

APPENDIX 3.1

ECOLOGY REPORT – BIODIVERSITY MONITORING STRATEGY



REDROW HOMES

GREAT WILSEY PARK,
HAVERHILL:
INFRASTRUCTURE
RESERVED MATTERS
APPLICATION

**Biodiversity Monitoring
Strategy**

Pursuant to Condition 45 of
DC/15/2151/OUT

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CONTENTS

1	INTRODUCTION	1
2	AIMS AND OBJECTIVES OF MONITORING	2
3	HABITATS	3

5	BATS	13
6	OTTERS	18
7	WATER VOLES	21
8	DORMICE	24
9	HEDGEHOGS	31
10	BIRDS	34
11	REPTILES	38
12	AMPHIBIANS	41
13	INVERTEBRATES	45

PLANS

PLAN ECO1	Site Location and Ecological Designations
PLAN ECO2	Ecological Features
PLAN ECO3	Biodiversity Monitoring Strategy

1. INTRODUCTION

1.1. Background

1.1.1. Ecology Solutions was commissioned by Redrow Homes in October 2018 to prepare materials to address the requirements of planning conditions for the development at Great Wilsey Park as shown on Plan ECO1 (reference: DC/15/2151/OUT). A series of Reserved Matters Applications (RMAs) is to be submitted in early 2019.

1.1.2. Condition 45 requires that a Biodiversity Monitoring Strategy be submitted and approved prior to commencement of development. The condition states:

Within any phase or reserved matters application, no development shall take place (including demolition, archaeological investigation, ground works and vegetation clearance), until a biodiversity monitoring strategy for that phase has been submitted to, and approved in writing by, the local planning authority. The purpose of the strategy shall be to monitor existing and new habitats on the site including hedges, attenuation ponds and adjacent areas, and protected and priority species mitigation including skylark, hazel dormice, reptiles and badgers. The content of the Strategy shall include the following:

- a) **Aims and objectives of monitoring to match the stated purpose.**
- b) **Identification of adequate baseline conditions prior to the start of development as appropriate.**
- c) **Appropriate success criteria, thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged.**
- d) **Methods for data gathering and analysis.**
- e) **Location of monitoring.**
- f) **Timing and duration of monitoring.**
- g) **Responsible persons and lines of communication.**
- h) **Review, and where appropriate, publication of results and outcomes.**

A report describing the results of monitoring shall be submitted to the local planning authority at intervals identified in the strategy. The report shall also set out (where the results from monitoring show that conservation aims and objectives are not being met) how contingencies and/or remedial action will be identified, agreed with the local planning authority, and then implemented so that the development still delivers the fully functioning biodiversity objectives of the originally approved scheme. The monitoring strategy will be implemented in accordance with the approved details.

Reason: Monitoring is required at the appropriate time to ensure that that the proposed development delivers the fully functioning biodiversity outcomes set out in the Environmental Statement.

1.2. Purpose of this Report

1.2.1. This report has been prepared to address the requirements of condition 45, providing details of the monitoring strategy proposed for the retained and newly established habitats as part of the Redrow development, as well as the mitigation of protected and priority faunal species associated with those habitats. Baseline information, as well as the proposed mitigation and enhancement measures, have also been summarised.

2. AIMS AND OBJECTIVES OF MONITORING

2.1. Purpose of the Strategy

2.1.1. The purpose of the strategy as defined in Condition 45 is as follows:

To monitor existing and new habitats on the site including hedges, attenuation ponds and adjacent areas, and protected and priority species mitigation including skylark, hazel dormice, reptiles and badgers.

2.2. Objectives

2.2.1. Specific objectives for the conservation of particular species or groups and particular habitats of nature conservation interest are set out in the relevant sections to follow.

2.2.2. The nature of these objectives has been guided by the principles set out in UK and European wildlife legislation, notably the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitat and Species Regulations 2017.

2.2.3. Furthermore, the formulation of these objectives has also been influenced by national and local biodiversity and conservation targets, previously referred to as Biodiversity Action Plan (BAP) species but now referred to as priority species.

3. HABITATS

3.1. The existing situation and distribution of habitats is described below and illustrated on Plan ECO2. A description of the mitigation and enhancement measures to be employed is also included.

3.2. Monitoring Objective

3.2.1. The monitoring of the retained and newly created habitats within the site will ensure that the range of habitats are present, and ensure that the existing interest is maintained and enhanced.

3.3. Baseline Information

3.3.1. The areas subject to the infrastructure reserved matters application comprise intensively managed arable fields, with field margins and hedgerows. Great Field Plantation – a large mixed woodland – is situated in the centre of the site, with an area of improved grassland present to the south of the plantation. A smaller, younger mixed (largely broadleaved) plantation is situated in the south of the site. A number of other trees are present, associated with the hedgerows and the Stour Brook tributary. The Stour Brook tributary is the main watercourse on site, with a series of ditches also present. Two ponds fall within the boundary for the infrastructure of the site, with several more ponds located adjacent to the site.

3.4. Mitigation and Enhancement Strategy

3.4.1. A summary of the mitigation and enhancement strategy is set out below to provide context for the approach to monitoring.

Construction Phase Mitigation

3.4.2. All habitats to be retained as part of development will be appropriately protected using robust fencing, i.e. Heras fencing or similar. Tree root protection areas will be safeguarded through fencing complying with the British Standard. Site personnel will be briefed as to the presence of these important retained areas. No storage of materials will be permitted within 10m of retained habitats, and vehicle movements within this area will be for essential works only.

3.4.3. The effect on the arable areas and improved grassland is of negligible ecological significance and no mitigation or monitoring is necessary.

Landscape Planting Mixes

3.4.4. New planting undertaken as part of the infrastructure of the site will include native species with an emphasis on trees and plants of known value to wildlife.

3.4.5. The planting schedule includes the provision of wet and dry grassland habitat, designed to encourage greater wildflower diversity, and the provision of swales and ponds as habitats containing taller vegetation. This habitat diversification will favour invertebrates and will in turn provide net gains for local wildlife.

Green Spine / Linear Country Park

- 3.4.6. The Linear Country Park will be a core component of the new development. Green corridors throughout the new development will serve as conduits for wildlife, encouraging natural processes to permeate into the establishing community. They will include new areas of wildflower grassland, native tree and shrub planting, and new swales and attenuation basins as part of the drainage strategy.
- 3.4.7. These features will offer new habitats for local wildlife, in particular birds, bats, small mammals and invertebrates.

Great Field Plantation

- 3.4.8. Overall, while Great Field Plantation does offer opportunities to wildlife, it is of limited intrinsic nature conservation interest. The understorey is virtually absent and the field layer is very impoverished, with little light penetrating to the woodland floor. The aims of management will therefore be to facilitate a gradual conversion to a more naturalistic woodland with greater structural diversity, focusing on native species as opposed to introduced conifers.

Conversion of Even-aged Plantation to Uneven-aged System

- 3.4.9. The principal advantage of the phased removal of conifers and the introduction of native broadleaves is that disruption to wildlife is minimised. A phased approach is therefore favoured over a clear-fell approach, which would have an adverse effect on protected and notable species, and is in any case unacceptable from a landscape and visual standpoint.
- 3.4.10. Three glades will be established in the woodland by felling conifer species. New understorey planting will be undertaken using native species. Existing broadleaved species will be encouraged to grow to maturity.
- 3.4.11. Felled timber will be cut into logs and set into 'loggeries' and more informal log piles to encourage saproxylic invertebrates. Felled trees will not be shredded or mulched.
- 3.4.12. New planting will exclusively be locally native species e.g. Oak *Quercus robur*, Hazel *Corylus avellana*, Hornbeam *Carpinus betulus*, Field Maple *Acer campestre*, Holly *Ilex aquifolium*, Guelder Rose *Viburnum opulus*, Hawthorn *Crataegus monogyna*, Spindle *Euonymus europaeus*, Honeysuckle *Lonicera periclymenum*, Dog Rose *Rosa canina*, Silver Birch *Betula pendula*, Cherry *Prunus avium*, Bird Cherry *Prunus padus*, Crab Apple *Malus sylvestris* and Rowan *Sorbus aucuparia*. The aim will be to encourage strong growth of these species to canopy and understorey layer as appropriate.

Coppicing

- 3.4.13. Existing Hazel stools will be coppiced on a 15-year rotation to encourage greater structural diversity, and layered to produce new coppice stools and expand the understorey. Cut wood will be used to diversify the habitat through establishment of wood piles.

Ground Flora

- 3.4.14. The effects of habitat management on the ground flora will be monitored. Though the intention will be to encourage natural regeneration, if this proves difficult consideration will be given to the introduction of plug-planted locally native species.

Wildlife Opportunities

- 3.4.15. It is expected that the habitat enhancements will generate greater wildlife interest. Additional opportunities will be established by providing a series of bat, bird and invertebrate boxes (see following sections).

Public Use and Recreation

- 3.4.16. Public use of the woodland will be monitored and management operations adapted where necessary. Generally it is envisaged that fencing will be avoided. Where it is necessary to dissuade the public from accessing certain areas (for example around the Badger setts and where new planting has been undertaken) this will be by means of dead hedging or planting thorny species. If fencing must be used it will be suitable for the area, e.g. natural woven Willow or Hazel hurdles.

Southern Plantation

- 3.4.17. The woodland in the south of the site is currently a mixed plantation, with a good proportion of native species, though largely even-aged. Long term management will encourage growth of native species and diversification of the habitat. Non-native conifers will be selectively felled to introduce habitat diversity, with timber retained as for Great Field Plantation.
- 3.4.18. An appropriate coppicing regime will be introduced on a 15-year rotation to encourage a vigorous understorey.
- 3.4.19. Bat and Dormouse 'hop-overs' will be established using trees approximately 6m in height at edges of new accesses.

Stour Brook Tributary

- 3.4.20. Generally the woodland along the watercourse is more semi-natural than that of the plantations, with mature broadleaved trees and a good understorey and field layer. At this stage it is considered that minimal intervention is necessary. Enhancements will focus on the provision of dead wood piles for habitat diversification.
- 3.4.21. The existing footbridge will be replaced to facilitate safe public access and recreation.

Hedgerows

- 3.4.22. The existing hedgerow network is a key green infrastructure asset and is to be retained and enhanced wherever possible.

- 3.4.23. Unless otherwise stated on the Hedgerow Removal Plan 5055-L-112 rev C accompanying the outline application, new gaps established will generally be a maximum of 12m to allow for Dormouse dispersal. Gaps in existing hedgerows will be reinforced with native species.
- 3.4.24. Hedgerows will continue to be managed, with the aim to ensure continued good structure. Hedgerows will be cut on rotation, so that not all are cut in any one year. This will encourage greater availability of winter forage for birds. Hedgerows will be laid on rotation to encourage greater structural diversity.
- 3.4.25. Bat / Dormouse 'hop-overs' will be established using trees approximately 6m in height at the edges of new accesses. Where gaps in existing hedgerows are created as part of the development, dropped kerbs will be installed on either side of the road in that location to aid the movement of wildlife through the site.

Field Margins / Wildflower Grassland Meadow

- 3.4.26. The existing field margins are recognised to be of relatively higher botanical interest, particularly in the north of the site. These will be retained and subject to ongoing management to maximise their botanical interest. There will be no storage of materials or tracking over of these areas, and no new tree planting.
- 3.4.27. New areas of wildflower grassland are to be established throughout the Green Spine and Linear Park. These areas are currently principally intensive arable and improved grassland respectively. In conjunction with the drainage strategy, areas of dry and wet grassland will be established.
- 3.4.28. Liaison with Suffolk Wildlife Trust will be held to determine the feasibility of using seed sourced from local nature reserves and designated sites, to ensure locally native varieties. Should this not be practicable, approved seed mixes appropriate for the habitat and soil type will be used.
- 3.4.29. Newly established meadows will be cut on an annual basis as required, with the arisings removed. These would be retained as 'habitat piles' in suitable locations to encourage reptiles.

New Attenuation Features

- 3.4.30. For the most part these new features will not be permanently wet, but some areas will be designed to retain water. This will diversify the habitats present. Locally native aquatic and emergent species will be planted to encourage early naturalisation. Swales to be planted with appropriate mix of native species.
- 3.4.31. Newly established basins will be seeded with locally native species mixes and managed appropriately. Areas of dry and wet grassland will be established. The blue infrastructure network of swales will provide new foraging and dispersal opportunities for a variety of wildlife.

Lighting Strategy

- 3.4.32. Pedestrian spaces and routes will be lit with low level path lighting (below 1 lux) to minimise any light pollution. Lighting of the vehicular routes will also have carefully considered lighting to reduce any adverse effects.
- 3.4.33. Bat hop-overs will be incorporated into the scheme where hedgerows are intersected by a lit road, footpath or cycle path. The bat hop-overs will encourage bats to fly at a height greater than that of the street lighting, enabling them to cross in darkness. Greater detail on bat hop-overs is provided in the bat section below.
- 3.4.34. Such an approach to lighting will reduce adverse effects on nocturnal wildlife and encourage use of habitats by bats and invertebrates.

3.5. Appropriate Success Criteria

- 3.5.1. The condition calls for *“thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged”*.
- 3.5.2. The programme will be judged a success if significant adverse effects on retained habitats of value are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

3.6. Methods and Analysis

- 3.6.1. Site visits by a suitably qualified ecologist will be undertaken throughout the work and any clearance of significant vegetation will be supervised.
- 3.6.2. Enhanced and newly created habitats will be monitored to ensure establishment has been successful. Where this is not the case, the management and maintenance plan for the development will be revised.
- 3.6.3. Particular attention will be paid to trees acting as bat hop-overs and bridges for Dormice across new roads throughout the site.

3.7. Location of Monitoring

- 3.7.1. Monitoring will take place across the retained and newly created habitats within the site (see Plan ECO3).

3.8. Timing and Duration

- 3.8.1. Areas of new and retained and enhanced planting, as well as ponds and swales, will be monitored annually for the first five years to ensure that the species diversity and composition is developing in such a way as to enhance the site for wildlife.
- 3.8.2. Watering will be required during periods of drought to ensure satisfactory establishment. Watering will be undertaken as required to maintain healthy plant growth.

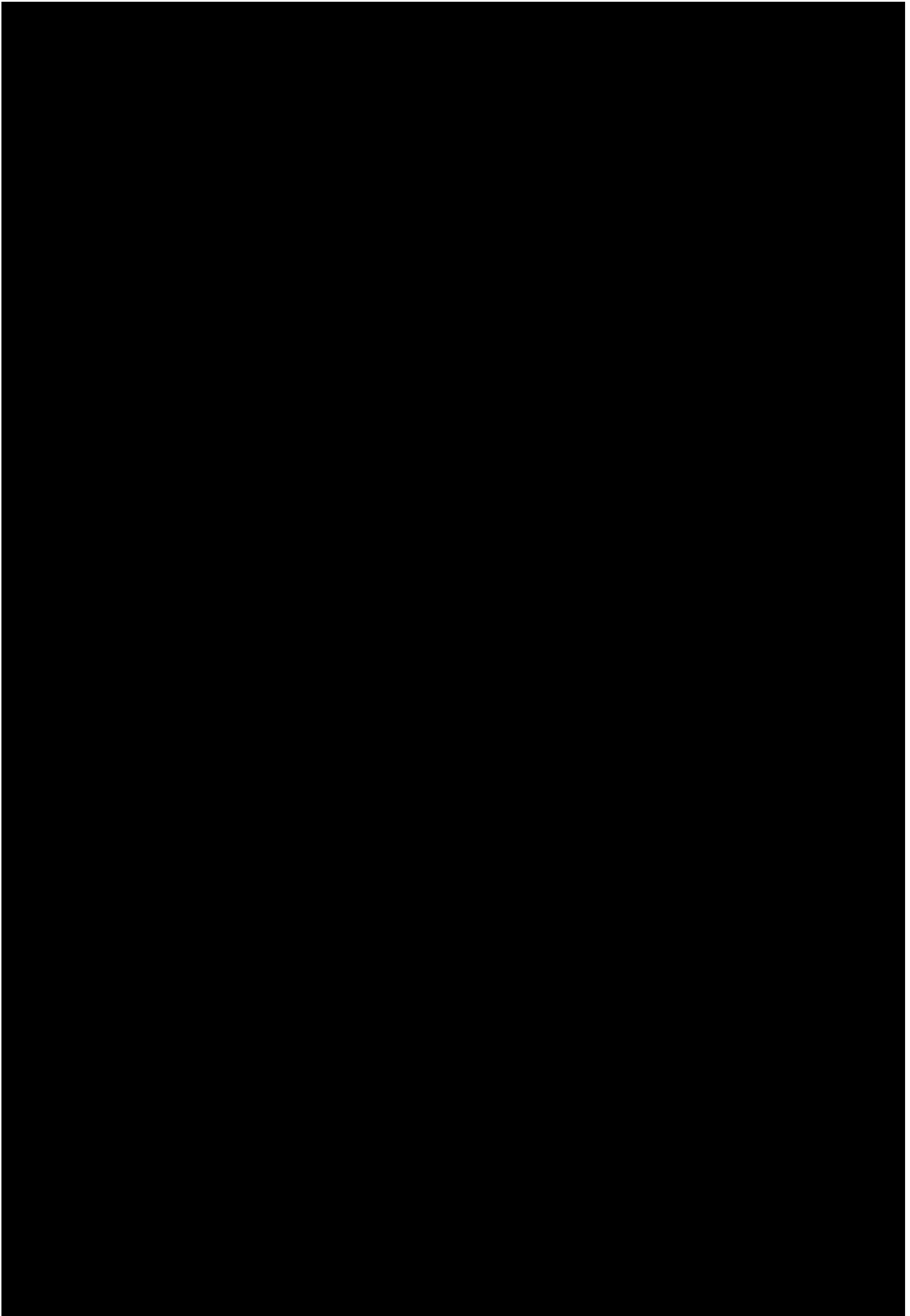
- 3.8.3. Dead or diseased plants will be removed and replaced with the same species immediately after identification.

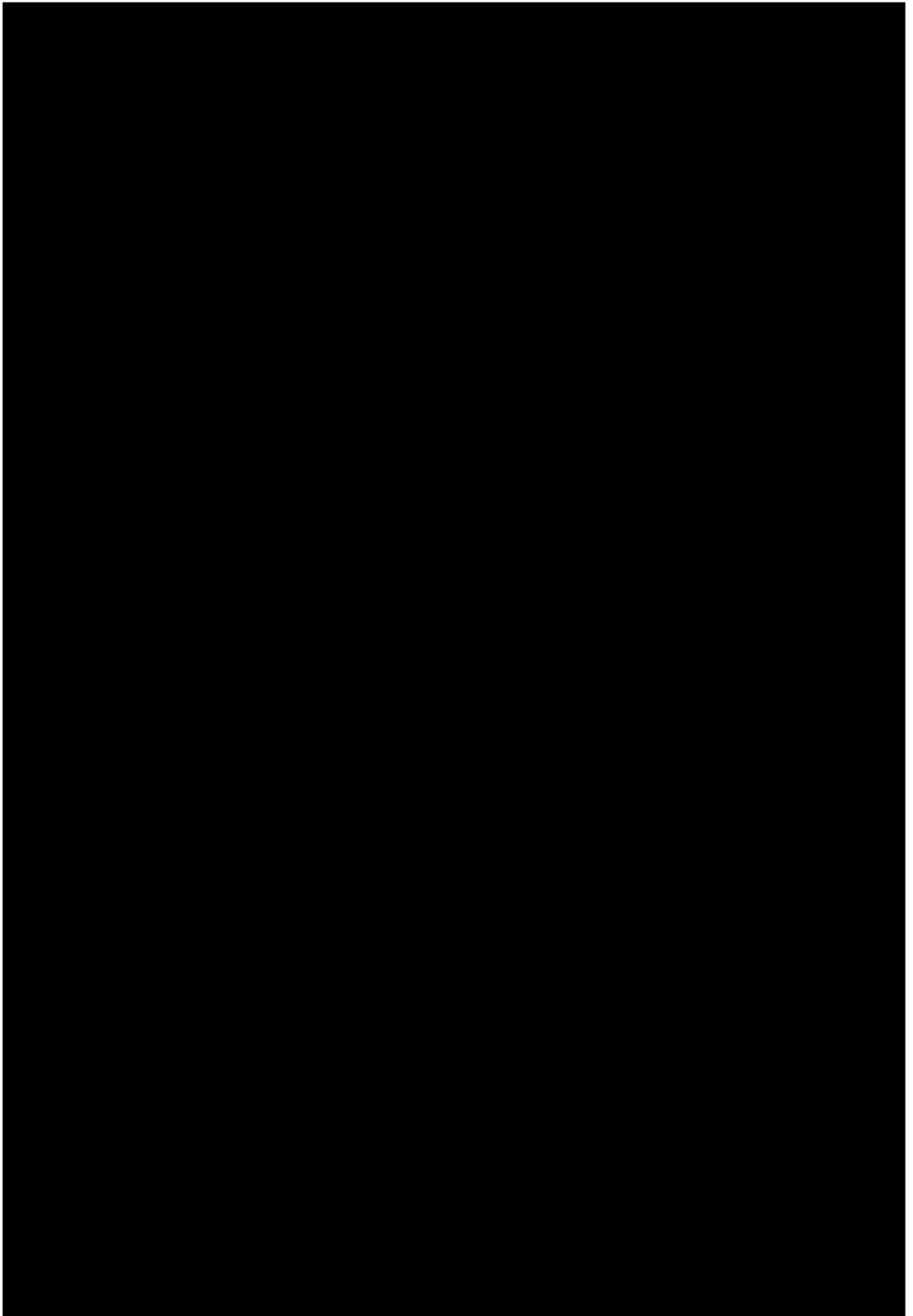
3.9. Responsible Persons and Communication

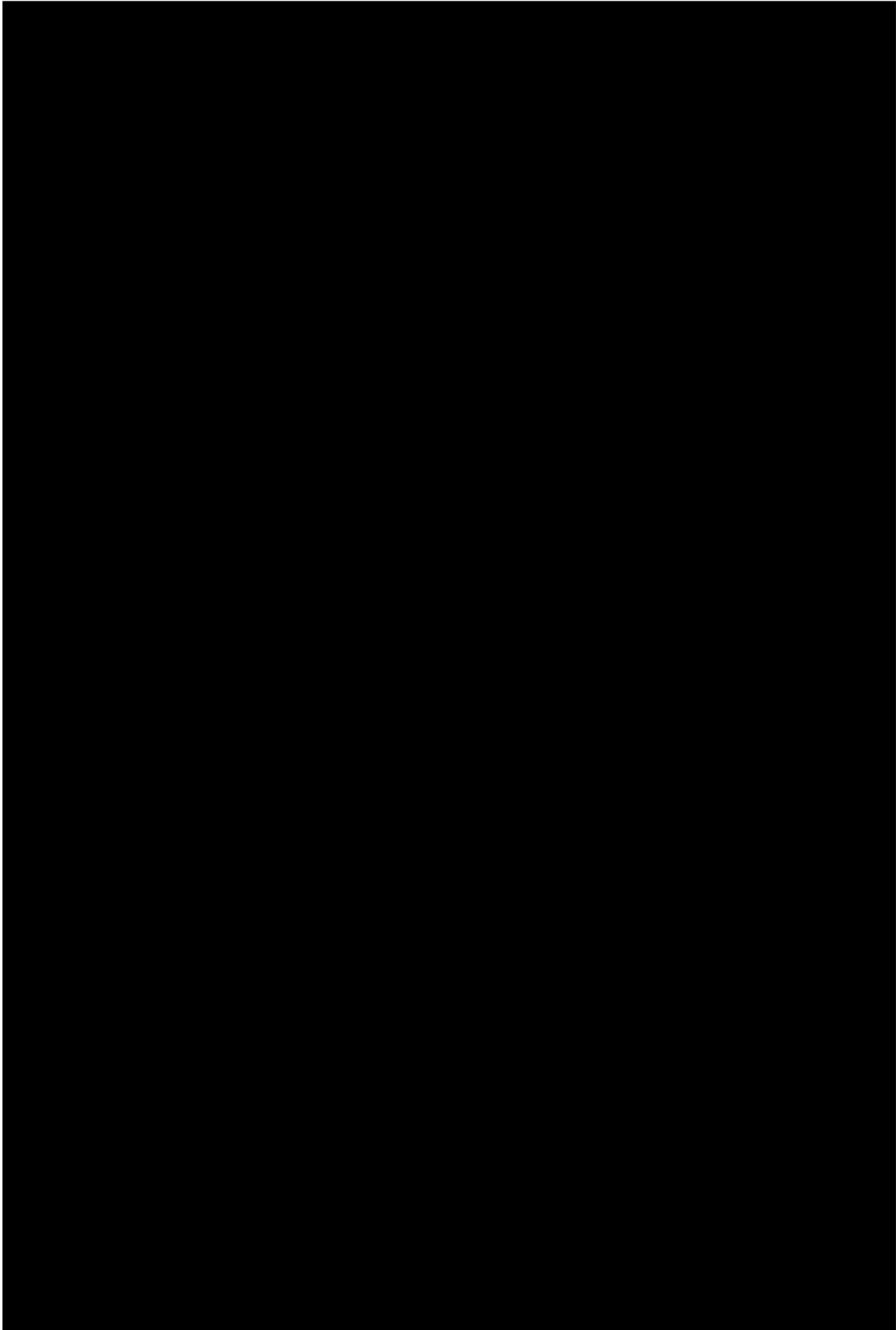
- 3.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.
- 3.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.
- 3.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.
- 3.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.
- 3.9.5. Redrow and the landowner are setting up a joint management company to manage and maintain the public landscape areas of Great Wilsey Park. The management company will be responsible for the ongoing maintenance of areas of soft landscaping within public open spaces, attenuation basins and Great Field Plantation.

3.10. Review and Publication of Results

- 3.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).









5. BATS

5.1. Monitoring Objective

- 5.1.1. To ensure mitigation measures put in place to protect the local bat population throughout development have been successful, with new and retained habitats for enhanced roosting, foraging and dispersal opportunities established, safeguarded and suitably managed.

5.2. Baseline Information

- 5.2.1. Bat activity surveys completed in October 2018 across the Redrow site recorded a low level of activity. Areas shown to be of greater interest for bats are Great Field Plantation and Hedgerow H4, intersecting the south of the site. Species recorded during the activity survey include Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Noctule Bat *Nyctalus noctula*, Brown Long-eared Bat *Plecotus auritus* and Barbastelle *Barbastella barbastellus*. The results of the activity surveys completed by FPCR in 2014 and 2015 across the wider site showed a similar assemblage of bats was recorded.

- 5.2.2. Several trees with potential roost features were identified by FPCR in 2014, three of which were found to contain roosts. A single Pipistrelle species hibernation roost was identified within tree T28. Trees T44 and T49 were identified as having bat roosts but the species were not identified from eDNA testing. Nocturnal surveys concluded that T49 was used as a roost by Soprano Pipistrelle.

5.3. Legislation

- 5.3.1. All bats are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations"). These include provisions making it an offence:

- Deliberately to kill, injure or take (capture) bats;
- Deliberately to disturb bats in such a way as to:-
 - (i) be likely to impair their ability to survive, to breed or rear or nurture their young; or to hibernate or migrate; or
 - (ii) affect significantly the local distribution or abundance of the species to which they belong;
- To damage or destroy any breeding or resting place used by bats;
- Intentionally or recklessly to obstruct access to any place used by bats for shelter or protection (even if bats are not in residence).

- 5.3.2. While the legislation is deemed to apply when bats are not in residence, Natural England guidance suggests that certain activities such as re-roofing can be completed outside sensitive periods when bats are not in residence provided these do not damage or destroy the roost.

- 5.3.3. The words deliberately and intentionally include actions where a court can infer that the defendant knew that the action taken would almost inevitably result in an offence, even if that was not the primary purpose of the act.

- 5.3.4. The offence of damaging (making worse for the bat) or destroying a breeding site or resting place is an absolute offence. Such actions do not have to be deliberate for an offence to be committed.
- 5.3.5. European Protected Species licences are available from Natural England in certain circumstances, and permit activities that would otherwise be considered an offence.
- 5.3.6. In accordance with the Habitats Regulations Natural England must apply the three derogation tests as part of the process of considering a licence application. These tests are that:
1. the activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety;
 2. there must be no satisfactory alternative; and
 3. the favourable conservation status of the species concerned must be maintained.
- 5.3.7. Licences can usually only be granted if the development is in receipt of full planning permission.

5.4. **Mitigation and Enhancement Strategy**

- 5.4.1. During the construction period no lighting will be present at night.
- 5.4.2. Retained trees containing roost potential will be safeguarded and site personnel briefed on the presence of bats.
- 5.4.3. To compensate for the partial loss of hedgerows, additional native species planting will be provided throughout the green infrastructure and open space area greater than that which is to be lost. The retained hedgerows will be included within the green linkages and should be 'gapped up' with native species; this will increase species diversity, strengthen the hedgerows and improve the corridor for foraging bats.
- 5.4.4. Preference will be given to planting species of local provenance within the hedgerows and woodland that will be nectar and fruit producing species to provide foraging for insects, birds and mammals. Species will include Alder *Alnus glutinosa*, Beech *Fagus sylvatica*, Silver Birch, Wych Elm *Ulmus glabra*, Cherry, Hornbeam, Oak, Rowan, Goat Willow *Salix caprea*, Hawthorn, Hazel, Field Maple, Blackthorn *Prunus spinosa*, Dogwood *Cornus sanguinea*, Elder *Sambucus nigra*, Guelder Rose, Field Rose *Rosa arvensis* and Dog Rose.
- 5.4.5. Management of the hedgerows will be undertaken in an ecologically sensitive manner to enhance the nature conservation value. Such management may include allowing the hedgerow to reach at least a height of 3m. Once reached the hedgerow can be 'topped out' to maintain the height or to suit circumstances, with a width of at least 1-2m; a proportion of trees within the hedgerow such as Oak and Field Maple should be allowed to mature into standard trees to provide nesting and foraging opportunities for local wildlife and a varied habitat structure; and grassland along the hedgerow base should be allowed to grow to provide a graduated sward height and habitat.

- 5.4.6. To compensate for woodland losses additional native species woodland planting (that of which will be greater than to be lost) will be incorporated into the scheme.
- 5.4.7. Across the site, dark corridors have been designed to ensure and incorporate habitats of value to bats for foraging, potential roosting and commuting into the wider area.
- 5.4.8. Development will be buffered from features of value to bats, such as hedgerows and woodland edges, that will be incorporated within the dark corridor, the buffer zones have been designed to be of sufficient size (a minimum of 10 or 15m) that will ensure that the features utilised by bats will maintain a light level of below 1 lux.
- 5.4.9. In order to maintain the linkages and an area of darkness (below 1 lux) across the gaps created by the road access through the hedgerows, young plantation woodland and tributary corridor a 'hop-over' will be created. This comprises trees that are already semi-mature (6m in height) planted at either side of the road so that the canopies of these trees will be allowed to interlink over this section of road. To minimise the potential effects to bats (particularly *Barbastelle*) during the development these standard trees will be planted immediately following the removal of hedgerows / trees to facilitate road access.
- 5.4.10. Habitat corridors to be created extending out of the site to the north have been designed with native species planting (2m in height) which will ensure that a dark corridor (below 1 lux) is maintained on the outer edge of the new habitats to increase linkages to the wider environment and provide additional foraging habitat for bats following completion of the development.
- 5.4.11. The green infrastructure area will be established in the early phases of the development. This will include planting of the buffer zones along woodland edges and additional planting along the boundaries / green infrastructure areas.
- 5.4.12. Other lighting considerations will also be implemented during construction and incorporated into the development in order to ensure minimal light spill from the site. Lighting will be directed to where it is needed, to avoid light spillage, particularly along the hedgerow and woodland edges; buffer zones will not be illuminated; lighting that is incorporated into the development design will be of a type that has a low attraction to insects; any upward lighting will be avoided; and security lighting on properties backing on to sensitive hedgerows and woodland will be low wattage LED which will be provided on the properties at construction to forestall a future homeowner installing unsuitable lighting which could impact on bats.
- 5.4.13. The introduction of a series of ponds across the site within the area of green infrastructure will increase the foraging opportunities for the local bat population. Adjacent to the ponds an area will be seeded with a mix with a high proportion of flower species to compensate for the loss of the field margin habitats. The inclusion of night scented species such as Evening Primrose *Oenothera biennis* and Fleabane *Pulicaria* sp. will attract night flying insects and in turn bats. The new ponds will be established within dark

corridors. Establishment of these habitats will increase the diversity of insects which will use the area and therefore increase the value of these features for bats.

- 5.4.14. The inclusion of a variety of bat boxes around the development site on suitable trees and particularly along the woodland edges would provide new potential roosting sites for bats within the local area. Boxes will be located in sheltered spots and placed at a height of at least three metres from the ground.

5.5. Appropriate Success Criteria

- 5.5.1. The condition calls for *“thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged”*.
- 5.5.2. The programme will be judged a success if significant adverse effects on bats are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

5.6. Methods and Analysis

- 5.6.1. Field surveys will be undertaken with regard to best practice guidelines issued by Natural England (2004¹), the Joint Nature Conservation Committee (2004²) and the Bat Conservation Trust (2016³).
- 5.6.2. The site has been subject to a bat activity survey in October 2018. Monthly surveys will be completed in April to October 2019 and 2021. The surveys will be undertaken with regard to the guidelines issued by the Bat Conservation Trust. The activity surveys will be undertaken across a set route which covers the majority of the site.
- 5.6.3. The transects will commence at sunset and continue for approximately two hours in order to maximise the encounter rate of bats i.e. both early and late emerging species. The echolocation calls of bats will be recorded on iPads paired with Echo Meter Touch 2 PRO bat detectors and analysed using Kaleidoscope software.
- 5.6.4. The surveyors will observe the behaviour of any bat recorded, i.e. foraging or commuting, together with noting the species present and number of bats present at that location.
- 5.6.5. Surveys will be conducted when the night-time temperature are above 10°C. The insectivorous diet of bats means there is little or no food available when temperature falls below this level and consequently levels of activity are low and may not accurately reflect the value of the site for bats. The

¹Mitchell-Jones, A. J. (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

²Mitchell-Jones, A.J. & McLeish, A.P. (Eds.) (2004). *Bat Workers' Manual*. 3rd edition. Joint Nature Conservation Committee, Peterborough.

³ Collins, J. (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3rd Edition. The Bat Conservation Trust, London.

weather conditions for the surveys will be recorded and any limitations noted.

5.6.6. Methods for habitat monitoring are detailed in the habitats section above.

5.7. Location of Monitoring

5.7.1. Monitoring will take place across the retained and newly created habitats within the site (see Plan ECO3).

5.8. Timing and Duration

5.8.1. Monitoring surveys will be completed monthly in April to October in the first and the third year of development.

5.8.2. The timing and duration of habitat monitoring is detailed in the habitats section above.

5.8.3. Bat boxes will be checked periodically (at least once a year in March) for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Boxes will be replaced if found to be damaged.

5.9. Responsible Persons and Communication

5.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.

5.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.

5.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.

5.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.

5.10. Review and Publication of Results

5.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).

6. OTTERS

6.1. Monitoring Objective

- 6.1.1. The enhancement measures proposed for this species are to provide new opportunities for future natural colonisation and it is not expected that there would be an immediate observable outcome in terms of rapid inward migration. Monitoring will be centred around ensuring the wetland habitats are suitable for Otters *Lutra lutra* and other wildlife.

6.2. Baseline Information

- 6.2.1. No evidence of Otter has been recorded in the existing waterbodies across the Redrow site and the wider site, but this species is known to be present in the River Stour, and the Stour Brook south of the site.

6.3. Legislation

- 6.3.1. Otters are subject to the same level of legislative protection as bats (see above).

6.4. Mitigation and Enhancement Strategy

- 6.4.1. Prior to any works on the existing habitats within the site, a check survey for Otters will be undertaken by an ecologist. In the event that evidence of the species is recorded, consideration will be given for the need for a Natural England licence, dependent on the nature of the works proposed.
- 6.4.2. Other measures as proposed for Badgers above would avoid potential conflicts with Otters during construction.
- 6.4.3. Though there is no evidence of their presence within the site at the time of writing, Otters are known to be present within the locality and the development represents an opportunity to provide greater opportunities for the species.
- 6.4.4. Measures to enhance existing waterbodies and to establish new areas as part of the drainage strategy may encourage greater use of the site by this species.
- 6.4.5. The provision of wet grassland associated with the drainage strategy will provide suitable overland habitat for Otter dispersal. The creation of this new habitat, based around native species, will also enhance the site for Otters.

6.5. Appropriate Success Criteria

- 6.5.1. The condition calls for *“thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged”*.
- 6.5.2. The programme will be judged a success if significant adverse effects on Otters are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved

through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

6.6. **Methods and Analysis**

6.6.1. Otters, being a large mammalian predator, are present in watercourses of varying sizes ranging from small lakes to rivers, estuaries and coasts.

6.6.2. Otter surveys will be undertaken in 2019 and 2021, by a suitably qualified ecologist to identify any characteristic signs of otters. The following signs will be sought:

- Spraint – Irregular, sometimes short, rounded segments containing fish bones, scales or crayfish parts;
- Footprints of otters in soft substrates along the watercourse typically 8cm wide and 10cm long;
- Holts and couches on the banks of the watercourse; and
- Slides on the banks of the watercourse.

6.6.3. Methods for habitat monitoring are detailed in the habitats section above.

6.7. **Location of Monitoring**

6.7.1. Monitoring will take place across the retained and newly created waterbodies and associated habitats within the site (see Plan ECO3).

6.8. **Timing and Duration**

6.8.1. Monitoring surveys will take place in the first and the third year of development and can be completed at any time of year.

6.8.2. The timing and duration of habitat monitoring is detailed in the habitats section above.

6.9. **Responsible Persons and Communication**

6.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.

6.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.

6.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.

6.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.

6.10. **Review and Publication of Results**

6.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes

will be prepared and submitted following completion of the work (October / November).

7. WATER VOLES

7.1. Monitoring Objective

- 7.1.1. The enhancement measures proposed for this species are to provide new opportunities for future natural colonisation and it is not expected that there would be an immediate observable outcome in terms of rapid inward migration. Monitoring will be centred around ensuring the wetland habitats are suitable for Water Voles *Arvicola amphibius* and other wildlife.

7.2. Baseline Information

- 7.2.1. No evidence of Water Vole was recorded in the existing waterbodies across the Redrow site and the wider site, but this species is known to be present in the River Stour, and the Stour Brook south of the site.

7.3. Legislation

- 7.3.1. Water Voles are fully protected under the Wildlife & Countryside Act 1981. It is an offence to:

- Intentionally kill, injure or take (capture) a Water Vole;
- Possess or control a live or dead Water Vole, or any part of a Water Vole;
- To sell, offer for sale or advertise for live or dead Water Voles;
- Intentionally or recklessly damage, destroy, or obstruct access to any structure or place which Water Voles use for shelter or protection or disturb Water Voles while they are using such a place.

- 7.3.2. The words deliberately and intentionally include actions where a court can infer that the defendant knew that the action taken would almost inevitably result in an offence, even if that were not the primary purpose of the act.

- 7.3.3. Operations where Water Voles are to be trapped or displaced require a conservation licence from Natural England. This may be in the form of a class licence or a site-specific licence dependent on whether the proposals meet particular criteria. To obtain either licence the project must deliver a net benefit for Water Voles.

7.4. Mitigation and Enhancement Strategy

- 7.4.1. Prior to any works on the existing habitats within the site, a check survey for Water Voles will be undertaken by an ecologist. In the event that evidence of the species is recorded, consideration will be given for the need for a Natural England licence, dependent on the nature of the works proposed.

- 7.4.2. Though there is no evidence of their presence within the site at the time of writing, Water Voles are known to be present in the locality and the development represents an opportunity to provide greater opportunities for the species.

- 7.4.3. The network of swales to be established as part of the green infrastructure and drainage strategy, as well as the retained and enhanced ditches across

the site, will be a valuable new area of potential habitat for Water Voles, should they colonise the site.

- 7.4.4. The provision of wet grassland associated with the drainage strategy will provide suitable overland habitat for Water Vole dispersal. New native species marginal planting and dry riparian grassland will also offer new foraging interest for Water Voles.

7.5. Appropriate Success Criteria

- 7.5.1. The condition calls for *“thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged”*.
- 7.5.2. The programme will be judged a success if significant adverse effects on Water Voles are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

7.6. Methods and Analysis

- 7.6.1. The site and immediate vicinity will be subject to specific surveys for Water Vole in 2019 and 2021 (mid-April to the end of June and July to September inclusive), having been identified as supporting suitable habitats for Water Vole with the species known to be present in the locale.
- 7.6.2. As Water Voles are rarely seen, the surveys will be based around the identification of characteristic signs. The surveys will follow guidance by Natural England and consisted of a close examination of all the ditches on site and banks up to two metres from the water's edge.
- 7.6.3. The experienced Water Vole surveyors completing the surveys will carefully search the length of the ditches, and their associated banks, for the characteristic field signs of Water Vole. The following signs will be sought:
- i) Faeces - 8-12 mm long and 4-5 mm wide with blunt ends;
 - ii) Latrines - Water Voles will deposit the majority of their droppings at points of their territory boundary;
 - iii) Feeding Stations – Water Voles often bring pieces of cut vegetation to favoured feeding stations close to the water's edge;
 - iv) Burrows - Typically 4-8 cm in diameter and found in the river / ditch bank;
 - v) Footprints of Water Vole in soft substrates along the ditches; and
 - vi) Water Voles that may be observed directly.
- 7.6.4. Methods for habitat monitoring are detailed in the habitats section above.

7.7. Location of Monitoring

- 7.7.1. Monitoring will take place across the retained and newly created waterbodies and associated habitats within the site (see Plan ECO3).

7.8. Timing and Duration

- 7.8.1. Monitoring surveys will take place from mid-April to the end of June and from July to September inclusive, in the first and the third year of development.
- 7.8.2. The timing and duration of habitat monitoring is detailed in the habitats section above.

7.9. Responsible Persons and Communication

- 7.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.
- 7.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.
- 7.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.
- 7.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.

7.10. Review and Publication of Results

- 7.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).

8. DORMICE

8.1. Monitoring Objective

- 8.1.1. To ensure mitigation measures put in place to protect Dormice *Muscardinus avellanarius* have been successful, and hedgerow and woodland management plans have provided greater foraging and nesting opportunities with natural bridges linking habitats across the site for greater dispersal.

8.2. Baseline Information

- 8.2.1. No evidence of Dormice was recorded by Ecology Solutions across the Redrow site in surveys completed in autumn 2018. A partial Dormouse nest was recorded in a survey tube in the south-east of the wider site in 2015; no evidence was recorded in the Redrow site.

8.3. Legislation

- 8.3.1. Dormice are subject to the same level of legislative protection as bats (see above).

8.4. Mitigation and Enhancement Strategy

- 8.4.1. During the construction period all contractors will be briefed about the importance of the habitats within the site for the range of species that have been identified, and that care should be taken when conducting any works near existing natural features. All vegetation removal will have been predetermined at the full planning stages, and no additional losses would occur until the project ecologists have confirmed so.
- 8.4.2. Where site offices, material and vehicle storage are proposed, and where the phased development commences all natural habitats will be fenced off with an appropriate buffer using high visibility fencing or similar. This will ensure that habitats are not degraded through soil compaction and interference by contractors and machinery.
- 8.4.3. The approach identified as part of the outline planning application, based on the survey evidence, is that work is to be undertaken on a non-licensed method statement basis. This is on account of the very limited indications of presence and the apparently limited distribution within the wider site. Information obtained to date as part of Ecology Solutions' updated surveys has not changed this understanding; further work to be completed in spring 2019 will help to determine whether this remains the most suitable approach or whether a licence would be required.

Timed Vegetation Removal – Hedgerows

- 8.4.4. Where sections of hedgerow are to be removed these will generally be limited to a length of 12m. The methods below cover habitat removal during the winter and summer.

Winter

- 8.4.5. Vegetation checks and removal will be undertaken during the winter between November and March inclusive under the supervision of a licensed ecologist. This period will avoid the bird breeding season and the active period for Dormice, as they are more likely to be in hibernation underground. Searches of the vegetation will be undertaken prior to any vegetation removal whereby nests and any cavities within trees etc will be inspected for Dormice. The clearance of vegetation will be undertaken by hand with no heavily machinery to be used in close proximity to the areas of removed, so avoiding any possible disturbance through noise and vibrations. All tree felling will also be undertaken during this period, provided there are no bat roosting constraints.
- 8.4.6. The vegetation will be cut down to approximately 10-15cm, to avoid disturbance to the ground and retain the roots and stumps, in order not to adversely affect any Dormice that may be hibernating at or below the surface. The hedgerow canopy will be removed from the stem, a small proportion of the hedge will be kept as a 'dead hedge', which will provide a feature within which Dormice could continue to move when they wake from hibernation, this also means that individuals will be able to move along such breaks into surrounding retained habitats.
- 8.4.7. The removal of the root systems of the cut vegetation will be undertaken when Dormice are active between April to October, although care will be taken to avoid periods of cold wet weather, when Dormice can go into torpor. All root removals will need to be supervised by a licensed ecologist. During this period the 'dead hedge' will also be removed from the site; care will be taken to ensure that there are no nesting birds present; if they are present then work will stop until young have fledged and a buffer created to ensure that the nest is not disturbed. These areas will also be searched for Dormouse nests prior to removal.

Summer

- 8.4.8. Vegetation will be cleared by hand during the summer when Dormice are active; this will be between May to late September, but clearance should ideally be undertaken in May to avoid separating young that would be dependent on their mothers. All vegetation that is scheduled for removal will be checked for bird and Dormouse nests before any removal is undertaken. All removal will take place under a watching brief by a licensed ecologist, whereby removal of small lengths (approximately 10m) will be undertaken over consecutive days, thus allowing time for any possible Dormice to move from the area. The removal of the canopy of vegetation will be undertaken by hand; this will ensure that sightings of Dormice are more likely. The root system of the vegetation should also be removed during this period so to avoid potential refuge and hibernation opportunities in the future.

Timed Vegetation Removal – Woodland

- 8.4.9. Small sections of woodland are to be removed to facilitate access roads in the south of the Redrow site, these are also well removed from the Dormouse nest recorded. Approaches for winter and summer vegetation removal were included in the outline application.

Winter

- 8.4.10. During the winter months (November to March) ground level vegetation will be removed from the woodland areas; this will persuade any Dormice that could potentially be present to move when they come out of hibernation. As with the above a 'dead hedge' will be provided to allow safe passage to surrounding retained habitats / woodland. The remaining tree stumps and any ground removal will take place in the summer months when any Dormice present would be expected to have left the area (May to September).

Summer

- 8.4.11. Summer removal will take place between May and September. Small sections of the woodland compartments will be removed over a number of consecutive days. This will allow time and opportunities for any Dormice that might be present to move into adjacent retained habitats. Care will be taken to ensure that no habitats contain nesting birds.

Habitat Enhancements and Management

- 8.4.12. All existing and retained habitats will be enhanced with additional planting to ensure that poor structure and gaps are filled with native species that will benefit foraging, commuting and nest building. These will have a positive effect on Dormice but also other species.
- 8.4.13. Woodland compartments will be thinned to allow understorey shrub development, which are of more value to Dormice than the current tree canopy. Understorey species will be planted, including Oak, Honeysuckle, Hawthorn, Wayfaring-tree *Viburnum lantana*, Bramble *Rubus fruticosus*, Crab Apple, Cherry and Hazel.
- 8.4.14. Management will include coppicing, rotational cutting of sections of hedgerows at three to five year intervals and / or hedgerow laying; such measures will ensure increased fruiting bodies and understorey renewal of growth which will benefit invertebrates.
- 8.4.15. There will be a number of new habitats created within the site that will increase opportunities for Dormice to spread from their current isolation into the wider site and off site.
- 8.4.16. Generally, gaps established in existing hedgerows will be limited to 12m, to facilitate movement of Dormice at ground level should they move into the area. To limit the requirement for individuals to go to ground taller shrubs / trees will be planted either side of any gaps, whereby management will ensure that the canopy is lifted to create a natural bridge over time. These measures are effectively the same as the bat hop-overs, and are in the same location. Similar measures will be adopted across the stream that runs through the site, whereby tree canopies will be encouraged to bridge the gap and potentially provide links to habitats where Dormice are currently absent.

- 8.4.17. A series of Dormouse nesting boxes will be installed within woodland habitats.
- 8.4.18. Wooden nest boxes will be installed within habitat adjacent to any vegetation losses, these will increase the nesting opportunities within the site and thus increase the carrying capacity in the long term. These will be monitored to ensure they remain viable as nesting features, and will also be used for future assessment of the population.

8.5. **Appropriate Success Criteria**

- 8.5.1. The condition calls for “*thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged*”.
- 8.5.2. The programme will be judged a success if significant adverse effects on Dormice are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

8.6. **Methods and Analysis**

- 8.6.1. At the time of writing, a nest tube and nest box survey for Dormouse is underway in respect of suitable habitats within the site, which will continue during the 2019 survey season until the necessary 20 points are obtained in the survey index. Surveys will also be undertaken in 2021 between the months of April to November.
- 8.6.2. Features of importance to Dormice include diverse well-structured hedgerows offering a range of food sources throughout the year. Good arboreal links through the canopy layer of hedgerows / woodlands are required along with suitably dense cover for nest sites and good hibernation sites. Typical indicator tree / plant species include Hazel, Honeysuckle and Bramble; but a mix of other species (such as Oak, Ash *Fraxinus excelsior*, Sycamore *Acer pseudoplatanus*, Blackthorn and Hawthorn) can prove equally important and the presence of food sources throughout the active period for Dormice, coupled with the presence of suitable hibernation sites, is of more importance than the presence / absence of any one key indicator species.
- 8.6.3. The survey technique involves the installation and checking of nest tubes and nest boxes within all habitats considered to be species-rich or of potential value to Dormice.
- 8.6.4. The Dormouse nest tubes / boxes utilised will be those approved as standard by the Mammal Society.
- 8.6.5. Nest tubes / boxes will be placed in accordance with the guidance provided by the Mammal Society and Natural England⁴. Typically, tubes are placed within scrub, hedgerows and woodland approximately every 20 metres where suitable locations can be identified. Nest boxes are placed at lower

⁴ Chanin, P. & Woods, M. (2003). *Surveying Dormice Using Nest Tubes – Results & Experiences from the South West Dormouse Project*. Research Report 524. English Nature, Peterborough.

densities but in similarly selected locations as for nest tubes. The nest tubes will be attached with wire ties underneath suitably sturdy horizontal branches and positioned approximately 1.5 metres above ground level on average.

- 8.6.6. The survey will be scored for effort according to the method developed from the South West Dormouse Project and carried through in the second edition of *The Dormouse Conservation Handbook* (English Nature, 2006)⁵. The system provides an overall score that reflects the chances of Dormice being discovered if present, and thus provides an indicator of the ‘thoroughness’ of a survey. This score is based on the number of tubes used and the number of months the tubes are in place.
- 8.6.7. The months of the year are weighted according to the likelihood of recording Dormice, as set out in Table 8.1 below.

Month	Weighting
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

Table 8.1. Monthly Score Weighting for Dormouse surveys (Chanin & Woods 2003).

- 8.6.8. Generally speaking, the index of effort is calculated based on the use of 50 nest tubes as a standard minimum.
- 8.6.9. A score of 20 (or above) is deemed a thorough survey and a score of 15 to 19 may be regarded as adequate where circumstances do not permit more time or more tubes (particularly if other survey methods have also given negative results).
- 8.6.10. The site does not contain areas dominated by Hazel and therefore hazelnut searches will not be employed as part of the Dormouse survey effort.
- 8.6.11. In addition to traditional nest tube and box surveys, footprint tunnel surveys were undertaken across the site in October and November 2018. Consideration will be given to the need to continue the footprint tunnel surveys into 2019 and subsequent monitoring in 2021. The application of these tunnels follows the recommendations of the Suffolk Wildlife Trust⁶.
- 8.6.12. Footprint tunnels comprise 65mm square drainpipe tubing containing a plywood insert lined with a sheet of high-quality white card. A non-toxic ink, made from a mix of olive oil and pharmaceutical grade charcoal powder, is applied to ink pads at both entrances, which when passed over will transfer

⁵ English Nature (2006). *The Dormouse Conservation Handbook*. English Nature, Peterborough.

⁶ Bullion, S., Looser, A. and Langton, S. (2018). An Evaluation of the Effectiveness of Footprint Tracking Tunnels for Detecting Hazel Dormice. *In Practice* 101, pp.36-41. CIEEM.

ink from the mammal's feet to the white card. The tunnels are deployed along a transect within areas of suitable habitat at approximately 15 to 20 metres apart, and at a height of approximately 1 to 1.5 metres off the ground, depending on the habitat present. Tunnels should be checked every two weeks to re-ink the pads and change the white card if required.

- 8.6.13. Dormice have a distinctive footprint compared to those of other small mammals that may use the tunnels, with Dormice displaying three obvious triangles when a good print is captured.
- 8.6.14. Currently, footprint tunnel surveys are only used as a presence / likely absence technique and must be used in combination with at least one other verified survey method. Despite this, footprint tunnels have been shown to have a higher detection rate for areas of scrub and hedgerow than nest tube and box surveys alone.
- 8.6.15. Footprint tunnel surveys should be completed for at least three months, typically between May and October, though the tunnels can be installed as early as late March. As April has a low detection rate, if there are no results recorded for this period then this month should be excluded from the three-month survey period. For areas that are primarily considered to be dispersal corridors, as opposed to permanently occupied by Dormice, the months of September and October should be included.
- 8.6.16. Methods for habitat monitoring are detailed in the habitats section above.

8.7. Location of Monitoring

- 8.7.1. Monitoring surveys will take place across suitable retained and newly created habitats within the site (see Plan ECO3).

8.8. Timing and Duration

- 8.8.1. Monitoring surveys will take place in the first and the third year of development, between April and November until 20 points have been obtained.
- 8.8.2. The timing and duration of habitat monitoring is detailed in the habitats section above.
- 8.8.3. Nesting boxes will be checked periodically (at least once a year in March) for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Boxes will be replaced if found to be damaged.

8.9. Responsible Persons and Communication

- 8.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.
- 8.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.

- 8.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.
- 8.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.

8.10. Review and Publication of Results

- 8.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).

9. HEDGEHOGS

9.1. Monitoring Objective

- 9.1.1. To ensure mitigation measures put in place to protect Hedgehogs *Erinaceus europaeus* throughout development have been successful, with new and retained habitats for enhanced foraging and dispersal opportunities established, safeguarded and suitably managed.

9.2. Baseline Information

- 9.2.1. The habitats present on site provide opportunities for Hedgehogs to forage and find places of refuge, and the species is considered likely to be present.

9.3. Legislation

- 9.3.1. Hedgehog is a species of principal importance for the conservation of biodiversity under Section 41 (England) of the NERC Act 2006.
- 9.3.2. The NERC Act 2006 requires the Secretary of State to:

... take such steps as appear... to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or... promote the taking by others of such steps.

9.4. Mitigation and Enhancement Strategy

- 9.4.1. Ground cover will be cleared outside of the winter hibernation period wherever possible. Where this is not possible, a check for hibernation nests will be completed by a suitably qualified ecologist prior to clearance.
- 9.4.2. Scrub and tree removal will be carried out in a sensitive manner, using hand tools to clear the base of trees to be removed prior to any large machinery pulling out roots.
- 9.4.3. Any clearance of log piles or other Hedgehog shelter features will be subject to inspection to ensure that Hedgehogs are absent. In the event that an individual is encountered, it will be carefully placed in an appropriate lidded box and immediately removed to an area of suitable habitat at the margins of the site away from working areas.
- 9.4.4. Any trenches or deep pits associated with construction that are to be left open overnight will be provided with a means of escape in case a Hedgehog enters. This is particularly important if the trench fills with water, and will take the form of a roughened plank of wood placed in the trench as a ramp to the surface.
- 9.4.5. The retention of hedgerows along with additional buffer planting and grassland will provide continued opportunities for commuting and foraging Hedgehogs. New planting including native species and species of known wildlife value will offer new foraging resources for Hedgehogs.
- 9.4.6. New residential gardens will offer new potential habitat for Hedgehogs and other small mammals. Garden fences will be provided with a 'Hedgehog

Gateway', a 13cm x13cm section of fence cut out at the base, to facilitate dispersal for Hedgehogs and other small animals. This will enhance the permeability of the new development for wildlife.

- 9.4.7. Hedgehog hibernation boxes and log piles will be installed in discrete locations throughout the development.
- 9.4.8. Specific enhancements for invertebrates (see below) will provide additional foraging opportunities for Hedgehogs.

9.5. **Appropriate Success Criteria**

- 9.5.1. The condition calls for *"thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged"*.
- 9.5.2. The programme will be judged a success if significant adverse effects on Hedgehogs are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

9.6. **Methods and Analysis**

- 9.6.1. Methods for habitat monitoring are detailed in the habitats section above.

9.7. **Location of Monitoring**

- 9.7.1. Monitoring will take place across the retained and newly created habitats within the site (see Plan ECO3).

9.8. **Timing and Duration**

- 9.8.1. The timing and duration of habitat monitoring is detailed in the habitats section above.
- 9.8.2. Hibernation boxes will be checked periodically (at least once a year) for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Boxes will be replaced if found to be damaged.

9.9. **Responsible Persons and Communication**

- 9.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.
- 9.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.
- 9.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.
- 9.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.

9.10. **Review and Publication of Results**

- 9.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).

10. BIRDS

10.1. Monitoring Objective

- 10.1.1. To ensure mitigation measures put in place to protect birds throughout development have been successful, with new and retained habitats for enhanced foraging and nesting opportunities established, safeguarded and of habitats suitably managed.

10.2. Baseline Information

- 10.2.1. Four wintering bird surveys have been completed, in November and December 2018, and in January and February 2019 by Ecology Solutions. A total of 47 species were recorded, including 17 species that are listed as NERC species of principal importance, Suffolk LBAP and/or on the UK Birds of Conservation Concern Red and Amber list. Species recorded include Song Thrush *Turdus philomelos*, Skylark *Alauda arvensis*, Yellowhammer *Emberiza citrinella*, Kestrel *Falco tinnunculus*, Linnet *Carduelis cannabina*, Redwing *Turdus iliacus*, Fieldfare *Turdus pilaris*, Stock Dove *Columba oenas*, Bullfinch *Pyrrhula pyrrhula*, Dunnock *Prunella modularis*, Mistle Thrush *Turdus viscivorus*, Starling *Sturnus vulgaris*, House Sparrow *Passer domesticus*, Reed Bunting *Emberiza schoeniclus*, Black-headed Gull *Chroicocephalus ridibundus*, Lesser Black-backed Gull *Larus fuscus* and Mallard *Anas platyrhynchos*.
- 10.2.2. A single Tawny Owl *Strix aluco* was recorded during bat surveys undertaken in October 2018.
- 10.2.3. Four wintering bird surveys were previously undertaken by FPCR between November 2014 and February 2015. A similar complement of species was recorded during the earlier work.
- 10.2.4. A breeding bird survey was undertaken by Ecology Solutions in April 2019. A total of 36 species were recorded, including 12 species that are listed as NERC species of principal importance, Suffolk LBAP and / or on the UK Birds of Conservation Concern Red and Amber list. Species recorded include Dunnock, Fieldfare, Herring Gull *Larus argentatus*, House Sparrow, Starling, Yellowhammer, Skylark, Black-headed Gull, Lesser Black-backed Gull and Song Thrush. Of these species, Dunnock, Linnet, Yellowhammer and Skylark were all recorded singing.
- 10.2.5. Breeding bird surveys were previously undertaken in 2015 by FPCR. In summary the results of this work were as follows: Surveys were completed in April, May and June across the wider site. A total of 49 species were recorded, including 22 species that are listed as NERC species of principal importance, Suffolk LBAP and / or on the UK Birds of Conservation Concern Red and Amber list. Of these species Dunnock, House Sparrow, Starling, Yellowhammer, Skylark, Swallow *Hirundo rustica*, Black-headed Gull, Song Thrush, Green Woodpecker *Picus viridis*, Meadow Pipit *Anthus pratensis*, Linnet, Stock Dove, Kestrel, Whitethroat *Sylvia communis*, House Martin *Delichon urbicum*, Bullfinch, Willow Warbler *Phylloscopus trochilus*, Mallard and Swift *Apus apus* were recorded within the Redrow site. None of these notable species were found to be breeding on site.

10.3. Legislation

- 10.3.1. Section 1 of the Wildlife and Countryside Act 1981 (as amended) is concerned with the protection of wild birds, whilst Schedule 1 lists species that are protected by special penalties. All species of birds receive general protection whilst nesting.

10.4. Mitigation and Enhancement Strategy

- 10.4.1. In order avoid impacts on nesting birds, and to avoid a potential offence under the Wildlife & Countryside Act 1981, all necessary clearance of vegetation would be undertaken outside of the bird breeding season (March to July inclusive) wherever possible. Where this is not possible, a check survey of vegetation by an experienced ecologist would be undertaken immediately prior to clearance. In the event that a nest was found to be present, the vegetation would be left uncleared with a 5m exclusion zone around it until the young had fledged.
- 10.4.2. The scheme will include habitat enhancements through the planting of native and ornamental trees and shrubs, with preference given to species of value to local bird populations, e.g. berry- and fruit-bearing species such as Crab Apple, Hawthorn, Rowan, Holly and Guelder Rose. The scheme will provide habitat buffers adjacent to retained hedgerows to minimise potential impacts to local bird populations in the long-term. New areas of woody species planting throughout the site will in time mature into habitats suitable for use by foraging and nesting birds.
- 10.4.3. Areas of new tussocky wildflower grassland will provide further nesting and foraging opportunities for farmland birds such as Skylark.
- 10.4.4. A series of bird boxes and Swift poles will be provided to enhance nesting opportunities for birds in the local area. A selection of hole- and open-fronted designs will be used in order to encourage a variety of species.
- 10.4.5. These measures would result in significant gains for nesting and foraging birds.

10.5. Appropriate Success Criteria

- 10.5.1. The condition calls for *“thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged”*.
- 10.5.2. The programme will be judged a success if significant adverse effects on birds are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved through the various measures described above in and in the Ecological Implementation Strategy prepared under Condition 42.

10.6. **Methods and Analysis**

Breeding Birds

- 10.6.1. Three breeding bird surveys will be undertaken during suitable weather conditions between April and June 2019 and 2021.
- 10.6.2. Transects will be designed to take in all the different habitats within the site and to allow visual inspections of all the open habitats within these areas. The direction in which transects will be walked will vary to increase the likelihood of seeing a wider range of bird species.
- 10.6.3. All birds seen or heard within the survey area will be identified and recorded, as will their behaviour. Binoculars and a telescope will be used when necessary.

Wintering Birds

- 10.6.4. Four wintering bird surveys have been completed to date (November and December 2018 and January and February 2019). A four monthly wintering bird surveys will be undertaken between November 2021 and February 2022. Transects were walked following the technique detailed above without a subsequent analysis of breeding status.
- 10.6.5. The surveys will commence at or soon after sunrise and will be performed in suitable weather conditions. The transect route will be chosen so that the entire site is covered and all features likely to support wintering birds are surveyed.
- 10.6.6. Methods for habitat monitoring are detailed in the habitats section above.

10.7. **Location of Monitoring**

- 10.7.1. Monitoring will take place across the retained and newly created habitats within the site (see Plan ECO3).

10.8. **Timing and Duration**

- 10.8.1. Monitoring will take place in the first and the third year of development and at the appropriate time of year to comply with the guidelines (see methods and analysis above for further details).
- 10.8.2. The timing and duration of habitat monitoring is detailed in the habitats section above.
- 10.8.3. Bird boxes will be checked periodically (at least once a year in March) for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Boxes will be replaced if found to be damaged.

10.9. **Responsible Persons and Communication**

- 10.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.

- 10.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.
- 10.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.
- 10.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.

10.10. Review and Publication of Results

- 10.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).

11. REPTILES

11.1. Monitoring Objective

- 11.1.1. To ensure that adequate habitat is available to the reptile populations following the completion of development to enable the species to be maintained at a favourable conservation status, with gains made wherever possible.

11.2. Baseline Information

- 11.2.1. Populations of Grass Snake *Natrix helvetica* and Common Lizard *Zootoca vivipara* are known from the Redrow site, but at the margins and generally within areas proposed for green infrastructure under the outline scheme. An adult Grass Snake was recorded along Hedgerow H11 on 24 June 2014 and Hedgerow H14 on 4 September 2014. Adult Common Lizards were recorded along Hedgerow H11 on 24 June and 23 September 2014 and along Hedgerow H4 and south-eastern boundary of the site on 14 August 2014. Juvenile Common Lizard were also recorded on the south-eastern boundary on 14 August 2014. Slow Worm *Anguis fragilis* have been recorded in the wider site.

11.3. Legislation

- 11.3.1. All reptile species receive protection under legislation in the UK. Smooth Snake *Coronella austriaca* and Sand Lizard *Lacerta agilis* receive full legal protection in England due to their status as scarce, rather local, species. These species are highly unlikely to be present within the site on account of their habitat requirements and geographical distribution.
- 11.3.2. The other reptile species, namely Slow Worm, Common Lizard, Grass Snake and Adder *Vipera berus*, are common and widespread across the country. As such, these species receive only partial protection under the Wildlife and Countryside Act 1981 (as amended), being protected from deliberate killing or injury, their habitat receiving no statutory protection.

11.4. Mitigation and Enhancement Strategy

- 11.4.1. Where habitats used by reptiles exist mitigation measures will be put into place to ensure that no offence is caused under the Wildlife & Countryside Act. This will include passive displacement and fencing of sensitive areas.
- 11.4.2. Areas where reptiles have been recorded are to be included within the green infrastructure network. These will undergo enhancements with hibernacula created to offer refuge, shelter and hibernation opportunities away from residential areas. The green corridors will link to larger areas, which will have multiple uses, including amenity, access and conservation. Habitats will be established with a tussocky grassland structure with wildflower mixes; this will provide the nectar sources for invertebrate / prey items, basking areas and safe passages through undergrowth. Where tree removal is required the trunks will be kept and cut up and arranged within retained habitats; these will create basking opportunities, refuge and as they rot provide a foraging resource.

- 11.4.3. Management of grassland will be important for the longevity of suitable habitats. Cutting regimes will be rotated whereby only small parcels of a compartment are cut in one year. Grassland mixes will include Crested Dogstail *Cynosurus cristatus*, Cocksfoot *Dactylis glomerata*, Red Fescue *Festuca rubra* with wildflower mixes to include Common Knapweed *Centaurea nigra*, Greater Knapweed *Centaurea scabiosa*, Oxeye Daisy *Leucanthemum vulgare*, Wild Carrot *Dipsacus fullonum* and Tufted Vetch *Vicia cracca*.

11.5. Appropriate Success Criteria

- 11.5.1. The condition calls for “*thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged*”.
- 11.5.2. The programme will be judged a success if significant adverse effects on reptiles are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

11.6. Methods and Analysis

- 11.6.1. Specific surveys for reptiles will be carried out in 2019 and 2021 between April and September. The methodology that will be utilised is principally derived from guidance given in Froglife Advice Sheet 10⁷, the *Herpetofauna Workers' Manual*⁸, the Herpetofauna Groups of Britain and Ireland's (HGBI) advisory note⁹ and Natural England's Standing Advice for Reptiles¹⁰.
- 11.6.2. Areas of suitable habitat will be surveyed for the presence of reptiles using artificial refugia (“tins”), 0.5m x 0.5m roofing felt tins will be placed within areas of suitable reptile habitat within the site.
- 11.6.3. The tins provide shelter and heat up more quickly than the surroundings in the morning and can remain warmer than the surroundings in the late afternoon. Being ectothermic (cold blooded), reptiles use them to bask under and raise their body temperature which allows them to forage earlier and later in the day.
- 11.6.4. To determine presence / absence the tins will be checked for reptile activity over seven visits at appropriate times of the day (avoiding the middle of the day when the ambient air temperature is at its highest) in accordance with Natural England and other guidance. Optimum weather conditions for reptile surveying are temperatures between 10°C and 17°C, intermittent or hazy sunshine and little or no wind.
- 11.6.5. Methods for habitat monitoring are detailed in the habitats section above.

⁷ Froglife (1999) *Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Froglife, Halesworth.

⁸ Gent, T and Gibson, S. (2003). *Herpetofauna Workers' Manual*. JNCC, Peterborough.

⁹ Herpetofauna Groups of Britain and Ireland (HGBI). (1998). *Evaluating Local Mitigation / Translocation Programmes: Maintaining Best Practice and Lawful Standards*.

¹⁰ Natural England (2011). Standing Advice for Reptiles.
http://www.naturalengland.org.uk/Images/Reptile%20feb11_tcm6-21712.pdf

11.7. Location of Monitoring

- 11.7.1. Monitoring will take place across the retained and newly created habitats within the site (see Plan ECO3).

11.8. Timing and Duration

- 11.8.1. Monitoring surveys will take place in the first and the third year of development and at the appropriate time of year to comply with the guidelines (see methods and analysis above for further details).
- 11.8.2. The timing and duration of habitat monitoring is detailed in the habitats section above.
- 11.8.3. Hibernacula will be checked annually for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Hibernacula will be replaced if found to be damaged.

11.9. Responsible Persons and Communication

- 11.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.
- 11.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.
- 11.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.
- 11.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.

11.10. Review and Publication of Results

- 11.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).

12. AMPHIBIANS

12.1. Monitoring Objective

- 12.1.1. To ensure that adequate habitat is available to the amphibian populations following the completion of development to enable the species to be maintained at a favourable conservation status.

12.2. Baseline Information

- 12.2.1. No Great Crested Newts *Triturus cristatus* were recorded during earlier survey work in 2015. Additionally, there are no records for Great Crested Newts in the local area. Common Toads *Bufo bufo* and Smooth Newts *Lissotriton vulgaris* were recorded during Great Crested Newt surveys completed in 2014 and 2015.

12.3. Legislation

- 12.3.1. All British amphibian species receive a degree of protection under the Wildlife and Countryside Act 1981 (as amended). The level of protection varies from protection from sale or trade only, as is the case with species such as Smooth Newt and Common Toad, to the more rigorous protection afforded to species such as the Great Crested Newt, which is also protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); included on Schedule 2 of the Conservation of Habitats and Species Regulations 2017.
- 12.3.2. Common Toads are also species of principal importance for the conservation of biodiversity under Section 41 (England) of the NERC Act 2006.
- 12.3.3. The NERC Act 2006 requires the Secretary of State to:
- ... take such steps as appear... to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or... promote the taking by others of such steps.**

12.4. Mitigation and Enhancement Strategy

- 12.4.1. Construction works and pollution of surface water run-off could result in pollution of the ponds, field ditches and water course. To ensure there are no potential negative effects to the quality of the water all operations will be undertaken in accordance with standard guidance provided in the Environmental Agency Guidelines PPG5 Pollution Prevention Guidelines. In addition, the drainage strategy will be designed to ensure that surface water run-off is suitably treated prior to discharge.
- 12.4.2. Works to enhance ponds and ditches will be undertaken outside of the amphibian breeding period from March to June inclusive.
- 12.4.3. No Great Crested Newts have been recorded within the site and a Natural England licence is not necessary to undertake the work.

- 12.4.4. Work to enhance and manage on site ditches, and to establish new wildlife-friendly attenuation features, will provide new aquatic habitats for amphibian species. New grassland habitats to be established within the site will offer new opportunities during the terrestrial phase.
- 12.4.5. The proposed development will include strong green linkages across the site. Within the green infrastructure additional ponds, species rich grassland and woodlands will be created. This will increase the habitats available and increase the potential range by increasing connectivity for amphibians and other species across the site. To increase the biodiversity potential of the ponds they will be designed to incorporate a shallow sloping gradient, marginal shelves, aquatic planting, and seeding of the banks with species rich grassland. The implementation of these habitat enhancements will increase potential diversity of insects using the site and in turn will provide a significant foraging resource for amphibians and many other species such as reptile and mammal species.
- 12.4.6. Additional habitats suitable for use by invertebrate and amphibian species will be provided by creating log piles within the green linkages at the base of hedgerows, and in areas of woodland and grassland. The piles would be established using wood generated through maintenance of trees / woodlands within the site. These structures would benefit amphibians by providing places of shelter and or rest and potential hibernation opportunities along with increasing habitat for invertebrates.
- 12.4.7. Where gaps in existing hedgerows are created as part of the development, dropped kerbs will be installed on either side of the road in that location to aid the movement of wildlife through the site.

12.5. **Appropriate Success Criteria**

- 12.5.1. The condition calls for *“thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged”*.
- 12.5.2. The programme will be judged a success if significant adverse effects on amphibians are avoided throughout the works and the mitigation and enhancement measures proposed are implemented. This will be achieved through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

12.6. **Methods and Analysis**

- 12.6.1. To determine the absence / presence of Great Crested Newts within the ponds, eDNA testing will be undertaken between mid-April and the end of June in 2019 and 2021. Water samples will be taken from ponds in accordance with recognised guidelines.
- 12.6.2. Testing for eDNA is a method to establish absence or presence of Great Crested Newts approved by Natural England. While residing within a waterbody, Great Crested Newts deposit traces of DNA which can be detected through sampling the pond water and analysis within the laboratory. Water samples can be collected between 15 April and 30 June inclusive.

- 12.6.3. Water samples of any given waterbody are taken in 20 separate locations, with a focus towards areas of high suitability for Great Crested Newts. The samples are then pooled together into a self-supporting Whirl-pak Bag. Once the pooled samples have been mixed thoroughly, 15ml of water is removed and transferred into an ethanol filled test tube. This is repeated a further five times leaving six test tubes that contain a mix of the sampled water and ethanol. These are then sent to a laboratory to undergo analysis.
- 12.6.4. Within the laboratory the samples are pooled together and tested via real time PCR (or q-PCR) in order to amplify select parts of the DNA allowing it to be detected and measured. A result of presence or absence is returned by the laboratory. However, if found to be present, no measure of the population size is obtained through this survey method.
- 12.6.5. If presence is confirmed a more detailed survey may be required, to inform the Natural England licensing process. This would typically take the form of bottle trapping, torching and egg searches. These surveys are undertaken between mid-March to mid-June.
- 12.6.6. Methods for habitat monitoring are detailed in the habitats section above.

12.7. Location of Monitoring

- 12.7.1. Monitoring will take place across the retained and newly created habitats within the site (see Plan ECO3).

12.8. Timing and Duration

- 12.8.1. Monitoring surveys will take place in the first and the third year of development and at the appropriate time of year to comply with the guidelines (see methods and analysis above for further details).
- 12.8.2. The timing and duration of habitat monitoring is detailed in the habitats section above.
- 12.8.3. Log piles will be checked periodically for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ. Log piles will be replaced if found to be missing.

12.9. Responsible Persons and Communication

- 12.9.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.
- 12.9.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.
- 12.9.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.
- 12.9.4. A copy of this strategy will be kept in the site office and form part of any site induction.

12.10. Review and Publication of Results

- 12.10.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).

13. INVERTEBRATES

13.1. Monitoring Objective

- 13.1.1. To ensure that invertebrate species that currently utilise the site will continue to be able to do so following completion of development.

13.2. Baseline Information

- 13.2.1. Given the habitats present, it is likely an assemblage of common invertebrate species utilises the site, though the intensive arable management of the majority of the land will limit variety. There is no evidence to suggest that any rare or notable species would currently be present.

13.3. Mitigation and Enhancement Strategy

- 13.3.1. No mitigation measures in respect of invertebrates are required during the construction phase.
- 13.3.2. The provision of new habitats of ecological interest including trees, wildflower grassland and wetland habitats, will offer new and enhanced resources for invertebrates.
- 13.3.3. As a further enhancement, invertebrate nesting aids and log piles, along with bee banks and a bug hotel feature will be established within the green infrastructure of the site. These will provide new opportunities for invertebrates.

13.4. Appropriate Success Criteria

- 13.4.1. The condition calls for *“thresholds, triggers and targets against which the effectiveness of the various conservation measures being monitored can be judged”*.
- 13.4.2. The programme will be judged a success if the enhancement measures proposed are implemented. This will be achieved through the various measures described above and in the Ecological Implementation Strategy prepared under Condition 42.

13.5. Methods and Analysis

- 13.5.1. Methods for habitat monitoring are detailed in the habitats section above.

13.6. Location of Monitoring

- 13.6.1. Monitoring will take place across the retained and newly created habitats within the site (see Plan ECO3).

13.7. Timing and Duration

- 13.7.1. The timing and duration of habitat monitoring is detailed in the habitats section above.

- 13.7.2. Nesting aids, bee banks and the bug hotel will be checked annually for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Nesting aids will be replaced if found to be damaged.

13.8. Responsible Persons and Communication

- 13.8.1. Peter Hadfield, Director of Ecology Solutions, has ultimate responsibility for the implementation of this monitoring strategy.
- 13.8.2. Richard Franks, Senior Engineering Manager at Redrow Homes, is leading for Redrow Homes.
- 13.8.3. Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.
- 13.8.4. A copy of this strategy will be kept in the site office and form part of any site induction.

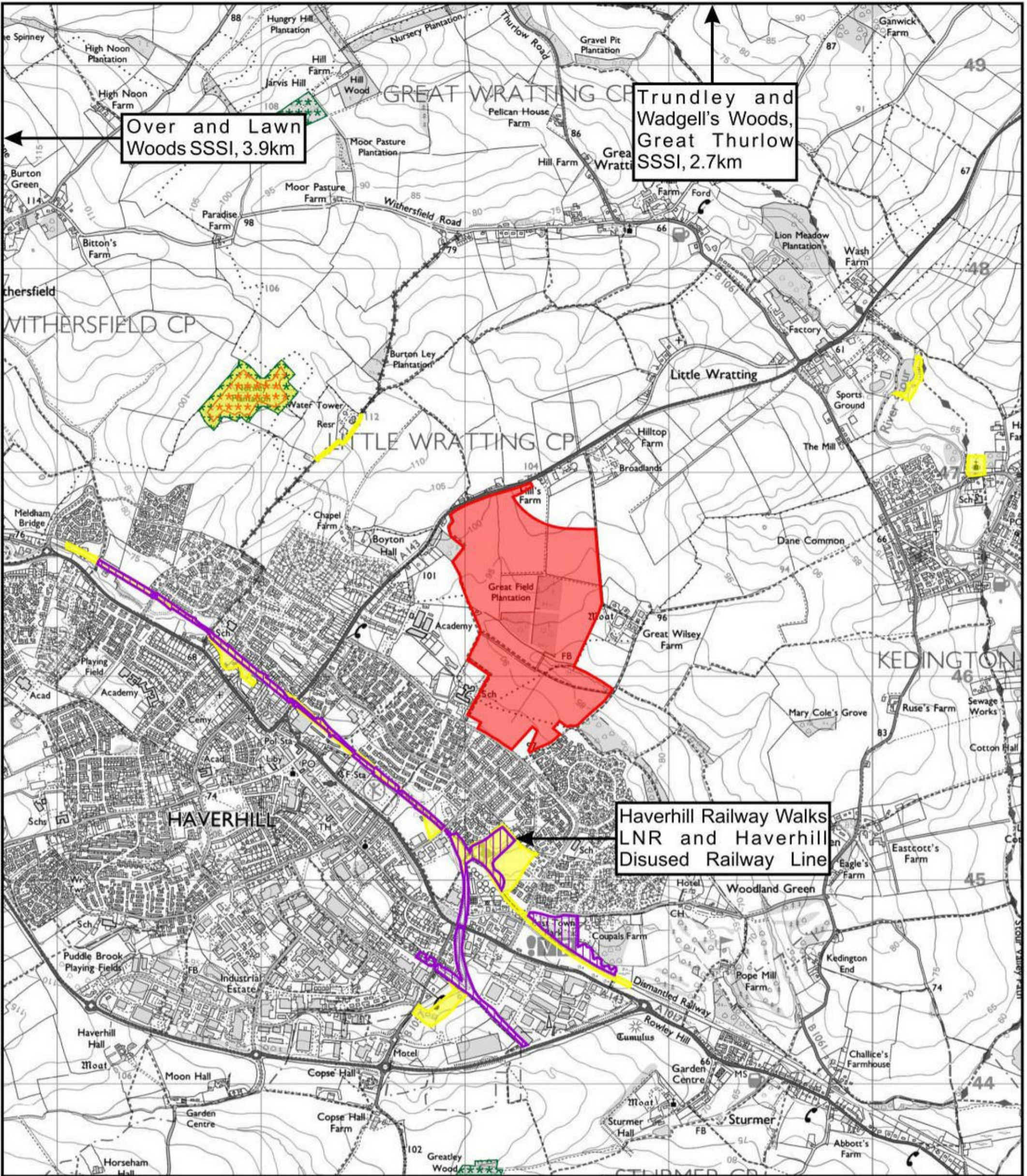
13.9. Review and Publication of Results

- 13.9.1. A review of the effectiveness of the monitoring strategy will be undertaken on completion of the surveys in the first and the third year (2019 and 2021). A report advising the Local Planning Authority of the results and outcomes will be prepared and submitted following completion of the work (October / November).

PLANS

PLAN ECO1

Site Location and Ecological Designations



Over and Lawn Woods SSSI, 3.9km

Trundley and Wadgell's Woods, Great Thurlow SSSI, 2.7km

Haverhill Railway Walks LNR and Haverhill Disused Railway Line

KEY:

-  SITE LOCATION
-  LOCAL NATURE RESERVE (LNR)
-  COUNTY WILDLIFE SITE (CWS)
-  ANCIENT WOODLAND
-  ANCIENT REPLANTED WOODLAND

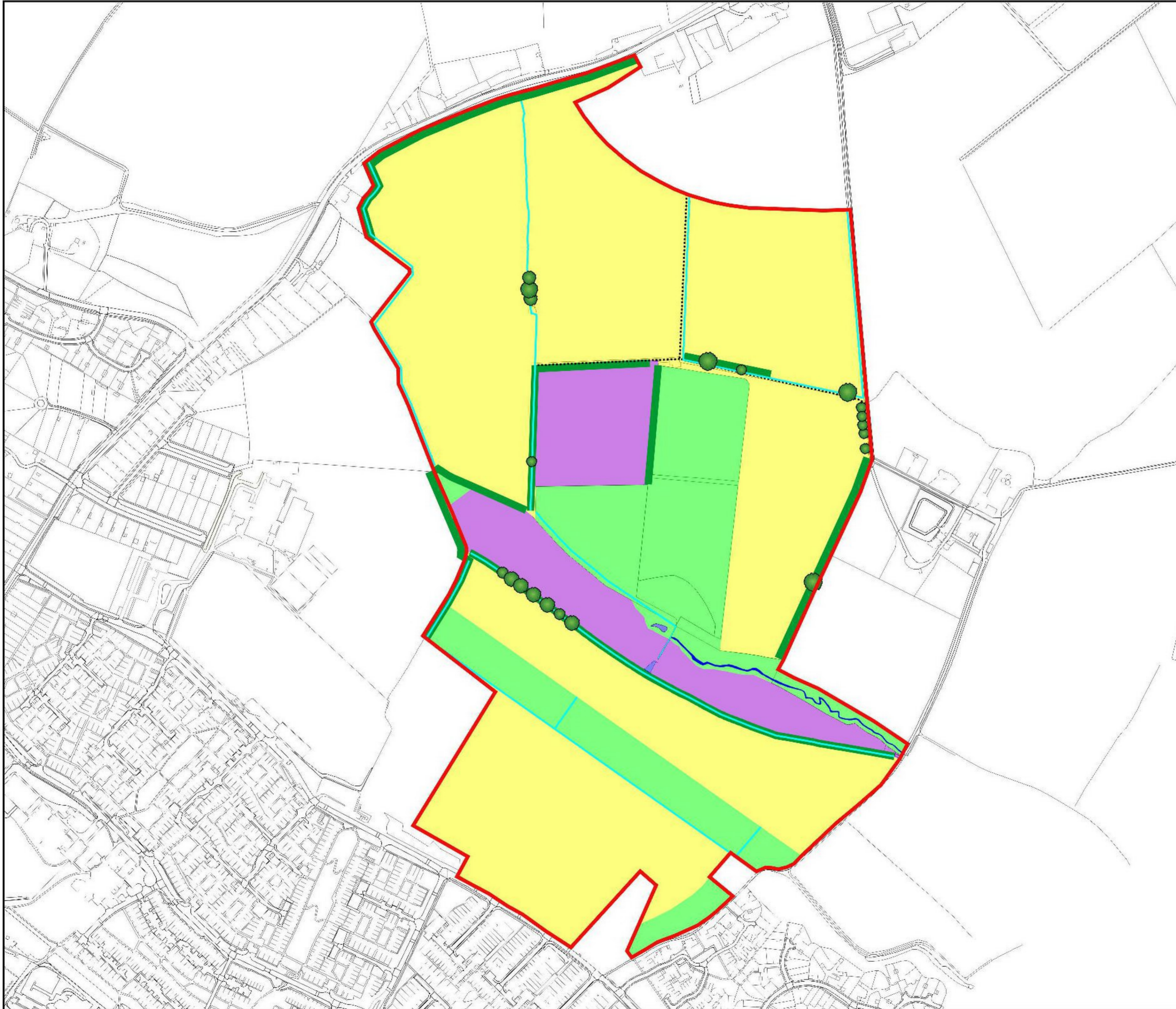


8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO1: SITE LOCATION AND ECOLOGICAL DESIGNATIONS

PLAN ECO2

Ecological Features



KEY:

-  SITE BOUNDARY
-  ARABLE LAND
-  WOODLAND
-  IMPROVED GRASSLAND
-  DITCH
-  STOUR BROOK TRIBUTARY
-  POND
-  HEDGEROW
-  TREE
-  TRACK



8110: GREAT WILSEY PARK,
HAVERHILL

PLAN ECO2:
ECOLOGICAL FEATURES

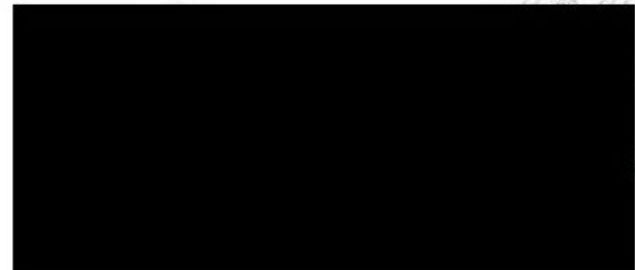
PLAN ECO3

Biodiversity Monitoring Strategy

Based upon the Ordnance Survey map with permission of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Ecology Solutions Ltd, Cokemach Estate, Barkway, Royston, Hertfordshire, SG8 8DL. CEM20130000228

Reptile surveys will be carried out in the areas of suitable habitat across the site in 2019 and 2021

Enhanced and newly created habitats will be monitored to ensure establishment has been successful



Hedgehog hibernation boxes will be checked periodically for the first five years after installation

Bat, dormice and bird boxes will be checked periodically for the first five years after installation

Retained and enhanced as well as newly established grassland will be monitored to ensure that it remains suitable for reptiles and amphibians during their terrestrial phase

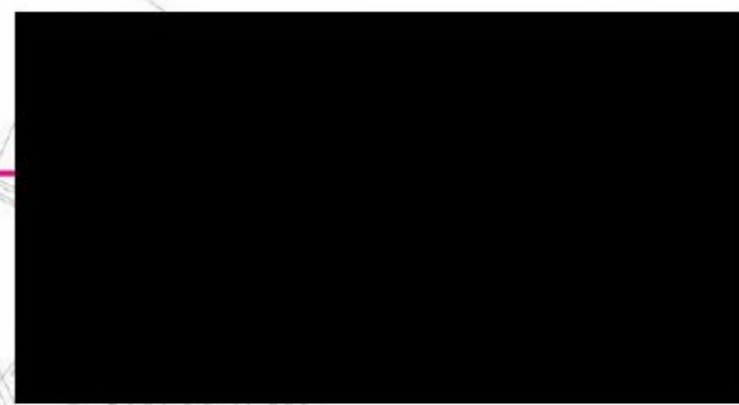
Newly created reptile hibernacula will be checked annually for the first five years after installation

Open trenches will be checked at the beginning of each day, to ensure that no Badgers or Hedgehogs are present, and at the end of each day, to ensure the means of escape remains in place

Nesting and wintering bird surveys will be completed across the site in 2019 and 2021

Bat activity surveys will be completed across the site in 2019 and 2021

Any log piles or other shelter features in areas of woodland and hedgerows will be checked for the presence of Hedgehogs prior to any clearance works



Dormouse nest tube and box surveys will be completed across the site in 2019 and 2021. These will be set out in areas of suitable habitat (i.e. woodland and hedgerows)

Stour Brook tributary and other waterbodies on site will be checked for Otters and Water Voles in 2019 and 2021

eDNA tests of the waterbodies on and adjacent to the site will be carried out in 2019 and 2021 to check for the presence of Great Crested Newts



Based on Exterior Architecture Drawing No. ExA_1868_Illustrative Masterplan



8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO3: BIODIVERSITY MONITORING STRATEGY



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