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## **Biodiversity Enhancement and Management Plan**

109 Memorial Road  
Hanham  
BS15 1XW

**February 2024**

Darwin Ecology Ltd  
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<b>QUALITY CONTROL</b>		
The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management’s Code of Professional Conduct.		
Prepared by	Assistant Ecologist Jonathan Bayliss BSc (Hons)	February 2024
Checked by	Principal Ecologist Olatz Gartzia BSc MSc ACIEEM	February 2024
<p>This report remains valid for 24 months from date of issue.</p> <p>Survey data are valid for 12-18 months from the date the survey was undertaken.</p>		

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Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living creatures are capable of migration and whilst protected species may not have been located during the survey duration, their presence may be found on site at a later date.

The views and opinions contained within the document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to works.

## 1. INTRODUCTION

- 1.1. This Biodiversity Enhancement and Management Plan (BEMP) has been prepared to support a planning application for 109 Memorial Rd, Hanham, BS15 1XW. The BEMP will support the discharge of Condition 3 of the Planning Consent with reference no. P23/01602/F which states;

*“Prior to commencement of works a habitat enhancement scheme is to be submitted for review, this is to include the management of the orchard area, details of tree species to be planted and other enhancements proposed. The scheme is to include a plan detailing the location and specifications of ecological enhancements detailed within (Herdwick Ecology, December 2021) is to be submitted to the local authority for review. This includes, but not limited to bee boxes, habitat boxes/piles, hedgehog holes, bat and bird boxes.*

- 1.2. This document presents a strategy for habitat compensation and biodiversity enhancement works both during and following the completion of the proposed development. Long-term management strategies for retained, enhanced and newly created habitats within the site are also provided, to ensure that the ecological value of the site is maintained in perpetuity.
- 1.3. This report has been informed by previous reporting including a Preliminary Ecological Appraisal and Preliminary Roost Assessment Report (Herdwick Ecology March 2023 update) and a subsequent site visit by Darwin Ecology on 5th January 2024, carried out by Principal Ecologist Olatz Gartzia BSc MSc ACIEEM.
- 1.4. This report summarises the methods and processes but should be read in conjunction with the Herdwick Ecology PEA report (March 2023 update) and Hillside Trees Ltd Arboricultural Impact Assessment and Arboricultural Method Statement (Feb 2023) for full context.
- 1.5. The BEMP is a ‘living document’ and regular reviews will be undertaken. This document will be shared with all relevant stakeholders (including sub-contractors) to ensure that the environmental requirements are communicated effectively The details of this document should be considered compulsory unless otherwise stated. All stakeholders should combine this document with their existing site policies and procedures.

### **Aims and Objectives**

- 1.6. This report aims to detail the habitats to be retained, enhanced and created as part of the scheme and provide details on how each habitat will be managed in perpetuity.
- 1.7. The primary objectives are as follows:
- 🌿 To detail the type and size of each habitat to be retained, enhanced or created;
  - 🌿 To provide a timescale for the delivery of habitat creation and enhancement including soft landscaping and green infrastructure;

- ✿ To ensure the removal of all harmful plants from the site and to ensure that no invasive non-native species are introduced to the site post-development;
- ✿ To detail 5 years of aftercare, 25 years of management and 30 years of monitoring of post-development habitats;
- ✿ To ensure that soft landscaping provides nectar, pollen and fruit resources throughout the seasons, a variety of structural diversity and larval food plants, through no less than 60% native and local species by number and diversity;
- ✿ To provide a monitoring strategy which will assess the condition of all habitats created and detail any and all necessary management or replacement/remediation measures required to deliver the agreed upon values, as well as suggesting appropriate contingency measures should monitoring identify that changes are required to ensure the habitat(s) are in the appropriate condition to deliver the required biodiversity values.

1.8. The compensation, enhancement and management proposals relate to three main themes:

- ✿ Protection of retained/enhanced habitats and features during construction;
- ✿ Methods of habitat creation and enhancement including aftercare to ensure proper establishment of plants to appropriate target conditions;
- ✿ Long-term management of all post-development habitats to maximise biodiversity and ensure a biodiversity net gain in perpetuity including monitoring strategy.

### **Site Overview**

1.9. No. 109, Memorial Road lies within an urban location, within the Hanham area of Bristol, which lies approximately 3km to the southeast of the city centre. The site comprises a modern detached garage block adjacent to an area of hardstanding. An area of mature, predominately ornamental and fruit trees, with dense area of scrub is present to the north and east which once formed the garden of the main property. A small dilapidated concrete garden shed lies on the northern boundary. The buildings were assessed as having negligible potential for bats and no further surveys were recommended.

1.10. The post-development habitats on site will comprise:

- ✿ Enhanced scrub habitat.
- ✿ Newly created wildflower grassland;
- ✿ Newly created vegetated gardens;
- ✿ Enhanced hedgerows;
- ✿ 3 x newly planted fruit trees;
- ✿ Hardstanding including new buildings.

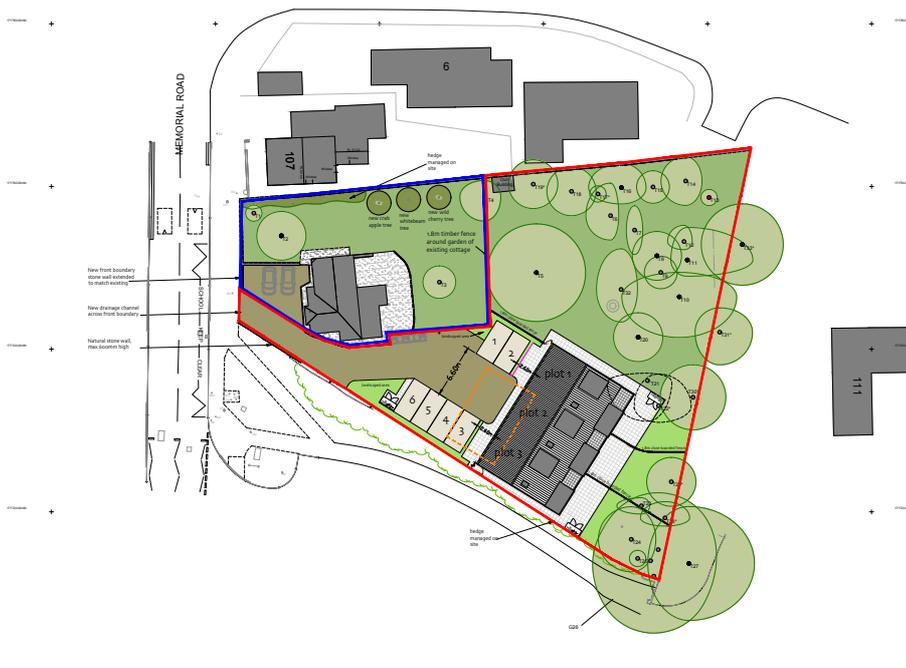
🌿 Features for protected species including bats, birds, hedgehogs and insects.

1.11. **Figure 1** Shows the proposed site outline with relevant boundaries

1.12. **Figure 2** Shows the proposed development plans.



**Figure 1:** Close up of the site (Google Maps, 2024).



**Figure 2.** Proposed development plans

## 2. LEGISLATION AND POLICY

### National Planning Policy Framework (NPPF)

- 2.1. NPPF aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including the establishment of coherent ecological networks that are more resilient to current and future pressures.
- 2.2. Local planning policies should seek to:
  - Plan for biodiversity at a landscape-scale across local authority boundaries.
  - Identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation.
  - Promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan. Priority species include those listed as UK Biodiversity Action Plan species.

### UK Biodiversity Action Plan & Habitats and Species of Principal Importance

- 2.3. The UK Biodiversity Plan (BAP) was a programme designed to help conserve the UK's biodiversity. It led to the production of 436 action plans between 1995 and 1999 to help many of the UK's most threatened species and habitats to recover. A review of the UK BAP priority list in 2007 led to the identification of 1,150 species and 65 habitats that met the BAP criteria at UK level. Currently 56 Habitats of Principal Importance and 943 Species of Principal Importance are included within Schedule 41 of the NERC Act and these include species and habitats which were identified in the UK BAP and which continue to be considered to represent the conservation priorities of England in the UK Post-2010 Biodiversity Framework.
- 2.4. Species of Principal Importance and Habitats of Principal Importance are those identified as the most threatened and requiring conservation action under the Schedule 41 of the U K Biodiversity Action Plan & Habitats and Species of Principal Importance
- 2.5. The UK Biodiversity Plan (BAP) was a programme designed to help conserve the UK's biodiversity. It led to the production of 436 action plans between 1995 and 1999 to help many of the UK's most threatened species and habitats to recover. A review of the UK BAP priority list in 2007 led to the identification of 1,150 species and 65 habitats that met the BAP criteria at UK level. Currently 56 Habitats of Principal Importance and 943 Species of Principal Importance are included within Schedule 41 of the NERC Act and these include species and habitats which were identified in the UK BAP and which continue to be considered to represent the conservation priorities of England in the UK Post-2010 Biodiversity Framework.

- 2.6. The local biodiversity action plan relevant to the site is South Gloucestershire Biodiversity Action Plan. It aims to set out a long-term strategy for biodiversity conservation within South Gloucestershire and provide a series of objectives and actions for achieving successful conservation of habitats and species across the county.

### **South Gloucestershire Biodiversity Action Plan**

- 2.7. The revised South Gloucestershire BAP (2016 - 2026) has adopted a spatial ecosystem services approach to biodiversity action planning to reflect the changes in national policy and should be read in conjunction with the previous South Gloucestershire BAP (2006 - 2015), which still contains relevant information on the biodiversity of the area.
- 2.8. The *South Gloucestershire Biodiversity Action Plan* aims to achieve the following:
- Share biological data to inform decision-making.
  - Ensure that the Council considers biodiversity in exercising all of its statutory regulatory functions.
  - Improve the management for biodiversity of land and buildings owned by South Gloucestershire Council.
  - Raise awareness of biodiversity and promote opportunities for formal and informal learning about and understanding of the natural world.
  - Establish and maintain an internal reporting mechanism to inform and report on how South Gloucestershire Council is actively halting biodiversity loss.

### 3. AVOIDANCE OF CONSTRUCTION PHASE IMPACTS

3.1. With the current understanding of the presence / likely absence or usage of the site by protected species, a number of precautionary working methods must be employed, including:

- ✿ Removal of vegetation outside of the breeding bird season (March to August, inclusive) or only after a breeding bird survey has been conducted by a suitably qualified ecologist; and
- ✿ Vegetation clearance outside of the hibernation period for hedgehogs *Erinaceus europaeus* (December to March, inclusive).
- ✿ Precautionary methods for reptiles, including phased vegetation cuts of grassland and tall ruderal zones most suitable for reptiles.
- ✿ Pre-works check of badger usage of the site.

#### Ecological Clerk of Works (ECoW)

- 3.2. The **Site Manager** and **Developers** will be responsible for the overall implementation of the BEMP. A suitably qualified ecologist will be appointed as an **ECoW** to supervise aspects of the BEMP outlined above.
- 3.3. It is the responsibility of the **Developer (or Land owner)** and the **Site Manager** to ensure that the **ECoW** is kept informed regarding work schedules and construction activities so that they are able to carry out their responsibilities efficiently and reliably. The ecologist should attend the site on the day of any proposed vegetation clearance, or no more than 24 hours beforehand to check for nesting birds.
- 3.4. If the **ECoW** identifies any issues during the construction phase, the **Developer** and **Site Manager** will be contacted and measures will be taken to resolve any issues. Likewise, if the **Developer** or **Site Manager** (or their contractors) notice any ecological or environmental issues during the construction phase, the **ECoW** must be contacted for advice immediately.
- 3.5. The **ECoW** will be required to be present for the following:
- A Toolbox Talk is recommended before works begin, to be conducted by the ECoW, This will include protection and methodologies to be used in relation to breeding birds, reptiles, amphibians and mammals.
  - Any vegetation clearance must be undertaken outside of the nesting bird season (March - September inclusive for most bird species in the UK). If this is not possible, an Ecologist should survey the vegetation for nesting birds immediately prior to removal. All occupied bird nests have legal protection from damage and destruction under the Wildlife and Countryside Act 1981.

- All dense vegetative areas and any deadwood piles should be cleared by hand, in a sensitive manner and under the supervision of the ECoW to ensure the welfare of any protected species.
- Buildings are to be inspected for nesting birds prior to demolition/removal by the ECoW.

### **Habitat Protection Fencing**

- 3.6. As per the arboriculture report (Hillside Trees Ltd 2021) tree root zones will need protection during construction to avoid impacts such as accidental damage and root compaction.
- 3.7. To protect the retained trees on and off-site from damage, all works will be undertaken in accordance with Arboricultural Impact Assessment and Arboricultural Method Statement Tree Protection Plan. Revision A (see appendix). This includes details of T21 and T22 being impacted by the construction of a building. The protection of these trees is shown in Tree Protection Plan Drawing No: 230223-109MRH-TPP-Rev A-SD prepared by Hillside Trees 2021 (see appendix)
- 3.8. No construction or storage of materials is permitted within these Protection Zones.
- 3.9. During all construction works any trenches or excavations will be covered overnight or a ramp provided to allow any animal to escape the hole should they fall in. All excavations should be investigated immediately prior to infilling to ensure no animals are trapped.

### **Construction Materials**

- 3.10. All chemicals should be kept in sealed storage units and away from any nearby habitats of ecological value.

### **Access to Ecological Reports During the Construction Phase**

- 3.11. Hard copies of this BEMP, prepared by Darwin Ecology, and the previous ecological reports, will be kept in the site office during the construction phase. The **Site Manager** will ensure the reports are available for contractors to refer to when necessary

## 4. BIODIVERSITY ENHANCEMENT PLAN<sup>1</sup>

### Introduction

- 4.1. The details below outline the practical tasks required to create and enhance the onsite habitats. The plans provided in the BEMP should be considered to be the most relevant. The Habitat Enhancement Plan (**Figure 3**) is provided as an overview of the recommendations.
- 4.2. The orchard area specified within the green line boundary (**Figures 2 and 3**) has been identified for management measures in order to achieve habitat enhancement as required in Condition 3 of the planning consent and referred to in Preliminary Ecological Assessment (Herdwick March 2023 update).
- 4.3. The orchard area will be part of the garden of Plot 1, and therefore its management as laid out in this report will fall under the responsibility of the new owners.
- 4.4. The complete removal of all harmful or Schedule 9 invasive species is required in order to protect the site from encroachment. Particular attention should be made to removing the species mentioned in the Herdwick PEA (March 2023 update), these being: Rhododendron, cherry laurel *Prunus lauroceracus*; cotoneaster; bamboo and snowberry *Symphoricarpos albus*.
- 4.5. Specific habitat creation and enhancement details are outlined below, with timings for each action outlined in the **Appendix**.

### Habitats

- 4.6. Presently, the site comprises a large number of non-native ornamental species (and also invasive species) that have grown large enough to block light from reaching the herbaceous ground cover, resulting in dense bramble and ivy ground cover dominating.
- 4.7. The boundaries of the site comprise vestiges of native hedgerow substantially overgrown with bramble.
- 4.8. Enhancement efforts for the site will concentrate on improving the available ground cover. This will take place by a by removing bramble, ivy and any woody shrubs that do not fall under a tree protection order to allow herbaceous and wildlife beneficial species to predominate. Further management measures will involve restoring the existing poor condition hedgerow with a series of pruning and re-planting where necessary.

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<sup>1</sup> All landscape contractors should be familiar with the National Plant Specification and follow the relevant British Standards and Codes of Practice, including BS5837:2012 - Trees in relation to design, demolition and construction; BS3882:2015 Specification for topsoil; BS3936:1992 Nursery Stock - Specification for trees and shrubs; BS8545:2014 - Trees: from nursery to independence in the landscape; and BS4428:1989 - Code of Practice for general landscaping operations.

## *Orchard area enhancements*

### *Introduction*

- 4.9. Approximately 0.068 ha of the site has been identified for enhancement and is identified by the green line boundary on **Figure 1**. This habitat will be part of the garden area of Plot 1.
- 4.10. Species exist on site that are capable of re-colonising the ground cover to create the diversity and structure required to achieve greater biodiversity. These species were identified in the Herdwick PEA (March 2023 update) and comprise: perennial rye-grass *Lolium perenne*, meadow grass *Poa sp.* Cock's-foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, creeping buttercup *Ranunculus repens*, chickweed *stellaria media*, rib-wort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, white clover *Trifolium repens*, dandelion *Taraxacum sp.* and Herb Robert *Geranium robertianum*.
- 4.11. The primary consideration is to remove existing ground cover and restore light levels to it through removal of bramble and ivy and other woody shrubs not covered under the present tree protection order. This will allow the existing on site grass and herb species to re-colonise the site as well as being complimented with re-seeding where appropriate.

### *Method*

- 4.12. Removal of bramble, and any woody shrubs ( not covered under Tree Protection Order) using hand tools only. With any woody material arising from these works to be used to construct habitat piles on site as per the BEMP plan (appendix)
- 4.13. The ground should then be mown back mown back to ground level to remove ivy and the arisings removed.
- 4.14. Any bare patches of ground will be re-sown with a shade tolerant grass mix, such as Emorsgate Seeds EG9 Grass Mixture for Hedgerows and Woodland.
- 4.15. A full order of works is set out in **Table 2**, below.
- 4.16. Tree planting onsite will follow the Arboricultural report's recommendation of 1 x crab apple, 1 x whitebeam and 1 x wild cherry within the blue line boundary (garden) of the existing property.
- 4.17. The above trees will be sourced from suppliers that have adopted Flora Locale's Code of Practice for collectors, growers and suppliers (Flora Locale, 2012). All newly planted trees will comprise minimum standards of 8 - 10 cm girth and 2 - 3 m height.
- 4.18. A radius of 1m around the base of the newly planted trees will be mulched, with trees watered to saturation on the day of planting and again the following day. Subsequently, they will be watered twice weekly throughout the first growing season (April to October). Wooden tree guards are advised to protect the trees.

<b>Table 2: Summary of order of enhancement works.</b>	
<b>Point</b>	<b>Activity</b>
1	Clearing of bramble to ground level
2	Removal of all invasive non native species from the site (as per 6.3 above)
3	Clearing of bramble and southern boundary hedgerow as per habitat plan. Care to be taken to retain any native woody species present.
4	Any suitable arising brush from above works to be used construct habitat piles, as per attached BEMP plan.
5	Removal of ground cover ivy by close mowing to ground level.
6	Any bare patches of ground re-sown with a shade tolerant grass mix, such as Emorsgate Seeds EG9 Grass Mixture for Hedgerows and Woodland.
7	Planting of three new fruit trees, as per Habitat Enhancement plan (Figure 3)
8	Removal of bramble and retention of any native hedging (if present) in the pink section as shown in pink section on Figure 3 and planting of native hedgerow in yellow section measuring approximately 20m in length.
9	Regular management of ground cover by mowing to height of 40-60 cm for the first year.

- 4.19. Throughout the first year of establishment, the ground cover should be mown regularly to 40 - 60 mm, to control the flush of annual weeds that often grow up from the soil bank during the first season, with all arisings removed.
- 4.20. Subsequent management of the site should involve mowing once a year in late summer or early autumn with the arisings removed. This is necessary in order to conserve the grassland/herbaceous layer structure and prevent it progressing to scrub habitat.

*Hedgerows*

- 4.21. The hedgerow onsite currently comprises a small section of privet along the southern boundary and approximately 10m along the north west blue line boundary. A walkover survey carried out in January 2024 observed that the hedgerow section of southern boundary was now entirely overgrown with bramble and none of the native hedge species identified in the March 2023 update PEA were visible.
- 4.22. Management of pink section of (see BEMP map) the southern boundary hedge should take the form of complete removal of the existing bramble. If any native species are discovered, they should be left in situ and pruned back to approximately 60-90 cm to encourage new growth. This represents the height of new (two years old) native hedgerow whips that will be planted to help restore the hedge. Hedgerow management techniques can be found in the appendix of this plan.

- 4.23. Approximately 20m of new hedgerow creation to take place along the yellow section of the southern boundary. A mix of native species (from below 4.26) will be planted in double rows. The pink hedge section will be cleared from overgrown scrub and any hedging found will be retained.
- 4.24. All hedgerow species will be sourced from suppliers who have adopted Flora Locale's Code of Practice for collectors, growers and suppliers of native flora (Flora Locale, 2012).
- 4.25. Beneficial native species planting will be used for creation and renovation of hedgerow on site. This will enhance biodiversity, improve connectivity to the surrounding habitats and provide food and shelter for a wide range of faunal species. All amenity planting and formal landscaped areas should be created from a palette of wildlife beneficial plants (not necessarily native) chosen for nectar or fruit. Non-invasive species should be planted.
- 4.26. Native hedgerows will comprise a mix of hawthorn, and blackthorn (*Prunus spinosa*), with supplementary hazel, field maple, spindle (*Euonymus europaeus*), dogwood (*Cornus sanguinea*), wild privet (*Ligustrum vulgare*), guelder rose (*Viburnum opulus*) and dog rose (*Rosa canina*).
- 4.27. Bare root saplings will be planted in two staggered rows approximately 30 cm apart (or five per metre) along the length of the cleared southern boundary hedge line between November and February. If planting occurs within existing RPZs, care will be taken not to sever any roots wider than 25 mm and if possible, the position of new saplings will be slightly altered to avoid established root systems.
- 4.28. Saplings will be watered to saturation on the day of planting and again the following day. Subsequently, new planting will be watered twice weekly throughout the first growing season (April to October).

#### *Seeded Wildflower Grassland*

- 4.29. Grassland parcels surrounding the proposed parking bays will be seeded with a standard general-purpose meadow mix (Emorsgate - EM2) to create additional habitat for wildlife. Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture.
- 4.30. Ground preparation comprises removing existing vegetation and approximately 150 - 200 mm of nutrient-rich topsoil to reach the lower nutrient sub-soil. Topsoil can either be banded at suitable areas within the site and capped with low-nutrient subsoil or removed from the site entirely. Soil should be lightly tilled where required to ensure that seeding does not take place onto compacted soil. Areas within RPZs of retained trees will be stripped carefully to ensure that significant root systems are not impacted. The soil will then be watered to saturation 48 hours prior to seeding. Areas will be sown at a rate of 2 - 4g / m<sup>2</sup>. Seed should not be covered, but firmed in with a roll, or by treading, to give good soil/seed contact.

- 4.31. Throughout the first year of establishment, the grassland should be mown regularly to 40 - 60 mm, to control the flush of annual weeds that often grow up from the soil bank during the first season, with all arisings removed.

*Deadwood Habitat Piles*

- 4.32. Habitat piles are to be created on site to offer invertebrates, amphibians and reptiles valuable places of shelter and help to encourage their presence on site in the future. Log piles offer valuable habitats for a wide range of saprophytic (deadwood eating) invertebrates that will in turn provide food for a wide range of predatory species of insect, birds, mammals, amphibians and reptiles. These structured features also provide shelter and refuge opportunities for a range of faunal species and have excellent wildlife value (see **Appendix 2** for examples of habitat piles). Habitat piles can be created using large piles of native deadwood and brash in a number of different locations within the site, preferably in south facing locations.
- 4.33. Habitat piles are to be created using any brash arising from the bramble and scrub clearance listed above. Habitat pile will be located as per the BEMP map (**Figure 3**). Habitat pile creation types and techniques can be found in the appendix.



Existing hedge to be managed for restoration

1 x Hedgehog house. Suitable commuting holes should be cut in fences

1 x Bee House on south facing fence

1 x tree mounted bat box on southern aspect and 1 x bird box on northern aspect

Plot 1 Ownership

**Bird and Bat Boxes**

1 x Integrated bat box to be mounted on proposed buildings

1 x Sparrow terrace to be mounted on proposed buildings

**Legend**

- ▲ Hedgehog Hole Placement
- Blue Line Boundary
- Red Line Boundary
- Green Line Boundary
- Log Habitat Pile
- New Tree Planting
- Wildflower Mix Planting
- Gardens
- Developed area
- ▲ Bird Box
- Enhanced Hedgerow
- New Hedgerow Planting

Biodiversity Enhancement Management Plan (BEMP)

Land at 109 Memorial Road.  
Hanham, BS15 1XW

February 2024

## Protected Species

### *Hedgehog*

- 4.34. Hedgehog is listed as a Priority Species for Conservation Action under the UK Biodiversity Action Plan, and protected from harm in the UK under Schedule 6 of the Wildlife and Countryside Act 1981. Under the NERC Act 2006, the hedgehog is categorised as a 'Species of Principal Importance' for biodiversity.
- 4.35. In addition to new foraging and sheltering features provided through the creation of hedgerow, wildflower and traditional orchard habitats, one hedgehog shelter will be installed within the site as shown in the BEMP map **Figure 3**. Specifications for building hedgehog houses will follow the guidance provided by the People's Trust for Endangered Species (2020), including a waterproof cover (such as polyethene or roofing felt) and natural materials (soil, leaves, brash, etc.) covering the box.
- 4.36. Brash piles can be created on site to replace any suitable hedgehog habitats that are to be removed to facilitate the development.
- 4.37. Gaps measuring 13cm x 13cm under any new fences installed in the garden will need to be created wherever possible to allow hedgehogs to move freely between adjacent gardens and the rest of the site (see below). Holes will be created by either cutting holes in the fences or digging a small channel beneath it, at a location furthest from likely disturbance by occupants of the new dwellings. A badge/sign above the access gaps must be installed so that all current and subsequent property owners will be aware of their purpose and importance.



Figure 5. Example of fence gap suitable for hedgehogs

### *Bat Boxes*

- 4.38. Two bat boxes will be installed on site. One tree mounted (such as Greenwood Habitats "small hollow" or similar) and one integrated in to the wall of the new building (such as the

Green and Blue, bat box or similar). Box installation will be supervised by suitably qualified and licensed bat ecologist, at least 4 m from the ground and in a south-facing elevation with uncluttered air space in front of the box entrance. Boxes will not be installed where light spill from existing or new dwellings, street lighting or security lighting may prevent the uptake of boxes.

#### *Bird Boxes*

- 4.39. In accordance with the Biodiversity Strategy, the development will include one building mounted/integrated terraced brick sparrow box such as the 1SP Schwegler Sparrow terrace (or similar), and two tree mounted bird boxes such as the 1 B Schwegler nest box (or similar). These will be situated 4m from the ground where possible, or at eaves level, on northern or eastern elevations.

#### *Insects*

- 4.40. A bee box will be located on a southern aspect with good connectivity to hedgerows and the proposed traditional orchard.

#### **Sign Off Visit**

- 4.41. A suitably experienced Ecologist must undertake a sign-off visit on completion of the development works in order to confirm the mitigation and enhancements have been implemented.

## 5. LONG-TERM HABITAT MANAGEMENT

- 5.1. All newly created or retained and enhanced habitats listed above will be managed appropriately to ensure the desired target habitat is reached. Management will include five years of specific aftercare, during which monitoring and remedial action must be proactive to ensure habitats establish successfully. After this initial five years, management in perpetuity to ensure long-term biodiversity value is maintained will be required.

### Habitats

#### *Seeded Wildflower Grassland*

- 5.2. Once established the grassland will require a single summer cut in August after flowering. The grassland will be cut with a strimmer to 50mm. The hay should be left for 1-5 days to dry out before removing off site.
- 5.3. No fertilisers or nutrients will be added to this area.
- 5.4. In the second year after sowing, if the grassland is not sufficiently established, damaged, defective or bare areas shall be re-seeded following the established as detailed in the points above. This will be repeated every autumn until the seed mixture has established.
- 5.5. Ongoing weed control will be carried out to ensure the wildflower meadow is free to broad leaved, injurious and invasive weeds. Injurious weeds are those listed in the Weeds Act 1959 and the Wildlife and Countryside Act 1981 (as amended) and include the following: spear thistle, creeping or field thistle, curled dock, broadleaved dock and common hogweed.
- 5.6. From Year 3 onwards the wildflower areas will be cut in late summer after flowers have seeded. All arisings should be removed from the site to avoid build-up of thatch or nutrients, which would encourage courser grasses to become dominant.

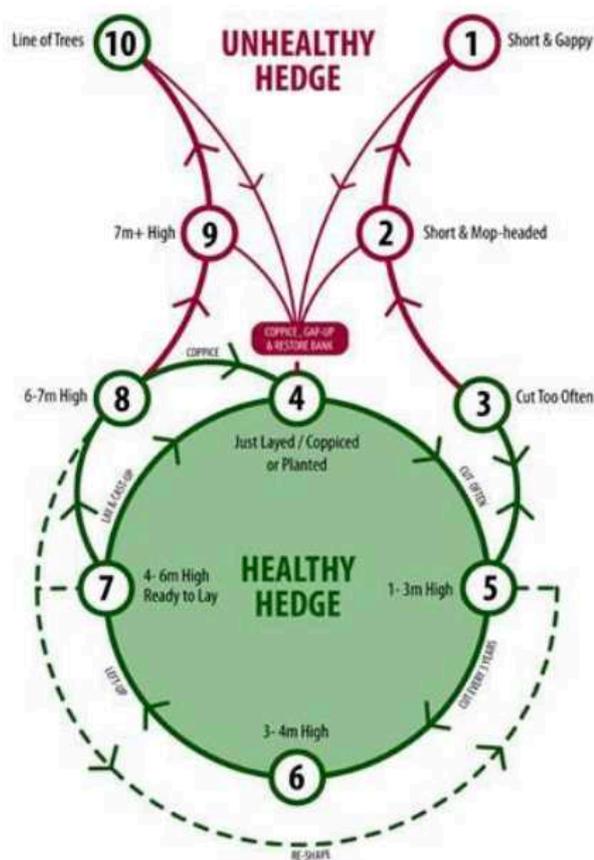
#### *Trees*

- 5.7. After the initial growing season trees will be watered at least once a week throughout the growing season (April to October) for the next three years. After this period, trees will be watered as required, with regular watering throughout dry periods of the year.
- 5.8. The health of the trees should be monitored throughout the growing season by the site management team, with any aggressive weed species removed from the base of the trees. Any failing trees will be replaced like-for-like.

#### *Hedgerows*

- 5.9. The ten steps to the HMC is shown in **Figure 4** below and described in more detail in Table 3. The cycle has a heathy green core and two unhealthy red offshoots. The aim of the hedgerow management cycle is to keep the hedge in the green parts (steps 3-8). To maintain this the hedge will require periodically laying or coppicing it with trimming at appropriate intervals in between.

5.10. Laying or steeping of the newly planted hedges will be required to create a thick and dense hedge. This will take place during points 1,2 and 7 of the HMC and may be used in conjunction with coppice management. The woody species with the hedge will be cut about 3/4 of the way through at the base and laid in one direction. This reduces the height of the hedge with new growth sprouts along the trunks and at the cut base producing a thick new hedge within 2-3 years.



**Figure 4:** The Hedgerow Management Cycle (HMC).  
Hedgelink UK

- 5.11. Where trimming of the hedge is required at points 5 and 6 of the HMC, cutting should be done by hand.
- 5.12. Trimming should only take place in January or February when the majority of fruit has been taken by local wildlife and carried out according to best practice guidance. Trimming should avoid deep frosts and is not permitted during the breeding bird season (March-August, inclusive).
- 5.13. All arisings should be removed from the site to a compost pile or larger branches can be used to create brush piles for protected species elsewhere on site.

**Table 3: The ten point Hedge Management Cycle (HMC)**

Point	Present conditions of the hedge	Management action
1	Cut short with many gaps and spares stems, the bases of the shrubs gnarled or rotting. Bank often badly eroded	Coppice, restore and replant gaps. Grub out or poison undesirable species.
2	Cut short and thin, with hard knuckle at trim line and shrubs have mop-headed growth form. Not yet gappy or moribund but stems still too far apart to be allowed to grow up for laying	Coppice and replant any gaps. Restore bank if necessary.
3	Coppice and replant any gaps. Restore bank if necessary.	Allow the hedge to grow up for between 8 and 20 years so that it can be laid, coppiced or reshaped. Hedge may be trimmed as it grows up, but raise cutting height each time.
4	Recently-laid, coppiced or planted.	In first years trim often to create dense growth, initially low down, raising cutting height a few inches each year until Point 5 reached.
5	Dense with frequent healthy stems, at 1 - 3m high (above bank).	Trim every two, three or four years, raising trimming height a few inches every few cuts to prevent development of dense knuckle and mopheaded growth until Point 6 reached. Alternatively, if the hedge is trimmed every year, raise the cutting height each time.
6	Dense, with frequent healthy stems, over 3m high.	Allow to grow up ready for laying, or re-shape with circular saw to Point 5.
7	Frequent healthy stems more than 4m high of right thickness to lay (typically 8 - 15cm diameter).	Lay (or coppice), or re-shape with circular saw to point 5.
8	Tall hedge with spreading canopy, typically 6 - 7m high and some stems too large for laying (typically more than 15cm in diameter).	Coppice, or reshape with circular saw to point 5, planting up gaps and restoring bank as necessary.
9	Tall, often gappy, hedge, typically over 7m high with many ash, oak or beech stems, with sparse shrub layer and the bank at risk of collapse. Most stems too large for laying.	Coppice and plant up gaps, restoring bank as necessary.
10	Mature line of trees, usually oak, beech or ash.	Retain as line of trees for as long as possible. When the trees die or have to be felled, restore the bank and replant the hedge, in whole or in part as appropriate.

## **6. ECOLOGICAL MONITORING AND REMEDIAL ACTION**

- 6.1. On completion of the development, a compliance check will be undertaken by a suitably qualified ecologist to ensure that habitats and protected species features have been created correctly and are established. Where habitats or features have not been established successfully, the ecologist will provide advice with regard to rectifying any issues.
- 6.2. The ecological condition of the habitats on site will be monitored on an annual basis by a suitably qualified ecologist, and where necessary a suitably qualified arboriculturist, starting one-year post-completion of the development and continuing for three years. Condition assessments of all habitats on site and collation of full species lists including relative abundance using the DAFOR scale will be undertaken as part of this review. If the condition of any of the habitats appears to be in decline, advice regarding additional management will be provided with the aim of returning/getting the habitats to their proposed target condition. This management will then be carried out by an appropriate landscape contractor.
- 6.3. If vegetation fails, planting of any replacements for failed trees should be undertaken between November and February.
- 6.4. After the initial five years post-development, this management plan (with any necessary amendments identified during those first five years) will be complied with in perpetuity. Reviews of the management plan will be undertaken by a suitably qualified ecologist every five years to ensure that the management regimes remain appropriate and that the habitats and features within the site continue to provide biodiversity gain.

## 7. REFERENCES

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**APPENDIX 1** Timetable for Habitat Creation, Enhancement and Management

Habitat	Action Details	Timing	Responsible Party	
<i>Orchard</i>	Planting of new fruit and nut trees	November - February	Developer / Site Manager	
	Creation of deadwood piles	During planting exercise	Site Manager / ECoW	
	Regular watering of newly planted trees	Watered to saturation on day of planting	Watered <b>twice weekly</b> throughout first growing season (April - October)	Developer / Site Manager
		Watered <b>weekly</b> for subsequent three years		Management contractor
		Removal of aggressive weeds at tree bases	April - October	Management contractor
	Maintenance of deadwood piles	Prior to required management works	Management contractor	
	Watering during dry periods	April - October	Management contractor	
<i>Seeded Wildflower Grassland</i>	Preparation of ground including removal of top-soil and rotovation / tilling (where required) of sub-soil	Autumn / Early Spring	Site Manager	
	Seeding of habitat extent with general purpose meadow mix	Autumn / Early Spring	Developer / Site Manager	
	Regular mowing to 40 - 60 mm with all arisings removed	As required to maintain desired height (40 - 60 mm)	Management contractor	
	Annual cut to 75 mm with all arisings removed	September / October	Management contractor	
<i>Hedgerow</i>	Planting of new hedgerow vegetation	November - February	Developer / Site Manager	
	Regular watering of newly planted hedgerow	Watered to saturation on day of planting	Management contractor	
		Watered <b>twice weekly</b> throughout first growing season (April - October)		
	Watering during dry periods	April - October	Management contractor	
Control of dominating or encroaching bramble	November - February	Management contractor		



## Design and creation

Deadwood habitat piles offer valuable habitats for an array of saprophytic (deadwood eating) invertebrates that will in turn provide food for a wide range of predatory species of insects, birds, mammals, reptiles and amphibians.



On sites where vegetation structure is limited, brash and log piles provide an instant enhancement. Deadwood habitat piles also provide shelter and refuge opportunities for larger animals, particularly reptiles and amphibians.

They can also be suitable hibernation sites during the winter for reptiles, amphibians and small mammals including hedgehogs. Think bonfire!

Habitat piles should be located in sunny or part shaded sites. A compact central core, with larger woody material in contact with the ground is recommended to provide the damp and decomposing wood conditions that are most suitable for benefiting saprophytic invertebrates. The outer layers should be laid more loosely on top. This provides a diverse structure within the habitat pile and provides suitable cover and basking opportunities for reptiles.

Habitat piles should be maintained by adding material every few years as the pile decomposes and do not require much management.



To provide optimal conditions for reptiles, amphibians and mammals, log piles should contain a mixture of sizes and shapes with plenty of small diameter material included. This introduces voids of different sizes and creates a complex internal structure.

They can be created to be an attractive feature of the landscape where a more formal appearance is required.

