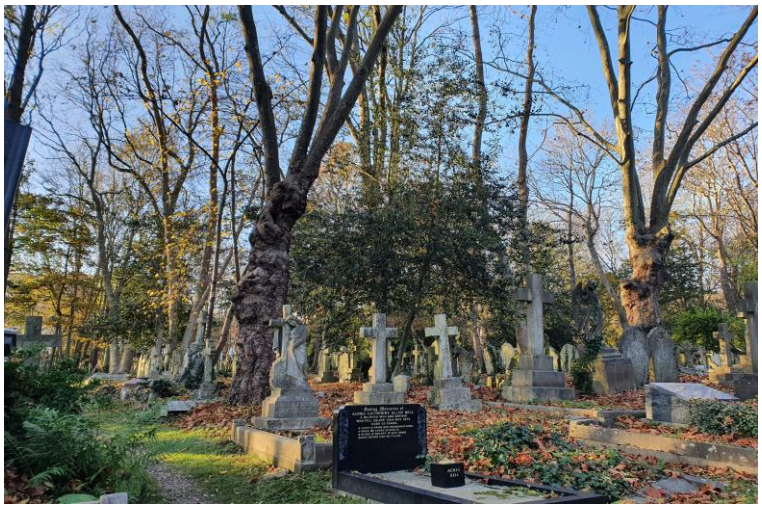
Ashgrove Ecology

Advice for Business



Highgate Cemetery

Ecological Impact Assessment

October 2024

Project title	Highgate Cemetery: Ecological Impact Assessment
Client	Gustafson, Porter and Bowman
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Author	Emma Pollard BSc (Hons) MCIEEM
Reviewer	Rachel Holmes BSc (Hons) MSc PhD MCIEEM CEnv

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APPENDICES

1. INTRODUCTION

This Ecological Impact Assessment (EcIA) assesses the potential effects of the proposed development on ecology and nature conservation. This includes the predicted impacts beneficial or adverse, during the construction and operational phases of the proposed development.

Highgate Cemetery, which comprises East and West Cemeteries (the Site), lies in the London Borough of Camden (central grid reference TQ 285 869). The ecology surveys which inform this assessment include a Preliminary Ecological Appraisal, undertaken to identify the habitats on the Site and assess the potential of the Site to support rare, notable or protected species; and flora and faunal surveys to confirm the status of features that could be impacted by the proposed development. The full details of the surveys are presented in the appendices:

- Appendix 1: Bat Survey Results
- Appendix 2: Botanical Survey Results
- Appendix 5: Highgate Cemetery Biodiversity Net Gain Report

Whilst the Site itself is relatively large (*c.*13.5 ha), it should be noted that the proposed building development works are of a scale and nature which will have limited impacts on the ecology of the Site. This EcIA takes a proportionate approach to the assessment of impacts by focusing on those receptors that are likely to be impacted by these works.

1.1 Legislation and Policy Context

The principal legislation relating specifically to the protection of wildlife and nature conservation comprises:

- The Conservation of Habitats and Species Regulations, 2017 (as amended);
- The Wildlife and Countryside Act (WCA), 1981 (as amended);
- The Countryside and Rights of Way (CRoW) Act, 2000 (as amended);
- Natural Environment and Rural Communities (NERC) Act, 2006; and
- Wild Mammals (Protection) Act, 1996.

The Conservation of Habitats and Species Regulations, 2017

The Conservation of Habitats and Species Regulations, 2017 (known as the Habitats and Species Regulations) are the principal means by which the European Union Directive on the Natural Habitats and Wild Fauna and Flora (92/43/EEC) (EC Habitats Directive) is transposed in England and Wales.

The Habitats and Species Regulations place a duty on the Secretary of State to compile a list of sites considered to be important for habitats or species listed in Annexes I and II of the EC Habitats Directive. Appropriate sites are identified as Sites of Community Importance, which are then designated as Special Areas of Conservation (SAC) or Special Protection Areas (SPA). Any proposed development that may have an adverse effect on an SAC or SPA, collectively known as Natura 2000 sites, should be assessed in relation to the site's conservation objectives.

The Habitats and Species Regulations also assign a European level of protection to a variety of native species of flora and fauna, listed in Annex IV(a) of the EC Habitats Directive, which are known as European Protected Species.

The Wildlife and Countryside Act, 1981

The WCA is the major legal instrument for wildlife protection in the UK. This legislation is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention), the Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention) and the European Union Directive on the Conservation of Wild Birds (79/409/EEC) (EC Birds Directive) are implemented in Great Britain.

The WCA protects the most important habitats as Sites of Special Scientific Interest (SSSIs). It also requires that the Secretary of State takes special measures to protect certain rare or vulnerable bird species, as defined in Annex I of the EC Birds Directive, through the designation and protection of Special Protection Areas (SPAs). Wild animals listed on Schedule 5 of the WCA are subject to specific protection under Section 9, which makes it an offence to:

- Intentionally kill, injure and take a scheduled animal;
- Cause intentional or reckless damage to, destruction of, or obstruction of access to any structure or place used by a scheduled animal for shelter or protection; and
- Intentionally or recklessly disturb an animal occupying such a structure or place.

The WCA prohibits the intentional killing, injuring or taking of any wild bird and the taking, damaging or destroying of a wild bird's nest or eggs. Birds listed on Schedule 1 receive additional protection: it is an offence to intentionally or recklessly disturb these birds or their young at, on or near an active nest.

The Countryside and Rights of Way Act, 2000

The CRoW Act requires all Government departments to have regard for the conservation of biodiversity. In addition, it requires the Secretary of State to publish a list of species and habitats considered to be of Principal Importance in conserving biodiversity within each Country. These species and habitats for England were originally listed under Section 74 of the CRoW Act 2000,

but are now embodied in Sections 40 and 41 of the NERC Act 2006, and are also found within the UK Biodiversity Action Plan (UK BAP).

The CRoW Act 2000 amends the WCA, by strengthening the protection of Sites of Special Scientific Interest, as well as increasing the legal protection of threatened species, by also making it an offence to *recklessly destroy, damage or obstruct* access to a sheltering place used by an animal listed in Schedule 5 of the WCA or to *recklessly disturb* an animal using such a structure or place.

Natural Environment and Rural Communities Act, 2006

The NERC Act, 2006 amends the CRoW Act, 2000 by extending the requirement to have regard for biodiversity to all public authorities', which includes local authorities and local planning authorities. Under Section 41, it also requires that the Secretary of State consults Natural England in the publication of the list of species and habitat types deemed to be of Principal Importance in conserving biodiversity and takes steps to further their conservation.

Wild Mammals (Protection) Act, 1996

It is an offence to intentionally cause unnecessary suffering to any wild mammal by certain methods, including crushing and asphyxiation.

National Planning Policy

The National Planning Policy Framework[1] sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced.

It states that the purpose of the planning system is to contribute to the achievement of sustainable development and that planning policies and decisions should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, sites of biodiversity or geological value and minimising impacts on and providing net gains for biodiversity, including establishing coherent ecological networks that are more resilient to current and future pressures;

Furthermore, plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least value, for development; and take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure.

To protect and enhance biodiversity, plans should identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat

[1] Ministry of Housing, Communities & Local Government (2023) National Planning Policy Framework.

management, enhancement, restoration or creation; and promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

When determining planning applications, local planning authorities should apply the following principles: if significant harm to biodiversity resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.

Furthermore, developments which are likely to have an adverse effect on a Site of Special Scientific Interest, should not normally be permitted; and development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists. Finally, development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged.

Local Planning Policy

Relevant planning policies within the Adopted Camden Local Plan 2017[2] include:

Policy A2: Open space
Policy A3: Biodiversity
Policy C2: Community facilities

Biodiversity Net Gain (BNG)

The Environment Act 2021 was granted Royal Assent on 9th November 2021 and contains provisions which mandate achieving a 10% BNG for most developments. These provisions legally require developers to ensure sites are improved for biodiversity, with a 10% increase in habitat value for wildlife compared with the pre-development baseline. This BNG can be achieved through habitat creation or enhancements to existing habitats. All biodiversity enhancements will be required to be maintained for a minimum of 30 years (UK Parliament, 2021).

The legal requirement for BNG is embedded in national planning policy, the National Planning Policy Framework (Ministry of Housing, Communities & Local Government, 2021a) states that "planning policies and decisions should…identify and pursue opportunities for securing measurable net gains for biodiversity".

[2] Camden Local Plan (2017) London Borough of Camden.

1.2 Consultation Regarding Ecology

Consultations were undertaken with Camden Borough Council, Buglife, London Wildlife Trust and British Lichen Society to inform the proposed developement. A summary of the consultations to date is provided in Appendix 3.

2. METHODOLOGY

Baseline data was collected by desk studies and field surveys between 2021 and 2024. A summary of the methodologies is presented below.

2.1 Desk Study

In October 2021, a desk study was undertaken for the project. Records of rare, legally protected and notable species within 2km of the Site were obtained from the Greenspace Information for Greater London (GIGL). Details of statutory and non-statutory sites within 2km were also obtained.

The MAGIC[3] website was consulted for details of European Protected Species licences within 2km.

2.2 Field Surveys

Habitat and Protected Species Scoping

A Preliminary Ecological Appraisal survey of the Site was undertaken by Arbtech Consulting Limited in September 2023. The habitats were identified and classified according to the UK Habitats classification system[4].

The survey was extended to look for field signs and identify the potential of the habitats to support rare, notable or legally protected species including amphibians, reptiles, badgers, hedgehog, birds, invertebrates and bats (roosting as detailed below along with foraging and commuting).

Bats

Preliminary Bat Roost Assessment of Buildings

A Preliminary Roost Assessment survey of the buildings within the Site was undertaken by Arbtech Consulting Limited in September 2023 with a direct search for evidence of bat use such as droppings, scratch marks, insect remains and urine smear marks along with an assessment of the potential of each building to support bats using professional judgement and the scale presented below, adapted from the 2016 Bat Conservation Trust's Good Practice Guidelines for Bat Surveys[5].

- Confirmed roost - Evidence of bat use found

[3] Multi Agency Geographic Information for the Countryside (MAGIC). At http://www.magic.gov.uk/default.htm

[4] UK Hab Limited (2023):UK Habitat Classification Version 2.0.

[5] Collins. J. (Ed) (2016) Bat Surveys for Professional Ecologists. Good Practice Guidelines. 3rdEdition. Bat Conservation Trust, London.

- High Suitability - One or more potential roost sites suitable for use by larger numbers of bats on a regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat
- Moderate Suitability - One or more potential roost sites that could support bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status
- Low Suitability - One or more potential roost sites that could be used by individual bats opportunistically: however, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or surrounding suitable habitat to be used on a regular basis or by a larger number of bats
- Negligible Suitability - Negligible habitat features likely to be used by roosting bats

Ground Level Tree Assessment

A ground level assessment of trees was undertaken in October 2023, by Level 1 bat survey class licence holder Dr Rachel Holmes, in accordance with the 2023 Bat Conservation Trust's Good Practice Guidelines for Bat Surveys[6]. Each tree was assessed from the ground for potential roosting features and categorised according to the following criteria:

- None – Either no potential roost features present or there are unlikely to be any
- FAR – Further assessment required
- PRF – A tree with at least one potential roost feature present

Phase 2 Bat Activity Survey

Bat activity surveys were conducted during the months of September 2023, May 2024 and June 2024. The surveys followed the Bat Conservation Trust's (BCT's) Good Practice Guidelines for Bat Surveys. The 2023 transect survey was undertaken by Arbetech Consulting Limited and followed the 3rd edition 2016 methodology; and the 2024 walkover surveys were undertaken by MKA Ecology Limited and followed the updated 4th edition 2023 methodology.

The Site was categorised in the Preliminary Ecological Appraisal survey as having low suitability for bat activity and so one survey per season (Spring, Summer and Autumn) was undertaken. This is consistent with both versions of the survey guidelines.

Two surveyors undertook each transect/night-time bat walkover survey recording all bats seen or heard, together with their species, numbers and activity, where possible. Two pre-determined routes (one at the East Cemetery and one at the West Cemetery) were walked starting just before dusk and continuing for two hours with stopping points at regular intervals. In 2024, this

[6] Collins. J. (Ed) (2023) Bat Surveys for Professional Ecologists. Good Practice Guidelines. 4th Edition. Bat Conservation Trust, London.

included vantage point surveys for the initial 40 minutes of the evening, followed by the transect. Bat activity was recorded in 2023 by EMT detectors and iPads, and in 2024 by Elekon Batlogger M detectors, with visual observations used to record flight patterns and feeding behaviour. To aid identification recorded bat passes were later analysed using Kaleidoscope or BatExplorer software to confirm species identification, where required.

Automated detector surveys were carried out with static detectors placed in two locations (East and West Cemeteries) for a minimum of 5 consecutive nights in each season to record bat activity at the Site. In 2023, this involved the deployment of A Song Meter SM4BAT and Song Metre mini, and in 2024 two Anabat Express's were used. All bat registrations were uploaded and analysed using bat sound analysis software Kaleidoscope or Anabat Insight.

Phase 2 Bat Hibernation Surveys

Two buildings on Site (The Terrace Catacombs and The Chapel southern basement corridor) were confirmed as being used by bats. Bat droppings were found in both buildings and potential roost sites for hibernating bats were identified in the Preliminary Roost Assessment survey.

A combination of survey method techniques were employed over the winter in line with the 2023 Bat Conservation Trust's (BCT's) Good Practice Guidelines for Bat Surveys. This encompassed visual inspection surveys in January and March 2024, DNA analysis of bat droppings, passive acoustic surveys using two Anabat Express and two Audiomoth static detectors and dataloggers to record the temperature and humidity of the buildings between December 2023 and February 2024. All bat registrations were uploaded and analysed using bat sound analysis software Kaleidoscope or Anabat Insight. The hibernation surveys were led by Emma Pollard MCIEEM, a Level 2 bat survey class licence holder.

Botanical Survey

A detailed habitat and botanical survey of the Site was undertaken between May and July 2022 by Dr Lesley Mason PhD ACIEEM, a suitably qualified ecologist with extensive experience of habitat and botanical surveys. All habitats were identified using the UK Habitats classification system; and a plant species list was made for each habitat type as well as notes on the condition of the habitats.

2.3 Assessment Methodology

The assessment of the potential effects of the development on ecological receptors uses an approach based on the Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland[7].

Ecological receptors that could be impacted by the proposed development are identified and quantified. Each receptor is then evaluated by taking into account a number of factors including

[7] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

the following: rarity (at local, national or international scale), endemic species, species or habitats that are threatened or in decline, habitats or ecosystems that support important populations species or assemblages; and particularly diverse habitats or species assemblages.

The value of each receptor is then categorised according to the following geographic scale:

- International;
- National;
- Regional;
- County;
- Local; or
- Site.

Receptors of less than Site value are classified as being of Negligible value.

Likely significant effects on receptors from each phase of the development are predicted, and where possible, quantified. Ecological experience and professional judgement are an integral part of the assessment process.

Measures to avoid and reduce significant effects, where possible, have been incorporated into the scheme design. Where necessary, measures to compensate for impacts to ecological receptors are also included. Residual impacts of the proposed development after the implementation of mitigation are then reported.

Opportunities for enhancements within the proposed development are considered, even if there are no significant negative effects.

3. BASELINE CONDITIONS

3.1 Designated Sites

There are no internationally designated sites within 2km of the Site. Hamstead Heath Woods Site of Scientific Interest (SSSI), a nationally important site lies 960m to the west. The conservation status of the SSSI is favourable across 100% of its extent (Natural England, 2024). The Site lies in the impact risk zone for the SSSI.

Three Local Nature Reserves (LNR) lie between 1km and 2km from the Site:

- Parkland Walk LNR lies 1,060m northeast of the Site
- Queens Wood LNR lies 1,400m north of the Site
- Belsize Wood LNR lies 1,750m southwest of the Site

There are 13 locally valuable non-statutory Sites of Importance for Nature Conservation (SINC) within 1km of the Site. Highgate Cemetery and Waterlow Park are located within the zone of influence. SINCs are recognised by the Greater London Authority and London borough councils as important wildlife sites. There are three tiers of sites:

- Sites of Metropolitan Importance
- Sites of Borough Importance (borough I and borough II)
- Sites of Local Importance

Highgate Cemetery has been designated as a Site of Metropolitan Importance for Nature Conservation (SMINC). SMINCs are those sites which contain the best examples of London's habitats; sites which contain particularly rare species, rare assemblages of species or important populations of species; or sites which are of particular significance within the otherwise heavily built-up areas of London. They are of the highest priority for protection.

Waterlow Park lies adjacent to the Site and has been designated as a Site of Borough Importance for Nature Conservation (SBINC). It abuts Highgate Cemetery to the northeast and provides additional habitats in the form of three spring-fed ponds, and areas of wet grassland, reedbed, willow carr and ruderal habitats. The park has several mature trees and extensive shrubberies. Due to the connectivity to Highgate Cemetery, the habitats at Waterlow Park are likely to provide additional resources for animals occurring at the cemetery: for example, the wetland habitats may provide important foraging areas for bats that roost at the cemetery and breeding habitats for amphibians.

Further details of designated statutory (within 2km) and non-statutory (within 1km) sites are provided in Table 1 below.

Table 1: Statutory (within 2km) and non-statutory (within 1km) sites

Site Name	Level of Designation	Value	Distance from Site	Reason for notification
Statutory sites within 2km				
Hampstead Heath Woods	Site of Scientific Interest (SSSI)	National	960m west	Long-established high forest woodland with exceptional structure comprising an abundance of old and over-mature trees providing dead wood habitat for a range of invertebrate species. The site also includes a small valley containing an acidic flush with developing bog-moss communities.
Parkland Walk	Local Nature Reserve (LNR)	County	1.06km northeast	Secondary woodland with a large area of naturalised wild plum. English elm are occasionally present and acidic grassland which is the only area in the borough.
Queen's Wood	LNR	County	1.4km north	Ancient oak-hornbeam woodland with English oak, beech stands above hornbeam, midland hawthorn, hazel, mountain ash, field maple, cherry, holly and both species of lowland birch. Rich ground flora including wood anemone, native bluebell, wood goldilocks and wood sorrel. Over 100 spider species have been recorded and a nationally rare jewel beetle.
Belsize Wood	LNR	County	1.75km southwest	Incorporates a pond, bird feeding area, insect house, stag beetle loggeries, bird boxes and other biodiversity enhancing features.
Non-statutory sites within 1km				
Highgate Cemetery	Site of Importance for Nature Conservation (SINC)	Metropolitan (County)	On site	14.8 ha supporting a rich array of plants and animals, including a population of the nationally rare orb-weaving cave spider which inhabits the vaults in the Egyptian Avenue. The site is dominated by secondary woodland of ash and sycamore, which has established amongst the graves. The woodland supports a diverse range of plants including rare and notable species such as great horsetail, and prickly sedge. A nationally scarce liverwort has been recorded, and the stonework also supports a diverse range of lichens, ferns and mosses.
Waterlow Park	SINC	Borough (Local)	Adjacent to the site at northeast	Waterlow Park abuts Highgate Cemetery to the northeast and provides additional habitats in the form of three spring-fed ponds, and areas of wet grassland, reed bed, willow carr and ruderal habitats. The

				park has several mature trees and extensive shrubberies. Due to the connectivity to Highgate Cemetery, the habitats at Waterlow Park are likely to provide additional resources for animals occurring at the cemetery: for example, the wetland habitats may provide important foraging areas for bats that roost at the cemetery and breeding habitats for amphibians.
Holly Lodge Gardens	SINC	Local	210m west	Parkland separated by a large, wooded avenue of mature Lime.
St Joseph's Social Centre	SINC	Local	280m northeast	Infrequently used gardens with orchard, hedges, woodland, flowerbeds and grassland areas.
Harrington Site	SINC	Local	300m north	Ornamental planting and specimen trees around the vegetable plots.
Dartmouth Park Hill and Reservoir	SINC	Local	350m south	Variety of grassland types from neutral to acidic.
Fitzroy Park Allotments	SINC	Local	500m west	The plot support a good number of mature fruit trees and berry bushes.
Archway Road Cutting	SINC	Local	515m northeast	Secondary and planted woodland.
Archway Park	SINC	Local	640m east	Shrubs and young trees with a good proportion of native species.
Southwood Lane Wood	SINC	Local	710m north	Woodland dominated by sycamore.
Junction Road Railway Cutting	SINC	Local	780m southeast	Isolated site, but well vegetated with secondary woodland and scrub dominated by sycamore.
Kentish Town City Farm, Gospel Oak Railsides and Mark Fitzpatrick Nature Reserve	SINC	Local	910m south	Green railside land with city farm and woodland nature reserve.
Whittington Park	SINC	Local	990m southeast	Wildflower meadows with some woodland and native hedges.

3.2 Habitats

Descriptions of the habitats on the Site are summarised below, full details are provided in the Ecological Baseline Report (Ashgrove Ecology, 2023). The following habitats are present within the Site:

- U1d 90 Cemeteries and Churchyard
- U1b 5 Buildings
- U1b Developed land, sealed surface

Urban Habitats (U1d): 90 Cemeteries and Churchyards

The majority of the Site was classified as Cemetries and Churchyards due to the ongoing use of the Site as a working cemetery with tightly packed graves, headstones and monuments. This incorporates areas of ornamental planting including trees, scrub and a variety of grasses and forbs which have established amongst the graves. Furthermore, strips of wildflowers have been seeded along the main paths. Numerous self-seeded trees, mainly ash and sycamore, have established between the graves to create stands of mixed semi-mature broad-leaved trees. Areas of coarse grassland and scrub have also established between the graves. These habitats are highly modified and do not represent recognised species assemblages. A large number of trees across the Site have contracted ash dieback and will be removed as part of ongoing management. The botanical survey revealed that the majority of the habitats were encroached with invasive non-native species.

Urban Habitats (U1b): Buildings

There are nine buildings on the Site. A cluster of buildings in the northwest corner of the Site comprises the Terrace Catacombs, Egyptian Avenue, The Circle of Lebanon, and the Beer Mausoleum. These buildings include features such as basements and a small area of green roof, which have potential to support faunal species. There are four buildings in middle of the Site, including a toilet block, a lodge, and a two-storey chapel with a basement.

Urban Habitats (U1b): Developed Land, Sealed Surface

There are areas of bitumen and pavement hardstanding around the buildings and bitumen and gravel footpaths around the graves and vaults, which are in regular use.

Surrounding Habitats

To the northeast lies Waterlow Park SINC which provides additional vegetated habitats in the form of three spring-fed ponds, and areas of wet grassland, reedbed, willow carr and ruderal habitats. The park has several mature trees and extensive shrubberies. Due to the connectivity to Highgate Cemetery, the habitats at Waterlow Park are likely to provide additional resources for

animals occurring at the cemetery: for example, the wetland habitats may provide important foraging areas for bats that roost at the cemetery and breeding habitats for amphibians.

Additionally, Parliament Hill lies approximately 500m to the west. Parliament Hill supports areas of parkland with trees and ponds. Whilst Parliament Hill is separated from the Cemetery by roads, the residential gardens and tree lines may provide green corridors for bats and birds to move between these areas.

3.3 Bats

Two Natural England roost mitigation licences have been issued within 2km of the Site. One approximately 1.8km to the west of the Site boundary for soprano pipistrelle bats, and the other approximately 2km east for common pipistrelle bats. GIGL returned 1,576 records of bats within 2km of the Site which included the following species: serotine, Daubenton's bat, Natterer's bat, Leisler's bat, noctule, brown long-eared, Nathusius's pipistrelle, common pipistrelle and soprano pipistrelle as well as unidentified Myotis, long-eared and pipistrelle species.

Preliminary Roost Assessment of buildings

The Preliminary Roost Assessment survey undertaken in September 2023 characterised the buildings on the Site as follows:

- Egyptian Avenue – High suitability
- Circle of Lebanon – High suitability
- Beer Mausoleum – Moderate suitability
- Terrace Catacombs – Confirmed roost
- The Chapel – Confirmed roost (basement)
- The Lodge – Negligible suitability
- Toilet block West Cemetery– Negligible suitability
- Toilet block East Cemetery – Negligible suitability

Ground Level Assessment of Trees

Four trees were identified as having potential bat roosting features (PRF). Twenty-one trees were identified as further assessment required (FAR). Several trees were also identified as supporting bat boxes. Further detail is provided in Appendix 1.

Bat Activity Survey

The bat walkover activity survey results from September 2023, May 2024 and June 2024 are summarised and discussed below. Further details are provided in Appendix 1.

The bat activity transect surveys identified four species of bat using the Site: common pipistrelle, soprano pipistrelle, noctule and brown long-eared bat, with common pipistrelle making 78% of

the registrations and only one brown long-eared pass recorded. The 2024 vantage point survey identified three species using the Site, common pipistrelle, soprano pipistrelle and noctule with common pipistrelle making 82% of the registrations.

In the 2023 automated static detector surveys, seven species were recorded within the period September-October 2023. These species are common pipistrelle, soprano pipistrelle, noctule, Natterer's bat, Daubenton's bat, serotine, and Nathusius' pipistrelle. The 2024 automated static detector surveys confirmed five species, common pipistrelle, soprano pipistrelle, noctule, Leislers and brown long-eared along with a Myotis species and with common pipistrelle making up 90% of the registrations.

Bat Hibernation Survey

Surveys of the two buildings identified as offering potential for hibernation bat species confirmed winter bat use of both buildings by common pipistrelle and a Myotis species. Droppings collected from both buildings were confirmed by DNA analysis to be from Daubenton's bat.

3.4 Botany

The botanical survey results are summarised below, and a species list is given in Appendix 2. No rare or notable plant species were encountered on site. The majority of habitats are encroached with invasive non-native species including three-cornered garlic, cotoneaster, snowberry, Virginia creeper, rhododendron, cherry laurel and butterfly bush.

The East and West Cemeteries supports secondary woodland comprising several mature trees, with an understorey dominated by ash and sycamore which has established between the graves.

The West Cemetery habitats are dominated by a self-seeded woodland of ash and sycamore. The shrub layer includes bramble., butterfly-bush, and holly, and the field layer is dominated by ivy, which has also encroached many of the trees. There are relatively few native woodland species in the field layer due to the recent origin of the woodland. Where there are gaps in the canopy, such as by the Terrace Catacombs, rank grassland, horsetails, ferns and ruderal species have established. Several introduced non-native tree and shrub species have also been recorded, such as spotted laurel. These are likely to represent remnants of the original planting palette.

The East Cemetery is dominated by broadleaved trees, with few conifer species. The majority of the trees are self-seeded ash, with low numbers of cherry, horse chestnut, hornbeam, common lime, London plane, pedunculate oak, English yew, Lawson's cypress, and cedar. There is some holly and elder in the shrub layer. The field layer is dominated by ivy. The habitats in the East Cemetery are more open than those in the West Cemetery. The East Cemetery is characterised by wide paths and mown grass verges. The amenity grassland supports common broadleaved species including daisy, dandelion and white clover which can tolerate trampling and mowing. The

Mound supports some native meadow species including yarrow, tufted vetch, and oxeye daisy. There are areas between the graves where introduced shrubs and ruderal plants have encroached. There are also areas where the woodland cover has been reduced, these are located along the eastern boundary in areas maintained for future burials, in the southeast and southern corners of the cemetery.

3.5 Other Species

GIGL returned records of numerous floral and faunal species within 1km of the Site. However, the scale and nature of the proposed development will not result in any impact pathways for the majority of these species. Of note is a record of the nationally rare orb-weaving cave spider, in the vaults in the Egyptian Avenue. Furthermore, a range of liverworts, mosses and lichens have been recorded on the masonry across the Site, including scarce Luisier's tufa-moss.

4. EVALUATION

This section evaluates the importance of the ecological receptors in a geographical context through the framework described in the Assessment Methodology section above.

4.1 Designated Sites

The Site lies 960m to the east and within the impact risk zone for Hamstead Heath Woods SSSI. The conservation status of the SSSI is in a favourable condition across 100% of its extent (Natural England, 2024) and it is of National value.

Highgate Cemetery has been designated a SMINC and is of County value.

Waterlow Park SBINC, which lies directly adjacent to the northeast of the Site, is of Local value.

4.2 Habitats

The majority of the Site was classified as Cemetries and Churchyards, under the UK Habitats classification system, due its ongoing use as a working cemetery with tightly packed graves, headstones and monuments. The Site does support self-seeded trees and some areas of grassland which increase the structure and botanical diversity of the Site, and provides opportunities for fauna, including invertebrates, birds, bats and small mammals; however, the Site lies in an urban location and the habitats are highly modified and disturbed by human activity which reduces their ecological value. The habitats are of Local value.

The buildings and hardstanding are of Negligible value.

4.3 Bats

Roosting Bats

Two buildings (the Terrace Catacombs and the Chapel basement) were used by hibernating Daubenton's bat and common pipistrelle. In accordance with the 2023 Bat Mitigation guidelines, these buildings are assessed as being of Local to County value. The remainder of the Chapel was assessed as offering low suitability for roosting bats. Three of the buildings (the vaults) were assessed as offering high suitability for use by roosting bats and one building (the Beer Mausoleum) was assessed as offering moderate suitability, the remaining three buildings were assessed as offering negligible suitability for roosting bats.

Four trees were identified as having potential bat roosting features (PRF) and twenty-one trees were identified as further assessment required (FAR). If any works are proposed that would impact these trees and bats are confirmed to be using them to roost, using the 2023 Bat Mitigation Guidelines, they will have a Site to County value depending on the species and type of roost identified.

Foraging and Commuting Bats

Using the 2023 Bat Mitigation Guidelines assessment of bat assemblages, the transect surveys, vantage point surveys and automated detector surveys recorded three abundant and widespread species (common pipistrelle, soprano pipistrelle and brown long-eared), three less abundant species (Daubenton's, Natterer's and noctule), and three rarer species (serotine, Leisler's and Nathusius's pipistrelle). The bat assemblage results in a score of 18, which meets the criteria of local importance for southern England and therefore, the bat assemblage is assessed as being of Local value.

4.4 Botany

No rare or notable plant species were encountered on the Site. The majority of habitats are encroached with invasive non-native invasive species including three-cornered garlic, cotoneaster, snowberry, Virginia creeper, rhododendron, cherry laurel and butterfly bush. The botany on the Site is of Site value.

4.5 Other Species

Whilst the current distribution of the orb-weaving cave spider, and lower plants within the Site is unknown. It is assumed that they are of at least County value.

4.6 Summary

Table 2 below provides a list of the ecological features identified within the zone of influence of the Site that have been valued at the Local level or above. These features will be taken forward to the technical assessment stage of the EcIA.

It should be noted that a large number of diseased ash trees will be removed from both the East and West Cemeteries. The tree removal will change the future ecological baseline of the Site and the value of the habitats and species that the Site supports.

Table 2: Summary of Ecological Features Considered in the Impact Assessment

Ecological Feature	Evaluation	Value	Important Ecological Feature?
Hamstead Heath Wood SSSI 960m west	Favourable condition	National	Yes
Highgate Cemetery SMINC	Good example of woodland habitat in London supporting a range of plants and animals	County	Yes
Waterlow Park SBINC	Spring fed ponds, wet grassland, reed bed and willow carr habitats directly connected to the Site	Local	Yes
Cemeteries and Churchyard U1d90	Medium distinctiveness	Local	Yes
Roosting bats in trees	Some trees offering bat roosting potential may be lost to the development	Site to Local	Yes
Roosting bats in buildings	Two buildings confirmed as bat hibernation roosts, four others offer roosting potential	Local to County	Yes
Bat assemblage	At least 8 species were recorded using the Site for foraging and commuting	Local	Yes
Other species	Historic records of orb-weaving cave spider and lower plants on the Site.	County	Yes

5. DESCRIPTION OF THE DEVELOPMENT AND ASSUMPTIONS

The assessment of significant effects on ecological receptors is based on the following assumptions about the proposed development:

- The Site is the subject of a planning application for the restoration, demolition and development of new buildings in the East and West Cemeteries, as well as Site wide landscaping, drainage, public realm and access works and repair of tombs and monuments to support the function of a working cemetery and community benefits.
- The East Cemetery includes the demolition and replacement of gardener's compound with a community education building; the removal of a ticket booth and replacement with a sentry at Swain's Lane; the erection of an additional sentry at Chester Road; and the erection of a two storey gardener's building, for office, workshop, staff welfare and storage uses; plus alterations to the boundary wall.
- The West Cemetery includes the erection of a two-storey visitor and operations building; the demolition and replacement of the visitor toilets building with a utility store; the restoration of the Dissenters' Chapel and Anglican Chapel for community and funeral uses; and restoration of the South Lodge for visitor toilets and the North Lodge for staff welfare.
- It should be noted that details of the location and methodology of the building restoration works is not yet known, but it is assumed that this work will be restricted to small repairs to the masonry in discrete locations, and this will have minimal impacts on the ecology of the Site.
- The three locations of the proposed new buildings have been carefully selected to minimise the loss of vegetated habitats and largely coincide with areas of hardstanding. The total loss of vegetated habitats to the developments is c. 0.7 ha.
- The Site will continue to be used as a cemetery for the foreseeable future.
- A large number of diseased ash trees will be removed from both the East and West Cemeteries. The removal of diseased trees will be undertaken outside of the planning application.
- No trees with the potential to support roosting bats will be removed as part of this project.
- Habitat creation and management measures will be undertaken across the entire Site by removing the invasive non-native species: all plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) will be removed. Other invasive non-native species will also be removed, with the exception of stands of cherry laurel, where they are required to maintain the stability of embankments or form an important part of the historic landscape of the Site. New areas of habitat will be created including:
  - 9.4 ha of other mixed woodland (w1h)
  - 2.1 ha of wet woodland (w1d)
  - 1.2 ha of other neutral grassland (g3c)
  - 0.7 km of native hedgerows (h2a)

The habitat creation and enhancement measures are required to achieve a Biodiversity Net Gain (BNG) of at least 10% on the Site. The BNG regulations also require a commitment to manage the habitats to achieve the required condition for at least 30 years. See the Highgate Cemetery Biodiversity Net Gain Report (Ashgrove Ecology, 2024) for full details of the habitat measures.

6. ASSESSMENT WITHOUT MITIGATION

6.1 Construction Phase

The impacts associated with the construction phase of the project fall into the following categories:

- Habitat loss and degradation;
- Disturbance (including physical disturbance, visual disturbance and noise); and
- Direct killing and injury of animals.

Designated Sites

The Site lies within the impact risk zone for Hamstead Heath Woods SSSI, a nationally important site that lies 960m to the west. The conservation status of the SSSI is in a favourable condition across 100% of its extent. Due to the small scale nature of the proposals and distance from the designated site, along with the urban location of the Site with physical barriers of roads and infrastructure, and no direct landscape links to the Site, no impact pathways have been identified. The effects of the construction phase on this designated site are Negligible (non-significant).

Highgate Cemetery SMINC is coincident with the Site and will be directly affected during construction by machinery, loss of habitats, disturbance, noise, lighting and dust. However, the works are temporary and limited to small areas of the Site and the majority of the habitats will be unaffected. In the absence of any mitigation this has the potential for a Minor Negative impact on Highgate Cemetery SMINC.

Waterlow Park SBINC lies directly adjacent to the northeast of the site. Given the nature of the proposed development there is potential for disturbance impacts during construction through exposure to dust, lighting and noise. However due to the small scale of the proposed development and the distance between the new buildings and Waterlow Park, the impacts are considered to be Negligible (non-significant) on Waterlow Park SBINC.

Habitats

The Site is the subject of a planning application for new buildings in three areas of the Site, which have been carefully selected to minimise the loss of vegetated habitats and largely coincide with areas of hardstanding. The total loss of vegetated habitats to the developments is *c*.0.7 ha. Furthermore, any impacts of disturbance will affect a small area of the overall habitat and be temporary in nature. The effects of the construction phase on habitats is Negligible (non-significant) on habitats.

Bats

Construction activity, noise and lighting along with vegetation removal has the potential to disturb commuting and foraging bat: however, given the small scale and temporary nature of the

development works and small area of habitats lost, this is unlikely to displace bats from a significant proportion of the Site and represents a Negligible impact (non-significant) on bats.

Works to the buildings that support bats in the winter and/or offering suitability to support bats at other times of the year may result in death and/or injury of bats should they be present when the works are undertaken. Furthermore, such works could remove features that bats use to roost. Such impacts would represent a Major Negative impact on bats, and a breach of UK legislation.

Other Species

At the time of undertaking this assessment, the locations and working methods of the restoration works are unknown, but it is assumed that they will be small scale repairs to damaged masonry.

The restoration of the buildings could kill or injure the orb-weaving cave spider which is a nationally rare species. Furthermore, the works could kill or reduce the vigour of notable species of liverworts, mosses and lichens. Based on the worst-case scenario there is the potential for the works to have a Major Negative impact on other species.

6.2 Operational Phase

The impacts associated with the operational phase of the project fall into the following categories;

- Habitat creation;
- Habitat degradation; and
- Disturbance (including physical disturbance, visual disturbance, noise and lighting).

Designated Sites

Highgate Cemetery SMINC is coincident with the Site and has the potential to be directly affected during the operational phase of the development. Increased visitor numbers, and associated disturbance, together with increased lighting from the buildings could create pressures on the SMINC. However, as the Site is already subject to high levels of footfall and is located in an urban environment.

The Site will be subject to an extensive programme of habitat creation works, including the establishment of large areas of broad-leaved woodland, shrubs, grassland and hedgerows. Furthermore, the new and retained habitats will be managed to maximise their ecological benefits for at least 30 years. The habitats will mature during the lifetime of the scheme, resulting in an increase in ecological value over time.

Taking into account the current degraded state of the habitats on the Site and the requirement to remove numerous diseased ash trees in the future, the proposed habitat creation and management measures during the operational phase of the development will result in a Major Positive impact on Highgate Cemetery SMINC.

Waterlow Park SBINC lies directly adjacent to the northeast of the site. Given the nature of the proposed development there is limited potential for the SBINC to be impacted by the increase in visitor numbers or other negative pressures. The habitat creation measures, detailed above, will provide new opportunities for wildlife that uses the SBINC and is likely to result in a more abundant and diverse fauna at the park. Overall the operational phase of the development will result in an indirect Minor Positive impact on Waterlow Park SBINC.

Due to the distance between Hamstead Heath Woods SSSI and the development, and the small scale of the development, the effects of the operational phase on the SSSI are Negligible (non-significant).

Habitats

The Site may experience increased visitor numbers, as result of the development and this could lead to the degradation of habitats through trampling and littering: however, as the Site is already subject to high levels of footfall and is located in an urban environment which is subject to disturbance.

The habitat creation and enhancement measures detailed above will improve the quality and diversity of the habitats on the Site; and the commitment to 30 years of management, required by the BNG criteria, ensures the appropriate habitat condition will be achieved and the new and retained habitats will provide the maximum ecological benefits for the long-term.

Overall, the operational phase will result in a Major Positive impact on habitats.

Bats

Increased visitor numbers could cause disturbance to bats: however, as the cemetery is closed to visitors at night, the effects on bats is likely to be minimal. Lighting from the new buildings may disturb commuting and foraging bats; however, the new buildings are located around the Site boundaries close to existing buildings or roads and are unlikely to make a significant change to the background illumination levels.

The proposed habitat creation and management measures will provide a suite of new foraging and commuting opportunities for bats. The creation of new areas of native shrubs and grassland will attract the invertebrates that bats feed on. Furthermore, the new hedgerows and tree planting will provide commuting and foraging areas, on a Site where large areas of trees need to be felled. It is considered that after the tree removal the value of the Site for bats will be significantly lower than at present, and the proposed habitat creation and management, which is designed to enhance biodiversity, will not only restore the value of the Site to bats, but result in a Major Positive impact on roosting, foraging and commuting bats.

Other Species

No impact pathways have been identified for the orb-weaving cave spider and liverworts, mosses and lichens during the operational phase of the development. The operational phase of the development will have **Negligible** (non-significant) impacts on other species.

6.3 Summary of Ecological Effects

Table 3 presents a summary of the predicted effects of the scheme on valued ecological receptors before additional mitigation, compensation and enhancement measures are considered. Due to the design of the scheme and the embedded habitat creation and management measures on the Site, the impacts of the development is predicted to have and overall benefit to ecology.

Table 3. Summary of Effects on Ecological Receptors

		Significance of Effects	
Receptor	Value	Construction Effects	Operational Effects
Hamstead Heath Wood SSSI	National	Negligible	Negligible
Highgate Cemetery SMINC	County	Minor Negative	Major Positive
Waterlow Park SBINC	Local	Negligible	Minor Positive
Habitat	Local	Negligible	Major Positive
Roosting bats	Local – County	Major Negative	Major Positive
Bat assemblage (foraging and commuting)	Local	Negligible	Major Positive
Other species	County	Major Negative	Negligible

7. ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

The following avoidance and mitigation measures are proposed to reduce or eliminate adverse effects on ecological receptors. Furthermore, habitat creation and enhancement measures are proposed to increase the biodiversity value of the Site to meet the 10% mandatory BNG requirement.

- A Construction Environmental Management Plan (CEMP) will be prepared prior to any works, including site clearance, beginning on the Site. This will set out detailed methods of construction to avoid impacts to the habitats and designated sites on and adjacent to the development to include:
    - Location of Biodiversity Protection Zones and locations of protective fencing to ensure that any areas of retained habitats and root protection zones are not damaged during site preparation and construction activities.
    - Details of the timing of activities to minimise the risks to wildlife. Any vegetation clearance will take place outside of the bird nesting season which is between March and September, inclusive.
    - Once the locations of the building restoration works are known, surveys for orb-weaving cave spider and notable species of liverworts, mosses and lichens should be undertaken so that the impacts of the works on these species can be assessed. Where an impact is predicted, a detailed working method statement setting out how these species will be protected should be agreed with Camden Borough Council.
    - Details of how materials / chemicals will be stored and controlled on-site to avoid pollution (for example - all plant will be fitted with drip trays in order to avoid potential pollution incidents and no re-fuelling will take place on the Site).
    - Details on the proposed construction methodology including factors such as construction access and methods of construction.
    - Construction lighting, if required, will be targeted and focused inwards away boundaries.
    - Industry standard noise management measures.
    - Dust suppression to protect the nearby habitats.
- None of the trees identified as offering potential for bats are currently proposed for works within the Tree Removal Plan 389 – HIG of 15th July 2024. Should this schedule change

and any works or felling of any of the trees identified as offering FAR or PRA for bats (or those containing bat boxes), an inspection for bats or signs of bats by a tree climber and licensed bat worker will be undertaken prior to any works commencing. Works will be done using a soft felling technique, dense patches of ivy will be carefully stripped from the tree and the felling will ensure that no cavities are cut through; branches or trunk pieces with cavities are lowered carefully to the ground and left with the access hole upward facing over night to allow any bats to leave. If bats or signs of bats are found in a tree during works to that tree they must stop immediately and a licence from Natural England sought. Provided the above measures are implemented there will be no legal implications to felling the trees.

- Prior to any renovation works on the buildings identified as supporting roosting bats or offering potential suitability for use by bats, further ecological input is required in the form a Bat Mitigation Plan to ensure the reduction in any risk to roosting bats is made along with appropriate mitigation and Natural England licencing, as required, is in place to ensure legal compliance is achieved. This would include details of the specific building works proposed, the timing the works (for example to avoid the hibernation season for the buildings identified as being used by bats in winter), a pre-works updated survey by a licenced ecologist and sensitive working methodology with a watching brief of works to key areas.

- Lighting during the operational phase of the development has been designed to minimise impacts on the boundary habitats, given the use of the Site by at least eight species of bat including light sensitive species such as brown long-eared. The lighting scheme will adhere to the Bat Conservation Trust Guidance Note[8] on lighting:

    - LED lighting will be used and light levels will be kept as low as possible. Metal halide, fluorescent sources will not be used;
    - Lighting will be directed to where it is required and away from the surrounding trees;
    - Only luminaires with no light output above 90 degrees and/or an upward light ratio of 0% and with good optical control will be used, luminaires will always be mounted on the horizontal, i.e. no upward tilt;
    - Any external security lighting will be set on motion-sensors and short (1min) timers;
    - Internal lighting within the new rooms will be recessed where installed in proximity to windows to reduce glare and light spill;

[8] Bat Conservation Trust and Institution of Lighting Professionals (2023): Guidance Note 8.23 Bats and Artificial Lighting in the UK.

- Light sources will emit minimal ultra-violet light, peak higher than 550nm and be of a warm white spectrum (ideally <2700 Kelvin);
- Glazing treatments (low transmission glazing treatments) will be considered;
- The use of bollard or low-level downward directional luminaires is strongly discouraged.

- In line with both local and national planning policies, the opportunity has been taken to design habitat enhancements into the proposed development and a plan of the location of the features is included in Appendix 4:

  - The provision of nest boxes for bird species such as house sparrow and swift on the walls of the new buildings will provide permanent nesting for species in decline. House sparrows and swift are colonial species and therefore the boxes will be fitted in groups with a minimum of three per building within proximity to each other to form colonies, installed on the north or east elevation.

  - Provision of integrated bat boxes within new buildings will provide new roosting opportunities for the local bat populations. The boxes will be fitted on south or west facing walls, as close to the eaves as possible. Bat boxes should not be fitted above or immediately adjacent to windows. These bat boxes are self-contained and are built into the wall at the eaves and can be clad over with a slot cut out over the entrance so only the entrance hole is visible. These gaps must be at least 4cm in width and 2.5 cm in height.

  - Installation of bee bricks within the walls of the new buildings. Provision of bee bricks can provide excellent alternative habitat for solitary non-stinging bees. Bee bricks (two per building) will be incorporated within the design of the Site. These bricks will be erected 1 metre above ground level within the brickwork.

  - There will be green roofs on the buildings were appropriate. Native grasses and wildflower mixes that are appropriate to the conditions will be selected. These will provide new foraging habitats for invertebrates and birds.

  - The boundaries of the Sites will be made as permeable as possible for small mammals such as hedgehogs. Gaps will be provided at regular intervals in the Site boundary of at least 13cm^2 to allow hedgehogs and other fauna to improve connectivity to the wider landscape.

8. RESIDUAL EFFECTS

The avoidance, mitigation and enhancement measures above reduce the risk of killing or injuring protected species and maintain legal compliance during the construction works. Furthermore, habitat creation and enhancement measures will result in an increase of biodiversity across the Site and provide new habitats for bats and other wildlife including breeding birds and invertebrates. Table 4 summarises the residual effects.

Table 4. Summary of Residual Effects on Ecological Receptors

		Significance of Effects	
Receptor	Value	Construction Effects	Operational Effects
Hamstead Heath Wood SSSI	National	Negligible	Negligible
Highgate Cemetery SMINC	County	Negligible	Major Positive
Waterlow Park SBINC	Local	Negligible	Minor Positive
Habitats Cemeteries and Churchyards	Local	Negligible	Major Positive
Bats – Roosting in buildings	Local – county	Negligible	Major Positive
Bat assemblage (foraging and commuting)	Local	Negligible	Major Positive
Other species	County	Negligible	Negligible

9. CONCLUSIONS

The proposals are for the restoration, demolition and replacement of buildings including landscaping, drainage, public realm and access works, repair of tombs and monuments; and the creation and management of the habitats across the Site. It is important to note that, numerous diseased trees on the Site will be removed which will reduce the Site's future value to wildlife, including bats and birds. The proposed project will create new habitats across the Site that will be of more diverse that the woodland that will be lost and the associated management plan will ensure all new and retained habitats improve the ecology of the Site in the long-term.

Measures to mitigate any risks to roosting bats during the construction phase will reduce the impacts to a negligible level. Furthermore, a Construction Ecological Management Plan will reduce the risk of killing of injuring other wildlife during construction.

The Biodiversity Metric 4.0 calculated a BNG increase of 10.7% across the Site as a result of the project. The details of the BNG assessment are presented in the Highgate Cemetery Biodiversity Net Gain Report (Appendix 5). Whist the BNG score is based only on changes to habitats, the provision of new areas of broadleaved woodland, neutral grassland and hedgerows, and the commitment to manage these habitats for 30 years, will result in new opportunities for a range of wildlife, including invertebrates, birds, bats and small mammals. It is therefore predicted that these measures, together with the additional enhancement measures included in this report will have significant positive benefits for the Site in the long-term

Appendix 1: Bat Survey Results

Ground Level Assessment of Trees

Due to the dominance of secondary woodland, the majority of the trees within the survey area were too immature to have developed features that could support roosting bats. However, a small number of trees had callus roles where limbs had been removed, flaking bark, trunk cavities or splits in limbs; or the tree supported dense ivy which meant that the trunk could not be assessed for potential roost features.

Only four trees were recorded as having potential roosting features (PRF). These trees had features such are loose bark, or cavities that were assessed as being suitable for roosting bats. Twenty-one trees were categorised as further assessment required (FAR). These trees either supported holes or callus rolls that could not be investigated from ground to determine whether they were suitable for roosting bats; or the tree supported dense ivy that may support roosting bats or could have hidden potential roosting features.

Due to the inaccuracy of GPS in woodland, no grid references are provided for the surveyed trees: however, the locations of trees that were identified as having potential bat roosting features or requiring further surveys are shown on the figure below. Furthermore, where the tree had a tag on the trunk, or was close to a tree with a tag, the tag number was noted. The remaining trees within Phase 1 were assessed as having no features that could support roosting bats and were scoped out of further assessments. During the survey no droppings or other evidence that would confirm the presence of a bat roost was recorded.

Bat Activity Survey

Tables 5: Summary of bat transect surveys

Date of survey visit	Start and end times, sunset/sunrise times	Weather
14/09/2023 (Autumn)	Transect Start: 19.03 End: 21.18 Sunset: 19.18	Start temp: 19°C End temp: 17°C Precipitation: None Wind: 1/8 Cloud cover: 0/8
23/05/2024 (Spring)	Vantage point start: 20:45 Transect start: 21:15 End: 23:45 Sunset: 20:58	Start temp: 14°C End temp: 11°C Precipitation: None Wind: 1/8 Cloud cover: 0/8
19/06/2024 (Summer)	Vantage point start: 21:11 Transect start: 21:51 End: 23:51 Sunset: 21:21	Start temp: 15°C End temp: 12°C Precipitation: None Wind: 3/8 Cloud cover: 2/8

Visit	Common pipistrelle	Soprano pipistrelle	Noctule	Nyctalus species	Myotis species	Brown long-eared	Total
September 2023 East	22	2	2	0	0	0	26
September 2023 West	9	2	4	0	1	1	17
May 2024 East	122	3	1	0	0	0	126
May 2024 West	35	32	0	4	3	0	74
June 2024 East	95	12	0	0	0	0	107
June 2024 West	14	11	3	0	2	0	30
Total	297	62	10	4	6	1	380

Table 6: Summary of bat vantage point survey 2024

Visit	Common pipistrelle	Soprano pipistrelle	Pipistrelle species	Noctule	Total
May East	109	15	0	0	124
May West	21	7	1	0	29

June East	51	6	0	3	60
June West	27	11	0	3	41
Total	208	39	1	6	254

Table 7: Summary of automated detector surveys bat registrations 2023

	Common pipistrelle	Soprano pipistrelle	Noctule	Serotine	Natterer's	Daubenton's	Nathusius' pipistrelle
Frequency of detection	1	1	0.3	0.17	0.8	0.8	0.8

Tables 8: Summary of automated detector surveys bat registrations 2024

Session	Dates	Weather description
1	23 May- 27 May (5 nights)	Overall: Good Average night-time temperatures: 16.1°C Average night-time wind speed: 13mph Precipitation: 0mm
2	19 June- 25 June (5 nights)	Overall: Good Average night-time temperatures: 18.3°C Average night-time wind speed: 15mph Precipitation: 0mm

Visit	Common pipistrelle	Soprano pipistrelle	Noctule	Leisler's	Brown long-eared	Myotis species	Total
May 2024 East	1527	158	7	16	0	0	1708
May 2024 West	88	34	1	0	3	5	131
June 2024 East	1668	62	3	9	0	0	1749
June 2024 West	55	25	6	1	0	0	87

Total	3338	279	17	26	3	5	3675

Bat Hibernation Survey

Visual survey

The first visual inspection was undertaken on 28th January 2024. The weather was clear and sunny at 10°C with no wind.

The Chapel basement was found to be damp, light and draughty and the same temperature as outside, 10°C, at the start of the survey. There is open access for bats as the area has an open doorway at the west that is set at the bottom of an open roofed area. The enclosed area measures around 3m long by 1.5m wide and is constructed from brick. There are three holes in the northern brick wall that lead to a big cavity with lots of gaps in the brickwork, a single bat dropping was noted on a cable running through one of the gaps. To the south of the space is a circular hole in the ceiling that extends around 1.5m up to meet what looks to be a horizontal cavity over the area. Several (6) bat droppings were noted atop a folded chair beneath this ceiling hole. These droppings were all collected and sent for DNA analysis that confirmed them to be from Daubenton's *(Myotis daubentonii*) bats. No bats were observed.

The Terrace Catacombs is a large damp building found to be draughty and light in places and colder than outside at 6°C inside at the start of the survey. It is constructed of large limestone bricks and has a flat roof which is used as a footpath and has beehives at the northern end. There is potential for bat access around the three large doors on the southern elevation, and through the ends of the main corridor at the east and west. Here there are windows that have large metal grill coverings with access beyond to small outdoor areas that extends vertically up to the flat roof and footpath, the openings on the flat roof/footpath have a horizontal metal grill covering preventing larger animals entering. The grills within the catacombs are broken and the one at the west had barbed wire which would likely prevent safe bat access. The brickwork is mostly intact and very few crevices or potential roosting places were identified although there may be hidden features behind some of the vaults that have front coverings with small access gaps in and around broken coffins that could not be fully or safely be surveyed by endoscope, torch and mirror. Several (6) droppings were found and sent for DNA analysis that confirmed them to be from Daubenton's bats. No bats were observed.

The second visual inspection was undertaken on 14th March 2024. The weather started with heavy rain at 9°C and 100% cloud which cleared by the end to be sunny at 13°C with a slight breeze of 3/12 and 30% cloud.

The Chapel basement was found to be very damp (there was heavy rain) and 10°C at the start of the survey. Several (8) fresh droppings were noted on the floor to the south of the space under the circular hole in the ceiling. No bats were observed.

The Terrece Catacombs were 11°C inside at the start of the survey and the heavy rain had stopped. One fresh dropping was observed. No bats were observed.

Passive acoustic survey

The results of the passive static bat detectors and data loggers is summarised here.

The dataloggers show that the winter was very mild with the temperatures inside the building not dropping below freezing. The data shows the only period where temperatures dropped below 5°C was around the 10th to 18th of January. The temperature varied between 0.1°C and 11.6°C in the Chapel basement and between 0.9°C and 9.8°C in the Catacombs. The humidity varied from 56.2% right up to 99.7% in the Chapel basement and in the Catacombs between 76.3% 93.5%.

The passive detectors deployed for the first session on 17th December did not record many files that could be identified as a bat call. The device deployed in the Chapel basement recorded very few files over the entire period that could be distinguished as bat however this may be due to the exposed nature of the space causing the device to be triggered by other sounds such as the weather and other factors outside of the space and not because bats were not using the space.

Bats were recorded in the Terrace Catacombs on the second deployment of passive detectors from 28th January 2024. These recorded bats passing regularly almost every evening during this period. Most calls were at sunset for until a few hours and occasionally later into the night and in the hours before dawn. Species recorded included common pipistrelle (*Pipistrellus pipistrellus*) and *Myotis* species of bat likely to include Natterer's (*Myotis nattereri*), Brandt's (*Myotis brandtii*) and Daubenton's however identification of these species from calls is notoriously difficult to be considered a definitive identification and thus the calls are classified as a *Myotis* species. There were also many calls that were clearly of bat origin and most likely *Myotis* species however the quality or duration made definitive identification unsure and so these were identified as bat. Occasionally common pipistrelle and a *Myotis* species were recorded together not long after sunset.

Discussion

Weather data has shown this to have been a very mild winter without significant cold spells and therefore bats likely not remaining torpid for long periods and often rousing to feed. Conditions required by bats for winter torpor or hibernation is likely to be species specific with most preferring cool, stable and damp conditions of varying degrees. Generally, bats will opt for an optimum constant temperature of around 5°C for hibernating periods and if the temperatures rises over 7-8°C and insects are flying they are likely to arouse and feed, and if the temperature drops below freezing, they may also rouse to move location.

The evidence in the Chapel basement of a small number of Daubenton's bat droppings; two recordings of a *Myotis* species passing; and the variations in the temperature and humidity conditions due to the exposed nature, indicate this area is likely to be used by an individual Daubentons' bat for roosting including over the winter months, most likely atop the hole in the ceiling at the southern end of the space where there appears to be a vertical void and the conditions are likely to be more stable.

The passive static bat detectors showed that bats (common pipistrelle and *Myotis* species) were regularly using the catacombs for flight and foraging, it is considered likely the bats are roosting in the building or very close by as they arrive very close to sunset, and Daubentons' droppings were identified inside the

building. The visual inspection did not however identify many potential roosting places although there may be hidden features behind the vault coverings and around the broken coffins. Bats could access the catacombs around the three metal doors at the southwest front elevation or through the grilled window and associated vertical shaft to the flat roof/footpath above at the northeast end of the main corridor (it is not considered the same feature at the southwest end of the corridor due to the presence of barbed wire). The vertical shaft leads directly to vegetative cover within the cemetery woodland and links to the wider Site.

Appendix 2: Botanical Survey Results

The East and West Cemeteries support broadleaved woodland comprising several mature trees, with an understorey of secondary woodland dominated by ash and sycamore which has established between the graves.

The West Cemetery habitats are dominated by a self-seeded woodland of ash and sycamore. The shrub layer includes bramble *Rubus fruticosus* sp., butterfly-bush *Buddleia davidii*, and holly *Ilex aquifolium*, and the field layer is dominated by ivy *Hedera helix*, which has also encroached many of the trees.

There are relatively few native woodland species in the field layer due to the recent origin of the woodland. Where there are gaps in the canopy, such as by the Terrace Catacombs, rank grassland, horsetails, ferns and ruderal species have established.

Several introduced non-native tree and shrub species have also been recorded, such as spotted laurel *Aucuba japonica Crotonifolia* and *Pyracantha* sp. These be are likely to represent remnants of the original planting palette.

There are some gaps in the canopy along parts of the West Cemetery boundary where trees have been removed, for example in the north and west corners, and on both sides of the Faraday Path adjacent to Swain's Lane. There has also been some tree removal around the catacombs.

A small, man-made pond is present within the West Cemetery. This pond is the only open water on the Site. The pond is lined and fed by a spring. The pond is *c.*5m^2 in area and the maximum depth is around 50cm. Aquatic vegetation includes yellow-flag iris *Iris pseudacorus*. The pond is heavily shaded and there is evidence of eutrophication of the water due to leaf accumulation. Both factors restrict the establishment of a more diverse flora.

The East Cemetery is dominated by broadleaved trees, with few conifer species. The majority of the trees are self-seeded ash, with low numbers of cherry *Prunus avium*, horse chestnut *Aesculus hippocastanum*, hornbeam *Carpinus betulus*, common lime *Tilia* × *europaea*, London plane *Platanus* × *acerifolia*, pedunculate oak *Quercus robur*, English yew *Taxus baccata*, Lawson's cypress *Chamaecyparis lawsoniana*, and cedar *Cedrus libani.* There is some holly *Ilex aquifolium* and elder *Sambucus nigra* in the shrub layer. The field layer is dominated by ivy.

The habitats in the East Cemetery are more open than those in the West Cemetery. The East Cemetery is characterised by wide paths and mown grass verges. The amenity grassland supports common broadleaved species including daisy *Bellis perennis*, dandelion *Taraxicum Officinale* and white clover *Trifolium repens* which can tolerate trampling and mowing. The Mound supports some native meadow species including yarrow *Achillea millefolium*, tufted vetch *Vicia cracca*, and oxeye daisy *Leucanthemum vulgare*.

There are areas between the graves where introduced shrubs and ruderal plants have encroached.

There are areas where the woodland cover has been reduced. These are located along the eastern boundary in areas maintained for future burials, in the southeast and southern corners of the cemetery, and in the north around the Site entrance.

2022 Botanical Survey

Botanical surveys were undertaken in the cemetery in 2022. The objectives of the surveys were to:

- Compile a list of plants for the Site;
- Identify rare and notable plants that should be retained and encouraged; and
- Identify non-native and invasive plants that should be removed.

Both cemeteries comprise an intimate mixture of native and non-native botanical species resulting from historical and more recent plantings combined with self-seeded native species.

An extensive list of native and non-native species recorded during the survey is provided.

Secondary woodland, comprising mainly ash and sycamore and woodland understory, is present across large parts of the cemeteries and has been described in previous reports[9][10]. The woodland understory contained many non-native shrubs including cherry laurel *Prunus laurocerasus*, spotted laurel *Aucuba japonica*, snowberry *Symphoricarpos albus*, rhododendron species *Rhododendron* spp. and cotoneaster species including willow leaved cotoneaster *Cotoneaster salicifolia.* The snowberry and cherry laurel shrubs should be managed and removed where possible within the Site and appropriate biosecurity measures employed.

The ground flora is not typical of ancient woodland, some remnant or self-seeded ancient woodland indicator (AWI) species were recorded, but the cover was not extensive. The ground flora is more typical of disturbed secondary woodland.

Native bluebell *Hyacinthoides non-scripta* features in previous accounts of the cemetery's flora. However, many bluebells were examined across the two cemeteries and very few convincing specimens of native bluebell were found. Most bluebells, present within both the West and East cemeteries were hybrid bluebell *Hyacinthoides* x *massartiana*, probably due to the planting of Spanish bluebell *Hyacinthoidies hispanica* and hybrid bluebells within the cemeteries and in the surrounding gardens. Pure Spanish bluebell is rare, due to hybridization and back-crossing, and no convincing specimens of Spanish bluebell were found during the 2022 survey. Various colour forms of the hybrid bluebell were found, including white, pink and pale lilac alongside the dominant blue form.

Great horsetail *Equisetum telmateia* is listed as unusual within previous accounts, however this is not a rare native species. This species is associated with the clay soils in damp areas, seepage and flushes throughout both cemeteries, but it is not locally dominant in any one area. Great horsetail may have been planted locally, but it can become invasive and difficult to remove once established.

[9] Baxter (2019): *Highgate Conservation Plan.*

[10] Bartlett Consulting (2021): *Tree Works Survey*.

Three-cornered garlic *Allium triquetrum* was locally frequent to abundant in the ground flora of the northern half of the West Cemetery and in large areas of the East Cemetery. This species is difficult to control once established.

West Cemetery

The West Cemetery is dominated by secondary ash and sycamore woodland. Graves and headstones are densely packed and cover much of the ground. Ivy dominates the field layer. Other native species recorded include ground elder *Aegopodium podagraria*, herb Robert *Geranium robertianum,* wood avens *Geum urbanum*, enchanter's nightshade *Circaea lutetiana*, ransoms *Allium ursinum*. Naturalised, non-natives included hybrid bluebell, fringecups *Tellima grandiflora*, knotted crane's-bill *Geranium nodosum,* green alkanet *Pentaglottis sempervirens* and both creeping and tuberous comfrey *Symphytum grandiflorum* and *S. tuberosum,* respectively. Snowberry is extensive in the understory, and spotted laurel is present above Snowdrop Bank, between Dickens Path and the Main Drive.

The area around the Circle of Lebanon supported a mix of wildflowers, including cornflowers and mallows, as well as the tall ruderal species ragwort and dock, these were not identified to species level as access to this area was denied. Common broom *Cytisus scoparius*, tutsan, garden Lady's-mantle *Alchemilla mollis,* dotted loosestrife *Lysimachia punctata* and woodruff *Galium odoratum* were also found within the catacombs below the Circle of Lebanon. Woodruff is an ancient woodland indicator species.

The embankments near the south-east entrance of the West Cemetery supported species-rich grassland, which is likely to have resulted from seeding the area with a native wildflower seed mix. The sward here included ragged robin *Silene flos-cuculi*, fodder burnet *Poterium sanguisorba* ssp. *balearicum*, common knapweed *Centaurea nigra* agg., wild carrot *Daucus carota* ssp. *carota*, oxeye daisy *Leucanthemum vulgare* and hedge bedstraw *Galium album*.

Some of the verges in the south of the cemetery supported turf comprising perennial ryegrass *Lolium perenne*, creating narrow strips of modified, amenity grassland. Furthermore, there is a small area of artificial grass at the Nick Hirsch memorial.

There is a small pond, which appears to be lined. The surrounding ground is wet, indicating some seepage. The pond is shallow and silty, and supports the marginal species yellow flag *Iris pseudacorus*, branched bur-reed *Sparganium erectum*, Pendulous sedge *Carex pendula* and great horsetail.

The ancient woodland indicator species Tutsan *Hypericum androsaemum,* wood anemone *Anenome nemorosa,* primrose *Primula vulgaris,* remote sedge *Carex remota* hairy wood-rush *Luzula Pilosa*, woodruff, and ransoms were recorded in the West Cemetery and should be retained and allowed to spread in the ground flora.

Undesirable species, including invasive non-native species include groups of cherry laurel and small patches of bracken *Pteridium aquilinum,* were recorded. Bracken is a native fern, but it can smother other vegetation and it is recommended that these patches are monitored and controlled if needed. Similarly, the patch of alexanders *Smyrnium olusatrum,* which can be invasive, should be removed.

Wall cotoneaster *Cotoneaster horizontalis*, an invasive non-native species, was found adjacent to the toilet block. This is a Category 2 species in the London Invasive Species Initiative list of Species of Concern, and it is recommended that it is removed.

East Cemetery

The East Cemetery supports large areas of grassland which appear to be subject to a range of management regimes. In the north of the Site, the grass is mown regularly and represents species-poor neutral grassland dominated by perennial rye grass, white clover and other species indicative of mowing, trampling and eutrophic conditions. However, these areas also support common bird's-foot-trefoil *Lotus corniculatus*, primrose and Lady's smock *Cardamine pratensis*.

Grassland verges along the main path also support primroses, bluebells (probably hybrid), columbine *Aquilegia vulgaris* (probably introduced). Nettle-leaved bellflower *Campanula trachelium* was also recorded. This species appears to have naturalised from the original plantings.

Mown verges along the eastern site boundary support hairy sedge *Carex hirta* and foxand-cubs *Pilosella aurantiaca*.

The steep bank (at TQ 28807 86818) supports species-rich grassland, which is probably the result of seeding with a wildflower grassland mixture. Species recorded in this area include field scabious *Knautia arvensis*, musk mallow *Malva moschata*, common bird'sfoot-trefoil, yarrow *Achillea millefolium*, fodder burnet, oxeye daisy, red campion *Silene dioica*, knapweed, hedge bedstraw and cowslip *Primula veris*.

The southwest corner of the Site comprises an area of rank neutral grassland. The grass in this area had not been mown. Meadow foxtail *Alopecuris pratensis,* false oat-grass *Arrhenatherum elatius,* hogweed *Heracleum spondylium*, cow parsley and species of dock had established here. Furthermore, grassland around the south gate also includes common ragwort *Jacobaea vulgaris.* This species can support many invertebrate species, including cinnabar moth caterpillars.

The vegetation is taller among the monuments under the secondary woodland canopy. Cow parsley *Anthriscus sylvestris* is frequent, along with clumps of pendulous sedge and ransoms.

The secondary woodland is similar throughout the cemetery, with ground cover frequently comprising ivy, bramble, docks, hybrid bluebell, wood avens, cleavers *Galium aparine* and occasional great horsetail and ransoms. There are also large areas of cow parsley and potentially some native bluebell which is an ancient woodland indicator species. Other species include herb Robert, hogweed *Heracleum spondylium*, garlic mustard *Alliaria petiolata*, meadow buttercup *Ranunculus acris*, cock's-foot *Dactylis glomerata*, rough meadow grass *Poa trivialis* and creeping Jenny *Lysimachia numularia*. The ancient woodland indicator species wood spurge *Euphorbia amygdaloides* was also recorded in the west of the Site.

The non-native invasive species Virginia creeper *Parthenocissus quinquefolia* was recorded amongst the gravestones. This species is listed on Schedule 9 of section 14 (1) of the Wildlife and Countryside Act 1981. It can spread rapidly and smother trees and could pose a risk to monuments, so it is recommended that it is removed.

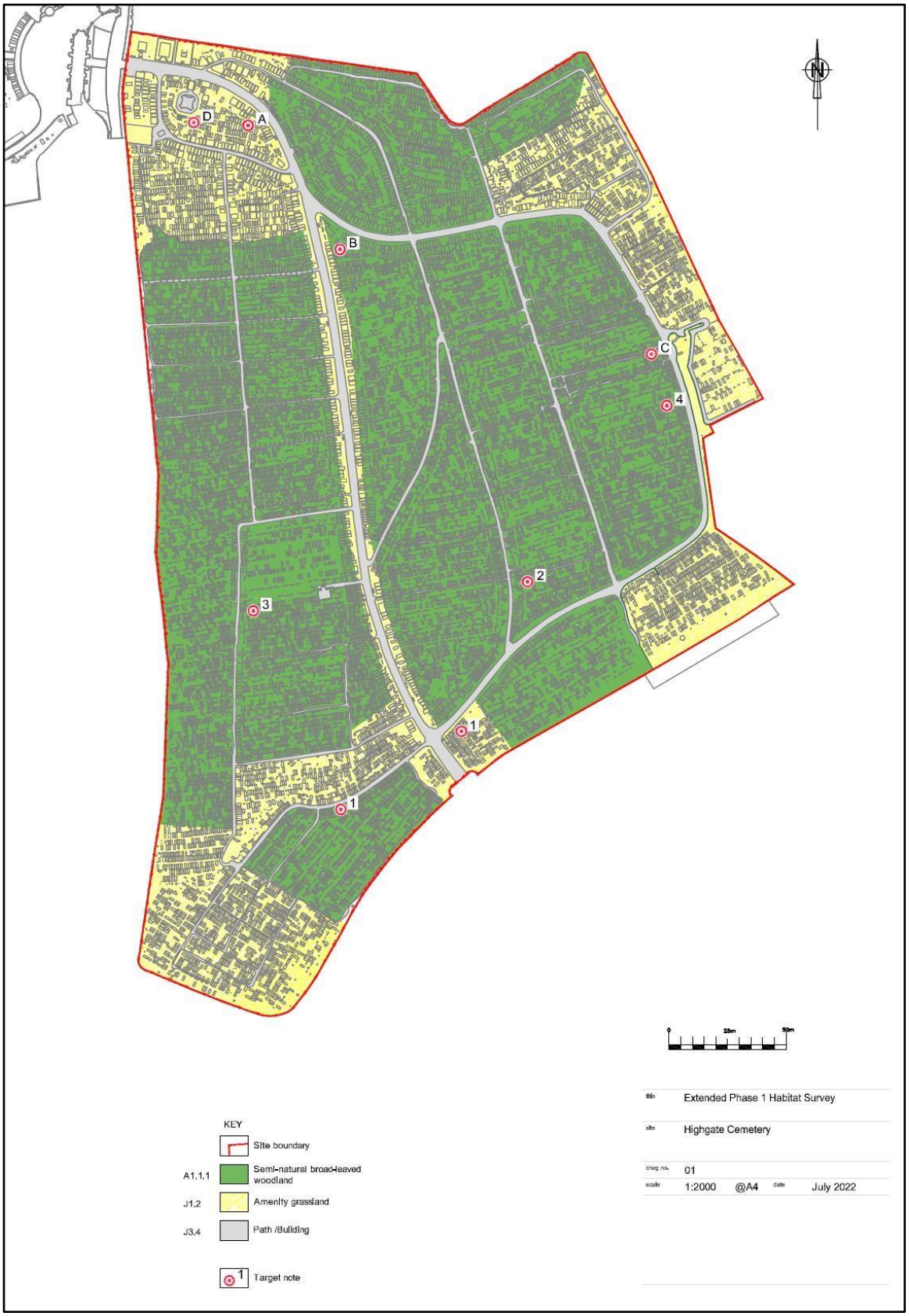
Wall cotoneaster *Cotoneaster horizontalis*, is also listed on Schedule 9 of section 14(1) of the Wildlife and Countryside Act 1981. This species was also recorded amongst the graves. It is recommended that this species is removed before it spreads further within the cemetery.

Butterfly-bush *Buddleja davidii* is a non-native invasive species, which should be removed.

Three-cornered garlic is a non-native invasive species found throughout the East Cemetery, which should also be removed.

Habitat Maps:


C
A
4
5
B
2
3
1
B
2
2
A
KEY
Site boundary
A1.1.1
Semi-natural broad-leaved woodland
A1.2.1
Semi-natural coniferous woodland
C3.1
Tall ruderal vegetation
G1
Standing water
J1.2
Amenity grassland
J3.4
Path /Building
1
Target note
Extended Phase 1 Habitat Survey
Highgate Cemetery
02 A
1:2000
@A4
July 2022


D
A
B
C
4
2
3
1
1
0
25m
50m
KEY
Site boundary
A1.1.1
Semi-natural broad-leaved woodland
J1.2
Amenity grassland
J3.4
Path /Building
1
Target note
title
Extended Phase 1 Habitat Survey
site
Highgate Cemetery
drwg no.
01
scale
1:2000
@A4
date
July 2022

Plant Species List:

West Cemetery Common Name	Scientific Name	Notes
Bear's Breeches	*Acanthus mollis*	Non-native planting
Field Maple	*Acer pseudoplatanus*	
Garden Lady's-mantle	*Alchemilla mollis*	Non-native introduction, likely planted
Yarrow	*Achillea millefolium*	Native but was probably seeded on bank
Ground Elder	*Aegopodium podagraria*	
Horse Chestnut	*Aesculus hippocastanum*	large pollard
Garlic Mustard	*Alliaria petiolata*	
Three-cornered Garlic	*Allium triquetrum*	INNS (LISI Species of Concern Cat. 4)
Ransoms	*Allium ursinum*	AWI
Wood anemone	*Anemone nemorosa*	AWI
Columbine	*Aquilegia vulgaris*	Native, but more likely a garden escape/planted
False Oat-grass	*Arrhenatherum elatius*	
Hart's-tongue Fern	*Asplenium scolopendrium*	AWI
Spotted Laurel	*Aucuba japonica*	Non-native planting
Daisy	*Bellis perennis*	
False Brome	*Brachypodium sylvaticum*	
Hedge Bindweed	*Calystegia sepium*	
Large Bindweed	*Calystegia silvatica*	Non-native introduction
Hairy Sedge	*Carex hirta*	
Pendulous Sedge	*Carex pendula*	AWI
Remote Sedge	*Carex remota*	AWI
Knapweed	*Centaurea nigra* agg.	Native but was probably seeded on bank
Common Mouse-ear	*Cerastium fontanum*	
Rosebay Willowherb	*Chamaenerion angustifolium*	
Enchanter's-nightshade	*Circaea lutetiana*	AWI
Wall Cotoneaster	*Cotoneaster horizontalis*	INNS, WCA Schedule 9 (LISI Species of Concern Cat. 2)
Willow-leaved Cotoneaster	*Cotoneaster salicifolia*	INNS (LISI Species of Concern Cat. 2 BUT doesn't specify species)
Common Broom	*Cytisus scoparius*	Native but could be planted and also garden varieties
Cock's-foot	*Dactylis glomerata*	
Wild Carrot	*Daucus carota* ssp. *carota*	Native but was probably seeded on bank
Foxglove	*Digitalis purpurea*	Native but could be planted and also garden varieties
Scaly Male Fern	*Dryopteris affinis* agg.	AWI
Male Fern	*Dryopteris filix-mas*	
Great Willowherb	*Epilobium hirsutum*	
Great Horsetail	*Equisetum telmateia*	
Red Fescue	*Festuca rubra* agg.	
Lesser Celandine	*Ficaria verna*	
Ash	*Fraxinus excelsior*	
Hedge Bedstraw	*Galium album*	
Cleavers	*Galium aparine*	

Woodruff	*Galium odoratum*	AWI, Native but also could be garden escape, TQ 28379 87162
Lady's Bedstraw	*Galium verum*	Native but was probably seeded on bank
Cut-leaved Crane's-bill	*Geranium dissectum*	
French Crane's-bill	*Geranium endressii*	Non-native garden escape/planting
Knotted Crane's-bill	*Geranium nodosum*	Non-native garden escape/planting
Dusky Crane's-bill	*Geranium phaeum*	Non-native garden escape/planting
Meadow Crane's-bill	*Geranium pratense*	Native but garden escape or seeded on bank
Herb Robert	*Geranium robertianum*	
Wood Avens	*Geum urbanum*	
Ivy	*Hedera helix* ssp. *helix*	
Hogweed	*Heracleum sphondylium*	Native (not harmful)
Yorkshire Fog	*Holcus lanatus*	
Spanish Bluebell	*Hyacinthoides hispanica*	INNS (LISI Cat 4), maybe present but the pure species is rare
Bluebell	*Hyacinthoides non-scripta*	AWI, A minority of bluebells at Highgate may be native
Hybrid Bluebell	*Hyacinthoides x. massartiana*	INNS (LISI Cat 4), majority of bluebells present here are hybrid
Tutsan	*Hypericum androsaemum*	AWI
Perforate St. John's-wort	*Hypericum perforatum*	Native but was probably seeded on bank
Cat's-ear	*Hypochaeris radicata*	Native but may have been seeded on bank
Holly	*Ilex aquilifolium*	AWI
Stinking Iris	*Iris foetidissima*	AWI, Native, but more likely a garden escape/planted
Yellow Iris	*Iris pseudacorus*	Pond
Nipplewort	*Lapsana communis*	
Oxeye Daisy	*Leucanthemum vulgare*	Native but was probably seeded on bank
Garden Privet	*Ligustrum ovalifolium*	Non-native planting
Common Toadflax	*Linum catharicum*	Native but was probably seeded on bank
Perennial Rye-grass	*Lolium perenne*	
Wilson's Honeysuckle	*Lonicera nitida*	Non-native planting (Varigated variety)
Box-leaved Honeysuckle	*Lonicera pileata*	Non-native planting
Greater Bird's-foot-trefoil	*Lotus pedunculatus*	Native but was probably seeded on bank
Hairy wood-rush	*Luzula pilosa*	AWI
Creeping Jenny	*Lysimachia nummularia*	
Dotted Loosestrife	*Lysimachia punctata*	Non-native introduction, likely planted
Apple cultivar	*Malus domestica*	Self-sown from pip or planted
Common mallow	*Malva sylvestris*	
Field Forget-me-not	*Myosotis arvensis*	
Green Alkanet	*Pentaglottis sempervirens*	Non-native introduction (LISI Species of Concern Cat 6)
Common Bistort	*Persicaria bistorta*	Native but likely garden escape/planting
Ribwort Plantain	*Plantago lanceolata*	
Annual Meadow-grass	*Poa annua*	
Rough Meadow-grass	*Poa trivialis*	
Yellow-flowered Strawberry	*Potentilla indica*	Non-native introduction
Creeping Cinquefoil	*Potentilla reptans*	

Fodder Burnet	*Poterium sanguisorba* ssp. *balearicum*	Native but was certainly seeded on bank
Primrose	*Primula vulgaris*	AWI
Selfheal	*Prunella vulgaris*	
Cherry	*Prunus avium*	Some mature trees
Cherry Laurel	*Prunus laurocerasus*	INNS (LISI Species of Concern Cat. 3)
Bracken	*Pteridium aquilinum*	
Hol/evergreen oak	*Quercus ilex*	INNS (LISI Species of Concern Cat. 5)
Pedunculate Oak	*Quercus robur*	
Meadow Buttercup	*Ranunculus acris*	
Rhododendron	*Rhododendron ponticum*	INNS (LISI Species of Concern Cat. 2)
Dog-rose	*Rosa canina* agg.	
Bramble	*Rubus fruticosus* agg.	
Wood Dock	*Rumex sanguineus*	
Dock species (including hybrids)	*Rumex* spp.	
Butcher's Broom	*Ruscus aculeatus*	AWI
Creeping Saxifrage	*Saxifraga stolonifera*	Non-native garden escape/planting
Red Campion	*Silene dioica*	
Ragged Robin	*Silene flos-cuculi*	
Alexanders	*Smyrnium olusatrum*	Non-native can be invasive (Small patch)
Branched Bur-reed	*Sparganium erectum*	Pond
Snowberry	*Symphoricarpos albus*	INNS (LISI Species of Concern Cat. 2)
Creeping Comfrey	*Symphytum grandiflorum*	Non-native garden escape/planting
Tuberous Comfrey	*Symphytum tuberosum*	Native, but more likely a garden escape/planted
Dandelion	*Taraxacum* agg.	
Fringecups	*Tellima grandiflora*	Non-native garden escape/planting
White Clover	*Trifolium repens*	
Thyme-leaved Speedwell	*Veronica serpyllifolia*	
Tufted Vetch	*Vicia cracca*	Native but was probably seeded on bank
Common Vetch	*Vicia sativa s.l.*	Native but was probably seeded on bank
Lesser Periwinkle	*Vinca minor*	Native, but more likely a garden escape/planted
arrow	*Achillea millefolium*	Native but was probably seeded on bank
Ground Elder	*Aegopodium podagraria*	
Garlic Mustard	*Alliaria petiolata*	
Three-cornered Garlic	*Allium triquetrum*	INNS (LISI Species of Concern Cat. 4)
Ransoms	*Allium ursinum*	AWI
Meadow Foxtail	*Alopecurus pratensis*	
Barren brome	*Anisantha sterilis*	
Cow Parsley	*Anthriscus sylvestris*	
Columbine	*Aquilegia vulgaris*	Native, but more likely a garden escape/planted
False Oat-grass	*Arrhenatherum elatius*	
Lords-and-Ladies	*Arum maculatum*	
Daisy	*Bellis perennis*	
False Brome	*Brachypodium sylvaticum*	
Butterfly-bush	*Buddleja davidii*	INNS (LISI Species of Concern Cat. 3)
Nettle-leaved Bellflower	*Campanula trachelium*	Native but probably a garden escape here

Lady's Smock	*Cardamine pratensis*	
Hairy Sedge	*Carex hirta*	
Small-fruited Prickly Sedge	*Carex muricata ssp. pairae*	Approximate 50 square metre area at TQ 28779 86802
Pendulous Sedge	*Carex pendula*	AWI
Knapweed	*Centaurea nigra* agg.	Native but was probably seeded on bank
Greater Knapweed	*Centaurea scabiosa*	Native but was probably seeded on bank
Red Valerian	*Centranthus ruber*	Non-native introduction
Spear Thistle	*Cirsium vulgare*	
Dogwood	*Cornus sanguinea*	
Wall Cotoneaster	*Cotoneaster horizontalis*	INNS, WCA Schedule 9 (LISI Species of Concern Cat. 2)

East Cemetery Common Name	Scientific Name	Notes
Cock's-foot	*Dactylis glomerata*	
Great Horsetail	*Equisetum telmateia*	
Wood spurge	*Euphorbia amygdaloides*	AWI, native but possible garden escape/planting
Red Fescue	*Festuca rubra* agg.	
Lesser Celandine	*Ficaria verna*	
Wild Strawberry	*Fragaria vesca*	
Ash	*Fraxinus excelsior*	
Hedge Bedstraw	*Galium album*	Native but was probably seeded on bank
Cleavers	*Galium aparine*	
Lady's Bedstraw	*Galium verum*	Native but was probably seeded on bank
Meadow Crane's-bill	*Geranium pratense*	Native but garden escape here
Herb Robert	*Geranium robertianum*	
Bloody Crane's-bill	*Geranium sanguineum*	Native but garden escape here
Wood Avens	*Geum urbanum*	
Ivy	*Hedera helix* ssp. *helix*	
Hogweed	*Heracleum sphondylium*	
Yorkshire Fog	*Holcus lanatus*	
Bluebell	*Hyacinthoides* cf. *nonscripta*	INNS (LISI Cat 4), maybe present but the pure species is rare
Spanish Bluebell	*Hyacinthoides hispanica*	AWI, A minority of bluebells at Highgate may be native
Hybrid Bluebell	*Hyacinthoides x. massartiana*	INNS (LISI Cat 4), majority of bluebells present here are hybrid
Perforate St. John's-wort	*Hypericum perforatum*	Native but was probably seeded on bank
Common Ragwort	*Jacobaea vulgaris*	
Field Scabious	*Knautia arvensis*	Native but was probably seeded on bank
Nipplewort	*Lapsana communis*	
Meadow Vetchling	*Lathyrus pratensis*	
Oxeye Daisy	*Leucanthemum vulgare*	Native but was probably seeded on bank
Perennial Rye-grass	*Lolium perenne*	
Common Bird's-foot-trefoil	*Lotus corniculatus*	Native but was probably seeded on bank
Creeping Jenny	*Lysimachia nummularia*	
Musk Mallow	*Malva moschata*	Native but was probably seeded on bank

Field Forget-me-not	*Myosotis arvensis*	
Wood Forget-me-not	*Myosotis sylvatica*	
Daffodil - garden varieties	*Narcissus* sp.	
Wild Marjoram	*Origanum vulgare*	Native but was probably seeded on bank
Virginia Creeper	*Parthenocissus quinquefolia*	INNS, WCA Schedule 9
Green Alkanet	*Pentaglottis sempervirens*	Non-native introduction (LISI Species of Concern Cat 6)
Fox-and-cubs	*Pilosella aurantiaca*	Naturalised non-native introduction
Ribwort Plantain	*Plantago lanceolata*	
Rough Meadow-grass	*Poa trivialis*	
Creeping Cinquefoil	*Potentilla reptans*	
Fodder Burnet	*Poterium sanguisorba* ssp. *balearicum*	Native but was certainly seeded on bank
Cowslip	*Primula veris*	Native but was probably seeded on bank
Primrose	*Primula vulgaris*	AWI
Selfheal	*Prunella vulgaris*	
Wild Cherry	*Prunus avium*	AWI
Bracken	*Pteridium aquilinum*	
Meadow Buttercup	*Ranunculus acris*	
Creeping Buttercup	*Ranunculus repens*	
Bramble	*Rubus fruticosus* agg.	
Dock species (including hybrids)	*Rumex* spp.	
Red Campion	*Silene dioica*	Native but was probably seeded on bank
Smooth Sow-thistle	*Sonchus oleraceus*	
Dandelion	*Taraxacum* agg.	
Red Clover	*Trifolium pratense*	
White Clover	*Trifolium repens*	
Common Nettle	*Urtica dioica*	
Germander Speedwell	*Veronica chamaedrys*	
Ivy-leaved Speedwell	*Veronica hederifolia*	
Thyme-leaved Speedwell	*Veronica serpyllifolia*	
Common Vetch	*Vicia sativa s.l.*	Native but was probably seeded on bank
Periwinkle	*Vinca major*	Non-native introduction
Lesser Periwinkle	*Vinca minor*	Native, but more likely a garden escape/planted

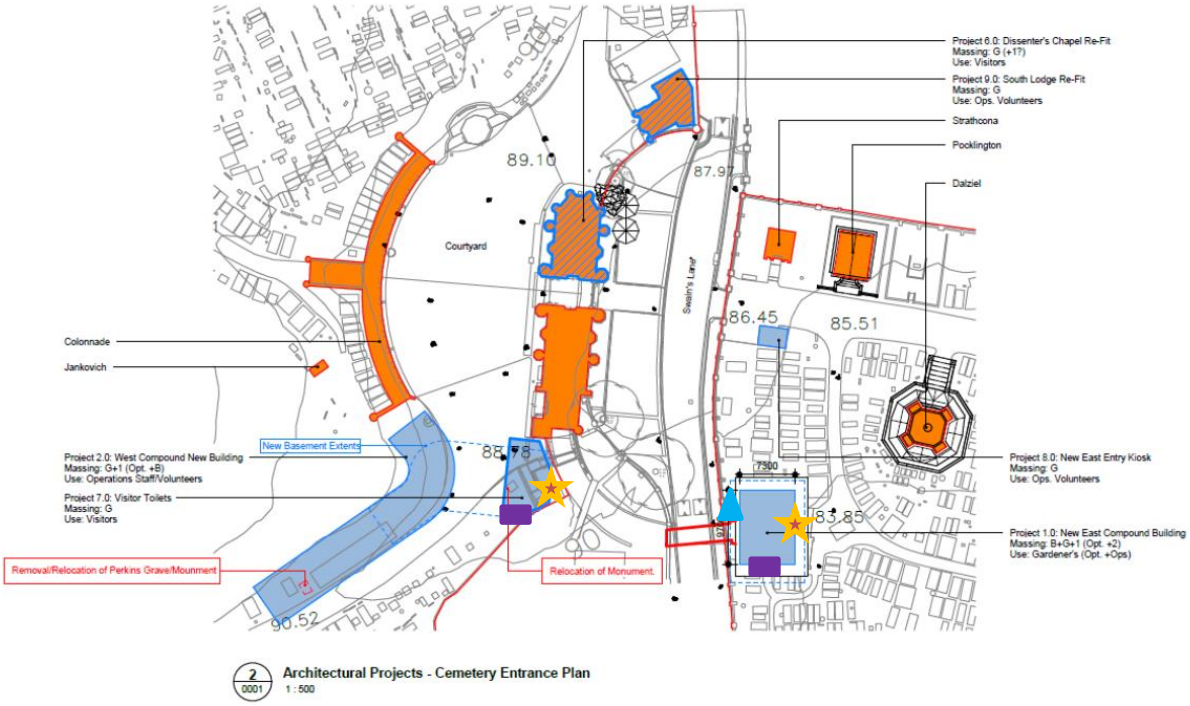
Appendix 3: Consultation Log

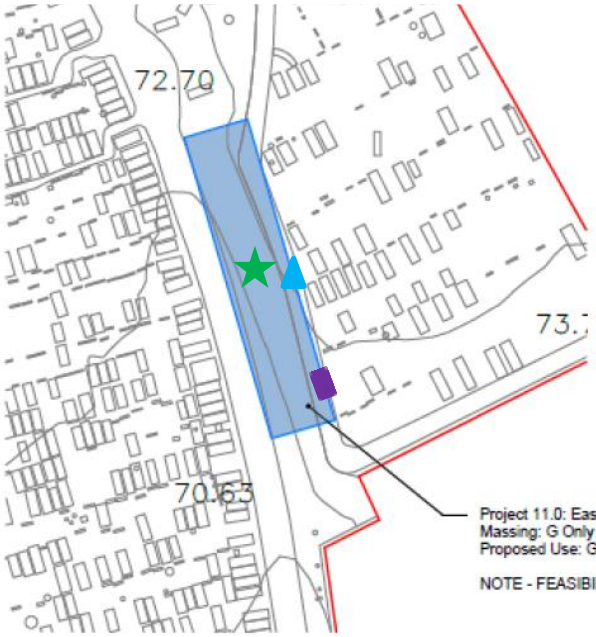
Consultee	Introduction and Broad Objectives	Project Details	Survey Scope
Camden Borough Council	July 2023- CBC confirmed Greg Hitchcock (Nature Conservation Officer) and Kate Henry (pre-app officer) are the correct contacts. Advised that consideration should be given to: • The SINC status and citation for the site; • The conservation of ash and sycamore trees being less important than maintaining the balance of broad habitat types and improving biodiversity. • The impact of the loss of trees and any building conservation works on the ferns, lichens, mosses and liverworts on stonework, and how this will be managed. • The effects of climate change. • Measures should be in accordance with the biodiversity strategy (https://www.camden.gov.uk/wildlife-areas#cjmw). Key objectives are increasing the area of species-rich woodland and increasing the area of SINCs in positive management for biodiversity. These can be achieved through better management of existing woodlands and increasing the area of flower-rich grasslands. • Improve connectivity with Waterlow Park through enhancement of the areas that lie adjacent to the park.	July 2023- CBC confirmed that if the application is submitted after BNG comes into force, and the application is not exempted for any reason, BNG must be included. Based on the pre-app documents, if the architectural elements don't trigger BNG, hard elements of the landscape masterplan may do so. The scheme as a whole, including enhancements through the landscape masterplan, would be used for the BNG calculations. The loss of ash trees owing to management of ash dieback should not be considered an impact of the proposals, but the removal of trees for views could be. Guidance (or secondary legislation) on how to calculate BNG for phased developments has not yet been issued. The BNG assessment should use the category that most accurately describes the current habitats, which could be Cemetery and Churchyard of various conditions, but some areas of woodland or grassland (or wetland) may also be present. The same goes for the future landscaping proposals. The scheme may rely on just improving the condition of 'Cemetery and Churchyard' habitat to achieve BNG. The requirement for BREEAM is a planning issue for the pre-app.	August 2023-CBC confirmed that they would require sufficient information on the impact of the project on along with any necessary mitigation to determine the application. A Preliminary Ecological Assessment should be undertaken to identify any further surveys necessary (with surveys for protected species being required prior to determination, phasing of other surveys determined by confidence in initial proposed avoidance/mitigation). The impacts of the project need to be identified to justify the approach taken and inform the final ecology report. The planning application cannot be determined before the surveys are completed, but as the application is phased, this may require further discussion. **The PEA and the assessment of trees for bat roost reports were forwarded in October 2023 and we are awaiting a response on the details of the protected species surveys**
Buglife	March 2023- Consultation initiated. Buglife confirmed that Rachel Richards (B-Lines Officer) is the correct contact.	Buglife confirmed that:	

		They approved of the creation of wetlands and the suggested wetland planting, but yellow iris should be removed in case it becomes too dominant. The site lies within a B-Line area and should be added to the B-Line map. More pollinator habitat should be created in the West Cemetery to improve connectivity across this part of the site. More legumes should be included in the planting palette, such as native reed clover which is very important to long tongued bees; bush vetch and common vetch. Foxglove could be included in shady areas to support long tongued bees. Scattered trees and shrubs can also be a good pollen and nectar source. Use species that flower at different times e.g. willow, blackthorn, hawthorn and rowan. Brambles and ivy are very important in autumn. Consider over-wintering habitat. For bees and solitary wasps this is either cavities (sunny deadwood, holes in mortar or bee hotels) or ground nesting (bare areas of soil, sunny banks, bee banks, tussocks). For invertebrates provide tussocks and dead wood (see Ancient Tree Hub - Buglife and Cross taxa management guide for ancient tree and deadwood habitats - Buglife). See Habitat Management - Buglife for guidance on habitat management, but pollen rich habitat should be cut and collected at least once a year, late summer, poss. early spring and late summer if there is a lot of growth. Tussocky areas should be cut and lifted on a 2-3 year cycle so each year there are uncut areas.	

		Tussocky areas should include hogweed, knapweed and oxeye daisy. Allow areas of nettles, creeping and spear thistles, and ragwort to be retained. **Next step- reconsult on updated scheme details if needed.**	
London Wildlife Trust	October 2021, November 2021, March 2023, October 2023- Consultation initiated. LWT confirmed that they did not want to comment on the application.		
London Bat Group	March 2023, October 2023.Directed to Philip Briggs as the Chair of LBG. Awaiting a response. **Next step – follow up for conservation advice after bat surveys have been completed.**		
British Lichen Society	October 2023: BLS confirmed John Skinner is the London NHS recorder for lichens and the British Lichen Society contact and recorder for London.	October 2023: Advised that most cemeteries are spoiled by excessive shading and some tree removal could enhance the site for lichens (except for the ones on the trees). See paper by Amanda Waterfield in the London Naturalist on lichens in 5 London cemeteries. **Next step- reconsult for conservation advice after the lichen survey has been completed.**	

Appendix 4: Location of Enhancement Features





Key:

- House sparrow and swift nest boxes (Indicative location of at least 3 in a row)
- Integrated bat box (Indicative location)
- Bee brick (Indicative location of 2)
- Green roof (Indicative location of building)

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Architectural Projects - East Cemetery Mound Plan
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Appendix 5: Biodiversity Net Gain Report

ASHGROVE ECOLOGY LIMITED

Ashgrove Ecology can provide ecology support throughout the planning process.

Our ecological consulting services include:

- Pre- acquisition site constraints surveys
- Scoping studies
- Preliminary Ecological Appraisals and Habitat Surveys
- Protected species surveys (bats, great crested newts, reptiles and badgers)
- Specialist bird surveys
- Biodiversity Net Gain
- Ecological Impact Assessments and Habitat Regulations Assessments
- Habitat management planning