Biodiversity Net Gain Assessment

Groundworks at Whitehaven Golf Course

15th March 2024

Report 0324/1

Report commissioned by;

Stuart Galpin
Galpin Landscape Architecture

On behalf of
Western Lakes Ltd

Report prepared by;

South Lakes Ecology
Survey and Habitat Management

Tamsin Douglas MSc MCIEEM
13 Rydal Road
Ulverston LA12 9BU
01229 582018

mail@southlakesecology.co.uk

EXECUTIVE SUMMARY

A Biodiversity Net Gain (BNG) assessment has been carried out for the proposed importing of clean topsoil to various locations on Whitehaven Golf Course. BNG requires a 10% gain in wildlife habitats post construction.

This report describes the existing habitats on site (using UK Habitats classification criteria) and provides an assessment of their condition, as well as any habitat losses as a direct consequence of the proposed development. The habitat value of the site was calculated using DEFRA's Small Sites Metric 4.0.

Enhancement measures are described in the report, and implementation, management, and monitoring plans are included. Planting plans provided as part of the planning permission are included with the landscaping design plan, planting plans for additional measures are included in this report.

A desktop search for statutory protected sites and priority habitats was undertaken. There are no protected sites within or adjacent to the red line boundary. There is deciduous woodland within the red line boundary – which is a priority habitat. None of this will be directly impacted by these proposals.

Amenity grassland (g4) is the predominant habitat present within the red line boundary – making up much of fairways and amenity grassland on the site. Mixed woodland also forms a substantial proportion of the habitat on site, and there are numerous ponds (non-priority habitat).

The imported soil will impact on existing bare ground habitats, amenity grassland and neutral grassland. No existing woodland or ponds will be impacted by these proposals.

The planting plan accompanying the planning permission incorporates extensive new planting of ornamental and native species (shrubs and scrub), and mixed native woodland. Additional measures are required to achieve the required gains in biodiversity units, and this will be achieved through additional planting of native scrub, individual native trees, and establishment of species-rich neutral grassland.

Overall the compensatory planting and enhancements to existing habitats will result in a gain of 32.81 habitat units, and 3.77 hedgerow units. This equates to a biodiversity net gain of 10.02% for habitats and 84.64% for hedgerow units.

The BNG calculation summary states that trading rules and BNG targets are met, and exceeded, by these proposals.

An implementation/ planting plan is included which describes methods of creating the new grasslands. The species lists for the additional proposals (beyond the approved planting plans associated with the planning permission) have been provided separately as part of the planting plan.

The enhanced habitats need to be managed sympathetically for a minimum of 30 years to offset the biodiversity loss. A management plan has been included for the grassland, scrub and trees.

Contents

1. INTRODUCTION……..4
1.1 The aim of the report.……4
1.2 Biodiversity net gain…….4
1.3 Proposed works……..5

2. SURVEY METHOD……..5
2.1 Desktop study……..5
2.2 Survey constraints……5

3. BASELINE ECOLOGICAL CONDITIONS…….6
3.1 Desktop survey results……6
3.2 Habitat survey results……...6

4. BIODIVERSITY NET GAIN ASSESSMENT…….7
4.1 Rationale…….....7
4.2 Additional considerations..……7
4.3 Metric calculations and conclusions..……....8

5. IMPLEMENTATION and MONITORING……..10
5.1 Planting plan……..…10
5.2 Management plan……12
5.3 Monitoring…….....12

6. REFERENCES……..……...13

APPENDICES

Condition assessments – habitats on site ……14

Figures 2 & 3 Habitat map – pre-works ……22

Figures 4 to 7 Habitat map – proposed earthworks and habitat enhancment areas ……..……24

Figures 8 & 9. Habitat map – post works (phase 1 to 5) ..……28

1. INTRODUCTION

1.1 The aim of the report

Western Lakes Ltd have received planning consent for phased groundworks at Whitehaven Golf Course (ref 4/22/2051/0F1). This report was commissioned to satisfy condition 6 of the planning approval - 'Prior to the commencement of each phase of development a Biodiversity Net Gain Strategy (BNGS) and a Project Implementation Plan (PIP) shall be submitted to and approved in writing by the local planning authority unless a BNGS and a PIP has previously been submitted to and approved in writing by the local planning authority for the whole site.'

The aim of the report is to make an assessment of the baseline ecological conditions present on Whitehaven Golf Course and to compare these conditions with the likely ecological status of the site after the development, both with and without enhancement measures. Ecological enhancement measures will be designed to ensure that the completed project results in a measurable gain to local habitats. Implementation, management and monitoring plans will be included for the lifetime of the project (30 years). Galpin Landscapes have provided the planting plan.

This report is based on the Preliminary Ecological Appraisal carried out by Hesketh Ecology (report MJN20PEA028.001), a walkover survey to assess the condition of habitats on site, and landscape plans provided by the developer and landscape architect.

This report follows technical guidelines provided by CIEEM (Chartered Institute of Ecology and Environmental Management) and the habitat was mapped following UK Habitat Classification guidance (see Appendices for full references).

1.2 Biodiversity Net Gain

Following the Environment Act 2021, a demonstrable net gain in biodiversity is required for all new developments (this is now mandatory for most projects). As part of the assessment the current biodiversity value of the landholding is calculated, and compared with the likely biodiversity value of the land after the development after taking account of enhancement measures prescribed by the ecologist. The aim is for a minimum of a 10% gain in biodiversity value of the land after completion of the development.

The standard means of calculating Biodiversity Net Gain (BNG) is using the DEFRA Matrix 4.0. The full details and calculations are included in the appendices.

1.3 Proposed works

The proposed works involve groundworks across the site to reduce the issue of water drainage across the course. Clean topsoil will be brought in and spread across various areas in several phases over a period of 15 years. The topsoil will be either sown with an amenity grass mix and form part of the golf course, or will be planted with scrub or trees to provide screening and complementary planting for the site. The ownership of the whole site is 77.3 hectares, the surveyed area of the golf course on which the BNG assessment is based is 74.8ha (which is the unfenced, operational land within the golf course, excluding roadside boundaries and agricultural land in the south-east corner). The proposed earthworks will be a total of 16.83ha over the whole works period.

The calculations in this report relate to phases 1-5 (first 5 years of works). The remaining phases will be assessed as the project progresses.

2. SURVEY METHOD

2.1 Desktop study and update site visit

The Preliminary Ecological Appraisal was studied to assess the likely habitat types in and around the site, followed up by a site walkover to assess the condition of habitats on 12th March 2024.

The DEFRA Magic website (www.magic.gov.uk) was used to ascertain whether any priority habitats has been identified on, or adjacent to, the site. Natural England and JNCC websites were used to obtain boundaries of any statutorily designated sites in the area.

2.2 Survey constraints

There were no constraints on access.

The original habitat survey was carried out in 2021 and phase one habitat codes were used, so these needed to be updated to the UK Habitats classification codes following the 2024 walkover survey.

Both the original habitat survey in 2021, and the habitat condition assessment were carried out in very early spring. This means that the botanical assessment of the site is somewhat limited - especially of grassland habitat. Given the intense management of the grassland habitat of the golf course, it is not considered that this would affect conclusions made about the grassland quality and condition (but some species will have been missed from the surveys).

The time of year also meant that aquatic plant growth in the ponds was still limited, affecting some of the assessment criteria of the freshwater habitats – most notably the amount of duckweed cover (which would be at its peak in summer). This would not affect the condition status of most ponds on the site – which were poor, but two ponds were marginal between moderate and poor so this could have resulted in a higher condition assessment than would be merited by a summer assessment.

3. BASELINE ECOLOGICAL CONDITIONS

3.1 Desktop survey results

3.1.1 Protected and statutory sites search

There are no statutory protected sites on the site of the development or immediately adjacent to the site.

There is a locally protected site within the golf course boundary – Hope Mission Pond County Wildlife Site. The PEA report states '*Hope Mission Pond County Wildlife Site (Site Ref. CO-NX91-09) measures 1.3ha and was apparently last surveyed in 1999, at a time when the pond existed on the site of a 'proposed golf course'. The site was selected under County Wildlife Site criteria H6.1.2: Waterbodies with characteristic emergent vegetation, but supports a variety of habitats including 'grassy banks, wet woodland, woodland and scrub, emergent vegetation, swamp and open water'. The site description presented on the site citation document, despite being >20 years old, is still broadly accurate and lists a range of plant species which are still found on the site*.'

3.1.2 Notable habitats search

The Magic website indicated that there is deciduous woodland priority habitat within the site, all of which have been mapped and described in the PEA report. All other local priority habitats are at least 100m from the site boundaries.

None of this priority habitat is to be directly impacted by the works.

3.2 Habitat survey results

3.2.1 Habitats present on site

The habitats were mapped, following UKHab methodology (see PEA Report for methods, full results and habitat map/ photographs).

The site comprises primarily of g4 modified grassland habitat, with a significant amount of w1h deciduous woodland. Rougher areas of grassland equate with g3c neutral grassland habitat, and there are numerous ponds throughout the site. There are some areas of wet woodland habitat (w1d) and planted coniferous woodland (w2c), and a long stretch of hedgerow on the eastern side.

Also present on site is unvegetated bare ground and developed land with a sealed surface (the club house, car park and driving range).

Most of the amenity grassland on site incorporates the fairways and greens of the golf course, with neutral grassland on the banks and areas of rough. Many of these areas of rough have been planted with conifers, but they are still very young (less than 1m tall) – so the primary habitat is grassland.

Many habitats are not being directly impacted by the proposed works – including the ponds and woodland (mixed, plantation and wet woodland). There will be some losses of moderate and poor quality neutral grassland, and losses of moderate quality amenity grassland as the soil is deposited on the site.

3.2.2 Habitat condition assessments

Habitat condition assessments were carried out following guidance in DEFRA Metric 4.0 condition assessment tool. No condition assessments are required for urban habitats (u1b developed land and u1c unvegetated developed land).

The summary of the condition assessment for each unit of habitat is included in the appendices.

4. Biodiversity Net Gain assessment

4.1 Rationale

The principles of Biodiversity Net Gain (BNG) are enshrined in local planning policy, and became a legal requirement for all developments from February 2024. The local planning authority (Cumberland Council) has requested a BNG assessment for this development, with a target increase of 10%. Habitats enhanced or retained as part of the BNG calculation need to be managed appropriately for a minimum of 30 years to satisfy the requirements of the metric.

Using the habitat condition assessments above, the impact of the proposals on the conservation value of the habitats has been calculated using DEFRA's Metric 4.0. Detailed results are in the appendices and the calculation tool Excel file attached separately, but summary results are shown in 4.3 below.

4.2 Proposed measures

A significant amount of planting was proposed as part of the planning application. This includes mixed woodland (predominantly broadleaf), native scrub, and amenity shrubs (non-native). Much of this planting is on top of the new soil mounds, with some beyond these areas. All other areas of bare soil were to be seeded with amenity grassland mix.

The above provisions are not adequate to compensate for the habitat losses to the works, especially of the neutral grassland areas, so additional measures have been proposed. These are summarised below (numbers correspond to Figures 4 to 7 in the Appendices):

1. Enhance the ecological condition of pond C (centre of the site near driving range), by allowing the development of semi-natural vegetation around the entire periphery of the pond (at least 10m wide). This will be achieved by sowing species rich grassland around the periphery.

2. Extensive woodland, native scrub and non-native shrub planting has been proposed as part of the planning application. Most of this is on bare soil created through the earthworks. All of these areas have been included into the BNG calculation other than those amended in number 3 and 5 below.

3. A large area of amenity shrub planting has been proposed alongside the entrance road (eastern side). It is proposed that the eastern half of this planting is of native scrub, with the roadside half still being of non-native shrubs to present an attractive entrance to the golf course all year round. (Native scrub scores more highly in terms of wildlife benefits than non-native shrubs).

4. Several areas of bare soil around the site which were to be sown with amenity grass mix, will be sown with a species rich neutral grassland mix and allowed to grow through the summer – producing an attractive wildflower meadow. These areas have been marked on the map showing proposed enhancements and are shown as neutral grassland on the post-works map.

5. Two areas of proposed amenity shrub planting have been removed from the original plans as they were to be planted on existing grassland (area to the south of the entrance and north of the bare ground by the clubhouse).

6. Three new areas of native scrub are planned. One will be planted to the south of Hope Mission Pond (Pond A) on existing modified grassland. Another will be to the

north of the driving range (alongside the public footpath) and will replace some young non-native conifers. The third area is adjacent to existing woodland by the third tee in the south of the golf course.

7. The neutral grassland to the west of pond B will be enhanced by plug planting wetland plants- resulting in a moderate condition grassland (currently poor condition).

8. Additional areas of species rich grassland will be sown near to the clubhouse (alongside the access road) on existing modified grassland.

9. A total of 57 medium and 33 large sized native broadleaf trees will be planted around the site. These will be along existing hedgerows on the eastern boundary, as individuals and as small copses throughout the site in areas that will not be impacted by future phases of the earthworks.

4.3 Metric calculations and conclusions

The total habitat value of the site before works is 327.4 habitat units, and 4.45 hedgerow units. The proposed development will result in the loss of 37.42 units of habitat (all of which is grassland – both neutral and amenity). There will be no loss of hedgerow units.

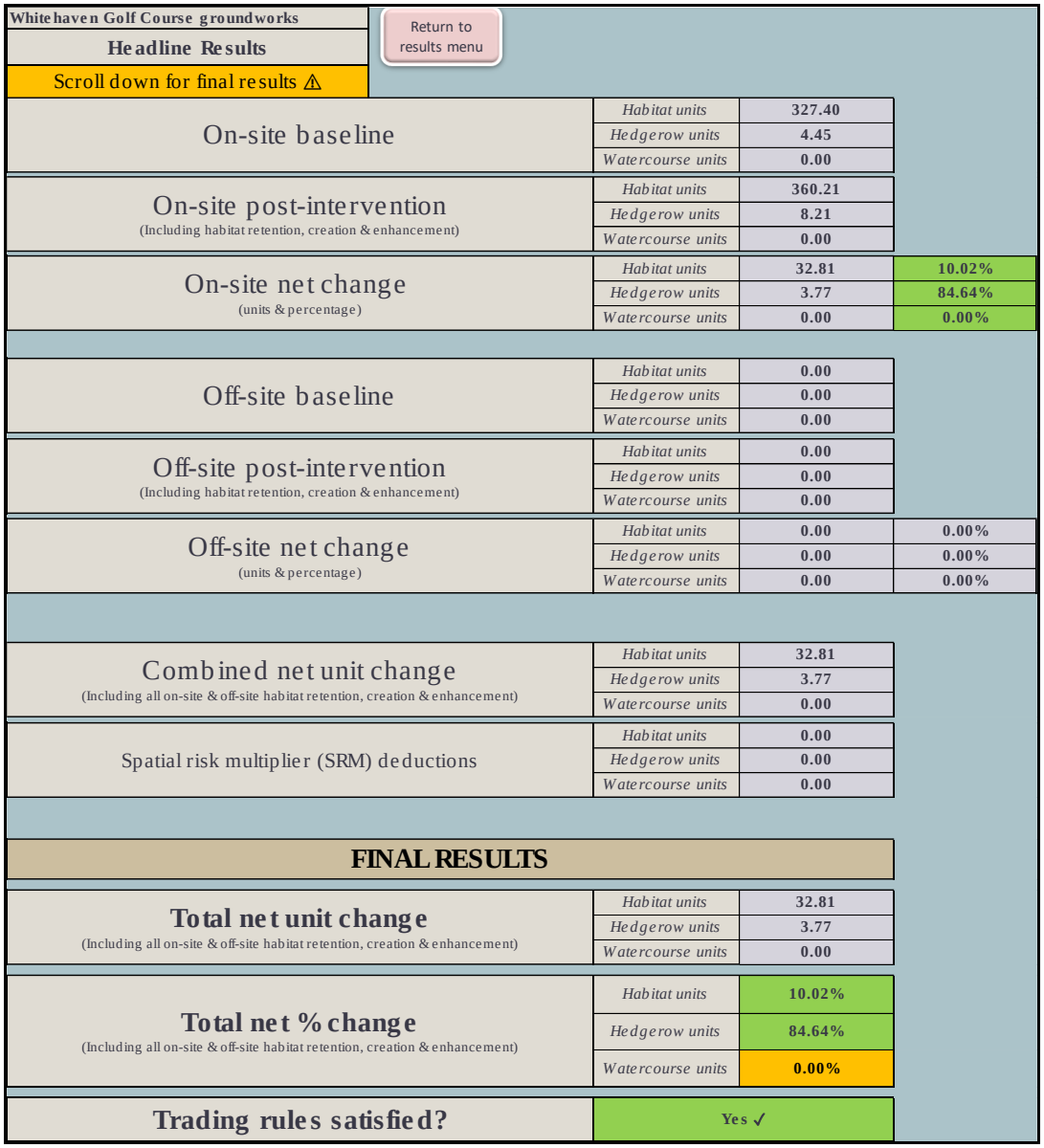
The proposed enhancements to the site will result in a net gain of 32.81 habitat units from new planting and from on-site enhancements to existing habitats. There will also be a net gain of 3.77 habitat units from new hedgerow planting.

These changes equate to a 10.02% net gain in biodiversity units for habitats, and 84.64% net gain in units for hedgerows.

A copy of the headline results page of the BNG calculation is shown below.

The BNG summary shows that trading rules and BNG targets have been met, and exceeded, by these proposals.

Figure 1. Headline results, showing required gain is achievable.



Whitehaven Golf Course groundworks			
Headline Results	Return to results menu		
Scroll down for final results ⚠			
On-site baseline	*Habitat units*	327.40	
	Hedgerow units	4.45	
	Watercourse units	0.00	
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	360.21	
	Hedgerow units	8.21	
	Watercourse units	0.00	
On-site net change (units & percentage)	*Habitat units*	32.81	10.02%
	Hedgerow units	3.77	84.64%
	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*	32.81	
	Hedgerow units	3.77	
	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*	32.81	
	Hedgerow units	3.77	
	Watercourse units	0.00	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	10.02%	
	Hedgerow units	84.64%	
	Watercourse units	0.00%	
Trading rules satisfied?	Yes ✓		

5. Implementation and monitoring

5.1 Planting plan

Species mixes and planting methods for all the amenity shrub, woodland and native scrub planting areas have already been determined, and are included with the landscaping design plan.

Species mixes for the new native scrub areas, plug planting by pond B, species rich neutral grassland and individual tree planting are detailed below, as are any specific management requirements for these habitats.

5.1.1 Species-rich neutral grassland

The most effective way to create the wildflower grassland is to start from scratch by seeding an area of bare ground. Seeds should be sown in autumn or early spring (Oct-November or March) to get the best establishment. Species rich grasslands establish best on low nutrient soils – so imported soil for wildflower areas should be inert and of low nitrogen/ phosphorous/ potassium levels to achieve the best results with the least additional management interventions.

The following seed mix is suggested for the site – and includes a mix of native grasses and herbs; 'Northumberland meadow mix' from https://britishwildflowermeadowseeds.co.uk or 'General purpose meadow mix' from https://meadowmania.co.uk/products/wildflower-meadow-for-mixed-soil-types . Other companies do similar mixes, but check that they are UK provenance, and where possible pesticide free, to ensure maximum gains for wildlife. As they are for seeding bare soil, the mixes should comprise about 80% native grasses and 20% herbs. Most require an application rate of 4-5g per m².

Establishing the meadow-

1. Prepare the ground. Remove any perennial weeds (such as docks) and lightly rotovate the top surface layer of the ground to create a seed bed.

2. Lightly roll or tread over the ground to firm up the seed bed.

3. Seed can be sown by hand or using a small lawn fertiliser applicator. The seed needs to be sown on the surface, not drilled. An inert carrier, such as sand, can be used to help indicate which areas have been sown to avoid excessive sowing in one area/ missing out others.

4. Lightly roll, or tread over, the sown area to ensure seeds are in contact with the soil.

5. The area may need protection from birds to prevent them consuming the sown seeds. Light horticultural fleece is best as there is no risk of entanglement with the birds. The fleece should be checked regularly and removed as soon as the seeds are germinating well.

6. During the first growing season perennial weeds should be removed before they seed, to prevent them dominating.

7. Each October the grass should be cut, leaving clippings for a week to allow the seeds to fall, before the cuttings are raked up and composted. This prevents the overdominance of more aggressive grasses and species such as docks, and also avoids any scrub establishing in the grassland areas.

Plug planting around Pond B

A selection of wetland herbs should be planted around pond B in existing rush dominated neutral grassland in the area indicated on the figures below (west of the pond).
Suitable species to be plug planted around pond B include: Ragged robin *Lychnis flos-coculi,* Common valerian *Valeriana officinalis,* Greater birds foot trefoil *Lotus pedunculatus,* Marsh bedstraw *Galium palustre,* Marsh marigold *Caltha palustris*, Marsh cinquefoil *Potentilla palustris,* Meadowsweet *Filipendula ulmaria,* Purple loosestrife *Lythrum salicaria,* Water avens *Geum rivale,* Yellow flag iris *Iris pseudocorus* and Water forget me not *Myositis scorpioides.*

I would normally suggest a planting density of 5 per m2 for a small pond – but as the total area of neutral grassland to be enhanced is 2350m2, a density of 4 per m2 in the area closest to the pond boundary would be best (within 7-8m of the water edge), with a view to the flowers establishing and spreading into surrounding rushy grassland. This pond edge is an area of about 800m2 – so will require a total of roughly 2800 plug plants. A suitable source for these plants would be: https://www.habitataid.co.uk/products/wildflower-plug-plants-wet

5.1.2 Species rich native scrub

Planted should be carried out between November and March, but not in frozen or waterlogged ground. Planting and management will be as for the proposed native scrub planting in the landscape architect's plan.
Suggested species for this area include:

Guelder rose	*Vibernum opulus*
Bird cherry	*Prunus padus*
Elder	*Sambucus nigra*
Hawthorn	*Crataegus monogyna*
Dogwood	*Cornus sanguinea*
Hazel	*Corylus avellana*
Bay willow	*Salix pentandra*
Goat willow	*Salix caprea*
Grey willow	*Salix cinerea*
Holly	*Ilex aquifolium*

5.1.3 Additional tree planting

Some additional specimen tree planting has been proposed.

Bare rooted trees should be planted over the winter months (November to March), with a minimum gap of 5m between trees to allow them to develop full crowns. Pot grown trees can be planted any time of year, but it is not recommended to plant them during especially dry or hot weather.

Suggested species for the site include:

Medium trees	Rowan	*Sorbus aucuparia*
	Alder	*Alnus glutinosa*
	Wild cherry	*Prunus avium*
	Downy birch	*Betula pubescens*
	Silver birch	*Betula pendula*
Large trees	Sessile oak	*Quercus petraea*
	English oak	*Quercus robur*
	Scots pine	*Pinus sylvestris*
	Small leaved lime	*Tilia cordata*

5.2 Management plan

5.2.1 Grassland

Habitats retained or enhanced as part of the BNG calculations need to be managed appropriately for a minimum of 30 years to count as an offset for the biodiversity losses resulting from the development.

Management of the flower rich grassland habitat should ensure that the habitat retains a good diversity of species and a good structure to maximise its value to wildlife. Once established, the main risk is of the grassland becoming dominated by coarser, tall grasses and scrub – which will out-compete finer grasses and flowers.

1. The flower rich grassland should be cut early each spring (March- if needed) and mid autumn (Sept-October) to maintain the flowery mix and prevent over-dominance of grasses or scrub (such as bramble).

2. Cutting can be done by brushcutter, scythe or mower. Cut the vegetation to a height of about 5cm.

3. Leave the cut grass for two weeks after the autumn cut to allow the seeds to fall.

4. After both cuts the arisings should be raked up and composted elsewhere on site.

5.2.2 Scrub

The new scrub should be permitted to grow tall and thick, to maximise its biodiversity value. Trimming should be carried out only when necessary, but not between March and August as this is the bird nesting season.

All tree tubes should be removed and composted/ recycled as appropriate once the scrub is suitably established (probably after 2-3 years).

5.2.3 Additional trees

The trees should be permitted to grow tall and develop full crowns, and only be pruned when necessary. As for the scrub, any tree tubes should be removed once they are established.

5.3 Monitoring

An initial check of the grasslands should be carried out at the end of the second full season of growing (i.e. if sown autumn 2025, grassland should be checked late summer 2027). This is to assess the success of the seeding and establish if any additional cutting, seeding or planting is needed.

The success of the tree and scrub planting should be assessed at the end of the first full growing season (ie if planted winter 2025, they should be checked late summer 2026). Any failed saplings should be replaced. If a particular species fails to establish well, then an alternative native species should be used in its place.

6. REFERENCES

Butcher B., Carey P., Edmonds R., Norton L. and Treweek J. (2023) The UK Habitat Classification User Manual version 2.01 www.ukhab.org

Cumbria Biodiversity Data Centre https://www.cbdc.org.uk/data-services/cumbria-biodiversity-evidence-base/cbeb-interactive-map/

DEFRA (2007) *Hedgerow Survey Handbook*

DEFRA Metric 4.0 Details and calculation tools for BNG and condition assessment https://publications.naturalengland.org.uk/publication/6049804846366720

Halliday G. (1997) *A Flora of Cumbria* University of Lancaster

Institute of Ecology and Environmental Management, Professional Guidance Series (CIEEM www.cieem.net) [Members only]

NCC (1990) *Handbook for Phase 1 Habitat Survey* JNCC Peterborough

Preston C.D., Pearman D.A. & Dines T.D. (2002) *New Atlas of the British and Irish Flora* Oxford University Press

Stace C.(2010) *New Flora of the British Isles* 3rd edition Cambridge University Press

www.magic.gov.uk (Information on priority habitats, species and protected sites)

www.jncc.defra.gov.uk (Information on legal framework, BAP species and habitats)

Appendices

Summary condition assessments – amenity grassland (g4)

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)			
UK Habitat Classification (UKHab) Habitat Type(s)			
Grassland - Modified grassland			
Site name and location	Whitehaven golf course	**On-site or off-site**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	
Habitat Description			
Close mown grassland across the managed area of the golf course, including greens and tee areas.			
ukhab – UK Habitat Classification			

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
A	There are 6-8 vascular plant species per m^2 present, including at least 2 forbs (this may include those listed in Footnote 1). **Note - this criterion is essential for achieving Moderate or Good condition.** Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m^2 (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.	Y	In places higher diversity, but mostly grasses. Buttercup, daisy and clover all frequent. Some areas with no forbs (greens & tee areas).
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 vertebrates and invertebrates to live and breed.	N	All close mown
C	Some scattered scrub (including bramble *Rubus fruticosus* agg.) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Y	
D	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	Y	
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens)[2].	N	No bare ground, except very smal localised areas
F	Cover of bracken *Pteridium aquilinum* is less than 20%.	Y	
G	There is an absence of invasive non-native plant species[3] (as listed on Schedule 9 of WCA[4]).	Y	
	Essential criterion achieved (Yes or No)		Y
	Number of criteria passed		5

Condition Assessment Result (out of 7 criteria)	Condition Assessment Score	Score Achieved ×/□
Passes 6 or 7 criteria including passing essential criterion A	Good (3)	
Passes 4 or 5 criteria including passing essential criterion A	Moderate (2)	Moderate
Passes 3 or fewer criteria; OR Passes 4 - 6 criteria (excluding criterion A)	Poor (1)	

Summary condition assessments – neutral grassland (g3c)

Habitat Description													
ukhab – UK Habitat Classification													
Site name and location	Whitehaven Golf course.	**On-site or off-site**											
		Survey reference (if relating to a wider survey)											
Limitations (if applicable)	Surveyed mid March, so species count is not relaible.	**Habitat parcel reference**											
		NW boundar	SW boundary	Marshy grasslan	Other areas								
Condition Assessment Criteria		**Grid reference**											
		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.**	Y. Low herb cover but passes other 3 criteria	Y	Y. Low herb cover but passes other 3 criteria	N								
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.	Y	Y	Y	Y								
C	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens[1].	Y	Y	Y	Y								
D	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.	N	N	Y	N								Planted scrub in NW area. Native scrub in
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.	Y	Y	Y	Y								Docks frequent throughout but less than 5%
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.**	N	N	N	N								Diversity better in boundary areas but still low. Within golf course most g3c is g4 that is now unmanaged
Essential criterion for Good condition achieved (for non-acid grassland) (Yes or No)		Y	Y	Y	N								
Number of criteria passed		4	4	5	3								
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)												
Passes 3 - 5 criteria, including essential criterion A.	Moderate (2)	Mod	Mod	Mod									
Passes 2 or fewer criteria; OR Passes 3 or 4 criteria excluding criterion A and F.	Poor (1)				Poor								

Summary condition assessments – hedgerow

Habitat Description			
Boundary hedgerow, NE corner			
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	Whitehaven golf course	**On-site or off-site**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	

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'	Criteria description	Habitat parcel reference / Grid reference										
Core groups - applicable to all hedgerow types				**Criterion passed (Yes or No)**										**Notes (such as justification)**
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).	YES										
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										Most of hedge 1m wide at base
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										
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.	YES										Only on the eastern side. Mown grassland to hedgerow base on golf course side for most of length.
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										Docks present but <20%

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											
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).	YES											
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.												
E3.	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.												

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:	

Condition categories for hedgerows with 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 5 failures in total; **AND** Does not fail both attributes in more than one functional group (e.g., fails attributes A1, A2, B1, C2 and E1 = Moderate condition).	2
Poor	Fails a total of more than 5 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:	3

Suggested enhancement interventions to improve condition score

Summary condition assessments – Hope Mission Pond (A) and pond B (non-priority)

Habitat Description			
Pond A is Hope Mission Pond CWS, pond B is on eastern edge of course. Both are surrounded by semi-natural vegetation on 75% of banks, but fail due to this and drainage/ pipework and turbidity.			
ukhab – UK Habitat Classification For ponds (non-priority) – see the Biodiversity Metric 4.0 Technical Annex 2.			
Site name and location	Whitehaven Golf course	**On-site or off-site**	
Limitations (if applicable)	Ponds A and B (both same score). Surveyed mid-March - duckweed covr minimal	**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
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.	N	Both quite turbid at time of survey
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.	N	Both with 75% bankside semi-natural vegetation. More than all other ponds on site
C	Less than 10% of the water surface is covered with duckweed *Lemna* spp. or filamentous algae.	Y	
D	The pond is not artificially connected to other waterbodies, e.g. agricultural ditches or artificial pipework.	N	Culverts, drains, valves all present
E	Pond water levels can fluctuate naturally throughout the year. No obvious artificial dams[2], pumps or pipework.	N	
F	There is an absence of listed non-native plant and animal species[3].	Y	
G	The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities.	Y	
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.	Y	
I	The pond surface is no more than 50% shaded by adjacent trees and scrub.	Y	
	Number of criteria passed	**5**	

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)	
Passes 5 or fewer criteria	Poor (1)	Poor
Suggested enhancement interventions to improve condition score		

Summary condition assessments – All other ponds (non-priority)

Habitat Description													
Ponds within golf course. Most linked by ditches, culverts or drains. None surrounded by natural vegetation (some with 25% semi-natural bankside vegetation).													
ukhab – UK Habitat Classification													
For ponds (non-priority) – see the Biodiversity Metric 4.0 Technical Annex 2.													
Site name and location	Whithaven Golf Course	**On-site or off-site**											
		Survey reference (if relating to a wider survey)											
Limitations (if applicable)	Surveyed in March - duckweed unlikely to be that evident as yet.	**Habitat parcel reference**											
			C	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	
		Grid reference											
Condition Assessment Criteria													
		Criterion passed (Yes or No)											**Notes (such as justification)**
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.	Y	Y	N	Y	Y	Y	Y	Y	Y	Y		
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.	N	N	N	N	N	N	N	N	N	N		
C	Less than 10% of the water surface is covered with duckweed *Lemna* spp. or filamentous algae.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
D	The pond is not artificially connected to other waterbodies, e.g. agricultural ditches or artificial pipework.	N	N	N	N	Y	N	N	Y	N	Y		
E	Pond water levels can fluctuate naturally throughout the year. No obvious artificial dams[2], pumps or pipework.	N	N	N	N	Y	N	N	Y	N	Y		
F	There is an absence of listed non-native plant and animal species[3].	Y	Y	Y	Y	N	Y	Y	Y	Y	Y		Cotoneaster on banks
G	The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
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.	N	N	Y	N	N	N	Y	Y	N	Y		
I	The pond surface is no more than 50% shaded by adjacent trees and scrub.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	Number of criteria passed	**5**	**5**	**5**	**5**	**6**	**5**	**6**	**8**	**5**	**8**		

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)					Y		Y	Y		Y	
Passes 5 or fewer criteria	Poor (1)	Y	Y	Y	Y		Y			Y		

Summary condition assessments – All woodlands (w1d, w1h, w2c)

Habitat Description

ukhab – UK Habitat Classification

This condition sheet is based on the England Woodland Biodiversity Group (EWBG) Woodland Condition Survey Method, available here:
Woodland Wildlife Toolkit (sylva.org.uk)

IMPORTANT: This biodiversity metric woodland condition assessment must be used to assess woodland being input into the biodiversity metric. The outputs of this condition assessment are not equivalent to, nor are they comparable with the scores from the EWBG condition assessment, because the EWBG assessment has been adapted for the biodiversity metric, including the removal of EWBG Indicator 7 (Proportion of favourable land cover around woodland) and Indicator 14 (Size of woodland), and minor changes to other indicators.

Site name and location	Whitehaven golf course	**On-site or off-site**		**Habitat parcel reference**											
				w1d N	w1d S	w2c	w1h								
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**		**Grid reference**											

Condition Assessment Criteria

	Indicator	Good (3 points)	Moderate (2 points)	Poor (1 point)	Score per indicator										Notes (such as justification)
A	**Age distribution of trees**	Three age-classes[1] present.	Two age-classes[1] present.	One age-class[1] present.	2	2	1	2							
B	**Wild, domestic and feral herbivore damage**	No significant browsing damage evident in woodland[2].	Evidence of significant browsing pressure is present in 40% or less of whole woodland[2].	Evidence of significant browsing pressure is present in 40% or more of whole woodland[2].	2	2	2	2							Deer browsing evident in all larger blocks of woodland
C	**Invasive plant species**	No invasive species[3] present in woodland.	Rhododendron *Rhododendron ponticum* or cherry laurel *Prunus laurocerasus* not present, other invasive species[3] <10% cover.	Rhododendron or cherry laurel present, or other invasive species[3] >10% cover.	3	3	3	2							Rhodo present in some blocks
D	**Number of native tree species**	Five or more native tree or shrub species[4] found across woodland parcel.	Three to four native tree or shrub species[4] found across woodland parcel.	Two or less native tree or shrub species[4] across woodland parcel.	2	2	1	3							
E	**Cover of native tree and shrub species**	>80% of canopy trees and >80% of understory shrubs are native[5].	50 - 80% of canopy trees and 50 - 80% of understory shrubs are native[5].	<50% of canopy trees and <50% of understory shrubs are native[5].	2	3	1	3							Overall over 80% native in w1h. Some blocks with lots of pine - to 50% cover
F	**Open space within woodland**	10 - 20% of woodland has areas of temporary open space[6]. Unless woodland is <10ha, in which case 0 - 20% temporary open space is permitted[7].	21 - 40% of woodland has areas of temporary open space[6].	<10% or >40% of woodland has areas of temporary open space[6]. But if woodland <10ha has <10% temporary open space, please see Good category[7].	3	3	3	3							All blocks small, so score 3 by default
G	**Woodland regeneration**	All three classes present in woodland[8]; trees 4 - 7 cm Diameter at Breast Height (DBH), saplings and seedlings or advanced coppice regrowth.	One or two classes only present in woodland[8].	No classes or coppice regrowth present in woodland[8].	3	2	1	3							
H	**Tree health**	Tree mortality less than 10%, no pests or diseases and no crown dieback[9].	11% to 25% tree mortality and or crown dieback or low-risk pest or disease present[9].	Greater than 25% tree mortality and or any high-risk pest or disease present[9].	3	3	3	3							

I	**Vegetation and ground flora**	Recognisable NVC plant community[10] at ground layer present, strongly characterised by ancient woodland flora specialists.	Recognisable woodland NVC plant community[10] at ground layer present.	No recognisable woodland NVC plant community[10] at ground layer present.	1	1	1	1							
J	**Woodland vertical structure**	Three or more storeys across all survey plots, or a complex woodland[11].	Two storeys across all survey plots[11].	One or less storey across all survey plots[11].	2	2	1	2							
K	**Veteran trees**	Two or more veteran trees[12] per hectare.	One veteran tree[12] per hectare.	No veteran trees[12] present in woodland.	1	1	1	1							
L	**Amount of deadwood**	50% of all survey plots within the woodland parcel have deadwood, such as standing deadwood, large dead branches and or stems, branch stubs and stumps, or an abundance of small cavities[13].	Between 25% and 50% of all survey plots within the woodland parcel have deadwood, such as standing deadwood, large dead branches and or stems, stubs and stumps, or an abundance of small cavities[13].	Less than 25% of all survey plots within the woodland parcel have deadwood, such as standing deadwood, large dead branches and or stems, stubs and stumps, or an abundance of small cavities[13].	3	3	1	2							
M	**Woodland disturbance**	No nutrient enrichment or damaged ground evident[14].	Less than 1 hectare in total of nutrient enrichment across woodland area and or less than 20% of woodland area has damaged ground[14].	More than 1 hectare of nutrient enrichment and or more than 20% of woodland area has damaged ground[14].	2	3	3	3							
				Total Score (out of a possible 39)	29	30	22	30							

Condition Assessment Result	**Condition Assessment Score**	**Result Achieved**										
Total score >32 (33 to 39)	Good (3)											
Total score 26 to 32	Moderate (2)	Y	Y		Y							
Total score <26 (13 to 25)	Poor (1)			Y								

Figure 2. Site habitat maps – pre-works (north)

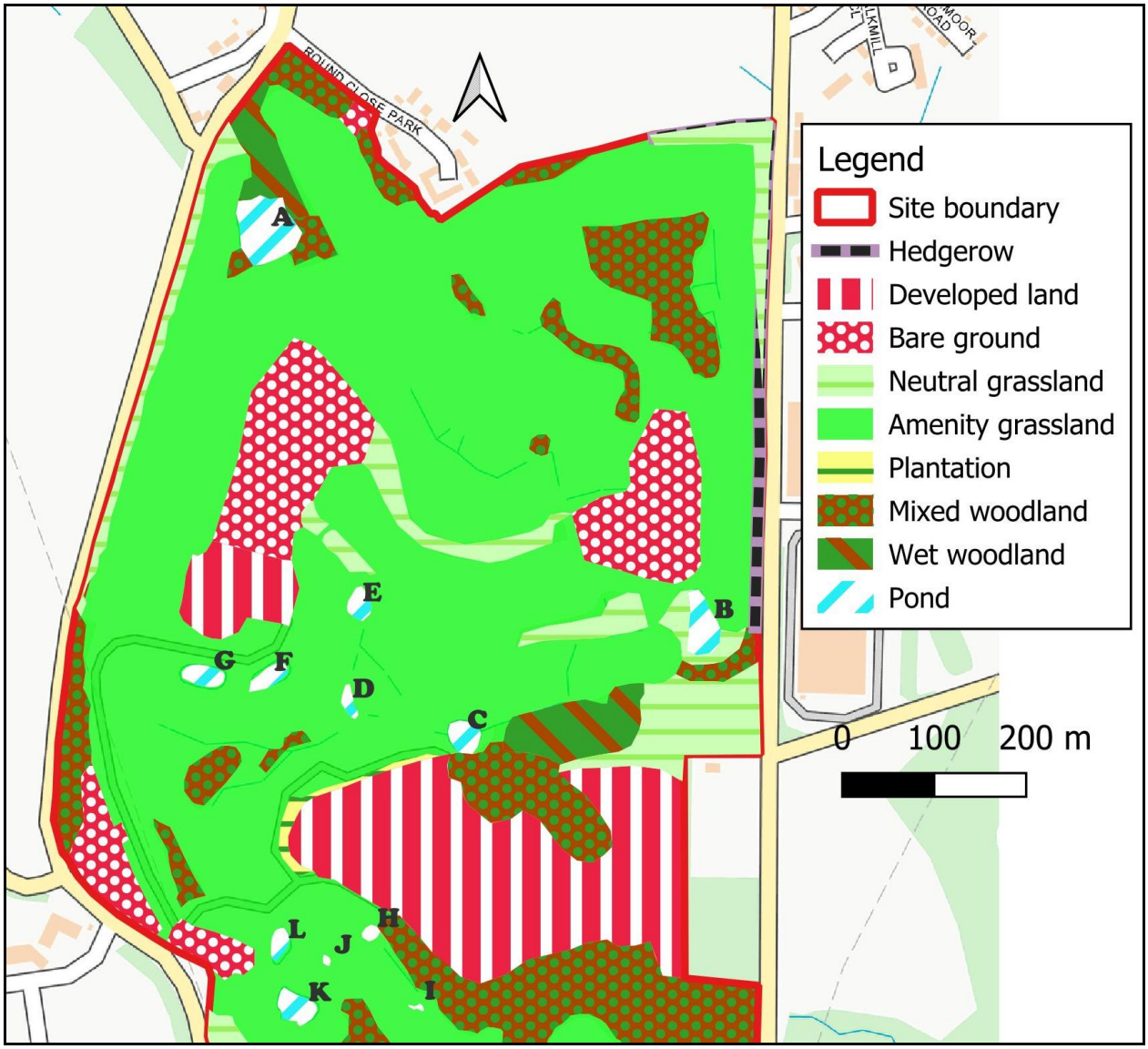


Figure 3. Site habitat maps – pre-works (south)

Figure 4. Site habitat maps – Enhancement and works areas (north)

Legend as Figure 5 below. Numbers correspond with enhancement measures outlined in section 4.2 of the report.

For clarity the 'bare ground layer' shown in Figures 2 and 3 above is not shown in Figures 4 to 7 (the bold symbology obscures the enhancement measures layer).

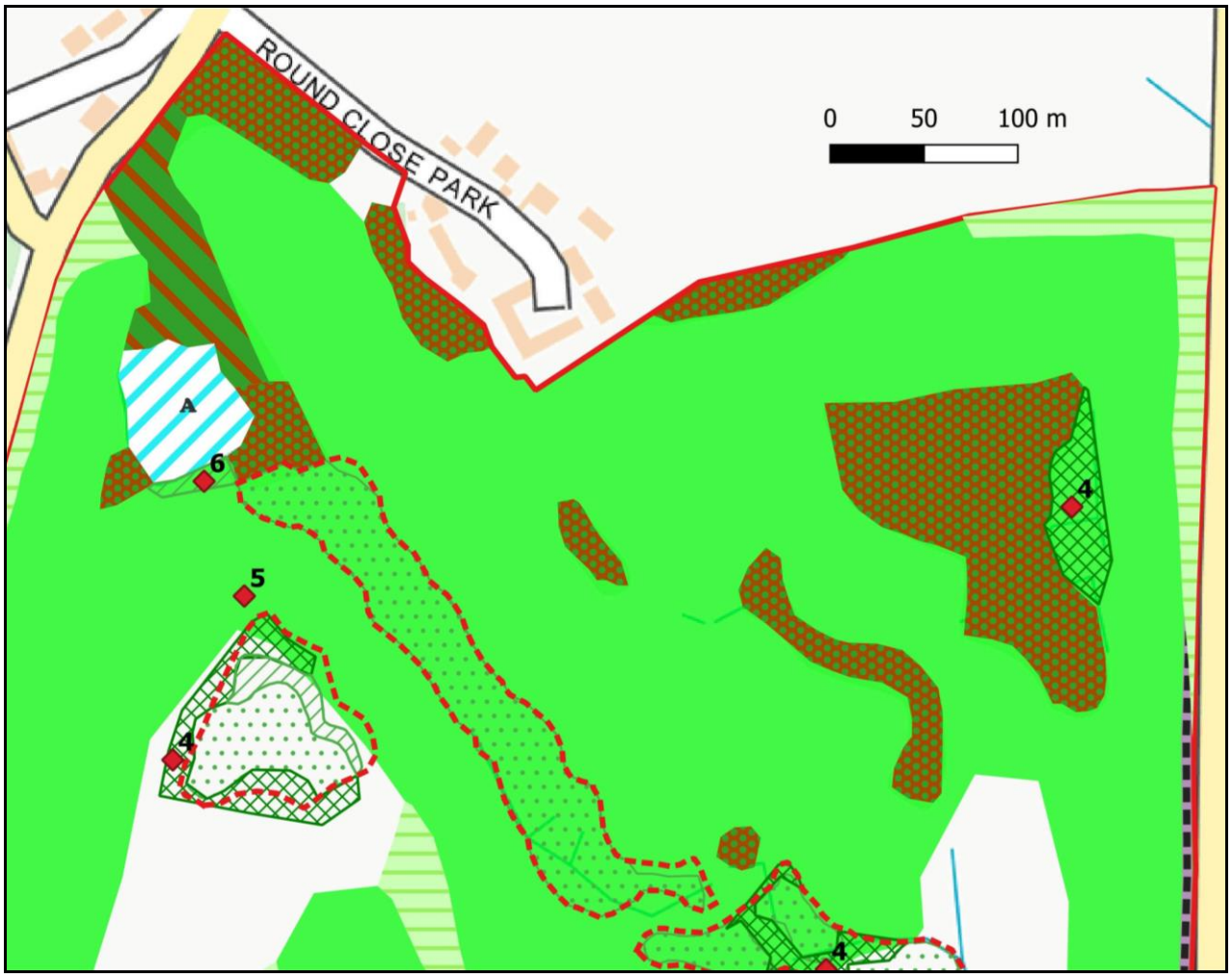


Figure 5. Site habitat maps – Enhancement and works areas (central east)

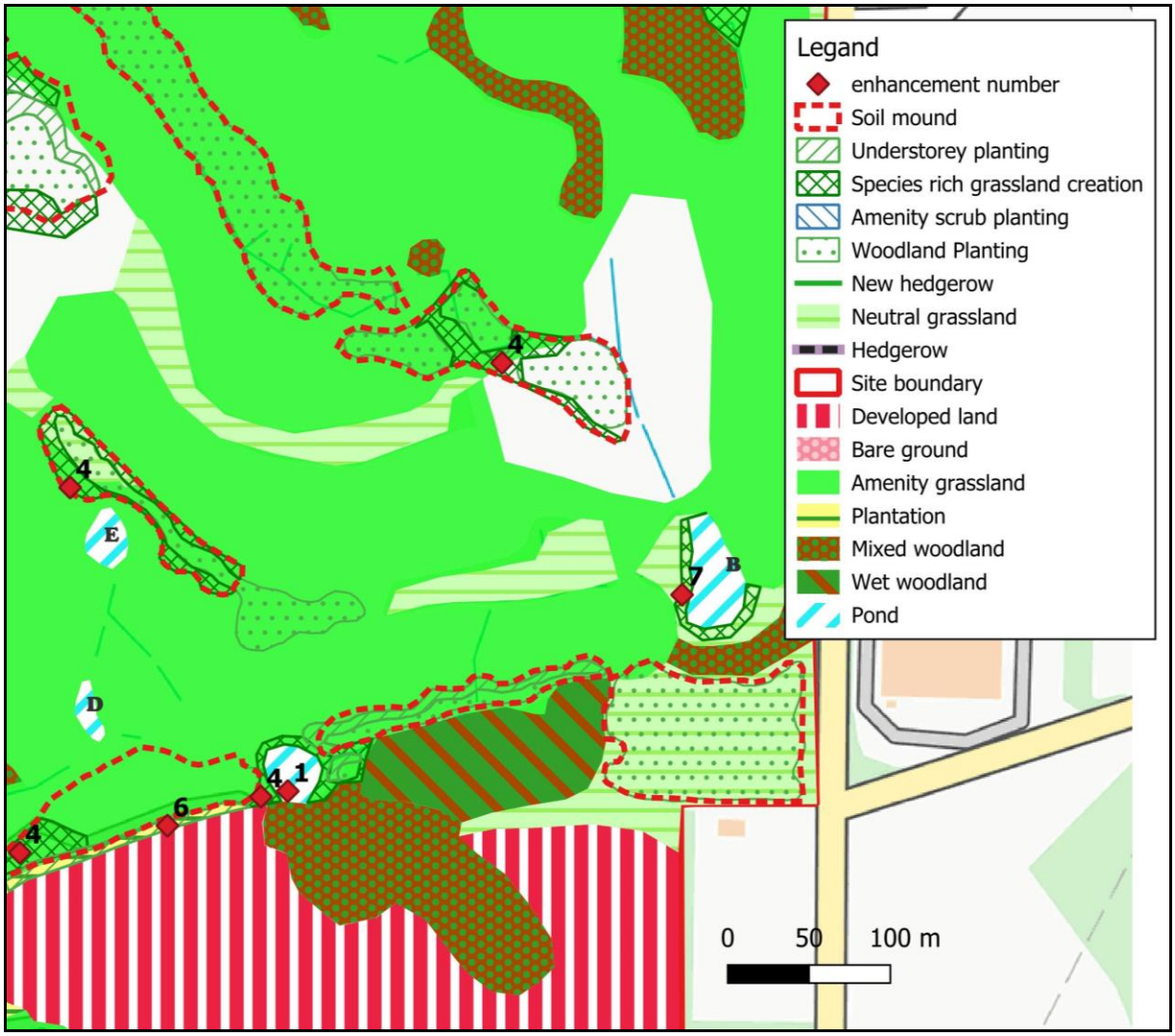


Figure 6. Site habitat maps – Enhancement and works areas (central west)

Figure 7. Site habitat maps – Enhancement and works areas (south)

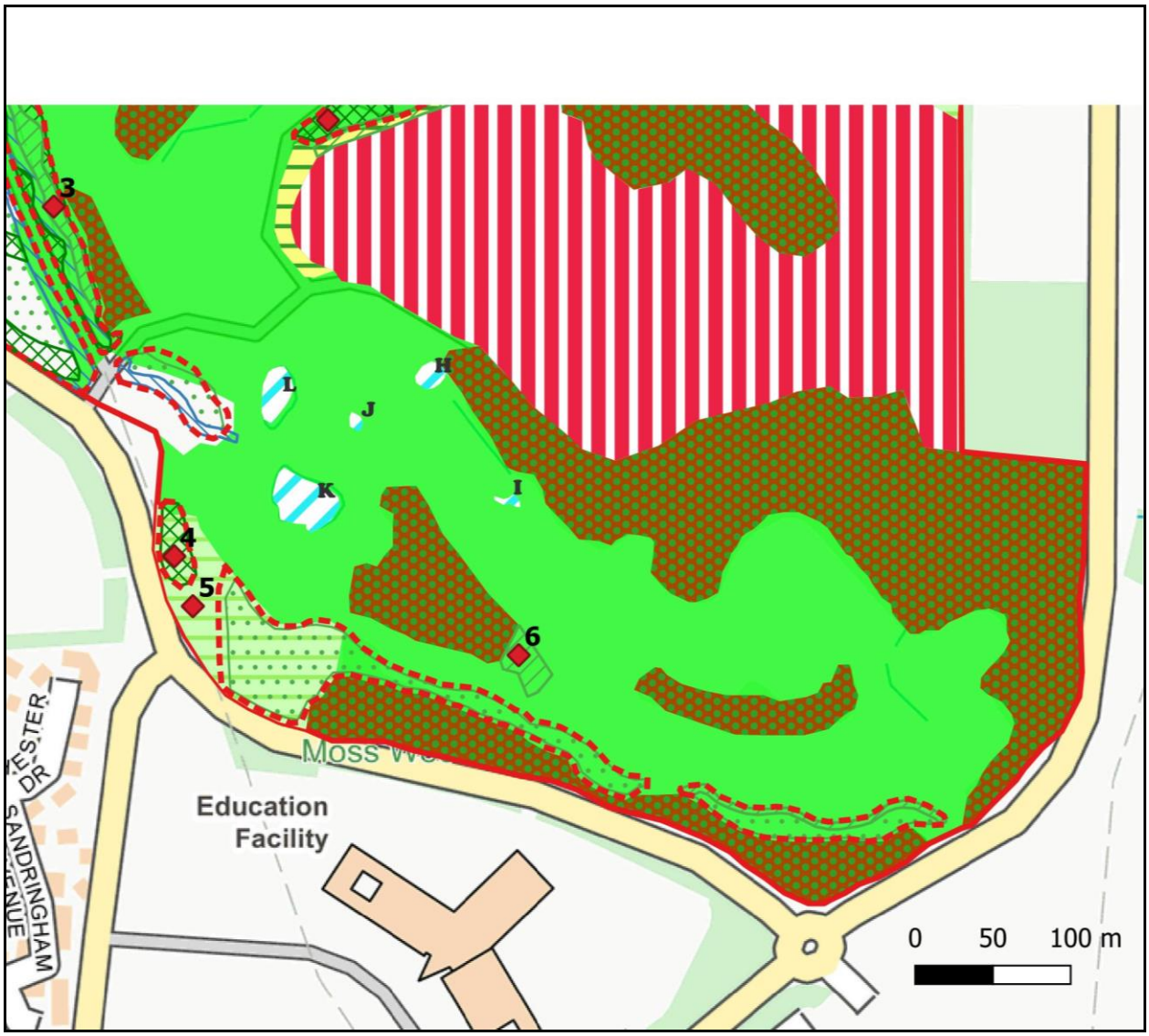


Figure 8. Site habitat maps – Post phase 1-5 works (north)

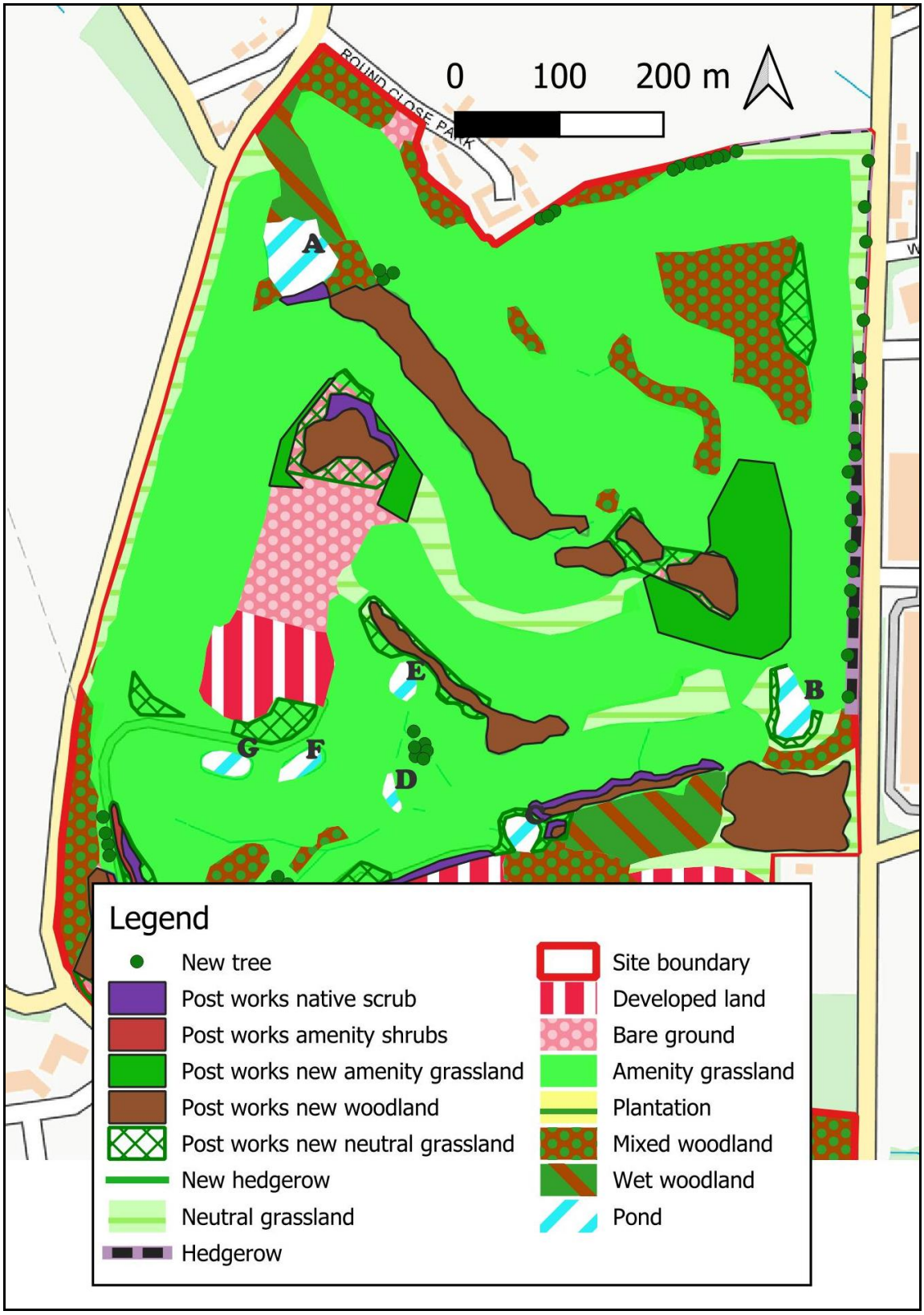


Figure 9. Site habitat maps – Post phase 1-5 works (south)

Legend as for Figure 8 above.