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Talwrn Farm, Llwyneinion

EXTENDED PHASE 1 HABITAT SURVEY July 2014

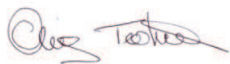
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Notes.	This report contains sensitive information concerning protected species and caution should be exercised when copying and distributing to third parties.	

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1.0 EXECUTIVE SUMMARY.

- 1.1 In June 2013, Wold Ecology was commissioned by Peter Molloy to undertake an Extended Phase 1 Habitat Survey on land to the north of Talwrn Farm, Llwyneinion (national grid reference SJ 29233 48010) near Wrexham.
- 1.2 In order to accomplish the brief, a desk top study, consultation and an extended Phase 1 field survey was undertaken by Wold Ecology staff.
- 1.3 The habitats within the Application Site comprise unimproved grassland, species rich hedge, mixed broadleaf woodland, ditches and open water. There are no statutory or non statutory sites within the site boundary.
- 1.4 The proposed development involves the erection of an egg laying unit including a road infrastructure and trenches for utilities.
- 1.5 The surrounding habitat is potentially important and the development area may impact upon mobile species. Consequently, the extended phase 1 assessment targeted the following species relevant to the Application Site and proposed development:
- Bats
 - Great crested newts
 - Badger
 - Birds
 - Reptiles
 - Hedgehogs
- 1.6 The report recommends a number of measures which should be adopted to ensure potential adverse impacts to wildlife are avoided and recommendations to enhance the sites ecological value:
- It is not possible to demonstrate site absence from a single scoping survey, with the evidence collected from the desktop study (great crested newt population within 250m), a habitat survey defining ponds and watercourses within 500m as having good suitability for great crested newts; Wold Ecology recommends that all building work (including site clearance) is undertaken under an EPSM license obtained from Natural Resource Wales. The license requires the following elements:
 - Determine the presence and absence of great crested newts within 500m of the Application Site; this also includes a population size class assessment to support any subsequent Natural Resource Wales development license.
 - The requirement for obtaining a great crested newt development license should be included on any planning decision letter.
 - Any hedges, tall herbage or trees to be removed inside the nesting bird season (early February to mid September) needs to be carefully checked by a suitably qualified ornithologist or other suitably qualified ecologist to confirm no active nests are present - prior to removal during this period. If nesting birds are found during the watching brief, works will need to stop until the young have fledged.
 - A method statement for reptiles should be copied to contractors and all those involved with site clearance and building works, whose work may affect refugia and hibernacula.

- 1.7 The data collected to support the output of this report is valid for 10 months. This report is valid until **July 2015**. After this time, additional surveys need to be undertaken to confirm that the status of the site, for European protected species, has not changed.
- 1.8 Species list within this report may be forwarded to the local biodiversity records centre to be included on their national database. No personal information will be sent. Please contact Wold Ecology if you do not wish the species accounts and six figure grid references to be shared.

2.0 INTRODUCTION

- 2.1 In June 2013, Wold Ecology was commissioned by Peter Molloy to undertake an Extended Phase 1 Habitat Survey on land to the north of Talwrn Farm, Legacy (national grid reference SJ 29233 48010) near Wrexham.
- 2.2 An ecological assessment is a requirement of the Local Authority Planning Department, as part of the planning application process. This is specified in the following legislation:
- Department for Communities & Local Government Circular 06/2005 Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System.
 - National Planning Policy Framework (NPPF): Biodiversity and Geological Conservation – national planning policy relation to biodiversity. NPPF Biodiversity and Geological Conservation gives further direction with respect to biodiversity conservation and land use change/development. NPPF states that not only should existing biodiversity be conserved but importantly that habitats supporting such species should be enhanced or restored where possible. The policies contained within NPPF may be material to decisions on individual planning applications.
- 2.3 In addition, a biodiversity assessment is also required so that the local authority comply with the Habitats and Species Regulations 2010 and to have regard to the purpose of conserving biodiversity in the exercise of their functions (Natural Environment and Rural Communities (NERC) Act 2006).
- 2.4 In order to fulfil the brief, the following has been undertaken:
- A desktop study and consultation.
 - An Extended Phase 1 Habitat Assessment.
- 2.5 This report describes the findings of the field survey work, the desktop study and identifies further surveys to ensure that a comprehensive study is undertaken.

3.0 COMPANY PROFILE

3.1 Wold Ecology Ltd is a well established, professional company whose staff has over 30 years experience in providing a bespoke service for environmental management. Wold Ecology employs a number of experienced and qualified associates to undertake specialist survey work. Professional service is of primary importance and Wold Ecology only employs staff who can demonstrate knowledge and expertise to an exceptional standard.

3.2 Wold Ecology provides a wide range of specialised advice aimed at integrating business with nature. We specialise in ecological surveys, land management planning and site assessments, these include;

- **European Protected Species Surveys;**
Bats, Birds, Great Crested Newts, Water Vole, Badger, Crayfish and Fungi surveys. Phase 1 and Phase 2 NVC Habitat Surveys, Landscape Character Assessment and Environmental Impact Assessments.
- **Environmental Grant Applications;**
Natural England Higher Level Scheme, Farm Environmental Plans, English Woodland Grant Scheme and Heritage Lottery Funding, Breathing Places.
- **Land Management and;**
Management Plans, Landscape Designs, Monitoring and Site Evaluation.
- **Practical Conservation.**
Habitat Creation, Tree Planting, Maintenance Programmes and Access Management.

3.3 Ethical Policy.

3.3.1 Wold Ecology provides a dedicated countryside management service in compliance with all relevant Local Agenda 21 directives and Biodiversity Action Plans.

3.3.2 We aim to raise awareness of current environmental issues amongst our clients, including UK and European legislation, industry guidelines such as BREEAM/CODE and case studies.

3.3.3 We strive to deliver the highest standards of ecological assessment and management.

3.3.4 We aim to purchase, wherever possible, environmentally friendly products and services, in order to limit negative effects on the environment.

3.3.5 Wold Ecology is committed to working towards the conservation of our natural heritage. Wold Ecology support The Wolds Barn Owl Study Group, Driffield Millennium Green and RSPB projects with volunteer staff time and financial resources. Wold Ecology has adopted an important site for nature conservation on Flamborough Head. North Marsh is owned by a local farmer and is an integral part of an exciting Higher Level Stewardship Scheme, supported by Natural England and RSPB. Richard Baines and Chris Toohie have provided free advice and practical conservation work for nearly 10 years on this site. The recent

work on the marsh and the return of scarce breeding birds, such as Corn Bunting, has given a huge sense of achievement for all concerned.

3.3.6 Wold Ecology is an Associate Member of the RSPB, Bat Conservation Trust Benefactor and Corporate Member of the Yorkshire Wildlife Trust.

3.4 Surveyor Profile – Chris Toohie M Sc., MCIEEM.

3.4.1 Job title : Director.

3.4.2 Expertise.

- Phase 1 habitat field surveys and biodiversity assessments including Building Research Establishment Environmental Assessment Method (BREEAM) and Code for Sustainable Homes (CODE) assessments.
- Bat surveys, bats and wind turbine assessments, writing and implementing bat development licenses, bat sound analysis and monitoring
- Great crested newt and reptile surveys.
- Management planning, woodland and orchard management and community environmental projects including funding applications.

3.4.3 Qualifications.

- M Sc. Arboriculture and Community Forest Management.
- HND Countryside Management.
- Great Crested Newt License – CLS 887.
- Bat License – CLS 00887.

3.4.4 Professional Membership.

- Member of the Chartered Institute of Ecology and Environmental Management.

3.4.5 Chris Toohie meets the criteria for a suitably qualified ecologist by:

- Holding a Masters degree in Community Forestry and Arboriculture;
- Being employed as a practising ecologist since 1995, with over 15 years relevant experience (within the last five years) and;
- Being a full member of the Chartered Institute of Ecology and Environmental Management (this makes him subject to peer review and bound by a professional code of conduct).

3.5 Surveyor Profile – Jennifer Hunt MSc., MCIEEM

3.5.1 Job title : Ecologist.

3.5.2 Expertise.

- Botanic surveys, phase 1 habitat field surveys and biodiversity assessments
- Bat surveys, great crested newt and reptile surveys.
- Management planning and habitat management
- Environmental education and events

3.5.3 Qualifications.

- BSc (Hons) Biological Sciences
- MSc (dist) Environmental Science and Environmental Management

- Great Crested Newt License – CLS 887
- Bat License 20130135

3.5.4 Professional Membership.

- Member of the Chartered Institute of Ecology and Environmental Management.
- Member of the Botanical Society of the British Isles

3.5.5 Jennifer Hunt meets the criteria for a suitably qualified ecologist by:

- Holding a Masters degree in Environmental Science and Environmental Management;
- Being employed as a practising ecologist since 2008, with over 10 years relevant experience (within the last five years) and;
- Being a full member of the Chartered Institute of Ecology and Environmental Management (this makes her subject to peer review and bound by a professional code of conduct).

3.6 Chris Toohie has read and reviewed the report and confirms that it:

- Represents sound industry practice
- Reports and recommends correctly, truthfully, and objectively
- Is appropriate, given the local site conditions and scope of works proposed
- Avoids invalid, biased, and exaggerated statements

4.0 SURVEY METHODOLOGY.

- 4.1 A Phase 1 Habitat Survey was undertaken on 10th June 2013 and 15th July 2014. During the site visit, the whole of the Application Site and accessible neighbouring land was examined in detail.

Survey	Date	Time		Wind Speed	Wind Direction	Temperature		Rainfall	Cloud Cover
		Start	Finish			Start	Finish		
Field	10/06/2013	1300	1630	3 mph	W	17°C	16°C	None	30%
Field	15/07/2014	0930	1030	Still	N/A	14°C	15°C	None	90%

- 4.2 The habitats within the Application Site were mapped (see Appendix 2) according to the techniques described in the publication *Handbook for Phase 1 Habitat Survey* (JNCC 2010).
- 4.3 Target notes (if applicable) provide descriptions of the main habitats found on the site, including information about species composition, habitat structure, evidence of management, habitats too small to map and transitional or mosaic habitats.
- 4.4 Sufficient detail on the composition of the vegetation was obtained from the Phase 1 Habitat Survey, which enabled it to be successfully characterised and assessed.
- 4.5 During the site visit, notes were made of features of potential value to other groups such as birds, mammals, amphibians, reptiles or invertebrates, paying particular attention to species protected by law.

5.0 LIMITATION OF FIELD SURVEY.

- 5.1 Whilst the majority of the Application Site was examined at the macro scale, many species will have been overlooked at the micro level because it is not the purpose of a phase 1 habitat survey to classify all taxa occurring in the Application Site. In addition, whilst the actual timing of the survey was adequate to classify the habitat types, there is undoubtedly a strong seasonal element to the presence of species within the site and species occurring outside of the survey period will have been missed.
- 5.2 This report will serve to indicate the possible value of the site in nature conservation terms based upon the survey and desk top data gathered. As with any survey of this kind, it cannot be seen as a definitive description of the site and its associated habitats and species.
- 5.3 Access was only granted within the Application Site and land owned by the client; neighbouring land was only studied from vantage points, maps and aerial photography and it is possible that habitats important to the ecology of the Application Site may not have been recorded fully.
- 5.4 However, a phase 1 habitat survey of this nature, supported by a thorough desk top survey, is sufficient to make a number of general assumptions about the ecology of the site.

- 5.5 The existing access track onto the site was locked with a gate and palisade fencing and consequently, it was not surveyed in any detail. However, as the gravel access track will be used rather than improved, Wold Ecology concludes that the use of the track will not have any negative impact to ecology of the adjacent land.

6.0 SURVEY RESULTS.

6.1 General Description.

- 6.1.1 Talwrn Farm is located 1.5km north of the town of Rhosllanachrug and 5km west of Wrexham; in a rural location. The Application Site is immediately surrounded by unimproved grassland habitats and grazed pasture. The Application Site is approximately 145m above sea level.
- 6.1.2 Woodland cover in the locality (2km radius) is good and comprises plantations, shelterbelts, ancient woodlands and semi natural woodlands; some of which have been planted within the farm as part of a Tir Gorfal Scheme (due to expire during late 2013). Habitat connectivity is excellent and provided woodland cover, shelterbelts, hedgerows with trees and hedgerows; the Pentrebychan Brook is located less than 200m north of the Application Site and the watercourse with riparian woodland habitats provides excellent habitat connectivity to the wider countryside.
- 6.1.3 A summary of the surrounding habitat is as follows (radius of < 2km from the Application Site):
- Buildings – farm buildings and residential properties
 - Hedgerow
 - Hedgerow with trees
 - Mature trees and woodland
 - Llwyneinion Wood
 - Plas Power Woods
 - Arable
 - Mature private gardens
 - Crematorium with remembrance gardens/woodlands
 - Ponds and watercourses
 - Pentrebychan Brook
 - Grazed pasture

6.2 Desktop Study.

- 6.2.1 Cofnod (North Wales Environmental Information Service) and the National Biodiversity Network (NBN) were consulted in order to obtain any ecological information that they hold of relevance to the Application Site.
- 6.2.2 The desk top study identifies land parcels of nature conservation value within 2 km locality of the Application Site. Relevant extracts from associated documentation are highlighted below. The following data resources were searched:
- Sites of Special Scientific Interest (SSSI)
 - Special Protection Areas (SPA)

- National Parks
- National Reserves
- Special Areas of Conservation (SAC)
- Ramsar sites
- Areas of Outstanding Natural Beauty (AONB)
- Local Nature Reserves (LNR)
- Local wildlife sites (LWS)
- Natural Area documentation
- European protected species records
- UK Biodiversity Action Plan habitats and species records
- Local Biodiversity Action Plan habitats and species records
- Notable species records

6.2.3 Statutory sites

6.2.3.1 Statutory site description.

6.2.3.1.1 There are no statutory sites within 1 km of the Application Site.

6.2.4 Local Wildlife Sites (LWS).

6.2.4.1 The following local wildlife sites lie within 2 km of the Application Site;

- Crematorium (418m)
- Big Wood (1491m)
- Bronwylfa (550m)
- Legacy Substation (227m)

6.2.4 The aforementioned wildlife sites will not be affected by the proposed development; this is due to the minimum distance of 227m between the Application Site and the local wildlife site.

6.2.5 European Protected Species records

6.2.5.1 Badger *Meles meles* is recorded in the surrounding 10km grid square SJ24 (source – NBN Gateway 2013).

6.2.5.2 Bats

- Currently there is no pre-existing information on bats at the site.
- Data for the 10km grid square SJ24 shows records of Daubenton's bat *Myotis daubentonii* brown long-eared bat *Plecotus auritus*, whiskered/Brandt's bat *Myotis mystacinus/brandtii*, Natterer's *Myotis nattereri*, soprano pipistrelle *Pipistrellus pygmaeus* and common pipistrelle *Pipistrellus pipistrellus* (source – NBN Gateway 2013).
- Whiskered, brown long-eared and common pipistrelle are recorded within 2km of the Application; the nearest record is within 322m (source - Cofnod 2013).

6.2.5.3 Great crested newt *Triturus cristatus*

- Currently there is no pre-existing information on great crested newts at the site.

- Great crested newt is recorded throughout the 10km grid square SJ24, (NBN Gateway 2013).
- There are numerous great crested newt records within 2km of the Application Site; the closest record is within 250m. The exact location is unknown (source - Cofnod 2013). Habitat connectivity between the Application Site and known great crested newt populations within 500m is good with no obvious barriers to dispersal.

6.2.5.4 Water vole *Arvicola amphibious* has been recorded within 2km of the Application Site (source – Cofnod and NBN Gateway 2013).

6.2.5.5 Barn owl *Tyto alba*, goshawk *Accipiter gentilis*, hen harrier *Circus cyaneus*, peregrine falcon *Falco peregrines*, red kite *Milvus milvus*, osprey *Pandion haliaetus*, fieldfare *Turdus pilaris* and kingfisher *Alcedo atthis* are recorded within 2km of the Application Site (source - Cofnod 2013).

6.2.5.6 Grass snake *Natrix natrix* is recorded within 2km of the Application Site and the surrounding 10km grid square SJ24 (source – Cofnod and NBN Gateway 2013).

6.3 Phase 1 Field Survey Results

6.3.1 The following habitat types were recorded within the Application Site:

- Broadleaved woodland - plantation
- Semi improved neutral grassland
- Tall ruderal
- Marsh/marshy grassland
- Running water
- Marginal Vegetation
- Species rich hedgerow
- Species poor defunct hedge
- Bare ground

6.3.2 Plantation woodland – A1.1.2

6.3.2.1 The proposed development cuts through an area of plantation woodland, planted by the owner during 2003; the dominant species is pedunculate oak *Quercus robur*.

6.3.2.2 Other species present within the woodland include alder *Alnus glutinosa*, dog rose *Rosa canina*, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, goat willow *Salix caprea* and hazel *Corylus avellana*.

6.3.2.3 The ground flora is not diverse and is restricted to rough meadow-grass *Poa trivialis*, germander speedwell *Veronica chaemadrys*, wood avens *Geum urbanum*, Yorkshire fog *Holcus lanatus* and ribwort plantain *Plantago lanceolata*.

6.3.3 Semi natural broadleaf woodland – A1.1.1

6.3.3.1 Semi natural broadleaved is present along the eastern boundary of the Application Site and comprises pedunculate oak, hawthorn, blackthorn and alder; the latter thriving on the damp conditions within this section of the site.

- 6.3.4 Semi improved neutral grassland - B2.2
- 6.3.4.1 Semi-improved neutral grassland is the primary habitat within the Application Site. The sward is open and approximately 20cm tall. Current management of the area is evident with a hay cut taking place annually whilst input from fertilizers is absent as part of a Tir Gorfal Scheme agreement.
- 6.3.4.2 The grassland habitat in which the poultry unit will be sited supports a buttercup *Ranunculus acris* and crested dog's-tail *Cynosurus cristatus* rich sward, with varying amounts of common bent *Agrostis capillaris*, sweet vernal-grass *Anthoxanthum odoratum*, Yorkshire fog, rough meadow-grass, meadow foxtail *Alopecurus pratensis*. Herbs include yellow rattle *Rhinanthus minor*, white clover *Trifolium repens*, common *Cerastium fontanum* and sticky *Cerastium glomeratum* mouse-ears, ribwort plantain and knapweed *Centaurea nigra*. This community is synonymous with well drained pasture.
- 6.3.4.3 The field to the south of the proposed egg laying unit is more species rich than the field to the north (site of the proposed poultry unit buildings) as it contains greater sward diversity. In addition to the species above, lesser stitchwort *Stellaria graminea*, timothy *Phleum pratensis*, common sorrel *Rumex acetosa*, red clover *Trifolium pratense* were present in the sward. Smooth meadow grass *Poa pratensis* and changing forget-me-not *Myosotis discolor* were found growing within 10m of the proposed access road (Target Note (TN) 1).
- 6.3.4.4 The proposed access track will be located in a field consisting of this grassland habitat. The grassland had been mown for hay during the July 2014 field survey.
- 6.3.5 Tall Ruderal – B4
- 6.3.5.1 This habitat can be found in the gaps in the defunct hedgerow along the proposed access road. Bramble *Rubus fruticosus* agg and common nettle *Urtica dioica* dominate with hogweed *Heracleum sphondylium*, cleavers *Galium aparine*, broad-leaved dock *Rumex obtusifolius* and wild angelica were also recorded.
- 6.3.6 Running water (mesotrophic) – G2.2
- 6.3.6.1 A ditch, approximately 1m wide and 1m deep is located along the southern boundary of the plantation woodland; the proposed access track will cross the ditch (TN2). The water appeared to be almost still, slowly moving in an easterly direction and was heavily shaded by the adjacent woodland cover. Leaf litter has silted the ditch. Water depth was less than 5cm at the time of survey and it is likely that the ditch dries during most years.
- 6.3.6.2 Although outside of the Application Site, a shallow ditch runs along the northern boundary of the Application Site; adjacent to the species rich hedgerow (TN3). The water runs slowly from west to east; the water was approximately 10cm deep and 50 cm wide at the time of survey. The ditch is heavily shaded. Ditch side vegetation favours those plants tolerant of shade including male fern *Dryopteris filix-mas* and field horsetail *Equisetum arvense*.

- 6.3.7 Marginal Vegetation F2.1
- 6.3.7.1 A narrow strips of emergent vegetation (TN4) runs along the margins of the aforementioned ditch. The aquatic and bankside vegetation was dense and lush and was dominated by hairy Willowherb *Epilobium hirsutum*, lesser water-parsnip *Berula erecta* with brooklime, reed canary grass *Phalaris arundinacea* soft rush, creeping thistle *Cirsium arvense*, field horsetail and common nettle.
- 6.3.8 Species rich defunct hedgerow - J2.2.1
- 6.3.8.1 Running 120 metres along the northern boundary of the field in which the development area lies, is a mature species rich hedgerow (TN4). The hedgerow is unmanaged and varies in structure and height along its length. Small gaps are present within the hedgerow (greater than 5m). The hedge is approximately 4m tall and 4m in height. Species present include hawthorn, holly, elder *Sambucus nigra*, pedunculate oak, goat willow, blackthorn, sycamore *Acer pseudoplatanus*, hazel and alder *Alnus glutinosa*; all of which were present within a 30m metre stretch.
- 6.3.8.2 Ground flora composed common and widespread species which favour eutrophic conditions; species include wild angelica, Yorkshire fog, ground elder *Aegopodium podagraria*, herb Robert *Geranium robertanum*, false brome *Brachypodium sylvaticum*, common nettle, hogweed, red campion *Silene dioica*, common sorrel and knapweed *Centaurea nigra*. The composition of the ground flora does not indicate a hedgerow of ancient origin.
- 6.3.9 Species poor defunct hedge – J2.2.2.
- 6.3.9.1 An unmanaged species poor hedgerow is located adjacent to the proposed access track; the hedge runs in a north/south direction. Towards the southern end species composition is restricted to birch *Betula sp.*, hawthorn and blackthorn. Towards the north of the hedge the species composition varies with goat willow, hazel, pedunculate oak and elder present. A single hybrid poplar *Populus sp.* approximately 25 metres high is located within the hedge. There are significant gaps (greater than 10m) along the length of the hedgerow and these are dominated by tall ruderal vegetation (6.3.4). The hedge varies in height being on average 4 metres high by 3 metres wide.
- 6.3.9.2 Although the hedgerow lacks structure and diversity, the associated flora is quite diverse. Hedgerow flora comprised bramble, common nettle, hogweed, cleavers, broad-leaved dock, wild angelica, dog rose *Rosa canina*, honeysuckle *Lonicera perichlymenum*, black bryony *Tamus communis*, common vetch *Vicia sativa*, creeping cinquefoil *Potentilla reptans*, marsh thistle *Cirsium palustre* and broad buckler fern *Dryopteris dilatata*. Grasses include Yorkshire fog, meadow foxtail, sweet vernal grass, rough meadow-grass, cock's foot and red fescue reflecting the influence of the adjacent grassland.
- 6.3.9.3 Small amounts of deadwood in the hedgerow provides limited habitat for invertebrates.
- 6.3.10 Marsh/marshy grassland - B5

- 6.3.10.1 A man-made wetland in the north east corner of the Application Site (TN5) was damp at the time of the survey. Species composition includes species typical of inundated grassland with abundant floating sweet-grass *Glyceria fluitans*, marsh foxtail *Alopecurus geniculatus*, creeping bent *Agrostis stolonifera*, rough meadow-grass *Poa trivialis* and creeping buttercup. Wetter areas hold small amounts of common yellow sedge *Carex viridula* subsp. *oedocarpa* and common spike-rush *Eleocharis palustris*, both species are listed as scarce on the draft rare-plant register for Denbighshire. The area surrounding the depression was dominated by soft rush *Juncus effusus* and creeping buttercup *Ranunculus repens*, both are species of poorly-drained pastures.
- 6.3.10.2 The wet area extends beyond the development area to the east; beyond the ditch the moist grassland (TN6) is dominated by reed sweet grass *Glyceria maxima*, also listed as locally scarce. The fringes of this area have been colonised by damp loving species including brooklime *Veronica beccabunga*, cuckoo flower *Cardamine pratensis* and wild angelica *Angelica sylvestris*.
- 6.3.11 Bare ground – J4
- 6.3.11.1 Bare ground habitat is located at the entrance to the site where the proposed access track meets the metalled road. This habitat comprises type 1 crushed stone which has no ecological value.
- 6.3.12 The following species were recorded during the field survey:
- Chiffchaff *Phylloscopus collybita*
 - Magpie *Pica pica*
 - Robin *Erithacus rubecula*
 - Song Thrush *Turdus philomelos*
 - Chaffinch *Fringilla coelebs*
 - Great tit *Parus major*
 - Fox *Vulpes vulpes* (evidence)
 - Speckled Wood *Pararge aegeria*
 - Green-veined White *Pieris napi*
 - Orange tip *Anthocharis cardamines*
 - Peacock *Inachis io*
- 6.3.13 Flora of Local Interest
- 6.3.13.1 The following species listed on the Denbighshire (VC50) County Rare Plant Register were recorded during the field survey:
- Common Yellow Sedge *Carex viridula* subsp. *oedocarpa* (scarce)
 - Common Spike-rush *Eleocharis palustris* (scarce)
 - Changing Forget-me-not *Myosotis discolor* (scarce)
 - Greater Spearwort *Ranunculus lingua* (rare)
 - Reed Sweet Grass *Glyceria maxima* (rare)
 - Smooth Meadow Grass *Poa pratensis* (rare)
- 6.3.13.2 Due to the abundance of suitable habitat, smooth meadow grass and changing forget-me-not are likely to be abundant throughout land owned the client. Other species of local interest are restricted to marsh or pond habitats that will also

remain post development and also abundant within similar aquatic habitats owned the client.

6.3.14 The surrounding habitat is potentially important and the development area may impact upon mobile species. Consequently, the extended phase 1 assessment targeted the following species relevant to the Application Site and proposed development:

- Bats
- Great crested newt
- Badger
- Water vole
- Reptiles
- Birds

6.4 Bats

6.4.1 The bat survey involved an initial walkover of the Application Site to assess the overall habitat quality for bats. This included the identification of key potential foraging habitat and potential flight corridors. This survey also targeted any potential or actual roost sites and evidence of actual bat use i.e. droppings, feeding signs.

6.4.2 Trees were assessed for features associated with phytophylous bat species. Such features typically consist of woodpecker holes, trunk and bough splits, tear outs, flush cuts, frost damage, wounds, cankers, dense ivy growth, areas of but rot, dry knot holes, impact shatters and dense epicormic growth.

6.4.3 The species, age and condition of each tree was assessed. Species of tree favoured by bats include ash *Fraxinus excelsior*, beech *Fagus sylvatica*, elm *Ulmus spp.*, oak *Quercus spp.* and willows *Salix spp.* In addition, trees with a diameter of less than 30cm and which are less than 80 years old are less likely to contain roosts; whilst trees of greater than 50cm diameter and more than 120 years old are most likely to contain roosts. This is only used as guidance and consideration to roosts in given to all individual trees, regardless.

6.4.4 Due to an absence of buildings or associated manmade structures on site the only potential for bats to roost on site is within trees. Currently, all of the trees with the Application Site have insufficient features to support roosting bats. The hedgerow trees are predominantly in good health and have no suitable features useful to roosting bats. The Application Site does not offer any habitat which is notably different from that of the surrounding area, for foraging.

6.4.5 Conclusions

6.4.5.1 No potential roost sites exist within the Application Site, predominantly due to a lack of buildings and the young age of the trees. The wider area supports a number of wetland and riparian habitats, woodlands, hedgerows and grassland habitats which offer alternate foraging and commuting habitat for bats.

6.4.5.2 Wold Ecology does not recommend any further surveys for bats.

6.5 Great crested newt.

6.5.1 Great crested newt records occur within 250m of the Application Site. The application site is linked to ponds and known populations by rough grassland, hedgerows and woodland cover; there are no barriers to prevent great crested newts from entering the Application Site.

6.5.2 The entire Application Site was assessed for its potential to support great crested newts, whilst conducting a walkover survey. This included looking at accessible ponds within 500m of the Application Site. In addition aerial photographs, maps and physical searches of the surrounding landscape gave an impression of how the Application Site is connected to wider sites and potentially great crested newt populations.

6.5.3 Results.

6.5.3.1 It has been determined that a great crested newt population is currently present within 250 metres of the Application Site. The great crested newt mitigation guidelines indicate that as a general guide, suitable habitat within 250m of a breeding pond is likely to be used most frequently. In addition, 500 metres is within the range that great crested newt may travel to terrestrial habitat and/or other aquatic breeding sites. The upper range for dispersal is typically around 1.3km (Baker *et al* 2011) and usually concerns sub-adult newts unconcerned with breeding (Arntzen & Teunis 1993). Beebee & Griffiths, 2000, suggest that new sites are colonised rapidly. In many cases these young newts form the preponderance of the population, when recruitment is high. Consequently, the occurrence of great crested newt occurring within the Application Site cannot be reliably ruled out.

6.5.3.2 Currently, the marshy/marsh grassland areas are likely to support open water during the spring and early summer months during most years. Populations may persist in similar ponds with a lower breeding productivity and be reliant on surrounding, more productive ponds to aid local recruitment. Key attributes to the increased probability of great crested newts being present within the Application Site are:

- Age of pond and permanence, older ponds within 500m of the Application Site support greater invertebrate communities and tend to have offer stable conditions
- Old ponds (analysis of maps and surrounding habitat) are of more value to great crested newts as they have had longer in which to be colonised, have richer invertebrate communities and often have similar aged surrounding habitats
- Excellent adjacent terrestrial habitat within 250 metres of the Application Site with large amounts of optimum refugia and hibernacula present within the study area, these consist of voids into tree root systems, dead fallen wood, logs, small mammal burrows, thick bramble growth and loose soil/debris.
- The Application Site offers good foraging habitat for prey species including invertebrates and juvenile amphibians
- The study area has an abundance of thick cover and damp areas suitable for loafing behaviour
- Minimal impact to the pond from waterfowl

- Absence of fish in the marshy/marsh grassland
- Presence of ponds and known populations in the wider area increases possibility of colonisation, which given the ponds age is likely to have occurred at some point in its history.
- The Application Site offers tree cover in conjunction with refugia which offers optimum hibernation conditions
- Abundant rodent habitat (with field vole and wood mouse recorded) within the surrounding area. Great crested newts typically occupy disused rodent burrows and similar habitats after the breeding season has finished
- Great crested newts are long lived enabling them to persist at a site for several years, an individual only needs one good breeding season within its life time to maintain the population (albeit at a lower level if failure regularly occurs).

6.5.3.3 The terrestrial habitat within the Application Site is excellent for great crested newt as it provides, daytime refugia, foraging areas, hibernation areas and dispersal route ways. These features are typically associated with the ditch edges, ruderal vegetation and scrub. Disused field vole colonies or sections of the colonies are notably good habitat for great crested newt (Beebee & Griffiths 2000) and allow the centre of the field to be utilised. Damp grassland of this nature offers excellent foraging potential for great crested newt particularly on molluscs, beetles and worms.

6.5.3.4 Whilst it is not possible to demonstrate site absence from a single scoping survey, with the evidence collected from a habitat survey and desktop study, the likelihood of the presence of great crested newts in the study area is increased.

6.6 **Badgers**

6.6.1 All features of potential value to badgers are surveyed; including areas of woodland (including plantation), small copses, hedgerows, embankments and rock outcrops. Well worn animal paths and footpaths were inspected for badger footprints and links to setts.

6.6.2 The surveyor observations included any areas where there were noticeable changes in the topography providing sloping ground into which the badgers could excavate setts. The following field signs will indicate the presence of badgers.

- Badger setts and associated soil excavation
- Badger latrines and dung pits
- Badger prints
- Badger hairs
- Badger paths
- Evidence of badger foraging activity

6.6.3 Results.

6.6.3.1 No main setts, annexe setts, subsidiary setts or outlier setts were located within 50 metres of the development area boundaries or within the Application Site. Badgers have a preference for excavating setts on well drained calcareous grits and upper chalks rather than middle chalks and clays, although exceptions to this rule occur where no similar geology is present. Badgers often show a preference to sett excavation in woodland and scrub.

6.6.3.2 A key consideration in relation to badgers is with respect to the temporary severance of regularly used paths and associated habitat and the possible disturbance or, in a worst-case scenario, damage to a badger sett. In relation to setts, the level of significance would be greatest in relation to impacts to large and permanently occupied setts. Since the Application Site currently has no evidence of any badger setts, it is only the risk of severance of well used dispersal routes which is likely to have an impact. None of which were observed within the Application Site.

6.6.3.3 No further surveys or mitigation are required for badgers.

6.7 Reptiles

6.7.1 The desktop study identified grass snake as the only reptile species which is found within the wider area.

6.7.2 Grass snakes occupy a broad range of habitats and often disperse through unfavourable habitats to get to new areas. They favour damp grassland, rivers, ditches, waterbodies and woodland edges; all of which exist within the Application Site; damp grassland and ditches are both key habitats for this species. Grass snakes have a particular affinity to damp and wet habitats. The proposed development area is suitable for grass snakes because it provides optimum habitat for foraging, dispersing, limited shelter and no breeding habitat. The increased value of the site to amphibians (the chief food source) further enhances the sites importance to grass snakes. The surrounding woodland cover offers refugia and hibernacula.

6.7.3 Wold Ecology recommends further reptile surveys to determine the presence/absence of grass snakes within the Application Site.

6.8 Birds

6.8.1 All bird species recorded by either sight, song or call were noted, in addition particular attention was given to key species of conservation concern and which habitat within the Application Site they were recorded using. All active (and disused) nests, territorial, breeding and foraging birds were recorded in further detail to analyse how breeding birds use the Application Site.

6.8.2 The following survey followed guidance and methods recommended within *Bird Monitoring Methods, a manual of techniques for key UK species* Gilbert et.al RSPB 1998, *Common Standards Monitoring Guidance for Birds* JNCC 2004 and *Survey Techniques Leaflet 8*.

6.8.3 Schedule 1 Listed Birds

6.8.3.1 Wold Ecology assessed the site for the following schedule 1 listed species (identified within the desktop study – see 6.2.5.5), which have the potential to breed within the Application Site and/or surrounding adjacent local area, or breed elsewhere whilst using the Application Site to forage or roost.

6.8.3.2 As non-breeding species, lowland mixed farmland within 500m of the Application Site is considered to be unsuitable breeding habitat for goshawk, hen harrier,

peregrine falcon, red kite, osprey and kingfisher; due to the lack of potential nest sites and optimum habitats.

6.8.3.3 Barn Owl *Tyto alba*

6.8.3.3.1 Barn owl presence is usually identified quite easily, without seeing the actual birds themselves. Droppings, pellets and feathers can be found at nest and roost locations. No evidence of barn owls was observed within the Application Site.

6.8.3.3.2 There is a possibility that the Application Site is used by foraging barn owls. The grassland habitats within the Application Site are excellent for key prey species like field vole, common shrew and pygmy shrew.

6.8.3.4 The Application Site is of low value to schedule 1 listed species other than possibly as a feeding habitat for barn owls. The site is not considered to be of value to any other schedule 1 listed bird species. Optimum barn owl foraging grounds is present within the locality and on land owned by the client; this will remain post development and the proposed development will not impact upon the long term viability of local barn owl populations.

6.8.4 None-schedule 1 birds

6.8.4.1 The field survey carried out in June 2013 recorded the following UK BAP Priority Species which is also Red or Amber listed species (high or medium conservation concern) as described in The Population Status of Birds in the UK (Birds of Conservation Concern: updated 2009):

- Song Thrush *Turdus philomelos*

6.8.4.2 Impacts related to breeding birds are essentially related to the temporary loss of habitat which is utilised by breeding species. Related to this is the risk that birds could be nesting within impacted habitats at the time that construction work is programmed to start. Of particular relevance to this project are small passerine species, particularly those associated with the woodland and hedgerows.

6.8.5.2 Wintering Birds

6.8.5.2.1 The Application Site is not considered to be valuable to wintering birds like wildfowl and waders. The Application Site is not within close proximity to any estuaries or large waterbodies, high hedgerows and roads causing regular disturbance reduce the value of the habitat for these species groups.

6.8.5.2.2 The only impact typically of any relevance to wintering birds are those associated with the temporary loss of food sources. This is principally associated with the loss of sections of hedgerow and woodland which provide a potential source of food to a range of wintering species. However, these habitats are abundant within the wider area and are not thought to be of significant importance to birds.

6.9 Hedgehog

6.9.1 Legislation

6.9.1.2 Although the Hedgehog *Erinaceus europaeus* only receives partial protection under the Wildlife and Countryside Act 1981 (as amended), its numbers have declined dramatically over the past two decades, resulting in the suggested proposal of upgrade to a higher level of protected status. The British population has declined by 25% over the past 10 years. The reasons for the decline are thought to be complex but include the loss of hedgerows and permanent grasslands as well as agricultural intensification.

6.9.2 Survey Methodology

6.9.2.1 All features of potential value to hedgehogs are surveyed; including areas of thick vegetation, outbuildings, lawns, grassland, scrub, woodland and hedge bases. Evidence of breeding nests, hibernation nests and loafing nests were searched for in areas of suitable cover.

6.9.2.2 Well worn animal paths, pool edges and footpaths were inspected for hedgehog footprints. Open areas were inspected for hedgehog droppings, particularly amenity grassland. Additionally, the surrounding road system was surveyed for road casualties.

6.9.2.3 The following field signs will indicate the presence of hedgehogs.

- Nests within dense vegetation, or under sheds/outbuildings
- Hedgehog droppings
- Hedgehog prints
- Road casualties.

6.9.3 Results.

6.9.3.1 **No evidence of hedgehogs was recorded but consideration to hedgehogs should be given during site clearance and during construction.**

6.10 Water vole

6.10.1 All aquatic habitats within the Application Site were assessed. This typically includes ditches, ponds and marsh habitats. Particularly when attached to other habitat corridors in the case of the latter two habitats.

6.10.2 A visual search for the presence of water voles and their signs was undertaken at within any suitable habitat on site. Specifically, the visual survey involved:

- Actual sightings.
- Evidence of burrow entrance holes.
- Cropped "gardens" around tunnel entrances.
- Survey for latrines and droppings.
- Remains of feeding stations.
- Runways through vegetation.
- Paths along the water's edge.
- Footprints.
- Dead animals or parts of dead animals.

- 6.10.3 As well as water voles, American mink *Neovison vison* were also looked for; this species has had detrimental impacts on water voles throughout Britain and Europe where it has become established in the wild. Suitable site mitigation measures for water voles require the knowledge of mink population densities within the local area.
- 6.10.4 Results.
- 6.10.4.1 There were no sightings or evidence to suggest that water vole is present on the ditches within 100 metres of the proposed development area. However, some sections of these ditches were inaccessible at the time of survey.
- 6.10.4.2 The proposed development area is unsuitable for water voles because:
- No evidence of water voles was recorded during the field survey.
 - The shallow, narrow, ephemeral nature of the ditch and marsh area does not allow sufficient means of escape from predators. Water voles require some areas of open water with sufficient depth to evade capture and feed on aquatic plants. It is likely that this ditch occasionally dries up, resulting in no aquatic habitat for periods of time.
- 6.10.5 Wold Ecology does not recommend any further surveys for water voles.

7.0 EVALUATION OF SURVEY RESULTS.

7.1 Overall Approach to Assessment.

- 7.1.1 The overall approach to assessment followed in this report can be summarised as: A baseline identification of the nature conservation interest within the ecological Application Site by establishing levels of interest for ecological features measured against definable criteria. The term Valued Ecological Receptor (VER) is used to describe the species, communities, habitats or sites selected for detailed study during the process of the ecological assessment.

7.2 Evaluation Criteria.

- 7.2.1 The thorough evaluation of the ecological importance of a site is essential in order to assess the significance of the ecological assessment

- 7.2.2 The evaluation criteria are given in detail in Appendix 7. Their aim is to consider the habitats, communities and species present on site in relation to the following:

- The legislative framework (e.g. the Wildlife and Countryside Act 1981, Habitats and Species Regulations 2010 and the EC Directive on the Conservation of Habitats and Wild Fauna and Flora (92/43/EEC) for the presence of protected species and habitats).
- Nature conservation designations, including national site designations (Sites of Special Scientific Interest, National Nature Reserves etc), local designations (Sites of Importance for Nature Conservation, Local Nature Reserves, County Wildlife Sites etc).
- Accepted criteria for species rarity and declining populations, and rarity of habitat types or communities, including species and habitats identified in the British Red Data Books, national biodiversity action plan, and species and habitats identified in regional or local biodiversity action plans where available.
- Accepted criteria for overall site evaluation (including rarity, diversity, naturalness, historical factors and issues relating to landscape ecology).

7.2.3 Evaluation of Survey Results.

- 7.2.3.1 The field survey work did not identify the presence of any habitats or plant species considered rare in the United Kingdom.

Rarity is defined in this report as:

Rare—species not recorded in more than 100, 10 x 10 km grid-squares in the British Isles.

Very Rare—species not found in more than 15 different 10 x 10 km grid-squares in the British Isles.

7.3 Habitats

7.3.1 The Application Site supports a number of habitats, as described in section 6.3, which support a number of species and add to the overall ecological value of the site.

7.3.2 Hedgerow

7.3.2.1 Hedgerow is listed as a UKBAP priority habitat. Hedgerows are a primary habitat for at least 47 species of conservation concern in the UK, including 13 that are globally threatened or rapidly declining, more than for most other key habitats. They are especially important for butterflies and moths, farmland birds, bats and dormice.

7.3.2.2 Since 1945 there has been a continual decline in both the quantity and quality of the UK's native hedgerows either through removal or poor management practices. The Environment Act 1995 introduced an enabling power to protect important hedgerows in Britain. Land managers are required to consult local authorities before hedgerows can be removed. Article 10 of the EC Habitats Directive requires member states to encourage the management of linear features such as hedgerows in their planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network. This is supported by the Habitats and Species Regulations 2010, which recognises the importance of these features for the migration, dispersal and genetic exchange of wild species.

7.3.2.3 UKBAP targets for hedgerows are:

- Maintain the net extent of hedgerows across the UK
- Maintain the overall number of individual, isolated hedgerow trees and the net number of isolated veteran trees;
- Ensure that hedgerows remain, on average, at least as rich in native woody species
- Achieve favourable condition of 348,000 km (50%) by 2015
- Reverse the unfavourable condition of over-managed hedgerows across the UK by reducing the proportion of land managers who trim most of their hedges annually
- Halt further decline in the condition of herbaceous hedgerow flora in Great Britain by 2010 (and improve their condition by 2015)
- Improve the condition of the hedgerow tree population by increasing numbers of young trees (1-4 years) in Great Britain to 80,000 by 2015 and
- Achieve a net increase in the length of hedgerows of an average of 800 km per year in Great Britain to 2015.

7.3.2.4 If applicable, hedges should be cleared outside of the bird nesting season (i.e. clearance should be undertaken between September and February inclusive) or be carefully checked by an ecologist to confirm no active nests are present - prior to removal during the summer period. If nesting birds are found during the watching brief, works will need to stop until the young have fledged. **Permission should be granted from the planning authority prior to removing a hedge.**

7.3.2.5 During the construction period, it is important that a root protection exclusion zone is in place adjacent to any hedgerow. This must be at least 5m from the

centre of the hedge and must be kept free of plant and storage of building supplies.

- 7.3.2.6 The hedgerows bounding the site should ideally be maintained to a minimum height of at least 2m and kept free of fertilisers, pesticides and development on land within 3m of the hedge centre. The long term management of these hedges will add to their biodiversity value; the hedge should be cut only once every three calendar years and should not be cut between the beginning of March and the end of August to ensure breeding birds are not disturbed. Hedge cutting should be occur outside of the bird nesting season (i.e. clearance should be undertaken between September and February inclusive) or be carefully checked by an ecologist to confirm no active nests are present - prior to removal during the summer period. Cutting the hedge in late January/early February will provide maximum quantities of food for birds over winter.

7.3.3 Lowland Meadows

- 7.3.3.1 A wide-ranging approach is adopted in this plan to lowland grasslands treated as lowland meadows. They are taken to include most forms of unimproved neutral grassland across the enclosed lowland landscapes of the UK. In terms of National Vegetation Classification plant communities, they primarily embrace each type of *Cynosurus cristatus* - *Centaurea nigra* grassland, *Alopecurus pratensis* - *Sanguisorba officinalis* floodplain meadow and *Cynosurus cristatus* - *Caltha palustris* flood-pasture. The plan is not restricted to grasslands cut for hay, but also takes into account unimproved neutral pastures where livestock grazing is the main land use. On many farms in different parts of the UK, use of particular fields for grazing pasture and hay cropping changes over time, but the characteristic plant community may persist with subtle changes in floristic composition.
- 7.3.3.2 In non-agricultural settings, such grasslands are less frequent but additional examples may be found in recreational sites, church-yards, roadside verges and a variety of other localities. Excluded from this plan are maritime grassland communities confined to coastal habitats (which will be covered in maritime cliff and machair action plans), *Anthoxanthum odoratum* - *Geranium sylvaticum* grasslands (which are treated in a companion action plan for upland hay meadows) and *Molinia* - *Juncus* pastures (which are covered in the purple moor grass and rush pasture (*Molinia-Juncus*) plan).
- 7.3.3.3 As indicated in the Habitat Statement included in *Biodiversity: the UK Steering Group Report, Vol 2* (1995), unimproved neutral grassland habitat has undergone a remarkable decline in the 20th century, almost entirely due to changing agricultural practice. It is estimated that by 1984 in lowland England and Wales, semi-natural grassland had declined by 97% over the previous 50 years to approximately 0.2 million ha. Losses have continued during the 1980s and 1990s, and have been recorded at 2-10% per annum in some parts of England. Extensive agricultural modification of unimproved grasslands has also been recorded in Scotland between the 1940s and 1970s. Recent conservation survey findings in Britain and Northern Ireland reveal that the impact has been pervasive, and an estimated extent of less than 15,000 ha of species-rich neutral grassland surviving today in the UK is given in the Habitat Statement.

- 7.3.3.4 The plan concentrates on meadows and pastures associated with low-input nutrient regimes and covers the major forms of neutral grassland which have a specialist group of scarce and declining plant species. Among flowering plants, these include fritillary *Fritillaria meleagris*, Dyer's greenweed *Genista tinctoria*, green-winged orchid *Orchis morio*, greater butterfly orchid *Platanthera chlorantha*, pepper saxifrage *Silene silene* and wood bitter vetch *Vicia orobus*. Lowland meadows and pastures are important habitats for skylark and a number of other farmland birds, notably corncrake which has experienced a major range contraction across the UK.
- 7.3.3.5 The overall outcome of habitat change in the lowland agricultural zone is that *Cynosurus - Centaurea* grassland, the mainstream community of unimproved hay meadows and pastures over much of Britain, is now highly localised, fragmented and in small stands. Recent estimates for cover in England and Wales indicate that there is between 5000-10,000 ha of this community in total. There is an especially important concentration in Worcestershire and other particularly important areas include south-west England (Somerset, Dorset and Wiltshire), the East Midlands & East Anglia (Leicestershire, Northamptonshire, Cambridgeshire and Suffolk), in various parts of Wales and in West Fermanagh and Erne Lakeland in Northern Ireland. In certain areas, such as in the old district of Brecknock in Powys, remnant examples are locally aggregated. Scotland is estimated to have between 2000-3000 ha of this community, with particular concentrations in the crofting areas of Lochaber, Skye and the Western Isles. Local data for Northern Ireland are less complete, but the West Fermanagh and Erne Lakeland ESA in NI contains an important concentration of the resource.
- 7.3.3.6 Unimproved seasonally-flooded grasslands are less widely distributed. They have lower overall cover, but there are still a few quite large stands. *Alopecurus - Sanguisorba* flood-meadow has a total cover of <1500 ha and is found in scattered sites from the Thames valley through the Midlands and Welsh borders to the Ouse catchment in Yorkshire. These include well-known but now very rare Lammas meadows, such as North Meadow, Cricklade, and Pixey and Yarnton Meads near Oxford, which are shut up for hay in early spring, cropped in July, with aftermath grazing from early August; nutrients are supplied by flooding episodes in winter. *Cynosurus - Caltha* flood-pasture is also now scarce and localised, with probably <1000 ha cover in England and Wales. Scotland is estimated to have 600-800 ha of this community.

7.4 Bats

- 7.4.1 Legal obligations towards bats are generally concerned with roost protection. All developments, known to contain bat roosts, require a licence from Natural Resource Wales. Under Section 9 of the Wildlife and Countryside Act (1981), it is an offence for anyone without a licence to kill, injure, disturb, catch, handle, possess or exchange a bat intentionally. It is also illegal for anyone without a licence to intentionally damage or obstruct access to any place that a bat uses for shelter or protection. There are no potential roost sites within the Application Site.
- 7.4.2 Lighting has a detrimental effect on bat activity; many bats will actually avoid areas that are well lit. Lighting can cause habitat fragmentation by preventing bats from commuting between roosts and foraging grounds (A.J Mitchell-Jones 2004). The principles are:

- Reduce or remove the UV component of light emitted. To achieve this, a lamp that does not emit UV or a filtration product is recommended
- External lighting requirements will be carefully designed to avoid light spillage affecting foraging bats and bat box entrances. Thus creating a dark and green infrastructure and can be achieved by using hoods, cowls, shields and louvers. Planting or manmade barriers can also protect against light spillage.
- Security lighting will be on a short timer and motion sensitive to large objects only.
- Use of timers to reduce the hours lit and tailors this specifically to wildlife affected.
- Lights will not be mounted where they will shine directly on to the surrounding habitat (hedgerows, woodland edges and watercourses) used by foraging bats.

7.4.3 Habitat enhancements

7.4.3.1 Freshwater, woodland, grassland, urban gardens, trees and amenity green space are suitable foraging habitats for bats whilst linear habitats such as hedgerows and streams are particularly important commuting routes between roosts and foraging ground. It is recommended that the natural landscape remains largely unchanged and as many mature trees are retained on the site to continue to provide cover and feeding grounds. Landscaped areas can provide good foraging grounds for bats. Areas can be improved by growing night-scented flowers and other flowers favoured by insects. More information on suitable planting to encourage bats obtained from The Bat Conservation Trust (www.bats.org).

Suitable species include:

- Foxglove *Digitalis purpurea*
- Cowslip *Primula veris*
- Red campion *Silene dioica*
- Marjoram *Origanum vulgare*
- Ox-eye daisy *Leucanthemum vulgare*
- Red clover *Trifolium pratense*
- Evening primrose *Oenothera biennis*.
- Honeysuckle *Lonicera perichlymenum*.
- Wild Clematis *Clematis virginiana*

7.4.4 Specially designed bat boxes can be located on site. Schwegler Bat Boxes are recommended and well tested boxes. The following bat boxes provide additional roost habitats and are available from Wold Ecology:

- The **1FD** is a larger version of the 2F. A general purpose bat box with two internal rough wood panels which simulate crevices.
- The **2FN** is a larger box with both a wide access slit at the base and an access hole on the underside. Particularly successful in attracting noctule and Bechstein's bats. It is ideally suited for trees.
- The rectangular shape makes the **1FF** ideal for attaching to the sides of buildings and trees or in sites such as bridges. It has a narrow crevice-like internal space to attract pipistrelle and noctule bats.
- The **1FQ** is an attractive box designed specifically to be fitted on the external wall of a house, barn or other building. Equally appealing to bats as a roost or a nursery, it features a special porous coating to help maintain

the ideal temperature inside along with a rough sawn front panel to enable the bats to land securely.

- Bat Tube (**1FR** and **2FR**) system. The tube is designed to meet behavioural requirements of the types of bats that roost in buildings i.e. pipistrelle spp. This design can be installed flush to external walls and beneath a rendered surface.

7.4.5 The majority of these boxes are self-cleaning as they are designed so that the droppings fall out of the entrance. This reduces the possibility of smell during the summer months. For more information on designs and installation of bat boxes see: www.schwegler-natur.de and www.bct.org.uk.

7.4.6 Wold Ecology recommends that at least 2 bat boxes are sited on trees within the ownership of the client. Bat boxes should be erected on south, east or west elevations; 3-5 metres above ground level or close to roof lines.

7.5 Great crested newt.

7.5.1 The UK has only a small amphibian fauna. There are six species of amphibians, common frog, common toad, natterjack toad *Bufo calamita*, smooth newt, palmate newt *Triturus helveticus* and great crested newt. There are also several non native amphibian species present in Britain.

7.5.2 The great crested newt is protected under European and British legislation. Under European legislation it is protected under EC Directive (92/43/EEC) 'The Conservation of Natural Habitats and of Wild Fauna and Flora', being listed under Annexes IIa and IVa. This is implemented in Britain under the Habitats and Species Regulations 2010. This prohibits the intentional killing of newts, the deliberate taking or destruction of eggs, damage or destruction of a breeding site or resting place, intentional/reckless damage to or obstruction of a place used for shelter or protection, possession of a great crested newt and any form of trade of great crested newts.

7.5.3 Under British legislation, the great crested newt is given full protection under section 9 of the Wildlife and Countryside Act 1981 (as amended). This Act transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (commonly referred to as the 'Bern Convention'). This prohibits the intentional killing, injuring or taking, possession or disturbance of great crested newts whilst occupying a place used for shelter or protection and the destruction of these places. Protection is given to all stages of life (e.g. adults, sub-adults, larvae, and ovae).

7.5.4 In combination, the above legislation prohibits the following:

- Intentionally kill, injure or take a great crested newt
- Possess or control any live or dead specimen or anything derived from a great crested newt
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a great crested newt
- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place which it uses for that purpose
- Deliberately capture or kill a great crested newt
- Deliberately disturb a great crested newt
- Deliberately take or destroy eggs of a great crested newt

- Damage or destroy a breeding site or resting place of a great crested newt. The great crested newt is therefore described as 'fully protected'.

7.5.5 Great crested newts, like all British amphibians, rely on water bodies for breeding, but otherwise spend much of their lives on land. They are ectotherms and have permeable skins, so most movement occurs when the air temperature is above approximately 5°C and there is, or has recently been rain.

7.5.6 Amphibians spend the winter in places where they will be protected from frost and flooding. Whilst on land outside of the hibernation period, great crested newts will also take refuge to shelter from extremes of weather; hence during the day they will often rest in dense vegetation, under refuges or underground. Adult great crested newts normally begin moving from their over-wintering land sites between February and April, with some adult newts not reaching the desired water body until May, depending on the weather. Not all life-stages enter water over the course of a year; immature newts (or efts) may spend all year on land.

7.5.7 It is not possible to demonstrate site absence from a single scoping survey, with the evidence collected from the desktop study (great crested newt population within 250m), a habitat survey defining ponds and watercourses within 500m as having good suitability for great crested newts; Wold Ecology recommends that all building work (including site clearance) is undertaken under an EPSM license obtained from Natural Resource Wales.

7.5.8 The license requires the following elements:

- Determine the presence and absence of great crested newts within 500m of the Application Site; this also includes a population size class assessment to support any subsequent Natural Resource Wales development license.
- The requirement for obtaining a great crested newt development license should be included on any planning decision letter.

7.5.9 **Impact Assessment – if great crested newts are present.**

7.5.9.1 Short term impact assessment

- The proposed development will occur within an area of rough grassland and woodland; a ditch will also be culverted to allow access into the Application Site. Whilst habitat of this nature is considered to be optimum terrestrial habitat for great crested newts; similar habitat is located within the wider area and will remain post development.
- However, due to work in a ditch and building works within close proximity (<50m) to suitable watercourses, the likelihood of great crested newts being harmed during the construction period cannot be completely ruled out. In addition, great crested newts may disperse through the site or seek refuge under materials or in burrows/crevices within the development area.

7.5.9.2 Long term impact assessment

- Watercourses – A ditch will be altered to incorporate improved access onto the site. As the proposal involves minor works to the ditch, the condition of the ditch and all other watercourses within 250m will remain favourable to great crested newts – post development. The ditch is not considered to be essential to the long term viability of local great crested newt populations as optimum aquatic habitats are available within 250m.

- Terrestrial habitat – A small amount of riparian habitat will be destroyed as part of the access track into the site; rough grassland will also be lost as a result of the construction of the poultry unit. Small mammal burrows and dense vegetation/brash/debris is suitable for refuge/loafing/foraging/hibernation great crested newts. Grass margins, scrub cover will remain or be re instated elsewhere on site to enhance the ecological value of the neighbouring land - post development.

7.5.9.3 Isolation caused by fragmentation.

- The proposed development will be built on a small area of terrestrial/aquatic habitat. Consequently, the surrounding landscape will not be impacted upon. Suitable foraging grounds (scrub, woodland, marsh areas and rough grassland) are located adjacent to the Application Site and these will remain post development.

7.5.9.4 Habitat modification.

- ‘Tidying up’ of semi-natural habitats for recreational or aesthetic reasons is likely to have negative impacts on the current population. This will be due to the destruction of refugia and hibernacula, as well as the loss of foraging habitat.

7.5.9.5 In conclusion, the short and long term impacts from the proposed development will have low/negligible impacts on great crested newts – providing the mitigation highlighted below is implemented. Wold Ecology considers that the proposed development and mitigation will ensure that any great crested newt populations at the site are maintained at a favourable conservation status. Conservation status is defined as “the sum of the influences acting on the species concerned that may affect the long term distribution and abundance of its population within its territory”. The impact assessment and mitigation strategy demonstrates that:

- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future
- There is, or will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.

7.5.10.6 **Summary of Reasonable Avoidance Measures - if great crested newts are present.**

7.5.10.6.1 Natural Resource Wales requires mitigation and compensation to be proportionate to the size of the impact and the importance of the population affected and as a principle:

- There should be no net loss of aquatic habitats and that compensation should provide an enhanced resource.
- Compensation should ensure that the affected great crested newt population can continue to function as before, so attention may need to be given to surrounding habitats.
- The strategy should be considered to ensure that the great crested newt populations at the site are maintained at a favourable conservation status.

7.5.10.6.2 In addition, the aim of mitigation should be to seek to achieve one of the following outcomes, in decreasing order of preference.

- No negative impact on great crested newt populations

- Where only a minor impact is predicted, compensation by small-scale relocation and exclusion of newts, combined with habitat creation, enhancement or restoration (all occurring on-site or in the immediate surrounding area, i.e. *in situ* mitigation).
- Where a major impact is unavoidable, and it is not possible to compensate through on-site mitigation, translocation of newts away from the site, to an area that provides equivalent or better habitats. To achieve this, new habitats, including ponds, will invariably need to be created, enhanced or restored prior to translocation.

7.5.10.6.3 Wold Ecology believes that the outcome in the second bullet point can be achieved as the proposed work includes restoration of the aquatic and riparian habitat.

7.5.10.6.4 Habitat enhancements and compensation measures must be completed prior to translocation of great crested newts from the development areas.

7.5.11 Trapping and Translocation

7.5.11.1 All optimal and sub-optimal great crested newt habitats within the construction zone will be trapped out using perimeter and drift fencing. The trapping and translocation will be undertaken under a European Protected Species (EPS) licence. Pitfall traps will be installed adjacent to the inside of the perimeter fence and on both sides of the internal drift fencing. Refugia such as carpet tiles will also be deployed to enhance the capture rate. The table below illustrates the minimum number of trapping nights in accordance to the population size class (great crested newt mitigation guidelines).

Peak count of great crested newts within a single night	Minimum number of trapping nights
0	0
1-10 (small population)	30
11-100 (medium population)	60
101+ (large population)	90

7.5.11.2 The great crested newt mitigation guidelines state “a ‘trapping night’ is counted as one during which the weather and seasonal conditions indicate that newt capture is likely.” Suitable seasonal and weather conditions are considered to be: “night air temperature >5°C, with rain (or if no rain, there should have been rain within the last few days, such that the ground is damp)”.

7.5.11.3 All great crested newts which are trapped from the development areas will be translocated to adjacent terrestrial habitat that is isolated from the construction zone. Upon completion of trapping, drift fencing will be removed but perimeter fencing will remain in place until the development is complete and risk of injury or death to great crested newts has ceased. These barriers will be maintained and kept in functional condition to prevent great crested newts becoming injured or killed by the development works.

7.5.12 Vegetation Clearance

7.5.12.1 The removal of vegetation will be undertaken after a thorough hand search of the area (each morning if clearance will occur over two or more days). The clearance will be supervised by a suitably qualified ecologist. If great crested newts are

found during this process, they will be removed from the development area to a suitable and safe location.

- 7.5.12.2 Sub optimal and non-viable habitat will be managed in accordance with its current management operations (i.e. scrub removed/strimmed) for the duration of the development, to ensure that (where vegetation is present) the sward length is kept short, and thereby less suitable for great crested newts. To ensure that great crested newts are not present within the grassland, cutting would be undertaken between the hours of 11:00 and 17:00 only, on days with no precipitation.

7.5.13 Method Statement (Reasonable Avoidance Measures) – to support any subsequent Natural Resource Wales License application

- 7.5.13.1 This method statement (MS) has been designed to ensure the avoidance of disturbance, killing or injuring great crested newts by taking all reasonable steps to ensure works do not impact upon great crested newts. This will be achieved by adhering to a site specific working method statement, which is aimed at reducing the potential impact upon great crested newts and their habitat during construction processes. The MS will also include additional steps in the form of an active barrier (temporary amphibian fencing) to exclude and prevent newts entering development area.

- 7.5.13.2 This Method Statement will ensure that:
- Reasonable steps are taken to ensure that the risk of great crested newts being killed or injured is minimal.
 - Great crested newts are not to be significantly disturbed by the works.

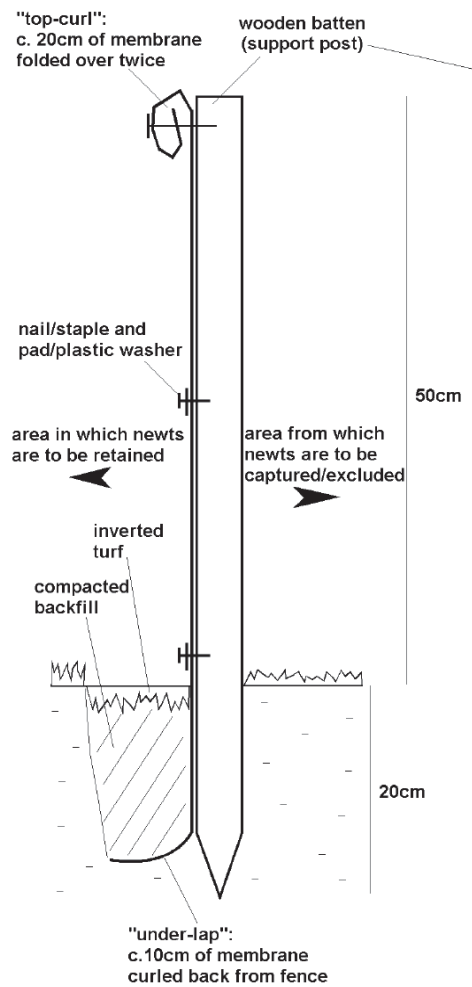
- 7.5.13.3 The following will take place to avoid potential injury to great crested newts during construction works:
- A thorough hand search immediately prior to any ground works and vegetation clearance in any area which has not been subject to trapping and translocation;
 - Supervision of vegetation clearance by a suitably qualified ecologist, holding a Natural England or Natural Resource Wales great crested newt survey licence;
 - Trapping and translocation of great crested newts from the construction zone prior to the onset of construction work;
 - The installation of temporary or permanent great crested newt exclusion fencing and cattle-grid style newt exclusion grids (if applicable) to ensure that great crested newts cannot access the development area.

- 7.5.13.4 Due to the close proximity of the great crested newt (if present), all works must be implemented with extreme caution/sensitivity, to minimise potential disturbance to important great crested newt habitat.

- 7.5.13.5 A tool box talk will be given to all contractors involved in the development before works proceed. This will provide background information on great crested newts in the area, where great crested newts are likely to be found and what to do if great crested newts are unexpectedly discovered during works. Staff will be shown photos of great crested newts to ensure they are aware of the possible presence of great crested newts on site, what to look out for and their level of protection. The method statement will remain on site during the building works.

- 7.5.13.6 Trenches should not be left overnight without a gentle slope to allow movement of amphibians that may be present in the trench. It is recommended that all trenches dug for cables are refilled daily. All trenches need to be checked prior to infilling.
- 7.5.13.7 Legislation dictates that foul water discharge into the water course or tributaries is not permitted and consequently the impact of the proposed development is considered negligible. However, a manure management and pollution prevention strategy in compliance with Nitrate Pollution Prevention Regulations (2008), Environment Agency guidelines and farming best practice have been produced separately by a specialist consultant.
- 7.5.14 Newt fencing
- 7.5.14.1 Great crested newts can be prevented from entering an area using temporary exclusion fencing. It is important that exclusion fencing is well specified, correctly installed and subject to on-going maintenance. Failure to do this could lead to it letting newts through unhindered.
- 7.5.14.2 There are a number of designs for amphibian exclusion fencing. The design of the fencing should be fit for the purpose, durable and repairable should damage occur. A recommended specification for temporary fences is shown below in Figure 1.
- 7.5.14.3 Fencing installation should be instructed by, and if necessary carried out under the supervision of, an appropriately experienced amphibian worker. Engaging the services of an experienced amphibian fencing contractor, who can fine-tune construction methods to cope with the different problems associated with different soil types, is strongly recommended. Natural England (2001) suggest that ‘despite the apparently simple construction methods involved, general fencing contractors with experience limited to the erection of ‘conventional’ stock barriers may not be appropriate’.

Figure 1 – Exclusion fencing specification.



CROSS-SECTION

- 7.5.14.4 The proposed fence-line should first be searched and cleared of amphibians if it is likely that they may be present.
- 7.5.14.5 The fencing is to be a continuous barrier (no gaps) to exclude any newts entering the development site.
- 7.5.14.6 The fence should be installed to the correct height and depth and with an adequate 'under-lap' to prevent newts from passing underneath.
- 7.5.14.7 The backfill should be placed turf downwards in the trench (to suppress re-growth of grass) and well compacted to eliminate any lumps or gaps. Backfill must not remain un-compacted overnight, and all fence trenches must be filled the same day as they have been dug, as amphibians may seek shelter within any un-compacted soil or turf.
- 7.5.14.8 Exclusion fencing should have an overhang or 'top curl' to prevent newts from climbing over the fence.
- 7.5.14.9 The fencing membrane should be of a type that will not break down or become brittle under exposure to the elements, notably UV light. '1000 gauge' transparent

polythene sheeting works well in many situations, as do woven polypropylene and black polythene DPC. Ensure that the sheet width is sufficient to permit the forming of the 'under-lap' and 'top-curl' (1m is sufficient for most fences). The blue plastic often used in the building industry is not recommended because it can become brittle quickly and usually requires replacement after only a few months. Replacing large sections of fencing will cause an unnecessary disturbance to the newts and should be avoided whenever possible.

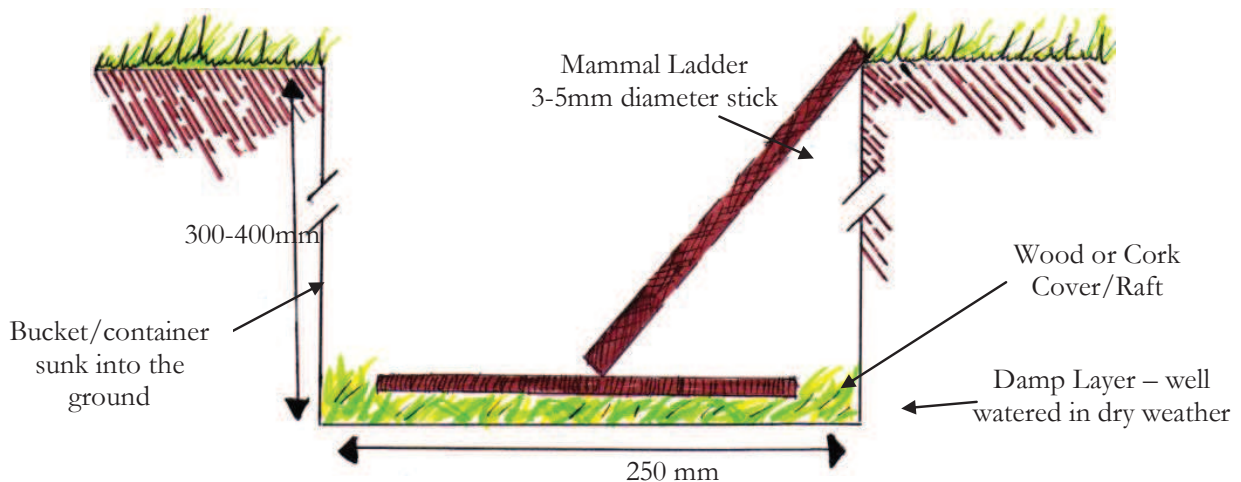
- 7.5.14.10 The fencing membrane should be as taut as possible without noticeable creases or folds which could allow newts to climb the fence. The use of too heavy a gauge of plastic may make it difficult to remove the creases and folds, and this could be a problem on uneven ground.
- 7.5.14.11 The fence should ideally be secured to the supporting posts by pads and nails or staples (not battens, which may allow newts to scale the fence).
- 7.5.14.12 Any joins in the membrane must be 'curl-joined' and well secured to a post with pads and nails. This jointing method should continue underground as well as above. Adhesive taped joins are not normally acceptable for long-term repairs to important parts of the fence, as they are not durable.
- 7.5.14.13 A record of fence inspection and damage repair work should be kept by the site manager as evidence that the newt-proof barrier has been properly maintained.
- 7.5.14.14 Newts may seek refuge in the shrinkage cracks that will occur between the fence and the backfill; therefore special care needs to be exercised when removing fencing. Should any fencing need replacement (including any that has to be replaced due to faulty installation), or during the final fence removal process, then all backfill should be removed carefully by hand under the supervision of newt ecologist, if it is thought likely that newts are present. This will minimise the risk of damaging or killing any amphibians that may be sheltering in the back-fill along the fence line.
- 7.5.14.15 It is sometimes necessary to control the vegetation along the fence-line to prevent the fence becoming overgrown, which helps the newts to breach the fence. This is best achieved by the careful application of an approved herbicide which is licensed for aquatic use (such as Roundup Biactive) to a narrow strip (50cm) on whichever side(s) of the fence newts are being prevented from climbing. Spraying should be undertaken once the amphibian fencing is erected and when the grass is still short and unsuitable for amphibians. This should ensure that vegetation is kept low throughout the growing season. Strimming should be avoided as amphibians may be present in the long grass. A licensed operator holding a certificate enabling them to spray on or near water would be required (Certificate: PA6aw).
- 7.5.14.16 The contractors and those involved with building works should take care not to provide temporary refugia for newts. Temporary refugia include stacking of sundries in plastic bags, leaving piles of rubble and the use of tarpaulins/plastic sheets. These all should be stacked on pallets (Off-Ground). All storage of materials and associated building works should only occur outside the newt fencing and on hard standing habitats.

- 7.5.14.17 The bank sides must be kept free of debris, storage and potential leaching of cement powders and building materials into the watercourse. It is recommended that any building materials are stored at least 10 metres away from the edge of the bank.

7.5.15 Pitfall Trapping

- 7.5.15.1 Pitfall traps are usually plastic containers sunk into the ground along the newt fencing (see Figure 2). These traps need to be designed to take into account the welfare of the species that they are after and other none target species that may become trapped in them. Each trap should contain a mammal ladder to allow small mammals such as shrews a way out of the trap. Mammal ladders can be made by simply placing a bit of rough wood into the base of the trap, allowing an easy escape route. Pitfall traps should be placed at 5-10 metre intervals.
- 7.5.15.2 Pitfall traps should provide cover in their bases in the form of vegetation. Drainage holes should also be incorporated into the traps base, to avoid the trap flooding.
- 7.5.15.3 Large gauge chicken wire should be placed over the top of the trap to stop crows and hedgehogs predating anything within the trap.
- 7.5.15.4 Pitfall traps need to be checked every 24 hours, preferably on a morning between 06.00 and 11.00 hours, earlier in hot weather.
- 7.5.15.5 All traps should be placed inside the construction zone and all trapped great crested newts should all be released within suitable habitat outside of the construction zones.

Figure 2 – Pitfall Trap Design (Gent & Gibson 1998)



- 7.5.15.6 Encountered amphibians should always be released in a sheltered area close to a suitable refuge (or in a pond), in weather conditions conducive to activity. Release should be as soon as possible and special care should be taken when releasing newts terrestrially during the day. Night releases are better but newts should not be unduly held in captivity. As a general rule, newts captured on land should not be released into water and vice versa, as this may disturb their physiology.

7.5.16 Timing

- 7.5.16.1 The development timescales are unknown.
- 7.5.16.2 It is normally unacceptable to attempt to capture newts once they have started to hibernate, which occurs when night temperatures drop towards freezing point, typically shortly before the first frosts, around mid-late October. This is largely because it is very difficult to find and capture animals once they have started to find refuges for winter; there is a risk that areas may be searched and declared free of newts when in fact the animals are still present in inaccessible underground crevices or in refuges. Searching destructively in winter, especially without a prior capture effort, is also more likely to result in mortality. In addition, from a welfare point of view it is most unwise to capture and relocate animals which have begun their winter dormancy.
- 7.5.16.3 Encountered amphibians should always be released in a sheltered area close to a suitable refuge, in weather conditions conducive to activity. Release should be as soon as possible and special care should be taken when releasing newts terrestrially during the day. Night releases are better but newts should not be unduly held in captivity. As a general rule, newts captured on land should not be released into water and vice versa, as this may disturb their physiology.
- 7.5.16.4 Amphibians use hibernation and safe refuge sites over winter. These are generally cheap to build and can use waster rubble and soil. The hibernacula should be located close to the pond and will provide shelter to compensate for any loss of hibernacula on site. The hibernation site should be created immediately and prior to building works.

7.5.17 Compensation

- 7.5.17.1 Only viable habitats which are lost as part of the development will be re-created. Aquatic habitats will be replaced like for like as part of the development, no loss of aquatic habitats will occur.
- 7.5.17.2 A minimum of 2 **(depending on the population size)** new hibernacula will be created in close proximity to ponds within the ownership of the client, to compensate for loss of terrestrial habitat. These will be built in such a way as to allow loafing, hibernating and foraging habitat within the same structure. This will aid survival and help allow the population to persist at the site post development.
- 7.5.17.1 Hibernacula are both cheap to create and effective. There are two types of hibernacula which can be used in different situations, in some cases in conjunction with one another. These are:
- Terrestrial and;
 - Subterranean.
- 7.5.17.2 Hibernacula will be created by excavating holes approximately 100cm deep into the bank at least 1 metre above the mean high water level mark. This is important to ensure the hibernacula are not at risk from flooding, which could result in the deaths of hibernating newts. The holes will then be in-filled with stone, rock, brick rubble (without cement residues, bricks and logs. The soil/tuft removed as part of the excavation should then be used to cover the surface of the hibernacula.

This needs to be a thin layer and allow numerous entrances to voids, in which the newts can access the hibernaculum. Eventually, mosses and grasses will colonise the outer edge of the hibernacula, disguising it but more importantly increasing the humidity and helping stabilize its structure. The following steps should be undertaken when building a hibernaculum.

- Remove the turf from the footprint of the hibernaculum and set aside.
- On well-drained soil excavate to a depth of approximately 100cm and set aside spoil (this is unnecessary on poorly drained soils;
- Fill the footprint or pit with core material, materials likely to retain moisture are preferable, including cut timber, brash and grubbed tree roots. Other material including inert hardcore, bricks, rocks and building rubble may also be used. Materials that will decompose should not be placed beneath heavy components such as bricks or rocks, to reduce the risk of collapse;
- Pack the larger spaces within the core materials with wood chippings, loose topsoil or spoil;
- Cover the hibernaculum with turves removed from footprint;
- Take care not to create structures that might attract rodents, such as piles of rubble with many entrance holes greater than 10mm.
- Hibernacula will be approximately 5 metres in length and two metres wide. It is optimum to create multiple small/medium hibernacula rather than a single large one.

7.5.17.3 All hibernacula should be:

- Within 200 metres of the breeding pond;
- In areas unlikely to flood (including raising groundwater);
- Within suitable habitat, not fragmented from breeding and foraging areas;
- In areas with minimal disturbance.

7.5.17.4 The following designs have been suggested to provide guidance. The client has expressed concern about vermin using hibernacula and consequently, they will carefully be designed to allow GCN access but prevent larger creatures including rats. This will be achieved by carefully placing paving slabs over the entrances of the hibernacula, 12mm spacing will allow GCN access and exclude larger creatures.

Figure 3 - Terrestrial Hibernaculum (modified from *Langton et al 2001*)

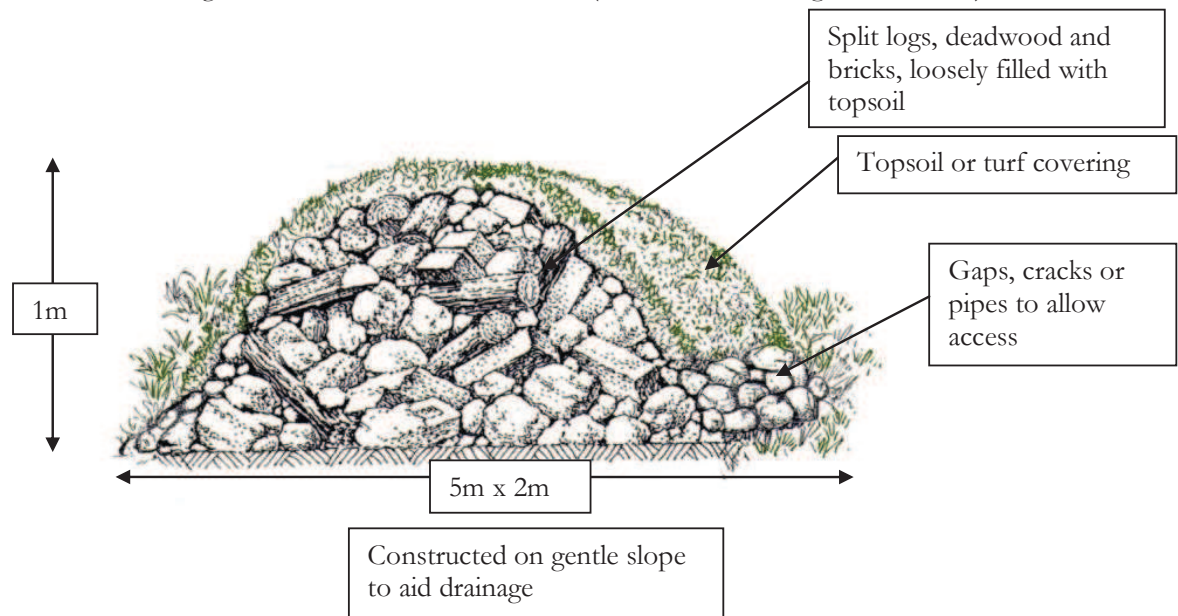
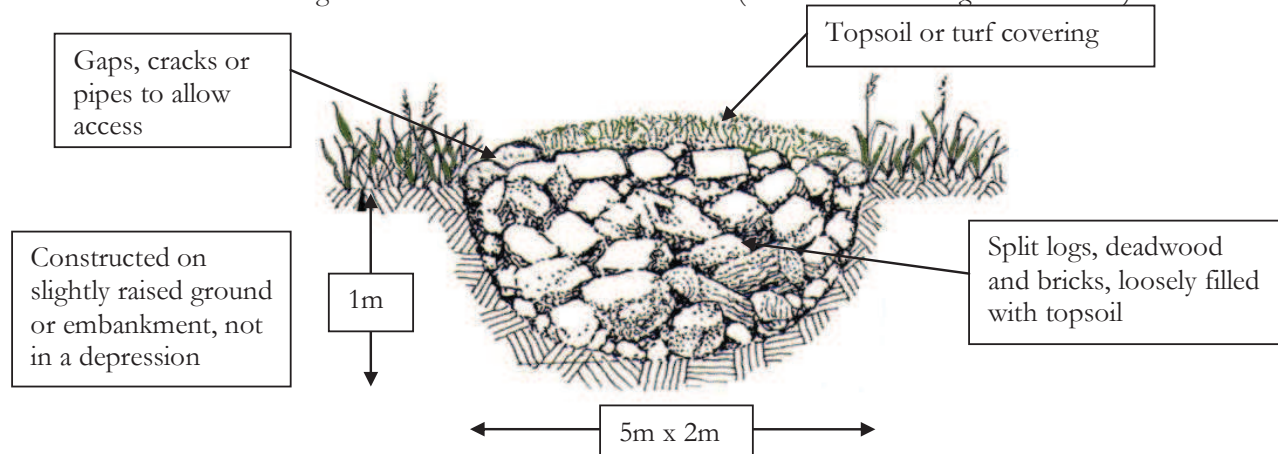


Figure 4 - Subterranean Hibernaculum (modified from *Langton et al 2001*)



7.5.18 Pond enhancements

- 7.5.18.1 The land surrounding the marshy area and ponds within the ownership of Mr Molloy, which appears to be prone to flooding, can be used as an area of wetland in which a number of additional ponds are created. These ponds should be enhanced with great crested newts in mind, the current population is of regional significance and work should target retaining and protecting this population. It is important that an area of wetland intermixed open water and wet grassland is created as opposed to a large lake.
- 7.5.18.2 There is great potential to vastly improve the flora and fauna value of the study area and surrounding habitats through the enhancement of existing ponds adjacent to the application site. The potential value of the pond to breeding amphibians, breeding birds, invertebrates, plants and small mammals will be significant. Additionally, ponds add a huge aesthetic value to an environment in which the owners of the pond can enjoy.
- 7.5.18.3 Wildlife ponds should be an irregular shape with bays, peninsulas, shallows and deeper areas. The margins should be shallow gently sloping off to a central channel which should have a maximum winter depth of approximately 1 metre in the centre. Approximately 70% of the ponds total area should be made up of the shallow sloping margins. The ponds diversity also increases when creating micro-habitats such as small seasonal pools within the ponds margin. New ponds should be between 500-750m², in full sunlight away from tree cover and be planted with a range of native aquatic vegetation.
- 7.5.18.4 It is important to develop a shallow pond as this offers more optimum habitat for a large diversity of species. Amphibians for example prefer shallow ponds as they heat up at a faster rate helping speed up the metamorphosis of their larvae as well as providing more larval food in the form of algae and invertebrates and increase plant growth for cover and egg laying. Birds also benefit from shallower pools as it allows them to bathe and forage on invertebrates in the shallow or exposed mud around the ponds edge. In addition, creating as much shoreline length as possible further increases the value to foraging birds and invertebrates.

- 7.5.18.5 Wildlife ponds should be linked to surrounding habitat features such as hedgerows, woodland and rough grassland. Linking ponds to habitat features helps increase the dispersal opportunities and speed for a wide variety of species. It also provides them with a safer way to and from the site. This can be achieved by encouraging rough uncut strips of grassland linking the pond to these areas, these act as highways for wildlife to travel between different habitat types.
- 7.5.18.6 The water table appears to be high at the site, so filling the new ponds should not be an issue. Initially filling an empty pond up, which has limited plant growth and no micro-organisms often results in the pond water turning green. Especially if pond creation occurs during the warmer summer months. This is due to an early bloom of phytoplankton which quickly turns the pond water green. This may not occur instantly and may happen after several weeks depending on a variety of factors. This problem soon corrects itself as zooplankton communities which feed on phytoplankton increase due to the abundance of their food. These graze the phytoplankton and eventually equilibrium (clear water in this case) is met. A pond of this design should stay clear all year. If excessive nutrients are entering the water which are too much for the zooplankton to process the pond will turn green again. This could be due to agro-chemical drift/runoff, garden chemical drift/runoff, fish, wildfowl, livestock nutrients leeching into the pond and excessive leaf litter entering the water. The source of the problem needs to be identified before the good water quality returns. Measures such as floating barley or chemicals are best avoided; dealing the root cause is more effective. A suitable buffer of rough grassland around the ponds should help protect them from nitrate input, retaining their aesthetic value.
- 7.5.18.7 Wildfowl should not be encouraged to the pond as they create a large range of problems. Mallards *Anas platyrhynchos* in particular graze aquatic vegetation, trample banks, eat amphibian larvae and defecate in the water. These factors increase nutrient input into the water which eventually turns the water green (as a result of algal blooms). This blocks out light and reduces plant growth, the green water then result in the pond having a much reduced ecological value. Most ponds however are capable of supporting nesting moorhens or little grebes *Tachybaptus ruficollis* these species do not exhibit the same problems as ducks and should be encouraged to stay, through minimal disturbance to them. Fish should not be introduced to the pond or allowed to become established. Most pond wildlife struggles to co-exist with fish and as a result large numbers of invertebrate species and amphibians such as common frog, great crested newt and smooth newt will disappear from the pond, as fish populations become more established. Additionally fish soon multiply creating heavily turbid water whilst foraging or through nutrient input. Even several goldfish *Carassius auratus auratus* within a pond can cause a large reduction in tadpole survivorship. If fish such as sticklebacks *Gasterosteus aculeatus* & *Pungitius pungitius* or perch *Perca fluviatilis* arrive naturally to the pond they should be removed. These species are successful colonizers of isolated ponds and are highly predatory, significantly reducing amphibian and invertebrate diversity.
- 7.5.18.8 Wildlife ponds should be specifically designed to include a series of buffers around the banks to intercept pollutants and phosphates which may have a negative impact of the water quality and species using the pond. This can be done through the creation of rough grassland, marginal vegetation and hedgerows, all of which offer a sufficient level of protection to the pond and should be maintained.

- 7.5.18.9 The habitat surrounding the ponds are often just as important as the pond itself and needs to be incorporated into any pond creation plan or management plan. An area of grassland surrounding the pond will be managed on a 2-3 year rotation and will be allowed to revert to tussock baring rough wet grassland. However this must not be allowed to grow into woodland. It is important to keep all shrubs particularly willows away from the ponds margins as it can become over dominant. This habitat offers value to amphibians, small mammals and nesting birds. It will provide a variety of micro-habitats within it dominated by grass tussocks, reedbeds and ruderal vegetation stands comprising nettle, campion and willowherbs.
- 7.5.18.10 Log piles, brash piles, habitat stacks and custom build hibernacula (see figure 2) should be created within the area surrounding a pond, they are all cheap to build and very successful. These should preferably be sourced from local plantations using the wood from native tree species (i.e. beech, oak, ash, hawthorn and elder). They should be built up with a variety of different trunk/branch sizes with some small thin sections and some larger thicker sections. They should be tightly packed together leaving small gaps as entrances. Additionally a purpose built hibernaculum should be made this is made in a similar way but the log pile is then covered in rubble and soil to create a mound with gaps in its sides. These hibernacula will offer important hibernation sites for amphibians, invertebrates and hedgehogs. They will also provide nesting and foraging areas for small mammals and birds in the summer.
- 7.5.18.11 Any new ponds or ponds considered for ecological enhancements should be planted with a variety of native pond plants. A List of species to use is highlighted below:
- Ragged Robin *Lychnis flos-cuculi*;
 - Common Yellow Sedge *Carex viridula* subsp. *Oedocarpa*
 - Common Spike Rush *Eleocharis palustris*
 - Round-leaved Crowfoot *Ranunculus omiophyllus*
 - Pond Water-crowfoot *Ranunculus peltatus*
 - Fine-leaved water-dropwort *Oenanthe aquatica*
 - Broad-leaved pondweed *Potamogeton natans*
 - Soft Rush *Juncus effusus*;
 - White water-lily *Nymphaea alba*
 - Cuckoo Flower *Cardamine pratensis*;
 - Amphibious bistort *Persicaria amphibia*
 - Marsh Marigold *Caltha palustris*;
 - Meadow Sweet *Filipendula ulmaria*;
 - Marsh Cinquefoil *Potentilla palustris*;
 - Yellow Flag Iris *Iris pseudacorus*;
 - Purple Loosestrife *Lythrum salicaria*;
 - Brooklime *Veronica beccabunga*;
 - Water Plantain *Alisma plantago-aquatica*;
 - Water forget-me-not *Myosotis scorpioides*;
 - Water Mint *Mentha aquatica*;
 - Duckweed *Lemna minor*;
 - Mare's-tail *Hippuris vulgaris*;

- Fennel-like Pondweed *Potamogeton pectinatus*;
- Greater Spearwort *Ranunculus lingua*;
- Frogbit *Hydrocharis morsus-ranae*;
- Water Crowfoot *Ranunculus aquatilis*;
- Spiked Water-milfoil *Myriophyllum spicatum*;
- Common Water Starwort *Callitriche stagnalis*;
- Water Soldier *Stratiotes aloides*;
- Willow Moss *Fontinalis antipyretica*;
- Curled Pondweed *Potamogeton crispus* and;
- Common Hornwort *Ceratophyllum demersum*.

7.6 Reptiles

7.6.1 Four reptile species, slow-worm, viviparous (or common) lizard, grass snake and adder also have protection under the Wildlife and Countryside Act 1981. Their inclusion on Schedule 5 gives 'partial protection' (i.e. only parts of section 9 apply). In addition to the restrictions on sale they are also protected from intentional killing or injuring. (Note that this latter protection was bestowed through amendments to their original listing on the 1981 Act through Variation of Schedules Orders in 1988 www.opsi.gov.uk/si/si1988/Uksi_19880288_en_1.htm and 1991 www.opsi.gov.uk/SI/si1991/Uksi_19910367_en_1.htm).

7.6.2 Since its original enactment, the Wildlife and Countryside Act has been subject to many changes (notably via Schedule 12 of the Countryside and Rights of Way Act 2000). These have in particular affected penalties and enforcement. Offences under section 9 of the Act are now 'arrestable'. Enforcement is usually by the Police and less frequently by Natural Resource Wales. However, section 25(2) of Wildlife and Countryside Act also states that a local authority may institute proceedings. Prosecutions can result in a level five fine (currently £5000) for each offence (and the Act is specific that killing/injuring of each individual animal can constitute a separate offence), the forfeiture of any equipment, etc., used to perpetrate that offence and (under the Countryside and Rights of Way Act 2000) up to six months imprisonment.

7.6.3 Reptiles are most widely distributed on large areas of ideal habitats such as heathland, moorland, rough grassland and sand dunes. However, they can be found in a wide range of other habitats that are found within the study area. The common factor is sufficient vegetation structure. Reptiles are often patchily distributed across a site, and may be concentrated into small areas or narrow strips of habitat, sometimes in large concentrations.

- Grass snakes tend to be found in rank grass, herbs, bramble etc; often along hedgerows, field margins and in gardens.

7.6 Method statement

7.6.1 **This method statement should be copied to contractors and all those involved with site clearance and building works, whose work may affect refugia and hibernacula.**

7.6.2 This Method Statement ensures that:

- Protection of reptiles from any harm that might arise during the development work.

- To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.
- Habitat enhancements will ensure that the reptile suitability of the site is increased
- Reptiles are not to be significantly disturbed by the works
- Compensation should ensure that the reptile population can continue to function as before
- The strategy should be considered to ensure that the reptile populations at the site are maintained at a favourable conservation status.

7.6.3 A tool box talk will be given to all contractors involved in the development before works proceed. This will provide background information on reptiles in the area, where reptiles are likely to be found and what to do if reptiles are unexpectedly discovered during works. The method statement will remain on site during the building works.

7.6.4 Timing

7.6.4.1 It is recommended that the removal of the composting area is conducted in late April or May when the impact on any reptiles would be minimal. It is not advisable to remove the spoil heap in the months of June-September due to the reptiles' reproductive cycle or November-March as this is when reptiles will be hibernating.

7.6.5 Locating reptiles

7.6.5.1 A hand search will be undertaken by a reptile ecologist or their agent each morning prior to the start of any vegetation clearance, removal of scrub and ground works. An endoscope will assist with the survey.

7.6.5.2 The removal of vegetation will be undertaken after a thorough hand search of the area, strimmers, brush cutters and hand tools will be used to clear the site. Such a disturbance will reduce the likelihood of reptiles remaining in that area. Reptiles are vulnerable to vibration, the vibration and noise caused during the excavation will be sufficient to discourage reptiles from the area of works.

7.6.5.3 To reduce the likelihood of reptiles being present within the construction, cutting would be undertaken between the hours of 11:00 and 15:00 only. Staff shall be given a tool box talk to ensure they are aware of the possible presence of reptiles on site, what to look out for and their level of protection. It is recommended that the vegetation is cut to a height of about 10cm, this should be short enough to make the area undesirable but will not be short enough to harm any.

7.6.5.4 The habitats within the construction zone will be kept short/mown for the duration of the development, to ensure that (where vegetation is present) the sward length is kept short, and thereby less suitable for reptiles. Once the development area has been strimmed it is advisable to use a biodegradable weed killer on the remaining vegetation. This will make the areas treated unfavourable to reptiles.

7.6.5.5 The contractors and those involved with on site works should take care not to provide temporary refugia for reptiles. This includes stacking of sundries in

plastic bags, leaving piles of rubble and the use of tarpaulins/plastic sheets. These all should be stacked off the ground or on hard standing.

7.7 Birds

7.7.1 A number of species have been identified during the course of the field surveys as having the potential to nesting within the impacted development area. These are species which typically utilise the hedgerow, scrub and ruderal vegetation habitats. It is therefore recommended that if such habitats are to be removed as part of the construction phase that this is done so outside of the breeding bird season (mid September to early February). During the construction phase, waste material such as brash and other debris removed as part of clearance works will be removed from the construction area.

7.7.2 In the unlikely event that the vegetation clearance works cannot be completed outside of the breeding season, a targeted visual inspection for active nests will be required. In considering this further, it is entirely lawful to clear vegetation within the breeding bird season as long as there is no breeding activity within the habitat to be cleared.

7.7.3 Consequently, any hedges, tall herbage or trees to be removed inside the nesting bird season (early February to mid September) needs to be carefully checked by a suitably qualified ornithologist or other suitably qualified ecologist to confirm no active nests are present - prior to removal during this period. If nesting birds are found during the watching brief, works will need to stop until the young have fledged.

7.8 Trees

7.8.1 Any trees to be retained and trees on adjacent land within 5m of the construction zone should be protected by barriers erected following guidelines given in BS5837:2012 "Trees in Relation to Construction". English Nature (2000) recommends that 'an exclusion zone of 15 times the diameter of the tree at breast height is created'. This will protect the roots from compaction and physical damage whilst protecting the tree from fertilizers and chemical applications. The latter can have a detrimental effect on the trees relationship with lichens and mycorrhizal fungi. Root protection zones should be free of plant, storage of building sundries and excavation works should be limited where possible; this will help preserve the life of the trees.

7.8.2 The tree planting scheme has yet to be devised and should target local provenance and native species. In addition, fruit bearing trees and shrubs should be considered to increase winter food sources for birds. The landscaping plan should consider habitat connectivity to other sites and enhance dispersion of fauna. Suitable trees to plant include :

Specie	Height	Comments
Blackthorn <i>Prunus spinosa</i>	3m	Important scrub coloniser.
Dogwood <i>Cornus sanguinea</i>	3m	Thrives on calcareous soils and provides nesting cover.
Hawthorn <i>Crataegus monogyna</i>	9m	Very tolerant and provides bird food.
Hazel <i>Corylus avellana</i>	6m	Thrives on calcareous soils.

Holly <i>Ilex aquifolium</i>	15m	Prefers drier soil, useful sub canopy tree.
Crab apple <i>Malus sylvestris</i>	6m	Bird, insect and small mammal food.
Dog rose <i>Rosa canina</i>	3m	Food for birds and insects.
Rowan <i>Sorbus aucuparia</i>	9m	Tolerates exposed sites. Bird and insect fruit.
Silver birch <i>Betula pendula</i>	18m	Aesthetic value and is a good invertebrate habitat.
Downy birch <i>Betula pubescens</i>	18m	Seeds provide a food source for birds.

7.9 Working in watercourses (if applicable) and best practice guidelines.

- 7.9.1 Under the Water Resources Act 1991 and associated byelaws, works in, over, under or adjacent to 'main rivers' require the consent of the Environment Agency. This is to ensure that they neither interfere with the Agency's work nor adversely affect the environment, fisheries, wildlife and flood defence in the locality. The Environment Agency functions under the responsibilities of the Environment Act 1995. The EC Habitats Directive protects Special Areas of Conservation (SAC) and Special Protection Areas (SPA) and special consents are required from Natural England or Natural Resource Wales (in Wales only).
- 7.9.2 Construction and maintenance activities in or near water have the potential to cause serious pollution or impact on the bed and banks of a watercourse and on the quality and quantity of the water. Some activities with the potential for affecting watercourses or groundwater may require either consent in England and Wales under the Water Resources Act 1991 or an authorisation in Scotland under the Water Environment (Controlled Activities) (Scotland) Regulations 2005.
- 7.9.3 Types of activity that may impact upon the bed and banks of a watercourse or of a wetland include:
- repairs, maintenance or improvements to any structure in, over or above main river (as defined in the Water Resources Act 1991);
 - erection or construction of any structure, either permanent or temporary, in, over or above main river;
 - diversion of flows;
 - works within the river channel or a lake/loch;
 - works within 10 metres of a main river watercourse or flood defence (in England, Northern Ireland and Wales).
- 7.9.4 Land Drainage consent from the Environment Agency and Natural Resource Wales consent under the Habitats Regulations and Wildlife and Countryside Act 1981/Countryside and Rights of Way Act 2000 need to be obtained prior to work commencing.
- 7.9.5 Natural Resource Wales, Environment Agency and Association of Rivers Trusts have produced guidance on working in and adjacent to rivers. The guidance discourages the use of machinery within 2m of the bank edge
- 7.9.6 If working in the river channel is necessary, the Environment Agency should be contacted during the early planning stages to discuss appropriate pollution control measures. Permission for this type of work may take up to four months to obtain. The risk of silt pollution causing an incident will depend on many factors including:

- likelihood of silt being disturbed
 - what the river bed is made of, e.g. silt or gravel;
 - the conditions in which the work is carried out, e.g. hot weather and low flows
- 7.9.7 Silt pollution caused by working in surface waters can be minimised or prevented by keeping water out of the works area using appropriate isolation techniques, such as coffer dams and by-pass channels.
- 7.9.8 Run off from site roads and river crossings can contain high levels of silt. Reducing the pollution risk can be achieved by:
- brushing or scraping roads to reduce dust and mud deposits
 - putting small dams in artificial roadside ditches to retain silt
 - using existing permanent bridges or pipe crossings for river crossing
 - if necessary building temporary bridges - but not fording rivers and
 - working from the bank where possible – not in the river
- 7.9.9 Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution. Concrete and cement mixing and washing areas should:
- be sited 10 metres from any watercourse or surface water drain to minimise the risk of run off entering a watercourse
 - have settlement and re-circulation systems for water reuse, to minimise the risk of pollution and reduce water usage
 - have a contained area for washing out and cleaning of concrete batching plant or ready mix lorries
 - Wash waters from concrete and cement works should never be discharged in to the water environment.
- 7.9.10 Ensure machinery is properly maintained, check for oil leaks before use. There are risks of pollution from fuel, oils and silt associated with use of machinery which could result in prosecution. Particular attention should be paid to using chainsaws in or near the water's edge as chain oil sprayed during operation easily contaminates the water. Follow the correct procedures and if possible use biodegradable oil to reduce this risk
- 7.9.11 Ensure fuel, oil and chemical storage on site is secure. Site the storage on an impervious base within a secondary containment system such as a bund. The base and bund walls should be impermeable to the material stored and able to contain at least 110% of the volume stored. Site the storage area above any flood water level and where possible away from high-risk locations (such as within 10 metres of a watercourse or 50 metres of a well, borehole or spring), to minimise the risk of a spill entering the water environment. Biodegradable chainsaw chain bar lubricant and biodegradable hydraulic oil in plant should be used when working in or near watercourses. The Environment Agency and its contractors use biodegradable oils for their own operations. Biodegradable oils are less toxic than most of the synthetic oil but should still be stored and used to the same standards as other oils.
- 7.9.12 Keep a spill kit with sand, earth or commercial products that are approved for your stored materials, close to your storage area. Train staff on how to use these correctly.

- 7.9.13 In no circumstance should burning take place in the river channel or close to the bank edge and ash must not blow or wash into the watercourse as it is harmful to water life
- 7.9.14 Be sure to stack or remove any material well away from the river to avoid it being washed into the water again during the next flood.
- 7.10 Utilities
 - 7.10.1 The proposed poultry unit will be connected to services via the existing farm to the south of the Application Site. Wold Ecology concludes that these trenches are located in areas of existing grassland that are located between the farm and proposed development.
 - 7.10.2 During the construction phase of any development it is necessary to undertake a number of additional measures to safeguard any wildlife which may be present within the Application Site.
 - 7.10.3 Trenches should not be left overnight without a gentle slope to allow movement of creatures that may be present in the trench. It is recommended that all trenches dug for cables are refilled daily. All trenches need to be checked prior to infilling.

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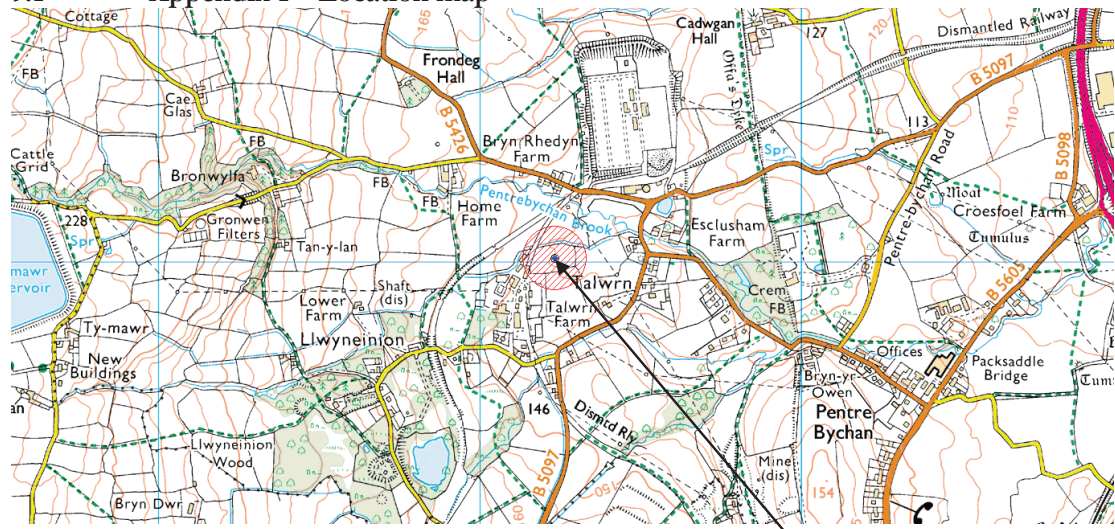
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<http://www.natureonthemap.org.uk/identify.aspx>

9.0 APPENDICES

9.1 Appendix 1 – Location map



Application Site

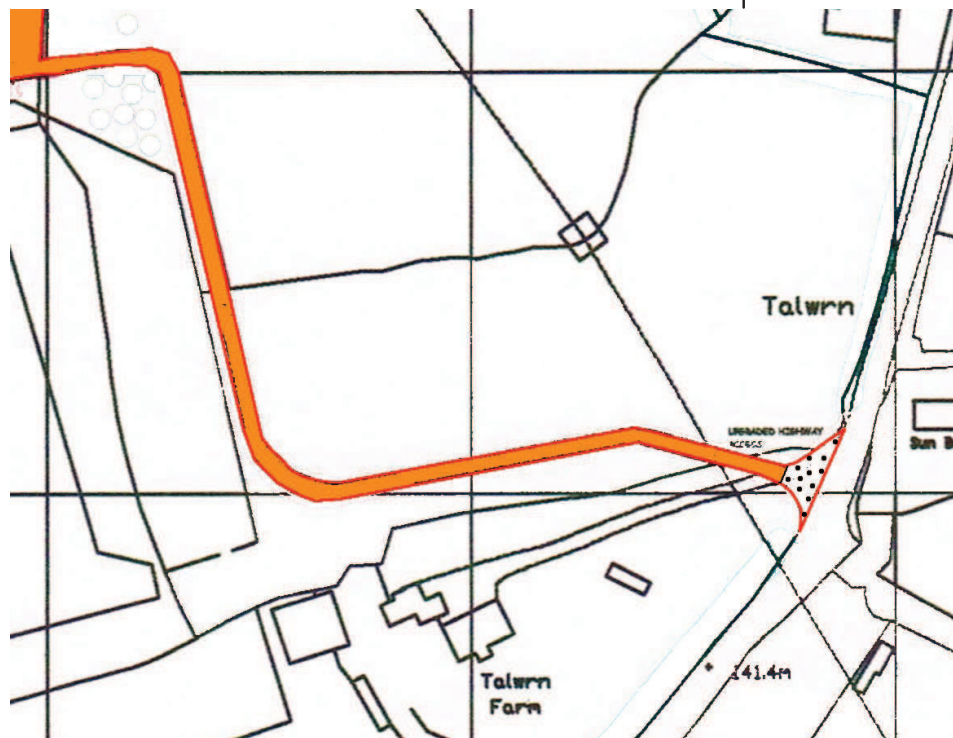


NB – tall rudural habitats too small to map.

Phase 1 Map B (proposed access track)

N

Not to scale.



KEY to phase 1 maps A and B

SI	Semi-improved neutral grassland.
	Broadleaf woodland.
	Broadleaf plantation woodland
	Running water.
	Marsh/marshy grassland
	Hedge (intact and defunct)
● ●	Bare ground
⊙	Target note.
—	Application Site boundary

NB – tall rudural habitats too small to map.

9.3 Target Notes

Target Note 1 - The field adjacent to the proposed access track is more species rich than the field to the north (site of the proposed poultry unit buildings) as it contains greater sward diversity. In addition to the species above, lesser stitchwort *Stellaria graminea*, timothy *Phleum pratensis*, common sorrel *Rumex acetosa*, red clover *Trifolium pratense* were present in the sward. Smooth meadow grass *Poa pratensis* and changing forget-me-not *Myosotis discolor* were found growing within 10m of the proposed access road.

Target Note 2 - A ditch, approximately 1m wide and 1m deep is located along the southern boundary of the plantation woodland; the proposed access track will cross the ditch. The water appeared to be almost still, slowly moving in an easterly direction and was heavily shaded by the adjacent woodland cover. Leaf litter has silted the ditch. Water depth was less than 5cm at the time of survey and it is likely that the ditch dries during most years.

Target Note 3 - Although outside of the Application Site, a shallow ditch runs along the northern boundary of the Application Site; adjacent to the species rich hedgerow. The water runs slowly from west to east; the water was approximately 10cm deep and 50 cm wide at the time of survey. The ditch is heavily shaded. Ditch side vegetation favours those plants tolerant of shade including male fern *Dryopteris filix-mas* and field horsetail *Equisetum arvense*.

Target Note 4 - Running 120 metres along the northern boundary of the field in which the development area lies, is a mature species rich hedgerow. The hedgerow is unmanaged and varies in structure and height along its length. Small gaps are present within the hedgerow (greater than 5m). The hedge is approximately 4m tall and 4m in height. Species present include hawthorn, holly, elder *Sambucus nigra*, pedunculate oak, goat willow, blackthorn, sycamore *Acer pseudoplatanus*, hazel and alder *Alnus glutinosa*; all of which were present within a 30m metre stretch.

Target Note 5 - A man-made wetland in the north east corner of the Application Site was damp at the time of the survey. Species composition includes species typical of inundated grassland with abundant floating sweet-grass *Glyceria fluitans*, marsh foxtail *Alopecurus geniculatus*, creeping bent *Agrostis stolonifera*, rough meadow-grass *Poa trivialis* and creeping buttercup. Wetter areas hold small amounts of common yellow sedge *Carex viridula* subsp. *oedocarpa* and common spike-rush *Eleocharis palustris*, both species are listed as scarce on the draft rare-plant register for Denbighshire. The area surrounding the depression was dominated by soft rush *Juncus effusus* and creeping buttercup *Ranunculus repens*, both are species of poorly-drained pastures.

Target Note 6 - The wet area extends beyond the development area to the east; beyond the ditch the moist grassland is dominated by reed sweet grass *Glyceria maxima*, also listed as locally scarce. The fringes of this area have been colonised by damp loving species including brooklime *Veronica beccabunga*, cuckoo flower *Cardamine pratensis* and wild angelica *Angelica sylvestris*.

9.4 Appendix 4 – Species encountered during field work.

9.4.1 Botanical species list

<i>Aegopodium podagraria</i>	Ground Elder
<i>Alnus glutinosa</i>	Common Alder
<i>Agrostis capillaris</i>	Common Bent
<i>Agrostis stolonifera</i>	Creeping Bent
<i>Alnus glutinosa</i>	Alder
<i>Alopecurus geniculatus</i>	Marsh Foxtail
<i>Alopecurus pratensis</i>	Meadow Foxtail
<i>Angelica sylvestris</i>	Wild Angelica
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass
<i>Bellis perennis</i>	Daisy
<i>Berula erecta</i>	Lesser Water-parsnip
<i>Betula</i> sp	Birch
<i>Brachypodium sylvaticum</i>	False Brome
<i>Cardamine pratensis</i>	Cuckooflower
<i>Carex disticha</i>	Brown sedge
<i>Carex panicea</i>	Carnation Sedge
<i>Carex viridula</i> subsp. <i>oedocarpa</i>	Common Yellow Sedge
<i>Centaurea nigra</i>	Common Knapweed
<i>Cerastium fontanum</i>	Common Mouse-ear
<i>Cerastium glomeratum</i>	Sticky Mouse-ear
<i>Cirsium arvense</i>	Creeping Thistle
<i>Cirsium palustre</i>	Marsh Thistle
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Cynosurus cristatus</i>	Crested Dog's-tail
<i>Dactylis glomerata</i>	Cock's-foot
<i>Dryopteris dilatata</i>	Broad Buckler-fern
<i>Dryopteris filix-mas</i>	Male-fern
<i>Eleocharis palustris</i>	Common Spike-rush
<i>Epilobium hirsutum</i>	Great Willowherb
<i>Epilobium montanum</i>	Broad-leaved Willowherb
<i>Epilobium obscurum</i>	Short-fruited Willowherb
<i>Equisetum arvense</i>	Field Horsetail
<i>Festuca rubra</i>	Red Fescue
<i>Galium aparine</i>	Cleavers
<i>Geranium robertianum</i>	Herb-Robert
<i>Geum urbanum</i>	Wood Avens
<i>Glyceria fluitans</i>	Floating Sweet-grass
<i>Glyceria maxima</i>	Reed Sweet-grass
<i>Hedera helix</i>	Ivy
<i>Heracleum sphondylium</i>	Hogweed
<i>Holcus lanatus</i>	Yorkshire-fog
<i>Ilex aquifolium</i>	Holly
<i>Juncus articulatus</i>	Jointed Rush
<i>Juncus conglomeratus</i>	Compact Rush

<i>Juncus effusus</i>	Soft-rush
<i>Juncus inflexus</i>	Hard Rush
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Myosotis discolor</i>	Changing Forget-me-not
<i>Phalaris arundinacea</i>	Reed Canary-grass
<i>Pbleum pratense</i>	Timothy
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Poa annua</i>	Annual Meadow-grass
<i>Poa pratensis</i>	Smooth Meadow-grass
<i>Poa trivialis</i>	Rough Meadow-grass
<i>Populus sp.</i>	Hybrid Black Poplar
<i>Potentilla anserina</i>	Silverweed
<i>Potentilla reptans</i>	Creeping Cinquefoil
<i>Prunus spinosa</i>	Blackthorn
<i>Quercus robur</i>	Pedunculate Oak
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Rhinanthus minor</i>	Yellow-rattle
<i>Rosa canina</i>	Dog-rose
<i>Rubus fruticosus agg</i>	Bramble
<i>Rumex acetosa</i>	Common Sorrel
<i>Rumex obtusifolius</i>	Broad-leaved Dock
<i>Sagina procumbens</i>	Procumbent Pearlwort
<i>Salix caprea</i>	Goat Willow
<i>Sambucus nigra</i>	Elder
<i>Silene dioica</i>	Red Campion
<i>Stellaria graminea</i>	Lesser Stitchwort
<i>Tamus communis</i>	Black Bryony
<i>Taraxacum officinale</i>	Dandelion
<i>Trifolium dubium</i>	Lesser Trefoil
<i>Trifolium pratense</i>	Red Clover
<i>Urtica dioica</i>	Common Nettle
<i>Veronica beccabunga</i>	Brooklime
<i>Veronica chamaedrys</i>	Germander Speedwell
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell
<i>Vicia cracca</i>	Tufted Vetch
<i>Vicia sativa</i>	Common Vetch

9.4.2

Birds

- Chiffchaff *Phylloscopus collybita*
- Magpie *Pica pica*
- Robin *Erithacus rubecula*
- Song Thrush *Turdus philomelos*
- Chaffinch *Fringilla coelebs*
- Great tit *Parus major*

- 9.4.3 Mammals
- Fox *Vulpes vulpes* (evidence)
- 9.4.4 Other
- Speckled Wood *Pararge aegeria*
 - Green-veined White *Pieris napi*
 - Orange tip *Anthocharis cardamines*

9.5 Appendix 5 – Summary of desktop study

Organisation.	Response Summary.	Date.
Countryside Council for Wales	Local designations.	May 2013
Countryside Council for Wales	UKBAP species and habitats within 2 km of the Application Site.	May 2013
Cofnod	Species lists within 2 km of the Application Site.	May 2013
National Biodiversity Network.	Species lists within 2 km of the Application Site.	May 2013
Denbeighshire Rare Plant Register (draft).	Botanical species	May 2013

9.6 Appendix 6 - Legal protection and policy framework

Species	Key Legal Protection
Great crested newt	Under the Habitats and Species Regulations 2010, the intentional killing of newts, damage or destruction of a breeding site or resting place and intentional/reckless damage to or obstruction of a place used for shelter or protection is prohibited. In addition, under the Wildlife and Countryside Act 1981 (as amended), the intentional killing, injuring or taking, or disturbance of great crested newts whilst occupying a place used for shelter or protection and the destruction of these places is prohibited.
Birds	Birds are afforded various levels of protection and levels of conservation status on a species by species basis. The most significant general legislation for British birds lies within Part 1 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is an offence to, kill, injure or take any wild bird, take, damage or destroy the nest of any wild bird while that nest is in use or being built, take or destroy an egg of any wild bird.
Reptiles	All native reptiles are listed on schedule 5 of the Wildlife and Countryside Act 1981 and are afforded different levels of protection. For the four most commonly occurring species and those that are relevant to this project; adder (<i>Vipera berus</i>), grass snake (<i>Natrix natrix</i>), common lizard (<i>Lacerta vivipera</i>) and slow worm (<i>Anguis fragilis</i>) this act makes it illegal to intentionally kill or injure these species.

9.7 Appendix 7 – Evaluation criteria.

Guidelines for ecological evaluation and the assessment of impacts have been published by Institute of Environmental Assessment (1995) and the Institute of Ecology and environmental Management (Regini 2000 and IEEM 2002).

Legislative Framework.

Species, communities, or habitats receiving legal protection under UK or EC law have high importance on national (and international) scales.

Species with special protection under UK law are listed on the schedules of the Wildlife and Countryside Act 1981 and amendments. The act also gives rise to statutory site designations i.e. National Nature Reserves, Sites of Special Scientific Interest, Areas of Special Protection for Birds, and orders e.g. Limestone Pavement Orders.

Species, communities or habitats requiring protection under EC law are listed on schedules I and II (whose conservation requires the designation of Special Areas of Conservation), IV (species in need of strict protection) and V (species whose exploitation may be subject to management measures) of the EC Directive on the Conservation of Habitats and Wild Fauna and Flora (92/43/EEC). The enabling legislation for the UK is the Conservation (Natural Habitat, &c) Regulations 1994. Species may also be scheduled under Appendix 1 of the Convention on the Conservation of European Wildlife and Natural Heritage 1979 (Bern Convention).

Other sites of international importance designated under international obligations include Biosphere Reserves (UNESCO Man and Biosphere Programme), Ramsar Sites (Convention on Wetlands of International Importance especially as Wildfowl Habitat 1971) and Special Protection Areas (EC Wild Birds Directive 79/409).

UK Site Designations.

Sites of national importance include the statutorily designated Sites of Scientific Interest (SSSI) and National Nature Reserves (NNR's).

Lower levels of importance attach to locally designated sites such as those non-statutory site designations applied by Local Authorities or Wildlife Trusts e.g. Sites of Importance for Nature Conservation (SINC's or equivalent) or Local Nature Reserves designated under the National Parks and Access to the Countryside Act 1949. Such sites may be considered to be of High Local Importance i.e. important at the county or metropolitan level (Regini 2000).

Rarity of Species and Habitats.

The British Red Data Book for vascular plants (Perring and Farrell, 1983) lists 317 species or subspecies as extinct, endangered, vulnerable and rare. Nationally rare species are defined as occurring in 1-15 10 km squares of the national grid in Britain, nationally scarce species occurring in 16 - 100 10 km squares. The presence of a breeding population of any nationally rare species is of national importance whereas a breeding population of a nationally scarce species is of regional importance. Assemblages of 2 or more species may increase the importance of a site further.

Regional rarities are defined as occurring in 15 or fewer localities or 1 km squares in a former Nature Conservancy Council region (NCC, 1989).

Biodiversity: The UK Steering Group Report contains a “Long List” of key species in the UK that fall into 1 or more of the following categories: threatened endemics or globally threatened; where the UK holds greater than 25% of the world population; where numbers or range have declined by more than 25% in the last 25 years; nationally rare species; and statutorily protected species. Presence of viable populations of such species may be of high importance.

County floras and biodiversity action plans, or district action plans may identify species that are rare at the county or district level. Viable populations will therefore have conservation importance in these contexts.

Further information on species rarity may be found in *Scarce Plants in Britain* (Stewart et al 1994) and the *Atlas of the British Flora* (Perring and Walters, 1962) and subsequent revisions.

Biodiversity: The UK Steering Group Report has identified a number of key habitats under the following criteria: those for which the UK has international obligations; rare habitats or those with high rates of decline; functionally critical habitats (marine areas); and habitats that are important for key species. Sites containing good examples of viable areas of any key habitat may be considered nationally important.

Importance may be attached to plant community types defined in the National Vegetation Classification (Rodwell, 1991 etc) that are also described as rare, declining or with restricted distributions or are identified as being of particular botanical importance (NCC, 1989).

Criteria for Overall Site Evaluation.

The accepted criteria for site evaluation are set out by Ratcliffe (1977) in a Nature Conservation Review and are also explained in Guidelines for the Selection of Biological SSSIs (NCC, 1989). The principal criteria are briefly outlined below:

Naturalness. Truly natural habitats are valued highly but are rare in Britain and most sites are modified and semi-natural at best. Physical habitat modifications vary greatly in their impact, some being beneficial whilst others are harmful. A greater degree of conformity of a particular community or site with semi-natural rather than highly modified vegetation types in the National Vegetation Classification (NVC) and the absence of species indicating disturbance are likely to lead to attachment of higher importance. However, note that communities that appear to be intermediate between semi-natural NVC types are not necessarily of lesser quality.

Size. The area of a site or habitat judged to be viable varies greatly between different habitat types and with factors such as the condition of the habitat, the shape of the habitat area and surrounding land use. In addition, the territorial requirements of particular species within the site/habitat and habitat management factors may need consideration.

In general, larger sites or areas of habitat tend to be valued more highly because of the greater population sizes and hence more robust populations of the species within them; the potential for increased site or habitat diversity and hence greater

species-richness over a larger area; and a reduced importance of edge effects (pollution drift, habitat degradation/change for other reasons at the site edge) if the site is block rather than ribbon shaped. Small sites become increasingly important in areas of little semi-natural habitat.

Rarity. Criteria for rarity of species and habitats are outlined above. The scarcer the habitat or species then the higher the level of importance attached.

Diversity. Diversity tends to be valued positively as it increases. At the phytosociological level, some habitats are more species-rich than others and so have a higher value, provided that the richness does not involve non-native species. Some plant communities are intrinsically more species-rich than others so comparisons should only be made between the same community types.

The standard of floristic diversity is guided by the floristic tables within the National Vegetation Classification (NVC) (Rodwell, 1991 etc). A community having more than 75% of the total plant species list for its type in the NVC would be rated very highly. Diversity of different communities within a vegetation formation (e.g. woodland) may also be rated highly as may structural diversity (e.g. rides, glades and differing age structures or canopy layering in woodland). Habitat diversity across a site may also increase its importance.

Fragility. Fragility is a measure of the intrinsic sensitivity of nearly all natural and semi-natural habitats and species to human impact. It is the fragility of such habitats and species which causes them to be more highly valued than any of the artificial substitutes which replace them through human activity; and the greater their fragility the greater their value. Fragility is therefore clearly related to irreplacability or non-recreatability. Re-creation of habitats that have taken centuries to develop, sometimes with centuries of traditional management, is impossible to the full extent of their former complexity.

Typicalness. Typicalness is an indication of how characteristic the features of a site are compared to its particular ecosystem. It is intended as a guard against designation of those sites with unusual features as being always the most important.

Position in an Ecological/Geographical Unit. This is a landscape ecological criteria designed to identify sites or habitats which may be important to maintaining the viability of a larger group thereof; or which is essential in maintaining the population of a species with a large territory spanning several sites; or is one of a number of sites important to a metapopulation of a species in fragmented landscapes; or may be important in a wildlife corridor or network of habitat patches.

Amenity Value

The amenity value of a site in ecological terms is generally seen as its value for the study or quiet enjoyment of wildlife. Sites with high intrinsic appeal and good access are therefore regarded as important in this context. Also important are issues such as site safety, proximity to schools and population centres and site management difficulties.