Biodiversity Net Gain Assessment

Boldon House

December 2023

Durham University

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Report Originator	James Streets	Director	August 2023
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1. Introduction

1.1 OS Ecology Ltd were commissioned by Durham University in June 2023 to undertake bat activity survey work of Boldon House, Pity Me, Durham. A Preliminary Ecological Appraisal, including a preliminary roost assessment was previously completed at the site by Tyne Ecology[1]. The site is proposed for refurbishment works including replacement of all windows, roof works and construction of new access.

Site Location

1.2 The site is located on the northern edge of Pity Me at approximate central grid reference of NZ 27290 45988. The site location is illustrated within figure 1 in the appendices.

Site Description

1.3 The site comprises Boldon House with adjacent parking and landscaping.

Objectives of the Study

1.4 The objectives of this report are:

- To assess and map the habitats present within the proposed development area using the UK Habitat Classification[2] criteria.
- To calculate the baseline 'Biodiversity Units' using Natural England's Biodiversity Metric 4.0[3].
- To use the above metric to assess the anticipated change in biodiversity as a result of the proposed development.

Development Proposals

1.5 It is proposed to carry out refurbishment works to include works to the roof and replacement of all windows. In addition a new entrance is to be constructed on the southern elevation, a further new entrance on the northern and new courtyard access.

[1] Preliminary Ecological Appraisal, Boldon House, Wheatlands Way, Pity Me, Tyne Ecology Ltd May 2023.
[2] Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020). The UK Habitat Classification User Manual Version 1.1 at http://www.ukhab.org/
[3] Natural England Joint Publication JP039 The Biodiversity Metric 4.0 User Guide (March 2023)

2. Methodology

Scope of Study

2.1 This study aims to utilise the Biodiversity Metric 4.0[4] to provide a measure of the existing biodiversity value of the proposed development site and of the anticipated impact on biodiversity of the development proposals.

Assessment of Baseline Conditions

Habitat Mapping

2.2 The proposed development site was mapped as different habitat types using the habitat classifications detailed within the UK Habitat Classification User Manual[5].

2.3 Habitat maps were digitised and area calculations for each UK Habitat Classification habitat type present within the site were undertaken using QGIS.

2.4 Area measurements are provided in hectares with linear features measured in metres.

Condition Assessment

2.5 Each area of habitat was assigned a condition score based on the relevant 'habitat condition sheet' as per the Biodiversity Metric 4.0 – Technical Supplement[5].

2.6 Habitat parcels are assigned one of three categories: Good, Moderate or Poor. If condition varies across an area of the same habitat type, the habitat will be split into separate parcels, each assigned a different condition category.

2.7 Certain habitat categories are allocated a fixed condition score and do not need the condition assessed as per the Technical Supplement[6].

2.8 Where appropriate, completed habitat condition sheets for each parcel of habitat are provided within the appendices.

Use of the Calculation Tool

2.9 The Biodiversity Metric 4.0 Calculation Tool is used to calculate biodiversity units for the existing baseline conditions within the proposed development area.

2.10 Habitat type, area (ha) and condition score as calculated above are entered into the metric for each parcel of habitat present within the proposed development site.

[4] Natural England Joint Publication JP039 The Biodiversity Metric 4.0 User Guide (March 2023)
[5] Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020). The UK Habitat Classification User Manual Version 1.1 at http://www.ukhab.org/
[6] Natural England Joint Publication JP039 Biodiversity Metric 4.0 User Guide – Technical Annex 2 (March 2023)

2.11 The metric assigns a 'Distinctiveness' category and score to each habitat parcel.

2.12 A 'Strategic Significance' score is then assigned to each habitat parcel. The assessment of strategic significance is based on local planning policy in the first instance. For example, if the site is located within a Nature Recovery Area then it would be of 'High Strategic Significance'.

2.13 Areas of 'Moderate Strategic Significance' would be classified as areas not formally designated, but which are ecologically desirable. 'Areas of Low Strategic Significance' are those which do not meet the above criteria.

2.14 Based on the above information, the metric then calculates Biodiversity Units for each habitat parcel and a total number of Biodiversity Units for the proposed development area.

Post Development Conditions

2.15 The areas of habitat to be retained within the proposed development are specified within the metric. Data is then entered into the metric with respect to enhanced habitats and new areas of habitat to be created as part of the development, in the same way as for the baseline conditions.

2.16 The same criteria detailed above are input for each habitat parcel, as well as an additional criterion for any off-site creation/enhancement proposed. A spatial risk category is associated with any off-site works. This spatial risk category specifies whether the proposed off-site mitigation is within the same local authority as the proposed development site, within an adjacent local authority or beyond the neighbouring authority.

2.17 The metric tool automatically applies an appropriate difficulty level associated with each type of habitat creation proposed and a temporal category based on the likely time taken to reach the assigned target condition.

2.18 For habitat enhancement the metric identifies the change in distinctiveness and condition of the habitat. Full details are provided within the Biodiversity Metric 4.0 User Guide[7].

Biodiversity Metric Calculation

2.19 Once both the pre-development and post-development habitat calculations have been assessed, the metric provides the results in a range of tables and graphs. These highlight whether biodiversity losses or gains have been achieved based on pre and post development Biodiversity Units. The metric presents a total net unit change and a total net percentage change.

[7] Natural England Joint Publication JP039 The Biodiversity Metric 4.0 User Guide (March 2023)

3. Results

Baseline Habitat Types and Condition Assessment

3.1 The following table details the results of the habitat survey and assigns the relevant UK Habitat Classification to each parcel of habitat, the metric category to which this relates and the condition of the habitat. The survey area covered the land within the applicant's control. Full survey information is provided within the Preliminary Ecological Appraisal report for this site[8]. Figures illustrating the habitat within the site are provided within the appendices with relevant condition assessment forms.

Table 3.1: Baseline Habitat Types

Habitat Description	UK Habs. Category	Metric Category	Condition
Built Development There are large areas of hard standing and building within the site comprising a car park to the east and Boldon House to the west.	u1b	Developed land, sealed surface	N/A
Grassland There are large areas of other neutral grassland within the western area of the site with the following species recorded:	G3c	other neutral grassland	Good
Smaller areas of amenity grassland are located around the building, these are of lesser diversity and condition. Species recorded in include:	G3c	other neutral grassland	Poor
Ornamental Shrub There are areas of ornamental shrub around the site in beds around the building and in areas to the west of the site.	H3	Ornamental shrubs	Poor
Mixed Scrub To the south east and north of the car park there are small strips of mixed scrub	H3h	Mixed Scrub	Poor
Pond There is a small pond to the centre of the site within the courtyard.	R1	Pond	Moderate

[8] Preliminary Ecological Appraisal, Boldon House Wheatlands Way, Pity Me, Durham DH1 5FA, May 2023, Tyne Ecology Ltd

Table 3.1: Baseline Habitat Types			
Habitat Description	**UK Habs. Category**	**Metric Category**	**Condition**
Vegetated gardens Areas within the courtyard of the site have been classified as vegetated garden.	U1	Vegetated Gardens	N/A

3.2 The following sections of this report focus on those habitats within the planning application boundary to calculate the baseline Biodiversity Units.

Baseline Biodiversity Units

3.3 Based on the results of field survey, the following table details the baseline Biodiversity Units associated with the proposed development area.

Table 3.2: Baseline Biodiversity Units					
Habitat Type	**Area (ha)**	**Distinctiveness**	**Condition**	**Strategic Significance**	**Biodiversity Units**
Habitat Element					
Other neutral grassland	0.1175	Medium	Good	Low	1.41
Other neutral grassland	0.0342	Medium	Poor	Low	0.14
Artificial unvegetated, unsealed surface	0.0293	V.Low	N/A - Other	Low	0.00
Developed land; sealed surface	0.9984	V.Low	N/A - Other	Low	0.00
Ponds (non-priority habitat)	0.001	Medium	Moderate	Low	0.01
Introduced shrub	0.0683	Low	Condition Assessment N/A	Low	0.14
Vegetated garden	0.0782	Low	Condition Assessment N/A	Low	0.16
Introduced shrub	0.0789	Low	Condition Assessment N/A	Low	0.16
Urban Trees	0.2239	Medium	Moderate	Low	1.79
				Baseline Habitat Units:	**3.80**

Post Development – Baseline Habitat Retention Category

3.4 The following table details for each of the baseline habitat types present on site the relevant retention category (retained, enhanced or lost) as a result of the proposed development.

3.5 For each category the area of each habitat type that falls into each category is provided. Where habitat is to be lost the number of Biodiversity Units to be lost is provided. In this case, all existing habitats are anticipated to be lost through development of the site.

Table 3.3: Post Development – Baseline Habitat Retention Category				
Habitat Type	**Area Retained (Ha)**	**Area Enhanced (Ha)**	**Area Lost (Ha)**	**Biodiversity Units Lost**
Habitat Element				
Other neutral grassland	0.1091	0	0.01	0.10
Other neutral grassland	0.0066		0.03	0.11
Artificial unvegetated, unsealed surface	0	0	0.03	0.00
Developed land; sealed surface	0	0	1.00	0.00
Ponds (non-priority habitat)	0.001	0	0	0
Introduced shrub	0.06	0	0.01	0.02
Vegetated garden	0	0	0.08	0.16
Introduced shrub	0	0.049	0.03	0.06
Urban Trees	0.1262	0	0.1	0.78
Habitat Units Lost:				**1.23**

Post Development – Habitat Enhancement

3.6 Given the nature of the existing site and the current development proposals no habitat enhancement is proposed.

Post Development – Habitat Creation

3.7 The following table details the post development habitats proposed within the site and the metric category considered to match the proposed habitat types most closely.

Table 3.4: Post Development Habitats	
Habitat Type	**Area/ Length/No.**
Other neutral grassland	0.0393
Urban tree (32no.)	1.1726
Developed land; sealed surface	1.0947
Vegetated garden	0.0327
Modified grassland	0.0033

3.8 For the purposes of the metric, it is assumed that a detailed management plan will be produced and adhered to, to ensure delivery of the target habitats and conditions.

3.9 A figure illustrating the location of habitat creation proposals is provided within the appendices. The following table details each element of the habitat creation proposed, including the target condition, other criteria assigned by the metric and the associated biodiversity units delivered by each element.

Table 3.5: Post Development Habitats - Biodiversity Units Delivered (Habitat Creation)							
Habitat Type	**Area (ha)**	**Distinctiveness**	**Condition**	**Strategic Significance**	**Time to target condition/years**	**Difficulty of Creation**	**Biodiversity Units Delivered**
Habitat Creation							
Other neutral grassland	0.0393	Medium	Moderate	Low	5	Low	0.26
Urban tree	1.1726	Medium	Moderate	Low	27	Low	3.58
Developed land; sealed surface	1.0962	V.Low	N/A - Other	Low	0	Low	0.00
Vegetated garden	0.0327	Low	Condition Assessment N/A	Low	1	Low	0.06
Modified grassland	0.0033	Low	Moderate	Low	4	Low	0.01
						Habitat Units:	**3.92**

4. Net Gain Assessment

4.1 The following extract details the anticipated change in Biodiversity Units as a result of the proposed development, including the associated habitat creation proposals. The full results broken down per habitat type, are detailed within the Biodiversity Metric 4.0 – Calculation Tool for this site which can be provided on request.

FINAL RESULTS		
Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	2.70
	Hedgerow units	0.00
	Watercourse units	0.00
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	71.03%
	Hedgerow units	0.00%
	Watercourse units	0.00%
Trading rules satisfied?	Yes ✓	

4.2 The current proposals will result in a **net gain in biodiversity units** with a **net gain of 2.70 units**.

Appendix 1: Condition Assessment

Individual Trees

Condition Assessment Criteria		Criterion passed (Yes or No)
A	The tree is a native species (or at least 70% within the block are native species).	No
B	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	No
C	The tree is mature (or more than 50% within the block are mature).	No
D	There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Yes
E	Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	No
F	More than 20% of the tree canopy area is oversailing vegetation beneath.	Yes
	Number of criteria passed	

Condition Assessment Result (out of 6 criteria)	Condition Assessment Score	Score Achieved ×/✓
Passes 5 or 6 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	Yes
Note that 'Fairly Good and Fairly Poor' condition categories are not available for this broad habitat type.		

Grassland

Limitations (if applicable)		Habitat parcel reference										
Condition Assessment Criteria		Grid reference										
		1	2									
		Criterion passed (Yes or No)										Notes (such as justification)
A	The grassland is a good representation of the habitat type it has been identified as, based on its UKHab description - the appearance and composition of the vegetation closely matches the characteristics of the specific grassland habitat type. Indicator species listed by UKHab for the specific grassland habitat type are consistently present. **Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.**	Yes	No									
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	Yes	No									
C	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens[1].	No	No									
D	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.	Yes	Yes									
E	Combined cover of species indicative of sub-optimal condition[2] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species[3] (as listed on Schedule 9 of WCA[4]) are present, this criterion is automatically failed.	Yes	Yes									
Additional Criterion - must be assessed for all non-acid grassland types												
F	There are 10 or more vascular plant species per m^2 present, including forbs that are characteristic of the habitat type (species referenced in Footnote 2 and 4 cannot contribute towards this count). **Note - this criterion is essential for achieving Good condition for non-acid grassland types only.**	Yes	No									
Essential criterion for Good condition achieved (for non-acid grassland) (Yes or No)												
Number of criteria passed												

Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓										
Acid Grassland types (Result out of 5 criteria)												
Passes 5 criteria	Good (3)											
Passes 3 or 4 criteria	Moderate (2)											
Passes 2 or fewer criteria	Poor (1)											
Non-acid grassland types (Result out of 6 criteria)												
Passes 5 or 6 criteria, including essential criterion A and additional criterion F.	Good (3)	Yes										
Passes 3 - 5 criteria, including essential criterion A.	Moderate (2)											
Passes 2 or fewer criteria; OR Passes 3 or 4 criteria excluding criterion A and F.	Poor (1)		Yes									

Pond

Core Criteria - applicable to all ponds (woodland[1] and non-woodland):			
A	The pond is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. Turbidity is acceptable if the pond is grazed by livestock.	Yes	
B	There is semi-natural habitat (moderate distinctiveness or above) completely surrounding the pond, for at least 10 m from the pond edge for its entire perimeter.	No	
C	Less than 10% of the water surface is covered with duckweed *Lemna* spp. or filamentous algae.	Yes	
D	The pond is not artificially connected to other waterbodies, e.g. agricultural ditches or artificial pipework.	Yes	
E	Pond water levels can fluctuate naturally throughout the year. No obvious artificial dams[2], pumps or pipework.	No	
F	There is an absence of listed non-native plant and animal species[3].	Yes	
G	The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities.	Yes	
Additional Criteria - must be assessed for all non-woodland ponds:			
H	Emergent, submerged or floating plants (excluding duckweed)[4] cover at least 50% of the pond area which is less than 3 m deep.	Yes	
I	The pond surface is no more than 50% shaded by adjacent trees and scrub.	Yes	
	Number of criteria passed		

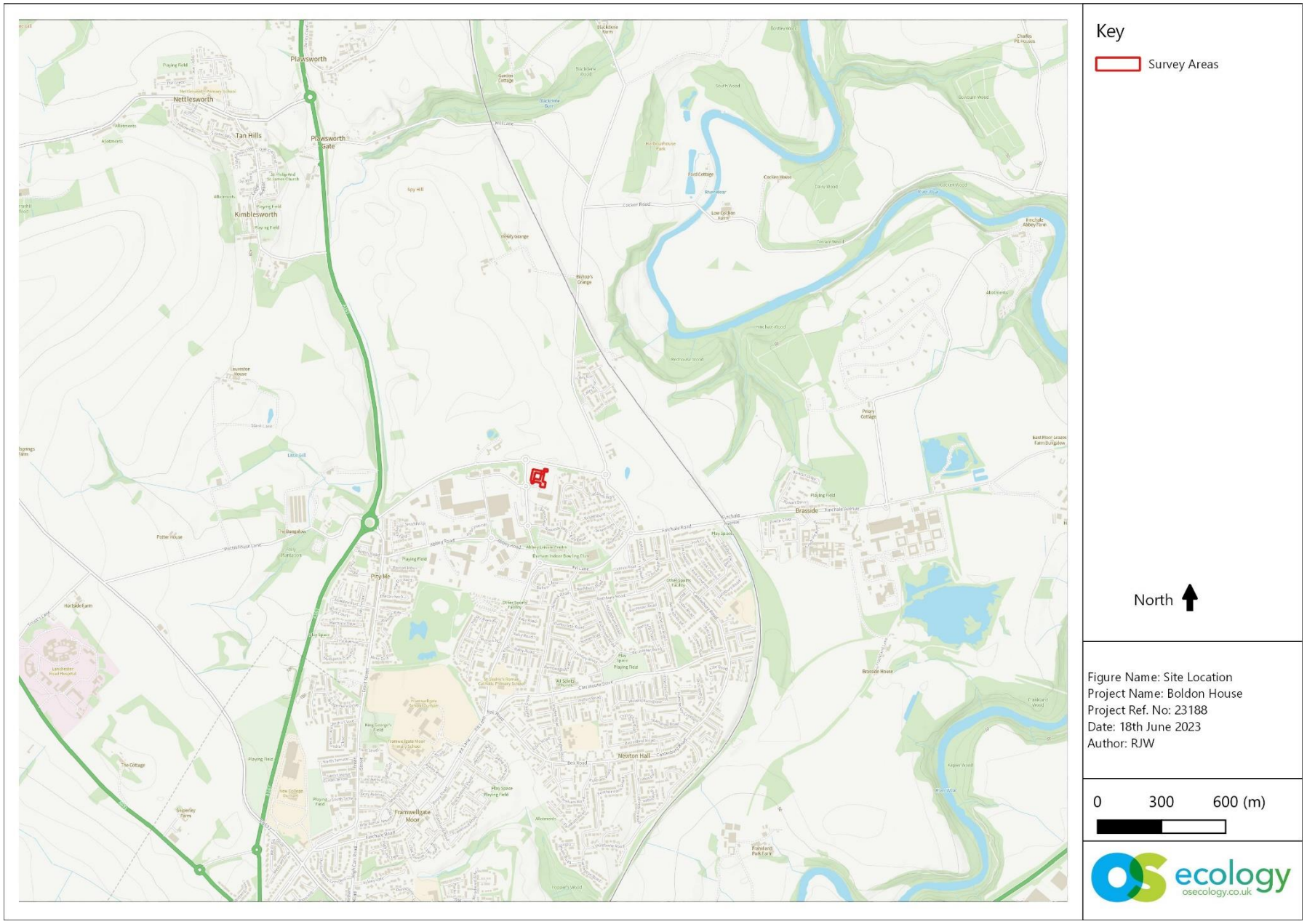
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓
Results for woodland ponds which require assessment of 7 core criteria		
Passes 7 criteria	Good (3)	
Passes 5 or 6 criteria	Moderate (2)	
Passes 4 or fewer criteria	Poor (1)	
Results for non-woodland ponds which require assessment of 9 criteria		
Passes 9 criteria	Good (3)	
Passes 6 to 8 criteria	Moderate (2)	Yes
Passes 5 or fewer criteria	Poor (1)	

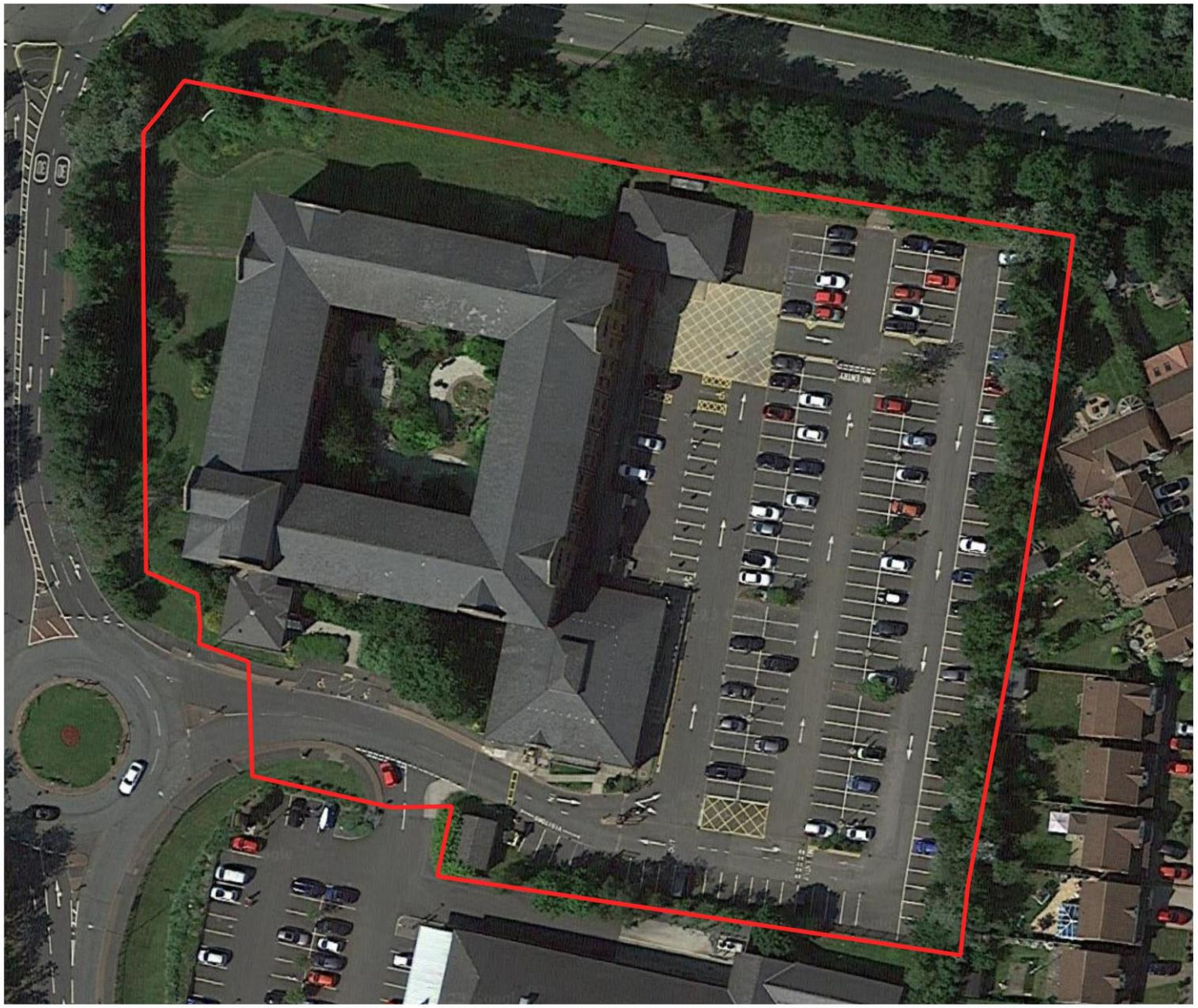
Scrub

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	The scrub is a good representation of the habitat type it has been identified as, based on its UKHab description (where in its natural range). The appearance and composition of the vegetation closely matches the characteristics of the specific scrub type. At least 80% of scrub is native, and there are at least three native woody species[1], with no single species comprising more than 75% of the cover (except hazel *Corylus avellana* , common juniper *Juniperus communis* , sea buckthorn *Hippophae rhamnoides* or box *Buxus sempervirens* , which can be up to 100% cover).	No	
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran[2]) shrubs are all present.	No	
C	There is an absence of invasive non-native plant species[3] (as listed on Schedule 9 of WCA[4]) and species indicative of sub-optimal condition[5] make up less than 5% of ground cover.	No	
D	The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.	No	
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.	No	
		Number of criteria passed	

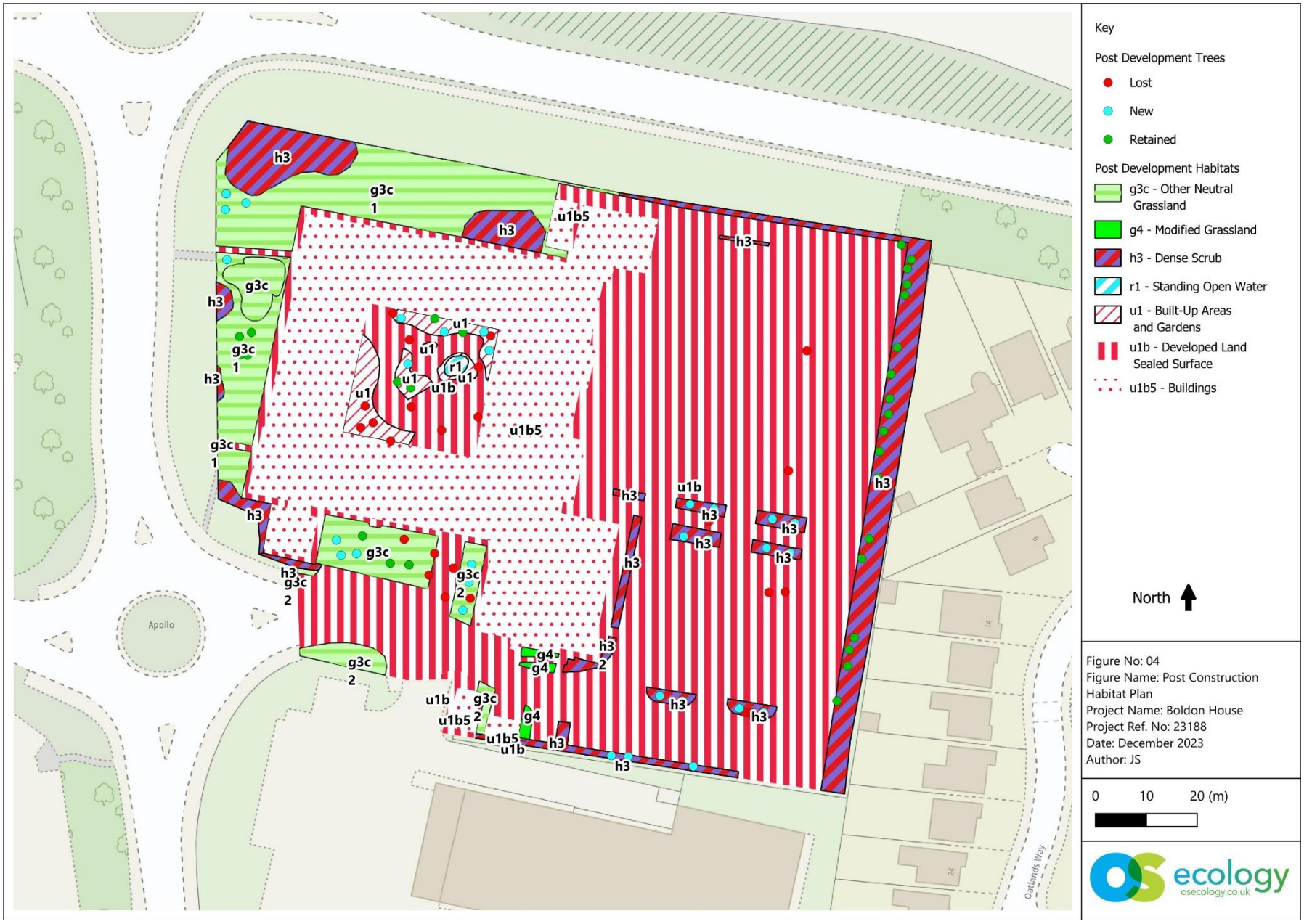
Condition Assessment Result (out of 5 criteria)	Condition Assessment Score	Score Achieved ×/✓
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	Yes

Appendix 2: Figures


Key
Survey Areas
North
Figure Name: Site Location
Project Name: Boldon House
Project Ref. No: 23188
Date: 18th June 2023
Author: RJW
0
300
600 (m)
Plawsworth
Nettlesworth
Tan Hills
Plawsworth Gate
Kimblesworth
Brasside
Newton Hall
Framwellgate Moor


Key
Site Boundary
North
Figure Name: Site Aerial
Project Name: Boldon House
Project Ref. No: 23188
Date: 18th August 2023
Author: JS
0 5 10 (m)


Key
Existing Trees
g3c - Other Neutral Grassland
h3 - Dense Scrub
r1 - Standing Open Water
u1 - Built-Up Areas and Gardens
u1b - Developed Land Sealed Surface
u1b5 - Buildings
u1c - Artificial Unvegetated Unsealed Surface
North
Figure No: 03
Figure Name: Pre Development Habitat plan
Project Name: Boldon House
Project Ref. No: 23188
Date: December 2023
Author: JS
0 10 20 (m)
ecology
osecology.co.uk
h3
g3c 1
g3c 2
u1b5
u1
u1c
r1
u1b
Apollo
Oatlands Way


h3
g3c
1
u1b5
u1
r1
u1b
g4
2
u1b5
Apollo
Oatlands Way
Key
Post Development Trees
Lost
New
Retained
Post Development Habitats
g3c - Other Neutral Grassland
g4 - Modified Grassland
h3 - Dense Scrub
r1 - Standing Open Water
u1 - Built-Up Areas and Gardens
u1b - Developed Land Sealed Surface
u1b5 - Buildings
North
Figure No: 04
Figure Name: Post Construction Habitat Plan
Project Name: Boldon House
Project Ref. No: 23188
Date: December 2023
Author: JS
0
10
20 (m)