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LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN
Proposed Great Wolf Lodge, Chesterton, Bicester

January 2022

BMD.21.0056.RPE.MP.805.LEMP

DOCUMENT HISTORY

Project Number: 21.0056		Document Reference: BMD.21.0056.RPE.MP.805.LEMP			
Revision	Purpose of Issue	Originated	Technical Reviewed	Approved	Date
-	Planning	JW	JP	JP	17.01.2022

Declaration of compliance with professional code of ethics or conduct

The information which we have prepared and provided is true and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bonafide opinions.

Every reasonable attempt has been made to comply with the relevant best practice guidelines and BS42020:2013 (Biodiversity: Code of practice for planning and development).

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EXECUTIVE SUMMARY

Client Great Lakes UK Ltd
Consultant..... Bradley Murphy Design Ltd.

SITE

Location Bicester Golf Course, Oxfordshire
National Grid Reference Approx. centre: SP549216
Over-view..... The Site comprises 9 of the existing 18-hole golf course which forms part of the wider site also occupied by the Bicester Hotel Golf and Spa. The Site is dominated by low value amenity grasslands but does support a variety of habitat types of ecological value including ponds, plantation and semi-natural woodland and species rich hedgerow, of which some are listed as Habitats of Principal Importance (HPI) under the NERC Act 2006. Other habitat present included a variety of grasslands, dense scrub and tall ruderal.
Landscape context The Site is located within the boundary of the Bicester Golf Course, Bicester, Oxfordshire, OX26 1TH, within the authority of Cherwell District Council (CDC). Land use surrounding the Site is mixed with the village of Chesterton to the east, Bignell Park Farm to the north and predominately arable land to the west and south. The M40 runs along the west boundary of the Site.

DEVELOPMENT & PLANNING BACKGROUND

Proposed works The development proposed is the redevelopment of part of a golf course to provide a new leisure resort incorporating a waterpark, a family entertainment centre, a hotel, conferencing facilities and restaurants with associated access, parking and landscaping.
Planning stage..... Discharge of conditions

ECOLOGICAL BACKGROUND

General A Preliminary Ecological Appraisal (PEA) was carried out in 2018 by WSP, informed by a desk study and Phase 1 habitat survey. Dedicated species surveys for the Site (and relevant surrounding habitat, where accessible and appropriate for the survey type) have been completed for the following species groups in 2018-2019; bat, badger, hazel dormouse, breeding birds, reptiles, great crested newts and invertebrates
Most recent baseline In 2019/20 BMD undertook a verification assessment to inform the Public Inquiry including a review of the habitat types and conditions as well as protected species matters. More recently, BMD undertook an ecological baseline assessment in September 2021 to review ecological constraints relevant to protected species and habitat features present within the golf course area adjacent to the south of the Site.

ECOLOGICAL MANAGEMENT PLAN

Objectives

1. To summarise the ecological baseline of the zone of influence associated with the construction works.
2. To summarise anticipated impacts based on known works details (where appropriate/available specific works timeframes and working methods will be detailed).
3. To detail mechanisms and add any area/time specific details by which the necessary mitigation outlined in the more strategic documents are implemented to:
 - ensure effective implementation of ecological protection measures
 - minimise harm and negative impacts to wildlife and habitats currently occurring on site.
 - Provide biodiversity enhancements
4. To meet the requirements of Condition 12 (ref 19/02550/F).

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1. INTRODUCTION

1.1 Background Information

1.1.1 Planning permission (Ref 19/02550/F) was granted on appeal (Ref APP/C3015/W/20/3259189) permitting the following development scheme;

“The appeal is allowed and planning permission is granted for the redevelopment of part of a golf course to provide a new leisure resort (sui generis) incorporating a waterpark, a family entertainment centre, a hotel, conferencing facilities and restaurants with associated access, parking and landscaping on land to the east of M40 and south of A4095, Chesterton, Bicester, Oxfordshire in accordance with the terms of the application, Ref 19/02550/F, dated 11 November 2019, and the plans submitted with it, subject to the conditions contained in the attached Schedule of Conditions.”

1.1.2 This document has been prepared to discharge Condition 12.

“12. Prior to commencement of development, a Landscape and Ecological Management Plan (LEMP) shall be submitted to and approved in writing by the local planning authority. The content of the LEMP shall include:

- a) Description and evolution of landscape and ecological features to be managed, including location shown on a site map;*
- b) Site constraints that might influence management;*
- c) Aims and objectives of management;*
- d) Appropriate management options for achieving aims and objectives;*
- e) Prescriptions of management actions;*
- f) Preparation of a work schedule (including annual work plan capable of being rolled forward over a 5-year period);*
- g) Details of the body or organisation responsible for implementation of the plan;*
- h) On-going monitoring and remedial measures;*
- i) The LEMP shall include details of the legal and funding mechanism(s) by which long term implementation of the plan will be secured by the developer with the management body responsible for its delivery; and,*
- j) The plan shall set out (where results of monitoring show that the conservation aims and objectives of the LEMP are not being met) how contingencies and/or remedial action will be identified, agreed and implemented.*

The LEMP shall be implemented in full in accordance with the approved details and ensure delivery of a net biodiversity gain which shall be provided/created prior to the first occupation of the development (and shall thereafter be maintained in accordance with the approved LEMP)."

- 1.1.3 The Habitat Management and Monitoring Plan (HMMP) prepared by WSP (Project number: 70058541) and submitted as part of the outline planning application is provided in Appendix A. This document provides key information relevant to the requirements of the LEMP and is a critical document as it is the basis of the great crested newt district licence report (Ref 201908002), also submitted with the outline application. As such, is considered that the HMMP delivers a key element of the habitat and landscape delivery in line with the requirement of the district licence
- 1.1.4 The treatments, location and specifications for key landscape areas are also detailed on the Landscape Overall General Arrangement Plan BMD.19.010.DR.P001, with detailed proposals illustrated on the accompanying Detailed General Arrangements and Planting Plans / Schedule.

1.2 Proposed Development

- 1.2.1 The Proposed Development comprises redevelopment of part of the golf course to provide a new leisure resort (sui generis) incorporating a waterpark, family entertainment centre, hotel, conferencing facilities and restaurants with associated access, parking and landscaping.
- 1.2.2 Throughout the master planning process, biodiversity has been a significant driver with regard to retention of key areas and species safeguard to ensure that biodiversity net gain is achieved and also protection of key protected species such as great crested newt.
- 1.2.3 A site location plan and General Arrangement plan is shown in BMD.19.010.DR.P001, with detailed proposals illustrated on the accompanying Detailed General Arrangements and Planting Plans / Schedule.

1.3 Site Context

Historic Context

- 1.3.1 The golf course was designed and built in 1973, having previously been arable land (Bicester Hotel 2017 & Google Earth Pro 2018). Habitats within the Site are therefore considered to be around 40 years old, with the likely exception of the boundary features such as hedgerows.

Present Context

- 1.3.2 The Site comprises 9 of the existing 18-hole golf course which forms part of the wider site also occupied by the Bicester Hotel Golf and Spa. The Site is dominated by low value amenity grasslands but does support a variety of habitat types of ecological value including ponds, plantation and semi-natural woodland and species rich hedgerow, of which some are listed as Habitats of Principal Importance (HPI) under the NERC Act 2006. Other habitat present included a variety of grasslands, dense scrub and tall ruderal.
- 1.3.3 The Site is located within the boundary of the Bicester Golf Course, Bicester, Oxfordshire, OX26 1TH, within the authority of Cherwell District Council (CDC). The Site was defined comprising the golf course

and associated buildings. The Site is approximately 52ha in area and located at SP549216. Habitats within the Site are predominately woodland, grassland, hedgerow and scrub with intermittent ponds.

- 1.3.4 Land use surrounding the Site is mixed with the village of Chesterton to the east, Bignell Park Farm to the north and predominately arable land to the west and south. The M40 runs along the west boundary of the Survey Area.

1.4 Ecological Context

- 1.4.1 This Site is the development for the Great Wolf scheme which comprises 9 of the existing 18-hole golf course. The works are related to an Outline Planning Application submitted in 2017 and re-submission in spring 2018.

- 1.4.2 The following information was submitted as part of the outline planning application for the wider Waterbeach site and provides the background and the ecological context for the Site:

- Preliminary Ecological Appraisal (WSP, 2018);
- Biodiversity ES Chapter (WSP, 2019), within this ES chapter the following appendixes were included:
 - Appendix 9.1 WSP (2018) Bicester Golf Course, Desk Study & Phase 1 Report
 - Appendix 9.2 WSP (2019a) Bicester Golf Course, Bat Survey Report
 - Appendix 9.3 WSP (2019b) Bicester Golf Course, Badger Report
 - Appendix 9.4 WSP (2019c) Bicester Golf Course, Hazel Dormouse Report
 - Appendix 9.5 WSP (2019d) Bicester Golf Course, Breeding Bird Survey Report
 - Appendix 9.6 WSP (2019e) Bicester Golf Course, Reptile Survey Report
 - Appendix 9.7 WSP (2019f) Bicester Golf Course, Great Crested Newt Survey Report
 - Appendix 9.8 WSP (2019g) Bicester Golf Course, Predictive System for Multimetrics (PSYM) Report
 - Appendix 9.9i WSP (2019h) Bicester Golf Course, Invertebrate Habitat Assessment and Hairstreak Butterfly Survey Report
 - Appendix 9.9ii Jones, R.A. (2019i) Bicester Golf Course, A Preliminary Invertebrate Assessment During 2018 and 2019
 - Appendix 9.10 WSP (2019j) Bicester Golf Course, Biodiversity Net Gain Assessment
 - Appendix 9.11 WSP (2019k) Bicester Golf Course, Habitat Management and Monitoring Plan

- 1.4.3 Within the above documents are the ecological baselines and the full results of the web-based desk study for the wider application Site.

- 1.4.4 A walk-over survey was completed on 09/09/2021, to identify any notable ecological features that may have implications to the proposed works. The survey concluded there was no change in ecological conclusions found in 2018/2019.

- 1.4.5 The previous ecological survey works is summarised in Section 2 below.

- 1.4.6 Table 1.1 provides a summary of previous ecological assessments since 2018/19.

Table 1.1 Summary of previous ecological assessments since 2018/19 for the Site

Assessment	2018	2019
Badger		✓
Bat – activity	✓	
Bat – roosts (initial)	✓	
Bat – roosts (nocturnal)	✓	
Birds – breeding	✓	
Botanical	✓	
Desk study	✓	
Great crested newt	✓	
Habitats (Phase 1 Habitat Survey)	✓	
Hazel Dormouse	✓	
Reptiles	✓	
Invertebrates	✓	✓
Notes Blue fill indicates species confirmed active on Site during the surveys. All surveys completed by WSP Ltd		

1.5 Compliance with Guidance, Policy and Legislation

- 1.5.1 An overview of national planning policy and wildlife legislation relating to the ecological features relevant to the scheme is provided in Appendix B.
- 1.5.2 The protocols, evaluations and recommendations contained within this report were made in accordance with these policies and legislation and with reference to BS42020:2013: Biodiversity – Code of Practice for Planning and Development.

2. ECOLOGICAL BASELINE

2.1 Summary of Most Recent Baseline

2.1.1 Table 2.1 provides a summary of conclusions drawn from the most recent ecological surveys.

Table 2.1 Conclusions of most recent ecological assessments: 2018/2019 and 2021 walkover survey

Assessment	Conclusions of relevance to the Site
Badgers	<p>Surveys have identified an active badger sett within the Site that is well separated from the Site (approximately 200m to the south east).</p> <p>Two possible badger setts were identified at the Site boundaries but these were subsequently confirmed to be in use by rabbits only using camera trapping and update inspections. The Site is therefore considered to be of no more than Site level importance for badgers for foraging and commuting only.</p>
Bat – activity	<p>At least five bat species were recorded to the north of the Site associated with the Great Wolf Resort scheme during the manual transect surveys conducted in 2018. These results were dominated by common and widespread species. The results of the activity surveys suggest that the value of the Site for bats is non-uniform, with the majority of high and medium/high activity being concentrated in the north-east of the Site, with species assemblages dominated by <i>Pipistrellus</i> spp. and noctule (a Priority Species).</p> <p>The results of the activity surveys indicate that the Site is of most value to noctule bat, with call levels indicating it is of District-County level value. The Site is also of up to Local level value to Myotis bats, common pipistrelle, soprano pipistrelle and brown long-eared bat. Other species recorded associated with the locality includes barbastelle, serotine, Leisler's bat, Nathusius' pipistrelle and brown long-eared bat.</p>
Bat – roosts (initial)	<p>Roosting: The trees within the main body of the Site are dominated by young to semi-mature specimens of relatively recent origin, likely planted during landscaping for the golf course complex. Some more mature specimens are present at the peripheries. Within the Site one tree with low bat roosting suitability was noted.</p> <p>A known roost which was off site at the existing golf club house was the subject of licenced works in 2016 (supporting three common species, including soprano pipistrelle which is a Priority Species). Works under licence were undertaken on the north-east corner of the existing golf club building facing away from the Site.</p>
Birds	<p>A total of 54 species were recorded within or over the golf course area which extends beyond the Site boundary during the breeding bird survey. Of the species recorded 40 are considered to breed within the golf course area. A total of 10 species considered to breed within the golf course are species of conservation concern.</p> <p>Ten species were recorded using the Site which are species of conservation concern: black-headed gull (BoCC Amber), linnet (BoCC Red), fieldfare (BoCC Red) song thrush (BoCC Red), starling (SPI BoCC Red), mistle thrush (BoCC Red), mute swan (BoCC Amber), swift (BoCC Amber), redwing (BoCC Red), and kestrel (BoCC Amber).</p> <p>Of these species, bullfinch, linnet, mistle thrush and song thrush were assumed to be possibly or probably breeding on Site based on behavior recorded on surveys conducted between 22 May and 22 June 2018. During the surveys (2018), the following species were confirmed as breeding on Site:</p> <ul style="list-style-type: none"> • Starling - colony observed in breeding season in suitable nesting habitat. • Mute swan - Pair observed in breeding season in suitable nesting habitat. Nest and recent fledglings located within reedbed within the Site. <p>Red kite, fieldfare and redwing were recorded on Site and they are Species listed on Schedule 1 of the Wildlife and Countryside Act 1981.</p>

Assessment	Conclusions of relevance to the Site
	The Site supports a variety of habitats which are considered to support various breeding bird species and notable birds.
Botanical	A number of ornamental plant species were present within the Survey Area. These have been identified to species level where possible; however, owing to the large number of horticultural varieties some plants could not be identified. Ornamental plants may be of value to wildlife; however, none are characterised as rare or notable from a native biodiversity conservation perspective.
Great crested newts	<p>11 ponds are present within the Site. The habitat suitability survey indicated that two ponds scored good, four ponds scored below average, two scored average and four scored below average suggesting that they provide suitable habitat for GCN. Two of the ponds were considered to contain poor habitat for GCN. One pond, SW4, did not have a HSI completed as it was dry at the time of all the surveys.</p> <p>GCN were found to be present in all waterbodies except SW4 and SW13. Within the Site, three ponds, SW11 and SW10 support breeding populations of GCN. Overall, the Site is considered to support a large breeding metapopulation of GCN.</p> <p>Peak adult count indicates that there are two large, five medium and one small populations of GCN. Considering the proximity of all the ponds, it is highly likely for movement between ponds to be occurring and therefore they should be considered as a single large metapopulation.</p>
Habitats (Phase 1 Habitat Survey)	<p>Habitats present within the Site:</p> <ul style="list-style-type: none"> • Broadleaved semi-natural woodland • Plantation broadleaved woodland • Plantation broadleaved woodland are mosaic habitats with poor semi-improved grassland • Plantation broadleaved woodland was identified as being in mosaic with semi-improved neutral grassland • Plantation mixed woodland • Dense scrub • Scattered scrub • Scattered broadleaved, coniferous and mixed trees • Semi-improved neutral grassland • Poor semi-improved grassland • Tall ruderal • Standing water • Running water • Bare ground and ephemeral short perennial grassland • Amenity grassland • Hedgerows • Buildings • Hardstanding
Hazel dormouse	No dormice or evidence of dormice were found within any nest tube during surveys in 2018 and as such dormice can be considered likely absent from the Site. No feeding material or other species of mice for example, wood mice were recorded in any tubes throughout the survey.
Invertebrates	<p>A preliminary invertebrate survey of part of Bicester Golf Course, was carried out in 2018 and 2019. 266 invertebrate species were recorded a relatively good list, but commensurate with recording effort and available habitats.</p> <p>Three nationally rare (red data book) species were found:</p> <ul style="list-style-type: none"> • <i>Dichetophora finlandica</i> a snail killing fly with poorly understood habitat requirements • <i>Dorycera graminum</i> a picture wing fly associated with rough meadowland • <i>Oxyna parietum</i> a picture wing fly that breeds on mugwort.

Assessment	Conclusions of relevance to the Site
	<p>13 nationally scarce (notable) species included:</p> <ul style="list-style-type: none"> • <i>Aphanus rolandri</i> a ground bug associated with fumitary • <i>Ceraleptus lividus</i> a ground dwelling shieldbug of warm dry places • <i>Donacia cinerea</i> a reed beetle that feeds on reed mace • <i>Donacia thalassina</i> a reed beetle that feeds on club rushes • <i>Hoplitis claviventris</i> a southern solitary bee of woodland edges • <i>Hippodamia variegata</i> the 'ladybird, a warmth loving species • <i>Lasioglossum pauxillum</i> a solitary bee of dry sandy and chalky soils • <i>Merzomyia westermanni</i> a picture winged fly that feeds on ragwort • <i>Phytoecia cylindrica</i> a longhorn beetle that breeds in plant stems • <i>Rhinocyllus conicus</i> a weevil that feeds on thistles <p>23 'very local' species were also recorded. The mosaic of habitats within the Site are likely to provide opportunities for a range of common and widespread invertebrates. The waterbodies and less managed areas of grassland are likely to be of greatest invertebrate interest. Furthermore, the presence of blackthorn, the larval food plant of brown hairstreak means that consideration should be given to the potential presence of this rare species known to be prevalent in the Site.</p>
Invasive species	Japanese knotweed was identified in the adjacent site (the southern golf course area). No other record of invasive species were recorded in previous surveys.
Other	Other mammals were recorded on previous surveys on the wider site incidentally including, roe deer, and a wide range of small mammals such as bank vole and common shrew. It is considered likely that the Site will support other mammals and fauna.
Brown hare	Brown hare have been noted across the Site associated with the arable landscape adjacent to the Site and is considered likely to support commuting brown hare given adjacent arable fields.
Hedgehog	No records of hedgehog were returned in the previous desk studies in 2018 for the wider site, although this species is widespread in the southeast and was recorded anecdotally in the Chesterton Parish Council Scoping Report Letter. Habitat within the boundaries of the Site is considered suitable to support hedgehog, providing foraging, shelter and hibernation opportunities.
Reptiles	<p>The survey results indicate a 'low' population of grass snake, concentrated in the north easterly part of the Site. Two common lizard were also recorded incidentally in 2019 on the western boundary of the Site, comprising a 'low' population.</p> <p>Overall, based on the survey results, habitats present and landscape context, the reptile population present is considered to be of value at a Local level, as the species recorded are widespread, and the populations supported are low in a rural area where suitable habitat is abundant.</p>
Otter	There are no suitable water courses which provide favourable habitat for otter within the Site. No signs were identified during the 2021 walkover assessment. Therefore, it is considered unlikely that otters will utilise the Site.
Water vole	There are no suitable water courses which provide favourable habitat for water vole within the Site. No signs were identified during the 2021 walkover assessment. Therefore, it is considered unlikely that otters will utilise the Site.
Statutory and non-statutory nature conservation sites	<p>The desk study identified no statutory European designated nature conservation sites within 10km of the centre of the Site.</p> <p>The desk study identified no statutory nature conservation sites within 2km of the Site. The closest statutory designated site is Weston Fen Site of Special Scientific Interest (SSSI), located 2.6km south west of the Site. One Local Nature Reserve (LNR), Bure Park, was also identified 2.8km north east.</p> <p>The records received from Thames Valley Environmental Record Centre identified no non-statutory nature conservation sites within 2 km of the Site.</p> <p>Deciduous woodland, a Habitat of Principal Importance (HPI) was identified within the Site.</p>

2.2 Further Surveys

- 2.2.1 No further surveys are considered necessary in order to inform the Landscape and Ecological Management Plan. However, pre-works checks and mitigation works will be necessary and will be managed by the appointed Ecological Management Team during construction and operational stages.

3. AIMS AND OBJECTIVES

- 3.1.1 The aim of this Landscape and Ecological Management Plan (LEMP) and accompanying HMMP is to provide an overview of how habitats will be created and managed following the completion of the Proposed Development. It also sets out the installation of ecological features, implementation of landscape features and monitoring proposals for habitats and certain species present on Site.
- 3.1.2 The Site affords significant opportunities for habitat creation and enhancement, with areas of managed/amenity grassland of low ecological value amenable to treatments such as pond, woodland or meadow creation. The landscape proposals have been informed using biodiversity metrics such that changes made to habitats at the Site result in a measurable 'biodiversity net gain'.
- 3.1.3 The proposals for landscape creation have also been informed by a range of baseline ecology studies, as summarised in Section 2. Informed by the ecological baseline, a range of wildlife installations, including bird boxes, bat boxes, hibernacula for herptiles and features for invertebrates are included within the scheme design to ensure the favourable conservation status of key species is maintained on the site, post development.

4. LANDSCAPE AND ECOLOGY FEATURES

4.1 Landscape Features

- 4.1.1 Throughout the master planning process biodiversity has been a significant driver with regard to retention of key areas and species safeguard to ensure that biodiversity net gain is achieved and also protection of key protected species such as great crested.
- 4.1.2 The Proposed Development consists of a new hotel and leisure complex buildings with associated hardstanding for access and a large area of landscaping including grassland, woodland, waterbodies and intermediate habitats.
- 4.1.3 The total size of the Site is 18.6ha and of this approximately 11.8ha will comprise soft landscaping once operational. Soft landscaping will include;
- Retained habitats of elevated ecological value (which will continue to be enhanced bespoke and sensitive management prescriptions)
 - Areas of habitat that are created on habitats of existing low ecological value (such as conversion of amenity grassland to meadow grassland, ponds and woodland); and
 - Habitat that will be created following completion of the construction phase
- 4.1.4 Table 2-2 in the HMMP details the habitat creation and management prescriptions per habitat type that will be implemented at the Site as per the landscape detailed shown on drawing in BMD.19.010.DR.P001, with detailed proposals illustrated on the accompanying Detailed General Arrangements and Planting Plans / Schedule.
- 4.1.5 As set out in detail in Table 2-2 of the HMMP, the following key habitat features will be created/enhanced and subject to ongoing management methods:
- Plantation woodland (broadleaved & mixed);
 - Parkland/scattered trees (broadleaved, mixed & coniferous);
 - Hedgerows;
 - Continuous Scrub
 - Sem-improved neutral grassland;
 - Marsh/marshy grassland;
 - Waterbodies;
 - Introduced shrub; and
 - Amenity grassland.

4.2 Wildlife Installations

- 4.2.1 A number of ecological enhancement features such as bat and bird boxes, and wildlife installations specifically designed for species recorded on Site have been integrated into the design of the Proposed Development.
- 4.2.2 The specification detail of these features along with proposed monitoring and maintenance procedures are detailed in Table 2-3 within the HMMP.
- 4.2.3 These features are distributed throughout the Site as per the scheme design shown on BMD.19.010.DR.P001, with detailed proposals illustrated on the accompanying Detailed General Arrangements and Planting Plans / Schedule.
- 4.2.4 In summary, the following ecological enhancement features will be installed on Site;
- Bat boxes;
 - A variety of bird boxes
 - Hibernacula features
 - Brash piles
 - Invertebrate features

5. MANAGEMENT PRESCRIPTIONS

5.1.1 In order to ensure habitats enhanced, created and retained reach their target distinctiveness and condition for the biodiversity metric, bespoke management prescriptions have been proposed for each habitat type. The habitat types and their objective condition within the Site are summarised as:

- **Plantation woodland (broadleaved & mixed):**
 - To create and maintain woodlands/ parklands with good structural and species diversity.
 - To promote high invertebrate biomass and diversity;
- **Parkland/ Scattered Trees (broadleaved, mixed & coniferous):**
 - To create and maintain woodlands/ parklands with good structural and species diversity.
 - To promote high invertebrate biomass and diversity;
- **Hedgerows:**
 - To create and maintain hedgerows with good structural and species diversity. Management to promote dense and wide hedgerows.
 - To provide less managed habitat around base of hedge as habitat for fauna;
- **Continuous scrub:**
 - To provide and established dense scrub area that will provide cover and resources for a range of fauna, notably birds and herptiles.
- **Semi- neutral grassland:**
 - To create and maintain a herb-rich meadow habitat that provides resources for a range of fauna, including herptiles and invertebrates. To provide cover/ refuge for fauna. With at least 30-50% of the grassland uncut each winter to provide some habitat structure for translocated animals.
- **Marsh/marshy grassland:**
 - To create diverse grassland area containing plant species more typical of wetter conditions.
 - To create a grassland with a tussocky structure providing opportunities for fauna such as great crested newt.
- **Waterbodies:**
 - To create ponds of value to fauna including invertebrates and great crested newt.
 - To maintain and enhance value of retained ponds.
- **Introduced shrub:**
 - Primarily for amenity value, management to provide wildlife resources as a secondary benefit.
- **Amenity grassland:**
 - Primarily for amenity value, management to provide wildlife resources as a secondary benefit.

5.1.2 Table 2-2 within the HMMP (presented in Appendix A) summarises habitat creation and management prescriptions by habitat type along with creation methods (where applicable) and management methods.

- 5.1.3 A 5-year landscape maintenance and management plan (LMMP) (ref: BMD.19.010.RP.P002) has also been prepared by BMD to cover the 5-year establishment period for the management and maintenance of Landscape within the Site.
- 5.1.4 The overarching aim of this LMMP is to provide a framework that will ensure the continuing successful management of the Resort through which landscape and ecological elements can be maintained and developed to contribute to the quality of the area and to ensure that the original concept and design intent is realised. Once implemented, this plan will help to maximise the overall quality and appearance of the development, its amenity and ecological value and its enjoyment by guests.

6. LONG TERM MAINTENANCE AND MONITORING

6.1 Maintenance and Monitoring

6.1.1 Following the completion of the Proposed Development, a programme of monitoring will be undertaken.

6.1.2 Habitat creation, habitat enhancement and wildlife feature installation will be undertaken in the first appropriate season following the receipt of planning permission. This will be no later than within 6 months of development commencing. Habitat creation in areas cleared during the construction phase will be completed within 6 months of completion of development activities. Management will continue for 25 years.

6.1.3 An annual programme outlining the key management and monitoring measures is detailed within Table 4.1 within the HMMP as presented in Appendix A.

6.1.4 The HMMP will be subject to periodic review (every 5 years) over the 25-year period to ensure it remains fit for purpose.

Landscape Monitoring

6.1.5 Annual checks should be made of the planted areas to confirm overall condition of the planted habitats. The check should be made between May and August as identification of many plants is easier at this time and should be completed by an individual able to identify plant species. Checks will be assessing condition of soft landscape areas against their target objective which is set out in Table 2-2 within the HMMP (presented in Appendix A).

6.1.6 The annual check should also include an inspection of waterbodies to confirm their condition, including criteria detailed in Table 2-2, which include vegetation coverage and presence of invasive species.

6.1.7 Where appropriate maintenance should be adjusted to ensure habitat types and wildlife installations reach target objectives

Species Monitoring

6.1.8 Monitoring from a species perspective will focus on great crested newts (in line with guidance in the great crested newt mitigation guidelines, 2001) to comply with requirements under the District Level licence. Monitoring would apply to all ponds shown on Figure 2 within the HMMP. Due to a 'large' population being present at the Site, monitoring for great crested newt (population size class assessment) will extend for 10 years following the completion of the Proposed Development to ensure favourable conservation of the species is maintained on the Site post development.

6.1.9 Monitoring will also include;

- Bird boxes will be monitored (from ground level) for usage by the target, or other species during the peak breeding season (April – May). If no uptake is recorded after three years, new boxes and locations shall be considered. The advice of a suitably qualified ecologist will be sought for this.
- Bat boxes will be monitored on at least one occasion in the first five years post-completion, an inspection of the bat boxes will be undertaken by a Natural England (NE) licensed ecologist to

record evidence of use by bats, and advise on any necessary repairs to be carried out. The inspection will occur between September and October as to avoid hibernation and maternity season. If a box has not been used for several years in succession, the installation of new alternative boxes (non-integral) shall be considered following the advice of a suitably qualified ecologist.

- 6.1.10 Inspections should also incorporate a general condition check and ensure repairs are administered where applicable.

6.2 Responsible Organisations

- 6.2.1 Great Wolf shall be managing the landscape and ecology matters around the Site and their land. This shall be carried out under the expert guidance of BMD Ecology.
- 6.2.2 Funding for the upkeep and implementation of the LEMP will be provide by the Great Wolf Resort operation as part of its grounds maintenance programme.

6.3 Remedial measurers

- 6.3.1 The monitoring programme may also identify issues which require remedial measures and alterations to the management prescriptions detailed in this document.
- 6.3.2 Remedial measures are detailed under management methods in Table 2-2 within the HMMP (presented in Appendix A) with the plan subject to a 5-year review by an appropriately qualified individual to confirm management prescriptions remain appropriate. The mechanism for identification of any remedial measures is through this 5-year review process, with any remedial measures or updates to the management prescriptions informed by the results of the monitoring programme.

7. GLOSSARY

7.1 Scientific Terms and Acronyms

BoCC Birds of Conservation Concern, the UK Red-list for birds, produced by the British Trust for Ornithology and last updated in December 2015.

BTO British Trust for Ornithology

CIEEM Chartered Institute of Ecology and Environmental Management, the professional organisation and provider of professional codes of conduct for ecological consultancy.

LBAP Local Biodiversity Action Plan.

Level of protection – “EU” Protected under the Conservation of Habitats and Species Regulations (2017).
“UK”: Protected under the Wildlife and Countryside Act 1981 (as amended) or other domestic legislation, e.g. Badgers Act 1992.

LNR Local Nature Reserve. Statutory designation.

Notable species A species which is listed as a UK Priority Species, carries an unfavourable conservation status (e.g. scarce, rare, threatened, Red-listed), is invasive or is otherwise worthy of note from an ecological perspective.

Protected species A species which is protected under specific UK or European legislation, including Habitats Directive, Wildlife and Countryside Act.

S41 Habitat / Species See UK Priority Habitat / species.

UK Priority Habitat / species A habitat or species identified as a priority for conservation in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006). Section 40 of the Act places a duty on public authorities to have regard for the conservation objectives of these habitats / species

7.2 Bird Specific Terminology and Terms

BoCC Red list

Species that are globally threatened (Critically endangered, endangered and vulnerable but not near threatened) using IUCN guidelines, as assessed by Birdlife International in 2015.

Historic decline: Historic decline in breeding populations. Species judged to have declined severely between 1800 and 1995 from an assessment conducted by Gibbons *et al.* (1996) and which have not recovered subsequently.

Breeding population decline: Severe decline in UK breeding population size, either a decline of over 50% over 25 years or the longer-term defined as the period since the first BoCC review (1969).

Non-breeding population decline: Severe decline in UK non-breeding population of over 50% over a 25-year period or over a longer-term defined as the period since the first BoCC review (1969). Non-breeding trends were only assessed if a species has substantially independent breeding and non-breeding populations, otherwise only breeding populations were assessed.

Breeding range decline: Species that have experienced a severe decline in the UK range between the breeding bird atlases in 1988-1991 and 2007-2011 or 1968-1971 and 2007-2011 as measured by the calculated change in the number of occupied 10 km squares.

Non-breeding range decline: Severe decline in UK range (more than 50%) between the wintering bird atlases in 1981-1984 and 2007-2011 as measured by the calculated change in the number of occupied 10 km squares.

BoCC Amber list

The European Red List of Birds (ERLoB) was published in 2015 by Birdlife International. It covers IUCN Red list assessments of regional extinction risk with no consideration of the wider suite of measures (species rarity, localization, moderate decline and depletion) included in SPEC assessments. Any species on the European Red list (Critically endangered, endangered, vulnerable) is included on the Amber list.

Historic decline – recovery: Species Red listed for historic decline in a previous review but with a substantial recent recovery (at least 100% in the last 25 years or the longer-term period). Longer-term is defined as the period since the first BoCC review (1969).

Breeding population decline: Species experiencing a moderate decline in UK breeding population (more than 25% but less than 50%) over 25 years of the longer-term period. Longer-term is defined as the period since the first BoCC review (1969).

Non-breeding population decline: Moderate decline in UK non-breeding populations (more than 25% but less than 50%) over a 25-year period or over longer-term defined as the period since the first BoCC review (1969). Non-breeding trends were only assessed if a species has substantially independent breeding and non-breeding populations, otherwise only breeding population was assessed.

Breeding range decline: Species that have experienced a moderate decline (more than 25% but less than 50%) in the UK range between the breeding bird atlases in 1988-1991 and 2007-2011 or 1968-1971 and 2007-2011 as measured by the calculated change in the number of occupied 10 km squares.

Non-breeding range decline: Moderate decline in UK range (more than 25% but less than 50%) between the wintering bird atlases in 1981-1984 and 2007-2011 as measured by the calculated change in the number of occupied 10 km squares.

Breeding and non-breeding rarity: Species with a UK breeding population of fewer than 300 pairs or with a UK non-breeding population of less than 900 individuals.

Breeding and non-breeding localization: Localized breeding or non-breeding population with at least 50% of UK population found in 10 or fewer sites. Sites were defined as either Special Protection Areas or Important Bird Areas. Rare breeding and non-breeding species were not assessed against this criterion as the small population size predisposes them to be restricted to a small number of sites.

Breeding or wintering population of international importance: Species with at least 20% of European breeding or non-breeding population found in the UK

7.3 Scientific Names

Table 7.1. lists the species mentioned in this report.

Table 7.1 Scientific names of species mentioned within this report

English name	Scientific name
Amphibians	
Common toad	<i>Bufo bufo</i>
Great crested newt	<i>Triturus cristatus</i>
Bats	
Barbastelle bat	<i>Barbastella barbastellus</i>
Brown long-eared bat	<i>Plecotus auritus</i>
Common pipistrelle	<i>Pipistrellus pipistrellus</i>
Leisler's bat	<i>Nyctalus leisleri</i>
Myotis	<i>Myotis sp.</i>
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>
Noctule	<i>Nyctalus noctula</i>
Pipistrelle	<i>Pipistrellus sp.</i>
Serotine bat	<i>Eptesicus serotinus</i>
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>
Birds	
Black-headed gull	<i>Chroicocephalus ridibundus</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Common snipe	<i>Gallinago gallinago</i>
Cuckoo	<i>Cuculus canorus</i>
Dunnock	<i>Prunella modularis</i>
Fieldfare	<i>Turdus pilaris</i>
Green sandpiper	<i>Tringa ochropus</i>
Graylag goose	<i>Anser anser</i>
Herring gull	<i>Larus argentatus</i>
Kestrel	<i>Falco tinnunculus</i>
Lapwing	<i>Vanellus vanellus</i>
Lesser black-headed gull	<i>Larus fuscus</i>
Lesser redpoll	<i>Acanthis cabaret</i>
Linnet	<i>Linaria cannabina</i>
Mallard	<i>Anas platyrhynchos</i>
Marsh tit	<i>Poecile palustris</i>
Meadow pipit	<i>Anthus pratensis</i>
Mistle thrush	<i>Turdus viscivorus</i>
Mute swan	<i>Cygnus olor</i>
Red kite	<i>Milvus milvus</i>
Redwing	<i>Turdus iliacus</i>

English name	Scientific name
Reed bunting	<i>Anthus pratensis</i>
Skylark	<i>Alauda arvensis</i>
Song thrush	<i>Turdus philomelos</i>
Starling	<i>Sturnus vulgaris</i>
Stock dove	<i>Columba oenas</i>
Swift	<i>Apus apus</i>
Willow warbler	<i>Phylloscopus trochilus</i>
Yellowhammer	<i>Emberiza citrinella</i>
Invertebrates	
Brown hairstreak	<i>Thecla betulae</i>
Finland snailkiller	<i>Dichetophora finlandica</i>
Ground bug	<i>Aphanus rolandri</i>
Ground dwelling shieldbug	<i>Ceraleptus lividus</i>
Longhorn beetle	<i>Phytoecia cylindrica</i>
Picture-winged fly	<i>Dorycera graminum</i>
Picture-winged fly	<i>Merzomyia westermanni</i>
Picture-winged fly	<i>Oxyna parietum</i>
Reed beetle	<i>Donacia cinerea</i>
Reed beetle	<i>Donacia thalassina</i>
Solitary bee	<i>Lasioglossum pauxillum</i>
Southern solitary bee	<i>Hoplitis claviventris</i>
Variiegated ladybug	<i>Hippodamia variegata</i>
Weevil	<i>Rhinocyllus conicus</i>
Mammals (excl. bats)	
Badger	<i>Meles meles</i>
Brown hare	<i>Lepus europaeus</i>
Bank vole	<i>Myodes glareolus</i>
Common shrew	<i>Sorex araneus</i>
Hazel dormouse	<i>Muscardinus avellanarius</i>
Hedgehog	<i>Erinaceus europaeus</i>
Otter	<i>Lutra lutra</i>
Roe deer	<i>Capreolus capreolus</i>
Water vole	<i>Arvicola amphibius</i>
Plants	
Blackthorn	<i>Prunus spinosa</i>
Japanese knotweed	<i>Fallopia japonica</i>
Ragwort	<i>Jacobaea vulgaris</i>
Reptiles	
Common Lizard	<i>Zootoca vivipara</i>
Grass Snake	<i>Natrix helvetica</i>

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APPENDICES

A. BICESTER GOLF COURSE HABITAT MANAGEMENT AND MONITORING PLAN



Great Wolf Resorts

BICESTER GOLF COURSE

Habitat Management and Monitoring Plan



Great Wolf Resorts

BICESTER GOLF COURSE

Habitat Management and Monitoring Plan

TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70058541

DATE: NOVEMBER 2019

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	First Issue	V2.0		
Date	October 2019	November 2019		
Prepared by	Rosie Pope/ Luke Roberts	Luke Roberts		
Signature				
Checked by	Owen Peat	Owen Peat		
Signature				
Authorised by	Adrian Hutchings	Adrian Hutchings		
Signature				
Project number	70042711			
Report number	001			
File reference	Document\Technical Studies\11 HMMP			

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APPENDICES

APPENDIX A

LANDSCAPE GENERAL ARRANGEMENT

APPENDIX B

PLANTING SCHEDULES

1 INTRODUCTION

- 1.1.1. Great Wolf Resorts (GWR) propose the construction of a new hotel and leisure complex at Bicester Golf Course, Chesterton, Bicester OX26 1TH, centred approximately at OS Grid Reference SP 54966 21669, hereafter referred to as the 'Proposed Development'. The 'Site', which will form the planning application boundary, includes the footprint of the building and car parks plus areas for landscaping (see Figure 1) which measures 18.6ha in area.
- 1.1.2. The Site affords significant opportunities for habitat creation and enhancement, with areas of managed/amenity grassland of low ecological value amenable to treatments such as pond, woodland or meadow creation. The landscape proposals have been informed using biodiversity metrics such that changes made to habitats at the Site result in a measurable 'biodiversity net gain'. The proposals for landscape creation have also been informed by a range of baseline ecology studies, as summarised in Section 1.3 below.
- 1.1.3. In addition, a range of wildlife installations, including bird boxes, bat boxes, hibernacula for herptiles and features for invertebrates are included within the Proposed Development.

1.2 AIMS AND OBJECTIVES

- 1.2.1. This Habitat Management and Monitoring Plan (HMMP) provides an overview of how habitats will be created and managed following the completion of the Proposed Development. It also sets out monitoring proposals for habitats and certain species present on site.
- 1.2.2. One of the aims of this document is intended to accompany an application to use the South Midlands District Licence scheme for great crested newts, administered by *the NatureSpace Partnership*. As part of the requirements for using this licence, a programme of habitat creation is presented in Section 4.
- 1.2.3. It should be noted that the landscape architect/contractor will also advise on specific management of the landscaped areas, whilst adhering to the ecological management activities contained herein.
- 1.2.4. It may be appropriate for this document to be updated following the completion of detailed landscape design, however the overall extents and types of created habitats, and their constituent ecological value, are unlikely to change.
- 1.2.5. Proposals for monitoring may also identify issues requiring remedial measures and alterations to the management prescriptions detailed in this document.

1.3 NOTES AND LIMITATIONS

- 1.3.1. The habitat areas detailed within this report (Figure 2) represent an interpretation of the Landscape General Arrangement drawing reference BMD.19.010.DR.P001, based upon translation into Phase 1 (JNCC, 2010) typology. Some minor updates were made to the Landscape General Arrangement subsequent to the translation exercise, including relocation of cycle stands and adding space for entrance signs (which has resulted in a small loss of existing scrub at the entrance). These changes are not considered to have significant implications for this HMMP or habitat areas. Should significant alterations occur to landscape plans, it will be necessary to revisit this HMMP to confirm its content remains valid.

1.4 SITE SAFEGUARDING

- 1.4.1. Great Wolf Resorts as the owner and operator of the Proposed Development will be responsible for implementation of this HMMP. The stated management will be undertaken for 25 years. It is envisaged that implementation of the HMMP will be secured by way of planning condition and will therefore be binding upon a future operator or occupier of the Proposed Development in the event that GWR transfers its interest in the Site or ceases to operate the Proposed Development during that 25 year period.
- 1.4.2. They will also undertake safeguarding measures such as reinstatement of habitats or installations such as fire, acute pollution or other major damage, and control and removal of dumped materials.

1.5 ECOLOGY BACKGROUND

- 1.5.1. A Preliminary Ecological Appraisal (PEA) was carried out in 2018 by WSP, informed by a desk study and Phase 1 habitat survey. The Phase 1 habitat survey found the Site contains a range of habitat types, many of which are relatively recent in origin, dating back to the construction of the golf course, understood to be during the 1970's. These include extensive areas of managed amenity grassland alongside plantation woodland and several ponds. Further ecological surveys were carried out by WSP in 2018, the results of which are summarised in Table 1-1 below

Table 1-1 - Ecological Baseline Information

Species/ Group	Baseline Survey Result Summary
Bats	<p>Roosting: The trees within the main body of the Site are dominated by young to semi-mature specimens of relatively recent origin, likely planted during landscaping for the golf course complex. Some more mature specimens are present at the peripheries. Within the Site one tree with low bat roosting suitability was noted, T17.</p> <p>Foraging and commuting: At least five bat species were recorded within the Survey Area¹ during the manual transect surveys, dominated by common and widespread species, as well as some calls not identifiable to species level. The results of the activity surveys suggest that the value of the Survey Area for bats is non-uniform, with the majority of high and medium/high activity being concentrated in the north-east, with species assemblages dominated by <i>Pipistrellus spp.</i> and noctule <i>Nyctalus noctula</i>.</p>
Badger	<p>Surveys have identified an active badger sett within the Survey Area that is well separated from the Site (approximately 200m to the south-east).</p> <p>Two possible badger setts have been identified at the Site boundaries which may be affected by the Scheme, as well as evidence of badger using the Site for foraging.</p> <p>Further survey using camera traps is ongoing at the time of writing to confirm whether the possible badger setts are being used by this species or another species.</p>

¹ Various survey areas were used during baseline data collection, all of which focused on 'the Site', with some survey methodologies extended to include adjacent parts of the golf course site.

Species/ Group	Baseline Survey Result Summary
Hazel dormouse	No evidence of dormouse was recorded during the course of surveys, and this species is considered to be absent from the Site.
Other mammals	<p>No records of hedgehog <i>Erinaceus europaeus</i> were returned in the biological data search, although this species is widespread. Habitat within the boundaries of the Site is considered suitable to support hedgehog, providing foraging, shelter and hibernation opportunities. The Site is therefore considered to be of Local level importance for hedgehog.</p> <p>Although there is a stream present within the Site, no evidence of water vole <i>Arvicola amphibus</i> was recorded incidentally, and no local records were returned.</p>
Breeding birds	<p>A total of 54 species were recorded within or over the Survey Area during the breeding bird survey, of these 40 are considered to breed within the Survey Area. A total of 10 species considered to breed within the Survey Area are species of conservation concern.</p> <ul style="list-style-type: none"> • Bullfinch <i>Pyrrhula pyrrhula</i> • Dunnock <i>Prunella modularis</i> • House martin <i>Delichon urbicum</i> • House sparrow <i>Passer domesticus</i> • Linnet <i>Carduelis cannabina</i> • Mallard <i>Anas platyrhynchos</i> • Mistle thrush <i>Turdus viscivorus</i> • Mute swan <i>Cygnus olor</i> • Song thrush <i>Turdus philomenos</i> • Starling <i>Sturnus vulgaris</i>
Reptiles	The survey results indicated a 'low' population of grass snake, concentrated in the north-easterly part of the Site. Two common lizard <i>Zootoca vivipara</i> were also recorded incidentally in 2019 on the western boundary of the wider site, comprising a 'low' population.
Amphibians	<p>Approximately 1ha of standing water is present within the Survey Area, comprising 12 waterbodies. Surveys in 2018 recorded large populations of great crested newt <i>Triturus cristatus</i> in two of these, medium populations in six, a small population in one, eggs only in one and two with no great crested newts. Seven further waterbodies in the wider site (in the rest of the golf course which will remain unaffected) returned between large populations and eggs-only results.</p> <p>Terrestrial habitats, particularly woodland and less managed grassland present across the Site are of importance to amphibians, which spend much of their lifecycle in such habitats.</p> <p>Populations of common toad <i>Bufo bufo</i>, common frog <i>Rana temporaria</i> and smooth newt <i>Lissotriton vulgaris</i> were also identified.</p>

Species/ Group	Baseline Survey Result Summary
Invertebrates	<p>Brown hairstreak butterfly <i>Thecla betulae</i> was confirmed as being present on Site, with eggs being found in suckering blackthorn along the northern boundary of the Site. Black hairstreak butterfly <i>Satyrrium pruni</i> and white-letter hairstreak butterfly <i>Satyrrium w-album</i> eggs were not recorded during the hairstreak survey, but they are known to be locally present.</p> <p>Terrestrial invertebrate surveys identified a limited number of notable invertebrates, indicating that the semi-natural habitats dominating the golf course have some value for invertebrate biodiversity. Scarce or interesting species found included the nationally rare snail-killing fly <i>Dichetophora finlandicam</i> (about which little is known), mottled fly <i>Dorycera graminum</i> (which is closely associated herb-rich unimproved meadows) and picture-winged fly <i>Oxyna parietina</i> (which relies on mugwort <i>Artemisa vulgaris</i> in disturbed and waste places).</p>

2 HABITAT CREATION AND MANAGEMENT

2.1 OVERVIEW

- 2.1.1. The Proposed Development consists of a new hotel and leisure complex buildings with associated hardstanding for access and a large area of landscaping including grassland, woodland, waterbodies and intermediate habitats.
- 2.1.2. Wildlife installations such as bat and bird boxes, refugia and hibernacula for herptiles and invertebrate features such as sandy scrapes will be distributed throughout the application site.
- 2.1.3. The landscape General Arrangement is provided within Appendix A of this document. Figure 2 provides a translation of this General Arrangement in Phase 1² (JNCC, 2010) typology.

2.2 GENERAL MEASURES

- 2.2.1. Annual checks should be made of the planted areas to confirm overall condition of the planted habitats. The check should be made between May and August as identification of many plants is easier at this time and should be completed by an individual able to identify plant species. The vegetation planted will be checked against landscape plans and associated species lists to check for any failed planting. Failed planting will be replaced by equivalent species, in consultation with landscape specialists. The annual check should also include an inspection of waterbodies to confirm their condition, including criteria detailed in Table 2-2, which include vegetation coverage and presence of invasive species.
- 2.2.2. Should species composition become dominated by one or very few species, advice will be sought on an appropriate mix to re-plant or otherwise increase the species diversity.
- 2.2.3. Checks will also be made for colonising flora, particularly non-native invasive species that may become naturally established, such as those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). If undesirable colonising species are present, they will be managed or removed in accordance with relevant good practise. It should be noted that where species listed under Schedule 9 of the Wildlife & Countryside Act are identified, these species are legally controlled and specialist advice should be sought.
- 2.2.4. It is important to note that there will be ecological constraints to habitat creation and management measures detailed in this report, due to the presence of protected species, as detailed in Table 1.1. Implementation of these measures will therefore be undertaken in consultation with professional ecological advice.

2.3 EXTENT OF HABITATS TO BE CREATED AND MANAGED

- 2.3.1. The Site covers 18.6ha and will include a total of approximately 11.8ha of soft landscaping upon completion. This will include: habitats that are retained (and enhanced through sensitive management); areas of habitat that are created on habitats of existing low ecological value (such

² The industry standard typology used by ecologists, including for Biodiversity Net Gain Assessments

conversion of amenity grassland to meadow grassland, ponds and woodland) and habitat that will be created following clearance during the construction phase.

2.3.2. The proposed grassland seed mixes to be used in habitat creation are as follows. Shrub and tree species to be used are:

- ┆ Emorsgate EM1 Basic General Purpose Meadow Mixture or similar
- ┆ Emorsgate EW1 Woodland Mixture or similar (woodland edge)
- ┆ Emorsgate EM 8 Meadow Mixture for Wetlands (marshy grassland)
- ┆ Emorsgate EG22 Strong Lawn Grass Mixture (amenity grassland)

2.3.3. Species mixes to be used for other areas of habitat creation are presented in Appendix B.

2.3.4. Table 2-1 below provides the areas of habitat that will be retained, enhanced and created. The layout of habitats is shown on Figure 2 with the 'Treatment' (i.e. whether the habitat will be retained, created or enhanced), detailed on Figure 3. In the interest of consistency with the district licence application for great crested newts, a worst-case scenario assumption has been made with regard to temporary loss due to uncertainties regarding the construction process. Accordingly, some areas specified as 'Creation (temporary loss)' may not be directly affected by construction works.

Table 2-1 – Post development habitat types

Type of habitat	Area (ha)	Treatment
Plantation Broadleaved Woodland	0.38	Retention & enhancement
Mixed Plantation Woodland	0.44	Retention & enhancement
Standing Water	0.90	Retention & enhancement
Broadleaved Parkland/Scattered Trees	0.04	Retention- no management
Amenity Grassland	0.33	Retention- no management
Plantation Broadleaved Woodland	1.34	Creation
Semi-Improved Neutral Grassland	1.27	Creation
Marsh/Marshy Grassland	0.53	Creation
Standing Water	0.05	Creation
Bare Ground	0.15	Creation
Plantation Broadleaved Woodland	0.81	Creation (temporary loss)

Type of habitat	Area (ha)	Treatment
Mixed Plantation Woodland	0.73	Creation (temporary loss)
Broadleaved Parkland/Scattered Trees	0.17	Creation (Temporary Loss)
Dense/continuous scrub	0.57	Creation (Temporary Loss)
Semi-Improved Neutral Grassland	1.89	Creation (Temporary Loss)
Marsh/Marshy Grassland	0.21	Creation (Temporary Loss)
Amenity Grassland	1.89	Creation (Temporary Loss)
Standing Water	0.14	Creation (Temporary Loss)
Intact species-poor hedge	41.94	Creation
Native species-rich hedge with trees	144.83	Creation
Native species rich intact hedge	636.91	Creation

2.4 HABITAT CREATION AND MANAGEMENT PRESCRIPTIONS

2.4.1. Table 2-2 details the creation/enhancement and management methods for the habitats detailed above.

Table 2-2 – Habitat Creation and Management Prescriptions by Habitat Type

Habitat Type	Objectives	Creation Methods (where applicable)	Management Methods
Plantation woodland (broadleaved & mixed) Parkland/ Scattered Trees (broadleaved, mixed & coniferous)	To create and maintain woodlands/ parklands with good structural and species diversity. To promote high invertebrate biomass and diversity.	<ul style="list-style-type: none"> - Trees should be planted in spring or autumn when there should be good amounts of rainfall but limited risk of frost. - To be planted with a mix of locally sourced native species, including at least 20 to 30% shrub. - To include wych elm <i>Ulmus glabra</i> and/or the disease-resistant cultivar <i>U. glabra</i> Sapporo Autumn Gold for the benefit of white-letter hairstreak butterfly, a local notable species of butterfly. - Planting to be at irregular spacings with different species planted adjacent to each other. - Prepare ground with appropriate mulching materials. - New trees to be obtained from approved suppliers, to be sturdy and vigorous, free from disease and fully hardened before installation. - Measures, such as tree guards, will be required to prevent pest damage. Ensure weeds/ competitive grasses are controlled around the base of planted trees. This can be achieved by hand pulling or by the careful and targeted use of glyphosate weed killer. Alternatively apply a mulch such as wood chip or mats around base of tree. - Log piles to be created in new and existing woodland from areas of felled woodland during site clearance - Replace failed planting as required. 	<ul style="list-style-type: none"> - Weed control to continue during establishment of new woodland/ parkland areas. - Tree guards to be removed after five to ten years once trees established. - Allow deadwood to remain in the habitat to naturally degrade. Replacement of failed planting to be done in the next suitable season with equivalent plants, or suitable similar specimens. - Ensure that trees and shrubs are not damaged by use of mowers, nylon filament rotary cutters and similar powered tools. - Check and maintain condition of stakes, ties, guys, guards and irrigation and ventilation systems. - Thin and or coppice (no more than 10%) of retained woodlands within 5 years of the completion of the Proposed Development. This will promote structural diversity. Dead wood to be used to create log piles within the woodlands. Such works would need to ensure active birds' nests or potential bat roosting features are not disturbed.
Hedgerows	To create and maintain hedgerows with good structural and species diversity. Management to promote dense and wide hedgerows. To provide less managed habitat around base of hedge as habitat for fauna.	<ul style="list-style-type: none"> - Initial tree care and planting as per above 	<ul style="list-style-type: none"> - Weed control to continue during establishment of new hedgerows. - Once established, hedgerows to be trimmed on rotation, such that they are trimmed every two to three years, such that only a proportion of hedgerows on site are trimmed in a given year. - Trimming approach to be sensitive such as to promote wider, thicker hedgerows that do not get too tall/ leggy. - An unmown buffer strip of 1-2m will be left around the base of hedgerows. Occasional mowing will be carried out to on an <i>ad-hoc</i> basis prevent scrub encroachment.
Continuous scrub	To provide and established dense scrub area that will provide cover and resources for a range of fauna, notably birds and herptiles.	<ul style="list-style-type: none"> - Planting should proceed in in spring or autumn when there should be good amounts of rainfall but limited risk of frost. - Utilise a range of native and locally-sourced species. - To be planted with locally-sourced native species, as well as allowed to naturally colonise. - To include blackthorn <i>Prunus spinosa</i> as suitable food plants for the benefit of brown hairstreak butterfly. 	<ul style="list-style-type: none"> - Replace failed specimens where detrimental to the establishment of the habitat. - Avoid use of artificial fungicide, pesticide or fertiliser. Use of such substances should be specially targeted if required. - Allow leaf litter and brash to remain on the ground to improve soil and provide refuge.

Habitat Type	Objectives	Creation Methods (where applicable)	Management Methods
Semi- neutral grassland	<p>To create and maintain a herb-rich meadow habitat that provides resources for a range of fauna, including herptiles and invertebrates.</p> <p>To provide cover/ refuge for fauna. With at least 30-50% of the grassland uncut each winter to provide some habitat structure for translocated animals.</p>	<ul style="list-style-type: none"> - The ground will be prepared appropriately, with measures taken to reduce soil fertility, such as stripping turf and the top 5 to 10cm of topsoil or deep ploughing the grassland³. - A diverse meadow mixture containing native and locally sourced species should be used suited to the soil pH. Yellow rattle <i>Rhinanthus minor</i> will be used, a parasitic species that can help combat competitive grass species. - The optimal time to sow seeds is September/ October, though April/ May are also suitable. 	<ul style="list-style-type: none"> - Mow newly sown meadows regularly throughout the first year of establishment removing cuttings. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers. Cut once sward is >25cm in height down to approx. 6cm. Leave a buffer of 3m uncut around ponds and reptile hibernacula. Return for second cut in late summer, cut down to approx. 10cm. Cut approximate area of 50% of each field. Use a cut and collect machine (forage harvester) piling arisings in the same locations used for first cut. - If those areas cut in late summer of the 1st season have already grown >25cm by mid-March, return for an early season cut of the same 50% of each field. Thereafter cut circa 70% meadow areas every summer with a mid-summer hay cut. - Reduce use of artificial fungicide, pesticide or fertiliser. Use of such substances should be specially targeted and minimised. - Allow a buffer strip (2-3m deep) to grow long around other woody habitats. - Pile arisings near ponds and hibernacula, as these will provide opportunities for grass snake to lay eggs.
Marsh/marshy grassland	<p>To create diverse grassland area containing plant species more typical of wetter conditions.</p> <p>To create a grassland with a tussocky structure providing opportunities for fauna such as great crested newt.</p>	<ul style="list-style-type: none"> - Sowing and/ or planting with appropriate locally-sourced species appropriate to the ground conditions, particularly levels of moisture. - The optimal time to sow seeds is September/ October when the seed bed is warm, though the period April/ May are also suitable. 	<ul style="list-style-type: none"> - Low-intensity mowing, annual cut in November (to avoid herptile active season) if required, cut down to no less than 300mm. - Allow a buffer strip (2-3m deep) to grow long around ponds and other woody habitats. - Selective scrub and weed control may be appropriate where encroachment occurs.

³ Avoidance based mitigation measures will be implemented to ensure such works proceed in accordance with legislation pertaining to protected species, particularly great crested newt

Habitat Type	Objectives	Creation Methods (where applicable)	Management Methods
Waterbodies	<p>To create ponds of value to fauna including invertebrates and great crested newt.</p> <p>To maintain and enhance value of retained ponds.</p>	<p>Ponds will be designed in accordance with guidance within The Great Crested Newt Mitigation Guidelines (English Nature, 2001) and with reference to the Freshwater Habitats Trust's <i>Pond Creation Toolkit</i>. Specifically, the following criteria will be adhered to in pond design and construction:</p> <ul style="list-style-type: none"> - Constructed with a variable profile, with some shallow slopes to allow animals to enter and exit early. - Measuring between 100m² to 800m², including a range of sizes. - Creation of substantial cover of marginal and submerged vegetation. Some natural colonisation allowance is acceptable, and if desired for speed the pond can be planted with suitable species of local provenance. - Absence of shading on south side, and no more than 25% of pond border to be shaded. - Designed to avoid drying every year (occasional drying is acceptable in some ponds). - A range of depths up to 2m, with some shallower ponds. - Ponds will be created for biodiversity benefit and will not receive surface water runoff directly resulting from Site drainage. The Site has a high water table and therefore water will primarily be sourced from ground water. - Ponds may be created at any time of year, though the optimal periods are spring or autumn. 	<ul style="list-style-type: none"> - Clearance of woody vegetation on southern banks (if applicable) to reduce shading. - Reduction of management close to banks by reduced mowing - Periodic check and control for invasive species and colonising fish. Where identified these should be controlled/ removed. - Checking pond condition and remedial action as required - Aquatic vegetation management in water bodies, where they become choked with vegetation. - Ponds should be de-silted and excess leaf litter removed occasionally if required, to maintain clear water areas. Such works if required should ideally be undertaken during autumn season when animals are not hibernating within the vicinity of the pond. Such works should be undertaken following ecological guidance.
Introduced shrub	Primarily for amenity value, management to provide wildlife resources as a secondary benefit.	<ul style="list-style-type: none"> - Should be planted with non-invasive species of known value to wildlife, such as berry bearing shrubs and species that provide a significant nectar resource. 	<ul style="list-style-type: none"> - Reduce use of artificial fungicide, pesticide or fertiliser. Use of such substances should be specially targeted and minimised.
Amenity grassland	Primarily for amenity value, management to provide wildlife resources as a secondary benefit.	<ul style="list-style-type: none"> - Will be planted using native grass species of some wildlife value. - Any wildflowers used should be low-growing species tolerant of regular trampling and mowing. 	<ul style="list-style-type: none"> - Where possible, tall margins to be retained to provide cover for fauna. Fertiliser inputs to be minimised where possible.



2.5 WILDLIFE INSTALLATIONS

- 2.5.1. A number of wildlife-specific installations have been included within the landscape design for the Proposed Development. These are summarised in along with proposed monitoring and maintenance procedures in Table 2-3, whilst the locations and numbers are shown in the landscape general arrangement drawings (Appendix A).

Table 2-3 – Wildlife Installation Summary

Target Species/ Group	Installation	Management Methods	No. Proposed
Bats	<p>Bat boxes will be installed on retained and newly planted trees of sufficient size and stability.</p> <p>Boxes should be installed as high as possible (>4m high), near suitable habitat and with a range of orientations. Ideally boxes should receive sun for part of the day and should not be exposed to strong winds.</p>	<p>The boxes should be checked annually for signs of damage.</p> <p><i>Note that intact boxes should not be disturbed or opened by anyone without a Natural England bat survey licence.</i></p>	<p>9 (varied models)</p>
Birds	<p>A variety of bird boxes are to be installed within the Proposed Development:</p> <ul style="list-style-type: none"> - Integral/wall mounted boxes <ul style="list-style-type: none"> - Swift nest cavities - House martin nest boxes - Sparrow terraces - Tree hung boxes <p>Nest provision should be made above 2m (and above 2.5m where possible to reduce risk of interference from members of the public), and at a maximum height of 5m.</p> <p>Bird nesting opportunities should be installed in locations that are not in direct sunlight, and that are sheltered from prevailing weather. For example, placing boxes oriented north and east should serve to avoid strong sunlight and wind-driven rain.</p>	<p>Where boxes may be safely accessed, an annual inspection should be undertaken outside of the bird nesting season (i.e. September-January inclusive). In the unlikely event birds are encountered they should be left undisturbed. During the inspection the boxes will be checked for integrity and any faulty or damaged parts will be replaced as required. All fixings will be inspected regularly to ensure the boxes remain securely attached. Any nesting material present will be removed and disposed of, with a record kept where there is evidence that the boxes have been used. Boxes should be replaced or re-hung if they become damaged, break or become loose/ unbalanced. Boxes may also be cleaned.</p>	<p>9 Swift nest cavities 4 House martin nest boxes 3 Sparrow terraces 13 Tree hung boxes (varied models)</p>

Target Species/ Group	Installation	Management Methods	No. Proposed
Herptiles (amphibians and reptiles, including great crested newt)	Hibernacula ⁴ will be provided within the landscaped areas close to woodland edges and waterbodies (in locations where flooding would be unlikely). These will be constructed using rocks and hardcore topped with logs then covered with soil.	Hibernacula require little management or maintenance, save occasional (e.g. every 5-10 years) topping-up with new rocks, logs and soil. Additionally, new hibernacula can be formed adjacent to older ones in order to maintain sufficient holes and crevices for hibernating herptiles.	5
	Brash piles and grass cutting heaps will also be formed as temporary refuge and protection using clippings from habitat management. These can also function as egg-laying heaps (e.g. for grass snake). These will be sited near to wooded areas and ponds also. Other additional piles could be created as required.	Brash piles and grass cutting heaps should be periodically topped-up up using fresh branches, brash and logs. Addition of fresh brash material (e.g. every 1-2 months) in the active season will allow continued bacterial digestion and heat generation for incubating eggs.	4
Invertebrates	Sandy scrapes or 'bee banks' will be created in suitable open, south-facing locations. These will be formed of soil with balanced sand and clay elements and should be angled towards the south.	Sandy scrapes should be cleared or 'disturbed' every year (or as often as necessary) to prevent colonisation by plants. This should be done by hand-pulling plants and manually loosening the surface of the soil with hand tools.	3

⁴ In accordance specified within Figure 3 of the Great Crested Newt Mitigation Guidelines (English Nature, 2001)

3 MONITORING

- 3.1.1. Following the completion of the Proposed Development, a programme of monitoring will be undertaken. Primarily this will focus on great crested newts (in line with guidance in the great crested newt mitigation guidelines, 2001) to comply with requirements under the District Level licence and because of the relatively significant impacts expected. It is also proposed to monitor the installed bird and bat boxes.

3.2 GREAT CRESTED NEWT

- 3.2.1. The population status of great crested newt at the site will be monitored following the completion of development. The Natural England GCN Method statement template for the traditional licencing route provides advice on monitoring methods and frequency (Natural England, 2019).
- 3.2.2. Based on a 'high' population undergoing 'high' (as defined within The Great Crested Newt Mitigation Guidelines (English Nature, 2001) impacts, the scheme will require population size class monitoring (i.e. via manual methods) of all ponds, every year for ten years following completion of the Proposed Development. This is in line with requirements of the District Level Licence.
- 3.2.3. If populations decline (assessed only after at least two years of monitoring), the management regime should be reviewed and adjusted accordingly. For example, if ponds are routinely drying out, consideration will be given to physical alterations to help them maintain water through the season.
- 3.2.4. Monitoring would apply to all ponds shown on Figure 2.

3.3 BIRDS

- 3.3.1. Bird boxes will be monitored (from ground level) for usage by the target, or other species during the peak breeding season (April – May inclusive). If no uptake is recorded after three years, new boxes and locations shall be considered. The advice of a suitably qualified ecologist will be sought for this.

3.4 BATS

- 3.4.1. On at least one occasion in the first five years post-completion, an inspection of the bat boxes will be undertaken by a Natural England (NE) licensed ecologist to record evidence of use by bats, and advise on any necessary repairs to be carried out. The inspection will occur between September and October (avoiding the time when bats are at their most vulnerable, i.e. avoiding the hibernation and maternity season). During this inspection the boxes will also be checked for integrity with any damage made good. If a box has not been used for several years in succession, the installation of new alternative boxes (non-integral) shall be considered following the advice of a suitably qualified ecologist.

4 PROGRAMME

4.1 HABITAT ENHANCEMENT AND CREATION PROGRAMME

- 4.1.1. Habitat creation and enhancement will be undertaken in the first appropriate season following the receipt of planning permission. This will be no later than within 6 months of development commencing. Habitat creation in areas cleared during the construction phase will be completed within 6 months of completion of development activities. Management will continue for 25 years. This management plan will be subject to periodic review (indicatively every 5 years) to ensure it remains fit for purpose.
- 4.1.2. A programme outlining the management and monitoring measures detailed within this document that will be implemented on an annual basis is present in Table 4-1 overleaf.

Table 4-1 – Indicative Programme. Green denotes recommended period, yellow denotes optional items.

Feature/ Month	January	February	March	April	May	June	July	August	September	October	November	December
General measures												
Annual inspection (all habitats to check for issues as detailed in Table 2-2)												
Meadow areas - 1st season												
Sowing												
Cut and collect once sward is at least 25cm												
Meadow areas - once established												
Early season cut and collect if >25cm by March												
High summer cut and collect, retaining some areas of longer grassland												
Marshy grassland												
Annual cut and collect arisings												
Trees and scrub												
Planting new/ replacement trees as required												
Waterbodies												
Creation (optimal)												
Management (optimal)												
Bird boxes												
Annual inspection and clean												
Annual monitoring												



Bat boxes												
Recommended season for management and clearing												
Great crested newts and reptiles												
Annual monitoring of ponds												
Brush pile top up												

5 CONCLUSIONS

- 5.1.1. This HMMP outlines a programme of management and monitoring to be implemented at the Site in order to maintain and improve the biodiversity value of retained, created and enhanced habitats. It is advised that the HMMP should be subject to periodic review (at least every 5 years) by an appropriately qualified individual to confirm management prescriptions are and remain appropriate. Updates should be informed by the results of monitoring, such as that outlined within this document.

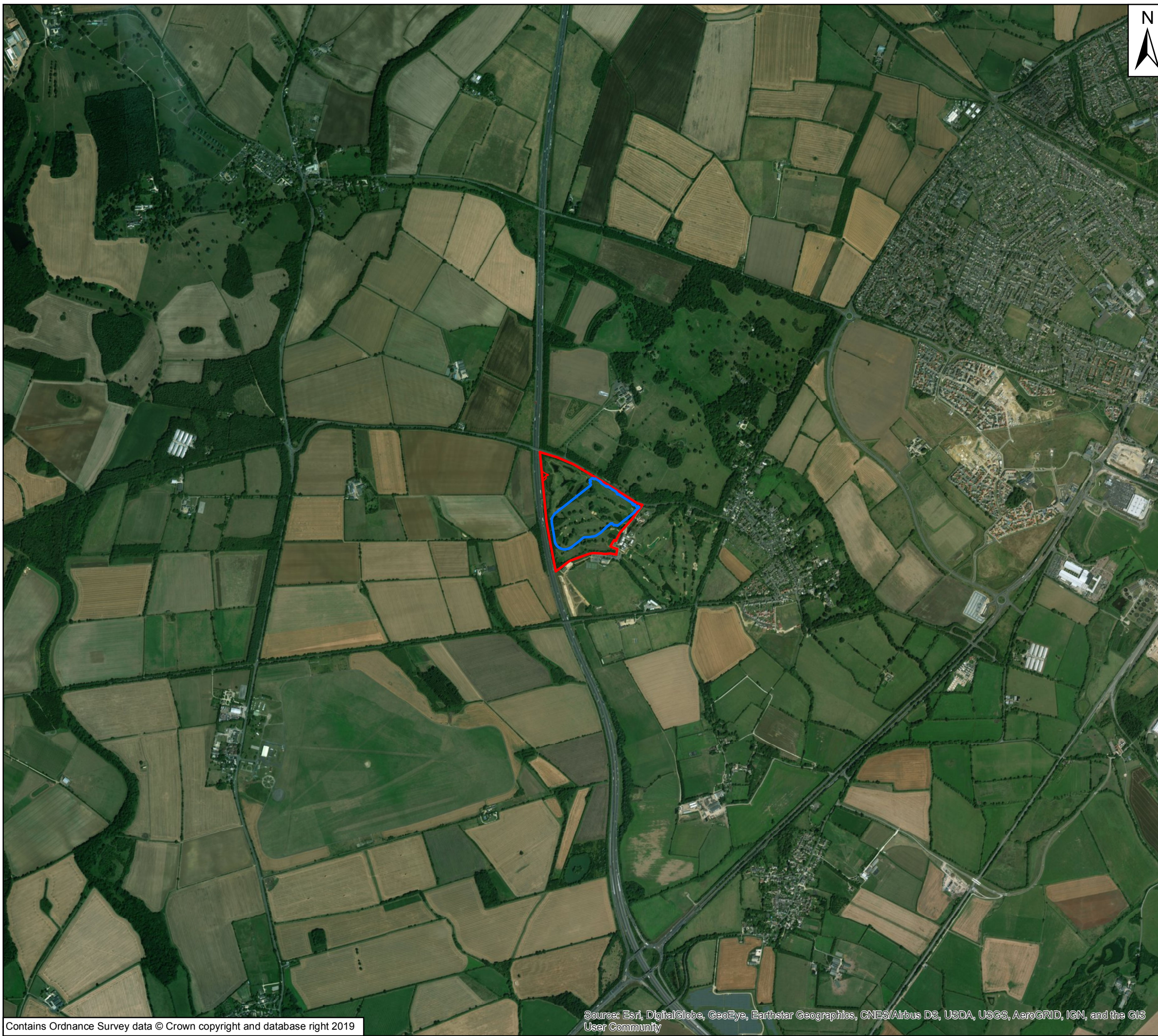


6 FIGURES

Figure 1 - Application Site Location Plan

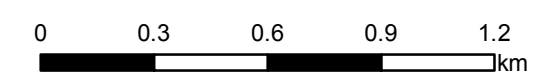
Figure 2 - Post-Development Habitat Plan

Figure 3 - GCN Impact Plan



Key

- Site Boundary
- Proposed Development Boundary



Client:	Great Wolf Resorts
Project:	Bicester Golf Course
Title:	Site Location Plan

Drawing No: Figure 1	Drawn: RD
Date: August 2019	Checked: VD
Scale: 20,000 @ A3	Approved: LR

