

LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

FOR UNIVERSITY COLLEGE

NORTH OXFORD DEVELOPMENT | 22/12/2021 | VERSION 1

Client

Project

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1 INTRODUCTION

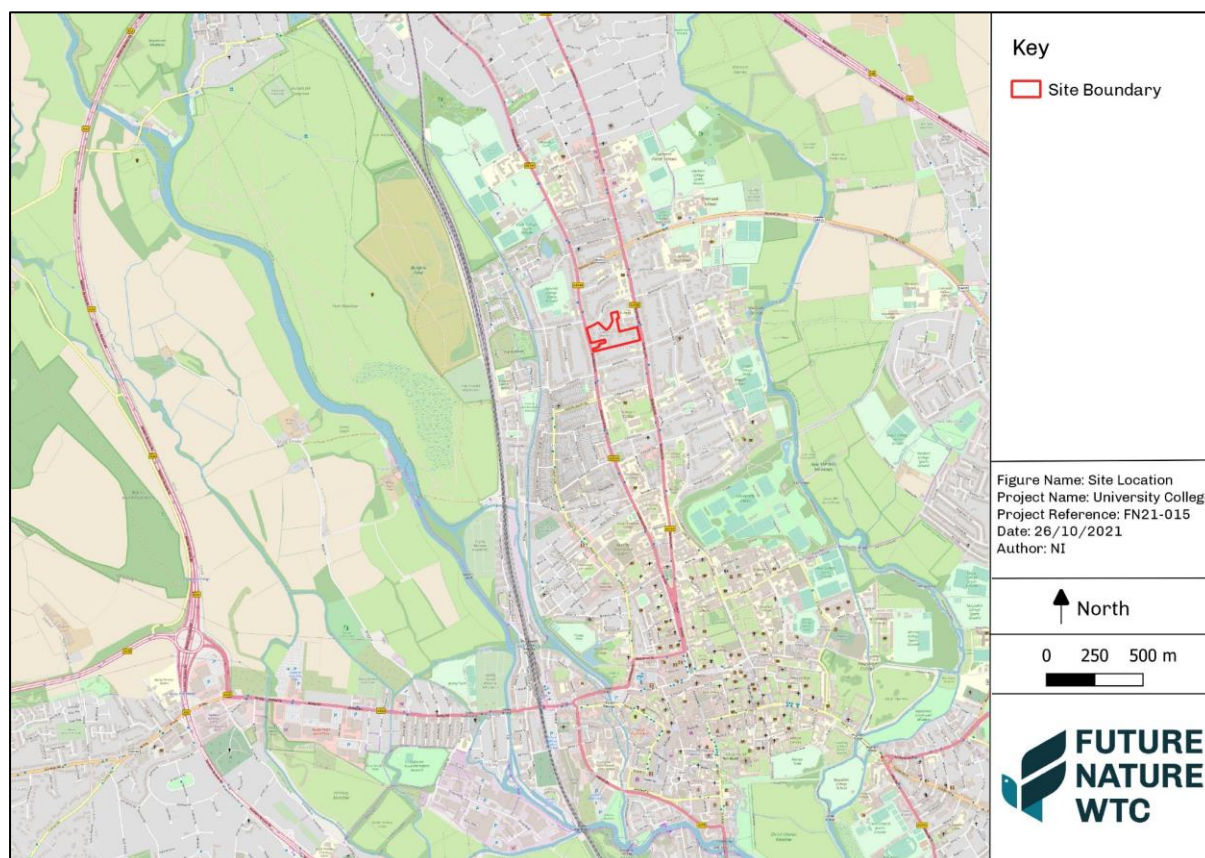
1.1 BACKGROUND

In July 2021, Future Nature WTC was commissioned by University College to undertake an independent Biodiversity Net Gain (BNG) Assessment. This work identified that a net gain of 20.62% is achievable if newly created grassland meets good condition within 30 years. A Landscape and Ecological Management Plan (LEMP) has been produced to ensure the long-term biodiversity of the site is enhanced. This also complies with Condition 13 of the approved planning application for the site (Ref. no: 20/00116/FUL).

1.2 SITE LOCATION & DESCRIPTION

The site is located in North Oxford, adjacent to Banbury Road, OX2 6LA at an approximate central grid reference of SP 50872 08176, as illustrated in Figure 1. The survey area is approximately 2.55 ha and comprises of accommodation and gardens associated with student residence and Fairfield Residential Home.

Figure 1. Site Location



1.3 SITE PROPOSALS

The proposals involve the demolition of a number of buildings on site, as well as partial-demolition and alteration of existing buildings. It will also involve the erection of new three-storey buildings as well as modification of roads, paths and landscaping features within the site. The current proposed site plan is presented in Appendix A.

The habitats proposed in the site plan have been mapped using UK Habitat Classification methodology and are presented in Appendix C.

1.4 REPORT OBJECTIVES

The objectives of this report are to:

- Describe the current ecological baseline and its proposed enhancements.
- To provide a plan to enhance existing habitats and establish proposed habitats during and post construction.
- Prepare a schedule of works to outline the timing associated with habitat management.
- Detail ongoing monitoring measures.

2 ECOLOGICAL BASELINE

2.1 HABITATS

A Preliminary Ecological Appraisal (PEA) was undertaken, consisting of three visits on 30/07/2021, 04/08/2021 and 11/08/2021. The PEA involved the mapping and identification of habitats in accordance with the UK Habitat Classification criteria¹. The habitats on site for which management and monitoring proposals are mapped in Appendix B, and detailed in Table 1. Those habitats to be retained include their current BNG Metric 3.0 condition as assessed during the field surveys. Newly created habitats include their target BNG Metric condition.

¹ The UK Habitat Classification, Habitat Definitions Version 1.1 (2020)

Table 1: Habitats to be retained and proposed habitats to be created on site.	
Habitat	Description
Modified Grassland	<p>Typical amenity lawn habitat present through the site. It is species poor (<9 species/m²). The lawn areas are frequently mown and cut very short.</p> <p>The species composition is dominated by perennial rye-grass and fescue sp. Field wood-rush is present, but rare.</p> <p>Other species present within the sward include; daisy, yarrow, ground-ivy, white clover and creeping buttercup.</p> <p>BNG Metric condition: Moderate</p>
Traditional Orchards	<p><u>Northern Orchard</u> An orchard containing a mixture of fruit trees, including apple, pear, medlar and plum. A mown path is present through the centre and around the perimeter, which is surrounded by areas of tall grassland of neutral composition.</p> <p>The grassland is species moderate (9-15 species/m²). The sward is primarily comprised of false oat-grass, perennial rye-grass, cock's foot and Yorkshire fog.</p> <p>BNG Metric condition: Moderate</p> <p><u>Southern Orchard</u> An area of orchard in which apple is dominant, with pear and hawthorn present to a lesser degree.</p> <p>The sward is species poor (<9 species/m²). The sward is dominated by perennial rye-grass and cock's foot. A significant amount of common nettle is present.</p> <p>BNG Metric condition: Poor</p>
Hedgerows	<p><u>Native Hedgerow</u> A number of well maintained, ornamental hedgerows predominantly comprising of yew, box and beech.</p> <p>BNG Metric condition: Moderate / Good</p> <p><u>Hedge Ornamental Non Native</u> A somewhat undermanaged, sparser hedgerow comprising of privet, yew and hazel.</p> <p>BNG Metric condition: Poor</p>

Proposed - Neutral Grassland	<p>A mosaic of neutral grassland is to be created across the site, resulting in a total area of 0.43 ha. The majority of which will be replacing the lawns currently present. This will provide a greater amount of foraging opportunities for invertebrates, which will provide feeding resources for mammals, birds and herptiles.</p> <p>BNG Metric target condition: Good</p>
Proposed – Traditional Orchards	<p><u>Southeastern Orchard</u> A 0.04 ha area of traditional orchard located on a neutral grassland sward, to target a similar structure and condition to the pre-existing Northern Orchard. Planting will primarily consist of local, oxford-provenance apple trees.</p> <p>BNG Metric target condition: Moderate</p> <p><u>Western Orchard</u> A small 0.01 ha area of traditional orchard to be created east of the Bennet Building. To be located on a tall, neutral grassland sward.</p> <p>BNG Metric target condition: Moderate</p>
Proposed - Hedgerows	<p>A number of new hedgerows are proposed to be created throughout the site, resulting in a total length of 0.56km. This includes replacement of the poor condition Leyland cypress trees along the eastern boundary of the southern orchard.</p> <p>BNG Metric target condition: Good</p>
Proposed – Standard Trees	<p>A total of 78 new trees are proposed to be planted within the site boundary. The species proposed include small-leaved lime, beech and walnut. A full species-list is identified within the Arboricultural Impact Assessment² produced by FLAC.</p>

3 LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

3.1 INTRODUCTION

This chapter provides the aims and objectives of management, as well as specific management recommendations for the retained and proposed habitats described in Table 1. A schedule of works is presented within each section to outline the timings associated with habitat management and creation works.

² Forbes-Laird, J. (December 2019). University College Oxford North Site, Arboricultural Impact Assessment

3.2 MODIFIED GRASSLAND

3.2.1 Aims and Objectives

Aims:

- To enhance the suitability of lawns on site for invertebrates whilst maintaining the current character of the site.

Objectives:

- Avoid use of weedkillers.
- Better connect the lawns with adjacent habitats through introduction of buffer zones.

3.2.2 Habitat Management and Creation Recommendations

To retain the current character of the site, the grassland will continue to be mown short. However the creation of a 1m buffer zone where lawns meet hedgerows and paths can greatly benefit invertebrates. This graded edge should be allowed to grow tall, which will encourage a greater diversity of wildflowers and provide a variety of microhabitats for invertebrates. This tall grassland will provide more food for larvae of grass-feeding butterfly species.

3.2.3 Schedule of Works

Habitat	Management Activity	Timing	Year											
			1	2	3	4	5	6	7	8	9	10		
Modified Grassland	Cutting of amenity grassland, can be weekly in summer. Grass should be cut less frequently in dry weather. Arisings to be removed.	Year round	x	x	x	x	x	x	x	x	x	x	x	x
	Spot pick pernicious weeds e.g. thistles, nettles and docks.	Year round	x	x	x	x	x	x	x	x	x	x	x	x
	Cut buffer zones to a few centimetres in height. Arisings to be removed.	Mid-July to September	x	x	x	x	x	x	x	x	x	x	x	x

3.3 TRADITIONAL ORCHARDS

3.3.1 Aims and Objectives

Aims:

- To increase the botanical diversity of retained orchards.
- To remove pernicious weeds and undesirables from the retained orchards.
- To establish two new native and wildlife-friendly orchards.

Objectives:

Northern Orchard

- Monitoring and continued removal of pernicious weeds, particularly bindweed.

Southern Orchard

- Monitoring and removal of pernicious weeds.
- Removal of enriched topsoil to leave nutrient-poor subsoil for planting.

Proposed Orchards

- Removal of topsoil to leave nutrient-poor subsoil for planting.
- Monitoring and management of young trees and sown grassland.

3.3.2 Habitat Management and Creation Recommendations

Northern Orchard

The northern orchard is in an overall good condition, though bindweed will need removal and ongoing monitoring. Additional enhancements can be made in this area by introducing deadwood. A number of log-piles should be arranged throughout this orchard, using wood from tree felling operations on site. This will provide a suitable hibernacula for small mammals, herptiles as well as providing an additional food source for invertebrates. Any fallen wood from fruits trees should be left in place, unless they are restricting access and movement along paths.

Southern Orchard

The topsoil is nutrient-rich and the sward is dominated by perennial rye-grass, cock's foot and common nettle. In order to reach the nutrient-poor subsoil, approximately 1.5cm of topsoil should be removed, along with the nutrient-rich soil mounds currently present within the orchard. This area will be prepared and sown with a meadow grassland seed mix, and supplemented with cuttings from the northern orchard. A general purpose meadow mix is recommended such as Emorsgate EM2 (Table 2).

Proposed Orchards

The proposed south-eastern orchard is currently located on good condition modified grassland. To achieve a similar character to the retained northern orchard, 1.5cm of topsoil should be removed. This area will be prepared and sown with a meadow grassland seed mix, such as Emorsgate EM2 (Table 2).

The proposed western orchard will be created on what is currently a road within the site. Nutrient poor subsoil should be present, and can be supplemented with building materials and aggregates won on site to reduce fertility. A general purpose meadow mix is recommended such as Emorsgate EM2 (Table 2).

Species	Percentage (%)
Wildflowers	
Yarrow	1
Betony	0.5
Common Knapweed	2.5
Wild Carrot	2.5
Hedge Bedstraw	2
Lady's Bedstraw	1
Oxeye Daisy	3
Musk Mallow	6.5
Ribwort Plantain	0.1
Salad Burnet	0.1
Meadow Buttercup	0.1
Yellow Rattle	0.1
White Champion	0.3
Grasses	
Common Bent	8
Crested Dogstail	28
Red Fescue	24
Smaller Cat's Tail	4
Smooth meadow-grass	16

3.3.3 Schedule of Works

Habitat	Management Activity	Timing	Year											
			1	2	3	4	5	6	7	8	9	10		
All Orchards	First cut: The grassland should be cut to remove the bulk of material to a height of 5-7.5cm. Arisings should be left for two days to allow seed drop, and then collected. It is recommended to vary the time of the first cut each year to prevent any one species becoming dominant.	Late June to August	x	x	x	x	x	x	x	x	x	x	x	x
	Subsequent cuts: If required additional cuts can be undertaken to a height of 4cm. Arisings should be left for two days to allow seed drop, and then collected.	Late autumn - Spring	x	x	x	x	x	x	x	x	x	x	x	x
	Spot pick pernicious weeds e.g. thistles, nettles and docks.	Year round	x	x	x	x	x	x	x	x	x	x	x	x
Southern Orchard and Proposed Orchards	Preparation of ground: Remove all topsoil and soil mounds, level using site won material, retaining nutrient poor subsoil on the surface.	March, April or September	x											
	Sowing: Seed should be bulked with an inert carrier, such as silver sand to aid spreading. A seed rate of 3-5 g/m ² is recommended. To ensure an even scattering, sow evenly half lengthways and the remaining half widthways. Walk in scattered seeds, do not cover with soil.													
	Immediately after planting maiden fruit trees, cut back by one third to promote branching	November to February	x											

Southern Orchard and Proposed Orchards	Identify 4-5 well space lateral branches to form the 'scaffold'. Prune back remaining growth by one third just above an outward facing bud.	November to February		x										
	Leave the previous years growth but cut back new side shoots by one third to just above an outward facing bud.	November to February			x									
	Undertake pruning as required, keeping the centre of the tree clear from growth and remove any diseased and weak growth. No more than 20% of the tree's mass should be removed at any one time.	November to February				x	x	x	x	x	x	x	x	
	Keep all newly planted trees clear and mulched, retaining a 10cm circle free around the woody stem to prevent the bark from rotting.	April - August	x	x	x									

3.4 HEDGEROWS

3.4.1 Aims and Objectives

Aims:

- To increase the overall species diversity on site.
- To create new, native hedgerows.

Objectives:

- Install native, species-rich hedgerows wherever possible (>5 woody species).
- Improve connectivity between habitats.
- Provide a mixture of woody species that fruit at different times of year.

3.4.2 Habitat Management and Creation Recommendations

Retained Hedgerows

The current character of the site consists of primarily single-species hedgerows, typically beech, box and hazel. The majority of these hedgerows are however in a good physical condition and provide opportunities for nesting birds. The privet, yew and hazel hedge on the western boundary is relatively sparse and it's condition should be improved by infilling gaps with native woody species.

Proposed Hedgerows

Where possible a native, species-rich (>5 woody species) hedgerow should be installed, particularly adjacent to the most wildlife suitable areas, such as the traditional orchards. It is recommended that the following species are incorporated into the mix:

- Hawthorn (To make up approximately 50% of the hedgerow)
- Blackthorn
- Dog rose
- Guelder rose
- Crab apple
- Elder
- Spindle

The aforementioned species will provide a good amount of forage for invertebrates, mammals and birds for a significant portion of the year

3.4.3 Schedule of Works

Habitat	Management Activity	Timing	Year											
			1	2	3	4	5	6	7	8	9	10		
Retained Hedgerows	Cut so that 50% of each side is trimmed yearly. This should be cut at least 2cm above the previous years growth. This should occur in late winter so food sources for birds and small mammals are not lost.	Late January to February	x	x	x	x	x	x	x	x	x	x	x	x
	If gaps develop, they should be infilled with native woody species	Year round	x	x	x	x	x	x	x	x	x	x	x	x
	Hedges should be slightly tapered on both sides to allow light and rain to reach the bottom of the hedge to prevent the base developing bare patches.	N/A	x	x	x	x	x	x	x	x	x	x	x	x
Proposed Hedgerows	Monitor condition of newly planted woody species, replace any losses.	Year round	x	x	x	x	x							
	Cut 50% of the height of plants following planting. This will encourage bushy growth and improve the establishment of roots.	N/A	x											
	Keep newly planted hedgerows moist as they are particularly vulnerable to drought.	Year round	x	x	x									
	Mulch with bark chippings to reduce water loss and suppress pernicious weed growth.	Mid-late spring	x	x	x									
	The hedgerow should be laid to meet the desired style of hedgerows on site. This will extend the life of the hedgerow and provide a more dense area of shelter for small mammals and herptiles.	November to February	x											

Please note that hedgerow trimming should be undertaken outside of the bird nesting season (March to August inclusive). This is to prevent committing an offence under the Wildlife & Countryside Act 1981 (as amended). If essential works are required within the bird nesting season, then areas to be cleared must be subject to a nesting bird check undertaken by a suitable qualified ecologist before works can proceed

3.5 NEUTRAL GRASSLAND

3.5.1 Aims and Objectives

Aims:

- To increase the overall botanical diversity and provide wildlife-friendly areas.
- To increase the suitability of the site for invertebrates.

Objectives:

- Removal of topsoil to leave nutrient-poor subsoil for planting.
- Adjustment of mowing regimes to encourage a more botanically rich habitat by allowing wildflowers to set seed.

3.5.2 Habitat Management and Creation Recommendations

Almost all areas of neutral grassland to be created are currently positioned on lawns. It is recommended that approximately 1.5cm of topsoil is removed to reach the nutrient-poor subsoil. Given the current proposed site plan, there is a relatively high shade cover from existing mature trees. It is therefore recommended that the majority of wildflower areas are created using a shade-tolerant seed mix, such as Charles Flower Mix. 5 (Table 3).

Species	Percentage (%) ³
Wildflowers	
Betony	4
Bluebell	7
Foxglove	8
Hairy St. Johns Wort	2
Hedge Bedstraw	12
Lesser Knapweed	5
Meadowsweet	7
Nettle-leaved Bellflower	5
Ragged Robin	6
Red Champion	15
Selfheal	14
Wood Avens	15
Grasses	

³ Note: 1kg of this mix contains 20% wildflower seed and 80% grass seed.

Red Fescue	25
Common Bent	5
Crested Dog's-tail	35
Meadow Foxtail	5
Smooth Meadow Grass	13
Sweet Vernal Grass	2
Wood Meadow Grass	15

There are several areas on site where the proposed planting has a relatively low shade cover, such as around the Water Court. In these areas it is recommended that a perennial wildflower species mix (Table 2) is planted in addition to a cornfield annual mix (Table 4). This will provide a bright and colourful aesthetic whilst helping to suppress any coarse grasses and pernicious weeds.

Species	Percentage (%) ⁴
Wildflowers	
Corncockle	45
Cornflower	30
Corn Chamomile	10
Corn Marigold	10
Common Poppy	5

⁴ Note: 1kg of this mix contains 20% wildflower seed and 80% grass seed.

3.5.3 Schedule of Works

Habitat	Management Activity	Timing	Year												
			1	2	3	4	5	6	7	8	9	10			
Neutral grassland	Preparation of ground: Remove approximately 1.5cm of topsoil, level using site won material, retaining nutrient poor subsoil on the surface. Sowing: Seed should be bulked with an inert carrier, such as silver sand to aid spreading. A seed rate of 3-5 g/m ² is recommended. To ensure an even scattering, sow evenly half lengthways and the remaining half widthways. Walk in scattered seeds, do not cover with soil.	March, April or September	x												
	First cut: The grassland should be cut to remove the bulk of material to a height of 5-7.5cm. Arisings should be left for two days to allow seed drop, and then collected. It is recommended to vary the time of the first cut each year to prevent any one species becoming dominant.	Late June to August	x	x	x	x	x	x	x	x	x	x	x	x	x
	Subsequent cuts: If required additional cuts can be undertaken to a height of 4cm. Arisings should be left for two days to allow seed drop, and then collected.	Late autumn - Spring	x	x	x	x	x	x	x	x	x	x	x	x	x
	Spot pick pernicious weeds e.g. thistles, nettles and docks.	Year round	x	x	x	x	x	x	x	x	x	x	x	x	x

3.6 STANDARD TREES

3.6.1 Aims and Objectives

Aims:

- To protect existing standard trees and successfully establish proposed trees.
- To provide a greater amount of nesting opportunities for birds.

Objectives:

- Monitoring of existing trees by a suitably qualified arborist.
- Stake and tie newly planted trees and monitor their establishment.

3.6.2 Habitat Management and Creation Recommendations

Wood from felling operations should be used elsewhere on site for the creation of log pile habitats. Existing trees should be closely monitored to ensure there is no risk to the public from overhanging limbs / dead trees. If possible (i.e. where safe to do so) standing deadwood should be retained on site as this is of high value to invertebrate populations.

The selection of tree species and management of woodland should be guided by recent studies and current advice issued by expert advisors such as the UK Forestry Commission, to mitigate against the forecast impact of climate change on trees.⁵

Tree species should be selected for their suitability for the habitats they are to be planted in, taking into account the availability of water, exposure to extremes of heat and wind, and synergy with their climate of origin. Tree selection should take into account predicted climate changes in 50 years' time, not just for present day conditions.

⁵ Forestry Commission guidance: <https://www.gov.uk/government/publications/managing-englands-woodlands-in-a-climate-emergency>

3.6.3 Schedule of Works

Habitat	Management Activity	Timing	Year									
			1	2	3	4	5	6	7	8	9	10
Retained Trees	Ongoing monitoring of trees and their condition by a suitably qualified arborist to ensure no risk to public.	Year round		x		x		x		x		x
Proposed Trees	Stakes, ties and tree guards installed as required and monitored to be adjusted as necessary as per recommendation of a suitably qualified arborist. The stake can be removed in the third year	Inspect ties in spring and autumn	x	x	x							
	Maintain a vegetation-free circle of at least 1.2m to prevent interception from surrounding vegetation. Mulch around this area but keep a 10cm circle free around the woody stem to prevent the bark from rotting. Water in exceptionally dry winter seasons.	Year round	x	x	x							
	Ongoing monitoring of trees and their condition by a suitably qualified arborist to ensure no risk to public.	Year round	x	x	x	x	x	x	x	x	x	x

Please note that tree management and felling should be undertaken outside of the bird nesting season (March to August inclusive). This is to prevent committing an offence under the Wildlife & Countryside Act 1981 (as amended). If essential works are required within the bird nesting season, then areas to be cleared must be subject to a nesting bird check undertaken by a suitable qualified ecologist before works can proceed.

Roosting bat assessments will be completed by a suitably qualified ecologist prior to any arboricultural works, and subsequent nocturnal surveys conducted should trees show a moderate or high suitability for bats.

3.7 ADDITIONAL BIODIVERSITY ENHANCEMENTS

3.7.1 Aims and Objectives

Aims:

- To increase roosting opportunities for bats.
- To increase nesting opportunities for birds.
- To provide shelter and hibernacula for small mammals and herptiles.

Objectives:

- Installation, integration and monitoring of bat boxes.
- Installation, integration and monitoring of bird boxes.
- Creation of dead wood habitat.

3.7.2 Habitat Management and Creation Recommendations

To increase opportunities for birds, bats, mammals and herptiles suitable habitat will be provided.

It is recommended that general purposes woodcrete bird boxes are installed across the site to provide shelter for a wide range of bird species. Additionally a sparrow terrace is recommended to support this red-listed species. A minimum of 10 swift boxes will be installed on site, and swift bricks may be used to integrate nesting habitat with the buildings. The exact locations of bird boxes should be identified by a suitably qualified ecologist and designed into the building plans prior to construction.

A minimum of three crevice bat boxes should be installed on suitably mature trees to support species such as common and soprano pipistrelle. The exact locations of bat boxes should be identified by a suitably qualified ecologist once the features are installed.

Log piles should be created using material sourced from felling operations on site. A mixture of wood sizes and leaf litter should be stacked to provide a suitable habitat for invertebrates and shelter for small mammals.

3.7.3 Schedule of Works

Habitat	Management Activity	Timing	Year												
			1	2	3	4	5	6	7	8	9	10			
Bird boxes	Installation of bird boxes on mature trees, swift boxes under eaves in locations specified by a suitably qualified ecologist.	Year round	x												
	Visual check of bird boxes and cleaning / maintenance undertaken as required.	November to February		x	x	x	x	x	x	x	x	x	x	x	x
Bat boxes	Installation of crevice bat boxes on mature trees, in locations specified by a suitable qualified ecologist.	Year round	x												
	A visual check of bat boxes to identify evidence of use.	Year round	x	x	x	x	x	x	x	x	x	x	x	x	x
	A bat box inspection by a licensed bat ecologist to determine signs of use, if none then they should be moved and positioned elsewhere on site.	October					x								
Log piles	Monitor condition and replenish with dead wood and vegetation as required and when tree operations are undertaken.	Year round	x	x	x	x	x	x	x	x	x	x	x	x	x

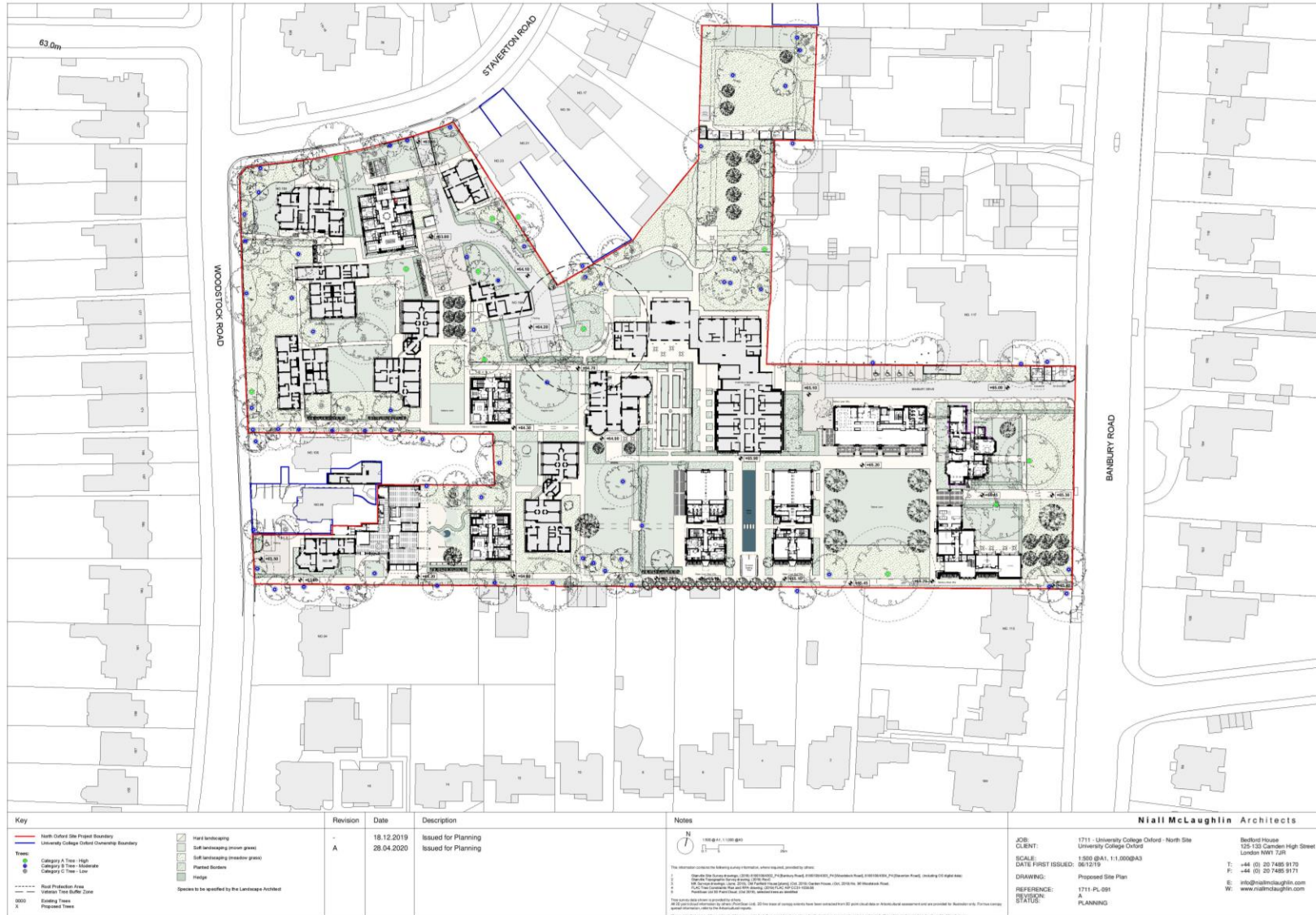
4 ONGOING MONITORING

In order to ensure that retained and newly created habitats are meeting their desired condition, a 10 year monitoring programme is to be implemented (Table 5). A report will be produced at the end of the fifth year to outline progress and additional opportunities for biodiversity enhancement.

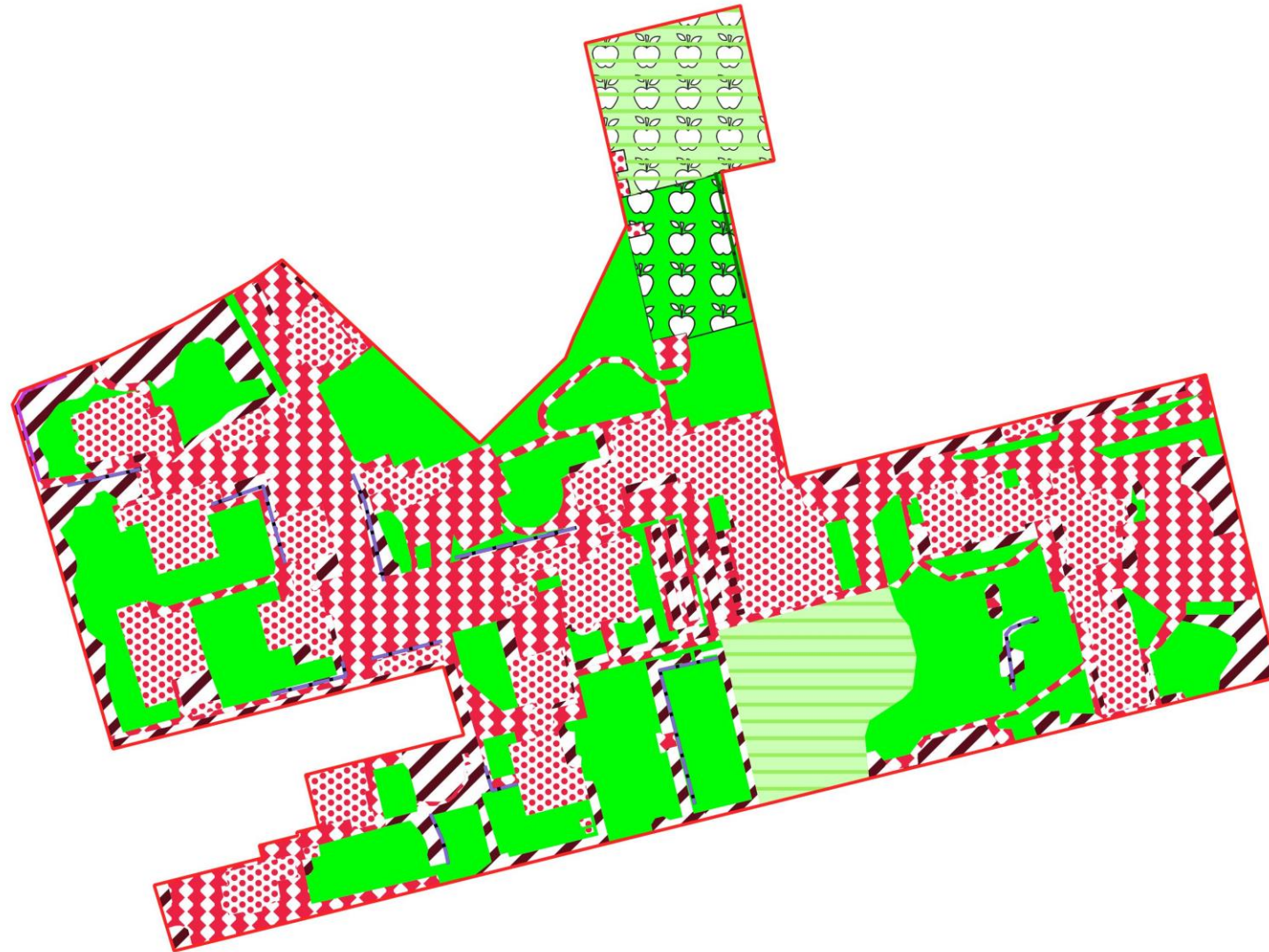
Feature	Monitoring Activity	Timing	Year												
			1	2	3	4	5	6	7	8	9	10			
All Habitats and hedgerows	An ecological survey using UKHab methodology and assessment of habitat and hedgerow conditions using BNG Metric 3.0.	May - June	x	x	x	x	x								x
Standard Trees	Trees should be monitored on an annual basis to check tree health by a suitably qualified arborist.	Year round	x	x	x	x	x	x	x	x	x	x	x	x	x

APPENDICES

APPENDIX A – PROPOSED SITE PLAN

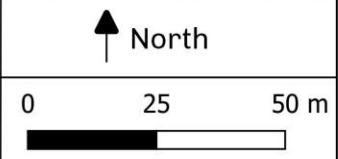


APPENDIX B – UK HABITAT CLASSIFICATION BASELINE MAP

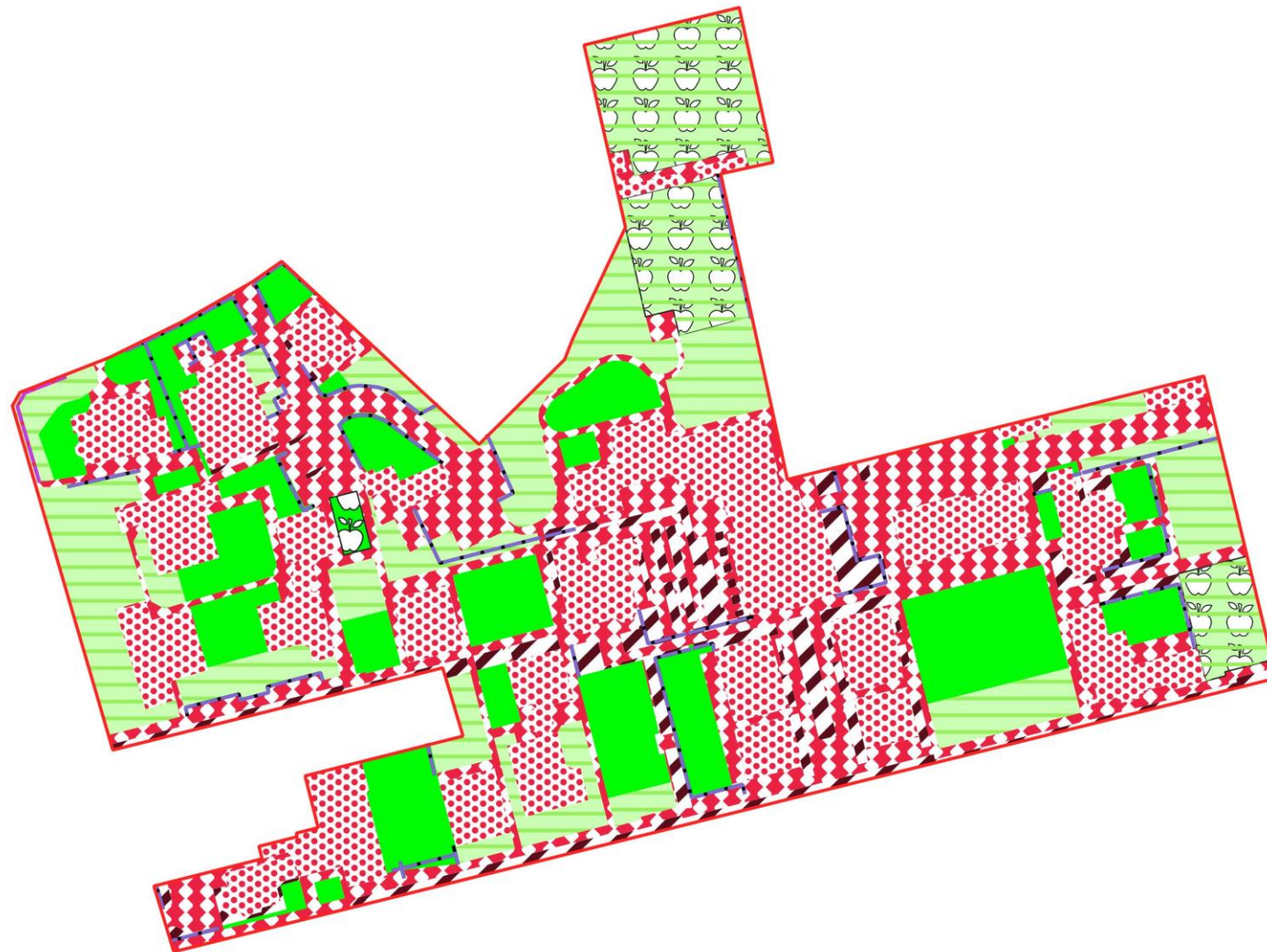


Key	
	Site Boundary
UKHab Linear	
	w1g6 - line of trees
	h2b - other hedgerow
	h2a - hedgerow (priority habitat)
UKHab Polygons	
	g3c - other neutral grassland
	g3c-21 - other neutral grassland - traditional orchard
	g4 - modified grassland
	g4-21 - modified grassland - traditional orchard
	u1 - built-up areas and gardens
	u1b5 - buildings
	u1b6 - other developed land

Figure Name: UKHab Pre-development
 Project Name: University College
 Project Reference: FN21-015
 Date: 27/10/2021
 Author: NI



APPENDIX C – UK HABITAT CLASSIFICATION POST-DEVELOPMENT MAP



Key

- Site Boundary
- UKHab Linear
- h2b - other hedgerow
- h2a - hedgerow (priority habitat)
- UKHab Polygons
- g3c - other neutral grassland
- g3c-21 - other neutral grassland - traditional orchard
- g4 - modified grassland
- g4-21 - modified grassland - traditional orchard
- u1 - built-up areas and gardens
- u1b5 - buildings
- u1b6 - other developed land

Figure Name: UKHab Post-development
 Project Name: University College
 Project Reference: FN21-015
 Date: 27/10/2021
 Author: NI

