Growth of Bristol Airport to 12mppa

Integrated Landscape and Biodiversity Mitigation and Management Plan (Planning Conditions 20 and 25)

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DOCUMENT CONTROL

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1.0	Draft document for client review	15/05/23
1.1	Final version issued	19/05/23
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1 INTRODUCTION

1.1 BACKGROUND

1.1.1 This document has been created to satisfy Conditions 20 and 25 associated with planning application Number 18/P/5118/OUT), with respect to the growth of Bristol Airport to 12 million passengers per annum (mppa).

1.1.2 This document sets out the specifics of the proposed Biodiversity Mitigation and Management Plan (associated with Planning Condition 25 as shown in Box 1) and associated detailed landscape designs (required by Planning Condition 20 as set out in Box 2) across land owned and managed by Bristol Airport.

1.1.3 Because of the very close association between the two, a single integrated Landscape and Biodiversity Mitigation and Management Plan (LBMMP) has been prepared (this document).

Box 1: Planning Condition 20

Planning Condition 20: Preparation of Detailed Landscape Designs
Condition 20 - No development shall begin until the landscape planting and landscape improvement areas that are shown in the 'Integrated / embedded landscape, visual and ecology mitigation masterplan' (Drawing Number 40506-Bri075c) have been developed into detailed landscape designs for each area. These shall be submitted to and approved by the Local Planning Authority before the landscape works are carried out and they shall include the following details: *a) Existing and proposed finished ground levels;* *b) Existing trees, shrubs, hedges or other soft features to be removed and retained;* *c) Details of the location and type of tree protection measures;* *d) Planting plans, including specifications of species, sizes, planting centres, number and percentage mix of all new planting;* *e) Details of how the soft landscaping will enhance biodiversity value* *f) A timetable for implementing the approved landscaping works for each area;* *g) A management plan of the landscaping scheme; including maintenance details and a timescale for implementation of the planting period, phased implementation and complexity of agreed scope of works.*

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Box 2: Planning Condition 25

Planning Condition 25: Preparation of the Biodiversity Mitigation and Management Plan (BMMP)

Condition 25 - Prior to the commencement of any part of the extension to the 'Silver Zone' car park (Site 'M' on the 'Site Reference Plan' – Drawing Number 17090-00-100-402 Rev 00) or the approved highway works at the A38 / Downside Road / West Lane (Site 'O' on Site Reference Plan – Drawing Number 17090-00-100-402), a Biodiversity Mitigation and Management Plan (BMMP) that accords with the document titled: 'Integrated / embedded Landscape, Visual and Ecology Mitigation Masterplan' Wood Consultants (August 2019) and Chapter 11 of the 'Environmental Statement', shall be submitted to, and approved in writing by, the Local Planning Authority. The BMMP shall include the following:
a) Description and evaluation of on-site features to be managed;
b) Description of the off-site features to be managed including replacement habitat for horseshoe bats as detailed in Outline SAC/SPD Ecological Management Plan for North Somerset and Mendip Bat SAC SPD (Johns Associates, 2018);
c) Details of the extent and location of habitat retention, creation and enhancement measures;
d) Ecological trends and constraints that might influence management;
e) Aims and objectives of management;
f) Appropriate management options for achieving aims and objectives.
g) Prescriptions for management actions;
h) The timescales for implementation of the BMMP, demonstrating that replacement horseshoe bat habitat will be available before suitable on-site habitat is removed, disturbed or otherwise negatively impacted in accordance with the North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document (Adopted January 2018);
i) A work schedule (including an annual work plan capable of being rolled forward over a ten-year period and recommendation for ongoing review);
j) Details of the body or organisation responsible for managing the day-to-day implementation of the plan;
k) Ongoing monitoring and remedial measures including a monitoring schedule for the off-site replacement habitat for horseshoe bats as detailed in Outline SAC/SPD Ecological Management Plan for North Somerset and Mendip Bat SAC SPD (Johns Associates, 2018). This shall include a compliance report submitted to and agreed in writing before suitable on-site habitat for horseshoe bats is removed, disturbed, or otherwise negatively impacted, to demonstrate that suitable off-site compensatory habitat has been provided. The means of reporting the findings to the Local Planning Authority and Natural England shall also be specified. The BMMP shall also include details of the mechanism(s) by which the long-term implementation of the plan will be secured by the developer, detailing responsibility for its delivery. The plan shall also set out contingencies and/or triggers and options for remedial action to ensure that it delivers the fully functioning biodiversity objectives of the approved scheme. The approved BMMP will be implemented in accordance with the approved details.

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1.1.4 The location of the site is Bristol Airport, North Side Road Felton BS48 3DY as shown on Figure 1.

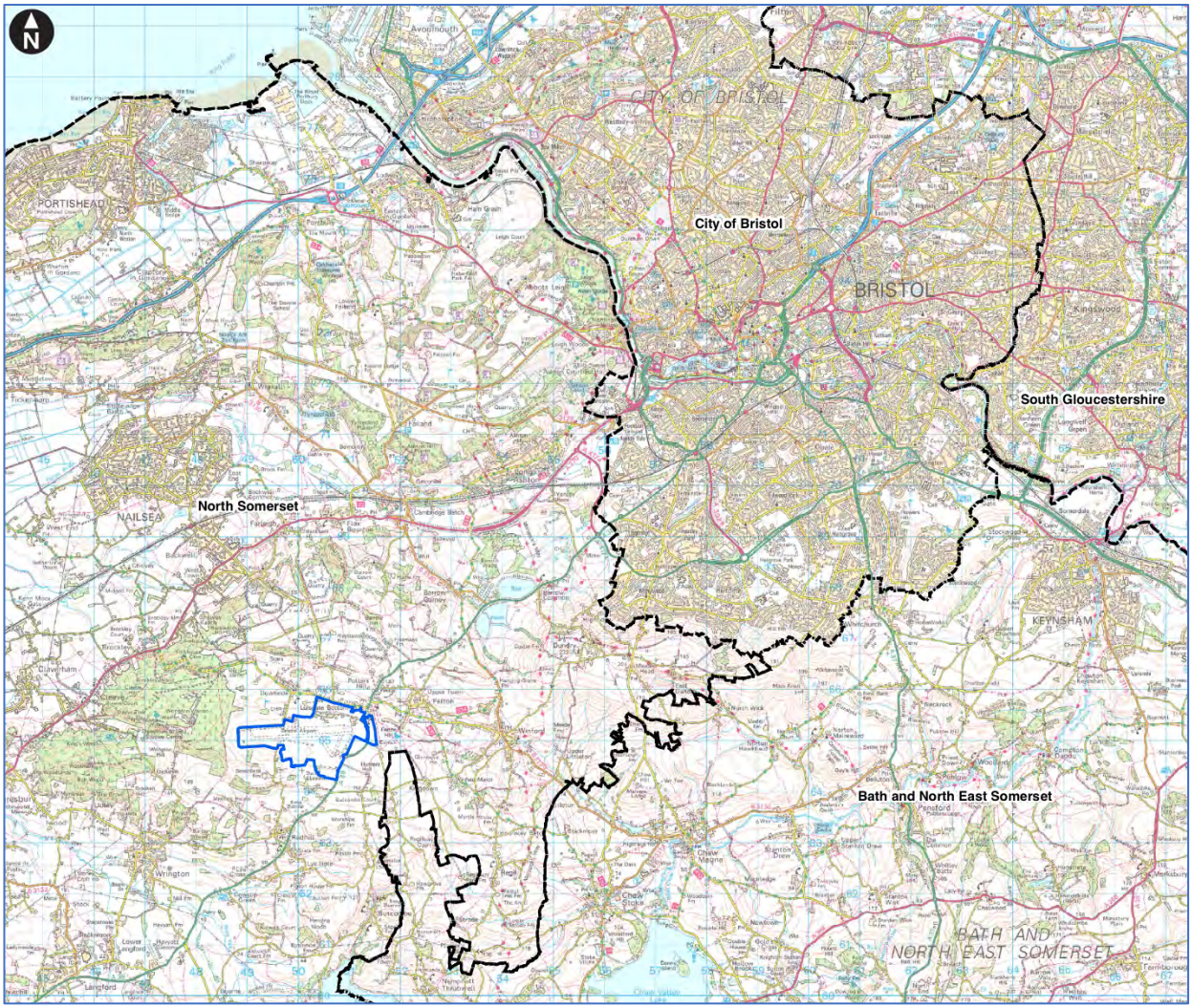

Figure 1. Location of Bristol Airport.

1.2 SAFEGUARDING & SECURITY

1.2.1 The development of this LBMMP has been influenced by considerations of safeguarding and security. With respect to bird strike and planting/seeding/habitat management at Bristol Airport, there is a need to comply with Civil Aviation Authority publication CAP772 which influences habitat and vegetation management regimes.

1.2.2 Typically, land that is located 'airside' or directly aligned with the runway needs more controlled management from a safeguarding and safety perspective. In order to ensure compliance with counterterrorism measures, it is necessary to maintain clear lines of sight to and from the airfield boundary. This requires a 3-meter clear zone to be retained on the inside of the security fence to ensure that clear sight lines exist at the bottom of the fence.

1.2.3 Notwithstanding, this, there is considerable opportunity to deliver mitigation and enhancement measures that both enhance biodiversity and the local landscape at Bristol Airport, including specific measures associated with the growth of the Airport to 12mppa.

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1.3 LEGAL AND FUNDING MECHANISMS

1.3.1 Bristol Airport is the landowner, developer and operator of all areas associated with the actions set out in this document and all planning conditions. Their appropriate implementation can be enforced by North Somerset Council. Bristol Airport will be solely responsible for the ongoing funding of all relevant works and taking overall management responsibility for their implementation/reporting/demonstrating that aims and objectives are being met.

1.4 ASSOCIATED DOCUMENTS

1.4.1 This document should be read alongside the separate Scheme of Grassland Translocation and Enhancement (Appendix J) associated with Planning Condition 24, prepared by Johns Associates (2023) that provides a single integrated strategy for long term grassland management at Bristol Airport.

1.4.2 This document should also be read alongside the separate Biodiversity Construction Management Plan associated with Planning Condition 23, prepared by Johns Associates (2023).

1.4.3 This document should also be read alongside the separate Woodland Management Plan (Appendix D) for the off-site woodland owned by Bristol Airport, prepared by Johns Associates, hereafter referred to as Lulsgate Wood, that will deliver the necessary replacement habitat for greater and lesser horseshoe bats (and enhancements for other biodiversity).

1.5 DOCUMENT STRUCTURE

The remainder of this document sets out:

Section 2: Description and Evaluation of On-site Features to be Managed
Section 3: Description of the Off-site Features to be Managed
Section 4: Details of the Extent and Location of Habitat Retention, Creation and Enhancement Measures
Section 5: Ecological Trends and Constraints that Might Influence Management
Section 6: Aims and Objectives of Management (Including Condition 20e)
Section 7 Appropriate Management Options for Achieving Aims and Objectives
Section 8: Prescriptions for Management Actions
Section 9: Timescales for Implementation of the LBMMP (Including Condition 20f)
Section 10: Details of the Organisation Responsible for the Day to Day Plan Implementation
Section 11: Mechanism for the Long-Term Implementation of the LBMMP

Appendix A:	On-site Features to be Managed
Appendix B:	Off-site Features to be Managed
Appendix C:	On-site Integrated/Embedded Landscape, Visual and Ecological Mitigation Masterplan
Appendix D:	Off-site Woodland Felling Licence and and Woodland Management Plan
Appendix E:	Existing and Proposed Finished Ground Levels
Appendix F:	Existing Trees, Shrubs, Hedges etc to be Removed/Retained
Appendix G:	Tree Protection Measures
Appendix H:	Planting and Biodiversity Feature Plans
Appendix I:	Integrated Landscape and Biodiversity Management and Monitoring Schedule (Including Condition 20g)
Appendix K	Airport Grassland Management, Enhancement and Translocation Plan
Appendix L	A38 Corridor Landscape Scheme

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2 DESCRIPTION AND EVALUATION OF ON-SITE FEATURES TO BE MANAGED

2.1 INTRODUCTION

2.1.1 Bristol Airport is located on a flat plateau and is dominated by buildings, car parks, areas of hardstanding (e.g. runway), other airport infrastructure, grassland and small areas of scrub. The surrounding landscape comprises alternating ridges and broad valleys that support wooded slopes and open rolling farmland. To the north and south of Bristol Airport the valleys run east to west and support a relatively high number of designated sites of nature conservation value. A large woodland complex is located west of the application site and includes designated sites of nature conservation value. Quarry exposures, screes, scrub, grassland and woodland support nationally rare and scarce plant species. Woodlands, parklands of conservation value, and species-rich calcareous grasslands are also present in the wider area.

2.1.2 The following section provides a summary of the ecological baseline, highlighting those features that will be managed through this holistic LBMMP.

2.2 HABITATS

Please refer to Appendix A, which sets out the pre-development arrangement of habitats at Bristol Airport.

Habitats recorded at Bristol Airport and in adjacent land parcels from the Phase 1 Habitat Survey are listed in Table 2.1. Those directly affected by the growth of Bristol Airport to 12mppa are highlighted together with their location, which can be seen on Figure 2.1 and also Appendix F.

Table 2.1 Habitat recorded at or adjacent to the Bristol Airport

Phase 1 Habitat Type	Within the Proposed Development Footprint?	Location/Areas – Please Refer to Figure 2.1
Scattered scrub	YES	A38 highway improvements, Silver Zone Car Park Extension (Phase 2)
Broadleaved tree	YES	Gyratory road, Canopies to front of existing terminal building, Multi-storey car park
Coniferous tree	YES	Gyratory road
Intact hedge – native species rich	YES	to Silver Zone Car Park Extension (Phase 2)
Intact hedge – native species poor	YES	Multi-storey car park
Defunct hedge – native species rich	NO	
Defunct hedge - native species poor	YES	A38 highway improvements
Fence	YES	A38 highway improvements, Silver Zone Car Park Extension (Phase 2)
Wall	YES	A38 highway improvements
Broadleaved woodland – semi-natural	YES	A38 highway improvements
Broadleaved woodland – plantation	NO	
Mixed woodland - plantation	NO	

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Phase 1 Habitat Type	Within the Proposed Development Footprint?	Location/Areas – Please Refer to Figure 2.1
Scrub – dense/continuous	NO	
Scrub - scattered	YES	A38 highway improvements, Silver Zone Car Park Extension (Phase 2)
Neutral grassland – semi-improved	YES	Silver Zone Car Park Extension (Phase 2)
Calcareous grassland – semi improved	YES	Taxiway Extension
Improved grassland	YES	Silver Zone Car Park Extension (Phase 1)
Poor semi-improved grassland	YES	to Silver Zone Car Park Extension (Phase 2), Taxiway widening and fillets, Taxiway widening and fillets (Taxiway ALPHA), East Taxiway
Other tall herb and fern – ruderal	YES	Silver Zone Car Park Extension (Phase 1)
Standing water	YES	Silver Zone Car Park Extension (Phase 2)
Cultivated/disturbed land – arable	NO	
Cultivated/disturbed land – amenity grassland	YES	Canopies to front of existing terminal building, Gyratory road
Cultivated/disturbed land – ephemeral/short	YES	Taxiway widening and fillets
Introduced shrub	YES	Canopies to front of existing terminal building, Multi-storey car park, Gyratory road
Earth bank	NO	
Buildings	YES	South terminal extension, West terminal extension, Service yard, Canopies to front of existing terminal building
Bare ground	YES	South terminal extension, West terminal extension, Service yard, East pier with vertical circulation cores & 5no pre-boarding zones, Canopies to front of existing terminal building, Gyratory road, A38 highway improvements
Other habitat	NO	

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Figure 2.1 Location of Development and On-site Ecological Zones of Influence

2.3 NOTABLE PLANTS

Although records of notable plant species exist for an area within 2km of the site, none have been identified within the footprint of the development proposals based on the current field surveys or desk study.

2.4 BATS

The following species/genus have been recorded at Bristol Airport.

- Common pipistrelle (Pipistrellus pipistrellus);
- Soprano pipistrelle (Pipistrellus pygmaeus);
- Nathusius' pipistrelle (Pipistrellus nathusii);
- Serotine (Eptesicus serotinus);
- Common Noctule (Nyctalus noctula);
- Leisler's (Lesser Noctule) (Nyctalus Leisleri);
- Greater Horseshoe (Rhinolophus ferrumequinum);
- Lesser Horseshoe (Rhinolophus hipposideros);
- Plecotus species; and
- Myotis species.

Surveys confirmed that none of the buildings (or other built structures) associated with the Proposed Development support or have the potential to support roosting bats. A small shallow former quarry associated with the woodland

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adjacent to the Downside Road/A38 junction was also examined in detail using a video endoscope and was confirmed to not offer potential for roosting bats.

Surveys confirmed that none of the trees associated with the Proposed Development have the potential to, or support, roosting bats.

Activity transect surveys were conducted in Silver Zone Car Park Extension (Phase 2) and A38 Highways Improvements area. A low number of open habitat foraging species were identified in Silver Zone Car Park Extension (Phase 2) area, over the grazed pasture habitat. A cluster of greater horseshoe records were recorded along the western field boundary with additional individual passes recorded to the west of the scrub matrix within the grassland and along the northern bund.

A number of open-habitat foraging bat species were identified in the A38 Highways Improvements area, over the Airport Tavern grassland/parking area. Two greater horseshoe bat passes were recorded in the centre and to the south of the woodland parcel in Zone B of the North Somerset and Mendip Bats SAC. No lesser horseshoe bats were recorded during these surveys.

Automated detector surveys were conducted at twelve locations covering the habitats identified as having high suitability for foraging or commuting bats. These were broadly identified as:

- Silver Zone Car Park Extension (Phase 2) - all boundary features, scrub matrix and open grazed grassland; and
- A38 Highway Improvements area – Woodland parcel south of Downside Road and the northern boundary hedgerow along the Airport Tavern grassland area.

Of these species, the following were considered to be of interest with respect to the Proposed Development based on the levels of activity recorded during these surveys:

- Common pipistrelle - High levels of activity were recorded throughout the natal period (Silver Zone Car Park Extension (Phase 2) boundary features) implying that the study area could provide a foraging resource for a maternity roost.

- *Myotis* species - High levels of activity were recorded throughout the natal period (A38 Highway Improvements area woodland canopy) implying that the study area could provide a foraging resource for a maternity roost and an important pre-hibernation foraging resource.

- Greater Horseshoe - Activity levels in excess of the North Somerset and Mendip Bat SAC Supplementary Planning Document (SPD) foraging activity threshold were recorded at 11 of the 12 automated detector locations in both Silver Zone Car Park Extension (Phase 2) area (hedgerows and grazed grassland/scrub matrix) and A38 Highway Improvement area (woodland and northern boundary hedgerow) within the natal period implying that the study area could provide a foraging resource for breeding roosts associated with the North Somerset and Mendip Bats SAC.

- Lesser Horseshoe - Activity levels in excess of the SPD foraging activity threshold were recorded at all 12 of the automated detector locations, particularly in the post-natal period in the woodland associated with the A38 Highway Improvement area and at lower levels within the natal period implying that the study area could provide a foraging resource for roosts associated with the North Somerset and Mendip Bats SAC.

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2.5 DORMOUSE

Dormouse has not been recorded at Bristol Airport (with surveys commencing in 2005). Based on the survey findings it is considered reasonable to conclude that dormouse is not currently present associated with the growth of Bristol Airport to 12mppa. It is known that dormice are present in the wider local area.

2.6 BADGER

Badger is present across Bristol Airport. This information remains confidential in order to uphold the objectives of the Protection of Badger Act 1992.

2.7 GREAT CRESTED NEWT

A small population of great crested newt is present within two water bodies located within the eastern margins of Kings Wood and Urchin Wood, approximately 300m west of the western perimeter of Bristol Airport. Consequently, it is only likely that activities associated with operating the far western end of Bristol Airport (the western end of the runway and airfield) have any potential to interact with great crested newt and these locations are beyond the ZoI associated with the growth of Bristol Airport to 12mppa.

2.8 REPTILES

Reptiles have not been recorded at Bristol Airport since surveys commenced in 2005, despite numerous surveys using artificial refugia, searches of natural refugia and potential observations whilst undertaking wider surveys. Based on these surveys it is considered reasonable to conclude that common reptiles are not currently present at the application site. It is known that common reptiles are present in the wider local area.

2.9 BIRDS

The growth of Bristol Airport to 12mppa will not result in the extensive reduction of foraging or nesting opportunities for birds. Notable areas of suitable habitat to be retained are located at the boundaries, airfield grassland and a small woodland south of the Silver Zone long-stay car park.

In general, breeding bird surveys only recorded common and ubiquitous bird species. Only one species of conservation significance was recorded on site (Dunnock, *Prunella modularis*). Other species, also common to Bristol Airport, have been recorded on the airfield grassland by the Airside Operations team.

The majority of bird records associated with the grassland, hedges and scattered scrub associated with Silver Zone Car Park Extension (Phase 2) area, including the majority of dunnock territories, were concentrated along the southern and eastern boundaries and within mature scrub. Dunnock were recorded during all survey visits in this area within the scrub and the hedgerows on the eastern, western and southern boundaries.

Disturbance from noise and commercial activity at the Airport Tavern site, within the A38 Highway Improvements area, severely limits the diversity of bird species at this location. Common woodland bird species were recorded throughout the woodland at the A38 Highway Improvements Area. Dunnock were recorded during all survey visits in this area within the woodland.

The application site does not offer any notable opportunities for wintering birds.

The airfield grassland management with respect to birds and CAP 772[Error! Bookmark not defined.] will not change as a result of the development proposals.

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3 DESCRIPTION OF THE OFF-SITE FEATURES TO BE MANAGED

3.1 OVERVIEW

Bristol Airport Ltd owns woodland within the much larger area of woodland at Wrington Warren, close to the airport. It will introduce wide-ranging long-term conservation management of will support the on-going 'favourable conservation status' of the internationally important North Somerset and Mendips Bat Special Area of Conservation (SAC) and significantly enhance the biodiversity value of the woodland owned by Bristol Airport, which is dominated by a dense and over-mature conifer plantation crop.

Wrington Warren is a large area of woodland located just to the west of Bristol Airport; it consists of a number of small woodland plots that have been created for sale to individuals. Plots typically vary in size between 4 and 6 acres (1.5 to 2.5 hectares). Wrington Warren as its name suggests was originally open rough pasture and was planted primarily with conifer plantations in the late 1950's and 1960's. There are some areas of remnant scrub woodland that pre-dates the plantings. The woodlands have all generally been actively managed and have been thinned.

Originally sold to Bristol Airport as three woodland parcels referred to as Goldstone Wood, Cleeve Wood and Fountain Wood, Bristol Airport is managing all three as a single 6.34 hectare woodland compartment which it has renamed as Lulsgate Wood, in commemoration of all those who served and were associated with the former RAF Lulsgate Bottom, where Bristol Airport is now located. Centered at approximately Ordnance Survey grid reference ST 47324 65577 Lulsgate Wood is located approximately 1.5km west north west of the eastern end of the runway of Bristol Airport.

Please refer to Appendix B that contains a series of drawings associated with Lulsgate Wood and the separate detailed Woodland Management Plan (and associated supporting documents) produced by Johns Associates.

3.2 VISION FOR LULSGATE WOOD

Lulsgate Wood will evolve to a thriving and biodiverse mixed woodland, dominated by native broadleaved trees, with an open canopy and revitalized understorey and ground flora, thereby maximizing opportunities for greater and lesser horseshoe bats, and the widest range of local, native flora and fauna in accordance with best practice. It will be monitored and managed in accordance with the Lulsgate Wood Management Plan to provide a diverse ecological structure and function, enhancements to ecosystem services, retaining existing access and acting as an example of responsible woodland management to educate and inspire others.

3.3 NORTH SOMERSET AND MENDIPS BATS SPD REQUIREMENTS (ALSO PLANNING CONDITION 25)

In January 2018, North Somerset Council (NSC) adopted the North Somerset and Mendip Bats Special Area of Conservation Guidance on Development: Supplementary Planning Document (SPD). Compliance with the SPD will be a material consideration in determination of the BAL 12mppa application. Compliance with the SPD enables proposals to demonstrate that adverse impacts on the SAC will be avoided or mitigated. In particular, the SPD states: "*…the landscapes around the SAC itself are also important in providing foraging habitat needed to maintain the favourable conservation status of the horseshoe bats. Therefore, the guidance sets out strong requirements for consultation, survey information and appropriate mitigation, to demonstrate that development proposals will not adversely impact on the designated bat populations.*"

The proposed Extension to the Silver Zone car park (Phase 2) is located within Zone B and the A38 Highway Improvement land within Zone C of the 'Bat Consultation Zone' identified in the SPD, with Bristol Airport itself

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being partly located in Zone B and partly located in Zone C. The SPD requires that development proposals within Zones B and C meet certain survey requirements and, where lesser horseshoe bats and/or greater horseshoe bats are likely to be affected, there is a requirement that mitigation is secured to avoid adverse effects on the integrity of the SAC.

Where existing habitats or features of value to bats cannot be retained as part of the development proposals, the SPD requires the provision of replacement habitat. The surveys undertaken in accordance with the SPD are also required to inform the metric for calculating the replacement habitat to be provided. The SPD sets out the precise methodology for calculating an appropriate level of replacement habitat. A suitable management plan for the site must be provided setting out how the site will be managed for SAC bats in perpetuity.

The SPD sets out how the Habitats Regulations will be applied at Section A7. In particular, it notes that any decision must be made on a precautionary basis and, following the Waddenzee case (C-127/02), that there can be no reasonable scientific doubt remaining as to the absence of adverse effects on the integrity of the site. It goes on to state (paragraphs A8 and A9):

> *"For the Somerset authorities to be able to conclude with enough certainty that a proposed project or development will not have a significant effect on the SAC, the proposal or project must therefore be supported by adequate evidence and bespoke, reasoned mitigation. Where appropriate a long term monitoring plan will be expected to assess whether the bat populations have responded favourably to the mitigation. It is important that consistent monitoring methods are used pre- and post-development, to facilitate the interpretation of monitoring data. Mitigation, an Ecological Management Plan and, (where required) monitoring during and / or post development, will be delivered and secured by Planning Condition 25. Data from monitoring will be used by the Somerset Authorities to determine how the bat populations have responded to mitigation and to increase the evidence base."*

The delivery of the replacement habitat requires a detailed Woodland (and Ecological) Management Plan (see separate Woodland Management Plan prepared by Johns Associates – key points are outlined here and in Appendix B) that will comply with the SPD to facilitate coordinated and targeted measures for both lesser and greater horseshoe bats in accordance with the habitat creation prescriptions detailed in Annex 6 of the SPD (and for other species of flora and fauna). This also delivers the relevant requirements of Planning Condition 25.

The provision of suitable replacement habitats in Lulsgate Wood can be described as (reproduced from the SPD):

> Bristol Airport Woodland: *"4.38 ha of existing coniferous plantation (WC0) with canopy cover 75-90% (WF111) currently unmanaged located in SAC Band A managed to become mixed woodland (WB0) with canopy cover <20% (WF114) within 10 years".*

The replacement habitat management option (4.38ha is required out of a total of 6.34ha available) would be phased to deliver the required area in advance of any loss of grassland or woodland horseshoe bat foraging habitat associated with the Silver Zone car park (Phase 2), which is 4.26ha in 2023 then the remaining 0.14ha associated with the A38 highway improvements in 2024.

3.4 HABITATS

3.5

Lulsgate Wood is dominated by coniferous plantation woodland habitat. The canopy has been planted with two different canopy crop species Scots pine *Pinus sylvestris* and hybrid larch *Larix marschlinsii*. Hybrid larch is widely used as a forestry crop species due to its quick growth rate and its ability to grow in poorer conditions. The woodland understory and field layer throughout this habitat were fairly homogeneous. The understory is generally very sparse often without any structure between the canopy and the field layer. The lack of understory within the Site may be due to previous thinning of the plantation crop in the past which might have removed much of the

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scrub present at the time. There are a few young trees of ash *Fraxinus excelsior* and oak *Quercus robur* growing up through the understory. The most frequently occurring scrub species throughout the understory is hawthorn *Crataegus monogyna* and hazel *Corylus avellana*.

The field layer is dominated by a mix of bramble *Rubus fruticosus* agg., bracken *Pteridium aquilinum* and honeysuckle *Lonicera periclymenum* other species occur very infrequently likely due to the heavy shading from the species previously mentioned. Ferns such as broad buckler fern *Dryopteris d*ilatata, grasses, both Yorkshire fog *Holcus lanatus* and false brome *Brachypodium sylvaticum* and moss species occur occasionally throughout the field layer.

In the northern part of the wood there are wetter areas that have been created by old track ways and ruts which have been colonized by a number of species associated with damp and wet habitats. These include a range of sedges, pendulous sedge *Carex pendula*, wood sedge *Carex sylvatica* and remote sedge *Carex remota*. Soft rush *Juncus effusus*, bog stitchwort *Stellaria alsine*, brooklime *Veronica beccabunga*, common figwort *Scrophularia nodosa* and tufted hair grass *Deschampsia cespitosa* are also present within this area.

Areas of semi-natural coniferous woodland occur within the Site, these areas are dominated by Yew *Taxus baccata*, only a few other species are present within the canopy the most frequent species to break through the yew canopy being common whitebeam *Sorbus aria* and rarely ash *Fraxinus excelsior*. This woodland type occurs on very rocky calcicolous ground and over a calcicolous scree slope which ran along the southern boundary of the site.

Wayfairing tree *Viburnum lantana*, hawthorn *Crataegus m*onogyna and wych elm *Ulmus glabra* occur as only as a handful of individual plants within the understorey, which is due to the dense yew canopy cover. The field layer was also very sparse, ash *Fraxinus excelsior* seedlings occur prolifically in sections of the woodland floor where there is more light ingress.

The calcicolous scree slope located associated with the southern boundary is an area that supports fern communities which are comprised of commonly occurring species included harts tongue fern *Asplenium scolopendrium*, Broad buckler fern *Dryopteris dilatata*, male fern, *Dryopteris affinis* scaly male fern *Dryopteris filix-mas*, lady fern *Athyrium filix-femina* and hard fern *Blechnum spicant*.

A number of non-native tree species are present along a footpath which run along the top of the scree slope (southern boundary area). Both turkey oak *Quercus cerris* and holly oak *Quercus ilex* are present in this area, although *Quercus ilex* is not listed under schedule 9 under the Wildlife and Countryside Act 1981 (as amended) it can become invasive in certain habitats, especially on calcareous rock faces and cliffs, quickly spreading and shading out native species.
There is a small area of broad-leaved semi-natural woodland that occurred towards the south-west of the Site. The canopy here is dominated by ash *Fraxinus excelsior* with oak *Quercus r*obur occurring occasionally, the canopy is fairly open and it is likely that this area had been previously opened up by either windfall causalities of the plantation crop species, or this area had been felled and not replanted, this has led to the opening up of the area and has allowed for regeneration with increased light ingress to the woodland floor.

The understory and field layer of this area was more diverse than the areas dominated by coniferous species. The field layer had an abundance of dog's mercury Mercurialis perennis together with bramble *Rubus fruticosus* and ivy *Hedera helix*. Other species occurring frequently throughout the area include, enchanter's nightshade *Circaea lutetiana*, wood avens *Geum urbanum*, lords-and-ladies *Arum maculatum*, wood melick *Melica uniflora* and common dog-violet *Viola rivinana*.

An old stone boundary wall runs along the western and southern boundaries, the wall has fallen down in many places and supports a range of moss and fern species including, broad buckler fern *Dryopteris dilatata*, harts tongue fern *Asplenium scolopendrium* and common polypody *Polypodium vulgare* occurring rarely.

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There are a couple of informal paths running through the woodland, these were generally dominated by bare ground with leaf litter, being more obscured by bramble and bracken growth during the latter part of the year.

3.6 NVC SURVEY

Overall the majority of the woodland within the site, classified as W10, is of low botanical interest due to its plantation nature and limited diversity due to dominance of bramble, bracken and honeysuckle in the field layer. However, the areas of semi-natural coniferous yew woodland and area of regeneration ash woodland have greater botanical importance and fall into two BAP priority habitats. W13 woodland falls into Lowland Beech and Yew Woodland and W8 falls into lowland mixed deciduous woodland. W13 woodland is a particularly unusual NVC community in the west of the country and should be retained and protected.

3.7 BATS

3.7.1 Woodland Edge Monitoring Location

Generalist Edge Adapted Species: Both common and soprano pipistrelle were recorded during the transect and static detector surveys however common pipistrelle activity was substantially greater. Common pipistrelle bat passes were high during August during the post-maternity period when juveniles are flying independently. The Site is considered to be within CSZ for juvenile common and soprano pipistrelle but not for a maternity colony.

3.7.2 Open Air Foraging Species

- Noctule were recorded in low numbers at this location with Serotine completely absent.
- Lesser and greater horseshoe were recorded at good levels at this location but ST2 recorded significantly higher number of recordings.

3.7.3 Woodland/Clutter foraging Species

- Myotis species activity recorded the highest level of activity at this location which is of the statistical analysis identifying a significant difference (P=<0.05) between activity at this location and elsewhere.
- These findings are considered to indicate probable commuting activity at the adjacent track.
- No myotis species were caught during the trapping surveys so the species present on Site cannot be confidently confirmed.
- Plecotus species were recorded in low numbers at this location with a total of 4 recordings. However, it was the most frequently caught species during the trapping surveys (three bats were caught, accounting for 50% of all bats caught). It is likely that the results of the static surveys under-represents the use of the Site by this species group, owing to their call being quiet (difficult to detect) and with regard to the foraging technique of this species, which can often be a combination of listening and sight rather than echolocation.
- One barbastelle recording was made at this location.

3.7.4 Woodland Ground Level Monitoring Location

Generalist Edge Adapted Species
Both common and soprano pipistrelle were recorded during the transect and static detector surveys however common pipistrelle activity was substantially greater. This was at a lower level of activity than at the woodland edge.

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Open Air Foraging Species
Noctule and serotine were recorded in low numbers at this location. Majority of records for greater horseshoe were made at the woodland ground monitoring location; with 2,527 (81.9%) of records made at this location which were found to be a statistically significant difference between activity at this location and elsewhere ($P<0.05$).

Due to the proximity of the Site to the maternity colony at Brockley Hall Stables SSSI, and the high number of recordings made consistently over the survey period, particularly during the natal period, along with the high number of greater horseshoe seen crossing into the site (28 bats in August); the Site is considered highly likely to form part of the maternity colonies CSZ. The Site is also likely to form part of the CSZ for juvenile greater horseshoe bats which is indicated by the rise in recordings in August in addition to the capture of a juvenile which was flying with an adult. As such, the Site is considered important for greater horseshoe bats.

The majority of records for lesser horseshoe were made at the woodland ground monitoring location, with 665 records made at this location (>75% of all records made for this species); and there was found to be a statistically significant difference between activity at ST2 and elsewhere. There was a peak in activity in May with 603 lesser horseshoe records made during this month, accounting for >68% of all records made for this species). This is followed by a decrease in activity levels during the summer months (June, July and August), with a slight increase in activity levels again in September and October.

These levels of early activity for lesser horseshoe suggests that the Site provides foraging habitat for this species commuting between winter and summer roosts, most notably for bats associated with the hibernation roost at King's Wood and Urchin Wood SSSI. The Site may fall within the CSZ for lesser horseshoe bats following hibernation at King's Wood and Urchin Wood.

Woodland/Clutter foraging Species
Plecotus species were recorded in low numbers at this location with a total of 16 recordings. However, it was the most frequently caught species during the trapping surveys (three bats were caught, accounting for 50% of all bats caught). It is likely that the results of the static surveys under-represents the use of the Site by this species group, owing to their call being quiet (difficult to detect) and with regard to the foraging technique of this species, which can often be a combination of listening and sight rather than echolocation. One barbastelle recording was made at this location.

3.7.5 Woodland Canopy Monitoring Location

Both common and soprano pipistrelle were recorded during the transect and static detector surveys however common pipistrelle activity was substantially greater. The number of recordings at this location were at a very similar level of activity to the woodland edge. The Site is considered to be within CSZ for juvenile common and soprano pipistrelle but not for a maternity colony.

Open Air Foraging Species
Noctule and serotine were recorded at their highest level at this location (21 and 4 recordings respectively). Lesser and greater horseshoe were recorded at good levels at this location but at the lowest level across the three locations.

Woodland/Clutter foraging Species
Myotis species was recorded at its lowest level at this location. Plecotus species were recorded at their highest level at this location. Four barbastelle recording was made at this location which is the highest number of recordings across the static locations.

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3.7.6 Trapping

No adult female horseshoes were captured during the trapping surveys therefore, it was not possible to confirm use of the site by breeding females. However, it is strongly indicated that the Site is used by breeding females from static detector surveys and transect records. A juvenile female was captured during the trapping surveys which confirms of the Site by juvenile greater horseshoe bats. 50% of all bats caught were brown long-eared bats which were all considered to be in breeding condition. No myotis species were captured during the course of the trapping surveys.

Barbastelle were confirmed to be using the Site due to capture of an adult male which was considered to be in breeding condition. Male lesser horseshoe was also captured and considered to be at the start of its breeding condition due to large testis but no presence of epididymis.

3.8 GREAT CRESTED NEWT

The Site does not support any aquatic habitat for great crested newt, with the closest pond being located at least 530m north-west of the Site. Furthermore, the Site comprises free-draining soil over limestone, making the Site particularly dry, with only a few few wet depressions present after periods of heavy rain (evident from numerous Site visits); further limiting its' suitability to this species.

The habitats on Site offer good-quality terrestrial habitat for newts, with the woodland offering foraging, refuge and hibernation habitat. Dead-wood, mossy ground, leaf-litter, bracken cover and root cavities offer foraging and refuge habitats; with tree root crevices, the dry-stone wall, earth banks, rocks, brash and deadwood offering hibernation habitat.

A small breeding metapopulation of great crested newt is located approximately 1.1km east of the Site. Considering the distance of the Site from these water bodies, there is considered to be a negligible likelihood of this population of great crested newt using the Site as terrestrial/ hibernation habitat. Furthermore, extensive hibernation habitat is likely located within woodland habitat (similar to that on Site), which is situated between the Site and the nearby great crested newt population.

The Site is located within a large area of woodland at least 2km in breadth, also making it highly unlikely that great crested newt would use the woodland as a migratory route to ponds, owing to ponds being >1.5 from each other.

3.9 DORMOUSE

Lulsgate Wood supports dormice, with a peak count of four dormice being recorded in October 2019. The Site likely supports natural nesting sites, evident from peak counts ranging from 1-4 dormice in 2019, indicating that they are using the nest boxes intermittently in combination with natural nest sites. Furthermore, formerly occupied nests were found to be unoccupied on subsequent visits, indicating that the dormice on Site regularly move nests. No actively used nest boxes were located in 2022, despite cleaning of the boxes in 2021, however, alternative natural habitat is present, and adjacent woodland is also known to support dormouse.

3.10 BADGER

Very limited evidence of badger has been recorded in Lulsgate Wood. It is considered that badgers only occasionally use the Site and no active setts are present. Lulsgate Wood offers good quality foraging but limited sett building habitat (due to proximity of bedrock) and adjacent parcels of adjacent woodland offer further extensive suitable habitat.

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3.11 INVERTEBRATES

Lulsgate Wood supports a limited number of promoting features for invertebrates, predominantly standing and fallen dead wood; a south-facing slope and rock face; and excellent connectivity to adjacent habitats. The lack of habitat diversity, or a mosaic of habitats limits its suitability to invertebrates; with the woodland typically lacking a well-established shrub and scrub understory layer.

Rocks and tracks offer basking opportunities to butterfly species, and also offer day roosting habitat for moths such as chalk carpet; in addition to offering habitat to beetle and orthoptera species.

Floristic diversity and abundance is low, though beneficial nectar and pollen producing plants are present in certain locations such as honeysuckle, traveller's joy, dog violet, dandelion, creeping buttercup, bramble and wild strawberry; offering suitability to pollinators such as lepidoptera and diptera species.

The high proportion of conifers limits the development of leaf-litter, which would likely be a limiting factor with regard to beetle and earthworm species.
While the Site is generally suboptimal for supporting a diversity of invertebrates, a number of notable species have been recorded in proximity to the Site. The presence of the adjacent Goblin Combe SSSI, featuring grassland habitat likely enhances the Site for invertebrates by offering nearby alternative habitat for species which prefer grassland habitats, such as mottled grasshopper and butterfly species wall and grayling. The Site supports beneficial species of flora for notable lepidoptera species, offering larval and adult foodplants for a high number of the species recorded locally, referring to the desk study.

Species of particular suitability to the Site include moth species satin beauty, buff ermine and ghost moth; and butterfly species green hairstreak and white admiral.

Birds
Local records indicate a wide range of species associated with the wider woodland associated with Lulsgate Wood.

These include the following set out below[1]:

[1] Sourced from https://www.landscapebritain.co.uk/nature-reserves/somerset/goblin-combe/ accessed 16/01/23

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- Black-Headed Gull (Chroicocephalus ridibundus)
- Blackbird (Turdus merula)
- Blackcap (Sylvia atricapilla)
- Blue Tit (Cyanistes caeruleus)
- Bullfinch (Pyrrhula pyrrhula)
- Buzzard (Buteo buteo)
- Carrion Crow (Corvus corone subsp. corone)
- Carrion Crow (Corvus corone)
- Carrion/Hooded Crow (Corvus corone agg.)
- Chaffinch (Fringilla coelebs)
- Chiffchaff (Phylloscopus collybita)
- Coal Tit (Periparus ater)
- Collared Dove (Streptopelia decaocto)
- Common Swift (Apus apus)
- Continental Goldcrest (Regulus regulus)
- Continental Robin (Erithacus rubecula)
- Cormorant (Phalacrocorax carbo)
- Crossbill (Loxia curvirostra)
- Cuckoo (Cuculus canorus)
- Dunnock (Prunella modularis)
- Feral Pigeon (Columba livia)
- Fieldfare (Turdus pilaris)
- Garden Warbler (Sylvia borin)
- Goldfinch (Carduelis carduelis)
- Great Spotted Woodpecker (Dendrocopos major)
- Great Tit (Parus major)
- Green Woodpecker (Picus viridis)
- Greenfinch (Chloris chloris)
- Grey Heron (Ardea cinerea)
- Grey Wagtail (Motacilla cinerea)
- Herring Gull (Larus argentatus)
- House Martin (Delichon urbicum)
- House Sparrow (Passer domesticus)
- Jackdaw (Corvus monedula)
- Jay (Garrulus glandarius)
- Kestrel (Falco tinnunculus)
- Lesser Black-Backed Gull (Larus fuscus)
- Lesser Redpoll (Acanthis cabaret)
- Little Owl (Athene noctua)
- Long-Tailed Tit (Aegithalos caudatus)
- Magpie (Pica pica)
- Marsh Tit (Poecile palustris)
- Meadow Pipit (Anthus pratensis)
- Mistle Thrush (Turdus viscivorus)
- Nuthatch (Sitta europaea)
- Pheasant (Phasianus colchicus)
- Pied/White Wagtail (Motacilla alba)
- Raven (Corvus corax)
- Redpoll (Acanthis flammea)
- Redwing (Turdus iliacus)
- Rook (Corvus frugilegus)
- Siskin (Spinus spinus)
- Skylark (Alauda arvensis)
- Song Thrush (Turdus philomelos)
- Sparrowhawk (Accipiter nisus)
- Spotted Flycatcher (Muscicapa striata)
- Starling (Sturnus vulgaris)
- Stock Dove (Columba oenas)
- Swallow (Hirundo rustica)
- Tawny Owl (Strix aluco)
- Tree Sparrow (Passer montanus)
- Treecreeper (Certhia familiaris)
- Turtle Dove (Streptopelia turtur)
- Wheatear (Oenanthe oenanthe)
- Whitethroat (Sylvia communis)
- Willow Warbler (Phylloscopus trochilus)
- Wood Warbler (Phylloscopus sibilatrix)
- Woodcock (Scolopax rusticola)
- Woodpigeon (Columba palumbus)
- Wren (Troglodytes troglodytes)

A number of these species are likely to be associated with Lulsgate Wood, although the dominance of the even aged conifer plantation will restrict diversity.

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4 DETAILS OF THE EXTENT AND LOCATION OF HABITAT RETENTION, CREATION AND ENHANCEMENT MEASURES

4.1 ON SITE MEASURES

Detailed knowledge of the flora and fauna and landscape and visual receptors associated with Bristol Airport has been gathered since at least 2005 and this has been used to confirm the on-site features to be managed under this LBMMP. Full details of these and associated assessments can be found in the Environmental Statement and supporting Appendices and other documents prepared in support of planning application 18/P/5118/OUT and the associated Planning Appeal.

A range of environmental measures have been integrated and embedded into the development proposals as outlined in Table 4.1. Please refer to the Integrated/Embedded Landscape, Visual and Ecological Mitigation Masterplan in Appendix C of the 12mppa ES for the location of these measures and the associated on site features that will be managed.

Table 4.1 Summary of On-site Features to be Managed as set out in the Integrated Landscape Visual and Ecological Mitigation Masterplan (Appendix C)

Receptor	On-site Habitat Affected, Changes and Effects	Integrated / embedded measures and associated on site features to be managed (please refer to Appendix A)
North Somerset & Mendip Bats SAC	Loss of 3.73ha of cattle grazed species poor semi-improved grassland associated with the proposed Silver Zone Car Park Extension (Phase 2) Loss of 0.16ha of sycamore dominated broadleaved woodland edge along the junction of Downside Road and the A38 Potential for direct effects to foraging and commuting behaviour of greater and lesser horseshoe bats from habitat loss associated with the Silver Zone Car Park Extension (Phase 2) area and the A38 highway improvement works. There is potential for disturbance effects to foraging and commuting horseshoe bats associated with the retained boundary and wider habitat features associated with the Silver Zone Car Park Extension (Phase 2) area and at the A38 highway improvements from newly introduced lighting. Potential for emissions from increased numbers of movements and an increase in road traffic associated with Bristol Airport, to result in nitrogen deposition and a reduction in the favourable conservation status of the vegetative designated features of interest associated with the SSSIs and associated SAC.	A. Full retention and ongoing management of the existing perimeter hedgerows and hedgerow trees. Construction of all bunds/structures outside of root protection area of existing/retained trees. Provision of suitable tree protection fencing during construction to demarcate and protect retained trees. B. Reduced footprint of the Silver Zone Car Park Extension (Phase 2) to a minimum extent (3.73ha), thereby maximising the retention of areas that can provide alternative but equally valuable bat foraging habitat (woodland and grassland) with further positive benefits to the microclimate (increase in sheltered conditions) associated with the retained perimeter features and new planted bund (see Measure 14 below). C. Lighting regime in the Silver Zone Car Park Extension (Phase 1) designed and installed to ensure that lux levels at the security fence perimeter are less than 1 lux and Silver Zone Car Park Extension (Phase 2) designed and installed to ensure that lux levels at the security fence perimeter are less than 0.5lux. This will be achieved through the use of specific lighting design criteria and guidelines (e.g. Institute of Lighting Professionals and the Bat Conservation Trust. 2018. Bats and Artificial Lighting in the UK. Bats and the Built Environment Series. Guidance Note 08/18) D. Lighting associated with the highway improvements along the A38/Downside Road junction will be no greater than current levels and <0.5 lux within and above the future woodland boundary/canopy. This will be achieved through the use of specific lighting design criteria and guidelines (e.g. Institute of Lighting Professionals and the Bat Conservation Trust. 2018. Bats and Artificial Lighting in the UK. Bats and the Built Environment Series. Guidance Note 08/18) as well

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		the use of planting of holly and yew,and fencing to reinforce the woodland edge/minimise light penetration. E. Provision of parkland trees within Downside Meadow to directly replace the loss of circa 0.16 ha associated with the A38/Downside Road junction (see Measure 3 below). F. Protection and management of existing woodland east of the A38 roundabout and main application site entrance and provision of circa 0.34ha of new broad-leaved woodland (see Measure 4 and 5 below). Both existing and planted woodland will be improved in quality from a current limited level of opportunities for horseshoe and other bat species by thinning the currently very dense woodland interior and provision of small pathways/rides within the existing woodland block. G. Implementation of embedded construction and air quality management measures including: a Dust Management Plan (DMP) as part of a Construction Environmental Management Plan (CEMP) – not presented in this document, agree and enforce a strict routeing agreement for incoming and outgoing Heavy Goods Vehicles (HGV), avoiding, where possible, peak traffic flow hours in order to minimise congestion and queuing, locating stockpiles away from the application site boundary/receptors, covering or damping down stockpiles, stockpile maintenance/management, and removal of materials from the application site. Enforce a "no unnecessary idling" policy for all vehicles on the application site. Implementing a range of operational air quality management measures including planning of aircraft arrival and departure scheduling to avoid over-long idling, taxiing and hold times. The airfield layout has been designed to minimise times for taxiing and holding. Maximise the use of reduced-engine taxiing. Use of Fixed Electrical Ground Power to minimise engine/auxiliary power unit (APU) use.
North Somerset & Mendip Bat SAC constituent SSSIs: Brockley Hall Stables SSSI and King's Wood SSSI, Banwell Caves, Banwell Ochre Caves SSSI, Compton Martin Ochre Mine SSSI, and Wookey Hole SSSI, Chedder Complex SSSI	As above	See measures A to G described above.
Goblin Coombe SSSI	As above	See measures A to G described above.
Avon Gorge SAC (and constituent SSSIs) – air quality	Potential for emissions from increased numbers of aircraft movements and an increase in road traffic associated with Bristol Airport will result in nitrogen deposition and a reduction in the favourable conservation status of the vegetative designated features of interest associated with the SAC, specifically H6210 Semi-natural dry grassland and scrubland facies: on calcareous substrates (Festuco-Brometalia, including the priority feature 'orchid rich sites'), and H9180 Tilio-Acerion forests of slopes, scree and ravines.	See Measure G described above.

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Mendip Woodlands SAC (and constituent SSSIs) – air quality	There is the potential that emissions to air from an increased number of aircraft taking off and landing at Bristol Airport and an increase in road traffic associated with Bristol Airport will result in nitrogen deposition and a reduction in the favourable conservation status of the vegetative designated features of interest associate with the SAC, specifically H9180 Tilio-Acerion forests of slopes, scree and ravines.	See Measure G described above.
Chew Valley Lake SPA (and SSSIs) – air quality	Potential emissions from increased number of aircraft movements and an increase in road traffic associated with Bristol Airport will result in nitrogen deposition and a reduction in the favourable conservation status of the vegetation associated with the SAC and SSSI, e.g. fringing reedbeds, carr woodland, open water plant communities and surrounding grassland communities. The open water of the reservoir and its margins are of the greatest value for wintering waterbirds which are the main designated features of interest.	See Measure G described above.
Felton Common LNR (acting as a surrogate for all other non-statutorily designated sites due to its position adjacent to the eastern boundary of the application site)	There is the potential for increased disturbance to fauna associated with Felton Common LNR from an increase in aircraft movements over this area. Potential for emissions from increased numbers of aircraft movements and an increase in road traffic associated with Bristol Airport, to result in nitrogen deposition and a reduction in the favourable conservation status of the vegetative designated features of interest associated with Felton Common LNR (acidic and calcareous grassland, scrub (including limestone heath), and hedgerows).	Increased provision of woodland habitat at Bristol Airport associated with Measure 4 (see below) to provide additional refuge habitat, noting the absence of species highly sensitive to an increase in overflying aircraft, also given the existing levels of disturbance and habituation. See Measure G described above.
Non-statutorily locally designated Sites of Nature Conservation Interest	Potential for emissions from increased numbers of aircraft movements and an increase in road traffic associated with Bristol Airport, to result in nitrogen deposition and a reduction in the favourable conservation status of the vegetative designated features of interest associated with locally designated Sites of Nature Conservation Interest (including woodlands, hedgerows, species-rich grasslands, ponds, wildlife corridors).	See Measure G described above.
Ancient Woodland (acting as a surrogate receptor for all woodland) including ancient woodland at Brockley Combe, Garleys Wood, Hyatts Wood, Oatfield Wood, Lye Wood, Scars Wood, High Wood, Horts Wood, Little Horts Wood, Tuckers Grove and Whitley Coppice, Shippenhays Wood, Prestow Wood and Corporation Woods.	Potential for emissions from increased numbers of aircraft movements and an increase in road traffic associated with Bristol Airport, to result in nitrogen deposition and a reduction in the favourable conservation status of the local Ancient Woodland.	See Measure G described above.
Groundwater-fed surface watercourses (associated with the aquifer under the application site) (River Kenn, Little River, Land Yeo, River	There is the potential for accidental pollution (e.g. hydrocarbon spillages) to be transported through groundwater below the application site and enter groundwater surface watercourses, changing water quality and coming into direct contact with	Please refer to best practice design and pollution prevention and response measures in the CEMP – not presented in this document.

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Chew, Winford Brook, Congresbury Yeo)	vegetation, sediment and some fauna causing chronic or acute effects.	
Bats	Loss of 3.73ha of cattle grazed species poor semi-improved grassland associated with the Silver Zone Car Park Extension (Phase 2) area. Loss of 0.16ha of sycamore dominated broadleaved woodland edge along the junction of Downside Road and the A38 There is a potential for direct effects to the foraging and commuting behaviour of bats at the application site from the loss of suitable habitat from the construction of the car park in the south west of the application site at the Silver Zone Car Park Extension (Phase 2) area and the highway improvement works at the junction of the A38 and Downside Road. There is potential for disturbance effects to foraging and commuting bats associated with the retained boundary and wider habitat features associated with the Silver Zone Car Park Extension (Phase 2) and at the A38 highway improvements from newly introduced lighting. Potential for emissions from increased numbers of aircraft movements and an increase in road traffic associated with Bristol Airport, to result in nitrogen deposition and a reduction in the favourable conservation status of vegetation associated with key habitats and prey species.	See integrated/embedded mitigation and enhancement measures A to G described above. Measures set out on the Integrated / Embedded Landscape, Visual and Ecological Mitigation Masterplan (see Appendix A) and listed below (individual measures / numbers relate to the drawing included in Appendix A): 1. Reinforce 250m of existing tall native hedgerow. Extend scrub planting at northern (Downside Road) end with provision for rides in scrub. Extend existing bat tower roost. 2. Reinforce 70m of woodland planting on the top and northern side of bund. Plant climbers (honey suckle, ivy and Clematis vitalba) on trellis along northern side of acoustic wall to soften appearance in views and provide opportunities for pollinators. 3. Provision of limited parkland tree planting in the remainder of the 0.3ha grassland to enhance for area for horseshoe bats and other species of bats. Provision of mown paths and information board (as per Measure F above). 4. Existing 0.35ha woodland copse to have management regime amended to thin internal areas of woodland to enhance habitat for bats, nesting birds and badgers (as per measure G above). 5. Extend woodland copse (4) to east by 0.3ha. Scallop eastern edge (as per Measure G above). 6. Enhance species diversity in existing 3.8ha grass sward using BAL supplied mix and CAP 772 compliant management plan (80% Grass: 7.00% Browntop Bent Argostis castellana 18.5% Red Fescue Festuca rubra 21.00% Crested Dogstail Cynosurus cristatus 28.50% Meadow Fescue Festuca pratensis 25.00% Smooth Stalked Meadow Grass Poa pratensis 20 % Wild Flowers: 5.00% Birdsfoot Trefoil Lotus corniculatus 8.00% Black Knapweed Centaurea nigra 5.00% Black Medic Medicago lupilina Yellow 5.00% Common Vetch Vicia sativa 7.00% Meadow Buttercup Ranunculus acris 4.00% Musk Mallow Malva moschata 12.00% Ox Eye Daisy Leucanthemum vulgare 8.00% Red Campion Silene dioca 12.00% Ribwort Plantain Plantago lanceolata 13.00% Self Heal Prunella vulgaris purple 15.00% White Campion Silene alba White 6.00% Yarrow Achillea millefolium. 7. Reinforce and thicken 120m of existing hedgerow and allow to grow to a maximum of 1.5m height. 8. Allow 300m of hedgerow section to grow out to improve screening effectiveness to a maximum of 1.5m height. 9. Introduce extra heavy standard trees into southern section of A38 boundary hedgerow and allow hedgerow section to grow out to maximum height of 1.5m. 10. Introduce 0.5ha small copses in the south-eastern and south-western corners of Gruffy's (Cornerpool) Field around existing building bat roosts. Ensure that in combination with (11) the total area of scrub/tree cover within field does not exceed 20% of surface area to maximise its attractiveness to horseshoe bats. Extend and enhance existing bat roosts.

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		11. Introduce parkland trees (protected from grazing) to Gruffy's (Cornerpool) Field to enhance existing patches of scrub so that the total area of scrub/tree cover within field does not exceed 20% of surface area to maximise its attractiveness to horseshoe bats. 12. Reinforce and thicken 235m of existing hedgerow and allow to grow to a maximum height of 1.5m. 13. Existing 1.1ha woodland copse to have management regime amended to enhance habitat for horseshoe bats. Extend and enhance existing horseshoe bat roosts. New building bat roost. 14. The Silver Zone Car Park Extension (Phase 2) area will include a 600m long x 10m perimeter bund with design, tree planting and seeding to replicate existing bund surrounding the Silver Zone Car Park Extension (Phase 1). Lighting regime in the Silver Sone Car Park Extension (Phase 1) to be maintained at the currently agreed 1 lux and the Silver Zone Car Park Extension (Phase 2) area has perimeter lux levels no greater than 0.5lux. 15. Improve existing pond to enhance conditions for lesser horseshoe bats, other species of bats, badger, common amphibians, birds and invertebrates. 16. Woodland management within retained 0.33ha to improve structure and composition, any necessary tree surgery, remove non-native invasive species and to plant native local species including hazel, yew and holly along the woodland margin to increase ecological functionality and to help reduce artificial light ingress into the woodland.
Breeding birds	Loss of circa 0.3ha of scrub within cattle grazed species poor semi-improved grassland associated with Silver Zone Car Park Extension (Phase 2) area – scattered scrub being suitable for nesting for some species. Loss of 0.16ha of sycamore dominated broadleaved woodland edge along the junction of Downside Road and the A38 Land take/ land cover change (habitat removal); management changes resulting in a reduction in breeding/nesting habitat. Potential direct effects on birds, young and/or eggs due to damage or destruction of active nests.	Provision of extensive replacement bird nesting, foraging, perching etc habitat, introduction of management to areas of potential nesting. Implemented through the delivery of the Measures described above. Avoidance of potential effects on actively nesting birds, young, eggs and nest through the avoidance of vegetation clearance between February to August inclusive, or through the use of a suitably qualified ecologist who has confirm no nesting activity present within 48 hours of clearance between February and August.
Badgers	Loss of 3.73ha of cattle grazed species poor semi-improved grassland associated with Silver Zone Car Park Extension (Phase 2) area Loss of 0.16ha of sycamore dominated broadleaved woodland edge along the junction of Downside Road and the A38 Potential disturbance of badgers in nearby setts associated with the construction of the Silver Zone Car Park Extension (Phase 2). Loss of some foraging habitat associated with the Silver Zone Car Park Extension (Phase 2).	Repeat badger survey to re-confirm extent of setts and to confirm any measures required. Relocation of car park access to the east. Works to be carried out under Natural England badger licence if sett expansion or new setts have been constructed. Use of an Ecological Clerk of Works during construction.

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Hazel dormouse	Loss of 0.16ha of potential dormouse habitat associated with the A38 highway improvements area and associated injury/killing risk (considered to be very low based on historic surveys and survey data	Completion of on-going dormouse monitoring across the airport to reconfirm absence. If subsequently confirmed to be present, all works to be carried out under Natural England dormouse EPS licence. Clearance of above ground vegetation from October until April and below ground vegetative structure and other potential hibernation features from May until October. Provision of additional replacement woodland / arboreal habitat in accordance with Measures 3, 4, 5 and 16 above. Introduction of suitable management regime in woodland associated with the A38 highway improvements area to enhance foraging, overwintering and nesting opportunities for dormouse.
Broadleaved woodland – semi-natural	Loss of small area (0.16m^2) of limited quality of woodland edge (dominated by sycamore, with associated scrub and bare ground) to be removed to form the highway improvement works at the junction of Downside Road and the A38 ranging from up to 10m from the existing road edge on the A38 and up to 8.5m from the edge of Downside Road.	Provision of suitable tree protection fencing during construction to demarcate and protect retained trees. Provision of additional replacement woodland habitat in accordance with Measures 3, 4, 5, 14 and 16 above, as well as application site wide measures to maintain/enhance woodland blocks (Measures 4 and 13) and introduce new woodland planting on the landscape bund in the Silver Zone Car Park Extension (Phase 2) (Measure 14 above).
Intact hedge – native species rich with hedgerow trees	Loss of 5m of defunct hedge adjacent to the A38. Construction of new landscape bund with additional trees and wildflower grassland could impinge on the root protection zone of the existing hedgerow/hedgerow trees causing dieback.	Construction of bund outside of the root protection zone of the hedgerow (at least 3m). Reinforcement/gap-filling of circa 600m of existing hedge and allow circa 300m to thicken and grow out as per measures specified above. Provision of suitable protection fencing during construction to demarcate and protect retained hedgerow. Introduction of suitable hedgerow management regime, suitable for multiple species as per Measures listed above.
Scattered scrub – see bats.	Loss of 0.3ha of scrub habitat in open grassland at the Silver Zone Car Park Extension (Phase 2) that supports foraging horseshoe bats and other species of bats and birds.	Provision of circa 3000m^2 tree and shrub planting along new landscape bund associated with the perimeter of the Silver Zone Car Park Extension (Phase 2) (Measure 14).
(Poor-species rich) semi-improved grassland (cattle grazed and airfield) – see bats above	Reduction in foraging habitat for lesser and greater horseshoe bat species at Silver Zone Car Park Extension (Phase 2). Species rich grassland located in the proposed location for taxi-way extension and car park bund.	Provision of circa 3000m^2 wildflower rich grassland on the inside of the bund associated with the perimeter of the Silver Zone Car Park Extension (Phase 2) and its immediate vicinity (Measure 14). Provision of other extensive areas of species rich grassland as defined by Measure 6). Translocated species rich grassland associated with eastern taxi-way extension to similar location on airfield and that associated with the car park bund to the outer slope of the bund.
Standing water	Potential for the development of additional car park at the Silver Zone Car Park Extension (Phase 2) area to cause the loss of or change in quality of a single standing small waterbody on its perimeter.	The pond will be protected by the landscape bund and car park SuDS[2] system. The pond will be improved through initial desilting in the winter 2023 (and repeated if necessary every 5 years) and by increasing light levels and provision of

[2] "Sustainable Drainage Systems"

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		additional runoff to it from local elevated vegetated ground (Measure 15).
Hedgerows	Lengths of hedgerows will be removed to facilitate the development proposals, with likely adverse effects on species that commute along the hedgerows.	The scheme layout has been optimised to enable the retention of nearly all existing hedgerows with only short sections of defunct hedgerow being lost within the internal part of the north side car park, along the western side of the A38 and the edge of the car park at the Airport Tavern/A38. Measures 1, 7, 8, and 12 more than mitigate for the loss of hedgerow elsewhere. Provision of suitable tree protection fencing during construction to demarcate and protect retained trees.

4.2 OFFSITE MEASURES

Lulsgate Wood

Detailed knowledge of the flora and fauna associated with Bristol Airport's offsite woodland (Lulsgate Wood) has been gathered since 2018 and this has been used to confirm the features to be managed under this LBMMP. Full details of these and associated assessments and agreed measures can be found in the Forestry Commission (Felling Licence) Woodland Management Plan for Lulsgate Wood, and other associated documents prepared in support of the Felling Licence that enables the works.

These can be found and are provided in full as part of Appendix D.

A range of environmental measures have been integrated and embedded into the (Lulsgate Wood) Woodland Management Plan as outlined in Table 4.1. Please refer to the Woodland Management Masterplan and the full Woodland Management Plan associated with Appendix D for the location of these measures and the associated on site features that will be managed.

The implementation of the Vision for Lulsgate Wood will involve a range of woodland and conservation management proposals that will both comply with the North Somerset and Mendips Bat SAC SPD (to facilitate coordinated and targeted measures for both lesser and greater horseshoe bats in accordance with the habitat creation prescriptions detailed in Annex 6 of the SPD), for the restoration of a more natural mixed woodland habitat assemblage, and for other species of flora and fauna.

This will involve the following conservation elements as a minimum (please refer to the separate Woodland Management Plan in Appendix D, prepared by Johns Associates for full details):

- Provision of a suitably qualified and experienced Ecological Clerk of Works to oversee matters;
- Use of suitably experienced contractors to undertake the woodland management works;
- Some phasing of management over 2 years (represented by the retention of 1.714 existing deciduous and yew woodland, removal of over 4.26ha of mature non-native hybrid larch and Scot's pine in 2023, and then the remaining 0.14ha in 2024) also taking into account that Lulsgate Wood is also surrounded by a significant extensive woodland that also provide support for the SAC greater and lesser horseshoe bat populations. This greater proportion of felling in 2023 would be mitigated by the introduction of cattle grazing in spring 2024.
- Retention of as much of the understorey as possible and encouragement of natural regeneration from the native seedbank.
- Ecological toolbox talk for all individuals involved in delivering the woodland management work, including maintenance of an attendance register;

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- To achieve a high canopy cover of no more but no less than 20% across the conifer plantation areas through sensitive tree felling and removal, with reuse of deadwood resource as habitat and dead hedge/management features;
- Implementing works in accordance with all best practice procedures associated with protected species (e.g. Forestry Commission 2018. Protected Species A Reminder, Forestry Commission, European Protected Species and Woodland Operations Checklist V, Forestry Commission Operational Site Assessment, Forestry Commission 2019, A protocol for undertaking woodland management in England where dormice are present, Forestry Commission 2013, Guidance on Managing Woodland with Bats in England);
- Retaining some standing conifer monoliths and the creation of natural bat crevice features suitable for a range of species;
- Adaption of two known shafts as cooler /potential hibernation roost features for horseshoe bats (and other species), whilst making them safe to people;
- Provision of two timber bat cabins for greater and lesser horseshoe bats to use as night roosts located in the lower lying southern area of Lulsgate Wood as per guidance provided by the Vincent Wildlife Trust;
- Creating/enhancing habitat opportunities for abundant suitable prey species for lesser horseshoe bat: Diptera of the crepuscular sub-order Nematocera including Tipulidae (crane-flies), Ceratopogonidae (biting midges), Chironomidae (non-biting midges), Culicidae (mosquitoes), and Anisopodidae (window midges). Lepidoptera (moths) Trichoptera (caddis flies) and Neuroptera (lacewings); and greater horseshoe bat: cockchafer Melolontha melolontha; dung beetles Aphodius sp. (Coleoptera: Scarabaeidae); and moths (Lepidoptera), crane flies (Diptera: Tipulidae), ichneumonids (Hymenoptera: Ichneumonidae) of the Ophian luteus complex, and caddis flies (Trichoptera).
- Provision of small ponds and scrapes in the lower lying southern area of Lulsgate Wood to support lesser horseshoe bats;
- Creation of a network of rides and glades and maintaining the open space through cattle grazing from spring 2024;
- Introduction of cattle grazing in spring 2024, to manage areas of the woodland and to enhance the prey species availability and increase carrying capacity for an increase in the greater and lesser horseshoe bat population;
- Thinning of retained conifer tree groups and remaining dense growth through gradual felling, allowing natural regeneration and replanting where necessary;
- Maintain the open canopy structure of the thinned conifer plantation through the use of rotational cutting;
- Management to sustain all species present within the wood and to create diverse habitats for the recolonisation by other species to maximise biodiversity;
- Management of open spaces as glades, encouraging the regeneration of ground flora (exploring the potential to re-establish areas of calcareous grassland, thereby supporting the conservation objectives associated with Goblin Combe SSSI);
- Encouragement of early successional habitats and management through rotational coppicing;
- Creation of mixed habitat opportunities for invertebrates;
- Removal of any non-native and invasive species of tree/understorey;
- Bracken, bramble and other shrub control (as necessary);
- Pest control e.g. squirrel and deer;
- Disease control e.g. Phytophtgora ramoram in larch and Hymenoscyphus fraxineus in ash;
- Long term aim to achieve a balanced age structure and to maintain a continuous supply of young growth through regular thinning/felling and to protect and enhance mature features, such as large trees and dead wood;
- The management of the habitat will continue in the long term and, as such, a detailed plan is essential to ensure that the provision for horseshoe bats is maintained in the future;
- Additional measures will be introduced within the first 12 months to provide multispecies biodiversity mitigation and enhancement from these proposals. These are:
    - Retention of standing and fallen deadwood (extent to be agreed);
    - 6 x hibernacula and 6 x log pile refugia suitable for a range of species

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- Provision of 20 bird boxes on mature retained trees;
- Provision of a network of 50 dormouse boxes within the Site, co-located with higher quality arboreally connected understorey and a range of food plants;
- Design and provision of suitable information boards highlighting the purpose and nature of the management works and key features of interest.
- Best practice woodland management in relation to health and safety, access, sustainability and other aspects.

At Bristol Airport, the measures (as defined in Section 4.1 and the Integrated Biodiversity and Landscape Masterplan located in Appendix C) will be implemented by the end of 2024, to improve foraging/connected and roosting habitats for greater and lesser horseshoe bat, within Zone B and C of the SPD area and wider biodiversity receptors. These fall outside of, and are in addition to, the agreed SAC SPD measures for horseshoe bats associated with Lulsgate Wood and should be viewed as additional enhancements, which in combination with cattle grazing within Lusgate Wood by spring 2024, will avoid any effect associated with the phasing of the proposed reduction in woodland canopy.

Voluntary Additional Offsite Tree Planting (outwith 12mppa Planning Permission or Conditions)

Uncle Paul's Chilli Charity, Butcombe Farm, North Somerset (approximately 1000 trees and shrubs)
Bristol Airport is providing funding for this local Charity to plant native fruit trees as these provide legacy. Many of its beneficiaries will then be able to learn about food growing along with forestry, understanding the farm ecosystem and care for the environment. Some of the fruits be turned into produce in its production kitchen. helping beneficiaries to learn about the process of safe food handling, production, labelling and more. Finally, some of the trees will likely be coppice trees such as willow and hazel. These trees support teaching woodcraft techniques such as fence weaving.

Friendship Farm, Bradford on Avon, Wiltshire (establishment of wood pasture between 100 and 250 trees and shrubs). Funding will be provided to purchase and plant trees, together with suitable scrub and grassland to support the establishment of wood pasture on the outskirts of Bradford on Avon, close to an area of Ancient woodland. This area will be carefully cattle grazed and managed to support the establishment of oak – bracken - bramble woodland (W10) communities, that will be of value to greater and lesser horseshoe bats, and wider biodiversity within the consultation zone of the Bath and Bradford on Avon Special Area of Conservation.

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5 ECOLOGICAL TRENDS AND CONSTRAINTS THAT MIGHT INFLUENCE MANAGEMENT

5.1 ECOLOGICAL TRENDS

Ongoing trends for general warming and the presence of an increase in more frequent high intensity high duration storms as a result of climate change have been taken into account in this LBMMP. Climate change resilience has been considered and incorporated by selecting suitably resilient integrated and embedded mitigation and enhancement measures. Features such as hedgerow management, grassland woodland management and provision of new planted bunds will all help to provide an increase in green infrastructure around Bristol Airport, providing better habitat connectivity and cohesiveness. Bristol Airport already successfully manages its natural assets and this management will be ongoing, be monitored, and will be adapted further where necessary.

Integrated/embedded mitigation and enhancement measures will be delivered at an early stage in the Proposed Development (all to be implemented by the end of 2024), to provide an increase in green infrastructure and added resilience to the effects of climate change, including woodland management and measures associated with greater and lesser horseshoe bats and other species.

Greenhouse gas (GHG) emissions contribute to climate change, which could affect the designated features of European, national and local sites, habitats and species considered in this Chapter. For example: climate change may lead to grassland management changes resulting in the loss of foraging habitat for bats and/or badgers. Climate change may also lead to, for example, changes in the distribution of bats due to other areas within the UK and abroad becoming more suitable for the species, leading to decline in the SAC populations.

The Climate Change Adaptation Manual supports practical and pragmatic decision making and guides reasonable judgement on the potential effects of climate change on the key habitats associated with the application site. The habitats that characterise the application site: for example, dry grassland, deciduous woodland, and hedgerows are of low relative vulnerability to climate change[Error! Bookmark not defined.].

Climate change and its implications for biodiversity has been incorporated into the design of the embedded landscape, visual and ecological mitigation and enhancement habitats to reduce the risk of impact on legally protected and other species. Selection of measures that are based on habitats that are known to be more resilient to climate change and provide extended ecological functionality for a wide range of species across the airport have been selected. Specific Measures that have been included in this table, that will help mitigate the effects of climate change on ecological receptors at Bristol Airport are: Measures A, B, E, F, G, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16.

This has largely been achieved through the creation of additional areas of replacement habitat that are considered to have a low level of sensitivity to climate change (subject to appropriate management). These measures are associated with the provision of trees, hedgerow, scrub and woodland, the improvement of an existing pond, provision of new bat roosts and improvement in grassland species diversity. This LBMMP has been produced to guide appropriate long-term care of these and existing habitats.

5.2 POTENTIAL CONSTRAINTS

The development of this LBMMP has been influenced by considerations of safeguarding and security. With respect to bird strike and planting/seeding/habitat management at Bristol Airport, there is a need to comply with Civil Aviation Authority publication CAP772 which influences habitat and vegetation management regimes.

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Typically, land that is located 'airside' or directly aligned with the runway needs more controlled management from a safeguarding and safety perspective. In order to ensure compliance with counterterrorism measures, it is necessary to maintain clear lines of sight to and from the airfield boundary. This requires a 3-meter clear zone to be retained on the inside of the security fence to ensure that clear sight lines exist at the bottom of the fence.

The mitigation and enhancement measures set out in this LBMMP that both enhance biodiversity and the local landscape at Bristol Airport have been reviewed and informed by the Airport Operations team so have been developed to meet the requirements of CAP 772.

As the measures set out in this LBMMP have been developed over the last few years in consultation with North Somerset Council and Natural England, and all on-site and off-site land associated with this LBMMP is under the ownership and stewardship of Bristol Airport, there is a very high level of confidence that it will be successfully delivered.

The implementation of the measures and their successful on-going long-term management will be informed by a program of monitoring, reporting and engagement with North Somerset Council, Natural England and the Forestry Commission – enabling a reactive approach to be taken, should it be deemed necessary to modify any aspects of the LBMMP management regime to meet success criteria (see Sections 6, 7 and 8).

No other constraints to the successful delivery of this LBMMP have been identified or considered relevant.

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6 AIMS AND OBJECTIVES OF MANAGEMENT (INCLUDING CONDITION 20E) AND PROPOSED ACTIONS

6.1 AIMS AND OBJECTIVES

1. To preserve and enhance the biodiversity and quality of the landscape associated with Bristol Airport.
2. To mitigate and minimise the negative impacts of the growth of Bristol Airport to 12mppa on biodiversity, landscape and views of the airport.
3. To promote the ongoing sustainable management of green infrastructure at Bristol Airport.
4. To increase public awareness and appreciation of the Bristol Airport's biodiversity and natural heritage.
5. To foster collaboration and cooperation between stakeholders at and associated with Bristol Airport, that are involved in the management of biodiversity and its landscape features.

6.2 ACTIONS/MANAGEMENT PRESCRIPTIONS

6.2.1 Specific Actions and Management Prescriptions For Core Aims and Objectives

1: "To preserve and enhance the biodiversity and quality of the landscape associated with Bristol Airport"

2: "To mitigate and minimise the negative impacts of the growth of Bristol Airport to 12mppa on biodiversity, landscape and views of the airport"

Specific Actions and Prescriptions that will help achieve these aims are set out below.

Aim/Objective 1 and 2	Actions and Management Prescriptions
1/2A	Implement the on-site and off-site mitigation, enhancement and management measures as set out in this LBMMP in accordance with the schedule of works. *Actions/Prescriptions* *- Implement the management prescriptions set out in Section 7 of this LBMMP, those set out in the separate Scheme of Grassland Translocation and Management and the Woodland Management Plan.* *- Carry out the management prescriptions in accordance with the timescales for implementation as set out in Section 8 of the LBMMP.*
1/2B	Conduct ongoing biodiversity and landscape monitoring. *Actions/Prescriptions* *- Conduct repeat surveys of the flora, fauna and landscape features at Bristol Airport and Lulsgate Wood, matching the baseline survey methods adopted to inform the planning application for the growth of Bristol Airport to 12mppa, to confirm ongoing status, condition and any emerging negative factors. See Appendix I.* *- Carry out the repeat surveys, analysis and reporting in accordance with the timescales for implementation as set out in Section 8 and Appendix I of the LBMMP.*
1/2C	Review/Update the LBMMP *Actions/Prescriptions* *- Review the LBMMP on an annual basis and revise LBMMP where necessary, to take into account the monitoring results, to maintain and enhance the ecological integrity of the*

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	landscape around Bristol Airport. *- Achieved through ongoing annual consultation and agreement with North Somerset Council, Natural England and the Forestry Commission, with a first meeting before the end of 2023.*
1/2D	Enhance and restore habitat. *Actions/Prescriptions* *- Identify and prioritise areas of the landscape at Bristol Airport for habitat enhancement and restoration activities where identified through the review/update of the LBMMP and agreement with North Somerset Council, Natural England and the Forestry Commission.* *- This will include additional planting/seeding of native vegetation, creating additional pollinator-friendly areas, removing invasive species, modifying grazing management etc.*
1/2E	Manage airport infrastructure. *Actions/Prescriptions* *- Ensure that airport infrastructure, such as runways, buildings, parking areas and airfield grassland, are managed to minimise their impact on the landscape and biodiversity at Bristol Airport.* *- Regular (i.e. monthly ecological/landscape co-ordination meeting starting in November 2023, between relevant Airport advisors and managers) to identify potential conflicts and agree solutions in line with this LBMMP.*
1/2F	Engage stakeholders. *Actions/Prescriptions* *- Collaborate with stakeholders such as local communities, airport users, conservation organisations, local government and government agencies to ensure that the LBMMP and actions are well-supported, well-informed, and appropriately implemented.* *- Produce annual biodiversity and landscape stakeholder update confirming collaboration achieve starting in 2024.*
1/2G	Ongoing Monitoring and Evaluation. *Actions/Prescriptions* *- Implement the agreed monitoring and evaluation program set out in this LBMMP to assess the effectiveness of management actions, track changes in biodiversity and landscape quality over time, and inform future decision-making.* See Appendix I.

Overall, these objectives and actions will help to preserve and enhance the biodiversity and quality of the landscape associated with Bristol Airport, and ensure that the airport operates in an ecologically and socially responsible manner.

6.2.2 Additional Management Objectives and Actions

Aim 3: "To promote the ongoing sustainable management of biodiversity and green infrastructure at Bristol Airport.
Specific integrated objectives and actions that will help achieve this aim are set out below.

Aim/Objective 3	Action/Management Prescription
3A	Implement the objectives and actions associated with Aims 1 and 2 (above).
3B	Ensure the LBMMP is fully integrated into Bristol Airport's ISO 14001 Environmental Management System by 2025 to ensure that environmental impacts are managed effectively and that the existing culture of continual improvement continues within the organization.

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Aim/Objective 3	Action/Management Prescription
3C	Provide an annual update landscape and biodiversity briefing to the Airport's Board starting at the end of 2023, reporting back on the findings of monitoring and management activities and to highlight and agree objectives for the following year.

Aim 4: "To increase public awareness and appreciation of the Bristol Airport's biodiversity and natural heritage".

Specific objectives and actions that will help achieve this aim are set out below.

Aim/Objective 4	Action/Management Prescription
4A	Develop and promote educational materials. *Actions:* *- Create and distribute educational materials, such as electronic brochures, signage, and website content, that highlight the biodiversity and natural heritage of the airport's surroundings and the measures taken to protect and enhance them.* *- Update materials as relevant and in response to feedback.*
4B	Offer guided tours. *Actions:* *- Offer guided tours of safe and accessible airport green infrastructure, focusing on areas that showcase the biodiversity and natural heritage of the Airport. These tours will be led by staff members, who have knowledge of the Airport's ecology and natural history.*
4C	Organize events. *Actions:* *- Organize events that highlight the biodiversity and natural heritage of Bristol Airport, such as birdwatching or bat walks, wildlife photography workshops, or talks on local ecology and conservation. - These events will be hosted at the airport, in Lulsgate Wood or in nearby community centres.*
4D	Partner with local organizations. *Actions:* *- Partner with local environmental organizations, schools, and community groups to organize joint initiatives that promote biodiversity and natural heritage.* *- This will include joint educational campaigns, volunteer opportunities, or community projects to enhance local habitats and green spaces.*
4E	Create an on-site nature centre. *Actions:* *- Create an on-site nature centre that provides information on Bristol Airport's natural surroundings, including interactive exhibits, displays, and educational programming. This could be a physical location or a virtual experience accessible through the airport's website. Complete by the end of 2025.*

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Aim/Objective 4	Action/Management Prescription
4F	Involve the media. *Actions :* *- Use the media to showcase Bristol Airport's efforts to protect and enhance biodiversity and natural heritage.* *- This will include press releases, interviews, and media events that highlight the airport's initiatives and successes in promoting sustainable practices.*

By implementing these strategies and actions, Bristol Airport can increase public awareness and appreciation of the biodiversity and natural heritage of its surroundings, while also promoting environmental education and sustainability. This can help to build a positive reputation for the airport, foster community engagement, and encourage a sense of stewardship and responsibility towards the natural environment.

Aim 5: "Foster collaboration and cooperation between stakeholders at and associated with Bristol Airport, that are involved in the management of biodiversity and its landscape features".

Specific objectives and actions that will help achieve this aim are set out below.

Aim/Objective 5	Action/Management Prescription
5A	Establishing a collaborative governance structure. *Actions:* *- Establish a collaborative governance structure that includes representatives from key stakeholder groups, such as the airport management, local communities, environmental organizations, local government and government agencies.* *- This structure can provide a platform for dialogue and decision-making, helping to ensure that the diverse perspectives and interests of stakeholders are taken into account.*
5B	Encouraging stakeholder engagement. *Actions:* *- Encourage stakeholder engagement by providing opportunities for stakeholders to provide feedback and input on biodiversity and landscape management initiatives.* *- This can be achieved through stakeholder meetings, public consultations, and surveys.*
5C	Developing partnerships. *Actions:* *- Develop partnerships with local organizations, including community groups, NGOs, and academic institutions, to leverage their expertise and resources in biodiversity and landscape management.* *- These partnerships can facilitate information sharing, joint projects, and collaborative research.*
	5d. Providing training and capacity-building. *Actions:* *- Provide training and capacity-building opportunities to stakeholders involved in biodiversity and landscape management starting in 2024.* *- This will include training on best practices, biodiversity monitoring, and landscape design, among other topics.*

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	5e. Sharing information and data. *Actions:* *- Establish mechanisms for sharing information and data related to biodiversity and landscape management, such as biodiversity surveys, mapping, and monitoring data byt the end of 2023.* *- This will help to ensure that stakeholders have access to the most up-to-date information and can make informed decisions.*
	5f. Implementing communication and outreach strategies. *Actions:* *- Develop communication and outreach strategies to inform stakeholders about biodiversity and landscape management initiatives, as well as the benefits of these initiatives. By the end of 2023.* *- This will include regular newsletters, social media campaigns, and public events.*

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7 OPTIONS/PRESCRIPTIONS FOR CORE HABITAT MANAGEMENT ACTIONS

7.1 GENERAL

All works shall be undertaken to recognised good ecological and horticultural practice and to relevant British Standards. The quality of all landscape works shall be carried out in accordance with British Standard 4428:1989 'Code of Practice for General Landscape Operations'.

All trees and other plants included within the approved details shall be healthy, well-formed specimens of a minimum quality that is compatible with British Standard 3936:1992 (Part 1) 'Specification for Trees & Shrubs' and British Standard 4043 (where applicable).

All works to be undertaken and supervised by a competent professional landscape/ecological contractor and consultant.

The first 12 months establishment and maintenance will be the responsibility of the landscape contractor as appointed by Bristol Airport. It may be necessary for some of the works to be phased depending on the timing of works (see Section 8).

At the end of the 12-month establishment / defects period for all completed works, these will then be managed in accordance with the approved LBMMP.

7.2 BIOSECURITY & LOCAL PROVENANCE

In the interest of Biosecurity, trees, shrubs, plugs and seeds should not be imported directly from European suppliers This is a measure to address the threat of the introduction of pests and diseases from outside the UK. For current advice refer to DEFRA website: https://www.gov.uk/government/collections/importing-and-exporting-plants-and-plant-products

The landscape/ecological contractor must demonstrate local provenance sourcing of all native trees, shrubs, plugs and seeds where possible and appropriate to follow best practice to sustain regional biodiversity.

7.3 IMPLEMENTATION OF THE LANDSCAPE WORKS

General

All works should be implemented in accordance with the details and specifications set out in this report, the separate Scheme of Grassland Translocation and Management and the Woodland Management Plan (prepared by Johns Associates) and those contained on the drawings in Appendices C, D and I.

Planting shall be maintained by the landscape contractor for a minimum period of 12 months following Practical Completion, with any defective planting replaced at the end of the first year (or before).

The remainder of Section 7.3 focuses on the proposed landscaping works associated with trees and shrubs.

Preparation

The contractor must ascertain the exact location of all underground services from Bristol Airport.

All setting out to be undertaken by the appointed contractor using a setting out engineer and agreed with CA prior to commencing works.

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Excavation shall NOT be undertaken within the root protection area of any existing trees or shrubs to be retained. Under existing trees / within tree root protection areas, except where minor regrading is noted, only the top 100mm of existing soil shall be prepared, by hand, to prevent damage to underlying roots.

In new planting areas to be topsoiled, away from existing trees, the underlying subsoil shall be broken up / ripped as required to provide adequate drainage.

Minimum topsoil depths (outside any tree RPA areas) shall normally be:

- Shrub areas: 400mm depth,
- Trees: 700mm depth.

Proposed topsoil depths generally (away from tree root protection areas) shall not normally exceed 300mm, with suitable and loosened subsoil providing the remainder of the minimum rooting depth.

Topsoiled areas shall be kept weed-free prior to planting by hand weeding or use of non-residual herbicides.

Imported topsoil, if required, should be compatible in pH with existing soil on site and shall comply with BS3882: 2015 Topsoil Specification. A topsoil analysis certificate is required to indicate compliance with this specification.

New plants, where specified, shall be carefully pit planted.

Additional PAS 100 peat free organic matter shall be incorporated into the soil into pit planting stations only at a ratio of 10% by volume of the backfill mix and thoroughly mixed in prior to planting.

Topsoil Analysis

Prior to planting, it is recommended that the physical and chemical parameters of representative samples of the placed topsoil (to be tested for amenity landscape use) in accordance with BS 3228:2015.

NB: The need for targeted applications of slow-release fertilizer within backfill mix for planting pits to be confirmed depending on soil analysis samples.

Proposed Planting Specification

All plant stock (seed/shrubs/trees will be sourced from a suitable quality supplier, having as local a provenance as possible. To be sourced in accordance with the relevant sections of BS3936 'Specification of Nursery Stock'. Plants shall be first class examples of their species or variety, free from all pests and diseases, with good fibrous root systems and materially undamaged.

Plants/ Trees - Specification Criteria

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- Name, forms, dimensions and other criteria: To the relevant part of BS 3936.
- Quality: It is essential that the plants on site are of the highest quality specimens.
- Condition: Materially undamaged, sturdy, healthy and vigorous.
- Appearance: Of good shape and without elongated shoots.
- Hardiness: Grown in a suitable environment and hardened off.
- Health: Free from pests, diseases, discoloration, weeds and physiological disorders.
- Root system and condition: Balanced with branch system.
- Species: True to name.
- Origin/ Provenance: Contractor to demonstrate local sourcing and provenance where possible and appropriate. Definition: Origin and Provenance have the meaning given in National Plant Specification.
- Inspection: Plants to be collected together in the nursery for inspection if requested by the landscape / ecological consultant prior to delivery to site.

ROOTBALLED TREES

The trees shall have a good well-formed root ball with dimensions according to the species and size of the tree. The diameter of the rootball is usually at least three times the size of the girth, measured at 1 metre above ground level. Rootballed trees shall be adequately supported by wire mesh and hessian, or other suitable material to prevent collapse of the rootball. The rootball shall be of sufficient size to contain the fibrous roots. Trees, which have a collapsed rootball or expose major parts of the root system will be rejected.

FEATHERED TREES

Feathered trees shall be furnished with a single leader and well-developed laterals to ground level with uniform and full leaf coverage appropriate to their age and species/type. Stems shall be straight and uniform and free from abrasions and stem girdling. All plants shall have a strong fibrous well developed but compact root system with root spread proportional to the size of the tree with a reasonable proportion of fine fibrous rootlets. The roots shall not be torn or lacerated.

BARE ROOT TREES

All bare rooted tree stock shall have a strong fibrous root structure. The root systems shall be well developed but compact with root spread proportional to the size of the tree with a reasonable proportion of fine fibrous rootlets. The roots shall not be torn or lacerated.

WHIPS AND TRANSPLANTS

All plants shall conform generally to BS 3936 Part 4 for Forest Trees and as further described in the plant schedules. They shall show a high degree of growth in their stem, shoots, and leaf cover appropriate to their age and species, and shall have a strong and well-developed fibrous root structure. The requirements given in the plant schedules constitute a guide to the required heights, and number of breaks (where appropriate) in the lower third. Plants shall be appropriately spaced to allow full and uniform leaf coverage to develop to the crown, evenly radiated around its stem.

All plants shall, on delivery, be free from diseases and pests and be materially undamaged.

Bare Root Stock shall be dipped into root dip mixed according to the manufacturer's recommendations as soon as is possible after lifting. The stock shall then be bundled in batches, of species, height or individually and the roots placed in a suitable plastic bag, to prevent drying out during transport and prior to planting.

CONTAINER GROWN PLANTS / TREES

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- Growing medium: With adequate nutrients for plants to thrive until permanently planted.
- Plants: Centred in containers, firmed and well-watered.
- Root growth: Substantially filling containers, but not root bound, and in a condition conducive to successful transplanting.
- Hardiness: Grown in the open for at least two months before being supplied.
- Containers: With holes adequate for drainage when placed on any substrate commonly used under irrigation systems.

PLANT HANDLING & OPERATIONS

Plant handling at the nursery, and during transit up to delivery, shall be in accordance with 'Plant Handling', the booklet published by the Committee for Plant Supply and Establishment (CPSE). The contractor shall comply with clauses 3 & 4 of the above booklet (obtained from the Horticulture Trades Association) which refers to the receipt, unloading and temporary storage of plants.

All planting operations to be in general compliance with BS4428:1989 'Code of Practice for General Landscape Operations.'

Planting shall not be carried out during periods of frost, drought, cold drying winds or when the soil is waterlogged or frozen. Carry out all work while soil and weather conditions are suitable.

Do not move, spread or cultivate soil for planting areas in unsuitable weather conditions; when it is wetter than the plastic limit, when the ground is frozen or covered by snow.

Do not plant during periods of frost or strong winds. Plant only during the following periods:

- Deciduous trees and shrubs: Late October to late March
- Container grown plants: At any time if ground and weather conditions are favourable. Ensure that adequate watering and weed control is provided

All planting that is within the root protection area of existing trees/shrubs to be retained shall be undertaken by hand and positions altered should tree roots be encountered, to avoid damage to the root system.

All plants shall be set out evenly over the areas as indicated and to the density and quantities shown.

All plants shall be planted upright at the same depth as the nursery soil level and evenly spaced, leaving room for growth.

All restrictive containers shall be removed with roots not twisted. Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings to be removed from site.

Bare root transplants to be dipped with anti-dessicant and mycorrhizal root dip to manufacturer’s instructions prior to planting.

The contractor shall make full allowance for provision of all cranes, lifting tackle, tree collars etc. required for lifting trees into position having confirmed the weight and dimensions of all the trees reserved with the nursery supplier(s). Any use of cranes shall be agreed and coordinated with the client or client’s representative, agree haul routes, types of tracks on vehicles etc. prior to commencing tree deliveries. Make good at no extra cost to the contract, any damage incurred to finished kerbs, hardstanding etc. during planting.

Trees shall be planted at the same depth at which they were previously growing. Great care shall be taken to avoid damage to the root systems, stems and crowns when planting and when removing crates and containers.

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Any damaged trees shall be taken off site and replaced at no additional cost

All plants to be firmed, watered-in and any dead, damaged, or lopsided branches shall be removed after planting.

PREPARATION OF AREAS PRIOR TO PLANTING

- Setting out: Ensure all proposed planting areas are set out in accordance with the approved drawings.
- Install boundary fencing (where proposed).
- Preparation: Cut all non-woody vegetation (grass / herbs) within proposed planting areas and remove arisings.
- Weed control: Apply non-residual selective weed control to achieve 600mm dia. Weed-free area around each planting station prior to planting. Each planting station to be kept weed-free for at least the first 3 years or until the canopy closes by hand, mechanical means, or selective weed control as required.

PLANTING

Transplants

Transplants and containerized plants shall be pit planted in a planting pit sufficient to accommodate the plant without causing root damage, with a minimum 50mm backfill beyond the root ball extent. Transplants (60-80cm high) and containerized plants to be pit planted in holes 300 x 300 x 300mm, using 'as dug' topsoil and incorporating c.10% by volume of non-peat planting compost within backfill mix at the time of planting.

Feathered Trees

Feathered trees to be pit planted in 500mm x 500mm x 500mm deep holes using 'as dug' topsoil and subsoil as backfill gently placed in 150mm layers and incorporating c.10% by volume of non-peat planting compost within backfill mix at the time of planting.

Standard Trees

- Pit sizes: 750mm x 750mm square pits x 600mm deep
- Depth of topsoil can be c.350-400mm with the remainder using approved free-draining subsoil (non-clay) free of contaminants.
- Sloping ground: Maintain horizontal bases and vertical sides with no less than minimum depth throughout. Adjoining sloping ground to be smoothly and evenly married in around tree pit.
- Pit bottoms: With slightly raised centre. Break up to a depth of 200 mm.
- Pit sides: Scarify.
- Backfilling material: Tree backfilling material using 'as dug' topsoil and subsoil gently placed in 150mm layers using and incorporating c.10% by volume of non-peat planting compost within backfill mix at the time of planting.
- Accessories:
- Irrigation tubes
- Stakes and rubber ties

NB: Excess material from pit excavation to be loosely spread in adjoining areas.

LABELLING AND INFORMATION

General: Provide each plant/ tree or group of plants/ trees of a single species or cultivar with supplier's labelling for delivery to site, showing:

- Full botanical name.

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- Total number.
- Number of bundles.
- Supplier's name.
- Plant specification, in accordance with scheduled National Plant Specification categories.

COMPOST
Sanitized and stabilized compost to PAS 100 or similar approved and sourced locally where possible.

Do not use peat or products containing peat.

Plants to be firmed, watered-in and dead, damaged, or lopsided branches shall be removed after planting.

PROTECTION
Staking Generally
Stakes: Softwood, peeled chestnut, larch or oak, straight, free from projections and large or edge knots and with pointed lower end.

- Preservative treatment: None.
- Nails: To BS 1202-1, galvanized, minimum 25mm long and with 10mm diameter heads.
- Stake size (minimum): 75mm diameter.

Standard tree stock to HS 12-14cm girth (+) to be double staked.

Standard trees (10-12cm) and Feathered tree stock shall be single staked and secured with rubber tree ties.

Transplants and 3L containerised stock shall be fitted with appropriate biodegradable shelter to suit size of plant eg Tubex Nature / Green-Tech or similar.

Shelters need to be well anchored; use a quality square stake, inserted into the ground to at least 1/3 of the stake height. Using the shelters natural strength push it lightly into the ground to remove the gap at the base.

Double Staking (Standard Trees 1-12cm girth +)
Standard trees to be staked using 75mm diameter x 1800mm long untreated softwood pointed stake. Stakes to be driven into ground 1000mm below finished soil level and finish c.800mm above and positioned on windward side. firmly fix tree to windward side of wood crossbar with nylon reinforced rubber tie and extra-large tree pad.

Short Single Staking
For all other Standard and Feathered Tree stock. Position stake close to tree on windward side and drive vertically at least 600mm into bottom of pit before planting. Consolidate material around stake during backfilling. Cut the stake to approximately 600mm above ground level. Secure tree firmly but not rigidly to the stake with:

- Belts, Pads and Spacers available from:
  J Toms Ltd. 7 Marley Farm, Headcorn Road, Smarden, Ashford, Kent TN27 8PJ
  Tel: 01233.770066 Fax: 01233.770055

Plant Protection for Native Structure Planting
All native mix planting areas shall be protected from rabbit damage with appropriate tree and shrub guards, depending upon species:

- Manufacturer: Tubex Ltd, Aberaman Park, Aberaman, Aberdare, Glamorgan, CF44 6DA, Tel: 01685 888000 Fax: 01685 888001 or equal and approved.

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Tubex Shrubshelter & Shrubshelter Plus: Suitable for landscaping projects with mixed planting stock including containerised shrub species such as Ilex.

Tree and shrub shelters to be installed in accordance with manufacturer's recommendations including:

- Choice of tree shelter height depends on the wildlife present on site (assuming rabbits).
- Shelters need to be well anchored; use a quality square stake, inserted into the ground to at least 1/3 of the stake height.
- Ensure the stake is below the flared rim at the top of the Shrubshelter.
- Using the shelters natural strength push it lightly into the ground to remove the gap at the base.

Additional Tree Protection (Standard and Feathered Trees)
Clear recycled plastic spiral guards to be located around base of trees where necessary to deter animal browsing eg Tubex Ecowrap by Green Tech or similar approved.

7.4 ESTABLISHMENT / DEFECTS PERIOD

This section covers the initial implementation of the works and establishment / defects period (typically 12 months from Practical Completion).

The general intent of landscape maintenance of the site is to ensure that the new planting and seeding works achieve successful establishment during this critical phase.

Maintenance and management operations are to be undertaken in such a way as to allow healthy plants to develop, unhindered by weed growth or other inhibiting factors.
All new landscape areas shall be maintained by the appointed landscape contractor for a minimum period of 12 months following installation, with any defective planting / seeding replaced or made good by the end of the first year (or before).

The landscape management work will be carried out in a manner that will avoid potential legal offences and harm to ecological receptors that may be present on site. Potentially harmful maintenance operations are to be performed with awareness of, or take place outside, the most ecologically sensitive periods, while providing the management necessary to maintain and increase the biodiversity value of the site.

The maintenance operators/contractors shall make themselves aware of all ecological constraints, drainage runs and services prior to commencing maintenance operations. They shall maintain access to all ditches, soakaways and other drainage systems.

Notice to Landscape Consultant/Contract Administrator (CA)
Provide 3 days-notice of the following operations, to give CA the opportunity of being present if deemed necessary:

- Watering
- Each site maintenance visit

Other Works
Contractor to be proactive and advise in advance any issues relating to plant health identified on site.

Landscape Maintenance Schedules
All landscape maintenance work is to be undertaken by an experienced / suitably qualified landscape maintenance contractor.

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Maintenance visits will typically be undertaken once monthly between October and March and twice monthly between April and September. A guide minimum number of 12 visits shall be undertaken.

The appointed landscape contractor must provide a schedule of operations based on the scope of the works set out in this specification.

The primary maintenance operations will include:

- Watering trees, plants, grass and wildflower areas as necessary to ensure vigorous and successful establishment during the early years after planting / sowing.
- Maintain c.600mm dia. weed-free planting stations by hand weeding or treatment with a non-residual herbicide as appropriate / required.
- General pruning and trimming to ensure footways, signs etc. are not obscured and to ensure plants develop appropriately according to their species.
- Checking and adjusting all shelter guards / tree stakes and ties at every maintenance visit during the first one to two years after planting. Remove when trees have established and are no longer required.

- Removal of litter.
- Replacing plants that fail where required in the following planting season with the approved species. All planting should be inspected annually in late Summer. Any dead, dying or diseased plants shall be removed and replanted according to the approved plan in the following planting season (November-March).

Pesticides, Herbicides & Fertiliser

NB: No pesticides, herbicides, or fertilisers to be used in the ongoing management and maintenance of the site unless otherwise approved by the CA.

Where the use of pesticide/ herbicide is deemed necessary for the removal of injurious or invasive species they are only to be used with prior agreement of the CA / suitably qualified ecologist and North Somerset Council. Any pesticides / herbicides to be applied by appropriately certified contractors.

Detailed records of any such applications must be kept in accordance with relevant legislation. These records shall be available for viewing during normal working / office hours by any person wishing to see them.

Weed Control

Weed control is to be restricted to planting stations only unless otherwise agreed. In all other areas, weed control is to be restricted to the control of injurious and invasive species and highly competitive weeds, unless otherwise instructed.

When weeding, ensure that the methods used cause the minimum of damage to adjacent plants / vegetation, including trees and grass, as well as to animal species.

Hand Weeding

Remove all weeds, including roots, by hand using hoes, trowels or forks, taking care to remove not more than a minimum quantity of soil, causing minimum disturbance to neighbouring plants and leaving the area in a neat, raked, clean condition.

Weeding Around Tree and Plant Stems

Do not allow nylon filament rotary cutters or other mechanical tools closer than 100 mm to the stem of any tree or shrub to be retained. Complete operations close to stems using hand tools.

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Herbicide Application

To be carried out only as a last resort (see Section 0). Application rate as per manufacturer's instructions. Remove arisings before applying.

Application of General Systemic Weedkiller (only where required for invasive weed species and following approval of the CA).

Spray or spot-treat individual plants or whole colonies in April/ May. Spot-treat new plants as they appear and re-treat in August/ September as necessary. Application to be carried out as per manufacturers' recommendations. Note: General systemic weed killers will kill/ damage all plant matter that it touches. Care must be taken to cover any adjacent plant material with polythene or similar to protect it from spray drift.

Arisings

Unless otherwise specified, deal with arisings from operations as follows:

Biodegradable arisings

Remove to designated compost area on site where available, otherwise remove to designated recycling facility. Grass cuttings and brash

Where grass cuttings are to be boxed, remove them to designated compost area on site where available otherwise remove to designated recycling facility. Where agreed, create piles from grass cuttings to create habitat features.

Tree roots and stumps

Where necessary and as agreed with CA, install any removed tree roots and stumps in grassland or woodland in a suitable location agreed by the Airside Operations team as deadwood habitat for invertebrates/ shelter for other fauna, or where this is not appropriate, removed from site to designated recycling/ chipping facility.

Leaf fall, branches and prunings

To be chipped and reused on site and/ or removed to designated recycling area. Where appropriate create piles from leaf litter/ small prunings in perimeter grassland areas.

Litter and non-biodegradable arisings

Remove from site to designated recycling/ refuse facilities.

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7.5 IMPLEMENTATION OF THE SCHEME OF GRASSLAND TANSLOCATION AND MANAGEMENT

Please refer to the separate Scheme of Grassland Translocation and Management prepared by Johns Associates (Appendix J).

7.6 IMPLEMENTATION OF THE OFFSITE WOODLAND MANAGEMENT

Please refer to the separate Woodland Management Plan for Lulsgate Wood (Appendix D), prepared by Johns Associates (Appendix D).

7.7 IMPLEMENTATION OF THE ONSITE WOODLAND MANAGEMENT

Please refer to the landscape and habitat/planting plans in Appendix H, which set out the woodland specific measures to be implemented and associated with Integrated/Embedded Mitigation Measures 4, 5, 13 and 16 that provide further enhancement of existing woodland.

The implementation of the onsite woodland management, informed by monitoring, seeks to achieve 'Good' Condition woodlands at Bristol Airport by 2030, in accordance with the criteria used to inform the Defra Biodiversity Metric and reproduced below.

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Condition Sheet: WOODLAND Habitat Type

UKHab Habitat Type(s)

Woodland and forest - Lowland beech and yew woodland
Woodland and forest - Lowland mixed deciduous woodland
Woodland and forest - Native pine woodlands
Woodland and forest - Other coniferous woodland
Woodland and forest - Other Scot's pine woodland
Woodland and forest - Other woodland; broadleaved
Woodland and forest - Other woodland; mixed
Woodland and forest - Upland birchwoods
Woodland and forest - Upland mixed ashwoods
Woodland and forest - Upland oakwood
Woodland and forest - Wet woodland

Habitat Description

See UKHab

This condition sheet is based on the England Woodland Biodiversity Group (EWBG) Woodland Condition Survey Method, available here: https://woodlandwildlifetoolkit.sylva.org.uk/assess

Condition Assessment Criteria

	Indicator	Good (3 points)	Moderate (2 points)	Poor (1 point)	Score per indicator
1	Age distribution of trees[1]	Three age classes present	Two age classes present	One age class present	
2	Wild, domestic and feral herbivore damage	No significant browsing damage evident in woodland[2]	Evidence of significant browsing pressure is present in 40% or less of whole woodland	Evidence of significant browsing pressure is present in 40% or more of whole woodland	
3	Invasive plant species[3]	No invasive species present in woodland	Rhododendron or laurel not present, other invasive species < 10% cover	Rhododendron or laurel present, or other invasive species > 10% cover	
4	Number of native tree species	Five or more native tree or shrub species found across woodland parcel	Three to four native tree or shrub species found across woodland parcel	None to two native tree or shrub species across woodland parcel	
5	Cover of native tree and shrub species	> 80% of canopy trees and >80% of understory shrubs are native	50-80% of canopy trees and 50-80% of understory shrubs are native	< 50% of canopy trees and <50% of understory shrubs are native	
6	Open space within woodland[4]	10 – 20% of woodland has areas of temporary open space, unless woodland is <10ha in which case lower	21- 40% of woodland has areas of temporary open space	More than 40% of woodland has areas of temporary open space	

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		threshold of 10% does not apply			
7	Woodland regeneration[5]	All three classes present in woodland; trees 4-7cm dbh, saplings and seedlings or advanced coppice regrowth	One or two classes only present in woodland	No classes or coppice regrowth present in woodland	
8	Tree health	Tree mortality less than 10%, no pests or diseases and no crown dieback	11% to 25% mortality and/or crown dieback or low risk pest or disease present	Greater than 25% tree mortality and or any high risk pest or disease present	
9	Vegetation and ground flora	Ancient woodland flora indicators present	Recognisable NVC plant community present	No recognisable NVC community	
10	Woodland vertical structure[6]	Three or more storeys across all survey plots or a complex woodland	Two storeys across all survey plots	One or less storey across all survey plots	
11	Veteran trees[7]	Two or more veteran trees per hectare	One veteran tree per hectare	No veteran trees present in woodland	
12	Amount of deadwood	50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	
13	Woodland disturbance[8]	No nutrient enrichment or damaged ground evident	Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground	More than 1 hectare of nutrient enrichment and/or more than 20% of woodland area has damaged ground	
				Total score (out of a possible 39)	

Condition Assessment Result	Condition Assessment Score
Total score >32 (33 to 39)	Good (3)
Total score 26 to 32	Moderate (2)
Total score <26 (13 to 25)	Poor (1)

Notes

Footnote 1 - See EWBG method INDICATOR 1 for more information. If tree species is not a birch, cherry or Sorbus: 0 – 20 years (Young); 21 - 150 years (Intermediate); and >150 years (Old). A recognisable age class should be a consistent recognisable layer across the woodland or stand being assessed. Presence of a few saplings would not indicate that the woodland has an 'age class' of young trees.

Footnote 2 - See EWBG method INDICATOR 2 for more information. Browsing pressure is considered to be significant where >20% of vegetation visible within each survey plot shows damage from any type of browsing pressure listed.

Footnote 3 - See EWBG method INDICATOR 3 for more information. Check for presence of the following invasive

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non-native species: American skunk cabbage Lysichiton americanus; Himalayan balsam Impatiens glandulifera; Japanese knotweed Fallopia japonica; Cherry Laurel Prunus laurocerasus; Shallon Gaultheria shallon; Snowberry Symphoricarpos albus; Variegated yellow archangel Lamiastrum galeobdolon subsp. argentatum; and Rhododendron Rhododendron ponticum.

Footnote 4 - See EWBG method INDICATOR 6 for more information. Open space within woodland in this context is temporary open space in which trees can be expected to regenerate (e.g. glades, rides, footpaths, areas of clear-fell). This differs from permanent open space where tree regeneration is not possible or desirable (e.g. tarmac, buildings, rivers). Area is at least 10m wide with less than 20% covered by shrubs or trees.

Footnote 5 - See EWBG method INDICATOR 8 for more information. This indicator measures regeneration potential of the woodland by considering three classes: seedlings; saplings; and young trees of 4-7 cm DBH. All three classes would fall in the 'young' category of the 'age distribution of trees' indicator, the regeneration indicator is gathers additional information by considering regeneration potential i.e. if seedlings, saplings and young trees are all present that means natural regeneration processes are happening.

Footnote 6 - This indicator is looking at structural diversity and is useful to understand in conjunction with the age of trees in a woodland. Vertical structure is defined as the number of canopy storeys present. Possible storey values are: 1) Upper; 2) Complex: recorded when the stand is composed of multiple tree heights that cannot easily be stratified into broad height bands (such as upper, middle or lower); 3) Middle; 4) Lower; and 5) Shrub layer.

Footnote 7- See EWBG method INDICATOR 12 for more information. All ancient trees are veteran trees, but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. These features contribute to its biodiversity, cultural and heritage value. Veteran trees can be classified if they have four out of the five following features:

1. Rot Sites associated with wounds which are decaying >400 cm^2;
2. Holes and water pockets in the trunk and mature crown >5 cm diameter;
3. Dead branches or stems >15 cm diameter;
4. Any hollowing in the trunk or major limbs;
5. Fruit bodies of fungi known to cause wood decay.

Footnote 8 - See EWBG method INDICATOR 15 for more information. Examples of disturbance are: significant nutrient enrichment; soil compaction from trampling, machinery or animal poaching; litter.

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7.8 IMPLEMENTATION OF POND RESTORATION

An existing un-managed and poor condition stone lined pond shown as mitigation/enhancement measure 15 will be restored in the winter of 2024. This will involve the desilting of the pond (with silt placed nearby), the reduction in over-hanging scrub canopy to no more than 25% and the provision of planted baskets of aquatic plants including frogbit (*Hydrocharis morsus-ranae*), marsh marigold (*Caltha palustris*), watermint (*Mentha aquatica*), water-forget-me-not (*Myosotis scorpioides*) and spiked water-milfoil (*Myriophyllum spicatum*).

7.9 IMPLEMENTATION OF ADDITIONAL BAT ROOST MEASURES

A range of measures will be implemented to enhance existing bat roost features at Bristol Airport and to provide further bat roosting opportunities by the end of 2024. These are set out in more detail in Sections 7.8.12 to 7.8.16. Off-site bat roost provision is described in the separate Woodland Management Plan.

In addition, all existing bat boxes previously installed at Bristol Airport will be inspected and cleaned on an annual basis from autumn 2023 by a suitably licensed and experienced ecologist. The general location of these existing features are shown below in Figure 7.1.

Figure 7.1 Location of Existing Bat (and Bird) Boxes at Bristol Airport

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7.9.1 MITIGATION AND ENHANCEMENT MEASURE 1 – EXISTING NORTHSIDE BAT TOWER

Please refer to the drawing in Appendix B for the location of this measure.

The existing northside bat tower will be inspected, cleaned, made weatherproof and enhanced in March of 2024.

It will be enhanced through the provision of external insulation on its sides and roof (fiberglass blanket) and a further external cladding of shiplap timber cladding on top. One internal woodlined cavity feature (20cm long, 5cm deep and 10cm high, with a single opening of 2cm x 2cm) will be added on each of the extended four sides of the bat tower.

7.9.2 MITIGATION AND ENHANCEMENT MEASURE 13 – EXISTING WOODLAND BAT TOWER

Please refer Figure 7.1 and to the drawing in Appendix B for the location of this measure.

The existing northside bat tower will be inspected, cleaned, made weatherproof and enhanced in the winter of 2024. It will be enhanced through the provision of external insulation on its sides and roof (fiberglass blanket) and a further external cladding of shiplap timber cladding on top. One internal woodlined cavity feature (20cm long, 5cm deep and 10cm high, with a single opening of 2cm x 2cm) will be added on each of the extended four sides of the bat tower.

7.9.3 MITIGATION AND ENHANCEMENT MEASURE 13 – EXISTING LATRINE BUILDING

Please refer Figure 7.1 and to the drawing in Appendix C for the general location of this measure (Cornerpool Wood).

The existing latrine building will be inspected, cleaned, made weatherproof and enhanced in the winter of 2024. It will be enhanced through the provision of additional free hanging roosting features (wire mesh below the ceiling) for horseshoe bats and the addition of a Schwegler 1FS large maternity colony box.

7.9.4 MITIGATION AND ENHANCEMENT MEASURE 13 – EXISTING AIR RAID SHELTER

Please refer Figure 7.1 and to the drawing in Appendix C for the general location of this measure (Cornerpool Wood).

The existing air aid shelter will be inspected, cleaned, and enhanced in the autumn of 2023. It will be enhanced through the provision of additional free hanging roosting features (wire mesh below the ceiling) for horseshoe bats.

7.9.5 MITIGATION AND ENHANCEMENT MEASURE 13 – NEW BAT BUILDING

Please refer to the drawing in Appendix C for the general location of this measure.

A new multi-species bat building will be constructed in Cornerpool Wood by the end of 2024 in accordance with the specification set out below.

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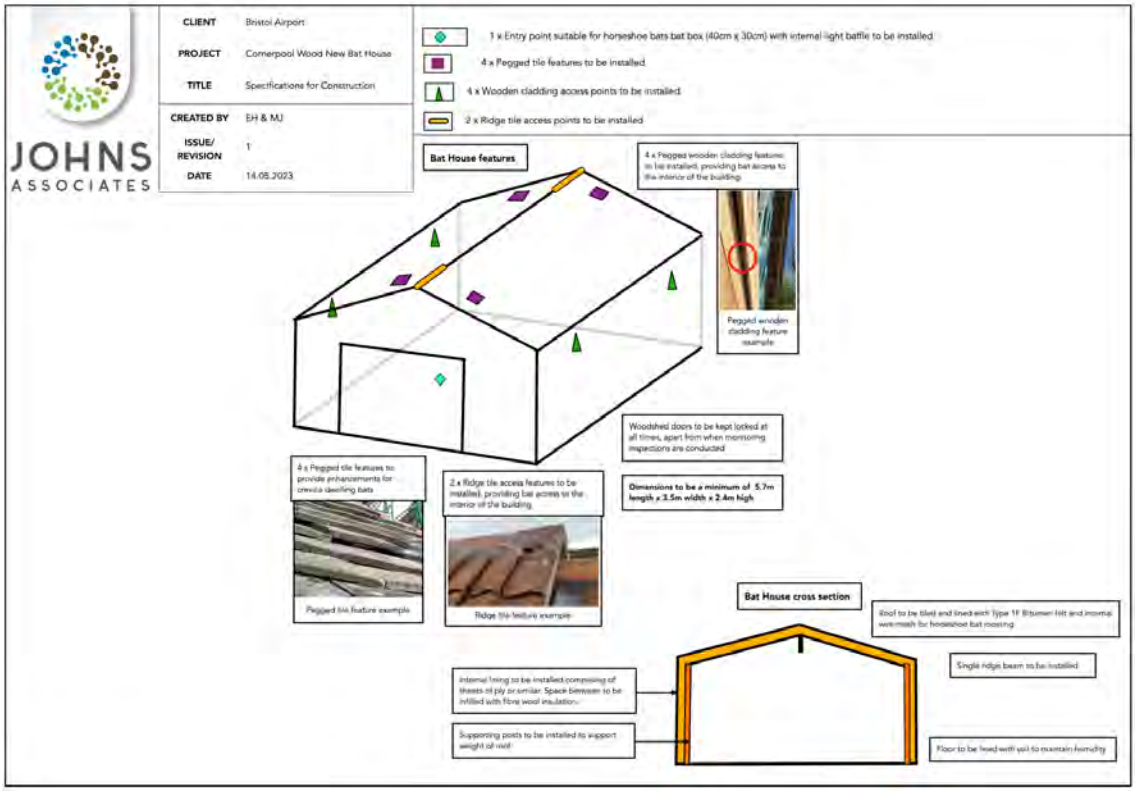

It will be enhanced for hibernating lesser horseshoe bats through the provision of a Vincent Wildlife Trust 'Cool Tower.

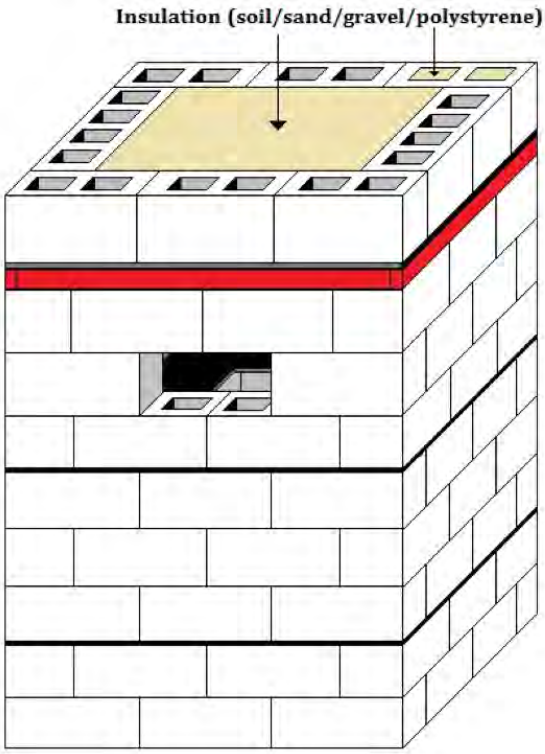

Figure 7.2 Lesser Horseshoe Bat Cool Tower (Vincent Wildlife Trust)

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8 TIMESCALES FOR IMPLEMENTATION OF THE LBMMP (INCLUDING CONDITION 20F)

8.1 OFF-SITE WOODLAND

Please refer to Appendix D for the separate Woodland Management Plan and Timescales (Provided Separately).

8.2 ON-SITE

8.2.1 Planting

All planting (other than that associated with works associated with the A38 corridor/Downside Road) shall be undertaken, within the first planting season (1st November to 31st March inclusive) following commencement of the groundworks associated with implementing the planning permission for the growth of Bristol Airport to 12mppa. However, planting outside the planting season, using fully containerised planting material would be acceptable. This is on the understanding that increased watering will be required to establish the planting successfully.

Planting associated with works to the A38 corridor/Downside Road will occur in the first planting season following completion of those works and as above). Information associated with this aspect of the proposals can be found in Appendix L.

All works to be carried out in a way that ensures the safety of the public, especially employees and visitors during operational times. This refers to health and safety requirements while work is being carried out, whilst also making sure that areas are kept safe when works are left, whether complete or incomplete. This may result in work being carried out only at specific times, etc. (to be agreed with CA/Site manager).

8.2.2 Grassland

Please refer to the Method of Grassland Translocation and Management in Appendix D.

8.2.3 Faunal Features

The Pond restoration associated with Measure 15 will be completed in December 2023 to January 2024 (inclusive). Annual inspections will be carried out with further maintenance being implemented in December/January of subsequent years as required.

All existing bat and bird boxes at Bristol Airport will be inspected, cleaned out and repaired (or replaced) starting in November 2023. Annual inspections will be carried out with further maintenance being implemented in November of subsequent years as required.

The Northside bat tower will be maintained/enhanced in March of 2024. Annual inspections will be carried out with further maintenance being implemented in March of subsequent years as required.

The Cornerpool woodland bat tower will be maintained/enhanced in March of 2024. Annual inspections will be carried out with further maintenance being implemented in March of subsequent years as required.
The existing latrine building will be maintained/enhanced in December 2023 to January 2024. Annual inspections will be carried out with further maintenance being implemented in December/January of subsequent years as required.

The existing air raid shelter will be maintained/enhanced in October of 2023. Annual inspections will be carried out with further maintenance being implemented in October of subsequent years as required.

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The new bat building in Cornerpool Wood will be constructed by the end of 2024. It will be inspected and maintained in October 2024 with further maintenance being implemented in October of subsequent years as required.

The habitat management and enhancement of Cornerpool Wood will be implemented by summer 2024.

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9 DETAILS OF THE ORGANISATION RESPONSIBLE FOR THE DAY TO DAY PLAN IMPLEMENTATION

Bristol Airport Limited, working with its ecological, woodland and landscape advisor, Johns Associates, is responsible for the day to day plan implementation.

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10 MECHANISM FOR THE LONG-TERM IMPLEMENTATION OF THE LBMMP

10.1.1 The mechanism for the long-term implementation of the LBMMP (including the separate but associated Scheme of Grassland Translocation and Management and the Woodland Management Plan for the offsite Lulsgate Wood) is the compliance with and delivery of the associated planning conditions by Bristol Airport, monitored and enforced North Somerset Council.

Bristol Airport is the landowner, developer and operator of all areas associated with the actions set out in this document and all planning conditions. Their appropriate implementation can be enforced by North Somerset Council. Bristol Airport will be solely responsible for the ongoing funding of all relevant works and taking overall management responsibility for their implementation/reporting/demonstrating that aims and objectives are being met.

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APPENDIX A: ON SITE FEATURES TO BE MANAGED

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JOHNS ASSOCIATES

- SiteBoundary
- B3.2 - Calcareous grassland - semi-improved
- B4 - Improved grassland
- B6 - Poor semi-improved grassland
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- J2.5 - Wall
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree

CLIENT	Bristol Airport Limited
PROJECT	Discharge of Planning Conditions 24 and 25
TITLE	Phase 1 Habitat Map - Grasslands

SCALE @ A3	CREATED BY	CHECKED BY
1:4,000	CA	MJ
REFERENCE	**ISSUE/REVISION**	**DATE**
J01105-001		24/4/2023

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- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- J2.5 - Wall
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree
- A3.2 - Coniferous tree

CLIENT Bristol Airport Limited

PROJECT Discharge of Planning Conditions 24 and 25

TITLE Phase 1 Habitat Map - Grasslands

SCALE @ A3	CREATED BY	CHECKED BY
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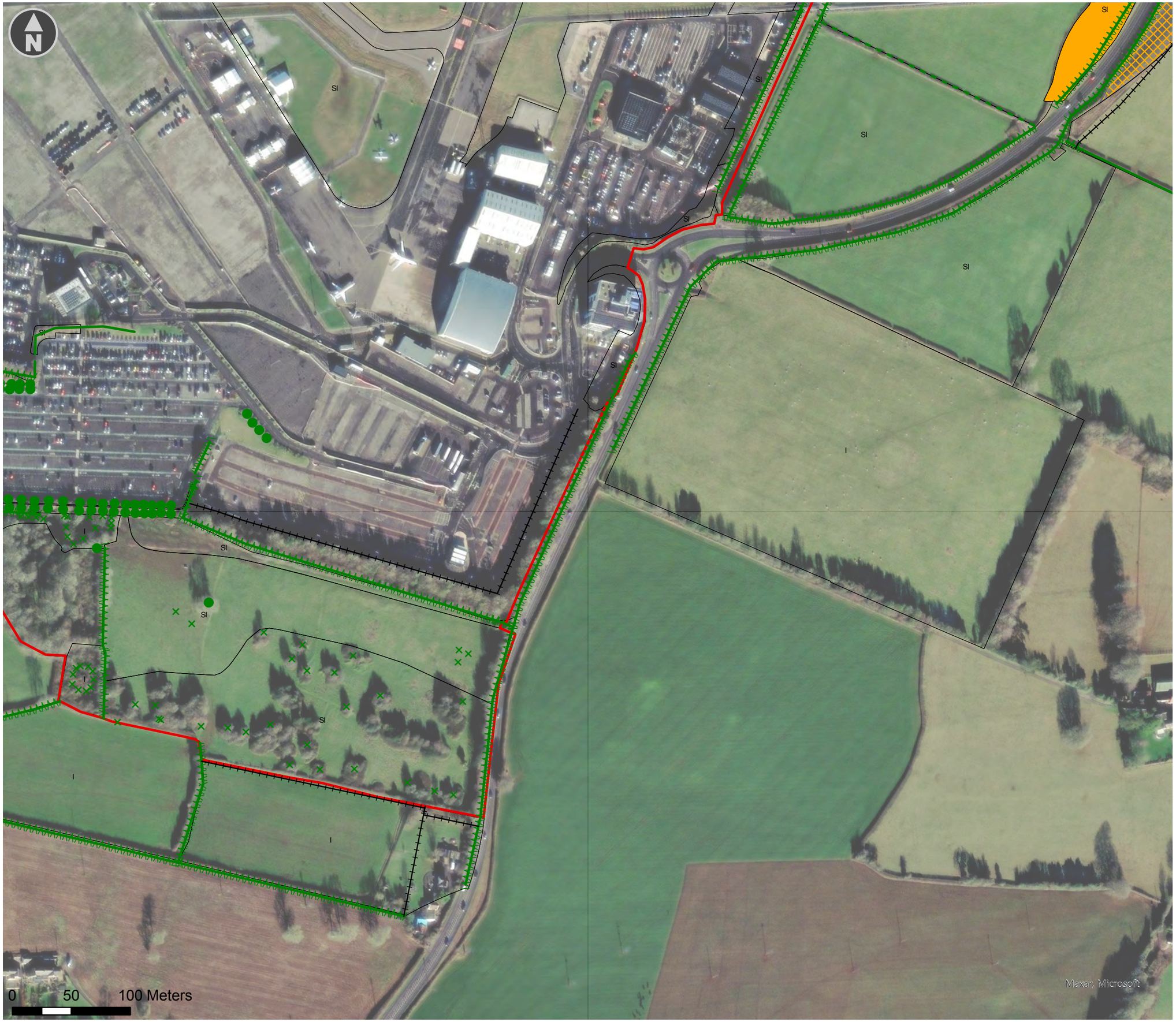

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- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree

CLIENT Bristol Airport Limited

PROJECT Discharge of Planning Conditions 24 and 25

TITLE Phase 1 Habitat Map - Grasslands

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- J2.1.2 - Intact hedge - species-poor
- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree

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PROJECT Discharge of Planning Conditions 24 and 25

TITLE Phase 1 Habitat Map - Grasslands

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- SI — B2.2 - Neutral grassland - semi-improved
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- J2.1.2 - Intact hedge - species-poor
- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- J2.5 - Wall
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree

CLIENT	Bristol Airport Limited
PROJECT	Discharge of Planning Conditions 24 and 25
TITLE	Phase 1 Habitat Map - Grasslands

SCALE @ A3	CREATED BY	CHECKED BY
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REFERENCE	**ISSUE/REVISION**	**DATE**
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- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- J2.5 - Wall
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree
- A3.2 - Coniferous tree

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PROJECT Discharge of Planning Conditions 24 and 25

TITLE Phase 1 Habitat Map - Grasslands

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- I — B4 - Improved grassland
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- J2.1.2 - Intact hedge - species-poor
- J2.2.2 - Defunct hedge - species-poor
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree
- A3.2 - Coniferous tree

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PROJECT Discharge of Planning Conditions 24 and 25

TITLE Phase 1 Habitat Map - Grasslands

SCALE @ A3	CREATED BY	CHECKED BY
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- I — B4 - Improved grassland
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- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree
- A3.2 - Coniferous tree

CLIENT Bristol Airport Limited

PROJECT Discharge of Planning Conditions 24 and 25

TITLE Phase 1 Habitat Map - Grasslands

SCALE @ A3	CREATED BY	CHECKED BY
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REFERENCE	**ISSUE/REVISION**	**DATE**
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- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- J2.5 - Wall
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree

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PROJECT Discharge of Planning Conditions 24 and 25

TITLE Phase 1 Habitat Map - Grasslands

SCALE @ A3	CREATED BY	CHECKED BY
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REFERENCE	**ISSUE/REVISION**	**DATE**
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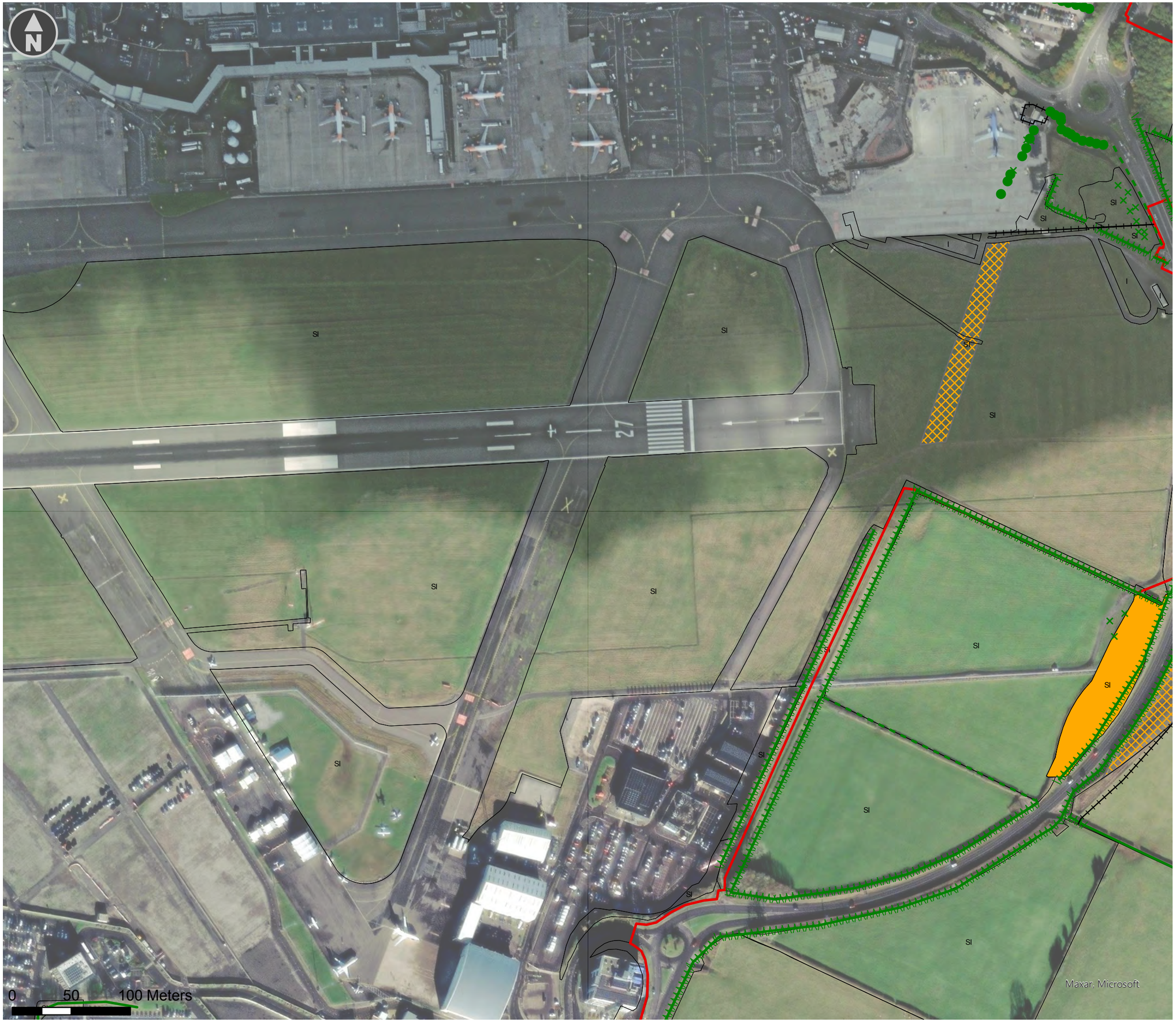

JOHNS ASSOCIATES

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- J2.1.2 - Intact hedge - species-poor
- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- A2.2 - Scattered scrub
- A3.1 - Broadleaved tree

CLIENT Bristol Airport Limited

PROJECT Discharge of Planning Conditions 24 and 25

TITLE Phase 1 Habitat Map - Grasslands

SCALE @ A3	CREATED BY	CHECKED BY
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REFERENCE	**ISSUE/REVISION**	**DATE**
J01105-010		24/4/2023

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APPENDIX B: OFF SITE FEATURES TO BE MANAGED

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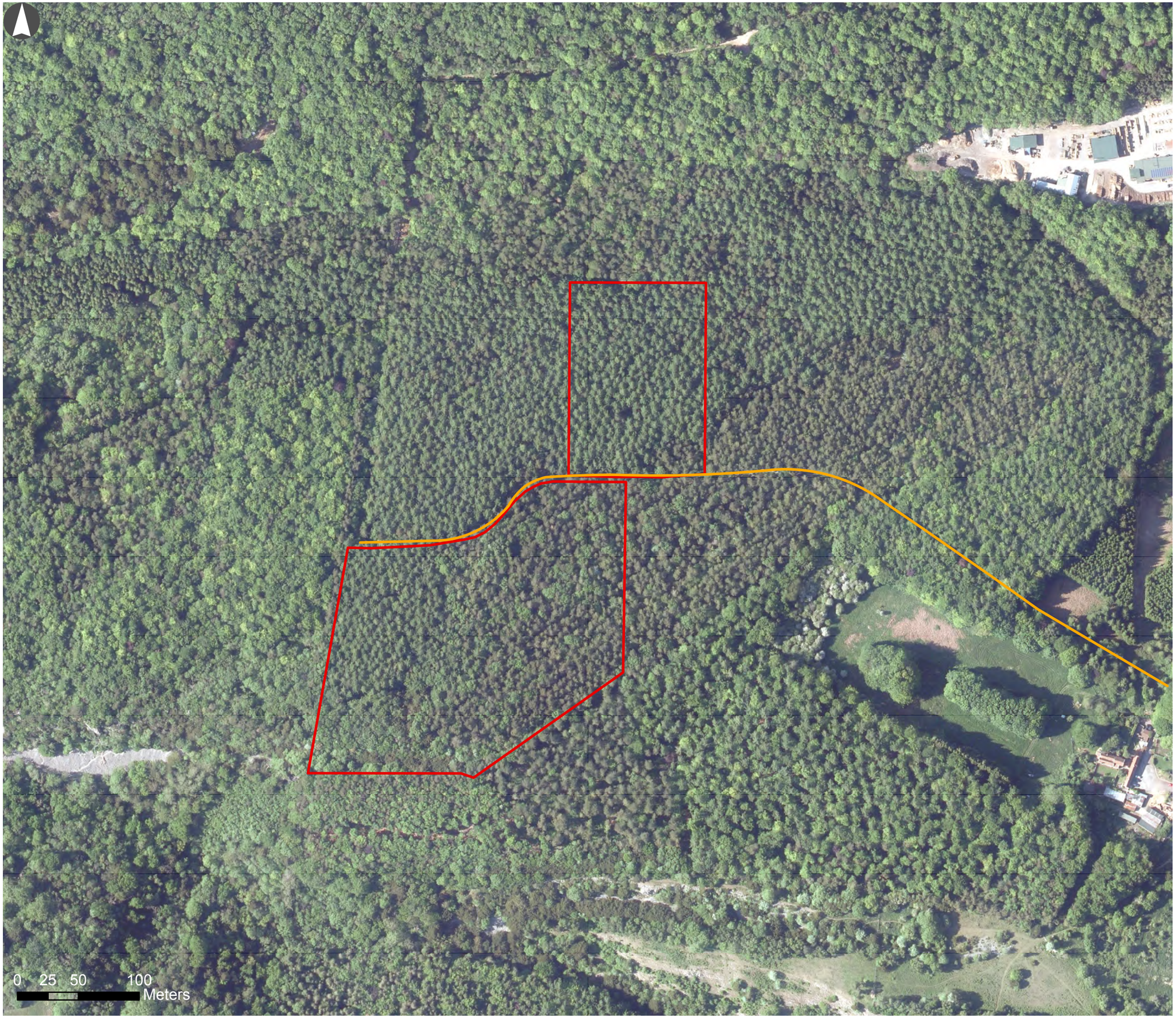

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Site Boundary
Trackway

Aerial imagery ©Bluesky International Limited

CLIENT	Bristol Airport Ltd
PROJECT	12mppa: Cogloop 2 Pre-Commencement Off-site Woodland
TITLE	Site Boundary Plan

SCALE @ A3	CREATED BY	CHECKED BY
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REFERENCE	**REVISION**	**DATE ISSUED**
J01025-001		30/9/2022

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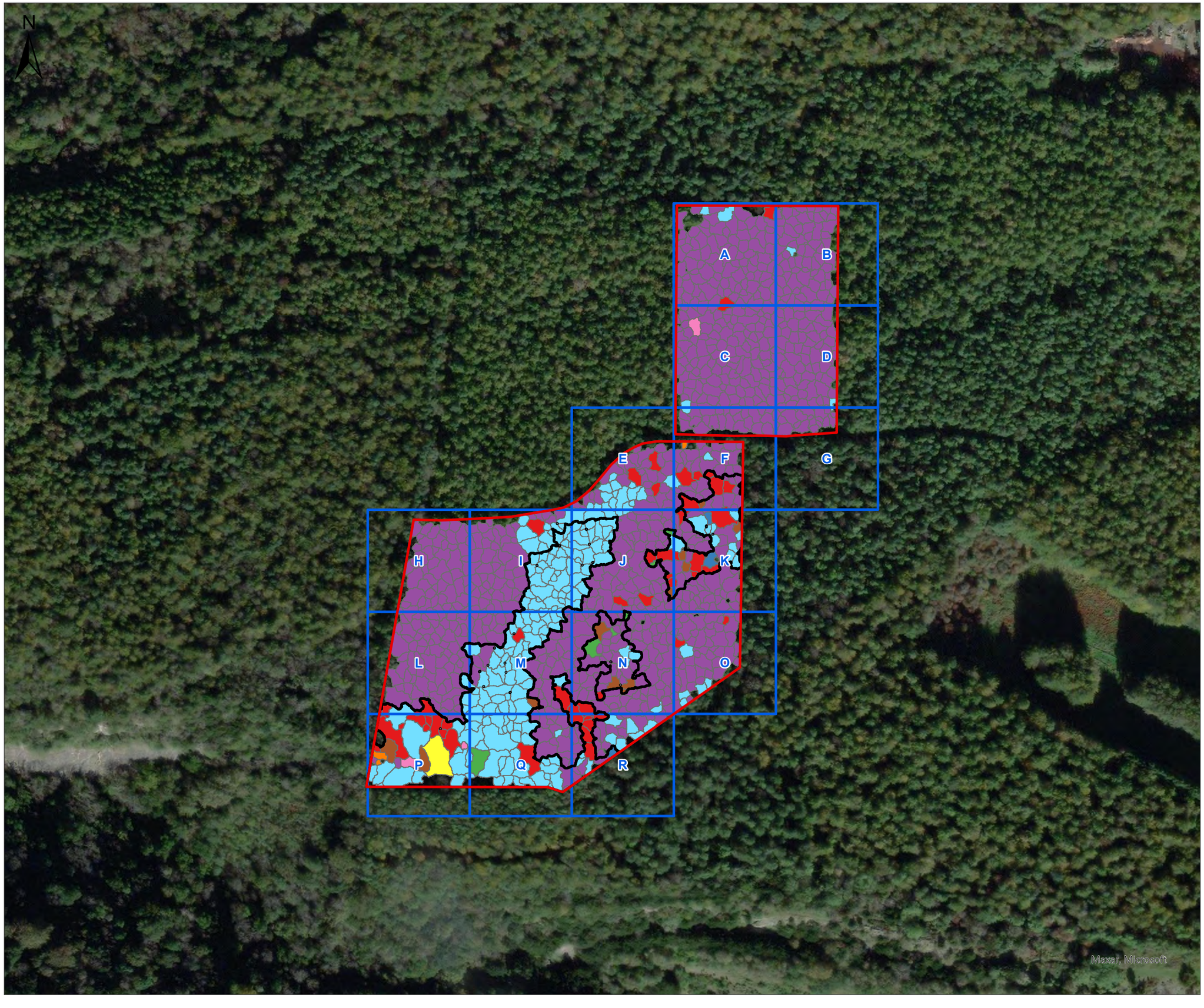

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Site Boundary
100% Canopy Retained
Grid 0.5 ha

Species

Ash
Beech
Birch
European Larch/Scots Pine
Holm Oak
Hornbeam
Oak
Whitebeam
Yew

Species	Sum of Area (ha)	% of Area
Ash	0.427	6.90%
Beech	0.015	0.24%
Birch	0.04	0.65%
European Larch/Scots Pine	4.322	70.13%
Holm Oak	0.008	0.12%
Hornbeam	0.038	0.63%
Oak	0.064	1.05%
Whitebeam	0.017	0.28%
Yew	1.224	19.98%
Grand Total	**6.2**	**100.00%**

CLIENT Bristol Airport Ltd

PROJECT J01025 Bristol Airport Off-Site Woodland Enhancment

TITLE Current Canopy Area by Tree Species

SCALE @ A3 1:2,500
CREATED BY RK
CHECKED BY MJ

REFERENCE J010025-00`
REVISION
DATE ISSUED 02/12/2022

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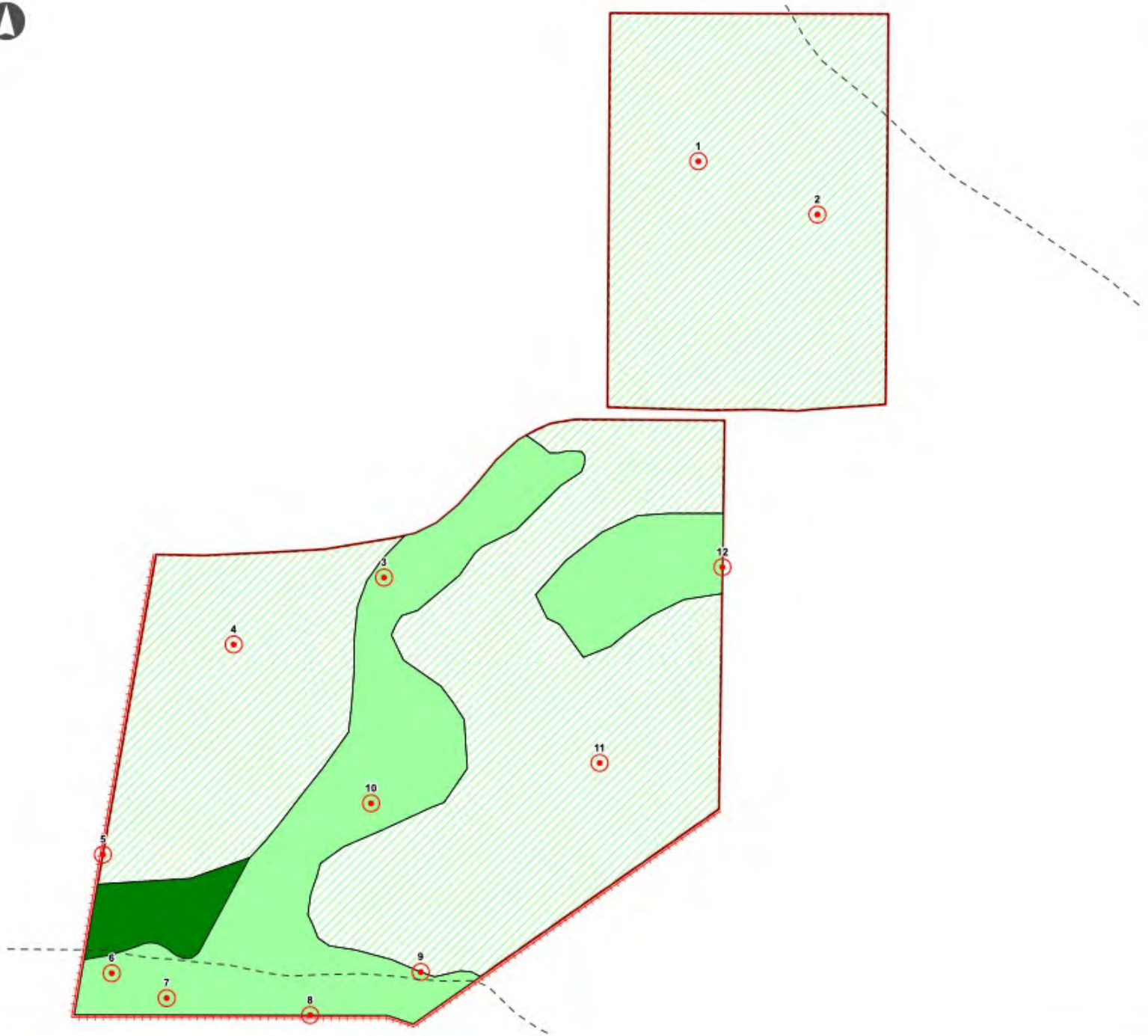

JOHNS ASSOCIATES

- Site Boundary
- Footpath
- Target Note
- J2.5 - Wall
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.1 - Coniferous woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation

CLIENT	Bristol Airport Limited
PROJECT	Replacement Woodland Ecological Baseline
TITLE	Phase 1 Habitat Survey

SCALE @ A3	CREATED BY	CHECKED BY
1:1,500	JS	KN
REFERENCE	**REVISION**	**DATE ISSUED**
J00407-002		13/05/23

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TARGET NOTES

1. Wet ditch from old tire track ruts – Had a number of damp loving plant species growing within this area.
2. This plantation woodland parcel canopy was mostly dominated by hybrid larch, with a small portion in the south east corner that was scots pine.
3. Large hole/pits in ground around this location – hazard, but also could be enhanced for bat hibernation roosts.
4. This plantation woodland parcel canopy was dominated by hybrid larch.
5. An old stone wall runs along the western site boundaries. The wall was partially fallen down which had a fern and bryophyte community existing covering most of its extent.
6. A number of non-native tree species were found of the footpath starting to spread across the scree slope. Both Quercus Ilex and Quercus cerris were noted in this area.
7. Area of limestone scree slope, forming part of the Goblin Combe SSSI and partially under canopy cover with a number of ferns and scrub growing.
8. An old stone wall runs along the western site boundaries. The wall was partially fallen down.
9. A number of common spotted orchids were noted growing along the footpath.
10. Area of semi-natural coniferous woodland dominated with Yew and common whitebeam. Very dense woodland with little light ingress.
11. This plantation woodland parcel canopy was dominated by Scots pine.
12. Smaller area of semi-natural coniferous woodland dominated with Yew and common whitebeam. Very dense woodland with little light ingress. *Quercus cerris* was noted growing on the edge of the woodland at ST 47424 65516.

APPENDIX C: ON-SITE INTEGRATED/EMBEDDED LANDSCAPE, VISUAL AND ECOLOGICAL MITIGATION MASTERPLAN

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