

Statutory Consultation 2022

# **Preliminary Environmental Information Report**

Volume 3: Appendix 8.2  
**Draft Landscape and Biodiversity  
Management Plan**



# Contents

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|  | Page      |
|--|-----------|
| <b>1 INTRODUCTION</b>                                      | <b>1</b>  |
| 1.1 Background   | 1         |
| 1.2 Landscape and Biodiversity Management Plan             | 1         |
| 1.3 Aim and objectives                                     | 2         |
| 1.4 Timeframe  | 3         |
| <b>2 MANAGEMENT REQUIREMENTS</b>                           | <b>5</b>  |
| 2.1 Description of the works                               | 5         |
| 2.2 Establishment and Maintenance responsibilities         | 5         |
| 2.3 Standard of work                                       | 6         |
| 2.4 Location of services                                   | 6         |
| 2.5 Weather and ground conditions                          | 6         |
| 2.6 Biosecurity  | 7         |
| 2.7 Approved chemicals                                     | 7         |
| 2.8 General management                                     | 8         |
| <b>3 MITIGATION AREAS</b>                                  | <b>9</b>  |
| 3.1 Introduction   | 9         |
| 3.2 Replacement open space                                 | 9         |
| 3.3 Habitat creation                                       | 9         |
| 3.4 Off site mitigation                                    | 10        |
| 3.5 Mitigation Area Considerations                         | 10        |
| <b>4 MANAGEMENT OF EXISTING HABITATS</b>                   | <b>12</b> |
| 4.1 Trees and Woodland                                     | 12        |
| 4.2 Hedgerows  | 13        |
| 4.3 Field margin vegetation                                | 13        |
| 4.4 Semi-improved neutral grassland                        | 14        |
| <b>5 ESTABLISHMENT AND MANAGEMENT OF PROPOSED HABITATS</b> | <b>16</b> |
| 5.1 Broad-leaved woodland                                  | 16        |
| 5.2 Hedgerows  | 19        |
| 5.3 Hedgerow trees and specimen trees                      | 22        |
| 5.4 Scrub  | 24        |
| 5.5 Ornamental plants                                      | 26        |
| 5.6 Neutral grassland                                      | 28        |
| 5.7 Calcareous grassland                                   | 34        |
| 5.8 Chalk exposures  | 37        |
| 5.9 Wildlife pond  | 38        |

|          |                              |           |
|----------|------------------------------|-----------|
| 5.10     | Plant translocation          | 39        |
| 5.11     | Bat and Bird boxes           | 41        |
| 5.12     | Artificial badger sett       | 41        |
| 5.13     | Public Access                | 42        |
| 5.14     | Public open space            | 43        |
| <b>6</b> | <b>Street Furniture</b>      | <b>44</b> |
| 6.1      | General maintenance          | 44        |
| 6.2      | Cleaning requirements        | 44        |
| <b>7</b> | <b>Monitoring Procedures</b> | <b>45</b> |
| 7.1      | Biodiversity                 | 45        |
| 7.2      | Landscape                    | 46        |

## Tables

Table 1: Woodland Management Schedule

Table 2: Hedgerow Management Schedule

Table 3: Hedgerow Trees and Specimen Tree Management Schedule

Table 4: Scrub Management Schedule

Table 5: Ornamental Planting Management Schedule

Table 6: Neutral Grassland Management Schedule

Table 7: Calcareous Grassland Management Schedule

Table 8: Chalk Exposure Management Schedule

Table 9: Wildlife Pond Management Schedule

Table 10: Translocated Turf Management Schedule

Table 11: Bat and Bird Box Management Schedule

Table 12: Artificial Badger Sett Management Schedule

Table 13: Outline schedule and responsible parties for monitoring on site

## Insets

Inset 1: Steps to consider when planning the sowing of seed in the countryside for conservation purposes

# 1 INTRODUCTION

## 1.1 Background

- 1.1.1 Luton Rising (a trading name of London Luton Airport Limited (the 'Applicant')), is proposing to expand London Luton Airport (the airport) through a Development Consent Order (DCO) for works that will allow growth to accommodate 32 million passengers per annum (mppa) (hereon referred to as the 'Proposed Development').
- 1.1.2 The growth to 32 mppa will be undertaken in two construction Phases, however, for the purposes of assessment three assessment Phases are defined as:
- a. Phase 1 construction works start in the second quarter of 2025 and will be operational in mid 2027;
  - b. Phase 2a construction works start early 2033 and will be operational in 2036; and
  - c. Phase 2b construction works start in 2037 and are operational in 2041.

## 1.2 Landscape and Biodiversity Management Plan

- 1.2.1 This Draft Landscape and Biodiversity Management Plan (LBMP) has been prepared to set out the high-level requirements for the establishment, management and monitoring of proposed landscape and biodiversity areas in relation to the Proposed Development.. The Draft LBMP identifies those landscape and ecological mitigation measures set out within the Preliminary Environmental Information Report (PEIR) and provides outline information on how these measures will be managed during the operation of the Proposed Development, from Phase 1. Habitat management will also continue through the construction and operation of Phase 2a and 2b. This Draft LBMP will therefore be updated with more detailed information during preparation and submission of an Environmental Statement (ES), incorporating feedback received during statutory consultation and stakeholder engagement.
- 1.2.2 Stakeholder engagement will continue as the application for development consent progresses and will include further discussion to agree details of habitat creation and long-term management with relevant consultees as part of a Biodiversity Technical Working Group, including:
- a. Natural England (NE);
  - b. Luton Borough Council (LBC);
  - c. Hertfordshire County Council (HCC);
  - d. Central Bedfordshire Council (CBC);
  - e. Herts and Middlesex Wildlife Trust and the Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire; and
  - f. Environment Agency (EA).
- 1.2.3 The Draft LBMP submitted with the ES will remain a working document and will be further updated to reflect changes agreed with stakeholders and PINS during

the examination. Once the Draft LBMP is in an agreed form, it will then be used as the basis for the contractor appointed to take forward to prepare a Final LBMP for approval by the relevant statutory bodies. Should subsequent updates be required during construction of the various phases of the Proposed Development these will be made in agreement with the relevant consultees where appropriate.

- 1.2.4 During construction of the Proposed Development the Code of Construction Practice (CoCP) will detail specific requirements to be followed in order to protect and manage all identified mitigation measures prior to and during construction as well as contractual, legislative and industry best practice requirements. A Draft CoCP is provided as **Appendix 4.2** in Volume 3 of the PEIR. The Applicant and its appointed contractors must comply with the requirements set out in the Draft CoCP in conjunction with this document where relevant, including for ongoing management and maintenance.
- 1.2.5 The Applicant and its appointed contractors will also comply with all statutory legislative requirements, statutory guidance and best practices at the time the works are carried out.
- 1.2.6 The area covered by this Draft LBMP is defined as the Proposed Development Mitigation Areas of the Proposed Development as per the Landscape Mitigation Plans **Figures 14.11 to 14.13** in Volume 4 to the PEIR, including associated replacement open spaces, habitat creation and off site mitigation.
- 1.2.7 The responsibility for delivering and maintaining each area will depend on individual land considerations (to be determined as the project progresses), but the standards set by this report should be consistently applied across the Proposed Development.
- 1.3 **Aim and objectives**
- 1.3.1 The overall aim of this plan is to adopt a coherent, strategic and integrated approach to the management and maintenance of the habitats and soft landscape components associated with the Proposed Development, and to enhance the biodiversity and amenity value of the Application Site; ensuring the successful establishment of vegetation and overall integration of works within the surrounding landscape, adopting a management approach that is appropriate to nature conservation, the users of the Application Site and its amenity.
- 1.3.2 The main objectives of the Draft LBMP are to:
- a. ensure the effectiveness of structure planting proposed to mitigate significant landscape and visual effects;
  - b. retain and enhance the value of existing habitats/landscape features;
  - c. successfully establish and integrate new habitats/landscape features into the surrounding landscape;
  - d. maximise the biodiversity value of both new and existing habitats on the Main Application Site;

- e. accommodate appropriate public use of the Main Application Site, by promoting a management regime which is appropriate to the Main Application Site's role;
- f. fulfil legal requirements, including nature conservation, environmental protection and public safety;
- g. ensure the successful establishment and aftercare of all planting and seeded areas; and
- h. ensure the mitigation proposed as part of the Proposed Development, as a result of the Environmental Impact Assessment (EIA), remains effective at reducing identified environmental effects as intended.

1.3.3 This Draft LBMP details the requirements of the landscape and biodiversity mitigation, including associated replacement open spaces, habitat creation and off site mitigation. It then sets out in the chapters below, the Management of Existing Habitats, followed by the Establishment and Management of Proposed Habitats. This covers the creation, establishment and aftercare, along with an appropriate management schedule, of the following habitats, along with subsequent specific mitigation requirements relating to:

- a. broad-leaved woodland;
- b. hedgerows;
- c. hedgerow and specimen trees;
- d. scrub;
- e. ornamental plants;
- f. neutral grassland;
- g. calcareous grassland;
- h. chalk exposures; and
- i. wildlife pond.

## 1.4 **Timeframe**

- 1.4.1 The Draft LBMP for the Proposed Development will cover a 50-year period from planting commencing on the Main Application Site. However, this current version of the plan for the purposes of the PEIR primarily covers the initial five-year period for habitats created and enhanced within the Proposed Development, with some information on the principles of ongoing management.
- 1.4.2 The Contractor's maintenance period will extend for five years post-planting, following contractual requirements. Any defects or other faults because of workmanship (other than those found to be stolen or maliciously damaged), will be made good by the Contractor during this period.
- 1.4.3 On completion of this initial five-year period, an initial review will be undertaken by the appointed ecologist and landscape architect to ensure that the management and maintenance that it prescribes remains relevant and appropriate to the habitats as they develop and mature. Should it be determined during this review that the objectives of the LBMP are not being

met, remedial action will then be identified, agreed and implemented so that the Proposed Development still delivers the fully functioning biodiversity objectives of the approved application. The LBMP itself will be updated as required at this time for use during the following period.

- 1.4.4 Alongside this review, agreement will also be made as to an appropriate length of time for the following management periods, which are anticipated to continue on a five yearly basis during establishment for the first 15 years, with subsequent review periods being assessed and subject to appropriate amendments.
- 1.4.5 This process of review/update/ periods will continue throughout the 50 year period at a frequency that ensures that the management and maintenance that it prescribes remains relevant and appropriate to the habitats as they continue to mature.



## 2 MANAGEMENT REQUIREMENTS

### 2.1 Description of the works

- 2.1.1 The requirements within this plan are applicable to the future maintenance of existing vegetation to be retained as part of the Proposed Development, and proposed trees, shrubs, hedgerows, woodland planting, mown grass, meadow grass and pond habitat areas, as well as additional habitat measures such as reptile hibernacula, brash/log piles, and bat and bird boxes. It also covers for any street furniture or paving to be installed.
- 2.1.2 Maintenance work within these areas may include: ground preparation; minor top-soiling; grass cutting; edge trimming; tree, hedge and shrub pruning; general tree care; watering; treatment of pests and diseases; creation of habitat features; woodland management; tree felling; brash removal; rubbish and debris removal; and cleaning and repairing of damaged street furniture and boundary treatments to ensure successful vegetation establishment and functionality.
- 2.1.3 A detailed programme of ecological monitoring will underpin this plan and be confirmed in a later Draft LBMP to be included within the ES. This monitoring will include an annual inspection of all habitats and ecological condition monitoring against the target habitat type.

### 2.2 Establishment and Maintenance responsibilities

- 2.2.1 The Contractor's period will extend for five years post-planting, following contractual requirements. Any defects or other faults because of workmanship (other than those found to be stolen or maliciously damaged), will be made good by the Contractor during this period.
- 2.2.2 The Applicant and its appointed contractor will employ a suitably qualified ecologist and landscape architect to oversee and advise on the establishment of habitats in line with requirements detailed in the ES and final LBMP that will accompany the application for development consent.
- 2.2.3 Once the contractor's obligations have ended,, the maintenance operations identified below will be carried out by a Landscape Maintenance Contractor capable of delivering the measures prescribed within this document appointed by the Applicant, which would also be overseen and audited by suitably qualified ecologist and landscape architects required, throughout the remainder of the 50 year period of the LBMP, and subject to appropriate review periods.
- 2.2.4 The approach outlined above will be implemented for works associated with each construction phase. It is envisaged that once parcels of land arising from a particular construction phase have been passed over to a Landscape Maintenance Contractor, they will remain responsible for that land (and will continue to follow this LBMP and relevant timeframes/requirements) alongside any construction work that may be ongoing in other areas of the site for subsequent construction phases. Should there be a need for construction activities (e.g. additional planting etc.) to be undertaken at any specific location already under the control of the Landscape Maintenance Contractor, agreement will be required by appropriate parties (Applicant, Main Contractor, Landscape

Maintenance Contractor and relevant stakeholders) as to how this will be managed and associated responsibilities/timeframes.

2.2.5 Further detail regarding establishment and management responsibilities will be provided in the LBMP as it evolves.

## 2.3 **Standard of work**

2.3.1 The Applicant and its appointed contractors must comply with the requirements set out in the Draft CoCP in conjunction with this document, including control of dust, control of water quality, control of noise and light pollution, management and eradication protocols for invasive species such as Japanese knotweed (*Reynoutria japonica*), protection of adjacent watercourses and erection of tree protection fencing to ensure root protection zones are adhered to.

2.3.2 At all times throughout implementation of the LBMP the Application Site is to be kept clean and neat and all planting is to be kept in a healthy state. The carrying out of the works will not cause danger or inconvenience to others, nor will it restrict other on site activities from taking place. All operations will be carried out using only suitable machinery in accordance with best practice, or by hand where impracticable to use machinery, as agreed with the airport authority with regards to health and safety within the airport environs.

## 2.4 **Location of services**

2.4.1 The Applicant and its appointed contractors must comply with the requirements set out in the Draft CoCP in conjunction with this document, including identifying location of services. Before undertaking works on site, contractors will contact service authorities to ascertain the accurate location of all services and apparatus. Contractors will not interfere with the operation of existing services (gas, water, electricity, telephones, buried cables or drains) without permission of the Applicant and, in the case of works, the relevant Statutory Authorities and/or private owners.

2.4.2 Any trees, shrubs, seeding or other planting which needs to be removed to enable access to buried services will be made good.

## 2.5 **Weather and ground conditions**

2.5.1 Contractors will order their works to take account of any specific ground or weather conditions required to undertake the maintenance operations and any specific requirements or conditions advised by the airport facilities management team. All works involving cultivation will not be carried out in conditions which will result in damage to the soil structure.

2.5.2 All cultivating and grass cutting operations will be suspended in periods of excessive rain, snow or frost; and herbicide applications will only be carried out in suitable weather conditions as described by the manufacturer.

2.5.3 Vegetation clearance works will be undertaken outside of the bird nesting season (generally taken to extend between March and August inclusive) where

practicable, or following oversight by a suitably qualified ecologist where this is not practicable.

## 2.6 **Biosecurity**

2.6.1 The Applicant and its appointed contractors must comply with the requirements set out in the Draft CoCP in conjunction with this document, including appropriate biosecurity measures. Biosecurity measures are the practical steps designed to minimise the risk of introducing or spreading pests, diseases and non-native species. Pests are most often transported in soil or organic material, such as plant debris, that can be carried on footwear or by the wheels/tracks of vehicles. Some pathogens are also dispersed in water, so the risk of these being spread increases when conditions are wet.

2.6.2 To avoid the spread of pests, diseases and non-native species on site the following measures will be employed during maintenance works:

- a. workers/contractors will wear footwear and outerwear that can easily be kept clean;
- b. footwear and outerwear must be cleaned regularly, ensuring that they are visually free from soil and organic debris;
- c. if moving between different sections of the site, these sections must be ordered from low to high risk, to reduce the likelihood of cross-contamination;
- d. a disinfectant solution such as Agrichlor or Virkon S must be used to clean footwear, outerwear and equipment (following removal of any organic material) where there is a risk of spreading any pests, diseases or non-native species during works;
- e. vehicular access to any high-risk sites will be avoided and vehicles will be regularly cleaned.
- f. ensure that mud and organic debris does not accumulate on tyres, wheels or under wheel arches; and
- g. ensure all tools and equipment are clean, serviceable and free from organic debris.

2.6.3 Contractors will immediately notify the Applicant of any pest or disease problems on site and seek advice from a suitably qualified contractor to manage appropriate removal/disposal (where required) in line with relevant legislation at the time. Each review of the LBMP will include an update to the relevant legislation and guidance on potential biosecurity risks.

## 2.7 **Approved chemicals**

2.7.1 The use of chemicals including pesticides and herbicides during landscape and biodiversity works will be avoided or minimised wherever practicable. Where use of chemicals is deemed to be absolutely necessary, care will be taken to ensure that all chemicals used are non-toxic to humans and animals under normal conditions and will comply with the relevant guidance/legislation at the time of work, current including Control of Pesticides (Amendment) Regulations

1997 and any relevant Code of Practice issued by the Department of Environment, Food and Rural Affairs (Defra).

2.7.2 Contractors will inform the Applicant of their intention to use chemicals; the product to be used; and the dose rates, before commencing operations.

2.7.3 Where work is near water, drainage ditches or land drains, the contractor will comply with all relevant EA requirements, including those for the use of herbicides on weeds in watercourses and lakes.

## 2.8 **General management**

2.8.1 A number of general prescriptions are applicable across the Application Site. These are:

- a. all legally designated weeds will be controlled;
- b. vegetation, which suppresses or otherwise inhibits the development of planted species and proper management of habitats will be restricted and/or removed;
- c. any species which colonise the site, and are incongruous with the planting scheme and/or the surrounding context, will be removed;
- d. all herbicides will be systemic, biodegradable, and non-residual, and only used where necessary and appropriate; and,
- e. all areas will be subject to a regular system of litter collection and removal.

2.8.2 The Proposed Development comprises existing and proposed habitats, as detailed within the relevant Landscape Mitigation Plans **Figures 14.11 to 14.13** in Volume 4 to the PEIR. The mitigation areas are described in **Section 3**. The management of these habitats are described respectively in **Sections 4 and 5**. Maintenance measures for public access and street furniture are described respectively in **Sections 6 and 7**. Monitoring procedures are described in **Section 8**.

### 3 MITIGATION AREAS

#### 3.1 Introduction

3.1.1 In order to address the landscape and ecological mitigation measures identified within the PEIR, the Draft LBMP has identified the following elements of mitigation which are briefly outlined in the below sections, and highlighted in the relevant Landscape Mitigation Plans **Figures 14.11 to 14.13** in Volume 4 to the PEIR.

#### 3.2 Replacement open space

3.2.1 A large area of replacement open space is proposed to be created in the north east of the Main Application Site (as defined in **Chapter 2** in Volume 2 of the PEIR), shown as Work No. 5b on **Figure 4.1** in Volume 4 of the PEIR. All of the replacement open space will be created in Phase 1 with additional provision created within Phase 2a and 2b, as shown on **Figures 4.2 and 4.3** in Volume 4 of the PEIR.

3.2.2 The replacement open space currently consists largely of previously intensively managed arable farmland that have been fallow since 2020, grassland fields and small blocks of woodland and scrub. This replacement open space will connect to the retained areas of Wigmore Valley Park, providing east west connectivity within the Main Application Site and wider landscape. This area will include habitat creation measures to mitigate for those habitats lost within Wigmore Park County Wildlife Site (CWS). The replacement habitat, once established, will mitigate for the loss of foraging, dispersal and shelter habitats which are used by a range of species including badger (*Meles meles*), bats, birds, reptiles, amphibians and invertebrate species.

3.2.3 This replacement open space will contain a largely landscaped mosaic of woodland, both retained, enhanced and newly planted, retained and restored hedgerows, scrub, ornamental planting (within urban realm areas throughout the Proposed Development), neutral meadow mown grassland and amenity grassland. As this area will be open to the public, it will also contain a network of footpaths and bridleways, as well as street furniture, discussed in detail in **Sections 6 and 7**.

#### 3.3 Habitat creation

3.3.1 Outside of the replacement open space, habitat creation proposals shown as Work No. 5d on **Figures 4.1 to 4.3** in Volume 4 of the PEIR, within the Main Application Site include large areas of neutral grassland, two areas of calcareous grassland and woodland blocks to the east of the replacement open space.

3.3.2 These habitat creation areas are created during Phase 1, Phase 2a and Phase 2b as detailed within the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR.

3.3.3 The habitat creation areas currently consists almost entirely of previously intensively managed arable cropping land (fallow since 2020) with two small

plantation woodlands in the southern section of this mitigation area. It is bordered to the east, north and south by partially defunct hedgerows and two small woodland blocks immediately to the north.

- 3.3.4 Four woodland blocks are to be created, that will link with the existing woodland blocks both spatially and in ecological characteristics. They will also compliment and link to the woodland planting within the replacement open space.
- 3.3.5 Hedgerow restoration and enhancements are planned around each field boundary, shown as Work No. 5e on **Figures 4.1 to 4.3** in Volume 4 of the PEIR, in order to remove gaps and increase linkage with the hedgerow network within the wider landscape. This will link to the extensive hedgerow restoration works that are planned to take place off site, as shown within the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR.
- 3.3.6 Calcareous grassland is proposed to be created within the Main Application Site during Phase 2b as detailed within the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR. These areas will mitigate for the loss of this habitat.
- 3.3.7 The Airport Access Road (AAR) mitigation area is located on the western side of the Proposed Development, northwest of the carpark by new airport way. This includes Dairyborn Scarp District Wildlife Site (DWS) and the surrounding habitat which comprises mainly of scrub and tall ruderals, where it lies within the Proposed Development.
- 3.3.8 Neutral meadow grassland, exposed chalk and scrub will be created on the reinstated slopes of the AAR. The scrub within this area will be managed and undesirable species such as buddleia (*Buddleja davidii*) will be removed.

#### 3.4 Off site mitigation

- 3.4.1 Hedgerow restoration and enhancements are planned on defunct hedgerows offsite, in addition to area of new hedgerows, in order to mitigate visual effects and improve the hedgerow network within the wider landscape. These are shown within the relevant Landscape Mitigation Plans **Figures 14.11 to 14.13** in Volume 4 to the PEIR, and Work No. 5e on **Figures 4.1 to 4.3** in Volume 4 of the PEIR.

#### 3.5 Mitigation Area Considerations

- 3.5.1 Each mitigation area will comprise a mosaic of habitat types, and it is important to note that other habitats will be created within the Proposed Development outside these mitigation areas. Each habitat retained and created within the Proposed Development will require varying management practices in order to maximise their landscape and biodiversity value, with careful consideration given to planning the integration of retained and proposed habitats. The aim is to increase ecological connectivity both between mitigation areas and with the wider landscape, and as a result, these mitigation areas should not be considered in isolation from one another.

- 3.5.2 Consequently, management techniques and regimes specific to each habitat are discussed in the following sections and should be applied to any areas within the Proposed Development that they occur following establishment.
- 3.5.3 It should be noted that the habitat creation shown with the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR, is at a level of detail relevant to the Proposed Development. Variation within each field is expected and will be especially encouraged in habitat creation areas. This is likely to include having some patches of bare ground.
- 3.5.4 Planting within these mitigation areas will be designed to segregate footpaths from the verges to ensure habitat is protected from trampling and disturbance.
- 3.5.5 All planting and maintenance operations have been designed to avoid any increased risk of bird strike, by planting away from the flight path. The carrying capacity for wood pigeon (*Columba palumbus*) will not be significantly increased by this planting for further details please see the Bird Strike Risk Assessment provided in **Appendix 8.4** in Volume 3 of this PEIR.



## 4 MANAGEMENT OF EXISTING HABITATS

4.1.1 All management outlined below supersedes current or previous management practices within these existing habitats.

4.1.2 All existing habitats referred to below are in the ownership of the Applicant with the exception of off-site hedgerow enhancements.

### 4.1 Trees and Woodland

4.1.3 Trees and woodland are to be retained in various locations across the Proposed Development, this is shown within the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR.

4.1.4 Four woodlands are to be enhanced. Details of the enhancements are described below:

- a. Woodland 6 Ancient Woodland Indicators (AWI) will be fenced to prevent access to people and deer, opportunities to create woodland glades will also be considered where appropriate. Management of Winch Hill wood will include sensitive thinning and coppicing to open up the canopy, and improve the structural diversity of the woodland, along with targeted planting.
- b. Woodland 1 will be managed to improve its condition, opportunities to create woodland glades will also be considered where appropriate.
- c. Woodland 2 (plantation coniferous) and Woodland 4 (mixed plantation) will be enhanced from plantation coniferous to mixed/broadleaved woodland. Any broadleaved trees will be retained within these woodlands, subject to condition surveys for diseases such as ash dieback. Coniferous trees will be slowly removed over a period of five years and replaced with suitable native broadleaf species.

4.1.5 The location of these woodlands is shown within the PEIR Phase 1 habitat map, Appendix A to the Ecology Baseline Report (**Appendix 8.2**, Volume 3 of this PEIR).

4.1.6 Retained trees will be subject to protection and monitoring to ensure their health is maintained throughout the life of the Proposed Development in line with BS5837: 2012 Trees in relation to design, demolition and construction (Ref. 1), including assessing for signs of ash dieback.

4.1.7 All maintenance works will be undertaken in accordance with BS 3998: 2010 Tree Work - Recommendations, and carefully monitored to eliminate undue stress. Contractors will be required to comply with the current Arboriculture and Forestry Advisory Group (AFAG) relevant to tree maintenance works.

4.1.8 The majority of arisings (>95%) that result from works to existing trees will be removed from site, but a small proportion will be retained as dead specimens in situ, with smaller material used as deadwood/brush piles within proposed wooded areas for their biodiversity value.



- 4.1.9 Where possible specific existing trees identified within the Arboricultural Impact Assessment (see **Appendix 14.3** in Volume 3 of the PEIR) will be managed and maintained differently in order to maintain and enhance their high nature conservation value, such as veteran trees. Such trees may include features such as dead limbs, hollows, rot-holes, water pools, seepages, woodpecker holes, splits, loose bark, limbs reaching the ground, and epiphytic plants and lichens, which may well be considered as undesirable on a non-veteran tree. This may include measures such as thinning of young trees around veteran trees to reduce stresses upon the tree. Opportunities will also be explored to undertake 'veteranisation' of mature trees within the Applicant's land ownership.
- 4.1.10 Translocation will be undertaken where possible, of suitable live trees that will otherwise be felled as part of the site clearance. Selected trees, including Category A tree T343, will be coppiced and moved to woodland habitat creation areas to provide a habitat resource for a range of species while the habitat creation areas establish.
- 4.2 Hedgerows**
- 4.2.1 Hedgerows are to be retained and protected wherever possible throughout the Proposed Development. Management will primarily focus on restoration and enhancement of existing hedgerows, both within the Proposed Development, and within the wider agricultural landscape.
- 4.2.2 Retained hedgerows within the Proposed Development will be cut on a 3-year rotation from commencement of establishing habitat areas, with alternate sides of the hedgerow cut to maintain a constant food source for birds and other wildlife. They will be maintained to a height and width customary to the local landscape, but not less than 2m in height (except when laid or coppiced as part of a regular management cycle).
- 4.2.3 No fertilisers, manures or pesticides will be applied to land within 2m of the centre of the hedgerow.
- 4.2.4 Any hedge-laying and coppicing will be carried out in a style customary to the local landscape and will be completed during February (in exceptional circumstances work may continue until 31 March, provided a survey has been carried out that concludes there are no nesting birds present). Berry bearing shrubs will be left overwinter to provide a food source for birds (and other wildlife) between October to February and cut later in February before the bird nesting season. Hedgelaying can be done from 10 years between cycles, or longer if retaining good condition, moving round the site in sections to stagger.
- 4.3 Field margin vegetation**
- 4.3.1 Arable margins will be retained along maintained woodland belts and hedgerows where possible. These margins will be managed to encourage retention and proliferation of the notable arable plant species and invertebrates that have been identified within the survey area.
- 4.3.2 Existing rough grass margins would be cut once every three years at a height between 7.5cm to 15cm. Cutting should be undertaken between 15 July and 30

September, to allow mature tussocks to develop and insect populations to build up, and on a rotation so that there are a number of uncut margins every year.

- 4.3.3 No fertiliser, manure or pesticides/herbicides are to be applied to existing margins, as these can encourage weeds and remove beneficial plants and associated insects.
- 4.3.4 Thistles, docks or ragwort (*Senecio jacobaea*) will be spot treated or weed-wiped whenever they occur in significant numbers as appropriate through the active growing season to avoid other species being out-competed. Hand pulling should be deployed as a potential method of eradication.
- 4.4 **Semi-improved neutral grassland**
- 4.4.1 Semi-improved neutral grassland is to be retained and enhanced in various locations across the Proposed Development, this is shown within the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR. This will include areas within Luton Parkway Verges DWS as appropriate.
- 4.4.2 Retained semi-improved neutral grassland areas will be mown between late-July and mid-August (although the timing of this will remain flexible to ensure cutting does not take place before desirable plant species set seed).
- 4.4.3 Cuttings will be left to lie and then removed between one and two days after an area has been cut, to help conserve invertebrates and to ensure the seeds are dispersed on site and not removed with the arisings.
- 4.4.4 Mowing will avoid times of high reptile activity after hibernation and breeding (March to June inclusive), and late August to October when hatchlings remain active.
- 4.4.5 Mowing method will be done slowly, and either from the centre out or along straight lines to ensure that wildlife, including birds and reptiles, has an opportunity to escape. Walking through areas of long grass prior to mowing can encourage them to move elsewhere. Ideally this should be done on a warm day when they will be most active and able to move away quickly, and not in Winter when they are hibernating.
- 4.4.6 The grass cutting height of the mower will be varied across different sections of the grassland to improve insect diversity and abundance.
- 4.4.7 Strimming or herbicide control will be undertaken where grassland areas abut for example fences, walls and around trees and obstacles (with care not to damage trees within grassed areas) in June and September, or more frequently is deemed necessary.
- 4.4.8 A mown strip will be maintained to form a boundary between grasslands and more intensively managed areas.
- 4.4.9 Damaged or worn areas will be reinstated during the next available season.
- 4.4.10 Undesirable herbaceous species or scrub within the grassland sward will be controlled by hand pulling or weed wiping/spot spraying with an appropriate systemic herbicide (if absolutely necessary).

- 4.4.11 Any large areas of encroaching scrub will be removed from grassland areas during Winter months (October to February), but leaving some scrub along the borders of the grassland to act as habitat for wildlife. Scalloped south-facing bays of vegetation will be used to provide sheltered pockets for reptile basking.
- 4.4.12 No machinery will access the grassland when ground conditions are damp so as to avoid rutting and vegetation damage.
- 4.4.13 Ruts and other damage will be repaired as appropriate. Such repairs will be undertaken using techniques and materials sensitive to this component.
- 4.4.14 Soil ameliorants will not be used on grassland areas.
- 4.4.15 Luton Parkway Verges DWS will be fenced off to prevent 'cut throughs' from use of the new car park adjacent.
- 4.4.16 In addition, grassland habitats within the airport boundary at the south of the Application Site between the runway and external fencing will continue to be managed at a short sward height to avoid the establishment of rough grassland and scrub. This should discourage encroachment of species such as Roman snail (*Helix pomatia*) from the adjacent habitats immediately to the south into the Proposed Development and away from active areas of the Proposed Development.

## 5 ESTABLISHMENT AND MANAGEMENT OF PROPOSED HABITATS

### 5.1 Broad-leaved woodland

#### Location

- 5.1.1 Broad-leaved woodland blocks are proposed in various locations across the Proposed Development, as shown in the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR. Where possible these establishing woodlands will link to existing woodland, aiming to increase their extent, connectivity and ecological value.
- 5.1.2 Woodland planting has been designed to avoid any increased risk of bird strike, by planting away from the flight path. The carrying capacity for wood pigeon, the only high bird strike risk species identified for the site, will not be significantly increased by this planting; for further details please see the Bird Strike Risk Assessment provided as **Appendix 8.4** in Volume 3 to the PEIR.

#### Specification

- 5.1.3 Woodland tree and shrub species to be planted will be similar to those that exist within the surrounding landscape, in line with the local landscape character and be resilient to climate change. The existing semi-natural broadleaved woodlands within the surrounding area are characteristic of the National Vegetation Classification (NVC) W8 and W10 plant communities, with the canopy comprising mainly either ash (*Fraxinus excelsior*), pedunculate oak (*Quercus robur*), and/or hornbeam (*Carpinus betula*). These woodlands qualify as **lowland mixed deciduous woodland** habitat of principal importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (Ref. 2). The oak-hornbeam woodland present at Chicksands Wood CWS and King's and Baker's Woods and Heaths CWS and Site of Special Scientific Interest (SSSI), are cited as good examples of this habitat type in Central Bedfordshire (Ref. 3). Hertfordshire also has a particular responsibility for the protection of this habitat type, with a large proportion of the national resource present within the county (Ref. 4).
- 5.1.4 Any woodland created will contain:
- a. 50% of the following woodland canopy species:
    - i. elm (a resistant variety such as *Ulmus* new horizon);
    - ii. pedunculate oak; and,
    - iii. hornbeam.
  - b. 50% of the following woodland understorey species:
    - i. blackthorn (*Prunus spinosa*);
    - ii. field maple (*Acer campestre*);
    - iii. hawthorn (*Crataegus monogyna*);
    - iv. hazel (*Corylus avellana*);
    - v. holly (*Ilex aquifolium*);
    - vi. honeysuckle (*Lonicera periclymenum*);
    - vii. silver birch (*Betula pendula*); and

viii. wild cherry (*Prunus avium*).

- 5.1.5 To add structural diversity to the new woodlands, specimen trees in addition to whips (unbranched young tree) will be planted and comprise resistant elm, pedunculate oak and hornbeam, as well as a plants added to begin creation of a woodland ground layer. All woodland ground layer species will be plug planted and comprise shade tolerant species such as pignut (*Conopodium majus*), wood melick (*Melica uniflora*), bluebell (*Hyacinthoides non-scripta*), yellow archangel (*Lamiastrum galeobdolon subsp. montanum*) and greater stitchwort (*Stellaria holostea*).
- 5.1.6 Where possible woodland planting should aim for a more natural/random appearance, with trees not being planted in straight lines.
- 5.1.7 Deadwood from clearance activities within the Proposed Development, will be moved into woodland creation areas to provide a habitat for saproxylic invertebrates.
- 5.1.8 Where possible monoliths (standing deadwood) should also be created to provide a diversity of structure within the new woodland. Large sections of felled trunks will be reinstalled vertically in the ground within the habitat creation areas, which will encourage the deadwood to decay in a similar way to how it would naturally as standing deadwood in-situ. This will be described within a Bat Mitigation Strategy to be prepared and submitted as part of the ES.

### **Establishment**

- 5.1.9 The proposed new woodlands will be planted in line with English Woodland Grant Scheme (Ref. 5), UK Forestry Standard (Ref. 6) and UK Woodland Assurance Scheme guidelines (Ref. 7). This will provide recognised management objectives and techniques to ensure the successful establishment of habitat and to provide long term benefits to biodiversity.
- 5.1.10 The Applicant and their appointed contractors will undertake the following operations as necessary during the first five years after planting, to ensure the satisfactory establishment and development of the woodland trees and shrubs:
- a. clearance of any woodland shrub species within a 1m diameter of the base of each tree;
  - b. maintenance of a 1m diameter weed free area around the base of all woodland specimens, through the application of an appropriate herbicide;
  - c. spot treatment of pernicious weeds (e.g. brambles (*Rubus fruticosus agg.*));
  - d. treatment against pests and diseases with spraying and dusting;
  - e. application of a slow release fertiliser around the base of all woodland specimens to ensure soil fertility is maintained at appropriate levels;
  - f. inspection, adjustment and maintenance of translucent guards, stakes and ties;

- g. review of fencing to ensure against structural damage in the period to establishment;
- h. re-firming of plants after strong winds, frost heave or other disturbances;
- i. removal of any vandalised, unhealthy or dead shrubs and replacement with plants of a similar size to those adjacent, during the next available planting season;
- j. watering of plants to ensure moisture levels are maintained appropriate for optimum growth; and
- k. mowing of underlying grassed areas to a height of 50mm, whenever the sward achieves a height of 125mm.

### Management/Maintenance

5.1.11 Following initial establishment, the Applicant and their appointed contractors will undertake the following operations as necessary, subject to appropriate reviews:

- a. inspect and where necessary remove and replace any tree or shrub found to be dead, dying or diseased, unless can reasonably be retained for biodiversity reasons;
- b. inspect the created woodland to ensure the desired diversity of flora is achieved. Carry out remedial action, where necessary pruning or removing plants that are dominating or smothering the woodland;
- c. inspect the structure of the woodland every five years, if crowding occurs some trees will be felled to promote the growth of others. The removal of any trees should aim to create a natural appearance with a diversity of structure. Any felled trees will be left within the woodland to provide dead wood habitat;
- d. formative pruning to achieve optimum growth rates and maintain a good shape, clear of any vehicular or pedestrian circulation routes; and
- e. removal of redundant fencing, guards, stakes and ties at appropriate times to ensure the optimum health of individual plants.

5.1.12 The Applicant and their appointed contractors will ensure that:

- a. most parts of the woodland are structurally diverse and includes dominant/sub-dominant tree species, understory tree and shrub species, low level shrubs, natural regeneration and ground flora;
- b. there is a good mix of nectar rich herbaceous plants;
- c. the woodland slowly merges into adjacent habitat, creating woodland/scrub habitat similar to those found within a wood glade;
- d. invasive or undesirable species such as sycamore (*Acer pseudoplatanus*), Himalayan balsam (*Impatiens glandulifera*) and *Rhododendron* are controlled and do not dominate the space;
- e. deadwood (standing trunks/monoliths and deadwood/brush piles) has been left wherever safe to do so;

- f. clearing and coppicing work is limited to specific areas on a rotational basis; and
- g. unacceptable levels of litter, debris or dog fouling are removed, and additional measures put in place to reduce the likelihood of reoccurrence where applicable.

**Woodland Management Schedule**

Table 1: Woodland Management Schedule

| Year post establishment   | All | 0 | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 + |
|---|-----|---|---|---|---|---|---|----|----|------|
| Prescription  |     |   |   |   |   |   |   |    |    |      |
| Practical management and removal of undesirable species (management of shrubs, weeds, mowing)                                 |     | X | X | X | X | X | X |    |    |      |
| Active care of establishing woodland (pest treatment, fertiliser application, watering, guard checks)                         |     | X | X | X | X | X | X |    |    |      |
| Control and removal of invasive species (e.g. rhododendron, sycamore, Himalayan balsam)                                       | X   |   |   |   |   |   |   |    |    |      |
| Dynamic management of woodland (pruning, guard removal, rotational coppicing, deadwood assessment, litter management)         | X   |   |   |   |   |   |   |    |    |      |
| Continuing assessment of woodland on a 5-yearly basis (subject to review) to ensure desired species mix and optimal structure |     |   |   |   |   |   | X | X  | X  | X    |

**5.2 Hedgerows**

5.2.1 The overall target for hedgerow creation and enhancements is to create hedgerows that achieve the species-rich hedgerow priority habitat type listed on Section 41 of the NERC Act 2006.



## Location

5.2.2 Hedgerow creation is proposed in various locations across the Proposed Development, as detailed within the relevant Landscape Mitigation Plan **Figures 14.11 to 14.13** in Volume 4 to the PEIR for demarcation, screening and visual interest along with their biodiversity benefit. As the primary effort will be the restoration and enhancement of retained hedgerows, establishment of new hedgerows will primarily be utilised to separate the previously extensive agricultural fields and provide a buffer to habitats that are adjacent to footpaths. Further hedgerow restoration is planned offsite, increasing habitat connectivity both within the Proposed Development and to the network of hedgerows in the wider landscape.

## Specification

5.2.3 The new hedgerows will be species rich and comprise a mixture of native shrubs, which when established will be a habitat of principal importance. Where possible coppiced stools will be added to hedgerows to provide additional variation in the structure of the newly created hedgerows.

5.2.4 The existing hedgerows are dominated by hawthorn with variable amounts of the following species ash, blackthorn, dogwood (*Cornus sanguinea*), elder (*Sambucus nigra*), field maple (*Acer campestre*), hazel, holly, dog rose (*Rosa canina*) aggregate and bramble aggregate. The species selected to be planted have been designed to be characteristic of the surrounding area. The species to be planted and the proportion of each are as follows:

- |                |     |
|----------------|-----|
| a. hawthorn    | 50% |
| b. blackthorn  | 10% |
| c. field maple | 10% |
| d. hazel       | 10% |
| e. holly       | 10% |
| f. hornbeam    | 10% |

5.2.5 The new native species-rich hedgerows will be maintained at a height and width customary to the local landscape, of at least 1.5 to 2m (except when laid or coppiced as part of a regular management cycle) in order to provide habitat for a range of species, and as an appropriate hedge form and density to the location.

## Establishment

5.2.6 The Applicant and their appointed contractors will undertake the following operations as necessary during the first five years after planting, to ensure the satisfactory establishment and development of the hedgerow trees and shrubs:

- replanting will occur as necessary (replacing poorly established and/or dead plants) so there are no gaps (using 1.5m deer protective guards/fencing);
- weed control will be carried out as needed;



- c. plant guards/supports will be straightened where needed and removed if necessary;
- d. irrigation as necessary to ensure healthy growth;
- e. cut back 50% of the current year’s growth in the Autumn to achieve the desired height and shape; and
- f. controlling of pests and diseases.

**Management/Maintenance**

5.2.7 Following initial establishment, the Applicant and their appointed contractors will undertake the following operations as necessary, subject to appropriate reviews:

- a. hedgerows will be maintained to a height and width customary to the local landscape, but not less than 2m in height (except when laid or coppiced as part of a regular management cycle);
- b. the removal of redundant fencing, guards, stakes and ties at appropriate times to ensure the optimum health of individual trees;
- c. no fertilisers, manures or pesticides are to be applied to land within 2m of the centre of the hedge;
- d. any hedge laying, and coppicing will be carried out in a style customary to the local landscape and will be completed between February and March; and
- e. hedgerows would be cut on a 3-year rotation with alternate sides of the hedgerow cut to maintain a constant food for wildlife. Hedges should be cut in January or February to avoid the nesting bird season, but berry bearing shrubs should be left overwinter to provide a food source for birds between October to February and cut later in February before the nesting season.

**Hedgerow Management Schedule**

Table 2: Hedgerow Management Schedule

| Year post establishment   | All | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 9 | 12 + |
|---|-----|---|---|---|---|---|---|---|---|------|
| <b>Prescription</b>   |     |   |   |   |   |   |   |   |   |      |
| Practical management and removal of undesirable species (weeds, extensive areas of bramble) |     | X | X | X | X | X | X |   |   |      |
| Active care of establishing hedgerow (planting up gaps,                                     |     | X | X | X | X | X | X |   |   |      |

| <b>Year post establishment</b>                                       | <b>All</b> | <b>0</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>9</b> | <b>12 +</b> |
|--|------------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|
| <b>Prescription</b>  |            |          |          |          |          |          |          |          |          |             |
| straightening and removal of guards, pest control)                   |            |          |          |          |          |          |          |          |          |             |
| Cut back of 50% of yearly growth to promote desired height and shape |            |          | X        | X        | X        | X        | X        |          |          |             |
| Ongoing maintenance (laying and coppicing)                           | X          |          |          |          |          |          |          |          |          |             |
| Management cycle with 3-yearly rotational cutting of alternate sides |            |          |          |          | X        |          |          | X        | X        | X           |

**5.3 Hedgerow trees and specimen trees**

5.3.1 Hedgerow trees would provide further height and structure within several of the proposed hedgerows. In addition, proposed individual trees would provide landscape structure to the soft landscaping areas within the replacement open space. Trees or groups of specimen trees would also be used to create enclosure, focal points and features. The overall target for hedgerow creation and enhancements is to create hedgerows that achieve the species-rich hedgerow priority habitat type listed on Section 41 of the NERC Act 2006.

**Location**

5.3.2 Hedgerow trees will be planted within several of the proposed hedgerows, distributed in various locations throughout the site. Individual or groups of specimen trees will also be planted to provide habitat and landscape features at various locations across the Proposed Development.

**Specification**

5.3.3 The specimen trees and those to be planted in mixed species hedgerows will include resistant elm, pedunculate oak and hornbeam. Where possible coppiced stools will be added to hedgerows to provide additional variation in the structure of the newly created hedgerows

**Establishment**

5.3.4 The Applicant and their appointed contractors will undertake the following operations as necessary during the first five years after planting, to ensure the satisfactory establishment and development of the trees:

- a. treatment against pests and diseases with spraying and dusting;

- b. application of a slow release fertiliser around the base of all trees to ensure soil fertility is maintained at appropriate levels;
- c. the removal of any vandalised, unhealthy or dead specimens (where not possible to retain safely) and replacement with trees of a similar size, during the next available planting season;
- d. inspection, adjustment and maintenance of fencing, guards, stakes and ties;
- e. re-firming of plants after strong winds, frost heave or other disturbances;
- f. removal of any vandalised, unhealthy or dead shrubs and replacement with plants of a similar size to those adjacent, during the next available planting season; and
- g. watering of plants to ensure moisture levels are maintained appropriate for optimum growth.

### **Management/Maintenance**

5.3.5 Following initial establishment of the hedgerow with trees, the Applicant and their appointed contractors will undertake the following operations as necessary, subject to appropriate reviews:

- a. the formative pruning of specimens to achieve optimum growth rates and maintain a good shape, clear of any vehicular or pedestrian circulation routes; and
- b. the removal of redundant fencing, guards, stakes and ties at appropriate times to ensure the optimum health of individual trees.

5.3.6 The Applicant and their appointed contractors will ensure that in relation to hedgerow trees and specimen trees:

- a. growth is healthy and vigorous with no sign of disease;
- b. no inappropriate dead branches;
- c. no basal or sucker growth;
- d. no damage to base of tree during maintenance; and
- e. no dead material or cuttings left in area (to be removed from site unless agreed area appointed on site).

## Hedgerow Trees and Specimen Tree Management Schedule

Table 3: Hedgerow Trees and Specimen Tree Management Schedule

| Year post establishment  | All | 0 | 1 | 2 | 3 | 4 | 5 | 6+ |
|--|-----|---|---|---|---|---|---|----|
| Prescription   |     |   |   |   |   |   |   |    |
| Practical management and removal of undesirable species (management of shrubs, weeds)                                    |     | X | X | X | X | X | X |    |
| Active care of establishing hedgerow and specimen trees (pest treatment, fertiliser application, watering, guard checks) |     | X | X | X | X | X | X |    |
| Dynamic ongoing management of hedgerow trees and specimen trees (pruning, deadwood assessment, disease treatment)        | X   |   |   |   |   |   |   |    |

### 5.4 Scrub

#### Location

5.4.1 Scrub areas are to be established in various locations, as shown in the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR. These scrub areas primarily border areas of woodland to be established within the replacement open space, to provide breeding and foraging habitat and a place of shelter for a range of fauna.

#### Specification

5.4.2 New areas of scrub will comprise a mixture of blackthorn, dog rose, field maple, hawthorn, hazel and holly. It is anticipated that bramble and elder will naturally colonise, so it has not been included within the planting species mixture.

5.4.3 Areas of scrub will comprise at least three shrub species with no one species occupying more than 75% of the cover. The planted shrubs species will include a mixture of whips and older plants.

#### Establishment

5.4.4 The Applicant and their appointed contractors will undertake the following operations as necessary during the five years after planting, to ensure the satisfactory establishment and development of the shrubs:

- a. cutting back scrub between September and February to avoid impacting nesting birds;

- b. all cuttings are to be removed (to be removed from site unless agreed area appointed on site) to avoid smothering the sward underneath;
- c. inspection, adjustment and maintenance of fencing, guards, stakes and ties;
- d. no fertiliser, manure or pesticides/herbicides are to be applied to existing scrub margins, as these can remove beneficial insects and plants; and
- e. thistles, docks or ragwort will be spot treated or weed-wiped whenever they occur in significant numbers as appropriate through the active growing season to avoid other species being out-competed by them. Hand pulling will be deployed as a potential method of eradication where appropriate, with arisings disposed of appropriately.

**Management/Maintenance**

5.4.5 Following initial establishment, the Applicant and their appointed contractors will undertake the following operations as necessary, subject to appropriate reviews:

- a. grass margins will be cut once every three years at a height between 7.5cm to 15cm, between 15 July and 30 September, to allow mature tussocks to develop and insect populations to build up, and will be cut on a rotation so that there are plenty of uncut margins every year;
- b. the removal of redundant fencing, guards, stakes and ties at appropriate times to ensure the optimum health of individual plants;
- c. all cuttings are to be removed (to be removed from site unless agreed area appointed on site) to avoid smothering the sward underneath;
- d. no fertiliser, manure or pesticides/herbicides are to be applied to existing margins, as these can encourage weeds and remove beneficial insects and plants; and
- e. thistles, docks or ragwort will be spot treated, weed-wiped or hand pulled whenever they occur to prevent numbers building up.

**Scrub Management Schedule**

Table 4: Scrub Management Schedule

| <b>Year post establishment</b>                                   | <b>All</b> | <b>0</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>9</b> | <b>12+</b> |
|--|------------|----------|----------|----------|----------|----------|----------|----------|----------|------------|
| <b>Prescription</b>  |            |          |          |          |          |          |          |          |          |            |
| Active cutting of establishing scrub areas and removal of debris | X          | X        | X        | X        | X        | X        | X        |          |          |            |
| Practical management and removal of                              | X          | X        | X        | X        | X        | X        | X        |          |          |            |

| Year post establishment  | All | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 9 | 12+ |
|--|-----|---|---|---|---|---|---|---|---|-----|
| <b>Prescription</b>  |     |   |   |   |   |   |   |   |   |     |
| undesirable species (weeds, ruderals)                              |     |   |   |   |   |   |   |   |   |     |
| Management cycle with 3-yearly rotational cutting of grass margins |     | X |   |   | X |   |   | X | X | X   |

**5.5 Ornamental plants**

**Location**

- 5.5.1 Ornamental plants are to be planted for aesthetic purposes in urban realm areas throughout the Proposed Development. The ornamental plant mixture will exclude those species which are invasive and included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).
- 5.5.2 The responsibility for delivering and maintaining each of these areas will depend on individual land considerations (to be determined as the project progresses), but the standards set by this report should be consistently applied across the Proposed Development.

**Specification**

- 5.5.3 Ornamental shrub and groundcover planting will be concentrated within accent locations throughout the development (e.g. roundabout junctions, entrance points).
- 5.5.4 Planting will include a combination of taller specimen shrub species (achieving in excess of one metre ultimate height), low ground cover species (averaging 600mm height) and specimen shrub planting to provide stature at key points. Ornamental plants will typically be planted in single species groups of 2-12 plants per sqm.
- 5.5.5 Detailed plant selection will ensure groundcover shrubs and those of a more compact nature are located nearer to the front of planting beds, with those of a more upright form located further to the rear. Planting design will also take into consideration highway visibility splay requirements, ensuring species selection is appropriate to maintain clear visibility within these areas.
- 5.5.6 Deer protective guards/fencing will be installed to vulnerable species following planting to assist in long term establishment.

## **Establishment**

5.5.7 The Applicant and their appointed contractors will undertake the following operations as necessary during the first two years after planting, to ensure the satisfactory establishment and development of the ornamental plants:

- a. hand weeding of planting beds during the first year;
- b. application of an appropriate herbicide to shrub planting areas;
- c. spot treatment, using an appropriate systematic herbicide only (to prevent damage to desired plant material) of herbaceous planting;
- d. annual replenishment of mulch to agreed contract levels;
- e. application of a slow release fertiliser to ensure soil fertility is maintained at appropriate levels;
- f. treatment against pests and diseases with spraying and dusting;
- g. pruning of shrubs for floral, foliage and stem colour effect and to remove weak, dead and diseased wood;
- h. training and tying of shrubs and climbers to walls/frames;
- i. remove dead growth and trim herbaceous perennial plants, avoiding damage to any new shoots that have emerged;
- j. remove any vandalised, unhealthy, dead or short-living plants and replace with plants of a similar size to those adjacent, during the next available planting season;
- k. maintain and replace frames, ties and guards; and
- l. watering of plants to ensure moisture levels are maintained appropriate for optimum growth.

## **Management/Maintenance**

5.5.8 Following initial establishment, the Applicant and their appointed contractors will also undertake the following operations as necessary, subject to appropriate reviews:

- a. heavy pruning, usually back to a stool, of overgrown shrubs and climbers;
- b. ensure pruning is correct for species type and that cuts are sharp and neat;
- c. ensure shrub beds are free of weeds;
- d. ensure no dead material or cuttings are left in area. Leaf fall, litter, debris and dog fouling will all be removed;
- e. ensure the selective removal of shrubs and other plants from planting beds;
- f. removal of redundant guards, stakes and ties at appropriate times to ensure the optimum health of individual plants;

- g. ensure a balanced and well-maintained display with a neatly defined edge; and
- h. if mulched, ensure that this is done evenly and to the correct depth across the area.

**Ornamental Planting Management Schedule**

Table 5: Ornamental Planting Management Schedule

| Year post establishment  | All | 0 | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|---|
| <b>Prescription</b>  |     |   |   |   |   |   |   |
| Practical management and removal of undesirable species (hand weeding, spot treatment, herbicide application)                          |     | X | X | X | X | X | X |
| Active care of establishing ornamental beds (pest treatment, fertiliser application, watering, mulch application, dead growth removal) |     | X | X | X | X | X | X |
| Dynamic ongoing management of ornamental planting (heavy pruning, weed treatment, aesthetic maintenance, mulch application)            | X   |   |   |   |   |   |   |

**5.6 Neutral grassland**

**Location**

5.6.1 Neutral grassland is to be established throughout various locations within the Proposed Development, as shown on the relevant Landscape Mitigation Plan **Figures 14.11 to 14.13** in Volume 4 to the PEIR. Neutral grassland would be created on previously existing arable fields (now fallow) to compensate for the loss of neutral grassland to development. The overall target habitat type is the priority habitat type lowland meadow grassland listed under Section 41 of the NERC Act 2006.

**Specification**

5.6.2 To create lowland meadow, species-rich neutral grassland characteristic of the NVC MG5<sup>1</sup> plant community will be created.

5.6.3 The neutral grassland seed mixture will comprise the following species:

- a. common knapweed (*Centaurea nigra*);

<sup>1</sup> MG5 is the NVC term for the Mesotrophic Grassland community *Cynosurus cristatus*–*Centaurea nigra*



- b. crested dog's-tail (*Cynosurus cristatus*);
- c. lady's bedstraw (*Galium verum*);
- d. oxeye daisy (*Leucanthemum vulgare*);
- e. common bird's-foot-trefoil (*Lotus corniculatus*);
- f. meadow buttercup (*Ranunculus acris*);
- g. red clover (*Trifolium pratense*); and
- h. yellow-rattle (*Rhinanthus minor*).

5.6.4 Cornfield annuals will be added to the seed mix to give instant visual appeal and to act as a nurse crop. Nurse crops are used in restoration to improve the establishment of target meadow species by providing shelter for seedlings of other species during the early stages of establishment, and by suppressing weed growth (Walker *et al.*, 2004 (Ref. 8)). The cornfield annual species mixture will include:

- a. common poppy (*Papaver rhoeas*);
- b. cornflower (*Centaurea cyanus*);
- c. corncockle (*Agrostemma githago*);
- d. corn chamomile (*Anthemis arvensis*); and
- e. corn marigold (*Glebionis segetum*).

### **Establishment**

5.6.5 The land currently allocated for the creation of species-rich neutral grassland was previously utilised for intensive arable cropping but now lies fallow due to ending of tenant contracts. Without remediation, high residual soil fertility resulting from intensive cropping is likely to place severe constraints on the enhancement and maintenance of plant species diversity (Marrs, 1993 (Ref. 9); Pywell, Webb and Putwain, 1994 (Ref. 10)).

5.6.6 Supplementary watering may be required depending on weather conditions at time of establishment.

### **Topsoil inversion**

5.6.7 Topsoil inversion will take place within the field east of Darley road and land north of the Chiltern Way long distance footpath. to reduce surface soil fertility, rather than waiting several decades for natural processes to revert the soil to its pre-intensive agricultural condition (Marrs 1993 (Ref. 11)). Topsoil inversion is also effective in reducing competition between sown species and agricultural weeds that may be present in topsoil (Gilbert *et al.*, 1996 (Ref. 12); Marrs 2002 (Ref. 13)). Prior to any topsoil inversion works be conducted, care must be taken to accurately locate and avoid any buried services ahead of undertaking these works.

5.6.8 The subsoil analysis determined low phosphorus and nitrogen levels and the suitability for establishment of species-rich neutral grasslands by using soil inversion. Additionally, and favourably, elevated organic matter content of the

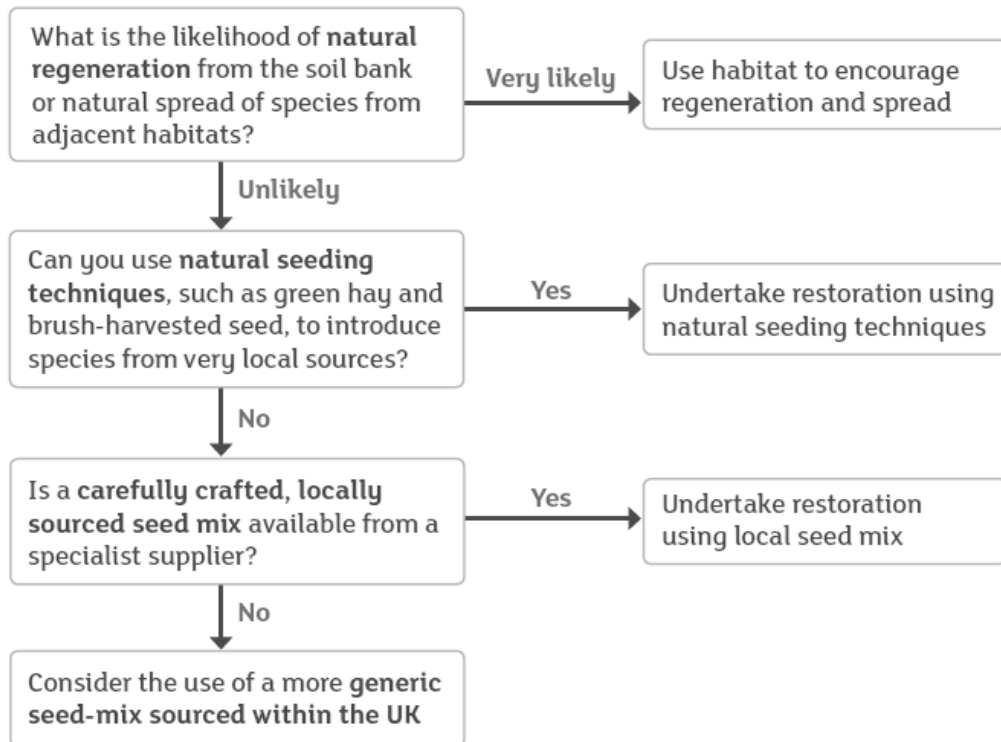
subsoils will significantly benefit establishment, but also longer-term continuity of species-rich grassland communities, subject to appropriate management regimes.

- 5.6.9 The soil inversion process uses a smaller ploughshare, following the main ploughshare, which tills a new furrow by cutting the topsoil layer and turning it into the previously excavated deep furrow. The main ploughshare works in the bottom of the furrow created when the topsoil was turned into the deep furrow. It lifts and turns the subsoil layers onto the inverted topsoil, in the process creating a new deep furrow into which the topsoil will be turned on the next run. This technique is fully explained by Luscombe, Scott and Young (2008) in the Landlife article on Soil Inversion Works (Ref. 14).
- 5.6.10 Based on topsoil depth, a minimum inversion depth of 600mm is recommended. Once the surface subsoil layer has been achieved, the soil will need to be cultivated to a suitable tilth and prepared for seeding. Establishment of specialist species by seeding has been shown to be more successful when bare ground conditions are created prior to sowing, with more severe soil disturbances favouring faster growth and reproduction of introduced specialist plants (Wagner *et al.*, 2015 (Ref. 15)).

### **Seeding**

- 5.6.11 The impoverishment of lowland species-pools (and seed sources) through habitat loss and fragmentation has meant that natural grassland re-establishment has usually been seed-limited (Poschlod *et al.*, 1998 (Ref. 16)). Furthermore, the widespread loss of farming practices that formerly transported grassland species between sites (e.g., shepherding, folding, hay-strewing) has meant that many grassland species are now isolated within a “sea” of intensively farmed land (Poschlod *et al.*, 1998 (Ref. 16)). Given these constraints, few target species are likely to reach isolated sites unaided, therefore the sowing of seed is required to create species rich grassland. Within the “Keeping the wild in wildflower – Frequently asked questions” article (Ref. 17), Plantlife have created the below chart of the steps to consider when planning the sowing of seed in the countryside for conservation purposes.

### Inset 1: Steps to consider when planning the sowing of seed in the countryside for conservation purposes



- 5.6.12 Engagement with the local Wildlife Trusts and other suitable local conservation organisations will be undertaken to determine if there are suitable sites nearby which could be utilised as a source for seed harvesting. Consent from Natural England would need to be requested at least four months in advance (by February of the year you want to harvest seed from a SSSI). This technique will be focused on sowing one field within the Proposed Development.
- 5.6.13 Green hay, taken from a species-rich donor site and spread on a species-poor receptor site, is another method of restoring and recreating wildflower grasslands. Green hay is harvested wildflowers and grasses just as they are shedding seed and still 'green'. The hay is quickly transferred to the species-poor recipient site where it is spread allowing the seed to drop.
- 5.6.14 Brush-harvested seed taken from a species-rich donor site and spread on a species-poor recipient site is another method of restoring and recreating wildflower grasslands. Good seed sources should be swept for seed throughout the growing season so that early and late flowering plants can be collected.
- 5.6.15 Where wildflower seeds are collected mechanically (brush harvesting or vacuum harvesting), this activity comes under the umbrella of 'marketing' seed. 'Marketing' includes:
- packing, selling or labelling seed;
  - processing seed;

- c. marketing seed; and
- d. collection and preparation of preservation mixtures.

5.6.16 Given the extent of species-rich neutral grassland created it is acknowledged that a commercially available seed mix will be needed. Seed mixtures need to suit the soil types and will be purchased from reputable companies. Reputable seed suppliers will be used that have signed up to the Code of Practice for collectors, growers and suppliers of native flora. Using locally sourced seeds is thought to improve performance due to the genotypes being better adapted to the local soil and weather conditions (Gilbert and Anderson 1998 (Ref. 18)).

#### **Management/Maintenance**

- 5.6.17 The Applicant and their appointed contractors will undertake the following operations as necessary during the first five years after planting, to ensure the satisfactory establishment of the neutral grassland, subject to appropriate reviews.
- 5.6.18 Livestock will not be placed on neutral grassland until it has established, which is likely to take at least three years. During this time frame cutting may be required. The exact details will be determined by a suitably experienced ecologist, upon establishment of the grassland.
- 5.6.19 Undesirable species will be controlled by hand (pulling, digging or cutting) or with selective herbicides depending on the species and extent of the problem.

#### **Management/Maintenance – mowing**

- 5.6.20 It is acknowledged that not all areas of neutral grassland created will be suitable for sheep grazing as appropriate. For these reasons some grassland fields will be mown instead of grazed following establishment of at least three years. This will be determined by a suitably experienced ecologist, upon establishment of the grassland.
- 5.6.21 Cutting once a year in late-July or late August (more beneficial for skylark (*Alauda arvensis*)) will be sufficient, a second cut in late-September can be undertaken if needed (not required where first cut is done in August).
- 5.6.22 Whilst not appropriate for all areas within the replacement open space, the mowing regime should vary sward height within different sections where possible, aiming to encourage structural heterogeneity to the grassland for the benefit of a variety of faunal species.
- 5.6.23 The grassland will be monitored by a suitably qualified ecologist annually to record changes in the sward and recommend changes to management requirements implemented, including changes to the cutting regime if necessary. This will ensure the sward created is in line with requirements of mitigation specified.
- 5.6.24 Undesirable species can be controlled by hand (pulling, digging or cutting) or with localised use of herbicides, if necessary, depending on the species and the level of the problem.

**Management/Maintenance - grazing**

- 5.6.25 Where fields are to be grazed, a conservation grazier (to be appointed by the Applicant and their contractor under a farm tenancy agreement at an appropriate future stage) will be consulted to confirm an appropriate grazing regime; this is likely to comprise low-intensity cattle grazing on rotation across the site. Grazing management will be implemented once the grassland has established. This regime will aim to create a mosaic of grassland of varying sward height, to provide a range of habitats for different species (including ground nesting birds such as skylark).
- 5.6.26 Where light grazing is practicable it is usually the better choice of management because it creates more diverse conditions than cutting, benefiting a wider variety of plants and animals. Trampling by cattle also creates small gaps in the turf in which plants can establish.
- 5.6.27 Cattle are more likely to maintain species-richness in a small area than sheep or horses, which are more selective in their grazing and as such more likely to remove most if not all individuals of a preferred species, however it is likely that grazing by sheep will occur in most areas.
- 5.6.28 Grazing between late-Summer and late-Winter is likely to maximise the biodiversity value of the species-rich neutral grasslands and should be undertaken where possible.
- 5.6.29 The grassland will be monitored by a suitably qualified ecologist (to be appointed by the Applicant and their contractor) annually to record changes in the sward and recommend changes to management requirements implemented, including changes to the grazing regime if necessary. This will ensure that the sward created is in line with requirements of mitigation specified. The grassland will also be monitored for poaching.
- 5.6.30 Undesirable species can be controlled by hand (pulling, digging or cutting) or with localised use of herbicides if necessary depending on the species in need of control and the level of the problem.

**Neutral Grassland Management Schedule**

Table 6: Neutral Grassland Management Schedule

| Year post establishment   | All | 0 | 1 | 2 | 3 | 4 | 5+ |
|---|-----|---|---|---|---|---|----|
| Prescription  |     |   |   |   |   |   |    |
| Practical management and removal of undesirable species (hand weeding, selective herbicide application) | X   | X | X | X | X | X | X  |

| Year post establishment                          | All | 0 | 1 | 2 | 3 | 4 | 5+ |
|--|-----|---|---|---|---|---|----|
| Active care of establishing grassland (watering) | X   | X | X | X | X | X | X  |
| Annual cutting regime (where no grazing occurs)  | X   | X | X | X | X | X | X  |
| Annual cutting regime (where grazing occurs)     |     |   | X | X | X |   |    |
| Light grazing regime late-Summer to later-Winter |     |   |   |   |   | X | X  |

5.7 **Calcareous grassland**

**Location**

5.7.1 Calcareous grassland is to be established in two fields, to the south east of the Proposed Development, as shown within the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR. Chalk exposure is covered in **Section 5.8**.

**Specification**

5.7.2 The calcareous grassland to be created will be characteristic of the National Vegetation Classification CG2 plant community, which qualifies as **lowland calcareous grassland** habitat of principal importance listed under Section 41 of the NERC Act, 2006.

5.7.3 The calcareous grassland seed mixture will comprise the following species.

- a. meadow oat-grass (*Helictotrichon pratense*);
- b. sweet vernal-grass (*Anthoxanthum odoratum*);
- c. crested dog's-tail;
- d. yarrow (*Achillea millefolium*);
- e. common knapweed;
- f. greater knapweed (*Centaurea scabiosa*);
- g. wild marjoram (*Origanum vulgare*);
- h. wild thyme (*Thymus drucei*);
- i. dropwort (*Filipendula vulgaris*);
- j. lady's bedstraw;
- k. perforate St John's-wort (*Hypericum perforatum*);

- l. rough hawkbit (*Leontodon hispidus*);
- m. oxeye daisy;
- n. common bird's-foot-trefoil;
- o. kidney vetch (*Anthyllis vulneraria*);
- p. ribwort plantain (*Plantago lanceolata*);
- q. hoary plantain (*Plantago media*);
- r. salad burnet (*Sanguisorba minor*);
- s. agrimony (*Agrimonia eupatoria*);
- t. cowslip (*Primula veris*);
- u. selfheal (*Prunella vulgaris*); and
- v. yellow-rattle.

## Establishment

### ***Substrate preparation***

- 5.7.4 There are several locations where surplus topsoil may be placed within the area of Landscape Restoration, including for calcareous grassland establishment.
- 5.7.5 For the *Low Intensity Grazed Calcareous Grassland* the chalk (once prepared) would be ideally suitable as *subsoil* for this purpose.
- 5.7.6 Seeding directly onto the chalk (unameliorated) would result in a very prolonged period of establishment for the new sward. The establishment period could be reduced by providing a suitable '*topsoil*' (150-200mm) for this purpose by spreading site-won subsoil (e.g. *Soil Type 2 – Agricultural Soil (Calcareous)*).
- 5.7.7 As an alternative, the upper layer of the chalk may be ameliorated (e.g. green compost) as a *topsoil substitute* for this purpose. The aim would be to improve the quality of the chalk to aid establishment of the new sward, without over fertilising the chalk.
- 5.7.8 Due to requirements for regarding the land, and the flat grade that is not conducive to drainage, the chalk used should be granular and not cohesive. It is recommended to use 400mm of exposed unameliorated chalk plus 200mm calcareous subsoil.

### ***Seeding***

- 5.7.9 Consultation with the local Wildlife Trusts and other suitable local conservation organisations will be undertaken to determine if there are suitable sites nearby which could be utilised for seed harvesting. Consent from Natural England would need to be requested at least four months in advance for seed harvesting from a SSSI.
- 5.7.10 Green hay, taken from a local, where possible, species-rich donor site and spread on a species-poor receptor site, is another method of restoring and recreating wildflower grasslands. Green hay is harvested wildflowers and grasses just as they are shedding seed and still 'green'. The hay is quickly



transferred to the species-poor recipient site where it is spread allowing the seed to drop.

- 5.7.11 Brush-harvested seed taken from a species-rich donor site and spread on a species-poor recipient site is another method of restoring and recreating wildflower. Good seed sources need to be found and swept for seed throughout the growing season so that early and late flowering plants can be collected.
- 5.7.12 Where wildflower seeds are collected mechanically (brush harvesting or vacuum harvesting), this activity comes under the umbrella of 'marketing' seed. 'Marketing' includes:
- a. packing, selling or labelling seed;
  - b. processing seed;
  - c. marketing seed; and,
  - d. collection and preparation of preservation mixtures.
- 5.7.13 Given the extent of species-rich calcareous grassland to be created it is acknowledged that a commercially available seed mix will be needed in addition to the use of local provenance green hay. Seed mixtures need to suit the soil types and will be purchased from reputable companies. Reputable seed suppliers will be used that have signed up to the Code of Practice for collectors, growers and suppliers of native flora. Using locally sourced seeds is thought to improve performance due to the genotypes being better adapted to the local soil and weather conditions (Gilbert and Anderson 1998 (Ref. 18)).
- 5.7.14 The Applicant and their appointed contractors will undertake the following operations as necessary during the first five years after planting, to ensure the satisfactory establishment of calcareous grassland.
- 5.7.15 Livestock will not be placed on this grassland until it has established, this is likely to take at least three years. During this time frame cutting may be required. The exact details will be determined by a suitably experienced ecologist, upon establishment of the grassland.
- 5.7.16 Supplementary watering may be required depending on weather conditions at time of establishment. The exact details will be determined by a suitably experienced ecologist. Undesirable species will be controlled by hand (pulling, digging or cutting) or with localised use of herbicides, if necessary, depending on the species and the level of the problem.

#### **Management/Maintenance**

- 5.7.17 A conservation grazer will be consulted to confirm an appropriate grazing regime; however, this is likely to comprise low-intensity cattle grazing on rotation across the site. Grazing management will be implemented on the site once the grassland has established. This regime will aim to create a mosaic of grassland of varying sward height, to provide a range of habitats for different species.
- 5.7.18 Where light grazing is practicable it is usually the better choice of management because it creates more diverse conditions than cutting, benefiting a wider



variety of plants and animals. Trampling by cattle also creates small gaps in the turf in which plants can establish.

- 5.7.19 Cattle are more likely to maintain species-richness in a small area than sheep or horses, which are more selective in their grazing and as such more likely to remove most if not all individuals of a preferred species, however it is likely that grazing by sheep will occur in most areas
- 5.7.20 Grazing between late-Summer and late-Winter is likely to maximise the biodiversity value of the species-rich neutral grasslands, and should be undertaken where possible.
- 5.7.21 The grassland will be monitored by a suitably qualified ecologist annually to record changes in the sward and recommend changes to management requirements implemented, including changes to the grazing regime if necessary. This will ensure that the sward created is in line with requirements of mitigation specified. The grassland will also be monitored for poaching.
- 5.7.22 Undesirable species can be controlled by hand (pulling, digging or cutting) or with localised use of herbicides, if necessary, depending on the species in need of control and the level of the problem. Invasive species, particularly rhododendron, are to be controlled to ensure they not dominate the space.

**Calcareous Grassland Management Schedule**

Table 7: Calcareous Grassland Management Schedule

| Year post establishment   | All | 0 | 1 | 2 | 3 | 4 | 5+ |
|---|-----|---|---|---|---|---|----|
| <b>Prescription</b>   |     |   |   |   |   |   |    |
| Practical management and removal of undesirable species (hand weeding, selective herbicide application, rhododendron control) | X   | X | X | X | X | X | X  |
| Active care of establishing grassland (watering)  | X   | X | X | X | X | X | X  |
| Annual cutting regime   |     |   | X | X | X |   |    |
| Bi-annual light grazing regime  |     |   |   |   |   | X | X  |

**5.8 Chalk exposures**

**Location**

- 5.8.1 Chalk exposures are to be promoted in shallow lying areas to the base of the engineered slope at Dairyborn Scarp DWS.

**Specification**

5.8.2 Exposed chalk slopes will be created as a result of engineering works. No soil will be placed on these slopes and the chalk will be left exposed. This area will not be seeded, instead being left to self-seed through natural colonisation by calcicolous species from the surrounding area.

**Establishment**

5.8.3 Given the base rock, steepness of the slope and the poor nutrient level it is anticipated that an interesting calcareous plant community will establish on these slopes. The need for future maintenance will be reviewed annually by a suitably qualified ecologist and a landscape consultant, for example if the slopes become colonised with scrub and appropriate control measures need to be implemented should it be safe to do so given the steep slope.

**Chalk Exposure Management Schedule**

Table 8: Chalk Exposure Management Schedule

| Year post establishment  | All | 1 | 2 | 3 | 4 | 5+ |
|--|-----|---|---|---|---|----|
| <b>Prescription</b>  |     |   |   |   |   |    |
| Practical management and removal of undesirable species (Scrub removal) where possible | X   | X | X | X | X | X  |

5.9 **Wildlife pond**

**Location**

5.9.1 A wildlife pond will be excavated, as shown in the relevant Landscape Mitigation Plans, **Figures 14.11 to 14.13** in Volume 4 to the PEIR. This pond will be designed to be small and not attractive to large waterfowl likely to present bird strike hazard, as per the Bird Strike Risk Assessment (**Appendix 8.4** in volume 3 of this PEIR).

**Specification**

5.9.2 One pond will be created in a fenced off area surrounded by neutral grassland and woodland habitat.

5.9.3 The design of the pond will be fully detailed within an Amphibian and Reptile Mitigation Strategy to be provided with the ES.

5.9.4 Detailed design of the pond will determine if artificial lining will be required for the construction of the pond, as although the subsoil mainly comprises clay it may yet be required.

5.9.5 The pond will be left to fill up with rainwater or filled from a rainwater source if water levels fall too low.

**Establishment**

5.9.6 During the first year of establishment the pond will be monitored by a suitably qualified ecologist, on a bi-monthly basis to check water levels (ensuring that the pond retains water) and monitor the establishment of aquatic planting, recommending remedial action as needed including replanting of any failed plants.

**Management/Maintenance**

5.9.7 Water levels will be checked annually to ensure the pond retains water; remedial action will be taken as needed. Aquatic planting will also be monitored during these checks, and replanting will occur as necessary.

**Wildlife Pond Management Schedule**

Table 9: Wildlife Pond Management Schedule

| <b>Year post establishment</b>   | <b>All</b> | <b>0</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5+</b> |
|--|------------|----------|----------|----------|----------|----------|-----------|
| <b>Prescription</b>  |            |          |          |          |          |          |           |
| Bi-monthly check of water retention with remedial action as necessary                  |            | X        | X        |          |          |          |           |
| Bi-monthly monitoring of aquatic flora establishment with remedial action as necessary |            | X        | X        |          |          |          |           |
| Annual check of water retention with remedial action as necessary                      |            |          |          | X        | X        | X        | X         |
| Annual monitoring of aquatic flora establishment with remedial action as necessary     |            |          |          | X        | X        | X        | X         |

5.10 **Plant translocation**

**Location**

5.10.1 Grassland turves as described below are due to be translocated to the existing set aside land and chalky soils.

**Specification**

5.10.2 Grassland turves containing bee orchid (*Ophrys apifera*), common spotted orchid (*Dactylorhiza fuchsii*), pyramidal orchid (*Anacamptis pyramidalis*) and common bird’s-foot-trefoil plants (Larval foodplant for the dingy skipper) will be translocated from impacted areas to suitably prepared receptor sites. This will be described in an Orchid and Dingy Skipper Butterfly Mitigation Strategy to be prepared as part of the ES.

**Establishment**

5.10.3 The translocation will take place during September and will involve the cutting of turves around the target species to a depth of at least 300mm (exact depths possible for each area will require investigation due to the underlying landfill). The turves will be cut during periods avoiding extremes of soil dampness or desiccation (to avoid disintegration when they are lifted) and translocated to suitably prepared receptor sites.

5.10.4 The area of translocation will be defined and protected by fencing and/or information boards to prevent trampling. In addition the pathways will be designed to direct away from these areas.

5.10.5 During September, a year after translocation, the turves will be cut to a height of 100mm. The arisings from the vegetation cut are to be removed to prevent nutrient build up. This maintenance is to occur on an annual basis for five years.

5.10.6 Monitoring by the appointed ecologist, will be carried out annually between mid-June and early-July for a period of five years. At the end of the five year monitoring program a review of the management and monitoring strategy will be undertaken, and the strategies altered appropriately to ensure the long-term viability of translocated populations.

**Translocated Turf Management Schedule**

Table 10: Translocated Turf Management Schedule

| <b>Year post establishment</b>               | <b>All</b> | <b>0</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
|--|------------|----------|----------|----------|----------|----------|----------|
| <b>Prescription</b>                          |            |          |          |          |          |          |          |
| Annual monitoring of turf establishment      | X          | X        | X        | X        | X        | X        | X        |
| Annual cutting of turf to 100mm              |            |          | X        | X        | X        | X        | X        |
| Review of management and monitoring strategy |            |          |          |          |          |          | X        |

**5.11 Bat and Bird boxes**

**Location**

5.11.1 Bat and bird boxes will be placed on retained mature trees away from public footpaths and other areas that have high public pressures. Once standing trees have established bat and bird boxes may be placed on these features.

**Specification**

5.11.2 A variety of bat and bird boxes will be used to provide nesting and roosting habitat for a variety of common bat and bird species. Details of the exact specifications will be provided in a Bat Mitigation Strategy and a Bird Mitigation Strategy to be provided with the ES.

**Management/Maintenance**

5.11.3 Boxes will be checked annually for the first five years by the appointed ecologist, to ensure that they remain in place and in good condition, with the frequency subject to review at this point. Any maintenance and/or cleaning required should be conducted by a suitable bat licence holder. Where boxes are lost or damaged, replacements should be installed as necessary.

**Bat and Bird Box Management Schedule**

Table 11: Bat and Bird Box Management Schedule

| Year post establishment  | All | 0 | 1 | 2 | 3 | 4 | 5+ |
|--|-----|---|---|---|---|---|----|
| <b>Prescription</b>  |     |   |   |   |   |   |    |
| Ensure bird/bat box is still structurally sound and firmly attached to the tree. | X   | X | X | X | X | X | X  |

**5.12 Artificial badger sett**

**Location**

5.12.1 An artificial badger sett will be created, the location of this sett is will be described in a confidential Badger Mitigation Strategy to be provided with the ES.

**Specification**

5.12.2 The specification of the artificial badger sett will be detailed within the confidential Badger Mitigation Strategy.

**Management/Maintenance**

5.12.3 The sett will be checked annually for the first five years by the appointed ecologist to ensure that the entrances remain open and accessible, with the frequency subject to review at this point. The use of the sett should be monitored as per the licence requirements.

**Artificial Badger Sett Management Schedule**

Table 12: Artificial Badger Sett Management Schedule

| <b>Year post establishment</b>  | <b>All</b> | <b>0</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5+</b> |
|---|------------|----------|----------|----------|----------|----------|-----------|
| <b>Prescription</b>   |            |          |          |          |          |          |           |
| Ensure that the sett entrances remain open and accessible (i.e. not blocked). Note the current status of use by badger. | X          | X        | X        | X        | X        | X        | X         |

5.13 **Public Access**

**Public Rights of Way (PRoW)**

- 5.13.1 The Applicant and their appointed contractors will reinstate and clearly mark a ploughed-up footpath or bridleway within 14 days of being affected and any subsequent operations will be reinstated within 24 hours and will seek permission from the relevant highway authority to erect any type of structure on or across a PRoW.
- 5.13.2 The Applicant and their appointed contractors will ensure that the minimum width (2m for footpaths/4m for bridleways) of all rights of way in their ownership are kept clear of obstructions and with nothing overhanging the path.
- 5.13.3 The Applicant and their appointed contractors will ensure that the surface of the path is kept level and firm, where necessary making good defective areas, in accordance with the HCC Rights of Way Good Practice Guide (Ref. 19).
- 5.13.4 The Applicant and their appointed contractors will ensure the condition of gates are maintained in accordance with Defra guidance (Ref. 20).
- 5.13.5 The Applicant and their appointed contractors will maintain vegetation around directional sign posting and way marking sufficiently to clearly show the line of the path on the ground and in accordance with all relevant highway authority guidance.
- 5.13.6 The Applicant and their appointed contractors will maintain the functionality of the PRoW network when undertaking management activities.

## 5.14 **Public open space**

- 5.14.1 The Applicant and their appointed contractors will manage and maintain areas of replacement open space to the standard of at least 'Good' and target 'Excellent' where feasible as set out within the *'Green space Quality Manual'* v2018-04 (Produced by Parks for London/London Parks Benchmarking Group), to which the Applicant subscribes. The management of the replacement open space is likely to fall under an appointed trust, with further details to be provided within the Final LBMP.

## 6 STREET FURNITURE

### 6.1 General maintenance

6.1.1 The responsibility for delivering and maintaining each area will depend on individual land considerations (to be determined as the project progresses), but the standards set by this report should be consistently applied across the Proposed Development.

6.1.2 The Applicant and their appointed contractors will undertake the following operations to all street furniture items throughout the life of the Proposed Development:

- a. surface cleaning (in accordance with guidance below);
- b. inspect and repair any superficial or physical damage to street furniture items;
- c. inspect and tighten (as necessary) all fixtures and fixings;
- d. remove graffiti, bird droppings or algae if present;
- e. check that the surrounding surface is sound;
- f. ensure paintwork/finish is weather protected with no marks where applicable; and
- g. manage litter, debris or dog fouling around street furniture.

### 6.2 Cleaning requirements

6.2.1 The Applicant and their appointed contractors will undertake the following cleaning regimes according to the surface type, as listed below:

- a. timber surfaces - to be cleaned annually with a stiff brush to prevent a verdigris type build up, removing sand, splinters and graffiti with 100 grit sandpaper to ensure an even and smooth surface finish;
- b. galvanised surfaces - to be cleaned annually using a damp cloth and warm soapy water only (scourers and abrasive cleaners are not suitable for these types of finish and may damage them);
- c. polypropylene carbonate (ppc) surfaces - to be cleaned quarterly using a damp cloth and warm soapy water only (scourers and abrasive cleaners are not suitable for these types of finish and may damage them);
- d. stainless steel - to be cleaned annually using a stainless-steel polish and a lint free cloth (to remove ground in dirt a stainless-steel finishing pad may be required); and
- e. concrete - to be cleaned annually using an abrasive sponge and warm soapy water only (to remove ground in dirt a stainless-steel finishing pad may be required).



## 7 MONITORING PROCEDURES

### 7.1 Biodiversity

7.1.1 Annual biodiversity monitoring will include a programme of fauna species monitoring (7.1.3 - 7.1.4 below) and habitat monitoring (7.1.5 – 7.1.6 below)

7.1.2 An annual monitoring report will be compiled to summarise the results of all biodiversity monitoring visits across the site, to be submitted in December each year as part of the Applicant and their appointed contractors Environmental Management Systems (EMS) and contract requirements. This annual monitoring report will record any corrective actions taken and monitor the condition of habitats against that prescribed within the ES that will accompany the DCO submission and biodiversity net gain calculations to ensure that the requirements of the assessment are met in the long term. A five year summary report, including a review of proposed subsequent review periods will also be completed.

7.1.3 A detailed programme of fauna species monitoring will be prescribed within later detailed LBMP during preparation and submission of the ES. However, this is likely to include monitoring of the following species/species groups as required:

- a. badger;
- b. bats;
- c. birds (including Schedule 1 species);
- d. reptiles and amphibians; and
- e. orchid and dingy skipper.

7.1.4 Detailed mitigation and enhancement measures will be provided in the respective Mitigation Strategies for each of the above groups, including long-term management and monitoring procedures. Additional information will be provided within the ES.

7.1.5 **Table 13** provides an overview of the proposed annual schedule of habitat monitoring on site, which will be refined during preparation of the detailed later LBMP.

Table 13: Outline schedule and responsible parties for monitoring on site

| Feature   | Activity   | Timing            | Responsible Party                |
|---|--|-------------------|----------------------------------|
| Neutral grassland and lowland calcareous grasslands | Ecological survey to record species and cover-abundance of grassland habitats. Additional orchid counts will be undertaken at the receptor site. | Spring and Autumn | Applicant<br>Appointed Ecologist |

| Feature      | Activity   | Timing                | Responsible Party   |
|--------------|--|-----------------------|---|
| All habitats | Photographic monitoring to be carried out using fixed-point photography to keep record of developing habitats and results of habitat management works. Fixed points to be set out in Y0. | Spring and Autumn     | Applicant<br>Appointed Ecologist                          |
| All habitats | Monitoring and implementation of corrective/replacement measures where necessary.  | September to December | Applicant<br>Appointed Ecologist and Landscape Contractor |

A1.1.1 The later detailed LBMP will be reviewed and updated every five years for 15 years, with review period beyond this to be amended appropriately, to ensure its suitability and effectiveness for managing habitats on site. Any changes to maintenance measures required in the interim will be prescribed and recorded within the annual monitoring reports.

**7.2 Landscape**

7.2.1 The monitoring outlined below has been developed in consultation with the LVIA Working Group to ensure establishment and effectiveness of mitigation measures against judgements stated within the LVIA.

7.2.2 Monitoring of landscape areas is required:

- a. to provide assurance to the overseeing authority that required mitigation measures are delivered;
- b. to inform the overseeing authority about the effectiveness of proposed mitigation measures with regards to mitigating significant effects;
- c. to provide an early warning to the overseeing authorities about any unexpected impacts of development as a consequence of changes to construction and/or mitigation procedures; and
- d. to provide an evidence base for discussions with the overseeing authorities or public concerning future delivery and/or management practices.

7.2.3 Monitoring of landscape areas will include both quantitative information and qualitative judgements.

7.2.4 Quantitative information will be compiled by the Applicant and their appointed contractors and will include:

- a. information, to be agreed with the overseeing authority, about the status of construction activities at the point of review;
- b. information, to be agreed with the overseeing authority, about where and when embedded and additional landscape mitigation measures (as described in **Section 14.9** in **Chapter 14** in Volume 2 of the PEIR and detailed in **Figures 14.9** and **14.10** in Volume 4 of the PEIR) have been delivered at the point of review;
- c. information, to be agreed with the overseeing authority, about the maintenance activities that have been undertaken since the previous review;
- d. information, to be agreed with the overseeing authority, about the establishment of vegetation within areas of delivered landscape mitigation; and
- e. a photographic record, from viewpoint locations to be agreed with the overseeing authority.

7.2.5 A qualitative review, prepared by a Chartered Member of the Landscape Institute (CMLI) and/or other professional experienced in the preparation of Landscape and Visual Impact Assessments (LVIAs), will be provided by the Applicant or their appointed contractors to consider the effectiveness of proposed landscape mitigation with reference the assumptions and judgements set out in **Chapter 14** Landscape and Visual Impact in Volume 2 of the PEIR.

7.2.6 Monitoring of landscape areas should be carried out in conjunction with the ecological monitoring where appropriate:

- a. annually for five years following the initial planting and/or seeding of landscape mitigation measures;
- b. in the year ahead of Phase 2a construction works commencing;
- c. annually throughout the construction of Phases 2a and 2b; and
- d. at a frequency to be agreed with the overseeing authority thereafter.

7.2.7 The Applicant and their appointed contractors need not hold professional competencies in order to compile the identified quantitative information but should acquire specialist advice (e.g. the input of a qualified ecologist or landscape consultant) on matters requiring professional expertise (e.g. how effectively landscape mitigation measures have established), to be agreed with the overseeing authority.

## GLOSSARY AND ABBREVIATIONS

| <b>Term</b> | <b>Definition</b>                                     |
|-------------|---|
| AAR         | Airport Access Road                                   |
| AFAG        | Arboriculture and Forestry Advisory Group             |
| AWI         | Ancient Woodland Indicators                           |
| BS          | British Standard                                      |
| BSRA        | Bird Strike Risk Assessment                           |
| CBC         | Central Bedfordshire Council                          |
| CG          | Calcareous Grassland                                  |
| CoCP        | Code of Construction Practice                         |
| COSHH       | Control of Substances Hazardous to Health Regulations |
| CMLI        | Chartered Member of the Landscape Institute           |
| CWS         | County Wildlife Site                                  |
| DCO         | Development Consent Order                             |
| Defra       | Department of Environment, Food and Rural Affairs     |
| DWS         | District Wildlife Site                                |
| EA          | Environment Agency                                    |
| EIA         | Environmental Impact Assessment                       |
| EMS         | Environmental Management Systems                      |
| ES          | Environmental Statement                               |
| Ha          | Hectare   |

| <b>Term</b>  | <b>Definition</b>                              |
|--------------|--|
| HCC          | Hertfordshire County Council                   |
| LBC          | Luton Borough Council                          |
| LBMP         | Landscape and Biodiversity Management Plan     |
| Luton Rising | A trading name of London Luton Airport Limited |
| LMP          | Landscape Mitigation Plans                     |
| the airport  | London Luton Airport                           |
| LVIA         | Landscape and Visual Impact Assessments        |
| MG           | Mesotrophic Grassland                          |
| mppa         | million passengers per annum                   |
| NE           | Natural England                                |
| NERC         | Natural Environment and Rural Communities      |
| NVC          | National Vegetation Classification             |
| PEIR         | Preliminary Environmental Information Report   |
| PPC          | Polypropylene Carbonate                        |
| PRoW         | Public Right of Way                            |
| Sqm          | Square metre                                   |
| SSSI         | Site of Special Scientific Interest            |
| Y0           | Year zero                                      |

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