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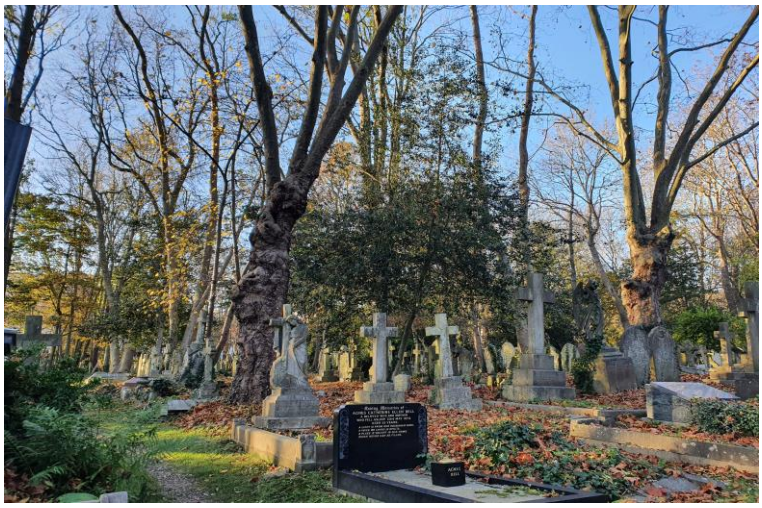

Highgate Cemetery

Biodiversity Net Gain Report

2024

Project title	Highgate Cemetery: Biodiversity Net Gain Report
Client	Gustafson, Porter and Bowman
Version	2
Date	October 2024
Author	Rachel Holmes BSc (Hons) MSc PhD MCIEEM C.Env
Reviewer	Emma Pollard BSc (Hons)

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This report does not constitute legal advice. For legal advice a legal professional should be consulted.

CONTENTS

1. INTRODUCTION

Ashgrove Ecology Limited was commissioned by Gustafson, Porter and Bowman to complete a Biodiversity Net Gain (BNG) calculation and associated feasibility report for the proposed project at Highgate Cemetery. This report will be submitted alongside the Ecological Impact Assessment Report (Ashgrove Ecology, 2024) to support an application for new development and a 25 year masterplan for the site.

Highgate Cemetery, which comprises East and West Cemeteries, lies in the London Borough of Camden (central grid reference TQ 285 869) (Figure 1). Highgate Cemetery comprises the paired Victorian cemeteries at Highgate, which have been designated a Site of Metropolitan Importance for Nature Conservation (SMINC) within the London Borough of Camden. The site is a working cemetery and secondary, broadleaved woodland and grassland has established between the graves and monuments. These habitats provide some opportunities for faunal species that are notable within urban environments.

The site is the subject of a planning application for new buildings in three areas of the site. However, it should be noted that these building largely coincide with areas of hardstanding.

The site is also the subject of a 25 year masterplan which includes the renovation of several buildings and a management strategy for the graves and habitats to prevent further deterioration, increase biodiversity, and create new habitats resilient to future pressures, including climate change.

During consultations with Camden Borough Council, it was acknowledged that the BNG metric was not designed for the type of project being proposed at Highgate Cemetery: which is essentially a plan for the long-term management of the site; however, it was agreed that an attempt should be made to apply the metric as far as possible, in order to provide an indication of the level of BNG which could be achieved within the scheme.

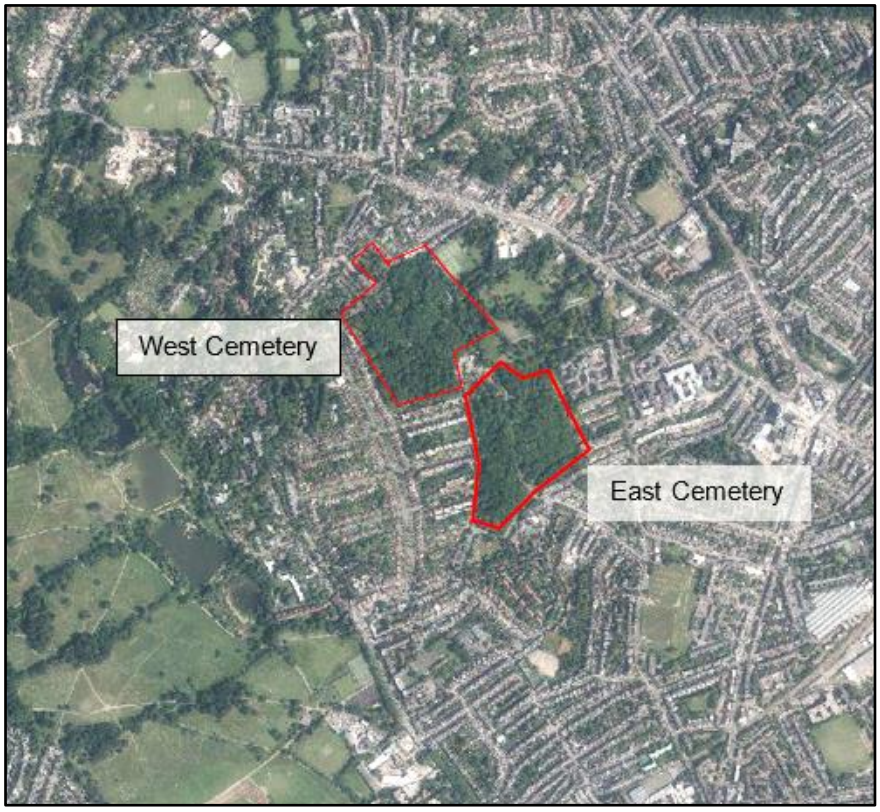


Figure 1. Location of Highgate Cemetery

2. GUIDANCE, LEGISLATION AND POLICY

2.1 Guidance

This report has been produced with consideration of the structure presented in the 'BNG Feasibility Report' in the CIEEM Biodiversity Net Gain Report and Audit Templates[1].

2.2 Legislation

The Environment Act 2021 was granted Royal Assent in November 2021 and contains provisions which mandate the requirement to achieve a 10% BNG for most developments. These provisions make it a legal requirement for developers to ensure sites are improved for biodiversity, with a 10% increase in habitat value for wildlife compared with the pre-development baseline. BNG can be achieved through habitat creation, or enhancements to retained habitats. All biodiversity enhancements will be required to be maintained for a minimum of 30 years[2].

2.3 Planning Policy

The legal requirement for BNG is embedded in the National Planning Policy Framework3 which states that "planning policies and decisions should…identify and pursue opportunities for securing measurable net gains for biodiversity".

[1] CIEEM (2021). Biodiversity Net Gain Report and Audit Templates Chartered Institute of Ecology and Environmental Management, Winchester, UK.

[2] Environment Act (2021)

3 Ministry of Housing, Communities & Local Government, 2021. National Planning Policy Framework, available at: National Planning Policy Framework (publishing.service.gov.uk)

3. METHODOLOGY

3.1 Baseline Habitat Characterisation

A detailed habitat and botanical survey of the site was undertaken between May and July 2022, by Dr Lesley Mason PhD ACIEEM, who is a suitably qualified ecologists with extensive experience of habitat and botanical surveys. Furthermore, a Preliminary Ecological Appraisal was undertaken by Arbtech Consulting Limited in September 2023, to identify the potential of the habitats to support rare, notable and protected species. Classification of the baseline habitats followed the UK Habitat[4] types criteria as required by the Biodiversity Metric 4.0.

The total area of the site was defined as the area within the red line boundary used for the planning application, minus any existing areas of buildings and hardstanding, as these have no biodiversity value. The total site area used in the BNG calculation was 13.46 ha.

The baseline habitat was classified as *Urban Habitats (U1): 90 Cemeteries and Churchyards*, due to the ongoing use of the site as a working cemetery with tightly packed graves, headstones and monuments. Whilst trees, scrub and a variety of grasses and forbs have established amongst the graves, these did not constitute functional habitats and therefore the entire site was classified as Cemeteries and Churchyards for the purpose of calculating BNG to avoid under-valuing the habitats.

Details of the baseline site conditions are provided in the Ecological Baseline Report (Ashgrove Ecology, 2023), and a summary of the key findings with regard to BNG are provided below:

- The majority of the site comprised tightly packed graves, with some areas of ornamental planting including trees. 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 course grassland and scrub have also established between the graves. Because these habitats are highly modified and do not represent recognised species assemblages, they have not be broken down in this assessment.
- No irreplaceable habitats are present on the site.
- All the baseline habitats were classified as area habitats, and no linear habitats were present.
- The habitats overlapped where trees, graves and scrub or grassland occurred in the same location.

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

- The botanical survey revealed that the majority of the habitats were encroached with invasive non-native species.
- A large number of trees across the site have contracted ash dieback and will be removed as part of ongoing management. The tree removal is outside of the planning application and the BNG calculation[5].

3.2 Calculation of Baseline Biodiversity Value

The baseline value of the habitats on the site was calculated using DEFRA's Biodiversity Metric 4.0 calculator. The metric calculations were undertaken by Dr Rachel Holmes C.Env, who is an experienced ecologist and environmental impact assessment practitioner.

The methodology for determining habitat distinctiveness and condition values follows the guidelines set out by the User Guide and Technical Supplement for Biodiversity Metric 4.0[6].

Distinctiveness and condition scores were assigned to habitats based on the results of the habitat and botanical surveys, and the classification guidelines in the Biodiversity Metric 4.0 User Guide and Technical Supplement, including the condition assessment worksheets for habitat types.

In the Biodiversity Metric 4.0., habitats are assigned to distinctiveness bands based on the type of habitat and its distinguishing features. This includes consideration of species richness, rarity, the extent to which the habitat is protected by designations and the degree to which a habitat supports species rarely found in other habitats.

The condition assessment assesses each habitat against a set of predefined criteria in the relevant habitat condition assessment worksheet. Based on this assessment each habitat is categorised as being in either Good, Moderate, or Poor condition.

Cemeteries and Churchyards are assigned a 'Medium' distinctiveness score in the metric by default. The condition of the habitat was assessed as 'Moderate' because it passed two out of three of the criteria in the Urban Habitat Type Condition Sheet (see Table 1):

[5] Consultation with Camden Borough Council confirmed that trees removed for the purpose of safety and disease as part of general management do not count as a loss within the BNG calculations.

[6] Natural England (2023): The Biodiversity Metric 4.0 User Guide – Technical Annex 2. Natural England Joint Publication JP039

Table 1: Cemeteries and Churchyards: Condition Assessment Results

Criteria	Assessment	Pass/ Fail
A: Vegetation structure is varied, providing opportunities for vertebrates and invertebrates to live, eat and breed. A single structural habitat component or vegetation type does not account for more than 80% of the total habitat area.	Highgate Cemetery has some variation in vegetation structure across the site, through the presence of semi-mature trees and ground flora including tussock forming grasses. The habitats also include structures which support mosses and lichens.	Pass
B: The habitat parcel contains different plant species that are beneficial for wildlife, for example flowering species providing nectar sources for a range of invertebrates at different times of year.	The habitat contains a range nectar bearing plants including trees and shrubs, understorey bulbs, broad-leaved herbs and grasses that provide nectar sources at different times of the year.	Pass
C: Invasive non-native plant species (listed on Schedule 9 of WCA) and others which are to the detriment of native wildlife (using professional judgement) cover less than 5% of the total vegetated area. To achieve Good condition, this criterion must be satisfied by a complete absence of invasive non-native species (rather than <5% cover).	The habitat throughout the site has become encroached by INNS including alexanders, cotoneaster, Virginia creeper, rhododendron, cherry laurel and butterfly bush which cover more than 5% of the habitat.	Fail

Finally, the site was considered to be of Strategic Significance because Highgate Cemetery has been designated a SMINC due to its importance for wildlife.

Based on the information above, the baseline biodiversity value of the site was calculated as 123.83 habitat units. The calculation is summarised below in Table 2. For the full BNG calculation see Appendix A.

Table 2: Summary of Baseline BNG Results

Broad Habitat	Habitat	Area (ha)	Condition	Distinctiveness	Strategic Significance	Habitat Units
Urban (U1)	Cemeteries and Churchyards	13.46	Moderate	Medium	High: Formally identified in local strategy	123.83

3.3 Calculation of the Post-Development Biodiversity Value

The locations of the proposed building 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; however, the removal of some graves, and felling of large numbers of diseased ash trees (which will be undertaken outside of the development application) presents an opportunity to create a suite of new habitats within the site. For this reason, BNG can be achieved through the enhancement and creation of on-site habitats and no off-site measures are proposed.

Habitat enhancement will be undertaken across the entire site by removing the invasive non-native species that prevent the Cemeteries and Churchyards habitat from achieving Good condition. 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 habitats will be created on the site: however only the new linear habitats are included in the metric due to the area habitats overlapping with the Cemeteries and Churchyards habitat. New linear habitats comprise 0.7 km of native hedgerows (h2a), which will provide corridors for wildlife.

See Figures 2 and 3 for plans showing the locations of the proposed post-development habitats.

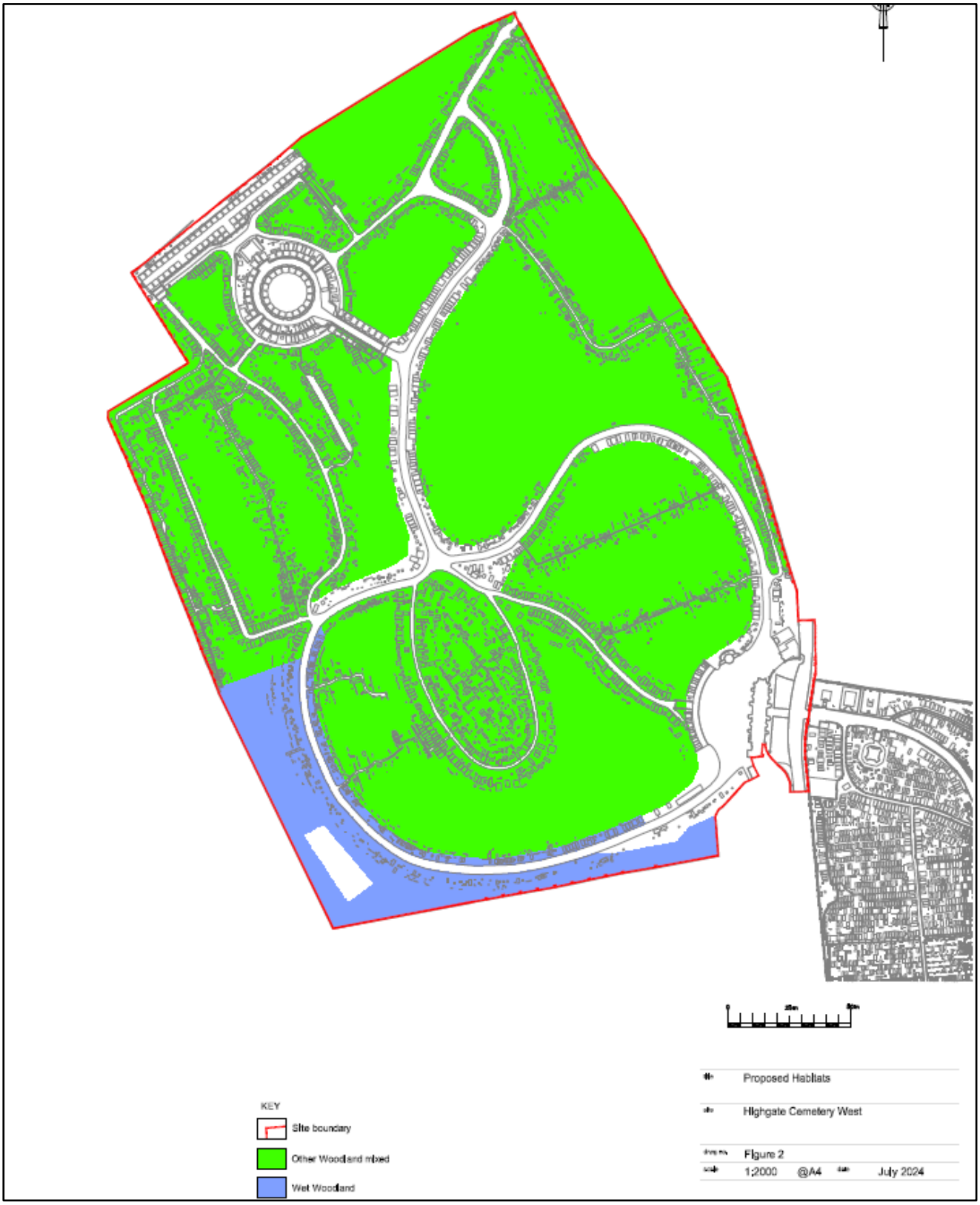


Figure 2: Post-development habitat creation (West Cemetery)

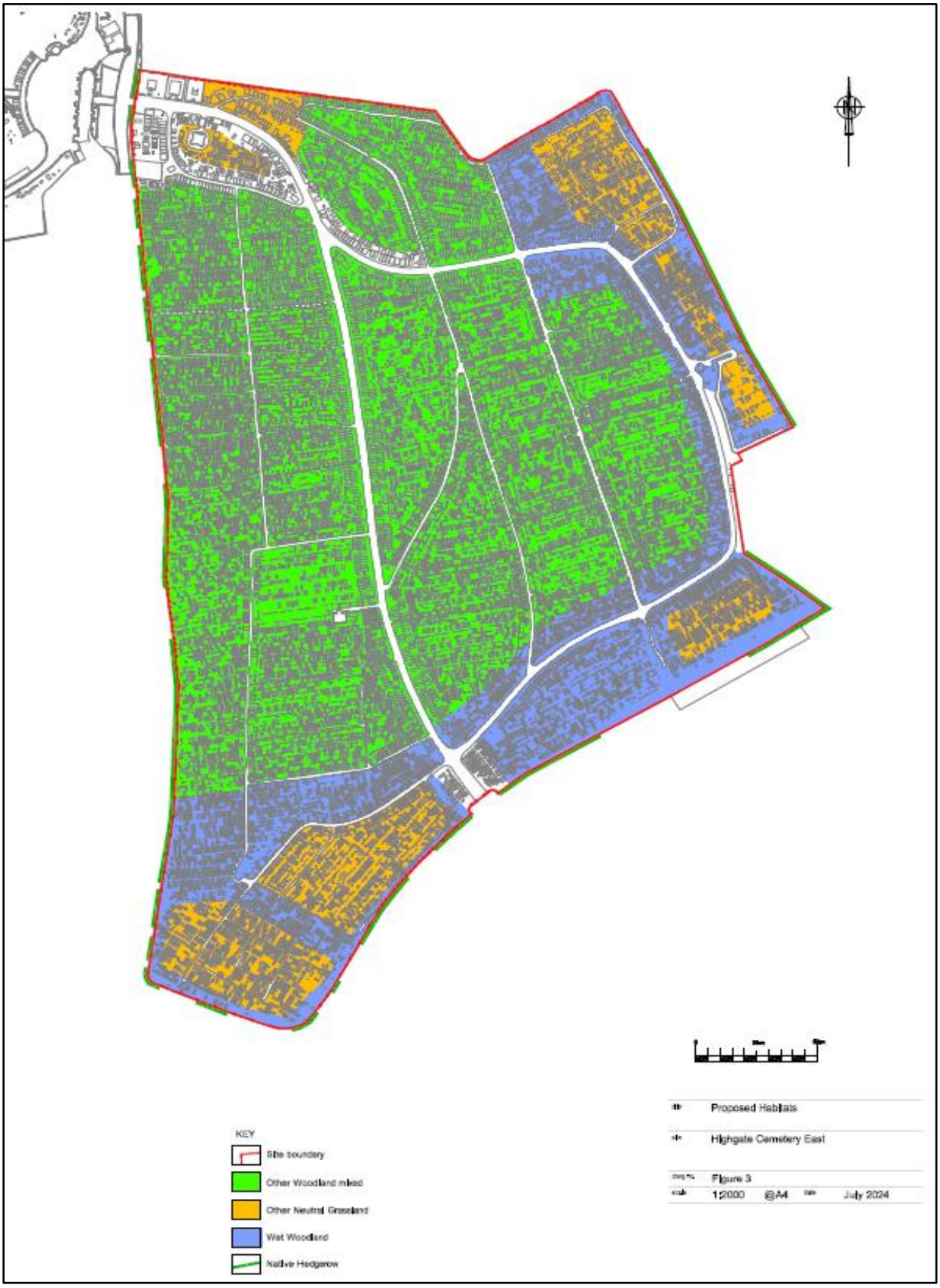


Figure 3: Post-development habitat creation (East Cemetery)

3.4 Post-Development Condition Scores

The post-development biodiversity value for the site is the predicted value of the on-site habitats at the time the development is completed. This value can only be accepted if the applicant can demonstrate that the BNG will be maintained for at least 30 years. This commitment is normally secured through either a planning condition, a planning obligation, or a conservation covenant.

Post-development condition scores are indicative and dependent on the appropriate management and maintenance of the post-development habitats. The management of created and enhanced habitats is critical to the BNG metric because the metric accounts for some of the risks associated with the difficulty in establish new habitats and maintaining them in the target condition for 30 years. By engaging with the BNG process, the developer is committing to the management and maintenance requirements that will be required to ensure that all the enhanced and newly created habitats achieve their target condition and are maintained for at least 30 years post-development as required to satisfy the conditions for biodiversity net gain in the best practice guidelines. A detailed habitat management plan will be prepared for Highgate Cemetery to ensure that this condition is met.

The condition assessment for the post-development habitat follows the same approach as that for the baseline condition assessment, by making use of the condition assessment worksheets. While it is not possible to know exactly how the habitat will establish, the assessment attempts to predict the future condition based on the planting palette, management measures and a general understanding of the constraints of the site.
The predicted condition score for the new native hedgerows is Moderate. For details of the condition assessment see Appendix B.

The distinctiveness score for the habitat is pre-populated within the metric. The standard time to the target condition being reached and the difficulty in creating the new habitat is also pre-populated, reflecting a general understanding of the constraints to habitat creation.
The time delay for starting the habitat creation function within the metric is designed to account for the period between the exiting habitat being lost and the new habitat being created. For this project, the creation of a linear habitat will not result in the loss of the exiting Cemeteries and Churchyards habitat and therefore this function has been set to zero within the metric.

Table 3 presents the number of habitat units the newly created habitat will add to the metric, based on the above parameters.

Table 3: Summary of Post-Development BNG Results

Broad Habitat	Habitat	KM	Condition	Distinctiveness	Years to Final Condition	Standard Difficulty of Creation	Habitat Units
h2a	Native hedgerows	0.7	Moderate	Low	5	Low	2.69

The post-development score is 2.69 hedgerow units. Because there are currently no hedgerows on the site, it is not possible to calculate a percentage increase for this habitat.

Most of the Cemeteries and Churchyard habitats will be retained and enhanced within the scheme. This results in an increase in the post-development area units to 137.08, which represents a 10.70% increase.

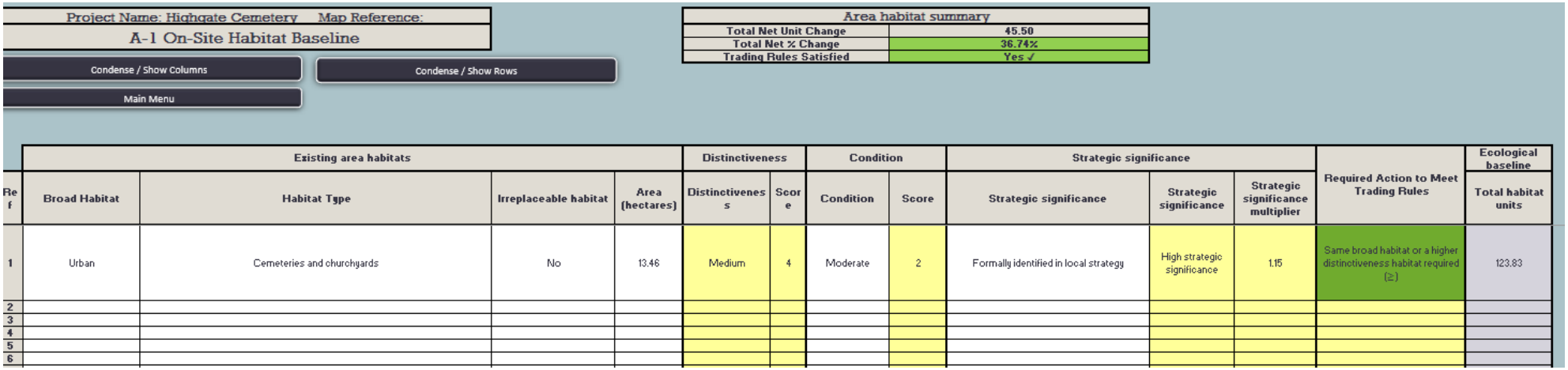
The total number of BNG units is 139.77 compared to the baseline of 123.83 units.

4. CONCLUSIONS

The total number of units post-development is predicted to be 139.77 which represents a BNG of more than 10.70% which exceeds the mandatory BNG of 10%.

It is concluded that, subject to an appropriate 30 year management regime being implemented, it is feasible for the project to proceed whist meeting the legislation with regards to BNG. It is recommended that the measures presented in this report should be secured through appropriate conditions in any planning consent for the project.

Appendix A: Biodiversity Net Gain Metric (Screenshots)



Project Name: Highgate Cemetery Map Reference:

A-1 On-Site Habitat Baseline

Condense / Show Columns | Condense / Show Rows | Main Menu

Area habitat summary	
Total Net Unit Change	45.50
Total Net % Change	36.74%
Trading Rules Satisfied	Yes ✓

Ref	Existing area habitats				Distinctiveness		Condition		Strategic significance			Required Action to Meet Trading Rules	Ecological baseline
	Broad Habitat	Habitat Type	Irreplaceable habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic significance multiplier		Total habitat units
1	Urban	Cemeteries and churchyards	No	13.46	Medium	4	Moderate	2	Formally identified in local strategy	High strategic significance	1.15	Same broad habitat or a higher distinctiveness habitat required (≥)	123.83
2													
3													
4													
5													
6													

Area retained	Area enhanced	Baseline units retained	Baseline units enhanced	Area habitat lost	Units lost	Bespoke compensation agreed for losses of VHDH or irreplaceable habitat	Comments		
							User comments	Planning authority comments	Habitat reference number
12.68	0	116.66	0.00	0.78	7.18		The majority of Churchyard and Cemetery habitat will be retained apart from approximately 0.7ha, which will be lost to the development. The remainder of the site will be used to create new areas of grassland and woodland. Much of this will be in areas where trees with ash dieback have been removed.		

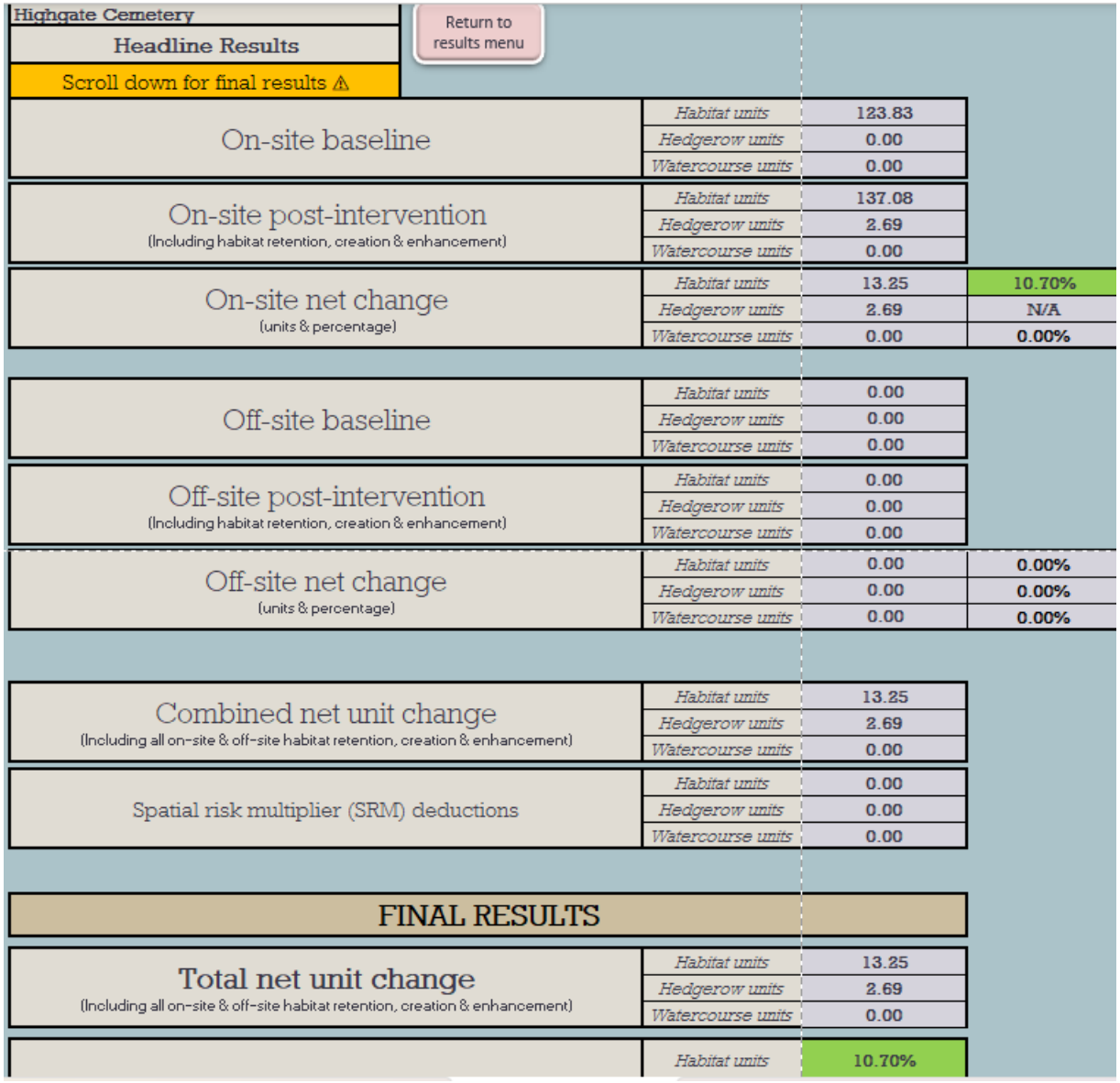
Project Name: Highgate Cemetery	Map Reference:
B-2 On-Site Hedge Creation	

Condense / Show Columns | Condense / Show Rows | Main Menu

Hedgerow summary	
Total Net Unit Change	2.69
Total Net % Change	117056.02%
Trading Rules Satisfied	Yes ✓

		Proposed habitats		Distinctiveness		Condition		Strategic significance			
Ref	New hedge number	Habitat type	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic significance multiplier	Standard Time to target condition (years)
1	1	Native hedgerow	0.7	Low	2	Moderate	2	Formally identified in local strategy	High strategic significance	1.15	5

Temporal multiplier					Difficulty risk multipliers				Hedge units delivered
Habitat created in advance (years)	Delay in starting habitat creation (years)	Standard or adjusted time to target condition	Final time to target condition (years)	Final time to target multiplier	Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation	Difficulty multiplier applied	
0	0	Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	2.69



Highgate Cemetery

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Headline Results

Scroll down for final results ⚠

On-site baseline	*Habitat units*	123.83	
	Hedgerow units	0.00	
	Watercourse units	0.00	
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	137.08	
	Hedgerow units	2.69	
	Watercourse units	0.00	
On-site net change (units & percentage)	*Habitat units*	13.25	10.70%
	Hedgerow units	2.69	N/A
	Watercourse units	0.00	0.00%
Off-site baseline	*Habitat units*	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	
Off-site net change (units & percentage)	*Habitat units*	0.00	0.00%
	Hedgerow units	0.00	0.00%
	Watercourse units	0.00	0.00%
Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	13.25	
	Hedgerow units	2.69	
	Watercourse units	0.00	
Spatial risk multiplier (SRM) deductions	*Habitat units*	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	

FINAL RESULTS

Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	13.25
	Hedgerow units	2.69
	Watercourse units	0.00
	Habitat units	10.70%

Appendix 2: Habitat Condition Assessments

Condition sheet: HEDGEROW Habitat Types			
Habitat Type			
Native Hedgerow			
Habitat Description			
See the Biodiversity Metric 4.0 User Guide Section 9. Each attribute is assigned to one of five functional groups (A – E) and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria.			
Site name and location	Highgate Cemetery	**On-site or off-site**	On-Site
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	
Condition Assessment Criteria			
A series of ten attributes, representing key physical characteristics are used for this assessment. This assessment is based on the Hedgerow Survey Handbook[1] and Favourable Conservation Status document[2]. For further clarification please refer to the Hedgerow Survey Handbook. Each attribute is assigned to one of five functional groups (A – E) and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria.			
Hedgerow favourable condition attributes			

Attributes and functional groupings (A, B, C, D and E)		Criteria - the minimum requirements for 'favourable condition'	Description	Criterion passed (Yes or No)	Notes (such as justification)
Core groups - applicable to all hedgerow types					
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of the shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is >1.5 m height).	No	
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (such as blackthorn *Prunus spinosa* suckers) are only included in the width estimate when they are >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice).	No	

B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	This is the vertical 'gappiness' of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	Yes	
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length; and No canopy gaps >5 m	This is the horizontal 'gappiness' of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall 'gappiness' but are not subject to the >5 m criterion (as this is the typical size of a gate).	Yes	New hedge will be densely planted to prevent gaps.
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: · Measured from outer edge of hedgerow; and · Is present on one side of the hedgerow (at least).	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1 m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	No	Area of high visitor pressure
C2.	Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	The indicator species used are nettles *Urtica* spp., cleavers *Galium aparine* and docks *Rumex* spp. Their presence, either singly or together, does not exceed the 20% cover threshold.	Yes	No nutrient enrichment will be undertaken.

D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA[3]) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes see the JNCC website[4], as well as the BSBI website[5] where the 'Online Atlas of the British and Irish Flora'[6] contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website[7].	Yes	Invasive non-native species will be removed from the hedgerow as part of on-going maintenance
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities.	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g., excessive hedgerow cutting).	No	Hedgerow may be subject to disturbance due to visitor pressure at the site.
Additional group - applicable to hedgerows with trees only					
E1.	Tree class	There is more than one age-class (or morphology) of tree present (for example: young, mature, veteran and or ancient[8]), and there is on average at least one mature, ancient or veteran tree present per 20 - 50m of hedgerow.	This criterion addresses if there are a range of age-classes or morphologies which allow for replacement of trees and provide opportunities for different species.	NA	

E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.	NA	

The hedgerow condition assessment generates a weighting (score) ranging from 1 - 3, which is used within the metric. The scores for each are set out in the tables below.

Condition categories for hedgerows without trees

Category	Category Requirements	Metric Score
Good	No more than 2 failures in total; **AND** No more than 1 failure in any functional group.	3
Moderate	No more than 4 failures in total; **AND** Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 and C2 = Moderate condition).	2
Poor	Fails a total of more than 4 attributes; **OR** Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 and B2 = Poor condition).	1
	Score achieved:	2