

NYN PARK

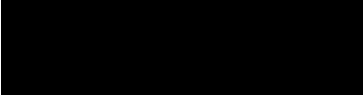
Landscape Management Plan March 2022 to March 2032



Document Amendment History

Version	Status	Date	Amendment to this version
1.1	Interim Meeting Draft	04.06.2019	Numerous sections updated and finalised further to project team meeting.
2.1	Draft Issue	12.06.2019	
3.1	Final Issue	15.09.2021	LMP dates changed to 2022-32

Document Approval

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1 Introduction

Nyn Park is a 128 ha privately owned country estate located to the north of the small village of Northaw in Hertfordshire.

The estate sits within a broad band of open countryside, the rural character of which has been left largely undented by the nearby dominant urban influences of the M25 and A1(M) corridors, Potters Bar and Hatfield, and the sprawling suburbs of Greater London. The estate is significant for its extensive, encompassing band of woodlands, including Well Wood which forms part of the large complex of SSSI ancient woodlands associated with Northaw Great Wood.

This **10-year Landscape Management Plan** has been prepared to guide and support the management of Nyn Park for the period **March 2022 to March 2032**. It has been written and compiled by Maydencroft Limited with the support and contribution from a number of other consultants and employees involved in the management of the estate. Maydencroft's connection to Nyn Park dates back over 10 years and includes the employment of two full time gardeners based on the site.

Production of this 10-year Landscape Management Plan was requested by Welwyn Hatfield Borough Council in support of a planning application for the setting out of a Golf Course on part of Nyn Park. It is the intention of this plan to provide a firm commitment to the positive management of the estate and its valuable habitats, and to maximise the biodiversity potential of the site, including within the golf course itself.

Following submission of a draft issue of the Plan, it was requested by Welwyn Hatfield Borough Council that a Biodiversity Net Gain Metric Assessment be completed for the golf course development (*Appendix C*). The metric assessment was able to demonstrate that a minimum 10% net gain in biodiversity can be achieved through habitat enhancement and creation across the estate. The commitment to deliver biodiversity net gain will be for a minimum period of 30 years and as such will be built into each subsequent 10-year update of the Landscape Management Plan.

The Nyn Park 10-Year Management Plan is a simple, map-based plan that is intended to be easily interpreted and understood by all the various site staff and external contractors that will need to use it on a regular basis. It follows a narrative structure that aims to give clarity to decision making and show the thought process behind capital works and maintenance prescriptions. The format is as follows:

2. Site Description This chapter provides some background factual context to Nyn Park, with information on the estate's history, landscape character, and biodiversity, including statutory and non-statutory designations.

3. Management Zones Nyn Park is a complex estate with a variety of distinct areas, habitats and functions. This chapter divides the estate into distinct Management Zones and includes a more detailed site description of each zone covering habitats, notable trees, soils, and hydrology. It then proceeds to a condition assessment of the zone, discussing issues with

current management, threats and weaknesses, and opportunities for improvement.

4. Action Plans

This chapter sets out the aims and objectives for each of the management zones, developing into detailed plans for how these will be achieved. The plans are divided into two tables – a Capital Work Programme listing all of the one off items required, and an Annual Maintenance Programme which details all of the regular management operations. Supporting specifications and prescriptions are included to provide details on how these works will be delivered on the ground.

5. Monitoring & Review

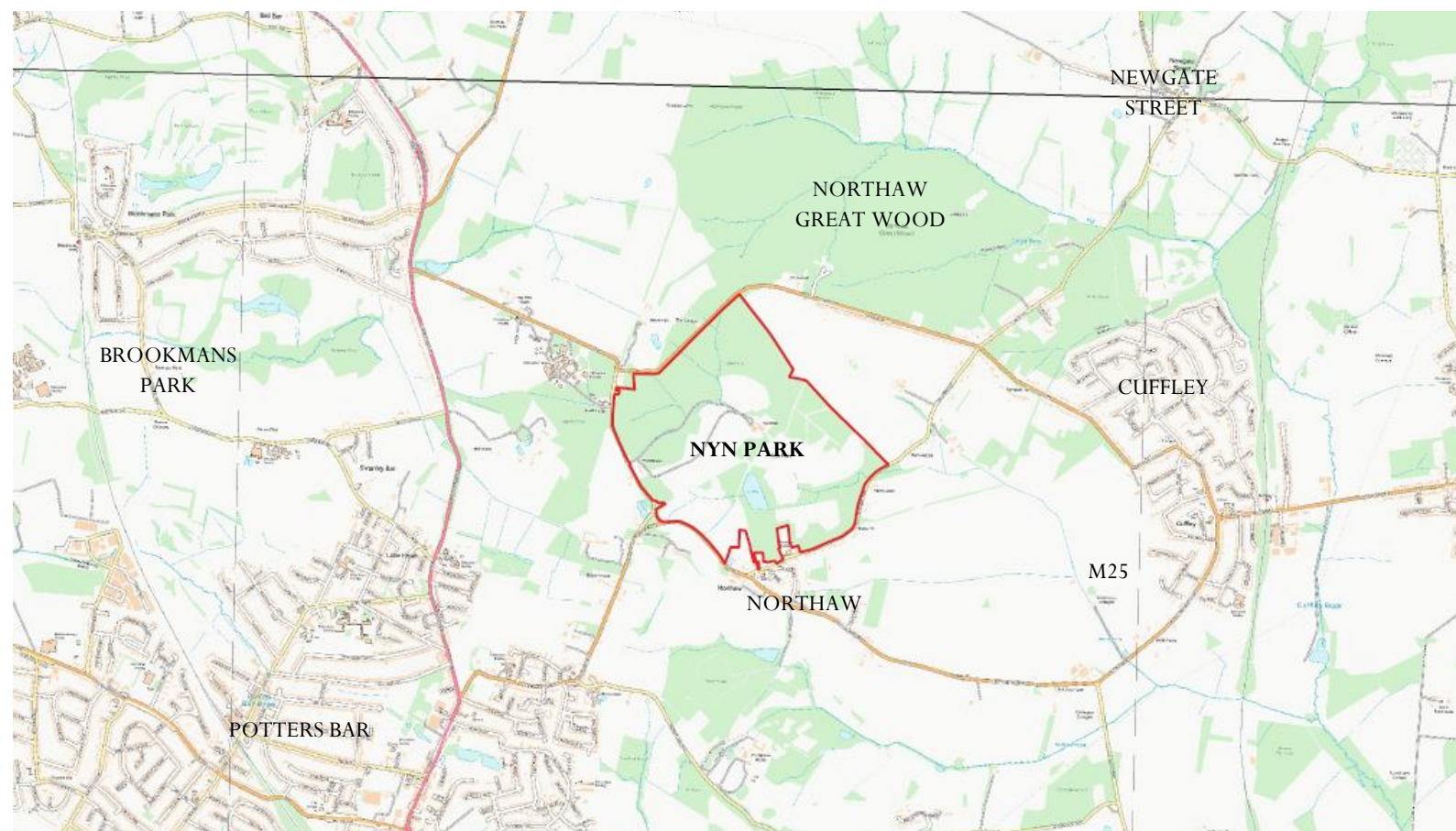
Landscape Management Plans are living, active documents that need constant monitoring and review to ensure they remain relevant and useful. This chapter sets out the process for regular review and updating of the plan, and a programme of more specific monitoring for different areas of the estate.

The production of this plan involved a number of specialist site surveys undertaken in May 2019. Detailed ecological surveys followed the CIEEM guidelines for extended phase 1 habitat surveys and included the recording of botanical information, identifying evidence of any protected species, and assessing habitats for their potential to support protected species. A survey of veteran and other notable

trees was undertaken by a Lantra-qualified Professional Tree Inspector to help provide an understanding of both their abundance and quality, to determine whether remedial works are required, and to help target areas for re-planting. An experienced Senior Forestry Consultant undertook surveys of all woodland areas, gathering information and making recommendations using the standard Forestry Commission Management Plan approach.

The remit of this Landscape Management Plan extends to the majority of the estate with a few exceptions. The formal gardens surrounding Nyn House (marked on the zone map as 'The Gardens') are managed by a two-person team of gardeners to a high horticultural standard under a standalone contract. There are no plans to change this current arrangement so the zone has been omitted from this plan. Similarly, two of the properties on the estate – Well Yard and Hatfield Lodge – are not covered herein.

The Golf Course is to be managed under a separate contract following its own maintenance plan, to be delivered by a team of six specialist grounds operatives. The high-spec management of the tees, greens, fairways and hazards falls outside of the remit of this plan. There are however blurred lines where the roughs will blend into the adjacent grasslands and habitats, and where there are opportunities for building more targeted habitat and landscape value into the course. It is these areas that are of particular relevance to this plan, and covered in more detail in section 3.9.



2 Site Description

2.1 Historic Context

“Common ling (heather) grew on it abundantly. It was covered with tufts of ling, between which bracken flourished and swamps abounded. In places *Carpinus* (hornbeam) grew fairly densely to a height of six feet, and the tops of it were cut for fuel”

Description of Northaw Common by Pehr Kalm, 1748 (Rowe & Williamson (2011) Hertfordshire: A Landscape History; University of Hertfordshire Press)

Nyn Park historically formed part of Northaw Common, one of the largest areas of common ‘wastes’ in Hertfordshire. The common land stretched from Cheshunt in the east to Brookman’s Park in the west, and likely arose due to the soils being too poor for cultivation. The land would have been grazed by livestock with scattered trees ‘pollarded’ at a height above the browse line with the growth harvested for fuel and fodder. This practice of pollarding prolongs the life of trees, meaning that many would have been retained over centuries, becoming local landmarks within the wastes (see the various named oak trees on the *Dury & Andrews* map, below). The lack of tree cover and practice of grazing on acidic soils would have resulted in heathland habitats of heather (ling) and gorse. The combination of grazed common lands with scattered pollarded trees is known as ‘Wood Pasture’.

The following paragraphs set out a brief timeline of Nyn Park to give some context as to how it has developed over the centuries.

2.1.1 AD 793 - 1539

It is believed that Northaw was one of the original manors that formed part of the Liberty of St Albans, dating back to the founding of St Albans Abbey by King Offa of Mercia in AD 793. Certainly by the 1100s it is recorded that the Abbey possessed a wood known as North Haga (*3. Gesta Abbat. (Rolls Ser.), i, 63.*) which extended across much of the parish.



Dury & Andrew’s Map of Hertfordshire 1766 (Windgather Press, 2016)

By 1086, the woods were being leased to Peter de Valognes; following his death, a dispute arose between the family and abbots which resulted in law suit that saw in favour of the Abbey. It is likely that there was a stone-built medieval hall on site dating to the early 14th Century. The manor continued to be owned and leased out by St Albans Abbey until the dissolution of the monasteries in 1539 when ownership was transferred to King Henry VIII.

2.1.2 1539 – 1774

In 1539-40, ownership of the manor was awarded to William Cavendish, an auditor of the Court of Augmentations. At this time a new ‘Palace’ was constructed incorporating the earlier medieval hall. By 1560, the manor had been passed back to the crown and it is believed that Queen Elizabeth I stayed on a number of occasions between 1563-64. In 1576 the manor was granted to Ambrose Dudley, Earl of Warwick who undertook extensive works to the palace, including the addition of gardens and walks. In 1579 the earl attempted to enclose larger areas of the common to extend the park, but was met by fierce riots from the commoners.

The manor was sold in 1632 to William Leman, a ‘woollen draper, citizen and fishmonger’ from London. It stayed with subsequent generations of the Leman family through the 17th and 18th centuries before the hall itself was demolished in 1774.



A painting of Nyn Hall, as it was under the ownership of John Leman Esquire in the 18th Century (Macnair, Rowe and Williamson; Dury & Andrews’ Map of Hertfordshire; Windgather Press, 2016)

2.1.3 1774 – 1945

A new smaller manor house was built between 1811-1822, close to the location of the original property. Subsequent alterations to the manor by the owner Rev Trenchard included enlargement of the pond and improvements to the gardens with the construction of a walled kitchen garden. The house was further enlarged under the ownership of Mr John Pearson Kidston from 1874 – 1894, possibly under the direction of the architect Sir Reginald Blomfield.



1930s aerial view of Nyn Hall showing extensive walled gardens (Britain from Above, 2019)

In 1903, Northaw Golf Club was founded with a 9-hole course established in Nyn Park, to the south west of the house. The course was recorded as having ‘a good variety of hazards including furze bushes, ditches and ponds’. The course lasted until the 1930s and at its peak had over 100 members.



2nd edition OS 6 inch map 1898 (National Library of Scotland, 2019)

2.1 Historic Context

2.1.4 1945 - PRESENT

Following the end of WW2, Nyn Park fell into disrepair and the gardens became disused and dilapidated. The house was eventually gutted by fire on 12th April 1963 with most of the structure subsequently torn down due to being dangerous. The estate was purchased in 1968 by Major Frank Russell Dore. He established a small timber house near Hatfield Lodge and planted the majority of open parkland with conifer plantations. In 1986 he bequeathed the estate to Haileybury School.



Aerial photo from 2000 showing conifer plantations across the majority of Nyn Estate (Google Earth 2019)

Nyn Park was purchased by Bessington Investments in the early 2000s. In 2009 the majority of conifer plantations were felled with the parklands restored in 2010 as part of a Landscape Management Plan agreed with the local authority. From 2010-2014 the mansion house was built, located at the centre of the estate on the site of the previous properties. The house includes formal and informal gardens containing many remnant ornamental trees with extensive herbaceous borders and lawns.

At the same time as plantations were being cleared on site, a document titled **Nyn Park Landscape Specification** was produced by the Landscape Agency. This management plan set out the works required to restore the areas of deforested landscape, and to bring retained woodland areas back into positive management. The majority of works within this plan were implemented over the following years by Maydencroft Limited, with monitoring from Welwyn Hatfield Borough Council as part of an Estate Committee.

The formal and informal gardens continued to be managed by a permanent team of 2 full time gardeners, with works to the wider estate undertaken by Maydencroft's tree surgeons, foresters, and landscape operatives.



Image from 2008 showing conifer plantations and a remnant open grown parkland oak (Alastair Davie)



Image from 2008 showing harvested timber stacks as a result of clearance (Alastair Davie)



A view across the estate in 2009, post-clearance (Tom Williams)



Formal gardens in 2017 (Tom Williams)



Nyn House in 2018 (Tom Williams)



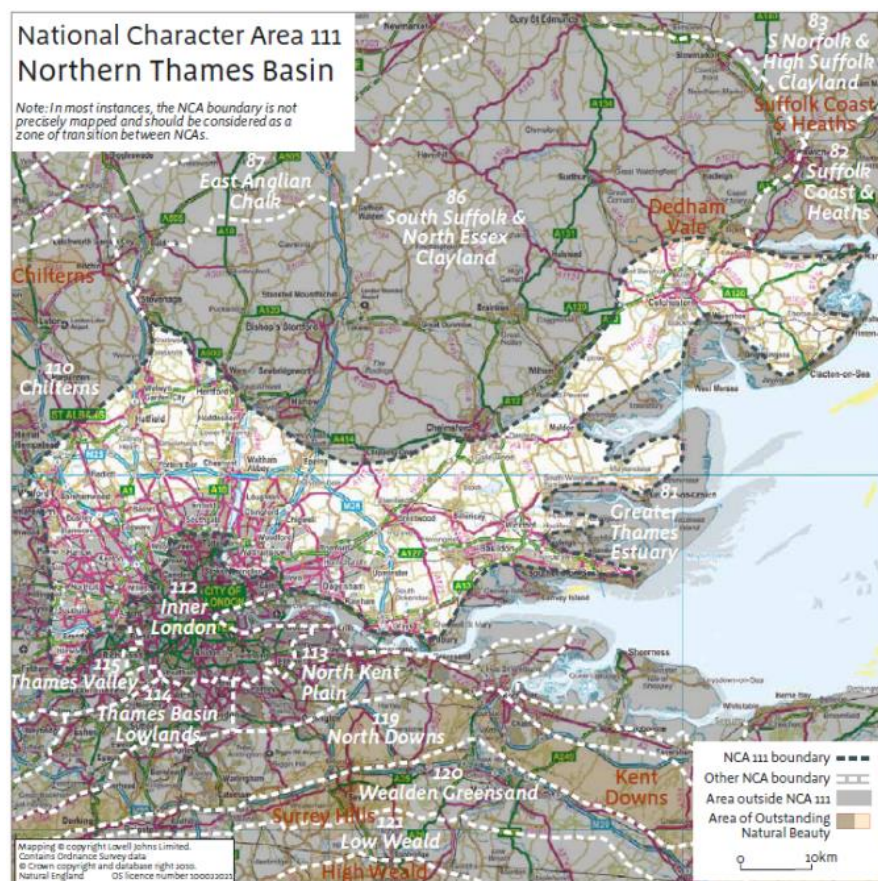
Delphiniums in the formal gardens, 2017 (Tom Williams)

2.2 Landscape Context

2.2.1 NATIONAL CHARACTER AREA (NCA)

Nyn Park is located within **NCA11 Northern Thames Basin**. This character area stretches across the north west and north of London, and extends east through Hertfordshire and Essex into the southern parts of Suffolk.

The area has strong urban influences and a legacy of rapid expansion with numerous large towns and a broad infrastructure network with major highways including the M25 and A1(M). The landscapes that encompass these aspects are varied in character, ranging from the wooded Hertfordshire plateaux that includes Nyn Park, to the predominantly open arable fields of the Essex heathlands. Whilst the landscape continues to evolve and be fragmented by the growth of urban areas and associated infrastructure, there are still numerous pockets of tranquillity and swathes of strong habitat connectivity.



Natural England map showing the area of NCA111 Northern Thames Basin.

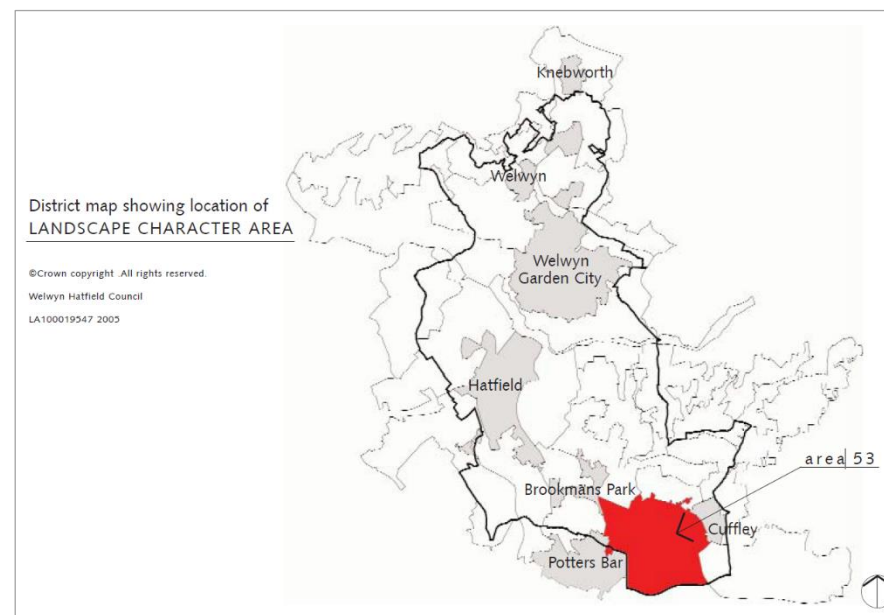
The NCA refers to the considerable areas of ancient semi-natural woodland and wood pasture habitats in Hertfordshire, retained in part due to the presence of heavy clay acidic soils. They are recognised of great importance as both standalone habitats and within the wider green infrastructure network, and for their ability to promote tranquillity and screen urban influences. Deer impact on woodland flora and natural regeneration is recognised as an increasing issue for woodland management in Hertfordshire. There is a recognised lack of management within historic coppice woodlands with many reverting to dense high forest.

Statement of Environmental Opportunity (SEO) 4 recognises the importance of managing and expanding the areas of broadleaf woodland and wood pasture in order to preserve and enhance landscape character, and to safeguard biodiversity value. SEO3 looks towards the protection and management of the historic environment, including the maintenance and enhancement of SSSIs.

2.2.2 LOCAL CHARACTER AREA (LCA)

Nyn Park is located within **LCA 53 Northaw Common Parkland**, as defined by the Welwyn Hatfield Landscape Character Assessment. This area to the north of the M25 and east of Potters Bar contains a number of historic parklands and estates with a scattering of small settlements. The landscape is defined by this historic legacy with large areas of woodland and enclosed parklands containing open-grown mature trees and, more specifically, tight circles of scots pine, limes and oaks. Public access and views are largely restricted, with numerous wooded roads containing occasional lodge houses and grand gateways.

Nyn Park sits within one of the ‘bowls’ that are a feature of the landscape, defined by surrounding ridgelines with an oval shape that suggests its former use as a deer park. Large areas of forestry are recognised as having affected the formal landscape features of Nyn Park, although some parkland tree circles and oak avenues still remain. Well Wood is identified as an important feature within the landscape due to its SSSI oak/hornbeam community with wood pasture and remnant heathland.



Plan showing the location of LCA 53 Northaw Common Parkland (Welwyn Hatfield Landscape Character Assessment)

It is recognised that the landscape character of this area has historically been defined (and continues to be defined) by the proximity to London and the proliferation of large estates over many centuries. As a result, the strategy for conserving and strengthening the landscape relies on the encouragement of private landowners. Key recommendations include the reversion of parklands to pasture where possible, establishing appropriate and distinct management systems for woodlands, and management of parkland trees for their heritage and ecological significance.

Nyn Park borders **LCA 52 Northaw Great Wood** to the north and shares many landscape characteristics. Well Wood is recognised as being a part of the Great Wood and together comprising one of the county’s largest areas of ancient oak-hornbeam woodland.

2.2.3 SITE LANDSCAPE ASSESSMENT

Nyn Park estate has a strongly defined wooded and tree lined boundary, providing a complete sense of enclosure and separation from the surrounding landscape. This is further defined by the topography and landforms which see the main house and formal gardens centrally located within a bowl, fully hidden from any external views.

As evidenced within LCA 53, this landscape pattern is a recognised component of the area’s character, which means that the continued privacy of the estate through maintaining and strengthening these wooded boundaries will continue to be beneficial to conservation of the landscape (provided that woodland management systems are appropriate to the types of woodland present, and any new planting uses locally present native species wherever possible).



View of the estate boundary from Judges Hill.

External views into Nyn Park are limited to vehicles and pedestrians using the surrounding roads which include Well Road, Judges Hill, Vineyards Road, and the B157 Ridgeway. For the most part these views are limited to dense broadleaved woodland bordered by deer fencing. There are currently some occasional fleeting views into the estate from the boundary shared with Judges Hill which is bordered by a tree belt and hedgerow, although these are becoming further restricted by developing areas of bramble scrub and new buffer planting. A small gap in the woodland on the north east boundary allows a pocket of visibility into a corner of the estate from properties on The Ridgeway, located approximately 0.6 km north-

2.2 Landscape Context

north-east. Elsewhere, the only true indication of the estate's presence to outsiders is the main gateway and associated lodges on Well Road.

With the exception of these locations, the character and value of Nyn Park within the local landscape is very much linked to that of Northaw Great Wood, combining to give the area a distinct wooded appearance and feel that continues onwards through the Broxbourne Woods National Nature Reserve to the north east. Roads benefit from an intimate landscape quality with oak and hornbeam canopies closing to form green tunnels with dappled light, giving a strong sense of place and identity.

As a result of these defined boundary features, the internal landscape of the estate enjoys relative seclusion from the outside world with a great deal of tranquillity. The house sits roughly central to the estate at one of the lowest points in the landscape, with several radial 'fingers' of open parkland emanating and rising outwards into the surrounding woodland. From almost any point within the estate the backdrop is continually wooded with occasional snatched glimpses of the house and formal gardens, containing an array of prominent mature ornamental conifers such as *Sequoia wellingtonia*. Landscape views that include properties and/or infrastructure outside of the estate are very rare and long-distance.



Remnant parkland 'roundel' of Corsican pine and dilapidated estate railings

Some historic landscape features are still present including numerous ponds, ditches, tree lines and woodland edges, parkland 'roundels' surrounded by dilapidated estate railings, and estate roads. However, the landscape character of the internal estate has evolved greatly over the past few centuries, being at a times a deer park, a golf course, and a conifer plantation. Since the latter was removed in 2009, the openness of the estate has been restored with a variety of internal views and vistas defined by the edges of woodlands, variations in levels, and remnant mature/veteran trees.

2.3 Biodiversity Context

2.3.1 OVERVIEW

Nyn Park is set within a semi-rural location but lies less than 1km from Potters Bar, with other urban areas in the wider surroundings. The immediately surrounding area comprises mostly mixed farmland and small villages, with a large expanse of woodland, Northaw Great Wood, to the north.

Nyn Park itself comprises a number of woodlands; one of which, Well Wood is a Site of Special Scientific Interest (SSSI). Woodland generally covers the northern, eastern and southern areas of the park, with divisions of broadleaved, plantation and mixed woodland. The remainder of the park is broadly covered by parkland, with semi-improved grassland and mature and veteran trees. These semi-natural habitats on site are considered to be of ecological significance to wildlife in the local area, given their size, maturity and connectivity around the park and into adjacent land.

More detailed habitat information is contained within the chapters of this plan, including lists of key botanical species within each habitat type and the wildlife each habitat is considered to have the potential to support.

2.3.2 STATUTORY DESIGNATIONS

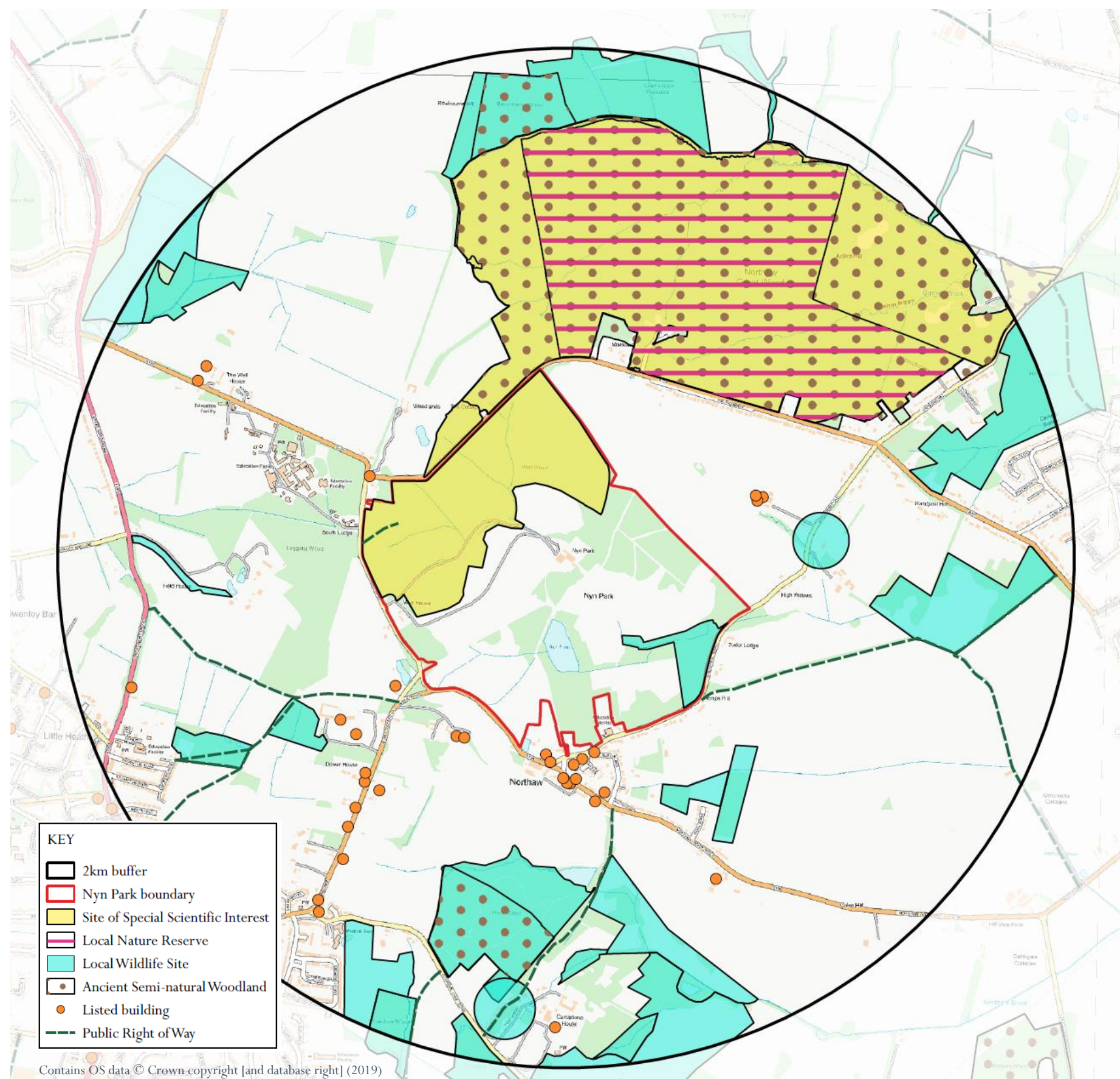
Northaw Great Wood SSSI

Northaw Great Wood SSSI covers approximately 225 ha of woodland. The SSSI lies within two valleys and comprises Great Wood and Well Wood which together forms one of Hertfordshire's most extensive areas of ancient hornbeam *Carpinus betulus* dominated woodland. The SSSI is also one of Hertfordshire's largest remaining historic wood pasture commons and comprises open bracken glades and wide rides with oak, hornbeam and birch woodland.



Wood Pasture habitat at Northaw Great Wood (Friends of Northaw Great Wood, 2019)

The hornbeam coppice is associated with a number of other broadleaved species, including oak, silver birch, aspen, sweet chestnut, ash and beech. Acidic soils, both poorly and freely draining leading to differing richness of plant communities



2.3 Biodiversity Context

throughout the SSSI and rides, glades, stream-sides and springs add considerably to the diversity of the ground flora. Traditional woodland management practices of coppice-with-standards and pollarding are still followed, ensuring survival for the site's important wildlife features (ref: Welwyn Hatfield District Council, File ref: WCS/438 17 WAY).

Well Wood is one of the units of the SSSI, which lies wholly within Nyn Park to its north and west. This area of woodland is approximately 41ha in size and contains broadleaved, mixed and yew woodland. In the previous condition assessments of this unit of the SSSI, Well Wood was regarded as 'Favourable' in 1998, 'Unfavourable - Declining' in 2004, and most recently 'Unfavourable –Recovering' in 2010. The decision for its 'Unfavourable' status was based on the higher than desirable proportion of sycamore, rhododendron and limited temporary open space. However since the last assessment, these aspects were scheduled to be addressed by a management agreement and so the unit is continuing to recover.

As SSSI's are statutory protected sites, all management of them must be appropriate in conserving the special features (broadleaved trees and woodland flora) of the site to work towards achieving or maintaining 'Favourable' condition. This means that consent from Natural England would likely be required for carrying out certain activities or intrusive operations, or changing the management regime of the site.

2.3.3 NON-STATUTORY DESIGNATIONS

Local Wildlife Sites

There is one Local Wildlife Site (LWS) within Nyn Park – The Vineyard. This site is located to the south-east of the park centred at grid reference TL283027 and covers an area of 4.26ha. The LWS is a combination of ancient semi-natural woodland and old secondary woodland, with a moderately diverse ground flora of bluebells, wood sorrel, hairy brome, sedges and ferns.

Local Wildlife Sites are non-statutory sites often recognised in local authority development plans and can be present on both private and public land. They are identified and selected for their nature conservation value, based on important, distinctive and threatened habitats and species within a region. The aim of LWS identification is to protect sites from land management changes, which may lessen their nature conservation interest, and to encourage sensitive management to maintain and enhance their importance. Although LWS have no statutory protection they need to be considered in the planning process.

There are a number of other LWS within the vicinity of Nyn Park, as listed in the Table below.

Site Name	Grid Reference	Wildlife Site Criteria	Distance from Nyn Park(m)
Hell Wood	TL285051	Ancient woodland with restorable elements of its previous semi-natural character including some semi-natural canopy and ancient features.	1820
Northaw Brook Pastures	TL282016	Grassland indicators.	1180

Site Name	Grid Reference	Wildlife Site Criteria	Distance from Nyn Park(m)
Northaw Brick Kiln Area	TL288032	Species.	920
Coldharbour Plantation & Broombarns Wood	TL278049	Buffers a SSSI.	1550
Home Wood (Cuffley)	TL296038	Old secondary woodland with a semi-natural canopy and varied structure.	1390
Queenswood Home Farm Grove	TL263041	Old secondary woodland with a semi-natural canopy and varied structure; >2 ha; woodland indicators.	1650
Hook Wood	TL276017	Ancient Woodland Inventory site; woodland indicators.	1150
Leggatts Park Drive	TL263030	Grassland indicators.	1330
Fritillary Meadow	TL268024	Grassland indicators.	1160
The Dell (Cuffley)	TL294029	Grassland indicators.	1210
Hook Copse	TL281012	Old/ancient woodland with a semi-natural canopy and ancient features.	1830
Grassland by Hook Copse	TL282010	Grassland indicators.	1580
Fir and Pond Woods HMWT Nature Reserve	TL278005	Old/ancient woodland with a semi-natural canopy and ancient features; woodland indicators; grassland indicators.	1830
Five Acre Wood (Potters Bar)	TL272012	Old/ancient woodland with a semi-natural canopy and ancient features; >2 ha; woodland indicators.	1830
Grasslands S. of Mymfield	TL262043	Grassland indicators.	1860
Woodland area S.E. of Little Heath Farm	TL264023	Old secondary woodland with a semi-natural canopy and varied structure, >2ha; woodland indicators.	1430
Meadow E. of Park Road, Northaw	TL285022	Grassland indicators.	1000
Woodland S.W. of Northaw Brook Pastures	TL279015	Old secondary woodland with a semi-natural canopy and varied structure; shown on OS (1880) as a small spinney; woodland indicators.	1530
Woodland Strip N. of School Camp	TL293047	Ancient woodland with a semi-natural canopy and field evidence suggesting an ancient origin plus an old hedgerow; >2ha; woodland indicators; linking habitat to a statutory site.	1940
Chequers Mead House Meadows & Ponds	TL270014	Grassland indicators.	1630
Park Road Pastures	TL283021	Grassland indicators.	970
Hook Lane	TL276013	Species.	1690

Ancient Semi-Natural Woodland

Northaw Great Wood is listed on the Ancient Semi-Natural Woodland (ASNW) inventory, which is woodland that has existed since 1600AD. ASNW is the richest form of land-based habitat in the UK, with unique and special flora and fauna.



Bluebells within Northaw Great Wood, typical of ASNW flora ((Friends of Northaw Great Wood, 2019)

Ancient woodlands are however extremely threatened, now covering just 2% of the UK's land area.

Although not on the ASNW inventory, Well Wood can be classified as ASNW based on its age, structure, and species composition, as can areas of Vineyard Wood. The inventories are provisional and woods continue to be added as new information is gathered. All ASNW should be preserved and managed appropriately to ensure its longevity. Well Wood is protected under the SSSI designation and so all management must be approved by Natural England.

2.3.4 FAUNA

Various species of fauna are known to be extant on Site or in the local area, through previous surveys, incidental sightings and local records attained from Hertfordshire Environmental Records Centre (HERC). The habitats on Site and in the surrounding area help to indicate other species that may be present. Listed below are those species/species groups which are confirmed or considered likely to be present on site; further detail is included within individual chapters for each of the park zones.

Amphibians

Common toad *Bufo bufo* have previously been recorded at Nyn Park and great crested newt *Triturus cristatus* have been recorded off-site in the local area. There are ponds on Site in Well Wood and north of South Parkland, in addition to ponds just beyond the site in the surrounding land. Due to the presence of both suitable aquatic and terrestrial habitat at the park, it is possible that amphibians inhabit the ponds and

2.3 Biodiversity Context

use them for breeding and use the woodland, hedgerows and grasslands for foraging and dispersal.

Great crested newt is protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2010 and under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), meaning the species is protected at all life stages, along with its terrestrial and aquatic habitats.

Badger

A large number of records of badger and badger setts from the local area were returned by HERC. Badger are known to inhabit Nyn Park with a minimum of four known setts within areas of woodland, one of which, in Well Wood, is thought to be a main sett. Evidence of badger dispersal and foraging is also spread across the park's woodland and grasslands, indicating their extensive use of the site.

Badgers and their setts are protected under the Protection of Badgers Act 1992, in England and Wales it is an offence to:

- Wilfully kill, injure or take a badger (or attempt to do so).
- Cruelly ill-treat a badger.
- Dig for a badger.
- Intentionally or recklessly damage or destroy a badger sett, or obstruct access to it.
- Cause a dog to enter a badger sett.
- Disturb a badger when it is occupying a sett.

Bats

At least eight species of bat were returned through the data search including common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared, Daubenton's, natterers, noctule and serotine. None of the records are from the park itself however many lie around the boundaries of Well Wood and along connecting hedgerows. It is highly likely that Northaw Great Wood and Well Wood support a number of species of bat, offering an expanse of optimal foraging and commuting habitat. The grasslands, scrub, hedgerows and other areas of woodland also likely provide a valuable resource to bats in the local area. In addition, mature trees containing potential roosting features within the woodlands have the potential to provide roosting habitat for bats throughout the year.

All species of bat in the UK are protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2010 and under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), meaning that not only are the individual bats protected but also their roosts and places of shelter.

Hazel dormouse

Five records of hazel dormouse were returned through the data search, one of which was from 2008, however the other four were historic records. All records were from the adjacent Northaw Great Wood, therefore indicating the potential for dormouse to be present in woodlands and scrub at Nyn Park.

Dormouse is protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2010 and under Schedule 5 of the Wildlife and Countryside Act

1981 (as amended), meaning the species is protected at all life stages, along with its breeding and resting sites.

Birds

A total of 87 species of bird were returned through the record search provided by HERC, many of which were recorded in Northaw Great Wood, therefore likely to be extant in the connecting Well Wood on Site. This includes nine species listed under Schedule 1 - Part 1, of the WCA 1981; barn owl, brambling, common crossbill, fieldfare, firecrest, hobby, kingfisher, red kite and redwing. Field observations at Nyn Park have also recorded the presence of barn owl, ring-necked parakeet, whitethroat, buzzard, red kite, woodcock, pied wagtail and wren. However the woodland and grasslands are considered to offer an abundance of suitable habitat for nesting, foraging and shelter, therefore many more species are considered likely to be present across the park.

All British wild birds, their nests and eggs (with certain limited exceptions) are protected by law under Section 1 of the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2000.

This makes it an offence to:-

- Kill, injure or take a wild bird
- Take, damage or destroy the nest of any wild bird while that nest is in use or being built
- Take or destroy the egg of any wild bird
- Possess or control any live or dead wild bird or any part of, or anything derived from a wild bird, or an egg or any part of the same.

Schedule 1 - Part I protects certain species of bird and their young, for which it is an offence to intentionally or recklessly disturb at, on or near an 'active' nest.

Reptiles

Records of two species of reptile were returned by HERC; grass snake *Natrix natrix* and slow worm *Anguis fragilis*. Both of these species have previously been recorded at Nyn Park, however the exact locations are unknown. It is considered that the grasslands at the park provide excellent foraging and basking habitat for reptiles, whilst woodlands, scrub and hedgerows may provide a source of shelter and hibernation sites. The habitats on site may provide an important resource for local populations, and are also well connected to suitable habitat off-site, particularly Northaw Great Wood where more recent records of these species exist.

All reptiles are protected under the Wildlife and Countryside Act 1981 (as amended), making it illegal to intentionally kill or injure a common reptile.

Invertebrates

An abundance of records of moth, butterfly, beetle and true bugs from the local area were returned by HERC through the data search. These were located at various sites including Northaw Great Wood and Brookmans Park. The mosaic of habitats at Nyn Park of differing levels of maturity, structure and species composition are considered to offer valuable habitat for invertebrate communities in the local area.

Other fauna

Other species of fauna are known to be present at Nyn Park including fox, rabbit, brown hare and mutjac deer; which have all been observed on many occasions. It is likely that hedgehog also inhabits the park and this may provide an important resource for this declining species. HERC returned historic records of hazel dormouse within Northaw Great Wood, and although thought to be extinct within the county, there is a possibility a small remnant population may exist within this woodland and the connected Well Wood.

3 Management Zones

3.1 Introduction

3.1.1 OVERVIEW

Managing an estate of the size and complexity of Nyn Park requires a thorough understanding of its various components and the ability to target key areas with tailored management prescriptions.

Of central importance to the successful functioning of a Landscape Management Plan is the ability for any person, be it the landowner, estate manager or sub-contractor, to readily interpret and understand the prescriptions and specifications contained within, and to clearly identify the particular areas of the estate to which they relate.

In order to meet this need for clarity, the estate has been divided into a series of defined **Management Zones**. The following chapters of this plan relate specifically to these zones, described as follows:

South Parkland A 10.3 ha area of open grassland habitat intersected by two wet ditches and containing a mosaic of scrub habitats along the southern boundary and the majority of the estate’s remnant veteran parkland trees.

North Parkland A 4.3 ha area of open grassland habitat to the north-west of Nyn House & Gardens. The zone is on a south facing slope, surrounded on three sides by woodlands.

Heathland A 6 ha area of former heathland located within the Well Wood SSSI complex.

Well Wood SSSI A 36 ha expanse of woodland forming a dense north western boundary to the estate. The entire zone is designated a SSSI and is recorded as unit 4 within the wider Northaw Great Wood SSSI complex.

Broadleaf Wood An 11.8 ha area of mostly 20th century plantation woodland, located on the north-eastern boundary of the estate.

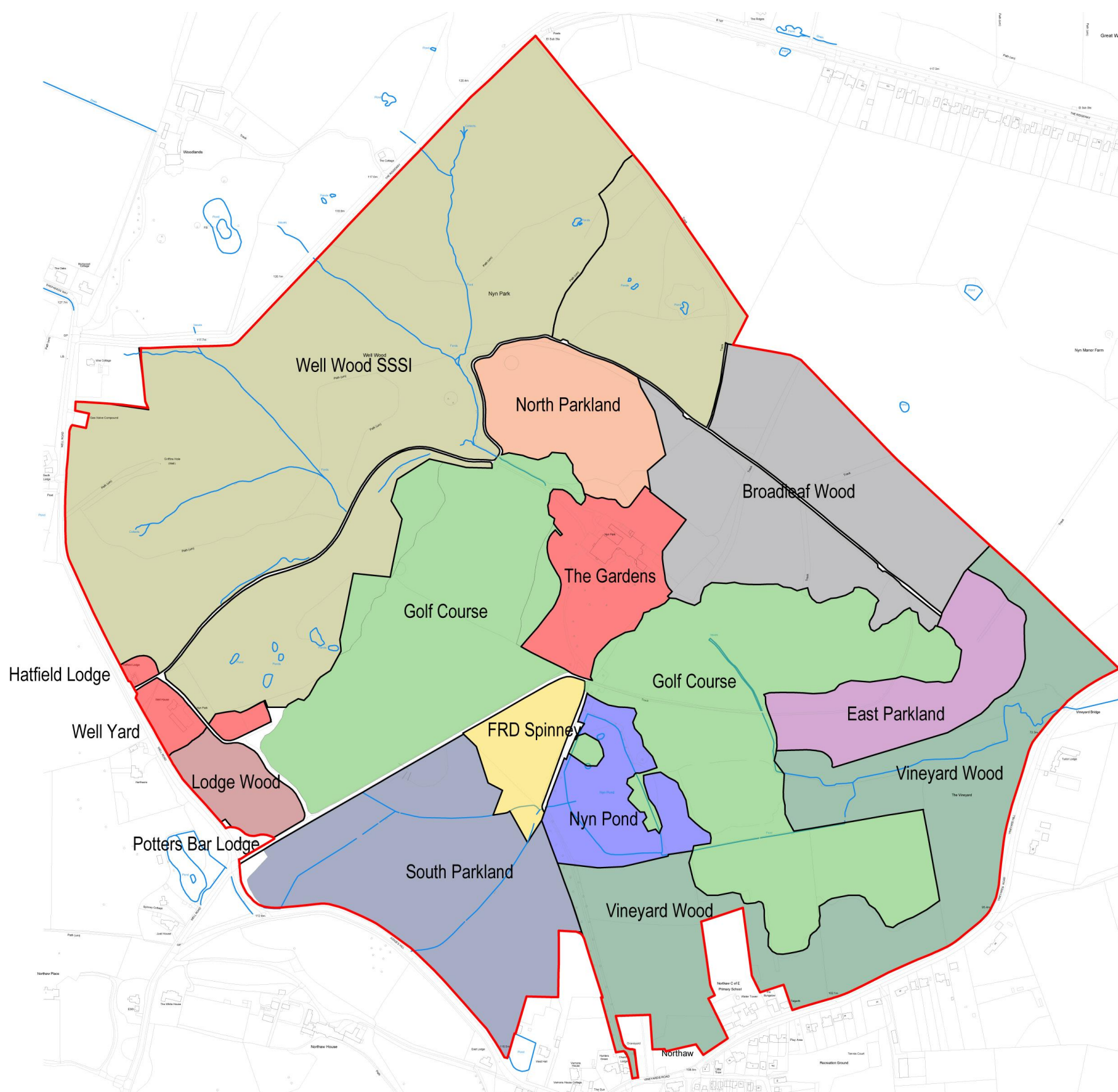
Vineyard Wood A 19.6 ha expanse of woodland and open grassland that stretches around the south eastern boundary of the estate, bordering Northaw village.

FRD Spinney & Lodge Wood Two distinct woodland plantation blocks of 2 ha and 1.7 ha size respectively. FRD Spinney is located at the centre of the estate, adjacent to Nyn Pond, and Lodge Wood is located on the western boundary.

Nyn Pond A 3.3 ha area containing Nyn Pond itself and a surrounding belts of trees and shrubs.

Golf Course The golf course is located within the open stretches of land that emanate out from Nyn House to the south-west, south-east and east.

The Zone Map also includes areas for **The Gardens** (containing Nyn House, associated buildings and formal gardens), **Hatfield Lodge** and **Well Yard**. It should be noted that the management of these particular zones falls outside of the remit of this Landscape Management Plan.



3.2 South Parkland



3.2.1 ZONE DESCRIPTION

South Parkland is a 10.38 ha area of predominantly open grassland located on the southern end of the estate. The zone shares a boundary with Judges Hill (road) to the south and adjoins the north western corner of Northaw village. The northern boundary is defined by the estate service road which runs in a straight line from Potters Bar Lodge on Well Road to just north of Nyn Pond. The zone borders FRD Spinney and Vineyard Wood to the east.

South Parkland is the most substantial area of remnant parkland on the estate and the only parkland area to have avoided being planted with conifers in the late 1960s. It contains the only un-wooded external boundary on the estate, although the narrow tree and hedge line that borders Judges Hill has in recent years been supplemented with new buffer planting. This includes a remnant avenue of oak and ash located close to the service road which is partly being suppressed by a developing block of suckering aspen (*Populus tremula*).



Recent buffer planting along the southern boundary with Judges Hill (Maydencroft Limited, 2019)

3.2.2 HABITATS & WILDLIFE

Habitats

The zone is predominantly composed of rank semi-improved grassland comprising common species (see table below for full botanical species list across the zone). The grassland is long and 'tussocky' and appears to have been unmanaged in recent years; it has fairly limited species diversity which suggests that its invertebrate assemblage is unlikely to be important. Ragwort and creeping thistle are both prevalent.

A scrub belt/ hedgerow extends around the southern boundaries of the zone with areas of scattered bramble scrub and a new mixed plantation comprising hawthorn,

3.2 South Parkland

hazel, field maple and spruce. The bramble scrub appears to be encroaching into the grassland areas from the zone edges. An area of marshy grassland lies within the north-western corner of the zone adjacent to the wet ditch and contains a number of species suited to wet conditions. Mature trees and bramble scrub lie to the north of the zone along the service road.

Habitat	Species	Latin name
Semi-improved grassland	Broad-leaved dock	<i>Rumex obtusifolius</i>
	Cock's foot	<i>Dactylis glomerata</i>
	Common couch	<i>Elymus repens</i>
	Common sorrel	<i>Rumex acetosa</i>
	Creeping thistle	<i>Cirsium arvense</i>
	Curly dock	<i>Rumex crispus</i>
	Cut leaved cranesbill	<i>Geranium dissectum</i>
	Greater willowherb	<i>Epilobium hirsutum</i>
	Meadow foxtail	<i>Alopecurus pratensis</i>
	Meadow vetchling	<i>Lathyrus pratensis</i>
	Nettle	<i>Urtica dioica</i>
	Ragwort	<i>Jacobaea vulgaris</i>
	Yorkshire fog	<i>Holcus lanatus</i>
	Scrub belt	Blackthorn
Hawthorn		<i>Crataegus monogyna</i>
Hazel		<i>Corylus avellana</i>
Field maple		<i>Acer campestre</i>
Scots pine		<i>Pinus sylvestris</i>
Oak		<i>Quercus robur</i>
Ash		<i>Fraxinus excelsior</i>
Cherry		<i>Prunus avium</i>
Hornbeam		<i>Carpinus betulus</i>
Scattered/planted scrub	Bramble	<i>Holcus lanatus</i>
	Field maple	<i>Acer campestre</i>
	Hawthorn	<i>Crataegus monogyna</i>
	Hazel	<i>Corylus avellana</i>
Marshy grassland	Spruce sp.	<i>Picea sp.</i>
	Compact rush	<i>Juncus conglomeratus</i>
	Greater willowherb	<i>Epilobium hirsutum</i>
	Pendulous sedge	<i>Carex pendula</i>
	Peat moss	<i>Sphagnum sp.</i>

Wildlife

South Parkland has the potential to support an array of species/species groups given the habitats present. The species listed below are those that are either confirmed on site, through observation or previous records or those that may be present based on habitat suitability for such species.

Bats The grassland is considered suitable for supporting foraging bats and has the potential to offer an important foraging resource in the local area, given the size of the grassland and its likelihood of supporting an abundance of invertebrates. The scrub and hedgerow around the zone boundaries have the potential to provide commuting routes for bats, particularly as these habitats are well connected to woodland areas both on and off-site. Several of the notable trees were noted to have the potential to support roosting bats, due to the presence of rot holes and other potential roosting features.

Badger A suspected outlier badger sett was recorded along the northern edge of the zone, directly adjacent to the service road. This sett is in current occupation and comprises a minimum of four entrance holes, at least two of which are in use. There were a number of mammal paths spread across the grassland within this zone, some of which led into other zones or off-site. It is likely that badger use the grassland for dispersal and as a foraging resource.

Birds The trees and scrub within the zone offer suitable nesting and foraging habitat for an array of bird species. The grassland may also offer nesting habitat for ground-nesting birds. A barn owl was observed flying over the grassland towards trees in FRD Spinney; the grassland offers suitable foraging habitat for this species and large cavities in trees offer potential nest sites.

Reptile The grassland is considered to offer potential basking and foraging habitat for species of reptiles including grass snakes and common lizard. The mosaic of wet ditches, marshy grassland and scrub/hedgerow habitats provide both foraging and hibernation sites for reptiles.

Inverts The mature trees, grassland, marshy grassland and scrub are all considered likely to support an array of invertebrate species.

3.2.3 NOTABLE TREES

No.	Species	Latin name	Age	Observations
T1	English oak	<i>Quercus robur</i>	V	Cavity on east side of buttress extending down into rootplate and base of tree; tree leans south; some signs of retrenchment; crown is slightly sparse; deadwood and major deadwood present in crown; dead branch suspended in crown at 6m height on north side
T2	English oak	<i>Quercus robur</i>	V	Multiple cavities in buttress; vertical wound on north side of stem from 0.5m height up to 2m height, reveals stem to be hollow as daylight is clearly visible from wound on south side of stem; tree leans south; deadwood present throughout crown although appears to be in reasonable condition; multiple large torn and split wounds from failed limbs; Potential bat roost features (PRFs); holly and bramble growing around base of tree
T3	Common ash	<i>Fraxinus excelsior</i>	M/V	Large wound on east side of stem at 9m to 10.5m height from failed limb at included union - some staining and run off from base of wound; PRF cavity at 12m on west side of stem; broken stubs throughout crown from failed limbs.
T4	English oak	<i>Quercus robur</i>	M	Southern lean to tree; slightly suppressed form; deadwood present throughout crown
T5	English oak	<i>Quercus robur</i>	M	Tree leans heavily south; deadwood present throughout crown.
T6	English oak	<i>Quercus robur</i>	V	Majority of tree has died leaving excellent standing deadwood habitat; western branches have foliage although slightly sparse; brambles around base of tree.

No.	Species	Latin name	Age	Observations
T7	English oak	<i>Quercus robur</i>	M	Crown is retrenching leaving stag headed deadwood at top and deadwood throughout, leaving a slightly sparse appearance; multiple cavities on base of south side of stem; holly and bramble growing around base of tree; PRF cavity at 5m height on northwest side of stem.
T8	English oak	<i>Quercus robur</i>	M	Crown appears slightly sparse with deadwood present throughout; un-occluded wound on west side of buttress.
T9	English oak	<i>Quercus robur</i>	V	Good open grown structure; minor cavities around base of tree; PRF cavity at 4m height on south side of stem and at 6m on west side of stem on broken stub; deadwood present throughout crown; many broken stubs from failed limbs present; crown appears slightly sparse
T10	English oak	<i>Quercus robur</i>	M	Multiple small cavities around base of tree; epicormic growth and 'bottle butt' appearance on south side of buttress, suggesting internal decay; some deadwood present in crown; crown appears in reasonable condition.
T11	English oak	<i>Quercus robur</i>	M	Good open grown structure; some deadwood present in crown; crown appears in reasonable condition.
T12	English oak	<i>Quercus robur</i>	V	Holly, bramble and weeds have grown up around base of tree impeding inspection; large limb has failed at union at 3m height on south side of tree - the shed limb has PRF features and is forming good deadwood habitat; multiple broken stubs from failed limbs throughout tree, many with PRFs and high habitat potential; crown appears slightly sparse with evidence of retrenchment.
G1	Mixed broadleaves	n/a	-	Mature/veteran oaks, semi-mature to mature ash and aspen, semi-mature hawthorn. Some ash have become monolithed and appear dead or in poor condition; mature oak with Ganoderma spp fungal fruiting body on base; aspen are spreading into the parkland.

3.2.4 GEOGRAPHY & SOILS

The zone has a north-east facing aspect, sloping away from its highest point along the boundary with Judges Hill to its lowest point at the boundary with FRD Spinney. There is some slight undulation in levels from west to east, generally following the pattern of the wet ditches to create shallow valleys.

The 2010 soil analysis report took one sample from the centre of South Parkland with a reading of pH 6.0, which means that the soils are moderately acidic, albeit one of the least acidic zones on the estate.

3.2.5 HYDROLOGY

There are two wet ditches running across the zone in a north-easterly direction from the Judges Hill boundary. These both appear on the 1st edition OS map, surveyed in 1866-73. They are well defined wet channels, scrubby in places with occasional shrubs and semi-mature trees. The ditches terminate at a pond in the southern corner of FRD Spinney, and from here they flow in a single channel into Nyn Pond.

3.2 South Parkland

Works to clear out the ditches was undertaken in 2016, and the pond was desilted in 2018 as part of the project to desilt Nyn Pond.

3.2.6 CONDITION ASSESSMENT

Parkland Management

The South Parkland constitutes a valuable remnant of the historic estate, being the only open area to have remained unplanted with conifer plantation, and containing the majority of the estate's finest veteran parkland trees. The zone is currently unmanaged and as such is in declining condition with grassland starting to see a dominance of coarse vegetation, particularly bramble. In some areas this has developed into dense scrubby stands, particularly along the southern boundary; in this location, it may be preferable to retain and manage scrub for both its habitat and screening value. As a whole, it is essential that the zone is brought into an appropriate conservation grassland management regime to preserve and enhance the important parkland landscape. The most sustainable and effective method for achieving this will likely be to introduce stock grazing to the zone, preferably using a traditional native bred cattle that will manage the sward and restrict the spread of coarse vegetation, helping to increase floristic diversity. Bringing cattle back into the parkland will also be of great value to restoring the landscape heritage of the estate, and the area's legacy of wood pasture.

Parkland trees and regeneration

Open grown veteran trees are a valuable component of the parkland landscape, and relatively scarce across the estate. They provide a rich source of habitat for a wealth of species, and give continuity of structure to the landscape. It is important that the veteran and mature trees within South Parkland are managed to ensure their healthy retention, and to enable them to naturally degrade and dismantle over time, continuing to provide habitat opportunities within cavities and deadwood.



Protected semi-mature oak trees in South Parkland (Maydencroft Limited, 2019)

Veteran trees should be considered a vulnerable resource in the latter stages of the life-cycle, which means that it is important to plan for the provision of replacements. There is great scope in South Parkland to encourage new parkland trees through the recruitment and protection of natural oak regeneration that is emerging in places along the southern boundary (in the vicinity of other remnant

trees). The map extract below from the 1st edition OS map (1866-73) corresponds well to the parkland trees that remain on site, and indicates a greater spread of trees along the east and north regions.

Oak trees planted and protected in recent years (located in the western corner of the parkland) are developing well. A few further recently planted oaks and hornbeams will also require protection from grazing to help them establish.



1st edition OS map 1866 showing parkland trees within Southern Parkland

There may be an opportunity to consider the establishment of new parkland 'roundels' within this management zone. Although they are not shown as being present in this area on old maps and aerial photos, roundels are a feature of the wider estate with the majority being engulfed by woodlands, particularly along the border with Northaw village. It would be interesting to establish new roundels by setting out a circle of estate railings in a location that already contains some good regenerating oak saplings; this could be further supported by some introduced standards. The roundels would create landscape parkland features, and if well located could assist with screening from Judges Hill.

Grey poplar suckering

On the western zone boundary (adjacent to the service road) there are a number of very large grey poplar trees which are rapidly suckering and starting to create several dense thickets, threatening the integrity of the remnant parkland trees in this area and encroaching into the grassland. Trees that sucker in this nature can become a significant management problem as the developing saplings can rapidly turn into a dense stand of trees, becoming costly to remove. Dealing with this issue at the earliest opportunity will help to preserve the integrity of the parkland and its remnant trees, and avoid future costly operations. The large mature trees are of

landscape value to the tree belt so should be retained, but the developing semi-mature trees should be cleared with suckering regrowth regularly flailed to control.

Boundary with Judges Hill

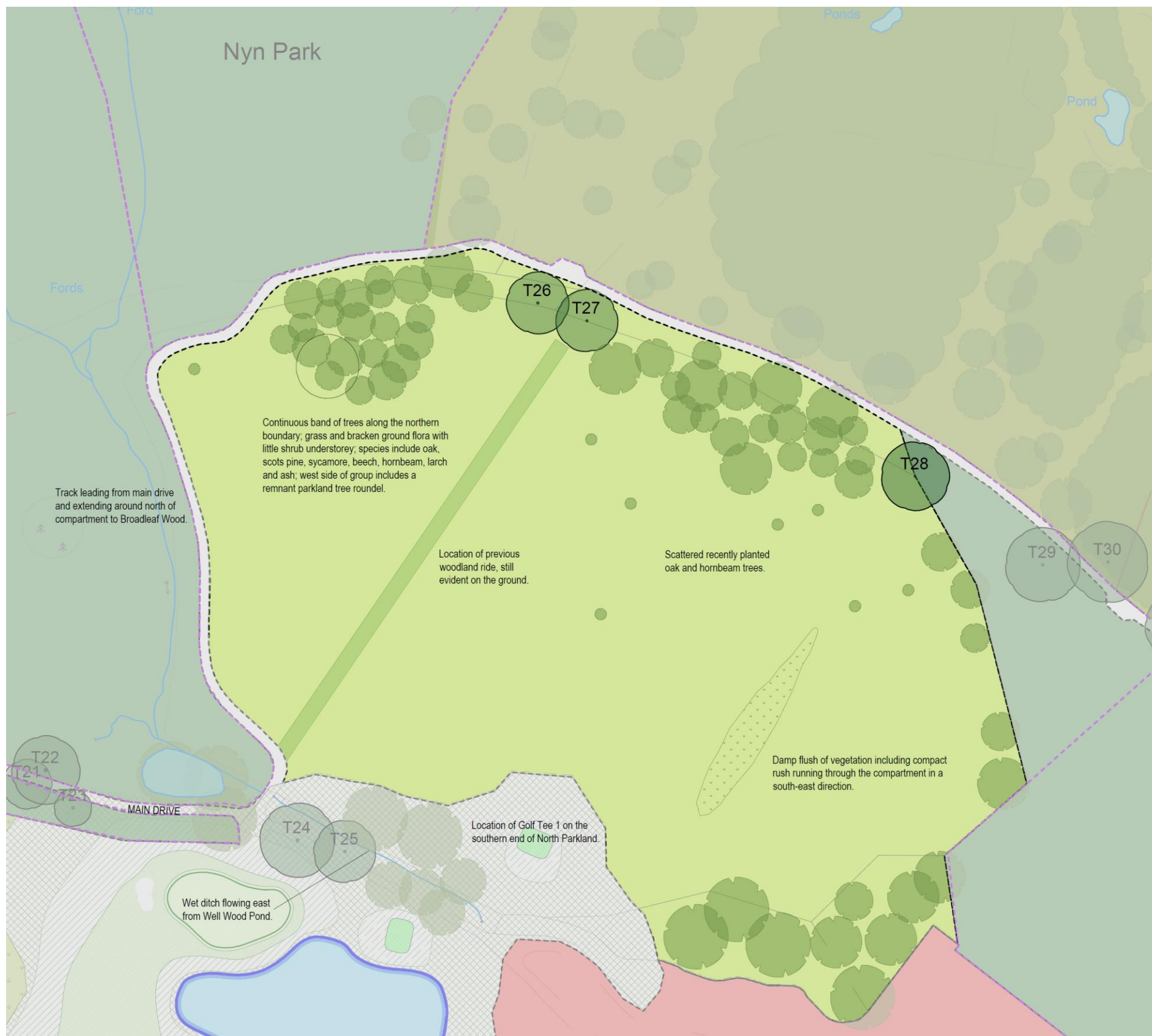
The southern area of the zone still contains a few remnant parkland trees, but otherwise the boundary is relatively sparse. A broad band of recent woodland planting is being established to address this issue, and in time will develop into a dense visual barrier. There are also some areas of developing bramble scrub that should be retained for their habitat value with occasional flailing to restrict encroachment into the grassland.

This whole planted boundary should remain outside of the proposed area for grazing to help aid healthy establishment.



View into Southern Parkland from Judges Hill (Maydencroft Limited, 2019)

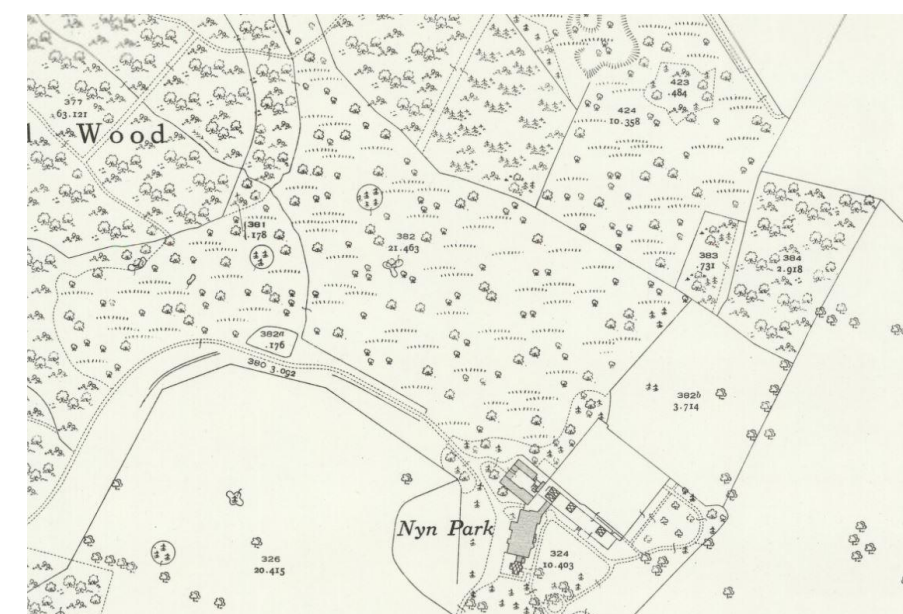
3.3 North Parkland



3.2.1 ZONE DESCRIPTION

North Parkland is an area of open grassland located to the north-west of Nyn House and Gardens. The zone is bordered to the east and north by Well Wood SSSI with the zone boundary defined by a maintenance track. To the south it adjoins the main drive to the house with an avenue of mature oak trees, and contains the first tee on the golf course. The eastern side of the zone merges into the formal gardens around the house and Broadleaf Wood.

North Parkland was one of the areas of the site entirely planted with conifers in the 1960-70s. It was subsequently cleared of all trees in the early 2000s, with the exception of groups of broadleaves along the northern boundary. A former woodland ride is still evident on the ground, running across the zone from roughly south to north.



2nd edition OS 25 inch 1935 showing North Parkland as rough pasture with occasional trees and shrubs.

3.2.2 HABITATS & WILDLIFE

Habitats

This zone is composed mostly of rank semi-improved grassland, which is considered species poor and dominated by undesirable species in large areas of this habitat (see table below for species list). Some areas do contain a higher diversity of species which are only occasional or rare; some are however indicators of acidic soils and would comprise a good grassland mix if these species were more abundant. The soils also appeared to be sandy in consistency. Encroachment of creeping thistle and bramble is a prevalent problem in this zone, and this is a significant concern for the longevity of the species-rich grassland.

The area of grassland covers approximately 3.3 ha. There is a small number of young to early-mature oak trees scattered across the grassland, with a number of newly planted saplings. A large vegetated depression lies within the grassland area, which is thought to be an old gravel pit according to historic maps, and evidence of

3.3 North Parkland

an old woodland ride can be observed spanning from north-east to south-west, visible by a marked linear variation in ground flora.

A belt of mature and semi-mature trees, mostly oak, also lies within this zone along the northern boundary of the grassland. This area is not overly dense, with a limited understorey.

Wildlife

North Parkland has the potential to support an array of species/species groups given the habitats present. The species listed below are those that are either confirmed on Site through observation or previous records, or those that may be present based on habitat suitability for such species.

Bats The grassland is considered suitable for supporting foraging bats and has the potential to offer an important foraging resource in the local area, particularly as the grassland is well-connected to the adjacent woodland and mature trees, where bats may roost or use the woodland edge as a commuting route.

Badgers No evidence of badger was observed within this zone during the walkover survey, however as badger are known to be present elsewhere on site and as a mobile species, it is possible that they use the grassland for feeding and dispersal.

Birds There is limited scope for tree nesting birds across much of this zone as the vegetation across the grassland is limited, however the grassland itself may provide sufficient cover for ground nesting birds. The mature trees along the northern boundary of the parkland would however be suitable for bird nesting. The grassland may provide a foraging resource for raptors, which have previously been observed elsewhere on Site.

Reptiles The grassland is considered to offer excellent basking and foraging habitat potential for species of reptiles including grass snake and common lizard. The habitats in this zone are also well-connected along woodland and scrub edges, to other areas of suitable reptile habitat both within the park itself and beyond. This woodland and scrub may provide vital hibernacula for reptile species on site.

Inverts The diversity and structure of the grassland in this zone is considered to have the potential to support a large assemblage of invertebrates, with a variety of species present. This in turn may provide an important food source for the above species groups.

Habitat	Species	Latin name
Semi-improved grassland	Birds foot trefoil	<i>Lotus corniculatus</i>
	Bristly ox-tongue	<i>Helminthotheca echioides</i>
	Broadleaved dock	<i>Rumex obtusifolius</i>
	Bugle	<i>Ajuga reptans</i>
	Chickweed	<i>Stellaria media</i>
	Cock's foot (Abundant)	<i>Dactylus glomerata</i>
	Common sedge	<i>Carex nigra</i>

Habitat	Species	Latin name
	Common speedwell	<i>Veronica officinalis</i>
	Common vetch	<i>Vicia sativa</i>
	Compact rush	<i>Juncus conglomeratus</i>
	Creeping cinquefoil	<i>Potentilla reptans</i>
	Creeping thistle (Dominant)	<i>Cirsium arvense</i>
	Cuckoo flower	<i>Cardamine pratensis</i>
	Cut-leaved cranesbill	<i>Geranium dissectum</i>
	Dandelion	<i>Taraxacum officinale</i>
	False wood brome	<i>Brachypodium sylvaticum</i>
	Germander speedwell	<i>Veronica chamaedrys</i>
	Ground ivy	<i>Glechoma hederacea</i>
	Lesser stitchwort	<i>Stellaria graminea</i>
	Meadow buttercup	<i>Ranunculus acris</i>
	Meadow vetchling	<i>Lathyrus pratensis</i>
	Pendulous sedge	<i>Carex pendula</i>
	Perforate St John's Wort	<i>Hypericum perforatum</i>
	Ragwort	<i>Jacobaea vulgaris</i>
	Red clover	<i>Trifolium pratense</i>
	Red fescue	<i>Festuca rubra</i>
	Sage	<i>Salvia officinalis</i>
Sheep's sorrel	<i>Rumex acetosella</i>	

3.2.3 NOTABLE TREES

No.	Species	Latin name	Age	Observations
T24	English oak	<i>Quercus robur</i>	M	Tree located 3m from main drive, directly adjacent to irrigation ditch, forming part of an old avenue; crown appears slightly sparse and starting to retrench; minor deadwood present throughout crown.
T25	English oak	<i>Quercus robur</i>	M/V	Tree located 1m from main drive, forming part of an old avenue; crown appears patchy but in reasonable condition; some deadwood present in crown.
T26	English oak	<i>Quercus robur</i>	M	Open-grown structure with spreading limbs; major deadwood present throughout crown, although appears to be in reasonable condition.
T27	English oak	<i>Quercus robur</i>	M	Crown appears sparse with deadwood present; some evidence of crown retrenchment; tree leans into field to the south-east.
T28	English oak	<i>Quercus robur</i>	M	Upper crown is sparse; tree has some veteran features; deadwood present throughout crown; evidence of crown retrenchment.

In addition to the trees listed above, the western end of the belt running along the northern boundary of the zone includes one of the remnant parkland roundels, as shown on the OS map (above).

3.2.4 GEOGRAPHY & SOILS

The zone has a south facing aspect and slopes downwards from north-north-east to south-south-west. It is quite a visible part of the internal parkland landscape and forms a backdrop to the house in a number of views.

The 2010 soil analysis report took one sample from the centre of North Parkland with a reading of pH 4.9, which shows that the soils are very acidic. The area of Well Wood SSSI directly north of the compartment is even more acidic and known to have supported heath and acid grassland communities.

3.2.5 HYDROLOGY

There is a single wet ditch running along the southern boundary of the compartment, adjacent to the main drive. Water flows in a west-east direction, fed from a network of ditches within Well Wood, including the overflow from the nearby pond. The 1st edition OS map shows a possible north-south ditch running through the eastern side of the zone; this appears to correspond with a wet flush of vegetation shown on a recent aerial photograph.

3.2.6 CONDITION ASSESSMENT

Parkland Management

North Parkland is currently unmanaged and as such in declining condition with grassland starting to be dominated by coarse vegetation. Bramble (*Rubus fruticosus*), creeping thistle (*Cirsium arvense*) and broadleaved dock (*Rumex obtusifolius*) are present throughout, reducing the floristic diversity in the sward and giving the zone a rough, scrubby appearance. These species will continue to spread if left unchecked and the zone will reduce in both biodiversity value and landscape quality. Prior to the commencement of an appropriate maintenance regime for the grassland, it will likely be necessary to undertake some form of ground preparation to improve the conditions, including harrowing and chemical treatment for broadleaf weeds.



View of North Parkland with rank semi-improved grass and occasional recently planted trees (Meydencroft Limited, 2019)

3.3 North Parkland

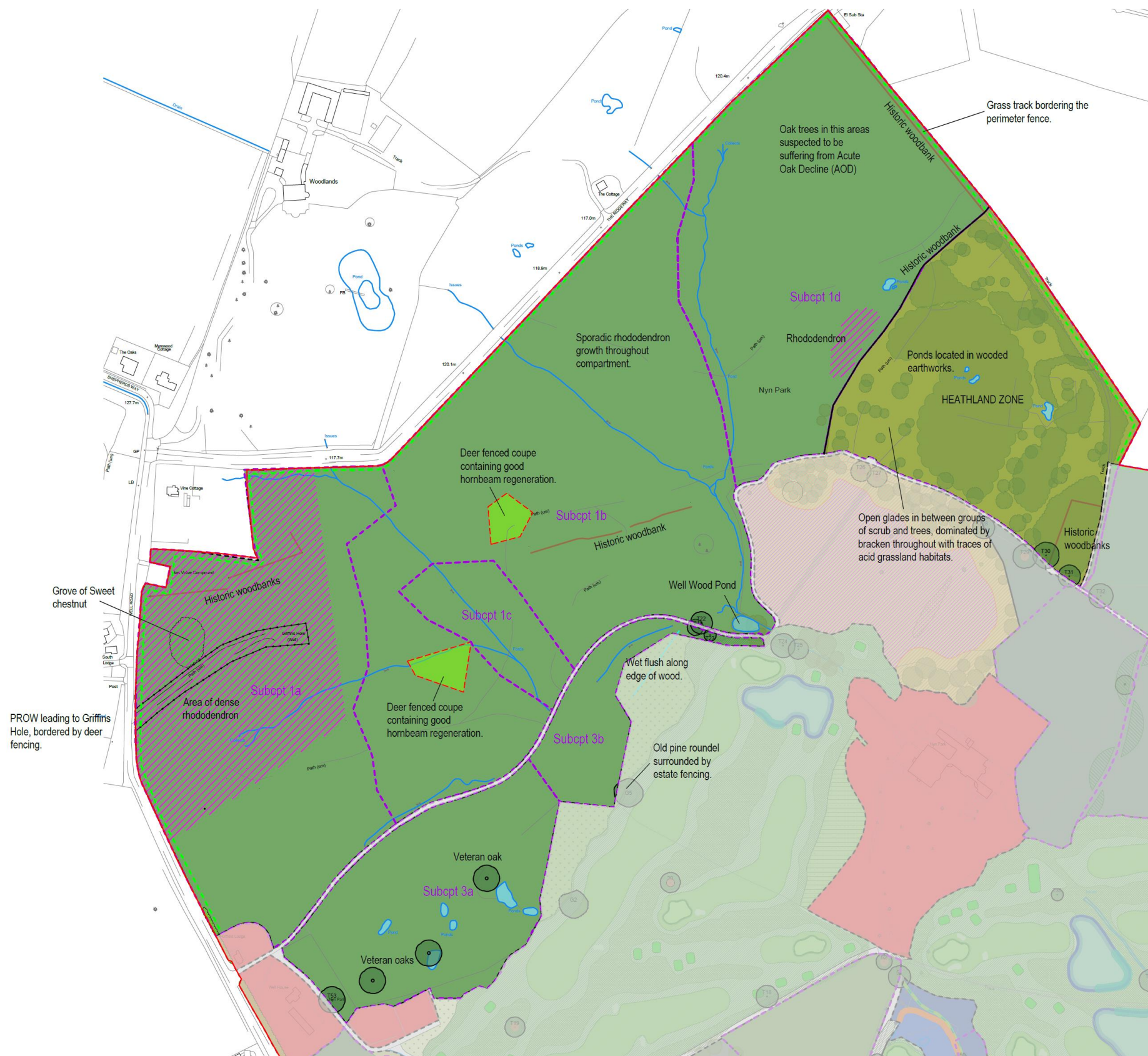
The focus for grassland management in this zone should be to prevent scrub and coarse vegetation species from being able to re-establish, and to improve the quality and diversity of the grassland sward with the aim of moving towards an increasingly acid grassland composition. Introducing grazing to the zone would be a way of achieving these aims, but unlikely to be a suitable option due to the close proximity to Nyn House. Instead, an appropriate programme of mechanical cutting will need to be established with arisings removed from site to prevent nutrient enriching of soils. Monitoring will be required to ascertain the success of maintenance regimes and the change in species composition.

There is currently no heather plants within the vegetation, but the acidity of the soils, open character of the site, and proximity to Well Wood suggests that there could be the potential for future establishment. Once the coarse vegetation issue has been resolved and an appropriate grassland maintenance regime put into place, this could be a potential future receptor site for heath creation.

Parkland trees

The zone contains a few remnant parkland trees and groups of broadleaf trees around the northern boundary and along the southern edge with the main drive. Old maps and photos suggest that it has historically always been open in character with little evidence of there ever being a greater abundance of trees throughout the core of the zone (with the exception of when it was a conifer plantation). There has been some previous planting of young oak and hornbeam trees which will develop to provide sufficient coverage. These trees would benefit from some additional establishment maintenance to ensure that they grow into healthy specimens.

3.4 Well Wood & Heathland



3.4.1 ZONE DESCRIPTION

Well Wood SSSI includes approximately 42 ha of woodland forming a dense north western boundary to the estate. The entire zone is designated a SSSI and is recorded as unit 4 within the wider Northaw Great Wood SSSI complex. More information on the SSSI citation is included in chapter 2.3 *Biodiversity*.

The zone is bordered to the west by Well Road and to the north by the B157 Ridgeway. Beyond this road, the woodland habitat continues into Northaw Great Wood. To the east the zone borders a large arable field that separates the estate from residential properties on the Ridgeway.

The main drive passes through the zone, providing the principle route between Nyn House and the site entrance on Well Road. Apart from this surfaced drive and a dead-end public right of way that provides access to Griffin's Hole (an historic monument), there are no formal paths or routes through Well Wood SSSI and no other public rights of way present. The recent OS mastermap plan of site shows a number of paths running through the wood, but these are no longer in use and often not visible on the ground. As such, the woodland remains a haven of tranquility receiving minimal disturbance.



View of Heathland Zone from 1930 showing open grass and heath habitats with occasional trees and shrubs (Britain from Above)

3.4.2 HABITATS & WILDLIFE

Habitats

The primary habitat within Well Wood is ancient semi-natural woodland, comprising oak and hornbeam with a limited understorey and ground flora. The woodland is considered a Habitat of Principal Importance (HPI) and is therefore regarded as a priority for sensitive management and conservation.

Throughout the woodland there are a number of streams with flowing water. These streams originate on site or just north of the site and are a result of drainage from the elevated land along the north-west boundary; they therefore do not connect to any streams or rivers upstream. A number of ponds lie within Well Wood, mostly located towards the south-east boundary of the woodland where the land is lower in elevation and water from the drainage channels collects. Both the ponds and the

3.4 Well Wood & Heathland

streams add habitat value to wildlife within the woodland and may provide an important water source for local populations of certain species, including mammals, birds, invertebrates, amphibians and reptile.

The Heathland zone broadly differs to the remainder of the woodland as it comprises open glades and scrub, with an abundance of bracken, providing a varied habitat structure and mosaic of value to birds and reptile. It is believed that this area once supported heath communities but no evidence of heather plants were found on site.

Wildlife

Well Wood has the potential to support an array of species/species groups given the size of the woodland and it being mostly free from disturbance. The species listed below are those that are either confirmed on site through observation or previous records, or those that may be present based on habitat suitability for such species. Consideration will be given to these species groups throughout the management plan and action plans to avoid negative impacts. The management proposed will have long-term benefits for many species potentially present, including bats, dormouse, reptile and invertebrates in particular, through enhancement of the habitats.

Bats The woodland is considered suitable for foraging bats and has the potential to offer an important foraging resource in the local area, given the size of the woodland and its connectivity to Northaw Great Wood. The woodland edges have the potential to support commuting bats, particularly as these habitats are well connected to woodland areas both on and off-site. Mature and veteran oak trees are also likely to support potential roosting features for bats. Other mature trees within the woodland may also support roosting bats.

Amphibians The ponds within Well Wood and Heathland offer suitable habitat for frogs, toads and newts. As the species is known to be extant in the local area, it is possible that great crested newt inhabit the ponds and surrounding woodland and scrub, which would offer locally important breeding and hibernation habitat.

Dormouse The woodland across the zone and scrub in the Heathland zone have the potential to support dormouse. The woodland in this zone provides good habitat structure, feeding resource and nesting sites suitable for dormouse and its direct connectivity to Northaw Great Wood increases the potential for this species to be present.

Badger A suspected main badger sett was recorded within sub-compartment 3a, and comprised approximately 10 entrance holes, two of which showed signs of current use. There were a number of mammal paths leading from the sett into the woodland and badger likely forage throughout the woodland and grasslands in the park.

Birds The woodland canopy within the zone offers suitable nesting and foraging habitat for an array of bird species. Cavities in trees also offer potential nest sites.

Reptiles The Heathland zone in particular is considered to offer suitable habitat for reptiles as the presence of scrub and open glades offer basking and foraging habitat and shelter. The presence of ponds and streams also increases the potential for reptile, particularly grass snake. Grass snake and slow worm have previously been recorded on site, therefore it is possible these species are still inhabiting areas of the park.

Invertebrates The mature trees, scrub and ground flora, particularly in broadleaved woodland areas are all considered likely to support an array of invertebrate species. The mosaic-like habitat in the Heathland zone and ponds also provide valuable resources for invertebrate assemblages.

Stag beetle (*Lucanus cervus*) is a European Protected Species and has historically been recorded in the nearby Northaw Great Wood SSSI, which remains connected to Well Wood SSSI via continuous woodland habitat. This species thrives in areas where there is an abundance of partially buried deadwood, and it is possible that the species may be present within the woodlands at Nyn Park.

3.4.3 NOTABLE TREES

It should be noted that the following list is not exhaustive and there are many more mature and veteran trees located throughout Well Wood SSSI.

No.	Species	Latin name	Age	Observations
T21	English oak	<i>Quercus robur</i>	V	Part of old avenue; crown appears slightly sparse; crown retrenchment has been managed through removal of deadwood; located 3.5m from main drive; some deadwood present in crown; located directly next to irrigation ditch/stream
T22	English oak	<i>Quercus robur</i>	M/V	Early signs of crown retrenchment; crown appears slightly sparse; deadwood present in crown; 2m from main drive; epicormic growth around crown break
T23	English oak	<i>Quercus robur</i>	M/V	Small retrenched crown; retrenchment appears to have been managed; minor deadwood present in crown; cavities in buttress reveal stem to be hollow, possibly from <i>Ganoderma resinaceum</i> , although no visible fungal fruiting bodies; tree is 2m from main drive with stream/irrigation ditch directly next to it; tree leans away from drive

No.	Species	Latin name	Age	Observations
T53	English oak	<i>Quercus robur</i>	M<V	Located next to road leading from well house to the compound; crown appears in reasonable condition; deadwood present in crown and large old wound on stem.

3.4.4 GEOGRAPHY & SOILS

The zone generally has an east-west sloping character, gently rising from low points along the main drive to the south-east towards a higher elevation in the north-west along the Ridgeway. The main drive sits within a roughly west-east valley with the woodland sloping away on both sides to the north and south, with the south-eastern edge of the zone forming a higher ridge within the landscape. The woodland is a prominent feature in the local landscape, combining with Northaw Great Wood to form a significant block of ancient woodland that contributes to the wooded character of local roads and views.

The 2010 soil analysis report took several samples from along the eastern side of Well Wood SSSI. The pH readings for these samples came back as 4.6, 4.9 and 5.3, which shows that the soils are quite acidic. A further sample from the Heathland zone had a pH reading of 3.8 which makes it the most acidic soils on the estate. This particular area is shown on past maps as being more furze / rough pasture in character and is known to have supported heath communities.

3.4.5 HYDROLOGY

The woodland contains a number of wet ditches & streams that have carved out deep valleys and channels, giving the zone an undulating character. All of these water bodies generally flow in a north-west to south-east direction, terminating in Well Wood pond which is located adjacent to the main drive. From here the water enters an open wet ditch running parallel to the main drive before entering a long culvert that runs underneath The Gardens and re-appears as a wet ditch in Vineyard Wood.

In addition to Well Wood pond there are a number of other ponds located throughout the woodland, including a series of six or seven ponds along the wooded ridge at the southern end of the zone (close to Well Yard).

3.4.6 HISTORIC ENVIRONMENT

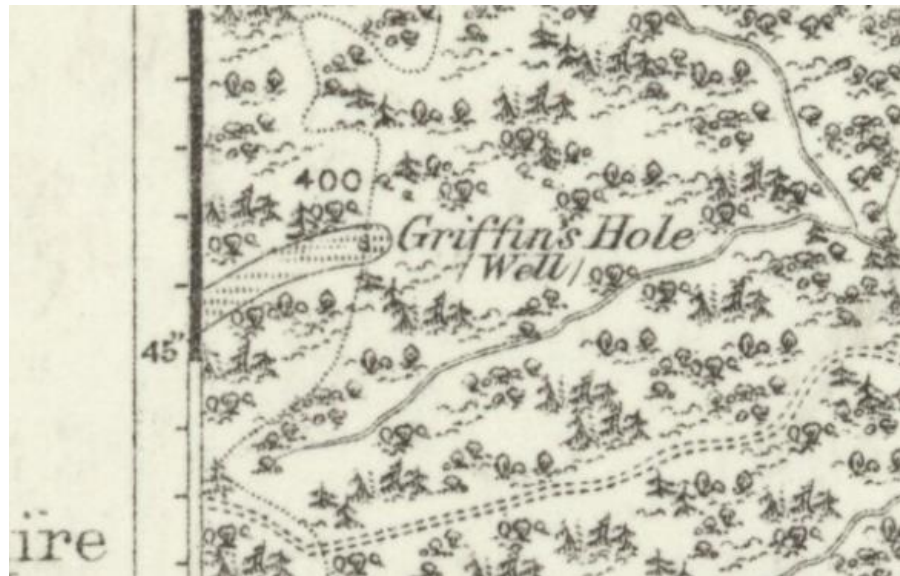
Well Wood does not feature on the Ancient Woodland Inventory but can definitely be classed as Ancient Semi-Natural Woodland, these being woodlands that have developed naturally and existed since at least 1600AD. The wood contains numerous historic features including woodbanks, wet ditches, veteran trees, and other earthworks.

Woodbanks were constructed to mark boundaries, create enclosures within woodlands, identify land ownership, and to protect young trees and coppice regrowth from grazing animals. There are three remnant woodbanks within Well Wood. A very straight woodbank planted with hornbeam marks the north-east boundary of the woodland and Nyn Park, and another forms the north-west boundary of the woodland (this section is starting to become smothered by tree

3.4 Well Wood & Heathland

regeneration and rhododendron). These particular banks are likely to date from the early 19th century. An irregular 165m section of woodbank located within the middle of the wood is likely to date from medieval times and as such is a strong indicator of ancient woodland. Its height, shape and the presence of overstood trees indicates it may have once been laid to provide a barrier.

A large hollow in sub-compartment 3b indicates the area may have previously been worked for clay extraction.



1st edition OS 1868 showing the location of Griffin's Hole (Well) in Well Wood.

The woodland contains a historic monument (recorded on the Hertfordshire HER as monument 11455) known as Griffin's Hole. This feature is first noted on a 1757 parish boundary map of Northaw/North Mimms, and appears on all subsequent OS maps through the 19th & 20th centuries. The monument citation mentions that the well is more properly described as being a tank or reservoir, accessed via a wide track and including a turning circle that may well have been for carts. It is believed that the well provided water for the village of Northaw until at least the late 19th century when an alternative supply was established. The woodland contains evidence of a conduit that once supplied water to Nyn Park.

3.4.7 WOODLAND STRUCTURE

Well Wood has a predominately even-aged structure with mature standards and limited understory. Although this gives a tidy appearance it provides low biodiversity value. Sub-compartment 1b would have traditionally resembled a stand of oak standards with coppiced hornbeam forming the understory, however the coppice is very overstood resulting in a dense, closed canopy and lack of understory. Sub-compartments 1d, 3a and the Heathland zone have a very open structure with widely spaced mature trees amongst hawthorn, gorse, and bracken; this mosaic of habitats is indicative of former wood pasture.

There are oak saplings and regeneration of holly coming through, however this is not translating into the understory. This is likely due to a lack of light and limited protection from deer browsing.

3.4.8 INVASIVE FLORA & FAUNA

The entire estate, including Well Wood SSSI, is surrounded by deer fencing. However, muntjac are still present on the estate and were seen during the survey. There is evidence that deer are having an impact on the success of tree regeneration, most notably affecting holly. The previously established fenced coupes within sub-compartment 1b are successfully providing protection from deer browsing with dense areas of hornbeam regeneration.



Fenced coupe showing dense hornbeam regeneration.

Rhododendron (*Rhododendron ponticum*) is evident throughout Well Wood, densest in the north-west corner with sporadic patches across the rest of the woodland. Patches consist of mature flowering plants with the majority of stems accessible for treatment. There is some evidence of previous control, however regrowth is in need of follow up treatment.



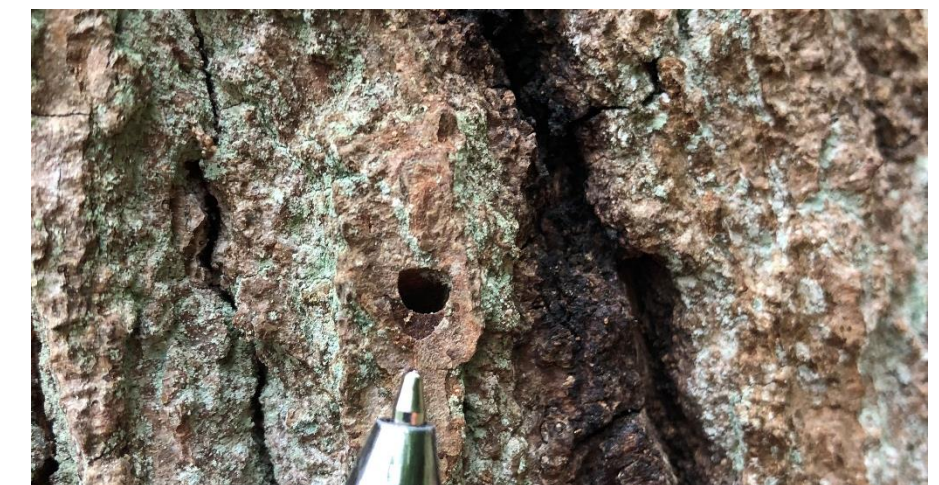
View through Heathland zone with stunted bracken growth and grasses emerging.

Bracken (*Pteridium aquilinum*) has become dominant in the Heathland zone, spreading throughout glades and extending into the more wooded areas to the west. In recent years the bracken has been treated with asulox, a selective herbicide that targets specifically bracken. The signs of this treatment are still evident, with some areas of bracken looking more sparse and stunted than they otherwise would. In these areas there is evidence of acid grassland species within the emerging flora.

3.4.9 TREE HEALTH

Evidence of Acute Oak Decline (AOD) was apparent in several oak trees within sub-compartment 1d. This disease mostly affects mature oak and has the visible symptoms of bark cracking, stem bleeding, and the presence of the buprestid beetle (*Agilus biguttatus*). The infected oak trees noted on site were found to have dead and dying canopies and the characteristic 'D-shaped' exit holes of the beetle.

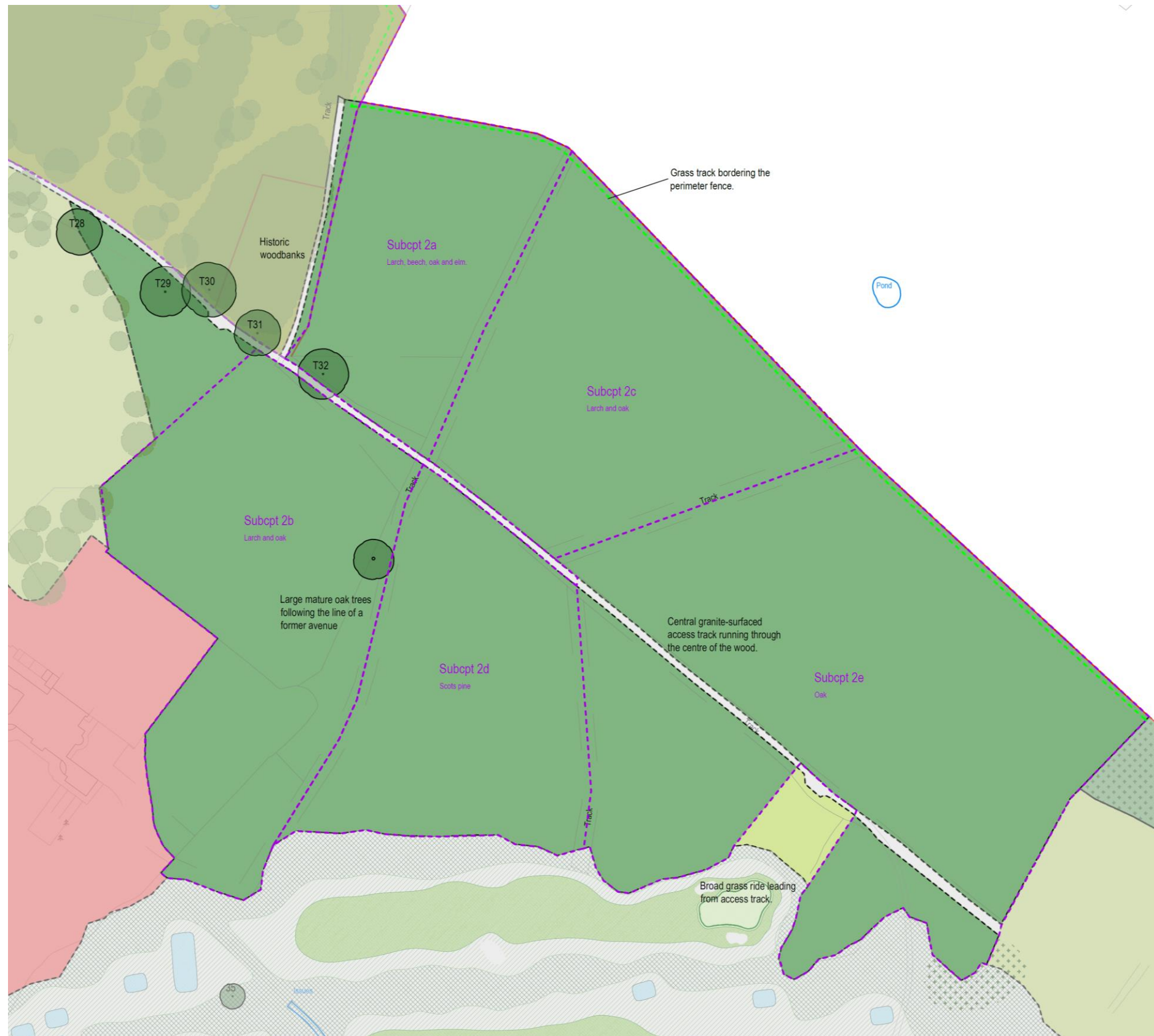
Current evidence from Forest Research suggests that the disease can spread from tree to tree which is of great concern to the integrity of woodlands at Nyn Park. It is important that the extent of currently infected trees is fully understood so that monitoring can take place to inform future action as required.



D-shaped beetle exit hole, likely belonging to the oak buprestid beetle

Ash forms 25% of the species composition in sub-compartments 1a and 1c. There is evidence that ash dieback disease (*Hymenoscyphus fraxineus*) is prevalent in the woodlands at Nyn Park. The disease is well established in Hertfordshire, and it is considered inevitable at the current time that it will eventually spread to all susceptible ash populations. It is advised to monitor the impact of the disease on the estate and plan for the succession of ash as part of woodland management.

3.5 Broadleaf Wood



3.5.1 ZONE DESCRIPTION

Broadleaf Wood is an area of approximately 11.8 ha of woodland located on the north-eastern boundary of the estate. The zone comprises relatively new plantations of both broadleaves and conifers, divided in two by an access track that forms a backbone through the woodland and links with a circular route around the estate. Beyond the estate boundary to the north is a large arable field which separates the estate from Manor Farm and residential properties on The Ridgeway.

The entire zone was un-wooded until the middle of the 20th century, with the exception of an older 1.3 ha block of woodland on the north western corner. Historic maps and aerial photos show that the majority of the zone was open parkland with occasional parkland trees and a tree lined avenue/track running north-south.



1930s view from south-west looking in the direction of Broadleaf Wood zone, predominantly open parkland. The white building visible in the top right hand corner is Nyn Manor Farm (EP3032769, Britain from Above, 2019)

3.5.2 HABITATS & WILDLIFE

Habitats

Broadleaf Wood is predominantly plantation woodland of mixed composition. It comprises of five broad sub-compartments, three of which contain a significant proportion of both broadleaf trees and conifers, with larch and oak dominating and an understory of sparse hazel and bramble. Sub-compartment 2d is almost entirely coniferous, dominated by scots pine, whilst sub-compartment 2e consists mostly of oak. Sub-compartments 2a, 2b and 2c are classified as Habitat of Principal Importance (HPI) and are therefore regarded as a priority for sensitive management and conservation.

The structure of the woodland across all compartments is similar, with evenly spaced trees forming a closed canopy. Ground flora is species-poor, consisting of a small number of flowering herbs, and in certain areas is dominated by coarse grasses such as wood brome, cock's foot and creeping bent. Ruderal vegetation such as common nettle is also prevalent in the ground flora in patches throughout the woodland.

3.5 Broadleaf Wood

A wide ride runs from south-east through to north-west in the centre of the woodland, containing a vehicular access track. Either side of the track is a ditch and bank structure for drainage. These rides are also dominated by coarse grasses.

Wildlife

Broadleaf Wood has the potential to support a wide range of species/species groups given the type and characteristics of the habitat. The species listed below are those that are either confirmed on site through observation or previous records, or those that may be present based on habitat suitability for such species.

Consideration will be given to these species groups throughout the management plan and action plans to avoid negative impacts. The management proposed will have long-term benefits for many species potentially present, including bats, dormouse, reptile and invertebrates in particular, through enhancement of the habitats.

Bats The wood contains many mature and standing deadwood trees with potential roosting features such as woodpecker holes, splits, cavities, loose bark and dense ivy which bats likely utilise. The woodland may also be used by bats for foraging and commuting, especially along the edges where it borders open grassland and parkland.

Dormouse The woodland across the zone has the potential to support dormouse and its direct connectivity to Well Wood increases the potential for this species to be present.

Badgers A badger latrine is located near to Broadleaf Wood in the adjacent East Parkland area, and it is possible that badger setts exist within the wood, although none were detected during the walkover survey. Badgers are also highly likely to utilise the wood in some capacity for foraging as well as commuting between setts and foraging grounds.

Birds The woodland canopy within the zone offers suitable nesting and foraging habitat for an array of bird species. Cavities in trees also offer potential nest sites.

Reptiles The woodland edge may provide sheltering and basking sites for any reptiles extant within the adjacent grassland habitats. Woodlands are less susceptible to frosts than open habitats, and coupled with the abundance of mature trees, leaf litter, deadwood and other debris, often provide vital hibernacula for reptiles when there is suitable adjacent grassland.

Invertebrates The mature trees, shrubs and ground flora are all considered likely to support an array of invertebrate species. The European Protected Species, stag beetle (*Lucanus cervus*), has historically been recorded in the nearby Northaw Great Wood SSSI, which remains connected to Broadleaf Wood via a continuous belt of woodland habitat. This species thrives in areas where there is an abundance of partially buried deadwood, and it is possible that the species may be present within the woodlands at Nyn Park.

Habitat	Species	Latin name
Mixed woodland	European larch	<i>Larix decidua</i>
	Norway spruce	<i>Picea abies</i>
	European Ash	<i>Fraxinus excelsior</i>
	English oak	<i>Quercus robur</i>
	European beech	<i>Fagus sylvatica</i>
	Elm	<i>Ulmus sp.</i>
	Hazel	<i>Corylus avellana</i>
	Scots pine	<i>Pinus sylvestris</i>
	Bramble	<i>Rubus fruticosus spp.</i>
	Pendulous sedge	<i>Carex pendula</i>
	Common sedge	<i>Carex nigra</i>
	Wood forget-me-not	<i>Myosotis sylvatica</i>
	Cleavers	<i>Galium aperine</i>
	Ground ivy	<i>Glechoma hederacea</i>
	Common nettle	<i>Urtica dioica</i>
	Red campion	<i>Silene dioica</i>
Wood brome	<i>Brachypodium sylvaticum</i>	
Cock's foot	<i>Dactylis glomerata</i>	
Creeping bent	<i>Agrostis stolonifera</i>	

3.5.3 NOTABLE TREES

It should be noted that the following list is not exhaustive and there are more notable oak trees located within Broadleaf Wood.

No.	Species	Latin name	Age	Observations
T29	English oak	<i>Quercus robur</i>	V	Fibre buckling on stem at 3m height; crown retrenchment and major deadwood present throughout; sections of delaminated bark
T30	English oak	<i>Quercus robur</i>	M	Large mature tree; 15m from drive; significant deadwood present throughout tree; Potential bat roost features present, including a deadwood hazard beam; crown appears in reasonable condition
T31	English oak	<i>Quercus robur</i>	M	Tree located 5m from drive with limbs extending over track; deadwood present throughout crown; multiple wounds from failed limbs on stem
T32	English oak	<i>Quercus robur</i>	M	Tree located 2m from drive; co-dominant stems from included union; deadwood present throughout crown

3.5.4 GEOGRAPHY & SOILS

The zone has a gentle sloping habit towards the north and north-east, away from the house. This rise in landform continues north into Well Wood and falls away to the east in the direction of Manor Farm. Broadleaf Wood contributes to an almost continuous wooded boundary along the north-eastern side of the estate, visible from The Ridgeway and Vineyards Road.

The 2010 soil analysis report took several samples from points within Broadleaf Wood. The pH readings for these samples came back as 4.3, 5.5 and 6.2, with soil acidity increasing the higher up the slope and closer to Well Wood.

3.5.5 HYDROLOGY

There are no waterbodies within this zone and no evidence of lost historic features on old maps or photographs. Site topography would suggest that water drains to the south-east in the direction of Vineyard Wood and its associated wet ditch

3.5.6 HISTORIC ENVIRONMENT

A woodbank forms the boundary between sub-compartment 2a and Well Wood to the west. This may delineate the wooded extent of Well Wood. There is a line of elm along the southern ride which is likely to be a remnant avenue. The mature trees located along this ride have the potential to develop into future veterans. No other historic features were identified within Broadleaf Wood.

3.5.7 WOODLAND STRUCTURE

Mixed stands of conifer and broadleaves planted between 1970's and 1980's. There is an even age structure throughout the compartments with varying success in the establishment of stands.

Sub-compartment 2a An even aged 1970's stand of oak, larch and beech. The larch and beech are of good quality and have outperformed the oak which are struggling.

Sub-compartment 2b An even aged 1970's stand of oak and larch which are well spaced and developing well.

Sub-compartment 2c An even aged 1980's stand of larch and mixed broadleaves. The larch have not developed well and many are dying.

Sub-compartment 2d An even aged 1980's stand of scots pine.

Sub-compartment 2e An even aged 1980's stand of oak, developing well.

The main issue with the woodland structure throughout all sub-compartments in Broadleaf Wood is a lack of diversity in age, and limited species diversity. This makes the woodlands more vulnerable and of overall lesser value. Woodland management should seek to address this through thinning to develop the better trees and help encourage regeneration through increased light levels. Some re-stocking may also be required where clear felling is recommended.

3.5.8 INVASIVE FLORA & FAUNA

No invasive species were recorded throughout the zone but muntjac deer are known to be present. As such any new planting will need to be protected with deer fencing or 1.2m tree shelters.

3.5.9 TREE HEALTH

The larch in sub-compartment 2c were noted to be developing very poorly. There was no clear reason for this as larch in other adjacent compartments were found to be in good health and developing well. It is unlikely that they will develop into good specimens so it is recommended that they are felled now and the area restocked with broadleaves.

3.6 Vineyard Wood



3.6.1 ZONE DESCRIPTION

Vineyard Wood lies within the south-eastern section of Nyn Park and covers approximately 19.6 ha of the estate. The woodland borders Vineyards Road to the south with a small strip of amenity grassland between the boundary fence line and road. To the north lies Nyn Pond and sections of the golf course, with farmland off-site to the east. The north-eastern area of woodland is undulating and contains a stream which flows west-east from the centre of Nyn Park and continues off-site under Vineyard Bridge.

Vineyard Wood is compartmentalised into blocks of different woodland communities, including poplar and conifer plantations, mixed plantation woodland, broadleaved deciduous woodland and small areas of open grassland.

Historic maps and photos of the estate show that up until the middle of the 20th century the area of woodland was much smaller with a large expanse of fields including a series of round plantations close to Vineyards Road.



1930s aerial photo taken from north-west, showing Vineyard Wood, a series of round in-field plantations alongside Vineyards Road, Nyn House at centre, and Nyn Pond to the right of the picture (Britain from Above, 2019)

The zone includes a broad belt of open land that sweeps around the western edge of the existing woodland. This area has historically been open parkland, as evidenced on the 1st edition OS maps and early 20th century maps, and once contained an estate road that provided the main link between Nyn House and Manor Farm. The Farm is no longer part of the estate and the alignment of the road has been amended to connect with a route through Broadleaf Wood. The area was entirely planted with conifers in the 1960-70s. It was subsequently cleared of all trees in the early 2000s. In recent years, the area has been used for the storage of silt in a series of drying beds following the dredging of Nyn Pond. This silt will be spread across the majority of the zone as part of the landscape reinstatement.

3.6.2 HABITATS & WILDLIFE

Habitats

Vineyard Wood is separated into a number of sub-compartments, with differing structure and species composition. Some sub-compartments support ancient and deciduous woodland, whilst others are mixed and plantation woodland. Section 3.7.7 provides a description of each sub-compartment and the key flora found within.

3.6 Vineyard Wood

Part of Vineyard Wood is designated as a Local Wildlife Site ('The Vineyard, Nyn Park'), covering an area of 4.26 ha across sub-compartments 6c and 6d. LWSs are non-statutory sites designated at a county level as being of conservation importance and often recognised in local authority development plans. This LWS is designated for its part ancient semi-natural, part old secondary woodland and moderately diverse ground flora. Management of the LWS will need to be sensitive to the habitats on site, protecting the soils, ground flora and mature trees. Management can also be designed to enhance the habitat by allowing a better understorey and ground layer to establish. This will improve the habitat and provision for native flora and fauna.

Key habitat features within each sub-compartment of Vineyard Wood are included in section 3.7.7 below.

Wildlife

Vineyard wood has the potential to support an array of species/species groups given the habitat structure (canopy, shrub layer and ground flora), particularly in the broadleaved and ancient semi-natural areas, and the shelter provided by the vegetation. The species listed below are those that are either confirmed on site, through observation or previous records or those that may be present based on habitat suitability for such species.

Consideration will be given to these species groups throughout the management plan and action plans to avoid negative impacts. The management proposed will have long-term benefits for many species potentially present, including bats, dormouse, reptile and invertebrates in particular, through enhancement of the habitats.

Bats The woodland is considered suitable for foraging bats and has the potential to offer an important foraging resource in the local area, given the size of the woodland. The woodland edges have the potential to support commuting bats, particularly as these habitats are well connected to woodland areas both on and off-site. Several of the veteran oak trees were noted to have the potential to support roosting bats, due to the presence of rot holes and other potential roosting features. Other mature trees within the woodland may also support roosting bats.

Dormouse The woodland, particularly areas of broadleaved woodland with a denser understorey such as sub-compartments 6a-6d, have the potential to support dormouse. The woodland in this zone provides good habitat structure, feeding resource and nesting sites suitable for dormouse. It is less likely that dormouse would be present within plantation and conifer stands.

Badger A suspected badger outlier sett was recorded along the northern boundary of sub-compartment 6a. This sett is in current occupation and comprises a single entrance hole, however there were a number of mammal paths leading from the sett into the woodland. A badger latrine was also present near the stream in 6a. A further disused sett was also located in sub-compartment 6c. It is likely that badger use the woodland for dispersal and foraging.

Birds The woodland canopy and shrub layer within the zone offer suitable nesting and foraging habitat for an array of bird species. Cavities in trees also offer potential nest sites. A high section of the stream bank within sub-compartment 6c was considered suitable for kingfisher and sand martin burrows and potential burrows were observed.

Invertebrates The mature trees, scrub and ground flora, particularly in broadleaved woodland areas are all considered likely to support an array of invertebrate species.

3.6.3 NOTABLE TREES

It should be noted that the following list is not exhaustive and there are more mature trees of importance located within Vineyard Wood.

No.	Species	Latin name	Age	Observations
T36	English oak	<i>Quercus robur</i>	Dead	Standing dead tree located next to a junction in the wet ditch on the western edge of vineyard wood; the tree has great habitat potential.
T38	Common ash	<i>Fraxinus excelsior</i>	M	Multiple PRFs and wounds throughout principal stem; deadwood present in crown
T34	English oak	<i>Quercus robur</i>	V	Tree growing from banks of wet ditch; crown is retrenched with major structural deadwood; foliage creates dense crown, but mostly reaction growth.
G4	Mixed broadleaves	n/a	M	Row of mature trees on side of irrigation ditch/stream; crowns are retrenching; deadwood present throughout most crowns; some crowns appear slightly sparse

3.6.4 GEOGRAPHY & SOILS

Vineyard Wood is located in one of the lowest parts of the site, with some slightly higher areas to the south west in the vicinity of Northaw village. The woodland provides a wooded backdrop to the village which is prominent in views from Vineyards Road. The southern boundary of the zone mostly extends up to this road with the exception of the longer rectangular playing field to the north of Northaw C of E Primary School.

The zone arcs around a rise in the landscape known as the 'teardrop', which against the tall backdrop of Vineyard Wood to the west gives the feel of a shallow valley. The zone has a predominantly south facing aspect but receives some shading from the woodland. In places the gradient is quite steep with the slope continuing to descend beyond the edge of Vineyard Wood, culminating in the stream.

The 2010 soil analysis report took several samples from along the edge of Vineyard Wood, including one next to the wet ditch. The pH readings for these samples

came back as 5.4, 5.2 and 5.7, which shows that the soils are moderately acidic in this area.

3.6.5 HYDROLOGY

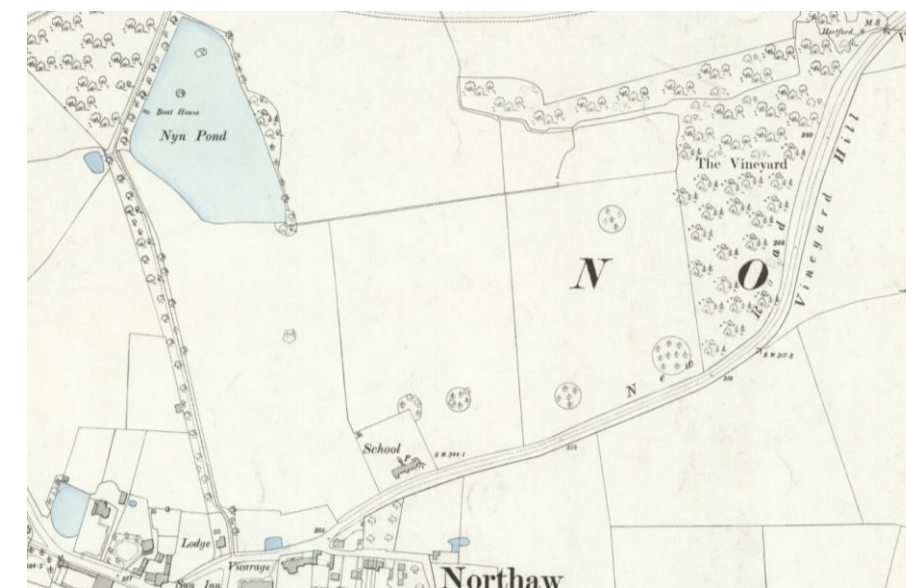
The woodland contains one significant wet ditch / stream that takes much of the water from the rest of Nyn Estate, including wet ditches through Well Wood to the west. The ditch flows through the middle of the wood from west to east, and is largely straight with some meanders towards the eastern end and steep banks in places. It leaves the site under a brick bridge on Vineyards Road (marked on old maps as Vineyards Bridge) and continues south east in the direction of Cuffley, recorded from this point onwards as Hempshill Brook.

3.6.6 HISTORIC ENVIRONMENT

The zone includes the linear historic access route that ran all the way from Nyn House to the centre of the village, opposite the Church. The 2nd edition OS 25-inch map from 1896 shows a Lodge being located next to this entrance. The track is still present and still contains an avenue of mature oak trees on either side.

The name Vineyard Wood suggests that the land did at one time support vineyards, perhaps dating back to ownership of the estate by St Albans Abbey.

The older section of Vineyard Wood (present on the 2nd edition OS map) was found to have characteristics to suggest it could be ancient semi-natural woodland. Other areas of the woodland contain features of the old parkland, including roundels located close to Vineyards Road which have now been engulfed by trees.



2nd edition OS 25-inch 1896 showing the extent of Vineyard Wood and several round plantations in the parkland around Northaw Village. The plan also shows the tree lined site access road to the east of the compartment (National Library of Scotland, 2019)

3.6 Vineyard Wood

3.6.7 WOODLAND STRUCTURE

Sub-compartment 6a

A 1980's even age stand of conifer and broadleaves. Conifer contributes 75% of the stand and includes Norway spruce and Western hemlock. Although the Western hemlock is not prolifically suckering it should be thinned out. Ash is the dominant broadleaf with occasional oak and a willow dominated scrub layer. In mixed areas the structure can be better developed by halo thinning around the oak.

The north-eastern end of the compartment contains a small area of recent mixed planting that has been established to fill a gap in the boundary created by the removal of conifer plantations. Limited ground flora throughout.

Sub-compartment 6b

Mixed age stand of 100 year old pine, oak and horse chestnut. There are 1980's ash and oak in the understorey with hawthorn and blackthorn. Ground flora includes false brome. A well-managed species-poor grassland strip runs along the southern boundary of this woodland compartment, approximately 10m wide

Sub-compartment 6c

Even age stand of hornbeam coppice with no oak standards. There is an ancient woodland feel with elm, field maple and bluebell and greater stitchwort within the limited ground flora. A stream runs through this compartment and supports diverse marginal vegetation of sedges and rushes on its banks.

An old avenue/ woodland ride lies along the northern boundary of 6c and small areas of species rich grassland remain alongside the woodland edge including bugal, germander speedwell, common vetch, ground ivy, white clover, ox-eye daisy, cut-leaved cranesbill, spear thistle, Yorkshire fog and field forget-me-not.

Sub-compartment 6d

Even age stand of 1930's oak and ash, and 1960's ash with an understory of hawthorn and holly. Sedges, grasses and honeysuckle dominate the ground layer with false wood brome and greater stitchwort.

Sub-compartment 5c

A mixed age stand of 1970's hybrid poplar at its final spacing. There are areas of sycamore, ash, Norway maple and horse chestnut with rhododendron and holly forming the ground layer. There is a good scrub understorey developing which should be encouraged to develop further once the poplar has been removed. The ground flora comprises false wood brome, dock and pendulous sedge.

Sub-compartment 5d

A mixed age stand of conifer and broadleaves, comprising Corsican pine, Norway spruce, oak, ash, goat willow and beach. There are a few areas of young mixed broadleaf and conifer planting, these need re-staking, cleaning and shelter maintenance.

Sub-compartment 5e

A 1970's Corsican pine stand with occasional Douglas fir and Norway spruce, they have become very tall and drawn and urgently need thinning. There is a sporadic understorey made up of holly and mixed broadleaves. The occasional large spreading oak was recorded.

An area of deciduous woodland lies to the south-east of this compartment and comprises mature elm, oak and ash with a more diverse ground flora of wood avens, ground ivy, creeping buttercup, garlic mustard, forget me not, pendulous sedge and false wood brome. Piles of brash and dead wood are also present in this area, offering more habitat features.

Sub-compartment 5f

Old ride lined either side with >200yr old oak forming an avenue. Ground flora along the ride is dominated by pendulous sedge and primrose. There is a mixed broadleaf understorey with some evidence of elm regrowth.

3.6.8 INVASIVE FLORA & FAUNA

The rhododendron within Vineyard Wood is predominately confined to sub-compartment 5c, with the occasional patch in 6e. The patch in 6e consists of mature flowering plants, however some appear to have been previously treated with regenerative growth now emerging. Without consistent control Rhododendron has the ability to spread further throughout the woodland.

3.6.9 TREE HEALTH

Ash dieback is evident across the estate, and a number of sub-compartments within Vineyard Wood are heavily reliant on ash as their main broadleaf component. It will be necessary to plan for the succession of ash in these sub-compartments to ensure the continued viability of woodlands.

3.6.10 POPLAR PLANTATION

Sub-compartment 5c contains a planation of hybrid poplar with some good mixed understorey regeneration. The poplar was noted to be at its final spacing and in need of felling within the next few years before they start to naturally dismantle and fall over. It should be possible to restock the area just by encouraging the natural regeneration, but some additional restocking may be required. Access for felling and removal of timber will likely need to utilise the east-west ride along the southern boundary of the sub-compartment, and the old estate track that links with the service road.



Hybrid poplar plantation with good developing understorey (Maydencroft Limited, 2019)

3.6.11 CONDITION ASSESSMENT

Open area restoration

The open swathe to the north of the wooded areas has changed significantly over the latter part of the last century, having been completely planted with conifer plantation before being cleared of all trees and then used for the storage of dredged silt from Nyn Pond. In its current condition the area is somewhat functionless, offering little to the landscape character of the estate and providing limited biodiversity value. The temporary status of the silt beds give the zone a feel of a landscape in transition, and certainly suggests an opportunity for undertaking landscape restoration for the benefit of the wider estate.

The first stage of any restoration process will be the spreading of silt across the area and incorporating this into the soils. This process will see the soils becoming highly enriched with nitrogen and nutrients which will encourage the rapid growth of vigorous grasses and broadleaf weeds. It will be necessary to consider soil testing to confirm the exact properties of soils and to determine whether any treatment is required to change the chemical composition for the benefit of the intended outcome.

It is intended to develop this area as an extension of Vineyard Wood and Broadleaf Wood, creating a larger expanse of new broadleaf woodland planting. This would help provide a stronger link between the two currently separated woodland areas, and a broader buffer to the County Wildlife Site area of Vineyard Wood.

3.7 FRD Spinney & Lodge Wood



3.7.1 ZONE DESCRIPTION

FRD Spinney is 2.2 ha block of woodland located in the centre of the estate, to the south of The Gardens and to the west of Nyn Pond. The spinney is named after Major Frank Russell Dore who purchased the estate in 1968 and set about planting significant areas of woodland across the parklands. The woodland is present on the 1st edition OS 1866 and all subsequent maps in the 19th and 20th centuries. An aerial photo dating from the year 2000 shows the entire area as new plantation, which suggests that at some point in the preceding years the spinney had been clear felled, save for a thin belt of mature trees along the south western border.



Aerial image from 2000 showing FRD Spinney as a new plantation (Google Earth 2019)

Lodge Wood is a 0.4 ha block of plantation woodland located between the two lodges (Well House and Potters Bar Lodge), bordering Well Road to the west and estate service road to the south and east. The area was historically part of the open expanse of parkland running through the centre of the site towards Nyn House. It was planted as woodland in the late 1960s and retained when the rest of the conifer plantations were cleared in the mid-2000s. To the north east of the compartment is a small band of more recent woodland edge planting bordering the service road and separated by a grass verge and shallow drainage ditch.

3.7.2 HABITATS & WILDLIFE

Habitats

FRD Spinney is a single-age plantation woodland with a thin structure, consisting predominantly of ash, sycamore, silver birch, oak and aspen. Sycamore regeneration and suckering aspen growth is prevalent within the woodland and the ground flora is dominated by very coarse grass and bramble. The trees are mostly single stemmed and there is limited structure in the understory.

3.7 FRD Spinney & Lodge Wood

Lodge Wood is a small area of mixed plantation woodland with a closed canopy and sparse understory. It is dominated by conifers including red cedar and Corsican pine.

Wildlife

FRD Spinney and Lodge Wood have the potential to support a wide range of species/species groups given the type and characteristics of the habitat. The species listed below are those that are either confirmed on Site through observation or previous records, or those that may be present based on habitat suitability for such species.

Bats The woodlands may also be used by bats for foraging and commuting, especially along the edges where it borders open grassland and parkland.

Badgers A badger sett is located along the access track approximately 200m south-west of FRD Spinney. The grassy ground flora of FRD Spinney offers potential foraging opportunities for badgers.

Birds The woodland canopy within the zone offers suitable nesting and foraging habitat for an array of bird species.

Inverts The trees, shrubs and ground flora are all considered likely to support an array of invertebrate species. The European Protected Species, the stag beetle (*Lucanus cervus*) has historically been recorded in the nearby Northaw Great Wood SSSI, which remains connected to Broadleaf Wood via a continuous belt of woodland habitat. This species thrives in areas where there is an abundance of partially buried deadwood, and it is possible that the species may be present within the woodlands at Nyn Park.

Habitat	Species	Latin name
Mixed woodland	Elm	<i>Ulmus sp.</i>
	Corsican pine	<i>Pinus nigra</i>
	Red cedar	<i>Thuja plicata</i>
	European beech	<i>Fagus sylvatica</i>
	Norway maple	<i>Acer platanoides</i>
	English oak	<i>Quercus robur</i>
Broadleaved woodland	Silver birch	<i>Betula pendula</i>
	Aspen	<i>Populus tremula</i>
	European Ash	<i>Fraxinus excelsior</i>
	English oak	<i>Quercus robur</i>
	Field maple	<i>Acer campestre</i>
	Sycamore	<i>Acer pseudoplatanus</i>
	Holly	<i>Ilex aquifolium</i>
	Bramble	<i>Rubus fruticosus spp.</i>
	Pendulous sedge	<i>Carex pendula</i>
	Garlic mustard	<i>Alliaria petiolata</i>
	Broadleaved dock	<i>Rumex obtusifolius</i>
	Curled dock	<i>Rumex crispus</i>
	Herb robert	<i>Geranium robertianum</i>
	Cleavers	<i>Galium aparine</i>
	Ground ivy	<i>Glechoma hederacea</i>
	Common nettle	<i>Urtica dioica</i>
	Red campion	<i>Silene dioica</i>

Habitat	Species	Latin name
	Greater stitchwort	<i>Stellaria holostea</i>
	Wood brome	<i>Brachypodium sylvaticum</i>
	Cock's foot	<i>Dactylis glomerata</i>
	Creeping bent	<i>Agrostis stolonifera</i>

3.7.3 NOTABLE TREES

No.	Species	Latin name	Age	Observations
T51	English oak	<i>Quercus robur</i>	M	Crown appears slightly sparse but in overall good condition; deadwood present throughout crown
T52	English oak	<i>Quercus robur</i>	M	Crown is sparse and in poor condition; 2 no. fungal fruiting bodies on buttress of tree, unidentifiable due to decay; deadwood present in crown; crown extends over service road

3.7.4 GEOGRAPHY & SOILS

FRD Spinney is located in a lower part of the estate with a slight sloping aspect towards Nyn Pond to the east. Lodge Wood is located in a slightly more elevated location alongside Well Road to the west.

The 2010 soil analysis report took two samples in close proximity to FRD Spinney and Lodge Wood. The pH readings for these samples came back as 5.6 and 6.0 which shows that the soils in this area of the estate are moderately acidic.

3.7.5 HYDROLOGY

There is a reasonably large pond located in the southern corner of FRD Spinney. The pond features on the 1st edition OS 6-inch map from 1866 and is shown being linked to the network of two wet ditches running across South Parkland with a single outfall into Nyn Pond. This outfall channel passes through a brick-headwall culvert that runs underneath the adjacent access road. The function of the pond is likely as a silt trap to prevent excessive silt levels from entering Nyn Pond.

A single drainage ditch runs along the south-western edge of the service road, adjacent to Lodge Wood. The ditch flows north-east via a culvert under the road and into the land beyond.

3.7.6 HISTORIC ENVIRONMENT

To the north of the compartment within the southern section of The Gardens is a flint cairn on a stone plinth with a plaque containing the inscription "The forest you see was planted by me and grew by the grace of God" – Major F.R.Dore. M.B.E, T.D, 1968-9.

No other historic features were recorded in these woodlands.

3.7.7 WOODLAND STRUCTURE

Sub-compartment 4a Even aged 1970's stand of Corsican pine, Western red cedar, beech, Norway maple, oak and elm. There is limited understory with the occasional hawthorn. Ground flora is minimal and holly regeneration is being grazed by deer. The woodland provides a dense boundary buffer to Well Road.

Sub-compartment 4b Even aged, recently planted mix broadleaf belt along the main track; trees still protected with stakes and guards.

Sub-compartment 5a Young 1990's single age broadleaf woodland consisting of ash, sycamore, silver birch, oak and aspen. A sycamore understory is developing. The ground flora is dominated by very coarse grass and bramble. Plantation has been fairly recently thinned so stocking density is currently adequate; risk of undertaking further thinning too soon would help the dominance of coarse vegetation. The compartment should be managed for oak, wild cherry and silver birch, aspen regrowth should be monitored.

3.7.8 INVASIVE FLORA & FAUNA

No invasive species were recorded throughout either of these woodlands but muntjac deer are known to be present. As such any new planting will need to be protected with deer fencing or 1.2m tree shelters. Aspen has a tendency to sucker rapidly which can affect the development of other trees and ground flora.

3.7.9 TREE HEALTH

No tree health issues were recorded, although the ash in sub-compartment 5a is vulnerable to infection from ash dieback disease, as evidenced elsewhere on the estate.



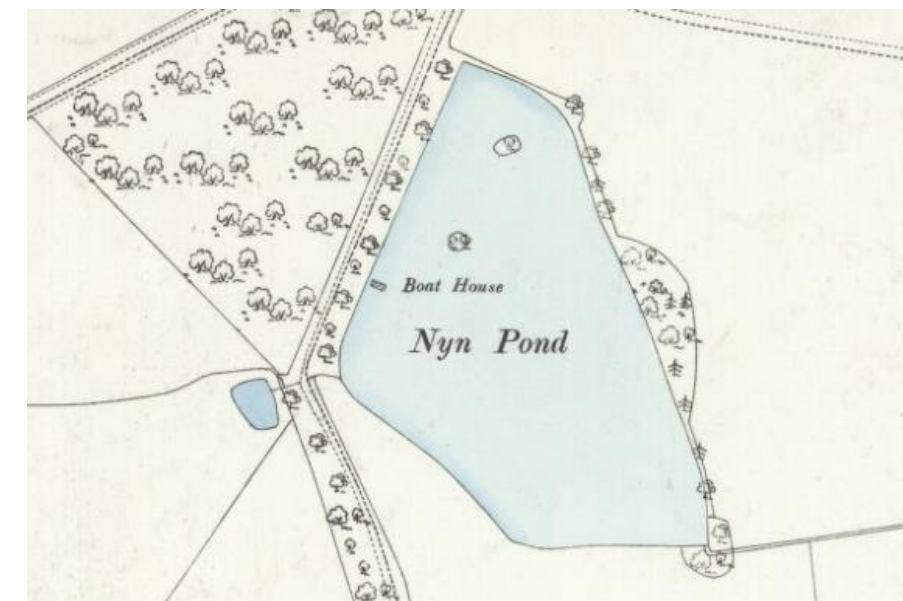
Flint cairn close to FRD Spinney

3.8 Nyn Pond



3.8.1 ZONE DESCRIPTION

Nyn Pond is a substantial waterbody of approximately 1.8 ha in size located at the centre of the estate. It is likely that a pond of some description has been present in this location for some years, given its position in one of the lowest parts of the estate. It is certainly mentioned as being present in the early 19th century when it was enlarged by the Rev Trenchard along with other improvements to the garden and estate. The pond features on the 1st edition OS map from 1866 in its current size and shape, with a boat house present on the west bank.



2nd edition OS 25-inch 1896 map showing the layout of Nyn Pond and the boat house on the west bank.

The historic maps and photos show that the pond has historically been surrounded by trees on most sides. This is still the case with some good specimens present, as evidenced in 3.10.3 below. It is not known how the pond has previously been managed, but certainly in recent years it had become very silty with mature trees becoming lost amongst dense secondary growth causing a great deal of enclosure. A recent restoration project saw the pond completely desilted and sensitive vegetation clearance works along the banks to open up light and give space to the more valuable trees. There is now a circular path that extends around the pond, linking into the historic estate road on the west side.

The pond has undergone some further changes as part of the development of the golf course, including the construction of tees on the south east bank, and an island hole in the north-west corner.

3.8.2 HABITATS & WILDLIFE

The water levels of the pond have receded from its original level and a large area of the pond bed to the east and south is now exposed. There is small amount of ephemeral/ short-perennial vegetation growing upon the exposed beds. The north-east bank supports a wider variety of botanical species including rushes and sedges and herbs such as greater stitchwort and red campion.

3.8 Nyn Pond

The pond itself provides an important water source for wildlife in the park, including mammals (bats, foxes, badger, deer), birds and invertebrates, and is known to contain a variety of fish species including carp, and a population of freshwater mussel.

The woodland surrounding Nyn Pond was recorded as compartment 5b in the woodland management plan, but with no particular recommendations for woodland management over the next 10 years. Tree species include oak, ash, horse chestnut, goat willow, elm, sycamore, and the surrounding hybrid poplar of compartment 5c.

3.8.3 NOTABLE TREES

No.	Species	Latin name	Age	Observations
T40	English oak	<i>Quercus robur</i>	M	Located between track and lake; tree appears in reasonable condition; crown is slightly sparse with deadwood present.
T41	English oak	<i>Quercus robur</i>	M	Large tree located next to lake; appears in reasonable condition; larger than most nearby trees; surrounding undergrowth has been removed
T42	English oak	<i>Quercus robur</i>	M	Tree located between track and lake; crown appears in reasonable condition although unbalanced; surrounding undergrowth has been removed
T43	English oak	<i>Quercus robur</i>	M	Tree growing adjacent to lake with a slight lean in that direction; crown appears to be in reasonable condition
T44	Common ash	<i>Fraxinus excelsior</i>	M	Tree located next to lake; multiple PRFs on main branches and stem, and clad with dead ivy; deadwood present in crown and over footpath
T45	English oak	<i>Quercus robur</i>	M	Tree located 2m from footpath; clad with dead ivy; crown appears slightly sparse; deadwood present in crown
T46	Common ash	<i>Fraxinus excelsior</i>	M	Surrounded by undergrowth impeding inspection of base of tree; stem is clad with dead ivy; deadwood present throughout crown
T47	English oak	<i>Quercus robur</i>	M	Growing in woodland around lake; crown appears in reasonable condition; deadwood present in crown
T48	Common ash	<i>Fraxinus excelsior</i>	M	Codominant stems from included union at 0.5m height; larger stem is in poor condition; PRF cavities on stem; deadwood present throughout crown and over footpath
T49	Common ash	<i>Fraxinus excelsior</i>	M	Growing next to footpath and steam from lake; some deadwood present in crown
T50	Common ash	<i>Fraxinus excelsior</i>	M	In heavy decline and nearly dead; multiple PRF habitat cavities on stem; active Blue tit nest; tree leans over lake

3.8.4 GEOGRAPHY & SOILS

Nyn Pond is located at one of the lowest points in the estate. While clearly evident from aerial photographs as a substantial feature, it is less obvious on the ground being largely obscured from views by a surrounding dense belt of trees and shrubs. These link into FRD Spinney to the west and Vineyard Wood to the south, making

the pond less of a formal waterbody and more a part of the wider, semi-natural estate.

A single soil sample was taken from close to the north-east corner of Nyn Pond as part of the 2010 soil analysis report. This gave a pH reading of 5.9 which is moderately acidic, but one of the more neutral areas on the estate.

3.8.5 HYDROLOGY

The pond is largely fed from two wet ditches that run south-west to north-east across South Parkland. These ditches terminate in the pond within FRD Spinney with a single outfall via a brick-walled culvert, flowing through the surrounding woodland and into the pond. The pond has an outfall in the south-east corner, controlled by a sluice so that water levels can be controlled. From here the water flows into a culverted pipe that connects to the ditch network in Vineyard Wood, leaving the site to the east as Hempshill Brook.

The pond has shallow surrounding banks with one small vegetated island, but extends to a far greater depth towards the middle.



View of Nyn Pond with low water levels exposing shallow surrounding banks.

3.8.6 HISTORIC ENVIRONMENT

The pond is an important historic feature of the estate, although there are no remnants of the former boat house present on site, and much has changed in the surrounding landscape. The track to the west of the pond still follows the same route as the estate road that provided direct access from Nyn House to the centre of Northaw Village.

3.8.7 CONDITION ASSESSMENT

Vegetation surrounding Nyn Pond

The survey recorded a number of notable trees in this area showing a particular concentration of valuable specimens in the vicinity of the pond. It appears to have been desirable for previous estate owners to retain tree cover around the pond, and

some of these associated trees were able to survive the planting of conifer plantations in the 20th century and subsequent felling in the early 2000s.

It is interesting to note that for the number of remnant mature trees recorded in this location, very little was recommended in the way of remedial works. The recent operations to sensitively manage vegetation around the pond have made a great deal of improvement to these trees, giving them space in which to develop. As such, there is currently little required in the way of tree and/or vegetation management. However, it is important that shrub growth continues to be managed through occasional coppicing and cutting back to ensure that the lake edges don't revert back to being overly dense. Maintaining light around the fringes of the lake and controlling scrub will help encourage the development of marginal and semi-aquatic vegetation species which will benefit the health and vitality of the pond.

Freshwater mussel

The survey identified the presence of an unknown species of freshwater mussel in Nyn Pond, as evidenced by shells found around the margins. It is recommended that a survey is undertaken to confirm the type of mussel that is present and the extent of the population within Nyn Pond. This information will help to determine any particular future management works required.

3.9 Golf Course

3.9.1 ZONE DESCRIPTION

The Golf Course at Nyn Estate is being established within open stretches of land that emanate out from Nyn House to the south-west, south-east and east, falling in-between the wooded zones. It is known that areas of this land previously contained a golf course, built in the late 19th century and remaining in active use for around 30 years. The entire park was then planted with predominantly conifer plantation in the late 1960s. These plantations were subsequently cleared from the park in the early 2000s, restoring the internal openness of the estate.



1930s aerial view of Nyn showing fairways, roughs and bunkers with occasional broadleaf and conifer trees (Britain from Above, 2019)

The nine-hole course itself will comprise the basic building blocks of tees, greens, fairways, semi-rough and rough, and will include for the construction of three new ponds and an area of new wetland. All of these areas will be maintained under a standalone maintenance contract that sits outside of the parameters of this management plan.

While it is accepted that management of the course's grassland zones will be determined by the demands of play, the course presents an opportunity within the wider landscape management of the estate to build in elements of the natural heritage and to maximise the potential for habitat creation and biodiversity enhancement, while at the same time benefitting its playability. The principle opportunities are discussed in the following sections.

3.9.2 HEATHLAND & ACID GRASSLAND CREATION

Background

The land surrounding and including Nyn Estate has a long history of being common land supporting wood pasture and lowland heath communities. The enclosure of Nyn Estate and other land holdings would have changed this landscape dramatically, and the once extensive heath 'wastes' that separated Hatfield Park and Theobalds Park developed into dense woodlands, arable fields and more intensively grazed parkland.

Heathland and acid grassland habitats are very valuable to Hertfordshire, representing a valuable and fragile group of habitats supporting specialised communities of plants



and animals, largely in decline due to cessation of grazing and/or cutting leading to eventual succession to secondary woodland.

The Hertfordshire Biodiversity Action Plan (BAP) highlights that heathlands are inherently unproductive in economic terms, which has resulted in the conversion to other lands uses and neglect. It also lists a series of major threats to the future of this habitat, including scrub encroachment, poor management practices including over-cutting, and nutrient enrichment of soils from chemicals.

It is important to note that the Lowland Heathland habitat does not just refer to heather plants. It is instead a mosaic of habitats on characteristically acidic soils (like those at Nyn) and comprising heathers (i.e. *Calluna vulgaris*, *Erica cinerea*), common and dwarf gorse (*Ulex spp.*), acid grassland species (i.e. sheep's fescue, common bent, brown bent, early hair-grass etc), and patches of bare ground. They do not tend to be floristically rich, but important for the invertebrate and bird species they can support.

3.9 Golf Course

The golf course at Nyn Estate presents an opportunity to undertake some heathland and acid grassland creation, for the mutual benefit of both the environment and the visual character of the golf course. It will not be possible for this to be 'true' heathland as the land no longer contains any semblance of a healthy flora or seed bank; however, Nyn Estate sits within one of the core areas of heath and acid-grassland re-creation in Hertfordshire, as evidenced within the Herts BAP. The work to create the golf course has involved laying a surface that is currently devoid of the species that would ordinarily threaten the integrity of these fragile habitats, and instead provides a blank canvas on which new habitat can be created. It is understood that these habitats will take time to develop into anything resembling semi-natural communities, but with the implementation of an appropriate maintenance regime and continued effort it is hoped that they may eventually grow into something of great value.

Establishment

Creation of heathland habitats generally involve the initial stripping the surface soil to remove the nutrient rich layer; this process has already been undertaken as part of the golf course development. Importing the plants tends to be through a process of seeding, often carried out by spreading cut heath litter (including seed heads) from a suitable donor site. It is also possible to purchase seed direct from seed houses, although it is more difficult to achieve local provenance. Both of these techniques can take some years for establishment. It is uncommon to plant pot-grown heather plants, mostly because of the cost, and because a lot of the varieties available have been cultivated for the domestic market and are not suitable for introduction into the semi-natural landscape. However, it is this approach that will ensure quicker establishment and may help to provide a sustainable future seed source for use elsewhere on the estate. Further information on this methodology is contained in section 4.9.3.

Maintenance

The ideal maintenance for effective management of lowland heath would be grazing; however, this is not going to be a feasible option on and around the golf course. Instead, management will be carried out by mechanical means but following a regime that will try to mimic grazing patterns, including the removal of arisings to reduce nutrient levels going back in to the soils.

3.9.3 'TUSSOCKY' GRASSLAND FRINGES

There are several fringe areas to the golf course that fall outside of the designated playing course (as defined by the extent of the roughs) and sit between the course itself and the adjacent woodland habitats. These grassland areas are largely coarse and tussocky with small areas of developing bramble scrub and reasonable floristic diversity. They provide an important buffer between the managed course and adjacent habitats, and in themselves deliver valuable habitat for invertebrates and small mammals. It is recommended that, in contrast to management of the roughs, these areas continue to be managed as coarse tussocky grasslands under a less frequent cutting regime.

3.9.4 PONDS & WETLANDS

The golf course will include for three new substantial ponds. The purpose of these ponds is for the storage of water for irrigation, to form hazards within the course, and

for the visual amenity they will bring to the golf course landscape. While certain areas of the pond banks will need to be maintained as short mown grass to facilitate play, other areas can be more naturalistic in character and it will be possible to develop them into valuable wetland habitats with rich marginal flora and surrounding cover for reptile and amphibian species. The construction of the ponds has included for a marginal shelf which will help with the establishment of plants.

A new area of wetland habitat is being created in the south east corner of the site, utilising silt dredged from Nyn pond. This shallow area will include gently undulating contours with permanent water levels controlled as part of the irrigation system. The wetland will be allowed to naturalise from seed contained within the spread silt, but may require some additional native plug planting and seed.

3.9.5 NOTABLE TREES

There are a number of notable trees recorded in and around the golf course, all of which will be retained and managed in accordance with recommendations.

No.	Species	Latin name	Age	Observations
T13	English oak	<i>Quercus robur</i>	M	Some veteran characteristics; crown appears slightly sparse with some deadwood in crown; early signs of retrenchment; brambles around base of tree
T14	English oak	<i>Quercus robur</i>	Dead	Standing dead tree; Ganoderma spp fungal fruiting bodies on stem; excellent deadwood habitat
T15	English oak	<i>Quercus robur</i>	Dead	Standing dead tree located 5m north of service road; tree contains PRFs and deadwood habitat
T16	English oak	<i>Quercus robur</i>	M	Tree located 4m north of service road; deadwood and major deadwood present in crown and over service road; signs of retrenchment in crown; brambles growing around base of tree
T17	English oak	<i>Quercus robur</i>	M	Tree located 5m north of service road; codominant stems at 3m height; deadwood present throughout crown; part of old avenue; brambles growing around base of tree
T18	English oak	<i>Quercus robur</i>	M	Tree located 6m from service road; deadwood present throughout crown; part of old avenue
T19	English oak	<i>Quercus robur</i>	M	Mature/veteran tree; crown appears to be retrenching with deadwood present throughout; brambles growing around base of tree
T20	English oak	<i>Quercus robur</i>	M	Mature/veteran tree; crown appears to be retrenching and sparse; PRF habitat features and deadwood present in crown; bramble growing around base of tree
G2	Mixed broadleaves	<i>n/a</i>	n/a	Group containing mature Scots pine and sycamore, one standing dead tree, young oak, birch and pine.
T35	English oak	<i>Quercus robur</i>	Dead	Standing deadwood habitat with areas of delaminating bark
T37	English oak	<i>Quercus robur</i>	M	Part of a boundary row; retrenched crown and major deadwood present throughout.
T39	English oak	<i>Quercus robur</i>	M	Very minor evidence of crown retrenchment but otherwise appears to be in reasonable condition with dense lower crown; deadwood and major deadwood present in crown; ground has been scraped leaving 1m circle of unscraped ground; soil is very clay based

No.	Species	Latin name	Age	Observations
G4	Mixed broadleaves	<i>n/a</i>	M	Old parkland roundel of mature Limes and oaks.
G5	Corsican pine	<i>Pinus nigra</i>	M	Old parkland roundel of mature <i>Pinus nigra</i> surrounded by dilapidated metal estate railings.

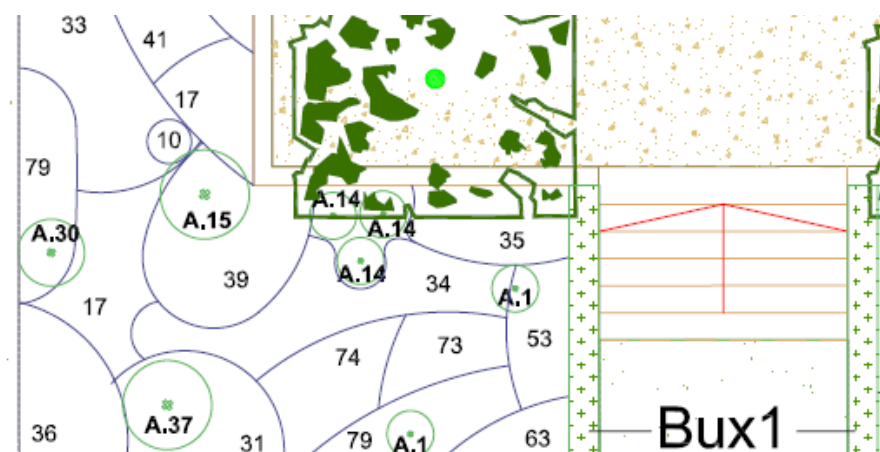
3.10 The Gardens

3.10.1 ZONE DESCRIPTION



The gardens around Nyn House include both formal and informal areas. The informal garden (to the southern end of the above plan) comprises an arboretum of mixed coniferous and broadleaf tree and shrub specimens set within lawns with occasional swathes of bulbs. Some of the trees date to the Victorian era and can be seen on historic photos and plans. This particular area of the site survived the conifer plantations in the mid-20th century and has since been restored. Trees of particular note include giant redwood (*Sequoiadendron giganteum*), a large mature copper beech (*Fagus sylvatica 'Purpurea'*), and multi-stemmed western red cedar (*Thuja plicata*).

The grass surrounding the trees throughout the informal garden blend seamlessly into the lawns around the house and formal gardens. Master planned by Wirtz International, the formal scheme includes a long continuous border of herbaceous perennials that extends around the south-west side of the main house and terrace, to a total length of approximately 150m. The borders include swathes of mixed species providing variety in colour and texture and flowering from early Spring through to Autumn. Stand out plant species within the borders include delphiniums, roses, agapanthus, hardy geraniums, iris, and campanula. The broad variety of flowering plants and the high standard of maintenance means that the borders play host to an abundance and diversity of pollinating invertebrate species, including bees and butterflies.



Sage 1 - Section of the herbaceous border planting plan, 2011 (D&H Architecture de Paysage)



Stage 2 - Setting out the herbaceous borders, 2014 (Maydencroft Limited)



Stage 3 - First year of establishment, 2015 (Maydencroft Limited)



Stage 4 - Established borders, 2017 (Maydencroft Limited)

The herbaceous borders are given structure by a number of shrub species including hydrangeas, lonicera spp, perovskia, osmanthus, and virburnums, in addition to clipped box hedging. The gardens include a formal terrace containing a continuous low bed of clipped box, bordered by two avenues of pleached hornbeam. To the west of the house (location of the main entrance) are two topiary features of clipped box.

The formal and informal gardens are maintained by a permanent team of two gardeners, employed by Maydencroft Limited, to a high horticultural standard. Regular tasks include lawn maintenance, edging, weeding beds, pruning, dead heading, and mulching. In recent years the gardeners have also been tackling issues threatening the health of plant and shrub species, such as box moth caterpillar (*Cydalima perspectalis*).



Formal garden leading into informal garden, 2017 (Maydencroft Limited)

4 Action Plans

4.1 Introduction

The following sections set out the 10-year work programme for each of the Management Zones, including both capital one-off actions and regular ongoing maintenance operations. The first page of each section contains an overall aim and set of supporting objectives related to the zone, and a plan showing the specific location of capital works where relevant.

The **Capital Work Programme** table is set out with the following information:

<i>Ref</i>	A unique reference number for the particular activity.								
<i>Item</i>	The name of the task/item								
<i>Detail</i>	A brief description of the task/item.								
<i>Year</i>	The management plan year in which the task will take place.								
<i>Timing/Restrictions</i>	A time frame for when the works should be undertaken.								
<i>Quantity</i>	The number / amount related to the task.								
<i>Unit</i>	ha / m ² / L m / no. / item								
<i>Delivery</i>	Works to be delivered by the following: <table border="0" style="margin-left: 20px;"> <tr> <td>ML</td> <td>Maydencroft Limited</td> </tr> <tr> <td>TAS</td> <td>Turfgrass Agronomy & Services</td> </tr> <tr> <td>GL</td> <td>Golf Links Ltd</td> </tr> <tr> <td>SC</td> <td>Specialist Consultant</td> </tr> </table>	ML	Maydencroft Limited	TAS	Turfgrass Agronomy & Services	GL	Golf Links Ltd	SC	Specialist Consultant
ML	Maydencroft Limited								
TAS	Turfgrass Agronomy & Services								
GL	Golf Links Ltd								
SC	Specialist Consultant								
<i>Pre-commencement Actions</i>	Any particular preparatory works or checks required prior to the task taking place.								
<i>Spec ref</i>	Reference to a supporting specification, located below the tables.								
<i>Objective ref</i>	Reference to the project objective to which the task will be contributing.								

A separate **Annual Maintenance Programme** contains the ongoing management operations for the zone, including any establishment maintenance required following the delivery of capital items (i.e. watering of trees etc). The table is set out with the following information:

<i>Ref</i>	A unique reference number for the particular activity.
<i>Item</i>	The name of the task/item
<i>Detail</i>	A brief description of the task/item.
<i>Start</i>	The start of the time period in which the task can be commenced.

<i>End</i>	The end of the time period in which the task can be undertaken.
<i>Frequency</i>	The number of operations required during the year.
<i>Years</i>	The management plan year in which the task will be undertaken.
<i>Quantity</i>	The number / amount related to the task.
<i>Unit</i>	ha / m ² / L m / no. / item
<i>Delivery</i>	As per capital work programme
<i>Objective ref</i>	Reference to the project objective to which the task will be contributing.

It is important that both the capital work programmes and annual maintenance programmes are regularly reviewed and updated as part of ongoing monitoring of the management plan, as set out in Section 5 of this document. This will ensure that the plans remain relevant and deliverable, with new operations and tasks built in as situations change.

4.2 South Parkland Actions

AIM	To restore the cultural and natural heritage value of South Parkland through the re-introduction of traditional conservation grazing and the recruitment of future parkland trees.
OBJECTIVES	SP1 Undertake all required preparatory works to allow for the re-introduction of native breeds to manage South Parkland.
	SP2 Establish future parkland trees and roundels from a combination of recruiting natural regeneration and planting new specimens, to include for protection from grazing to aid healthy establishment.
	SP3 Allow the boundary with Judges Hill to develop into a dense woodland and scrub buffer.
	SP4 Undertake regular scrub and vegetation management along ditches and boundary lines to control encroachment into grassland.
	SP5 Improve habitat quality and diversity for wildlife, including protected species.



4.2 South Parkland Actions

4.2.1 CAPITAL WORK PROGRAMME

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
SPc1a	Weed spraying – Year 1	Boom-spray South Parkland with Depitox (2-4d) & Larke (mcpa) broadleaf herbicides to tackle creeping thistle, ragwort and other dominant weed species. Leave a broad buffer of between 5-10m around wet ditches, parkland trees and areas of new planting.	1	March – April	10	Ha	ML	n/a	4.2.9	SP1
SPc1b	Weed spraying – Year 2	Boom-spray South Parkland with Depitox (2-4d) & Larke (mcpa) broadleaf herbicides to tackle creeping thistle, ragwort and other dominant weed species. Leave a broad buffer of between 5-10m around wet ditches, parkland trees and areas of new planting.	2	March – April	10	Ha	ML	n/a	4.2.9	SP1
SPc2	Preparation for grazing fencing	Undertake preparatory works to set out the fence line, to include cutting back branches and removing scrub vegetation as required.	1	Sep - Feb	1340	L m	ML	Walkover check by ecologist to confirm no impact on protected species / habitats.	n/a	SP1
SPc3	Estate fencing	Supply and install 5-bar galvanised steel estate railings around the north-west and north-eastern boundaries of South Parkland, to be painted black.	1	n/a	700	L m	ML	n/a	4.2.3	SP1
SPc4	Estate fencing - gates	Include for the installation of 2 no. 3m wide gates and 1 no. 1.2m single leaf gate, to be painted black.	1	n/a	3	No.	ML	n/a	4.2.3	SP1
SPc5	Stock fencing	Supply and install 1.2m height stock fencing to include timber posts, high tensile stock netting, and 2-strands of barbed wire.	1	n/a	640	L m	ML	n/a	4.2.4	SP1
SPc6	Water supply	Supply and install a galvanised steel drinking trough and connect to a nearby water supply (likely in the vicinity of Potters Bar Lodge); trough to be installed half-in-half-out of timber corral.	1	n/a	1	Item	ML	Confirm location of a suitable water supply.	4.2.5	SP1
SPc7	Timber corral	Supply and install a timber corral.	1	n/a	1	Item	ML	n/a	4.2.6	SP1
SPc8	New parkland trees – Guards	Recruit future parkland trees from natural oak regeneration; trees to be protected from grazing by installing galvanised metal tree guards, painted black; include existing young 2no.oak and 2no. hornbeam within field.	1	n/a	7	No.	ML	n/a	4.2.7	SP2
SPc9	Grey poplar suckering	Remove several areas of semi-mature grey poplar and suckers to ground level; leave mature grey poplar located in tree line adjacent to service road. Grind out any stumps larger than 100mm diameter. All arisings to be chipped and removed from site.	1	Sep - Feb	550	m ²	ML	n/a	n/a	SP2
SPc10	Established semi-mature parkland trees	Remove wooden tree guards from around established semi-mature parkland trees.	2	n/a	8	No.	ML	Check trees are ready for removal of guards.	n/a	SP2
SPc11a	Parkland roundels – fencing	Create 4no. parkland roundels to be 12m radius in size, 5-bar galvanised steel railings painted black and including a 1.2m single leaf gate.	4	n/a	4	Item	ML	Precise locations to be marked out on site.	4.2.3	SP2
SPc11b	Parkland roundels – planting	Trees to be planted within roundels in accordance with specification.	4	Nov - Feb	80	No.	ML	n/a	4.2.8	SP2
SPc12	Barn owl nest box	Install 2 no. barn owl nest boxes on mature oak trees located on the north western edge of south parkland, facing into the grassland.	2	n/a	2	No.	ML	Ecologist to determine best location for installing boxes.	4.2.9	SP5
SPc13	New hedgerow planting	Hedgerow to be planted along north side of ditch in accordance with specification.	1	Oct - Feb	351	L m	ML	n/a	4.2.11	SP5

4.2.2 ANNUAL MAINTENANCE & MONITORING PROGRAMME

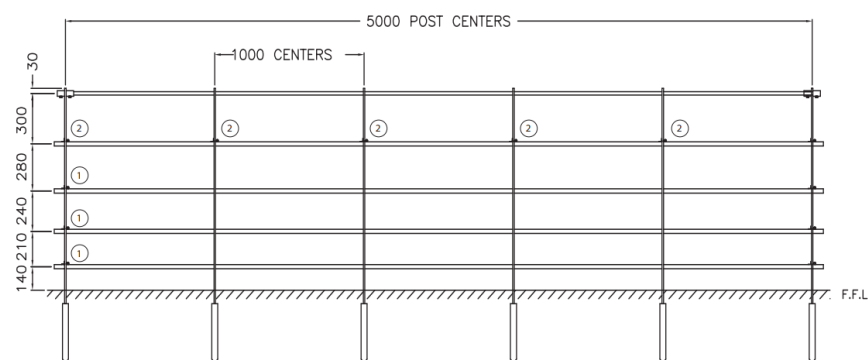
Ref	Item	Detail	Start	End	Frequency	Years	Quantity	Unit	Delivery	Objective ref.
SPm1	Grazing management	Provision of a herd of native breed animals to maintain the grassland, including delivery, collection and regular inspections.	TBC	TBC	n/a	Every	n/a	Item	ML	SP1
SPm3a	New parkland trees – weeding	Weeding around base of recruited and planted parkland trees.	Mar	Sep	Once per year	1 – 3	7	No.	ML	SP2
SPm3b	New parkland trees – pruning	Formative pruning of trees.	Nov	Feb	1	3	7	No.	ML	SP2
SPm4	Scrub management	Tractor with flail arm to cut back bramble, blackthorn and aspen suckering along ditch lines.	Oct	Feb	Every 2 years	1, 3, 5, 7 & 9	480	L m	ML	SP4
SPm5	Grey poplar suckering	Tractor with flail arm to cut back any poplar regrowth within compartment (if not being managed by cattle grazing)	Oct	Feb	Every 2 years	1, 3, 5, 7 & 9	300	m ²	ML	SP2

4.2 South Parkland Actions

Ref	Item	Detail	Start	End	Frequency	Years	Quantity	Unit	Delivery	Objective ref.
SPm6	Boundary cut with flail	Tractor with flail arm to cut back vegetation along grazing compartment boundary to keep clear of fence line.	Oct	Feb	Every 2 years	3, 5, 7 & 9	1340	L m	ML	SP4
SPm7	Young tree maintenance	Remove tree guards (further to monitoring visit) and formative pruning of best trees.	Jan	Dec	n/a	3	1	Item	ML	SP3
SPm8	Roundels	Carefully strimming grass within roundels, avoiding oak regen if present.	Aug	Sep	Once per year	Every	4	No.	ML	SP2
SPm9	New hedgerow - weeding	Carefully weed around bases of hedge plants in summer. Replace dead plants in autumn or winter.	Aug	Jan	Once per year	1 - 3	351	L m	ML	SP5
SPm10	New hedgerow - trimming	Cut plants to max 60cm in first spring/ then trim in winter.	Mar/Jan	Mar/Feb	Every 3 years	1, 4, 7	351	L m	ML	SP5
-	Grazing infrastructure	Undertake an annual inspection to check that fences and gates are all intact and water supply is functioning.	Mar	Apr	1	All	1	Item	ML	-
-	Grazed grassland	Undertake an annual monitoring visit to check on the condition of the grazed grassland to help determine whether the stocking rates and timings are appropriate. Monitoring to also determine whether additional scrub control is required. Amend specification accordingly. Monitoring likely to only be required for the first few years.	Aug	Sep	1	Yrs 2, 3, 4	1	Item	ML	-
-	Recruited Parkland trees	Inspect recruited parkland trees for healthy establishment, the need for formative pruning, and the effectiveness of guards.	May	Sep	1	Yr 2, Yr 5	1	Item	ML	-
-	Tree Safety Inspection	Professional Tree Inspector to undertake a Tree Safety Inspection of all wooded boundaries every 2.5-3 years; any trees with significant defects requiring remedial works will be recorded in a detailed report.	Jan	Dec	1	Yr 1, Yr 4, Yr 7, Yr 10	1	Item	ML	-

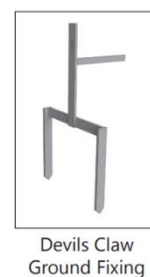
4.2.3 ESTATE FENCING

Estate railings will be installed around the north-west and north-east field boundaries where they are most visible from internal views within the estate. The railings will match those installed elsewhere on the estate, comprising 'Sterndale' continuous bar hot-dipped galvanised steel fence. This is a 5-bar fence of the following specification:



- 1 no. 20mm diameter top rail;
- 4 no. 25 x 6mm flat horizontal rails;
- 1 no. 50 x 10mm flat joiner post, every 5 metres;
- 1 no. 40 x 10mm flat intermediate post every 1 metre.

Posts to be installed into the ground to a depth of 430mm on 'Devil's Claw' ground fixings. Further to installation, fencing



to be etch primed and painted black.

Fencing to include one pair of combination gates, comprising of 2 no. 3.0m width gates with drop bolts and lockable sliding bar. It will be possible to automate these at a later date if required. Fencing to also include 1 no. 1.2m single leaf gate with drop bolts and lockable sliding bar.



4.2.4 STOCK FENCING

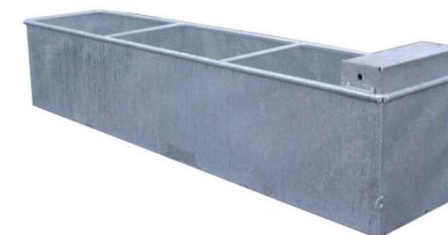
Stock fencing to be installed around the southern and south-east boundary of South Parkland where it will be less visible from internal views. The fencing will match in appearance the deer fencing that extends around the entire site boundary but at 1.2m height instead of 2m height. Along the southern boundary the fencing will be set back by up to 35m in order to retain a broad buffer mosaic of existing trees, bramble scrub, new tree and shrub planting, and tussocky grassland. A 2-3m strip of short grass will be maintained around the perimeter of the fence to allow for maintenance access.

Fencing to include (a) 1.2m x 125-150mm diameter peeled & pressure treated creosote strainer posts at 50m intervals and any changes in direction, and (b) 1.65m x 75-100mm diameter peeled & pressure treated creosote intermediate posts at 3.5m intervals. Posts to be fitted with high tensile 8-80-15 stock netting and 2-strands of barbed wire, fastened with 40mm staples to a finished height of between 1100-1200mm.



4.2.5 WATER SUPPLY

A large drinking trough is to be installed close to the field entrance near Potters Bar Lodge. Trough to be 1.8m length and 68 litre capacity, manufactured in 2.0mm flat steel and galvanised to BS2n



4.2 South Parkland Actions

ISO 1461. To be installed half-in-half-out of the timber corral so that it can provide water to animals on either side.

Trough to be connected to the water supply in the vicinity of Potters Bar Lodge via a standard 25mm blue MDPE pipe. This connection will need to be confirmed prior to installation.

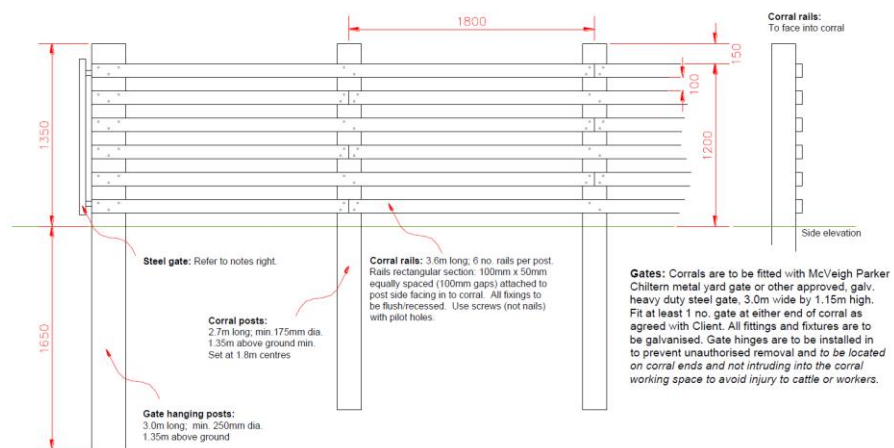
4.2.6 CORRAL

A timber corral is to be located adjacent to gated entrance, close to Potters Bar Lodge, to assist with the gathering of stock from the field. The corral will be 10.8m x 6m in size with two separate compartments and a post & rail entrance funnel. Specification as follows:

2 no. 3m heavy duty galvanised steel gates;

2.4m x 150mm x 150mm 4 way weathered timber posts at 1.8m intervals, concreted into the ground;

3.6m x 50mm x 100mm timber rails; 6 rails per post at equal 100m intervals, fastened with 90mm screws.



Source: Lee Valley Regional Park Authority (June 2013)

4.2.7 PARKLAND TREES – RECRUITING & PROTECTING

The parkland currently contains some good naturally regenerating oak, particularly in the vicinity of the remnant parkland trees along the boundary with Judges Hill. Prior to initiating grazing, the best of these specimens are to be identified on site and either left in-situ or relocated to a preferable location.

Trees to be protected by steel tree guards, painted black to match with estate fencing. Height of approximately 1.8m above ground level with a lower diameter of 1m and curved lip extending to a



diameter of 1.5m.

Tree protection to include 2no. oak and 2no. hornbeam that have previously been planted and currently supported by timber stakes and 600mm guards.

4.2.8 PARKLAND TREES – ROUNDELS

4 no. Parkland tree roundels will be established by setting out a circle of estate fencing to 12m radius. Fencing to be installed in accordance with specification 4.2.3 and each roundel to include a 1.2m single leaf gate with drop bolts. Exact location to be determined on site.

Roundels to be planted with single species trees to create a stronger impact in the landscape, with an allowance for 20 trees in each. Trees to be planted as light standards, bare root transplants, supported by timber stakes with rubber belts, planted at 3-4m spacing.

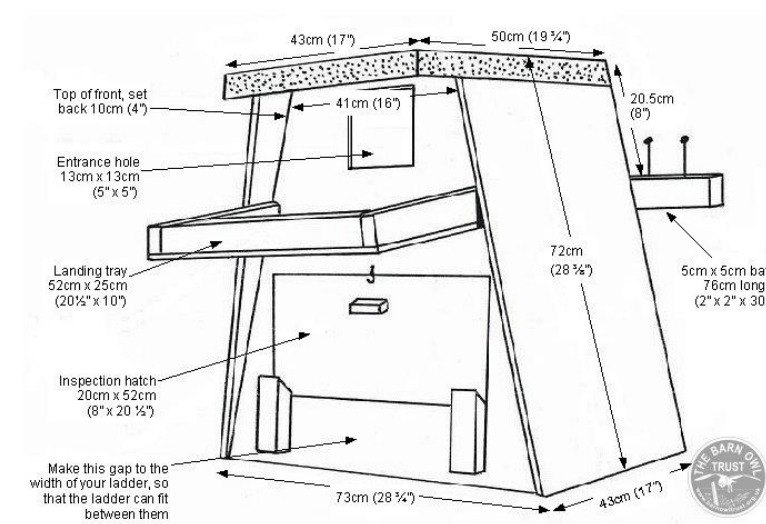
No.	Species	Scientific name	Height	Girth	Type
20	Common lime	<i>Tilia x europaea</i>	2-2.5m	6-8cm	Light standard
20	Copper beech	<i>Fagus sylvatica purpurea</i>	2-2.5m	6-8cm	Light standard
20	English oak	<i>Quercus robur</i>	2-2.5m	6-8cm	Light standard
20	Scots pine	<i>Pinus sylvestris</i>	2-2.5m	6-8cm	Light standard

4.2.9 WEED SPRAYING

Use a tractor-mounted boom spray to undertake weed treatment of South Parkland Depitox (2-4d) & Larke (mcpa) broadleaf herbicides to tackle creeping thistle, ragwort and other dominant weed species. Spraying to leave a 10m buffer strip along the woodland and stream edges and around any areas of new planting, including parkland trees. Spraying to only be undertaken on still days where this is minimal risk of drift.

4.2.10 BARN OWL NEST BOXES

A pair of barn owl boxes are to be installed on mature oak trees on the north western edge of south parkland, facing south-east into the parkland. The two boxes are to be positioned approximately 150m apart to provide both male and female roosting opportunities, at a minimum height of 3m. Boxes to be ordered from the Barn Owl Trust and follow installation guidelines.



Barn owl nest box construction (The Barn Owl Trust)

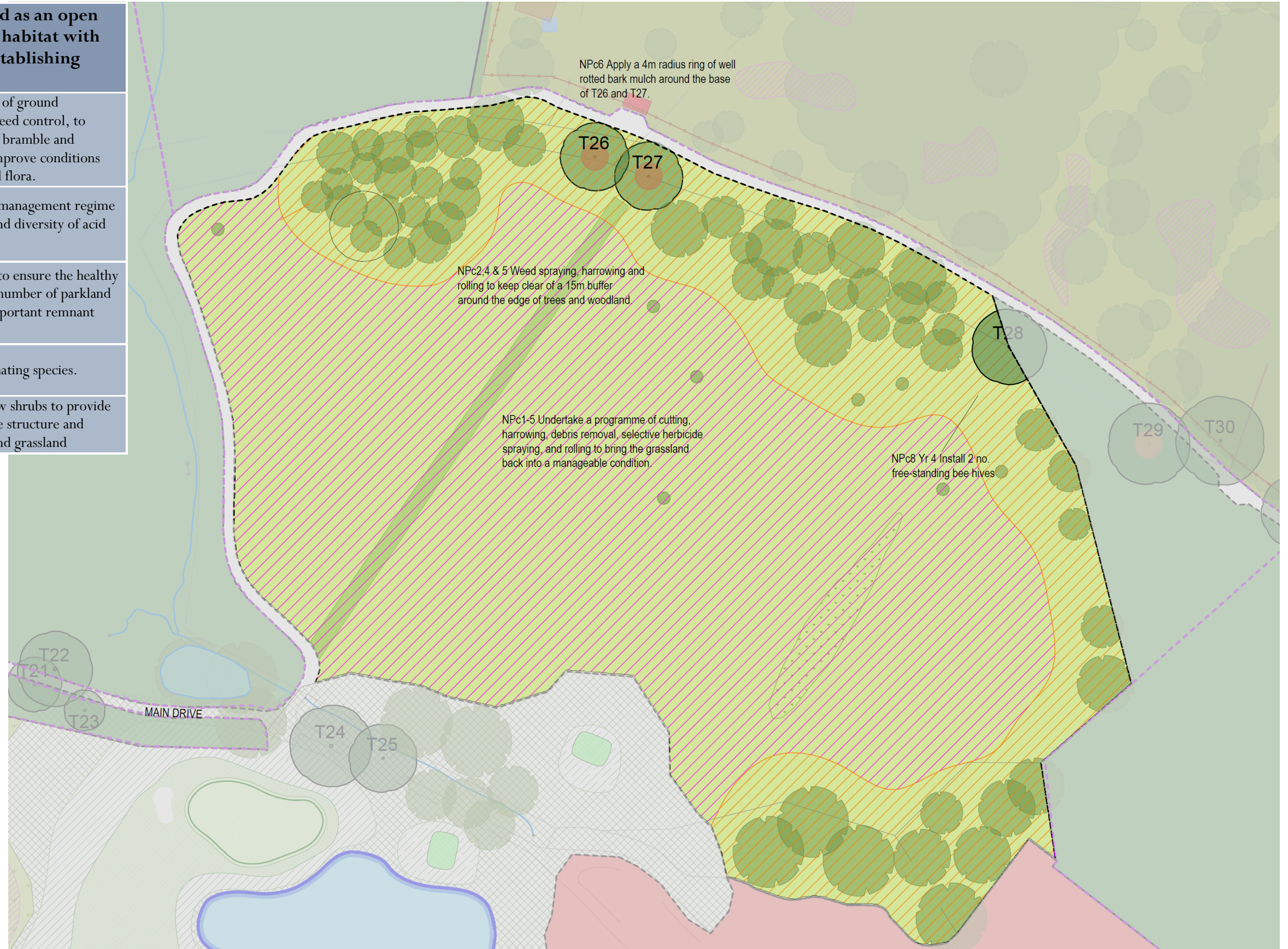
4.2.11 HEDGEROW PLANTING

The hedgerow will be planted along the northern side of the northern ditch which run across the parkland. The hedge will be planted with five plants per metre, as a double row hedge. Plants will be 60—90cm high 'whips' which have a better survival rate and will grow more quickly. All plants to be fitted with 1.2m tubex tree shelters and 1.2m softwood stakes.

%	No.	Species	Scientific name	Form	Height	Type
25	440	Hawthorn	<i>Crataegus monogyna</i>	1u1	60-90cm	Bare root transplant
10	176	Midland hawthorn	<i>Crataegus laevigata</i>			
20	352	Hazel	<i>Corylus avellana</i>			
15	264	Field maple	<i>Acer campestre</i>			
5	88	Dog rose	<i>Rosa canina</i>			
5	88	Blackthorn	<i>Prunus spinosa</i>			
10	176	Guelder rose	<i>Viburnum opulus</i>			
10	176	Crab apple	<i>Malus sylvestris</i>			

4.3 North Parkland Actions

AIM	To manage North Parkland as an open expanse of acid grassland habitat with the future potential for establishing heath communities.
OBJECTIVES	NP1 Undertake a programme of ground preparation, including weed control, to reduce the dominance of bramble and creeping thistle and to improve conditions for grasses and associated flora.
	NP2 Establish an appropriate management regime to promote the quality and diversity of acid grassland.
	NP3 Undertake maintenance to ensure the healthy establishment of a small number of parkland trees and retention of important remnant specimens.
	NP4 Provide habitat for pollinating species.
	NP5 Plant a broad band of new shrubs to provide improved woodland edge structure and ecotone between trees and grassland



4.3 North Parkland Actions

4.3.1 CAPITAL WORK PROGRAMME

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
NPc1	Grass cutting	Carry out a late-summer cut of North Parkland with all arisings collected and removed.	1	September	4	Ha	ML	n/a	n/a	NP1
NPc2	Harrowing	Undertake chain harrowing of areas of North Parkland to disturb and breakdown the dense thatch and areas of coarse vegetation, and to expose any wood left from the previous deforestation. Leave a broad buffer of 15m around trees and woodland edge.	1	Early-Spring	4	Ha	ML	Walkover survey to check for ground nesting birds if harrowing takes place after 1 st March & to confirm areas that are to be harrowed	4.3.3	NP1
NPc3	Collecting wood	Any wood disturbed from harrowing to be collected by hand and removed.	1	Early-Spring	1	Item	ML	n/a	4.3.3	NP1
NPc4	Weed spraying	Boom-spray areas of North Parkland with Depitox (2-4d) & Larke (mcpa) broadleaf herbicides to tackle creeping thistle, ragwort and other dominant weed species. Leave a broad buffer of 15m around trees and woodland edge.	1	April	4	Ha	ML	n/a	4.3.3	NP1
NPc5	Rolling	North Parkland to be rolled with a very heavy flat roll pulled by a tractor. Rolling will help to balance the uneven ground level to enable future maintenance and to invigorate grass growth. Leave a broad buffer of 15m around trees and woodland edge.	1	April	4	Ha	ML	n/a	4.3.3	NP1
NPc6	Tree mulching	Carefully cut back any vegetation growing from around base of notable trees T27 and T28. Apply 4m radius ring of well-rotted bark mulch around base of each tree to a depth of 100mm.	1	September	2	No.	ML	n/a	n/a	NP3
NPc7	Weed spraying	Boom-spray North Parkland with Depitox (2-4d) & Larke (mcpa) broadleaf herbicides to tackle creeping thistle, ragwort and other dominant weed species. Leave a broad buffer of 15m around trees and woodland edge	2	April	4	Ha	ML	n/a	4.3.3	NP1
NPc8	Free-standing bee hive	Supply and install 2 no. sustainable free-standing timber bee hive - to be located in south facing, sheltered position.	4	Early-Spring	2	No.	ML	Ecologist to determine most suitable location	4.3.4	NP4
NPc9	Woodland edge planting	Undertake new woodland edge planting along the southern fringe of the woodland belt to provide a scalloped ecotone from mature trees to grassland.	2	Nov – Feb	0.4	Ha	ML	n/a	4.3.5	NP5

4.3.2 ANNUAL MAINTENANCE & MONITORING PROGRAMME

Ref	Item	Detail	Start	End	Annual Frequency	Years	Quantity	Unit	Delivery	Objective ref.
NPm1	Summer cut	Undertake a later-summer grass cut with all arisings left in situ for one week before being collected, baled and removed from site.	August	September	1	2 onwards	4	ha	ML	NP2
NPm2	Tree mulching	Turn over bark mulch by hand and top up levels to 100mm total depth.	March	April	1	3, 6 & 9	2	No.	ML	NP3
NPm3a	New parkland trees	Weeding around base	Mar	Sep	1	1 – 3	7	No.	ML	NP3
NPm3b	New parkland trees	Formative pruning of trees	Nov	Feb	1	2	7	No.	ML	NP3
NPm4	Scrub management	Tractor with flail arm to cut back vegetation along wet flush and woodland edge where not possible to cut & collect.	Sep	Feb	1	Every year	1	Item	ML	NP2
NPm5	Woodland edge planting	Check guards and stakes are still in place; right any that have been knocked over and replace any that have broken.	Jan	Dec	1	2 – 4	0.4	Ha	ML	NP5

4.3 North Parkland Actions

Ref	Item	Detail	Start	End	Annual Frequency	Years	Quantity	Unit	Delivery	Objective ref.
-	Grassland	Monitor effectiveness of weed spraying and mowing regime to determine whether any further operations are required.	Aug	Sep	1	Yrs 2, 3 4, 7 & 10	1	Item	ML	NP1

4.3.3 GRASSLAND RESTORATION

The first stage of grassland restoration will involve harrowing certain areas of the grassland where undesirable species have dominated the sward. These areas will be specified by the ecologist. Areas which support a range of species, including acid grassland indicators, will be retained. The harrowing process will help to break up the soils and dense thatch, exposing any remnant wood from the previous removal of conifers. This wood can then be collected and removed by hand. A 15m buffer will be maintained around the trees and woodland surrounding the grassland to avoid any damage to root systems.

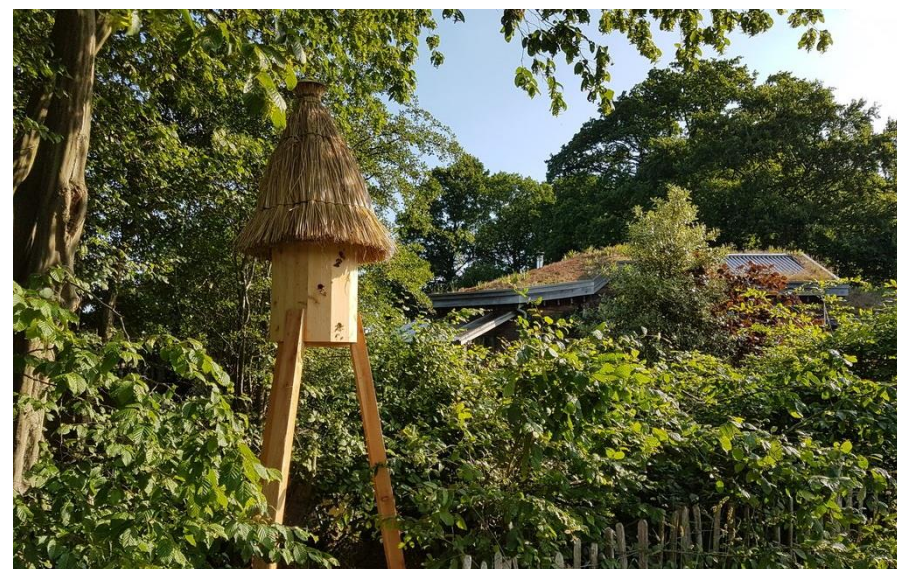
The areas with invasive weeds are so dominant in the existing grassland that it will likely require at least two stages of herbicidal treatment. A tractor-mounted boom spray will be used to undertake weed treatment of these areas of North Parkland, using Depitox (2-4d) & Larke (mcpa) broadleaf herbicides to tackle creeping thistle, ragwort and other dominant weed species. Spraying will leave a 15m buffer strip around the trees and woodland edge. Spraying to only be undertaken on still days where this is minimal risk of drift. Weed spraying to be undertaken in Year 1 and Year 2.

Further to Year 1 spraying, the grassland will be rolled using a heavy tractor-mounted roller. Rolling will help to aid future cut and lift grass maintenance operations. A 15m buffer will be maintained around the trees and woodland surrounding the grassland to avoid any damage to root systems.

The zone is to be monitored for the first few years to assess how the grassland is responding to treatment and the prescribed cutting regime, and the presence of coarse vegetation including bramble and bracken. This will help determine whether any adjustment is required.

4.3.4 SUSTAINABLE BEE HIVE

Installation of 2 no. sustainable bee hives, constructed from western red cedar timber with 6' larch legs and straw thatched roof. Hive to be installed in a south facing, sheltered location.



Freedom bee hive (Bee Kind Hives, 2019)

4.3.5 WOODLAND EDGE PLANTING

%	No.	Species	Scientific name	Form	Height	Type
25	108	Hawthorn	<i>Crataegus monogyna</i>	1u1	60-90cm	Bare root transplant
10	43	Midland hawthorn	<i>Crataegus laevigata</i>			
20	86	Hazel	<i>Corylus avellana</i>			
15	65	Field maple	<i>Acer campestre</i>			
5	22	Dog rose	<i>Rosa canina</i>			
5	22	Blackthorn	<i>Prunus spinosa</i>			
10	43	Guelder rose	<i>Viburnum opulus</i>			
10	43	Rowan	<i>Sorbus aucuparia</i>			

All shrubs to be fitted with 1.2m tubex tree shelters and 1.2m softwood stakes. Shrubs to be planted at spacing of four per meter.

4.4 Heathland Actions

AIM	To restore the SSSI Heathland back to a manageable 'wood pasture' habitat mosaic of lowland heath, acid grassland and scrub.	
OBJECTIVES	HL1	Undertake scrub and woodland removal to open up areas of the site.
	HL2	Commence a programme of bracken treatment.
	HL3	Ensure that all restorative works include for protected species mitigation as required.
	HL4	Install infrastructure to allow for low intensity grazing management.



4.4 Heathland Actions

4.4.1 CAPITAL WORK PROGRAMME

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
HLC1	Liaison with Natural England	Discussion/site meeting with Natural England officer to discuss management objectives and gain consent for all planned operations within the SSSI.	1	n/a	1	Item	ML	n/a	4.5.5	All
HLC2a	Ponds GCN survey	Undertake eDNA surveys to confirm whether great crested newt are present within any of the ponds.	2	mid-Apr – Jun	4	No.	ML	n/a	4.4.7	HL3
HLC2b	Ponds GCN licence	Stage 1 - If great crested newt are confirmed present in any ponds, full population surveys will be required (including 6 survey visits) and a Natural England licence to be obtained.	2	mid-Apr - Jun	1	Item	ML	n/a	4.4.8	HL3
HLC2c	Ponds GCN mitigation	Stage 2 - Mitigation for great crested newt will be implemented to include timing of works to ponds to be carried out in winter and vegetation clearance in summer under supervision and a method statement.	2	n/a	1	Item	ML	n/a	4.4.9	HL3
HLC3a	Reptile survey	Reptile presence/absence survey using artificial refugia; survey to determine whether any further mitigation is required – the intention will be to avoid needing to move reptiles.	2	Mar - Sep	1	Item	ML	n/a	4.4.10	HL3
HLC3b	Reptile mitigation	Stage 1 - If reptiles are present and require translocation, a potential receptor site will be identified within Nyn Park; this may require some further surveying to determine suitability.	2	Mar - Sep	1	Item	ML	n/a	4.4.10	HL3
HLC3c	Reptile mitigation	Stage 2 - Installation of reptile fencing under the supervision of an ecologist.	2	Mar - Sep	1	Item	ML	n/a	4.4.10	HL3
HLC3d	Reptile mitigation	Stage 3 - Reptile trapping and translocation to a receptor site, to take place for 30 consecutive days.	2	Mar - Sep	1	Item	ML	n/a	4.4.10	HL3
HLC4a	Bracken – Stage 1 herbicide treatment	Undertake spray treatment of bracken areas with Asulox herbicide.	2	mid-Jul - late Sep	6	Ha	ML	n/a	4.4.3	HL2
HLC4b	Bracken – Stage 2 herbicide treatment	Undertake spray treatment of bracken areas with Asulox herbicide.	2	mid-Jul - late Sep	6	Ha	ML	n/a	4.4.3	HL2
HLC4c	Bracken – Stage 3 herbicide treatment	Carry out spot treatment of regenerating bracken using Asulox with spot-guns and hose & lance on an ATV/quad.	3	mid-Jul - late Sep	6	Ha	ML	n/a	4.4.3	HL2
HLC5a	Scrub and tree removal	Fell and clear up to 25% of scrub and trees using a tree shear and rotator grapple, retaining best specimens and avoiding groups around the pond and hollows. Clearance to focus on southern section leaving a considerable buffer along the northern boundary.	3	Sep - Feb	1.5	Ha	ML	Best trees and groups to be marked up for retention.	-	HL1
HLC5b	Bracken mulch clearance	Scrape and dispose as much bracken mulch as possible; intention to lose on site - location TBD.	3	Sep - Feb	1.5	Ha	ML	-	-	HL1
HLC5c	Scrub and tree removal	Fell and clear up to 25% of scrub and trees using a tree shear and rotator grapple, retaining best specimens and avoiding groups around the pond and hollows. Clearance to focus on southern section leaving a considerable buffer along the northern boundary.	6	Sep - Feb	1.5	Ha	ML	Best trees and groups to be marked up for retention.	-	HL1
HLC5d	Bracken mulch clearance	Scrape and dispose as much bracken mulch as possible; intention to lose on site - location TBD.	6	Sep - Feb	1.5	Ha	ML	-	-	HL1
HLC5e	Scrub and tree removal	Fell and clear up to 25% of scrub and trees using a tree shear and rotator grapple, retaining best specimens and avoiding groups around the pond and hollows. Clearance to focus on southern section leaving a considerable buffer along the northern boundary.	9	Sep - Feb	1.5	Ha	ML	Best trees and groups to be marked up for retention.	-	HL1
HLC5f	Bracken mulch clearance	Scrape and dispose as much bracken mulch as possible; intention to lose on site - location TBD.	9	Sep - Feb	1.5	Ha	ML	-	-	HL1
HLC6a	Heathland creation – sowing	Supply and spread heather litter over prepared seed bed to a depth of 50-100mm; allowance for supply and delivery of 50 bags (each bag should cover approx. 20 m2)	3	Autumn	1000	m2	ML	n/a	-	HL1
HLC6b	Heathland creation – sowing	Supply and spread heather litter over prepared seed bed to a depth of 50-100mm; allowance for supply and delivery of 50 bags (each bag should cover approx. 20 m2)	6	Autumn	1000	m2	ML	n/a	-	HL1
HLC6c	Heathland creation – sowing	Supply and spread heather litter over prepared seed bed to a depth of 50-100mm; allowance for supply and delivery of 50 bags (each bag should cover approx. 20 m2)	9	Autumn	1000	m2	ML	n/a	-	HL1
HLC7a	Preparation for grazing fencing	Undertake preparatory works to set out the fence line, to include cutting back branches and removing scrub vegetation as required.	3	Sep - Feb	960	L m	ML	Ecological walkover	4.4.4	HL4
HLC7b	Stock fencing	Supply and install 1.2m height stock fencing to include timber posts, high tensile stock netting, and 2-strands of barbed wire.	3	n/a	960	L m	ML	n/a	4.4.4	HL4

4.4 Heathland Actions

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
HLc7c	Gates	Include for the installation of 2 no. 3m wide timber gates	3	n/a	2	No.	ML	n/a	4.4.4	HL4
HLc7d	Water supply	Supply and install a galvanised steel drinking trough and connect to a nearby water supply (TBC).	3	n/a	1	Item	ML	Confirm location of a suitable water supply or the need to use a bowser.	4.4.4	HL4
HLc7e	Timber cattle corral	Supply and install a timber corral for gathering livestock.	3	n/a	1	Item	ML	n/a	4.4.4	HL4

4.4.2 ANNUAL MAINTENANCE & MONITORING PROGRAMME

Ref	Item	Detail	Start	End	Annual Frequency	Years	Quantity	Unit	Delivery	Objective ref.
HLm1	Grazing management	Provision of a herd of native breed animals to provide low intensity grazing including delivery, collection and regular inspections.	TBC	TBC	n/a	3 onwards	1	Item	ML	HL4
HLm2a	Heather Stage 1 – first cut	Undertake a first cut of established heather plants three years following planting. Plants to be cut to a height of 150mm with all arisings collected	Oct	Nov	1	6	0.1	Ha	ML	HL
HLm2b	Heather Stage 1 – rotational cutting	Heather to be cut every 1-3 years to a height of approximately 150mm; rotational system to be set once areas of heather have established; All arisings to be collected and re-used.	Oct	Nov	1	7 onwards	0.1	Ha	ML	HL1
-	Wood pasture & heath habitats	Monitoring of the restoration works on Heathland zone to include the development of desirable vegetation and re-emergence of bracken, rhododendron, and scrub; monitoring to determine whether additional maintenance is required and/or import of heather brush.	Jul	Sep	1	Yr 3, 4, 6, 8, 10	1	Item	ML	HL1
-	Grazing infrastructure	Undertake an annual inspection to check that fences and gates are all intact and water supply is functioning.	Mar	Apr	1	Yr 3 onwards	1	Item	ML	HL4

4.4.3 BRACKEN MANAGEMENT

There are a number of different methodologies available for managing bracken, dependent on site conditions and constraints. It is likely that the following three-stage approach will be adopted:

Stage 1 In Year 1, area to be treated with asulam (Asulox). This is a selective herbicide that specifically targets bracken and docks and can be applied without risk to any other species (with the exception of other ferns). Asulam should be applied by ground spraying at an approximate rate of 11 litres/ha. Dye can be added to the spray to show which plants have been treated.

Asulox should only be applied on a dry and preferably still day to limit chance of drift. The best time is when bracken is in full frond, between mid-July to late September.

Bracken should not be cut prior to treatment for the herbicide to be most effective. Following treatment, it the compartment should be left undisturbed until at least autumn.

Stage 2 Repeat same treatment in Year 2.

Stage 3 Carry out spot treatment of regenerating bracken using Asulox with spot-guns and hose & lance on an ATV/quad. Establish grazing infrastructure (as per specification) and in Year 3 introduce low intensity conservation grazing to the site.

4.4.4 GRAZING INFRASTRUCTURE

Stock fencing to be installed around the zone. The fencing will match in appearance the deer fencing that extends around the entire site boundary but at 1.2m height instead of 2m height. A 2-3m strip of short grass will be maintained around the perimeter of the fence to allow for maintenance access.

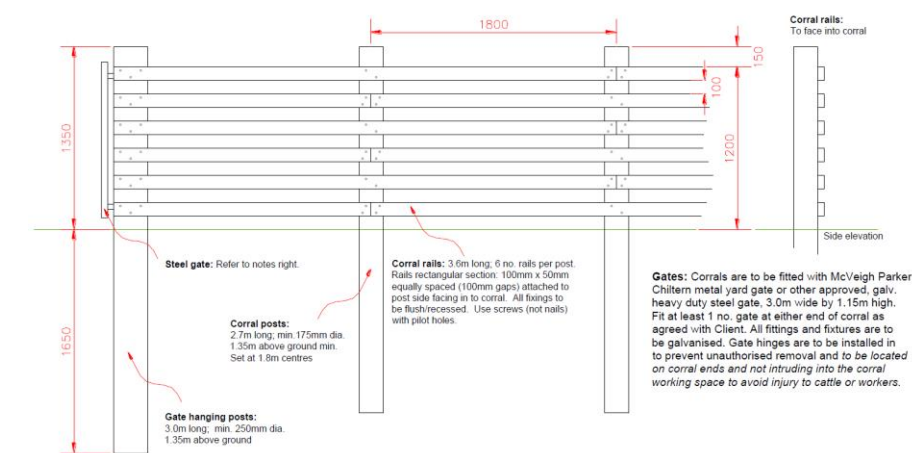
Fencing to include (a) 1.2m x 125-150mm diameter peeled & pressure treated creosote strainer posts at 50m intervals and any changes in direction, and (b) 1.65m x 75-100mm diameter peeled & pressure treated creosote intermediate posts at 3.5m intervals. Posts to be fitted with high tensile 8-80-15 stock netting and 2-strands of barbed wire, fastened with 40mm staples to a finished height of between 1100-1200mm.

A timber corral is to be installed to assist with the gathering of stock from the field. The corral will be 10.8m x 6m in size with two separate compartments and a post & rail entrance funnel. Specification as follows:

2 no. 3m heavy duty galvanised steel gates;

2.4m x 150mm x 150mm 4 way weathered timber posts at 1.8m intervals, concreted into the ground;

3.6m x 50mm x 100mm timber rails; 6 rails per post at equal 100m intervals, fastened with 90mm screws.



Source: Lee Valley Regional Park Authority (June 2013)

4.4 Heathland Actions

4.4.5 LIAISON WITH NATURAL ENGLAND

The proposed management operations for the Heathland will require consent from Natural England prior to commencement. An on-site meeting or detailed discussion is to be held with Natural England to confirm the proposed management objectives and operations prior to commencement. Once consent is received, management must follow any strict guidelines provided by Natural England to avoid detrimental impacts to the SSSI.

4.4.6 ECOLOGICAL SITE WALKOVER

Prior to any woodland thinning operations within the zone, an ecologist will conduct a pre-commencement site walkover survey to identify any important ecological features that will need to be considered prior to or during management operations. The ecologist will focus on the identification of potential for protected species, including potential hazel dormouse habitat, potential roosting bat features in trees, presence of badger setts, and presence of potential reptile and amphibian hibernacula.

Any features found will either be surveyed further to confirm presence/absence or mitigation will be implemented to avoid damaging impacts. Mitigation will be determined by the ecologist on a case-by-case basis, however Method Statements relating to badger setts may be broadly followed (see **Appendix B** for *Method Statement for Works Close to Badger Setts*).

4.4.7 POND SURVEYS FOR PRESENCE/ABSENCE OF GREAT CRESTED NEWT

Great crested newt surveys will involve the collection of water samples between mid-April to end of June, followed by external laboratory analysis of the samples to confirm if great crested newt are present or absent.

4.4.8 GREAT CRESTED NEWT MITIGATION

If great crested newt are confirmed to be present, mitigation will be implemented in two stages, as follows;

Stage 1 A Natural England Mitigation licence will be obtained to allow the habitat restoration works to proceed lawfully. In order to gain a licence, a full population survey of each pond found to support newts will be undertaken between March and mid-June. This will involve six visits, each using a combination of survey techniques (torching, bottle trapping and netting).

Stage 2 Following attainment of a Natural England licence, a Method Statement for the works will be followed, to include appropriate timing and supervision of works by an ecologist. Appropriate timing may involve undertaking any works to the ponds during winter and carrying out vegetation removal/ground works during the summer. The latter may contradict what is currently in the plan for vegetation removal due to avoidance of bird nesting season (WWc3, WWc4 and WWc5a), however if the timings of the plan need to change then further mitigation and precautionary measures will be put into place as required; to be determined following completion of 4.5.10.

4.4.9 REPTILE SURVEY

A reptile presence/absence survey will be required prior to clearance of vegetation and other operations. The surveys will involve the installation of artificial refugia across suitable habitat, to then be checked for the presence of reptiles on seven survey visits between March and October. If reptile are not found to be present, then the works can proceed without the likelihood of encountering reptile, however a precautionary approach should be implemented.

4.4.10 REPTILE MITIGATION

If reptile are found to be present, the works methodology will be designed to ensure that they are not impacted (i.e. scrub management to avoid areas that may support basking reptiles). However, if this is not possible, it may be necessary to implement the following mitigation stages to avoid detrimental impacts;

Stage 1 A receptor site for reptile to be determined. The receptor site will be chosen based on its proximity to the zone, its suitability, and absence of an existing reptile population (to be determined by survey of the receptor site as per 4.5.12 or through enhancement to increase its carrying capacity).

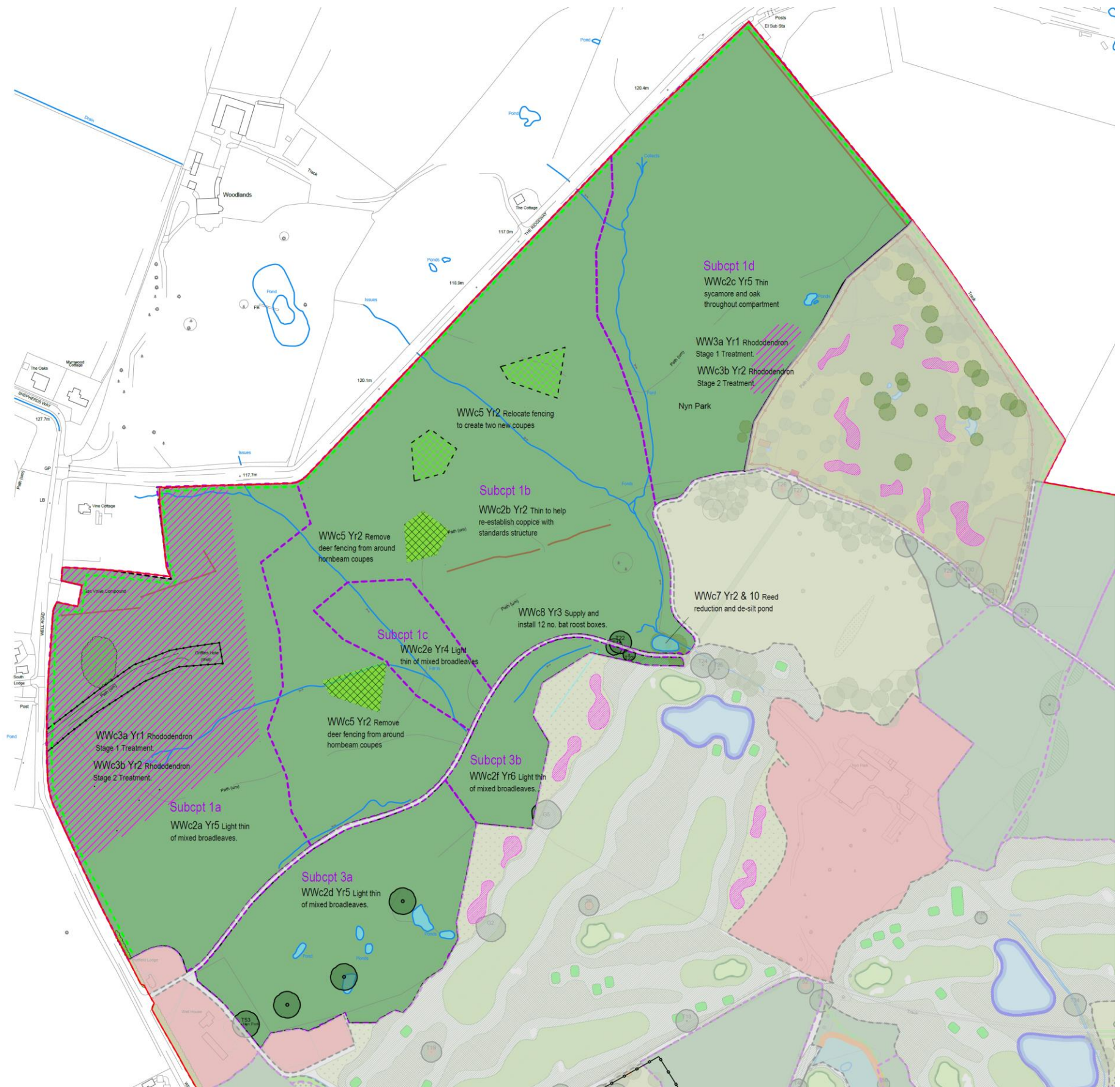
Stage 2 Reptile fencing will be installed under the supervision of an ecologist. The reptile fencing installation will follow standard best practice guidelines, using standardised reptile fencing.

Stage 3 Once fencing is in place, reptile trapping and translocation can commence, following best practice guidelines and overseen by an ecologist. Reptiles will be translocated to the pre-determined receptor site and kept out of the operational area by the fencing. Trapping will take place for a minimum of 30 days between March and October.

Habitat manipulation will also be carried out within the zone. This could include cutting areas of high habitat potential within the site to a lower level (under supervision), to reduce its suitability, making it easier to capture the remaining individuals.

4.5 Well Wood Actions

AIM	To improve the condition and quality of Well Wood SSSI through a programme of woodland management and targeted restoration.	
OBJECTIVES	WW1	Commence a programme of rhododendron management to protect the integrity of the SSSI.
	WW2	Encourage natural broadleaf regeneration through the protection of saplings and canopy management.
	WW3	Revitalise areas of over-stood hornbeam coppice.
	WW4	Undertake monitoring and management to protect the integrity of the woodland from pests & diseases.
	WW5	Improve habitat quality and diversity for wildlife, including protected species.



4.5 Well Wood Actions

4.5.1 CAPITAL WORK PROGRAMME

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
WWc1a	UKFS Woodland Management Plan	Production of a UKFS Woodland Management Plan for Well Wood SSSI (and other woodlands on the estate) to include Plan of Operations, Felling Licence, work schedule and SSSI consent; to be submitted to FC and NE.	1	n/a	1	Item	ML	n/a	-	All
WWc1b	Liaison with Natural England	Discussion/site meeting with Natural England officer to discuss management objectives and gain consent for all planned operations within the SSSI.	1	n/a	1	Item	ML	n/a	4.5.6	All
WWc2a	Thinning – subcpt 1a	Carry out a light thin of mixed broadleaves later in the plan period.	5	Sep - Feb	8.04	Ha	ML	Ecological walkover	-	WW3
WWc2b	Thinning – subcpt 1b	Thin to help re-establish the coppice with standards structure. Respace the stand oaks to around 12 per acre and thin the hornbeam understorey by following a graduated thinning procedure.	2	Sep - Nov	12.26	Ha	ML	Ecological walkover	-	WW3
WWc2c	Thinning – subcpt 1d	Light thin of sycamore and oak later in the plan period.	2	Sep - Nov	7.71	Ha	ML	Ecological walkover	-	WW3
WWc2d	Thinning – subcpt 3a	Light thin of mixed broadleaves.	5	Sep - Nov	3.57	Ha	ML	Ecological walkover	-	WW3
WWc2e	Thinning – subcpt 1c	Light thin of mixed broadleaves.	4	Sep - Nov	1.2	Ha	ML	Ecological walkover	-	WW3
WWc2f	Thinning – subcpt 3b	Light thin of mixed broadleaves.	6	Sep - Nov	1.3	Ha	ML	Ecological walkover	-	WW3
WWc3a	Rhododendron – Stage 1 cutting and stump treatment – all subcpts	Use a 360 excavator and grapple to pull rhododendron out of the ground, removing as much root as possible. Arisings to be burnt on site with the bonfire buried on completion.	1	Oct - Feb	7	Ha	ML	n/a	4.5.3	WW1
WWc3b	Rhododendron – Stage 2 herbicide treatment – all subcpts	Spray rhododendron regrowth with a glyphosate based herbicide. NOTE: Likely to require annual follow up treatment.	2	Sep - Oct	7	Ha	ML	n/a	4.5.3	WW1
WWc4a	Protection of natural broadleaf regeneration – subcpts 1a, 1b & 1c	Install 1.2m height tubex tree guards with wooden stakes to protect naturally regenerating oak and hornbeam.	1	Any time	200	No.	ML	n/a	4.5.4	WW2
WWc4b	Protection of natural broadleaf regeneration – subcpts 1a, 1b & 1c	Remove tree guards and re-use elsewhere in the wood if still in useable condition.	5-7	Any time	200	No.	ML	n/a	4.5.4	WW2
WWc5	Hornbeam regen coupes – subcpt 1b	Carefully remove fencing from around 2 no. hornbeam regen coupes and use to establish two new coupes elsewhere in the woodland.	2	Any time	1	Item	ML	Confirm exact location for new coupes	4.5.4	WW2
WWc6	Acute Oak Decline survey	Undertake a survey to record, map and tag any oak trees showing evidence of Acute Oak Decline, following Forest Research guidance.	1	May - Oct	1	Item	ML	n/a	4.5.5	WW4
WWc7a	Well Wood Pond	Reed reduction and light de-silt	2	Any time	1	1	ML	Work to be specified	-	WW5
WWc7b	Well Wood Pond	Reed reduction and light de-silt	10	Any time	1	1	ML	Work to be specified	-	WW5
WWc8	Bat roost boxes	Supply and install a series of bat roost boxes in trees throughout Well Wood, focussing on ride and woodland edges, and close to ponds.	3	Any time	12	No.	ML	Ecologist to determine most appropriate locations	4.5.8	WW5
WWc9	Creation of pollards	Creation of pollards from large maidens and/or multi-stemmed trees.	1-3	Sep - Nov	TBC	No.	ML	Ecologist/Arborist to identify suitable trees	-	WW5
WWO	Creation of orchard	Undertake study and design specification for traditional orchard within grassland directly adjacent to Well Wood.	1	n/a	n/a	Item	ML	Ecological walkover	-	WW5
WWO	Creation of orchard	Orchard planting as per specification.	2	Sep -Feb	TBC	-	ML	TBC	-	WW5

4.5.2 ANNUAL MAINTENANCE & MONITORING PROGRAMME

Ref	Item	Detail	Start	End	Annual Frequency	Years	Quantity	Unit	Delivery	Objective ref.
WWm1	Maintenance track	Undertake topping of boundary maintenance track, including clearance of any debris blocking the route.	Aug	Oct	1	All	1900	L m	ML	n/a

4.5 Well Wood Actions

Ref	Item	Detail	Start	End	Annual Frequency	Years	Quantity	Unit	Delivery	Objective ref.
SBm1	Site boundaries – Litter picking	Litter to be picked around site boundaries	Jan	Dec	12	All	1	Item	ML	n/a
-	Woodlands	Annual consultant visit to walk all areas of woodland and assess status of works and the need for any alterations to plan of operations, including monitoring of ash dieback, AOD, OPM, aspen suckering etc.	Jan	Dec	1	All	1	Item	ML	All
-	Woodlands – thinning and felling	Prior to any thinning or felling operations, woodland subjects to receive a walkover survey from an ecologist to check for the presence of protected species/habitats and any other constraints to be considered.	Jan	Dec	1	All	1	Item	ML	All
-	Tree Safety Inspection	Professional Tree Inspector to undertake a Tree Safety Inspection of all wooded boundaries every 2.5-3 years; any trees with significant defects requiring remedial works will be recorded in a detailed report.	Jan	Dec	1	Yr 1, Yr 4, Yr 7, Yr 10	1	Item	ML	-
-	Orchard	Ecologist to monitor establishment and condition of orchard.	TBC	TBC	2	All	1	Item	ML	-

4.5.3 RHODODENDRON MANAGEMENT

There are a number of different control techniques for managing rhododendron depending on site conditions and constraints. For rhododendron across Well Wood the following three-stage approach will be adopted:

Stage 1 In Year 1 between October and February, use a 360 excavator and grapple to pull rhododendron out of the ground, removing as much root as possible. Arisings to be burnt on site with the bonfire buried on completion.

Stage 2 Target foliar regrowth after new shoots have had at least one full growing season to develop, and before it reaches a height of 1.3m. Apply glyphosate between March and October; use a knapsack sprayer at a low pressure fitted with a flood jet or solid cone nozzle

Stage 3 Annually monitor for regrowth and spray with glyphosate as required.

It is recommended to start in sub-compartment 1a where rhododendron growth is densest and work in a north-east direction across Well Wood towards sub-compartment 1e.

4.5.4 PROTECTION OF NATURAL REGENERATION

Natural regeneration is to be protected from browsing deer to enable successful recruitment of trees into the understory. A combination of individual tree guards and fenced coupes will be used within Well Wood.

Tree shelters Tubex tree shelters at a height of 1.2m and diameter of 73-105mm will protect saplings against browsing from muntjac and roe deer. Shelters should be installed with a 1.2 – 1.35m square sawn stake. Trees will naturally outgrow and break free from the shelters, once this occurs the shelters should be collected and reused if possible.

Fenced coupes The two fenced coupes have proved successful at protecting coppiced hornbeam. In Year 2 carefully dismantle the coupes, and inspect for signs of damage. Repair or replace damaged sections and re-instate the coupes around coppiced hornbeam stools elsewhere in Well Wood.

4.5.5 DISEASE MANAGEMENT

The following recommendations are based on guidance from Forest Research. All oak in previously noted areas should be inspected for Acute Oak Decline (AOD) and infected specimens individually mapped, tagged and recorded. If only a limited number of trees appear to be infected, it would be prudent to fell and destroy the infected individuals to reduce the risk of infecting healthy trees elsewhere on the estate. If a large number of trees are infected, unless there are immediate safety concerns, they should be left in place and monitored.

If felling, undertake when conditions and trees are dry, as wet conditions may increase the likelihood of spreading pathogens. The outer layer of bark and sapwood should be stripped after felling and burnt immediately. Caution should be exercised about the resulting use of wood because it is not known if the disease affects timber properties. All felling equipment must be disinfected after use and mud should be washed off boots and vehicle tires before moving elsewhere on the estate.

Ash trees should be monitored and only felled if there are safety concerns. Any tolerant individuals should be reported to Forest Research,

4.5.6 UKFS WOODLAND MANAGEMENT PLAN

The majority of proposed management operations for Well Wood SSSI will require consent from Natural England prior to commencement. It has been agreed that a UKFS Woodland Management Plan will need to be produced, including Felling Licence, Plan or Operations, and Work Schedule. This may need to be followed by an on-site meeting or detailed discussion with Natural England to confirm the proposed management objectives and operations prior to commencement. Once

consent is received, management must follow any strict guidelines provided by Natural England to avoid detrimental impacts to the SSSI.

4.5.7 ECOLOGICAL SITE WALKOVER

Prior to any woodland thinning operations within Well Wood, an ecologist will conduct a pre-commencement site walkover survey to identify any important ecological features that will need to be considered prior to or during management operations. The ecologist will focus on the identification of potential for protected species, including potential hazel dormouse habitat, potential roosting bat features in trees, presence of badger setts, and presence of potential reptile and amphibian hibernacula.

Any features found will either be surveyed further to confirm presence/absence or mitigation will be implemented to avoid damaging impacts. Mitigation will be determined by the ecologist on a case-by-case basis, however Method Statements relating to badger setts may be broadly followed (see **Appendix B** for *Method Statement for Works Close to Badger Setts*).

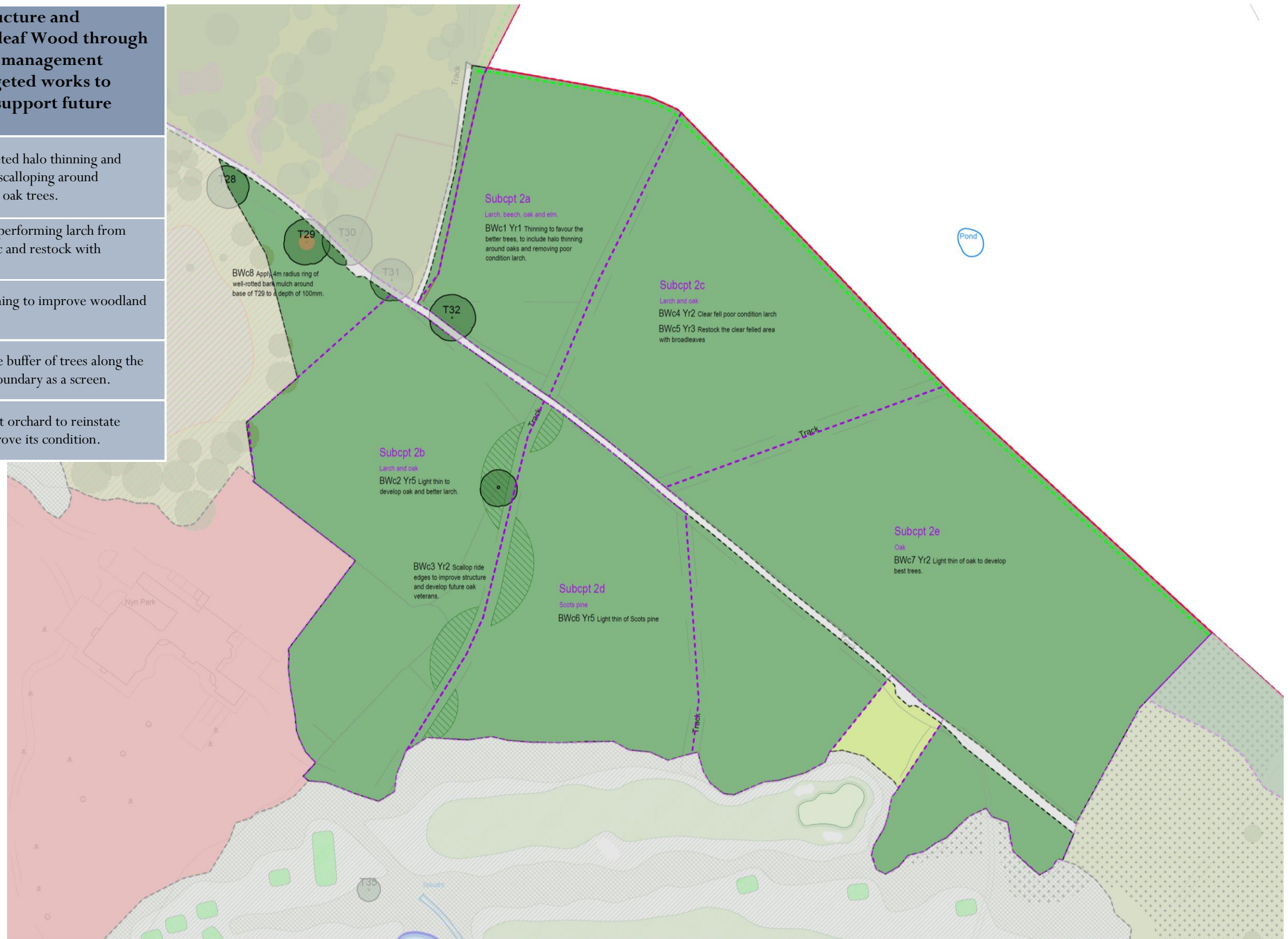
4.5.8 BAT ROOST BOXES

Make	Type	No.	Location
Schwelger	3FF Bat Box (self cleaning)	6	To be attached to trees at 4-6m height.
Schwelger	2FN Special Woodland Bat Box	6	To be attached to trees at 4-6m height.

Bat boxes to be installed where they are out of reach of people and predators at a minimum height of 4m above the ground, placed at differing heights and facing in different directions. Where possible, boxes to be sited adjacent to linear foraging and commuting features such as rides and tree lines. Boxes to avoid areas in close proximity to artificial lighting or where there is excessive noise or vibration.

4.6 Broadleaf Wood

AIM	To improve the structure and condition of Broadleaf Wood through ongoing woodland management operations and targeted works to enhance rides and support future veteran trees.
OBJECTIVES	BW1 Undertake targeted halo thinning and woodland edge scalloping around mature/veteran oak trees.
	BW2 Remove under-performing larch from compartment 2c and restock with broadleaves.
	BW3 Undertake thinning to improve woodland structure.
	BW4 Maintain a dense buffer of trees along the north-eastern boundary as a screen.
	BW5 Restore remnant orchard to reinstate habitat and improve its condition.



4.6 Broadleaf Wood

4.6.1 CAPITAL WORK PROGRAMME

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
BWc1	Thinning – subcpt 2a	Thin stand to favour the better trees; halo thin around the best oaks and remove poor condition larch.	1	Sep - Feb	1.39	Ha	ML	Ecological walkover	n/a	BW3
BWc2	Thinning – subcpt 2b	Light thin to develop oak and better larch.	5	Sep - Feb	2.41	Ha	ML	Ecological walkover	n/a	BW3
BWc2	Orchard restoration	Undertake study and design orchard reinstatement and restoration	1	n/a	0.1	Ha	ML	Ecological walkover	n/a	BW5
BWc2	Orchard restoration	Carry out orchard restoration & planting	2	Sep -Feb	0.1	Ha	ML	TBC	n/a	BW5
BWc3	Ride enhancement – subcpt 2b & 2d	Scallop ride edges to improve structure and develop future oak veterans.	2	Sep – Feb	0.6	Ha	ML	Mark up trees to determine the layout of the scallops	n/a	BW1
BWc4	Larch removal – subcpt 2c	Clear fell poor condition larch.	2	Sep – Feb	0.98	Ha	ML	Ecological walkover	n/a	BW2
BWc5	Restocking – subcpt 2c	Restock the clear-felled area with broadleaves.	3	Nov - Feb	0.98	Ha	ML	n/a	4.6.3	BW2
BWc6	Thinning – subcpt 2d	Light thin of Scots pine	5	Sep - Feb	1.56	Ha	ML	Ecological walkover	n/a	BW3
BWc7	Thinning – subcpt 2e	Light thin of oak to help develop best trees.	2	Sep - Feb	3.84	Ha	ML	Ecological walkover	n/a	BW3
BWc8	Tree mulching	Carefully cut back any vegetation growing from around base of notable tree T29. Apply 4m radius ring of well-rotted bark mulch around base of each tree to a depth of 100mm.	1	September	1	No.	ML	n/a	n/a	n/a

4.6.2 ANNUAL MAINTENANCE & MONITORING PROGRAMME

Ref	Item	Detail	Start	End	Annual Frequency	Years	Quantity	Unit	Delivery	Objective ref.
BWm1	Woodland Planting subcpt 2c – weeding	Carry out knapsack weeding around the base of each tree using a non-residual glyphosate based herbicide, to create a 1m diameter weed free area.	Mar	Sep	1	3 – 5	0.98	Ha	ML	BW2
BWm2	Woodland Planting subcpt 2c – guards & stakes	Check guards and stakes are still in place; right any that have been knocked over and replace any that have broken.	Jan	Dec	1	3 – 5	0.98	Ha	ML	BW2
BWm3	Woodland Planting subcpt 2c – beating up	Check planting for any losses and replace in next growing season; allowance for 10%	Aug	Sep	1	4	0.98	Ha	ML	BW2
BWm4	Woodland Planting subcpt 2c – removing guards	Remove tree guards and stakes – likely to be in Years 8-10 but to be confirmed by monitoring.	Jan	Dec	1	8 - 10	0.98	Ha	ML	BW2
BWm5	Ride maintenance	Rides to be cut once a year in late-summer to a height of approx. 50-70mm with arisings left in situ; to include cutting a 1.5-2m strip either side of access track.	Sep	Oct	1	Every	1500	L m	ML	BW3
BWm6	Maintenance track	Undertake topping of boundary maintenance track, including clearance of any debris blocking the route.	Sep	Oct	1	Every	490	L m	ML	n/a
BWm7	Tree mulching	Turn over bark mulch by hand and top up levels to 100mm total depth.	March	April	1	3, 6 & 9	1	No.	ML	NP3
-	Woodlands	Annual consultant visit to walk all areas of woodland and assess status of works and the need for any alterations to plan of operations, including monitoring of ash dieback, AOD, OPM, aspen suckering etc.	Jan	Dec	1	All	1	Item	ML	All
-	Woodlands – thinning and felling	Prior to any thinning or felling operations, woodland subcpts to receive a walkover survey from an ecologist to check for the presence of protected species/habitats and any other constraints to be considered.	Jan	Dec	1	All	1	Item	ML	All
	Orchard	Ecologist to monitor establishment and condition of orchard.	TBC	TBC	2	All	1	Item	ML	-

4.6 Broadleaf Wood

4.6.3 WOODLAND PLANTING

%	No.	Species	Scientific name	Form	Height	Type
20	314	English oak	<i>Quercus robur</i>	1u1	60-90cm	Bare root transplant
20	314	Sessile oak	<i>Quercus petraea</i>			
20	314	Hornbeam	<i>Carpinus betulus</i>			
10	157	Cherry	<i>Prunus avium</i>			
5	78	Downy birch	<i>Betula pubescens</i>			
5	78	Hazel	<i>Corylus avellana</i>			
5	78	Hawthorn	<i>Crataegus monogyna</i>			
10	157	Scots pine	<i>Pinus sylvestris</i>			
5	78	Field maple	<i>Acer campestre</i>			

All trees to be fitted with 1.2m tubex tree shelters and 1.2m softwood stakes. Trees to be planted at 2.5m spacing in groups and clumps. Approximately 1600 per hectare.

4.7 Vineyard Wood

AIM	OBJECTIVES
<p>To improve the structure, condition and resilience of Vineyard Wood through ongoing woodland management operations, targeted restorative works, and woodland planting.</p>	<p>VW1 Undertake thinning operations to improve species range and structural diversity, including halo thinning around developing mature oak trees.</p>
	<p>VW2 Carry out establishment maintenance to newly planted areas.</p>
	<p>VW3 Remove a plantation of hybrid poplar and allow for natural succession.</p>
	<p>VW4 Remove rhododendron and manage regrowth.</p>
	<p>VW5 Enhance the quality and condition of existing rides.</p>
	<p>VW6 Plant a broad band of new mixed woodland to provide improved woodland edge structure and a stronger link between Vineyard and Broadleaf Wood.</p>



4.7 Vineyard Wood

4.7.1 CAPITAL WORK PROGRAMME

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
VWc1	Hybrid poplar removal – subcpt 5c	Harvest the hybrid poplar leaving the broadleaf understorey to develop; work to be phased across two seasons.	4 – 5	Sep - Feb	1.7	Ha	ML	Ecological walkover	n/a	VW3
VWc2	Rhododendron removal – subcpt 5c	Remove rhododendron as part of felling operation	4	Sep - Feb	TBC	Ha	ML	n/a	TBC	VW4
VWc3	Tree regeneration – subcpt 5c	Monitor tree regeneration in subcpt 5c – supplementary stocking with oak, hornbeam and wild cherry if required.	5	Sep - Feb	1.7	Ha	ML	n/a	TBC	VW1
VWc4	Thinning – subcpt 5d	Thinning to favour best trees.	5	Sep - Feb	0.53	Ha	ML	Ecological walkover	n/a	VW1
VWc5	Thinning – subcpt 5e	Compartment requires urgent thin.	1	Sep - Feb	2.47	Ha	ML	Ecological walkover	n/a	VW1
VWc6	Ride enhancement – subcpt 5e	Develop and widen the ride between subcpts 5c and 5e.	1	Sep - Feb	165	L m	ML	n/a	n/a	VW5
VWc7	Thinning – subcpt 6a	Thin woodland to develop structure throughout mixed areas. Halo thin around best oaks.	1	Sep - Feb	1.83	Ha	ML	Ecological walkover	n/a	VW1
VWc8	Thinning – subcpt 6c	Thin hornbeam throughout to help develop ground flora.	2	Sep - Feb	3.59	Ha	ML	Ecological walkover	n/a	VW1
VWc9	Thinning – subcpt 6d	Thin to reduce the proportion of ash, retaining any that appear to be in healthy condition.	3	Sep - Feb	1.91	Ha	ML	Visit the site in late summer to identify and mark mature ash that are suffering from dieback and need to be felled; ensure FC felling licence has been received.	n/a	VW1
VWc10	Thinning – subcpt 6b	Thin compartment and halo thin around best oak trees.	4	Sep – Feb	1.88	Ha	ML	Ecological walkover	n/a	VW1
VWc11	Thinning – subcpt 5f	Light thin to re-establish the avenue character.	5	Sep - Feb	0.7	Ha	ML	Ecological walkover	n/a	VW1
VWc12	Weed spraying	Boom-spray open area with a non-residual glyphosate based herbicide to kill off all vegetation. Leave a 15m buffer strip along the edge of woodlands, along the stream to the west of the compartment, and around newly planted areas.	1	Aug – Sep	4	Ha	ML	n/a	4.7.3	VW6
VWc13	Soil preparation	Soils to be cultivated, rolled and harrowed in preparation for seeding.	1	Spring or Autumn	4	Ha	ML	n/a	4.7.4	VW6
VWc14	Seeding – seed mix	Consult with a seed house to confirm a suitable grass & wildflower seed mix for the soil conditions.	1	n/a	1	Item	ML	n/a	4.7.5	VW6
VWc15	Seeding – sowing	Order grass & floral seed mix (80% grass, 20% wildflowers); sow at manufacturers recommended rate, approx. 4g/m ² ; roll on completion.	1	Spring or Autumn	1.35	Ha	ML	n/a	4.7.5	VW6
VWc16	Parkland trees – Planting	Undertake planting of new specimen parkland trees within open areas to include stakes and guards.	1	Nov – Feb	10	No.	ML	Precise locations for planting to be confirmed on site.	4.7.6	VW6
VWc17	Woodland extension	Undertake new woodland planting around the northern edge of Vineyard Wood and sweeping round to join with Broadleaf Wood.	3	Nov – Feb	2.7	Ha	ML	n/a	4.7.7 & 4.7.8	VW6
VWc18	Seeding – establishment maintenance	New meadows to be mown regularly (every 6 weeks) during the first growing season; arisings to be collected and removed.	1	Mar - Sep	4	No.	ML	n/a	4.7.5	VW6

4.7 Vineyard Wood

4.7.2 ANNUAL MAINTENANCE & MONITORING PROGRAMME

Ref	Item	Detail	Start	End	Annual Frequency	Year/s	Quantity	Unit	Delivery	Objective ref.
VWm1	Woodland Planting subcpt 5c – weeding	Carry out knapsack weeding around the base of each tree using a non-residual glyphosate based herbicide, to create a 1m diameter weed free area. 53	Mar	Sep	1	5 – 7	1.7	Ha	ML	VW2
VWm2	Woodland Planting subcpt 5c – guards & stakes	Check guards and stakes are still in place; right any that have been knocked over and replace any that have broken.	Jan	Dec	1	5 – 7	1.7	Ha	ML	VW2
VWm3	Woodland Planting subcpt 5c – beating up	Check planting for any losses and replace in next growing season; allowance for 10%	Aug	Sep	1	5	1.7	Ha	ML	VW2
VWm4	Woodland Planting subcpt 5c – removing guards	Remove tree guards and stakes – likely to be in Years 8-10 but to be confirmed by monitoring.	Jan	Dec	1	10	1.7	Ha	ML	VW2
VWm5	Ride maintenance subcpts 5f and 5c	Rides to be cut once a year in late-summer to a height of approx. 50-70mm with arisings left in situ.	Sep	Oct	1	Every	510	L m	ML	VW5
VWm6	Woodland Planting subcpt 6a – weeding	Carry out knapsack weeding around the base of each tree using a non-residual glyphosate based herbicide, to create a 1m diameter weed free area.	Mar	Sep	1	1 - 2	0.27	Ha	ML	VW2
VWm7	Woodland Planting subcpt 6a – removing guards	Remove tree guards and stakes – likely to be in Years 5-7 but to be confirmed by monitoring.	Jan	Dec	n/a	5 – 7	0.27	Ha	ML	VW2
VWm8	Grass cutting – High	Use a ride-on mower (i.e. Kubota 3890) to mow a 2m width strip either side of the access road to 30-40mm height.	Mar	Sep	14	2 onwards	400	L m	ML	VW5
VWm9	Grass cutting – Spring cut	Undertake a spring grass cut to 50-70mm height with all arisings collected and removed from site.	March	Early-April	1	2 onwards	1.35	Ha	ML	VW6
VWm10	Grass cutting – Summer cut	Undertake a later-summer grass cut to 50-70mm height with all arisings left in situ for one week to shed seed before being collected and removed.	Late-July	August	1	2 onwards	1.35	Ha	ML	VW6
VWm11a	New parkland trees – weeding	Carry out knapsack weeding around the base of each tree using a non-residual glyphosate based herbicide.	Mar	Sep	2	1 – 4	2	Visits	ML	VW6
VWm11b	New parkland trees – watering	New parkland trees to be watered as needed during summer months.	Mar	Oct	8	1 – 4	8	Visits	ML	VW6
VWm11c	New parkland trees – formative pruning	Formative pruning of trees.	Nov	Feb	1	4	10	No.	ML	VW6
VWm12a	Woodland Planting – weeding	Carry out knapsack weeding around the base of each tree using a non-residual glyphosate based herbicide, to create a 1m diameter weed free area.	Mar	Sep	1	3 – 5	2.7	Ha	ML	VW6
VWm12b	Woodland Planting – guards & stakes	Check guards and stakes are still in place; right any that have been knocked over and replace any that have broken.	Jan	Dec	1	3 – 5	2.7	Ha	ML	VW6
VWm12c	Woodland Planting – beating up	Check planting for any losses and replace in next growing season; allowance for 10%	Aug	Sep	1	4	2.7	Ha	ML	VW6
VWm12d	Woodland Planting – removing guards	Remove tree guards and stakes – likely to be in Year 8 but to be confirmed by monitoring.	Jan	Dec	1	9	2.7	Ha	ML	VW6
SBm1	Site boundaries – Litter picking	Litter to be picked around site boundaries	Jan	Dec	12	All	1	Item	ML	n/a
-	Grassland	Monitor establishment of grassland and maintenance regimes. Monitoring likely to only be required for the first 2-3 years.	Aug	Sep	1	Yrs 2, 3, 4	1	Item	ML	-
-	New woodland and edge planting	Monitor establishment of new planting; record numbers of any lost trees and make plans for replacement planting; Determine need for removing stakes and guards, and eventually for thinning.	May	Sep	1	Yrs 3, 4, 7 & 10	1	Item	ML	VW2
-	New parkland trees	Monitor establishment of new planting; record numbers of any lost trees and make plans for replacement planting; Determine need for formative pruning and removal of stakes and guards.	May	Sep	1	Yrs 2, 3, 6 & 9	1	Item	ML	VW6

4.7 Vineyard Wood

Ref	Item	Detail	Start	End	Annual Frequency	Year/s	Quantity	Unit	Delivery	Objective ref.
-	Woodlands	Annual consultant visit to walk all areas of woodland and assess status of works and the need for any alterations to plan of operations, including monitoring of ash dieback, AOD, OPM, aspen suckering etc.	Jan	Dec	1	All	1	Item	ML	All
-	Woodlands – thinning and felling	Prior to any thinning or felling operations, woodland subjects to receive a walkover survey from an ecologist to check for the presence of protected species/habitats and any other constraints to be considered.	Jan	Dec	1	All	1	Item	ML	All
-	Tree Safety Inspection	Professional Tree Inspector to undertake a Tree Safety Inspection of all wooded boundaries every 2.5-3 years; any trees with significant defects requiring remedial works will be recorded in a detailed report.	Jan	Dec	1	Yr 1, Yr 4, Yr 7, Yr 10	1	Item	MI	-

4.7.3 WEED SPRAYING

Use a tractor-mounted boom spray to undertake weed treatment of the area with a glyphosate based herbicide. This is to help provide a clean seed bed in which to establish the new sward. Spraying to leave a 10m buffer strip along the woodland and stream edges and around any areas of new planting, including areas of establishing golf course vegetation dependent upon timing. Spraying to only be undertaken on still days when there is minimal risk of drift.

4.7.4 SOIL PREPARATION

Soils to be cultivated to a depth of 50mm to alleviate any compaction and then rolled and harrowed to produce a fine, firm surface. Buffer strip to be maintained as above to ensure that tree roots are not damaged. Leave the area for 3-4 weeks to give time for any residual perennial weeds to re-emerge; if required undertake a second weed spray, as per 4.4.3.

4.7.5 SEEDING

Details of soil condition from EPc1 to be used to determine the most appropriate mix of grass and wildflowers.

Sowing to be undertaken in Autumn (or Spring), aiming for damp and warm conditions. Seed to be machine distributed at a rate of approximately 4 g/m² (dependent upon manufacturer's recommendations for the particular mix used). Sow seed in overlapping sections to avoid areas being missed. Roll the areas on completion to firm in seed.

In the first season of establishment, new meadow areas to be mown regularly (every 2-4 weeks) with arisings removed. This will help control the development of annual weeds.

4.7.6 PARKLAND TREES – PLANTING

No.	Species	Scientific name	Form	Height	Type
3	Lime	<i>Tilia x europaea</i>	Standard	2.5-3m	Container grown

No.	Species	Scientific name	Form	Height	Type
4	English oak	<i>Quercus robur</i> 54			
3	Red maple	<i>Acer rubrum</i>			

Tree pits to be dug at least 1.5 times wider than the size of the root ball but no deeper. Remove any material from the pit which may inhibit root development (i.e. larger stones, debris etc) and loosen the bottom and sides of the pit to encourage root establishment.

Ensure that new trees are only lifted by the root ball to avoid damage to stem and crown. Follow any specific instructions provided by the nursery for planting the trees.

Carefully position the root ball in the pit, ensuring that the top of the ball is raised at least 5cm above the level of the surrounding soil. Prepare a mix of imported top soil with peat-free compost (approximately 30% compost to 70% soil) and backfill the hole, firming around to ensure the tree is not loose in the ground;

Standard trees to be fitted with a supporting system comprising two softwood machine-rounded timber stakes (approx. 2.4m x 60mm) with rubber ties and spacers. Multi-stemmed trees to be fitted with underground anchoring systems.

Water the tree and ensure the root ball is well saturated. Cover the planting pit with well-rotted bark mulch to a minimum depth of 100mm and a diameter of 1m, leaving a hollow in the centre to avoid the base of the tree rotting.

For the first year of establishment, plants to be watered between April and September as required by climatic conditions to ensure that the soil doesn't get too dry. Mulch to be topped up and weeds removed/killed as required. After the first year's establishment, trees to be inspected for losses, all of which will be replaced.

4.7.7 WOODLAND PLANTING

%	No.	Species	Scientific name	Form	Height	Type
20	780	English oak	<i>Quercus robur</i>			
20	780	Sessile oak	<i>Quercus petraea</i>			
20	780	Hornbeam	<i>Carpinus betulus</i>			
10	390	Cherry	<i>Prunus avium</i>			
5	195	Downy birch	<i>Betula pubescens</i>			
5	195	Hazel	<i>Corylus avellana</i>			
5	195	Hawthorn	<i>Crataegus monogyna</i>			
10	390	Scots pine	<i>Pinus sylvestris</i>			
5	195	Field maple	<i>Acer campestre</i>			

%	No.	Species	Scientific name	Form	Height	Type
20	780	English oak	<i>Quercus robur</i>			
20	780	Sessile oak	<i>Quercus petraea</i>			
20	780	Hornbeam	<i>Carpinus betulus</i>			
10	390	Cherry	<i>Prunus avium</i>			
5	195	Downy birch	<i>Betula pubescens</i>			
5	195	Hazel	<i>Corylus avellana</i>			
5	195	Hawthorn	<i>Crataegus monogyna</i>			
10	390	Scots pine	<i>Pinus sylvestris</i>			
5	195	Field maple	<i>Acer campestre</i>			

All trees to be fitted with 1.2m tubex tree shelters and 1.2m softwood stakes. Trees to be planted at 2.5m spacing in groups and clumps. Approximately 1600 per hectare.

1u1 refers to plants that are two years old and have had their roots undercut at least once in this time; undercutting helps to develop denser, fibrous root systems which improve the quality and establishment of trees when transplanted.

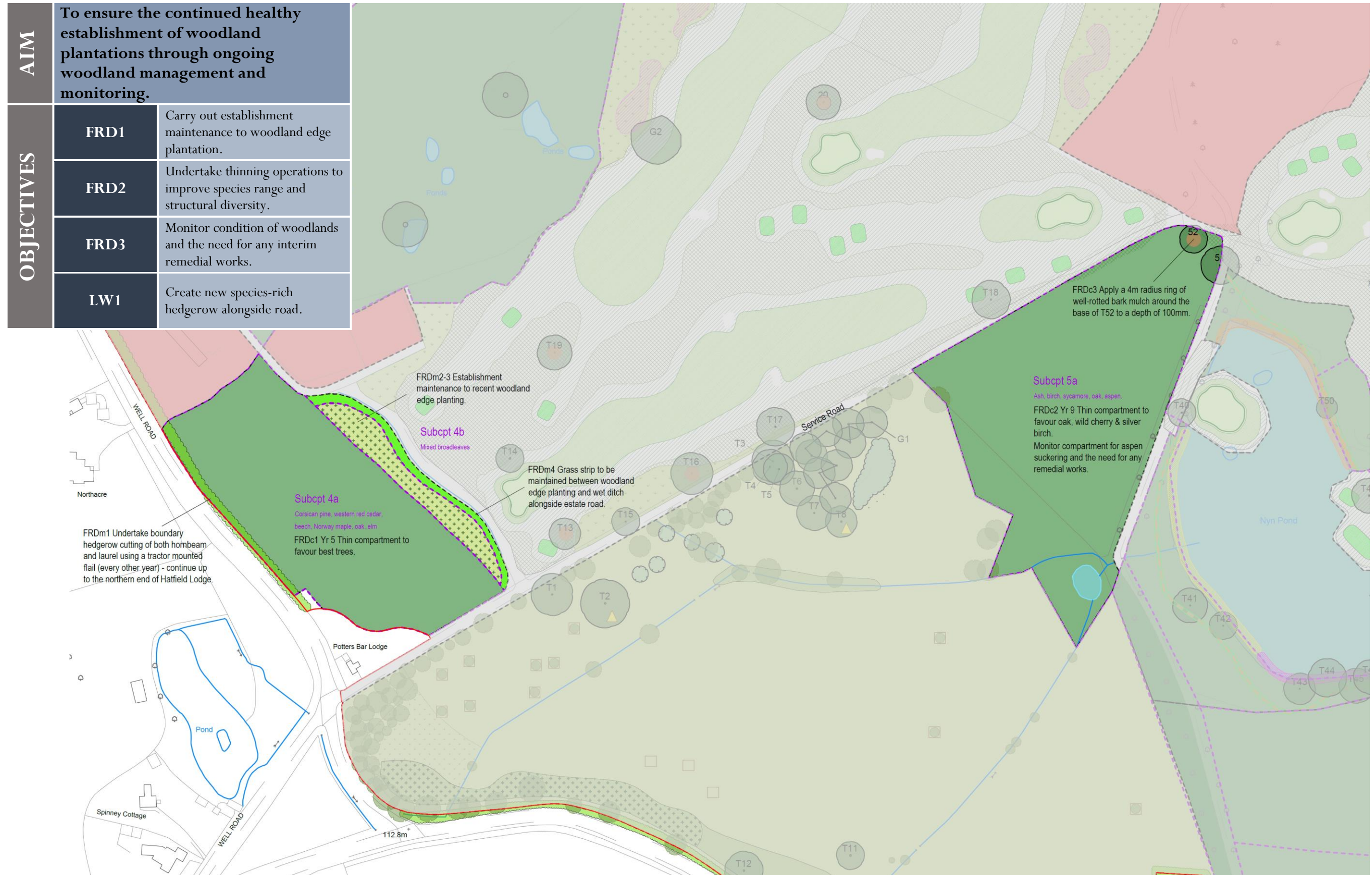
4.7.8 WOODLAND EDGE PLANTING

%	No.	Species	Scientific name	Form	Height	Type
25	108	Hawthorn	<i>Crataegus monogyna</i>			
10	43	Midland hawthorn	<i>Crataegus laevigata</i>			
20	86	Hazel	<i>Corylus avellana</i>			
15	65	Field maple	<i>Acer campestre</i>			
5	22	Dog rose	<i>Rosa canina</i>			
5	22	Blackthorn	<i>Prunus spinosa</i>			
10	43	Guelder rose	<i>Viburnum opulus</i>			
10	43	Rowan	<i>Sorbus aucuparia</i>			

4.7 Vineyard Wood

All trees to be fitted with 1.2m tubex tree shelters and 1.2m softwood stakes. Trees to be planted at 2.5m spacing in groups and clumps. Approximately 1600 per hectare.

4.8 FRD Spinney & Lodge Wood



4.8 FRD Spinney & Lodge Wood

4.8.1 CAPITAL WORK PROGRAMME

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
FRDc1	Thinning – subcpt 4a	Thin compartment to favour best trees.	5	Sep - Feb	1.38	Ha	ML	Ecological walkover	n/a	FRD1
FRDc2	Thinning – subcpt 5a	Thin compartment to favour oak, wild cherry and silver birch.	9	Sep - Feb	1.4	Ha	ML	Ecological walkover	n/a	FRD1
FRDc3	Tree mulching	Carefully cut back any vegetation growing from around base of notable tree T52. Apply 4m radius ring of well-rotted bark mulch around base of each tree to a depth of 100mm.	1	September	1	No.	ML	n/a	n/a	n/a
LWc1	Hedgerow planting	Hedgerow to be planted along west side of road in area of grassland.	1	Oct - Feb	175	L m	ML	n/a	4.2.11	LW1

4.8.2 ANNUAL & MONITORING MAINTENANCE PROGRAMME

Ref	Item	Detail	Start	End	Annual Frequency	Years	Quantity	Unit	Delivery	Objective ref.
FRDm1	Hedgerow maintenance	Undertake boundary hedgerow cutting of both hornbeam and laurel using a tractor mounted flail.	Nov	Feb	Every 2 years	1, 3, 5, 7, 9	300	L m	ML	n/a
FRDm2	Young tree maintenance	Weed around bases of all trees to leave a 1m radius circle.	March	Sep	1	1, 2	0.17	Ha	ML	FRD2
FRDm3	Young tree maintenance	Remove tree guards.	Jan	Dec	1	3	0.17	Ha	ML	FRD2
FRDm4	Grass cutting – medium	Use a ride-on mower (i.e. Kubota 3890) to mow an approx. 4m width strip between the edge of the planted area and the wet ditch adjacent to the access road. 50-70mm height.	March	Sep	3	Every	0.07	Ha	ML	n/a
FRDm5	Tree mulching	Turn over bark mulch by hand and top up levels to 100mm total depth.	March	April	1	3, 6, 9	1	No.	ML	n/a
SBm1	Site boundaries – Litter picking	Litter to be picked around site boundaries	Jan	Dec	12	All	1	Item	ML	n/a
LWm1	New hedgerow - weeding	Carefully weed around bases of hedge plants in summer. Replace dead plants in autumn or winter.	Aug	Jan	Once per year	1 - 3	175	L m	ML	LW1
LWm2	New hedgerow - trimming	Cut plants to max 60cm in first spring/ then trim in winter.	Mar/Jan	Mar/Feb	Every 3 years	1, 4, 7	175	L m	ML	LW1
-	New woodland and edge planting	Monitor establishment of new planting; record numbers of any lost trees and make plans for replacement planting; Determine need for removing stakes and guards, and eventually for thinning.	May	Sep	1	Yrs 3, 4, 7 & 10	1	Item	MI	VW2
-	Woodlands	Annual consultant visit to walk all areas of woodland and assess status of works and the need for any alterations to plan of operations, including monitoring of ash dieback, AOD, OPM, aspen suckering etc.	Jan	Dec	1	All	1	Item	ML	All
-	Woodlands – thinning and felling	Prior to any thinning or felling operations, woodland subpts to receive a walkover survey from an ecologist to check for the presence of protected species/habitats and any other constraints to be considered.	Jan	Dec	1	All	1	Item	ML	All
-	Tree Safety Inspection	Professional Tree Inspector to undertake a Tree Safety Inspection of all wooded boundaries every 2.5-3 years; any trees with significant defects requiring remedial works will be recorded in a detailed report.	Jan	Dec	1	Yr 1, Yr 4, Yr 7, Yr 10	1	Item	MI	-

4.9 Nyn Pond

AIM	To conserve the semi-natural qualities of Nyn Pond through the retention and management of surrounding valuable trees, and to encourage the development of diverse marginal vegetation.	
OBJECTIVES	PD1	Carry out works to mature trees surrounding the pond as required, including the removal of any in poor condition.
	PD2	Undertake periodic coppicing and clearance of shrubs surrounding the pond.
	PD3	Manage the pond for the benefit of wildlife, including freshwater mussel.
	PD4	Maintain access around the perimeter of the pond.



4.9 Nyn Pond

4.9.1 CAPITAL WORK PROGRAMME

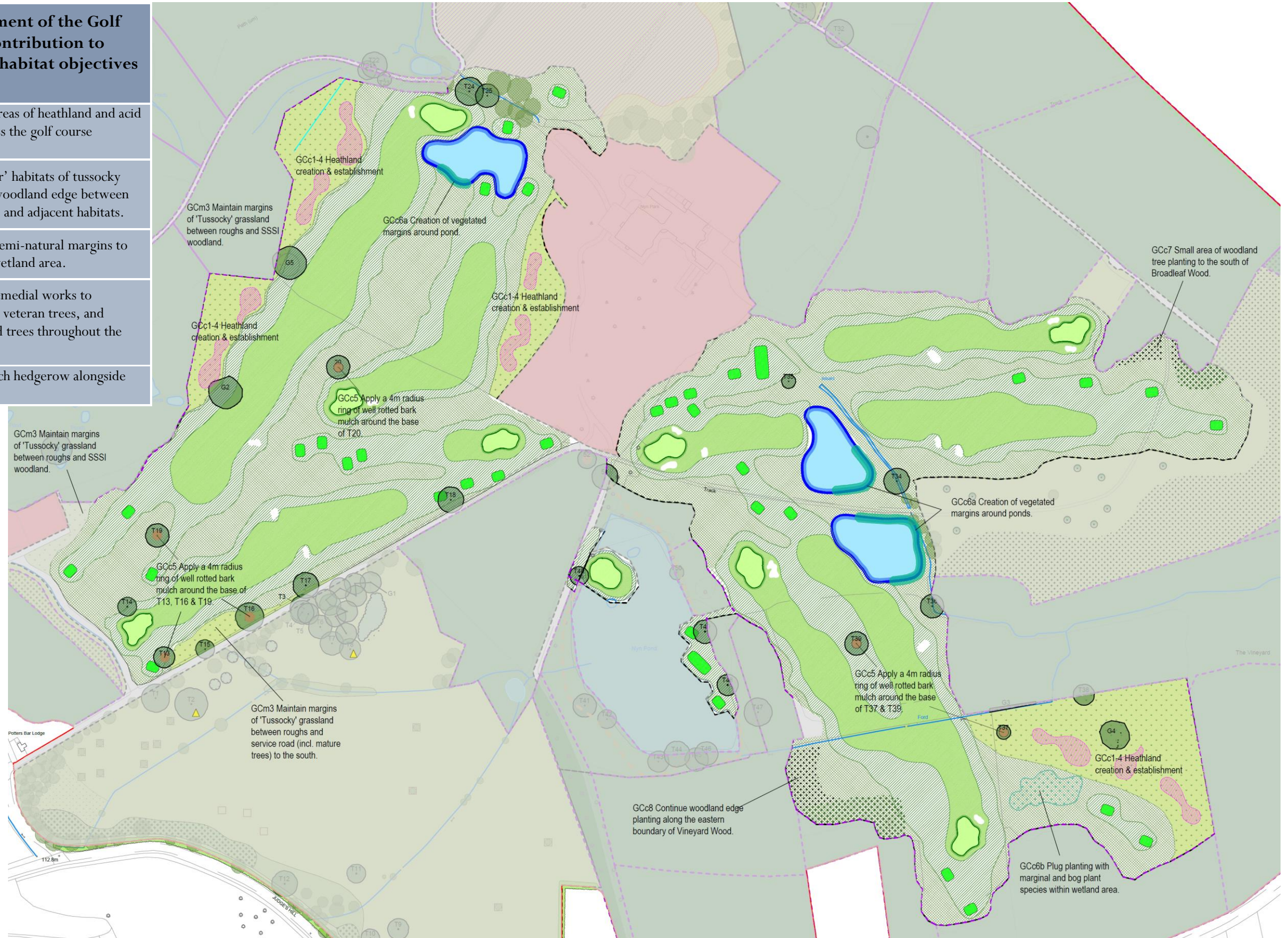
Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
PDc1	T50 bat climbing inspection	2 person climbing team including a level 2 licensed bat ecologist to climb T50 and inspect Potential Roost Features for any evidence of roosting bats, using a high powered torch, mirrors and endoscope.	1	Sep – Oct	1	No.	ML	n/a	n/a	PD1
PDc2	T50 tree removal	Further to confirmation of the absence of bats and nesting birds, remove T50 to ground level.	1	Sep - Oct	1	No.	ML	n/a	n/a	PD1
PDc3	Pond footpath	Top up path surfacing with granite aggregate, 40mm to dust and re-compact.	2	Any	450	L m	ML	n/a	n/a	PD4
PDc4	Freshwater mussel survey	Suitably trained and competent ecologist to survey Nyn Pond in order to assess the distribution (and to confirm species) of freshwater mussel. Results to inform future management of pond.	2	Apr - Sep	1	Item	ML	n/a	n/a	PD3

4.9.2 ANNUAL MAINTENANCE & MONITORING PROGRAMME

Ref	Item	Detail	Start	End	Annual Frequency	Years/s	Quantity	Unit	Delivery	Objective ref.
PDm1	Path strimming	Undertake strimming/cutting back of vegetation to give 0.5-1m clearance either side of path.	Mar	Oct	2	Every	450	L m	ML	PD3
PDm2	Pond edge vegetation management	Carry out periodic rotational coppicing and cutting of shrub vegetation around pond to keep the banks from becoming too overgrown and shading out developing marginal vegetation. Each operation to focus on roughly a third of the pond bank; extent of works to be determined and specified by an initial monitoring visit.	Sep	Feb	1	3, 5, 7	900	m2	ML	PD2
-	Woodlands	Annual consultant visit to walk all areas of woodland and assess status of works and the need for any alterations to plan of operations, including monitoring of ash dieback, AOD, OPM, aspen suckering etc.	Jan	Dec	1	All	1	Item	ML	All
-	Woodlands – thinning and felling	Prior to any thinning or felling operations, woodland subpts to receive a walkover survey from an ecologist to check for the presence of protected species/habitats and any other constraints to be considered.	Jan	Dec	1	All	1	Item	ML	All

4.10 Golf Course Actions

AIM	To ensure that management of the Golf Course maximises its contribution to biodiversity and wider habitat objectives wherever possible.
OBJECTIVES	GC1 Create and establish areas of heathland and acid grassland habitat across the golf course landscape.
	GC2 Maintain fringe 'buffer' habitats of tussocky grassland, scrub and woodland edge between the edge of the roughs and adjacent habitats.
	GC3 Manage wildlife rich semi-natural margins to the three ponds and wetland area.
	GC4 Undertake targeted remedial works to important mature and veteran trees, and establish new parkland trees throughout the golf course.
	GC5 Create new species-rich hedgerow alongside road.



4.10 Golf Course Actions

4.10.1 CAPITAL WORK PROGRAMME

Ref	Item	Detail	Year	Timing / Restrictions	Quantity	Unit	Delivery	Pre-commencement Actions	Spec ref.	Objective ref.
GCc1	Stage 1 Heathland creation – soil conditions	Confirm nutrient and pH status of soils to ensure that they are suitable for heather plants and don't require the addition of chemicals/nutrients.	3	n/a	1	Item	ML	n/a	4.10.3	GC1
GCc2	Stage 1 Heathland creation – ground preparation	Undertake ground preparation to ensure conditions are appropriate for seeding and planting. Strip top layer of vegetation and soil to approx. 25mm depth to reveal bare soil. Remove any large stones and other material. Carry out light cultivation to provide a medium tilth and lightly roll if required. If broadleaf weeds are starting to emerge undertake herbicidal treatment using a glyphosate base herbicide.	3	n/a	4350	m ²	ML	n/a	4.10.3	GC1
GCc3	Stage 1 Heathland creation – acid grassland sowing	Carry out sowing of an appropriate acid grassland mix, using seeds of local provenance where possible. Sowing rate approx. 5 g/m ² .	3	Spring or Autumn	4350	m ²	ML	n/a	4.10.3	GC1
GCc4	Stage 1 Heathland creation – sowing	Supply and spread heather litter over prepared seed bed to a depth of 50-100mm; allowance for supply and delivery of 150 bags (each bag should cover approx. 20 m2)	3	n/a	4350	m ²	ML	n/a	4.10.3	GC1
GCc5	Notable trees	Strim undergrowth vegetation from around the base of 6 no. trees; Apply a 2m radius width ring of well-rotted bark mulch around the base of each tree to 100mm depth.	1	Spring or Autumn	6	No.	ML	n/a	n/a	GC4
GCc6a	Pond margins	Creation of vegetated margins around ponds, to include plug planting / seeding with native species.	1	Apr - May	240	L m	ML	n/a	4.10.4	GC3
GCc6b	Wetland margins	Creation of vegetated margins around wetland area, to include plug planting with native marginal and bog plant species.	1	Apr - May	150	m2	ML	n/a	4.10.4	GC3
GCc7	Woodland extension	Woodland tree planting in a small area to the south of broadleaf Wood.	2	Nov – Feb	0.2	ha	ML	n/a	4.10.5	GC2
GCc8	Woodland edge creation	Continue woodland edge planting along the western boundary of Well Wood and along the eastern boundary of Vineyard Wood to provide structure to the woodland edge and improved habitat potential.	2	Nov – Feb	0.82	ha	ML	n/a	4.10.6	GC2
GCc9	Parkland trees – Planting	Undertake planting of new specimen parkland trees across the golf course, to include stakes and guards	1	Nov – Feb	12	No.	ML	Precise locations for planting to be confirmed on site.	4.10.7	GC4
GC10	Hedgerow planting	Hedgerow to be planted along east side of road in area of grassland.	1	Oct - Feb	175	L m	ML	n/a	4.2.11	GC5

4.10 Golf Course Actions

4.10.2 ANNUAL MAINTENANCE & MONITORING PROGRAMME

Ref	Item	Detail	Start	End	Annual Frequency	Year/s	Quantity	Unit	Delivery	Objective ref.
Gcm1	Heather Stage 1 – first cut	Undertake a first cut of established heather plants three years after planting. Plants to be cut to a height of 150mm with all arisings collected	Oct	Nov	1	4	4350	m ²	TAS	GC1
Gcm2	Heather Stage 1 – rotational cutting	Heather to be cut every 1-3 years to a height of approximately 150mm; rotational system to be set once areas of heather have established. All arisings to be collected and re-used.	Oct	Nov	1	5 onwards	4350	m ²	TAS	GC1
Gcm3	‘Tussocky’ grass margins	Cut areas once every 2 years to a height of 100mm; all arisings to be collected and removed from site (may need to include for occasional spot treatment of broadleaf weeds using a selective herbicide)	Aug	Sep	1	1, 3, 5, 7, 9	1.25	ha	ML	GC2
Gcm4	Scrub control	Undertake periodic cutting and (if required) herbicide treatment of invasive scrub and coarse vegetation species (incl. gorse, bracken, rhododendron, bramble etc) on areas of heathland and acid grassland.	Sep	Feb	TBC	TBC	TBC	ha	TAS	GC2
Gcm5	Notable trees - mulching	Monitor the condition of trees that have previously been mulched; if required, strim back any vegetation, turn over mulch by hand using a fork, and top up to 100mm depth.	Mar	May	1	3, 6, 9	6	No.	ML	GC4
Gcm6a	New parkland trees – weeding	Carry out knapsack weeding around the base of each tree using a non-residual glyphosate based herbicide.	Mar	Sep	2	1 – 4	TBC	No.	ML	GC4
Gcm6b	New parkland trees – watering	New parkland trees to be watered as needed during summer months.	Mar	Oct	6	1 – 4	TBC	No.	ML	GC4
Gcm6c	New parkland trees – formative pruning	Formative pruning of trees	Nov	Feb	1	4	TBC	No.	ML	GC4
Gcm7a	Woodland Planting – weeding	Carry out knapsack weeding around the base of each tree using a non-residual glyphosate based herbicide, to create a 1m diameter weed free area.	Mar	Sep	1	2 – 4	0.34	Ha	ML	GC2
Gcm7b	Woodland Planting – guards & stakes	Check guards and stakes are still in place; right any that have been knocked over and replace any that have broken.	Jan	Dec	1	2 – 4	0.34	Ha	ML	GC2
Gcm7c	Woodland Planting – beating up	Check planting for any losses and replace in next growing season; allowance for 10%	Aug	Sep	1	3	0.34	Ha	ML	GC2
Gcm7d	Woodland Planting – removing guards	Remove tree guards and stakes – likely to be in Years 6 – 7 but to be confirmed by monitoring.	Jan	Dec	1	6/7	0.34	Ha	ML	GC2
Gcm8	New hedgerow - weeding	Carefully weed around bases of hedge plants in summer. Replace dead plants in autumn or winter.	Aug	Jan	Once per year	1 - 3	175	L m	ML	GC5
Gcm9	New hedgerow - trimming	Cut plants to max 60cm in first spring/ then trim in winter.	Mar/Jan	Mar/Feb	Every 3 years	1, 4, 7	175	L m	ML	GC5
-	New woodland and edge planting	Monitor establishment of new planting; record numbers of any lost trees and make plans for replacement planting; Determine need for removing stakes and guards, and eventually for thinning.	May	Sep	1	Yrs 3, 4, 7 & 10	1	Item	ML	GC2
-	New parkland trees	Monitor establishment of new planting; record numbers of any lost trees and make plans for replacement planting; Determine need for formative pruning and removal of stakes and guards.	May	Sep	1	Yrs 2, 3, 6 & 9	1	Item	ML	GC4
-	Heath habitats	Monitor establishment of heathland areas to determine need for altering maintenance regimes and undertaking any further planting / seeding. Future monitoring to assess scrub encroachment, tree regen, and any other threats to integrity of habitat.	Jul	Sep	1	All	1	Item	ML	GC1

4.10 Golf Course Actions

4.10.3 HEATHLAND CREATION

It will first be important to confirm the soil nutrient status to ensure that pH and nutrient levels are of sufficient standard for the establishment of heath. Low pH and infertile soils are generally most suited.

The primary species to include will be common heather (*Calluna vulgaris*) with some bell heather (*Erica cinerea*) if available, sourced as brash or seed from a suitable donor site. Brash will need to be passed through a coarse sieve to separate the seed from woody material. Seed is best sown in Autumn at an approximate rate of 150 g/m². Heather is best sown with a nurse crop of acid grassland species, to include *Agrostis capillaris*, *Agrostis vinealis*, *Festuca rubra*, *Festuca ovina*, and *Deschampsia flexuosa*, at a sowing rate of approximately 5g per m².

Subsequent grass cutting should avoid the establishing areas of heather. It is also important to prevent/limit human and vehicular access to areas of developing heather plants as they are very vulnerable to trampling. Once established (18-24 months), areas of heather are to be maintained by mechanical cutting (using tractor-mounted equipment if access allows), typically at a height of 150mm at 1-3 year intervals. This regularity of cutting will keep heather plants in the 'building' stage of growth with profuse flowering, preventing developing into woody, leggy stands. All arisings from cutting operations to be collected and either used immediately for heathland restoration elsewhere on site, or stored in a dry place for such a purpose.

Aside from cutting, regular scrub monitoring and maintenance will be required to ensure that none of the species known to be present and vigorous on site (i.e. bracken, gorse, rhododendron, and regeneration of birch and pine) have the opportunity to become readily established. In the first instance control of these species can be by cutting, but follow up targeted herbicide treatment may be required if they start to become too dominant.

4.10.4 POND & WETLAND MARGINS

It should be possible for certain areas of the new ponds and wetlands to be managed as semi-natural habitats with floristic diversity and cover to support range of invertebrate and vertebrate species. The following plant species should be planted as plug plants and/or seed, sourced locally where possible. Planting rate of approx. 5/m² in clusters/swathes of the same species.

Submerged, oxygenating and floating plants

%	Species	Scientific name
40	Willow / water moss	<i>Fontinalis antipyretica</i>
20	Spiked water milfoil	<i>Myriophyllum spicatum</i>
40	Frogbit	<i>Hydrocharis morsus-ranae</i>

Marginal plants

%	Species	Scientific name
15	Purple loosestrife	<i>Lythrum salicaria</i>
15	Water mint	<i>Mentha citrata</i>
15	Lesser pond-sedge	<i>Carex acutiformis</i>
15	Soft rush	<i>Juncus effusus</i>
10	Reed canary grass	<i>Phalaris arundinacea</i>
10	Brooklime	<i>Veronica beccabunga</i>
5	Water plantain	<i>Alisma plantago-aquatica</i>
5	Water forget-me-not	<i>Myosotis scorpioides (pallustris)</i>
5	Marsh cinquefoil	<i>Potentilla palustris</i>
5	Yellow flag iris	<i>Iris pseudacorus</i>

Bog plants

%	Species	Scientific name
20	Marsh marigold	<i>Caltha palustris</i>
10	Hairy sedge	<i>Carex hirta</i>
10	Pendulous sedge	<i>Carex pendula</i>
20	Ragged robin	<i>Lychnis flos-cuculi</i>
10	Water avens	<i>Geum rivale</i>
10	Cuckoo flower	<i>Cardamine pratensis</i>
10	Bugle	<i>Ajuga reptans</i>
10	Meadow buttercup	<i>Ranunculus acris</i>

4.10.5 WOODLAND PLANTING

%	No.	Species	Scientific name	Form	Height	Type
20	64	English oak	<i>Quercus robur</i>	1u1	60-90cm	Bare root transplant
20	64	Sessile oak	<i>Quercus petraea</i>			
20	64	Hornbeam	<i>Carpinus betulus</i>			
15	48	Cherry	<i>Prunus avium</i>			
15	48	Scots pine	<i>Pinus sylvestris</i>			
10	32	Field maple	<i>Acer campestre</i>			

All trees to be fitted with 1.2m tubex tree shelters and 1.2m softwood stakes. Trees to be planted at 2.5m spacing in groups and clumps. Approximately 1600 per hectare.

4.10.6 WOODLAND EDGE PLANTING

%	No.	Species	Scientific name	Form	Height	Type
25	56	Hawthorn	<i>Crataegus monogyna</i>	1u1	60-90cm	Bare root transplant
10	23	Midland hawthorn	<i>Crataegus laevigata</i>			
20	45	Hazel	<i>Corylus avellana</i>			
15	34	Field maple	<i>Acer campestre</i>			
5	12	Dog rose	<i>Rosa canina</i>			
5	12	Blackthorn	<i>Prunus spinosa</i>			
10	23	Guelder rose	<i>Viburnum opulus</i>			
10	23	Rowan	<i>Sorbus aucuparia</i>			

All trees to be fitted with 1.2m tubex tree shelters and 1.2m softwood stakes. Trees to be planted at 2.5m spacing in groups and clumps. Approximately 1600 per hectare.

4.10.7 PARKLAND TREES – PLANTING

No.	Species	Scientific name	Form	Height	Type
TBC	English / Pedunculate oak	<i>Quercus robur</i>	TBC	TBC	TBC
	Sessile oak	<i>Quercus petraea</i>			
	Pin oak	<i>Quercus palustris</i>			
	Red oak	<i>Quercus rubra</i>			
	Hungarian oak	<i>Quercus frainetto</i>			
	Turkey oak	<i>Quercus cerris</i>			
	Cork oak	<i>Quercus suber</i>			
	Chestnut leaved oak	<i>Quercus castaneifolia</i>			
	Common lime	<i>Tilia x europaea</i>			
	Silver birch	<i>Betula pendula</i>			
	Copper beech	<i>Fagus sylvatica</i>			
	Red maple	<i>Acer rubrum</i>			
	Sugar maple	<i>Acer saccharum</i>			
	Freeman maple	<i>Acer x freemanii 'Autumn Blaze'</i>			
	Tulip tree	<i>Liriodendron tulipifera</i>			
	Sweetgum	<i>Liquidambar styraciflua</i>			
London plane	<i>Platanus x hispanica</i>				
Scots pine	<i>Pinus sylvestris</i>				
Corsican pine	<i>Pinus nigra</i>				
Swamp cypress	<i>Taxodium distichum</i>				
Cedar of Lebanon	<i>Cedrus libani</i>				

4.10 Golf Course Actions

Tree pits to be dug at least 1.5 times wider than the size of the root ball but no deeper. Remove any material from the pit which may inhibit root development (i.e. larger stones, debris etc) and loosen the bottom and sides of the pit to encourage root establishment.

Ensure that new trees are only lifted by the root ball to avoid damage to stem and crown. Follow any specific instructions provided by the nursery for planting the trees.

Carefully position the root ball in the pit, ensuring that the top of the ball is raised at least 5cm above the level of the surrounding soil. Prepare a mix of imported top soil with peat-free compost (approximately 30% compost to 70% soil) and backfill the hole, firming around to ensure the tree is not loose in the ground.

Standard trees to be fitted with a supporting system comprising two softwood machine-rounded timber stakes (approx. 2.4m x 60mm) with rubber ties and spacers. Multi-stemmed trees to be fitted with underground anchoring systems.

Water the tree and ensure the root ball is well saturated. Cover the planting pit with well-rotted bark mulch to a minimum depth of 100mm and a diameter of 1m, leaving a hollow in the centre to avoid the base of the tree rotting.

For the first year of establishment, plants to be watered between April and September as required by climatic conditions to ensure that the soil doesn't get too dry. Mulch to be topped up and weeds removed/killed as required. After the first year's establishment, trees to be inspected for losses, all of which will be replaced.

5 Monitoring & Review

The Nyn Park Landscape Management Plan is intended to cover a period of 10 years between March 2022 and March 2032. Monitoring the progress of the plan and the landscape’s response to changes in management will be essential to guarantee success.

The production of a 10-year Landscape Management Plan for Nyn Park is the start of a process that will see the delivery of capital changes to the landscape, the initiation of new maintenance prescriptions, and alteration to existing regimes. Whilst all recommendations have been carefully considered for their suitability and appropriateness, it is important that constant monitoring takes place to ensure that this remains the case and that any required alterations are identified and responded to at the earliest opportunity.

As individual capital items are delivered, they will be assessed against the maintenance prescriptions contained herein and the Management Plan updated as required. Any particular issues will be recorded in a separate register to be discussed and resolved as part of the annual review meetings (see below).

A lot can change in 10 years and it is vital that any new management challenges are built into the plan as they occur. It will be the responsibility of the lead contractor to consider the impact and management requirement of any significant factors, such as the threat of new pests & diseases that could affect plant health, changes in climate that may require alterations to maintenance prescriptions and necessitate variations in tree species used, and the influence in changes to surrounding land use. Any of these issues will be added to the aforementioned register and discussed at the annual review meeting.

5.1.1 ANNUAL REVIEW

An annual management plan review meeting will take place between the lead contractor, the client’s representatives, and any key consultants and contractors that can be considered to be ‘stakeholders’ with regards to the management of Nyn Park. This meeting will review in detail the progress of all capital items prescribed for the year with an update on their status, including discussion of the issues register. The meeting will also discuss the effectiveness of current maintenance regimes and the need to make any amendments to existing prescriptions, and any larger site issues that may have an impact on site management.

All minutes from the meeting will be recorded and issued to all parties, and an updated version of the Landscape Management Plan produced.

5.1.2 MANAGEMENT PLAN 10-YEAR REVIEW

At the end of the plan’s 10-year term, the management of Nyn Park will be discussed in a more thorough review meeting with the same panel of representatives and stakeholders. This meeting will look at the preceding 10-years and discuss the establishment of capital works and the effectiveness of management prescriptions. It will use the Site Description and Condition Assessment sections of this document as a baseline from which to assess how far the estate has come, where improvements have been made and outcomes achieved, and where proposals have been less

successful. It will also review any wider challenges that weren’t necessarily an issue at the commencement of this plan (i.e. new tree pests & disease).

The intended outcome of this review meeting will be to form the basis of an updated 10-Year Management Plan for the period 2032-2042.

5.1.3 TARGETED MONITORING PLAN

The following table details the anticipated monitoring activities related to the various capital and maintenance works taking place as part of this Management Plan. The list is not exhaustive and it is likely that there may be other monitoring activities required.

Zone / Area	Habitat / Feature	Detail	Timing	Year/s	Delivery
South Parkland & Heathland	Grazing infrastructure	Undertake an annual inspection to check that fences and gates are all intact and water supply is functioning.	Mar – Apr	All	ML grazier
South Parkland	Grazed grassland	Undertake an annual monitoring visit to check on the condition of the grazed grassland to help determine whether the stocking rates and timings are appropriate. Monitoring to also determine whether additional scrub control is required. Amend specification accordingly. Monitoring likely to only be required for the first 2-3 years.	Aug – Sep	2, 3, 4	ML ecologist
South Parkland	Recruited Parkland trees	Inspect recruited parkland trees for healthy establishment, the need for formative pruning, and the effectiveness of guards.	May - Sep	2 & 5	ML contracts manager
South Parkland	Barn owl boxes	Annual monitoring of 2 no. barn owl boxes to check for occupancy	Apr - Sep	All	ML licensed ecologist
North Parkland	Grassland	Monitor effectiveness of weed spraying and mowing regime to determine whether any further operations are required. Monitoring likely to only be required for the first 2-3 years.	Aug – Sep	2, 3 & 4	ML ecologist
Vineyard Wood	Grassland	Monitor establishment of grassland and maintenance regimes. Monitoring likely to only be required for the first 2-3 years.	Aug – Sep	2, 3 & 4	ML contracts manager
Vineyard Wood, Golf Course, Lodge Wood	New woodland and edge planting	Monitor establishment of new planting; record numbers of any lost trees and make plans for replacement planting; Determine need for removing stakes and guards, and eventually for thinning.	May – Sep	2, 3, 6 & 9	ML contracts manager
Vineyard Wood, Golf Course	New parkland trees	Monitor establishment of new planting; record numbers of any lost trees and make plans for replacement planting; Determine need for formative pruning and removal of stakes and guards.	May – Sep	2, 3, 6 & 9	ML contracts manager
Golf Course	Heathland	Monitor establishment of heathland areas to determine need for altering maintenance regimes and undertaking any further planting / seeding. Future monitoring to assess scrub encroachment, tree regen, and any other threats to integrity of habitat.	Jul – Sep	All	ML ecologist
Heathland	Wood pasture/heath	Monitoring of the restoration works in the Heathland zone to include the development of desirable vegetation and re-emergence of bracken, rhododendron, and scrub; monitoring to determine whether additional maintenance is required.	Jul – Sep	All	ML ecologist
All Woodland Zones	Woodlands	Annual consultant visit to walk all areas of woodland and assess status of works and the need for any alterations to plan of operations, including monitoring of ash dieback, AOD, OPM, aspen suckering etc.	Any	All	ML forestry consultant
All Woodland Zones	Woodlands – thinning and felling	Prior to any thinning or felling operations, woodland subcppts to receive a walkover survey from an ecologist to check for the presence of protected species/habitats and any other constraints to be considered.	Any	All	ML ecologist
Site boundaries	All wooded and tree lined boundaries	Professional Tree Inspector to undertake a Tree Safety Inspection of all wooded boundaries every 2.5-3 years; any trees with significant defects requiring remedial works will be recorded in a detailed report.	Any	1, 4, 7 & 10	ML arboricultural consultant

6 References

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WEBSITES

- The Barn Owl Trust www.barnowltrust.org.uk
- Britain from Above www.britainfromabove.org.uk
- British History Online www.british-history.ac.uk/vch/herts/vol2
- Friends of Northaw Great Wood www.fongw.org.uk
- Golf's Missing Links www.golfsmissinglinks.co.uk
- Heritage Gateway www.heritagegateway.org.uk
- Hertfordshire Geological Society www.hertsgeol Soc.ology.org.uk
- MAGIC www.magic.gov.uk
- National Soil Resources Institute www.landis.org.uk/soilscapes/
- Northaw & Cuffley Parish Council www.northawcuffleypc.org.uk

MAPS

Middlesex 1 st edition OS 6 inch map	1868	National Library of Scotland
Middlesex 2 nd edition OS 6 inch map	1898	National Library of Scotland
Hertfordshire OS 6 inch map	1938	National Library of Scotland
Middlesex 2 nd edition OS 25 inch map	1896	National Library of Scotland
Hertfordshire OS 25 inch map	1935	National Library of Scotland

7 Appendices

Appendix A: Northaw Great Wood SSSI Citation

County: Hertfordshire Site

Name: Northaw Great Wood

District: Welwyn Hatfield

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: Welwyn Hatfield District Council

National Grid Reference: TL 280043 Area: 223.6 (ha) 552.6 (ac)

Ordnance Survey Sheet 1: 50 000: 166 1: 10 000: TL 20 SE

Date Notified (Under 1949 Act): 1953 Date of Last Revision: 1972

Date Notified (Under 1981 Act): 1985 Date of Last Revision: -

Other Information:

Part of the site is managed by Welwyn Hatfield District Council as a Country Park and part is managed by Hertfordshire County Council as a Schools Park. There have been boundary changes to exclude buildings and gardens, improved grassland and plantations.

Reasons for Notification:

Prominently situated in two valleys dissecting the London Clay plateau of south Hertfordshire are Great Wood and Well Wood which together comprise one of the county's most extensive areas of ancient hornbeam *Carpinus betulus* dominated woodland. The acid soils range from poorly to freely draining with a corresponding richness in plant communities. Traditional woodland management practices of coppice-with-standards and pollarding are still pursued, so ensuring survival for the site's important wildlife features.

Tall hornbeam coppice is found almost throughout in association with both sessile and pedunculated oak *Quercus petraea* and *Q. robur*, though silver birch *Betula pendula* is a constant member of the tree canopy. Present in more or less well defined groves are sweet chestnut *Castanea sativa*, aspen *Populus tremula*, beech *Fagus sylvatica* and ash *Fraxinus excelsior*. Rowan *Sorbus aucuparia* also occurs. The generally sparse shrub layer is comprised mainly of hawthorn *Crataegus monogyna*, holly *Ilex aquifolium* and hazel *Corylus avellana*. Blackthorn *Prunus spinosa* locally forms dense thickets which along with re-growth from hornbeam coppice, is attractive to nightingale *Luscinia megarhynchos*. The diverse breeding bird community also includes tree pipit *Anthus trivialis*, nuthatch *Sitta europaea* and great spotted woodpecker *Dendrocopos major*.

In places ground flora is absent under the densely shading hornbeam, but either bracken *Pteridium aquilinum* or bramble *Rubus fruticosus* can be dominant with honeysuckle *Lonicera periclymenum* and bluebell *Hyacinthoides non-scripta* abundant. Rides, glades, streamsides and springs add considerably to the diversity of the wood's herb layer. Foxglove *Digitalis purpurea*, wood sage *Teucrium scorodonia*, heath bedstraw *Galium saxatile* and common bent *Agrostis capillaris*, characterise the drier areas. Where wetter, the less common marsh pennywort *Hydrocotyle vulgaris* and skullcap *Scutellaria galericulata* have been found. Elsewhere are pendulous sedge *Carex pendula*, yellow pimpernel *Lysimachia nemorum* and lady and broad buckler-ferns *Athyrium filix-femina* and *Dryopteris dilatata*.

(Source: Magic Map, 2019)

Appendix B: Method Statement for Works Close to Badger Setts

If it is considered necessary to undertake works that may cause interference with badgers and/or their setts, where the purpose of the work does not fall within the scope of the Protection of Badgers Act, it is advised that the following mitigation procedures are followed.

If the following cannot be undertaken and works within 20m of a sett are considered likely to result in an offence under the Protection of Badger Act, then a licence from Natural England must be attained before works commence.

1. Work near active badger setts must be carried out between July and November inclusive, to avoid the disturbance of breeding female badgers.
2. Badger tunnels can extend up to 20 metres from the entrance holes and are located between 0.2 metres and several metres deep. Excavation work and heavy machinery must be kept well away (20m minimum) from where it could result in damage to the sett or disturbance to any badger occupying the sett.
3. All works within 10 metres of the nearest sett entrance must be undertaken using hand tools only.
4. Fires and chemicals must not be used within 20 metres of a sett. Chemicals should be stored safely away from the sett area.
5. Disturbances, such as loud noise or vibrations, that might agitate badgers occupying a sett must be avoided or limited to areas well away from the sett.
6. If trees and shrub need to be felled within 20m of a sett entrance hole, then this must be supervised by the ecologist and felled so that they fall away from the obvious direction of a sett and/or sectionally felled and must not be uprooted but cut to ground level where necessary.
7. All badger paths leading from a sett must be cleared of felled timber and scrub wherever possible.
8. All trenches left open overnight must include a means of escape for any animals which may fall in.
9. Entrances to setts must not be blocked in any way and must be cleared of any felled vegetation at the end of each day that works take place.
10. All work must be carried out as quickly and quietly as possible.

(Source: Natural Resources Wales)

BIODIVERSITY METRIC ASSESSMENT

GOLF COURSE DEVELOPMENT

at

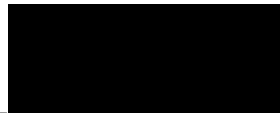

**NYN PARK ESTATE,
HERTFORDSHIRE**

UPDATED SEPTEMBER 2021

DOCUMENT AMENDMENT HISTORY

Version	Status	Date	Amendment to this version
1	Draft	23.11.20	25.11.20
2	Final	10.03.21	17.09.21

DOCUMENT APPROVAL

	Name	Title	Signature	Date
Author	Alison Hood	Senior Ecologist		23.11.20
Reviewer	Jon Collins	Principal Landscape Consultant		23.11.20

SITE SUMMARY

Site Name	Nyn Park
Site Address	Nyn Park Estate Northaw Hertfordshire Potters Bar EN6 4BT
Grid Reference	TL 27848 03140
Size	Approx. 128ha
Statutory Designations	Northaw Great Wood SSSI on site.

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EXECUTIVE SUMMARY

Report purpose	<p>To carry out a metric assessment of the golf course development at Nyn Park.</p> <p>To test and quantify the biodiversity net gain outputs of the Nyn Park 10-Yr Landscape Management Plan 2022-2032.</p>
Client and commission date	<p>Bessington Investments</p> <p>October 2020</p>
Date and methods of survey	<p>Full Site habitat survey in May 2019 and condition assessment in October 2020.</p>
Site baseline	<p>The Site baseline has been calculated for the pre-golf course development as 1100.96 habitat units plus 7.35 hedgerow units.</p>
Opportunities for net gain	<p>With on-Site habitat enhancement and creation implemented, the Site has been calculated to be able to attain a post-intervention value of 1244.88 habitat units, plus 8.92 hedgerow units.</p> <p>This has been calculated to achieve a biodiversity net gain of 13.07% in habitat units and 21.4% in hedgerow units.</p> <p>With the implementation of the management prescriptions within the Nyn Landscape Management Plan and following recommendations in regard to mitigation of impacts on species as a result of management, it is considered that the net gain opportunities are viable.</p>
Additional considerations	<p>Regular compliance monitoring of the habitats on site will take place at a minimum of once per annum, to record management progress and to make recommendations for amendments as required.</p> <p>An annual report will be produced and submitted to WHBC as evidence of project delivery and on-going management.</p> <p>Consideration will be given to protected species throughout management plan implementation; this will involve survey, mitigation and creation of additional habitat features.</p> <p>Existing 10-Yr Landscape Management Plan to be updated to include a 30-year commitment to habitat enhancement and creation.</p>

1.0 INTRODUCTION

1.1 Project overview

Maydencroft Limited was commissioned by Bessington Investments to carry out a net gain calculation of the golf course development at Nyn Park, Hertfordshire. The calculation was requested by Herts Ecology in a stakeholder communication to Welwyn Hatfield Borough Council (the Local Planning Authority) regarding planning application ref. 6/2020/0311/MAJ.

1.2 Site information

1.2.1 Site background

Nyn Park is a 128 ha privately owned country estate located to the north of the village of Northaw in Hertfordshire. The Site is set within a semi-rural location but lies less than 1km from Potters Bar, approximately 2.5km north of the M25 and 3km east of the A1(M) corridors. The immediately surrounding area comprises mostly mixed farmland and small villages, with a large expanse of ancient woodland, Northaw Great Wood, to the north.

Woodland covers much of the northern, eastern and southern areas of the park, with both broadleaved oak-hornbeam woodlands, and mixed plantations. Well Wood forms part of the complex of Northaw Great Wood Site of Special Scientific Interest (SSSI). The remainder of the park is broadly covered by parkland, with semi-improved grassland and mature and veteran trees. Most of these parkland areas were only recently cleared of 20th century conifer plantations. The semi-natural habitats on site are considered to be of ecological significance to wildlife in the local area, given their size, maturity and connectivity around the park and into adjacent land.

A golf course has been constructed within areas of open grassland on Site covering approximately 28ha. The LPA have requested a net gain metric calculation in order to determine the number of units lost as a result of the development, and to use the metric to demonstrate a measurable net gain in biodiversity as a result of proposed habitat interventions.

1.3 Background to biodiversity net gain

1.3.1 The net gain concept

Biodiversity net gain is distinguished from other forms of ecological compensation by the requirement for providing measurable outcomes. Losses from development and gains from an 'offset' are calculated using a biodiversity metric, which quantifies habitats against fixed units of biodiversity. On any given site, the baseline units are calculated initially. Net gain results from an increase in units from the baseline value after habitat loss, followed by off-setting, has been taken into account. The amount of net gain (number of units gained) is calculated as a percentage.

Biodiversity offsets can be both on-site and off-site, and can involve creation, enhancement or accelerated succession of habitats. The amount of biodiversity units for an offset must exceed the amount of biodiversity units that will be lost as a result

of development. Calculation of biodiversity units is determined by a number of factors, as detailed in *Table 1 (Section 2.1.2)*.

Use of a metric to calculate biodiversity units and offsetting does not take into account wildlife or protected species on a site, therefore these must be considered separately and in conjunction with the mitigation hierarchy.

1.3.2 Legislative context

At the current time, there is no statutory duty for LPAs to enforce biodiversity net gain measures on developers, above and beyond what is already contained within their LDFs and NPPF. The forthcoming Environmental Bill will introduce a legal obligation for Local Authorities to seek the delivery of biodiversity net gain in the determination of planning applications. This will require developers to ensure habitats for wildlife are enhanced, with a 10% increase in habitat value for wildlife compared with the pre-development baseline.

1.3.3 Biodiversity Metric 2.0

Biodiversity Metric 2.0 is the current 'best practice' metric used to calculate biodiversity units. It has been produced by Natural England and is currently in the beta phase of testing. The metric quantifies habitats by assigning numeric value as proxy for a categorical qualitative assessment of each influencing factor described in more detail in *Section 2.1.2*.

The current metric is compatible with the UK Habitat Classification Hierarchy, which recognises five levels of classification. Classification Levels 3 (Broad Habitat Type) and 4 (Habitat including UK BAP Priority Habitats) apply to Biodiversity Metric 2.0.

1.4.1 Aims of the study

The aim of this study is to complete a unit calculation of habitats on Site, and identify appropriate interventions to achieve a net gain in biodiversity, which is to be fed into the current *Nyn Park Landscape Management Plan (2022-2032)*. This report aims to:

- Carry out a qualitative assessment of the site to determine the baseline habitat characteristics and potential for protected species.
- Quantify the baseline of the site in terms of its biodiversity unit value using *Biodiversity Metric 2.0*;
- Identify opportunities for habitat creation, enhancement or accelerated succession which will deliver a minimum 10% net gain margin;

2.0 METHODOLOGY

2.1 Data collection

2.1.1 Site survey

A comprehensive Site survey and assessment was carried out in May 2019 to record and map habitats in support of the 10-Yr Landscape Management Plan, and an update visit carried out in October 2020 to assess habitat condition qualitatively set criteria.

The 2019 surveys also assessed the potential for protected species to be present on Site. Although this aspect cannot be incorporated into the metric calculations, protected species have been considered as part of the overall habitat enhancement proposals.

The update survey was undertaken on 28th October 2020 by Senior Ecologist Alison Hood, Ecologist John Salisbury and Assistant Ecologist Alice Webb of Maydencroft Limited. The weather during the survey was overcast with light wind at a temperature of 9°C.

2.1.2 Net gain calculation

The calculator used to provide a quantitative assessment of the habitats through calculation of baseline units and net gain is Natural England's Biodiversity Metric 2.0. Although in its beta phase, this tool has been used as it is to be the most widely used version for best practice working, and so the outcomes will be comparative to other projects and sites.

Using the Metric, the first five factors are used to calculate the baseline on Site, as detailed in *Table 1*. Area habitats (such as grasslands), and linear features (such as hedgerows) are measured using a separate calculation. Further constraining factors for habitat creation, enhancement or succession are subsequently incorporated into the post-intervention unit calculation; these include time to target condition, difficulty of creation and spatial risk.

The *Biodiversity Net Gain Good Practice Principles for Development (2016)* have been followed throughout the assessment and incorporated into the recommendations for habitat enhancement and creation.

2.1.2.1 Strategic significance

For the purposes of this assessment, habitats on Site within the SSSI have been included as 'within area formally identified in local strategy'. Habitats outside of the SSSI have been listed 'location ecologically desirable but not in local strategy' as they lie in close proximity to the SSSI and offer connectivity to habitats within the SSSI.

Table 1: A description of factors influencing the biodiversity unit value of a site and a proposed offset.

Factor	Explanation
Area or length	Area of a habitat is measured in hectares. Length of a linear habitat is measured in kilometres.
Distinctiveness	The relative value of a habitat type before any other factors have been considered; includes parameters such as species richness, diversity, rarity and the degree to which a habitat supports species rarely found in other habitats. Each habitat type has a pre-set value of distinctiveness and is assigned as very high, high, medium or low .
Condition/target condition	The condition of the baseline habitat/expected condition of the habitat following completion of the offset. Condition is assessed against a set of criteria (see Section 7.0 references) for that specific broad habitat type and can be good, moderate or poor (fairly good and fairly poor can also be used but must be justified).
Connectivity	The proximity of the habitat to similar or related habitats. Results are given as high, medium or low . <i>A proxy value of 'medium' is given for habitats of high or very high distinctiveness, whereas a proxy value of 'low' is given for habitat of medium or low distinctiveness.</i>
Strategic significance	The significance of the site location in relation to local/regional biodiversity, including designated sites or conservation areas listed in local plans. The site can be assigned as one of the following; High - (High potential & within area formally identified in local policy); Medium - (Good potential but not in area defined in local policy); Low - (Low potential and not in area defined in local policy).
Time to target condition	The predicted length of time for completion of the offset, normally given in years. These values are predefined.
Difficulty of creation	The relative difficulty of implementing the offset. These values are predefined.
Spatial risk	The risk involved with changing the location of the habitat resource. These values are predefined.

2.1.3 Surveyor qualifications

- Alison Hood – Senior Ecologist, BSc (Hons), MSc

Alison has over 7 years' experience working in Ecological Consultancy and leads on a variety of projects.

- John Salisbury – Ecologist, BSc (Hons), MSc, ACIEEM

John has over 4 years' experience of carrying out a wide variety of ecological surveys and producing ecological reports.

- Alice Webb – Assistant Ecologist BSc (Hons), MSc, ACIEEM

Alice has over 3 years' experience of carrying out a wide variety of ecological surveys and producing ecological reports.

Surveyors have attended CIEEM accredited training courses relating to biodiversity net gain and using the Biodiversity Metric 2.0.

2.2 Limitations

2.2.1 Use of the Metric

The assessment of habitats and recommendations for enhancement to achieve net gain are formulated from the ecologist's knowledge and experience. The Metric can be used as a tool, with units providing a quantification of net gain; however, it does not replace qualitative assessment from an experienced ecologist and so should not be used for projects without guidance and assessment from a suitably qualified ecologist.

The habitat sizes (area and linear) were measured using Google Earth measurement tools and so a level of inaccuracy in the measurements may occur as the exact boundaries of the habitats could not be confirmed on the ground during measuring.

2.2.2 Site conditions

Development of the golf course had commenced at the time of the 2019 survey and had been completed at the time of the 2020 update surveys. The metric calculation has therefore been carried out retrospectively for the golf course area. The baseline habitats (grassland/parkland and ditches with hedgerows) within the golf course area could not be assessed prior to development and so values input into the metric have been based on assumption informed by the surveyors' knowledge of the site, combined with an advisory note from Hertfordshire Ecology to use a proxy value for the grassland as being of a 'medium distinctiveness' habitat.

2.2.3 Botanical survey

Because of the time of year that the update survey was undertaken, a full botanical appraisal of the grassland habitats on Site could not be undertaken to aid in the condition assessment. This is not however considered to be a significant constraint to the appraisal as the habitat types had been surveyed the previous summer with botanical species recorded.

3.0 METRIC CALCULATIONS

3.1 Habitat baseline

The calculations of the baseline habitats on site and the pre-development baseline of the golf course are shown below and in *Appendix B* (metric calculations).

3.2 Baseline biodiversity unit value

The Site's ecological baseline for habitats as calculated by the Biodiversity Metric 2.0 is worth **1100.96 habitat units plus 7.35 hedgerow units**, incorporating the grasslands, woodlands, ponds, ditches, hedgerows and lines of trees (shown in Figure 1 below).



Figure 1. Nyn Park aerial image from 2018, prior to golf course development.

3.3 Post-intervention unit value

The recommendations for ecological enhancements and creation have been made to achieve net gain on Site and to improve the value of the Site for habitats and wildlife (see *Appendix A – numbered habitats correlate to reference numbers within the metric Site Habitat Enhancement tab*). Habitat enhancements have created the majority of post-interventions due to the Site supporting an abundance of semi-natural established habitat. A smaller amount of habitat creation has been recommended to

increase habitat interest in certain areas, as described in Section 4.2. All proposed interventions have been kept on-site without the need to incorporate off-site areas.

With the interventions implemented on Site, including a combination of habitat retention, enhancement, and creation, the future biodiversity unit value on Site has been calculated to be **1244.88 habitat units, plus 8.92 hedgerow units.**

This has been calculated to achieve a **biodiversity net gain of 13.07% in habitat units and 21.4% in hedgerow units.**

The proposals detailed within the 10-yr Landscape Management Plan have been incorporated into the metric calculations and form a significant proportion of the post-intervention units.

It is acknowledged that some of the recommended management actions in the new LMP are similar to those contained within the 2007 Landscape Agency Plan. The reason for this is that the overriding aims and objectives of the previous plan are still very much relevant to the estate and its habitats, and whilst both capital improvements and management actions have been implemented and delivered over the last 13 years in accordance with the plan, there is still a need to address issues and provide ongoing active management to achieve biodiversity gains. An example of this is within Well Wood SSSI, where a great deal of work has been undertaken to control rhododendron and bracken, but they both still pose a threat to the woodland biodiversity and require continued active management in order to bring the woodland into favourable condition. We see the ability to incorporate these previous commitments into the new LMP as a mechanism for ensuring that appropriate management continues to be implemented, existing habitats enhanced and new habitats created for a minimum period of 30 years.

4.0 DISCUSSION

4.1 Assessment of impacts of the golf course development

4.1.1 Habitats lost

Development of the golf course has resulted in a loss of certain types of habitat on the site, pertaining to neutral grassland, ditches and hedgerows. As a large proportion of the golf course is to be maintained as an amenity area, the main focus of net gain has therefore been within areas beyond the golf course development site, within the surrounding habitats that lie within the estate ownership boundary. The golf course development itself has incorporated some smaller amounts of enhanced or created habitat in the form of heathland creation and pond creation, with proposed hedgerow and scrub planting.

4.1.1.1 Neutral grassland

The loss of neutral grassland has been quantified as 18ha; this loss pertains to semi-improved grassland which has been replaced by short mown amenity grassland of a species-poor seed mix. The remaining 10ha of neutral grassland outside of the golf course development has either been enhanced or habitats of higher distinctiveness have been created in its place, as per good practice principles of the metric.

To inform the pre-development baseline of which could not be surveyed, it was advised by Hertfordshire Ecology to use a proxy of a 'medium distinctiveness' habitat; based on this the baseline for the golf course was input into the metric to be of 'other neutral grassland', in 'poor condition'. The latter was based on the condition assessments of the adjacent North and East Parkland, also being of poor condition. It is considered that these areas have all been subject to the same management, with all being previously conifer plantation which were cleared approximately 10 years ago. Within this time, the parklands and golf course area have all been subject to the same seeding and management regime. In addition, the golf course area and the parklands all had comparable conditions such as a similar number of trees and drainage ditches present, and all with similar elevations, inclines and aspects, meaning that environmental conditions are likely to be alike. Consequently, it is considered appropriate to assign the baseline grassland of the development to also be of 'poor condition' of a 'medium distinctiveness' habitat.

Although there has been a loss in overall grassland area, this loss has been compensated for by enhancing (improving condition of) retained grassland, and higher distinctiveness habitats such as woodland and heathland, also aligning with the good practice principals of net gain.

It is acknowledged that 18ha of semi-improved other neutral grassland has been replaced by amenity grassland, however it is important to consider that the impacts of the golf course on site are not equal to those of a housing or industrial development, or even those of a commercial golf course. The golf course at Nyn Park does not use lighting and has not resulted in any additional persons or traffic to the site which may increase disturbance to habitats and wildlife. Further to completion of the development, there has been very little disturbance caused on site to habitats and wildlife, with the exception of regular grounds maintenance activities. In addition, the

golf course has not created any major barriers to the movement of wildlife throughout the site, retaining the openness and woodland edge habitats that are used by bats, barn owls, and raptors.

4.1.1.2 *Ditches & hedge*

The golf course has resulted in the direct loss of one ditch and associated hedge (hedge no. 2 in Appendix A), and the partial loss of three further ditch and hedge habitats.

Despite the impacts as stated above, the golf course development is not considered to have severed any significant wildlife corridors or connectivity around the estate, as the surrounding woodlands have been retained around the golf course, with significant woodland belts and tree lines having also been retained through the central area of the site. It is acknowledged that a small amount of ditch and hedgerow habitats passing across the grassland have been removed, although this loss is not considered significant in the context of the wider site. In addition, the enhancements on site, particularly the woodland planting and creation of new hedgerows will provide more enhanced habitat connectivity and corridors for wildlife.

4.2 **Assessment of post-intervention benefits**

Through a combination of habitat enhancement and creation, it is considered that a net gain in biodiversity can be achieved on Site. This work will be guided by the existing 10-year Nyn Park Landscape Management Plan, which will be extended to cover a 30-year period.

Through the delivery of this management plan over the 30-year period, supported by regular compliance monitoring, it is thought perfectly possible for all habitats on Site to become 'good condition'.

4.2.1 *Habitats created and enhanced*

4.2.1.1 *Woodland enhancement & creation*

The proposed woodland management will improve the structure and condition of woodlands across the site through a process of selective thinning and coppicing, INNS Management pest control, restocking, and identifying and securing veteran trees. Canopy management will help to encourage natural regeneration and development of a better understorey and diverse ground flora.

Management of Well Wood SSSI has been excluded from the metric calculation for reasons pertaining to the Good Practice Principles of Biodiversity Net Gain as gains should achieve outcomes that do not include or exceed those resulting from existing obligations, such as those already relating to SSSIs. Management of the SSSI on site will however be included within the Management Plan and will be in accordance with recommendations from Natural England with the aim of bringing the unit up to favourable condition.

Woodland planting is proposed on an area of poor condition grassland within East Parkland, bordering Vineyard Wood. This is considered appropriate as it will create a higher distinctiveness habitat and improve the woodland edge and connectivity around the eastern part of the site.

4.2.1.2 *Scrub planting*

Planting of scrub is proposed between woodland edges and grassland habitats to provide a buffer and ecotone between mature woodland and grassland. Scrub will be scalloped to provide niches for an array of wildlife, and will include a locally native mix of species.

4.2.1.3 *Grassland enhancement*

The improved management of grassland will enable a more diverse sward in structure and species to provide resources for numerous species groups, including invertebrates, birds, reptiles, amphibians and small mammals. Native species-rich seed mixes will be sown if necessary, to aid in the creation of a species-rich sward. The onset of conservation grazing in South Parkland will provide a sustainable management approach.

The rough areas within the golf course will be managed through an annual cut and lift regime. Removing the arisings will reduce nutrient input into the soils which in time will encourage more species within the seedbank to germinate, and increase the richness of the sward.

The restoration of lowland acid grassland within North Parkland will provide further habitat niches for acid grassland species, and the fauna that this habitat type supports, including ground nesting birds, reptiles, and invertebrates such as solitary bees and wasps, and grayling, common blue and silver-studded blue butterflies.

4.2.1.4 *Heathland restoration & enhancement*

Restoration of the lowland heath habitat will allow a rare and rapidly declining habitat to develop on site and be managed in perpetuity as a legacy to the historic character of the habitats in the area. The total heathland resource for Hertfordshire is estimated to be less than 20 ha of dry and wet heath communities, and thus the restoration of 3.65ha will make a significant contribution to the county's resource.

The heathland will be maintained by low-intensity grazing which is fundamental to the development and maintenance of this habitat type to create and maintain a wide variety of heath communities and to preserve open areas, trample bracken and prevent scrub encroachment.

A specialised fauna is also associated with heathlands and heath / grass mosaics, including warblers, and nightjars which nest in open heathy areas, often close to woodland. Heathland can also support numerous amphibians and reptile species and specialised invertebrates, including moths, beetles, butterflies, spiders, bees and wasps.

4.2.1.5 *Pond creation*

Nyn pond has been restored as part of the golf course development. The two islands on the pond have been retained and continue to be used by nesting birds, including mallards. In addition, a total of five other ponds have been created to provide additional wetland habitat on site. Pond margins will be planted with native aquatic species to provide a shelter, breeding places and food sources for wildlife, including birds, amphibians and invertebrates. It has been recommended that fish, unless naturally occurring, should not be stocked within any of the water bodies on site in order to prevent high levels of predation of invertebrate and amphibian species.

4.2.1.6 Orchard restoration and creation

A remnant orchard is located to the south-west of Broadleaf Wood, adjacent to the main house. The age of this orchard is unknown however it is considered to be historic due to the age class of the few remaining trees being mature/veteran. There are approximately 10 trees remaining but are in need of restorative works to ensure their longevity. The secondary woodland and scrub have also encroached into the remnant orchard and so restoration will likely include clearance of scrub and replanting of new fruit trees, along with restoration of existing fruit trees. The specific restoration plan is to be confirmed following a full study and liaison with Orchards East experts.

A new orchard area will also be created within an area of grassland immediately south-west of Well Wood SSSI. The specification and plan for this will also be determined following further study and research to ensure the orchard's success and longevity.

Orchards are of a high distinctiveness habitat and when managed as Traditional Orchards, are considered a Priority Habitat, and so will provide benefits for biodiversity on site, particularly invertebrates but will also provide resources for a broad range of species groups.

4.3 Viability of enhancements

The recommended habitat enhancements to achieve 'good condition', along with habitat creation to attain the net gain percentage specified are considered achievable over a 30-year period if capital works and short and long-term management and prescriptions can be followed as per the Landscape Management Plan. All works and management operations should be carried out under best practice approaches and with continual advice from the ecologists.

4.4 Monitoring

Regular compliance monitoring visits will be carried out by Maydencroft consultants to record the progress of management in line with the Landscape Management Plan and metric. These visits will take place at a minimum of once per annum. Where management has not achieved a satisfactory outcome for a particular area or habitat within the monitoring period, recommendations will be made for amendments to the management prescriptions, as required.

Annual monitoring reports supported by photographs will be produced and submitted to the LPA as evidence of Management Plan delivery.

4.5 Consideration of protected species

4.5.1 Mitigation during management

Protected species will be considered throughout management planning and implementation of operations as specified within the Landscape Management Plan. This will include undertaking prior presence/absence surveys for species, as required, or implementing specific mitigation measures for particular management practices that have the potential to impact protected species, in order to maintain the favourable conservation status of species on site.

4.5.2 Other enhancements for species

The Site has been identified as currently supporting or having the potential to support a number of protected/important species/species groups, including birds, bats, badger, reptiles, amphibians and invertebrates. The habitat enhancements, once established, will increase the value of the Site for these species. In addition, the below recommendations will provide enhancements for wildlife in the short term:

- Creation of deadwood and log piles within the peripheral regions of management compartments and where grassland transitions to adjacent scrub, woodland or hedgerow;
- Installation of barn owl boxes and other bird nest boxes on retained mature trees within South Parkland and woodland edges;
- Installation of sustainable free-standing timber bee hives within the North Parkland, to be located in a south facing, sheltered position;
- Bat boxes including Schwelger 3FF Bat Box (self-cleaning) and Schwelger 2FN Special Woodland Bat Box to be installed within woodland areas on mature trees;
- Hibernacula to be created within restored heathland to provide hibernation habitat for reptiles and amphibians.

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Disclaimer

Every effort has been made to ensure that the content of this report accurately identifies the potential ecological constraints to operations, its overall ecological value, and considered the possibility of the presence or absence of all Protected Species and the need for further surveys or ecological works. External factors such as weather conditions, time of day, seasons, disturbance by others, can all affect the use of the site by such species, and this report should therefore not be viewed as definitive. No liability can be accepted for omissions or changes within the status of wildlife after the production of this report.

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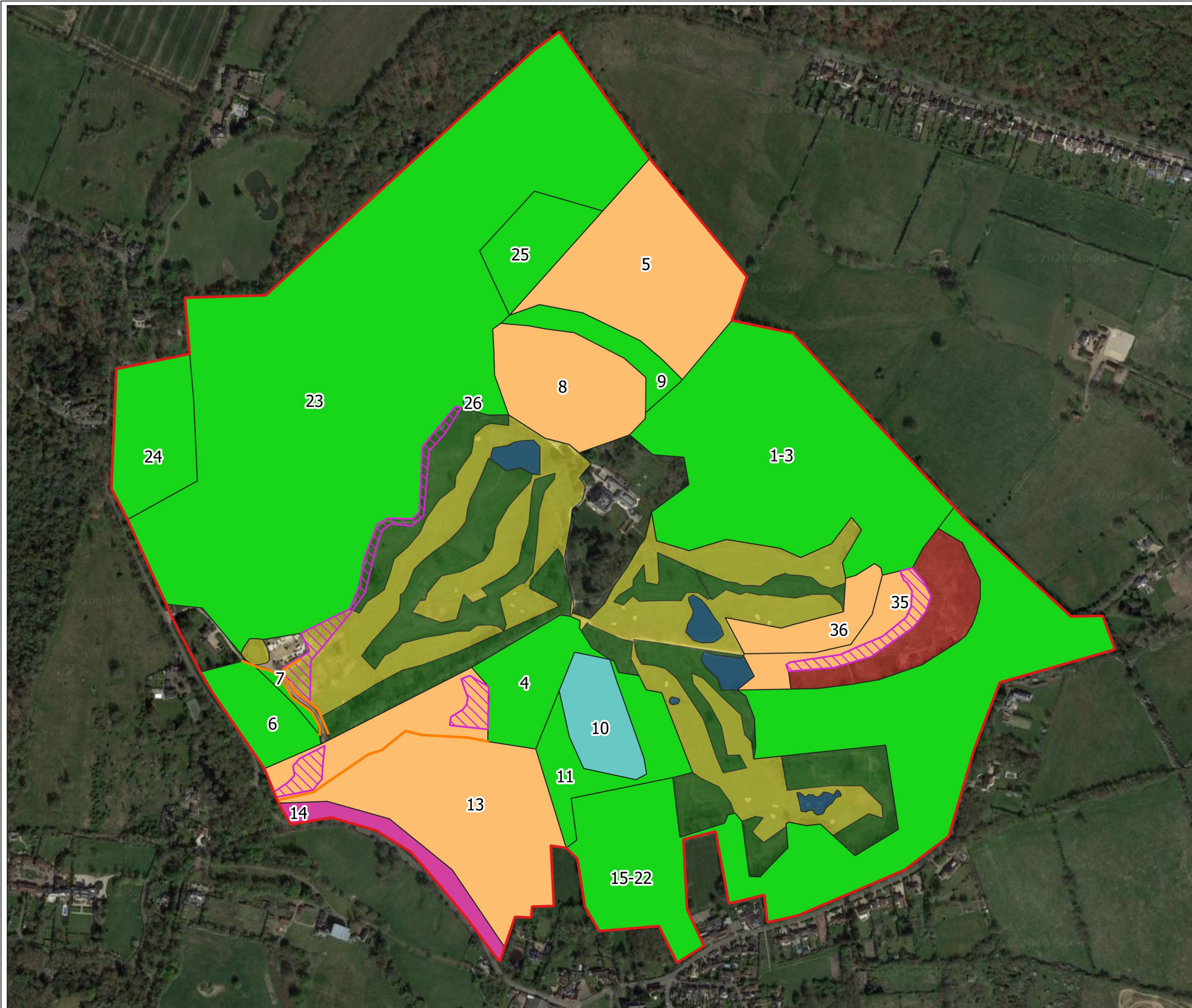
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8.0 APPENDICES

Appendix A. Nyn Park Biodiversity Net Gain Plan

Appendix B. Biodiversity Metric 2.0 Nyn Park




Legend

- Boundary

- Net Gain Enhancement Areas**
- Grassland
- Heathland and shrub
- Lakes
- Woodland

- Golf Course Enhancements**
- Amenity Grassland
- Pond
- Retained Grassland
- Planted Woodland
- Planted Scrub
- Planted Hedgerow

Client	Bessington Investments	
Project	Nyn Park Golf Course Biodiversity Net Gain Project	
Title	Biodiversity Net Gain Map	
Drawn	JS	Checked AH
Drawing No.	A	
Date	23.11.20	Revision Issue
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