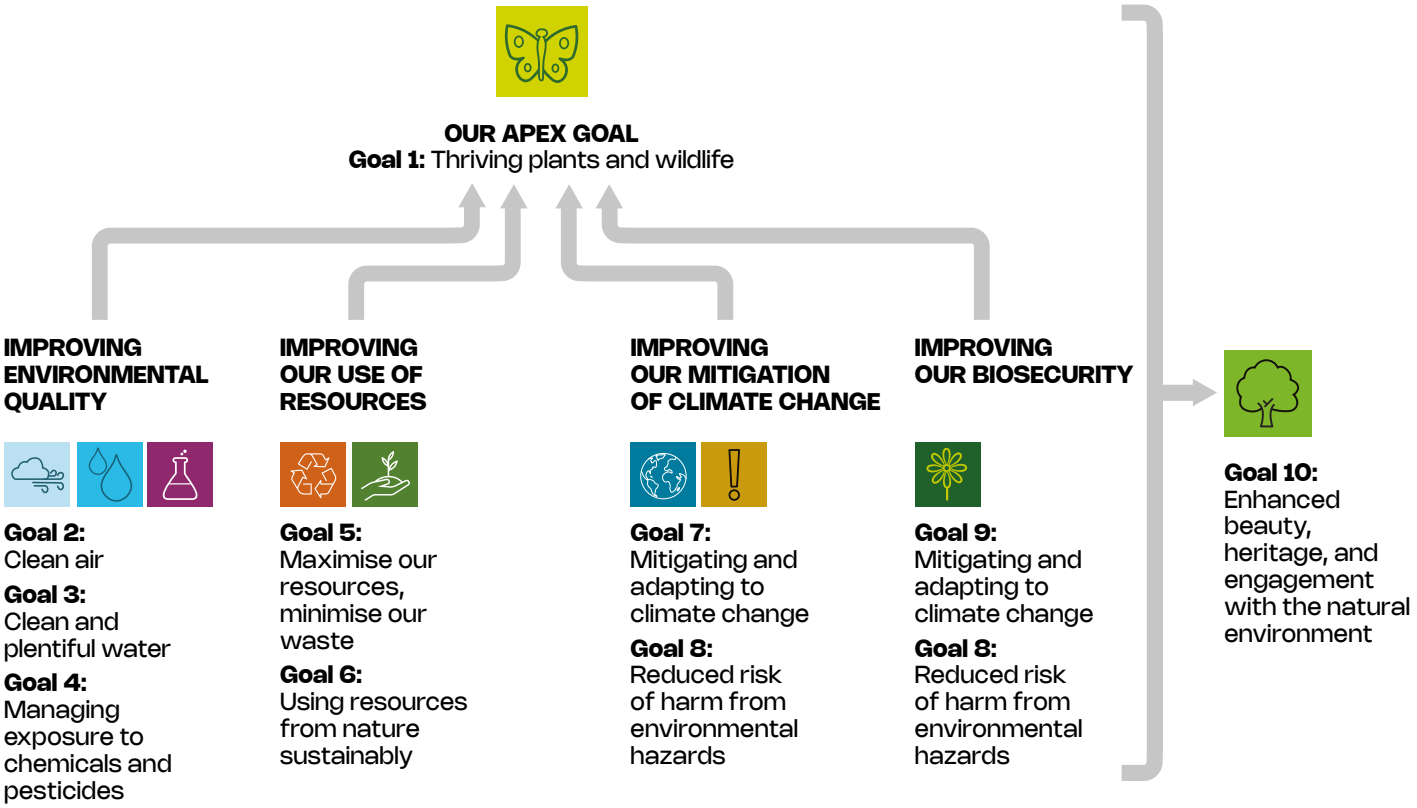
In essence, this strategy's overarching aim to follow the Lawton Principle of "more, bigger, better and joined' will enable species to move through the county.

Alignment of the Warwickshire Local Nature Recovery Strategy Overarching Principles with the Environmental Improvement Plan[7] (EIP) goals

The LNRS is a comprehensive framework designed to enhance and restore natural habitats, promote biodiversity, and engage communities in environmental stewardship. By aligning its themes and overarching priorities with the EIP goals shown in Figure 2, the Warwickshire LNRS demonstrates a strong commitment to achieving a sustainable and resilient natural environment.

Table 1 shows this alignment and whilst the Warwickshire Local Nature Recovery Strategy (LNRS) aligns with many of the Environmental Improvement Plan (EIP) goals, not all EIP goals are fully addressed by the LNRS. Some EIP goals such as Goal 4: 'Managing exposure to chemicals and pesticides' and Goal 5: 'Maximise our resources, minimise our waste' are not directly addressed by the LNRS principles, but some actions may be indirectly linked.

Figure 2 : *Diagram showing the environmental Improvement Plan Goals and their connections*



Whilst the LNRS contributes significantly to many environmental goals, a comprehensive approach involving additional strategies and policies is necessary to achieve all EIP goals.

Warwickshire LNRS Themes	EIP Goals
Nature-rich Habitats	1, 2, 3, 6, 7, 8, 9,10,
Species Populations	1, 7, 9, 10
Water Resilience	1, 3, 6, 7, 10
Urban Green and Blue Placemaking	1, 2, 5, 6, 7, 10
Connecting Communities to Nature	1, 6, 10
Sustainable, Nature–Friendly Land Management	1, 2, 3, 5, 6, 7, 8, 9, 10
Natural Processes and Nature-based Solution	1, 2, 3, 6, 7, 10
Nature Markets	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Habitat Priorities and Actions

The Warwickshire LNRS identifies a range of Habitat Priorities that will deliver the Themes identified: habitats essential for supporting biodiversity and ecosystem services. Each of these habitats play a crucial role in maintaining ecological balance, supporting species, and providing environmental and social benefits to our communities. Our approach focuses on conserving, creating, enhancing, and maintaining these habitats, and by connecting them together, to ensure their resilience at landscape scale. The Habitat Priorities and their associated Actions have been prepared with wide partnership engagement to ensure alignment with both local and national environmental objectives, existing plans and strategies, Local Biodiversity Action Plans (LBAPs) plus local groups and organisations to ensure that they meet each partner's objectives. In so doing the Warwickshire LNRS aims to support all partners in their campaigning, objective setting, funding bids and most importantly delivery on the ground.

The tables that follow show the 'habitat-focused' priorities and actions that can be mapped to various degrees on the Local Habitat Map. To view the priorities and actions for the Areas that Could Become of particular importance (ACB), visit the online map here [link]:

The list below outlines Habitat Priorities in accordance with the **LNRS** guidance.

- **Habitat Priorities** are the key habitats in Warwickshire identified as being at risk or of particular importance for conservation focus.
- **Potential Actions** are the targeted, practical steps—referred to as 'measures' in statutory guidance, designed to support the recovery and protection of Habitat Priorities.

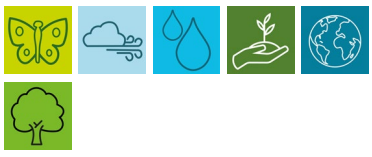
Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
All Habitats   Guidance: LNRS guidance Environment Improvement Plan Goals	Encourage community engagement, education, natural play and other activities that benefit Natural Health and Wellbeing and the appreciation of the natural environment where they are sympathetic to the management or species objectives of the site.	Unmappable
	Encourage the uptake of Local Nature Action Plans currently being led by parish and town councils.	Unmappable
	Encourage the development of regulatory and voluntary Nature Markets and Farm Assurance Schemes that are of High Integrity and adhere to relevant British Standards Institute standards.	Unmappable
	Promote the control of invasive species to enable native species to thrive and preserve their genetic heritage.	Unmappable
Built Environment   Guidance: Urban & Built Environment Environment Improvement Plan Goals	Identify, create, enhance and maintain nature-rich green and blue space and other nature opportunities (such as public parks and public green spaces, avenues, raingardens, green roofs and living walls) within urban and peri-urban environments to maximise biodiversity benefits for people and bring wildlife into urban centres.	Unmappable
	Encourage new developments to make meaningful, positive contributions to nature and nature's recovery on and above those required under planning and other regulations.	Unmappable
	Encourage the retrofitting of nature-based solutions and other wildlife friendly measures into existing urban and peri-urban areas.	Unmappable
	Encourage wildlife friendly gardening to assist in maximising the benefits of nature for people and bring biodiversity into urban centres or contribute to rural ecosystem service functioning (such as pollinators).	Unmappable

Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
Roadside Verges  Guidance: Roadside Verges Environment Improvement Plan Goals	Conserve, create, enhance, and maintain nature-rich road verges and streets to act as ecological oases and corridors through both rural and urban environments. Native species are to be promoted in rural areas whereas pictorial mixes may be considered appropriate within urban settings.	Unmappable
Sacred Grounds and Memorial Sites  Guidance: Sacred Grounds and Memorial Sites Environment Improvement Plan Goals	Create, enhance, and maintain nature-rich sacred grounds (including places of worship, burial grounds etc.) and memorial sites in ways that supports biodiversity	Unmappable

Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
Farmland & Horticulture (excluding Grassland)   Guidance: Farmland & Horticulture Environment Improvement Plan Goals	Encourage nature friendly, sustainable, and environmental farming practices that reduce the impacts of intensive farming and increase the biodiversity value of farmland. Actions include establishment and proactive management of nature-rich headlands, in-field trees, flora plots and pollen and nectar mixes plus reduced reliance on the use of chemicals.	Unmappable
	Promote best practice to create, enhance and maintain healthy soils, through maintaining a natural biological, chemical and physical balance.	Unmappable
	Identify, conserve, and manage above and below ground archaeological and historic monuments and features (such as tythe barns, ridge and furrow and barrows) through nature-rich habitat enhancements and management practices.	Unmappable
	Encourage tree planting, where appropriate, to increase canopy cover in farmland including by means of 'agroforestry' or by planting small copses or trees within existing hedgerows.	Priority Woodland Creation Areas
Grassland (Acid, Calcareous & Neutral)   Guidance: Grasslands Environment Improvement Plan Goals	Encourage the conservation of existing nature-rich habitat through secured management plans and appropriate policies in spatial strategies focusing on the important grassland types to any particular area.	Existing Acidic Grassland Existing Calcareous Grassland Existing Semi-Improved Grassland
	Identify, create, restore, enhance, and maintain nature-rich grassland prioritising those in strategic areas or would make significant contributions to nature's recovery.	Existing Acidic Grassland Existing Calcareous Grassland Existing Semi-Improved Grassland Priority Grassland Creation Areas

Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
Floodplain Meadows   Guidance: Floodplain Meadows Environment Improvement Plan Goals	Encourage the conservation of existing nature-rich floodplain meadows through secured management plans and appropriate policies in spatial strategies.	Unmappable
	Identify, create, restore, enhance, and maintain nature-rich floodplain meadows prioritising those that reconnect the watercourse to the floodplain and make significant contributions to nature's recovery.	Priority Areas for Floodplain Meadow Creation
Lowland Heathland   Guidance: Lowland Heathland Environment Improvement Plan Goals	Encourage the conservation and buffering of existing lowland heathland through secured management plans and appropriate policies in spatial strategies focusing on the important grassland types to any particular area.	Existing Lowland Heath
	Identify, create, restore, enhance and maintain lowland heathland.	Existing Lowland Heath
	Expand and connect ericaceous vegetation/ heathland and also associated habitats such as mire, acid grassland and boggy woodland.	Existing Lowland Heath

Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
Watercourses & Canals   Guidance: Watercourses & Canals Environment Improvement Plan Goals	Expand, restore, enhance, and maintain riparian habitat to improve biodiversity and water quality through secured management plans and appropriate policies in spatial strategies.	Existing Rivers, Ditches and Watercourses Canals
	Promote industry good practice to reduce pollution events, such as through re-routing or retrofitting nature-based solutions or pollution traps.	Existing Rivers, Ditches and Watercourses Canals
	Restore, enhance, buffer, and maintain watercourses to improve their morphology, substrate, aquatic vegetation to bring all watercourses towards at least 'good' Water Framework Directive standards.	Existing Rivers, Ditches and Watercourses Canals Priority Areas for Floodplain Reconnection and Restoration
	Promote, encourage, and restore natural flow regimes, re-naturalisation and enable natural flood management and natural flood alleviation measures.	Priority Areas for Floodplain Reconnection and Restoration Leaky barrier
	Increase watercourse connectivity through the removal of artificial barriers and, where restoration of natural function is not feasible, implement fish, eel and lamprey etc passages.	River Obstacles
	Restore, enhance, and maintain canals to improve their aquatic vegetation and marginal habitat especially along hard engineered banks.	Canal
Ponds, Scrapes and Reedbeds   Guidance: Ponds, Scrapes & Reedbeds Environment Improvement Plan Goals	Conserve, create, enhance, and maintain existing nature-rich ponds, scrapes, reedbeds and other wetland habitat including on disused mineral excavation sites or as part of restoration schemes as well as through secured management plans and appropriate policies in spatial strategies.	Ponds, pools and scrapes
	Identify and restore existing ponds and ghost ponds (where it would not be detrimental to other priority or important species or habitat).	Ponds, pools and scrapes
	Promote sensitive management and industry good practice to reduce pollution and improve water quality.	Ponds, pools and scrapes

Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
Standing Water, Lakes and Reservoirs  Guidance: Standing Water, Lakes & Reservoirs Environment Improvement Plan Goals	Encourage the use of nature rich, well-designed nature-based solutions for rainwater harvesting, whether through new or existing lakes and reservoirs, regardless of whether these water bodies are intended for drinking water or agricultural use.	Unmappable
Traditional Orchards   Guidance: Traditional Orchards Environment Improvement Plan Goals	Encourage the conservation of existing traditional orchards through secured management plans and appropriate policies in spatial strategies.	Existing Traditional Orchard
	Create, restore, enhance, and maintain traditional orchards and promote or encourage them to meet the People's Trust for Endangered Species Grade 1 condition.	Existing Traditional Orchard
Ancient Woodlands   Guidance: Woodlands & Ancient Woodlands Environment Improvement Plan Goals	Restore, enhance, and maintain existing Ancient Woodland, Ancient Semi-Natural Woodland (ASNW)and Plantations on Ancient Woodland Sites (PAWS). Including the restoration of PAWS to more natural woodland conditions where appropriate.	Existing Ancient Woodlands
	Encourage natural regeneration to create buffer zones and sites beside ancient woodland to retain local provenance	Existing Ancient Woodlands

Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
Woodland (newly created, plantation & commercial)   Guidance: Woodlands & Ancient Woodlands Environment Improvement Plan Goals	Encourage the conservation of existing nature-rich woodland through secured management plans and appropriate policies in spatial strategies.	Existing Woodland
	Create, restore, enhance, buffer, and maintain woodland to maximise its nature potential, through increasing structural and species diversity and the management of invasive non-native species (including grey squirrel and deer), prioritising those that would make significant contributions to nature's recovery and sites which will reconnect woodlands.	Existing Woodland Priority Woodland Creation Areas
	Identify and encourage woodland creation sites, prioritising historic woodland sites and where they would improve woodland connectivity using species that are resilient to climate change and conform to the Warwickshire Landscape Guidelines where the creation site is located.	Floodplain reconnect and restoration Priority Woodland Creation Areas
	Establish and promote local markets for woodland produce from woodlands that evidence their commitment to nature's recovery focusing primarily on semi-natural ancient and other broad-leaved woodlands.	Existing Woodland Floodplain reconnect and restoration Priority Woodland Creation Areas
Wet Woodland   Guidance: Woodlands & Ancient Woodlands Environment Improvement Plan Goals	Encourage the conservation of existing nature-rich wet woodland through secured management plans and appropriate policies in spatial strategies.	Wet woodland
	Create, restore, enhance, and maintain wet woodland to maximise its nature potential, prioritising those in strategic creation areas or would make significant contributions to nature's recovery.	Wet woodland Priority Areas for Floodplain Reconnection and Restoration Priority Woodland Creation Areas
	Identify and encourage wet woodland creation sites prioritising sites that will improve the water quality of any hydrologically connected watercourse.	Priority Areas for Floodplain Reconnection and Restoration

Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
Wood Pasture and Parkland  Guidance: Wood Pasture & Parkland Environment Improvement Plan Goals	Encourage the conservation of existing Wood Pasture and Parkland through secured management plans and appropriate policies in spatial strategies.	Wood Pasture & Parkland
	Create, restore, enhance, and maintain Wood Pasture and Parkland to maximise its nature potential, prioritising those in strategic areas or would make significant contributions to nature's recovery.	Wood Pasture & Parkland Priority Woodland Creation Areas
	Identify and encourage Wood Pasture and Parkland creation sites prioritising historic sites and where they would improve woodland or grassland connectivity using species that are resilient to climate change and conform to the Warwickshire Landscape Guidelines where the creation site is located.	Wood Pasture & Parkland Priority Woodland Creation Areas
Ancient and Veteran Trees  Guidance: Ancient & Veteran Trees Environment Improvement Plan Goals	Identify, conserve, and maintain existing and future Ancient and Veteran Trees through secured management plans and appropriate policies to maximise their nature potential.	Areas Particular Importance for Biodiversity (APIB)
	Maintain genetic provenance of Warwickshire Ancient and Veteran trees through seed collection and cuttings.	Unmappable
Scrub  Guidance: Scrub Environment Improvement Plan Goals	Create, restore, enhance, and maintain scattered and dense scrub to maximise its nature potential, prioritising those where they make significant contributions to nature's recovery.	Unmappable

Priority Habitat and Themes	Potential Actions	Key Action Areas (Linked to LNRS Mapping) LNRS
Hedgerows  Guidance: Hedgerows Environment Improvement Plan Goals	Create, restore, enhance, and maintain species-rich hedgerows prioritising those that link existing habitat together, contain standard trees and are managed to compliment other nature benefit management objectives (such as pollinators, species priorities and assemblages).	Hedgerows
Open Mosaic Habitat  Guidance: Open Mosaic Habitat Environment Improvement Plan Goals	Encourage the conservation of existing Open Mosaic Habitat through secured management plans and appropriate policies in spatial strategies. Create, restore, enhance, and maintain species-rich Open Mosaic Habitat, particularly on disused mineral excavation sites or their restoration.	Open Mosaic Habitat Open Mosaic Habitat
Quarries, stone walls, rock, stone habitat  Guidance: LNRS guidance Environment Improvement Plan Goals	Conserve, restore, enhance, and maintain existing old quarries and areas of rock/cuttings that are nature-rich and does not conflict with any geological interest.	Unmappable

Species Priorities List

Warwickshire is home to many notable, threatened and near-threatened species and require significant habitat improvements, increased connectivity, and the creation of new habitats to facilitate their population recovery and expansion. The Warwickshire LNRS's Habitat Priorities and associated actions will inherently support these species. By implementing these actions, we can establish a more extensive, interconnected, and ecologically valuable network of habitats across Warwickshire and neighbouring LNRSs which will benefit a broad range of species.

However, some species require more targeted conservation efforts beyond general habitat-based actions. These are grouped as:

- **Species Priorities:** Individual species in Warwickshire that are at risk or of particular conservation importance.
- **Priority Assemblages:** Groups of species that share similar habitat needs and face similar threats, allowing them to be addressed collectively.

Each Species Priority or Species Assemblage is supported by one or more Actions—targeted, practical steps designed to aid their recovery and long-term viability. These actions are usually bespoke and go beyond the general habitat actions provided for Habitat Priorities, ensuring that the specific needs of these species or groups are met.

The tables below includes:

- **17 Species Priorities** identified for Warwickshire,
- **16 Priority Assemblages** of associated species for Warwickshire, and
- **3 Species for Potential Reintroduction or Translocation** within Warwickshire.

The methodology used to select these species is detailed in LNRS Appendices.

Species Priorities

Species *(latin name)*	Species Detail and Background	Actions that will be promoted and encouraged	Key Action Areas (Linked to LNRS Mapping)
Bittern *(Botaurus stellaris)*	Bitterns are regular winter visitors to Warwickshire, but their breeding numbers remain low. To improve this, we need to focus on managing and enhancing their habitat, particularly reed beds, to encourage breeding. Current efforts include improving reedbed habitat at Brandon Marsh Site of Special Scientific Interest (SSSI), creating deeper pools where they can hunt and breed and at Middleton Lakes, on the Staffordshire border. The Species Recovery Programme Fund has funded a project in 2023 – 2025 for Bittern in Warwickshire targeting actions to ensure its survival. Bitterns are also included in several neighbouring Responsible Authorities' LNRS's highlighting the regional importance of their conservation.	▪ **Increase Fish Populations:** Enhance fish stocks in wetlands to provide a reliable food source for Bitterns. ▪ **Create, Manage and Enhance Reedbeds:** Develop and restore reedbed habitats to create suitable breeding and feeding grounds. Including practices such as lowering reedbeds at risk from drying out and managing the reed structure to achieve diversity within the reedbed (aiming for no more than 30 per cent being older than 7 years and no more than 5 per cent of the area being scrub). Manage the reedbed through cyclical cutting of different sections of reed over time and regularly remove willow.	Unmappable
Black poplar *(Populus nigra)*	The Black Poplar is Britain's rarest native timber tree. In Warwickshire, most specimens have been deliberately planted, including in urban parks and streets. Some of the oldest rural trees may be descendants of naturally occurring ones. Since 2005, the 'Big Tree Hunt' has significantly increased the number of recorded specimens from 30 to nearly 600, one of the highest figures for any county. About a third of our trees are within floodplains, with important concentrations of mature trees occurring along parts of the River Blythe, River Tame, River Alne, lower River Avon and the lower River Dene. Notable specimens can be seen at Coombe Country Park and the Moathouse Car Park in Stratford-upon-Avon. Despite this, only about 20 female trees have been confirmed.	▪ **Establish a tree nursery:** for growing local provenance black poplar with the intention of increasing the number of trees (in particular females) in Warwickshire. ▪ **Increase the numbers of black poplar** in Warwickshire by planting new specimens, preferably using those established in a Warwickshire tree nursery. ▪ **Retain dead and dying poplars:** where feasibly possible and don't remove or burn deadwood.	Black Poplar Action Areas

Brown Hairstreak *(Thecla betulae)*	The brown hairstreak butterfly, a rare species in the UK, is experiencing a promising spread from a population in Worcestershire. As a neighbouring county to Worcestershire, Warwickshire plays a crucial role in supporting the expansion of this species. The main threat to the brown hairstreak is the poor management or removal of mature blackthorn habitats, which are essential for their survival. These butterflies benefit from long-term habitat restoration and the creation of sheltered (but unshaded) stands of blackthorn, which should be allowed to grow to about 5 meters in height. Populations do not readily spread away from blackthorn, so connecting habitats is key to their expansion. In Warwickshire, the brown hairstreak has been rediscovered in the Princethorpe area and the Heart of England Forest (which is now a key location for the species), with populations spreading in both areas. Conservation efforts in Warwickshire are vital to ensure the continued expansion and survival of this species.	▪ **Retain Existing Blackthorn Thickets:** Preserve current thickets of blackthorn and mature hedges containing blackthorn. ▪ **Plant New Blackthorn:** Establish new thickets and hedgerows with blackthorn. ▪ **Manage and Coppice:** Implement management and coppicing routines for hedges, trees, and thickets suitable for the species. ▪ **Increase Habitat Connectivity:** Enhance connectivity by creating and extending stands, trees, and hedgerows with blackthorn to link existing areas. Develop wide rides, glades, and scrub edges in and around woodlands. ▪ **Correct Hedgerow Management:** Manage blackthorn-rich hedgerows with a rotational cutting cycle of 3 years (or 4-5 years if necessary). Connectivity is important as this species relies on appropriately managed hedgerows between known sites. Brown hairstreak favours the south-facing sides of hedges and favours 1-2 years of hedge growth. Blackthorn suckering should be retained on both sides of the hedgerow. ▪ **Citizen Science:** Utilise citizen science for recording and mentoring efforts. ▪ **Establish New Orchards:** Create new orchards as it is a useful habitat for the species. Blackthorn is the primary food plant, but fruit trees are also utilised. ▪ **Co-benefits:** Use blackthorn planting to support brown hairstreak and deliver additional benefits, including deterrence of anti social behaviour through defensive planting.	Unmappable

Species *(latin name)*	Species Detail and Background	Actions that will be promoted and encouraged	Key Action Areas (Linked to LNRS Mapping)
Common Lizard *(Zootoca vivipara)*	The Common Lizard is a severely declining species in the Warwickshire Strategy Area. They are found in various habitats, including heathlands, grasslands, and woodlands. However, their populations have been dwindling due to habitat loss and fragmentation.	▪ **Safeguard and appropriately manage key habitats** such as Baddesley Common and Kenilworth Common. ▪ **Maintain railway lines and other corridors** to ensure they remain viable pathways for lizard movement. ▪ **Expand suitable habitat** on adjacent to corridors and locations of known recent records.	Common Lizard Action Areas
Eurasian Curlew *(Numenius arquata)*	Dependent on wet grassland and marsh for breeding and feeding. In Warwickshire, the species faces severe challenges due to habitat loss and degradation and predation of fledgelings. As of 2024, only five pairs were identified in the Strategy Area, highlighting the urgent need for conservation efforts. Fencing techniques have proven successful in supporting curlews to hatch chicks with a good success rate in neighbouring Counties. Warwickshire's farmers, nature recovery organisations, and volunteers should continue to adopt and support these methods to aid in the recovery of curlew populations.	▪ **Fencing:** Erect protective (electric) fencing around known nests to prevent disturbance and predation. ▪ **Conservation Grazing:** Apply appropriate conservation grazing practices to maintain suitable habitat conditions for Curlews. ▪ **Predator Control:** Predator control should be utilised where appropriate to increase adult and chick survival rates. ▪ **Expand suitable habitat:** to increase breeding areas and increase breed success as well as increased breeding pairs.	Curlew Action Areas
Eurasian otter *(Lutra lutra)*	Otter is recovering well within the Strategy Area but there are hot spots where road traffic collisions (specifically where roads cross watercourses) are causing high incidents of mortality.	▪ **Retrofit mammal ledges under bridges:** at known road–watercourse intersections to reduce road traffic accidents when rivers are in flood. ▪ **Erect fences** alongside roads to direct otters to safe crossing points	Otter Action Areas

European Beaver *(Castor fiber)*	Individual wild beavers have been recorded infrequently in north Warwickshire from 2023 and there are established populations in the Tame Anker Mease catchment as well as several hundred wild beavers in England as of 2025, therefore their natural arrival is feasible due to dispersal from established populations elsewhere in the UK. Beavers play a pivotal role in the restoration of riverine habitats and the enhancement of ecosystem health. Their activities, including dam construction and wetland creation, foster a diverse range of wildlife, establishing them as a keystone species. This strategy endorses the natural arrival of beavers, ensuring their integration into the local environment is appropriate. Key initiatives should focus on engaging with landowners, managing potential conflicts, and monitoring the impacts of beavers on the landscape.	▪ **Enhance riparian habitats:** to support the natural arrival and spread of beavers. Allow natural revegetation of buffer zones next to watercourses to provide space for beavers to forage, build dams and create wetlands. Suitable habitats include a mix of woodlands, trees, shrubs, grasses, and water-dependent vegetation. ▪ **Encourage beavers to settle in locations that offer significant ecological benefits:** including improved ecosystem structure, hydrology, water quality, and freshwater ecology. ▪ **Plant suitable tree species that coppice easily:** for example, willow, aspen, poplar to encourage beavers to settle in suitable locations. ▪ **Raising Public Awareness:** Educate the public about the benefits of beavers and their role in natural flood management (NFM). ▪ **Engage landowners:** in supporting return of beavers to the county and support a system to address any conflicts that may arise in the future.	Unmappable

Species *(latin name)*	Species Detail and Background	Actions that will be promoted and encouraged	Key Action Areas (Linked to LNRS Mapping)
Hazel dormouse *(Muscardinus avellanarius)*	Despite their expected presence in large, deciduous, semi-natural woodlands in the Strategy Area, dormice are known only in a few sites. Efforts to reintroduce dormice began in 1998 with 65 individuals introduced to Bubbenhall Wood. Surveys in 1999/2000 found dormice in Brandon Wood and four other isolated locations. Subsequent introductions in 2009–2010 at Windmill Naps and in 2012 at Alne Wood have shown mixed success. Further releases in 2017 and 2018 aimed to restore habitat continuity through the Dunsmore Living Landscape Partnership Scheme. There has been successful natural breeding, retaining the population. Despite these efforts, dormice are struggling to expand from the relocation areas, highlighting the need for continued conservation focus.	▪ **Appropriate hedgerows management–:** to allow existing populations to expand (increasing landscape connectivity). ▪ **Coppicing and thinning of regenerating woodland:** Regular coppicing and thinning help maintain a dense understorey and create a mosaic of different habitat types and ages, ensuring continuous food supply and nesting sites. Keep some standards throughout the woodland. ▪ **Deer management:** Manage deer populations to prevent overgrazing or implement ways to protect young trees and shrubs from deer browsing, ensuring the growth of a diverse and dense understorey. ▪ **Monitoring:** continue to maintain knowledge of the population and breeding success.	Unmappable

Hedgehog *(Erinaceus europaeus)*	Hedgehogs will benefit from general habitat improvements such as hedgerow creation and appropriate land management, as well as nature-friendly farming techniques. However, bespoke actions are essential to support hedgehogs in urban and semi-urban areas, where they face unique challenges.	▪ **Promote Wildlife-Friendly Gardening:** – Reduce the use of pesticides. – Provide areas with longer grass and reduced mowing, for foraging areas and shelter in gardens. – Create compost, log, and leaf piles. – Ensure ponds are not steep-sided or have ramps to allow hedgehogs to climb out. – Encourage allotments to retain hedgerows and shelter areas ▪ **Increase Habitat Permeability:** Promote the creation of 'hedgehog highways' (13cm x 13cm holes in fences). These should be listed as a planning condition on new-build sites. ▪ **Professional Guidance:** Ensure greenspace managers, landscapers, and other professionals receive specific guidance or training on hazards, mitigation, and appropriate timings for habitat clearance, including promoting the reduction of pesticides in public parks and spaces to remove toxic chemicals ▪ **Public Awareness:** Educate public on needs of hedgehogs and the simple actions to maintain and expand populations.	Hedgehog Action Areas
Lesser horseshoe *(Rhinolophus hipposideros)*	The lesser horseshoe bat is rare in the British Isles, primarily found in Wales, western England, and western Ireland. They are particularly sensitive to disturbance, especially at their maternity and hibernation roosts. This species will benefit from general habitat improvements and increased connectivity between habitats but conservation efforts for lesser horseshoe bats should focus on protecting their roost sites and ensuring the availability of suitable feeding habitats.	▪ **Identify, safeguard, manage and create suitable habitat around maternity roosts within the Core Sustenance Zone (CSZ);** such as broadleaved woodland, wooded riparian corridors, as well as along mature tree lines and tall hedgerows that have associated hedge margins that support prey insects. ▪ **Identify, safeguard and/or create suitable hibernation roosts;** to secure populations and enhance colonisation.	Lesser horseshoe Action Areas

Species *(latin name)*	Species Detail and Background	Actions that will be promoted and encouraged	Key Action Areas (Linked to LNRS Mapping)
Osprey *(Pandion haliaetus)*	Ospreys are visitors to Warwickshire, using known migratory pathways through the region. They occasionally stop to hunt in the area's wetlands and reservoirs. Despite the presence of potentially suitable habitats, Ospreys are not known to breed in Warwickshire. Conservation efforts should focus on encouraging Ospreys to breed within the Strategy Area.	▪ **Install nest platforms:** in suitable locations near large waterbodies and other suitable habitat. This should also include the implementation of a 400-metre exclusion zone around nest sites/ platforms to protect nests and prevent disturbance. ▪ **Protection:** Measures should be taken to protect nest sites from persecution and egg collection. ▪ **Desilting Lakes:** Consider desilting lakes to provide sufficient food sources where appropriate and required. ▪ **Raise Awareness:** Promote and improve communication and information about the requirements of ospreys and how to protect fishery areas, in order to prevent conflict.	Unmappable
Slow worm *(Anguis fragilis)*	The slow worm is a declining species in Warwickshire, facing challenges from habitat fragmentation and loss. They are also subject to predation by pheasants. Slow worm will benefit from general habitat improvements such as appropriate grassland and woodland management and creation and known populations are present in Kenilworth Common nature reserve and Brandon Marsh nature reserve. However, bespoke actions are essential to support slow worm in urban and semi-urban areas, where they face unique challenges.	▪ **Raise awareness:** of the importance of gardens and allotments for wildlife ▪ **Establish/create suitable habitat and buffer strips** in public parks, churchyards and cemeteries and nature reserves to support population ▪ **Promote Wildlife-Friendly Gardening to support slow worm and their prey:** -Promote creation of wildlife ponds in gardens and allotments -Identify and retain any confirmed or potential hibernation sites. -Avoid using pesticides	Unmappable

Snipe *(Gallinago gallinago)*	The snipe, listed on the UK Amber List of Birds of Conservation Concern is declining markedly throughout the county and is experiencing a significant decline in Warwickshire due to habitat loss and there are no known breeding pairs of snipe in the County. Whilst this species will benefit from general wetland management and improvements, bespoke actions are required to help this species thrive. Snipe is also a species priority in neighbouring RAs, highlighting the regional importance of their conservation.	▪ **Appropriate Habitat Management:** Implement suitable cattle grazing practices to maintain optimal ground conditions. ▪ **Maintain Water Tables:** Ensure water tables are within 20cm of field level throughout the breeding season to provide soft, damp soils. ▪ **Fencing:** Erect protective (electric) fencing around known nests to prevent disturbance and predation.	Snipe Action Areas

Species *(latin name)*	Species Detail and Background	Actions that will be promoted and encouraged	Key Action Areas (Linked to LNRS Mapping)
Water vole *(Arvicola amphibius)*	Water voles have experienced drastic declines in England. By 2010, water vole numbers in Warwickshire had plummeted by up to 95%, with fragmented colonies primarily in the Coventry/ Nuneaton area and a few isolated colonies elsewhere. However, by 2018, the situation had improved due to mink displacement by otters and targeted habitat enhancements. Water voles have since expanded their range along the Coventry and Oxford canals, with significant populations at the Hawkesbury and Marston junctions. The isolated population on Noleham Brook remains, and extending the potential Local Wildlife Site at Long Marston could further aid their dispersal. The Species Recovery Programme Fund funded in 2023-2025 a project in Warwickshire aimed at ensuring the survival of water voles. Conservation efforts, including reconnecting fragmented populations and extending potential Local Wildlife Sites, are crucial for their continued survival.	▪ **Monitor and Reduce Mink Numbers:** Monitor mink distribution and reduce populations to lessen impacts on water voles, using sensor equipped mink rafts and catchment wide trapping. ▪ **Reduce Livestock Grazing:** Fence off buffer zones of 2m or more from the water's edge to reduce trampling but allow access for periodic grazing of the buffer zones. Create designated livestock drinking areas or use off-stream watering troughs or pasture pumps. ▪ **Control Trees and Scrub:** Manage the number of trees and scrub along waterways to prevent them from dominating the banks or overshading vegetation that water voles rely on for food and shelter. ▪ **Habitat Management:** If required, cut bankside vegetation on a two-year rotation (or longer), leaving one bank uncut each year. Cutting should take place in early Autumn, from late September. De-silt ditches (only remove silt, do not remove any soil from banks or sides of channel) on a five-year rotation, avoiding machinery that could crush fragile banks. ▪ **Encourage Grassy Buffer Strips:** Create buffer strips of 4-6m wide along watercourses, ditches, and in-field ponds, especially along intensively managed grassland or cultivated fields. ▪ **Create and restore habitat:** Create pools connected to watercourses and canals, restore straightened ditches and streams by re naturalising channels and increasing bank habitat, and remove redundant hard engineered embankments to enable burrowing and vegetation growth. ▪ **Soften Engineered Embankments:** Establish vegetation along hard engineered embankments to give food plants and access to and from canals.	Water vole Action Areas

White clawed crayfish (Austropotamobius pallipes)	The UK is home to approximately a quarter of the world's population of white-clawed crayfish, the country's only native crayfish species. However, it is under threat due to the spread of invasive non-native crayfish, which are driving native crayfish towards extinction through the spread of crayfish plague and competition for resources (refuges in particular). Ensor's Pool in Nuneaton, a Special Area of Conservation, was once a notable site for white-clawed crayfish but surveys in 2014 and 2015 found no native crayfish, likely due to non-native crayfish infection. In Warwickshire, white-clawed crayfish are only surviving in very localised areas and are vulnerable to extinction. Key locations include the River Alne and its tributaries, the Coventry Canal, and possibly Newbold Quarry. Populations may also exist in several other rivers and at Middleton Hall. The River Blythe population is thought extinct, replaced by signal crayfish. Local Wildlife Sites for white-clawed crayfish include the River Alne, and Perch Hill Quarry. The Species Recovery Fund has funded a project for white clawed crayfish in Warwickshire targeting the creation of an Ark site and reintroductions of the species.	▪ **Strategic Approach:** Develop a regional strategy to retain the species — including reintroduction / translocation actions (see Potential Reintroduction/ Translocations table below). ▪ **Implement Biosecurity Actions:** Control crayfish plague by promoting the 'Check Clean Dry' biosecurity campaign at all watercourses. ▪ **Control Invasive Signal Crayfish:** Implement actions to control the population of invasive signal crayfish if suitable techniques emerge. ▪ **Disease Control:** Focus on controlling crayfish plague through community and angler awareness of biosecurity actions. ▪ **Prioritise Habitat Needs:** Ensure consistent, steady flows of good quality water. Offer numerous natural (or artificial where appropriate) refuges along riverbanks to provide hiding spots from predators.	White clawed crayfish Action Areas

Species *(latin name)*	Species Detail and Background	Actions that will be promoted and encouraged	Key Action Areas (Linked to LNRS Mapping)
White-letter Hairstreak *(Satyrium w-album)*	The white-letter hairstreak butterfly has faced significant declines nationally over recent decades, largely due to the loss of elm trees to Dutch Elm Disease. Elm trees, which are now relatively rare, are crucial for the survival of this species. Targeted conservation actions around remaining, or newly planted elm sites are essential. In Warwickshire, the white-letter hairstreak is widespread (which is rare countrywide) and holds a nationally significant population, making the region a core area for this species in the UK. Efforts to protect and enhance elm habitats, are vital for the continued survival of this butterfly in Warwickshire.	▪ **Retain and Plant Elm Trees:** Preserve existing elm trees and plant new disease-resistant elms (noting that no elm is currently fully disease resistant and the most suitable species should be used at the time of planting), especially within 2km of existing elm woodlands. ▪ **Avoid Felling Healthy Elms:** Do not cut down mature, healthy elm trees as a precaution against Dutch Elm Disease. ▪ **Encourage Elm Suckers:** Where appropriate, allow elm suckers to grow wherever they appear. ▪ **Introduce Coppicing:** In areas affected by Dutch Elm Disease, implement coppicing on a 10-year cycle. ▪ **Manage Hedgerow Shelterbelts:** Maintain hedgerow shelterbelts containing elm and avoid cutting edges where new elm suckers appear. ▪ **Enhance Woodland Rides and Glades:** Improve rides and glades and create extensive networks within woodlands. ▪ **Connect and expand Habitats:** Link habitats with hedgerows containing Wych Elm (Ulmus glabra) and disease-resistant elms as hedgerow trees. ▪ **Plant other hosting species;** consider the planting of suitable non-native species where appropriate.	White-letter Hairstreak Action Areas

Willow tit *(Poecile montanus)*	The willow tit, whose core range includes mid-Wales and the Midlands, is extremely rare and on the brink of extinction in Warwickshire. Climate change is significantly impacting their survival; however, they are present in very low numbers in the Tame Valley NIA. The Species Recovery Programme Fundhas funded a project in 2023-2025 aimed at implementing targeted actions to secure the survival of the willow tit in the region. This species will benefit from general actions to improve, create and connect wet woodland and ex quarries and abandoned industrial/brownfield sites but bespoke, immediate and effective conservation actions are essential to ensure the species' continued presence in Warwickshire.	▪ **Surveying:** Identification and safeguarding of key remaining nesting sites and population strongholds. Monitoring can include 'call back' surveys in early spring. ▪ **Increase availability of specialist nest sites:** in key population strongholds — such as rotting logs in suitable positions. ▪ **Retain and create a successive supply of deadwood:** such as tall stumps, within and around wet woodland and scrub. ▪ **Create structural diversity and promote dense scrub growth:** near willow tit nesting sites through selective felling or the reintroduction of coppicing within damp woodlands, former quarries, abandoned industrial/brownfield and open mosaic sites ▪ **Restore wet woodlands:** by reversing drainage where suitable. ▪ **Improve Connectivity:** To improve the stability of willow tit populations, link up suitable habitats by creating or retaining scrub lined river corridors and mature hedgerows.	Willow tit Action Areas

Priority Assemblages

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Aspen *(Populus tremula)* A Leaf-rolling Weevil *(Byctiscus Populi)* *(Sciota Hostilis)* *(Phyllonorycter Sagitella)* Light Orange Underwing *(Archiearis Notha)* Dusky clearwing (*Paranthrene Tabaniformis)*	Aspen is an important species for a number of invertebrates in the West Midlands. **Leaf-Rolling Weevil:** Feeds on Aspen, with Oversley Wood part of a key woodland alignment in the West Midlands. Whilst ideally the population size and range in Warwickshire should be increased by further reintroductions to historic and appropriately managed sites, the current population at Oversley Wood is not strong enough at present to source reintroductions. Details on how the Forestry Commission are managing Oversley Wood are detailed within this document: warwickshire woodlands forest plan 24-34 web use.pdf **Both *Sciota hostilis* and *Phyllonorycter sagitella:*** require mature Aspen for their survival. **Light Orange Underwing:** This species also depends on mature Aspen. **Dusky Clearwing:** Recently rediscovered in Warwickshire in 2021, this species prefers wet woodlands and river valleys with Aspen, making it crucial for the survival of the Dusky Clearwing.	▪ **Retention and Planting:** Retain and plant Aspen within woodlands to support the survival of various invertebrate species. ▪ **Regeneration for Leaf-Rolling Weevil *(Byctiscus populi):*** – Implement coppicing to provide young Aspen, which is crucial for this species. – Encourage suckering and sapling stages of Aspen growth, preferred by the weevil. – Allow Aspen suckers at the edge of rides to mature by clearing around them during ride management. – Maintain sheltered, warm pockets of woodland edge habitat. ▪ **Habitat management for *Sciota hostilis, Phyllonorycter sagitella* and *Light Orange Underwing:*** – Ensure mature Aspen develop with longer rotation periods for coppice with standards. A 12 year coppice cycle is recommended to cater for both species. ▪ **Habitat management for Dusky Clearwing:** – Maintain wet woodland, broad-leaved woodland, and river valleys where Aspen and Poplar grow. ▪ **Diverse Aspen Ages:** – Various ages of Aspen are required to support all these species. – Practice coppicing on long rotations, allowing some Aspen to grow older, leaving some as standards, and coppicing others to encourage new growth. – Tailor management to specific species where known.	Aspen Assemblage Action Areas

Bats Western Barbastelle (*Barbastella Barbastellus)* Serotine *(Eptesicus Serotinus)* Bechstein's Bat *(Myotis Bechsteinii)* Brandt's Bat (*Myotis Brandtii)* Daubenton's Bat *(Myotis Daubentonii)* Whiskered Bat (*Myotis Mystacinus)* Natterer's Bat (*Myotis Nattereri)* Leisler's Bat *(Nyctalus Leisleri)* Noctule *(Nyctalus Noctula)* Nathusius's Pipistrelle *(Pipistrellus Nathusii)* Common Pipistrelle (*Pipistrellus Pipistrellus)* Soprano Pipistrelle (*Pipistrellus Pygmaeus)* Brown Long-eared Bat: (*Plecotus Auritus)* Lesser Horseshoe Bat (also see Species Priorities)	There are 18 species of bat in the UK and 14 bat species have been recorded in Warwickshire. Bats can be found in almost all habitat types and general habitat improvement actions/ appropriate management/ improved connectivity will benefit this assemblage. However, human disturbance needs to be addressed particularly the effects of light and noise in key areas/corridors, particularly around roost sites.	▪ **Mitigate effects of light and noise in key areas/corridors:** especially near known roost sites for all species, by maintaining unlit areas, reducing light trespass, and implementing dimming or partial night lighting. ▪ **Dark Corridors:** Restore and retain dark corridors along waterways. Where lighting is unavoidable, use best practice guidance and avoid the use of white and blue light. ▪ **Safeguard roost sites:** particularly maternity and hibernation roosts of rarer species. ▪ **Create hibernation and maternity roosts:** create purpose-built bat barns and towers in or adjacent to core sustenance zones. ▪ **Community Engagement:** Promote wider understanding of the problem by identifying community members who will pioneer light management. ▪ **Hedgerows with high vegetation and trees:** Promote tall hedges with standard trees, and no gaps wider than 5-10m, to provide important commuting and foraging corridors for bats. ▪ **Night-flowering species:** Encourage the planting of night flowering species such as campions and honeysuckle that attract moths and other night flying invertebrates. ▪ **Connectivity:** Promote the creation, enhancement and bat-friendly maintenance of hedgerows and other connectivity features to link woodlands and other roost sites to for foraging sites and zones.	Unmappable

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Birds of Wet Woodland Willow Tit (also see Species Priorities) Marsh Tit *(Poecile Palustris)* Lesser Spotted Woodpecker *(Dryobates Minor)*	The birds within this assemblage, will benefit from the actions set out for wet woodlands including the creation of new wet woodlands. However, to help these species group thrive, additional actions are necessary in woodlands where they are present or could potentially frequent. These actions include targeted conservation actions and habitat enhancements tailored to their specific needs.	▪ **Identify and Safeguard Nesting Sites:** Protect key remaining nesting sites and areas where populations are still present. ▪ **Monitor Populations:** Regularly monitor these areas, focusing on the impacts of competition and predation. ▪ **Increase Nest Site Availability:** Enhance the availability of specialist nest sites in key areas. ▪ **Create areas of dense under canopy and ample dead wood within new and existing Wet Woodlands:** to provide specific habitat nesting. ▪ **Improve Habitat Connectivity:** Enhance connectivity of remaining populations by creating new wet woodlands in targeted areas. See willow tit in the Species Priorities table above for more details specific to willow tit.	Birds of Wet Woodlands Action Areas

Deadwood Assemblage *Species dependent on deadwood (dead, dying, and decaying) including detritovores, invertebrates, fungi and lichen*	This assemblage will benefit with proper management of ancient and long-established woodlands, wood pasture, parklands, and ancient and veteran trees, all of which include deadwood. However, some additional actions have been provided to ensure this assemblage group is able to thrive in Warwickshire.	▪ **Retain Older Trees:** Preserve older trees that are typically removed for health and safety reasons or for tidiness. ▪ **Keep or Introduce Dead, Decaying, or Dying Wood:** As far as safe and possible, retain or introduce dead, decaying, or dying wood in the environment. Ensure a range of sizes and ages of deadwood, including standing deadwood (upright trees, trunks, or stumps), fallen deadwood (wood on the floor), and deadwood branches on live trees. Where management of dying trees is necessary look to manage the declining tree by reducing the height of dead and dying trees in stages to make them safe and prolong the presence of dead and dying wood in the location. ▪ **Vernalisation technics:** consider the deliberate damaging or wounding of 'younger' trees to accelerate the development of microhabitats typical of large, old trees (veterans) ▪ **Minimise Land Use Intensification Impacts**: Implement actions to reduce the impacts of land use intensification, such as minimising root damage or concentrating defaecation in shaded areas increasing nitrogen impacts that impacts lichens ▪ **Avoid Cutting Up Dead Limbs and Fallen Trunks:** Prevent changes in the microclimate of the heartwood decay environment by not cutting up dead limbs and fallen trunks. ▪ **Log Piles:** Where log or wood piles are required, orientate them north—south. Where possible, use a mix of species and partially bury logs to support a wide range of beetles and fungi. ▪ **Manage woodland grazing appropriately:** ensure grazing levels enable regeneration. Where there is no grazing in woodlands, consider introducing and carefully maintain grazing in woodlands to prevent older trees from being smothered by secondary growth. ▪ **Avoid chemical use:** Avoid using fungicides, pesticides and fertilizers to allow and encourage fungal growth on deadwood. ▪ **Natural Regeneration of Larger Trees:** Through allowing and/or planting native thorny scrub in wood-pasture and parkland. This can enable natural regeneration of larger trees, and species like Hawthorn are key nectar sources for saproxylic invertebrates.	Deadwood Assemblage Action Areas

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Scarce Wall Ferns Brittle bladder-fern *(Cystopteris Fragilis)* Maidenhair Fern (*Adiantum Capillus-veneris)* Rusty-back fern (*Asplenium Ceterach)*	These ferns typically grow in mortar crevices, often on historic walls and within churchyards. Their survival is increasingly at risk due to modern preferences for urban cleanliness and tidiness, the replacement of aging structures where they are found, and the destruction of their habitats through re-plastering or other excessive and uninformed 'tidying' practices.	▪ **Identify, monitor, and safeguard sites for scarce wall ferns,** ensuring sites are not disturbed, removed, or restricted. ▪ **Promote public awareness and education.** Inspire community stewardship to help safeguard these plants, as well as informing land managers especially churchyard and parish management groups on the need to conserve existing wall ferns encouraging them not to use sprays or mechanical means to remove them.	Unmappable

Farmland Birds Corn Bunting (*Emberiza Calandra)* Yellowhammer (*Emberiza Citrinella)* Linnet *(Linaria Cannabina)* Yellow Wagtail (*Motacilla Flava)* Tree Sparrow (*Passer Montanus)* Skylark *(Alauda Arvensis)* Lapwing (*Vanellus Vanellus)* Barn Owl (*Tyto Alba)* Grey Partridge (*Perdix Perdix)* Turtle Dove (*Streptopelia Turtur*) Reed Bunting (*Emberiza Schoeniclus)* Swallow (*Hirundo rustica)*	A substantial number of our characteristic farmland birds have declined dramatically in range and number over recent decades. Approximately 49% of Warwickshire is classified as Phase 1 'cultivated and disturbed' land, encompassing habitats like amenity grassland, arable land, and introduced shrub. Given that a significant portion of Warwickshire's land is used for agriculture, it is crucial to focus on species that can benefit from sustainable farmland management to achieve population recovery. The species in this assemblage are expected to benefit from wider habitat action across the county to create and appropriately manage habitats including grasslands, hedgerows, wetland-edges, and floodplain meadows, however, appropriate management of farmland is crucial for this assemblage group.	▪ **Enhance Arable Land:** Create wildflower, grass, and nectar-rich margins or plots to boost insect populations and provide other food resources for breeding birds. ▪ **Retain Habitat Diversity:** Maintain diverse habitats and unfarmed wild corners to support birds that feed on invertebrates. Keep and/or plant trees, hedgerows, ditches, grass banks, scrub, bramble, and/ or gorse to provide diverse habitats and foraging opportunities. ▪ **Provide and Maintain Seed Sources:** Support birds by providing seed during late winter or allowing plants to go to seed in suitable areas. ▪ **Manage Ploughing:** Reduce, delay, or avoid ploughing after harvest to increase winter stubble cover. Spray (if only absolutely necessary) and cultivate stubbles as late as possible in spring. Consider not using pre-harvest desiccants enabling greener stubbles. Consider sowing or establishing winter cover crops wherever possible. ▪ **Manage Hedgerows:** Avoid cutting hedgerows before March to provide winter berries. Also cut hedges on a rotational basis, leaving some areas of the farm uncut each year to meet the various needs of the birds, and leaving some trees and high growth. ▪ **Boost Seed Food:** Provide uncut areas on grasslands, a mix of crops, stubbles, or seed-rich wild bird cover crops. ▪ **Avoid Nesting Sites during the Cutting or Grazing Silage in Spring:** identify and protect ground nests prior to cutting. ▪ **Increase Crop Rotation Diversity:** Include a range of crops in rotation, such as winter wheat and spring cereals, where possible to create a variety of crops over the farm. ▪ **Restore and Maintain Wet Features:** Maintain wet features like open wet ditches, ponds, and scrapes. ▪ **Reduce Over-Grazing:** Lower grazing levels to prevent over-grazing of pasture to maintain a varied sward structure all allow plants to flower and set seed. ▪ **Reduce Herbicide and Insecticide Use:** Minimise herbicide and broad-spectrum insecticides use to protect arable plants and insect prey. ▪ **Create Skylark Plots:** Establish Skylark plots within winter cereals. ▪ **Create Corn Bunting plots:** Establish corn bunting plots away from hedgerows or trees. ▪ **Install Nesting Boxes:** Offer nesting boxes specific to local species, such as Swallows, Tree Sparrows and Barn Owls.	Unmappable

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Freshwater Invertebrates This includes dragonflies, damselflies, snails, sponges, mayflies, stoneflies, caddisflies, alderflies, pond skaters, some beetles, freshwater woodlice, shrimps and more. Freshwater habitats include ponds, springs, seepages, ditches, lakes, rivers and streams. Specific species include: Mere Wainscot (*Chortodes Fluxa)* Fen Wainscot (*Arenostola Phragmitidis)* Cream-bordered Green Pea (*Earias Clorana)*	Freshwater invertebrates play a vital role in maintaining clean water — helping to break down and filter organic matter. They are also an important food source for fish, birds and mammals. Their presence is the standard indicator of the health of the habitat they live in. However, many of our freshwater invertebrates are declining in the face of pollution, watercourse straightening and hard engineering, invasive species, abstraction and development, and are already being affected by climate change with an increase in water temperature. This assemblage will benefit from water quality improvements to rivers and other freshwater habitats. However, some additional actions have been provided to ensure this assemblage group is able to thrive in Warwickshire.	▪ **Introduce Large Woody Debris:** Add logs and branches into watercourses to create shelter, feeding areas, and breeding sites for invertebrates. ▪ **Plant Riparian Trees:** Establish native trees along riverbanks to provide shade, regulate water temperature, and allow roots to extend into the water, enhancing habitat complexity. ▪ **Encourage Riparian Vegetation:** Promote the growth of plants that overhang or extend into the water's edge, offering cover, food sources, and microhabitats for aquatic invertebrates. ▪ **Pond Management:** Cut reeds on a rotation to prevent encroachment. This is particularly important for Cream-bordered Green Pea. ▪ **Foodplants for Specific Species:** – Mere Wainscot – wood small-reed *(Calamagrostis epigejos)* – Fen Wainscot – common reed *(Phragmites australis)* – Cream-bordered Green Pea – various willows *(Salix)*, including osier *(S. viminalis)*	Freshwater Invertebrates Action Areas

Garden Invertebrates Garden Tiger (*Arctia Caja)* Golden Plusia (*Polychrysia Moneta)*	Some of the species in this assemblage are considered Nationally Scarce in Britain. They will benefit from general habitat improvements but are reliant on specific food plants for survival. The garden tiger moth, once a quite common moth in most of Britain, has declined in many places in the last few years largely due to climate change. The golden plusia was first discovered in south-east England in 1890, this classic 'invasion' moth species rapidly spread north-westwards, reaching Scotland, but has shown signs of range decline in recent decades.	- **Promote Wildlife Friendly Gardening for Invertebrates:** Encourage less intensive gardening by leaving areas undisturbed for overwintering and creating mini-meadows through reduced mowing and increased plant diversity. - **Include Larval Foodplants:** The food plants of the species in this assemblage should be considered for inclusion/ promotion when designing gardens to support these invertebrates in Warwickshire. **Foodplants for Each Species:** – **Garden Tiger:** The larvae are generalists and feed on a wide variety of herbaceous plants, including foxglove, nettles, dock, and plantain. – **Golden Plusia:** The larvae feed on Delphiniums, Larkspur, and Aconitum.	Unmappable

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Hedgerow Invertebrates Including but not exclusive of: Small Eggar (*Eriogaster Lanestris)* Pretty Chalk Carpet (*Melanthia Procellata*) Pinion-spotted Pug (*Eupithecia Insigniata)* Mocha (*Cyclophora Annularia)* Dusky-lemon Sallow (*Xanthia Gilvago)* Lesser-spotted Pinion (*Cosmia Affinis)* Clouded Magpie (*Abraxas Sylvata)* Scarce Tissue (*Rheumaptera Cervinalis)*	Some of the species in this assemblage are considered Nationally Scarce in Britain. They will benefit from general habitat improvements but are reliant on specific food plants for survival.	▪ **Provide for overwintering invertebrates:** Leave a proportion of hedgerow at a site/ on a farm uncut each year to accommodate overwintering invertebrates. ▪ **Introduce standard trees to hedgerows:** Strengthen hedgerow connectivity and habitat value by establishing standard trees, particularly oak, within existing hedgerows. ▪ **Ensure a continuous blossom sequence:** Use diverse planting mixes that provide a continuous sequence of flowering from spring through summer, ensuring a consistent food source for invertebrates, including solitary bees. ▪ **Include Larval Foodplants:** The food plants of the species in this assemblage should be considered for inclusion/ promotion when designing the habitat (i.e. hedgerows) to support these invertebrates in Warwickshire. **Foodplants for Each Species:** – **Small Eggar:** Hawthorn *(Crataegus)* and Blackthorn *(Prunus spinosa)* – **Pretty Chalk Carpet:** Traveller's-joy *(Clematis vitalba)* – **Pinion-spotted Pug:** Hawthorn and Apple *(Malus)* – **Mocha:** Evergreen Oak *(Quercus ilex)* – **Dusky-lemon Sallow:** Wych Elm and English Elm *(Ulmus procera)* – **Lesser-spotted Pinion:** English Elm and Wych Elm – **Clouded Magpie:** Wych Elm and English Elm – **Scarce Tissue:** Various species of Prunus, including Almond, Cherry, Blackthorn, and Hawthorn	Hedgerow Invertebrates Action Areas

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Invertebrates of calcareous grasslands Including but not exclusive of: Adonis Blue (*Lysandra Bellargus)* Chalkhill Blue (*Lysandra Coridon)* Duke of Burgundy (*Hamearis Lucina)* Grizzled Skipper (*Pyrgus Malvae)* Small Blue (*Cupido Minimus)* Green hairstreak (*Callophrys Rubi)* Dark Green Fritillary (*Speyeria Aglaja*) Dingy Skipper (*Erynnis Tages)* chalk carpet moth (*Melanthia Procellata)* light feathered rustic (*Agrotis Cinerea)* Dark brocade (*Mniotype Adusta)* *(Osmia Aurulenta* *Osmia Spinulosa)* Red-tailed Mason Bee (*Osmia Bicornis)* Yellow-shouldered Nomad Bee *Nomada Fulvicornis)* Dotted Bee-fly *Bombylius Discolor)* Clover stilt (Parectopa Ononidis) *Ethmia dodecea* *(Pancalia Schwarzella* *Coleophora Squamosella* *Stephensia Brunnichella* *Commophila Aeneana)* *(Aethes Williana* *Notocelia Incarnatana)* Rock-rose Pot Beetle *(Cryptocephalus Primarius)* Rugged Oil Beetle *(Meloe Rugosus)*	Calcareous grasslands in Warwickshire are vital for invertebrates, supporting over 500 calcareous species, including many that are nationally or regionally scarce. Key species include flies, bees, wasps, moths, beetles, and bugs. Important sites for calcareous insects include the Bishops Hill — Bishops Bowl complex and Southam Quarry, which are significant for their rich invertebrate populations. Southam Quarry is particularly notable as the richest bumblebee site in the Midlands. Warwickshire is a crucial region in the Midlands for the conservation of these species, providing essential habitats for a diverse range of invertebrates. The adonis blue is not currently present in Warwickshire but is spreading northwards. It is a Species Priority in the Oxfordshire LNRS (a neighbouring RA). Invertebrates within this assemblage will benefit from calcareous grassland actions and other neutral / semi-improved grassland habitat priorities, however, bespoke actions are also required.	▪ **Manage Grassland Mosaic:** Create a mosaic of long and short grassland sward heights and bare earth areas through rotational livestock grazing, ensuring appropriate stocking densities to avoid overgrazing to encourage a wide range of invertebrates from this assemblage group. ▪ **Appropriate Grazing and Cutting:** Ensure grazing and cutting practices support the spread of required food plants. ▪ **Scrub management:** Scrub-edge conditions are required to provide shelter for many warmth-loving invertebrates associated with calcareous grassland but should be managed to ensure it does not take over. ▪ **Continue to Create Habitat for Adonis Blue:** Continue to prepare habitats for the adonis blue i.e. warm south facing slopes with sheltered hallows. ▪ **Include Larval Foodplants:** Incorporate larval foodplants in seed mixes or allow them to colonise naturally to encourage invertebrate colonisation. Seed mixes should ideally be of local provenance. **Foodplants for Each Species:** – **Adonis Blue:** Horseshoe vetch – **Chalkhill Blue:** Horseshoe vetch – **Dingy Skipper:** Common birds-foot trefoil – **Dark Green Fritillary:** Violets – **Duke of Burgundy:** Cowslip/ primrose – **Small Blue:** Kidney vetch – **Red-tailed Mason Bee:** Bird's-foot-trefoils and vetches – **Yellow-shouldered Nomad Bee:** Willows – **Dotted Bee-fly:** Ground-ivy, violets, coltsfoot	Invertebrates of Calcareous Grassland Action Areas

Light Feathered Rustic (*Agrotis Ciner)*

Bordered Sallow (*Pyrrhia Umbra)*

Ruddy Carpet (*Catarhoe Rubidata)*

Netted Pug (*Eupithecia Venosata)*

Shaded Pug (*Eupithecia Subumbrata)*

Chalk Carpet (*Melanthia Procellata)*

Reddish Light Arches (*Apamea Sublustris)*

invertebrates dependent on Devil's-bit scabious (*Succisa Pratensis*):

Marsh fritillary (*Euphydryas Aurinia*)

Narrow-bordered Bee (*Hemaris Tityus)*

Hawk-moth *(Hemaris Tityus)*

- **Clover Stilt, Ethmia dodecea, Pancalia schwarzella, Stephensia brunnichella:** Path edges
- **Coleophora squamosella:** Blue fleabane
- **Commophila aeneana:** Ragwort
- **Aethes williana:** Wild carrot
- **Notocelia incarnatana:** Rose, particularly burnet rose
- **Rock-rose Pot Beetle:** Common rock-rose
- **Rugged Oil Beetle:** Species-rich grasslands
- **Light Feathered Rustic:** Wild thyme
- **Bordered Sallow:** Restharrow
- **Ruddy Carpet:** Bedstraw
- **Netted Pug:** Bladder campion
- **Shaded Pug:** Field scabious, hawk's-beard
- **Chalk Carpet:** Common bird's-foot-trefoil, other trefoils, clovers, vetches
- **Reddish Light Arches:** Grass roots
- **Marsh Fritillary, Narrow-bordered and Bee Hawk-moth:** Devil-bit scabious

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Open Mosaic Habitat Invertebrates (including post-industrial sites and brownfield sites) Dark Spinach *(Pelurga Comitata)* Wormwood *(Cucullia Absinthii)* Annulet *(Charissa Obscurata)* Bloody-nosed beetle *(Timarcha Tenebricosa)* Common glow-worm *(Lampyris Noctiluca)* Grizzled skipper *(Pyrgus malvae)* Dingy skipper *(Erynnis tages)* Small blue *(Cupido minimus)*	Open Mosaic Habitats in Warwickshire provide essential habitats for diverse invertebrates. These areas, characterised by bare ground, flower-rich meadows, patchy grassland, scrub, and wet areas, create high biodiversity value when combined. They occur on previously developed sites or heavily modified ground. In the Midlands, these habitats are among the best for invertebrates, including many nationally rare species. Some species in this assemblage are Nationally Scarce in Britain and rely on specific food plants for survival, benefiting from general habitat improvements and some bespoke actions are required.	▪ **Include Larval Foodplants:** When designing habitats, especially brownfield sites, include and promote food plants that support the species in this assemblage in Warwickshire. ▪ **Create Structural Diversity:** Develop and sustain a variety of sward heights and areas of bare ground (roughly 10%- 20% per site)through periodic ground disturbance and rotational scrub clearance, so that scrub is present but does not dominate. ▪ **Identify and monitor invertebrates at key sites.** **Food plant:** – **Dark Spinach:** Larvae feed on orache (Atriplex) and goosefoot (Chenopodium). – **Wormwood:** Mugwort. – **Annulet:** Common Bird's-foot Trefoil (Lotus corniculatus), Wild Strawberry (Fragaria vesca). – **Bloody-nosed Beetle:** Cleavers. – **Cinnabar Moth:** Ragwort. – **Small Blue:** Kidney Vetch. – **Dingy Skipper, Green Hairstreak:** Common Bird's-foot Trefoil. – **Dingy Skipper:** Greater Bird's-foot Trefoil. Horseshoe vetch. – **Grizzled Skipper:** Wild Strawberry, Creeping Cinquefoil, Agrimony.	Unmappable

Open Mosaic Habitat Plants Including bare ground/ disturbed ground plant specialist and post-industrial site plants	Open mosaic habitat plants face several significant threats, primarily due to changes in land use and lack of appropriate management. As these habitats often occur on previously developed land such as old industrial sites, they are frequently targeted for redevelopment, leading to direct habitat loss. When left unmanaged, natural succession allows scrub and woodland to encroach, outcompeting the specialist plant species that rely on open, disturbed ground. Additionally, a general lack of awareness and understanding of the ecological value of these sites often results in neglect or inappropriate management, further endangering the unique plant communities they support.	▪ **Maintain and Restore Open Mosaic Habitats:** Actively manage sites by clearing encroaching scrub and trees, using controlled disturbance techniques like light grazing or soil scraping, and restoring degraded areas—such as former industrial or brownfield sites—through reintroduction of native plant species and appropriate habitat management. ▪ **Safeguard Sites through Planning and Development Collaboration:** Protect key habitats from redevelopment by incorporating them into local planning policies, and work with developers to integrate open mosaic habitat features into new projects wherever possible. ▪ **Raise Awareness and Involve Communities:** Educate the public and landowners about the ecological value of open mosaic habitats and encourage citizen science initiatives to involve volunteers in monitoring and conservation efforts.	Unmappable

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Pollinators Pollinating insects, including, but not limited to bees, hoverflies, butterflies, moths and flower-visiting beetles. **Including Warwickshire's Rare Bumblebees:** Red-shanked Carder Bee (*Bombus ruderarius)* Brown-banded Carder Bee (*Bombus humilis)* Large Garden Bumblebee (*Bombus ruderatus)* **Associated species:** Necklace Ground Beetle (*Carabus monilis)*	Pollinating insects are widely recognised for their benefits to food production. In Warwickshire, pollinators such as bees, butterflies, beetles, and wasps are essential for the health of our environment and the food we eat. However, they face significant challenges due to habitat loss, urban growth, climate change, and pesticide use. Efforts like the #Plant4Pollinators campaign aim to support these vital species by encouraging the planting of pollinator-friendly plants. Supporting pollinators is crucial for maintaining biodiversity and ensuring the sustainability of food production in Warwickshire. Red-Shanked Carder Bee: One of the sub-region's rarest surviving bumblebees, showing severe national declines. Brown-Banded Carder Bee: Another rare bumblebee species facing national declines.	**Actions for Landowners and Farmers:** ▪ **Safeguard and Restore Wildflower-Rich Grasslands:** Prioritise safeguarding existing wildflower-rich grasslands and restore abandoned or heavily grazed areas. Preserve permanent pastures with diverse flowers and features like anthills. Protect existing flower-rich meadows from ploughing, spraying, or fertiliser input. ▪ **Reduce Pesticide Use:** Minimise the use of pesticides to protect pollinators. ▪ **Create Bee Banks and Hotels:** Establish bee banks for ground-nesting bees and set up bee hotels for solitary bees. ▪ **Promote Wild Grasslands:** Allow areas of grassland to grow wild or create wildflower meadows. ▪ **Manage Hedgerow Cutting:** Rotate the cutting of hedgerows on a three-year basis to ensure continuity of food resources. ▪ **Enhance Hedgerows:** Plant shrubs and trees that flower at different times of the year and manage hedgerows to provide continuous food resources and shelter. ▪ **Maintain Flower-Rich Margins:** Create uncultivated flower-rich margins of at least 5m width, cutting only after flowering in autumn and removing cut material. Flower-rich margins may shift with crop rotation; however, the aim should be to provide the same amount of habitat across the landscape (no more than 500m between patches). ▪ **Scarify Permanent Margins:** permanent margins can benefit from occasional scarification to maintain diversity of flowering plants. ▪ **Sow Spring Oilseed Rape:** Sow Oilseed Rape in the spring to extend its value to foraging pollinators into midsummer. ▪ **Encourage Wildflowers in between Crops and Margins:** Allow wildflowers like mayweeds, dead-nettles, poppies, and pansies to grow within crops for additional food sources and can provide a valuable late summer bloom between harvesting and ploughing.	Unmappable

Large Garden Bumblebee: Warwickshire is designated as the second national stronghold for this species, which thrives on red clover and agricultural field margins.

Necklace Ground Beetle: Although not technically a pollinator, this beetle is included due to the impact from pesticides and its need for good field margins. It has a stronghold in the Midlands and is at risk of going extinct in Britain in the next decade.

- **Use Fodder and Seed Mixes:** Plant fodder crops, wild bird seed, and 'bumblebird' or AB15s and AB1 seed mixes that contain valuable food plants for pollinators; such as legumes, brassicas, borage and fodder radish.
- **Delay Hay-Cutting:** Delay hay-cutting until late summer to extend foraging value and improve seed production or alternatively implement a rotational cutting regime to ensure nectar is still available throughout the season.
- **Leave Uncut Patches:** Leave patches or margins uncut to create refuges for invertebrates and overwintering opportunities.
- **Common Ragwort and Thistles:** Where legally acceptable, allow these plants to grow as they provide important foraging resources for pollinators.
- **Limit Worming Medications:** Reduce the use of worming medications like avermectin to protect invertebrates, including dung beetles which help to maintain healthy soils.

Specific actions for Warwickshire's Rare Bumblebees and Beetles include:

- Create flower-rich habitats with legumes and labiates
- Create field margins with red clover and common birds foot trefoil.
- Connect field margins with well managed hedgerows.

Actions for Community Groups and Individuals:

- **Use Pollinator-Friendly Planters:** Place planters with pollinator-friendly plants in heavily urbanised areas.
- **Promote Wild Grasslands:** Allow areas of grassland to grow wild or create wildflower meadows/ verges.
- **Relax Mowing Regimes:** Implement a relaxed mowing schedule for areas like road verges, mowing after the end of May.
- **Plant Nectar-Rich Flora:** Introduce a variety of nectar-rich flowers, shrubs, and trees.

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Scarce arable plants Including but not limited too: Blue Pimpernel *(Anagallis arvensis ssp. foemina)* Corn Buttercup *(Ranunculus arvensis)* Corn Gromwell *(Lithospermum arvense)* Corn Marigold *(Chrysanthemum segetum)* Corn Spurrey *(Spergula arvensis)* Dwarf Spurge *(Euphorbia exigua)* Field Woundwort *(Stachys arvensis)* Large Hemp-Nettle *(Galeopsis speciosa)* Narrow-Leaved Hemp-Nettle *(Galeopsis angustifolia)* Night-Flowering Catchfly *(Silene noctiflora)* Prickly Poppy *(Papaver argemone)* Shepherd's Needle *(Scandix pecten-veneris)* Small Flowered Buttercup *(Ranunculus parviflorus)* Spreading Hedge-Parsley *(Torilis arvensis)* Stinking Chamomile *(Anthemis cotula)* Wild Pansy *(Viola tricolor hbrids)* Others Include: Sharp-Leaved Fluellen *(Kicksia elatine)*	Since the mid-twentieth century, arable weeds have experienced the most significant decline among British plants, primarily due to modern farming practices and possibly climate change. Many arable plants grow not only in arable fields but also in small-holdings, roadsides, waste places, allotments, parks, and gardens. However, some specialised species are almost entirely dependent on arable land and have significantly declined or become extinct due to intensive farming and horticulture. These species often reappear after ploughing releases old seedbanks. The best sites for arable weeds tend to have lighter, often calcareous soils. Warwickshire still boasts a moderately diverse range of these plants. Whilst this assemblage is likely to benefit from general habitat improvements to farmland, particularly field margins, bespoke actions are required.	▪ **Create conditions for existing plant populations to flourish,** enabling natural seedbank replenishment and local range expansion. Where necessary, supplement with carefully selected local provenance seed mixes to support habitat restoration and maintain genetic integrity. ▪ **Reduce Herbicide and Fertiliser Use:** Minimise herbicides and fertilisers, and leave untouched field margins by not ploughing up to the base of the field boundary. ▪ **Allow Natural Recolonisation:** At appropriate locations after works (e.g., road works), let bare soil recolonise naturally from the seed bank and avoid topsoiling. ▪ **Implement Good Farming Practices:** Maintain field margins, beetle banks, conservation headlands and adopt minimal tillage systems at appropriate locations. ▪ **Manage Arable Plants as Crops:** Treat arable plants with the same care as commercial crops to create areas with annual flowers, supporting invertebrates, small mammals, and farmland birds. ▪ **Select Appropriate Cultivation Timing:** Choose autumn or spring cultivation to favour target species and fit with cropping regimes. Rotate cultivation around the farm to avoid continuous autumn or spring cropping. This can help control some pernicious weeds, such as autumn germinating grasses and Bristly Oxtongue. ▪ **Ploughing for Arable Plants:** At historic sites, traditional ploughing may be necessary to stimulate the germination of arable plant species, as minimal tillage often fails to sufficiently disturb the soil. This can result in dense grass cover that shades out smaller, less competitive arable plants. It's important to consider the earlier point about adopting minimal tillage systems where appropriate, recognising that different sites may require tailored approaches based on their specific conditions and conservation goals.	Unmappable

Round-Leaved Fluellen *(Kicksia spuria)*

Venus' Looking Glass *(Legousia hybrida)*

Mousetail *(Myosurus minimus)*

Please note this is not a comprehensive list of the sub-region's scarce arable plants.

Falk (2009) provides a checklist of plants strongly associated with local arable land plus a county checklist revealing which ones, additional to the fifteen listed above, are considered scarce at a county level.

- **Cultivate Plots with Care:** Cultivate plots to a fine tilth, providing the best growing medium for arable plants, similar to cereal crop cultivation. Without cultivation, arable plants won't germinate, and weeds like Creeping Thistle can dominate.
- **Rotate Plots:** Rotate plots to manage weed problems and maintain low fertility soils, which are ideal for arable flowers.

Unmappable

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Urban Nesting Birds Swift (*Apus apus)* House martin (*Delichon urbicum)* Starling (*Sturnus vulgaris)* House sparrow (*Passer domesticus*)	This bird assemblage, while associated with various habitats, will benefit from actions aimed at improving urban nesting sites. Many of these birds migrate from Africa to the UK each summer to breed. They require good foraging habitats, particularly along rivers, which are being enhanced through wider habitat improvements. Swifts and House Martins, found in towns and cities across Warwickshire, present an opportunity for local communities to support urban wildlife. Hotspots for swift 'screaming parties' and nest locations include Nuneaton, Rugby, Warwick, Harbury, Stratford-upon-Avon, Shipston-on-Stour, and Stockton. To support their recovery, providing additional nesting spaces (such as boxes, swift bricks, and spaces in buildings) and retaining existing sites is crucial. Renovation or redevelopment of older buildings can lead to the loss of nesting sites, but new nesting spaces can mitigate this. These efforts also benefit other urban birds like house sparrows and starlings.	▪ **Install Bird Boxes:** Support species by installing homes for wildlife on buildings, such as swift bricks, swift boxes, and house martin nesting cups. ▪ **Identify, monitor, and safeguard nesting sites,** ensuring nests are not disturbed, removed, or restricted. ▪ **Mitigate Redevelopment Impacts:** Where older buildings are being renovated or demolished, incorporate new nesting features into the design of replacement structures. ▪ **Engage Local Communities:** Raise awareness and encourage residents, schools, and businesses to participate in urban bird conservation.	Urban Nesting Birds Action Areas

Assemblages	Assemblage Detail and commentary	Actions needed help the assemblage to recover	Action Areas
Woodland Invertebrates Some key species within this assemblage are listed below but are not exclusive too: Autumn Green Carpet (*Chloroclysta miata)* Cloaked Carpet (*Euphyia biangulata)* False Mocha (*Cyclophora porata)* Mottled Grey (*Colostygia multistrigaria)* White-marked (*Cerastis leucographa)* Oak Lutestring (*Cymatophorina diluta)* Angle-striped (*Sallow Enargia paleacea)* Dark Brocade (*Mniotype adusta)* Wood white Purple emperor White admiral	Some of the species in this assemblage are considered Nationally Scarce in Britain. They will benefit from general habitat improvements but are reliant on specific food plants for survival.	▪ **Ensure a continuous blossom sequence:** Use diverse planting mixes that provide a continuous sequence of flowering from spring through summer, ensuring a consistent food source for invertebrates, including solitary bees ▪ **Include Larval Foodplants:** The food plants of the species in this assemblage should be considered for inclusion/ promotion when designing the habitat (i.e. woodlands) to support these invertebrates in Warwickshire. Foodplants for Each Species: ▪ **Autumn Green Carpet:** Rowan (Sorbus aucuparia) and Sallow (Salix). ▪ **Cloaked Carpet:** Various chickweeds (Stellaria spp.). ▪ **False Mocha:** Oak (Quercus spp.). ▪ **Mottled Grey:** non-invasive Cotoneaster. ▪ **White-marked:** A variety of tree species including Oaks, Black Locust, Hackberry, Hickory, and Willow. ▪ **Oak Lutestring:** Oak (Quercus spp.). ▪ **Angle-striped Sallow:** Birch (Betula spp.) and Aspen. ▪ **Dark Brocade:** A variety of herbaceous and woody plants, including Bog-myrtle, Heather, and Alder.	Woodland Invertebrates Action Areas

Possible Reintroduction/Translocation Species

Species	**Species Detail** *(specific to Warwickshire – existing problems/ projects etc.)*	**Actions needed help the assemblage to recover**	**Action Areas** *(link to mapping)*
Black-veined White *(Aporia crataegi)*	This species was believed to have gone extinct in the UK due to climatic conditions. However, the current weather has become suitable for its return. The last known site of this species prior to its extinction was on the Worcestershire/ Warwickshire border. The Heart of England Forest has since created numerous suitable habitats to support its re-establishment.	▪ The Heart of England Forest has established a diverse range of high-quality habitats, including structurally varied, flower-rich hedgerows and rides. Subject to the availability of appropriate funding and opportunities, Heart of England Forest sites could serve as a strategic location for reintroduction initiatives for this species	Unmappable
European beaver *(Castor fiber)*	There have been infrequent records of beaver in the Tame Valley Wetland NIA since 2023 and suitable sites within Warwickshire may be identified for the release and subsequent reintroduction of beavers. Warwickshire's watercourses are failing and are in overall poor health. Restoring beavers to Warwickshire would greatly improve the ecological, biological and chemical status of rivers due to their dynamic habitat alterations as a Nature-based Solution (NbS). Evidence for this is shown across Europe and in other parts of the UK for up to 40 years. Long term management advice and incentivised management changes will need to be implemented.	▪ Consider (re)introducing beaver into habitats which are identified as suitable ensuring full compliance with current best practice and all necessary licensing and permitting requirements.	Unmappable
White clawed crayfish *(Austropotamobius pallipes)*	The UK is thought to support a quarter of the world's population of White-Clawed Crayfish – the UK's only native crayfish species. It is under threat due to the spread of invasive non-native species which quickly eradicates native crayfish populations. The Species Recovery Programme Fund is currently funding a project for white-clawed crayfish in Warwickshire targeting actions to ensure its survival, including looking at Ark sites for reintroductions.	▪ **Establish ARK sites:** identify suitable locations to relocate native crayfish and build a population in Warwickshire. ▪ **Control INNS:** Take suitable effective actions to exclude American Signal Crayfish if effective techniques emerge.	Unmappable