Cinderford Northern Quarter

Habitat Survey and Assessment

On behalf of Forest of Dean District Council

Project Ref. EP2019017Av4

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Contents

1 Introduction

1.1 Scope

1.1.1 Wild Service was commissioned by Forest of Dean District Council (FoDDC) to undertake baseline monitoring surveys of an area cleared of conifer plantation in 2016 that forms part of the Cinderford Northern Quarter (hereafter referred to as the 'Site'), to help inform future management. The baseline monitoring surveys comprise;

- An ecological grassland survey,
- A Phase 1 habitat assessment and;
- A National Vegetation Classification (NVC) survey & accompanying shapefiles

1.1.2 The ecological grassland survey was commissioned to assess species diversity and ascertain whether the following was being achieved:

a. A species diversity of more than 15 species per sqm
b. Less than 10% cover of rye grass, clovers and creeping buttercup
c. 30% or more cover in wildflowers (excluding 'weed' plants such as dock, nettle etc.)

1.1.3 This report includes a description of the methods used during the grassland survey, results, and recommendations for management and monitoring.

1.1.4 The Cinderford Northern Quarter (CNQ) is located to the north-west of Cinderford in the Forest of Dean. An Area Action Plan (AAP) for the Northern Quarter was published in 2012. The AAP seeks to enable significant regeneration opportunities within the area whilst respecting the ecological importance of the area. Conifer plantation on land to the south of the AAP area was removed in 2016 and replaced with new ponds, grassland and broadleaf woodland, in order to avoid net loss of habitat for a variety of protected and important species including great crested newts.

1.2 Site Description

1.2.1 The Site comprises flat to gently sloping ground at the north end of what is known as Cinderford Linear Park. It adjoins mixed woodland to the south-west and west, alder carr to the south, open ground to the north and a mosaic of grassland, scrub and woodland habitats to the east. It overlies Cinderford Member bedrock (mudstones, siltstones and sandstones), giving rise to acidic soils. Much of the Site is waterlogged, with drier ground on the higher, gently north-east facing sloping ground in the south-west corner. There are two newly created ponds on Site. A ditch runs down the eastern boundary and the raised ground of an old railway line runs alongside the ditch, forming the eastern part of the site.

1.3 Legislation

1.3.1 This report has been prepared in accordance with relevant legislation and policy. Further detail is provided in **Appendix 5**, however the following primary documents are of relevance:

- The Wildlife and Countryside Act 1981 (as amended) (WCA 1981);
- The Countryside and Rights of Way Act (CRoW Act), 2000 (as amended);
- The Protection of Badgers Act 1992 (PBA 1992);
- The Natural Environment and Rural Communities Act (NERC Act), 2006; and
- The Conservation of Habitats and Species Regulations 2017 (as amended) (CHS 2017).

1.3.2 No part of this report should be considered as legal advice and when dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.

2 Survey Methods

2.1 Survey Dates, Conditions & Surveyors

2.1.1 All surveys were conducted over the course of three site visits on 29th and 30th May 2019, and 10th June 2019.

2.1.2 Surveyors comprised Jeremy Doe, Elizabeth Pimley, Michelle Newman, Julia Morrison, Glenn Norris.

2.2 Ecological Grassland Survey

2.2.1 The survey methodology was based on Natural England's Common Standards Monitoring (JNCC, 2009), devised as a method for rapid assessment of SSSIs. This involves a structured walk (following a W route) across the site stopping at regular points to record species and other attributes in an approximate 1 x 1m quadrat (see Figure 1). In the event the walk sampled 35 points, working north to south and including points along the old railway line. Points were at 20 pace intervals, avoiding areas beneath trees. GPS grid references were taken of each sample point and photographs taken of the route of each line of the W.

2.2.2 At each point along the structured walk, the following data was recorded:

- All vascular plant species within 1mX1m quadrat,
- % cover of rye-grass, clovers and creeping buttercup
- % cover of 'weed' species (docks, nettles, thistles (excluding marsh thistle))
- % cover wildflowers
- % cover of scrub and bare ground
- Average sward height
- Any observations of wildlife were also recorded and added to Appendix 2.

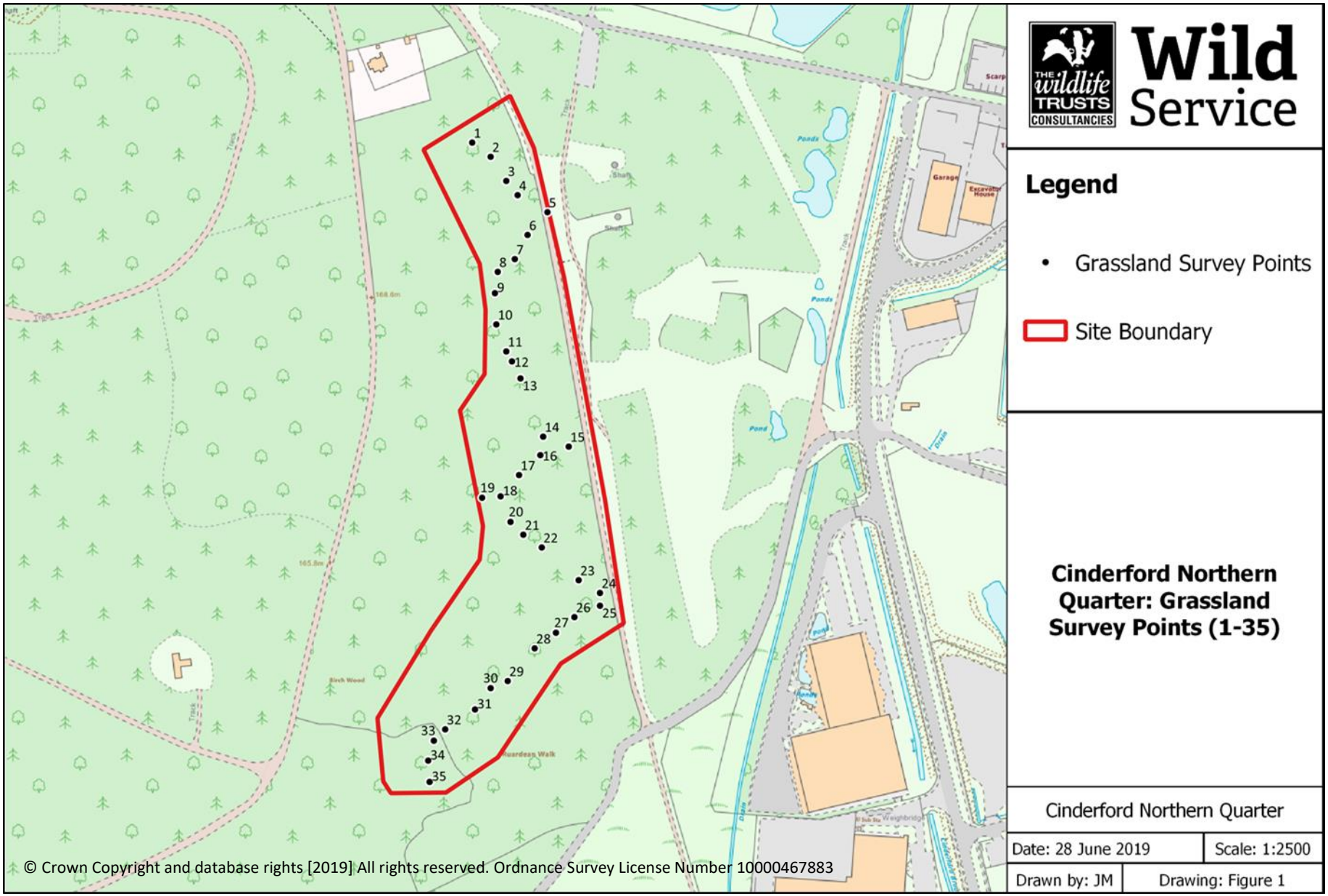
2.3 Phase 1 Habitat Survey

2.3.1 During the structured walk conducted for the ecological grassland survey, habitats were mapped to provide a description of the semi-natural vegetation of the site in

order to produce a Phase 1 Habitat map in accordance with the JNCC Phase 1 Habitat Survey methodology (JNCC, 2010). A full species list was produced, including any invasive plants listed on Schedule 9 of the Wildlife & Countryside Act which may have implications for works on site.

2.4 National Vegetation Classification (NVC)

2.4.1 NVC types were recorded in targeted areas using a quadrat (1mx1m) centred on each sampling point. The vegetation community was classified using the National Vegetation Classification (NVC) where appropriate. The abundance for each species and bare ground was recorded using the DOMIN scale in line with the NVC methodology (Rodwell, 2006).


Wild Service
Legend
Grassland Survey Points
Site Boundary
Cinderford Northern Quarter: Grassland Survey Points (1-35)
Cinderford Northern Quarter
Date: 28 June 2019
Scale: 1:2500
Drawn by: JM
Drawing: Figure 1
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3 Results

3.1 Ecological Grassland Survey Results – Species Diversity

3.1.1 Overall the site supports a good range of vascular plants, with over 160 species recorded (see Appendix 1 for full species list). As this was not an exhaustive plant survey it is likely numerous other species await finding. The majority of species recorded are widespread and commonplace, typical of such habitats in west Gloucestershire. None are of particular rarity, although there are several listed as 'Near Threatened' on the English Red Data List indicating a decline of at least 20% since 1930. One species, lesser spearwort *Ranunculus flammula*, is listed as 'Vulnerable' on the Red List, indicating a decline of c.45% through loss of wetland habitats. 'Near Threatened' species recorded on Site include quaking-grass *Briza media*, heather *Calluna vulgaris,* star sedge *Carex echinata*, wild strawberry *Fragaria vesca*, corn mint *Mentha arvensis*, wood-sorrel *Oxalis acetosella*, ragged-robin *Silene flos-cuculi*, mat-grass *Nardus stricta* and tormentil *Potentilla erecta*.

3.1.2 The average species diversity per sqm recorded a score of 13.94, which is near to the target of 15. The resultant score was reduced by two or three poorly scoring quadrats. Some quadrats in the bracken underscrub scored badly, as did a couple of *Juncus* dominated quadrats. It should be stated that there was some 'lumping' of species during the rapid quadrat assessments, particularly of bent *Agrostis spp.* and willow *Salix spp.* seedlings.

3.1.3 A few axiophyte species i.e. species of particular interest to botanists, were recorded and include sneezewort *Achillea ptarmica*, narrow buckler-fern *Dryopteris carthusiana* and marsh violet *Viola palustris*, the latter considered to be restricted to west of the Severn in Gloucestershire.

3.1.4 No invasive Schedule 9 plants were seen on site or in the vicinity.

3.2 Ecological Grassland Survey Results – Rye Grass, Clovers & Buttercup (% cover)

3.2.1 % cover of wildflowers, excluding 'weed' plants, namely docks, nettle and creeping and spear thistles were recorded in 35 quadrats across the site, following the

structured W walk to ascertain if species diversity of more than 15 per sqm. Analysis of all the quadrat data are provided in full in Appendix 2 and is summarised below.

3.2.2 Average % cover rye-grass, clover and creeping buttercup was recorded at 0.68%., which is well below the 10% maximum limit for these species The only rye-grass and white clover recorded were located along the railway line, and they were not a component of the marshy grassland, bracken underscrub, or acidic grassland. Creeping buttercup was recorded in many of the quadrats but is a natural component of the M23 community (see NVC results section), in particular, so these results are not of undue concern.

3.3 Ecological Grassland Survey Results – Wildflower Diversity

3.3.1 Average % cover of wildflowers was recorded at 20.2%; which is 33% less than the target cover of 30%. However, it should be mentioned that M23 and W25, which were the most frequently sampled NVC communities, are not particularly floriferous habitats, either in diversity or abundance, being more dominated by bulky rushes, grasses and ferns. Interestingly, if the bracken underscrub quadrats, some of which were very barren, were excluded, it is considered likely that the 30% would be achieved. Acidic grassland quadrats had a cover over 50%.

3.4 Ecological Grassland Survey Results – Additional Attributes

3.4.1 Additional attributes recorded were bare ground, scrub cover and sward height. Bare ground average cover was 3.6%. Extensive wild boar damage in 2-3 quadrats and rabbit digging on some of the ant-hills in the acidic grassland, were the main contributory factors to these results; otherwise bare ground was negligible. Scrub cover of 3.31% mainly comprised bramble *Rubus fruticosus* and seedling willows *Salix* spp. and birch *Betula*, with some young oak *Quercus* and hawthorn *Crataegus monogyna*.

3.5 Phase 1 Habitat Survey Results

3.5.1 Phase 1 Habitat survey results are presented in Figure 2.

3.5.2 The majority of the site supports damp to waterlogged marshy grassland dominated over large areas by a tall, lush growth of soft-rush *Juncus effuses*. The higher drier ground in the south-west, (more recently cleared woodland) supports bracken dominated tall herb and fern. A narrow ditch runs near the eastern boundary, beyond which are small areas of acidic grassland and a mosaic of other habitats along the old railway line, including rank grassland, tall herb and scrub. There are also two ponds within the grassland areas

3.6 **NVC Survey Results**

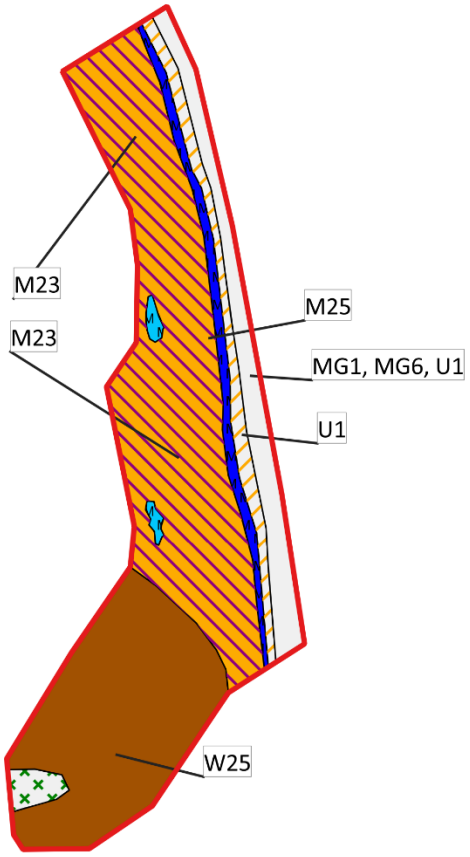
3.6.1 NVC survey results are presented in Figure 2.

3.6.2 The majority of the marshy grassland can be assigned to M23b *Juncus effusus/acutiflorus – Galium palustre* rush-pasture; *Juncus effusus* sub-community. In places, particularly alongside the ditch, an increase in purple moor-grass *Molinia caerulea* shifts this into M25 *Molinia caerulea – Potentilla erecta* mire, specifically the M25b *Anthoxanthum odoratum* sub-community.

3.6.3 The bracken dominated ground is best allocated to the W25 *Pteridium aquilinum – Rubus fruticosus* underscrub community and, more specifically, to the W25a *Hyacinthoides non-scripta* sub-community.

3.6.4 Acidic grassland on and alongside the old railway line, characterised by frequent ant-hills, fits nicely into the U1e *Festuca ovina – Agrostis capillaris – Rumex acetosella* grassland; *Galium saxatile – Potentilla erecta* sub-community.

3.6.5 Also, along the railway line are small areas of rank grassland (MG1 *Arrhenatherum elatius* grassland), semi-improved grassland (MG6 *Lolium perenne – Cynosurus cristatus* grassland), scrub and young alder woodland (the site adjoins alder carr).



Wild Service

Phase 1 Habitats

- A2.2 Scrub - scattered
- B1.1 Acid grassland
- B5 Marshy grassland
- C1.1 Bracken continuous
- G1.2 Standing water
- G2.2 Running water
- J5 Other: mosaic habitat

Cinderford Northern Quarter: Phase 1 Habitat Map & NVC Map

Cinderford Northern Quarter

Date: 17 July 2019	Scale: 1:2500
Drawn by: JM	Drawing: Figure 2

4 Assessment

4.1 UK Priority Habitats

4.1.1 The site supports UK Priority Habitats: Purple moor-grass and Rush Pastures and Lowland Dry Acid Grassland. These habitats and NVC habitats M23, M25 and U1 are characteristic of the acidic areas of the Forest of Dean coal measures. They were regularly recorded on the English Nature Grassland Inventory Surveys 1993-94. The adjacent Laymore Quag supports M23 and M25 habitats and the nearby Steam Mills and Bilson Green support U1 (J. Doe, pers. comm. & Ref. Magic Map).

4.1.2 Assessment of habitat quality is made against the Gloucestershire Wildlife Trust's (GWT) Key Wildlife Site criteria (now known as Local Wildlife Site (LWS)) (GWT, 2015). This was considered the best criteria to assess against, particularly as the site adjoins the existing Cinderford Linear Park LWS to the east and south, the land to the south being also the long-standing Laymore Quag GWT nature reserve.

4.1.3 The majority of the site, marshy grassland, is assessed against criteria H8.1 All areas of marsh, bog, swamp, mire and tall herb fen over 0.5ha in extent which support 10 or more species from table H8a. The marshy grassland scores 23 qualifying species and being over 0.5ha meets the criteria.

4.1.4 The acidic grassland is assessed against criteria H5.2 – Areas of semi-natural grassland larger than 0.5 ha which are identified as one or more of the NVC types in Table H5b and which support 20 or more species from Table H5c, in this case NVC type U1. 20 species for an acidic grassland is not easy to achieve; however, 24 qualifying species were present. The extent of acidic grassland is less than 0.5ha so does not met LWS criteria but exhibits high quality. It is recommended that it be considered for inclusion in any proposed extension of the Cinderford LP LWS.

4.1.5 The bracken underscrub W25 habitat is not covered by the KWS habitat criteria, but again may be considered for addition to the LWS as good reptile/invertebrate habitat.

4.1.6 The site is likely to meet some species' criteria, most probably for reptiles (common lizards) and amphibians (great crested newts). Records for over three years are needed. Invertebrate surveys may show up species meeting LWS criteria.

5 Management Recommendations

5.1 Long-Term Management

5.1.1 In the long-term it would make sense to incorporate this site into an overall management plan for the Cinderford Linear Park and link with the GWTs management of its Laymore Quag reserve. The recommendations in this report should be reviewed in combination with GWT Forest of Dean projects, namely Heritage Lottery Fund Foresters' Forest conservation grazing project and the ERDF Wild Towns project. The Foresters' Forest project involves the following sites: Woorgreens, Edgehills Bog, Wigpool and Laymoor Quay; which have been earmarked for open habitat restoration/creation under the existing Forestry Commission Forest Plans (Gloucestershire Wildlife Trust 2018). The Wild Towns project involves three areas around Cinderford (a Forestry England owned block to the south of Ruspidge Halt, Church Bank (FoDDC owned) above Valley Road and a Severn Trent Water owned area behind the Crumpmeadow sewage plant in Ruspidge Halt.

5.1.2 The project has been discussed with GWT staff Del Jones and Wil Masefield, who are running projects in the area. Long-term management would include appropriate levels of mixed species grazing. A combination of ponies (e.g. Exmoor) to nibble young scrub, Herbridean sheep to nibble young growth down to ground to give a more uniform sward, and cattle which use their tongues to rip grass out giving varied sward structure – in particular belted Galloway and Highland cattle would be suitable breeds (Highland cattle also use their horns to push through and nibble young shrub growth such as birch and bramble) (D. Jones, pers. comm.).

5.1.3 One of the disadvantages with the use of livestock for conservation grazing is that they generally need to be fenced in, which can be problematic in the Forest of Dean. Electric fencing could be used but can be trampled down by wild boar. Another option that could be considered is the use of a virtual fence system. The Boviguard (Agrifence, Henderson Products Ltd., Gloucester, UK) invisible fence is now commercially available, consisting of cow collars, a battery-based transformer,

and an induction cable laid on the ground or buried in the ground. As the Boviguard collar comes close to the induction cable, a warning sound is triggered and if the animal continues to move closer, an electrical stimulus is triggered. In a trial of the system, the virtual fence approach was found to successfully prevent collared animals from crossing the virtual fence line. Further details can be found at the link below:

https://www.sruc.ac.uk/info/120580/smarter_farming/1887/virtual_fencing

5.2 **Short-Term Management**

5.2.1 In the short-term there are no obvious critical management issues, so lack of any practical work in the next 2-3 years is unlikely to be a problem. However, it is considered likely that scrub growth, particularly birch and willow, in the marshy grassland will develop beyond small seedlings in the next few years so will need to be pulled out/cut by hand (or treated with herbicide Glyphosate or similar) at intervals.

5.2.2 To control the overall dominance of soft-rush it is suggested that selected patches (not the whole area) are cut and arisings raked in late summer/autumn. Manageable areas could be done annually on rotation (perhaps 3 or 4 areas – see Appendix 3), pending a longer-term grazing regime, which would be a more ideal solution.

5.2.3 It is considered likely that the bracken under scrub will continue to thicken up lessening the diversity of wildflowers and its suitability for reptiles. Occasional cutting is recommended (if possible with a tractor-mounted flail). Rabbits are grazing the acidic grassland areas, but some occasional cutting of encroaching scrub is needed, also along sections of the railway line for public access as much as habitat enhancement.

5.3 **Recommended Survey Effort**

5.3.1 The 2019 survey provided a snapshot of the wildlife interest and value of the site. The FODDC recommendation to repeat the survey in 2021 seems sensible and would no doubt identify additional features and give an indication of any changes.

After that repeat surveying at least every five years to monitor the management measures' success.

5.3.2 Considering the diversity of insects observed during the botanical surveys, a dedicated invertebrate survey would provide useful information. It is thought the Gloucestershire Invertebrate Group (GIG) have surveyed the linear park and it could be of interest for them to visit this site for surveys. Another option would be to consult individual invertebrate recorders with an interest in groups of most likely interest (e.g. butterflies and moths, beetles, dragonflies) – GWT may have a list of volunteer invertebrate recorders.

5.3.3 During the botanical surveys, common lizards and slow-worms were recorded in the grassland and adder has been recorded from nearby. It would be useful to record reptile species and numbers more systematically by laying out refugia, which could be monitored every few years (potentially alongside the botanical monitoring surveys to assess population size/composition.

5.3.4 Considering the presence of ponds and great crested newts in the area, in addition to the suitability of habitat, it would be useful to undertake newt surveys of the ponds at least annually to enable monitoring of the populations present (which we believe is being undertaken as part of the great crested newt mitigation licensing monitoring).

5.3.5 The site could accommodate some small additional ponds without detriment to the wider grassland area.

5.3.6 As the site supports a variety of mosses, including Polytrichum and Sphagnum species, and could hold some notable species, a dedicated Bryophtye survey is recommended.

6 References

Gloucestershire Wildlife Trust (2015). Gloucestershire Key Wildlife Sites Handbook Part 2 v4.5 final GCER, July 2015

Gloucestershire Wildlife Trust. 2018. HLF Conservation Grazing Vision in the Forest of Dean – November 2018

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Joint Nature Conservancy Committee, Peterborough (2010). Handbook for Phase 1 habitat survey- a technique for environmental audit.

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UK Biodiversity Framework http://jncc.defra.gov.uk/page-6189

Appendix 1: Species List

Scientific Name	English Name	Status/Comments
Plants		
Achillea millefolium	Yarrow	
Achillea ptarmica	Sneezewort	
Agrostis capillaris	Common bent	
Agrostis stolonifera	Creeping-bent	
Alnus glutinosa	Alder	
Alopecurus pratensis	Meadow foxtail	
Angelica sylvestris	Wild angelica	
Anthoxanthum odoratum	Sweet vernal-grass	
Aphanes arvensis	Parsley-piert	
Apium nodiflorum	Fool's water-cress	
Aquilegia vulgaris	Columbine	'garden escape'
Arrhenatherum elatius	False oat-grass	
Bellis perennis	Daisy	
Betula pendula	Silver birch	
Blechnum spicant	Hard fern	
Brachypodium sylvaticum	False-brome	
Briza media	Quaking-grass	NT England Red List
Bromus hordaceus	Soft-brome	
Callitriche agg	Water-starwort	
Calluna vulgaris	Heather	NT England Red List
Cardamine flexuosa	Wavy bitter-cress	
Cardamine pratensis	Cuckooflower	
Carex demissa	Common yellow-sedge	
Carex echinata	Star sedge	NT England Red List
Carex flacca	Glaucous sedge	
Carex hirta	Hairy sedge	
Carex leporina (*ovalis*)	Oval sedge	
Carex pendula	Pendulous sedge	
Carex pilulifera	Pill sedge	
Carex remota	Remote sedge	
Carpinus betulus	Hornbeam	
Centaurea nigra	Common knapweed	
Cerastium fontanum	Common mouse-ear	
Chamerion angustifolium	Rosebay willowherb	

Circaea lutetiana	Enchanter's-nightshade	
Cirsium arvense	Creeping thistle	
Cirsium palustre	Marsh thistle	
Cirsium vulgare	Spear thistle	
Conopodium majus	Pignut	
Crataegus monogyna	Hawthorn	
Crepis capillaris	Smooth hawk's-beard	
Cynosurus cristatus	Crested dog's-tail	
Dactylis glomerata	Cock's-foot	
Dactylorhiza fuchsii	Common spotted-orchid	
Deschampsia cespitosa	Tufted hair-grass	
Deschampsia flexuosa	Wavy hair-grass	
Digitalis purpurea	Foxglove	
Dryopteris affinis	Scaly male-fern	
Dryopteris carthusiana	Narrow buckler-fern	
Dryopteris dilitata	Broad buckler-fern	
Dryopteris filix-mas	Male-fern	
Eleocharis palustre	Common spike-rush	
Epilobium hirsutum	Great willowherb	
Epilobium montanum	Broad-leaved willowherb	
Equisetum arvense	Field horsetail	
Equisetum palustre	Marsh horsetail	
Eupatorium cannabinum	Hemp-agrimony	
Euphrasia agg	Eyebright	
Festuca ovina	Sheep's-fescue	
Festuca rubra	Red fescue	
Filipendula ulmaria	Meadowsweet	
Fragaria vesca	Wild strawberry	NT England Red List
Galium aparine	Cleavers	
Galium mollugo	Hedge bedstraw	
Galium palustre	Common marsh-bedstraw	
Galium saxatile	Heath bedstraw	
Galium verum	Lady's bedstraw	
Geranium dissectum	Cut-leaved crane's-bill	
Geranium robertianum	Herb-Robert	
Geum urbanum	Wood avens	
Glechoma hederacea	Ground-ivy	
Glyceria sp	Sweet-grass	
Holcus lanatus	Yorkshire-fog	

Holcus mollis	Creeping soft-grass	
Hyacinthoides non-scripta	Bluebell	
Hypericum maculatum	Imperforate St John's-wort	
Hypochaeris radicata	Cat's-ear	
Ilex aquifolium	Holly	
Iris pseudacorus	Yellow iris	
Juncus articulatus	Jointed rush	
Juncus bulbosus	Bulbous rush	
Juncus effusus	Soft-rush	
Juncus inflexus	Hard rush	
Juncus tenuis	Slender rush	
Lamium album	White dead-nettle	
Lapsana communis	Nipplewort	
Lathyrus pratensis	Meadow vetchling	
Leucanthemum vulgare	Oxeye daisy	
Linum catharticum	Fairy flax	
Lolium perenne	Perennial rye-grass	
Lots corniculatus	Common bird's-foot-trefoil	
Lotus pedunculatus	Greater bird's-foot-trefoil	
Luzula campestris	Field wood-rush	
Luzula multiflora	Heath wood-rush	
Lychnis (*Silene*) *flos-cuculi*	Ragged-Robin	NT England Red List
Malva moschata	Musk mallow	
Medicago lupulina	Black medick	
Mentha aquatica	Water mint	
Mentha arvensis	Corn mint	NT England Red List
Molinia caerulea	Purple moor-grass	
Myosotis arvensis	Field forget-me-not	
Myosotis discolor	Changing forget-me-not	
Nardus stricta	Mat-grass	NT England Red List
Odontites verna	Red bartsia	
Oxalis acetosella	Wood-sorrel	NT England Red List
Pilosella officinarum	Mouse-eared hawkweed	
Plantago lanceolata	Ribwort plantain	
Poa pratensis	Smooth meadow-grass	
Poa trivialis	Rough meadow-grass	
Potamogeton natans	Broad-leaved pondweed	
Potentilla anserina	Silverweed	
Potentilla erecta	Tormentil	NT England Red List

Potentilla reptans	Creeping cinquefoil	
Potentilla sterilis	Barren strawberry	
Prunella vulgaris	Selfheal	
Prunus spinosa	Blackthorn	
Pteridium aquilinum	Bracken	
Quercus sp	Oak	
Ranunculus acris	Meadow buttercup	
Ranunculus ficaria	Lesser celandine	
Ranunculus flammula	Lesser spearwort	VU England Red List
Ranunculus repens	Creeping buttercup	
Rhinanthus minor	Yellow-rattle	
Ribes uva-crispa	Gooseberry	
Rosa canina	Dog-rose	
Rubus fruticosus	Bramble	
Rubus idaeus	Raspberry	
Rumex acetosa	Common sorrel	
Rumex acetosella	Sheep's sorrel	
Rumex conglomeratus	Clustered dock	
Rumex crispus	Curled dock	
Rumex obtusifolius	Broad-leaved dock	
Salix caprea	Goat willow	
Salix cinerea	Grey willow	
Scrophularia nodosa	Common figwort	
Senecio erucifolius	Hoary ragwort	
Senecio jacobaea	Common ragwort	
Sherardia arvensis	Scarlet pimpernel	
Silene dioica	Red campion	
Sorbus aucuparia	Rowan	
Sparganium erectum	Branched bur-reed	
Stachys sylvatica	Hedge woundwort	
Stellaria graminea	Lesser stitchwort	
Stellaria holostea	Greater stitchwort	
Taraxacum agg	Dandelion	
Thymus polytrichus	Wild thyme	
Torilis japonica	Upright hedge-parsley	
Trifolium dubium	Lesser trefoil	
Trifolium pratense	Red clover	
Trifolium repens	White clover	
Trisetum flavescens	Yellow oat-grass	

Ulex europaeus	Gorse	
Ulex gallii	Western gorse	
Urtica dioica	Common nettle	
Veronica beccabunga	Brooklime	
Veronica chameadrys	Germander speedwell	
Veronica officinalis	Heath speedwell	
Veronica persica	Common field -speedwell	
Veronica serpyllifolia	Thyme-leaved speedwell	
Vicia cracca	Tufted vetch	
Vicia hirsuta	Hairy tare	
Vicia sativa	Common vetch	
Viola palustris	Marsh violet	
Viola riviniana	Common dog-violet	
Invertebrates		
Chrysolina herbacea	Mint leaf beetle	
Cantharis sp	a soldier beetle	
Nicrophorus vespilla	Common burying beetle	
Coreus marginatus	Dock bug	
Rhopalomyia ptarmicae	a midge gall	
Libellula depressa	Broad-bodied chaser	
Chorthippus parallelus	Meadow grasshopper	
Erynnis tages	Dingy skipper	UK Priority Species
Coenonympha pamphilus	Small heath	UK Priority Species
Polyommatus icarus	Common blue	
Vertebrates		
Anguis fragilis	Slow-worm	UK Priority Species
Zootoca vivipara	Common lizard	UK Priority Species
Lissotriton helveticus	Palmate newt	
Anthus trivialis	Tree pipit	Red List Species

Appendix 2: Grassland Survey Results & Photos

NVC Codes corresponding to Quadrat Numbers

- M23 - 1 - 14, 16 - 22, 28 & 29
- M25 - 23
- U1 - 15 & 25
- W25 - 30-35
- Quadrats 24, 26 and 27 appear to be a transition through drier M25 to U1.
- M25 is a narrow strip just west of the ditch/railway line.

CINDERFORD NORTHERN QUARTER – GRASSLAND SURVEY

Surveyors. JD, EP, MN, JM (29/5/19) - JD, EP (30/5/19) Date: 29/5/19 (1 – 5) 30/5/19 (5 - 12)

NGRefs structured walk..Pt 1 SO6428815153, Pt 6 SO6432715088.

Habitat description: *Juncus effusus* dominated marshy grassland/M23 mire

	1	2	3	4	5	6	7	8	9	10	11	12
% ryegrass, clovers, cr buttercup	0	0	0	2	1	1	10	0	5	0	0	0
% cover wild flowers	45	60	25	10	75	30	40	35	35	5	15	5
% cover dock, nettle, thistles	0	1	0	0	0	0	2	0	1	0	0	0
% cover scrub	10	1	1	2	0	1	4	5	2	5	2	2
% cover bare ground	0	0	0	15	1	1	0	0	0	0	5	2
Sward height cm	30	45	25	10	10	20	15	12	25	30	40	30
Grasses, sedges, rushes												
Agrostis sp	x		x			x	x	x		x	x	x
Alopecurus pratensis									x			
Anthoxanthum odoratum	x			x	x		x					
Brachypodium sylvaticum				x	x							
Bromus hordaceus					x							
Carex demissa										x		
Carex flacca					x							
Carex hirta												
Carex ovalis	x							x		x		
Carex pendula									x			
Cynosurus cristatus			x	x			x					
Dactylis glomerata			x									
Deschampsia cespitosa		x		x		x			x		x	x
Equisetum palustre				x		x	x	x	x			
Festuca rubra	x	x	x	x	x	x	x	x	x	x	x	x
Holcus lanatus						x		x			x	x
Holcus mollis	x		x	x		x	x		x			
Juncus articulatus								x				

Juncus effusus	x	x	x	x		x	x	x	x	x	x	x
Lolium perenne					x							
Luzula campestris					x							
Luzula multiflora	x							x		x		
Molinia caerulea												
Poa pratensis					x		x					
Poa trivialis						x			x			
Pteridium aquilinum												
Flowers												
Achillea millefolium		x			x							
Angelica sylvestris			x			x						
Betula pendula							x			x	x	x
Centaurea nigra	x	x	x			x	x				x	x
Cerastium fontanum												
Cirsium palustre	x		x	x		x	x					
Cirsium vulgare												
Crataegus monogyna			x				x					
Digitalis purpurea											x	
Epilobium sp.						x	x		x		x	
Filipendula ulmaria								x				
Galium mollugo		x				x						
Galium palustre		x	x									x
Galium verum							x					
Hyacinthoides non-scripta												
Lathyrus pratensis												
Leucanthemum vulgare		x										
Lotus corniculatus					x							
Lotus pedunculatus	x	x	x				x	x	x		x	x
Lychnis flos-cuculi												
Medicago lupulina					x							
Oxalis acetosella											x	
Plantago lanceolata					x							
Potentilla erecta	x									x		
Potentilla reptans												
Prunella vulgaris		x	x			x		x				
Quercus sp												
Ranunculus acris	x	x	x			x	x	x			x	
Ranunculus repens	x	x	x	x		x	x		x			
Ranunculus flammula							x					x
Rubus fruticosus		x	x	x		x	x	x	x		x	
Rumex acetosa	x	x	x	x		x	x	x			x	
Rumex acetosella												

Rumex obtusifolius							x		x			
Salix sp										x	x	x
Taraxacum agg				x	x							
Trifolium dubium					x							
Trifolium pratense												
Trifolium repens					x							
Ulex sp												
Urtica dioica												
Veronica chameadrys			x			x						
Veronica serpyllifolia		x										
Vicia sativa		x	x	x	x							
Viola palustris							x					
Species per sq m.	14	16	19	14	16	19	22	14	13	9	15	11

Surveyors. JD, EP, GN Date: 30/5/19

NGRefs structured walk..Pt 15 SO6435614939 (acid grassland) Pt 16 SO6433814932 Pt 19 SO6430114902

Habitat description: Marshy grassland grading to acid grassland at Pt 24, with true acidic grassland along the old railway line at Pt 15
*anthills

	13	14	15	16	17	18	19	20	21	22	23	24
% ryegrass, clovers, cr buttercup	0	0	0	0	0	0	0	0	0	0	0	0
% cover wild flowers	15	10	60	10	5	40	5	10	5	10	10	10
% cover dock, nettle, thistles	0	0	0	0	0	0	0	0	0	0	0	0
% cover scrub	2	2	0	2	3	1	5	5	3	2	5	10
% cover bare ground	0	0	10*	0	0	15	0	0	1	0	0	0
Sward height cm	40	30	10	45	25	15	40	30	10	40	30	10
Grasses, sedges, rushes												
Agrostis sp		x	x	x		x	x	x	x		x	x
Alopecurus pratensis												
Anthoxanthum odoratum		x	x	x				x	x		x	x
Arrhenatherum elatius			x									
Brachypodium sylvaticum												
Bromus hordaceus												
Carex demissa												
Carex echinata									x		x	
Carex flacca												
Carex hirta												
Carex ovalis	x				x	x	x		x	x	x	
Carex pendula												
Carex pilulifera				x	x						x	x
Cynosurus cristatus												
Dactylis glomerata												
Deschampsia cespitosa	x	x		x	x		x	x		x	x	

Deschampsia flexuosa												
Dryopteris sp.									x			
Equisetum palustre												
Festuca ovina			x									
Festuca rubra			x	x	x	x			x		x	
Holcus lanatus	x	x		x	x	x	x	x	x			
Holcus mollis												
Juncus articulatus												
Juncus effusus	x	x		x	x	x	x	x	x	x	x	
Lolium perenne												
Luzula campestris			x									x
Luzula multiflora		x										x
Molinia caerulea									x		x	x
Nardus stricta												
Poa pratensis			x									
Poa trivialis												
Pteridium aquilinum				x	x		x	x				
Flowers												
Achillea millefolium												
Achillea ptarmica										x		
Angelica sylvestris												
Betula pendula				x	x		x		x	x	x	x
Calluna vulgaris								x	x			x
Centaurea nigra	x	x						x				
Cerastium fontanum		x										
Cirsium palustre												
Cirsium vulgare												
Crataegus monogyna			x		x							
Digitalis purpurea								x			x	
Epilobium sp.							x		x		x	
Filipendula ulmaria								x				
Galium mollugo												
Galium palustre	x	x		x	x			x	x	x	x	x
Galium saxatile			x									
Galium verum												
Hyacinthoides non-scripta							x	x				
Iris pseudacorus										x		
Lathyrus pratensis												
Leucanthemum vulgare												
Lotus corniculatus												
Lotus pedunculatus	x	x			x		x	x		x	x	x
Lychnis flos-cuculi		x										

Medicago lupulina												
Oxalis acetosella					x							
Pilosella officinarum			x									
Plantago lanceolata												
Potentilla erecta	x	x	x	x					x	x	x	x
Potentilla reptans												
Prunella vulgaris												
Quercus sp	x										x	
Ranunculus acris	x		x									
Ranunculus repens												
Ranunculus flammula												
Rubus fruticosus	x	x		x	x		x	x	x			
Rumex acetosa		x	x	x	x		x				x	
Rumex acetosella											x	
Rumex obtusifolius												
Salix sp				x	x	x	x	x	x		x	x
Silene dioica	x											
Stellaria graminea			x									
Taraxacum agg												
Trifolium dubium												
Trifolium pratense												
Trifolium repens												
Ulex sp												x
Urtica dioica												
Veronica chameadrys			x									
Veronica serpyllifolia												
Vicia sativa			x									
Viola palustris												
Viola riviniana			x									
Species per sq m.	11	14	17	14	15	6	13	15	16	9	19	13

Surveyors. JD, EP, GN (30/5/19) JD, EP, MN, JM, CL (10/6/19) Dates: 30/5/19 (25 – 32) 10/6/19 (33 - 35)

NGRefs structured walk..Pt 26 SO6436014819 Pt 32 SO6426914740

Habitat description: Marshy grassland grading to bracken underscrub at Pt 29, with true acidic grassland along the old railway line at Pt 25 *boar damage

	25	26	27	28	29	30	31	32	33	34	35	
% ryegrass, clovers, cr buttercup	0	0	0	0	0	0	0	0	0	0	5	0.68
% cover wild flowers	20	15	10	5	20	25	2	3	10	15	12	20.2
% cover dock, nettle, thistles	0	0	0	0	0	0	0	0	0	0	0	0.11
% cover scrub	0	10	5	1	5	5	1	0	1	10	3	3.31
% cover bare ground	10	10	0	0	0	20*	30*	0	3	0	3	3.6

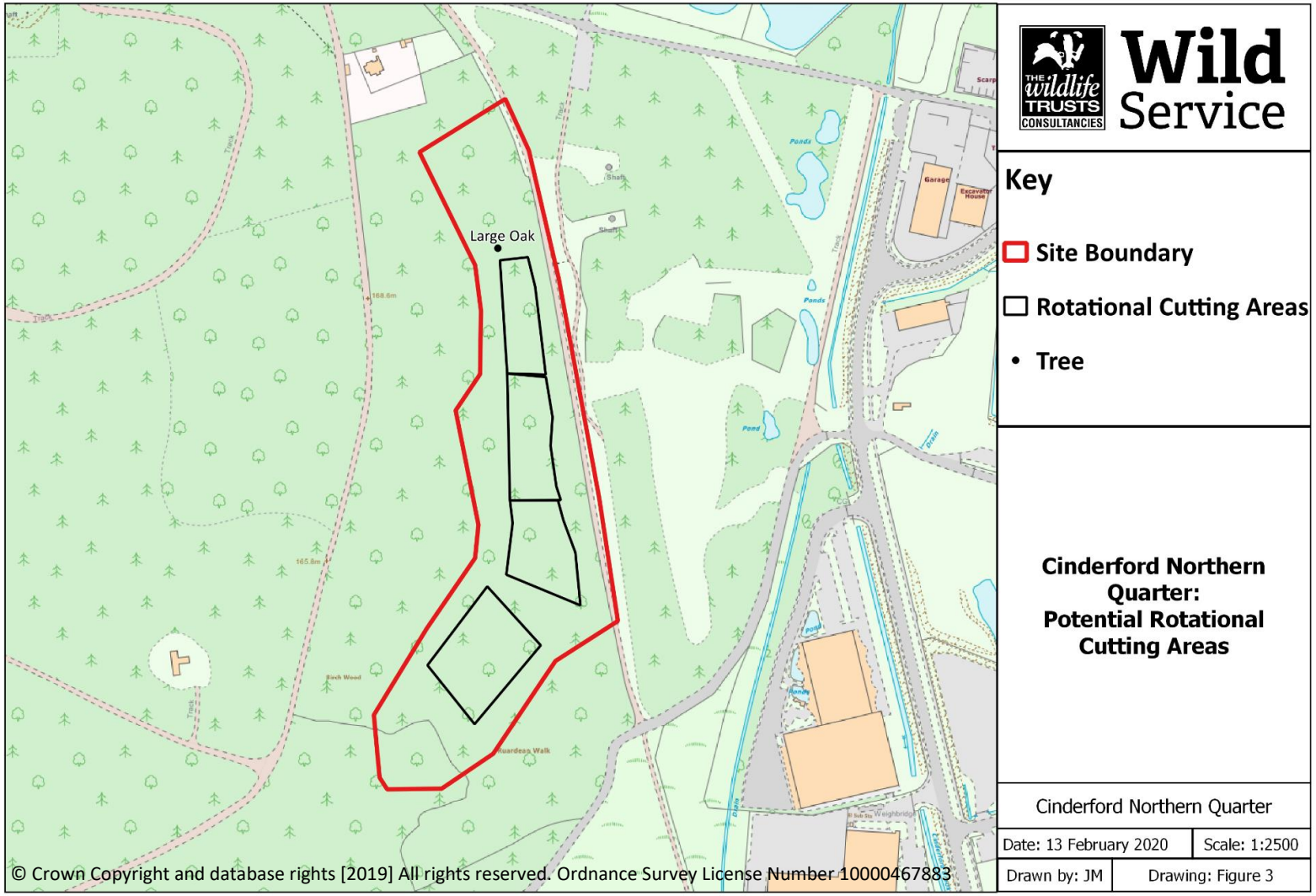
Sward height cm	15	40	10	25	15	20	15	10	12	20	10	
Grasses, sedges, rushes												
Agrostis sp	x	x	x		x	x	x	x	x	x	x	
Alopecurus pratensis												
Anthoxanthum odoratum	x	x			x	x	x		x			
Arrhenatherum elatius			x									
Brachypodium sylvaticum											x	
Bromus hordaceus												
Carex demissa												
Carex echinata												
Carex flacca												
Carex hirta												
Carex ovalis				x		x		x	x			
Carex pendula												
Carex pilulifera		x	x		x	x			x			
Cynosurus cristatus												
Dactylis glomerata												
Deschampsia cespitosa		x	x				x		x	x		
Deschampsia flexuosa	x											
Dryopteris sp.												
Equisetum palustre												
Festuca ovina	x								x			
Festuca rubra	x			x	x			x	x			
Holcus lanatus		x						x	x	x	x	
Holcus mollis							x					
Juncus articulatus												
Juncus effusus		x	x	x	x	x	x	x	x	x		
Lolium perenne												
Luzula campestris	x											
Luzula multiflora		x			x							
Molinia caerulea		x	x									
Nardus stricta	x											
Poa pratensis	x											
Poa trivialis											x	
Pteridium aquilinum					x	x	x	x	x	x	x	
Flowers												
Achillea millefolium												
Achillea ptarmica												
Angelica sylvestris												
Betula pendula		x	x	x	x	x			x	x		
Calluna vulgaris	x	x	x									
Centaurea nigra								x				

Cerastium fontanum												
Cirsium palustre												
Cirsium vulgare												
Crataegus monogyna												
Digitalis purpurea				x				x		x		
Epilobium sp.											x	
Filipendula ulmaria												
Galium aparine											x	
Galium mollugo												
Galium palustre		x	x	x								
Galium saxatile	x				x	x	x		x	x	x	
Galium verum												
Hyacinthoides non-scripta					x	x	x					
Hypericum maculatum							x					
Iris pseudacorus												
Lathyrus pratensis												
Leucanthemum vulgare												
Lotus corniculatus												
Lotus pedunculatus										x		
Lychnis flos-cuculi												
Medicago lupulina												
Oxalis acetosella												
Pilosella officinarum												
Plantago lanceolata												
Potentilla erecta	x	x	x	x								
Potentilla reptans											x	
Prunella vulgaris												
Quercus sp												
Ranunculus acris												
Ranunculus repens											x	
Ranunculus flammula												
Rubus fruticosus	x	x	x		x	x	x		x	x	x	
Rumex acetosa				x				x				
Rumex acetosella	x				x	x		x	x	x	x	
Rumex obtusifolius												
Salix sp	x	x			x				x	x		
Silene dioica	x											
Stellaria graminea												
Taraxacum agg												
Trifolium dubium											x	
Trifolium pratense												
Trifolium repens												
Ulex sp		x										

Urtica dioica												
Veronica chameadrys												
Veronica serpyllifolia											x	
Vicia sativa												
Viola palustris												
Viola riviniana												
Species per sq m.	15	15	11	8	13	11	10	10	15	12	14	13.94

Views across the site

Appendix 3: Potential Rotational Cutting Areas



Appendix 4: Ecological Experience

Jeremy Doe: Associate Ecologist/Botanist, BSc (Hons) MCIEEM

Jeremy has over 30 years' experience as a field surveyor of habitats and higher plants of lowland England. He was part of the team of Ecologists who produced the ancient woodland and grassland inventories for Natural England. He has carried out habitat and species monitoring on GWT reserves, County key sites and conservation road verges. Jeremy has attained Level 5 in vascular plant identification on a BSBI/FSC assessment. He also holds great crested newt, dormouse and Roman snail survey licences. He is also a competent bat surveyor and regularly assists Wild Service on bat surveys.

Jeremy has extensive experience in NVC surveys in the west of England having completed numerous grassland surveys mainly within Gloucestershire and Worcestershire. He was a member of the survey teams that carried out the Natural England Grassland Inventory NVC surveys of the Cotswolds and Forest of Dean in the early/mid 1990s. Jeremy has also undertaken numerous NVC surveys of Gloucestershire Wildlife Trust nature reserves, SSSIs and County Key Wildlife Sites, including using Common Standards Monitoring methodology. Specific examples include: Supervisor of GWT/EN Cotswold Grassland Survey to NVC methodology; GTNC Key Site Surveys; supervision of Forest of Dean (NVC) Survey for Natural England; Condition assessment monitoring; survey of SSSI flood meadow for Natural England; survey of acidic grasslands and heaths in Forest of Dean as part of Severn-Trent Water land-holdings survey; and supervisor of Forest of Dean (NVC) survey for Natural England; and Road-side verge surveys - survey for GTNC/GWT/Glos County Council.

Elizabeth Pimley: *Head of Ecology & Principle Ecologist, BSc (hons) PhD CEnv MCIEEM*
Elizabeth has worked in both the academic and consultancy ecology sectors since 2000 with a focus on mammalian ecology, particularly badgers, dormice, bats, water voles and otters. Elizabeth manages the Consultancy as well as being involved in project delivery. She has managed ecological projects, ranging in size and type, both in the UK and abroad. She regularly advises clients on the planning process in relation to Ecology.

Elizabeth has expertise in a wide variety of ecological survey techniques including Preliminary Ecological Appraisals/Phase 1 habitat assessments and a variety of protected species surveys (e.g. the aforementioned mammal species as well as reptiles and great crested newts).

Elizabeth also devises ecological mitigation schemes, both as part of protected species mitigation licences (e.g. bats, great crested newts, badgers, dormice) and for projects not requiring licensing (e.g. reptiles). She has produced a wide variety of preliminary ecological appraisals, BREEAM/CSH Ecology Assessments, mitigation licences for protected species (including Bat Mitigation Class Licences), Ecological Impact Assessments (EcIA), Construction Ecological Management plans, Habitat Regulations Assessments, Biodiversity Enhancement Schemes, Ecological Design Strategies as well as writing for scientific journals, books and magazines.

Elizabeth offers a scientific approach to projects with additional skills in radiotracking, bat call analysis, statistical analysis, home range and compositional habitat analysis and Geographical Information Systems (GIS) mapping. Elizabeth holds Natural England and Natural Resources Wales licences for bats and dormice as well as Natural England licences for great crested newts and water voles. She is also a Registered Consultant of the Bat Mitigation Class Licence (BMCL) and holds a CSCS card.

Glenn Norris: BSc (Hons) ACIEEM – Senior Ecologist

Glenn has worked as a consultant ecologist since 2011, including conducting fieldwork and reporting for renewable energy, including wind farms and Scotland's first large solar farm. He has experience in several protected species surveys, including bats, birds (holding a Natural England barn owl licence), otter, water vole, badger, pine marten, beaver, great crested newt (holding Natural England Level 2 licence) and reptiles.

Glenn specialises in invertebrate survey and identification, particularly of spiders and beetles, and has completed three Site Condition Monitoring projects covering 25 Scottish SSSIs. Glenn brings experience in ecological report writing having authored and co-authored Ecological Appraisals and chapters for Environmental Statements and provides consultancy services to South Gloucestershire Council on planning matters regarding ecology including applications that may impact ancient woodlands. Glenn also has vast experience in GIS mapping and analysis after completing an ESRI certified course for ArcMap and implementing it on a range of different infrastructure and wind farm projects.

Glenn has undertaken a variety of grassland surveys over the years and has received over 15 days of training from leading botanist Ben Averis.

Michelle Newman: Ecologist, BSc (Hons)

Michelle has worked in Ecological Consultancy for several years and has also volunteered for a number of nature conservation organisations over the years. She is experienced in undertaking

Phase 1 habitat surveys and protected species surveys including those for bats, birds, otters, water voles, badgers, great crested newts and reptiles (including adder handling experience). She has also undertaken a variety of invertebrate surveys, specialising in bumble bee surveys. She holds a CSCS card and has worked as an Ecological Clerk of Works (ECoW) on a wide variety of sites.

Michelle has prepared preliminary ecological appraisals and protected species reports for a range of projects. In addition to project delivery, she is also involved with the management of Wild Service projects and advises clients on the ecological aspects of the planning process. She is experienced in analysing bat call data using a variety of software packages. She is currently working towards personal Natural England licenses for great crested newts, bats and white-clawed crayfish.

Julia Morrison: Assistant Ecologist, BSc (Hons)

Julia has been worked with Wild Service for several years. Julia has a keen interest in bat ecology and in addition to undertaking professional bat surveys and assessments, she has also studied bats in Ghana, West Africa.

She is also experienced in a range of other ecological surveys including Phase 1 habitat assessments, protected species surveys, reptile surveys and translocations, great crested newt and dormouse surveys. Julia's additional skills include advanced data analysis and GIS mapping using various software packages including QGIS and ArcGIS. In addition to project delivery, she also assists with the management of Wild Service projects. Julia has also spent time volunteering on conservation projects with the Gloucestershire Bat Group and the Gloucestershire Wildlife Trust. Julia is a student member of CIEEM and is currently working towards her Natural England bat and great crested newt licences. Julia is completing a Masters Degree in Applied Ecology at the University of Gloucestershire, where she is undertaking a research project at a Gloucestershire Wildlife Trust wetland reserve on the effects of habitat management on bird diversity and abundance.

Appendix 5: Legislation

Statutory nature conservation sites and protected species are a 'material consideration' in the UK planning process (DCLG, March 2012). Where planning permission is not required, for example on proposals for external repair to structures, consideration of protected species remains necessary given their protection under UK law.

The **Conservation of Habitats and Species Regulations 2017** transpose the requirements of European Directives such as the Habitats Directive and Birds Directive[1] into UK law, enabling the designation of protected sites and species at a European level.

The **Wildlife and Countryside Act 1981** (as amended) forms the key piece of UK legislation relating to the protection of habitats and species. The **Countryside and Rights of Way Act 2000** provides additional support to the 1981 Act, for example, increasing the protection of certain reptile species. Specific protection for badger is provided by the **Protection of Badger Act 1992**. The **Wild Mammals (Protection) Act 1996** sets out the welfare framework with respect to wild mammals prohibiting a range of activities which may cause unnecessary suffering.

The Government has a duty to ensure that parties take reasonable practicable steps to further the conservation of habitats and species of Principal Importance for Conservation in England listed under Section 41 of the **Natural Environment and Rural Communities Bill 2006**[2]. In addition, the 2006 Act places a Biodiversity Duty on public authorities who 'must, in exercising [their] functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity' (Section 40 (1)). Criteria for selection of priority habitats and species include, for example, international threat (such that species may be protected in their strong holds) and marked national decline.

The **National Planning Policy Framework**[3][1] states (in section 11) that the planning system should minimise impacts on biodiversity, providing net gains in biodiversity, where possible. It also states that local planning authorities and planning policies should:

- Plan positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.
- Take account of the need to plan for biodiversity at a landscape-scale across local authority boundaries.
- Identify and map components of the local ecological networks, including: international, national and local sites of importance for biodiversity, and areas identified by local partnerships for habitat restoration or creation.
- Promote the preservation, restoration and re-creation of priority habitats, ecological networks and the recovery of priority species populations, linked to national and local targets and identify suitable indicators for monitoring biodiversity in the plan.

[1] Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, and Council Directive 79/409/EEC on the Conservation of Wild Birds, respectively.

[2] **The NERC Act** refers to "*species of principle importance for the conservation of biodiversity*", which translates to BAP habitats and species occurring in England.

[3] National Planning Policy Framework (DCLG, March 2012).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• We provide ecological surveys and assessments, mitigation, advice and guidance regarding wildlife, plants and habitats for both development and conservation projects throughout the UK.
• Wild Service is the Ecological Consultancy for Gloucestershire Wildlife Trust. As such, the company reinvests its profits into local conservation work.
• We are also part of a wider network of Wildlife Trust Consultancies enabling us to offer national delivery with local expertise.
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BREEAM Assessments
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