Biodiversity Management Plan

Liss Riverside Railway Walk

Carmen Green

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Acknowledgements

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Executive Summary

Arcadian Ecology & Consulting Ltd (Arcadian Ecology) were commissioned by East Hampshire District Council (EHDC) on behalf of the South Downs National Park Authority (SDNPA) to undertake a Preliminary Ecological Appraisal (PEA) of Liss Riverside Railway Walk and produce a Biodiversity Management Plan.

Liss Riverside Railway Walk is an approximately 1.8km walk that follows the line of the Longmoor Military Railway which ran alongside the River Rother until its closure in 1971. It is located within the South Downs National Park to the north of the village of Liss (SU 78041 28347). The site is a Local Nature Reserve (LNR) consisting of a stretch of broad-leaved woodland interspersed with patches of scrub and rough grassland.

Liss Riverside Railway Walk is owned by EHDC and Liss Parish Council. There is a public right of way running from the north to south of the site with several smaller trails branching off it. The main access points are from Forest Road at the northern end and Station Road next to Liss Railway Station at the southern end, with other access points from the residential area on the eastern side and agricultural fields to the west. It is currently used for recreational activities such as walking, cycling, running and wildlife watching.

A Phase 1 Habitat survey of the site, conducted on 15th February 2023, identified the key habitat types on site as broad-leaved woodland, scrub, running water, rough grassland, amenity grassland and marsh/marshy grassland,

No protected or notable species were recorded during the PEA survey. Based on the habitat types and features identified at Liss Riverside Railway Walk, it is considered that the site has the potential to support amphibians, common and widespread reptiles, breeding birds, common and widespread invertebrates, and mammals such as badger, bats, dormice, fox, otter and water vole. Multiple trees had features that are potentially suitable for roosting bats including woodpecker holes, splits and cavities and a number of bird species were observed during the survey.

A previous survey by Hampshire Biodiversity Information Centre in 2016 noted the presence of Himalayan balsam along the river but this was not observed during the PEA, which may be due to the time of year. This species is listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). However, another species listed on Schedule 9 was observed within the woodland during this survey: rhododendron. It is an offence under the Wildlife and Countryside Act 1981 (as amended) to cause any species listed on Schedule 9 to spread into the wild. Therefore, these should be controlled so as not to cause these plants to spread on this site or other sites as well as to improve the woodland for wildlife. Other invasive non-native species present within the site but not listed on Schedule 9 include bamboo and cherry laurel.

Based on the results of the PEA survey, the site is considered to be of moderate to high ecological value in its current state, but has the potential to be of significantly greater value through habitat enhancement and management measures. Suitable objectives and actions have been developed that will enhance the biodiversity interest of Liss Riverside Railway Walk. The management recommendations are aimed at maintaining and increasing the biodiversity of the site in the future while being able to manage the site sustainably long-term.

The main objectives for the site are:

- To maintain and enhance the woodland habitats;
- Naturalise and enhance the River Rother and its banks;
- Maintain and increase the ecological value of the grassland habitats;
- Create an aesthetically pleasing wildlife rich landscape for visitors to enjoy and encourage recreational use and community engagement; and
- Comply with health and safety requirements and all other statutes.

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1. INTRODUCTION

1.1. Background

Arcadian Ecology & Consulting Ltd (Arcadian Ecology) were commissioned by East Hampshire District Council (EHDC) on behalf of the South Downs National Park Authority (SDNPA) to undertake a Preliminary Ecological Appraisal (PEA) of Liss Riverside Railway Walk and produce a Biodiversity Management Plan.

Liss Riverside Railway Walk is a Local Nature Reserve (LNR) owned by EHDC and Liss Parish Council. There is a public right of way running from the north to south of the site with several smaller trails branching off it. The main access points are from Forest Road at the northern end and Station Road next to Liss Railway Station at the southern end, with other access points from the residential area on the eastern side and agricultural fields to the west. It is currently used for recreational activities such as walking, cycling, running and wildlife watching.

1.2. Site Description

Liss Riverside Railway Walk is an approximately 1.8km walk that follows the line of the Longmoor Military Railway which ran alongside the River Rother until its closure in 1971. It is located within the South Downs National Park to the north of the village of Liss (SU 78041 28347; Map 1). The site is within the floodplain of the River Rother and consists of a stretch of broad-leaved woodland interspersed with patches of scrub and rough grassland. The immediate surroundings consist of agricultural fields, residential housing and a disused railway line.

In the wider landscape the town of Petersfield is to the south, the main A3 road is to the west and there are extensive areas of arable fields and grazed pasture in all directions. In addition, there are large blocks of woodland in all directions, particularly to the north and south.

1.3. Remit and Scope of the Report

This report provides an assessment of the current ecological status of Liss Riverside Railway Walk and makes recommendations on how to improve the habitats on site to increase biodiversity long term through a Biodiversity Management Plan.

2. BIODIVERSITY AND LEGISLATION

There has been a notable increase in people's engagement with the environment, recognising the immense pressure that the environment is under and the need to act before it is too late.

The State of Nature report 2013 identifies the biodiversity losses the UK has suffered, with over 60% of species having declined in the last 50 years (Burns *et al.,* 2013). The latest State of Nature report, published in 2019, further highlights the declines in abundance with 13% of the 696 terrestrial and freshwater species within the indicator showing a significant decline since 1970, and 6% over the last 10 years; with more species having decreased (41%) than increased (26%) within the indicator since 1970, and 44% decreased and 36% increased in the last 10 years. Species distribution also decreased, by an average of 5% since 1970, and is 2% lower than in 2005 (Hayhow *et al.* 2019).

The Aichi Biodiversity Targets were agreed by 196 countries under the Convention on Biological Diversity in 2010. In March 2019, the Joint Nature Conservation Committee (JNCC) on behalf of Defra, assessed the UK's performance and found that the UK had failed to meet 14 of the 19 targets assessed (House of Commons Environmental Audit Committee, 2021).

It reported that the status of habitats and species has deteriorated and there has been a continued increase in the prevalence of invasive species, as well as a continued deterioration in the fish size classes in the North Sea and in the status of pollinating insects. There has also been a shortfall in the funding for biodiversity by government of 29% from £641 million to £456 million between 2012/13 and 2017/18 (House of Commons Environmental Audit Committee, 2021).

In 2019, the Chartered Institute of Ecologists and Environmental Managers (CIEEM) declared a climate emergency and biodiversity crisis. This was a call to action for CIEEM members, governments and society to reduce greenhouse gas emissions through nature-based solutions, as the restoration of biodiversity can potentially mitigate the effects of climate change, such as carbon sequestration by peat bogs (CIEEM, 2019). EHDC declared a Climate Emergency in July 2019 and adopted a wide-ranging *Climate and Environment Strategy 2020-25* in August 2020 (EHDC, 2023).

Action is being taken at many levels, through government legislation and policy, to more local initiatives such as the Hampshire & Isle of Wight Wildlife Trust's Wilder 2030 strategy, an overview of some of these are detailed below.

2.1. Environment Act 2021

The Environment Act makes provision about targets, plans and policies:

- for improving the natural environment;
- for statements and reports about environmental protection;
- for the office for Environmental Protection;
- about waste and resource efficiency;
- about air quality;
- for the recall of products that fail to meet environmental standards;
- about water;
- about nature and biodiversity;
- for conservation covenants;
- about the regulation of chemicals; and
- for connected purposes.

It will be key for the delivery of the government's 25 Year Environment Plan and tackling the environmental and climate crises. It will set long-term and legally binding environmental targets (GOV.UK, 2020a).

2.1.1. 25 Year Environment Plan

The environment plan sets out goals for improving the environment within a generation, through improvement of air and water quality, and protection of plants, trees and wildlife (GOV.UK, 2019).

Key areas of the plan are (including some, but not all, of the actions identified for achieving the goals):

- **Clean air** – including the reduction of emissions from five damaging air pollutants; and stopping the sale of conventional petrol and diesel cars and vans by 2040.
- **Clean and plentiful water** – including a reduction in damaging abstraction from rivers and groundwater; reduction in water leakage; and minimising harmful bacteria in designated bathing waters.
- **Thriving plants and wildlife** – including the reverse of loss of marine biodiversity; increase in proportion of protected marine sites; restoring 75% of terrestrial and freshwater protected sites to favourable condition; creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected sites network; increasing woodland in England.
- **Reducing the risks of harm from environmental hazards** – including making sure everyone has access to information to assess risk to lives and livelihoods from flooding and coastal erosion; and ensuring decisions on land, including development, reflect current and future flood risk.
- **Using resources from nature more sustainably and efficiently** – including maximising the value and benefits we get from resources; improving our approach to soil management; ensuring fish stocks are recovered and maintained at levels that can produce maximum sustainable yield; and ensuring that food is produced sustainably and profitably.
- **Enhancing beauty, heritage and engagement with the natural environment** – including the safeguarding and enhancement of the beauty of our natural scenery; ensuring there are high quality, accessible, natural spaces close to where people live and work; and increasing action to improve the environment from all sectors of society.
- **Mitigating and adapting to climate change** – including the continued cutting of greenhouse gas emissions.
- **Minimising waste** – including working towards zero avoidable waste by 2050; eliminating avoidable plastic waste by 2042; and significantly reducing marine plastic pollution.
- **Managing exposure to chemicals**
- **Enhancing biosecurity** – including the management and reduction of the impact of existing plant and animal diseases, lowering the risk of new ones and tackling invasive, non-native species; and ensuring strong biosecurity protection at our borders.

2.1.2. Nature Recovery Network

The Nature Recovery Network (NRN) is part of the 25 Year Environment Plan. The NRN will be a national network of wildlife-rich places to increase and restore nature, with Defra and Natural England leading to bring together partners, legislation and funding to create the network which will restore and enhance England's wildlife-rich places (GOV.UK, 2020b).

2.1.3. Biodiversity Net Gain

A biodiversity metric has been created to use habitats to assess the wildlife value of an area. Biodiversity Net Gain is included in the new Environment Act, making it a mandatory condition for planning permission. The target for net gain can vary across the country/planning authorities, but a 10% biodiversity net gain is most widely adopted (GOV.UK, 2021).

2.2. Pledges and Initiatives

2.2.1. 30x30

The 30x30 commitment aims to protect 30% of land and sea around the world by 2030. It is a pledge by political leaders from 64 countries to reverse biodiversity loss. The UK government announced at the same time their commitment to protect 30% of the UK's land for biodiversity by 2030 (GOV.UK, 2020c).

The Wildlife Trusts are also running a fundraising appeal '30 by 30' to generate funds to start the process of nature's recovery across 30% of land and sea by 2030 (The Wildlife Trusts, 2021).

2.2.2. Wilder 2030

Wilder 2030 is Hampshire & Isle of Wight Wildlife Trust's 10-year strategy to create a much wilder Hampshire and Isle of Wight, with nature's recovery at the forefront of tackling the climate crisis; restoration of broken ecosystems and the return of missing wildlife; and people to benefit from a healthy

natural environment (Hampshire & Isle of Wight Wildlife Trust, 2019). This will be achieved through two key programmes:

- **Team Wilder:** more people on nature's side – 1 in 4 people connecting with wildlife and taking action for nature's recovery.
- **Wilder Land & Sea:** more space for nature to thrive – at least a third of land and sea to be wilder and where wildlife is recovering; pressure on nature reduced everywhere else; and nature recovering, ecosystems restored and wildlife returning.

2.2.3. Rewilding

Rewilding is the large-scale restoration of ecosystems, allowing nature to take back control and natural processes to prevail. It is a minimal intervention approach which allows the landscape to evolve and return to a more natural state. It allows ecosystems to provide natural functions for the benefit of people (ecosystem services) such as carbon sequestration, natural flood management and nitrate reduction. It also provides the opportunity to re-introduce missing species, such as beaver.

2.3. Legal context for Protection of Biodiversity

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019
These regulations state that:

"Where impacts cannot be avoided or satisfactorily reduced/mitigated, the competent authority will need to ascertain that the plan or project will not have a negative impact on the designated site populations, which would otherwise constitute an adverse effect on the integrity of the international site as a whole."

European designated sites are the Special Areas of Conservation (SAC) and Special Protection Areas (SPA), designated before 31st December 2020, collectively known as the National Site Network; in addition, Ramsar sites are areas of international wetland importance. These designations all have implications for local decision making and special care must be taken to ensure decisions and plans do not adversely impact on these sites, the species or features for which they have been designated.

The **Natural Environment and Rural Communities (NERC) Act 2006** requires every local authority to have regard to conserving biodiversity in the execution of their functions. Section 41 of the act lists 65 priority habitats and 1150 priority species, all of which are identified on the 'UK Post-2010 Biodiversity Framework' which succeeded the UK Biodiversity Action Plan, which should be taken into consideration by local authorities when implementing their duty under the NERC Act.

2.4. Health and Well-being

In 2020, NHS England announced its greener NHS campaign to tackle the climate 'health emergency', reducing its carbon footprint to tackle air pollution and climate change, and the associated illnesses and pressures on A&E that this causes (NHS England, 2020).

Being in and around nature has many recognised benefits to mental health. These include improving mood, reducing feelings of stress and anger, improving physical health and increased social interaction (Mind, 2018).

A study commissioned by The Wildlife Trusts in 2019 also demonstrated that people engaged in targeted programmes with the Trusts (designed for people with health or social needs) showed a return of £6.88 for £1 invested, the value generated from health gains such as improved mental wellbeing. This was further increased to £8.50 for every £1 invested for the Trust's more general volunteering programmes (Bagnell *et al.,* 2019).

3. CURRENT STATUS OF BIODIVERSITY

The current status of biodiversity at Liss Riverside Railway Walk has been assessed through undertaking a Phase 1 Habitat survey of the site, to establish the habitats present and potential species it supports.

Whilst these methods will not capture everything present, they will give an indication of current biodiversity interest and highlight areas for improvement for inclusion in the management plan.

This survey is complemented by a background data search, obtaining records for the site and within a 2km radius, providing information on the species the site has potential to support.

3.1. Background Data Search

A data search of Hampshire Biodiversity Information Centre (HBIC) protected and notable species GIS layer was undertaken for records within 2km of the boundary of Liss Riverside Railway Walk. Species included in the search parameters are:

- species that are protected by international law;
- nationally protected species under The Conservation of Habitats and Species (Amendment)(EU Exit) Regulations 2019, The Wildlife & Countryside Act 1981 (as amended), Badgers Act 1992 and The Deer Act 1991;
- all species listed as Red or Amber on the Birds of Conservation Concern 5 (BOCC5, 2021);
- plant species that are Nationally Rare or Nationally Scarce; and
- species that have Action Plans under the UK Biodiversity Action Plan or are Priority Species under the Hampshire Biodiversity Action Plan.

A data search was made for statutory (those that are internationally and nationally important sites for ecology) and non-statutory (those that are important in a local context) sites designated for nature conservation within 2km of the site boundary. This search included SPAs, SACs, Ramsars, Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and LNRs as well as Sites of Importance for Nature Conservation (SINCs) within 1km.

A map indicating the extent of the data search areas is provided in Appendix 1.

3.2. Phase 1 Habitat Survey Methodology

The Phase 1 Habitat survey of the site was conducted on 15th February 2023 by Carmen Green (ACIEEM) of Arcadian Ecology & Consulting Ltd.

The JNCC methodology for Phase 1 habitat survey was followed (JNCC, 2010). A walkover survey of the site was undertaken, with areas classified and mapped using a standard set of colours on a Phase 1 Habitat map to indicate the habitat types present. For each different habitat type a species list was compiled, with particular reference to protected, notable or BAP species. This list will not give every species found on the site, but will give a representation of the diversity, significance, and dominance of plant species found within each habitat type. The location of descriptions relating to specific areas and features of interest or note were annotated on the Phase 1 Habitat map using Target Notes (Map 2).

Plant nomenclature in this report follows Rose (1989; 2006) for native and naturalised species of vascular plant. Plant names in the text are given with the common names first, followed by the scientific name in italics. Where there is a degree of doubt in the identification of a plant, 'cf.' precedes the specific epithet to signify the plant is very probably the species indicated, but it was not possible to distinguish it from similar members of the genus with certainty.

Conducting a Phase 1 habitat survey in winter months is sub-optimal as a lot of plant species are not evident or not flowering until spring/summer. This limitation is not considered to impact the survey results due to the nature of the habitats present, and it was possible to identify the species present in their vegetative form. However, it is likely that some species, including ancient woodland indicators, that do not emerge until later in the year will have been missed.

3.3. Background Data Search Results

3.3.1. Protected and notable species

The background data search returned 8,302 records for 323 protected and/or notable species, within 2km of the boundary of Liss Riverside Railway Walk in the past 20 years. Of these, there were 1,629 records of 116 species within the boundaries of the site. A breakdown by group is given in Table 1.

Table 1. Background data search results

Group	Number of Species		Number of Records	
	Within boundaries	Within 2km	Within boundaries	Within 2km
Amphibians & Reptiles	1	8	1	143
Birds	52	101	1463	7061
Higher plants - Ferns	0	1	0	9
Higher plants - Flowering Plants	11	41	19	198
Higher plants - Horsetails	0	1	0	1
Invertebrates - Coleoptera	1	12	4	58
Invertebrates - Diptera	0	1	0	1
Invertebrates - Hymenoptera	1	1	1	1
Invertebrates - Lepidoptera	45	131	104	638
Invertebrates - Odonata	2	2	34	34
Invertebrates - Orthoptera	1	1	1	1
Lower plants - Liverworts, Hornworts & Mosses	1	5	1	5
Mammals - Terrestrial (bats)	1	11	1	119
Mammals - Terrestrial (non-bats)	0	7	0	33
Total	**116**	**323**	**1629**	**8302**

The full results of the background data search are available on request including older records from more than 20 years ago.

3.3.2. Statutory and non-statutory designated sites

There are four statutory designated sites within 2km of Liss Riverside Railway Walk. Of these, two are within the boundary of the site: Liss Riverside Railway Walk (North) LNR and Liss Riverside Railway Walk (South) LNR. The remaining two are Wealden Heaths Phase II SPA and Woolmer Forest SSSI, both located just the other side of Forest Road to the north, approximately 10m away. These are shown on the map in Appendix 2.

Eleven non-statutory designated sites, SINCs, are located within 1km of Liss Riverside Railway Walk, as detailed in Table 2 and shown on the map in Appendix 3. Details of the SINC criteria can be found on the HBIC website: SINCCriteria.pdf (hants.gov.uk).

Table 2. SINCs within 1km of Liss Riverside Railway Walk

SINC Ref	SINC Name	Central Grid Reference	SINC Criteria	Notables
EH0447	Field by Evangelical Church, Liss Forest	SU78362848	2A/5B	
EH0446	Wyld Green North Meadow	SU78352815	2B	
EH0449	Wyld Green Woodland	SU78502800	1A	
EH0559	The Mint	SU78802870	1Cii/6A	*Potentilla palustris*
EH0432	Liss Railway (disused)	SU77922867	1B/1Cii/2B/5B/6A	*Stellaria neglecta*
EH0448	Wyld Green Central Meadow	SU78402810	2A	
EH0428	Moor Park Farm Woodland (North & South of Railway Line)	SU77902900	1Cii	
EH0429	Moor Park Farm Meadow 2	SU77902920	5B/6A	*Potentilla palustris*
EH0434	Moor Park Farm Meadow 3	SU78002910	2A	
EH0435	Flashmere, Woolmer Forest	SU78002990	1Cii/2B/5B	
EH0430	Moor Park Farm Meadow 1	SU77902940	2B	
EH0458	Warren Hill Meadow	SU78702910	2D	
EH0394	River Rother	SU76682566	5A	
EH0584	Lane North of St. Patrick's Copse, Liss	SU79402804	6A	*Epilobium lanceolatum*
EH0427	Liss Forest Site 1135	SU77902890	1Cii	
EH0471	Mint Road Meadow & Carr	SU79102870	6A	*Viola palustris, Stellaria neglecta, Equisetum sylvaticum*
EH0597	Liss Meadow	SU77552820	5B	

3.4. Phase 1 Habitat Survey Results - Habitats

The site consists of a stretch of broad-leaved woodland interspersed with patches of scrub and rough grassland. The immediate surroundings consist of agricultural fields, residential housing and a railway line. The results of the Phase 1 habitat survey are provided below, and a botanical species list is provided in Appendix 4.

3.4.1. Broad-leaved woodland

The majority of the site consists of broad-leaved woodland on a bank either side of the footpath (Photographs 1 and 2; Target Note 5). The canopy at the northern end is mostly oak *Quercus robur* with occasional silver birch *Betula pendula* and willow *Salix* spp. In addition, there are a few Scot's pine *Pinus sylvestris* trees at the entrance of the walk. The understorey contains an abundance of bramble *Rubus fruticosus* agg. with a mix of shrubs including hazel *Corylus avellana*, hawthorn *Crataegus monogyna* and holly *Ilex aquifolium* as well as ivy *Hedera helix* and small amounts of honeysuckle *Lonicera periclymenum*. In the field layer there are occasional patches of bracken *Pteridium aquilinum* and tussocks of pendulous sedge *Carex pendula* with grasses such as cock's-foot *Dactylis glomerata* and Yorkshire fog *Holcus lanatus*, ruderals and the woodland herbs bluebell *Hyacinthoides non-scripta*, cow parsley *Anthriscus sylvestris*, docks *Rumex* sp., dog's mercury *Mercurialis perennis*, lesser celandine *Ficaria verna*, lords-and-ladies *Arum maculatum*, nettle *Urtica dioica* and wood avens G*eum urbanum*.

Further south where the river intersects and follows the stretch of woodland, the ground becomes damper, and the canopy is dominated by alder *Alnus glutinosa* (Photograph 3; Target Note 4). There is a greater abundance of holly in the understorey towards the centre of the woodland. The field layer contains rough meadow-grass *Poa trivialis* and Yorkshire fog with occasional patches of snowdrop *Galanthus nivalis*. At the south-eastern end of the site, it becomes wetter still, dominated by alder with

sycamore *Acer pseudoplantanus*, willow, some regenerating holly, elder *Sambucus nigra*, hazel coppice and frequent bramble.

Towards the centre of the site past the Nightingale bridge, there is a row of new tree planting either side of the path which largely comprises hazel with some rose *Rosa* sp.

3.4.2. Scrub

There are several patches of bramble scrub, particularly next to houses with occasional mature trees (alder) and ruderal (nettle) and open areas of rough grassland (cock's-foot) with nettle, lords-and-ladies, ground ivy *Glechoma hederacea*, docks, cleavers *Galium aparine*, and hogweed *Heracleum sphondylium*.

At the southern end of the site there is dense bramble scrub and pendulous sedge tussocks (Photograph 4; Target Note 3).

3.4.3. Running water: River Rother

The River Rother flows across various points throughout site and becomes the western boundary towards the south (Photographs 5 and 6; Target Note 6). It is shallow with a moderate flow and has a gravel bed. The banks comprise bare earth that are mostly steep and heavily eroded. There is an abundance of alder on both banks along with occasional patches of bramble and pendulous sedge as well as some wild garlic *Allium ursinum* starting to appear. There is some metal reinforcement along bank towards the southern end of the site.

3.4.4. Rough grassland

Either side of the track amongst the area of woodland there are open areas comprising rough grassland with scattered bramble scrub, bracken and ruderals including nettle and docks (Photographs 7 and 8; Target Note 2). The sward consists of annual meadow-grass *Poa annua*, cock's-foot, and Yorkshire fog.

3.4.5. Amenity grassland

At the southern end of the site is a small picnic and play area with amenity grassland (Photograph 9; Target Note 1). The sward is dominated by annual meadow-grass and perennial ryegrass *Lolium perenne* with a low abundance and diversity of herbs including daisy *Bellis perennis* and dandelion *Taraxacum* agg.

3.4.6. Marsh/marshy grassland

To the east of the main path at the centre of the site is an open area comprising damp grassland/swamp habitat (Photograph 10; Target Note 7). It is dominated by meadowsweet *Filipendula ulmaria* with occasional soft rush *Juncus effusus* and hogweed. There are areas of bracken at the edges particularly to the north as well as stands of regenerating holly (Photograph 11).

3.5. Phase 1 Habitat Survey Results – Protected and Notable Species

No protected or notable species were recorded during the PEA survey. Based on the habitat types and features identified at Liss Riverside Railway Walk, it is considered that the site has the potential to support amphibians, common and widespread reptiles, breeding birds, common and widespread invertebrates, and mammals such as badger, bats, dormice, fox, otter and water vole.

Multiple trees had features that are potentially suitable for roosting bats including woodpecker holes, splits and cavities (Photograph 12). A number of bird species were observed during the survey, as detailed in Table 3 below.

Table 3. Birds observed during the Phase 1 Habitat survey

Common Name	**Scientific Name**
Blackbird	*Turdus merula*
Blue tit	*Cyanistes caeruleus*
Buzzard	*Buteo buteo*
Chaffinch	*Fringilla coelebs*
Dunnock	*Prunella modularis*
Green woodpecker	*Picus viridis*
Goldcrest	*Regulus regulus*
Goldfinch	*Carduelis carduelis*
Greenfinch	*Chloris chloris*
Great spotted woodpecker	*Dendrocopos major*
Great tit	*Parus major*
Jackdaw	*Corvus monedula*
Long tailed tit	*Aegithalos caudatus*
Magpie	*Pica pica*
Marsh tit	*Poecile palustris*
Nuthatch	*Sitta europaea*
Redwing	*Turdus iliacus*
Robin	*Erithacus rubecula*
Raven	*Corvus corax*
Song thrush	*Turdus philomelos*
Stock dove	*Columba oenas*
Woodpigeon	*Columba palumbus*
Wren	*Troglodytes troglodytes*

3.6. Phase 1 Habitat Survey Results – Invasive Non-native Species

A previous survey by HBIC in 2016 noted the presence of Himalayan balsam *Impatiens glandulifera* along the River Rother (Miller, 2016). However, this was not observed during the PEA, which may be due to the time of year. This species is listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Another species listed on Schedule 9, which was observed within the woodland during this survey is rhododendron *Rhododendron ponticum* (SU 78055 28400).

It is an offence under the Wildlife and Countryside Act 1981 to cause any species listed on Schedule 9 to spread into the wild. Therefore, these should be controlled so as not to cause these plants to spread on this site or other sites as well as to improve the woodland for wildlife. Two main options exist: mechanical removal and chemical treatment.

Other invasive non-native species present within the reserve but not listed on Schedule 9 include bamboo *Bambusa* sp. and cherry laurel *Prunus laurocerasus.* There are large patches of bamboo in several areas along the river. It was noted further downstream in adjacent gardens and likely to have spread from there. Cherry laurel was recorded in low levels of abundance at the south-western end of the site by the river (SU 77988 28545)

Both rhododendron and cherry laurel can form dense thickets that smother and out-compete native species. Chemicals produced in the plants leaves also act to suppress the germination of the seeds of other species.

4. RECOMMENDATIONS AND MANAGEMENT ACTIONS

Based on the results of the Phase 1 Habitat survey, the site is considered to be of moderate to high ecological value in its current state, but has the potential to be of significantly greater value through habitat enhancement and management measures. Suitable objectives and actions have been developed that will enhance the biodiversity interest of Liss Riverside Railway Walk. The management recommendations are aimed at maintaining and increasing the biodiversity of the site in the future while being able to manage the site sustainably long-term.

4.1. Objectives

The main objectives for the site are:

- To maintain and enhance the woodland habitats;
- Naturalise and enhance the River Rother and its banks;
- Maintain and increase the ecological value of the grassland habitats;
- Create an aesthetically pleasing wildlife rich landscape for visitors to enjoy and encourage recreational use and community engagement; and
- Comply with health and safety requirements and all other statutes.

4.2. General Recommendations

It should be noted that if any tree works or clearance of vegetation is required, this should be undertaken outside of the bird nesting season (March to August inclusive) to avoid causing death or injury to nesting birds, their eggs and young, and the damage or disturbance of nests and nesting sites. If this is not feasible, a suitably experienced ecologist should be employed immediately preceding the works to carefully check for the presence of breeding birds and/or their nests at the proposed site, and works may commence if none are found.

In addition, if any works are to be carried out on any trees with bat roost features, then further surveys (potentially including a detailed inspection for roosting bats) will need to be carried out.

4.3. Potential Issues

Due to the urban location of the reserve, there is potential for anti-social behaviour, fly tipping, vandalism, litter and fires. There should be engagement with the local community to value the site and stop/report anti-social behaviour to help protect the reserve.

With housing and gardens on the east and west sides, there are likely to be issues with the dumping of garden waste into the reserve, and this could lead to the introduction and/or spread of invasive non-native species on the site such as bamboo, which was observed within the adjacent gardens. Regular surveys to check and then manage/remove non-natives should be undertaken.

In addition, the management of hazardous trees is a continual health and safety risk, particularly those that overhang that paths and bridges.

The southern end of the site, particularly along the river and its banks, are within a high to medium flood risk area while the northern end has no risk of flooding (GOV.UK, 2023). Undertaking management activities to enhance habitats on site will not only benefit biodiversity, but some will also help provide better flood and drought resilience on the site and ensure the safety of visitors. Paths, bridges and access points should be checked regularly and maintained long-term to withstand potential flooding events and ensure the reserve can continue to be used recreationally by visitors.

Natural succession is the process by which open bare ground develops into grassland and eventually woodland. All open habitats in the UK are prevented from becoming woodland by external factors such as grazing pressure, mechanical cutting or fire. At Liss Riverside Railway Walk, a combination of manual and mechanical cutting and clearance will be required to maintain the open habitats, namely the grasslands, to prevent them becoming encroached by scrub and developing into woodland.

Management and monitoring need to take into consideration the increasing number of diseases affecting native species, such as ash dieback *Hymenoscyphus pseudoalbidus* and oak processionary

moth *Thaumetopoea processionea*. Regular surveys, particularly for dangerous trees, should identify potential issues.

With temperatures predicted to rise due to climate change, species are going to need to adapt or move to survive. For sedentary species and plants this will be more challenging and likely to result in at least localised declines or extinctions. There is also the potential for more non-native species to arrive from the continent. Monitoring of the biodiversity of the site and comparison with local and national trends will be key to identifying those species that are struggling, and regular updates of the management plan will be required to reflect this.

4.4. Management Actions

A management plan outlining the biodiversity actions for Liss Riverside Railway Walk is detailed in Table 4. The table is divided into 5 main columns; Objective, Action, Outcome, Targets and Monitoring Action. Objectives are the overall aim of undertaking the action, actions are the key activities that need to be undertaken, outcomes are the benefits to biodiversity that will be achieved, the targets are the steps that need to be fulfilled by the end of the stated years, and the monitoring action identifies how progress towards the final objective is going to be assessed. Some targets also include management suggestions on how best to achieve the target. Timing of works are set out in an annual task plan and long-term work plan which can be found in Appendix 5 and 6.

Table 4. Biodiversity actions for Liss Riverside Railway Walk

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
Maintain and enhance existing woodland habitats	Removal of invasive non-native species (cherry laurel, rhododendron and bamboo)	Encourage growth of native species within the woodland	All non-native species removed. ***Management:*** Controlled by mechanical removal or chemical treatment (cutting and removing stems by hand or by chainsaw, as close to the ground as possible. The stumps can then either be dug out or treated with herbicides such as glyphosate or triclopyr. Clumps of bamboo can be dug out together using a fork or trowel to lift out and completely remove the roots and rhizomes)	As previous		Monitor invasive non-native species continuously to ensure no new plants appear	High
	Open up woodland through thinning and light pruning	Allow more sunlight to reach the woodland floor, increasing the biodiversity of ground flora (including bluebell) to attract insects such as butterflies and bumblebees	Improved structural and floral diversity. ***Management:*** The woodland could be thinned and some standards removed to allow more light onto the woodland floor. Sycamore in particular can be a problem as this comes into leaf early in the year and causes a lot of shading. It is recommended that sycamore is one of the first trees to be removed. Some bramble, holly and willow could be thinned in places where they have become dominant. Thinning should be carried out little and often, ensuring			Botanical survey every 3-5 years	High

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
			that not too much of the tree canopy is removed at a time to reduce the risk of windthrow. It is suggested that no more than 5% of the trees are removed at any one time.				
	Regular coppicing on a rotational basis	Create a varied structure suitable for a range of woodland species	Improved structural and floral diversity ***Management:*** Coppicing of hazel should be continued long-term to increase fruiting and provide additional food resource. Coppice in small coups in a mosaic pattern to create a varied age structure (adjacent coups should not be coppiced in consecutive years). The brash could be piled on top to deter deer browsing.	Rotational coppice		Botanical survey every 3-5 years	High
	Retain and increase standing dead wood	Retention of trees as habitat for invertebrates, birds and bats	Any trees identified as hazardous retained as monoliths if safe to do so.	Additional holes could be drilled to create cavities and stimulate rotting		N/a	Low
	Maintenance of existing bat boxes and erection of additional bat boxes on mature trees	To enhance the site for bats by creating additional roosting habitat	Any damaged boxes should be repaired/replaced. Install new boxes on mature trees. Check boxes once a year and clean out any debris Further information on bat boxes can be found in Appendix 7	Ensure vegetation does not grow over boxes as this will deter bats from using them	As previous	Regular bat box checks by a licenced bat ecologist	Low

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
	Erection of bird boxes for a range of species	To provide additional nesting opportunities on the site for breeding birds	A range of bird boxes should be installed and include a mix of standard, open-fronted bird boxes and starling boxes. Boxes should not be positioned too close together and attract a range of species such as blue tit *Cyanistes caeruleus*, robin *Erithacus rubecula* and starling *Sturnus vulgaris*. The boxes should be checked once a year during the late autumn/winter to remove old bedding. Any damaged boxes should be replaced. Further information on bird boxes can be found in Appendix 7	Any damaged boxes should be replaced	As previous	Carry out annual bird box checks and woodland breeding bird survey. Data submitted to BTO nest Record Scheme, and Wildlife Trust.	Low
	Provision of log piles	Increased habitat for invertebrates and small mammals as well as providing hibernation habitat for amphibians and reptiles	Creation of at least one log pile in a suitable area within the woodland Use logs from broad-leaved trees of varying sizes. These should be partially buried in the ground in a semi-shaded area (i.e. somewhere warm enough for insects but not exposed to prolonged sunlight which can dry out the wood). Some logs should be positioned upright as this is suitable for stag beetles			N/a	Low

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
			Lucanus cervus which lay their eggs into deadwood Further information can be found in Appendix 7				
	Provision of compost heaps	Increased habitat for invertebrates, reptiles and small mammals	Can be created using cuttings from the grassland piled up into a heap.			N/a	Low
	Provision of invertebrate houses	Increased habitat for invertebrates	Install invertebrate house "bug hotel" within rough grassland. Further information can be found in Appendix 7			N/a	Low
Naturalise and enhance the River Rother	Maintain and enhance river channels	Improved water quality and floral diversity	Light pruning of overhanging vegetation to allow more sunlight to reach the stream and its banks, increasing the biodiversity of aquatic vegetation and ground flora. ***Management:*** Any areas of dense bramble and pendulous sedge on the banks should be cut back to allow more light to reach the watercourse. Some bramble, holly and willow could also be thinned. While it is beneficial to native wildlife, it can grow rapidly contributing to low light levels. If desired, some areas of denser vegetation could be maintained between the path and river to reduce frequency of people/dogs entering the channel and eroding river banks	As previous		Botanical survey every 3-5 years	High

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
	Removal of invasive non-native species (Himalayan balsam)	Encourage growth of native species	All non-native species removed. ***Management:*** Controlled by chemical treatment (by a suitably qualified professional with appropriate licences due to the close proximity of the stream) or mechanical removal (hand pulling April to June, before seed heads form), so as to avoid dispersing the seeds; removing individual stems from the ground ensuring the whole root system is removed. Stems can be placed in piles, avoiding bare ground where plants could re-root. Avoid removing Himalayan balsam from site as this could cause transfer of seeds and the spread of this plant outside of the reserve).	As previous		Monitor invasive non-native species continuously to ensure no new plants appear	High
	Commission a feasibility study by a river/wetland specialist to investigate the potential restoration opportunities along the River Rother	Increase in the quality and extent of river habitats, and by association, the diversity of flora and fauna the site will support		Feasibility study to enhance river (if budget/funding allows)		N/a	Low
Maintain and increase the ecological value of the grassland habitats	Enhance areas of rough grassland, retaining areas of longer grass and increase floral diversity for wildlife	Habitat for invertebrates, such as bees and butterflies as well as reptiles and small mammals	Reduce mowing frequency to allow wildflowers to grow and set-seed, particularly creating ecotones (transitional habitats) around woodland edge.	Grassland with a mixture of grass and native wildflowers with no dominant species ***Management:***	Grassland with a mixture of grass and native wildflowers with no dominant species ***Management:***	Botanical survey every 3-5 years Carry out surveys for invertebrates	High

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
		Area for visitors to enjoy nature	Areas of long grass and wildflowers with no large ruderal species such as nettle, docks and thistles ***Management:*** Year 1: Cut grass in March then leave to grow over the summer. In autumn remove any coarse grasses, ruderals and scrub & cut. Do not leave cut grass in-situ. Retain an area of approximately 25% uncut Year 2: Cut when height between 10 - 15cm, then every 6 to 8 weeks, always removing the grass. Do not cut below 5cm. Avoid cutting during main flowering period (mid-May to July)	Year 3: Cut twice – once in late March/ early April, & once in late August/ early September. From Year 4: Adopt an annual mowing regime – cutting once in late August/ early September. Vary the time of the cut each year to allow late-flowering plants to set seeds in some years. Remove any coarse grasses, ruderals and scrub. Remove grass cuttings from area	Continue annual mowing regime, mowing alternate strips on a rotational basis, removing the cut grass from the area and not cutting below 5cm	such as butterflies and bumblebees	
	Control encroachment of scrub and ruderals	Maintain areas of open grassland with an abundance of wildflowers for wildlife	Repeated cutting of scrub and ruderal vegetation should be carried out to prevent these from dominating and out-competing wildflowers. All cuttings should be removed and added to a compost heap. Removal of cuttings will ensure that any wildflowers present are not smothered. The vegetation should not be cut to a height of less than 5cm. Ecotones should develop at the base of scrub at the edges, creating a transition from short grassland, to long	As previous		Botanical survey every 3-5 years Surveys for invertebrates such as butterflies and bumblebees	Moderate

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
			grassland, to scrub and woodland.				
	Creation of wildflower areas	To enhance floristic diversity of site and provide pollen and nectar sources for invertebrates	Sow wildflower meadow in areas of amenity grassland and maintain with appropriate cutting regime to create areas of long grass and wildflowers with no large ruderal species such as nettle, docks and thistles. Plant native wildflower species such as common knapweed *Centaurea nigra*, oxeye daisy *Leucanthemum vulgare*, red campion *Silene dioica* and selfheal *Prunella vulgaris*. This could be created using a seed mixture, bee bombs or by using plug plants. More information on native species to plant can be found in Appendix 7. ***Management:*** Year 1: Late summer cut to no less than 5cm, then removal of cut material to keep nutrient levels low and encourage wildflower growth and seed germination. In autumn remove any weeds & cut. Year 2: Cut when height between 10 - 15cm, then every 6 to 8 weeks, always removing the grass.	Grassland with a mixture of grass and native wildflowers with no dominant species ***Management:*** Year 3: Cut twice – once in late March/ early April, & once in late August/ early September. From Year 4: Adopt an annual mowing regime – cutting once in late August/ early September. Vary the time of the cut each year to allow late-flowering plants to set seeds in some years. Repeated cutting of nettlebed and ruderal vegetation Remove grass cuttings from area. Mow alternate strips on a rotational basis with some areas left uncut so that any animals that are disturbed during the mowing have a safe refuge to retreat to	Grassland with a mixture of grass and native wildflowers with no dominant species ***Management:*** Continue annual mowing regime, mowing alternate strips on a rotational basis, removing the cut grass from the area and not cutting below 5cm	Carry out baseline survey to check establishment of meadow plant species then survey every 3-5 years Carry out bee and butterfly survey	Low

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
			Repeated cutting of nettlebed and ruderal vegetation to prevent these from dominating and out-competing the grasses and wildflowers				
	Planting of perennial bulbs	Provisioning of additional habitat and a food resource for a range of invertebrate and bird species. Snowdrops in particular can provide a late winter nectar and pollen source for early-emerging pollinators	Bulb planting could be carried out in sunny locations between the woodland edges and fields of semi-improved grassland. Species could include bluebell, daffodil and snowdrop. More information on native species can be found in Appendix 7. ***Management:*** Regular management of grass and weeds around bulb planting.	As previous		Carry out baseline survey to check establishment of bulbs then survey every 3-5 years	Low
Create an aesthetically pleasing wildlife rich landscape for visitors to enjoy and encourage recreational use and community engagement	Maintain access/path network across the reserve	Ensure the path network is well-maintained to encourage visitors to the site	Regular checks and review of path to ensure there is no encroachment of vegetation or otherwise inaccessible areas, enabling access throughout the reserve all year round. If desired, some areas of denser vegetation could be maintained to prevent people/dogs entering more sensitive areas	As previous	As previous	Deploy counters to monitor usage of the site	High
	Information exchange – contact local Wildlife Trust for press releases and suitable news articles on the reserve	Awareness of wildlife issues e.g. effects of non-native species on local wildlife, value of wildlife gardening etc.	Regular articles in local magazines/newspapers or online on relevant topics e.g. encouraging appropriate disposal of garden waste			Publications in magazine and webpage	Low

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
	Create a webpage for recording species and links to useful information and websites	Increased engagement and sense of ownership of green spaces	Develop page to allow submission of records and photos. Link to online recording system e.g. iRecord	Update with articles or links to local/national projects and sightings of interest		Webpage counter	Low
	Install additional signage and interpretation boards	Increased visitor interest and engagement	Review of current, and installation of additional signage and interpretation. Signage to include: path map and interpretation, local history and biodiversity of the site.	Repair or replace as necessary		N/a	Low
	Invite specialist groups to survey a site e.g. Hampshire bat group, Hampshire fungus recording group, Hampshire Flora Group	Generate more species records for the LNR			Invite Hampshire bat group to check bat boxes	Number of species records for LNR	Low
	Hold a BioBlitz to increase knowledge of species found in the reserve	Increased awareness of natural environment Engagement with local community		Organise day to hold BioBlitz, contacting local experts and organizations to help with species ID Recruit volunteers to assist on day	Hold BioBlitz Disseminate results to participants	Count of attendees	Low
	Encourage recording by residents	Engagement with local community Increased knowledge and understanding of local wildlife	Promote national events such as 'big garden bird watch' and 'big butterfly count' to aid learning and then encourage people to use systems such as iRecord to submit their own records	Use BioBlitz to further promote own recording and submission of records		Number of species records for LNR	Low
Comply with health and safety requirements and all other statutes	Regular and appropriate health and safety inspections undertaken and recorded	Health and safety requirements on site are complied with Maintain safety of visitors	A log of all visual checks and repair works to be maintained long-term. Regular surveys, particularly for dangerous trees.	Remove dangerous trees as necessary Repair or replace as necessary		Log of health and safety inspections and repair works	High

OBJECTIVE	ACTION	OUTCOME	TARGET (YEARS)			MONITORING ACTION	PRIORITY
			1- 2	3 – 5	6 – 10		
			Ensure paths, gates and bridges are maintained. Any incidents of anti-social behaviour reported and reviewed.			Dangerous tree report Incident log	
	Ensure that all works on site have permissions/consents in place prior to work commencing.	Compliance with these and other statues during their operations	Consents available for inspection prior to work commencing			Copies of consents and permissions held on file	High

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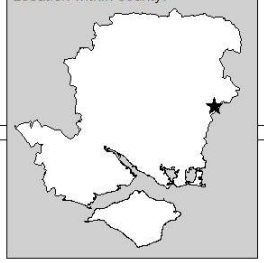
MAPS

Location within county:



Map 1. Site Location

Liss Riverside Railway Walk

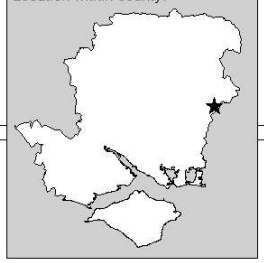
Scale 1:25000

Arcadian

Hampshire & Isle of Wight Wildlife Trust

Site boundary

Location within county:



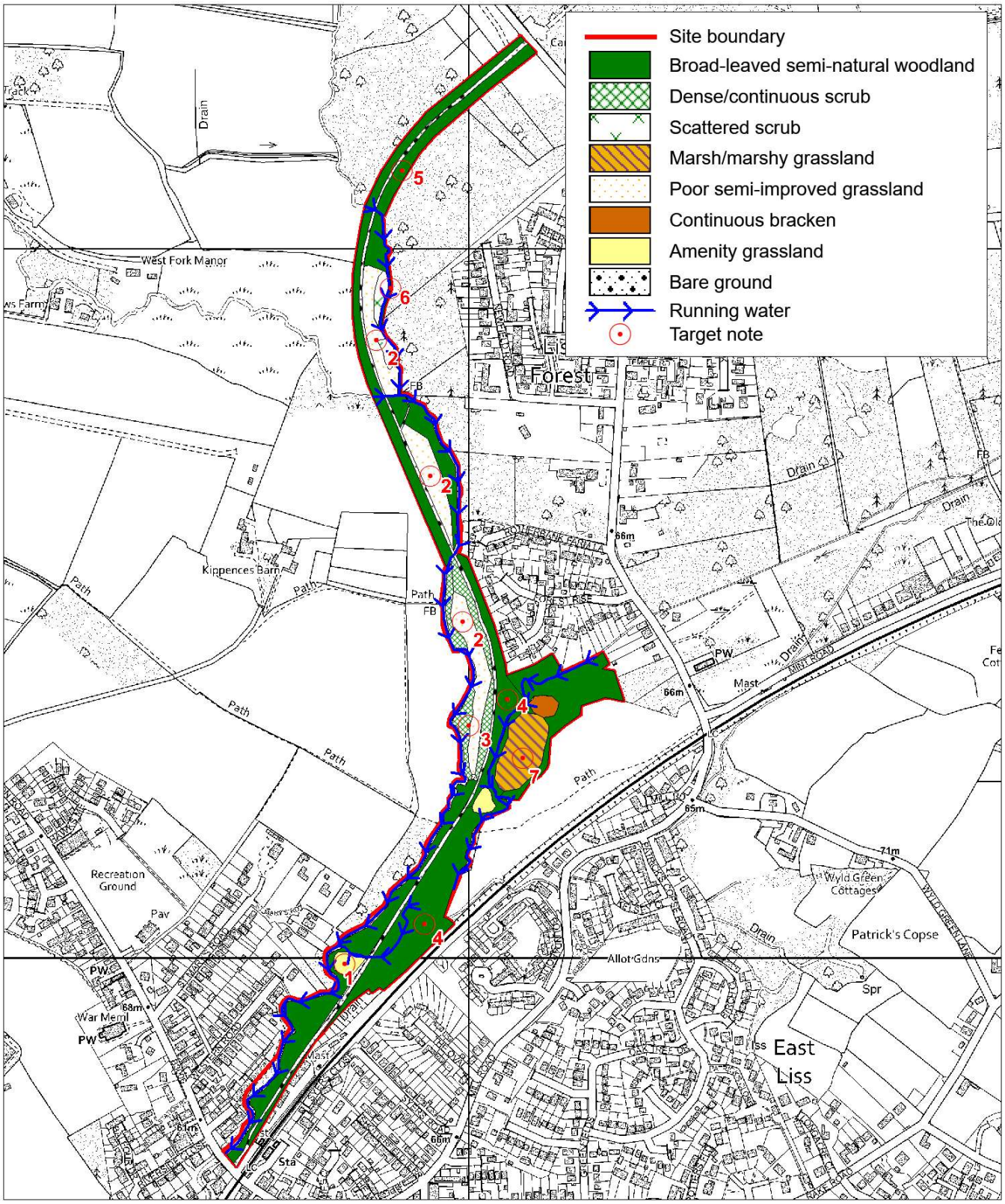
Map 2. Phase 1 Habitat Map

Liss Riverside Railway Walk

Scale 1:7500

Arcadian

Hampshire & Isle of Wight Wildlife Trust



N

BAP Priority habitat, notable species and SINC data supplied by the Hampshire Biodiversity Information Centre on behalf of the HBIC Partnership.
Aerial photography courtesy of GetMapping plc. Produced on 22 February 2023 by Carmen Green

PHOTOGRAPHS

Photograph 1. Entrance to the site at the northern end facing south

Photograph 2. Woodland at the northern end of the site

Photograph 3. Damper woodland dominated by alder

Photograph 4. Dense bramble scrub and tussocks of pendulous sedge

Photograph 5. Section of the River Rother at the northern end of the site

Photograph 6. Section of the River Rother along the western boundary of the site

Photograph 7. Rough grassland to the east of the site

Photograph 8. Rough grassland to the west of the site

Photograph 9. Amenity grassland and picnic area to the west of the site

Photograph 10. Marsh/marshy grassland to the east of the site

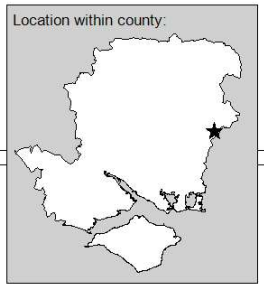
Photograph 11. Large patch of bracken to the north of the damp grassland/swamp area

Photograph 12. Example of a tree with potential bat roosting features (woodpecker holes)

APPENDICES

Appendix 1:
Extent of Background Data Search Area

Location within county:



Appendix 1. Extent of Background Data Search Area

Liss Riverside Railway Walk

Scale 1:25000

Arcadian

Hampshire & Isle of Wight Wildlife Trust

Site boundary

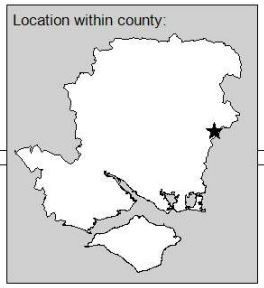
2km buffer

N

BAP Priority habitat, notable species and SINC data supplied by the Hampshire Biodiversity Information Centre on behalf of the HBIC Partnership.
Aerial photography courtesy of GetMapping plc. Produced on 22 February 2023 by Carmen Green

Appendix 2:
Locations of Statutory Designated Sites

Location within county:



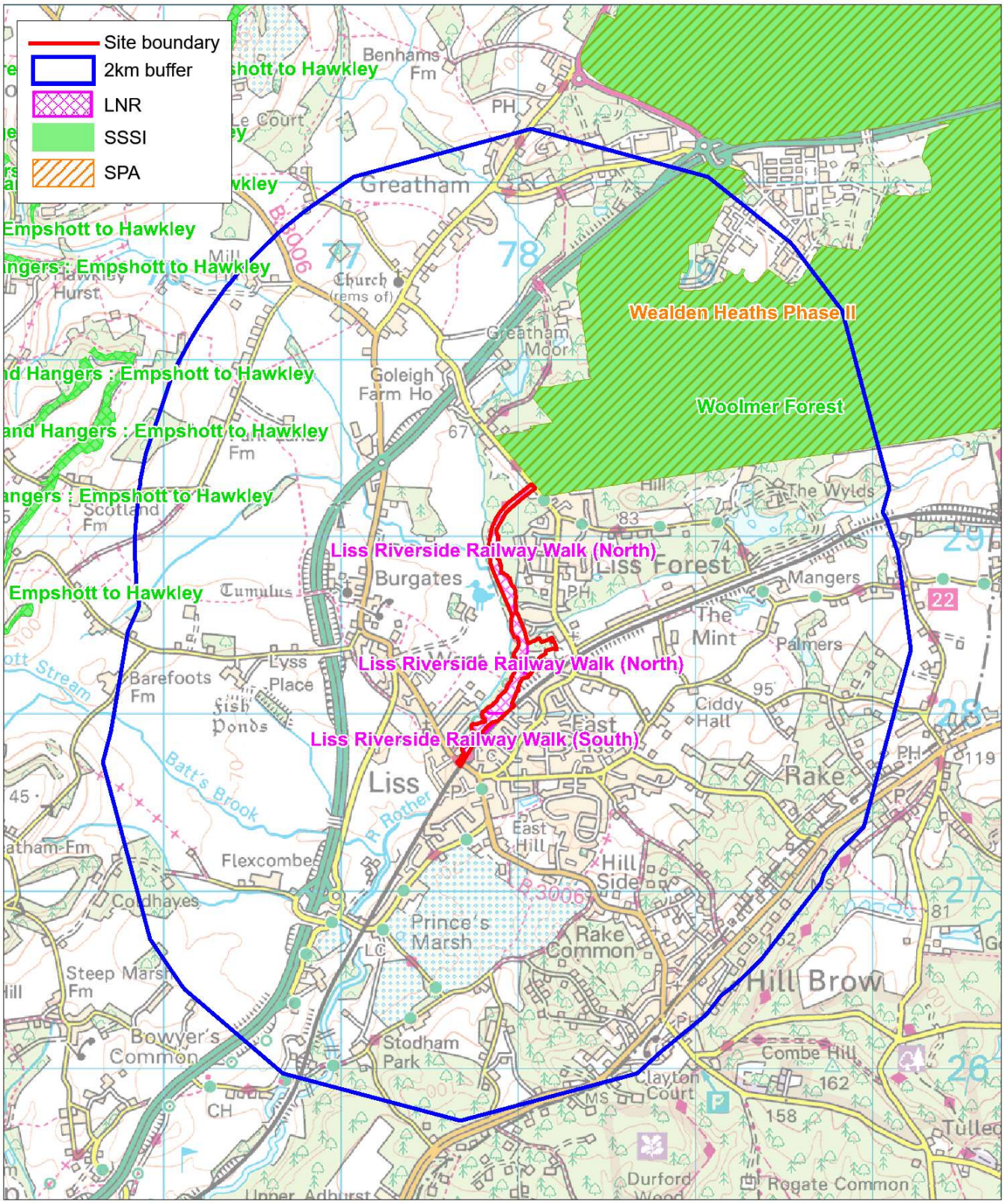
Appendix 2. Locations of Statutory Designated Sites

Liss Riverside Railway Walk

Scale 1:30000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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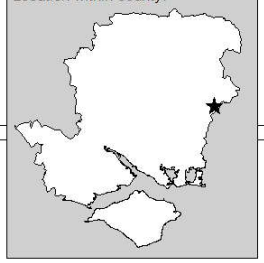
Appendix 3:
Locations of Non-statutory Designated Sites

Location within county:



Appendix 3. Locations of Non-statutory Designated Sites

Liss Riverside Railway Walk

Scale 1:20000

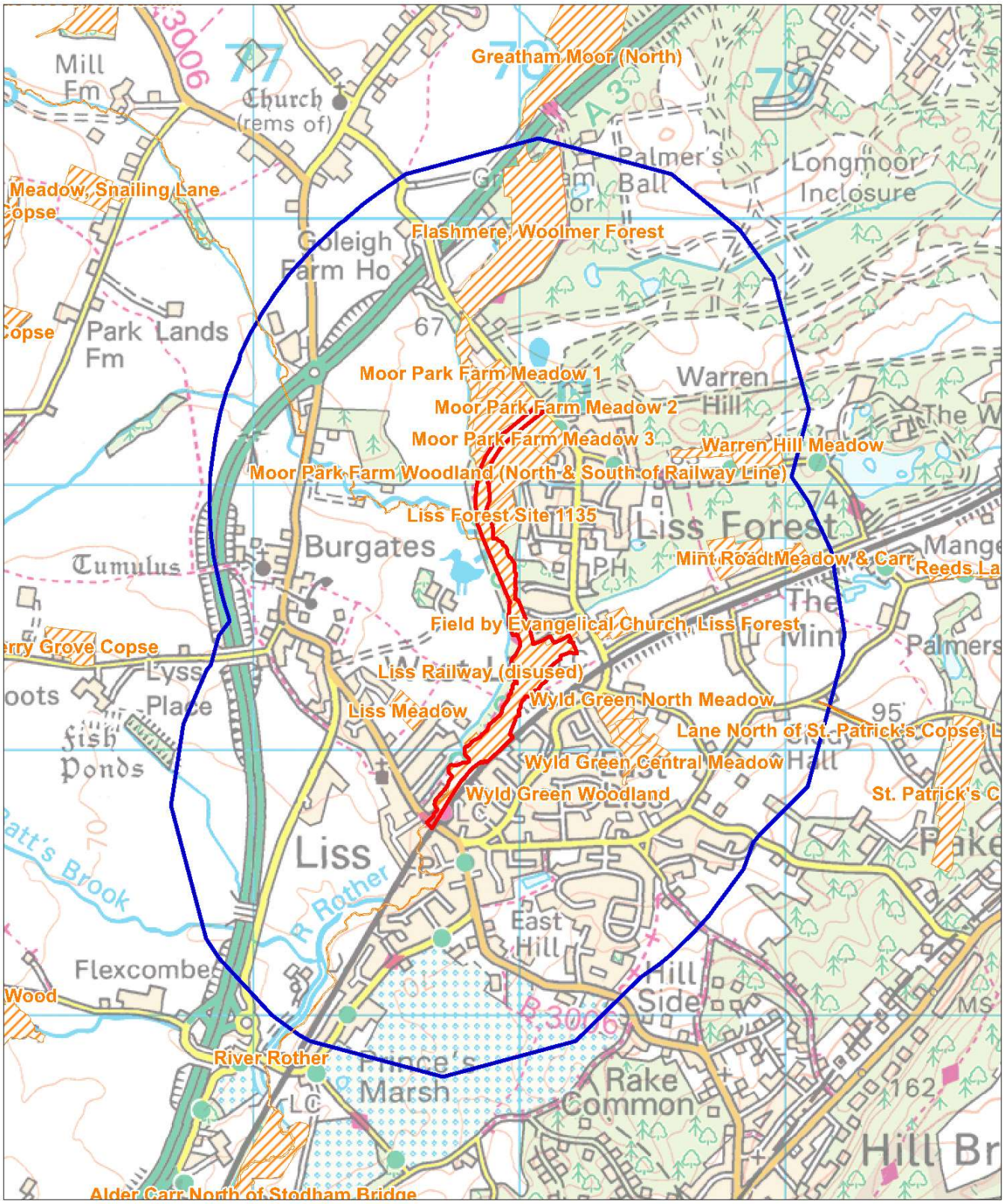
Arcadian

Hampshire & Isle of Wight Wildlife Trust

Site boundary

1km buffer

SINC



N

BAP Priority habitat, notable species and SINC data supplied by the Hampshire Biodiversity Information Centre on behalf of the HBIC Partnership.
Aerial photography courtesy of GetMapping plc. Produced on 22 February 2023 by Carmen Green

Appendix 4:

Botanical Species List Compiled During Phase 1 Habitat Survey with a Qualitative Measure of Abundance Based on DAFOR Scale

Appendix 4. Botanical Species List Compiled During Phase 1 Habitat Survey with a Qualitative Measure of Abundance Based on DAFOR Scale.

The DAFOR scale provides an assessment of the abundance of particular species.
D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare. Species can also be Locally Dominant (LD) or Locally Abundant (LA) meaning there is a particularly dense patch but it does not extend to an entire area, for example a nettle bed

Scientific Name	Common Name	Woodland/ scrub	Grassland	River/damp areas
Grasses, sedges and rushes				
Poa annua	Annual meadow grass		O	
Dactylis glomerata	Cock's-foot	R	F	
Lolium perenne	Perennial ryegrass	R	A	
Carex pendula	Pendulous sedge	F		O
Poa trivialis	Rough meadow-grass		F	
Carex sp.	Sedge	R		
Juncus effusus	Soft rush			O
Holcus lanatus	Yorkshire fog	O	O	
Herbs				
Hyacinthoides non-scripta	Bluebells	O		
Galium aparine	Cleavers	O		
Symphytum officinale	Common comfrey	R		
Centaurea nigra	Common knapweed		R	
Anthriscus sylvestris	Cow parsley	O	R	
Ranunculus repens	Creeping buttercup		O	
Lysimachia nummularia	Creeping Jenny			R
Narcissus sp.	Daffodil	R		
Bellis perennis	Daisy		O	
Taraxacum sp.	Dandelion		R	
Rumex sp.	Docks	O	R	
Mercurialis perennis	Dog's mercury	O		
Veronica chamaedrys	Germander speedwell	R		
Ulex europaeus	Gorse	R		
Glechoma hederacea	Ground ivy	O		O
Oenanthe crocata	Hemlock water dropwort			O
Heracleum sphondylium	Hogweed		O	R
Ficaria verna	Lesser celandine	O		
Arum maculatum	Lords-and-ladies	O		
Cirsium palustre	Marsh thistle			O
Filipendula ulmaria	Meadowsweet			LD
Urtica dioca	Nettle	R	F	
Silene dioica	Red campion		R	
Rosa	Rose	O		
Galanthus nivalis	Snowdrops	O		
Allium ursinum	Wild garlic	O		
Geum urbanum	Wood avens	O		
Woody species				
Alnus glutinosa	Alder	LA		LA
Bambusa sp.	Bamboo			O/LA
Laurus nobilis	Bay	R		
Fagus sylvatica	Beech	O		
Rubus fruticosus agg.	Bramble	F		

Scientific Name	Common Name	Woodland/ scrub	Grassland	River/damp areas
Buddleja davidii	Buddleia	R		
Prunus laurocerasus	Cherry laurel	O		
Sambucus nigra	Elder	R		
Corylus avellana	Hazel	F		
Ilex aquifolium	Holly	LF		
Lonicera periclymenum	Honeysuckle	R		
Hedera helix	Ivy	F		
Quercus robur	Oak	F		
Rhododendron ponticum	Rhododendron	R		
Pinus sylvestris	Scot's pine	R		
Betula pendula	Silver birch	O		
Acer pseudoplantanus	Sycamore	O		
Salix sp.	Willow	O		
Taxus baccata	Yew	O		
Ferns				
Pteridium aquilinum	Bracken	LF		
Dryopteris dilatata	Broad buckler-fern	O		
Asplenium scolopendrium	Hart's tongue fern			R

Appendix 5:
Annual Work Plan

Appendix 5. Annual Work Plan

Operational Objective	Activity	Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maintain and enhance existing woodland habitats	Removal of invasive non-native species (cherry laurel, rhododendron and bamboo)	X	X								X	X	X
	Thinning/light pruning of the woodland	X											X
	Rotational coppicing	X											X
	Retain and increase standing dead wood	X										X	X
	Maintenance of existing bat boxes and erection of additional bat boxes on mature trees	X	X										
	Erection of bird boxes	X	X										
	Create log piles and compost heaps in sheltered locations	X	X								X	X	X
	Install insect hotels		X										
	Botanical survey					X	X						
Naturalise and enhance the River Rother	Light pruning of overhanging vegetation including dense bramble and pendulous sedge	X										X	X
	Removal of invasive non-native species (Himalayan balsam)				X	X	X						
	Botanical survey						X	X					
Maintain and increase the ecological value of the grassland habitats	Mowing of the grasslands, leaving some areas uncut. Remove all cuttings and add to a compost heap			X						X			
	Repeated cutting of scrub and ruderal vegetation should be carried out to prevent these from dominating and out-competing wildflowers									X	X	X	
	Creation of wildflower areas								X	X			
	Planting of perennial bulbs									X	X	X	X

Operational Objective	Activity	Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Botanical survey						X	X					
	Invertebrate (butterfly and bumblebee) survey				X	X	X	X	X	X			
Create an aesthetically pleasing wildlife rich landscape and encourage recreational use and community engagement	Maintain access/path network across the reserve	X	X	X	X	X	X	X	X	X	X	X	X
	Install additional signage and interpretation boards	X	X	X	X	X	X	X	X	X	X	X	X
	Invite specialist groups to survey the site					X	X	X	X				
	Hold a BioBlitz						X	X	X				
Comply with health and safety requirements	Site infrastructure check and maintenance when required	X	X	X	X	X	X	X	X	X	X	X	X
	Dangerous tree survey	X									X	X	X

Appendix 6:
Long-term Work Plan

Appendix 6. Long-term Work Plan

Operational Objective	Activity	Year									
		1	2	3	4	5	6	7	8	9	10
Maintain and enhance existing woodland habitats	Removal of invasive non-native species (cherry laurel, rhododendron and bamboo)	X	X	X	X	X	X	X	X	X	X
	Thinning/light pruning of the woodland	X	X			X			X		
	Rotational coppicing	X	X	X	X	X	X	X	X	X	X
	Retain and increase standing dead wood	X		X		X		X		X	
	Maintenance of existing bat boxes and erection of additional bat boxes on mature trees	X	X	X	X	X	X	X	X	X	X
	Erection of bird boxes	X									
	Create log piles and compost heaps in sheltered locations	X									
	Install insect hotels	X									
	Botanical survey	X			X			X			X
Naturalise and enhance the River Rother	Removal of invasive non-native species (Himalayan balsam)	X	X	X	X	X	X	X	X	X	X
	Botanical survey	X			X			X			X
Maintain and increase the ecological value of the grassland habitats	Mowing of the grasslands, leaving some areas uncut. Remove all cuttings and add to a compost heap	X	X	X	X	X	X	X	X	X	X
	Repeated cutting of scrub and ruderal vegetation should be carried out to prevent these from dominating and out-competing wildflowers	X	X	X	X	X	X	X	X	X	X
	Creation of wildflower areas	X									
	Planting of perennial bulbs	X									
	Botanical survey	X			X			X			X
	Invertebrate (butterfly and bumblebee) survey	X	X	X	X	X	X	X	X	X	X
Create an aesthetically pleasing wildlife rich landscape	Maintain access/path network across the reserve	X	X	X	X	X	X	X	X	X	X
	Install additional signage and interpretation boards	X	X								
	Invite specialist groups to survey the site	X	X	X	X	X	X	X	X	X	X

Operational Objective	Activity	Year									
		1	2	3	4	5	6	7	8	9	10
and encourage recreational use and community engagement	Hold a BioBlitz	X			X			X			X
Comply with health and safety requirements	Site infrastructure check and maintenance when required	X	X	X	X	X	X	X	X	X	X
	Dangerous tree survey	X	X	X	X	X	X	X	X	X	X

Appendix 7:
Habitat Creation

Appendix 7. Habitat Creation

Information on bird and bat boxes and insect hotels

Type	Typical species	Height	Additional information
Standard bird box e.g. Schwegler 1B 	Blue tits, great tits	2-4m	• Position on a building or tree, angled north and east (away from prevailing winds) and tilt forward slightly. • Chances of occupation can be increased by positioning boxes near vegetation.
Starling box e.g. Schwegler 3S 	Starlings, woodpeckers and nuthatches	≥ 2m	• Position on a tree, angled north and east (away from prevailing winds) and tilt forward slightly. • Chances of occupation can be increased by positioning boxes near vegetation.
Open-fronted bird box e.g. Schwegler 2H 	Robins, wrens	≤ 2m	• Mount on a tree or shrub • Conceal amongst foliage to keep well hidden from predators.
Bat box e.g. 2F Schwegler 	Bats	2.5-5m	• Site on mature trees with 1 or 2 boxes per tree • South-east to south-west facing • Away from lighting • Near to vegetation without it obscuring entrance
Insect hotel 	Invertebrates	≥ 1m	• Position in sunny location on a tree, fence or wall near to bee-friendly vegetation • Ensure it is accessible with no vegetation blocking the entrance

Native Wildflower Species

The choice of wildflower species should reflect the local habitats and be similar to those already found at Liss Riverside Railway Walk and surrounding area. They should be sourced locally when possible.

A neutral grassland seed mix would be suitable. However, soil testing should also be undertaken to ensure the correct seed mix is chosen to maximise chance of establishment. Species the mix could include are:

- Common knapweed *Centaurea nigra*
- Common bird's-foot trefoil *Lotus corniculatus*

- Common cat's-ear *Hypochaeris radicata*
- Devil's-bit scabious *Succisa pratensis*
- Lady's bedstraw *Galium verum*
- Marjoram *Origanum majorana*
- Meadow buttercup *Ranunculus acris*
- Ox-eye daisy *Leucanthemum vulgare*
- Red campion *Silene dioica*
- Red clover *Trifolium pratense*
- Selfheal *Prunella vulgaris*
- Sheep's sorrel *Rumex acetosella*
- Wild carrot *Daucus carota*
- Wood sage *Teucrium scorodonia*
- Yellow rattle *Rhianthus minor*

Sources of seeds include:
Emorsgate Seeds https://wildseed.co.uk/home
Charles Flower Wildflowers http://www.charlesflower-wildflowers.co.uk/

Native bulbs that could be planted include:
- Bluebell *Hyacinthoides non - scripta*
- Daffodil *Narcissus pseudonarcissus*
- Lesser celandine *Ranunculus ficaria*
- Snowdrop *Galanthus nivalis*

Sources of bulbs include:
Wildflower Shop https://www.wildflowershop.co.uk/
Native British Bulbs https://wildnativebulbs.co.uk/index.html

Further advice about buying native flora can be found in the Flora locale advice note:
https://cieem.net/wp-content/uploads/2019/07/Buying-native-flora-a-Flora-locale-advisory-note.pdf

Stag Beetle Log Pile

Example of a stag beetle log pile taken from the People's Trust for Endangered Species (PTES) Stepping stones for stags guide (https://stagbeetles.ptes.org/how-to-build-a-log-pile/)