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LAND AT TUNSTEAD MILTON

Appeal by Mr Garie Bevan against the decision by High Peak Borough Council to refuse to grant outline planning permission for residential development at land at Manchester Road, Tunstead Milton (ref: HPK/2015/0351).

PROOF OF EVIDENCE IN RESPECT OF ECOLOGY AND BIODIVERSITY

By

UNA MAGINN BSc (Hons), MSc, MCIEEM

Appeal Reference: APP/H1033/W/16/3147726

November 2016

Introduction

1. My name is Una Maginn. I am a Technical Director with Avian Ecology Limited, an ecological consultancy. I have a BSc (Hons) in Environmental Science and a Master's degree in Applied Hydrobiology. I am a Full Member of the Institute of Ecology and Environmental Management and have over 25 years of experience working for both the public and private sectors on ecology and environmental sciences. I am familiar with, and have wide experience in, the assessment of ecological impacts of new development and in habitat creation and management for biodiversity mitigation and enhancement.

2. This document provides my Proof of Evidence to the Inquiry regarding the proposed development on land at Tunstead Milton (the Site) in relation to ecology and biodiversity.

Scope of Proof of Evidence

3. In my evidence I will consider matters relating to ecology, in terms of the potential effects of the proposed development and the contribution made by the application site to local biodiversity, and to ecological networks as part of Local Green Space 6 within the Chapel-en-le-Frith Neighbourhood Plan.

4. My evidence draws upon the Habitat Survey conducted by Arc Ecology in June 2014[1], the Arboricultural Statement prepared by Cheshire Woodlands in 2015[2], and a walkover site visit carried out by Avian Ecology in 2016.

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[1] Arc Ecology. *Land at Manchester Road, Tunstead Milton – Tree Survey and protected Species Appraisal*, July 2014

[2] Cheshire Woodlands *Arboricultural Statement Proposed Residential Development Land at Manchester Road, Tunstead Milton.* CW/7645-AS1 September 2015

5. In my evidence I will discuss the relatively low current biodiversity interest of the Site, the fact that the proposed development footprint within the Site comprises only a small part of the Local Green Space LGS 6 (approximately 4%), and the net biodiversity gain that is offered as a part of the proposed development.

Site description and Baseline Ecological Conditions

6. The 1ha application site lies on the edge of Tunstead Milton, Derbyshire. The B5470 Manchester Road runs along its northern boundary, and residential housing lies along the other side of this road. Residential and commercial properties lie to the west of the Site. The embankment of Combs Reservoir SSSI lies to the east, on the other side of Tom Lane. The Site slopes from the Manchester Road roughly north to south down to a small stream (Randal Car Brook), and the canal feeder watercourse to the south. Further open land lies to the south. A public footpath passes from the north across Manchester Road and adjacent to the western boundary of the land, then alongside the stream towards Tom Lane and the reservoir.

7. The majority of the land comprises intensively-grazed pasture with semi improved grassland and some areas of tall ruderal vegetation. Hedgerows and hedgerow trees run along to the northern and eastern boundaries and there are several further trees within the Site, predominantly in a line running north to south.

8. The grazed pasture, a common and widely occurring habitat type, provides low biodiversity interest. Greater biodiversity value (albeit at a local scale) is provided by the boundary hedgerows and trees.

9. Derbyshire Wildlife trust (DWT) visited the Site in September 2015 in order to assess the ecological interest of the grassland and other habitats present and provide advice to the Local Planning Authority. As part of that visit the

grassland was evaluated to see if it met the criteria for species-rich grassland against the Local Wildlife Sites Guidelines. On this basis, DWT has stated that the Site's grassland is semi-improved in character, based on the Trust's good knowledge of the local grassland resource from other work in the district and at this location in particular.

10. DWT confirms in an email of 17 September 2015 (**Appendix 2**) that the grassland present is semi-improved and notes:

    '… the site is highly unlikely to qualify as a Local Wildlife Site, even if surveys were conducted during the main field season'.

11. This confirms that the Site is not special or distinctive in terms of its ecological interest. It does not have a functional habitat link with the qualifying interest features of the Combs Reservoir SSSI which relate to aquatic habitats.

12. Details of the trees present across the proposed development area are provided in the Arboricultural Statement. A line of trees runs north to south across the Site which predominantly comprises alder *Alnus glutinosa*. There are also a number of trees bounding the Site along the roads on the northern and eastern borders and within an area of woodland to the south of the Site including beech, sycamore, hawthorn, blackthorn *Prunus spinosa*, elder *Sambucus nigra*, holly *Ilex aquifolium* and hazel *Corylus avellana*. Some trees are subject to Tree Preservation Orders.

13. Habitats of Principal Importance listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006) present on site comprise:

    - Grassland (species poor semi-improved grassland).
    - Deciduous woodland (comprising tree lines to boundaries and scattered trees only, there is no actual woodland on Site).

14. The overall ecological / biodiversity value of the Site is low, and is limited due to the intensive grazing management regime, lack of species diversity, short sward and limited refuge or foraging habitat for other wildlife. No protected species have been identified as being present on Site. The Site does not contain any ponds or ditches and hence does not support aquatic species, and is of low suitability for toads or other amphibians due to its lack of refuge habitat and the short grazed nature of the grassland. DWT concur (DWT email dated 17/09/2015) that the Site is highly unlikely to support great crested newts.

15. The Site has very limited suitability for notable bird species present in the local area and associated with Combs Reservoir SSSI, such as breeding lapwing, due to the small size of the field, and presence of boundary hedgerows and trees which obstruct the open views required by this species. Suitable habitat is available in the wider area, particularly on the open moorland to the south. Birds are however likely to nest within trees and hedgerows around the Site and some ground nesting bird species may attempt to breed within the grassland.

16. Adjacent land, to the east and south in particular, offers higher ecological and biodiversity interest and value for protected and notable species, including the corridor of the canal feeder stream and associated valley woodland, Combs Reservoir itself and its wetland and marginal habitat. Combs Reservoir is one of the few sites in Britain that support an unusual community of short-lived mosses and liverworts which grow on exposed mud flats whilst the reservoir is drawn down. The mixture of woodland, grassland and water-margin habitats around the reservoir which support a number of breeding bird species and swallows, house martins and sand martin hunt over the waters.

17. The habitats present within the Site do not directly relate, in habitat or species terms, to the qualifying interests of the Combs Reservoir SSSI.

18. The Site as a whole comprises approximately 8.25% of the total area of LGS 6. Within this, the proposed development footprint is only around 4% of the LGS 6 area. The majority of the rest of LGS 6 provides more varied biodiversity interest than the Site itself.

Effects on Ecology and Biodiversity

19. The Site is currently managed mainly as open grassland by sheep grazing and is in private ownership with no authorised public access. In its current condition the Site has low biodiversity interest. The surrounding area contains a range of habitats of greater value to biodiversity and supports a range of protected and notable species. However, opportunities for protected or notable species to use the Site itself are limited due to the intensive grazing regime and the limited diversity of habitats present, and none have been recorded during surveys completed to date.

20. The proposal will not result in the loss of all or part of any designated site, nor would it result in any significant loss or degradation of priority habitats or species listed in Section 41 of the NERC Act 2006.

21. The proposed development involves the permanent loss of approximately 0.5ha of species poor semi-improved grazed grassland for residential development, gardens and associated access, and the temporary loss of five trees and sections of gappy hedgerow along the Manchester Road frontage to create accesses.

22. The grassland loss is set in context by its limited biodiversity value of this commonly occurring and widespread habitat type, as confirmed by Derbyshire Wildlife Trust. The loss will be outweighed by the creation of more species-rich and valuable (in biodiversity terms) meadow grassland within a 'nature reserve' area of approximately 0.5ha which will be created within the southern half of the Site.

23. The hedgerow along Manchester Road is in poor condition, with gaps at the base, overgrowing ivy, and encroaching snowberry *Symphoricarpos albus,* a non-native species which can be out-compete less vigorous plants. The trees and hedgerow sections to be removed will be replaced within the Site by new tree and hedgerow planting, using native species appropriate to the locality and will result in no net loss of these features over time. Trees and hedgerows will be replaced on a more than '2 for 1' basis across the Site with an additional 200m of new hedgerow being added.

24. Any removal of trees or sections of hedgerow or ground vegetation clearance will take place outside of the bird breeding season, ensuring nesting birds are protected under the provisions of the Wildlife and Countryside Act (1981, as amended).

25. The potential for the trees directly affected by the proposed development to support bat roosts has been considered. The 2014 survey conducted by Arc Ecology (using a suitably qualified ecologist and current holder of a Level II Class Licence to survey for bats), concluded that the trees did not have bat roost potential.

26. A subsequent walkover site visit by Avian Ecology Ltd. and ground-based review of the trees along the Manchester Road frontage in 2016 confirmed that the trees themselves have very low bat roost potential due to a lack of suitable features including rot holes, dead wood, cracks and crevices. The ivy growth on these trees does however provide opportunities for small number of summer roosting bats, and on a precautionary basis the trees are considered to have 'low' bat roost potential. Further surveys would be unlikely to provide definitive presence/absence information, however in line with the current published guidance (Bat Conservation Trust, Collins, J. 2016) the affected trees would be removed in winter, when the risk of bats being present is lowest, and outside the bird breeding season. Arborists working on these trees would be alerted to the possibility of bats being present and

felling would proceed using 'soft felling' techniques, after suitable checks and under the supervision of a licensed bat ecologist as required. This will be confirmed before works on trees are undertaken, and in consultation with the Tree Officer.

27. There will be no habitat fragmentation or severance as a result of the proposed development. Habitat connectivity will be maintained around and across the Site, and will be enhanced through new tree and shrub planting, wetland creation, and management of grassland areas to enhance foraging and movement opportunities as described in a Biodiversity Management Plan prepared for the Site, provided as **Appendix 1** of this Proof of Evidence.

Legislation and Policy Context

28. Local policies relating to the protection, maintenance and enhancement of nature conservation and biodiversity are discussed below in relation to the Site:

Chapel-en-le-Frith Neighbourhood Plan - Local Green Space Site 6

29. The Site forms a small part (approximately 8.25%) of Local Green Space 6 within the Neighbourhood Plan. One of the reasons for its notification is for '*wildlife*'. The Neighbourhood Plan states that

> *"These spaces, in close proximity to the people they serve, are demonstrably special and hold particular local significance"*

30. The Statement of Case on behalf of the Local Planning Authority[3] refers specifically to Chapel-en-le-Frith Neighbourhood Plan - Policy CF4 – Open Space, Sports and Recreation Facilities, which states that:

    "Development that would harm the openness and/or special character of a Local Green Space or its significance and value to the local community will not be permitted unless there are very special circumstances which outweigh harm to the Local Green Space."

31. In my evidence I only comment on the Local Green Space 6 (of which the Site forms a relatively small part) in terms of the wildlife/biodiversity value associated with the green space allocation, and the context of the Site within this wider Local Green Space.

32. The Site does not contribute in any notable way to the overall wildlife value of LGS 6 for the reasons set out in Paragraphs 6-18; other non-designated land nearby could be considered to contribute to an equivalent extent. In my opinion, based on the findings of the habitat survey and from the responses made by DWT, the Site is not '*demonstrably special*' in wildlife terms.

33. Similar and higher quality grassland is widely present in the surrounding area, and its loss would not constitute a significant ecological effect (i.e in terms of change to local species populations) even at a local geographic scale.

<u>Local Plan Policy EQ5 Biodiversity</u>

"The biodiversity and geological resources of the Plan Area and its surroundings will be conserved and where possible enhanced by ensuring that

[3] White Peak Planning *Appeal by Mr Garie Bevan against the decision by High Peak Borough Council to refuse to grant outline planning permission for residential development at land at Manchester Road, Tunstead Milton (ref: HPK/2015/0351).* September 2016.

development proposals will not result in significant harm to biodiversity or geodiversity interests."

34. The proposed development, with the creation of a nature reserve area and integration of positive wildlife features within the built development itself, is considered to be compliant with Policy EQ5, Biodiversity. Effectively, the new planting and habitat creation proposed as part of the development would result in a localized benefit to biodiversity through the creation of more valuable and varied habitat, across the proposed development area and within the nature reserve area.

35. This is supported by comments made by DWT (Email dated 17/09/2015, **Appendix 2**) in which the Trust states that setting land aside as a nature reserve area which can be managed 'in perpetuity' for the benefit of wildlife:

> "*….could be beneficial to the local area's biodiversity and increase the diversity of the grassland's flowering species by appropriate control of thistle and management of grazing to allow flowering and seed fall.*"

36. Habitat enhancement and long-term management will take place across the Site to make a net positive contribution to local biodiversity compared to the Site's current relatively limited potential. Approximately half of the total Site area will be set aside for wildlife (hereafter referred to as the '*nature reserve*' area) to be sustainably managed to benefit biodiversity and for the quiet enjoyment of nature by the public. The overall Site area is 10,009m^2 and the proposed nature reserve area is 4,898m^2. The area of nature reserve will continue to provide open green space and fulfil a buffering function for the Combs reservoir, with increasing value over time as habitat enhancement measures and positive management practices develop more ecological value.

37. Enhancement measures are summarised below, and set out more fully in the Biodiversity Management Plan (BMP) (**Appendix 1)**, which has been prepared for agreement with the Council with the following objectives:

- Maintain and enhance the existing nature conservation value of the Site, integrated with the proposed development.
- Create new habitats and features to enhance local biodiversity value and connect with the wider environment.
- Provide sustainable and long term biodiversity benefit through appropriate management of the nature reserve area.
- Provide access and interpretation linked to the local path network for the quiet enjoyment of nature.

38. Implementation of the BMP and future management of the nature reserve will be the responsibility of the site 'Owner' or their appointed Managing Agent, to be agreed with the Local Planning Authority. The BMP address both the construction and post-construction phases of the proposed development to ensure habitat and species protection.

39. The enhancement measures described in the BMP (**Appendix 1**) are summarised below and are shown on **Figure 1** and described in **Table 4.2** of the BMP:

- Low intensity grassland management regime to increase species diversity and develop more structural variety than currently exists.
- Shrub and tree planting including over 200m of new native species hedgerow. Trees removed to facilitate the proposed development will be replaced, using appropriate native species, at well over the two for one basis which is the requirement in Policy EQ9 the Local Plan. *Requiring new developments where appropriate to provide tree planting and soft*

landscaping, including where possible the replacement of any trees that are removed at a ratio of 2:1

- Creation of a small community orchard using heritage species local to Derbyshire.
- Wetland area creation taking advantage of the natural hollow in the land which is already wetter than the surrounding grassland.
- Bird and bat boxes installed on suitable buildings and mature trees.
- Creation of 'refuge' habitat including log piles and two hibernaculae.
- Creation of a 'bug hotel' feature for invertebrates, including pollinating insects.
- Creation of a new west-east footpath access route through the nature reserve linking the existing public footpath with Tom Lane and access to the reservoir.
- Provision of a 'wildlife information board' and seating bench for the public within the nature reserve.

40. Within the built development, the residential gardens will also, in time, provide their own contribution to Site biodiversity although this has not been included in the appraisal of biodiversity gain.

41. The development will incorporate specific enhancement features, to include swift bricks installed on suitable east and north facing elevations. These will provide new nesting and roosting locations for birds foraging across the Combs Reservoir SSSI and other habitats in the area.

42. Additional benefit will accrue from changes to the existing grassland management regime, whereby areas of grassland along the south facing slope of the nature reserve will be subject to less intensive management and allowed to grow longer and develop into a more structurally and species diverse meadow. Tussock grassland and meadow areas provide considerably more habitat value to a wide range of species, providing seed, nectar sources

and foraging opportunities for invertebrates, birds and small mammals in a way that intensively grazed, very open, species poor grassland cannot.

43. A new wetland area will be created with associated marginal planting, accompanied by the creation of amphibian / reptile hibernaculae and wildlife refuge piles nearby. This will provide new habitat not currently present on site, with opportunities for amphibians and other species to forage, breed and safely overwinter. It is noted that DWT consider that the Combs area supports a high breeding toad population and recommends the creation of a new pond and hibernacula. This will be met through the planned wetland area and hibernaculae /refuges described in the BMP.

44. The BMP sets out the management practices to be adopted within the nature reserve and around the proposed development as a whole. The aim of the measures is to develop and maintain habitat to provide a net gain for local biodiversity and also provide public greenspace for the quiet enjoyment of nature.

45. The protection of retained features such as trees and hedgerows during and after construction, and the creation and long-term management of additional habitats will mitigate for permanent loss of grassland and temporary loss of five trees and short sections of hedgerow, and will in addition provide local benefits to biodiversity.

46. The proposed creation of a nature reserve area, accompanied by a Biodiversity Management Plan implemented to secure its long-term appropriate management, will in the short and medium term, provide net biodiversity gain compared to the grassland habitat that is currently present on the Site.

Local Plan Policy EQ8 Green Infrastructure

"*The Council will, through partnership working, develop, protect and enhance networks of Biodiversity and Green Infrastructure.*"

47. In my opinion with the implementation of the habitat enhancement and ongoing management proposals, the Site will continue to contribute to local green infrastructure and will maintain habitat connectivity across and around the Site.

48. Habitat enhancement measures and ongoing management practices are proposed which seek to conserve habitat diversity and connectivity with the wider landscape and will over time move the 'managed green space' within the Site to a better and more favourable condition in ecological terms. The addition of new wetland habitat and associated marginal vegetation will provide 'stepping stone' habitat links not currently provided by the open grazed grassland that is currently present.

49. Management of the grassland within the nature reserve to develop a more species-diverse meadow habitat will provide improved connectivity with adjoining habitat, including hedgerows and watercourses, as well as foraging and shelter for a range of species from insects to small mammals.

50. Careful lighting design and boundary planting will avoid light spill and will maintain a dark corridor along tree lines (where not already lit by street lights and adjoining residential properties), within the nature reserve and along the valley of the canal feeder stream.

51. Biodiversity networks will be maintained beside and around the houses through retained trees and hedgerow lines and the creation of new and strengthened boundary features, including over 200m of new hedgerow and native species trees as well as shrub planting and wetland creation. This will include new hedgerows on east-west and north-south orientations, linking to

woodlands and tree lines in the wider area and maintaining and strengthening commuting and foraging routes for bats.

52. Overall these measures will maintain coherent ecological networks, in line with the targets of the National Planning Policy Framework (2012), and will be consistent with the High Peak Local Plan and the Chapel-en-le-Frith Neighbourhood Plan.

53. It is not considered that this habitat loss (mainly comprising 0.5ha of low ecological interest grassland) will have any discernible effect on local ecological interest, wildlife networks, foraging resources, or on any species populations. There will be no effects on populations of local protected species that are likely to be present in the area.

Conclusions

54. The proposed development, associated as it is with the creation of a publicly accessible nature reserve, goes beyond simply mitigating the effect of habitat loss from the development footprint by enhancing an area of currently low ecological value, and ensuring its continued increased value through implementation of a long-term Biodiversity Management Plan, and opening up previously private land to public access and the quiet enjoyment of nature.

55. In my opinion the Site is not '*demonstrably special*' in wildlife terms in the context of LGS 6, and I consider that the proposed development can deliver local biodiversity gain through habitat creation and management that is beneficial to local biodiversity interests. Habitats of greater species and structural diversity than currently present will be created and maintained, providing opportunities for a great number and variety of species to utilize the nature reserve area than at present.

56. I conclude that, with appropriate agreement with the Local Planning Authority regarding habitat enhancement and management measures, the proposed development would not conflict with policy or wildlife legislation relating to designated sites, protected species or biodiversity.

Land at Tunstead Milton

on behalf of Mr & Mrs Bevan

Biodiversity Management Plan

avian ecology

Document Control				
Project Name:	Land at Tunstead Milton			
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Report Title	Biodiversity Management Plan			
Issue	**Date**	**Notes**	**Prepared**	**Reviewed**
V1	26/08/2016	Draft	U Maginn	A Logan
V2	14/10/2016	Final	U Maginn	A Logan
V3	03/11/2016	Final updated	U Maginn	A Logan

CONTENTS

1 INTRODUCTION

1.1.1 This Biodiversity Management Plan (BMP) sets out habitat protection and enhancement measures in relation to land at Tunstead Milton (the Site). Part of the Site is proposed to be developed for residential housing, with the remaining land to be established as a nature reserve area. The BMP details management practices to be adopted around the development and within the nature reserve area with the aim of developing and maintaining habitat to provide a net gain for local biodiversity, while also providing public greenspace for the quiet enjoyment of nature.

1.1.2 Habitat enhancement measures and ongoing management practices are proposed which seek to conserve habitat diversity and connectivity with the wider landscape. This will contribute to the establishment of coherent ecological networks, in line with the targets of the National Planning Policy Framework (2012) and the High Peak Local Plan.

1.1.3 Proposed measures to benefit biodiversity, such as new hedgerow/tree planting and bat and bird boxes are illustrated on the Nature Reserve Area Plan (**Figure 1**).

2 BACKGROUND

2.1 Location

2.1.1 The 1ha Site lies on the edge of Tunstead Milton, Derbyshire. The B5470 Manchester Road runs along its northern boundary, and residential housing lines the other side of this road. Combs Reservoir SSSI lies to the east on the other side of Tom Lane. The Site slopes from the Manchester Road roughly north to south down to a small stream (Randal Car Brook, a canal feeder watercourse) which runs along the southern boundary.

2.1.2 A public footpath passes from the north across Manchester Road and adjacent to the western boundary of the land, then alongside the stream towards Tom Lane and the reservoir.

2.1.3 The proposed development comprises the erection of six dwellings and associated gardens and accesses in the northern part of the Site immediately adjacent to Manchester Road, with the remaining land in the southern half of the Site retained, enhanced and managed as greenspace accessible to local residents.

2.2 Habitat Baseline

2.2.1 An ecological survey of the Site was undertaken in June 2014[1] and a further update habitat walkover was undertaken by Avian Ecology in February 2016 to inform this BMP.

2.2.2 The majority of the land comprised grazed pasture containing semi improved grassland and tall ruderal vegetation and a number of trees, predominantly in a line running north to south, but with other individual trees to the east and west of this main line. Dominant plant species consisted of common grasses including red fescue *Festuca rubra*, rough meadow grass *Poa trivialis*, Cock's foot *Dactylis glomerata*, Timothy *Phleum pratense* and false oat grass *Arrhenatherum elatius* with other vegetation including red clover (*Trifolium repens*), meadow buttercup *Ranunculus acris*, broad-leaved dock *Rumex obtusifolium*, nettle *Urtica dioica*, plantain *Plantago minor*, dandelion *Taraxacum officionale*). In the south-eastern section of the Site there are also large numbers of slender thistle *Carduus tenuiflorus*, spear thistle *Cirsium vulgare* with scattered soft rush *Juncus effusus* and common spotted orchid *Dactylorhiza fuchsii*.

[1] Arc Ecology. *Land at Manchester Road, Tunstead Milton – Tree Survey and protected Species Appraisal*, July 2014.

2.2.3 Details of the trees present across the proposed development area are provided in an Arboricultural Statement[2]. A line of trees runs north to south across the Site which is predominantly alder *Alnus glutinosa*. There are also a number of trees bounding the Site along the roads on the northern and eastern borders and within an area of woodland to the south of the Site including beech, sycamore, hawthorn, blackthorn *Prunus spinosa*, elder *Sambucus niger*, holly *Ilex aquifolium* and hazel *Corylus avellana*.

2.2.4 Habitats of Principal Importance listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006) noted as present on site comprise:

- Grassland (species poor semi-improved grassland)
- Deciduous woodland (comprising bordering tree lines only).

2.2.5 Combs Reservoir SSSI lies to the east of the Site and is one of the few sites in Britain that support an unusual community of short-lived mosses and liverworts which grow on exposed mud flats whilst the reservoir is drawdown. The mixture of woodland, grassland and water-margin habitats support a number of breeding bird species and swallows, house martins and sand martin hunt over the waters.

2.2.6 Views of the Site are shown in the photographs below.

View across the grassland field towards Manchester Road

View of nature reserve area and south facing slope (looking north-east)

[2] Cheshire Woodlands *Arboricultural Statement Proposed Residential Development Land at Manchester Road, Tunstead Milton.* CW/7645-AS1 September 2015

Line of trees running north-south across the site

View along Manchester road frontage showing built development and street lighting on the other side of the road

View of gappy hedgerow and trees on Manchester Road frontage

2.3 Future Baseline

2.3.1 The Site is currently managed mainly as open grassland by sheep grazing and is in private ownership with no authorised public access. In its current condition the Site provides some local biodiversity interest and contributes to the wider biodiversity network as species poor grassland with trees and gappy hedgerows to the boundaries. The surrounding area contains a range of habitats of greater value to biodiversity and supports protected and notable species. However, opportunities for protected or notable species to use the Site itself are limited due to the intensive grazing regime and the limited habitats present.

3 MANAGEMENT PLAN OBJECTIVES

3.1.1 Approximately half of the total Site area will be set aside for wildlife (hereafter referred to as the '*nature reserve*' area) to be sustainably managed to benefit biodiversity and for the quiet enjoyment of nature by the public. The overall Site area is 10,009m^2 and the proposed nature reserve area is 4,898m^2.

3.1.2 This BMP identifies appropriate enhancement and management measures to be implemented in association with the proposed development. The BMP complies with the High Peak Local Plan Policies relating to biodiversity, specifically **Policy EQ5 Biodiversity** which states that '*The biodiversity and geological resources of the Plan Area and its surroundings will be conserved and where possible enhanced by ensuring that development proposals will not result in significant harm to biodiversity or geodiversity interests*'.

3.1.3 The existing habitat provided by the Site in its undeveloped state comprises intensively managed species-poor grassland bounded by hedgerows and trees. Its overall biodiversity value is therefore limited due to its lack of structural diversity and species variety. It provides unsuitable habitat for a number of the protected and notable species recorded locally, particularly those associated with the Combs Reservoir SSSI, many of which have specific habitat requirements not provided by the Site. This includes wetland species, and species reliant on open vistas with clear views (e.g. lapwing).

3.1.4 The proposed development will result in the loss of 50% of the grazed grassland, along with four trees and sections of hedgerow along Manchester Road. However, by providing additional habitat features within the nature reserve area and around the proposed new development, the overall value of the retained space for biodiversity will be enhanced at a local level compared to existing conditions, due to the new opportunities provided for breeding, shelter and foraging for a wider range of species, from pollinating insects and invertebrates in general to small mammals, bats and birds. The benefit can be developed and maintained sustainably over the long term through the implementation of appropriate habitat management measures as described in this BMP.

3.1.5 Implementation of this BMP will ensure the continued contribution of the nature reserve area to local ecological networks in accordance with **Policy EQ8**, maintaining corridors between habitats (both terrestrial and freshwater). '*The Council will, through partnership working, develop, protect and enhance networks of Biodiversity and Green Infrastructure…. Requiring that development proposals, where appropriate, contribute towards the creation of new or enhancement of existing green infrastructure, including public and private open space, recreation areas, parks and formal outdoor sports facilities, local nature reserves, wildlife sites, woodlands, allotments, bridleways, cycle ways and local green spaces*..'

3.1.6 The Site will continue to contribute to local green infrastructure and will maintain habitat connectivity across and around the Site, which will be strengthened through the planting of approximately 200m of new native species hedgerow and hedgerow trees. The addition of new wetland habitat and associated marginal vegetation will provide 'stepping stone' habitat links not currently provided by the open grazed grassland that is currently present. Careful lighting design and boundary planting will avoid light spill and will maintain a dark corridor along tree lines (where not already lit by street lights and adjoining residential properties), within the nature reserve and along the valley of the canal feeder stream.

3.1.7 The objectives of this BMP are to:

1. **Maintain and enhance the existing nature conservation value of the Site, integrated with the proposed development.**
2. **Create new habitats and features to enhance local biodiversity value and connect with the wider environment.**
3. **Provide sustainable and long term biodiversity benefit through appropriate management.**
4. **Provide access linked to the local path network for the quiet enjoyment of nature.**

3.1.8 Implementation of the BMP and future management of the green space will be the responsibility of the site 'Owner' or their appointed Managing Agent, to be agreed with the Local Planning Authority.

3.1.9 The BMP will be subject to regular review and update by the Owner or their appointed Agent as a sustainable and 'live' document in order to ensure continued adherence to the objectives.

4 BIODIVERSITY PROTECTION DURING CONSTRUCTION

4.1.1 The construction phase of the development will ensure that retained habitat features of the nature reserve (including the streamside corridor, trees and shrubs) are protected during construction works by implementing the following measures:

- All works will be confined to the development application area and no works will impinge on the nature reserve, which will be separated from the development area by fencing before works commence. Standard runoff control and pollution prevention measures will be implemented in accordance with Environment Agency Guidelines; these measures will safeguard the stream and its associated habitats and species.
- Mature trees to be retained will be protected in-line with BS 5837:2012 *Trees in relation to design, demolition and construction*. Protective fencing to safeguard root zones will be installed before construction begins.
- Development will require the removal of five trees and short sections of hedge along Manchester Road. This will be compensated for by additional tree and hedgerow planting using native species appropriate to the location and agreed with the Local Authority Tree Officer. Some retained trees within the development area will be selectively pruned to help them develop a balanced habit.
- Trees identified for removal have not to date been identified as having bat roost potential[3], however the trees have ivy cover and hence are considered on a precautionary basis to have '*low'* bat roost potential. In line with the current published guidance (Collins, 2016) surveys are not proposed (and would be unlikely to provide definitive presence/absence information). These trees will be removed in winter, when the risk of bats being present is lowest, and outside the bird breeding season. Arborists working on these trees will be alerted to the possibility of bats being present and felling will proceed using 'soft felling' techniques under the supervision of a licensed bat ecologist as necessary. This will be confirmed before works on trees are undertaken and in consultation with the Tree Officer.

[3] Arc Ecology. *Land at Manchester Road, Tunstead Milton – Tree Survey and protected Species Appraisal*, July 2014

- There will be clear delineation of working areas and access routes for vehicles entering the Site and instructions of these will be given to all Site construction staff, delivery drivers and subcontractors in order to protect retained vegetation.

- Site clearance works will be undertaken outside of the breeding bird season in so far as reasonably practical. The breeding bird season is generally acknowledged to be 1st March to 31st August inclusive. Where this cannot be avoided, a competent ecologist will be appointed to undertake a pre-site clearance survey to identify the presence of any wild bird nests being built or in use. Only once the appointed ecologist is satisfied that an offence under Part 1 of the *Wildlife and Countryside Act* 1981 (as amended) will not occur, may works proceed.

- Construction lighting will be positioned to avoid illuminating mature trees, the stream corridor and nearby houses.

- All ground excavations during the construction phase will be covered overnight or fitted with a means of escape suitable for badgers and small mammals to prevent both from becoming trapped. All construction materials will also be stored in secured compounds or raised off the ground.

5 BIODIVERSITY ENHANCEMENT AND MANAGEMENT

5.1 Key Measures

5.1.1 Enhancement and management practices to enhance the nature reserve for the benefit of local wildlife and provide a net biodiversity gain at a local level are detailed below.

5.1.2 The design and long-term management of the land will maintain and improve habitat functionality through: protecting and enhancing the wildlife corridor provided by the stream and its bankside habitat, planting and maintenance of native species shrubs and trees, wetland creation, and maintenance and creation of more species-diverse open grassland areas than is currently present.

5.1.3 The enhancement measures summarised below are shown on **Figure 1** and described in **Table 4.2**:

- **Low intensity grassland management regime to increase species diversity and develop more structural variety than currently exists.**

- **Shrub and tree planting including over 200m of new native species hedgerow.**

- **Creation of a small orchard area using heritage species.**

- **Wetland area creation taking advantage of the natural hollow in the land.**

- **Bird and bat boxes installed on suitable buildings and mature trees.**

- **Creation of 'refuge' habitat including log piles and two hibernaculae.**

- **Creation of a 'bug hotel' feature for invertebrates, including pollinating insects.**

- **Creation of a new west-east footpath access route through the nature reserve linking the existing public footpath with Tom Lane and access to the reservoir.**

- **Provision of a 'wildlife information board' and seating bench for the public within the nature reserve.**

5.1.4 Within the built development the gardens will also, in time, provide their own contribution to site biodiversity. The development will incorporate specific enhancement features, to include swift bricks installed on north and east facing facades (examples provide in **Appendix 1**). These will provide new nesting and roosting locations for birds using the nearby Combs Reservoir SSSI.

5.2 Enhancement and Management

5.2.1 A summary of the biodiversity management and enhancement measures is set out in **Table 4.2**. General measures will include works on retained trees and shrubs to bring them back to good condition and growth habitat. This will include removing dead/dangerous and overgrown trees and shrubs and pruning selected trees to allow more light to reach the ground and help develop diverse understory vegetation. Planting and grassland meadow creation will take place across as shown on **Figure 1**.

5.2.2 Selective pruning, along with new native species planting set back from the watercourse banks will increase habitat interest and species diversity along this section of stream.

Native Hedgerow, Shrub and Trees

5.2.3 Additional hedgerow/tree and shrub planting will be undertaken using native species appropriate to the High Peak area. Selected fruit trees will be planted and managed as a small community orchard using heritage species appropriate to the area. This may include apple trees local to Derbyshire such as the Beetley Pippin, Newton Wonder, Lamb's Seeding and Beledge Pippin. These will be planted and grown as widely spaced standard or half-standard fruit trees, in permanent grassland once established, in line with traditional orchards.

5.2.4 Shrub and hedgerow/tree planting will be undertaken, with species as detailed in **Table 4.1** planted at 5 plants per linear metre in a double staggered row. A detailed planting specification will be provided in advance to the Local Planning Authority.

Table 4.1: Shrub and tree planting.

Shrub and Tree Species	
Hawthorn	*Crateagus monogyna*
Blackthorn	*Prunus spinosa*
Hazel	*Corylus avellana*
Field maple	*Acer campestre*
Rowan	*Sorbus aucuparia*
Holly	*Ilex aquifolium*
Dogwood	*Cornus sanguinea*
Goat willow	*Salix caprea*
Grey willow	*Salix cinerea*
Oak	*Quercus robur*
Alder	*Alnus glutinosa*
Crab apple	*Malus sylvestris*

5.2.5 All planting stock supplied shall be healthy and viable and comply with BS 3936: Parts 1 to 10 as relevant, and BS 4043, the National Plant Specification, published by the Horticultural Trades Association (HTA) as appropriate. Supplying nurseries will be registered under the HTA Nursery Certification Scheme. All plants will be packed and transported in accordance with the Code and Practice for Plant Handling as produced by CPSE.

5.2.6 All bare-root planting stock will be kept covered until actually planted in order to minimise water-loss and prevent the roots from drying out and will be root dipped in an approved water-retaining polymer. To prepare the ground for planting, where necessary existing weeds will be removed with hand-weeding. All extraneous matter such as plastic, wood, metal and stones greater than 50mm diameter will be removed from Site to a registered waste disposal facility.

5.2.7 The exact timing of planting will be dependent on the ground conditions but planting should take place between the months of October and March. It is expected that ground conditions and climate will allow for earlier planting (i.e. before January), and this will allow the plants more time to establish a network of feeder roots before the onset of spring. Planting will not be carried out when the ground is waterlogged, frost bound or during periods of cold drying winds.

5.2.8 Planting slots shall be made using a planting spade. Plant notches should be T-, H- or L- shaped, or straight notches, using spades of a design suitable for this purpose. The planting notches must be vertical and deep enough for the roots to hang freely, with the transplant being planted so that the root collar is exactly level with the ground surface. The notch must then be closed and the soil will be well firmed round the roots in line with the guidelines as set out in BS 4428 (1989).

5.2.9 Prior to tree planting, all existing rough grass and weeds will be cut to between 20mm and 30mm with 300mm x 300mm squares of turf removed at 1m centres.

5.2.10 The minimum overall recommended rooting depth for shrubs is 600mm and for trees is 900mm. The first 450mm shall be made up of multi-purpose topsoil; it shall be ensured that suitable subsoil provides the remainder of the minimum rooting depth. Before receiving topsoil, subsoils may need to be loosened if necessary using ripping equipment; this shall be done when the subsoil is dry to encourage soil shattering.

5.2.11 Tree planting should be planted at even spaces into the prepared soil at the specified number per centre, with minimal disturbance to the rootball, and well firmed in. All planting stock will be protected from damage using approved proprietary 600mm plastic shrub shelters, supported with 0.9m x 32mm x 32mm softwood stakes as advised by the manufacturer. These shelters must be removed by the third year after planting.

5.2.12 During the first two years after planting (establishment period) all dead, dying or diseased stock will be replaced with stock of similar size and species by the appointed contractor at their own cost. The planting areas will be kept weed-free during the establishment period using hand-weeding. Transplants shall be watered as required during the first one or two growing seasons until successfully established.

5.2.13 Trees will be left to grow naturally and not cut. Stakes and guards will be removed once trees are established (typically by Year 2 or 3). In the initial maintenance period, weeds around the base of each tree will be removed within a 1m to 1.5m radius.

5.2.14 During establishment, shrubs will be trimmed outside each growing season if needed to develop a healthy habit, and hedgerows will be cut back by half the growth of that year with pruning aiming to encourage the development of healthy well-shaped specimens. Cutting will be undertaken in late January/February or September/October when necessary to reshape and manage more mature shrubs over time.

5.2.15 Hedgerow shrubs will subsequently be cut on a 2-3 year rotational basis and will be cut on different sides each year and not all shrubs will be cut in the same year to allow a varied structure for the benefit of wildlife. No cutting or trimming is to be undertaken during the breeding bird season (01st March to 31st August inclusive).

Grassland

5.2.16 Grassland within the nature reserve will be managed by low intensity cutting to help increase its species diversity over time, adjusting the management to allow plants to flower and set seed. These will provide valuable south-facing open sunny 'glades' on the slopes which will be attractive to pollinating insects, other invertebrates and in turn to birds and other species.

5.2.17 The grassland will be managed to be structurally as well as species diverse, with seasonal rotational cutting designed to leave some longer tussock grassland areas at the peripheries and around shrubs and trees, providing refuge and shelter for wildlife. Grassland will be managed either through light, low intensity seasonal grazing or with a single cut (reducing sward height to approximately 150mm) late in September, subject to weather conditions. The late cuts will allow the seeds of the later flowering species to fall prior to the cut. Grass cuttings will be removed or piled up in a suitable corner of the nature reserve to provide additional refuge habitat.

5.2.18 Cutting should work outwards towards the boundary features; this systematic cutting will allow fauna such as invertebrates, amphibians, birds and small mammals to safely vacate the area temporarily. A phased (rotational) cutting regime is recommended (i.e. ideally the entire area should not be cut at the same time) in order to allow for more structured grassland. Areas around trees and hedgerows will be allowed to grow taller, providing increased cover and will benefit a variety of fauna including amphibian species, invertebrates and small mammals.

Bird Boxes

5.2.19 Additional bird nesting provision will be made through the inclusion of 6 bird boxes erected on mature trees, at an appropriate height of approximately 3-4 metres. Boxes should be angled so that they face away from the prevailing wind or in a semi sheltered environment. Positioning within or close to hedgerows will increase chances of occupation. Specifications for suitable bird boxes are provided in **Appendix 1**. Indicative locations of where bird roosting boxes should be located are provided in **Figure 1**.

5.2.20 Six swift bricks (colony nest boxes, each box providing 2-3 nest spaces) will be installed on suitable elevations of the new houses, examples as shown in **Appendix 1**.

Bat Boxes

5.2.21 New bat roost provision will be made through the inclusion of 8 bat roost boxes erected on mature trees, at an appropriate height (minimum height of 3m) and with clear flight paths to the boundary of the Site. Long-lasting woodcrete bat boxes suitable for nursery or summer roosting for small crevice dwelling bat species will be erected, two per tree, each facing different directions in order to provide roosts with varying conditions. Specifications for suitable bat roosting boxes are provided in **Appendix 1**. Indicative locations of where bat roosting boxes should be located are provided in **Figure 1**.

Refuge Habitats

5.2.22 Several refuge habitats will be created, as shown on **Diagrams 4.1** and **4.2**. Once constructed these require little management over the long-term other than occasionally adding cut material from shrub management to supplement the habitat pile/hibernaculae. These features provide valuable

shelter, foraging habitat and overwintering refuges for a variety of wildlife, from invertebrates to small mammals.

5.2.23 Deadwood taken down during tree works and any wood removed during habitat management or other work operations will be used to create habitat or log piles and hibernaculae, placed at several locations within the nature reserve, in order to provide valuable invertebrate habitat and shelter for other species including reptiles and small mammals. These shelter habitats shall include at least one hibernaculum as illustrated in **Diagram 4.1** and one 'loggery' shown on **Diagram 4.2**. These shall be located in undisturbed areas. Arisings from ongoing management can be used to supplement the habitat piles. These will be placed in the same locations each year. The indicative locations of where log / brash piles should be located are provided in **Figure 1**.

5.2.24 Refuges such as these will also benefit local hedgehog populations for secure overwintering. Hedgehogs will also benefit from the improved foraging opportunities offered by the habitat created.

5.2.25 Bug hotels will be created within the nature reserve designed to provide overwintering refuges for a range of invertebrates.

Diagram 4.1 Suggested hibernaculum design as depicted in the Great Crested Newt Mitigation Guidelines (English Nature 2001).

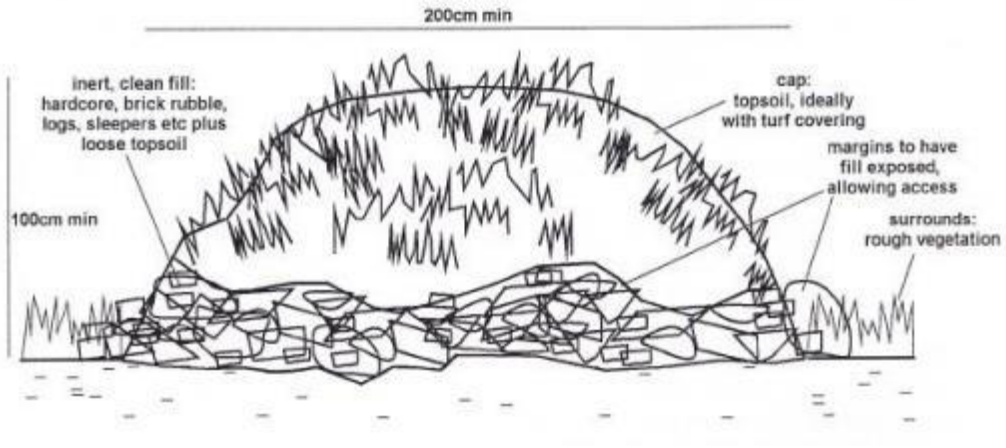


Diagram 4.2: Illustration of typical vertical log pile for invertebrates

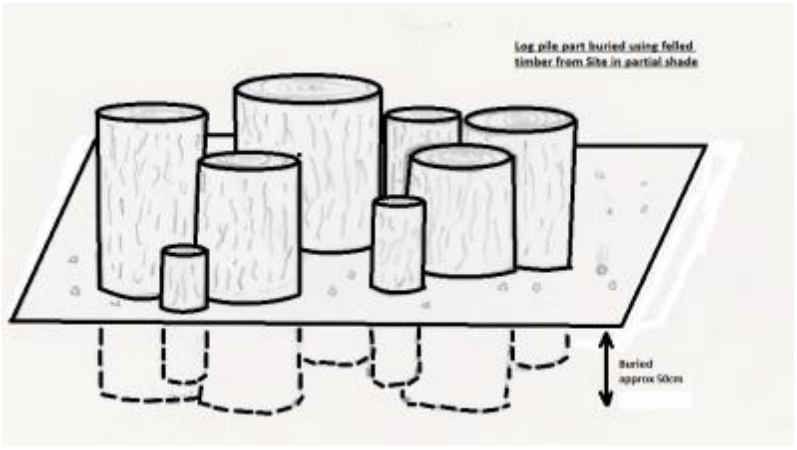


Table 4.2: Summary of Biodiversity Enhancement and Management Measures

Biodiversity Item/Number	**Location**	**Biodiversity Benefit**
Bat boxes (8 No.)	On suitable building elevations and mature trees	Enhanced long-term roosting opportunities to benefitting bats using the stream corridor and nearby reservoir habitat for foraging and commuting.
Swift bricks (6 No.) Bird Boxes (6 No.)	Proposed development on east facing elevations Within nature reserve and on suitable trees	Provide new nesting opportunities, complementing the foraging resource provided by the Combs Reservoir and within the nature reserve. *Swift bricks or house martin boxes will not constrain householders during maintenance etc. as the nesting features are separate from the main fabric of the buildings. They would need to be carefully placed at second storey height just below the roofline approx. 5m above ground.*
Stream protection and bankside vegetation management	Along stream corridor beside nature reserve where within land ownership	Help maintain and protect stream corridor and ecological network. Provide complementary features including habitat piles, meadow grassland and native species shrubs and trees, along with bat and bird boxes to strengthen the corridor value.
Meadow grassland - low intensity grassland management to develop species and structural diversity.	Within nature reserve	Increased overall habitat diversity in combination with nearby trees, hedgerows/shrubs and watercourse. Beneficial to range of invertebrates and other species, providing food resources for pollinators and birds as well as shelter for small mammals.
Native species hedgerow shrubs and trees Over 200m of new native species hedgerow, planted a 5 plants per linear metre in a double staggered row (approx. 1000 plants) with native species trees	Around Site	Increased range of plant species and habitat diversity. Improved habitat value and corridor connections with wider area helping to maintain habitat networks in association with the stream. Enhanced commuting and foraging opportunities for bats and birds. Shelter and foraging habitat for range of invertebrates, shelter for other species; plus flowers and berries provide food for pollinating insects, birds, bats, small mammals etc.
6 No. Heritage variety fruit trees, including varieties of apple local to Derbyshire	Within nature reserve	Help preserve local fruit tree varieties special to Derbyshire. Provide community resource (free fruit) and raise awareness of local heritage. Trees flowers and fruit will benefit pollinating insects and provide a valuable resource to birds, small mammals etc.

Wetland area	Natural low lying area within nature reserve to be extended to create small wetland area. Natural collection point for site drainage	New wetland habitat which will attract a wide range of plant, insect and other species including amphibians and possibly also reptile species. Provides complementary habitat to nearby watercourses and the reservoir. Provides a 'stepping stone' habitat linked to other waterbodies in the area.
Log piles or refuges/hibernaculae	Adjacent to hedgerows and by wetland/meadow area. Some in shade, some in sunny position.	Increased structural diversity within the site. Refuges or hibernacula provide valuable overwintering and general shelter to wildlife, especially amphibians and possibly also reptiles if present in the area.
Bug 'hotel'	Within nature reserve	Shelter and overwintering refuge for a range of invertebrates including pollinating insects.
Linking west-east footpath	Through nature reserve linking footpath to west of the Site with Tom lane to the east.	Enhanced local access, community use of the small orchard, and provision for the quiet enjoyment of the nature reserve.
Information board and bench	Within nature reserve	Interpretation board for people walking through or visiting the nature reserve about local wildlife, linking footpaths, what has been planted within the nature reserve, and the local species to look out for. Seating provision for the quiet enjoyment of the nature reserve.

6 INDICATIVE MANAGEMENT SCHEDULE

6.1.1 The following management programme shows possible months in which activities will commence within the first planting period after construction:

Initial Habitat Enhancement Year 1

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 1												
Hedgerow, shrub and tree planting.	✓	✓								✓	✓	✓
Light cutting and weed control (if required to control weeds around trees and shrubs and grassland).				✓	✓	✓	✓					
Install bird nest and bat roost boxes on mature trees	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Creation of log piles, hibernaculae and bug hotel.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Creation of footpath, seating area and installation of information board	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Annual Habitat Management Year 2

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 2												
Light cutting of grassland to help sward develop (as required).									✓			
Weed control as required to control weeds around trees and shrubs				✓	✓	✓	✓					
Light pruning of newly planted shrubs/hedgerow if required.	✓	✓										
Checks by contractor through the initial maintenance period to comprise weed clearance, watering, checking stakes and ties and pruning.				✓	✓	✓	✓	✓	✓			
Remove tree ties, stakes and shelters	✓	✓								✓	✓	✓

Ongoing Annual Management

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 3 onwards												
Rotational cutting of grassland.									✓			
Periodic pruning to establish strong tree/shrub growth and prevent excessive shrub encroachment into grassland and over paths etc.	✓	✓										

7 ECOLOGICAL MONITORING

7.1.1 The development of the biodiversity interest of the nature reserve will be monitored at agreed periods by a suitably experienced ecologist. This will involve an inspection of shrubs, trees and grassland and any other ecological enhancement features to ensure that they are being managed to achieve biodiversity objectives. The monitoring programme will be established to review the habitats and management practices and, where necessary, implement any revisions to the habitat management practices in order to ensure to the proposed biodiversity gains are realised and habitat establishment is achieved.

7.1.2 The results of the monitoring will be used to inform future changes in management and the need or otherwise to replace missing bat/bird boxes and to replace dead or dying shrubs and trees plants. The management plan will be amended if necessary based on the monitoring recommendations.

7.1.3 The development of the biodiversity interest of the Site will be monitored over time by a suitably competent ecologist in Years 1 and 5 after development. By this time there will be sufficient stability in, and understanding of, the establishing habitats to enable ongoing management without further monitoring.

7.1.4 Monitoring will involve an inspection of the planted shrubs, trees, grassland and any other ecological enhancement features to ensure that they are being managed in a manner suitable for the enhancement of wildlife interest. Bird and bat boxes will be checked and log piles, hibernacula and bug hotel inspected.

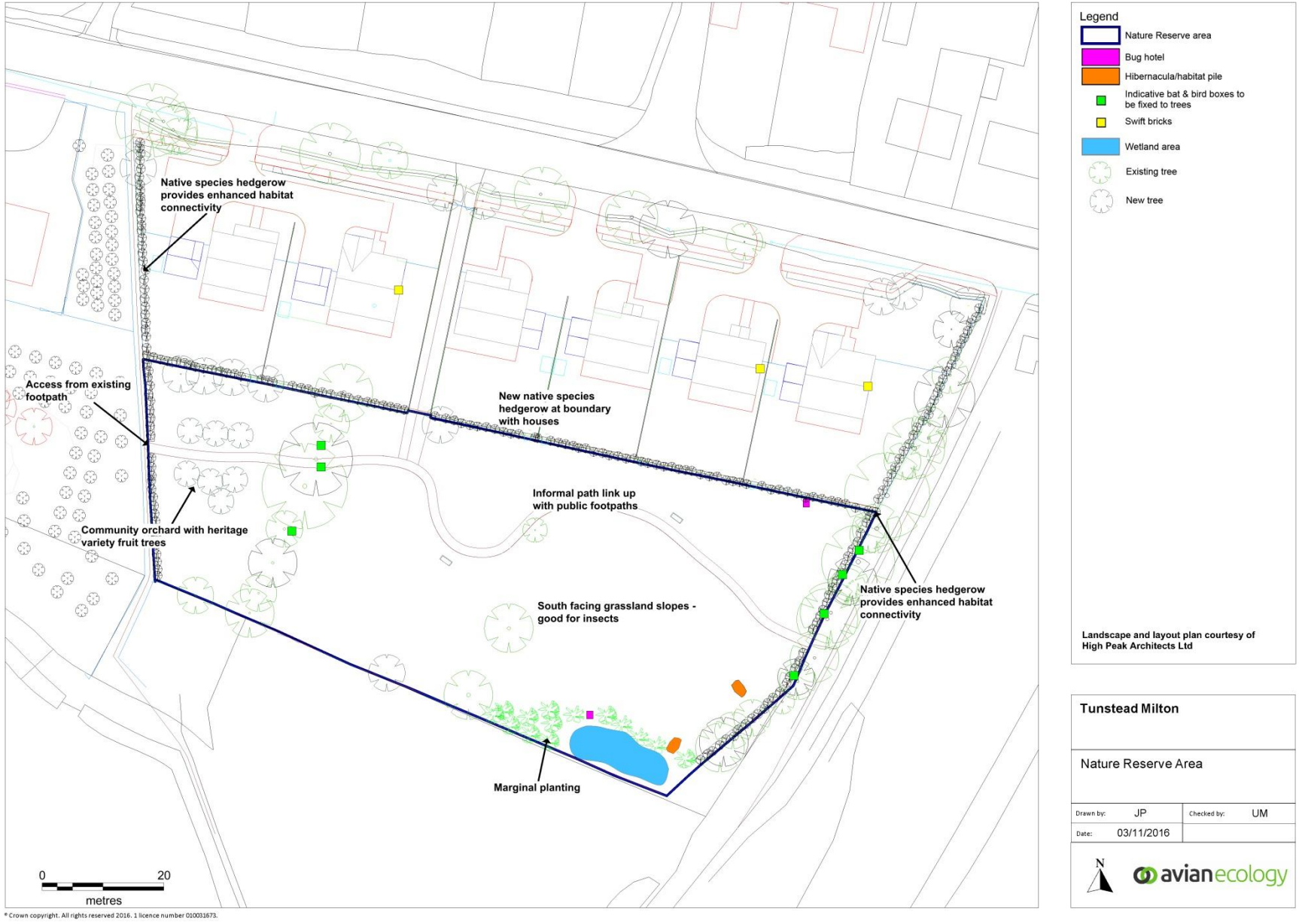
7.1.5 Monitoring reports will be made available by the reporting ecologist to the managing organisation (the site 'Owner' or Agent) each year in which monitoring is carried out. Following the outcomes of each monitoring survey it will be the responsibility of the 'Owner' to amend the BMP and implement any revised management approaches if necessary based on the monitoring recommendations.

7.1.6 Monitoring procedures are outlined in **Table 7.1**:

Table 7.1: Habitat Feature Monitoring procedures and key indicators.

Biodiversity feature	**Monitoring procedure**	**Key indicators**
Shrubs and trees	Walk all areas of Site	Damaged stems or branches, dead plants, weed choking – *Indicates replacement planting or repair pruning required* Check tree and shrub guards and tree shelters have been removed, after year 3.
Meadow Grassland	Walk all areas of Site	Review diversity of plant species present. Check cutting times and confirm cut material is being piled up in a suitable corner or removed. Overgrowth of unwanted perennial weeds (docks, brambles) may need control by occasional herbicide spot treatment following supplier's instructions. To control bramble development and excessive growth, an occasional additional early cut may be required.
Bird and bat boxes	Inspect each box	Visually check boxes are intact, secured, and clean. Check for signs of use and record. Replace broken or damaged boxes with new (ideally put up new boxes during October- December). *NB Bat boxes to only be internally inspected or removed by licensed bat worker*.
Log piles (refuges) and hibernaculae	Visual inspection	Check refuges are in place and in good condition. Arrange for additional suitable cut material (shrub trimmings etc.) to be placed on top if lacking.

FIGURE 1: NATURE RESERVE PLAN



APPENDIX 1: BAT AND BIRD BOX SPECIFICATIONS

Suitable Bat Roost Boxes		
2F Schwegler Bat Box		The 2F bat box is designed as a summer roosting space for bats and has a simple entrance hole at the front. The box is manufactured from long-lasting woodcrete, which is a blend of wood, concrete and clay which will not rot, leak, crack or warp, and will last for at least 20 - 25 years, making it suitable for long-term projects. This provides ideal quarters for bats that inhabit crevices, such as Pipistrelle *Pipistrellus* sp. and *Myotis* species.
1FF Schwegler Bat Box		The 1FF bat box is designed as a summer roosting box. The box is made from the same woodcrete material and will also last 20 – 25 years. The open bottom allows droppings to fall out reducing the requirement for maintenance. This provides ideal quarters for bats that inhabit crevices, such as Pipistrelle *Pipistrellus* sp. and noctule bats *Nyctalus noctula*.
Siting	The bat boxes can be sited in trees or mounted to poles and are best positioned at a height of between 3 to 6 metres. Bat boxes should ideally be sited in open sunny positions facing different directions to provide a variety of micro-habitats.	
Timing	Bat boxes can be installed at any time of year following the cessation of construction works.	
Other Notes	Note that once bats have inhabited a roost site they may only be disturbed by licensed bat workers.	
References	http://www.nhbs.com/title/158629/2f-schwegler-bat-box-general-purpose http://www.nhbs.com/title/158636/1ff-schwegler-bat-box-with-built-in-wooden-rear-panel	

APPENDIX 1: BAT AND BIRD BOX SPECIFICATIONS

Suitable Bird Boxes		
1B Schwegler Nest Box		The 1B nesting box is designed for cavity nesting species such as great tit *Parus major*, blue tit *Cyanistes caeruleus*, marsh tit *Poecile palustris*, coal tit *Periparus ater* and crested tit *Lophophanes cristatus*, redstart *Phoenicurus phoenicurus*, nuthatch *Sitta europaea*, tree *Passer montanus* and house sparrows *Passer domesticus*, the interchangeable front panel comes with a variety of entrance holes (32mm, 26mm and oval shape) to attract different species, however, an entrance hole of 32mm is recommended for maximum diversity of use. The 1B nesting box is also available in four colors: brown, green, white and red. Brown would be considered the most appropriate colour, aiding the box to blend into the landscape and making it less evident to predators. The box is manufactured from long-lasting woodcrete.
1N Schwegler Deep Nest Box		Birds which nest in recesses or cavities are at risk where there are large numbers of magpies *Pica pica*, jays *Garrulus glandarius* and mammalian predators. The 1N has two entrances and a removable wooden insert and offers excellent protection. Robins *Erithacus rubecula* are particularly attracted to this type of box, especially if it is placed approx. 1 to 1.5m above the ground, preferably in a moist, shady area. The wooden insert, which can be removed for inspection and cleaning purposes, gives protection against predators because nesting takes place at the far end of the box. It is particularly effective against predators and therefore makes an effective contribution to breeding success. The box is manufactured from long-lasting woodcrete.

APPENDIX 1: BAT AND BIRD BOX SPECIFICATIONS

Suitable Bird Boxes		
Swift brick - Schwegler Delta Box (604) or similar		Installed minimum 5m height in groups of 2-3 placed under eaves or fascia board at gable end, with unobstructed access. As swifts make minimal nests there is no mess or maintenance required. The box can be easily installed flush with the wall surface, leaving only the entrance visible.
Siting	The 1B nest boxes can be sited in trees or mounted to poles and are best positioned at a height of between 2 to 4 metres. The 1N nest boxes can be sited in trees or mounted to poles and are best positioned at a height of between 1 to 1.5 metres. Boxes should be angled so that they face away from the prevailing wind or in a semi sheltered environment. Positioning within or close to hedgerows will increase chances of occupation.	
Timing	Bird boxes will be erected outside of the breeding bird season, to eliminate the possibility of disturbing birds currently utilising the trees for nesting.	
Other Notes	Note that bird boxes should not be opened between the months of March to September to avoid disturbing nesting birds.	
References	http://www.nhbs.com/title/158587/1b-schwegler-nest-box http://www.nhbs.com/title/158609/1n-schwegler-deep-nest-box	