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Technical Report

Ysgol Penyffordd

Ecology Report

Wynne Construction

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1 Introduction

1.1 Terms of Reference

Atmos Consulting Ltd (Atmos) was commissioned in May 2017 by Wynne Construction Ltd to undertake a desk study and ecological walkover survey of the Penyffordd Primary School and produce an Ecological Assessment Report to accompany the planning application for the site.

1.2 Objectives of the Study

The principal objectives of the baseline ecological assessment provided in this report were to:

- Undertake a preliminary desk study and extended Phase 1 habitat survey to describe the baseline ecological status of the site;
- Determine the potential of the area of the proposed development work to support protected species of which account must be taken prior to and during the planned works, in accordance with the relevant wildlife legislation;
- Assess the potential for other notable species, such as Welsh Species of Principal Importance, which should be considered during the planning process;
- Assess the potential for ecological impacts likely to arise from the construction and operation of the proposed development, including access roads etc, and to recommend mitigation and enhancement measures; and to
- Provide guidance and recommendations on how to enhance the biodiversity of the site and manage this resource into the future. This is provided in the context of the BREEAM 'Excellent' rating which this development requires to gain Welsh Government funding.

1.3 Site Description

The application site lies within the village of Penyffordd in Flintshire, Wales, and centres on grid reference SJ 30101 61163. The school site covers a total area of 2.07 ha and is surrounded on all sides by housing estates. The site currently comprises the existing school buildings, car park, hardstanding playgrounds and two large playing fields. Mature broadleaved trees are present in hedgerows on the site, and small areas of tall ruderal vegetation and scrub are also present in field corners.

1.4 Proposed Development

The proposed development involves the demolition of the existing school buildings and the construction of a new school building with associated playgrounds and landscaping to the south of the existing school, on land which is currently used as a school playing field. The proposed site layout is provided in Appendix B (as submitted by Ryder Landscape Consultants).

2 Legislation and planning policy

2.1 National Planning Policy

In Wales, guidance on nature conservation planning policy is provided in the Welsh Government's **Technical Advice Note 5: Nature Conservation and Planning (TAN 5)** which supplements the land use policy document **Planning Policy Wales**. TAN 5 provides advice about how the land use planning system should contribute to protecting and enhancing statutory and non-statutory sites of biodiversity and/or geological conservation value, as well as species protection and biodiversity conservation in the wider environment. To achieve this, it demonstrates how local planning authorities, developers and key stakeholders in conservation can work together to deliver more sustainable development that does not result in losses of the natural heritage, but instead takes every opportunity to enhance it.

TAN 5 also states that the presence of a protected species is "*… a material consideration when a planning authority is considering a development proposal which, if carried out, would be likely to result in harm to the species or its habitat*". If there is likely to be an effect on a protected species, adequate mitigation must be proposed prior to planning permission being granted.

All public authorities have a requirement to pay due regard to the conservation and enhancement of habitats and species through Section 40 of the **Natural Environment and Rural Communities Act 2006** (NERC), which states, "*Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity*". To this end, Section 42 of the NERC Act provides for the establishment of a list of habitat and species that are considered to be of "*principal importance for the conservation of biological diversity in Wales*". This list can be viewed on the DEFRA website at www.defra.gov.uk.

National legislation for the special protection of selected species is provided in the **Wildlife and Countryside Act 1981**, as amended. Under Section 1(1) and 1(2), all British bird species, their nests and eggs (excluding some pest and game species) are protected from intentional killing, injury or damage. Under Sections 1(4) and 1(5), special penalties are applied to bird species included on Schedule 1 of the Act, and protection is extended for these species to disturbance to birds whilst building, in or near a nest and disturbance to dependant young. Section 9(4)(a) prohibits the damage, destruction, or obstruction of access to any structure or place which any wild mammal listed on Schedule 5 uses for shelter or protection, and Section 9(4)(b) prohibits the disturbance of any such mammal while it is occupying a structure or place which it uses for that purpose.

The **Protection of Badgers Act 1992**, as amended, provides protection to badgers *Meles meles* and their setts.

A number of animals, known as European protected species (EPS), are afforded full protection through inclusion on Schedule 2 of **The Conservation of Habitats and Species Regulations 2010**, as amended. The Regulations provide protection against deliberate disturbance to those animals wherever they are present, and provides tests against which the permission for a development that may have an effect on a Schedule 2 protected species must be assessed before permission can be given.

In addition to species protection, the Wildlife and Countryside Act and Habitats Regulations also set out requirements/procedures for the notification, designation and protection of specific localities in order to preserve important nature conservation resources.

2.2 UK Post-2010 Biodiversity Framework

The 'UK Post-2010 Biodiversity Framework' (JNCC and DEFRA, 2012), published in July 2012, sets out a framework of priorities for UK-level work for the Convention on Biological Diversity, to which the UK is a signatory. Covering the period 2011-2020, this framework replaces the original UK Biodiversity Action Plan (UK BAP, 2004) system, and now the work is focussed on the separate countries (England, Scotland, Northern Ireland and Wales).

The overall aim remains to protect a number of rare species and habitats and reverse the declines of more widespread but declining species and habitats, and so currently many of the species and habitats in the UK BAP still form the basis of the biodiversity work carried out in the devolved countries.

In addition to the species on the UK BAP, BAPs have been devolved to local levels (LBAPs). Under the NERC Act, the Welsh government and public bodies, including planning authorities, have a duty to have due regard to the purpose of conserving biodiversity, so it remains good practice for BAP and LBAP species and habitats to be taken into consideration in the planning of a development scheme.

2.3 Local Planning Policy

The local planning authority relevant to the site, Flintshire Council, has a duty to consider the conservation of biodiversity when determining a planning application. This includes having regard to the safeguard of species protected under the law and also sites designated for their wildlife or geological importance and a range of other important species and natural features.

3 Review of Existing Information

3.1 Desk Study

Review of existing information and records held by local organizations can help establish the extent to which species, habitats, statutory designated sites, such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Wetlands, Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs) or non-statutory designations, such as North Wales Wildlife Trust Reserves, Local Wildlife Sites or ancient woodland, all of which represent material considerations in planning terms, are likely to be present on or in the vicinity of a proposed development site. A consultation exercise was therefore undertaken in May 2017 with the North Wales Local Record Centre 'Cofnod' in order to obtain existing records of designated nature conservation sites and protected or otherwise notable species within 1km of the application site.

3.1.1 Statutory nature conservation designations

No statutory nature conservation designation overlaps with the proposed development site, and no such designation is present within 1km of the application boundary.

3.1.2 Non-statutory nature conservation designations

A Local Wildlife Site is present approximately 0.8km to the west of the site. Black Brook Plantation (26SE01) is a broad-leaved semi-natural woodland, and includes the habitats broad-leaved semi-natural woodland, broad-leaved plantation, broad-leaved parkland/scattered trees, marsh/marshy grassland, fen and standing water.

An ancient woodland site is also present approximately 150m to the south-west of the site.

3.1.3 Protected or otherwise notable species

Cofnod did not provide any records of protected or notable species relating to the site itself.

Two records of great crested newt *Triturus cristatus*, an EPS, were provided for locations 546m and 915m west of the site. Both date from 1992.

Three records of bat roosts were provided within 1km of the site: Two records of common pipistrelle *Pipistrellus pipistrellus* roosts were given, one 150m northeast of the site (record dates to 1993, roost size not provided) and the other 700m north (record dates to 1993, roost comprising 18 individuals). In addition, a record was provided of an unidentified *Pipistrellus* species roosts 250m northwest of the site (record dates to 2003, roost comprising 3 bats). All native bats are EPS.

A Clwyd badger group record, dating from 2007, was provided for the 1km grid square, which overlaps with the site. The exact location was not detailed. The data comprised two badger setts.

Six records of hedgehog *Erinaceus europaeus* were provided within 1km of the site, with records dated between 2002 and 2015. Hedgehog is a Welsh Priority Species.

Records for otter *Lutra lutra* were provided from locations 677m north and 907m south of the site. Both records dated from 2001 and were road causalities.

Records for 40 species of bird were provided within 1km of the site. This included several species which could potentially use the application site, including the Schedule 1 species barn owl *Tyto alba*, and the Welsh Priority Species bullfinch *Pyrrhula pyrrhula*, grasshopper warbler *Locustella naevia*, grey partridge *Perdix perdix*, house sparrow *Passer domesticus*, kestrel *Falco tinnunculus*, linnet *Linaria cannabina*, song thrush *Turdus philomelos* and starling *Sturnus vulgaris*. Other species recorded which could be present in the habitats on the school site included goldcrest *Regulus regulus*, green woodpecker *Picus viridis*, lesser whitethroat *Sylvia curruca*, meadow pipit *Anthus pratensis,* swallow *Hirundo rustica*, whitethroat *Sylvia communis* and willow warbler *Phylloscopus trochilus*. Other species listed which are not considered relevant to the habitats present on the site included the Schedule 1 species brambling *Fringilla montifringilla* and little ringed plover *Charadrius dubius*, and the Welsh Priority Species curlew *Numenius arquata*, lapwing *Vanellus vanellus*, and tree pipit *Anthus trivialis*.

4 Methodology

4.1 Extended Phase 1 Habitat Survey

A suitably experienced ecologist from Atmos undertook an extended Phase 1 habitat survey on 16th May 2017. The survey area is shown on the map in Figure 1.

Phase 1 habitat survey is a standardised method of recording habitat types and characteristic vegetation, as set out in the 'Handbook for Phase 1 Habitat Survey – a technique for Environmental Audit' (JNCC, 2010[1]). This survey was 'extended' through the additional recording of specific features indicating the presence, or likely presence, of protected species or other species of nature conservation significance.

In the survey, habitats were mapped and 'target notes' were produced to describe characteristic habitats, features of ecological interest, or any other features which could require sensitive design, mitigation, or which could be subject to enhancement as part of the proposed development.

Whilst not a full protected species or detailed botanical survey, the extended Phase 1 method enables a suitably experienced ecologist to undertake a baseline ecological appraisal of the site that:

- Provides a preliminary evaluation of the nature conservation significance of the site and assesses the potential for impacts on habitats/species likely to represent a material consideration in planning terms; and
- Determines the scope of further specialized surveys that may be required.

4.2 Bat Survey

4.2.1 Buildings

An experienced bat ecologist from Atmos undertook an external inspection of the buildings on the site on 16th May 2017. The external inspection involved assessment of features visible from ground level which may provide potential roosting sites for bats. This included looking for missing/lifting tiles and gaps in soffits or brickwork of buildings. Internal inspection was not considered necessary as there were no internal roof spaces to examine.

As some features were identified as providing low bat roost potential, a single dusk bat emergence survey was carried out on 8th June 2017. As recommended by Bat Conservation Trust (BCT) guidance (Collins et al., 2016[2]), the survey commenced 15 minutes before sunset and continued until 90 minutes after sunset. The survey was carried out by three suitably experienced surveyors equipped with Anabat SD2 detectors, with recorded calls downloaded and analysed to species level using the Analook program.

[1] JNCC (2010). Handbook for Phase 1 habitat survey - a technique for environmental audit. Revised re-print. Joint Nature Conservation Committee, Peterborough.

[2] Collins J (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London.

4.2.2 Trees

The mature trees present on the site were also assessed for bat roost potential. This included looking for natural holes and rot holes, woodpecker holes, cracks and splits in major limbs, loose bark, dense ivy and hollows/cavities of trees.

As four trees were assessed as providing moderate or high bat roost potential, dusk bat emergence and dawn bat re-entry surveys were recommended. The BCT guidance recommends that trees with high roost potential should be surveyed on three occasions and trees with moderate roost potential should be surveyed twice. The first surveys (dusk emergence surveys, following the methodology detailed above) were carried out on 13th and 21st June 2017 and the results of those survey are included in this report. The remaining surveys are to be carried out in late June and early July, and will be reported as an addendum to this report.

5 Results

5.1 Habitat Baseline

The habitats recorded within and immediately adjacent to the site are shown on Figure 1 and described below. General target notes are also shown on Figure 1 in Appendix A and detailed in Appendix C, and a botanical species list for the site is presented in Appendix E. No invasive species were recorded to be present on the site.

The habitats present were as follows, listed in decreasing order of extent:

- Poor semi-improved neutral grassland;
- Buildings;
- Hardstanding;
- Amenity grassland;
- Scrub;
- Bare ground;
- Tall ruderal vegetation;
- Intact hedgerow;
- Boundary fences; and
- Individual broadleaved trees.

5.1.1 Poor semi-improved neutral grassland

The site is predominantly poor semi-improved, neutral grassland used as school playing fields (TN4 and TN5). The grassland is mowed, so the sward is kept short. Species frequently present in the grassland include annual meadow-grass *Poa annua*, perennial rye-grass *Lolium perenne*, Yorkshire fog *Holcus lanatus*, cock's-foot *Dactylis glomerata*, red fescue *Festuca rubra*, daisy *Bellis perennis*, dandelion *Taraxacum officinale* Agg., white clover *Trifolium repens* and creeping buttercup *Ranunculus repens*.

5.1.2 Buildings

Two buildings were present on the site: The main school building (TN16) and a small garage outbuilding (TN17). The school building was a single story brick built building with a flat roof. Wooden barge boards were present on some sections of walls, and white soffit boxes were present above some windows and around the entrance. The external garage was a single-story brick-built building, with flat roof and wooden barge boards.

5.1.3 Hardstanding

Areas of hardstanding were present around the buildings on the site (TN12, TN13). This hardstanding was largely intact, and plants were absent, although ornamental planting boxes were present containing flowers such as pansy *Viola sp.,* geranium Geranium sp. and lavender *Lavandula angustifolia*.

5.1.4 Amenity grassland

Small areas of amenity grassland were present at the front of the school (TN14). The amenity grassland was dominated by annual meadow-grass and perennial rye-grass,

with cock's-foot, Yorkshire fog, daisy, dandelion and white clover also present. There were also 15 semi-mature trees present, including birch *Betula* sp., Norway maple *Acer platanoides*, sycamore, rowan *Sorbus aucuparia*, cherry *Prunus* sp. and apple *Malus* sp.

5.1.5 Bare ground

A climbing play area to the south of the school buildings was surrounded by wood chip, creating an area of bare ground partly colonised by rosebay willowherb *Chamaenerion angustifolium*, pineapple weed *Matricaria discoidea* and dandelion.

5.1.6 Tall ruderal vegetation

Tall ruderal vegetation was present in two locations. One (TN10) was in the corner of the eastern playing field, where common nettle *Urtica dioica*, cleavers *Galium aparine*, broadleaved dock *Rumex obtusifolius*, hogweed *Heracleum sphondylium* and rosebay willowherb dominated. The other area was in the wildlife garden (TN15). A small pond was present, but was completely dry and full of dead leaves, with the margins overgrown by plants such as rosebay willowherb, cleavers, dock, creeping thistle *Cirsium arvense* and common nettle.

5.1.7 Intact hedgerow and scrub

One species-rich hedgerow (TN1) was present on the site. This hedgerow and tree line ran north-south across the centre of the site. The hedgerow included the woody species hawthorn, blackthorn *Prunus spinosa*, holly *Ilex aquifolium*, sycamore, beech *Fagus sylvatica*, field maple *Acer campestre*, elder *Sambucus nigra* and rose *Rosa* sp. Shrubs in the hedgerow included yew *Taxus baccata* and laurel *Laurus sp*. Standard trees in the hedgerow included five mature sessile oak *Quercus petraea*, three mature/semi-mature sycamore, a mature *Zelkova* and a mature ash *Fraxinus excelsior*. Smaller trees included silver birch *Betula pendula*, horse chestnut *Aesculus hippocastanum* and holly.

The boundaries of the school playing fields were largely species-poor hedgerows with fences in front or behind (TN6, TN7, TN8, TN9) and with some large gaps in the hedgerows present. The hedgerow along the southern and western boundaries of the western playing field (TN2) was a species poor hedgerow dominated by hawthorn, with hazel, elder and *Rosa sp* also present. Trees in the hedgerow included silver birch, bird cherry *Prunus padus*, field maple, alder *Alnus glutinosa*, willow *Salix* sp. and horse chestnut. This hedgerow and treeline, provides a good habitat feature for species such as birds and bats.

To the north of the school buildings, the site boundary was a species-poor hedgerow dominated by hawthorn, with hazel *Corylus avellana* also present (TN14). A *Leylandii* hedgerow was present to the east of the school carpark.

5.1.8 Boundary fence

Several sections of the boundary were wire or wooden fences.

5.1.9 Individual broadleaved trees

A total of 27 individual trees were recorded on the site, along with several groups of smaller trees. Individual tree species included sessile oak, ash, sycamore, Zelkova, silver

birch, rowan, apple, Norway maple, holly and cherry. The six mature sessile oaks formed the treeline which crosses the centre of the site.

5.2 Habitat Recommendations

Recommendations are provided below regarding the management of the habitats present on the site, and also recommendations regarding the enhancement of site ecology which the BREEAM 'Excellent' rating requires.

5.2.1 Wildflower planting

It is recommended that some areas of the new school site are planted as wildflower areas. Some areas have already been identified on the submitted landscape plan (see figure in Appendix B), with further areas under consideration. The diverse wildflower planting should be on low-fertility topsoil, and species assemblages should be designed with input from the site ecologist to be appropriate for soil conditions and location with locally-provident wildlife-friendly species favoured. Depending upon the requirements of visual amenity in different parts of the site, grassland swards can be designed to be of low, medium or tall height. This habitat will provide diverse nectar sources for a variety of invertebrate species. The grassland areas will also provide a mix of invertebrate species suitable for foraging bats and birds. Management of these areas should require that cutting is carried out only in late summer. Following cutting, the arisings should be left in situ for at least 5 days to allow seeds to dry and drop out, and then removed.

5.2.2 Hedgerow planting

As the section of hedgerow crossing the centre of the site will be removed for the development of the new school, new hedgerows will planted to replace the hedgerow habitat that will be lost. Some areas for hedgerow planting have already been identified on the submitted landscape plan (Appendix B), with further areas under consideration. New hedgerows should be planted as species rich hedgerows, with at least five native woody species being planted.

5.2.3 Tree planting

Some trees on the site are proposed for removal to allow for the construction of the new school (see the submitted Arboricultural Impact Assessment for further details regarding trees are to be retained and removed). The site design process ensured that all mature oak trees present on the site, which have the highest ecological and landscape value, are retained and protected within the development. Trees to be removed are largely to be semi-mature trees, as well as one mature ash tree which is to be removed for safety reasons.

To compensate for the loss of trees, tree planting should be carried out as part of the landscaping of the new school. Locations of new trees are shown on the submitted landscape plan (Appendix B).

5.2.4 Wildlife-friendly planting

Formal planting in beds around the buildings should also attempt to maximise value for biodiversity through use of wildlife-friendly, native or non-invasive exotic species where

possible. Where cultivars of native species are preferred, these should be selected specifically based on them having retained their potential to provide resources, such as nectar (double-flowered forms often lack nectaries) and overwintering shelter for a range of invertebrates.

5.2.5 Wildlife-friendly hard landscaping

Although hard landscaping does not offer any provisions for wildlife, physical features can reduce the potential impacts on wildlife. Considerations for this site should include the provision for species such as badgers, reptiles and hedgehogs to move unhindered through the site. This can be achieved by having periodic low kerbing and avoidance of any formal sunken areas where small animals may become trapped.

5.2.6 Wildlife-friendly habitat management

Management of all habitats created on site should be undertaken in a wildlife-friendly way. Such considerations include:

- As described in section 5.2.1 above, areas planted with wildflower seed mix should not be cut until late summer, with arising left in situ for at least 5 days to allow seeds to dry and drop out, and then removed.
- It is recommended that the margins of the retained eastern grassland playing field should be mown less frequently than they are currently. Whilst the football pitch obviously requires frequent mowing, the boundaries, including a 5-10m strip along the southern boundary of the field and a 2-3m strip along the western and eastern boundaries of the field, should only be mown in late summer. This would provide habitat with nectar sources for a variety of invertebrate species and shelter for small mammals.
- Avoidance of intrusive management work to trees, shrubs and long vegetation during bird nesting season (March to August inclusive); and
- Maintenance and replacement of bird and bat boxes – bat boxes will need to be checked by a licenced bat worker.

6 Protected Species

6.1 Protected Species Baseline

6.1.1 Bats

Roosting potential of buildings on site

All buildings currently present on the site are proposed for demolition to allow for the construction of the new school and car park.

The main school building (TN16) was a single story brick built building with a flat roof. White soffit boxes were present above some windows and around the school entrance and these soffit boxes were considered to provide low bat roost potential, as crevices were present which could allow bats access to the internal spaces in the soffit boxes. The external garage (TN17) was also a single story brick built building, with a flat roof. Wooden barge boards on the front of the buildings provided a crevice between the boarding and the brickwork which could potentially be used by roosting bats, and so this structure was also considered to have low bat roost potential.

The dusk emergence survey carried out by three surveyors on the 8th June 2017 did not record bats emerging from the building.

Roosting potential of trees on site

Some trees on the site are proposed for removal to allow for the construction of the new school. The submitted Arboricultural Impact Assessment details which trees are to be retained and which are to be removed, and this document should be referred to for further information.

The trees on site were inspected from ground level to determine their potential to support bat roosts. Of the trees present on the site, T19 was considered to provide high bat roost potential, T8, T9 and T15 were considered to provide moderate bat roost potential, and T10, T13, T14, T16 and T18 were considered to provide low bat roost potential. Full descriptions are provided in Appendix D.

The four trees assessed as providing high or moderate bat roost potential (T19, T8, T9 and T15) are all to be retained within the proposed development. However, survey was still carried out as these trees will be in close proximity to the development and two trees (T8 and T15) may have pruning or crown reduction works carried out for safety reasons.

As described in Section 4.2.2, the BCT guidance recommends that trees with high bat roost potential (here: T19) should be surveyed on three occasions and trees with moderate potential (here: T8, T9 and T15) should be surveyed on two occasions. The first dusk emergence survey on trees T8, T9 and T19 was carried out on 13th June 2017, and the first dusk emergence survey on tree T15 was carried out on 21st June 2017. These surveys did not record any bats emerging from these trees. The remaining surveys are to be carried out in late June and early July, and will be reported upon as an addendum to this report.

Foraging and commuting

During the bat emergence surveys described above, the surveyors also made notes regarding flight and foraging activity of bats in the general area. These surveys recorded individual common pipistrelle and soprano pipistrelle bats foraging intermittently in the two hours following sunset along the hedgerow-treeline that crosses the site, along the trees that form the western boundary of the school site and generally around the buildings. Individual noctule bats were also recorded on several occasions in flights high across the site.

The hedgerows on site can therefore be seen to provide good foraging habitat for bats. The activity patterns observed during the surveys do not suggest that they are of particularly high value to bats, but they are well used for foraging. The section of hedgerow to be removed, which crosses the centre of the site, does not form a key linkage between habitats. The aerial image provided in Figure 2 in Appendix A shows that while the hedgerow to be lost is well linked to other habitats in the wider landscape, in itself it does not form a key linkage.

Noctule and pipistrelle bats do also forage in the open habitats of the site. As a result of the proposed development, much of the western playing field grassland will be replaced by school buildings and hardstanding. The eastern playing field will remain as grassland. This does represent a loss of foraging habitat, however, semi-improved grassland is a widespread habitat in the local area and as such this loss is unlikely to have a significant effect on the local bat population.

6.1.2 Great crested newt

As the small pond present on site was dry at the time of survey (16th May 2017), there is no habitat suitable for use by breeding great crested newt on the site. The nearest pond shown on the OS mapping is 120m to the north of the site, and is likely to be a small garden pond. There are several ponds within 1km of the site. However, as the site is surrounded by housing estates on all sides, and beyond that is enclosed by a triangle of three main roads, the habitat connectivity between offsite ponds and the site itself is very poor. It is therefore not considered that great crested newts would be present on the site.

6.1.3 Otter and water vole

As described in Section 3.1.3, otters are known to be present within the local area. However, there are no watercourses present on or adjacent to the site and so otter is unlikely to use the site.

No records of water vole were identified in the desk study and the lack of watercourses means there is no potential for water vole to occur on site.

6.1.4 Reptiles

No records of reptiles were identified in the desk study, and the site is considered to provide negligible habitat for reptiles.

6.1.5 Birds

The mature trees and hedgerows on the site provide potential nesting sites and a feeding resource for wild birds. Species recorded during the Phase 1 survey included

blackbird *Turdus merula*, wren *Troglodytes troglodytes*, robin *Erithacus rubecula*, song thrush, chiffchaff *Phylloscopus collybita* and wood pigeon *Columba palumbus*. Other species present locally which may use the site are listed above in Section 3.1.3.

6.2 Protected Species Recommendations

Recommendations are provided below regarding the mitigation required to ensure the safeguarding of protected species present on the site, and also recommendations regarding the enhancement of site ecology which the BREEAM 'Excellent' rating requires.

6.2.1 Bats

Bat mitigation and compensation measures

The hedgerows and grassland habitats on the site provide good foraging and commuting habitat for bats.

As the hedgerows on the site do provide foraging habitat for bats, it is recommended that any loss of hedgerows is compensated through the planting of new hedgerows within the site. The submitted planting plan (see Appendix B) shows area to be planted with hedgerow and also shows the planting of new trees on the site. It is considered that collectively this new planting should adequately compensate for the loss of the hedgerows.

A further aspect of the recommended mitigation relates to the use of artificial lighting installed as part of the development. A lighting strategy will be developed for the school site which should ensure that artificial lighting is kept to a minimum and directed away from habitat features, such as hedgerows and trees which may be used by bats. The lighting plan should implement the following principles which will ensure that disturbance to nocturnal species is minimised:

- External lighting will be on a timed setting, which can be amended by school staff to ensure that lighting is only used as and when required for the safety and security of pupils and staff; and
- Lighting intensity and directional control has been used to tailor lighting to specific requirements. For example, along footpaths low intensity, low level bollard lighting has been chosen to provide an appropriate level of illumination. Car park lighting will require higher intensity, higher level illumination, but the lighting plans show that light spillage beyond the site boundary is minimal, with illumination levels decreasing rapidly to 2.5 lux.

Bat enhancement measures

Trees identified are providing bat roost potential are to be retained within the development, however, it is recommended that bat boxes should be incorporated into the site design to increase the provision of roosting spaces on the site. The below recommendations have been based on the species observed using the site.

The site should provide at least two of the following items:

- Two bat boxes suitable for use by small number of summer roosting pipistrelle or noctule bats, placed on a south or west facing aspect at a height of at least 3m on trees within hedgerows to be retained in the development.

- Two bat boxes suitable for use by small number of summer roosting pipistrelle or noctule bats, placed at a height of at least 3m on a south or west facing wall of the new school building.
- Two bat boxes suitable for use by small number of winter hibernating pipitrelle or noctule bats, placed on a north or east facing aspect at a height of at least 3m on trees or on the new school building.

6.2.2 Birds

Bird mitigation measures

As birds are likely to nest in the hedgerows and trees present on the site, any work to hedgerows or trees should take place outside of the breeding bird season (March-August, inclusive). If this is not possible, then these habitats should be checked by a suitably experienced ecologist for nesting birds prior to works being carried out, and if present, nests should be left undisturbed until chicks have fledged.

Bird enhancement measures

It is recommended that bird boxes should be incorporated into the site design, to increase the provision of nesting spaces on the site. The recommendations listed below are based on the species observed using the site and records of species identified in the desk study as being present locally. The site should provide at least three of the following items:

- Four nest boxes suitable for use by species such as wren or robin, placed at a height of at least 3m on trees within hedgerows to be retained in the development.
- Two nest boxes suitable for use by house sparrow and two nest boxes suitable for use by swift, located on west or south facing walls of the new school buildings, and mounted just below the roof, either within the wall or mounted externally.
- Four nest boxes suitable for use by starling placed at a height of at least 3m on trees within hedgerows to be retained in the development.
- A single kestrel nest box mounted on a pole at a height of at least 5m and placed in south-west corner of the eastern playing field adjacent to mature retained trees, with the entrance facing east, northeast, or southeast.

Consideration should be given to installing boxes with wireless CCTV in place, so that images can be viewed on monitors inside the school, for educational and general interest purposes.

6.2.3 Badger

No badger setts are present on the site. However, badgers are known to be present within 1km and could range across the site. Therefore all works within the site should adopt good practice measures and ensure that any excavations are covered overnight to prevent mammals such as badgers becoming trapped. Where this is not practical a mammal ladder (e.g. wooden plank) should be included to allow animals to escape freely.

6.3 Enhancement of Site Ecology

In addition to the habitat and protected species recommendations made above, recommendations are also provided below on enhancement of site ecology, as required for a BREEAM 'Excellent' rating.

6.3.1 Invertebrates

It is recommended that to maintain and increase the invertebrate fauna of the site, four invertebrate nest boxes should be installed in the school grounds. These should be located on suitable sheltered fence posts or trees with a southerly open aspect with a good proportion of direct sunlight. The final locations of these would be decided once the landscaping process has been completed.

6.3.2 Hedgehogs

The desk study documented the presence of hedgehog in the local area. To enhance the site for hedgehogs, the following should be implemented:

- Create two designated 'wild corners' within the school site, with a small log pile and where tall vegetation is allowed to grow.
- Place a 'hedgehog house' in each of the wild corners, to provide safe spaces for hedgehogs to nest and to hibernate through the winter.

If possible, given the requirement for secure fencing around the site, small gaps should be left at the bottom of fences to allow hedgehogs to move in and out of the site.

Appendices

Appendix A. Phase 1 Habitat Survey Map and Aerial Imagery of the Site

Penyffordd

Wynne Construction Ltd

Phase 1 Habitat Survey Results

330000 330100 330200

361200 361100

Key

- Planning boundary and survey area
- Target Note
- Broadleaved Parkland/scattered trees
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Fence
- Scrub - dense/continuous
- SI Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- A Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
- Hardstanding

atmos CONSULTING

0 5 10 20

Metres

N

Scale @ A3:

1:750

28/06/2017 26603/HB/001a

Drawn by: AA Checked by: TH Approved by: ES

Penyffordd

Wynne Construction Ltd

Figure 2
Aerial imagery illustrating habitat connectivity in the local area

Key

Site boundary

Draft

atmos CONSULTING

0 50 100 200

Metres

N

Scale @ A3:
1:4,000

15/06/2017 26603/SL/002a

Drawn by: AA Checked by: Approved by:

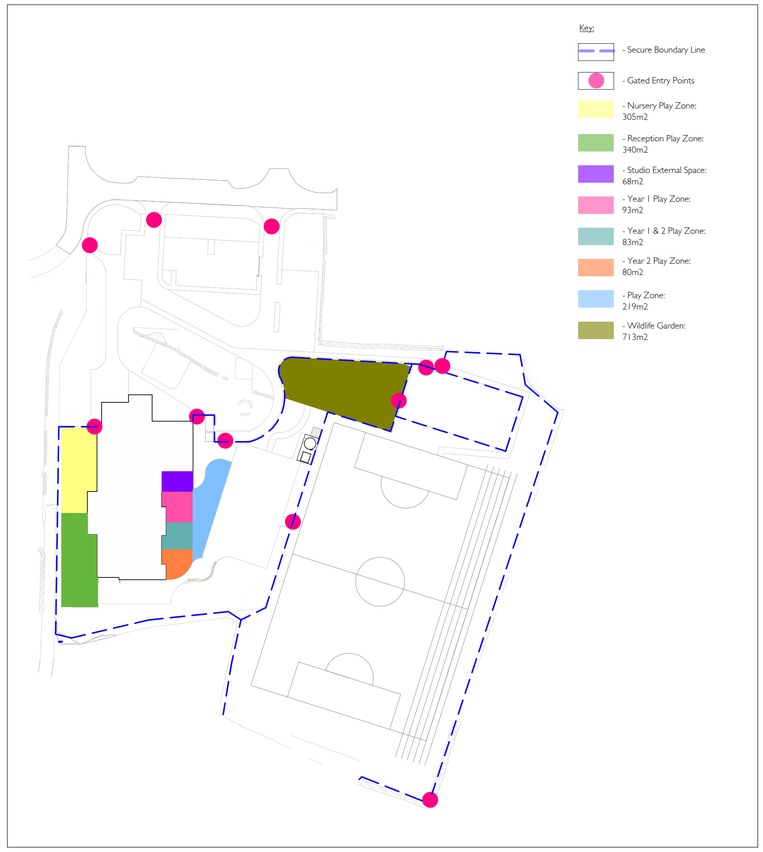
Appendix B. Current Landscape Plan (Ryder Landscape Consultants)

MASTERPLAN

1:500 at A1

SPATIAL ARRANGEMENT

1:1000



Notes:

1. Vehicular Entrance:
Widened to accommodate coach access and pavements either side of the road.

2. Staff and Visitor Parking:
38 spaces, using the existing parking area for ease of construction

3. Drop Off Area:
5 spaces for managed drop off and pick up. Also accommodates a coach or bin lorry to park within the layby.

4. Disabled Parking Bays:
4 spaces located closest to the main entrance with drop kerbs and level access to main entrance.

5. Main Pedestrian Entrance:
New pedestrian route from Abbott's Lane leads directly to the main entrance.

6. Pedestrian Boulevard:
A pedestrian route leads to the main entrance between existing and new tree planting. Wide enough to accommodate a fire engine.

7. Existing Tree Belt:
Healthy feature trees are retained with undergrowth cleared with grass embankment allowing glimpses of the building from the car park.

8. Duke of Westminster's Zelkova Tree:
Ornamental tree will become a new feature along the entrance frontage with seating underneath for parents waiting at pick up.

9. Community Access:
A side path with gated access provides direct access to the football pitch without breaking the school's secure boundary line.

10. Multi-Use Games Area, MUGA:
A fenced and gated court for five-a-side and other court games.

11. Sports Field:
Grass football/ rugby and running track to be left untouched. A new fenceline will enclose it to allow community use without breaking the school's secure boundary line.

12. Wildlife Garden:
Located within the school secure boundary line, the main path provides access between the school and the MUGA.

13. Wildlife Planting:
New habitat areas will be designed by the school, with mown paths, orchard tree planting, bug hotels and other features that the school can implement over time.

14. Raised Planting Beds:
Timber log raised beds are within the Wildlife Garden for planting flowers and vegetables.

15. Seating Area:
Informal seating area for classes in the Wildlife Garden.

16. Picnic Area

17. Key Stage 1 and 2 Yard:
Netball line markings with access to the Sports Field and Play Zone.

18. Play Zone:
Colourful safety surfacing and artificial grass create a play zone with mounding and tunnels.

19. Key Stage 1 Play Zones:
Raised beds with hedge planting creates a green external classroom space for individual classes. With seating areas, artificial grass corners for flexible use.

20. Key Stage 2 Yard:
Open play space with line markings is flexible for potential building extension.

21. Meadow Garden:
Wildflower seed & main grass paths

22. Amphitheatre:
Timber amphitheatre would use the natural levels to create a performance area under existing tree, designed for both large and small groups.

23. Nursery and Reception Play Zones:
Raised timber planters create a back drop separation from the Public Footpath. With bench seating and sandpits the spaces extend naturally out of the covered teaching areas.

24. Access Route:
Access from the main entrance round to the Foundation Classes.

25. Bin Store:
Located close to the kitchen, between the existing trees and building to help integrate the scale.

26. External Store:
Relocated from existing school, to be clad and screened with planting.

27. Studio Play Zone:
Secured covered play area is easily accessible from the car park.

28. Sprinkler Tank:
Located between the Sports Field and the MUGA.

29. Cycle Shelter/Storage:
Lit and covered adjacent to main school gates

30. External battery:
Battery to be included with the Sprinkler Tank fence line.

31. Fire engine turning provision:
Grasscel or similar reinforced ground for turning vehicles.

32. Area of No Dig Construction:
RPA of an existing tree is to have an area of no-dig construction. Extent of area is dependent on Arb Report and tree works associated with construction access.

Notes

- This drawing is to be read as part of a full Landscape Drawing Package in conjunction with all the relevant surveys alongside the Architectural and Engineers drawings
- Only figured dimensions are to be taken from this drawing. Dimensions should not be scaled from this drawing, as scaling of this drawing cannot be assured.
- All dimensions are to millimetres unless specified otherwise
- All contractors must visit the site and be responsible for taking and checking all dimensions, services and setting out related to the works shown on this drawing
- All coordinates are set to dimensional points to enable easy cross referencing on site
- All setting out points are to be verified on site and any discrepancies should be clarified by the Landscape Architect
- Hatching is not a technical representation of surface patterns, contractors are to follow the line of direction specified on drawings . Where no line of direction is given contractor to contact Landscape Architect before laying. All levels should be checked on site and conflicts reported to the design office.

...If in doubt ask

Rev	Drawn	Checked	Date	Description
5	RF	SR	170627	Trees removed along western boundary for construction access
4	JG	RF	170622	Changes after client review
3	SO	RF	170620	General amendments following client feedback
2	RF	GO	170608	Realigned MUGA
1	RF	GO	170607	Issue for comment

FOR PLANNING

RYDER
LANDSCAPE CONSULTANTS

Meyer House, 42 City Road, Chester, CH1 3AE
TEL: 01244 400064 EMAIL: info@ryderlandscape.co.uk
www.ryderlandscape.co.uk Company Registration no: 6065464

Client:
Wynne Construction

Project:
Penyffordd Primary School

Drawing Title:
Masterplan

Drawn By: RF **Date:** 170601

Checked By: GO **Date:** 170601

Drawing Scale: As indicated **Sheet Size:** A1

Drawing No:	Status	Rev.
PYF-RYD-XX-XX-DR-L-2000	P	5

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Appendix C. Phase 1 Habitat Survey Target Notes

TN1

Hedgerow and treeline running north – south across the centre of the site. The hedgerow included the woody species hawthorn, blackthorn, holly, sycamore, beech, field maple, elder and *Rosa sp*. Shrubs in the hedgerow included yew and laurel. Standard trees in the hedgerow included five mature sessile oak, three mature/semi-mature sycamore, a mature *zelkova*, and a mature ash. Smaller trees included silver birch, horse chestnut and holly. Ground flora included ivy, cleavers, rosebay willowherb, field forget-me-not, creeping buttercup, greater plantain, curled dock, cow parsley, hogweed, foxglove, daffodil, field wood rush, bramble, hedge woundwort, nettle, white clover, daisy, celandine, cocks foot and Yorkshire fog.

TN2

Hedgerow and treeline present the western boundary of the site. Dominated by hawthorn, with hazel and rose also present. Trees in the hedgerow included silver birch, bird cherry, field maple, alder elder, *willow* and horse chestnut. Ground flora included dandelion, nettle, broad leaved dock, cleavers, cocks foot, lesser celandine, ivy, daffodil, hogweed, cow parsley, cuckoo flower, bramble, creeping buttercup, rosebay willowherb, speedwell, wood avens, hedge woundwort, greater plantain, vetch and Yorkshire fog.

TN3	
Southern boundary fence and hedgerow. Part of the hedge comprised *Leylandii*, with the eastern half comprising holly, hawthorn and sycamore with a line of mature sessile oaks. One oak tree with bat roost potential, a split branch with moderate bat roost potential slightly overhung the school boundary.	
TN4	
Western playing field. Species present included annual meadow-grass (D), perennial rye-grass (D), Yorkshire fog (F), cock's-foot (F), red fescue (F), creeping bent (O), meadow foxtail (O), sweet vernal-grass (O), daisy (F), dandelion (F),white clover (F), creeping buttercup (O/F), meadow buttercup (O), common knapweed (O), greater plantain (LD), red clover (O), germander speedwell (R), field wood rush (R), common mouse ear (LF), and pineapple weed (LF).	
TN5	
Eastern playing field. Species present included annual meadow-grass (D), perennial rye-grass (D), Yorkshire fog (F), cock's-foot (F), red fescue (F), sweet vernal-grass (O), daisy (F), dandelion (F),white clover (F), creeping buttercup (O/F), meadow buttercup (O), common knapweed (O), greater plantain (LD), red clover (O), germander speedwell (R), common mouse ear (LF), and pineapple weed (LF).	
TN6	
The northern boundary of the eastern playing field, partly comprising a 1.5m tall *Leylandii* hedge, partly a 1m tall hawthorn-holly hedge and partly a wire fence. The ground adjacent to the boundary was bare ground colonised with species including pineapple weed, cleavers, sow thistle, common nettle, cock's-foot, daisy, sycamore seedlings, germander speedwell, ivy, rosebay willowherb, vetch, black medic, herb Robert, greater plantain, ivy, daisy, creeping thistle, lesser celandine, cleavers, Yorkshire fog, sterile brome and false oat grass.	
TN7	
An area of blackthorn, hawthorn, bramble, nettle, cleavers, bracken *Pteridium aquilinum*, holly, with one semi-mature oak just over the boundary fence (no bat roost potential).	
TN8	
The eastern boundary comprising a 1.5m high hawthorn dominated hedgerow for much of its length, with small patches of scrub/tall ruderals present along the hedgerow (including	

bramble, common nettle and rosebay willowherb).	
TN9	
The southern boundary of the eastern playing field was a metal fence with a *Leylandii* hedge on the far side of the fence and mature *leylandii*, hawthorn and sessile oak trees overhanging parts of the fence.	
TN10	
A patch of tall ruderal in the corner of the eastern playing field, dominated by nettle, cleavers, broad leaved dock, hogweed and rosebay willowherb.	
TN11	
A woodchip play area, partly colonised by rosebay willowherb, pineapple weed and dandelion.	
TN12	
A hand standing play area adjacent to the mature oak trees in the hedgerow, with a path leading from the school buildings. Ornamental planting in containers.	
TN13	

Hardstanding playground with planting beds present, including ornamental flowers such as pansy, geranium and lavender.	
TN14	
Amenity grassland present around the front of the school. Grasses were dominated by annual meadow-grass and perennial rye-grass, with cock's-foot, Yorkshire fog, daisy, dandelion and white clover also present. The 15 semi mature trees present included birch, Norway maple, sycamore, rowan, cherry and apple. The hedgerow bounding the school buildings to the north and west was dominated by hawthorn and hazel.	
TN15	
Wildlife gardening area. Three planting beds were present, along with an apple tree, lilac bush and raspberry canes. A small pond was present (approximately 8m^2) but was dry and filled with leaves at the time of survey. Ruderals such as rosebay willowherb and herbs including cleavers, dock, thistle and nettle surrounded the pond.	
TN16	
School buildings comprising single story, flat roofed structures. Bat roost potential was largely negligible, however, two sections of the building did have large white soffit boxes with gaps under wooden boarding with provided potential access points for bats. These structures were assessed as providing low bat roost potential.	

	
TN17	
A small garage outbuilding present to the west of the main school buildings. This had largely negligible bat roost potential. However, the wooden barge board on the front of the building did provide a crevice between the board and the wall which was assessed as having low potential to support roosting bats.	

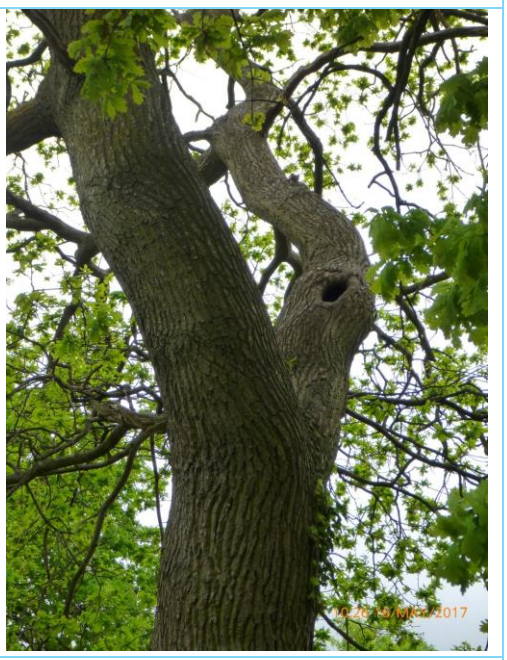
Appendix D. Bat Roost Assessment Notes

Feature **(N.B. Tree numbers correspond to those used in the Tree Survey)**	**Bat Roost Potential**	**Photos**
Trees T1 – T7		
Small semi-mature trees planted in amenity grassland at the front of the school buildings. Trees include rowan, birch, sycamore, apple and Norway maple. No features with bat roost potential present.	None	
Tree T8		
Large mature oak. A split branch on the south-western aspect approximately 4m high provides moderate bat roost potential.	Moderate	
Tree T9		
Very mature sessile oak. A split trunk and a crack in one branch provides moderate bat roost potential.	Moderate	
Tree T10		

Feature (N.B. Tree numbers correspond to those used in the Tree Survey)	Bat Roost Potential	Photos
Mature sessile oak, largely covered in ivy. No cavities apparent, but given the ivy coverage, assessed as providing low bat roost potential.	Low	
Tree T11		
Small holly tree, with no bat roost potential.	None	
Tree T12		
Semi-mature sycamore tree, trunk covered by ivy. No cavities suitable for use by roosting bats.	Negligible	
Tree T13		
Semi-mature sycamore tree, largely covered by ivy. No cavities apparent, but given the ivy coverage, assessed as providing low bat roost potential.	Low	
Tree T14		
Mature ash tree. Two small rot holes present about 3m high on the southern aspect, but endoscope survey revealed habitat of only low bat roost potential.	Low	
Tree T15		

Feature **(N.B. Tree numbers correspond to those used in the Tree Survey)**	**Bat Roost Potential**	**Photos**
Mature *Zelkova* tree. Moderate bat roost potential created by a tear wound on the main stem at 10m height on the north. Also a large nest constructed of sticks in the top of the tree (no sign of active occupation).	Moderate	 
Tree T16		
Mature sycamore tree. Trunk and branches very heavily covered by ivy. No cavities apparent, but given the ivy coverage, assessed as providing low bat roost potential.	Low	

Feature (N.B. Tree numbers correspond to those used in the Tree Survey)	Bat Roost Potential	Photos
Tree T17		
Mature sessile oak, no cavities suitable for use by roosting bats.	Negligible	
Tree T18		
Mature sessile oak immediately adjacent to T19, largely covered with ivy. No cavities apparent, but given the ivy coverage, assessed as providing low bat roost potential.	Low	
Tree T19		
Mature sessile oak in the hedgerow which runs through the centre of the site. Tree approximately 15m in height. On the eastern aspect just above the trunk fork, a large hole is present which leads into a sizable trunk cavity.	High	

Feature (N.B. Tree numbers correspond to those used in the Tree Survey)	Bat Roost Potential	Photos
		
Trees T20 – T27		
Small semi-mature trees planted in amenity grassland at the front of the school buildings. Trees include rowan, birch and cherry. No features with bat roost potential present.	None	

Appendix E. Species List

Species	Semi-improved grassland	Hedgerows / boundaries / scrub / tall ruderal	School buildings / hardstanding	Amenity grassland
Alder *Alnus glutinosa*		Y		
Annual meadow grass *Poa annua*	Y	Y		Y
Apple *Malus domestica*		Y		Y
Ash *Fraxinus excelsior*		Y		
Beech *Fagus sylvatica*		Y		
Bird cherry Prunus padus		Y		
Black medic *Medicago lupulina,*		Y		
Blackthorn *Prunus spinosa,*		Y		
Bracken *Pteridium aquilinum*		Y		
Bramble *Rubus fruticosus*		Y		
Broad leaved dock Rumex obtusifolius		Y		
Cherry *Prunus sp.*		Y		Y
Cleavers *Galium aperine*		Y		
Cocks foot *Dactylis glomerata*	Y	Y		Y
Common knapweed *Centaurea nigra*	Y			
Common mouse ear *Cerastium fontanum*	Y	Y		
Cow parsley *Anthriscus sylvestris*		Y		
Creeping bent *Agrostis stolonifera*	Y			
Creeping buttercup *Ranunculus repens*	Y			
Creeping thistle *Cirsium arvense*		Y		
Curled dock *Rumex crispus,*		Y		
Cuckoo flower Cardamine pratensis		Y		
Daffodil *Narcissus sp.*	Y			Y
Daisy *Bellis perennis*	Y			Y
Dandelion Taraxacumn officinale	Y	Y		Y
Dogwood *Cornus sanguinea*		Y		
Elder *Sambucus nigra*		Y		
Enchanters nightshade *Circaea lutetiana*		Y		
English elm *Ulmus minor*		Y		
False oat grass *Arrhenatherum elatius*		Y		
Field forget-me-not *Myosotis arvensis,*				
Field maple *Acer campestre*		Y		
Field wood rush *Luzula campestris*	Y	Y		
Foxglove *Digitalis purpurea*		Y		
Flowering currant				Y
Geranium *Geranium sp.*			Y	
Greater plantain *Plantago major*	Y			
Germander speedwell *Veronica chamaedrys*	Y			
Hawthorn *Crataegus monogyna*		Y		
Hazel Corylus avellana		Y		

Hedge woundwort *Stachys sylvatica*		Y		
Herb Robert *Geranium robertianum*,		Y		
Hogweed *Heracleum sphondylium*		Y		
Holly *Ilex aquifolium*,		Y		
Honeysuckle *Lonicera periclymenum*		Y		
Horse chestnut *Aesculus hippocastanu*		Y		
Hybrid whitebeam *Sorbas sp*		Y		
Ivy *Hedera helix*		Y		
Lavender *Lavandula angustifolia*			Y	
Laurel *Laurus sp.*		Y		
Lesser celandine *Ranunculus ficaria*		Y		
Leyland Cypress *Cupressus leylandii*		Y		
Lilac *Syringa sp*		Y		
Lime *Tilia cordata*		Y		
Meadow foxtail *Alopecurus pratensis*	Y			
Norway maple *Acer platanoides*				Y
Pansy *Viola sp.*			Y	
Perennial rye grass *Lolium perenne*	Y	Y		Y
Pineapple weed *Matricaria discoidea*	Y	Y		
Raspberry *Rubus idaeus*			Y	
Red clover *Trifolium pratense*	Y	Y		
Red fescue *Festuca rubra*	Y			
Rose *Rosa sp.*		Y		
Rosebay willowherb *Chamaenerion angustifolium*,		Y		
Rowan Sorbus aucuparia		Y		Y
Sessile oak *Quercus petraea*		Y		
Silver birch *Betula pendula*		Y		Y
Sow thistle *Sonchus sp*		Y		
Speedwell *Veronica sp.*	Y			
Sterile brome *Bromus sterilis*		Y		
Stinging nettle *Urtica dioica*		Y		
Sweet vernal grass *Anthoxanthum oderatum.*,	Y			
Sycamore *Acer pseudoplatanus*,		Y		Y
Vetch *Vicia sp*		Y		
White clover *Trifolium repens*	Y			Y
Wilsons honeysuckle *Lonicera nitida*		Y		
Willow *Salix sp.*		Y		
Wood avens *Geum urbanum*		Y		
Yew *Taxus baccata*		Y		
Yorkshire fog *Holcus lanatus*	Y	Y		Y
Zelkova		Y		