



Nottinghamshire County Council

**Kimberley Green and Great North Railway Path**

**HABITAT MANAGEMENT PLAN**

June 2023

**FPCR Environment and Design Ltd**

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## 1.0 INTRODUCTION

- 1.1 The following Habitat Management Plan (HMP) has been prepared by FPCR Environment & Design Ltd on behalf of Nottinghamshire County Council. It details the proposed objectives and prescriptions for habitat management within an area of land proposed for designation a Local Nature Reserve (herein referred to as the Site). The Site is illustrated in Figure 1.
- 1.2 The Site comprises parts of two separate but adjacent Local Wildlife Sites (LWS), Kimberley Green (Kimberley Rough Grassland) LWS and Great North Railway Path (Kimberley Dismantled Railway) LWS.
- 1.3 This Management Plan includes the following details in accordance with current guidance for LNR designation<sup>1</sup>:
- Ownership of the land.
  - Agreements and/or partnerships.
  - Why the LNR site was chosen.
  - Aims and objectives.
  - Biodiversity management and environmental education.
  - Community participation, access and visitor management.
  - Costs and funding arrangements.
- 1.4 The Management Plan provides information on current and future management of habitats within the Site, in order to safeguard their long-term biodiversity value.

## 2.0 PLAN CONTENT

- 2.1 The Management Plan identifies the features which require maintenance; this includes:
- Initial management of habitats (within the first 5 years) to modify current habitats for biodiversity objectives, and
  - Ongoing sympathetic management over the length of the Plan period.
- 2.2 Every management plan should have an over-arching vision, and, for this site, this is to:
- Enhance retained habitats for nature conservation and the benefit of wildlife.
  - Maintain, enhance and promote public access along designated footpaths.
- 2.3 The Management Plan has been presented in tabular format for conciseness and ease of use. Management prescriptions have been provided (Table 1) which are considered necessary to achieve the objective for each feature. Figure 1 provides the location of the management features which are the subject of this plan. The Plan covers a period of thirty years, with the programme of works required over this period summarised in Table 2.
- 2.4 Monitoring is an essential part of any management plan, to:
- Ensure that the proposed management is being implemented.
  - Respond to unexpected outcomes from management.

- Detail remedial/contingency measures where applicable.
- Determine if objectives are being achieved.

- 2.5 Monitoring requirements are identified in Table 3. Ongoing management should be reviewed every 5 years in perpetuity.

## 3.0 RESPONSIBILITY FOR IMPLEMENTATION

- 3.1 Nottinghamshire County Council's Green Spaces service will be responsible for implementation of the Management Plan. There will be appropriate legal and funding mechanisms in place as part of this to secure the long-term maintenance of greenspaces, including the requirements set out in this plan.
- 3.2 There is no dedicated budget for the management of the sites covered by this Management Plan, with management paid for from Nottinghamshire County Council's overall Green Spaces budget.

## 4.0 SITE INFORMATION

- 4.1 All land described below and detailed within this Management Plan is under the ownership of Nottinghamshire County Council.
- 4.2 An informal BMX track exists on part of Kimberley Green, which is currently being regularised (with the intention that it will be leased out). This area is omitted from inclusion in this Management Plan and will not form part of the LNR.
- 4.3 No community groups are associated with the sites, but community participation is enabled through periodic volunteer work parties. Access to all the sites is available at all times by a mix of formal and informal paths.

### Site Descriptions

- 4.4 The below site descriptions are taken from the LWS Site Information documents for 5/21 Kimberley Rough Grassland and 2/140 Kimberley Dismantled Railway produced by Nottinghamshire Biological and Geological Records Centre and provided by Nottinghamshire County Council.

#### Kimberley Green (Kimberley Rough Grassland LWS)

- 4.5 'This site comprises neglected hay meadows interspersed with hawthorn *Crataegus monogyna*, ash *Fraxinus excelsior*, hazel *Corylus avellana*, willow *Salix* sp. and dense bramble *Rubus fruticosus* thickets creating a mosaic of habitats. The areas of grassland contain old meadow relicts including great burnet *Sanguisorba officinalis*, glaucous sedge *Carex flacca* and common spotted-orchid *Dactylorhiza fuchsii* along with a diversity of grasses. Common fleabane *Pulicaria dysenterica*, hemp-agrimony *Eupatorium cannabinum* and rushes *Juncus* spp. characterise damper soils while verges along paths are rich with common bird's-foot-trefoil *Lotus corniculatus*, common knapweed *Centaurea nigra* and meadow vetchling *Lathyrus pratensis*. A varied site likely to be rich in invertebrates and to support good breeding bird populations.'

#### Kimberley Dismantled Railway LWS

- 4.6 'This dismantled railway, which is situated on the magnesian limestone, has scrub, mature woodland tall herb vegetation and calcareous grassland forming a mosaic of habitats on the embankments and cutting

<sup>1</sup> <https://www.gov.uk/guidance/create-and-manage-local-nature-reserves>

sides. Hawthorn *Crataegus monogyna* dominates the scrub with ash *Fraxinus excelsior*, goat willow *Salix caprea* and silver birch *Betula pendula* forming the canopy of wooded areas. Species-rich grassland occurs on either side of the limestone footpath with notable species including cowslip *Primula veris*, common milkwort *Polygala vulgaris* ssp. *vulgaris*, burnet-saxifrage *Pimpinella saxifraga*, glaucous sedge *Carex flacca* and greater knapweed *Centaurea scabiosa*.<sup>2</sup>

### The Local Nature Reserve

4.7 This Site has been selected by Nottinghamshire County Council for designation as a Local Nature Reserve as it is:

- Currently well used by the public for informal recreation, including walking, dog walking and cycling.
- Under current positive management which is carried out by Nottinghamshire County Council, along with contractors and a team of volunteers.
- Accessible via well maintained footpaths from Awsworth to the west and Kimberley to the east.
- Well-served by multiple formal and informal footpaths throughout which create a network of trails throughout the on-site habitats.
- Of nature conservation value, with all areas designated as Local Wildlife Sites and supporting a range of notable species.
- Of cultural value with owing to its industrial heritage, which is represented through the display of old railway memorabilia located within the Great North Railway Path in the east.

## 5.0 HABITAT BASELINE

### Data Collection

5.1 Desk study data was provided by Nottinghamshire County Council, and this has been reviewed and included within this Management Plan where considered relevant.

5.2 A Phase I Habitat survey<sup>2</sup> was also carried out by FPCR in March 2023. As the survey was undertaken during the sub-optimal period for vegetation surveys, a full detailed botanical assessment of the site was not carried out. However, it is considered that the data collected during the survey, in addition to the desk study data and information provided by site managers for the LWS are sufficient to inform this Management Plan.

5.3 A summary of habitats present are detailed below, as well as faunal species which require consideration during ongoing management.

### Habitats

5.4 Habitats are illustrated in Figure 1 and further descriptions with references are provided below.

## Broadleaved Semi-Natural Woodland

### Great North Railway

5.5 Woodland within Great North Railway was semi-natural broadleaved woodland characterised by mature ash. Variations in this habitat were noted and are described below:

- Woodland W1 (west of Great North Railway) was dominated by mature ash, with scattered mature sycamore *Acer pseudoplatanus* and willow, and a shrub layer of young ash, hawthorn, bramble *Rubus fruticosus* agg. and holly *Ilex aquifolium*. The ground flora included lords-and-ladies *Arum maculatum*, hart's-tongue *Asplenium scolopendrium* and dog's mercury *Mercurialis perennis*, however bare ground and leaf litter were dominant. On the woodland edges, common ivy *hedera helix*, common nettle *Urtica dioica*, hedge bedstraw *Galium mollugo*, creeping cinquefoil *Potentilla reptans*, hogweed *Heracleum sphondylium* and wood avens *Geum urbanum* were also present.
- Woodland W2 (west of Great North Railway) was young woodland dominated by dense mature elder *Sambucus nigra* and hawthorn scrub, with occasional to locally frequent semi-mature ash, and scattered oak *Quercus* sp., willow and sycamore. The shrub layer comprised elder, field maple *Acer campestre* and ash saplings, with frequent holly in the east of the woodland. Ground flora comprised frequent wood avens and mosses *Bryophyta* sp. with common ivy dominant adjacent to the footpath, along with similar species to W1.
- Woodland W3 (centre of Great North Railway and south of Kimberley Green) and comprised mature ash, with scattered semi-mature willow and mature silver birch. The shrub layer comprised hawthorn and holly, and ground flora was limited with 60% - 70% bare ground; species recorded included a bluebell *Hyacinthoides* sp., lords-and-ladies, common ivy, moss and male fern *Dryopteris filix-mas*.
- Woodland W4 (south of Great North Railway) comprised mature ash, with scattered semi-mature willow and oak. The shrub layer was dense in the east and comprised dogwood *Cornus sanguinea*, a rose *Rosa* sp, bramble, hazel, hawthorn and holly. Ground flora was limited in the east owing to the dense nature of the shrub layer however the woodland was more open in the west, and ground flora composition was similar to W2.
- Woodland W5 (east of Great North Railway) was present along the plateau of the railway embankment adjacent to the footpath and on its steep sides. Mature sycamore was dominant to the south with a limited shrub layer and ground flora of common ivy. Mature ash were also present to the north where the woodland was located on the steep sides of the embankment, with hawthorn, holly and yew *Taxus baccata* as the understorey and ground flora of common ivy. Between the woodlands the verges of the path comprised species characteristic of shaded conditions including ground ivy *Glechoma hederacea*, wood avens and lords-and-ladies. Patches of bramble scrub were also present. Clearance works had previously been undertaken along the woodland edges and verges, with a number of trees having been recently felled and ivy cut and bramble scrub cleared.

### Kimberley Green

- Woodland W3 (south of Kimberley Green) is described above.
- Woodland W6 (centre of Kimberley Green) was a young woodland habitat which comprised mature even aged hawthorn scrub and occasional semi-mature ash. The shrub layer was limited owing to the dense

<sup>2</sup> JNCC. (2010). Handbook for Phase 1 habitat survey – a technique for environmental audit. Peterborough: Joint Nature Conservation Committee

nature of the hawthorn and ground flora was limited to common nettle, common ivy, moss and wood avens, with 60%-70% bare ground.

- Woodland W7 (north of Kimberley Green) was located on sloping ground and comprised mature ash and field maple with an understorey of hawthorn. Ground flora was similar to W6.

FEATURE	MANAGEMENT OBJECTIVE & RATIONALE
W1, W3, W4	To increase the biodiversity value of the wood by creating a woodland ground flora. <i>Woodland has species-poor ground flora with opportunity to improve.</i>
W2 and W6	To increase the biodiversity value of the wood by improving the age-structure, creating a woodland ground flora, and increasing the deadwood resource. <i>Woodland has poor structure and species-poor ground flora with tall ruderal herbs and non-native species.</i>
W5 and W7	To allow natural woodland to develop where only trees adjacent to footpaths are managed as required for health and safety. <i>Woodland has varied structure and present on steep slopes/embankments.</i>

**Dense Scrub**

5.6 N.B. Scattered scrub within grassland habitat is detailed within the Grassland section below, and Grassland section of Management Tables.

Great North Railway

- Scrub S1 (west of Great North Railway) was dominated by dense hawthorn on steep slopes, with a *Cotoneaster sp.*, rose, oak, ash and willow. Ground flora was limited due to the high level of shading dominated by moss.
- Scrub S2 (east of Great North Railway) comprised hawthorn and holly, with semi-mature silver birch and a ruderal ground flora.
- Scrub S3 (centre of Great North Railway) was an area of dense blackthorn, hawthorn, ash, elder bramble and holly.

Kimberley Green

- Scrub S4 (west of Kimberley Green) formed the boundary between grassland G3 and the Awsworth Lane. Dense hawthorn and bramble were present in addition to mature ash along the road.
- Scrub S5 (south-west of Kimberley Green) was a small area of hawthorn, hazel and bramble scrub within a shallow depression, also including a mature ash tree. The edges comprised tall ruderal herbs including common nettle and cleavers, along with ivy.
- Scrub S6 (south-west of Kimberley Green) was a small area dominated by bramble with edges of tall ruderal herbs.

FEATURE	MANAGEMENT OBJECTIVE & RATIONALE
All scrub	To manage the outer edges of scrub to ensure no encroachment into adjacent grassland and create a graded structural edge where appropriate. <i>Scrub present on steep slopes hindering management (S1) or covers only small areas adjacent to grassland habitats.</i>

**Scattered Trees**

Great North Railway

- Scattered trees ST1 were present along the southern boundary of Great North Railway over a grassland and tall ruderal herb ground flora. Shrubs were largely absent however scattered bramble, dogwood and blackthorn were present. In the more shaded sections, common ivy, wood avens and lords-and-ladies formed the understorey.

FEATURE	MANAGEMENT OBJECTIVE & RATIONALE
ST1	To maintain current tree cover and health of individual trees adjacent to footpaths for health and safety. <i>Scattered trees provide additional opportunities for wildlife however trees adjacent to areas of public use should be appropriately monitored and managed for health and safety.</i>

**Grassland**

Great North Railway

5.7 Grassland within Great North Railway was largely restricted to narrow verges along footpaths, with wider sections also present in the west and east:

- Neutral grassland G1 (west of Great North Railway) was a grassland track and verges between areas of scrub and woodland. Species recorded included common knapweed, cock's-foot, false oat grass, perennial rye grass *Lolium perenne*, a fescue *Festuca sp.*, a St. John's-wort *Hypericum sp.*, hedge bedstraw and yarrow *Achillea millefolium*. Some recent scrub clearance had taken place from the outer edges and previous work has included scraping of topsoil to the underlying limestone and overseeding with suitable calcareous grassland species.
- Calcareous grassland G2 (west of Great North Railway) exhibited a very short sward and was present along a central plateau between two sloping embankments. Species recorded included field woodrush *Luzula campestris*, glaucous sedge *Carex sp.*, oxeye daisy, cowslip and great mullein *Verbascum thapsus*. The edges of grassland G2 and the eastern end at G2a comprised bare ground and tall ruderal herbs including stands of willowherb *Epilobium sp.*, a St John's-wort, common nettle and ground elder *Aegopodium podagraria*, along with common knapweed and common hogweed. The edges of G2a and the edges of G2 had also been subject to recent scrub and tree clearance, and as G1 previous work has included overseeding with suitable calcareous grassland species.
- Grasslands G3 (east of Great North Railway) were two areas similar in composition to G1 and G2 with a St. John's-wort, a *Carex sp.*, hedge bedstraw, creeping cinquefoil and cowslip recorded. Some field maple and ash saplings were present in the western area of G3.
- Grassland G4 comprised narrow margins along the path through the centre of Great North Railway similar to G1 and G2, but with species more characteristic of shaded conditions also present including white deadnettle, cow parsley and common ivy.

Kimberley Green

- Grassland G5 (south-west of Kimberley Green) was an open field of neutral grassland which was wet in places and characterised by tufted hair grass which was abundant in the south. Common sorrel, creeping buttercup and common knapweed were present throughout, with a stitchwort *Stellaria sp.* and soft rush also recorded in the est. This area has previously been subject to flailing and scarification to open up

the grassland and overseeding to increase species diversity. The area is also subject to some overseeding on an annual basis.

- Grasslands G6 (north and centre of Kimberley Green) were heavily encroached by scrub with hawthorn, bramble and dogwood recorded throughout. The grasslands were dominated by tufted hair grass, along with a sedge *Carex sp.*, common knapweed and a St. John's-wort.

FEATURE	MANAGEMENT OBJECTIVE & RATIONALE
G1, G2, G3, G4, G5 and G6	To progress and implement restorative management followed by long-term maintenance management to deal with scrub. <i>Scrub is invading the important grassland areas.</i>
G1, G3 and G4	To increase the extent of these grassland habitats through gradual removal of scrub (for example S1 and S3) and scattered tree (ST1). <i>To increase the extents of grassland within the site.</i>
G5	To continue overseeding programme on ad hoc basis and sympathetically manage areas of open grassland. <i>Open areas of grassland provide an important habitat resource within the site.</i>

**Wetlands and Watercourse**

- An area of wetland WE1 including a shallow flowing stream WC1, soft mud and standing water and small area of wet woodland were present in a depression within the centre of Kimberley Green. The stream supported greater pond sedge, floating sweet grass, great reedmace and willowherb. Sections of the stream were culverted, and there is opportunity to open these sections to create additional sections of natural watercourse within the Site. Adjacent to the stream (and also in areas where the stream widened out) soft mud supported tufted hair grass, duckweed, fool's watercress *Apium nodiflorum*, hard rush, a liverwort and a figwort. Woodland surrounding these features was characterised by damp ground conditions, and supported willow and poplar species.
- A small ephemeral pool WE2 was also recorded to the north of grassland G3 where the ground was lowest within the field. There is scope to create a larger pond or series of small ponds and surrounding wetland area in this location owing to the low-lying nature of the area and high water table within the field. If undertaken, consideration should be given to the design of this feature and ponds should include, where feasible, shallow and undulating draw down zones, shallow slopes (less than 1:5), scalloped edges, underwater bars and surrounding wetland features.

FEATURE	MANAGEMENT OBJECTIVE & RATIONALE
WC1 and WE1	To maintain and enhance the biodiversity value of the stream and wetland. <i>Ponds and wetland provide a variety of opportunities for wildlife.</i>
WE2	To create a larger pond or series of small ponds within the area of WE2. <i>Ponds and wetland provide a variety of opportunities for wildlife.</i>

**Faunal Considerations**

- 5.8 Amphibians, reptiles nesting birds, badger *Meles meles* and roosting bats will be considered as part of future management to ensure these species are not harmed by management practices but instead benefit from the enhancement of the habitats.

Amphibians and Reptiles

- 5.9 The small ephemeral pool provided limited suitable breeding and foraging opportunities for amphibians, however works (including the creation of a larger pond, if undertaken) should be undertaken at a time of year which is the least detrimental. This is typically accepted to be the winter months. The grassland habitats are to be cut on a rotational basis to ensure that areas of longer grassland are present for any foraging and commuting reptiles with works to any areas offering potential for hibernation undertaken outside of the winter period.

Bats

- 5.10 A number of trees with bat potential are located within the woodlands across the Site. These should be identified and protected during management works on the site. If any additional trees require removal or Arboricultural works in the future, then an ecologist should check the tree for bat potential before works are conducted.

Birds

- 5.11 The Site provides habitat for tree and shrub nesting species. Removal of trees or coppicing activities should be done outside the nesting season (works to be undertaken between September/October and January/February).

Badger

- 5.12 An ecologist should be contacted should badger setts be identified within any working areas where machinery, trees/scrub removal or ground breaking are proposed. The ecologist can provide appropriate working methods, if necessary.

**Non-Native Species**

- 5.13 Japanese knotweed was previously present within the site. This has undergone a programme of treatment and is no longer present, however the site should be monitored for any recurrences and if recorded, appropriate treatment actioned.

**Access**

- 5.14 The Site is served by a number of footpaths including stepped sections with handrails which were generally in good condition. These should be monitored and maintained for the length of the Management Plan period.

Table 1: Management Plan

FEATURE	OBJECTIVES	PRIORITY	MANAGEMENT ACTION TO ACHIEVE OBJECTIVE AND CRITERIA – INITIAL MANAGEMENT	MANAGEMENT ACTION TO ACHIEVE OBJECTIVE – ONGOING HABITAT MANAGEMENT	INDICATOR THAT OBJECTIVE HAS BEEN ACHIEVED AND REMEDIAL ACTION IF REQUIRED
<p><b>1. Broadleaved Semi-natural Woodland</b></p> <p><b>W1, W2, W3, W4, W5, W6 and W7</b></p>	<p>To increase the biodiversity value of woodlands W2 and W6 by improving the age-structure, creating a woodland ground flora, and increasing the deadwood resource.</p> <p>To increase the biodiversity values of woodlands W1, W3 and W4 by creating woodland ground flora.</p> <p>To allow woodlands W5 and W7 to develop naturally and with limited intervention where only trees adjacent to footpaths are managed for health and safety.</p>	<p><b>LOW</b></p> <p><b>LOW</b></p> <p><b>LOW</b></p>	<p><b>1.1 <u>Thinning W2 and W6</u></b></p> <p>To create a more open woodland to help development of shrub layer and ground flora. A progressive thin of the woodland focusing on retaining higher quality specimens and the removal of 10-20% trees during each management session. Thinning operations should also aim to create woodland edge habitat of native scrub and young trees along the outer edges of woodland compartments and adjacent to footpaths. This should be carried out using chainsaws and the removed brush material should be chipped on site ideally using a tracked chipper to reduce any compaction to the soil. The woodchip could be piled on site, if appropriate. Alternately, cut material could be stacked to create brush piles.</p> <p>Any wood created from the thinning operation will be stacked in log pyramids no greater than 5 logs high within the woodland forming habitat log piles. Alternately, material could be removed from site using appropriate machinery or horse-logging.</p> <p><b>1.2 <u>Planting ground flora within suitable areas within W1, W2, W3, W4 and W6</u></b></p> <p>Introduce woodland wildflowers. Plant woodland wildflower plugs or bulbs at a planting density of 5 plants/m2 using the following planting mixes.</p> <ul style="list-style-type: none"> <li>Suitable central areas: wood anemone, bluebell, yellow archangel, wood forget-me-not, common dog-violet, wild strawberry, primrose, woodruff.</li> <li>Suitable woodland edges: wood avens, red campion, greater stitchwort.</li> </ul> <p>Or,</p> <ul style="list-style-type: none"> <li>Surface sow Emorsgate EW1F Woodland Mixture (or similar) during spring (April/early May) or preferably the optimal period for lowland sites of autumn (late August to September), selecting a time when the soil is moist and can be worked. See can be applied by machine or broadcast by hand.</li> </ul> <p><b>1.3 <u>Create deadwood – All woodlands.</u></b></p> <ul style="list-style-type: none"> <li>Retain all deadwood in-situ unless plant health reasons require removal and destruction off-site.</li> <li>Maximise opportunities to create standing deadwood during any tree works required for health and safety issues</li> </ul>	<p><b>1.4 <u>Thinning W2 and W6</u></b></p> <ul style="list-style-type: none"> <li>As per 1.1.</li> </ul> <p><b>1.5 <u>Monitoring ground flora W1, W2, W3, W4 and W6</u></b></p> <ul style="list-style-type: none"> <li>Control nettle and bramble in areas of ground flora planting.</li> <li>Replant as required if initial planting unsuccessful.</li> </ul> <p><b>1.6 <u>Arboricultural works for health and safety - All woodlands</u></b></p> <ul style="list-style-type: none"> <li>Any felling works required outside of nesting bird season and after checks on semi-mature and mature trees for bats.</li> <li>Deadwood to be left standing where appropriate and logs and branches used in log piles.</li> </ul> <p><b>1.7 <u>Invasive species management - All woodlands</u></b></p> <ul style="list-style-type: none"> <li>Removal of any invasive or undesirable non-native species</li> <li>Arisings to be removed from site to appropriate disposal facility.</li> </ul>	<p><u>Indicators W1, W2, W3, W4 and W6</u></p> <ul style="list-style-type: none"> <li>Diverse woodland present with a canopy layer, understorey of scrub and young trees and ground flora evident.</li> <li>Invasive and undesirable non-native species are absent.</li> <li>Standing deadwood is present throughout the woodlands as dead branches, stems or stumps (e.g., in 50% of all survey/monitoring plots).</li> <li>Vegetation and ground flora: – recognisable NVC community.</li> <li>Tree health: Tree mortality less than 10%, no pests or diseases and no crown dieback.</li> <li>Number of native tree species: Five or more native tree or shrub species found across woodland parcel.</li> <li>Woodland regeneration: All three classes present in woodland; trees 4-7cm dbh, saplings and seedlings or advanced coppice regrowth.</li> </ul> <p><u>Remedial actions W1, W2, W3, W4 and W6</u></p> <p>If woodland layers not present, appropriate areas should be managed as prescribed in management actions.</p> <p><u>Indicators W5 and W7</u></p> <p>Trees adjacent to footpath have been monitored and managed with no health and safety risks identified.</p> <p><u>Remedial actions W5 and W7</u></p> <p>Carry out arboricultural works where required.</p>



FEATURE	OBJECTIVES	PRIORITY	MANAGEMENT ACTION TO ACHIEVE OBJECTIVE AND CRITERIA – INITIAL MANAGEMENT	MANAGEMENT ACTION TO ACHIEVE OBJECTIVE – ONGOING HABITAT MANAGEMENT	INDICATOR THAT OBJECTIVE HAS BEEN ACHIEVED AND REMEDIAL ACTION IF REQUIRED
<p><b>2. Scrub</b></p> <p><b>S1, S2, S3, S4, S5 and S6</b></p>	<p>To manage the outer edges of scrub habitats to ensure no encroachment into adjacent grassland and create a graded structural edge where appropriate.</p>	<p><b>LOW</b></p>	<p><b>2.1 <u>Creation of a graded edge to mature even aged scrub S2, S4 and S5</u></b></p> <ul style="list-style-type: none"> <li>S2, S4, S5: Cut/coppice scrub within a strip measuring 1-2m along the edge where this meets the adjacent grassland habitat on-site. Cut 20% within this 1-2m strip on a fifteen-year rotation and allow cut specimens to regenerate to create a mixed age edge habitat.</li> </ul> <p><b>2.2 <u>Remove scrub from select areas at the edges of G1, G3 and G4 (also see 4.2 and 4.5)</u></b></p> <ul style="list-style-type: none"> <li>Grassland habitats G1 and G3 are bordered by areas of scrub (S1 and S3) and scattered trees (ST1). It would be feasible to increase the extent of these grasslands by the gradual removal of scrub and mature trees. Similarly, removal of tree/shrubs from the edge of W4 and W2 (where appropriate) would create a wider corridor of grassland/wildflower habitat along the path through the south of the site.</li> <li>Remove 90 – 100% of scrub and young trees within select areas to create additional grassland habitat. Retain a mixture of scrub and young trees of varied species and age. Cut back scrub by 50% in each year of management.</li> </ul> <p><b>2.3 <u>Remove Cotoneaster from S1 by either:</u></b></p> <ul style="list-style-type: none"> <li>Cutting back and grubbing up roots</li> <li>Cutting and treating stumps with an appropriate herbicide.</li> </ul>	<p><b>2.4 <u>Monitor scrub growth within grassland habitats.</u></b></p> <ul style="list-style-type: none"> <li>Monitor scrub growth within areas of grassland and cut back on a regular basis to maintain open grassland habitat.</li> </ul> <p><b>2.5 <u>Maintain a graded edge to mature even aged scrub S2, S4 and S5</u></b></p> <ul style="list-style-type: none"> <li>As 2.1.</li> </ul> <p><b>2.6 <u>Invasive species management (all)</u></b></p> <ul style="list-style-type: none"> <li>Removal of any invasive or undesirable non-native species</li> <li>Arisings to be removed from site to appropriate disposal facility</li> </ul>	<p><u>Indicator</u></p> <ul style="list-style-type: none"> <li>There is a good age range: seedlings, young shrubs and mature shrubs present within managed areas.</li> <li>There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species make up less than 5% of ground cover.</li> <li>The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).</li> <li>There are clearings present within scrub S1, S2 and S3, providing sheltered edges.</li> </ul> <p><u>Remedial actions</u></p> <p>Appropriate areas should be managed as prescribed in management actions.</p>
<p><b>3. Scattered Trees</b></p> <p><b>ST1</b></p>	<p>To maintain current tree cover and health of individual trees adjacent to footpaths for health and safety.</p>	<p><b>HIGH</b></p>	<p><b>3.1 <u>Arboricultural works for health and safety - All woodlands</u></b></p> <ul style="list-style-type: none"> <li>Any felling works required outside of nesting bird season and after checks on semi-mature and mature trees for bats.</li> <li>Deadwood to be left standing where appropriate and logs and branches used in log piles.</li> </ul>	<p><b>3.2 <u>Arboricultural works for health and safety - All woodlands</u></b></p> <ul style="list-style-type: none"> <li>Any felling works required outside of nesting bird season and after checks on semi-mature and mature trees for bats.</li> <li>Deadwood to be left standing where appropriate and logs and branches used in log piles.</li> </ul>	<p><u>Indicators</u></p> <p>Trees adjacent to footpath have been monitored and managed with no health and safety risks identified.</p> <p><u>Remedial actions</u></p> <p>Carry out arboricultural works where required.</p>

FEATURE	OBJECTIVES	PRIORITY	MANAGEMENT ACTION TO ACHIEVE OBJECTIVE AND CRITERIA – INITIAL MANAGEMENT	MANAGEMENT ACTION TO ACHIEVE OBJECTIVE – ONGOING HABITAT MANAGEMENT	INDICATOR THAT OBJECTIVE HAS BEEN ACHIEVED AND REMEDIAL ACTION IF REQUIRED
<p><b>4. Grassland</b></p> <p><b>G1, G2, G3, G4 and G5</b></p>	<p>G1, G2, G3, G4, G5 and G6: To progress and implement restorative management followed by long-term maintenance management to deal with scrub.</p> <p>G1, G3 and G4: To increase the extent of these grassland habitats through gradual removal of scrub (for example S1 and S3) and scattered tree (ST1).</p> <p>G5: To continue overseeding programme on ad hoc basis and sympathetically manage areas of open grassland.</p>	<p><b>HIGH</b></p> <p><b>HIGH</b></p> <p><b>HIGH</b></p>	<p><b>4.1 <u>Manage scrub cover.</u></b></p> <ul style="list-style-type: none"> <li>Remove scrub as required to have less than 5% cover</li> <li>Arisings to be placed on log piles</li> </ul> <p><b>4.2 <u>Remove scrub from select areas at the edges of G1, G3 and G4.</u></b></p> <ul style="list-style-type: none"> <li>Grassland habitats G1 and G3 are bordered by areas of scrub (S1 and S3) and scattered trees (ST1). It would be feasible to increase the extent of these grasslands by the gradual removal of scrub and mature trees. Similarly, removal of tree/shrubs from the edge of W4 and W2 (where appropriate) would create a wider corridor of grassland/wildflower habitat along the path through the south of the site.</li> <li>Remove 90 – 100% of scrub and young trees within select areas to create additional grassland habitat. Retain a mixture of scrub and young trees of varied species and age. Cut back scrub by 50% in each year of management.</li> </ul>	<p><b>4.3 <u>Conservation cut of grasslands.</u></b></p> <ul style="list-style-type: none"> <li>Cut grassland on rotation each September using either a flail and collect machine, or rake-off arisings.</li> </ul> <p><b>4.4 <u>Manage scrub cover.</u></b></p> <ul style="list-style-type: none"> <li>Remove scrub as required to have less than 5% cover.</li> <li>Arisings to be placed on log piles.</li> </ul> <p><b>4.5 <u>Continue with removal of scrub from select areas at the edges of G1, G3 and G4 (as 4.2).</u></b></p> <ul style="list-style-type: none"> <li>Remove 90 – 100% of scrub and young trees within select areas to create additional grassland habitat. Retain a mixture of scrub and young trees of varied species and age. Cut back scrub by 50% in each year of management.</li> </ul> <p><b>4.6 <u>Continue overseeding.</u></b></p> <ul style="list-style-type: none"> <li>Select suitable seeds for ground conditions (for example lady's smock <i>Cardamine pratensis</i> and ragged Robin <i>Silene flos-cuculi</i> within wetter areas).</li> <li>Cut existing grassland short within area to be overseeded in summer months and create 50% bare ground by scarification. Scatter seeds in autumn and roll or tread seeds into the soil.</li> <li>Follow 4.2 for cutting regime.</li> </ul>	<p><u>Indicators</u></p> <ul style="list-style-type: none"> <li>Significant areas of flowering grassland present with evidence of low-intensity management</li> <li>Cover of bare ground between 1% and 5%</li> <li>Cover scrub (including bramble) less than 5%.</li> <li>There is an absence of invasive non-native species and undesirable species and physical damage less than 5% of total area.</li> </ul> <p>Note: Species considered undesirable for this habitat type include; creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, curled dock <i>Rumex crispus</i>, broad-leaved dock <i>Rumex obtusifolius</i>, common nettle <i>Urtica dioica</i>, creeping buttercup <i>Ranunculus repens</i>, greater plantain <i>Plantago major</i>, white clover <i>Trifolium repens</i>, cow parsley <i>Anthriscus sylvestris</i>.</p> <p><u>Remedial actions</u></p> <p>If grassland shows evidence of mismanagement (not fulfilling criteria) management actions will be followed.</p>
<p><b>5. Wetland and Watercourse</b></p> <p><b>WE1, WC1 and WE2</b></p>	<p>To maintain and enhance the biodiversity value of the stream WC1 and wetland WE1.</p> <p>To create a larger pond or series of small ponds and surrounding area of wetland within the area of WE2.</p>	<p><b>LOW</b></p> <p><b>LOW</b></p>	<p><b>5.1 <u>Monitor and maintain the extent of wetland WE1 habitat through the removal of scrub, if required.</u></b></p> <ul style="list-style-type: none"> <li>Cut back willow and other scrub species.</li> <li>This should be carried out in the winter on a little-and-often basis, to reduce disturbance to wildlife.</li> </ul> <p><b>5.2 <u>De-culvert sections of watercourse WC1 when feasible.</u></b></p> <ul style="list-style-type: none"> <li>Watercourse W1 flows through underground culverts. To increase the biodiversity value of the stream these sections could be opened up through removal of culverts and the stream profiled to recreate a natural watercourse.</li> </ul> <p><b>5.3 <u>Create larger pond or series of ponds at WE2 when feasible.</u></b></p> <ul style="list-style-type: none"> <li>Consideration should be given to the design of this feature and ponds should include, where feasible, shallow and undulating draw down zones, shallow slopes (less than 1:5), scalloped edges, underwater bars and surrounding wetland features.</li> </ul>	<p><b>5.4 <u>Manage to remove any scrub encroachment.</u></b></p> <ul style="list-style-type: none"> <li>Cut back or remove any regenerating willow scrub encroachment within waterbodies.</li> </ul> <p><b>5.5 <u>Invasive/undesirable Species Management.</u></b></p> <ul style="list-style-type: none"> <li>Ensure wetland and watercourse remain free of non-native plant species.</li> </ul>	<p><u>Indicator</u></p> <ul style="list-style-type: none"> <li>No scrub growth within wetland areas.</li> <li>Ponds and wetland areas are free from invasive or undesirable species.</li> </ul> <p><u>Remedial actions</u></p> <ul style="list-style-type: none"> <li>Clear scrub and non-native flora.</li> </ul>

FEATURE	OBJECTIVES	PRIORITY	MANAGEMENT ACTION TO ACHIEVE OBJECTIVE AND CRITERIA – INITIAL MANAGEMENT	MANAGEMENT ACTION TO ACHIEVE OBJECTIVE – ONGOING HABITAT MANAGEMENT	INDICATOR THAT OBJECTIVE HAS BEEN ACHIEVED AND REMEDIAL ACTION IF REQUIRED
6. Access	To maintain footpath surfaces and infrastructure free from damage and erosion.	LOW	6.1 <u>Monitor and maintain footpaths and infrastructure.</u> <ul style="list-style-type: none"> <li>• Carry out repair works as necessary.</li> </ul>	6.2 <u>Monitor and maintain footpaths and infrastructure.</u> <ul style="list-style-type: none"> <li>• Carry out repair works as necessary.</li> </ul>	<u>Indicator</u> <ul style="list-style-type: none"> <li>• Footpaths and infrastructure in good condition.</li> </ul> <u>Remedial actions</u> <ul style="list-style-type: none"> <li>• Carry out repair work as necessary.</li> </ul>

Table 2: Thirty-Year Work Programme

FEATURE	MANAGEMENT/ MONITORING WORKS	YEAR AND TIMING																							
		1x = undertake management action once only within 5-year period, 5x = undertake management action once a year within 5-year period, x As req. = undertake management action as required within 5-year period.																							
		YEARS 1 – 5				YEARS 6 - 10				YEARS 11 - 15				YEARS 16 - 20				YEARS 21 - 25				YEARS 26 - 30			
Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi		
1. Broadleaved Semi-natural Woodland W1, W2, W3, W4, W5, W6 and W7	LOW 1.1 and 1.4 Thinning of W2 and W6.				1x				1x				1x								1x				
	LOW 1.2 Planting ground flora W1, W2, W3, W4 and W6, spring or autumn. Replant as necessary in years 16 – 20 if initial planting unsuccessful.	1x		1x										1x		1x									
	LOW 1.3 Create deadwood	Continuous, where appropriate, outside of nesting bird period if woody vegetation removed.																							
	LOW 1.5 Monitoring ground flora, controlling bramble and common nettle W1, W2, W3, W4 and W6.		5x				5x				5x				5x				5x				5x		
	HIGH 1.6 Additional arboricultural works such as for health and safety – all woodlands				x As req.				x As req.				x As req.				x As req.				x As req.				x As req.
	LOW 1.7 Invasive species removal – all woodlands	Continuous, where appropriate, outside of nesting bird period if woody vegetation removed.																							
2. Scrub S1, S2, S3, S4, S5 and S6	LOW 2.1 and 2.5 Cutting/coppicing of scrub from edges of S2, S4 and S5. Cut 20% on a fifteen-year rotation.				2x				1x				2x				1x				2x				2x
	HIGH 2.2 Remove scrub (S1 and S3) and scattered trees (ST1) from select areas at the edges of G1, G3 and G4				2x				2x				2x				2x				2x				2x
	LOW 2.3 Remove <i>Cotoneaster</i> , during growing season.		2x	2x																					
	HIGH 2.4 Monitor scrub growth, cut back on a regular basis to maintain open grassland habitat.				5x				5x				5x				5x				5x				5x
	LOW 2.6 Invasive/undesirable species management.	Continuous, where appropriate, outside of nesting bird period if woody vegetation removed.																							
3. Scattered Trees ST1	HIGH 3.1 and 3.2 Arboricultural works for health and safety, when required.				5x				5x				5x				5x				5x				5x
4. Grassland G1, G2, G3, G4 and G5	HIGH 4.1 and 4.3 Manage scrub cover to less than 5%				5x				5x				5x				5x				5x				5x
	HIGH 4.2 and 4.5 Remove scrub (S1 and S3) and scattered trees (ST1) from select areas at the edges of G1, G3 and G4				2x				2x				2x				2x				2x				2x
	HIGH 4.3 Conservation cut of grasslands.			5x				5x				5x				5x				5x				5x	

FEATURE	MANAGEMENT/ MONITORING WORKS	YEAR AND TIMING																							
		1x = undertake management action once only within 5-year period, 5x = undertake management action once a year within 5-year period, x As req. = undertake management action as required within 5-year period.																							
		YEARS 1 – 5				YEARS 6 - 10				YEARS 11 - 15				YEARS 16 - 20				YEARS 21 - 25				YEARS 26 - 30			
Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi		
	<b>HIGH</b> 4.6 Continue programme of ad hoc overseeding. Create bare ground in summer and overseed in autumn.		x As req.	x As req.			x As req.	x As req.			x As req.	x As req.			x As req.	x As req.			x As req.	x As req.			x As req.	x As req.	
5. Wetland WE1	<b>LOW</b> 5.1 and 5.4 Remove scrub from wetland habitats when required.				2x				2x				2x				2x				2x				2x
	<b>LOW</b> 5.2 Open up currently culverted sections of WC1 when feasible during plan period.				x As req.				Or x As req.																
	<b>LOW</b> 5.3 Create larger pond or series of ponds at WE2				x As req.				Or x As req.																
	<b>LOW</b> 5.5 Remove any non-native and undesirable species from ponds and wetland with appropriate methods.	Continuous, where appropriate, during winter months.																							
6. Access	<b>LOW</b> Carry out maintenance works to footpaths and infrastructure.	Continuous, where appropriate, during winter months.																							
7. All Habitats	<b>HIGH</b> Remove litter and monitor signs of antisocial behaviour.	Continuous, where appropriate, outside of nesting bird period if woody vegetation needs to be removed.																							

Table 3: Annual monitoring requirements

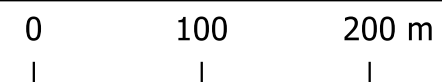
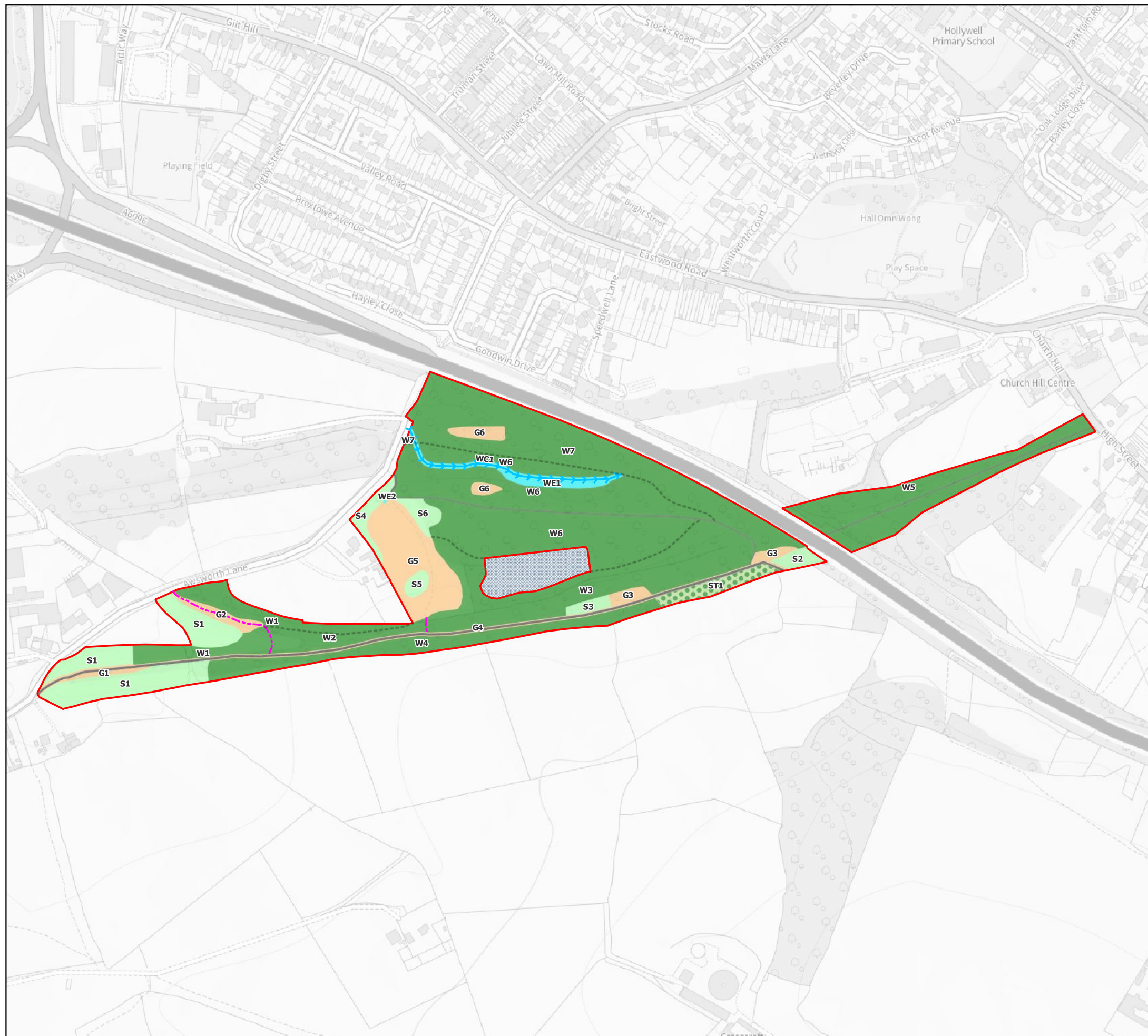
Location	Monitoring Frequency	Monitoring Items
1. Broadleaved Semi-natural woodland	Monitoring visit every 5 <sup>th</sup> year to record management that has been implemented and monitor condition of the woodland. Refer to Indicators in Table 1.	Do the woodlands have a varied structure, with a canopy layer, understorey and ground flora evident? Has thinning taken place? Is deadwood present?
2. Scrub	Monitoring visit every 5 <sup>th</sup> year to record management that has been implemented and monitor condition of the scrub. Refer to Indicators in Table 1.	Does managed scrub have a good age range and structure? Has Cotoneaster been removed? Has scrub been removed from grassland habitats, where required? Do stands of scrub have a graded edge?
3. Scattered Trees	Monitoring visit every year to record management that has been implemented and monitor condition of the trees. Refer to Indicators in Table 1.	Are trees in good health where adjacent to public footpaths?
4. Grassland	Annual monitoring to record management that has been implemented and monitor condition of the ponds and wetland. Refer to Indicators in Table 1.	Has annual grassland cutting taken place? Has scrub been removed to increase the extent of grasslands? Is there <5% scrub within grassland habitats? Has overseeding taken place?
5. Wetland	Annual monitoring to record management that has been implemented and monitor condition of the ponds and wetland. Refer to Indicators in Table 1.	Has scrub been removed from wetland areas? Have ponds been created at WE2? Has watercourse been de-culverted?
6. Access	Continuous monitoring of footpaths and infrastructure.	Are footpaths and infrastructure free from damage?
7. All Habitats	Continuous monitoring for accumulations of litter, damage to infrastructure and signs of antisocial behaviour.	Is the Site free of litter and non-native invasive species? Is there any damage to infrastructure (gates, way markers, benches etc.)? Are there any signs of antisocial behaviour?
8. Management Plan	Every 5 <sup>th</sup> year.	Has Management Plan been reviewed?


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## Key

- Site Boundary**
- Habitats (with reference)**
- Broadleaved Semi-Natural Woodland**
- Grassland**
- Offsite Scramble Track**
- Scattered Trees**
- Scrub**
- Surfaced Footpaths**
- Wetland**
- Running Water (with culverted sections)**
- Unsurfaced Footpath**





client  
Nottinghamshire County Council

project  
Kimberley Green and Great North  
Railway Path

drawing title  
**MANAGEMENT PLAN**

scale @ A3  
1:4500

drawn  
LG / ERD

issue date  
8/6/2023

drawing / figure number  
**Figure 1**

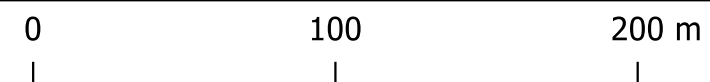
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- Surfaced Footpaths
- Wetland
- Running Water (with culverted sections)
- Unsurfaced Footpath



client  
Nottinghamshire County Council

project  
Kimberley Green and Great North  
Railway Path

drawing title  
**MANAGEMENT PLAN - WEST**

scale @ A3  
1:2500

drawing / figure number  
**Figure 1a**

drawn  
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issue date  
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rev  
**A**



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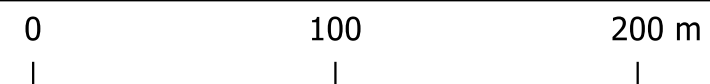
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### Key

- Site Boundary**
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- Scattered Trees**
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- Surfaced Footpaths**
- Wetland**
- Running Water (with culverted sections)**



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Nottinghamshire County Council

project  
Kimberley Green and Great North  
Railway Path

drawing title  
**MANAGEMENT PLAN - EAST**

scale @ A3  
1:2500

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LG / ERD

issue date  
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**Figure 1b**

rev  
**A**