Biodiversity Enhancement Assessment

Dodderhill PC - Wychbold Recreational Area

Project code	86
Applicant	Dodderhill Parish Council
Site location	Wychbold Recreation Area (WR9 7PU)
Date	August 2020
Natural Networks Officer	Sean Webber
Existing biodiversity	The surrounding landscape contains urban development, including gardens and road verges, and arable and pasture farmland with hedges. There are also small areas of traditional orchard and deciduous woodland. The 3.8 ha site is predominately amenity grassland but also has several small woods, an allotment, and a community orchard. There are several play areas with amenity grassland and artificial surfaces, a car park, and a community hall. The orchard contains a mix of fruit trees and shrubs with the grassland being managed as a meadow. The woodlands contain a mixture of tree species, predominantly ash and sycamore, with some lime, oak, silver birch, sweet chestnut, and Scot's pine. The woodland trees are all approximately the same age and the canopy is dense, with a sparse understory and limited ground flora. The hedges around the site have some valuable features, particularly some large oak trees and scrub in the boundary around the football pitch. The mixture of habitats means there is good potential to increase the biodiversity value of the site.
Biodiversity enhancements	**1. Orchard grassland enhancement** **2. Orchard tree planting** **3. Orchard willow management** **4. Woodland and hedgerow enhancement -** A. Planting shrubs and trees, B. Wildflower bulbs **5. Wildlife boxes -** A. Bat boxes, B. Bird boxes, C. Hedgehog houses, D. Insect hotels **6. Raingarden planters and container pond/s** **7. Nature trail and orchard interpretation panels**
Target area	**Up to 1.1 ha**
Things to consider	Natural Networks can only help to fund public access improvements, including interpretation panels, up to a maximum of 20% of the total project cost. Holding 'planting days' where volunteers help to plant the bulbs, plugs, trees, and shrubs is a good way of encouraging community engagement.

1. Introduction

The Natural Networks programme is a European Regional Development Fund (ERDF) funded three-year partnership between Worcestershire Wildlife Trust and Worcestershire County Council (https://www.worcswildlifetrust.co.uk/natural-networks). The programme aims to support biodiversity and enhance habitats by offering advice and grants.

This report uses information gathered from the site manager, a desk study, and a field survey. The report aims to describe the ecological context and status of the site and to recommend biodiversity enhancement measures and wildlife-friendly management practices. Worcestershire Wildlife Trust and Worcestershire County Council, the partner organisations forming the Natural Networks programme, are engaged to provide information and advice, including design advice, for this project. Recognising Construction Design Management Regulations, we will not be undertaking the role of 'Principal Designer' and our recommendations are advisory only.

A comprehensive ecological assessment of a site can only be made through repeated visits to the site covering multiple seasons. Consequently, this assessment can only be considered to provide a 'snapshot' of the ecological interest of the site.

2. Site context

Wychbold Recreation Area covers approximately 3.8 ha and includes a community hall, car park, children's play park, outdoor gym, multi-use games area, football field, allotments, a community orchard, and several parcels of deciduous woodland. There is a programme of renovation and improvement underway for the site and the play areas in particular have been expanded and enhanced recently, with a pump track due to be installed in the future. There is a proposal to create a new vehicle entrance for the allotments from the road to the east which will reduce the length of the track running along the eastern hedgerow. The creation of a new entrance is not considered part of this project.

The site lies on the eastern edge of Wychbold village and is surrounded by urban development and farmland. The surrounding habitats include gardens, pasture fields, arable farmland, hedgerows, and other urban greenspaces. Although most of these habitats have relatively limited value for biodiversity, the landscape also contains several small areas of higher value habitats, including traditional orchards to the southeast and southwest, and strips of deciduous woodland and wetlands to the east of Wychbold. Designated sites nearby include the River Salwarpe Local Wildlife Site (LWS) to the northwest, the Worcester-Birmingham Canal LWS to the east and Upton Warren Nature Reserve (Worcestershire Wildlife Trust Reserve) to the northeast. These sites have only limited ecological connectivity to the project site.

Notable species records (held by the Worcestershire Biological Records Centre - WRBC - http://www.wbrc.org.uk/WBRC/index.html) for the area within 1 km of the site boundary include hornbeam, wayfaring tree, smooth newt, grass snake, slow-worm, hedgehog, pipistrelle bat, and Daubenton's bat.

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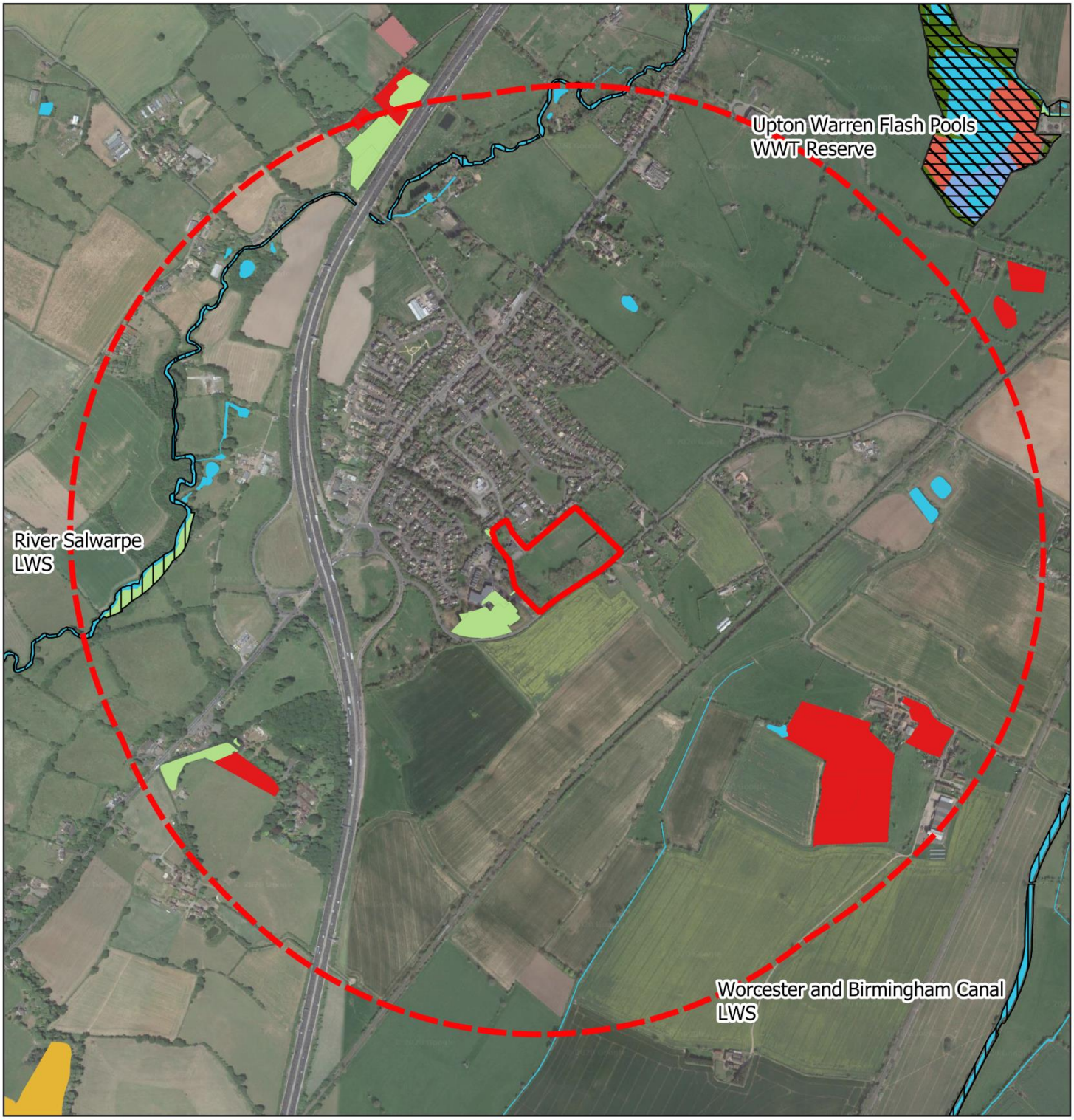
Dodderhill Parish Council Wychbold Recreational Area Designated Sites and Priority Habitats Map



- Approximate site boundary
- 1 km site buffer
- SSSI
- Local Wildlife Site
- WWT Reserve
- Surface water
- Deciduous woodland
- Traditional orchard
- Lowland meadows
- Lowland fens
- Reedbeds
- No main habitat
- Wood Pasture and Parkland

0 250 500 m

N

1:13,000

Site and habitat data from Natural England and Worcestershire Biological Records Centre

3. Existing Habitats and Biodiversity

Most of the site is amenity grassland, comprising the football pitch and play areas. This closely mown grassland has relatively low biodiversity value. In places, strips along the hedgerows which surround the football pitch have been managed less intensively and the taller grasses and scrub which are present here provide useful habitat and corridors for wildlife. The hedgerows themselves contain a mixture of shrubs and trees, including hawthorn, field maple, silver birch, holly, apple, and several large mature oak and ash trees along the western and northern boundaries. The large oak and ash trees are of particular value for wildlife and some have veteran features such as dead branches, crevices, and dense ivy growth, which will help to provide places for invertebrates, birds, and bats to nest and shelter. A mature conifer hedge with elder shrubs separates the football pitch from the orchard and allotments, this hedge has been reduced in height but is still substantial.

The margin and scattered hedgerow with veteran oaks to the northwest of the football pitch.

The margin and hedgerow to the northeast of the football pitch.

The community orchard is approximately 0.13 ha in size and contains a range of fruit trees and shrubs, though there is enough space to approximately double the number of fruit trees. There are pairs of outgrown willow trees in two of the corners of the orchard that are intended to be converted into willow arches. The grassland has been allowed to grow in 2020. Much of the sward consists of rank grasses and some scattered species such as common nettle, bramble, field bindweed, and dock, but there are other species present which indicate the grassland could be more species rich with the right management. These indicator species include common

knapweed, oxeye daisy, lady's bedstraw, and field scabious. The hedgerow to the north of the orchard consists of hawthorn (with some mistletoe), elm, ash, elder, ivy, common nettle, and bramble scrub.

The community orchard.

The allotments cover 0.31 ha and are enclosed by a stock mesh and rabbit wire fence. The allotments contain a mixture of fruits, vegetables, flowers, and patches of ruderal vegetation such as common nettle, providing a mixed habitat which will be beneficial to pollinating insects. There is an access track which leads from the allotments between the eastern boundary hedge and the east wood to a gateway in the southern corner of the site. This track is the only vehicular access to the allotments and it reportedly becomes muddy and difficult to use during the winter. As part of a separate project it is proposed that a new gateway and parking area will be created closer to the allotments. This will make this track redundant and will reduce impact on the wood, e.g. compaction of soil around trees roots.

The allotments with the edge of the east wood to the left.

The south eastern boundary of the site is lined by a hedgerow and Stoke Road. The hedge contains elm, field maple, ash, hawthorn, ivy, wild rose, common nettle, and bramble along with a strip of common nettle and other ruderal plants. The hedge is sparse where the elm component has died out. There is a patch of common nettle near the allotment parking area. There is also a group of three ash trees in a cluster next to the hedge. Some of the ash trees around the site appear to show early signs of ash dieback disease (https://www.woodlandtrust.org.uk/trees-woods-and-wildlife/tree-pests-and-diseases/key-tree-pests-and-diseases/ash-dieback/).

The allotment track between the south eastern boundary hedgerow and the east wood.

The woodland on site extends to approximately 0.69 ha and covers three areas: the east wood by Stoke Road, the west wood adjacent to the sports centre, and the small copse to the north of the community hall. The woodland contains ash, sycamore, oak, lime and sweet chestnut, as well as smaller numbers of silver birch, field maple, Scot's pine, and alder. There is a veteran pear tree near the southern end of the east wood. There is a limited understory and ground flora consisting of scattered elder, bramble, common nettle, wood avens, lords and ladies, and small numbers of young hawthorn shrubs and non-native holm oak saplings. The west wood alongside the sports centre has particularly limited understory and ground vegetation and there are several paths and bike tracks running through the wood.

The east wood from near the allotment, note gravel path.

The west wood with disturbed ground and limited understory.

The play areas contain a mixture of artificial surfaces and amenity grassland running the length of the west wood. A series hard-surface paths have been created around the site, including paths along the edges of the woods and one which runs through the east wood. The community hall, car park, and surrounding areas of hard surfacing currently offer little habitat for wildlife.

The play area and community hall with the west wood on the left and east wood to the right.

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Dodderhill Parish Council
Wychbold Recreation Area
Site Map

Approximate site boundary Veteran tree 1:1600

0 50 100 m

N

4. Biodiversity Enhancements

Aspirations

The main aim of the project should be to enhance the site's existing habitats by introducing more native plants and adjusting management to encourage diversity and flowering.

To enhance the orchard, it is recommended that wildflowers and native grasses are introduced to the diversify the meadow, the willow trees should be managed, and more fruit trees and shrubs should be planted. The orchard grassland management should aim to encourage a diverse wildflower meadow, as well as introducing new species, an important part of this will be gradually lowering the soil fertility by cutting and removing arisings as part of a long-term management regime.

The woodland and hedges can be improved by planting more native shrubs, particularly flowering shrubs, and trees to enhance the understory and woodland edges. The woodland ground flora should also be enhanced by planting native bulbs and woodland wildflowers.

The site's wildlife habitat can be further enhanced by creating 'ecotones' around the edges of the woodland and hedges. Ecotones are where different habitats gradually blend into each other, creating a gradient of vegetation height and structure which provides multiple ecological niches for different species of wildlife. They also provide a corridor of habitat which many different species can use. An ecotone can be achieved by introducing more shrubs around the edges of the woodland and hedges and by allowing the grassland around the boundaries to grow longer (as has already been done in some places). Expanding this boundary area further by creating a linear meadow around the edge of the football pitch and woods would provide even more flowers and habitat for wildlife.

A sketch of a blended habitat 'ecotone' - from trees, to shrubs, then to scrub and tussocky grasses or meadow, and eventually to short grassland.

The site's overall habitat value can also be enhanced by installing habitat features such as wildlife boxes, raingarden planters, and container pond/s. This work will be beneficial for a wide range of wildlife, particularly pollinators, bats, and birds. A nature trail with interpretation panels has been proposed for the site and interpretation panels are recommended for the orchard and woodland. These panels will help to improve public understanding and appreciation of the site's wildlife and its habitat management. Improving public access to nature has been shown to improve health and wellbeing.

The project will contribute toward the goals outlined in the Worcestershire Climate Change Strategy 2012-2020, by helping to form an ecologically coherent network of habitats for wildlife to live in and move through, sequester carbon, and improve air quality (see http://www.worcestershire.gov.uk/downloads/file/3780/worcestershire_gi_strategy_document_2013-2018 and http://www.worcestershire.gov.uk/info/20235/sustainability/1092/county_strategies).

The creation of a new parking area for the allotments is outside the scope of this project but some recommendations for the work are given below.

Table 1. Summary of recommended biodiversity enhancement measures.

Biodiversity enhancement recommendations	Estimated area//number/etc
1. Orchard grassland enhancement	**~0.13 ha** **2 kg of seed** **1500 plug plants**
2. Orchard tree planting	**Up to 20 small fruit trees and shrubs (0.13 ha)**
3. Orchard willow management	**Pruning of 4 willow trees to create two archways**
4. Woodland and hedgerow enhancement **A. Planting shrubs and trees** **B. Wildflower bulbs**	**~0.98 ha** **A. Up to 200 shrubs and trees** **B. Up to 1500 wildflower bulbs**
5. Wildlife boxes **A. Bat boxes** **B. Bird boxes** **C. Hedgehog house** **D. Insect hotels**	**Up to 23 boxes** **A. 4 bat boxes** **B. 10-14 bird boxes** **C. 3 hedgehog houses** **D. 2 insect hotels**
6. Raingarden planters and container pond/s	**Up to 6 raingarden planters and 2 container ponds**
7. Nature trail and orchard interpretation panels	**At least two A4 panels recommended (N.B. Natural Networks can contribute to these features up to 20% of the total project cost)**
Up to approximately 1.1 ha	

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Dodderhill Parish Council
Wychbold Recreation Area
Concept Map

- Approximate site boundary
- Ecotone - tree, shrub, and meadow planting
- Woodland enhacement - Tree, shrub, bulb, and plug planting
- Orchard enhacement
- Bird box
- Large bat box
- Small bat box
- Hedgehog house
- Rain planter/container pond

1:1,600

0 50 100 m

N

Recommended Methods

1. Grassland enhancement

The main area of grassland to be enhanced is the orchard meadow, but an additional linear strip of meadow could be created in the ecotone around the edge of the woodland and hedges.

Meadow establishment

It is recommended that wildflowers are introduced as a combination of plug plants and seeds: using a combination of methods will increase the chances of successful establishment of a range of different species. To prepare the ground the grassland should be closely mown in the autumn. Tall grass can be difficult to cut without tractor-mounted equipment - one method is to strim or scythe the tall grass first, rake up and remove the arisings, then mow as closely as possible with a cut-and-collect lawnmower. It is vital that the arisings are removed as this helps to reduce soil fertility, thereby allowing less vigorous wildflowers to compete. Removing arisings also prevents the build-up of a thatch of cut material which would otherwise smother germinating plants. Repeated mowing through the autumn will help to prepare the ground for sowing and plug planting. Hoeing and raking the mown grassland by hand will help to open small patches of bare soil for plugs and seeds to grow. However, exposing bare soil will also encourage the growth of vigorous plants such as docks and thistles and it is likely that these species will need to be controlled by pulling and hoeing during the following summer.

Wildflower and native grass seed should be spread over the meadow following mowing in September or October 2021. Alternatively, the seed could be sown in April 2021, following additional mowing during March and April. Seed can be broadcast by hand onto the surface of the soil. Mixing the seed with sand and broadcasting from several different directions will help to ensure an even spread. Walking over the ground following sowing will help to press the seed into good contact with the soil. Seed should be spread at a rate of 2-3 g per m^2. Either of the following mixtures would be suitable:

- 1kg x https://wildseed.co.uk/mixtures/view/6 and 1 kg x https://wildseed.co.uk/mixtures/view/5
- 2 kg x https://www.habitataid.co.uk/collections/wildflower-seed-meadow-mixes-others/products/clay-soil-meadow-seed-mix

Wildflower plugs should be planted in the spring or autumn. When planting a wildflower plug, first clear a small circle of vegetation to reduce competition. Planting in spring 2021 is recommended and further planting could be undertaken in autumn 2021. Approximately 1500 plug plants are recommended for the orchard area. This number could be increased if the boundary grassland around the rest of the site is included. Watering the plug plants during the first spring and summer will help to improve survival rates. 100-150 plugs of each of the following species is recommended:

Common name	**Scientific name**
Yellow rattle	*Rhinanthus minor*
Common/black knapweed	*Centaurea nigra*
Oxeye daisy	*Leucanthemum vulgare*
Meadow cranesbill	*Geranium pratense*
Yarrow	*Achillea millefolium*
Lady's bedstraw	*Galium verum*
Cowslip	*Primula veris*
Autumn hawkbit	*Scorzoneroides autumnalis*
Birdsfoot trefoil	*Lotus corniculatus*
Field scabious	*Knautia arvensis*

Yellow rattle is an important plant to include in wildflower meadows because it parasitizes grasses, thereby reducing their vigour and helping other wildflowers to compete. Yellow rattle is an annual plant and it must be allowed to grow and set seed every year otherwise it will be lost from the meadow. Unfortunately, yellow rattle is in short supply this year and it may be necessary to introduce it next year instead.

Example suppliers:

- https://www.wildflower.co.uk/wildflower-plugs-and-plants/perennial-wildflower-plug-plants.html
- https://www.meadowmania.co.uk/wild-flower-meadow/wild-flower-plug-plants.htm
- https://www.wildflowerlawnsandmeadows.com/product/clay-loam-and-sandy-soils-plant-plug-collection/
- https://www.wildflowerlawnsandmeadows.com/product/yellow-rattle-hay-rattle-plant-plugs/

For more information on meadow establishment see:

- https://wildseed.co.uk/page/sowing-and-aftercare
- http://www.magnificentmeadows.org.uk/advice-guidance
- https://www.wildflowerlawnsandmeadows.com/how-to-plant-wild-flower-plant-plugs/

Meadow management

The meadow grassland should be left uncut from April to August so that plants can produce flowers and seeds. The grassland should then be cut to approximately 5 cm and the arisings removed - this may require strimming or scything first. The meadow can be mown several more times during the autumn with a cut-and-collect lawnmower. This will help to remove more nutrients and prevent a thatch of material from building up. To accelerate the increase in wildflowers, some seed can be collected before cutting and grown on in a glasshouse ready to be planted out as plugs in the following spring. The orchard grassland can also be mown in the early spring, though this should stop before April and as soon as any yellow rattle seedlings are seen.

Some areas of the meadow should be left uncut each year to provide shelter for overwintering wildlife. Paths can be mown through the orchard or to improve access elsewhere. Vigorously growing plants such as broadleaved dock, common nettle, and creeping thistle should be pulled or hoed to prevent them dominating the meadow.

The arisings can be put into several compost heaps around the site. These heaps should not be too clearly visible or near any entrances, including the proposed new allotment entrance, as this may encourage fly-tipping of garden/allotment waste.

For more information on meadow management see:

- https://wildseed.co.uk/page/management-of-meadows-and-grassland
- http://www.magnificentmeadows.org.uk/advice-guidance

2. Orchard planting

Up to 20 new fruit trees and shrubs can be planted in the orchard. These should be a mixture of species and varieties, including traditional Worcestershire apple varieties, pears, plums, and cherries. Tree rootstocks should be semi-dwarfing or moderate, e.g. M26 or MM106 for apple. Trees should be planted in a regular order to make management easier and reduce competition. A spacing of 5 m between trees will be suitable if semi-dwarfing or moderate rootstocks are used.

Trees should be planted in the winter whilst they are dormant. Each tree will require a rabbit-proof guard and a 1 m diameter area around the base of the trees should be covered with mulch (e.g. compost or well-rotted wood chip) to reduce competition with grasses. Mulch should not be piled up against the trunks of the trees as this can result in fungal damage to the trees. It is recommended that trees are planted with a post for support during the first few years at least. Watering the trees for the first few years during dry spells will help them to establish.

Example suppliers include:

- https://walcotnursery.co.uk/ (a local organic nursery with a range of traditional varieties)
- https://www.frankpmatthews.com/

For more information on planting and traditional orchards see:

- https://www.orangepippintrees.co.uk/articles/fruit-tree-planting-instructions
- https://ptes.org/campaigns/traditional-orchard-project/
- http://publications.naturalengland.org.uk/file/80011

3. Orchard willow tree management

The willow trees should be pruned to improve access and could be managed to create an archway feature. The desired outcome will decide the best method but each of these alternatives could be considered:

- Pollarding at or above head height to encourage regrowth at this height
- Coppicing at just above ground level and training the regrowth into an archway
- Pruning and bending the existing growth to form an arch shape

Further willow planting could be considered in or around the orchard area but given the vigorous growth of the willows they may become dominant and shade out the new fruit trees if they are not regularly pruned: it is therefore recommended that the central area of the orchard is reserved for fruit trees.

If there are other areas where more willow growth is desired, the cut branches could be moved and laid on their sides where they are likely to sprout roots and develop into new trees. Branches could also be used to delineate the edges of paths through the woods or the new parking area, though to prevent re-growth they should be air dried for a period first.

4. Woodland and hedgerow enhancement

A. New shrubs and trees

The woodland and hedges should be enhanced by planting shrubs and trees to increase diversity, fill hedgerow gaps, and create a more varied understory and woodland edge.

Shrubs and trees should be planted in the winter months whilst they are dormant. Approximately 200 shrubs and trees can be planted around the site. Recommended species, numbers, and locations are shown below:

Common name	Scientific name	Number	Location
Hawthorn	*Crataegus monogyna*	30	Woodland, woodland edge, hedges
Hazel	*Corylus avellana*	20	Woodland edge, hedges
Blackthorn	*Prunus spinosa*	20	Woodland edge, hedges
Wild privet	*Ligustrum vulgare*	20	Woodland, hedges
Holly	*Ilex aquifolium*	20	Woodland, hedges
Dog rose	*Rosa canina*	20	Woodland edge, hedges
Dogwood	*Cornus sanguinea*	10	Woodland edge, hedges
Guelder rose	*Viburnum opulus*	10	Woodland edge, hedges
Midland hawthorn	*Crataegus laevigata*	10	Woodland edge, hedges
Crab apple	*Malus sylvestris*	10	Woodland edge, hedges
Spindle	*Euonymus europaeus*	10	Woodland edge, hedges
Honeysuckle	*Lonicera periclymenum*	10	Woodland edge, hedges

For more information on planting see:
- https://www.woodlandtrust.org.uk/plant-trees/advice/how-to-plant/
- https://www.wildlifetrusts.org/actions/how-make-woodland-edge-garden-wildlife

Potential suppliers include:
- https://www.habitataid.co.uk/collections/british-trees-shrubs
- https://shop.woodlandtrust.org.uk/trees
- The Woodland Trust may also supply free/discounted shrubs and trees to community projects: https://www.woodlandtrust.org.uk/plant-trees/schools-and-communities/

B. Woodland ground flora

The woodland and woodland edges can be further enhanced by introducing bulbs, plugs, and seed of woodland and shade-tolerant wildflowers. Bulbs and plugs should be planted in swathes and small clusters of the same species with plants approximately 15-30 cm apart. Gently throwing a handful of bulbs and planting them where they fall can help to create a more ‘natural’ looking spread of plants. Bulbs and plugs can be planted in late autumn or early spring. Recommended wildflower bulbs species include:

Common name	Scientific name	Number	Location
British bluebell	*Hyacinthoides non-scripta*	500	East wood and west wood
Wild daffodil	*Narcissus pseudonarcissus*	500	Woodland edges and grassland
Ramsons (wild garlic)	*Allium ursinum*	250	West wood
Snowdrop	*Galanthus nivalis*	250	Copse and lone trees around community hall

Example suppliers for bulbs include:
- https://www.bostonbulbswholesale.co.uk/
- https://wildnativebulbs.co.uk/index.html

Recommended wildflower plug plants for areas of dappled shade within the woodland and along the woodland edge include:

Common name	Scientific name	Number
Foxglove	*Digitalis purpurea*	50-100
Red campion	*Silene diocia*	50-100
Primrose	*Primula vulgaris*	50-100
Herb Robert	*Geranium robertianum*	50-100

See example suppliers as for the meadow plug plants.

Woodland and hedgerow management

The edges of the woodland and the hedges surrounding the site should be managed as ecotones as described earlier. This can be achieved by planting shrubs around the woodland edge and allowing vegetation to grow taller. In some areas, strips alongside the edge of the woodland could be managed as meadow in the same way as the orchard meadow. This will help to create a network of wildflower and flowering shrubs throughout the site. The margins between different habitats should be managed to create wavy edges, rather than straight lines, as this helps to create microclimates and increase edge habitat.

The east wood currently has a dense canopy of similarly aged trees with a sparse understory and ground flora and little deadwood habitat. The wood could be enhanced by thinning some of the ash or sycamore trees, to create small openings where more light can penetrate the canopy, thereby supporting the development of an understory and ground flora. This can be achieved by reducing and ringbarking a small number of ash or sycamore to create deadwood monoliths, leaving the felled wood on the ground or gathering it to build habitat piles.

Deadwood, and particularly standing deadwood, is a valuable habitat for wildlife and where possible, dead trees should be left standing. If they need to be managed for health and safety reasons, the preference should be for reduction, e.g. removing branches to create a monolith, rather than felling. Any deadwood from reduced or felled trees should be kept on site. Pieces of deadwood should be kept as large as possible so that they take longer to break down and provide suitable habitat for beetle larvae, many of which require large pieces of wood in which to complete their lifecycle. Ideally fallen trees should be left intact, but where they need to be cut up the wood should used to create habitat/log piles, preferably near the stump of the tree. Habitat piles can be created by simply piling lengths of trunk and branches together. Some logs and branches could also be used to mark the edges of paths or create borders of areas where bulb planting has taken place. This may be particularly useful in the west wood. Large sections of tree trunk could also be stabilised to create informal seats which will also provide deadwood habitat.

Ash is one of the most abundant tree species around the site. Unfortunately, some of the ash trees appear to show early signs of ash dieback disease (see https://www.woodlandtrust.org.uk/trees-woods-and-wildlife/tree-pests-and-diseases/key-tree-pests-and-diseases/ash-dieback/). Given the popularity of the site and the proximity of some of the ash trees to Stoke Road, it may be prudent to commission an arboricultural survey to check the trees' health and assess the risk of falling branches.

For more information on woodland management see:

- https://www.wildlifetrusts.org/wildlife-advice/how-manage-woodland-wildlife#:~:text=A%20whole%20tree%20will%20be,for%20all%20manner%20of%20wildlife.
- http://www.hedgelink.org.uk/index.php?page=23

An example of a habitat pile created using large sections of tree trunk and branches at a sunny woodland edge.

4. Wildlife boxes

Wildlife boxes can help to make up for the lack of natural nesting and roosting opportunities which would be found in ancient woodland but are missing from many of our more managed environments. There are several large trees in the hedges and woodland which would be suitable for installing bat and bird boxes. Some bird boxes could also be installed on the hall building. Some suggested locations for the boxes are shown on the Concept Map.

It is recommended that boxes are constructed from 'woodcrete' or 'woodstone' material as this provides better insulation, better protection against predators, and generally lasts much longer than wood (for examples see https://www.wildcare.co.uk/wildlife-nest-boxes/bat-boxes/woodstone-woodcrete/show/all.html and https://gardenature.co.uk/shop/wildlife-habitats/schwegler-habitats/schwegler-bat-boxes). Natural Networks can provide more advice on box types and locations.

Boxes can be installed at anytime of the year but installing them in the autumn increases the chances that they will be used for nesting in the next spring and provides additional shelter for animals over the winter. When boxes are installed on trees, aluminium or stainless-steel nails should be used as other types of nail may damage the tree and corrode (e.g. https://www.wildcare.co.uk/aluminium-nails-75mmx3mm-16145.html?___store=wildcare). Larger boxes may require more substantial fixtures.

A. Bat boxes

Bat boxes can be installed on trees or buildings, but they should not be exposed to artificial light - the hall is therefore unlikely to be suitable. The boxes should be at least 4 m above the ground and should face into an open space to ensure easy flight lines. Large, healthy, and long-lived trees (e.g. oaks) can be suitable locations. Bat boxes should be exposed to sunlight for at least part of the day so that they warm up. Installing several small boxes on the same tree but facing in different directions helps to provide shelters with different temperature regimes, the bats can then choose where to roost to optimise their body temperature. Installing one small box facing between south and east and another between south and west gives a good range of temperatures. Larger boxes can be installed individually, preferable orientated south or south east. For more information see: https://www.bats.org.uk/our-work/buildings-planning-and-development/bat-boxes/putting-up-your-box. Once installed, bat boxes should only be opened or moved by people with the required licences.

Suggested models include:

- (large) https://www.wildcare.co.uk/miramare-woodstone-bat-box-11268.html,
- (small) https://www.wildcare.co.uk/harlech-woodstone-bat-box-11266.html

An example of two small bat boxes fixed to a mature, healthy tree. Note the open flight paths to the boxes.

B. Bird boxes

Unlike bat boxes, bird boxes should be not be exposed to direct sunlight for long periods. They should face south-east in shady locations, and east or north where the sunlight is more direct. Boxes should not face southwest in open areas as this exposes them to prevailing winds and rain. Birds boxes should be 1.5 - 3 m above ground level. Getting a mixture of nest holes sizes (e.g. 28mm and 32mm) as well as some open-fronted boxes will help make them suitable to several different species.

Ideally, bird boxes should be cleaned out during autumn so that birds are more likely to use them in the following year. It is recommended that boxes are installed in positions which can be reached with a step ladder but are out of reach of the public - so that they can be maintained but are less likely to be disturbed.

Examples include:

- https://www.wildcare.co.uk/woodstone-barcelona-open-nest-box11287.html, https://www.wildcare.co.uk/vivara-pro-woodstone-nest-box-11251-g.html, https://www.wildcare.co.uk/vivara-pro-woodstone-nest-box-11241-g.html
- https://www.birdfood.co.uk/nest-boxes/woodstone

C. Hedgehog houses

These should be positioned in areas where disturbance will be minimal. They should be covered by branches and vegetation to make them less obvious. The preference should be for woodcrete or wooden boxes. Examples include:

- https://www.wildcare.co.uk/woodstone-hedgehog-house-10506.html
- https://www.wildcare.co.uk/10512-hedgehog-nest-box-nbc.html

This project could potentially be used to initiate a community-led hedgehog conservation project, with the recreation area acting as a hub. For more information see: https://www.hedgehogstreet.org/

D. Insect hotel

These should be mounted in a sunny, south facing location. They should preferably be out of the reach of the public. One could be installed on the community hall and another could be installed near the orchard and allotments, potentially on one of the exposed tree trunks in the conifer hedge.

Examples include:

- https://www.wildcare.co.uk/elba-insect-tower.html
- https://www.arkwildlife.co.uk/product/mason-bee-house/

These features could also be built as part of a community engagement project:

- https://www.wildlifetrusts.org/actions/how-make-bee-hotel
- https://www.wildlifetrusts.org/actions/how-build-bug-mansion
- https://www.woodlandtrust.org.uk/blog/2019/09/how-to-build-a-bug-hotel/

5. Raingarden planters and container ponds

Several raingarden planters, or 'stormwater planters', could be installed around the community hall. These planters take water from the guttering downpipes to keep plants watered, with excess water being redirected back to the drains. Raingarden planters can be made from simple galvanised troughs, lined wooden boxes, or even brick and stone. Some raingarden planters or stormwater planter designs incorporate several different planters, container ponds, or elaborate pipework (e.g. https://www.wendyallendesigns.co.uk/stormwater-downpipes, and https://www.welshwildlife.org/pressreleases/swansea-makes-a-splash-rain-gardens-officially-opened/). Depending on their size, approximately 6 planters could be installed. These planters can also be aesthetically pleasing and would improve the appearance of the front of the hall. In addition to the planters, the downpipes could be used to feed bird baths and container ponds. Creating ponds is an excellent way to increase biodiversity on a site as they can be home to a wide range of species.

The planters should include a range of flowering plants which will be beneficial for pollinators and other wildlife. Natural Networks can provide more information if required.

Examples of suppliers include:

- https://www.sudsplanter.com/product-range
- https://marmaxproducts.co.uk/products/recycled-plastic-rain-garden/
- It may also be possible to order bespoke planters

For more information see:

- http://www.sgif.org.uk/index.php/docman/10-000-raingardens/56-rg-box-basics/file
- https://raingardens.info/wp-content/uploads/2012/07/UKRainGarden-Guide.pdf
- http://www.rbc.com/chelsea/pdf/gardening-ebook.pdf

7. Nature trail and interpretation panels

Several interpretation panels should be installed around the site as part of the proposed nature trail, with at least one in the orchard and another near the entrance to the east wood. The panels should describe the adjacent habitat and the species which it hosts. An orchard panel should include information about the meadow management and the fruit trees. Tree tags showing the species and variety of the orchard's fruit trees (along with date of planting if known) would be an interesting addition. Small to medium sized panels are recommended (e.g. A4 or A3). Natural Networks can provide more advice on the content of the panel if required. Natural Networks can only contribute towards interpretation panels and public access improvements up to a maximum of 20% of the total project cost.

An example of an interpretation panel giving information about the habitat and species which can be found at a pond.

Notes on the new allotment parking area

This work is not part of the Natural Networks project, but some recommendations are given below.

A new vehicle entrance and small parking area is proposed for the eastern corner of the site next to the orchard. The new entrance and parking area should be screened with a new section of hedge to help it blend in with the existing hedges and maintain habitat connectivity. The new parking area should be surfaced with 'grasscrete' or another type of permeable surface which allows vegetation growth and water permeation whilst still providing a solid base to drive and walk on.

The new entrance will make the track along the east wood redundant, helping to reduce disturbance to the wood. The old track should be managed as a relatively open and sunlit 'woodland ride' between the edge of the east wood and the Stoke Road hedgerow. The woodland edge and hedgerow can be widened slightly and enhanced by planting scattered shrubs and trees along their edges and by allowing a denser undergrowth to develop. The old gateway in the southern corner of the site should be planted up to extend the hedgerow, preferably including the creation of a ditch and bank to provide more variety for wildlife. The hedgerow planting should consist of a range of shrubs and trees such as those given in the list for the woodland and hedgerow enhancement.

Any trees or shrubs which are cleared in the creation of the new gateway should be kept on site and used to create habitat piles within and on the edge of the east wood. Larger sections of trunk and branches could also be staked in place to mark the edges of the parking area or used to create informal seating.

Table 2. Recommended timeline for the first year of biodiversity enhancement works. Darker orange indicates optimum timing.

Type of work	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Meadow cut and collect												
Wildflower seeding (after mowing)												
Plug planting (after mowing)												
Bulb planting								Dormant bulbs			‘In the green bulbs’	
Tree and shrub planting												
Install wildlife boxes, raingarden planters, container ponds, interpretation panels, etc.												

5. Long-term management

A management plan will be required by the Natural Networks appraisal panel before a grant is awarded. Management plans can be very helpful for ensuring the long-term future of wildlife habitats, such as wildflower meadows and orchards, which often require rotational and/or season-specific management over many years. It is recommended that the plan contains photos and a map of the site so that changes can be monitored through the years.

Biological recording is a good way of improving species identification skills and understanding of wildlife. Records of species found at the site, particularly notable or rare species, should be submitted to the Worcestershire Biological Records Centre to improve records of wildlife in the area (http://www.wbrc.org.uk/WBRC/index.html).

6. Things to consider

- Holding ‘planting days’ where volunteers help to plant the bulbs, plugs, trees, and shrubs is a good way of encouraging community engagement.
- Habitat enhancement works and the future management of the site should use minimal and ideally no pesticides or synthetic fertilisers.
- Natural Networks can only help to fund public access improvements, including interpretation panels, up to a maximum of 20% of the total project cost.
- All plants and seeds purchased as part of the project should be sourced and grown in the UK, ideally from local stock. They should be produced using peat-free and preferably organic methods. All other materials should be sustainably sourced and reused or recycled wherever possible.
- Applicants are encouraged to be mindful of policy and legislation which protects wildlife from some activities which may be included within the proposed biodiversity enhancement works. A summary of relevant legislation can be found at https://www.wildlifetrusts.org/uk-wildlife-law. Scrub clearance, for

example, should take place outside of the bird nesting season, which generally takes place between March and August inclusive.

- Grants cannot be given for works which have taken place before the grant agreement is signed. Before a grant can be claimed, a Natural Networks Officer will carry out a check for satisfactory completion of works. If works are found to be unsatisfactory or incomplete, the grant cannot be claimed until remedial works are undertaken by the applicant.
- The applicant should discuss the recommendations made in this report with the Natural Networks officer to ensure the proposals are suitable. Once this has been done, it is recommended that a full application is submitted to the Natural Networks appraisal panel for funding.

Appendix 1

Notable species records from within 1 km of site boundary (as of March 2019).

Order	Common name	Scientific name	Status
amphibian	Smooth Newt	*Lissotriton vulgaris*	WCA
bird	Kingfisher	*Alcedo atthis*	WCA
bird	Peregrine	*Falco peregrinus*	WCA
bird	Red Kite	*Milvus milvus*	WCA
flowering plant	Common Restharrow	*Ononis repens*	Locally Nb
flowering plant	Grey Club-rush	*Schoenoplectus tabernaemontani*	Locally Nb
flowering plant	Heath Groundsel	*Senecio sylvaticus*	Locally Nb
flowering plant	Hornbeam	*Carpinus betulus*	Locally Nb
flowering plant	Lesser Sea-Spurrey	*Spergularia marina*	Locally Nb
flowering plant	Little Mouse-ear	*Cerastium semidecandrum*	Locally Nb
flowering plant	Marsh Arrowgrass	*Triglochin palustre*	Locally Nb
flowering plant	Reflexed Saltmarsh-Grass	*Puccinellia distans*	Locally Nb
flowering plant	Small-Flowered Buttercup	*Ranunculus parviflorus*	Locally Nb
flowering plant	Water Dock	*Rumex hydrolapathum*	Locally Nb
flowering plant	Wayfaring-tree	*Viburnum lantana*	Locally Nb
reptile	Grass Snake	*Natrix helvetica*	WCA NERC s.41 UKBAP
reptile	Slow-worm	*Anguis fragilis*	WCA NERC s.41 UKBAP WorcBAP
terrestrial mammal	Badger	*Meles meles*	PBA
terrestrial mammal	Brown Hare	*Lepus europaeus*	NERC s.41 UKBAP
terrestrial mammal	Daubenton's Bat	*Myotis daubentonii*	WCA ECH4 WorcBAP
terrestrial mammal	Hedgehog	*Erinaceus europaeus*	NERC s.41 UKBAP
terrestrial mammal	Otter	*Lutra lutra*	WCA NERC s.41 UKBAP ECH4 WorcBAP
terrestrial mammal	Pipistrelle sp.	*Pipistrellus*	WCA NERC s.41 UKBAP ECH4 WorcBAP
terrestrial mammal	Polecat	*Mustela putorius*	NERC s.41 UKBAP
terrestrial mammal	Water Vole	*Arvicola amphibius*	WCA NERC s.41 UKBAP WorcBAP

Locally Nb: Locally Notable
NERC s.41: Natural Environment and Rural Communities Act (2006) Section 41
UKBAP: United Kingdom Biodiversity Action Plan
WorcBAP: Worcestershire Biodiversity Action Plan
Bird:Red: Red Listed by Birds of Conservation Concern 4 (2015)
WCA: Wildlife and Countryside Act (1981)
PBA: Protection of Badgers Act (1992)
ECH4: European Protected Species, Conservation of Habitats and Species Regulations (2017)