

Living Ecosystems

'Working Towards Sustainable Development and Providing Ecological Education...'



Results of an Preliminary Ecological Appraisal carried out at Bowlee Park Driving Range, Heywood Old Road, Middleton M24 4TH, Near Rochdale - May 2024

1.0 Introduction

Living Ecosystems was commissioned by Improve Your Golf Ltd to carry out a preliminary ecological appraisal at Bowlee Park Driving Range, Heywood Old Road, Middleton, M24 4TH. National grid reference SD 84567 06503. The survey is in support of the proposed development of an adventure golf course, an increase in the number of car parking spaces and the addition of another storey on the existing driving range building. The purpose of the appraisal is to provide an independent opinion of the likely presence of protected species on a site to inform the client of their obligations and to assist the Local Planning Authority in their determination of a planning application. It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation could ensure the complete characterisation and prediction of the natural environment. The survey provides a preliminary view of the likelihood of protected species occurring on site, based on the suitability of the habitat and any direct evidence on site. Additional surveys may be required if it is considered reasonably likely a protected species may be present.



Figure 1 The site is Bowlee Park Driving Range

Site description and location

The development site is located at Bowlee Park Driving Range off Heywood old Road, Middleton, and measures 175 metres by 120 metres or approximately 2.10 hectare area of very flat close mown amenity grassland.

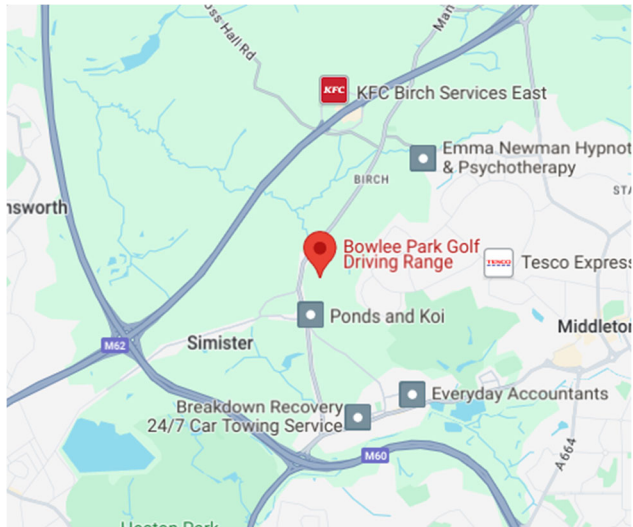


Figure 2 The survey site is Bowlee Park Driving Range M24 4TH

Details of the proposed works

The proposed development comprises the construction of an adventure golf course, an increase in the number of car parking spaces and the addition of another storey on the existing driving range building.



Figure 3 The current development proposals

2.0 Desktop Study and Data Search

This report contains the findings of a Preliminary Ecological Assessment (PEA). The Purpose of a PEA is to identify the potential for presence of protected species on a site, in line with European legislation, UK law and the requirements of The National Planning Policy Framework (NPPF, 2021). The brief of the ecological survey was to assess the habitats found on site and identify the potential for presence on site of protected species. The site-based element is supported by a desktop study undertaken to identify presence of Statutory/National/Local designations or protected species within the vicinity (from a 1 km to a 5 km radius) of the site. The final part of the project brief was to identify and make recommendations as appropriate for any further surveys required to determine presence/absence of protected species on site if the survey determined that presence of a protected species on site was considered to be reasonably likely.

The following sources of information and ecological records were consulted:

A desktop study was undertaken through MAGIC (Multi-Agency Geographic Information System for Countryside). The search looked to identify the presence of statutory designated sites within a 1km radius (e.g. Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR). A wider search radius up to 5 km has also been considered where appropriate in the site's context. The NBN Atlas: which is the UK's largest repository of publicly available biodiversity data was used to find local records of relevant protected species and any other species of importance locally. All measurements within this report are approximate only, and have been estimated whilst on site or calculated using mapping software (QGIS) or internet-based mapping services such as MAGIC Maps and Google Earth.

3.0 Desktop Study and Data Search Results

The site is not designated as a statutory designated site for nature conservation, and no statutory designated sites for nature conservation lie within a 1.0 kilometre radius of the site. The site does not lie within the impact risk Zone of any statutory designated site

The site has no non-statutory designations for nature conservation, and no non-statutory designated sites for nature conservation lie directly adjacent to the site boundary. No statutory or non-statutory sites exist within a 1.0 kilometre radius of the site. The site does not lie within the impact zone of a SSSI.

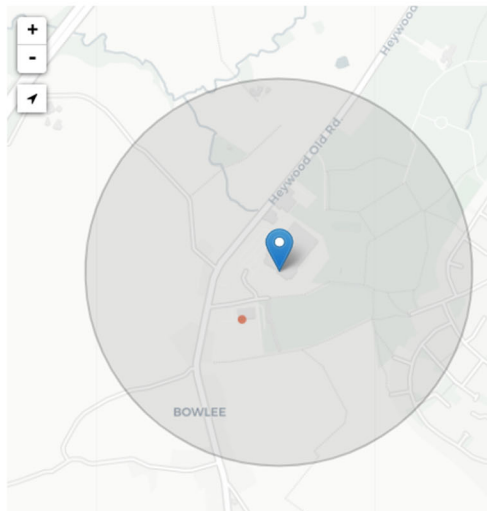
Previous records of protected species within a 1.0 km radius of the site.

The only protected species recorded within a 1.0 km radius of the site is the common pipistrelle bat.

Bats

There have been four records of common pipistrelle bats within a 0.5 kilometre radius of the site, all of the records were made at a location about 150 metres south of the site which is marked on the map below. The area around the site does provide significant foraging potential and common pipistrelle bats wererecorded foraging around the site during the amphibian survey visits during May 2024. A bat scoping survey was carried out at the site during April 2024. There was no evidence for bat roosts in buildings on the site and they arconsidered to be unsuitable for bats. The lighting scheme at the site will include mitigation measures to reduce any impacts upon bats.

ies	Common Name	Species	Records
1.	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	4
	species profile list of records		
2.	Smooth Newt	<i>Lissotriton vulgaris</i>	3
3.	Rook	<i>Corvus frugilegus</i>	1
4.	Robin	<i>Erithacus rubecula</i>	1
5.	Swallow	<i>Hirundo rustica</i>	1
6.	Great Tit	<i>Parus major</i>	1
7.	Tree Sparrow	<i>Passer montanus</i>	1
8.	Pheasant	<i>Phasianus colchicus</i>	1
9.	Dunnock	<i>Prunella modularis</i>	1
10.	Common Frog	<i>Rana temporaria</i>	1
11.	Goldcrest	<i>Regulus regulus</i>	1



Location of the 4 common pipistrelle bat records within a 0.5 km radius of the site

Amphibians

Two ponds within a 500 metre radius of the site were considered to be suitable as breeding site for great crested newts or other amphibians. For this reason a survey for great crested newts (*Triturus cristatus*) was considered necessary. The survey of both ponds was carried out during May 2024 and found smooth newts and common frogs breeding in Pond Number 2 and juvenile frogs but no evidence of breeding in Pond Number 1.



Figure 4 Suitable newt breeding ponds in a 500 metre radius of Bowlee Park

Great crested newt (gcn) surveys

Planning regulations require that all suitable great crested newt breeding ponds within a 500 metre radius of a proposed development site be surveyed for gcns, unless they are separated from the site by insurmountable barriers such as running water or busy roads. Suitable breeding ponds may be identified by competent gcn licenced ecologists or using the GCN Habitat Suitability Index Matrix Calculator. All ponds scoring 'Average' or better using the GCN HSI Matrix should be surveyed.

Categorisation of HSI Score by Lee Brady	
HSI Score	Pond Suitability
< 0.50	Poor
0.50 - 0.59	Below average
0.60 - 0.69	Average
0.70 - 0.79	Good
> 0.80	Excellent

Based on ARGUK advice note 5 - Great Crested Newt Habitat Suitability Index

ARGUK GCN HSI Calculator			
	Pond Name		Bowlee D R
	Grid Ref		
SI No	SI Description		SI Value
1	Geographic location		1
2	Pond area		0.2
3	Pond permanence		1
4	Water quality		1
5	Shade		1
6	Water fowl effect		1
7	Fish presence		1
8	Pond Density		0.8
9	Terrestrial habitat		1
10	Macrophyte cover		0.6
HSI Score			0.79
Pond suitability (see below)			Good

Figure 5 GCN HSI score for pond & ditch number 1

ARGUK GCN HSI Calculator			
	Pond Name		
	Grid Ref		
SI No	SI Description		SI Value
1	Geographic location		1
2	Pond area		1
3	Pond permanence		0.9
4	Water quality		1
5	Shade		1
6	Water fowl effect		1
7	Fish presence		1
8	Pond Density		1
9	Terrestrial habitat		1
10	Macrophyte cover		1
HSI Score			0.99
Pond suitability (see below)			Excellent

Figure 6 GCN HSI score for pond number 2

Pond & ditch number 1 in the Bowlee Driving Range car park area scored 0.79 or 'Good' on the GCN HSI Matrix and therefore must be surveyed. Pond number 2 scored 0.99 or 'Excellent' on the GCN HSI Matrix and therefore must also be surveyed. This requirement is further re-inforced by the known existence of a great crested newt breeding population less than 2 km to the south east of the site as shown by the National Biodiversity Network Gateway record below.

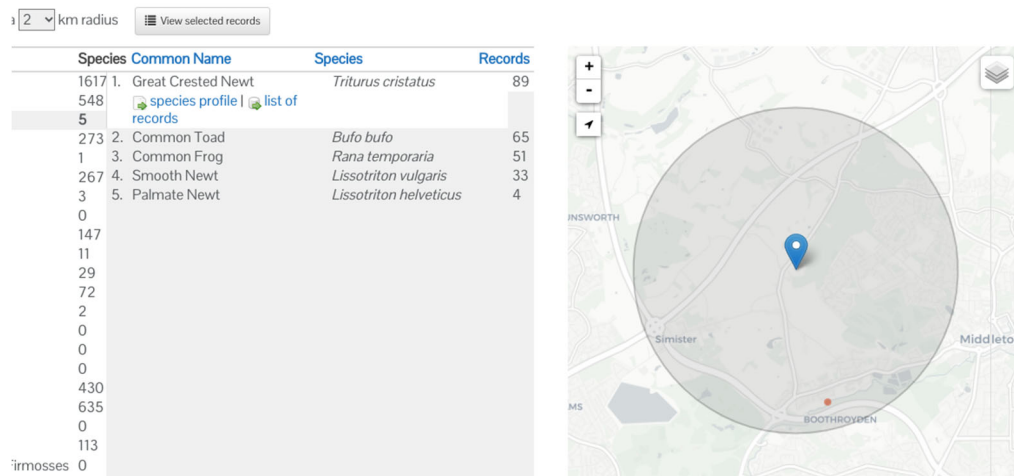


Figure 7 Great crested newts have been recorded slightly less than 2 km south of the site

Common frog and smooth newt - Both species have all been recorded at a site within a 0.5 km radius of the site. All of the records were made at a location approximately 400 metres to the south of the site.

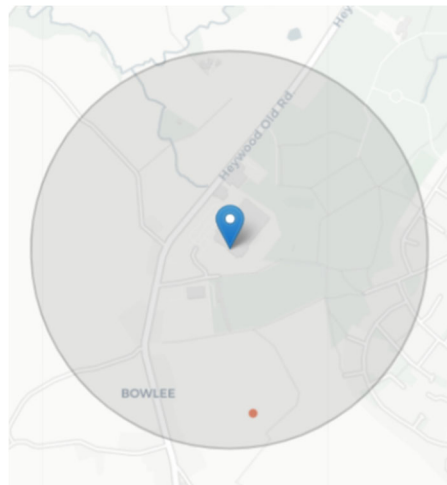


Figure 8 Location of common frog and smooth newt records within a 0.5 km radius of the site

4.0 Habitat survey methodology

A detailed habitat survey of the site was undertaken on the morning of 1st May 2024. The weather was overcast, dry, mild (12 degrees C) and with a light wind. The survey was carried out by Richard Parkinson a very experienced Principal Ecologist with over 30 years of appropriate experience. The initial survey was carried out at an optimal time and I am entirely confident that the survey has identified and addressed all the relevant ecological issues at the site.

All habitats were mapped and each habitat was separated where possible into compartments with a list of the plant species found in each.

Objective(s) of the botanical survey

The objectives of the survey were to assess the habitats and plant assemblages on site:-

- 1) Undertake a habitat survey of the site and the surrounding environs;
- 2) Identify the habitat and plant assemblages on the site.
- 3) Determine the likely presence/absence of any protected plant species or habitats on the site.

4.1 Results of the initial habitat survey - 1st May 2024



Figure 9 A view of part of the survey area

The following section presents the findings of the habitat survey. The habitats compartments are shown on the map below. A detailed species list is included for each compartment.

DAFOR frequency ratings have used as follows :

- ☐ Dominant: the species appears at most (>60%) stops and it covers more than 50% of each sampling unit;
- ☐ Abundant: species occurs regularly throughout a stand, at most (>60%) stops and its cover is less than 50% of each sampling unit;
- ☐ Frequent: species recorded from 31-60% of stops;
- ☐ Occasional: species recorded from 11-30% of stops;
- ☐ Rare: species recorded from up to 10% of stops.

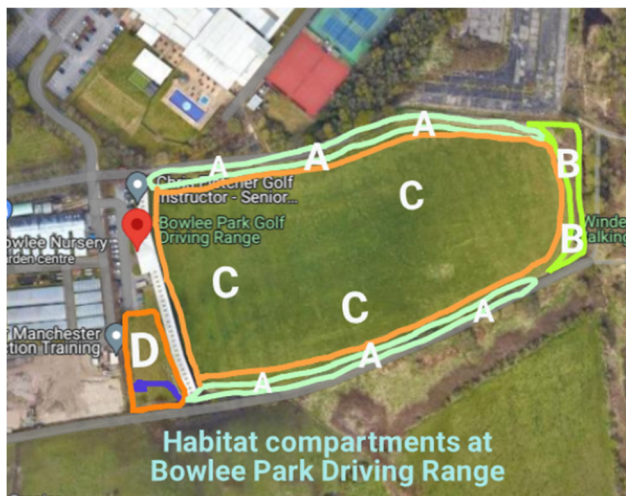


Figure 10 Habitat compartments

Compartment A – an area of self generated tall ruderal herbs

Compartment A is an area of self generated tall ruderal herbs forming a 2 metre wide strip along the side of most of the Bowlee Park Driving Range's northern and southern boundary fences.



Figure 11 Compartment A

Species present in compartment A

Norway maple (*Acer palmatum*) R
 Sycamore saplings (*Acer pseudoplatanus*) R
 Grey willow saplings (*Salix cinerea*) R
 Ash saplings with dieback (*Fraxinus excelsior*) R
 Cow parsley (*Anthriscus sylvestris*) A
 Nettle (*Urtica dioica*) A
 Dandelion (*Taraxacum officinale*) F
 Ribwort (*Plantago lanceolata*) O
 Bush vetch (*Vicia sepium*) R
 Cuckoo flower (*Cardamine palustris*) R
 Broad leaved dock (*Rumex obtusifolius*) O
 Black knapweed (*Centaurea nigra*) O
 Common sorrel (*Rumex acetosa*) O
 Holly sapling (*Ilex aquifolium*) R
 Bramble (*Rubus fruticosus*) R
 Ground elder (*Aegopodium podagraria*) R
 Rosebay willowherb (*Chamaenerion angustifolium*) R

Compartment B - an area of dense bramble

The whole compartment is occupied by a 3 metre wide strip of very dense bramble along the eastern boundary fence of the Bolee Park Driving Range.



Figure 12 Compartment B

Species present in compartment B

Bramble (*Rubus fruticosus*) D
 Ground elder (*Aegopodium podagraria*) A

Cow parsley (*Anthriscus sylvestris*) O

Compartment C - an area of closely mown amenity grassland

The whole compartment consists of closely mown amenity grassland used for golf.



Figure 13 Compartment C

Species present in compartment C

Meadow foxtail (*Alopecurus pratensis*) F
Annual meadow grass (*Poa trivialis*) F
Red fescue (*Festuca rubra*) F
Cocksfoot grass (*Dactylus glomerata*) O
False oat grass (*Arrhenatherum elatius*) F
Broad leaved dock (*Obtusifolius*) O
Daisy (*Bellis perenis*) R
White clover F
Black medick F
Creeping buttercup (*Rannunculus repens*) F
Dandelion (*Taraxacum officinale*) F
Hoary plantain (*Plantago media*) F
Ribwort (*Plantago lanceolata*)F

Compartment D - an area of tussock grass with some trees and shrubs



Figure 14 Compartment D is an area of tussock grass with some trees and shrubs surrounding a ditch terminating in a pond. The ditch and pond were dug out to alleviate flooding approximately 18 months earlier.

Species in compartment D

Meadow foxtail (*Alopecurus pratensis*) F
Annual meadow grass (*Poa trivialis*) F
Red fescue (*Festuca rubra*) F
Cocksfoot grass (*Dactylus glomerata*) O
False oat grass (*Arrhenatherum elatius*) F
Broad leaved dock (*Obtusifolius*) O
Daisy (*Bellis perenis*) R
Creeping buttercup (*Rannunculus repens*) F
Dandelion (*Taraxacum officinale*) F
Hoary plantain (*Plantago media*) F
Ribwort (*Plantago lanceolata*) F
Hawthorn (*Crataegus monogyna*) R
Beech (*Fagus sylvatica*) O
Bramble (*Rubus fruticosus*) O
Alder (*Alnus glutinosa*) R
Cleavers (*Gallium aparine*) O
Rosebay willowherb (*Chamaenerion angustifolium*) O
Spear thistle (*Cirsium vulgare*) O
Creeping thistle (*Cirsium arvense*) O

Figure 15 Pond & ditch inside compartment D



Figure 16 Evidence for water voles in Pond and ditch number 1

A recently excavated ditch terminating in a small pond have been excavated during the last two years in order to alleviate flood risks. The pond is at an early successional phase and has been colonised by flote grass. A few seedlings of water loving trees alder and willow have begun to grow on the margins of the pond. A water vole burrow was clearly visible on the southern bank of the pond and is shown in the photographs above.



Figure 17 Location of water vole burrow

Species present in the pond inside compartment D

Aquatics

Flote grass (*Glyceria fluitans*) 15% cover

Filamentous algae 5% cover

Margins

Grey willow seedlings (*Salix cinerea*) F

Red shank (*Persicaria maculosa*) O

Curled dock (*Rumex crispus*) R

Alder seedlings (*Alnus glutinosa*) R

5.0 Constraints of the survey

The initial survey was carried out at an optimal time and I am entirely confident that the survey has identified and addressed all the relevant ecological issues at the site. However such surveys can only ever be a snapshot of the conditions at a single moment in time.

6.0 Impacts and recommendations

Enhancement and mitigation for protected species

Enhancements for bats

A detailed bat scoping survey was carried out on 1st May 2024. No direct or indirect evidence for bat roosts was found in the buildings or the loft space. The buildings are considered unsuitable for bat roosts. There are no trees on the site with bat roost potential. Many trees on the land adjacent to the site do have significant bat roost potential. The site does provide significant foraging potential. Common pipistrelles have been observed on four evenings during May foraging at the site. These were identified using a Batbox 3 bat detector.

Under the National Planning Policy Framework (2021) there is a requirement to provide features in proposed developments that promote biodiversity and habitat enhancements. The proposal would have no significant impact on any bat roosts or foraging and commuting routes.

As the site has been observed to be used by foraging bats it recommended that the lighting scheme be designed in order to reduce any potential impact bats. Any lighting installed on or around the new structures is low-pressure or high- pressure sodium with glass glazing, or alternatively LED. This will reduce the UV output, which attracts insects. Lighting should be directional, installed with baffles if possible and should be directed to avoid light shine on boundary trees and vegetation. Roads or trackways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies. These unlit stretches should be 10 metres in length either side of commuting route.

It is further recommended; that new roosting opportunities for bats be provided at the site as part of the proposals. A total of 3 suitable bat roost boxes should be attached onto the building as high up as possible facing east.



Figure 18 Suitable bat boxes would include the Schwegler 1FF Flat bat box

Enhancements for birds

A survey of singing was carried out on the 1st May 2024. No active nests were observed but a limited amount of singing was recorded at the eastern boundary of the site. The following species were observed or heard singing in the woodland on the motorway slip-road embankment and in the adjoining scrub woodland at the southern end of the site; robin and wren. No birds were observed on the amenity grassland portion of the site itself although swallows were observed foraging high above the site.

Swallows were observed foraging high above the site on the day of the survey. Swallows are listed as a Species of Principal Importance in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006), they are UK BAP Priority Species. Swallows are listed in the RSPB's Red List of 'Birds of Conservation Concern 3' (2009).

In order to provide new nesting opportunities for swallows at the site, it is recommended that 6 swallow nest boxes be fitted on the rear wall immediately under the open roof of the driving range structure. The above enhancement would facilitate the aims and objectives of the UK BAP Species Action Plan for House Sparrows.



Figure 19 - 6 X swallow nest boxes the Schwegler 10 Swallow nest is a good example but many others are available

Note on breeding birds and vegetation clearance

It is strictly illegal in the UK to take, damage or destroy the nest of any wild bird while it is being built or in use. Therefore prior to any vegetation clearance or tree felling operation during the nesting bird season [March to August inclusive] trees and dense brush should be carefully inspected for any active nests. If an active nest is identified this area should be left undisturbed until nesting activity has finished. It is an offence to disturb any nesting bird or its nest. It is recommended that if vegetation clearance operations are scheduled to take place during the nesting bird season then a breeding bird survey should first be undertaken by a suitably qualified person in order to assess any potential impacts and inform future action. If active nests are found an exclusion area should be established around the nest in order to ensure that birds are not disturbed until nesting activity has ceased.

Enhancements and mitigation for terrestrial mammals

A detailed terrestrial mammal survey was carried out on 1st May 2024 and upon 4 other occasions throughout May and June 2024. Evidence for water voles was found during the survey. A water vole burrow was identified on the southern bank of Pond & ditch number 1 (see Figure 20 below).



Figure 20 Location of water vole burrow on the bank of Pond & ditch number 1

As water voles are present on the site it is vital that measures be taken to avoid any negative impacts upon this protected species as a result of the development proposals. Therefore it is recommended that a reasonable avoidance strategy be adopted in relation to water voles. A 10 metre wide protective buffer zone be established around the burrow. The tussocky grassland comprising habitat compartment D is ideal habitat for water voles. For this reason this habitat should be retained and protected within a radius of 10 metres of the burrow. Any works inside this protected area should be kept to a minimum and supervised by a suitably qualified ecologist. Full details of the Water Vole RAMs can be found in Appendix 1.

7.0 Defra Biodiversity Metric calculations and Biodiversity Net Gain Statement for the proposed development at Bowlee Park Driving Range with required habitat improvements and planting instructions.

The Defra National Biodiversity Metric is designed to provide a means of assessing changes in biodiversity value (losses or gains) brought about by development or changes in land management. The metric is a habitat based approach to determining a proxy biodiversity value. Baseline conditions at the Site were measured with areas (hectares - ha) calculated for each of the existing habitat parcels present. Proposed habitats to be 'created' were measured in the same way.

These measurements were input into the National Biodiversity Metric calculation tool along with the habitat type and a number of other variables including habitat condition and connectivity. Based on these multipliers the calculator provides a total number of biodiversity 'habitat units' for each habitat and an overall 'net unit' and 'net percentage' change for the whole site. Use of the tool therefore characterises the overall biodiversity interest of the existing and proposed habitats at the Site quantitatively and provides an indication of the overall loss or gain in biodiversity value at the Site.

Combined net unit change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	8.91
	Hedgerow units	0.07
	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	8.91
	Hedgerow units	0.07
	Watercourse units	0.00
Total net % change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	145.36%
	Hedgerow units	57.63%
	Watercourse units	0.00%
Trading rules satisfied?	Yes ✓	

In order to achieve the required minimum 10% uplift in biodiversity units post development the landscape masterplan incorporates the enhancement of the existing 140 metre length of hedgerows with trees around the car park by the addition of suitable native species and small trees/shrubs of UK provenance be planted around the boundaries of the site. The landscape plan also includes the addition to the site of 200 square metres of wildflower meadow. Taken together these measures more than meet the statutory minimum 10% biodiversity gain required post development. This increase can be seen on the Biodiversity Metric 4.0 headline results shown above.

8.0 Suggested Habitat enhancements

Good horticultural practices should be employed to ensure no, or minimal, use of pesticides and herbicides. Where possible landscape planting within the proposed development area should aspire to consist of at least 50% of native or otherwise beneficial species preferably of UK provenance. A beneficial species is one which though not native is not invasive or harmful; and also provides significant ecological resources to native species, such as nectar, fruit, berries, nesting opportunities or cover amongst others. This will contribute to local Biodiversity Action Plan goals. Beneficial species include non native species which are not invasive and provide significant wildlife opportunities such as nectar berries, cover or nesting opportunities.

Hedgerow creation/enhancement

The 140 metre length of existing hedgerows with trees along the boundaries of the car park will be enhanced by additional planting. This will support a wide range of species, including breeding birds, amphibians, foraging bats, invertebrate species and other small mammals.

Hedgerow specification

Areas of hedgerow to be restored should use typical native species of local provenance. The following list of species and the percentage mix are typical of hedgerows found in Greater Manchester. Planting should contain a mix of 5 or more the following species, with a predominance (40% +) of hawthorn (*Crataegus monogyna*) and or blackthorn (*Prunus spinosa*).

Beech spp (up to 10%) *Fagus* species
Hornbeam (5% +) *Carpinus betulinus*
Climbing roses (5% +) *Rosa* species
Rowan (5% +) *Sorbus aucuparia*
Holly (10% +) *Ilex aquifolium*
Hazel (10% +) *Corylus avellana*
Hawthorn/Blackthorn (40% +) *Crataegus monogyna* / *Prunus spinosa*
Guelder rose (5% +) *Viburnum* species
Dogwoods (10% +) *Cornus* species
Barberry (5% +) *Berberis* species

All hedgerow planting shall be carried out in accordance with BS4428:1989 code of practice for general landscape operations (excluding hard surfaces). Hedgerow plants shall either be notch or trench planted into uncompacted soil, free of vegetation. Hedge trenches shall be dug to a minimum depth of 400mm and width of 600mm, with the plants put into the ground at the same depth at which they had been previously grown in the nursery. All plants shall be well heeled in after planting. Hedging plants to

be supplied as bare-root specimens. All plant roots shall be kept under a moist cloth or in a bucket of water during planting. Plants not planted on day receipt are to be heeled-in in a pre-prepared trench and kept moist until plants are required. Hedges should only be planted between November and March, while plants are still dormant. Avoid planting in very cold or wet weather. All plants to be feathered whips 1.25 – 1.50 m high, to be planted at 0.3 m spacing in a double row at 0.4 m apart.

The following species can be planted in the hedge bases at a rate of 2 to 4 plants per metre of hedge to further improve diversity. At least 5 of the species below should be included in the scheme.

Bluebell (UK variant) *Hyacinthoides non-scripta*
 Honeysuckle *Lonicera periclymenum* or other suitable *Lonicera* species
 Red campion *Silene dioica* and or White campion *Silene alba*
 Ramsoms (wild garlic) *Allium ursinum*
 Wood anemone *Anemone nemorosa*
 Primrose *Primula vulgaris* or other primulas
 Wood avens *Geum urbanum*
 Common dog-violet *Viola riviniana* or other pansies
 Herb Robert or other geranium species
 Ivy/*Hedera* species (preferably *Hedera helix*)
 Tutsan species or other *Hypericum* species

Add shrubs to the planting scheme

Add small trees and shrubs to the planting scheme. Where possible the scheme should include two of the listed berry bearing trees which will provide useful autumn forage for birds. Spring flowering shrubs from the list below should be added to the planting scheme scheduled for the site at a rate of 2 plants per garden. Flowering currants provide a much needed source of nectar to bees in early spring.

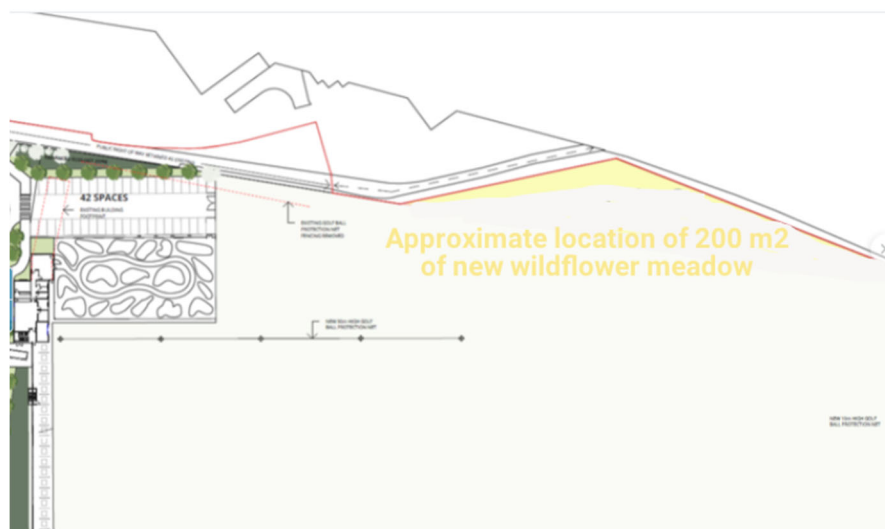
Beneficial trees and shrubs in Greater Manchester

Common name	Latin name
Shrubs and trees suitable for hedges	
Rowans & whitebeams	<i>Sorbus sp</i>
Cherries and plums	<i>Prunus sp</i>
Apples and crabapples	<i>Malus sp</i>
The species below may be used either as garden plants or in hedges	
Guelder rose or other viburnums	<i>Viburnum sp</i>
Flowering currant or other currant species	<i>Ribes sp</i>
Hawthorn	<i>Crataegus monogyna</i>
Blackthorn	<i>Prunus spinosa</i>
Holly	<i>Ilex aquifolium</i>
Dogwoods	<i>Cornus sp</i>

Similar species which will perform the same function may be substituted if necessary.

Lowland meadow creation

200 square metres of species-rich lowland meadow will be created on land formerly closely mown amenity grassland.



The creation of 200 square metres of lowland species rich meadow is recommended

This will be achieved by leaving the land fallow for 18 months before lightly harrowing and sowing with a local provenance wildflower seed mix appropriate to the location. Plug planting may form part of the long-term species establishment and management of the grassland areas to increase species diversity. Following consultation with the Greater Manchester Ecology Unit, a suitable species-rich grassland seed mix containing native species of local provenance (such as MG6 or 5) will be agreed. The seed will be sown directly on to the soil, which will have been previously harrowed and treated with an appropriate translocated herbicide, to help prevent colonisation by undesirable species such as dock, ragwort and creeping thistle. The maximum wild flower and grass seed sowing rate should not exceed 5gm-2. It is recommended that the wild flower component of a seed mixture should contain about ten herb species from table below. Where soil has been removed as part of the de-contamination process - as in the case of the burning ground - it will be replaced with subsoil topped with a thin layer (5 cm) of infertile topsoil or appropriate subsoil in order to reduce fertility and to provide a suitable growing medium for the wildflower mix.

Alternatively, a thin - 8cm or less - dressing of a topsoil-and-sand mix may be applied prior to sowing. Wherever stripped topsoil is used, there should be treatment with a systemic herbicide six weeks after being laid to remove any undesirable re-growth from the seed bank in the topsoil. The meadow area will be over-sown in September 2011 with yellow rattle (*Rhinanthus minor*), an attractive annual which is a hemi-parasite on grass species as part of the on-going grassland management. This species is helpful as it reduces the vigour of grasses, allowing sensitive flowering herb species - which would normally be swamped - to grow and spread. The resulting meadow will be a slightly smaller but far more diverse and sustainable replacement for the temporary cornfield annual habitat. It will have several distinct advantages: it is sustainable and easy to manage, requiring only a biennial cut, with a swipe in late summer (late July to early August); cutting once every two years will reduce the potential impact on amphibians whilst still preventing woody species from becoming established. The cut vegetation should be removed from the site and disposed of either for composting or as hay. This meadow containing native local species will also be aesthetically pleasing and will attract an even more diverse mix of invertebrate species than the cornfield annuals, providing even greater foraging opportunities for bat and bird species. Over time this habitat should improve still further as additional wild flower species colonise naturally.

Grass and herb species suitable for new grassland habitat include the following:

COMMON NAME	SCIENTIFIC NAME
Grass species	
Common bent	<i>Agrostis capillaris</i>
Creeping bent	<i>Agrostis stolonifera</i>
False oat grass	<i>Arrhenatherum elatius</i>
Quaking-grass	<i>Briza media</i>
Crested dog's-tail	<i>Cynosurus cristatus</i>
Red fescue	<i>Festuca rubra ssp rubra</i>
Rough meadow-grass	<i>Poa trivialis</i>

Herb species	
Yellow-rattle	this species is of particular value for the establishment new meadows.
Harebell	
Common Knapweed	
Meadow Vetchling	
Hawkbitt	
Oxeye	
Common Bird's-foot-trefoil	
Cowslip	
Meadow Buttercup	
Bulbous Buttercup	
Common Sorrel	
Great Burnet	
Betony	
Devil's-bit Scabious	
Sneezewort	
Cuckooflower	
Meadowsweet	
Ragged Robin	
	<i>Rhinanthus minor</i> (over-sow in early autumn)
	<i>Campanula rotundifolia</i>
	<i>Centaurea nigra</i>
	<i>Lathyrus pratensis</i>
	<i>Leontodon spp</i>
	<i>Leucanthemum vulgare</i>
	<i>Lotus corniculatus</i>
	<i>Primula veris</i>
	<i>Ranunculus acris</i>
	<i>Ranunculus bulbosus</i>
	<i>Rumex acetosa</i>
	<i>Sanguisorba officinalis</i>
	<i>Stachys officinalis</i>
	<i>Succisa pratensis</i>
	<i>Achillea ptarmica</i>
	<i>Cardamine pratensis</i>
	<i>Filipendula ulmaria</i>
	<i>Lychnis flos-cuculi</i>

Management proposals should take account of the following:

Sowing should take place between August-October or March-mid May.

In the first year of establishment the sward should be cut to 50mm whenever a height of 100mm is reached. The arisings should be removed.

Over-sow yellow-rattle (*Rhinanthus minor*) in the autumn following the initial sowing. Yellow-rattle is a hemi-parasite of grasses and helps to reduce their vigour.

For years 2-5 following sowing, a weed-wipe is to be used to treat any invasive weed species (e.g. broad-leaved and curled docks, thistles, etc.).

A single cut to a height of 50-70mm is usually adequate, in the summer (between late July and mid August, after yellow-rattle has set seed).

The aim is to create a habitat which is an improvement on the existing habitat. This will be suitable to support a wide range of species, including breeding birds, foraging bats, invertebrate species and small mammals.

9.0 CONCLUSION

In order to achieve the required minimum 10% uplift in biodiversity units post development the landscape masterplan incorporates the enhancement of a 140 metre length of existing hedgerow with shrubs and herbs of UK provenance be planted around the boundaries of the car park. The landscape plan also includes the addition to the site of 200 square metres of wildflower meadow. Taken together these measures more than meet the statutory minimum 10% biodiversity gain. The addition of 3 bat roosting boxes and 6 swallow nesting boxes will further improve biodiversity. The water vole population identified on the site will be protected and habitats maintained.

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Appendix 1: Water Vole Reasonable Avoidance Strategy

A detailed terrestrial mammal survey was carried out on 1st May 2024 and upon two other occasions throughout May 2024. Evidence for water voles was found during the survey. A water vole burrow was identified on the southern bank of Pond & ditch number 1 (see Figure 1 below).



Figure 1 Location of water vole burrow on the bank of Pond & ditch number 1

Terrestrial mammal survey results



Figure 2 Compartment D is an area of tussock grass with some trees and shrubs surrounding a ditch terminating in a pond. The ditch and pond were dug out to alleviate flooding approximately 18 months earlier.



Figure 3 Pond & ditch inside compartment D



Figure 4 Evidence for water voles in Pond and ditch number 1

A recently excavated ditch terminating in a small pond have been excavated during the last two years in order to alleviate flood risks. The pond is at an early successional phase and has been colonised by flote grass. A few seedlings of water loving trees alder and willow have begun to grow on the margins of the pond. A water vole burrow was clearly visible on the southern bank of the pond and is shown in Figure 4 above.

As water voles are present on the site it is vital that measures be taken to avoid any negative impacts upon this protected species as a result of the development proposals. Therefore it is recommended that a reasonable avoidance strategy be adopted in relation to water voles.

Initially a 10 metre wide protective buffer zone be established around the burrow (see Figure 5 below). The tussocky grassland comprising habitat compartment D is ideal habitat for water voles. For this reason this habitat should be retained and protected within a radius of 10 metres of the burrow. The pond and drainage ditch being used by the water voles should be retained and maintained. Any works inside this protected area should be kept to a minimum and supervised by a suitably qualified ecologist.



Figure 5 Red line showing 10 metre protective buffer zone around water vole burrow

Reasonable avoidance methodology for carrying out works near water vole habitat without a license

If it is considered essential to undertake works inside the 10 metre radius protective buffer zone:

1. The work must be necessary and unavoidable.
2. A method statement must be prepared, describing how work will be undertaken to minimise the likelihood of any offences being committed.
3. All works within 10 metres of the nearest sett entrance must be undertaken using hand tools only unless unavoidable. In the event that work must be carried out using machines within the protective buffer zone this should be carried out under the supervision of a qualified ecologist.
4. Fires and chemicals must not be used within 20 metres of a sett. Chemicals should be stored safely away from the sett area.
5. Disturbances, such as loud noise or vibrations, that might agitate badgers occupying a sett must be avoided or limited to areas well away from the sett.
6. Trees and shrubs must be felled so that they fall away from the obvious direction of a sett and must not be uprooted but cut to ground level where necessary.
7. Entrances to burrows must not be obstructed or buried or excavated.
8. All work must be carried out as quickly and quietly as possible.

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