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LANDSCAPE & ECOLOGICAL MANAGEMENT PLAN

At

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1 INTRODUCTION

1.1 Author and qualifications

This report is compiled and written by Tom Kenwright BSc MSc ACIEEM, UES Senior Ecologist.

It has been verified by Toby Hart BSc MCIEEM PIEMA, UES Managing Director.

1.2 Instructions received from the client

UES has been commissioned to produce a Landscape and Ecological Management Plan (LEMP) – detailing the stipulations for the proposed and retained habitats on site, as well management responsibilities and timings.

The development proposals are for the construction of three industrial units with associated parking and access roads. The proposals include the retention of a significant area of habitat within the southern section of the site and an additional area within the eastern section of the site, hereby referred to as the ecological compensation area. This ecological compensation area will be subject to enhancement measures and managed as a community nature reserve, with access granted to the public or special interest groups by permit.

1.3 Objectives and scope

This LEMP has been compiled in order to address how the final site landscaping plans will be implemented, maintained and managed, and which organisations are responsible for these requirements. The LEMP aims to:

- Ensure that retained and created habitats are established and managed appropriately throughout their lifetime.
- Provide habitats and features on site which promote protected or otherwise notable species and enhance the overall biodiversity and ecology of the site.
- Ensure that management responsibilities are appropriately delegated and that specific measures are scheduled.

1.4 Structure of the report

This report sets out the baseline ecological information before detailing how the objectives of this LEMP will be achieved during and after the development.

It should be read in conjunction with Appendix 1, as well as the following supplementary reports:

- Preliminary Ecological Appraisal – UES, 30th March 2023 V3, reference: UES03448/01
- Ground Level Tree Assessment – UES, 30th March 2023 V2, reference: UES03448/06

- Great Crested Newt Impact Assessment V2 – UES, 30th March 2023, reference: UES0338/07
- Reptile Presence / Absence Survey – UES, 30 March 2023 V2, reference: UES03448/08
- Great Crested Newt Population Size Class Assessment – UES, 30th March 2023 V2, reference: UES03448/09
- Breeding Bird Survey – UES, 30th March 2023 V2, reference: UES03448/11
- Bat Activity Survey – UES, 30th March 2023 V2, reference: UES03448/12
- National Vegetation Classification Survey – UES, 30th March 2023 V3, reference: UES03448/13
- Pond Assessment: Predictive System for Multimetrics (PSYM) – UES, 30th March 2023 V2, reference: UES03448/14
- Dingy Skipper Survey – UES, 30th September 2022, reference: UES03448/15
- Bat Aerial Tree Assessment & Presence / Absence Survey – UES, 30th March 2023 V2, reference: UES03448/16
- Badger Activity Survey – UES, 30th March 2023 V3, reference: UES03448/17
- Invertebrate Assessment – Conops Ecology Ltd, 29th September 2022, report number 19.22
- Ecological Impact Assessment – UES, 18th December 2023 V4, report number UES03448/22
- Great Crested Newt Method Statement V2 – UES, 30th March 2023, reference: UES03448/23
- Badger Method Statement – UES, 3rd October 2022, reference: UES03448/24
- Planting Plan and Schedule – PGLA Landscape Architects, reference WRE2205_PP01
- Ecological Area Landscape Strategy – PGLA, reference WRE2205_LPA02

2 BASELINE ECOLOGICAL INFORMATION

The land parcel has an area of approximately 20.9ha and was formerly used for industrial and agricultural purposes, prior to being left unmanaged for several years. The site contains large semi-improved species-rich grassland fields interspersed with ponds, small stands of woodland, hedgerows and scattered trees. Large areas of the site have succeeded into dense scrub and areas of bare ground and ephemeral / short perennial are present on previously developed land within the south-eastern section of the site. The south-western section of the site contains an area of amenity grassland and a large hardstanding compound used to store vehicles. A shallow stream runs along the northern site boundary and wet ditches are present along the western and part of the eastern site boundaries.

An additional 4.5ha of adjacent land has been included within the development boundary which will be used as an ecological receptor area, to provide enhancements for biodiversity in order to offset the biodiversity loss elsewhere onsite: This land comprises two agricultural grassland fields that are divided and bordered by hedgerows and trees. A dry and unvegetated ditch runs along part of the eastern boundary, and a pond, surrounded by willow *Salix* scrub, is present within the northernmost field.

A suite of ecological survey work has been undertaken on the site by UES across 2021, 2022 and 2023. These are detailed in Section 1.4 of this report, as summarised in the accompanying Ecological Impact Assessment (EcIA) (report reference UES03448/22). The EcIA identified various impacts due to the presence, or potential presence, of protected or species / habitats of principal importance within the site boundary or the surrounding area.

The following ecological receptors have been identified as having the potential to be impacted by the development proposals:

- **Amphibians**: A medium population of great crested newts *Triturus cristatus* (GCNs) is present within the onsite ponds, and a small population is present within two of the off-site ponds within 500m of the proposed development boundary. Additionally, the site supports a large population of common toads *Bufo bufo*, a medium population of smooth newts *Lissotriton vulgaris*, a medium population of common frogs *Rana temporaria* and a small population of palmate newts *Lissotriton helveticus*.

- **Badgers**: Badgers *Meles meles* are present on site, as confirmed by identification of foraging and scat evidence. A single outlier sett was identified within the site boundary.

- **Bats**: The site supports moderate-high quality habitats for foraging and commuting bats: Bat activity transects, and static detector analysis identified moderate levels of use of the site by common and widespread bat species. The majority of bat activity was associated with the onsite woodland, tree lines, hedgerows and lines of scrub at the site and field boundaries. There are no buildings on site suitable for use by roosting bats, however 18 mature trees exhibit features suitable for use by roosting bats: These trees were subjected to presence / absence surveys where required: No bats (or evidence of bats) were found within the trees; 10 were assessed as having low potential, 5 as having moderate potential and 3 as having high potential.

- **Breeding birds**: Breeding bird surveys found the site to support a typical bird assemblage (both diversity and density) for the habitats present. The variety of habitats

present offer suitability for a variety of nesting bird species, however no Schedule 1[1] breeding species were found to be breeding on site.

- **Butterfly species of principal importance[3]**: Suitable habitats for dingy skipper *Erynnis tages* and grizzled skipper *Pyrgus malvae* are present in the southern section of the site, and records were returned from within 2km of the site. Butterfly surveys particularly targeting dingy skipper that were undertaken of the southern section of the site observed peak counts of two dingy skippers, four small heath butterflies *Coenonympha pamphilus* and seven grizzled skippers. All three butterflies were observed using both the unimproved grassland and the open mosaic area; however, all three species showed a greater affinity for the open mosaic habitat. As such, the southern section of the site is considered to support small-moderate size populations of all three species.

- **General terrestrial invertebrate communities:** Terrestrial invertebrate surveys found the site to support a moderately rich invertebrate fauna that includes a number of localised and specialised species. The presence of scarce and declining butterfly species being of particular note, and the presence of other specialised and demanding ground and aerial (deadwood)-nesting bee and wasp species is also notable.

- **Grassland:** The site contains numerous fields and areas of grassland of varying quality and botanical composition: Unimproved neutral grassland (MG5[2]), semi-improved neutral grassland (MG9 and MG1), marshy grassland (MG10) and species poor-semi-improved grassland. MG5 is considered to meet the criteria to qualify as lowland meadow, a habitat of principal importance[3].

- **Hedgerows:** The site supports eight hedgerows (of varying quality). Given the low number of component species, they are not considered to qualify as important for ecological reasons as per the Hedgerow Regulations, however they qualify as habitats of principal importance[3] due to their percentage of native species cover.

- **Open mosaic habitat:** The southern section of the site features areas of high botanical diversity on gravel and other loose material; previously developed land. It meets the assessment criteria for open mosaic habitat, a habitat of principal importance [3].

- **Ponds:** Four of the ponds on site are assessed as pond habitats of principal importance[3] as they support GCNs. The three ponds (Ponds 1, 2 and 4) which are due to be removed to facilitate the development proposals were assessed for their ecological importance via the Predictive System for Multimetrics (PSYM) method: none of these ponds returned a PYSM score of greater than 75%, and therefore none of the ponds qualify as Priority Ponds for this reason.

- **Trees:** Various trees are scattered across the site (as well as those located within areas of woodland). No veteran trees were identified, and no trees are present which are subjected to tree preservation orders (TPO). Some of the trees form lines which provide habitat continuity and commuting corridors for a variety of taxa.

[1] Schedule 1 species – as per the Wildlife and Countryside Act 1981 (as amended)
[2] As per the National Vegetation Classification (NVC) survey methodology
[3] Section 7 of the Environment (Wales) Act 2016

- **Watercourse and ditches:** Wet ditches are present at the western and eastern site boundaries, which adjoin a minor stream which flows at the northern site boundary. These ditches are generally poor examples of this habitat.

- **Woodland and dense scrub:** There are three areas of woodland on site, which are isolated from each other; they are likely to have originated from planting and generally feature semi-mature specimens and feature relatively poor woodland ground-flora communities. A narrow strip of woodland is present at the northern site boundary which is more mature and offers a greater species diversity. Various areas of dense scrub are present across the site. Although they are not considered as habitat of principal importance, they are likely to be of high ecological value, especially where they provide habitat continuity throughout the site and to offsite areas.

The impact on these receptors will be mitigated for through formal mitigation agreements (licences and / or method statements) which have been designed through consultation with Natural Resources Wales (NRW) and Wrexham County Borough Council. This LEMP details the compensatory habitat creation and enhancement that will be provided as part the proposed development.

3 LANDSCAPING AND HABITAT MANAGEMENT

Through consultation with NRW and Wrexham County Borough Council, and in conjunction with UES (as ecological consultant) the project design team have designed a site layout and landscaping scheme that prioritises the retention of the most ecologically valuable habitats present, in addition to their enhancement and the creation of compensatory habitat that targets key species and habitats. This is detailed within a Planting Plan and Schedule, produced by PGLA Landscape Architects, reference WRE2205_PP001.00.

Each habitat on site will require a certain level of establishment, maintenance and monitoring to ensure that they are providing the ecosystem function required of them. Section 3.1 details the habitats being retained or created, and specific management measures for each habitat. The management responsibilities and mechanisms to ensure compliance are explained in Section 3.2, and finally the management measures are summarised in the management schedule in Section 3.3.

3.1 Habitat management

3.1.1 Woodland and scrub

Retained woodland

Three existing areas of woodland are to be retained (or partly retained) as per the development proposals. These areas will require no specific management as woodland is already established and natural processes will be permitted to develop and continue.

No non-native species are to be introduced to these parcels of woodland and they will be protected in accordance with BS5837:2012 during construction.

The retained woodland presents the opportunity for the development to provide an ecological enhancement in the form of bird and bat boxes, which will be installed on suitable trees (see Section 3.1.12 for further details).

Newly planted woodland / scrub

A total of 5925m^2 will be planted across the site, predominantly in the eastern section. The location of planted woodland / scrub has been designed to provide an enhancement / enlargement of areas of existing dense scrub or existing hedgerows. The combination of mature and immature scrub will offer structural diversity for wildlife using the site.

Species composition will feature native species only, as per the planting schedule: 10% silver birch *Betula pendula*, 10% hazel, 15% hawthorn, 5% holly, 10% rowan *Sorbus aucuparia*, 10% wild cherry *Prunus avium*, 5% blackthorn, 15% pedunculate oak *Quercus robur*, 5% dog rose and 15% guelder rose.

Newly planted shrubs will be planted 1m apart, to a depth of root collar in accordance with BS4428. Plants will be staked and protected with 600mm spiral rabbit guards. During the first growing season the newly planted shrubs must be well watered particularly during dry periods, and weeds should be suppressed at the base of each plant, either through herbicide treatment or mulching.

The newly planted plants must have an initial prune within the second year after planting to encourage dense, bushy growth. This should be undertaken in late winter (January to February), when birds are not nesting.

Retained dense scrub and ongoing management

A large amount of the existing scrub on site will be retained by the development proposals, as this habitat provides significant value to wildlife, providing an array of food sources and shelter throughout the year.

Much of this scrub is mature, and in some areas is losing its dense structure; thus becoming less valuable to wildlife. The more mature areas will be highlighted by the project ecologist during annual management meetings, and these areas will be subjected to coppicing: the total area coppiced annually will amount to 10% of the area of existing dense scrub. All other areas of scrub will be left unmanaged to allow natural processes to occur.

Coppicing will be undertaken through the winter months (October – February inclusive), using hand tools. Arisings will be piled up in dense log / brash piles and cut stumps will not be treated with herbicide, to allow regrowth. If the volume of arisings is too great and not suitable for brash piling, a proportion may be chipped and left in a pile at the edge of the coppice plots.

3.1.2 Scattered trees

Some existing scattered trees will be retained as part of the development proposals and will be protected in accordance with BS5837:2012 during construction. They will not require any specific management with regards to ecological enhancement. If any future arboricultural works are required for these trees (for example, health and safety), these should be undertaken by an appropriately qualified arboriculturist (to BS3998:2010) and undertaken outside of the breeding bird season and should not be undertaken from March to August inclusive. If this is not possible, a breeding bird nest check will be undertaken immediately prior to the works by a suitably experienced ecologist.

A total of 207 newly planted trees are included within the planting schedule for the site. Some of these are ornamental trees; to be planted within the operational parts of the site to provide an amenity benefit. The majority however are native species that have been chosen for the benefit they will provide to wildlife known to use the site and local area. Planted trees will have a girth of 10 – 16mm and a height of 3-6m.

Newly planted trees will be planted in pits (2m diameter and 1m deep), lined with Terram geo-textile membrane, topped with 20mm free draining pea-gravel to a depth of 150mm. They will be backfilled with 80% clean topsoil, 15% peat-free compost and 5% ‘GroChar’ tree growth enhancer. The top 75mm of the trees will be covered with surface bark chippings and heavily watered after planting. All trees will be triple staked with timber crossbars and soft ties, and protected with 600mm spiral rabbit guards.

The growth and establishment of the trees will be assessed after the first growing season after planting, and if any are deemed not to be in sufficient health / sufficiently well established, they will to be replaced by the planting contractor. Replacements should be replaced like-for-like, unless deemed inappropriate for their location; if this is the case, advice from the project ecologist and / or arboriculturist will be sought.

Once established, trees will then require little management in the future, unless specifically addressing problems or damage to individual specimens. Branches will only be removed when

they pose a risk to the health and safety of people or property. Where possible, all branch removal and any other arboricultural works will be undertaken outside of the breeding bird season and will not be undertaken from March to August inclusive. If this isn't possible, a pre-commencement nesting bird check will be undertaken immediately prior to the works. If any specialist works are required, an approved arboriculturist will be appointed.

The newly planted and retained trees on site will provide nesting opportunities for birds, and once fully mature may develop fissures and crevices which could be used by roosting bats. Furthermore, they will provide a food source for bats and birds in the form of fruit and invertebrates attracted to the trees.

The retained mature trees present the opportunity for the development to provide an ecological enhancement in the form of bird and bat boxes, which will be installed on suitable trees (see Section 3.1.12 for further details).

3.1.3 Hedgerows

The existing hedgerows in the centre of the development area will be lost to facilitate the development, however Hedge 1 (at the western site boundary) and the existing hedgerows in the eastern section of the site (Hedges 5 – 8) will be retained and enhanced to provide an ecological benefit. Additionally, a total of 1772m of new mixed, native species hedgerows will be planted as part of the proposals.

The new hedges and plants used to improve the existing hedges will feature native species only, as per the planting schedule: 15% hawthorn *Crataegus monogyna*, 10% blackthorn *Prunus spinosa*, 15% holly *Ilex aquifolium*, 10% crab apple *Malus sylvestris*, 5% dog rose *Rosa canina*, 5% field rose *Rosa arvensis,* 15% hazel *Corylus avellana*, 10% elder *Sambucus nigra,* 10% guelder rose *Viburnum opulus* and 5% honeysuckle *Lonicera periclymenum*.

Newly planted hedges will be planted in double rows, 5 plants per linear metre. Plants will be staked and protected with 600mm spiral rabbit guards. The base of the hedges will be kept free of weeds through the first two growing seasons through using secured mulch matting. Bare root plants will be 'notch planted' to a depth of root collar in accordance with BS4428.

During the first growing season the newly planted hedges must be well watered particularly during dry periods.

The newly planted hedgerows must have an initial prune within the second year after planting to encourage dense, bushy growth. This will be undertaken in late winter (January to February), when birds are not nesting and so that the fruits of the trees have been left as a food source for birds over the majority of winter.

After the initial prune, trimming will be undertaken every 3 years in January to February. The flowers and fruits on the most common hedgerow species develop on 2–3-year-old wood and therefore trimming more frequently than this will reduce the wildlife value. Growth should not be left untrimmed for longer than 3 years however, as the woody growth will become too thick to be cleanly trimmed with a flail. A tall thick hedge with good growth at the base is optimal for wildlife (e.g. 2-3 metres tall by 2 metres wide). This management regime will also be implemented for all retained hedgerows.

The additional hedgerows and the enhanced existing hedgerows will provide suitable terrestrial habitat for a variety of wildlife such as amphibians and mammals. They will also provide nesting and foraging opportunities for birds.

3.1.4 Wildflower grassland

24480m^2 of wildflower grassland (Emorsgate EM3 Special General-Purpose Meadow Mix) will be sown in the eastern section of the site. This seed mix contains a mixture of native grass and wildflower species, which can be used to create a diverse sward where conditions vary across the site. The meadow mix is to be sown at a sowing rate of 4g per m^2.

Prior to sowing, the ground will be levelled, and soil exposed to diminish the vigour of any perennial, dominant plants already present; this may be done by repeated cultivation to bury surface vegetation.

The initial sowing and ground works will be carried out by a suitably experienced contractor and will be undertaken in spring (March to April) or autumn (September to October). Sowing will be surface-cast and may be undertaken by hand or machine, however care must be taken if using machinery around trees or areas already planted. The sward will be cut at the end of October following sowing, when flowers have set seed and amphibians are entering hibernation.

From the second year onwards, the first annual cut will be carried out in May, after amphibians have migrated to ponds. The sward will be cut to 40 – 75mm. The second annual cut will be carried out at the end of October, to a similar sward height. During each cut, the sward will be monitored for establishing weeds, including brambles, and these will be uprooted, cut back or treated with appropriate weedkiller.

Any litter or debris will be removed from the area prior to cutting and underneath these materials will be checked for sheltering wildlife. Where possible, arisings will be left *in situ* for 48 hours, before being collected and piled in designated composting areas at the edge of the grassland; this will provide sheltering opportunities for amphibians, small mammals and other wildlife. The cuttings must not be left spread across the grassland for longer than 72 hours, as this will increase the level of nutrients within the soil and prohibit the establishment of the wildflower grassland.

The above ongoing mowing regime will also be implemented for the retained area of wildflower grassland within the southern section of the site.

The wildflower grassland will attract an array of invertebrates, which will present foraging opportunities for amphibians, birds, bats and other mammals.

A narrow path is to be mown through the grassland in the eastern section of the site, designed to facilitate access for management and also for use by pre-arranged access groups (such as school groups, local nature groups, scouts etc.). The paths will be 2m wide and will be maintained through monthly mowing during the growing season of April to September inclusive, to minimise the likelihood of disturbance to any wildlife using the paths.

3.1.5 Tall tussocky grassland

5228m^2 of tall 'tussocky' grassland (Emorsgate EM10 Tussock Mixture) will be created in the south-eastern section of the site. 80% of this seed mix contains a variety of native, tall grass species, designed to create areas of tussocky grassland that, once established require little maintenance. 20% of the mix features native wildflower which are tolerant of tall grasses.

The mix is to be sown at a sowing rate of 4g per m^2.

Prior to sowing, the ground will be levelled and soil exposed to diminish the vigour of any perennial, dominant plants already present; this may be done by repeated cultivation to bury surface vegetation.

The initial sowing and ground works will be carried out by a suitably experienced contractor under ecological supervision and will be undertaken in spring (March to April) or autumn (September to October). Sowing will be surface-cast and may be undertaken by hand or machine, however care must be taken if using machinery around trees or areas already planted. The sward will be cut at the end of October following sowing, when flowers have set seed and amphibians are entering hibernation.

From the second year onwards, the grassland requires minimal maintenance: An annual inspection will monitor for establishing weeds (docks and thistles), including brambles, and these will be uprooted, cut back or treated with appropriate herbicide. Scrub and bramble will be controlled through cutting every 2-3 years but will be discussed and agreed with the project ecologist during annual management meetings. This cutting will be undertaken on a rotational basis so that no more than half of the area is cut in any one year, leaving part as an undisturbed refuge.

Where possible, arisings will be left *in situ* for 48 hours, before being collected and piled in designated composting areas at the edge of the grassland; this will provide sheltering opportunities for amphibians, small mammals and other wildlife. The cuttings must not be left spread across the grassland for longer than 72 hours, as this will increase the level of nutrients within the soil and prohibit the establishment of the wildflower grassland.

The dense, tussocky structure of this grassland will provide habitats for invertebrates, small mammals, birds and amphibians, providing nesting sites during the spring, foraging opportunities during the summer and autumn, and shelter through the winter.

3.1.6 Marshy grassland

2,432m^2 of marshy grassland seed mix (Naturescape N7F Wetland Mix) will be sown around three of the ponds in the eastern section of the site. The seed mix features 80% grass and 20% wildflowers and is designed to suit lower lying areas which may be subjected to regular flooding.

The mix is to be sown at a sowing rate of 5g per m^2.

Prior to sowing, the ground will have been disturbed and landscaped to facilitate the creation of ponds (detailed in Section 3.1.7). The initial sowing and ground works will be carried out by a suitably experienced contractor and will be undertaken in spring (March to April) or autumn (September to October). Seed will be hand-cast to reduce any impact upon the adjacent created ponds. In the first year, prolific weeds, such as docks and thistles must be removed

by hand or spot-treated with an appropriate glyphosate-based herbicide, suitable for use adjacent to water.

The marshy grassland is to be mown / cut annually in the autumn (September – October) to a height of no-lower than 40cm, to reduce any risk of harm to amphibians. Any litter or debris will be removed from the area prior to cutting and underneath these materials will be checked for sheltering wildlife. Where possible, arisings will be left *in situ* for 48 hours, before being collected and piled in designated composting areas at the edge of the grassland; this will provide sheltering opportunities for amphibians, small mammals and other wildlife. The cuttings must not be left in situ longer than 72 hours, as this will increase the level of nutrients within the soil and prohibit the establishment of the marshy grassland.

3.1.7 Ponds

New pond creation

The development proposals include the creation of 22 new ponds, which will provide new ecological niches and will act as a significant ecological enhancement to the site.

As the primary purpose of the ponds is to provide breeding opportunities for GCNs, the proposed ponds will largely share key design features, however some will be designed to provide different conditions and ecological niches, targeting a range of species. Most ponds will have a maximum depth of 1m to provide optimum conditions for GCNs. However, some deeper and shallower ponds will be created to maximise the variety of ecological niches and provide a range of micro habitats. The proposed ponds are all due to be created in advance under a separate planning application (reference P/2023/0640) and full details of the ponds initial creation and specification is detailed within the Great Crested Newt Method Statement & Pond Specification document that has been submitted to inform the application (see report reference UES03348/31).

Some of the pond margins will be left to colonise naturally, whereas some will be planted with native marginal plant species to expedite colonisation and ensure that sufficient egg-laying opportunities are immediately available for GCNs. Marginal planting will include a mix of Cuckoo flower *Cardamine pratensis*, floating sweet-grass *Glyceria fluitans,* cypress sedge *Carex pseudocyperus*, greater pond-sedge *Carex riparia,* meadowsweet *Filipendula ulmaria*, yellow flag *Iris pseudacorus*, ragged robin *Lychnis flos-cuculi*, purple loosestrife *Lythrum salicaria*, water mint *Mentha aquatica*, water forget-me-not *Myosotis scorpioides*, amphibious bistort *Persicaria amphibia*, marsh cinquefoil *Potentilla palustris*, lesser spearwort *Ranunculus flammula,* branched bur-reed *Sparganium erectum*.

In the longer term, the newly created ponds will also support many other plant species as part of a process of natural succession.

In order to regulate the oxygen levels in the pond, submerged oxygenating plant species will be planted within 10 of the ponds in the second year following establishment, once water levels have settled and it can be determined which ponds hold sufficient water. Suitable species include hornwort *Ceratophyllum demersum*, common water crowfoot *Ranunculus aquatilis* and spiked water milfoil *Myriophyllum spicatum*.

Where available from material generated on site, a small amount of deadwood will be left in the five deepest ponds, which will further enhance the biodiversity of the ponds by providing organic features for invertebrates and offering shelter for amphibians using the ponds.

Existing pond improvements

Three of the existing ponds on the site will be retained and improved as an ecological enhancement.

These existing ponds currently support healthy amphibian populations, and do not require radical habitat remediation. However, they are becoming encroached upon by willow *Salix* scrub. In order to prevent further encroachment and drying out of the ponds, 80% of the scrub around each pond will be removed by appropriately experienced contractors, under ecological supervision.

Scrub removal will be undertaken using hand tools, and arisings will be used to create log / brash piles adjacent to the ponds to provide hibernacula for amphibians and other wildlife. Cut stumps will be treated with glyphosate-based herbicide, suitable for use adjacent to water. These works will be undertaken in the winter months (November – February) to minimise the impact to breeding birds and amphibians using the ponds.

Long term pond management

Once fully established, the newly created ponds (and retained ponds) will not require a great amount of management. However, ponds are always susceptible to leaks and invasion of non-native species which can change habitats, supress native species and dry out ponds. Over time, ponds may become encroached by scrub.

Table 1 – Ongoing pond management requirements

Management activity	**Description**	**Timings**
Monitoring pond water levels	In natural ponds water levels vary seasonally, which can be beneficial for wildlife as it provides a “drawdown zone”. Water levels often drop during the summer months, but if the pond water levels drop and do not rise again within the following year, specialist hydrological advice must be sought to advise on the cause and solutions available.	Ongoing, monitoring of the water levels at least twice per year for the first three years.
Preventing invasion of alien species	Alien, non-native plant species can “choke” ponds, supressing native vegetation and decreasing water levels. The pond vegetation will be checked annually for invasive species, including great reedmace *Typha latifolia*. Information and identification sheets on such species can be found at https://www.nonnativespecies.org/non-native-species/ If any of these species are found within the ponds, ecological advice will be sought to provide the best solution for removing the species.	Monitor every year, during summer months when plants are easier to identify.
Preventing the introduction of fish	Under no circumstances should fish be introduced to the ponds. Fish predate on the eggs, larval and juvenile forms of many invertebrates and other wildlife, which has a negative effect on the overall health of the ecosystem.	At all times

Surrounding grassland management and scrub removal	The grassland surrounding the ponds is to be cut once a year in the autumn, to allow the vegetation to grow and provide shelter for commuting wildlife, such as amphibians. The arisings (cut grass) will be removed from the ground after mowing). An unmown 3m buffer will be retained around each hibernaculum to reduce the risk of harm to any individuals using the features. Natural successional processes will lead to scrub establishment around the ponds. Low levels of scrub is tolerable, such as willow or bramble, as they will offer sheltering opportunities for amphibians, but scrub should not to be allowed to dominate. No more than 20% of the pond's banks should feature scrub; where required, this will be removed by physically cutting and / or digging it out, or through use of appropriate herbicide.	Autumn, annually. Winter, as required
Removal of algal blooms	The submerged, oxygenating aquatic plants planted should prevent the growth of algal blooms. However, in the case that an algal bloom does occur, blankets of algae will be carefully raked off.	If and when an algal bloom develops.

No fish or any other animals should ever be introduced to the ponds. Fish are often detrimental to the overall pond ecosystem as they predate on the larval stages of many other species. Secondly, introducing animals from other areas increases the possibility of transmitting and spreading disease.

3.1.8 Wet ditches

Two wet ditches will be created in the eastern section of the site, connected to newly created ponds, to provide linear wet features. The ditches will feature a depth of approximately 1m, and a width of 6m; resulting in a bank profile of approximately 30% gradient.

The water levels of the ditches will be allowed to fluctuate naturally and seasonally, and vegetation on the banks of the ditches will need to be resistant to regular inundation; as such, they will be allowed to colonise naturally with species tolerable of the varying conditions.

The spoil from the created ditches will be retained and profiled on the northern bank of each ditch, so that they are shallower in gradient on the southern aspect and steeper on the northern aspect, in order to ensure that the maximum area of each bank is afforded the maximum level of sunlight, creating optimal opportunities for invertebrates. This will then be sown with wildflower meadow mix, as detailed in Section 3.1.4.

As with the ponds, the wet ditches will not require a high level of management. However, annual monitoring of the ditches for invasive non-native plant species will be undertaken. If any are found, they will be removed. Advice from the project ecologist may be required. Additionally, scrub encroachment should be monitored annually in the autumn; any encroaching scrub beyond 10% will be removed accordingly in the winter.

3.1.9 Orchard

Orchard creation

A small orchard will be created in the eastern section of the site, featuring 15 fruit trees: 6 *Malus domestica*, 6 *Pyrus communis* and 3 *Prunus domestica*. The planted specimens will have a girth of 14 – 16mm and a height of 400-450mm. Planting should be undertaken whilst the trees are dormant (October – February inclusive).

Fruit trees have vigorous growth and require a large area for their rootstock to develop. As such, they should be planted between 5m and 8m apart. They will be planted in pits (2m diameter and 1m deep), lined with Terram geo-textile membrane, topped with 20mm free draining pea-gravel to a depth of 150mm. They will be backfilled with 80% clean topsoil, 15% peat-free compost and 5% 'GroChar' tree growth enhancer. The top 75mm of the trees will be covered with surface bark chippings and heavily watered after planting. All trees will be triple staked with timber crossbars and soft ties, and protected with 600mm spiral rabbit guards.

Once planted, the trees may require an initial prune to shape the trees and encourage vigorous growth. This should be undertaken by an experienced arboriculturist with experience in fruit tree establishment and pruning.

The growth and establishment of the trees will be assessed after the first growing season after planting, and if any are deemed not to be in sufficient health / sufficiently well established, they are to be replaced by the planting contractor. Replacements should be replaced like-for-like.

Ongoing orchard management

In general, fruit trees should be pruned annually to encourage vigorous growth and shape the trees, however each tree should be assessed on its merit each year by the pruning arboriculturist. Pruning should be undertaken when the tree is dormant (October – February inclusive).

The trees may take up to 4 years from planting to produce fruit, all of which should be left as a foraging resource for wildlife using the site.

The fruit trees will be planted in an area of created wildflower grassland. Management of this grassland is detailed in Section 3.1.4; however care must be taken to avoid damage to the fruit trees.

3.1.10 Open mosaic habitat

Open mosaic creation

The southern section of the site currently features a large area of concrete hardstanding which has become partially colonised by scrub and tall ruderal plant species within cracks in the concrete. This area is currently of limited value to wildlife as the majority of the concrete is intact, preventing plants from colonising. Due to its low ecological value, this area will be used as the site compound during the construction works, however, following completion, it will be enhanced, to create a greater structural and ecological diversity, creating more opportunities for plants, invertebrates and other wildlife.

The works to this habitat will be undertaken by a suitably experienced contractor, under supervision of a suitably experienced ecologist, who will advise site specific work accordingly. The open mosaic construction will follow the following principals:

- Destructive works are to be undertaken in the autumn and winter to minimise the impact to breeding birds and other wildlife using the areas.

- The existing concrete is to be broken up using an excavator and hydraulic breaker, into pieces up to $3m^2$. In some areas concrete slabs may remain in situ once broken, however in other areas these may be removed and piled up to create rubble piles. These piles may be combined with spoil from elsewhere on site to offer a more-densely structured pile.

- Where concrete is removed, the substrate beneath is to be disturbed, to create opportunities for pioneer plant species to colonise.

- Mounds of earth are to be created at various points around the habitat, using spoil from elsewhere on site (for example from pond creation); these will create topological diversity, offering opportunities for species with differing requirements. The southern aspects of these slopes may be steep-graded; offering some steep 'cliffs' and some flatter areas.

- The area is to be allowed to colonise naturally; pioneer plant species colonising initially and later successional species gradually colonising over time.

- A pond / scrape is to be created in the southern section of this habitat; the dimensions and topography of the pond is to adhere to those detailed in Section 3.1.7; however the pond will be allowed to colonise naturally.

- Two large sand banks will be included within this area: they will measure approximately 20m in length, 5m wide and 3-5m in height. The sand will be imported to the site, unless suitable sandy substrate is available onsite; care must be taken to ensure that the sand is not contaminated by invasive plant species. The banks will be profiled so that they feature a shallower gradient on the southern aspect and steeper northern aspect; thus increasing the area subjected to sunlight. Part of the sand banks may be step-graded on the southern aspects to offer 'cliffs' and flatter areas, suitable for burrowing invertebrates. Some of the broken-up pieces of concrete or large rocks may also be mixed in with the sand to provide further structural diversity.

<u>Existing open mosaic habitat</u>

There is an area of existing disturbed ground / open mosaic habitat in the south-western section of the site, which will be retained by the development proposals. This area currently supports populations of dingy and grizzled skipper butterfly and requires little remedial management.

In order to enhance the diversity of habitats present in this section of the site, two sand banks (as described above) are to be created within this area, as well as a pond / scrape (also as described above).

Additionally, patches of bare ground (approximately $3m^2$) will be created by scraping back the top 10cm of substrate with an excavator bucket; this will offer opportunities for pioneer plant species and may offer burrowing opportunities for invertebrates. The scraped back material

will be left in a loose pile adjacent to the scrape. This will be overseen by the onsite ecologist, who will determine the exact location and quantity of scrapes.

Ongoing open mosaic management

Open mosaic habitats require little intervention on the whole, as natural processes should be allowed to occur. However, annual site inspections and management meetings will review the establishment of the newly created area and assess whether any further remedial works are required in the existing area. The following principles should be considered by the project ecologist and site management company during the annual review meeting:

- Invasive species: Recently exposed ground may offer opportunity for colonisation by invasive species. If any invasive species become established, they should be subjected to appropriate control measures as soon as possible.

- Dominant ruderals: After initial habitat creation works, an initial flush of dominant ruderal (such as thistles and willowherbs) may occur. This dominance is likely only to persist for 1 - 2 years before natural processes control them. However, if their dominance does persist, or begins to create a monoculture across the habitat, targeted control may be required. This control may be undertaken by physical uprooting of plants, or treatment with appropriate herbicide. This should be undertaken before the plants set seed (likely before August); care should be taken to ensure that nesting birds are not affected by these works.

- Scrub encroachment: Small areas of scrub are desired within this habitat as it will offer structural diversity, however scrub starts to dominate large areas, consideration should be given to control.

- Bare-ground creation: Maintaining some areas of bare ground is desirable. Initially, the sand banks and scrapes will offer bare ground, however these will become vegetated over time. New scrapes may be created and sand banks may be subjected to minor excavation works or re-profiling of step-graded cliffs.

- Sward height: Given the shallow soils present within these areas and the existing grazing pressure from rabbits, the sward height is generally maintained between 15mm and 20mm, though some larger tussocks are present. This sward height should be used as a target for at least 50% of the area. If this cannot be maintained by natural processes, cutting back through use of brushcutters may be required.

3.1.11 Amenity grassland and ornamental shrub planting

The areas of amenity grassland and ornamental shrub planting on site can be managed freely according to the appointed managements company's programme. This habitat type is of limited value to wildlife, and as these areas are likely to be frequently disturbed by site operations, encouraging wildlife into these areas may cause unnecessary impacts on the wildlife and site operations.

3.1.12 Additional habitats

Butterfly and beetle mounds

Three south-facing mounds will be created within the eastern section of the site, totalling 240m^2. These mounds will be sown with Naturescape N4F Butterfly and Bee Mix. This mix contains native grass and wildflower species, flowering between June and September, offering nectar resource to invertebrates at their most active time of year. The mix is to be sown at a sowing rate of 5g per m^2.

The mounds will be created using spoil from the adjacent ponds; if the spoil comprises predominantly heavy soils with a high clay content, mixing with 50% imported, clean, sand may be required to facilitate better establishment of wildflower mix and offer improved opportunities for burrowing invertebrates.

The mounds will be profiled so that they are shallower in gradient on the southern aspect and steeper on the northern aspect, in order to ensure that the maximum area of each bank is afforded the maximum level of sunlight; creating optimal opportunities for invertebrates.

Hibernacula and log piles

Various amphibian hibernacula and log / brash piles will be created across the site. At least 9 hibernacula and 4 log piles will be created. These will provide sheltering and hibernating opportunities for a variety of wildlife on site.

The hibernacula will be created by excavating a pit in the ground (0.5-1m deep, 0.5-1m wide, and 1-2m long). Ideally, the pits will then be filled using materials already present on site, including hay, brash, cut timber / logs and brick / rock hard-core, or the materials can be sourced from elsewhere if necessary. The pits will be piled up to a height of approximately 1m above ground level. Hibernacula will then be loosely capped with topsoil or turf, ensuring that access is still available through to the lower layers at the margins. The following diagram provides a visual representation of the hibernaculum, with the only additional requirement to the diagram being that a pit is first excavated.

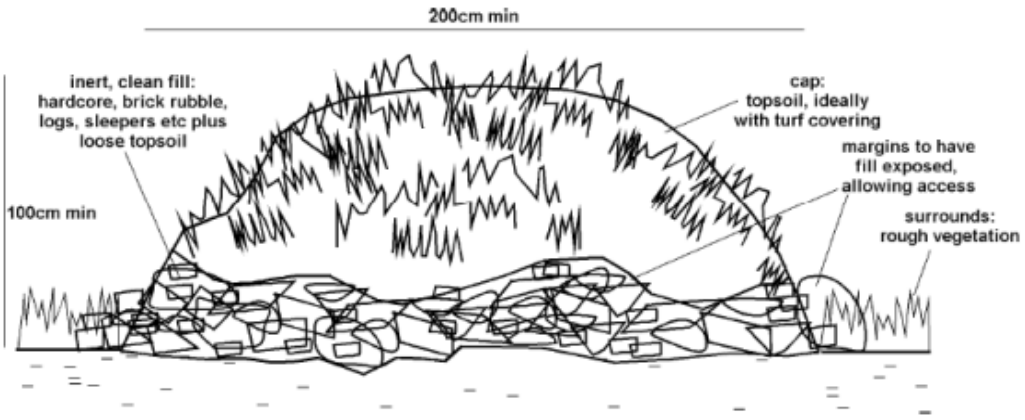


Figure 1 – Hibernacula design

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The log / brash piles will be created using arisings from the scrub removal works. The arisings from the scrub removal will be stacked close to the areas of retained woodland and dense scrub.

Bat boxes

To further enhance the site, the following bat boxes will be provided as part of the development:

- 3 x Schwegler 1FF bat boxes (general purpose)
- 3 x Schwegler 2F bat boxes (general purpose)
- 1 x Schwegler 1FS bat boxes (large colony box)
- 1 x Schwegler 1FW bat box (hibernation box)

These bat boxes are durable and will enhance the site by providing immediate roosting opportunities for a range of bat species that are likely to be present in the local area. They will provide mitigation for the mature trees with bat roost potential which will be lost to facilitate the development proposals.

If the proposed models of bat boxes are not available due to stock shortages, alternative models can be used instead. However, all proposed changes must be discussed and agreed with the project ecologist to ensure that they provide similar roosting opportunities. The use of woodcrete or woodstone boxes will be prioritised due to their durability and longevity.

The bat boxes will be affixed to mature trees scattered across the site or within retained areas of woodland. Exact locations will be advised by the project ecologist at the time of installation. The boxes will be fitted at a height of between three and six metres, on a southerly aspect, with no clutter around the entrance by surrounding branches.

Once bats have inhabited a bat box, they may only be disturbed by a licenced bat ecologist.

Bird boxes

The following nest boxes will be provided as part of the development:

- 5 x Schwegler 1B Nest Box (32mm entrance hole)
- 2 x Schwegler 3S Starling Nest Box (45mm entrance hole)
- 1 x Raptor Aid Tawny Owl Nest Box
- 1 x Raptor Aid Barn Owl Nest Box
- 1 x Raptor Aid Little Owl Nest Box

These bird boxes are durable and will enhance the site by providing nesting opportunities for a wide range of bird species that are known to be present within the local areas.

If the proposed models of bird boxes are not available due to stock shortages, alternative models can be used instead. However, all proposed changes must be discussed and agreed with the project ecologist to ensure that they provide similar nesting opportunities. The use of woodcrete or woodstone boxes will be prioritised due to their durability and longevity.

The bird boxes will be affixed to mature trees scattered across the site or within retained areas of woodland. Exact locations will be advised by the project ecologist at the time of installation. The boxes will be sited at a minimum height of three metres and will be oriented between north and east, thus avoiding strong sunlight and the wettest winds.

3.2 Responsibilities, monitoring and remedial measures

3.2.1 Management responsibilities

The responsibility for the initial habitat creation works lies with the contractors appointed to carry out those works at the time of the development. They will be responsible for ensuring that the habitat creation works are carried out to in accordance with this LEMP.

Subsequent management of the habitats on site will be the responsibility of the management company of the site. An ecology cooperative is being established that will involve FI-REM (developer / landowner), United Environmental Services (ecological consultant), North Wales Wildlife Trust and Enfys Ecology Ltd. Butterfly Conservation and Amphibian and Reptile Conservation will also be invited to be members of the cooperative as advisors. Furthermore, Whilst Wrexham Borough Council's Ecologist and Natural Resources Wales won't be members of the cooperative, their expertise and advice will be regularly sought from the cooperative.

Through the cooperative, Enfys Ecology and the North Wales Wildlife Trust will be appointed as the management company responsible for undertaking the ongoing habitat management works as detailed within this document. They must ensure that the ongoing measures detailed within this LEMP are implemented. They will also be responsible for monitoring the establishment of habitats as well as monitoring them for any changes affecting their quality or function.

3.2.2 Monitoring

As part of the 30-year management plan, annual site inspections will be undertaken of the created and retained ecology areas by Enfys Ecology, North Wales Wildlife Trust and / or the project ecologist. Following this, annual meetings will be held and will include all members of the ecology cooperative. The purpose of the meeting will be to discuss any issues, particularly in relation to failed habitat establishment and management, and to determine whether any remedial works are necessary to restore the habitats to a satisfactory standard, or to implement further enhancement measures. This meeting will be held from late summer to winter, so that the habitats can be assessed when in flower (e.g. wildflower meadows) and to allow for the required remedial works to be arranged.

Additional to the annual site inspection and subsequent management meetings, the GCN Mitigation licence that will be secured from NRW prior to the start of works will require ongoing GCN population monitoring surveys of the retained and newly created ponds. These monitoring surveys will be undertaken by UES (or any other appointed project ecologist). Any individuals undertaking these surveys must hold an appropriate NRW GCN survey licence, or be listed as an accredited agent under another ecologist's licence.

Following completion of the construction works and establishment of the habitats, further butterfly monitoring surveys will be undertaken of the site by an appropriately skilled ecologist, with particular focus on dingy skipper, grizzled skipper and small heath butterflies (species of principle importance). These monitoring surveys will be undertaken annually for the first 5 years, after which they will be undertaken every other year from years 6-10. It is considered that specific surveys are not required after the 10-year period as it is highly unlikely that changes to management plan will be implemented at this point and hence the butterfly populations on site will have stabilised. Any significant reductions in the populations of these

species will be picked up during detailed invertebrate monitoring surveys, covering all taxa, which will be undertaken of the ecology areas every five years.

Survey results from all monitoring surveys will be provided to the ecology cooperative to inform the need for changes to the management plan. Results will also be submitted to NRW, Wrexham County Council Ecologist and Cofnod, the North Wales Environmental Information Service.

3.2.3 Site access restrictions

The eastern section of the site has designed as a designated ecological mitigation and compensation area. Paths will be mown through the area, to facilitate monitoring, access for maintenance and access for pre-arranged interest groups, however the site will not have open public access. This is to protect the habitats and species present. All access gates will be fitted with secure padlocks, with keys / access codes kept securely by assigned persons.

A strict policy of no access to dogs will be imposed.

Nocturnal access to the site will be restricted to access only for ecological monitoring (for example surveying of ponds by licenced ecologists).

3.3 Management schedule

The below table summarises the management requirements and responsibilities detailed in the previous sections. This table should be read in conjunction with the previous sections, which include more detail which should not be overlooked.

All initial works are to be undertaken at the appropriate time of year as indicated in the table below and are to be completed within 2 years of the commencement of construction works, unless specified otherwise.

The 30-year ongoing management will commence immediately following the start of construction works or initial habitat creation works, whichever occurs first, unless specified otherwise.

Table 2 – 30-year management schedule

ACTIVITY	DESCRIPTION	TIMINGS
Initial works – carried out by appointed contractors		
Initial arboricultural works	Following the recommendations of the Arboricultural Impact Assessment produced for the site.	During the development - September to February. If not possible, then a bird nest scoping survey should be carried out immediately prior to the works.
Tree planting, including orchard trees and scrub / woodland planting	Planted in pits (2m, 1m deep), triple stakes with soft ties and rabbit guards. Fruit trees in orchard to be given initial prune to encourage vigorous growth.	During the development, although planting between October and March is preferred.
Hedgerow planting	Including gapping up of existing hedgerows and planting of new hedgerows, with only native species to be planted. New hedges planted in double rows, 5 plants per linear metre. Staked and protected with rabbit guards. Base vegetation supressed with mulch matting. Plants to be well watered during first growing season, during dry periods.	During the development, although planting between October and March is preferred.
Sowing of wildflower, tussocky and marshy grassland	Preparatory ground works and sowing to be carried out by appropriately experienced contractor. Specified seed mixes to be used.	March to April, or September to October.
Pond creation and ditch creation	Undertaken by appropriately experienced contractor under supervision of ECoW. Some pond margins will be sown with native marginal plant species and ponds planted with aquatic plant species, as directed by onsite ecologist.	During development. April-July.

	Deadwood placed in deeper parts of ponds.	Following pond creation, as material is available.
Remedial works to existing ponds	Removal of 80% of existing scrub around retained ponds. Undertaken using hand tools under ecological supervision. Arisings used to create log / brash piles adjacent to ponds.	November to February.
Planting of oxygenating plants within ponds	Planted within 10 of the ponds in the second year following establishment, once water levels have settled and it can be determined which ponds hold sufficient water.	In second year following establishment.
Open mosaic habitat creation	Breaking up of concrete. Creation of spoil mounds. Agitation of substrate. Creation of sand banks. As directed by onsite ecologist.	Within year of completion of development works or removal of site compound.
Existing open mosaic habitat	Creation of two sand banks. Creation of bare-ground scrapes and two ephemeral pond scrapes. Under the supervision and direction of the onsite ecologist.	During development, November to February.
Creation of amphibian hibernacula and log piles	Including excavation of pits and filling with suitable materials, before capping with topsoil and turf. Under the supervision and direction of the onsite ecologist.	During the development – October to February.
Creation of butterfly and beetle mounds	Created using spoil from ponds; mixed with clean sand if required. Sown with WFM1 seed mix. Under the supervision and direction of the onsite ecologist.	During the development – sowing from March to April, or September to October.
Installation of bird and bat boxes	Various bat and bird boxes to be fixed to suitable trees, on the advice of the project ecologist, as detailed in Section 3.1.12.	During the development.
30-year ongoing management plan – carried out by the appointed site management company		
Arboricultural works / tree pruning	To address specific health and safety risks	September to February. If not possible, then a bird nest scoping survey should be carried out immediately prior to the works.
Tree / hedge plant establishment assessment	Inspection of newly planted trees / hedgerows to monitor establishment after first growing season. Any trees deemed not to be in sufficient health / sufficiently well-established are to be replaced by the planting contractor.	After first full growing season, in late summer when leaves are still present to provide indication of tree health.

Initial pruning of hedgerows and scrub	To establish dense, bushy growth	Two years after planting. January to February.
Subsequent pruning of hedgerows	To establish dense, bushy growth. Pruning should aim to achieve a height of around 3m and a width of around 2m.	Once every three years following the initial pruning. January to February.
Weed suppression of sown grasslands	To decrease competition for target wildflower species: Prolific weeds (thistles, docks and dominant grasses)	The first April after sowing.
Initial mowing of wildflower grassland	To prevent nutrient enrichment. Sward is to be cut down to 40 – 75mm. Cuttings are to be left *in situ* for 48 hours, then collected and piled up in designated composting areas.	End of October after first year of sowing; this will allow flower to set seed and amphibians to move towards hibernation sites.
Ongoing mowing of wildflower grassland.	Removal of litter or debris from mowing area, and checking for sheltering wildlife underneath. Sward is to be cut down to 40 – 75mm. Cuttings are to be left *in situ* for 48 hours, then collected and piled up in designated composting areas. During each cut, the sward should be monitored for establishing weeds, including brambles, and these should be uprooted, cut back or use of appropriate herbicide.	May and October, annually.
Ongoing tussocky grassland management	Minimal maintenance required to form tussocks and rank structure. Monitoring for establishing weeds and scrub to be undertaken and uprooted / cut back if required. Mowing may be required every 2-3 years: done on a rotational basis so that no more than 50% of area is mown in any one year.	October as required and agreed with project ecologist.
Ongoing management of marshy grassland	Removal of litter or debris from mowing area, and checking for sheltering wildlife underneath. Sward is to be cut down to 40 – 75mm. Cuttings are to be left *in situ* for 48 hours, then collected and piled up in designated composting areas. During each cut, the sward should be monitored for establishing weeds, including brambles, and these should be uprooted, cut back or use of appropriate herbicide.	October, annually.

Mowing of access paths through grassland in designated ecology zone	2m width path mown to minimise risk of use by wildlife.	Monthly mowing from April to September inclusive.
Ongoing pond and wet ditch management	Water level monitoring to ensure no leaks. Hydrological advice and remedial works may be required. Monitoring for invasive species colonisation, including great reedmace. Control may be required as advised by project ecologist. Monitoring scrub encroachment. Ponds and banks to feature no more than 20% scrub cover. To be removed by cutting and treatment with herbicide, or uprooting where required. Monitoring of algal blooms. To be raked off if required.	Ongoing monitoring. At least twice per year during first 3 years from creation. April and August. Annually between June and August. October to February, as required. If and when algal blooms develop.
Ongoing orchard management	Annual pruning undertaken by experienced arboriculturist to encourage vigorous growth and shape trees.	Annually, October to February.
Scrub coppicing	Most mature 10% areas of dense scrub to be highlighted by annual management meeting and subjected to coppicing: cutting to ground level with hand tools, and arisings piled up or chipped.	Annually, October to February.
Ongoing open mosaic management	Monitoring for invasive species colonisation. Control measures undertaken if required. Monitoring of dominant ruderals. Control measures required if dominance not controlled by natural processes. Monitoring of scrub control, at discretion of project ecologist or appointed management company. Continued presence of bare ground required; creation of new areas as initial areas become vegetated. Monitoring of sward height: 50% of area varied sward 20mm – 150mm. To be controlled by natural processes, but remedial action may be required if not.	Annually, June to August. Second year from creation, as required. As required, October to February. As required, October to February. October as required.
Mowing of amenity grassland and ornamental shrub maintenance.	In accordance with the site's management programme.	No time restrictions.

Management meetings	To discuss the establishment and condition of habitats, and whether any remedial actions are required to restore habitats.	Annually, August – September.

4 CONCLUSION

Once implemented, the landscaping and ecological measures will provide a biologically diverse landscape. The bottom-up approach to improving the biodiversity on site will ensure that the habitats on site can support a range of invertebrate species and provide other food sources, which will then in turn benefit fauna further up the food chain. These landscaping proposals also ensure that any habitats which are to be lost to facilitate the development are appropriately compensated for.