

Abbotswood Management Plan

2020-2030

Compiled by: J. Abery

Checked by: K Harrington and B Jeffery

Community and Leisure Service

Version 1, completed September 2019 (Adjusted March 2020)

Table of Contents:

1. Background Information	
1.1 Location	4
1.2 Scope of the document	4
1.3 Description of Abbotswood	4
1.4 Planning history of the site	5
1.5 Past land use	5
1.6 Past management for conservation	5
1.7 Conservation status of the site	6
1.8 Land tenure	6
1.9 Map coverage	7
1.10 Access	7
2. Site information	
2.1 Hydrology	8
2.2 Geology and soils	8
2.3 Size	8
2.4 Flora	9
2.5 Areas and features	14
2.6 Fauna	17
2.6.1 Amphibians and reptiles	17
2.6.2 Birds	17
2.6.3 Invertebrates	17
2.6.4 Mammals	18
2.7 Archaeology	18
2.8 Social and cultural value	19
2.8.1 Working with the community	19
2.8.2 Volunteers	19
2.8.3 Access	20
2.8.4 Paths	20
2.8.5 Interpretation	20
2.9 Significant hazards, constraints or threats	21
2.9.1 Operations likely to damage the site	21
2.9.2 Health and safety of employees	22
2.9.3 Legal constraints	22
3. Long term vision, objectives and strategy	
3.1 Rational for proposed management options	23
3.2 Identification of operational objectives	24

4. Management prescriptions and operations	
4.1 Prescriptions	27
4.2 Project register	37
4.3 Timings for management and monitoring	38
4.4 Work schedule	41
4.5 Monitoring and review	45
4.6 Monitoring progress	45

Table of Tables:

Table 1:	Vehicle access points for maintenance works and emergency services
Table 2:	Breakdown of management compartments by area
Table 3:	Details of relevant Tree Preservation Orders
Table 4:	Broad management options and objectives for various aspects of the site
Table 5:	Summary of management projects
Table 6:	Summary of monitoring projects
Table 7:	Timing of management projects
Table 8:	Timing of monitoring projects
Table 9:	10 year work schedule

Appendices:

Appendix 1: Maps

Map 1:	Location of Abbotswood
Map 2:	Boundary map
Map 3:	Historic maps
	3a: 1867-1883
	3b: 1933-1946
Map 4:	Paths and entrances
	4a: Nature Reserve paths and entrances
	4b: Development cycle ways and informal paths
Map 5:	Compartment maps
	5a: All compartments
	5b: Sub-compartments
Map 6:	Tree preservation order map

Appendix 2: SINC designation

Appendix 3: Floral surveys (Botanical species list from the pre-development ecological survey)

Appendix 4: Tree Management Strategy

Appendix 5: Great crested newt survey

5a: Great crested newt survey strategy

5b: Great crested newt survey results

Appendix 6: Pre-development reptile survey map

Appendix 7: Bird species survey (from the pre-development ecological survey)

7a: Pre-development bird species list

7b: Pre-development ground nesting bird map

Appendix 8: Invertebrate species surveys (from the pre-development ecological survey)

8a: Invertebrate survey results 2019

8b: Discovery Day results 2019

8c: Pre-development invertebrate species list

Appendix 9: UK Butterfly Monitoring Scheme survey results

Appendix 10: Bat survey results – Predevelopment ecological survey map

1.1 Location (See Map 1)

Abbotswood is a recently completed housing development, located to the north of Romsey, with the adjoining Nature Reserve located to the west of the development. The site is bordered by Cupernham Lane to the west, Castle Lane to the north, Braishfield Road to the east and Woodley Lane and associated housing to the south.

OS Map 1:50,000 Sheet 185 Grid reference centred on SU366230.

Parish:	Romsey Extra
County:	Hampshire
Local Planning Authority:	Test Valley Borough Council

1.2 Scope of the document

This document will cover the current condition and management options for the Nature Reserve and semi-natural areas within the boundaries of the new Abbotswood development, outlined in map 2. The history of the site will also be explored, as well as the planned management and projects over the next 10 years. This is a working document which will be reviewed on an annual basis to ensure the objectives are being met, and any appropriate adjustments to the management schedule are made.

1.3 Description of Abbotswood

Abbotswood is situated on a south-facing, gently sloping terrain with the highest point being in the north-east corner of the site. The soil consists mainly of Bagshot beds (a type of sand deposit) and London Clay, with the exception of the south-west corner of the site, known locally as Minchin Hill woods, which still forms part of the former Valley Gravel terraces which once underlay the majority of the site prior to gravel extraction.

Previous uses for the site have included gravel extraction, cattle grazing and dairy production. More recently, the site has been developed and now accommodates over 800 houses, a community centre, various green spaces and other local amenities. Over a third of the site is designated as a Nature Reserve, primarily set aside due to the large population of Great crested newts (*Triturus cristatus*), a European Protected Species (EPS), and the amount of suitable habitat found on site.

The Nature Reserve consists of a mosaic of habitats, including pond and wetland habitats, grassland, oak and birch woodland and young oak scrub. As well as the great crested newt, other notable species found on site include lapwings, grass snakes, slow worms and six different bat species. Fourteen veteran oaks, and over 30 trees of interest (i.e. future veterans), are located throughout the Abbotswood Nature Reserve and development, each of high value ecologically and of amenity importance. Pond and wetland habitats within the site include permanent and

ephemeral ponds, SUDS (Sustainable Urban Drainage System) features and ditch habitats, all of which facilitate the breeding and movement of all three native newt species, as well as other amphibians such as frogs and toads.

1.4 Planning history of the site

The Abbotswood consortium submitted the application for 800 dwellings at Abbotswood, Romsey, in 2008. The application also included the provision of shops, community centre, nursery, 60 bed care/nursing home, parking, recycling centre, formal and informal green spaces and an Nature Reserve.

1.5 Past land use

Prior to the construction the site was used as grazing pasture for cattle (Map 3a), with a dairy situated in the south of the site, to the east of Brook Way.

Banks and mounds within the western side of the Nature Reserve are evidence of previous gravel extraction taken place within the last 100 years (see Map 3b). These banks are clearly visible on LIDAR maps of the area. Building foundations located within the same area are likely to be associated with these works. The exact origin of these banks may however be more historic than this, with evidence of Roman and medieval field systems located to the west of Cupernham Lane, and a the remains of a Roman building is known to be located off of Sandy Lane to the north.

Historical maps of the site show a number of trees were present as far back as 1808, indicating that some of the veteran oaks on site may be at least 200 years old. Maps indicate that around this time, the land was broken into several enclosures, presumably for farming or pasture. The land use notably changed in the 1930's-1940's, when the gravel extraction works began (see Map 3b).

1.6 Past management for conservation

There is no evidence of previous management for nature conservation at Abbotswood. The Nature Reserve was set aside following the approval of the development, with several key changes taking place. New habitat ponds were created to provide compensatory habitat for great crested newts, as well as SUDS features, newt crossings and cat proof fencing on the boundary adjacent to the new housing development. Cattle grazing was phased out, resulting in the open meadow habitat developing into a mosaic of rough grassland and scrub habitat. There is also evidence of traditional woodland management techniques such as willow and hazel coppicing taking place previously on site.

1.7 Conservation status of the site

Over a third of the site has been designated by Hampshire County Council as a Site of Importance for Nature Conservation (SINC) (Appendix 2), primarily due to the presence of protected species such as the great crested newts. This area is now mostly encapsulated by the Nature Reserve. There are a number of other legally protected and BAP (Biodiversity Action Plan) species recorded on site prior to the commencement of the development, including:

- Slow worm (*Anguis fragilis*)
- Grass snake (*Natrix natrix*)
- Six bat species, including Common (*Pipistrellus pipistrellus*) and Soprano pipistrelle (*Pipistrellus pygmaeus*), Noctule (*Nyctalus noctula*), Serotine (*Eptesicus serotinus*), *Myotis* and Long-eared bat species
- Skylark (*Alauda arvensis*)
- Linnet (*Linaria cannabina*)
- Lapwing (*Vanellinae*)

One long term aim for the site is to raise the protective status of the site and apply for Local Nature Reserve status, in order to further protect the diversity of habitats and wildlife on site.

1.8 Land tenure

Following the completion of the development by the Abbotswood Consortium, the management of the site has been transferred to Test Valley Borough Council, with informal green spaces and the Nature Reserve under the management of the Countryside Officers within the Parks and Countryside Team.

Type of holding:	Public Open Space
Total area (Development and Nature Reserve):	52.4Ha (133.9 acres)
Total Nature Reserve area:	19.4Ha (47.9 acres)
Total area of informal green space:	8.7Ha (21.5 acres)
Total open water area:	0.8Ha (2 acres)
Boundaries:	See Map 2
Owner:	Test Valley Borough Council
Address:	Community and Leisure, Test Valley Borough Council, Beech Hurst, Weyhill Road, Andover, SP10 3AJ
Telephone:	(01264) 368000

1.9 Map coverage

OS Map: 1:50 000 (Landranger) Sheet Number 185
1:25 000 (Explorer) Sheet Number 131

Geological Map: 1:50 000 Sheet Number 299 and 315

1.10 Access

There are no Public Rights of Way across the site. The Nature Reserve has a number of permissive paths which cross the site (see Map 4a).

A circular cycleway surrounds the housing development, with several other cycleways connecting certain amenities to this route, such as the play areas and community centre (Map 4b). There are also connections to Woodley Lane, Braishfield Road and Sandy Lane as part of further commuting routes.

There is no vehicle access permitted on site, other than that necessary for management purposes or emergency services. The secured access points can be viewed on table 1.

Table 1: Vehicle access points for maintenance works and emergency services.

Area (Compartment)	Type of access (all padlocked)	Road name	Grid reference
Nature Reserve (East)	12ft field gate	N/A	SU365230
Nature Reserve (West)	12ft field gate	Cupernham Lane	SU362227
Nature Reserve (1a)	12ft field gate	N/A	SU364230
Nature Reserve (2)	12ft field gate	N/A	SU363227
Development (7, 9a)	Removable bollards (or staggered barriers on cycleway)	Magnolia Walk (or Chivers Road)	SU365233 (or SU365233)
Development (8, 9b)	Staggered barriers on cycleway	Chivers Road (or Braishfield Road)	SU366233 (or SU370229)
Development (9c)	Staggered barriers on cycleway	Braishfield Road (or Cutforth Way)	SU370229 (or SU368227)
Development (9d)	Staggered barriers on cycleway	Cutforth Way	SU367227
Development (10a)	Staggered barriers on cycleway	Chivers Road	SU367231
Development (10b)	Staggered barriers on cycleway	Chivers Road	SU367231

2 Site information

2.1 Hydrology

The site is low lying, on average around 12m above sea level, and gently slopes from north-east to the south-west. The average rainfall for the area is 779.2mm annually, according to the 1981-2010 average monitored by the Met Office. A series of drainage ditches and SUDS features can be found throughout the site, ultimately draining into a SUDS feature located within the Nature Reserve, and then through a ditch/pipe under Cupernham Lane to the West. There are a series of naturally occurring ponds, as well as several created for habitat mitigation, with some ephemeral and permanent ponds (see Map 5a).

2.2 Geology and Soils

Historically the underlying geology for the site has been gravel, as part of the Valley Gravel Terraces, with London clay underneath the gravel layer. Following gravel extraction in the area much of the underlying gravel has been depleted, with the exception of the south-west corner of the site, otherwise known as Minchin Hill Wood. The majority of the site therefore mainly consists of clay, with a deposit of Bagshot beds (sandy deposit) within the north-east corner of the site.

2.3 Size

The total area managed by the Parks and Countryside Team covers 52.4 hectares, with the Nature Reserve covering 19.4 hectares and the remaining area being the green space surrounding the development. For management purposes, these areas have been divided into compartments (see table 2 for full breakdown of compartment sizes).

Table 2: Breakdown of management compartments (as per map 5a) by area

Location	Compartment number	Area (Ha)
Nature Reserve	1	6.0
	2	2.3
	3	2.8
	4	4.8
	5	1.1
	6	2.4
Development	7	1.7
	8	1.1
	9	3.7
	10	2.0
	11	0.2

2.4 Flora

A full flora survey was conducted prior to the construction of the development in 2002, results of which can be seen in Appendix 3. Species located on site at this time included 3 unimproved grassland indicator species; Grass Vetchling (*Lathyrus nissolia*), Green-winged Orchid (*Orchis morio*) and Hoary Ragwort (*Senecio erucifolius*). A summary of the general assemblage of vegetation within each compartment (as per Map 5a) is summarised below, according to the National Vegetation Classification system (NVC).

a) Compartment 1 – Great crested newt ponds and terrestrial habitat

6.0 hectares of rough grassland and scrub habitat, with 4 habitat ponds.

NVC categories present within compartment 1:

MG1 *Arrhenatherum elatius* grassland

W22 *Prunus spinosa-Rubus fruticosus* scrub

This compartment mainly consists of rough grassland and scrub habitat of various age classes. Scrub species present within this section include oak (*Quercus robur*), blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*) and dog rose (*Rosa canina*). Stands of willow coppice (*Salix caprea*) can be found adjacent to the ponds, which also support a range of aquatic species. Areas of rough grassland and bramble habitat (*Rubus fruticosus*) also surround the ponds within this compartment.

b) Compartment 2 – Hibernacula area

2.3 hectares of rough grassland and young oak scrub, as well as mature oak woodland.

NVC categories present within compartment 2:

MG1 *Arrhenatherum elatius* grassland

W10 *Quercus robur* woodland/scrub

W22 *Prunus spinosa-Rubus fruticosus* scrub

Over half of this section consists of rough grassland and scrub habitat, of various age classes. A stand of oak (*Q. robur*) scrub, all of the same age class, is located to the North-east of the compartment. Rough grassland makes up the majority of the central, north and north-east corner of this section, with scattering of blackthorn (*P. spinosa*), dog rose (*R. canina*) and bramble (*R. fruticosus*) present. The western boundary comprises of mature oak woodland, with several veteran oak (*Q. robur*) present. The ground flora here is dominated by nettles (*Urtica dioica*) and brambles. This area of more mature woodland continues along the south of the compartment, along the edge of the ride habitat which follows the southern boundary of this section. Other woodland species present include hawthorn (*C. monogyna*), aspen (*Populus tremula*) and willow (*S. caprea*).

c) Compartment 3 – Mature oak woodland

2.8 hectares of mature oak woodland and scrub habitat.

NVC categories present within compartment 3:

W10c *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, *Hedera helix* sub-community

This section consists of mature oak (*Q. robur*) woodland, featuring several examples of veteran oak trees, and oak scrub of various age classes. Other tree and scrub species present include silver birch (*B. pendula*), hazel coppice (*Corylus avellana*) and hawthorn (*C. monogyna*). Understorey vegetation is dominated by bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticosus*), but also includes other species such as common honeysuckle (*Lonicera periclymenum*) and previous records of helleborines.

d) Compartment 4 – Open grassland, scrub and pond habitats

4.8 hectares of a mixture of pond, oak scrub and open grassland habitat.

NVC categories present within compartment 4:

MG1 *Arrhenatherum elatius* grassland

MG6 *Lolium perenne-Cynosurus cristatus* grassland

MG10 *Holcus lanatus-Juncus effusus* rush pasture

W10 *Quercus robur* woodland/scrub

The dominant habitat within this compartment is the rough grassland, with areas of mainly oak (*Q.robur*) scrub gradually encroaching on this habitat. Several veteran oaks are also located in the south-east corner of the compartment. Two ponds are located to the north and western boundary of this section, one being an original pond, and the other a SUDS feature added as a planning requirement for the development (map 5a). Small amounts of willow (*S. caprea*) coppice is located around the ponds. Other scrub species located within the compartment include gorse (*Ulex europaeus*), dog rose (*R. canina*), hawthorn (*C. monogyna*) and blackthorn (*P. spinosa*), as well as larger feature trees such as silver birch (*B. pendula*) scattered around the grassland.

e) Compartment 5 – Open grassland and scrub habitat

1.1 hectares of mainly oak dominant scrub habitat, interspersed with rough grassland.

NVC categories present within compartment 5:

MG1 *Arrhenatherum elatius* grassland

W10 *Quercus robur* woodland/scrub

This section comprises mostly of oak (*Q. robur*) dominant scrub, with other species such as hawthorn (*C. monogyna*), blackthorn (*P. spinosa*), dog rose (*R. canina*) and gorse (*U. europaeus*) scattered throughout the compartment. The northern boundary features mainly rough grassland habitat with varying sward heights, owing to the variation in cutting regime between the path running along the northern boundary, and the scrub habitat.

f) Compartment 6 – Grassland and encroaching scrub habitat

2.4 hectares of grassland habitat, with oak dominated scrub encroaching on the south-west corner of the compartment.

NVC categories present within compartment 6:

MG1 *Arrhenatherum elatius* grassland

W10 *Quercus robur* woodland/scrub

The oak (*Q. robur*) dominated scrub habitat is located in the south west of the compartment, with the most mature scrub located on the boundary with compartment 3. As most of the oak is the same age class, there is very little in the way of understorey vegetation. Other woodland species present within this section include the occasional bramble sward (*R. fruticosus*) and hawthorn (*C. monogyna*). The remainder of the compartment consists of grassland habitat of various sward heights, with shorter swards adjacent to paths, and rough grassland closer to the scrub boundary.

g) Compartment 7 – Strategic land buffer

1.7 hectares of pond, grassland and scrub habitat, providing a buffer strip between the Nature Reserve and the Abbotswood housing development.

NVC categories present within compartment 7:

MG1 *Arrhenatherum elatius* grassland

S12 *Typha latifolia* swamp

W22 *Prunus spinosa*-*Rubus fruticosus* scrub

W23 *Ulex europaeus*-*Rubus fruticosus* scrub

The most prominent habitat features are the 3 SUDS features, located to the north and centre of this section, with drainage ditches running from these features to the south and west into the Nature Reserve. The SUDS feature to the north of the compartment is ephemeral, whereas the other two (central) are permanent wetland features. The wetland plant species within these pond habitats are dominated by Reed maize (*Typha latifolia*), with the banks consisting of rough grassland. Planted scrub habitat between the pond habitat and the western boundary provide a buffer to the Nature Reserve habitat, and consist of species such as willow (*S. caprea*), gorse (*U. europaeus*), blackthorn (*P. spinosa*), hawthorn (*C. monogyna*) and common honeysuckle (*L. periclymenum*). Planted standard trees are also located throughout

this compartment, and include various tree species including Hornbeam (*Carpinus betulus*), Turkish hazel (*Corylus colurna*), black walnut (*Juglans nigra*), various apple species (*Malus spp.*), pear (*Pyrus communis*), medlar (*Mespilus germanica*), oak (*Q. robur*) and wild service tree (*Sorbus torminalis*). Formal amenity grassland intersperse the planted trees and adjacent to the footpath, merging into more informal, rough grassland towards the Nature Reserve (west) boundary.

h) Compartment 8 – Mature oak dominated woodland

1.1 hectares of mature oak dominated woodland.

NVC categories present within compartment 8:

MG1 *Arrhenatherum elatius* grassland

U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland

W10c *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, *Hedera helix* sub-community

This section features a number of veteran oak (*Q. robur*) trees, interspersed with oak scrub of various ages and other species such as hazel (*C. avellana*), willow (*S. caprea*), gorse (*U. europaeus*) and field maple (*A. campestre*). The ground fauna is dominated by bracken (*P. aquilinum*), and bramble (*R. fruticosus*). A small amount of formal grassland is located to the west of the compartment.

i) Compartment 9 – Boundary hedge and tree habitat

3.7 hectares of hedge and scrub habitat, with mature oak trees dispersed throughout the compartment.

NVC categories present within compartment 9:

MG10 *Holcus lanatus-Juncus effusus* rush pasture

W10 *Quercus robur* woodland

The prominent species within this section is oak (*Q. robur*), of which there are a number of examples of mature and veterans located throughout the section, along the boundaries of the development. The planted hedge and scrub boundary surrounding these larger trees include hawthorn (*C. monogyna*), hazel (*C. avellana*), holly (*I. aquifolium*), blackthorn (*P. spinosa*), dog rose (*R. canina*), gorse (*U. europaeus*), willow (*S. caprea*), field maple (*A. campestre*) and common dogwood (*Cornus sanguinea*). Ground fauna also include thickets of bramble (*R. fruticosus*).

j) Compartment 10 – Formal amenity areas

2.0 hectares of species poor, formal grassland with areas of planted hedgerow and scrub habitat.

NVC categories present within compartment 10:

MG1 *Arrhenatherum elatius* grassland

W22 *Prunus spinosa-Rubus fruticosus* scrub

W23 *Ulex europaeus-Rubus fruticosus* scrub

This section mainly consists of formal grassland, with a short sward height and of very low species diversity. Areas of scrub and hedge have been planted to provide corridors to aid the movement of fauna around the site. The species composition of these planted areas include hazel (*C. avellana*), hawthorn (*C. monogyna*), holly (*I. aquifolium*), blackthorn (*P. spinosa*), dog rose (*R. canina*), gorse (*U. europaeus*) and dogwood (*C. sanguinea*). Standard trees have also been planted throughout this section and include species such as silver birch (*B. pendula*), rowan (*Sorbus aucuparia*) and crab apple (*Malus sylvestris*).

l) Compartment 11 – Magnolia Walk pond and scrub area

0.2 hectares of mainly woodland scrub habitat and a small pond area.

NVC categories present in compartment 11:

W10 *Quercus robur* woodland/scrub

This compartment consists mainly of woodland edge habitat, with mature and veteran oak (*Q. robur*) trees. The understorey vegetation include brambles (*R. fruticosus*), yew (*Taxus baccata*) and hawthorn (*C. monogyna*). The pond habitat and associated wetland species is located to the south-east corner of the compartment, surrounded by rough grassland and bramble habitat.

2.5 Areas and Features

The habitats within the Nature Reserve and housing development can broadly be divided into a number of areas:

a) Ancient Semi-Natural Woodland and Veteran Trees

Stands of ancient semi-natural woodland at Abbotswood can mainly be found in the south-west corner of the site (Compartment 3, Map 5a), formerly known as Minchin Woods, and the north-east corner of the site (Compartment 8, Map 5a). 14 veteran oaks, with 30 more being labelled as 'future veterans' or 'trees of interest' are located mainly around the perimeter of the site (see Appendix 4). Due to the presence of these important specimens, a tree management strategy has been drawn up for the Abbotswood site, outlining the long term management plan for mature, veteran and future veteran trees within the Abbotswood site boundary (Appendix 4).

b) Scrub

Oak dominated scrub habitat can be found across all compartments within the Nature Reserve (Map 5a). Oak is interspersed with other woodland scrub species, including hawthorn (*C. monogyna*), blackthorn (*P. spinosa*) and dog rose (*R. canina*). The extent of oak scrub will be managed on a rotational basis to prevent it from spreading into the neighbouring grassland habitat. Formal areas of scrub have also been planted around the Abbotswood development, to provide wildlife corridors and facilitate the movement of species such as great crested newts (*Triturus cristatus*) throughout the site. These areas will also need to be managed going forward, by preventing encroachment onto formal grass areas and cycleways, as well as thinning the trees as they mature. The density of scrub will need to be thinned in some areas to encourage a greater diversity of understorey vegetation.

c) Dead wood

Dead wood will be retained on site where appropriate to provide habitat for a diversity of species, including insects, reptiles, amphibians, mammals, fungi, mosses and lichens. Standing deadwood will also be retained wherever possible to provide habitat particularly for birds and bats, as well as other species mentioned previously. Log and brash piles will be created within the Nature Reserve using any materials from scrub and tree works. These piles will be placed preferably in shady conditions to retain moisture. Dead hedges will also be used as connective, sheltered habitat to facilitate movement of fauna, and also to provide natural barriers where required, for example around veteran oak trees.

d) Hazel and willow coppice

Hazel coppice stools are scattered within the woodland areas of the site. Currently there are no formal coppice coupes established, therefore stools will be monitored and managed on an individual basis. Coppiced material will be used to create a

barrier around each stool to prevent the regrowth from being stunted by grazing pressure from deer and rabbits.

Willow coppice can be found within most wetland areas throughout the Nature Reserve and adjacent to ditch habitat in compartment 9c. These will be coppiced on rotation to prevent these stands from becoming over-stood, and to prevent encroachment and drying of wetland habitats.

e) Open ride

There is currently one area which has been designated as a ride habitat, which is located on the south boundary of compartment 2 within the Nature Reserve (Map 5a). This habitat will be cut and collected once annually in October/November, and any scrub managed on rotation. This ride is also the main access to the site for vehicles and will therefore also need to be kept open for ongoing management purposes. The permissive path located near the north and west boundary of compartment 1 also acts as a ride, and will be further enhanced going forwards (Map 5b).

f) Hedgerow

The hedge habitats provide vital linkages throughout the site, as well as providing foraging and sheltering habitat for various species, including newts, mammals, reptiles, birds and invertebrates. These hedges range from more mature hedges, mainly around the boundary of the site, to newly planted, formal hedging within the development.

g) Rough grassland

Rough grassland can be found throughout the site, and provides a vital habitat for a wide range of species, including foraging habitat for pollinators, reptiles and amphibians, such as great crested newts (*T. cristatus*). Areas of grassland will be cut and collected once annually, in the Autumn, with the arising's used to create hibernation and resting habitats for amphibians and reptiles, such as slow worms (*Anguis fragilis*) and grass snakes (*Natrix natrix*). Due to the presence of a European protected species within this habitat (great crested newt) the annual grass cut will be restricted to the colder autumn months, when the newts are less active and have entered hibernation. As the newts at Abbotswood appear to emerge early from hibernation (around February), therefore there will be no spring cut on any rough grassland areas on site.

h) Amenity grassland

Formal grassland areas are located throughout the development, adjacent to rough grassland and scrub areas, as well as surrounding formal planting areas. These will be cut as required throughout the year and are not therefore managed for their wildlife value. Wherever possible, site managers will seek to improve the wildlife and

intrinsic value of amenity grassland areas by planting a variety of wildflower species and altering the cutting regime to suit less dominant species (i.e. cut and remove arising's).

i) Ponds

In total there are 11 ponds located within Abbotswood (Map 5a). Six of these are located within the Nature Reserve, three of which were created as part of the mitigation measures for building the development, one designed as SUDS feature, with the remaining two being the original ponds present prior to the development. Most of these are fenced off to prevent public access, with the exception of the ephemeral pond, due to the breeding population of great crested newts present found within all ponds on site.

The remaining five ponds are located outside the Nature Reserve, within the green space surrounding the development. Three of these are SUDS features, located within the strategic buffer strip (Compartment 7, Map 5a), however only 2 of them permanently contain water, with the third being ephemeral. These are largely fed by runoff from the Abbotswood development, with their primary purpose being to provide flood alleviation for the development. However they are still valuable habitat for a range of invertebrates, such as dragonflies, as well as feeding areas for birds and bats. Amphibians, including great crested newts, also utilise these areas for breeding, sheltering and foraging.

There is another ephemeral pond located within compartment 9d between the Nature Reserve boundary and sports pitches (Map 5a), and a further pond to the north of the site within the neighbouring Magnolia Walk development.

Ponds are monitored for great crested newts on an annual basis, and subsequent management conducted to enhance these ponds for aquatic flora and fauna, with particular focus on the resident newt population. Fish have been introduced to the ponds at some point over the last 5 years or so. As they can directly affect the great crested newt population, as well as cause other ecological damage to the site, a removal program for the site will be established. The extent of wetland plants will also need to be monitored and controlled to prevent particularly the smaller ponds becoming overgrown and eventually drying out.

j) Ditches and other wetland areas

There are a number of ditches linking valuable wetland habitats within the Nature Reserve and the development part of the site. Within the grassland habitat in the Nature Reserve, there are patches of wetland habitat, featuring a variety of wetland flora. Ditches are located to the west of the site, running adjacent to the ride habitat, to the south east of the development, and between SUDS features, all of which provide a valuable drainage feature as well as connective wetland habitat for a range of flora and fauna.

2.6 Fauna

2.6.1 Amphibians and Reptiles

Abbotswood has been designated as a SINC due to the presence of a large breeding population of Great crested newts, a European protected species and legally protected by the Wildlife and Countryside Act 1981. Ongoing GCN population surveys will be conducted to monitor the state of the population to ensure habitat management objectives are having a positive effect on their population (Appendix 5).

Other species of amphibian historically recorded at the site include Common toad, smooth and palmate newt. Notable reptile species include Grass snake and Slow worm (Appendix 6), both of which are again legally protected species under the Wildlife and Countryside Act (1981).

2.6.2 Birds

A survey conducted in 2008 recorded 61 bird species on site, 37 of which were found to be utilising the site for breeding. Notable species included the Barn Owl, Skylark, Song Thrust, Linnet, Reed Bunting and Bullfinch. Full survey results can be seen in Appendix 7. Another full bird survey will be commissioned in order to ascertain if these species are still present following the construction of the Abbotswood development. Abbotswood Nature Reserve is located approximately 250m from Fishlake Meadows Local Nature Reserve, a wetland site of great ecological importance, particularly for wetland bird species. The proximity of this site, in addition to the habitats present at Abbotswood makes the site of particular importance to bird species.

2.6.3 Invertebrates

Invertebrate surveys conducted prior to established management techniques revealed a species poor invertebrate community in 2007, with only 111 invertebrate species associated with the site. This was mostly due to the lack of habitat diversity and species poor grassland which dominated the site prior to the formation of the Nature Reserve. A full invertebrate survey of the site will be commissioned within the first 2 years of the current management plan in order to ascertain baseline data for the site following the construction of the Abbotswood development and the formation of the Nature Reserve. The results of this survey can be viewed in Appendix 8a. Annual aquatic invertebrate surveys will also be conducted, as part of the annual discovery day.

Within the previous survey, only 1 notable invertebrate species was detected, the Roesel's Bush-cricket (*Metrioptera roeselii*), a full species list can be seen in Appendix 8c.

The annual butterfly survey was first established on site in 2017, with the aim of monitoring long term trends in the butterfly population on site, as an indicator of

climatic conditions and impacts of management on site. The results (Appendix 9) will help guide future management, as well as feed into the national monitoring database (UK Butterfly Monitoring Scheme). The long term aim is to establish monitoring programmes for other invertebrate species, which can be fed into national monitoring schemes, such as for bumblebees and dragonflies.

2.6.4 Mammals

The most notable mammal species known to utilise the site are a number of bat species. Six different species were recorded on site, using the site for both foraging and/or roosting opportunities, including:

- Noctule (*Nyctalus noctula*)
- Serotine (*Eptesicus serotinus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Common pipistrelle (*Pipistrellus pipistrellus*)
- Long-eared species (*Plecotus sp.*)
- *Myotis* species

Ongoing monitoring of the bat populations located on site will be conducted, by specialist volunteers and through the annual public bat walk (most recent results can be seen in Appendix 10a). New technologies will also be included, including the use of static detectors, which can then contribute to the National Bat Monitoring Programme. Previous surveys have found bats utilising the scrub boundaries throughout the site for foraging and commuting purposes, with the woodland and wetland habitats providing well-used foraging habitats (Appendix 10b).

Other mammals which have been recorded on site include rabbits (*Oryctolagus cuniculus*), and unconfirmed sightings of foxes (*Vulpes vulpes*) and badgers (*Meles meles*).

2.7 Archaeology

Aside from previous gravel extraction works, there are no known archaeological interest for this site. There are building remains and/or rubble located to the west of the Nature Reserve, near to the entrance off of Cupernham Lane, however they are most likely linked to the gravel extraction works, and is now designated as a hibernacula for resident great crested newt population.

2.8 Social and Cultural Value

2.8.1 Working with the community

As a newly established community, establishing and maintaining a positive relationship with the local residents will be essential to ongoing management of the site. Encouraging public participation in events such as discovery days, guided walks and talks will be important platforms to promote the local volunteer group, provide guidance to residents on local conservation issues, and keep residents informed on general management throughout the site. This will also be achieved through notice boards located on the entrances to the Nature Reserve, as well as within prominent places within the community, such as the community centre, local shops and sports facilities. Additional interpretation boards will also be installed to provide additional information on specific projects or the management of important habitats, such as the great crested newt breeding ponds.

2.8.2 Volunteers

A local volunteer group will be established to not only achieve management tasks for the site, but also to provide links to the local community, giving residents a sense of ownership and input into the ongoing management of the site. Tasks will include conservation tasks within the Nature Reserve and development, litter picking and other general maintenance tasks around the development, as well as walks, talks and discovery days. Tasks will be scheduled monthly at least initially to gauge and maintain interest.

While this group will initially be largely led by Countryside Officers from Test Valley Borough Council's Community and Leisure team, the aim in the long term is to create an independent charitable group, which assist with the implementation of the management plan, as well as having input into its contents.

Volunteers will also be encouraged to help conduct various surveys throughout the year. This will include the annual butterfly survey, which links into the UK Butterfly Monitoring Scheme, bat surveys and potentially the annual great crested newt survey. The council is keen to utilise any local knowledge, and encourage anyone from the local community with an interest to get involved.

The site also has potential to incorporate other voluntary groups, including school, college and university students, Cubs, Scouts, Girl Guiding and any other local community groups, as well as incorporating the site in the annual school visits programme in the future. The council have also worked collaboratively on student dissertation/PhD projects on other sites, which will also be considered for Abbotswood as they arise.

2.8.3 Access

Although there are no formal public footpaths across the Nature Reserve, the presence of permissive paths and the proximity to various housing areas will result in heavy use of the site by local residents. This will result additional pressure to the site, potentially leading to the degradation of habitats, disturbance of protected species and conflicts of interest. Monitoring the use of the site and the subsequent impacts will therefore be vital to meet management targets. For some areas, such as the great crested newt habitat ponds, public access will be excluded for habitat management or health and safety reasons. Kissing gates located at the entrance to the Nature Reserve will be replaced with mobility access gates.

2.8.4 Paths

Having been utilised by walkers and other recreational users for a number of years, there are many informal paths throughout the Nature Reserve. Although there are no formal footpaths on site, there are a number of permissive paths which will be maintained to allow public access (Map 4a). None of these paths will be hard surfaced, and will therefore be maintained through cut and collect where required, and removal of overhanging vegetation to maintain a 1.2m clearance. Fencing will be used in some cases to exclude public access and to guide walking routes around the site.

A cycleway creates a circular route around the neighbouring Abbotswood housing development, as well as connecting to key areas such as the play area, community centre and other local amenities (Map 4b). The maintenance of these cycle ways will be the responsibility of Hampshire Highways.

2.8.5 Interpretation

As Test Valley Borough Council take over management of the Nature Reserve, old interpretation boards installed by the consortium will need to be removed and replaced. New interpretation boards will be designed and installed at key entrances and features within the site. Temporary notice boards are located at most entrances to the site, to inform local residents of management works taking place within the site, as well as upcoming events and volunteer tasks. Temporary notices will also be used where appropriate throughout the site to alert members of the public to maintenance works or hazards.

There are also notice boards located near prominent locations within the neighbouring development, such as the Sports Pavilion and the Community Centre. These will also be utilised to alert the public to upcoming events, as well as advertising through community groups, shops, social media and website.

2.9 Significant Hazards, Constraints or Threats

2.9.1 Operations Likely to Damage the Site

- Further development of housing into the nature conservation area
- Use of pesticides and herbicides without proper guidance
- Use of heavy machinery, leading to soil compactions and root damage
- Unauthorised fires within wooded areas
- Allowing 'right to roam' policy
- Unauthorised forestry works
- Use of ill equipped/advised contractors
- Planting of non-native or diseased tree stock
- Release or spread of non-native species
- Insufficient control of invasive species, allowing native flora to be out-competed
- Use of fertilisers/manure, or allowing garden waste to be disposed on site
- Dumping of other substances harmful to flora and fauna
- Change in soil structure and pH
- Construction or maintenance of pipelines/cables above or below ground
- Erection of permanent structures within the Nature Reserve
- Removal of flora and fauna by the public, particularly of protected species
- Construction of tracks or paths through the Nature Reserve
- Drainage of wetland habitats
- Change in water table levels
- Infilling of ditch and pond habitats
- Extraction of minerals
- Physical harm to any animals on site, including killing or removal
- Unsustainable use by dog walkers and other recreational uses of the site, including disturbance of animals, dumping of waste and widening of paths
- Use of the site for unauthorised recreational use, e.g. motorcycles, swimming etc...
- Physical damage to veteran trees through negligent use
- Current and future pests and diseases potentially introduced to the site, including Ash die back and Oak processionary moth.

2.9.2 Health and Safety of Employees

The health and safety of employees is subject to the Test Valley Borough Council Health and Safety Policy and Lone Working Policy, as well as through liaison with the Health and Safety Officer.

2.9.3 Legal Constraints

The council is required to seek permission from the Secretary of State to undertake work on trees covered under Tree Preservation Orders (TPO), of which there are number of individual TPO trees and TPO areas within the Abbotswood Nature Reserve and development, outlined within the table below (Table 3, Map 6).

Table 3: Details of the relevant Tree Preservation Orders within the Abbotswood Nature Reserve and development.

TPO number	Area/Individual	Compartment
TPO.TVBC.0111	Area	2
TPO.TVBC.0080	Area	3
TPO.TVBC.0944	Area and individuals	4 and 9c
TPO.TVBC.434	Area and individuals	8 and 9
TPO.TVBC.0775	Area	9b
TPO.TVBC.453	Individuals	9b and 9c

A felling licence from the Forestry Commission will also be required for any works in which more than 5m³ per calendar month is required.

Monitoring surveys for great crested newts will take place annually between March and June. These surveys will need to be led by a qualified surveyor, with a valid licence issued by Natural England.

3 Long Term Vision, Objectives and Strategy

3.1 Rational for Proposed Management Options

The main aim for Abbotswood Nature Reserve is to conserve and enhance the site for native flora and fauna, while providing a space for members of the public to access and benefit from the natural environment. The site should therefore provide a safe environment for native flora and fauna to thrive, as well as enhancing the quality of life of local residents. The Nature Reserve in particular was initially created as compensatory habitat for the Abbotswood housing development. Ongoing management should aim to increase the diversity of species and the richness of habitats found on site.

The site is highly important locally as it provides much needed green space in the expanding urban area of Romsey, providing a mosaic of habitats and therefore supporting a diverse range of species, many of which are locally and nationally scarce. Its proximity to other protected areas such as Fishlake Meadows Local Nature Reserve also make it a potentially important connective site for a range of species including migrating birds. Abbotswood is also important on a national level, as it supports a large breeding population of great crested newts, as well as other legally protected species such as bats and slow worms. Vital habitats such as species rich grassland, wetland and woodland habitats are disappearing throughout the country. This is particularly prominent for ancient and veteran trees, which are under threat from development, damaging recreational use and neglectful management. It is therefore vital to preserve the range of habitats present at Abbotswood, and enhance their value for wildlife.

As the urban population is now greater than rural for the first time in our history, we become more and more disconnected from nature, an outcome which can impact the mental and physical health of people living in these areas. Sites such as Abbotswood, which are within easy reach of people living in urban/sub-urban areas, are therefore highly valuable in providing much needed access to nature. Such areas provide recreational and educational opportunities for the local community.

Various active management strategies will need to be employed to manage and enhance the site for nature conservation. Particular care should be taken around protected species and features, such as veteran oaks. If left unmanaged, much of the site would revert to oak woodland, reducing the overall diversity of habitats and therefore species the site is able to support. Scrub management will be vital to prevent the succession of valuable grassland habitats to woodland. Equally, woodland habitats will need to be enhanced to maximise its value to wildlife. Traditional woodland management practices such as tree thinning and coppicing will be used to achieve this. Utilising material from woodland management and the cut and collect of grassland on site will provide additional habitats for a range of species, including reptiles, amphibians and insects.

Grasslands are highly important habitats for wildflower species, and subsequently pollinating insects which are in decline nationally due to agricultural intensification and lack of adequate management techniques. The extent of grassland habitat will therefore be maintained, and enhanced through an annual cut and collect regime, creation of rides and other connective habitats.

Non- native species can arguably enhance the species diversity of a site, but ultimately many will result in a decline in native species. The extent of both aquatic and terrestrial non-native species will need to be controlled. Native invasive species such as bracken can also result in a decline in species diversity in a similar way (by outcompeting other species) and will also need to be managed at a sustainable level.

Test Valley Borough Council will use a range of contractors and resources to achieve these management goals. Wherever possible, volunteers from the local community will be involved in conducting management tasks, in order to gain support from the local community for the ongoing management of the site, and to help achieve one of the main aims of the site; to enhance the quality of life of the local residents.

3.2 Identification of Operational Objectives

The long term aims of the site can be broadly categorised into four management options:

- A – Active Conservation Management
- B – Monitoring and Research
- C – Education and Access
- D – Administration and Public Relations

Management features which are incorporated within each category are outlined on the table below (Table 4). Together with appropriate objectives, these management options will provide a broad guide for the operational management of the site.

Table 4: Broad management options and objectives for various aspects of the Abbotswood Nature Reserve and development.

Feature/Habitat	Management Option	Outline Prescription
Woodland	A	Thin in favour of best individuals and removal of non-native species
Veteran trees	A	Retain dead wood where possible and reduce public access under canopy
Scrub	A	Thin in favour of best individuals and manage extent

Coppice	A	Coppice percentage of hazel and willow on rotation
---------	---	--

Feature/Habitat	Management Option	Outline Prescription
Grassland	A	Cut and collect once annually and manage extent of scrub. Look to enhance diversity through planting and management where possible
Hedges	A	Replant where required and cut on rotation
Pond/wetlands	A	Control of non-native and invasive species such as willow and periodic control of extent of aquatic plants to prevent infilling
Amphibians and reptiles	B	Conduct annual amphibian survey, focussing on protected surveys. Compile baseline information for all species, utilising local knowledge.
Birds	B	Conduct a Common Bird Census (CBC) with assistance from local volunteers
Butterflies	B	Conduct annual butterfly monitoring surveys, with the support of local volunteers/residents
Other invertebrates	B	Compile baseline information for other invertebrate species, utilising local knowledge and experts. Aquatic invertebrates will be surveyed annually within the events programme (i.e. Discovery days)
Mammals	B	Compile baseline information using local knowledge and experts, including data from organised events such as bat walks
Flora	B	Commission HBIC plant survey for all areas under TVBC management to establish baseline data

Public access	C and D	Create and maintain permissive paths throughout the site, outlining desired routes using maps on site
---------------	---------	---

Feature/Habitat	Management Option	Outline Prescription
School involvement	C	Add site to the annual school visits programme and encourage independent visits to the site
Interpretation	C and D	Design and install interpretation boards on site near prominent features, i.e. entrances and habitat ponds
Control of invasive species	A	Where appropriate, using good practice techniques
Increased public awareness	D	Through interpretation boards, guided walks and talks, local volunteer group, social media, website and local newspapers
Control of non-native species	A	Remove where possible and using appropriate techniques

4. Management prescriptions and operations

4.1 Prescriptions

The Abbotswood development and Nature Reserve have been divided into compartments, and many into further sub-compartments, based on habitat types and subsequent management options. This section will outline the management objective for each compartment and the associated management prescriptions. The timings for each management option will be outlined in sections 4.3 (Timings for management and monitoring) and 4.4 (Work schedule).

Abbotswood Nature Reserve:

Compartment 1a: *Great crested newt (GCN) breeding ponds (Map 5b)*

To manage and maintain the ponds in a favourable condition to support a stable population of great crested newts.

- Reinststate post and rail fencing around the compartment and pond areas to discourage public access
- Removal of fish and non-native plant species (*Crassula helmsii*)
- Undertake surveys to monitor the great crested newt population
- Coppice willow on rotation to prevent over-shading of ponds. Use coppiced material to create a dead hedge around the boundary to discourage unauthorised public access and to create deadwood habitat piles.
- Monitor the extent of bankside vegetation to maintain access for survey purposes (maintain at 50%)
- Monitor extent of marginal vegetation at 70% to maintain open areas for GCN breeding display areas
- Monitor the extent of aquatic vegetation in the centre of the ponds to prevent infill (maintain at 50-70%)

Compartment 1b: *Permissive path, veteran oak, scrub and hedgerow habitat (Map 5b)*

To maintain access to the public and encourage positive management for the longevity of veteran trees.

- Clearance of marked path to maintain 1m margin either side of path

- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works conducted
- Divert path away from veteran oaks on east boundary (Baroona Way) to reduce impact on valuable trees

Compartment 1c: *Oak scrub, rough grassland and scrub habitat (Map 5b)*

To manage the area as a barrier to the terrestrial great crested newt in order to minimise public access.

- Cut and collect grassland once annually (autumn) on rotation, leaving 2m margin around scrub to minimise disturbance to GCN
- Removal of scrub on a 5 year rotation, removing 20% of scrub on rotation to control the extent and prevent encroachment into neighbouring grassland
- Replace interpretation boards

Compartment 1d: *Terrestrial GCN habitat, incorporating rough grassland, oak regen and scrub habitat (Map 5b)*

To manage and maintain the compartment as favourable terrestrial GCN habitat.

- Removal of scrub on a 5 year rotation, removing 20% of scrub on rotation to control the extent and prevent encroachment into neighbouring grassland
- Discourage public access through use of dead hedges and scrub management
- Phase out Ash through coppicing due to infection with Ash Dieback

Compartment 2: *GCN hibernacula and terrestrial habitat (Map 5a)*

To manage and maintain a favourable area for hibernating GCN.

- Removal of scrub on a 5 year rotation, removing 20% of scrub on rotation to control the extent and prevent encroachment into neighbouring grassland
- Utilise woody material found on site through scrub clearance and coppicing to enhance existing and create new hibernacula
- Replace and maintain fencing to discourage public access
- Maintain access to site via the entrance track through cut and collect once annually
- Clear drainage ditch of debris to prevent flooding
- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works conducted
- Minimal intervention to veteran oaks, retain standing deadwood where possible

- Coppicing of relevant species on 5 year rotation
- Cut and collect ride feature (entrance track) and prevent encroachment of scrub

Compartment 3a: *Oak woodland and scrub habitat (Map 5b)*

Minimal intervention to encourage the natural generation of woodland habitat.

- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works conducted on road boundary
- Retain deadwood and ivy
- Ongoing monitoring of fly tipping
- Selectively thin oak scrub, removing 20% on 5 year rotation, subject to TPO and felling licence
- Coppicing of relevant species on 5 year rotation
- Remove barbed wire fencing and replace roadside fence

Compartment 3b: *Oak woodland, silver birch and scrub habitat (Map 5b)*

Minimal intervention to encourage the natural generation of woodland habitat.

- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works conducted on road boundary and permissive paths
- Retain deadwood and ivy where possible
- Ongoing monitoring of fly tipping
- Selectively thin oak scrub, removing 20% on 5 year rotation, subject to TPO and felling licence
- Coppicing of relevant species on 5 year rotation
- Minimal intervention to veteran oaks, retain standing deadwood where possible
- Remove barbed wire fencing and replace roadside fence
- Maintenance of marked path to retain 1m margin either side of path

Compartment 3c: *Veteran oaks, scrub and hedge habitat (Map 5b)*

To maintain the extent of scrub to prevent encroachment to compartment 6 and to maintain the veteran oaks in a favourable condition.

- Reduce the extent of scrub every 5 years
- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works conducted on road boundary

- Minimal intervention to veteran oaks, retain standing deadwood where possible
- Ongoing monitoring of fly tipping along boundary

Compartment 4a: *Rough Grassland, oak scrub and individual standard trees (Map 5b)*

To maintain and improve the area of rough grassland, discouraging the encroachment of oak regen.

- Cut and collect grass once annually (Autumn), outside of active newt season and ground nesting bird season
- Removal of non-native plant species, such as ragwort, by hand pulling/mechanical methods
- Remove 20% of oak scrub on 5 year rotation

Compartment 4b: *Rough grassland, oak scrub and several veteran oaks (Map 5b)*

To maintain and improve the area of rough grassland, prevent further encroachment of oak scrub.

- Cut and collect grass once annually (Autumn), outside of active newt season and ground nesting bird season
- Cut and collect permissive paths
- Removal of non-native plant species, such as ragwort, by hand pulling/mechanical methods
- Remove 20% of oak scrub on 5 year rotation
- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works adjacent to permissive paths conducted
- Monitor sump near exit pipe to SUDS feature. Empty every 5 years.

Compartment 4c: *SUDS feature (Map 5b)*

To manage and maintain the pond in a favourable condition to support a stable population of great crested newts and fulfil its role as a drainage feature.

- Ongoing monitoring and removal of fish and any non-native plant species
- Undertake surveys to monitor the great crested newt population
- Undertake freshwater invertebrate surveys to monitor the suitability of the habitat
- Monitor extent of bankside vegetation, encourage replanting of areas to reduce public access (dogs etc...). Maintain at 90% coverage.

- Monitor extent of marginal vegetation at 70% to maintain open areas for GCN breeding display areas
- Monitor the extent of aquatic vegetation coverage in the centre of the ponds to prevent infill (maintain at 50%), by hand pulling
- Look to improve access for educational activities such as pond dipping (e.g. through a dipping platform)
- Undertake bank reinstatement works where appropriate (e.g. at key access points)
- Regular inspection of inflow and outflow pipes to ensure flow

Compartment 4d: *GCN breeding pond (Map 5b)*

To manage and maintain the pond in a favourable condition to support a stable population of great crested newts.

- Reinstatement post and rail fencing to discourage public access
- Monitor extent of bankside vegetation, maintain at 90% coverage.
- Monitor extent of marginal vegetation at 70% to maintain open areas for GCN breeding display areas
- Monitor the extent of aquatic vegetation coverage in the centre of the ponds to prevent infill (maintain at 50%), by hand pulling
- Monitor and removal of fish and non-native plant species
- Undertake surveys to monitor the great crested newt population
- Coppice willow on rotation

Compartment 5: *Mature scrub and rough grassland (Map 5a)*

To manage the extent scrub to prevent encroachment into grassland habitat and optimise the area as a GCN foraging area.

- Cut and collect grass once annually (Autumn), outside of active newt season and ground nesting bird season
- Remove 20% of oak scrub on 5 year rotation
- Removal of non-native plant species, such as ragwort, by hand pulling/mechanical methods
- Replace interpretation boards

Compartment 6a: *Permissive paths and adjacent rough grassland (Map 5b)*

To enhance the grassland to maximise diversity of wildflowers and pollinators.

- Cut and collect grass once annually (Autumn), outside of active newt season and ground nesting bird season
- Cut and collect permissive paths as required
- Removal of non-native plant species, such as ragwort, by hand pulling/mechanical methods

- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works adjacent to permissive paths conducted
- Replace interpretation boards

Compartment 6b: *Rough grassland and scrub habitat, mainly oak regen (Map 5b)*

To enhance the grassland to maximise diversity of wildflowers and pollinators, while providing foraging habitat for GCN.

- Remove 20% of oak scrub on 5 year rotation
- Cut and collect grass once annually (Autumn), outside of active newt season and ground nesting bird season
- Removal of non-native plant species, such as ragwort, by hand pulling/mechanical methods

Abbotswood Development:

Compartment 7: *SUDS features and associated amenity grassland, planted trees and scrub (Map 5a).*

To maintain the SUDS features for drainage purposes, which is also sympathetic to GCN population, and encourage newt movement into the Nature Reserve. Also to enhance the amenity grassland through wildflower planting and altered cutting regime.

- Assess the extent of scrub every 5 years – prevent encroachment into grassland and re-plant gaps to provide screen to Nature Reserve. Retain scrub adjacent to the Nature Reserve to facilitate movement to GCN from the SUDS features. Thin scrub by 20% on rotation as required.
- Annual inspection of standard trees, replacement planting as required
- Ongoing maintenance of fencing and access gates to Nature Reserve. Replace kissing gates with mobility access gates.
- Removal of terrestrial and aquatic non-native vegetation
- Removal of fish from SUDS features
- Ongoing GCN monitoring within SUDS features
- Monitor extent of bankside vegetation, encourage replanting of areas to reduce public access (dogs etc...). Maintain at 90% coverage.
- Monitor extent of marginal vegetation at 70% to maintain open areas for GCN breeding display areas
- Monitor the extent of aquatic vegetation coverage in the centre of the ponds to prevent infill (maintain at 50%), by hand pulling
- Implement wildflower planting scheme to enhance the amenity grassland habitat and increase species diversity

- Alter the current cutting regime to a once annual cut and collect following the implementation of the wildflower planting scheme to further enhance the diversity of the grassland
- Cut and collect banks around SUDS features once annually (Autumn) to facilitate the movement of GCN and encourage a greater diversity of wildflowers
- Discourage recreational use of the wetland areas
- Maintain multi-use waste bins, replace as necessary
- Install and maintain knee rail fencing around most of attenuation basins
- Undertake freshwater invertebrate surveys to assess and monitor the habitat quality
- Removal of non-native plant species, such as ragwort, by hand pulling/mechanical methods
- Regular inspections of inflow and outflow pipes to SUDS features

Compartment 8: *Mature woodland, with veteran oak trees and planted hedgerows (Map 5a)*

To enhance the woodland habitat and retain veteran trees to maximise biodiversity.

- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works adjacent to permissive paths and cycle way conducted
 - Minimal intervention of veteran oaks to increase longevity.
- Cut and collect 1m either side of paths and cycleway as required
- Control extent of bracken, cut and collect twice per season between mid-June and July, while retaining bracken and scrub surrounding prominent (veteran) trees to reduce public access. Reduce to 50% coverage to encourage a higher diversity of woodland plant species. Concentrate management on areas adjacent to the permissive path.
- Coppice relevant species on 5 year rotation
- Remove non-native plant species by mechanical methods
- Annual inspection of standard trees, replacement planting as required
- Maintain multi-use waste bins, replace as necessary
- Cut amenity grassland 12-14 times annually as required
- Explore options to enhance amenity grassland habitat through planting wildflowers and altering cutting regime

Compartment 9a: *Planted hedge, tree and scrub habitat (Map 5b)*

To maintain the extent of scrub and planted hedge.

- Annual inspection of standard trees, replacement planting as required
- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works adjacent to cycle way and boundaries conducted

- Selective thinning of spruce trees
- Cut amenity grassland, and 1-2m either side of cycleway, 12-14 times annually as required
- Monitor and manage extent of scrub to ensure it does not encroach on grassland/paths. Cut back 1m from path as required.
- Remove tree guards and stakes from planted hedge and scrub
- Replacement planting of hedge as required
- Maintain hedge at desired height (height of adjacent fence/wall)
- Explore options to enhance amenity grassland habitat through planting wildflowers and altering cutting regime

Compartment 9b: *Planted hedge, tree and scrub habitat (Map 5b)*

To maintain the extent of scrub and planted hedge.

- Annual inspection of standard trees, replacement planting as required
- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works adjacent to cycle way and boundaries conducted
- Cut amenity grassland, and 1-2m either side of cycleway, 12-14 times annually as required
- Monitor and manage extent of scrub to ensure it does not encroach on grassland/paths. Cut back 1m from path as required.
- Remove tree guards and stakes from planted hedge and scrub
- Replacement planting of hedge as required
- Maintain hedge at desired height (height of adjacent fence/wall)
- Explore options to enhance amenity grassland habitat through planting wildflowers and altering cutting regime
- Removal of non-native plant species by mechanical methods

Compartment 9c: *Planted hedge, wetland habitat with willow coppice (Map 5b)*

To enhance wetland habitat to facilitate the movement of GCN.

- Annual inspection of standard trees, replacement planting as required
- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works adjacent to cycle way and boundaries conducted
- Monitor and manage extent of scrub to ensure it does not encroach on grassland/paths. Cut back 1m from path as required.
- Cut amenity grassland, and 1-2m either side of cycleway, 12-14 times annually as required
- Remove tree guards and stakes from planted hedge and scrub
- Replacement planting of hedge as required
- Maintain hedge at desired height (height of adjacent fence/wall)
- Coppice willow on 5 year rotation
- Monitor wetland habitat for GCN

- Thin tree species in favour of wetland species (20%)

Compartment 9d: *Planted hedge and scrub habitat, with drainage ditches and ephemeral pond (Map 5b)*

To maintain the extent of scrub and planted hedge.

- Annual inspection of standard trees, replacement planting as required
- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works adjacent to cycle way and boundaries conducted
- Cut amenity grassland, and 1-2m either side of cycleway, 12-14 times annually as required
- Implement wildflower planting scheme to enhance the amenity grassland habitat and increase species diversity. Alter the cutting regime of amenity grassland to cut and collect once annually in favour of wildflower species.
- Monitor and manage extent of scrub to ensure it does not encroach on grassland/paths. Cut back 1m from path as required.
- Remove tree guards and stakes from planted hedge and scrub
- Replacement planting of hedge as required
- Maintain hedge at desired height (height of adjacent fence/wall)
- Removal of non-native plant species by mechanical methods
- Coppice willow on 5 year rotation
- Monitor ephemeral pond for GCN
- Cut and collect ditch as required

Compartment 10a: *Amenity grassland, hedgerows and play area (Map 5b)*

To maintain area for amenity purposes, maintaining and enhancing the current extent of scrub.

- Annual inspection of standard trees, replacement planting as required
- Maintain hedge at desired height (height of adjacent fence/wall)
- Remove tree guards and stakes
- Replacement planting of hedge as required
- Cut amenity grassland 12-14 times annually as required
- Explore options to enhance amenity grassland habitat through planting wildflowers and altering cutting regime
- Control the extent of scrub habitat, to prevent encroachment of grassland habitat. Thin by 20% on rotation.

Compartment 10b: *Amenity grassland, planted standard trees, hedges and scrub (Map 5b)*

To maintain area for amenity purposes.

- Annual inspection of standard trees, replacement planting as required

- Maintain hedge at desired height (height of adjacent fence/wall)
- Remove tree guards and stakes
- Replacement planting of hedge as required
- Cut amenity grassland 12-14 times annually as required
- Control extent of scrub to prevent encroachment of grassland as required. Thin by 20% on rotation.
- Explore options to enhance amenity grassland habitat through planting wildflowers and altering cutting regime

Compartment 11: *Pond habitat, with scrub and larger oak trees (Map 5a)*

To enhance the pond habitat for GCN and surrounding scrub to facilitate movement of GCN from aquatic to terrestrial habitat.

- Monitor extent of bankside vegetation, maintain at 90% coverage.
- Monitor extent of marginal vegetation at 70% to maintain open areas for GCN breeding display areas
- Monitor the extent of aquatic vegetation coverage in the centre of the ponds to prevent infill (maintain at 50%), by hand pulling
- Undertake surveys to monitor the great crested newt population
- Maintain fencing to prevent public access
- Control extend of scrub habitat to prevent encroachment
- Survey trees once every 5 years, unless otherwise specified, and subsequent health and safety works conducted
- Undertake freshwater invertebrate survey to ascertain and monitor the habitat quality
- Ongoing maintenance of platform feature

4.2 Project Register

The overall summary of management (Table 5) and monitoring (Table 6) can be seen below. The timings and work schedule for these projects can be seen in more detail in section 4.3 and 4.4.

Table 5: Summary of Management Projects

Project	Compartments
Repair/replace fencing where required	Whole site
Fish removal from ponds	1a, 4c, 4d, 7
Removal of non-native plant species	Whole site
Control extent of wetland plant species	1a, 4c, 4d, 7, 11
Monitor extent of bankside, marginal and aquatic vegetation within ponds	1a, 4c, 4d, 7, 11
Management of scrub habitats	Whole site
Removal of tree guards	7, 9a, 9b, 9c, 10a, 10b
Enhancement of deadwood hibernacula	1 – 6, 8
Selective thinning in favour of best individuals	1c, 3a, 3b, 9a
Coppicing of hazel	2, 3a, 3b, 8
Coppicing of willow	1a, 4d, 9c, 9d
Bracken control	8
Maintain planted hedgerows	9a, 9b, 9c, 10a, 10b
Replacement planting where required	7, 8, 9a, 9b, 9c, 9d, 10a, 10b
Maintain drainage ditches	2, 7, 9c, 9d, 10a, 10b
Cut and collect grass areas	Whole site
Interpretation boards	1b, 1c, 5, 6a, 7
Path maintenance	Whole site
Enhancement of amenity grassland areas through wildflower planting scheme	7, 9a, 9b, 10a, 10b

Table 6: Summary of Monitoring Projects

Project	Compartment
Great crested newt surveys	1a, 4c, 4d, 7, 9c, 9d, 11
Survey freshwater invertebrates	1a, 4c, 4d, 7, 11
Survey terrestrial invertebrates	Whole site
National butterfly monitoring survey	Nature Reserve
Survey birds	Whole site
National bat monitoring survey	Whole site (focus on Nature Reserve)
Monitor other mammals	Whole site
Plant surveys	Whole site
Tree surveys	Whole site
Annual inspection of fencing	Whole site
Monitor drainage ditches	2, 7, 9c, 9d, 10a, 10b
Monitor fly tipping	Whole site
Monitor litter	Whole site

4.3 Timings for management and monitoring

The timing within which the various management and maintenance prescriptions previously outlined can be undertaken will vary considerably. The timescale within which each of these projects can be undertaken are outlined below (Tables 7 and 8). These timings are based on best practice guidelines as well as taking into account local conditions and site requirements.

Table 7: Timing for management projects for months from January (1) to December (12).

Project	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Repair/replace fencing where required												
Fish removal from ponds												
Removal of non-native aquatic species												
Removal of non-native terrestrial species												
Control extent of wetland plant species												
Monitor extent of bankside vegetation												
Management of scrub habitats												
Removal of tree guards												
Create new hibernacula												
Enhance existing hibernacula												
Selective thinning in favour of best individuals												
Coppicing of hazel												
Coppicing of willow												
Bracken control												
Maintain planted hedgerows												
Replacement planting where required												
Maintain drainage ditches												
Cut and collect grass areas												
Interpretation boards												
Maintain paths by cutting back vegetation												
Wildflower planting												

Table 8: Timing for monitoring projects for months from January (1) to December (12). Green indicates the optimum time frame, yellow is suboptimum.

Project	Month ^[1]											
	1	2	3	4	5	6	7	8	9	10	11	12
Great crested newt surveys		Green	Green	Green	Green	Green						
Survey freshwater invertebrates					Green	Green	Green	Green	Green			
Survey terrestrial invertebrates	Yellow	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow
National butterfly monitoring survey				Green	Green	Green	Green	Green	Green			
Survey birds	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Bat monitoring survey			Yellow	Green	Green	Green	Green	Green	Green	Yellow		
Plant surveys				Green								
Tree surveys	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Green
Annual inspection of fencing	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Monitor drainage ditches	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Monitor fly tipping	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Monitor litter	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

4.4 Work schedule

A 10 year work schedule has been drawn up for the areas managed by Test Valley Borough Council within Abbotswood (Table 9, compartments outlines in Map 5a) to fulfil the objectives and long term vision for the site.

Table 9: 10 year work schedule

Objective	Prescription	Compartment	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Repair and maintain fencing	Repair and if necessary replace fencing around ponds	1a	*	*									
		4d	*										
	Inspection of fencing and entrances, repair as necessary	All sections	*	*	*	*	*	*	*	*	*		
Maintenance of gateways and entrances to the Nature Reserve	To replace kissing gates with mobility access gates	7	*										
	To cut back overhanging scrub/branches to maintain open access	All entrances	*	*	*	*	*	*	*	*	*	*	*
Enhance and maintain pond habitats in favourable condition	Removal of fish from ponds	7	*		*		*		*		*		*
	Ongoing monitoring of fish population, removal as required	All ponds	*	*	*	*	*	*	*	*	*	*	*
	Removal of non-native aquatic plant species (<i>Crassula helmsii</i>)	1a	*	*	*	*	*	*	*	*	*	*	*
	Monitor and control of extent of native aquatic plant species (maintain to specified coverage)	All ponds	*	*	*	*	*	*	*	*	*	*	*
	Monitor the extent of bankside vegetation (maintain to specified coverage)	All ponds	*	*	*	*	*	*	*	*	*	*	*
	Monitor the extent of marginal vegetation within ponds (maintain to specified coverage)	All ponds	*	*	*	*	*	*	*	*	*	*	*

Objective	Prescription	Compartment	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Biological surveys	GCN monitoring survey	All ponds	*	*	*	*	*	*	*	*	*	*	*	
	Freshwater invertebrates	4c	*	*	*	*	*	*	*	*	*	*	*	
		4d	*			*			*			*		
		7	*	*	*	*	*	*	*	*	*	*	*	
		11	*			*			*			*		
	Plant surveys conducted by HBIC	All sections					*					*		
	Butterfly monitoring survey	Reserve (1-6)	*	*	*	*	*	*	*	*	*	*	*	
	Bat monitoring survey	Reserve (1-7)	*	*	*	*	*	*	*	*	*	*	*	
Bird census	Reserve (1-6)	*					*					*		
Scrub management	Rotational scrub removal/thinning (20%) on rotation	1c		*					*					
		1d				*					*			
		2	*	*				*					*	
		3b	*					*					*	
		3c			*						*			
		4a				*						*		
		4b			*			*			*			
		5		*			*				*		*	
		6b					*						*	
		7			*						*			
	10			*						*				
	Removal of tree guards from planted scrub boundary	7			*									
		9a		*										
		9b	*											
		9c			*									
		10a	*											
		10b			*									
	Removal of non-native species	Whole site	*	*	*	*	*	*	*	*	*	*	*	
	Enhance hibernacula for amphibians and reptiles	Use of deadwood/coppiced material to create new/enhance existing deadwood piles	Nature Reserve (1-6) and 8	*	*	*	*	*	*	*	*	*	*	
	Path maintenance	Cut and collect grass paths 3-4 times annually (as required)	Nature Reserve	*	*	*	*	*	*	*	*	*	*	
Monitor and cut back vegetation as required (1m either side of path)		Nature Reserve and comp. 8	*	*	*	*	*	*	*	*	*	*		
	Monitor vegetation adjacent to cycleways, cut back and remove overhanging vegetation as required	9 & 10	*	*	*	*	*	*	*	*	*	*		

Objective	Prescription	Compartment	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Tree management	Full health and safety inspection of all trees	whole site				*					*			
	Visual inspection for hazards, including health assessment of veterans and identified monitor trees	whole site	*	*	*	*	*	*	*	*	*	*	*	
	Inspection and ongoing maintenance of standard, planted trees	7		*	*	*								
		8		*	*	*								
		9 (all sections)		*	*	*								
		10 (all sections)		*	*	*								
	Full inspection of all trees bordering other properties	1			*			*			*			*
		2			*			*			*			*
		3b			*			*			*			*
		9b			*			*			*			*
		11			*			*			*			*
	Full inspection of all roadside trees	2		*		*		*		*		*		*
		3a		*		*		*		*		*		*
		3b		*		*		*		*		*		*
		9		*		*		*		*		*		*
	Enhance/maintain wetland habitat	1a		*					*					*
		4d				*					*			
		9c						*					*	
		9d			*					*				
Enhance/maintain woodland habitat	Undertake coppicing to enhance woodland habitats (Hazel, etc...)	2				*					*			
		3a		*					*					
		3b			*						*			
		8					*					*		
	Bracken control (cut and collect twice annually)	8	*	*	*	*	*	*	*	*	*	*	*	
Enhance/maintain hedgerows	Replacement planting as required	9	*	*										
		10			*									
	Remove tree guards and stakes	9a			*									
		9b	*	*										
		9c			*									
		10a	*											
		10b	*	*										
Maintenance of drainage ditches	Keep pipes and ditches clear of debris	2	*	*	*	*	*	*	*	*	*	*	*	
		7	*	*	*	*	*	*	*	*	*	*	*	
		9c	*	*	*	*	*	*	*	*	*	*	*	
		9d	*	*	*	*	*	*	*	*	*	*	*	
		10	*	*	*	*	*	*	*	*	*	*	*	
	Inspection of Sump	4c	*	*	*	*	*	*	*	*	*	*	*	
	Pump out of sediment within Sump	4c	*										*	

Objective	Prescription	Compartment	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Maintain and enhance grassland habitat	Cut and collect once annually, leaving a 1-2m margin around scrub	1c	*	*	*	*	*	*	*	*	*	*	*
		1d	*	*	*	*	*	*	*	*	*	*	*
		2	*	*	*	*	*	*	*	*	*	*	*
		4a	*	*	*	*	*	*	*	*	*	*	*
		4b	*	*	*	*	*	*	*	*	*	*	*
		5	*	*	*	*	*	*	*	*	*	*	*
		6	*	*	*	*	*	*	*	*	*	*	*
	7	*	*	*	*	*	*	*	*	*	*	*	
	Amenity grassland (and 1-2m adjacent to cycleways) cut 12-14 times annually, as required	8	*	*	*	*	*	*	*	*	*	*	*
		9	*	*	*	*	*	*	*	*	*	*	*
		10	*	*	*	*	*	*	*	*	*	*	*
	Enhance the diversity of amenity grassland areas through wildflower planting (where appropriate and leaving 1-2m adjacent to cycleways)	7	*										
		8			*								
		9a	*										
		9b			*								
		9d	*										
		10a		*									
	Monitor and control of non-native terrestrial plant species e.g. ragwort	10b		*									
		1	*	*	*	*	*	*	*	*	*	*	*
		4	*	*	*	*	*	*	*	*	*	*	*
		5	*	*	*	*	*	*	*	*	*	*	*
		6	*	*	*	*	*	*	*	*	*	*	*
		7	*	*	*	*	*	*	*	*	*	*	*
	Replace and maintain signage	Replacement/ installation of interpretation boards	8	*	*	*	*	*	*	*	*	*	*
			1c	*									
			5	*									
			6a	*									
		Discourage recreational use of wetland areas	7	*									
1a			*										
4c			*										
4d			*										
7			*										
7			*										
Monitor fly tipping	Ongoing monitoring	All sections	*	*	*	*	*	*	*	*	*		
Monitor litter	Install and maintain dual use litter and dog waste bins (replace as necessary)	2	*										
		7	*										
		9 (all sections)	*										
	Ongoing monitoring of litter levels (with annual litter pick)	All sections	*	*	*	*	*	*	*	*	*		

4.5 Monitoring and Review

The management plan is a fluid document which is subject to change. Management strategies, timings and techniques will be adjusted according to the success of projects and prior experience of on-site conditions. The work schedule will be reviewed annually to ensure the required works have been completed. The management plan will be reviewed in full every 5 years, during which management objectives and prescriptions will be revised.

4.6 Monitoring Progress

Ongoing surveys of flora and fauna will be conducted on site in order to monitor the effects of management on the species assemblage. Baseline data will be established within the first 3 years of management, which will help guide objectives and prescriptions, and monitor changes as a result of management strategies. This will aid the reviewing process and ongoing monitoring.

As part of establishing baseline data, fixed point photography will be used to give a visual representation of the condition of the site. This technique can also be used to record the effects of certain projects to monitor the changes which occur as a result and longer term effects of the works. Aerial photography made available through Hampshire County Council can also be used to monitor changes across the site.