THE ENVIRONMENT PARTNERSHIP

HARRAS MOOR

WHITEHAVEN

ECOLOGICAL ASSESSMENT

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Executive Summary

1. TEP was commissioned by Homes England to undertake an ecological assessment of a site off Caldbeck Road, Harras Moor, Whitehaven, to inform an outline planning application for residential development.

2. Surveys and assessments have taken place during the period September 2017 to September 2018, including pre-application consultation with Copeland Borough Council and Natural England. All surveys are now complete and this report has been updated based on the findings. The results of these surveys and consultations have influenced the Illustrative Masterplan (A090070-410 003 Rev: A), Parameters Plan (A090070-410 004 Rev B) and the Ecology Mitigation Plan (within the Design and Access Statement).

3. The survey results reported in this document enable a reliable description of the nature conservation interest of the site, and alongside the Ecology Mitigation Plan, enable a robust ecological impact assessment. Drawing 2 shows the Parameters Plan overlaid on the Phase 1 Habitat Survey, and this drawing indicates the areas affected by development and the areas to be retained.

4. The site primarily comprises poor semi-improved grassland fields used for grazing animals, though some are now unmanaged and overgrown. Within these fields are areas of marshy grassland. Bordering many of these areas is mixed plantation woodland of varying ages. Scrub, hedgerows and remnant stone walls are present.

Designated Sites

5. The site is not covered by any nature conservation designations.

6. There are three national and internationally designated sites within 10km:

    - St Bees Head Site of Special Scientific Interest (SSSI) 1.7km Southwest
    - Solway Firth proposed Special Protection Area (pSPA) 1.8km west
    - River Ehen Special Area for Conservation (SAC) and SSSI 5.3km Southeast

7. The site lies within the Impact Risk Zones for these SSSIs, but the nature of the development and the distances involved mean that no adverse direct or indirect effect is predicted from the proposed development.

8. Specifically in relation to the Solway Firth pSPA, winter bird surveys undertaken by TEP in 2017/18 showed that there is no use of the site by SPA-qualifying bird species. Thus the development has no habitat loss implications in terms of the Habitats Regulations. The type of development proposed will not cause any indirect effects to this marine pSPA off the coast of Whitehaven and TEP concludes there is no likely significant effect on the pSPA or its conservation objectives and no requirement for any special measures to prevent adverse effects.

9. There are five locally designated sites within 1km of the site including three County Wildlife Sites (CWS), one Local Geological Site (LGS) and one Site of Invertebrate Significance (SIS). There are significant functional links between the application site and the locally designated sites and the distance between the closest sites (Midgey

Gill and Castle Park Woods CWS) is considered small enough for there to be possible impacts as a result of the proposals. In response, the Ecology Mitigation Plan shows a minimum 15m buffer zone including native planting would be established along the boundary between the proposed development site and Midgey Wood (which is upstream of the CWS).

10. A Construction Environment Management Plan (CEMP) would include measures to minimise risk of emissions, pollution, sediment run-off and encroachment into protective buffer zones, thereby reducing risk of adverse effects on the offsite designated sites.

Ancient Woodland and Priority Habitats

11. Midgey Wood, adjacent to the site, is classified as ancient woodland. It has been somewhat degraded by sycamore colonisation, trampling damage and deer grazing. The Ecology Mitigation Plan confirms Midgey Wood will be appropriately protected with a minimum 15m buffer of new planting and semi-natural vegetation. This is in line with Natural England and Forestry Commission Standing Advice[1]. As it is privately-owned, the long-term management of the woodland is not under the control of Homes England or Copeland Borough Council.

12. A small area of mature woodland within the site is classed as priority habitat (broadleaved woodland) under section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act. The habitat survey and arboricultural assessment found that this block of woodland does not differ significantly in species composition or age structure to the remainder of the plantation woodland on site and Magic Map reports that the confidence in this habitat classification is 'Low'. The woodland contains a number of introduced and non-locally native species such as beech and sycamore and it is not felt that this woodland constitutes Section 41 priority habitat. The Parameters Plan shows that 0.138ha of the S41 woodland habitat would be affected by construction of a roadline to access the eastern part of the site. The balance of the woodland would retained and protected.

13. Hedgerows are also listed as S41 habitats. A hedgerow assessment confirmed that none of the hedgerows qualify as 'Important' under the ecology criteria of the Hedgerow Regulations (1997). Most woodlands within the site are recent plantations which are not S41 status. Approximately 160m of hedgerow would need to be removed to facilitate the proposed residential blocks.

14. Replacement woodland and hedgerow habitat should be established in public open space and ecology mitigation areas during the landscape detailing at the reserved matters stages. To ensure no net loss of biodiversity, and given the time needed to establish a woodland habitat, it is recommended that replacement of S41 and hedges is at a 2:1 ratio. The parameters plan confirms this can be achieved.

15. A detailed grassland survey was undertaken in August 2018. This confirmed that none of the grassland areas qualified as S41 priority habitat, but some areas are particularly diverse and provide a variety of niches for a range of invertebrates and

[1] Ancient Woodland and Veteran Trees: Protecting them from development. https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences

other animals. Species rich grassland areas will be retained or translocated where possible.

Protected and Priority Species

Bats

16. No trees or structures on site have potential for roosting bats. There were several trees within woodland adjacent to site identified as having potential for roosting bats.

17. The Ecology Mitigation Plan confirms that the woodlands on site are to be retained, generally within a buffer zone, other than at two specific points of road access through plantation. The trees that would be affected by the road accesses were assessed by a licenced bat consultant who confirmed no roosts or potential roosting features were present.

18. Since bats are mobile species, and age-ing or weather damage can create roost opportunities in trees, a planning condition can ensure that future reserved matters applications are accompanied by an updated bat survey, as and when any trees are proposed to be affected.

19. Bat transect surveys were undertaken in summer 2018 to determine the foraging use of the habitats on site by bats in order to inform the habitat creation design process and to inform a proposed planning condition for the provision of bat boxes within and adjacent the site's green infrastructure. This activity survey was not required prior to determination of the outline application.

20. This approach to survey and assessment is consistent with Natural England's Standing Advice[2] on dealing with bats in planning applications. As there are no roosts and no long-term impacts on bat commuting corridors, the potential adverse impact is less than "low".

Amphibians

21. Due to the unsuitability of the aquatic habitats on site for breeding great crested newts, and the lack of great crested newt records in the local area (including negative results from a recent adjacent planning application), detailed surveys are not required in respect of great crested newts.[3]

22. Common toad may be present, however on-site habitat creation, including wetland areas, will compensate for loss of habitat for common toad and other amphibians. A Reasonable Avoidance Measures (RAMs) method statement for common amphibians should be produced and followed during site clearance and construction. This can be a matter for planning condition, with the expectation that RAMs are produced for each reserved matters application.

[2] https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects

[3] Consistent with advice on "decide if you need to survey" in Natural England's Standing Advice Great crested newts: surveys and mitigation for development projects. https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects

Birds

23. A winter bird survey has been carried out in 2017 and 2018 and confirms that the site is of less than local winter bird interest. The surveys specifically investigated whether the site might be important for a) birds of prey associated with the Cumbrian fells or b) waterbirds and wintering gulls associated with the Solway Firth pSPA. Single peregrine and kestrel were seen flying over the site on single occasions indicating low interest for birds of prey. No relevant waterbirds were seen on site, indicating no functional link with the pSPA.

24. The site supports flocks of snipe in early winter and a migratory flock of twite in late winter, the latter presumably moving northwards. Retention of areas of marshy grassland and pools in the green infrastructure will retain some habitat of value, but the overall interest will decline.

25. Due to the presence of scrub, woodland and unmanaged grassland/wetland habitats, a breeding bird survey was carried out in 2018. This assessed the extent of use of the site by S41 species and thus informed the design of habitat creation in the site's green infrastructure.

26. Woodland, scrub and rough/marshy grassland habitats provide nesting opportunities for breeding birds. The parameters plan shows only a negligible loss of woodland. There will be a loss of marshy grassland and scrub with the potential impact of loss of breeding sites for S41 birds of marsh and grassland, the extent of which will be revealed during the breeding bird surveys.

27. Any vegetation clearance and demolition works should avoid the nesting bird season (March to August inclusive). If works cannot avoid the nesting season, a nesting bird check will be required immediately prior to the removal of any nesting bird habitat (no more than 24 hours in advance).

28. This approach to survey and mitigation is in line with Natural England's Standing Advice[4].

Water voles and otters

29. Water vole field signs were found in marshy grassland and some ditchsides. Feeding remains, droppings, terrestrial nests and burrows were observed during field surveys in October 2017 and April 2018. An incidental sighting of a water vole was made by a surveyor during one of the reptile survey visits. However a water vole survey of the watercourses in Midgey Wood in spring 2018 did not find vole signs and suggests these watercourses do not provide suitable habitat.

30. Because of the unusual distribution of the vole fieldsigns (being almost totally terrestrial), droppings were collected in April 2018 and sent for eDNA analysis at Warwick University to confirm if they were of water vole. However, the results of the analysis were inconclusive, so additional survey visits were conducted in June and August. No conclusive signs of water vole was found during either survey visit.

[4] Wild Birds: Surveys and mitigation for development projects. https://www.gov.uk/guidance/wild-birds-surveys-and-mitigation-for-development-projects

31. Despite not finding conclusive signs in summer 2018, due to the number of signs found earlier in the year a vole conservation scheme will be required under planning condition to move voles from development footprints into favourable retained habitat.

32. This is likely to include a combination of displacement, trapping and translocation and will require a Natural England licence, as the species is protected under the Wildlife and Countryside Act, 1981.

33. This approach to survey and assessment is consistent with Natural England's Standing Advice on dealing with water voles[5], insofar as it can be because the Standing Advice is targeted at managing aquatic populations.

34. The scheme will require a Natural England licence in respect of water voles. Since the species is using terrestrial areas of the site and there would be no adverse effect on any watercourses (the ditches at TN18 are shown as retained), it is likely that a "trap and translocate" method of conservation will be needed, to move voles from development footprints to permanent green infrastructure. This approach is used in Scotland where the species occurs in urban areas. Advice will be sought from Natural England and surveys will continue to monitor the presence and distribution of voles.

35. There was no evidence of otter on site.

Badgers

36. No evidence of badger activity was recorded on site. The woodlands on site would provide appropriate habitat for foraging, commuting and sett building. A planning condition can require that a pre-commencement badger survey is carried out to determine whether badgers have established in the intervening period between this survey and any work taking place on site.

Other mammals

37. In respect of brown hare and hedgehogs (S41 priority species), boundary and corridor habitats would be maintained to provide some foraging and commuting habitats. It is expected that the site's value to brown hares would decline and its interest to hedgehogs can be maintained. A Reasonable Avoidance Measures (RAMs) method statement can be implemented, through planning condition, to set out measures to limit potential construction-phase impacts on these species.

38. The retention of the network of woodland across the site (apart from where crossings are required) will avoid significant adverse impacts on red squirrel. A pre-commencement inspection of any trees that will be removed during the works is required to assess for the presence of any squirrel dreys.

Reptiles

39. Reptile surveys were carried out in spring 2018 to determine the population that will require mitigation, if present. No reptiles were recorded during seven survey visits. Significant impacts on reptiles are therefore unlikely, but will be avoided though

[5] Water voles: surveys and mitigation for development projects https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences

retention of suitable habitats within the masterplan, creation of new habitats on site and adherence to a RAMs method statement during clearance and construction.

Invasive Species

40. Several invasive plant species listed on schedule 9 of the Wildlife and Countryside Act were identified on site. The species include Himalayan balsam, montbretia, and a cotoneaster species. It is an offence to allow these species to spread, therefore the CEMP would include eradication and control measures.

Ecological Networks

41. The "core areas"[6] of the local ecological network are offsite: i.e. Midgey Wood and adjoining County Wildlife Sites. The S41 woodland and the north-south plantation linked to Midgey Wood can be considered as "stepping-stone corridors" which link Midgey wood to open countryside to the north-east. The parameters plan and Ecology Mitigation Plan show these corridors would be retained together with a buffer zone of open habitats alongside the woodland edge.

Biodiversity Enhancement and Management

42. Recommendations for biodiversity enhancement in line with the NPPF are included, including enhancing the ecological network across the site, advice on habitats to be included in the green infrastructure and features to be included in the built development. These can be secured through planning conditions requiring:

- development to accord with parameters plan and Ecology Mitigation Plan;
- agreement of detailed designs for green infrastructure; and,
- Landscape and Habitat Management Plan(s) for the public open space and ecological areas.

Consultations

43. During the preparation of the planning application, Copeland Council and Natural England were consulted on the principle of an outline application with a Ecology Mitigation Plan. Natural England advised that there should be consideration of impacts on the Solway Firth pSPA and that, in respect of surveys and assessments, these should comply with relevant Standing Advice issued by Natural England. The assessment has followed this advice.

Compliance with legislation

44. The scheme would not have any significant effect on the Solway Firth pSPA, nor on any other nationally or internationally designated site.

45. The scheme would not result in any damage or disturbance to European Protected Species, and no licence is required in respect of bats or great crested newts.

46. The scheme will require a Natural England licence in respect of water voles occupying terrestrial areas of the site.

[6] "Core areas" and stepping-stones" are components of ecological networks as defined in s2.12 of "Natural Choice: securing the value of nature" https://www.gov.uk/government/publications/the-natural-choice-securing-the-value-of-nature

47. There is no current evidence of need for any other protected species licence e.g. in respect of badgers and red squirrels, and a programme of ongoing ecological survey can be implemented under planning conditions, to ensure that future reserved matters applications are accompanied by contemporary ecological information.

48. Nesting birds enjoy general protection which can be ensured by a precautionary planning condition preventing vegetation clearance in the bird breeding season.

49. There are no important hedgerows, as defined by the ecological criteria of the Hedgerow Regulations, 1997.

50. The spread of invasive species during construction activities would be controlled through imposition of a planning condition requiring an invasive species survey and management plan to be drawn up for each reserved matters application.

Compliance with policy

51. The scheme has been designed in line with the mitigation hierarchy and protection and enhancement measures set out in NPPF paragraph 118 and Copeland Policies ST1 (section Biii and ci); ENV3; DM25 and DM28. The Ecology Mitigation Plan demonstrates avoidance of better quality habitats and the components of the ecological network of the area.

52. Local Wildlife Sites would not be directly affected, and the possibility of adverse indirect effects can be removed through implementation of a Construction Environment Management Plan (CEMP) to control emissions and disturbance, and through the provision of green infrastructure and long-term habitat management.

53. Neighbouring ancient woodland and S41 habitats on site would be protected and incorporated into the scheme's design. Where hedgerow is removed, its loss can be compensated through provision of replacement hedges and woodland in the site's green infrastructure.

54. The loss of marshy grassland would result in loss of habitat for some S41 species e.g. water vole, common toad and breeding birds. This loss can be compensated by habitat creation and management. In respect of common toads and water voles, loss can be fully compensated. In respect of birds, the retention and protection of woodland, and the creation of new areas of habitat will enhance the site for many species.

2.0 INTRODUCTION

2.1 TEP was commissioned by Homes England to undertake an ecological assessment of a site off Caldbeck Road, Harras Moor. The purpose is to report on ecological constraints and opportunities that may influence the planning and design of future residential development of the site. A Parameters Plan and an Illustrative Masterplan form part of the planning application (WYG drawings A090070-410 - 003A and 004B respectively).

2.2 This assessment is to accompany an outline planning application and conforms with CIEEM guidance on Ecological Impact Assessment (EcIA).

2.3 The report has the following objectives:

- Give an overview of habitats present on site and describe existing vegetation;
- Identify features of conservation value, such as species or habitats which are legally protected or of biodiversity importance; and
- Advise on the need for further surveys or mitigation requirements that might be needed prior to proposed works.

2.4 The location of the application site is shown in Figure 1, and the approximate central grid reference is NX986180. The site does not contain any buildings.

Figure 1. Site Location. Contains Ordnance Survey data © Crown copyright and database right 2017

3.0 METHODS

Desk Study

3.1 A desk study was undertaken by reviewing online sources and records obtained from the local record centre (Table 1). A data search of 1km was generally applied within the desktop study, with an additional buffer of 5km applied to international/national designated sites. The desk study is reported at Appendix A.

Table 1. Ecological Information and Consultations

SOURCE	NATURE OF INFORMATION
MAGIC Map: Multi-Agency Geographic Information for the Countryside	Maps showing legally protected areas, designated sites and priority habitats
Where's the Path?	Satellite & OS imagery
Google Maps	Satellite imagery
Cumbria Biodiversity Data Centre (CBDC)	Designated sites and protected species records
Copeland Borough Council	Ecological Information associated with recent planning applications (St Benedicts School 4/16/9014/0F2 and housing at Harras Moor 4/16/2415/0O1)

Consultations

3.2 During the preparation of the planning application, Copeland Borough Council and Natural England were consulted on the principle of an outline application with an Ecology Mitigation Plan. Natural England advised that there should be consideration of impacts on the Solway Firth pSPA and that, in respect of surveys and assessments, these should comply with relevant Standing Advice issued by Natural England. The assessment has followed this advice

Extended Phase 1 Habitat Survey

Habitat survey

3.3 An Extended Phase 1 habitat survey was undertaken by Senior Ecologist Ian Holland BSc, MSc, ACIEEM (BSBI Field Identification Skills (FISC) Level 3) and ecologist Phil Askew BSc (FISC level 3) on 28th September 2017. Further detailed botanical assessment was carried out by Lynsey Crellin (FISC Level 5) in November 2017. The surveys were carried out using the assessment methods set out in JNCC (2010) and the Guidelines for Preliminary Ecological Appraisal (CIEEM, 2013) in accordance with British Standard (BS) 42020. Habitat types and any incidental evidence of protected or invasive species were noted.

3.4 The Phase 1 Habitat Survey is illustrated at Drawing 1 and target notes are at Appendix B.

National Vegetation Classification (NVC) Survey

3.5 The woodland NVC survey was undertaken in April 2018 by Lynsey Crellin. Each target area was walked-over and an initial provisional assessment made of the boundaries of different vegetation types (as defined by the NVC system (Rodwell, 1991-2000).

3.6 Within each boundary, the vegetation was sampled using quadrats according to JNCC National Vegetation Classification Field Guide to Woodland (4m x 4m quadrats for woodland ground flora and understorey). Each quadrat was recorded in the field by listing all plants within it along with the abundance of each species and the percentage cover of any bare ground or leaf litter. Sufficient quadrats were recorded so as to include all community types occurring on the site and to allow a robust statistical analysis of the data.

3.7 A search was also made for any nationally or locally notable plant species (protected species or those listed in UK or local BAPs). The quadrat data was analysed using TABLEFIT to identify the relevant NVC vegetation community/ies present onsite. Any other habitats of potential biodiversity interest was also noted.

3.8 The NVC survey is reported at Appendix C.

Hedgerow Assessment

3.9 A hedgerow assessment was undertaken by Lynsey Crellin on 17th April 2018 in order to determine whether the hedgerows to be impacted by development qualify as 'Important' under the Hedgerow Regulations Act. The survey also determined any important ground flora that will require translocation/re-instatement.

3.10 The native hedgerows on site were subject to a detailed sampling survey in accordance with the criteria set out in the Hedgerow Regulations (1997) in terms of wildlife and landscape criteria for determining "important" hedgerows. This entailed recording the number of woody species (as listed on Schedule 3 of the Hedgerow Regulations) within 30m sample sections as well as any features within 2m associated with each hedge. These features include the presence of any bank or wall, ditch, standard trees and ground flora species (as listed on Schedule 2 of the Hedgerow Regulations). Also, the number of connections with adjacent hedgerows was recorded. Hedgerow target notes were made on standard data recording forms, this including a description of the hedge and detailed plant species list for each hedgerow. The results are reported at Appendix C.

Protected Species

3.11 During the habitat survey, the site was assessed for its potential to support protected species, including badger, red squirrel and brown hare.

Bat Assessment of Trees

3.12 A daytime scoping assessment was undertaken on 28th September 2017 by licensed bat ecologist Phil Askew (Licence Ref: 2016-26978-CLS-CLS) in accordance with the 2016 Bat Conservation Trust (BCT) guidance (Collins, 2016).

3.13 There are no buildings or structures within the site. The trees within the red line boundary were inspected for any evidence of use by bats and classified according to the suitability for roosting bats in line with the criteria set out at Table 2. The surrounding habitat was also assessed for its potential to support foraging and commuting bats.

Table 2. Categorisation of tree roost suitability (from Table 4.1 of BCT Guidelines 2016)

Roosting Habitats	Commuting/ Foraging Habitats
Negligible Suitability	
Negligible potential roost features are present that are likely to be used by bats	Negligible features on site likely to be used by commuting or foraging bats. A general lack of linear features and low habitat, structural or floristic diversity.
Low Suitability	
A structure or tree with one or more potential roost features that could be used by individual bats opportunistically, but which do not offer sufficient space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats.	Habitat that could be used by small numbers of commuting bats (e.g. a gappy hedgerow or an un-vegetated stream) or foraging bats (e.g. a lone tree or small patch of scrub) but which is isolated from the surrounding countryside.
Moderate Suitability	
A structure or tree with one or more potential roost features that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat, but which is unlikely to support a roost of high conservation status (maternity or hibernation).	Continuous habitat connected to the wider landscape that could be used by bats for commuting (e.g. lines of trees or scrub or linked back gardens), or foraging bats (e.g. trees, scrub, water, grassland).
High Suitability	
A structure or tree possessing one or more potential roost features that are suitable for use by larger numbers of bats on a regular basis and potentially for longer periods of time, due to their size, shelter, protection, conditions and surrounding habitat.	Continuous high quality habitat that is strongly connected with the wider landscape that is likely to be used regularly by commuting bats (e.g. river valley, vegetated stream, woodland edge, hedgerows with trees) or foraging bats (e.g. broadleaved woodland, grazed parkland, tree-lined watercourses or ponds).

Bat Activity Surveys

3.14 Bat transect and static detector surveys were conducted on 18th June, 16th July and 13th August 2018. The site was covered by one transect route (Drawing G5810.66.004). The transect route was devised to cover the whole working area, incorporating a variety of habitats suitable for bat foraging, commuting and dispersal.

3.15 A pair of surveyors walked the route using heterodyne (Pettersson D230) and frequency division (Anabat) detectors. The surveys commenced before sunset and continued for at least 120 minutes after sunset. Number of bat passes, species, and behaviour and flight direction were noted at each pre-determined four-minute stop and the intervening walks.

3.16 The static detector locations are shown in Drawing G5810.66.004. These locations were chosen as the features monitored (e.g. woodland edge and hedgerow) are considered valuable foraging/commuting habitat for bats and are likely to be impacted by the proposals.

3.17 The statics were left for a minimum of five nights during favourable weather conditions to monitor bat activity in accordance with the Bat Conservation Trust (BCT) Guidance (Collins, 2016[7]).

Great Crested Newts (GCN) and other Amphibians

3.18 The waterbodies on site are shallow and ephemeral so are unsuitable for breeding of newts, but will support common toads (S41 species) and other amphibians. Due to a lack of suitable breeding habitat on site and an absence of records (including in adjacent planning applications mentioned in Table 1), the need for GCN surveys was scoped out. The Ecology Mitigation Plan indicates how aquatic and woodland habitats of value to S41 and other amphibians will be retained and enhanced.

Winter Bird Survey

3.19 The winter bird survey comprised five visits across the months of November 2017 to March 2018. October to March forms the winter period where species of potential interest for this site are likely to be present in the area.

3.20 During each survey visit a transect route was walked throughout the proposed development site and surrounding area (up to 500m from site boundary). The transect surveys lasted for between four and six hours. The winter bird survey is at Appendix D.

Breeding Bird Survey

3.21 Breeding bird surveys were undertaken in April, May and June 2018. The survey was carried out applying methods based on the standard breeding bird survey and common bird census methods developed by the British Trust for Ornithology (BTO).

[7] Collins, J. (ed.) (2016) Bat surveys for professional ecologists: Good Practice Guidelines (3rd edn). Bat Conservation Trust.

3.22 Three survey visits were carried out in the morning period, starting at least half an hour after dawn. Each survey visit was carried out approximately 4 weeks apart, over the period April to June. Bird species and activity patterns were recorded and mapped using standard BTO symbology. The three survey visits were undertaken using pre-determined survey routes to cover the entire site and land within 100m of the site.

Water Vole and Otter Surveys

3.23 The Water Vole Mitigation Handbook (Dean et al, 2016), recommends that two survey visits be undertaken over a season, to support planning applications or to inform construction activities.

3.24 Vole field signs (droppings and feeding remains) were noted in a marshy grassland area during the November 2017 habitat survey. Feeding remains, droppings, terrestrial nests and burrows were observed during field surveys in October 2017 and on 17th and 18th April 2018. An incidental sighting of a water vole was made by a surveyor during one of the reptile survey visits. Additional survey visits were made on 6th June and 2nd August 2018 to maintain the overall survey evidence base in readiness for future licence applications and negotiations with Natural England.

3.25 As the November 2017 and April 2018 surveys did not reveal evidence of water voles in watercourses, and the fieldsigns were detected only in terrestrial areas, which is unusual for water voles in England, a sample of droppings was sent to Warwick University for eDNA analysis to confirm whether the species *Arvicola amphibius* is definitely present or whether the fieldsigns were of other rodent species. The results were inconclusive, and the lab suggested the sample had been degraded.

3.26 During the water vole survey of April 2018, the surveyor also inspected for signs of otter e.g. spraints, holts. No signs of otter were found.

Reptile Surveys

3.27 There are records of common lizard and slow worm in the local area and the site holds suitable habitat (unmanaged grassland, wetland areas, trees, scrub and walls) for reptiles. Given this, reptile surveys were carried out on site. Surveys should be undertaken between April and mid-June and/or in September. Seven survey visits were conducted between 18th and 8th May 2018. Reptile surveys are typically undertaken in sunny or partially cloudy conditions with temperatures between 10 and 20^{o}C. Surveys are weather dependent and any extended periods of hot/dry weather and strong wind or heavy rain may mean surveys have to be re-scheduled or postponed.

3.28 A mix of survey methods were used which included direct observation, checking of existing refuges e.g. wood/rubble piles and use of Artificial Cover Objects (ACOs).

3.29 Initially, eight visits are necessary, the first to set up the ACO's and allow these to bed in for a week prior to the first of seven survey visits being carried out. The ACO's are a mix of corrugated metal sheets and roofing felt approximately 0.5m x 0.5m. Depending on presence/absence of reptiles on site and the results of the population survey (first seven visits) up to 20 survey visits (in total) may be required. See Drawing 4 for reptile tin locations.

Grassland Surveys

3.30 As previous habitat surveys had not been undertaken within the optimum grassland survey period (Mid-late summer), a dedicated grassland survey was undertaken on 2nd August 2018. This focussed on species rich parcels of grassland across the site. Currently, these areas of grassland form a valuable habitat mosaic with the network of woodland, and detailed survey highlighted the more diverse areas which should be protected or translocated to retain the biodiversity interest of the site.

3.31 The survey was undertaken by experienced botanist, Principal Ecologist Lynsey Crellin (FISC Level 5). Within each grassland area, or parcel, the vegetation was sampled using quadrats for grassland of the recommended size (2m x 2m) according to standard NVC methodology (Rodwell, 2006). Each quadrat was recorded in the field by listing all plants within it along with the abundance of each species and the percentage cover of any bare ground or leaf litter using the Domin scale of abundance. Sufficient quadrats were recorded so as to include all community types occurring within each surveyed area and to allow a robust statistical analysis of the data using Tablefit.

Limitations

3.32 The initial phase 1 habitat survey took place towards the end of the suitable Phase 1 classification period, therefore some plants within the site had died back and no longer had identifiable features. The repeat visit in April 2018 was able to address these limitations.

4.0 RESULTS

Desk Study

4.1 A summary of the desk study is outlined below. Full results, including maps of designated sites can be found in Appendix A.

Designated Sites

4.2 There are no statutory designated sites within 1km of the application site, however national and internationally designated sites are located within 10km:

- St Bees Head Site of Special Scientific Interest (SSSI) 1.7km Southwest;
- Solway Firth proposed Special Protection Area (pSPA) 1.8km west; and,
- River Ehen Special Area for Conservation (SAC) and SSSI 5.3km Southeast.

4.3 The site lies within the Impact Risk Zones for these SSSIs, but the nature of the development and the distances involved mean that no adverse direct or indirect effect is predicted from the proposed development.

4.4 In relation to the Solway Firth proposed SPA, winter bird surveys (reported below) targeted "qualifying species" to assess whether there was any possibility of such species using the site for foraging or roosting. The survey concluded there is no functional link between the proposed development and the pSPA, and hence no possibility of a direct adverse effect due to habitat losses.

4.5 As the pSPA is an extensive marine site, and given the intervening distance there is no possibility of an adverse indirect effect on the pSPA arising from emissions or from recreational disturbance.

4.6 In relation to the River Ehen SAC, the intervening distance and the lack of any "pathway" for adverse effect on the SAC means there is no possibility of a direct or indirect adverse effect on the qualifying features or conservation objectives.

4.7 The development may therefore be screened out of Habitats Regulation Assessment.

4.8 There are five locally designated sites within 1km of the application site, which are:

- Midgey Gill County Wildlife Site (CWS) lies 50m southwest of the site boundary. This site however is 200m from the development boundary;
- Castle Park Woodland CWS lies 130m west of the site;
- Hope Mission Pond CWS lies 700m north east of the site;
- Priestgill Wood Site of Invertebrate Significance lies 650m east of the site;
- Snebra Hill Local Geological site lies 790m south of the site.

Ancient Woodland

4.9 The adjacent Midgey Wood is designated as Ancient Woodland.

Priority Habitats[8]

4.10 Magic Map indicates there are Priority Habitats within and adjacent to the application site: deciduous woodland and hedgerows. However, the deciduous woodland is recorded with "low confidence" on Magic Map, requiring further ground-truthing.

Relevant Planning Policies and Guidance

4.11 The majority of the application site was allocated for residential development under the previous Copeland Borough Council Local Plan (2006). Relevant planning policies within the extant Copeland Local Plan Core Strategy (2013 - 2018) are considered to be:

- SS5 (Provision of Open and Space and Green Infrastructure);
- ENV3 (Biodiversity and Geodiversity), and;
- DM10 (Achieving Quality of Place).

4.12 The scheme has been designed in line with the mitigation hierarchy and protection and enhancement measures set out in the NPPF, paragraph 118.

Notable Species Records

4.13 There are numerous records of notable species within 1km of the site, which are described under the subheadings below. The records are summarised below and are from the last 10 years only. For a full list of records see Appendix A. Species include those listed under any of the following:

- European Protected Species (EPS);
- Schedule 5 of the Wildlife and Countryside Act 1981, as amended (WCA5);
- Species of principal importance under Section 41 of the Natural Environment and Communities Act 2006 (S41);
- Local Biodiversity Action Plan (LBAP); and
- Red and Amber listed Birds of Conservation Concern (BoCC) (BRd/BAm).

Amphibians

4.14 There are records of common frog *Rana temporaria* and common toad *Bufo bufo* within 1km of the site (although all older than 10 years). There are no records for GCN, including on adjoining planning applications. The waterbodies on site are unsuitable for breeding of newts, but will support common toads (S41 species) and other amphibians. Desktop study included an appraisal of a recent planning approval on adjacent land (Copeland BC ref4/16/2416/0O1 and 4/16/2415/0O1)) which included a great crested newt survey of one of the waterbodies and concluded no GCN were present. The other four off-site waterbodies are understood to be relatively recently created on Whitehaven Golf Course, for which no permission to access was given. One common toad was recorded during the reptile surveys.

[8] Habitats of principal importance for conservation of biodiversity in England, protected under S41 of the Natural Environments and Rural Communities Act, 2006

Birds

4.15 The possibility of an important winter bird and raptor site being present inland of the proposed development site was raised informally by the Council, although no reference of such a site could be found through consulting desktop sources. There are a number of Section 41 (S41) bird species and Birds of Conservation Concern located within 1km of the site. These include:

- Cuckoo *Cuculus canorus;*
- Lapwing *Vanellus vanellus;*
- Curlew *Numenius arquata;*
- Grey Partridge *Perdix perdix;*
- Grasshopper warbler *Locustella naevia;*
- Skylark *Alauda arvensis;*
- Spotted flycatcher *Muscicapa striata;*
- Tree sparrow *Passer montanus;*
- House Sparrow *Passer domesticus;*
- Lesser redpoll *Acanthis cabaret;*
- Reed bunting *Emberiza schoeniclus.*

Terrestrial Mammals

4.16 There are several records of the following mammals within 2km of the application site:

- Otter *Lutra lutra* (S41, WCA5);
- Common pipistrelle *Pipistrellus pipistrellus* (WCA5 & EPS);
- Hedgehog *Erinaceus europaeus* (S41);
- Eurasian red squirrel *Sciurus vulgaris* (S41).

4.17 As several species of bats were recorded within 1km, it is likely that these species are roosting within this radius. The application site lies within the Core Sustenance Zones (CSZ) for these bat species. A CSZ is defined as "the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost" (Collins, 2016).

Reptiles

4.18 There are recent records of common lizard *Zootoca viviparus* and slow worm *Anguis fragilis* approximately 800m west of the site.

Extended Phase 1 Habitat Survey

4.19 The site is located on the edge of the town of Whitehaven. There is a golf course to the east with residential or commercial properties on all other sides. Brief descriptions of the key species and relative importance of the habitats on site are set out below and illustrated in Drawing 1. Appendix B contains detailed habitat survey results.

Habitats and Flora

4.20 The following habitats are present within or immediately adjoining the site:

- Semi-natural woodland
- Plantation woodland
- Scattered broad leaved trees
- Scattered scrub;
- Dense/continuous scrub;
- Semi-improved grassland;
- Modified neutral grassland;
- Marshy grassland;
- Continuous bracken;
- Tall ruderal herb;
- Standing water;
- Walls;
- Wet/dry ditches; and
- Hardstanding.

Broadleaved semi-natural woodland

4.21 Midgey Wood is a block of broadleaved semi-natural woodland adjacent to the western boundary of the site. This is designated as Ancient Woodland. A woodland National Vegetation Classification (NVC) survey was carried out in April 2018 and is reported in Appendix C. This survey noted a number of ancient woodland indicator ground flora species, including native bluebell *Hyacinthoides non-scripta* and opposite-leaved golden saxifrage *Chrysosplenium oppositifolium*. The canopy is dominated by sycamore *Acer pseudoplatanus* with English oak *Quercus robur*.

Plantation woodland

4.22 Many of the fields have bands of mixed plantation woodland along their boundaries which act as shelter belts. Collectively, these woodlands form a valuable habitat network across the site and help link Midgey Wood to the wider landscape to the east. Species noted in this woodland include crack willow *Salix fragilis*, Pine species *Pinus* sp., hawthorn *Crataegus monogyna*, rowan *Sorbus aucuparia*, English oak *Quercus robur*, holly *Ilex aquifolium*, ash *Fraxinus excelsior*, hazel *Corylus avellana*, silver birch *Betula pendula* and sycamore *Acer pseudoplatanus*.

4.23 The habitat survey and arboricultural assessment found that the block of woodland shown as S41 priority woodland on Magic Map does not differ significantly in species composition to the remainder of the plantation woodland on site. It is thus considered that it is not S41 woodland.

Scattered broadleaved trees

4.24 Self-seeded young scattered trees are found in areas of unmanaged grassland, for example at TN17 and 18. The species found here are predominantly alder *Alnus glutinosa*, and willow *Salix* sp.

Scrub

4.25 Areas of dense scrub are found adjacent to the turning circle at the end of Caldbeck Road, around the margins of the former playing fields at TN14, and in the area of unmanaged marshy grassland at TN21. Scattered scrub is found across the site in unmanaged areas of grassland, for example at TN17, 20 and 22. The scrub is dominated by bramble *Rubus fruticosus* agg., but blackthorn *Prunus spinosa*, hawthorn, and willow species *Salix* sp. are also found frequently.

Semi-improved grassland

4.26 The majority of the site is comprised of semi-improved grassland (SI), much of which is species-poor and heavily grazed by horses or sheep. These areas tend to be dominated by perennial ryegrass *Lolium perenne*, with a few other species including Yorkshire fog *Holcus lanatus*, Soft rush *Juncus effusus* and creeping buttercup *Ranunculus repens*.

4.27 The field at TN8 slopes downwards to the west, and becomes more marshy towards the boundary at the bottom of the slope. It also becomes more diverse, with additional species such as oval sedge *Carex leporina*, crested dog's tail *Cynosurus cristatus* and blinks *Montia fontana*.

4.28 A detailed grassland NVC survey was conducted in August 2018 and detailed results are reported at Appendix F. The survey found that although some areas were particularly diverse, the match to recognised NVC communities was low.

Modified neutral grassland[9]

4.29 A small area in the centre of site (TN2) and a former playing field in the east (TN14) are composed of species poor modified neutral grassland. These areas appear to be unmanaged and are not currently grazed.

4.30 TN2 is open to the public and is evidently well used by dog walkers. It is dominated by a few coarse grass species (cock's foot *Dactylis glomerata* and false-oat grass *Arrhenatherum elatius)*, with some common forb species, such as creeping buttercup, creeping thistle *Cirsium arvense* and broadleaved dock *Rumex obtusifolius*.

4.31 TN14 is a former playing field which has fallen into disuse and is becoming encroached by scrub and tall ruderal herb around the margins. The ground is quite marshy and soft rush has colonised much of the field. The margins are more diverse than the centre and a species of orchid was noted here.

4.32 A detailed grassland NVC survey was conducted in August 2018 and detailed results are reported at Appendix F. The survey found that although some areas were particularly diverse, the match to recognised NVC communities was low.

[9] The neutral grassland categories detailed within the Phase 1 Habitat Survey Handbook are concentrated on grassland associated with rural situations (pastures and meadows), as such it was agreed with JNCC in 2005 (P. Gateley, pers. comm.) that neutral grassland habitats that don't easily fit within these categories, usually within urban or industrial areas, can be referred to as modified neutral grassland –

'Modified neutral grassland is not derived from agricultural grassland and the terms semi-improved and improved do not apply. Some modified neutral grassland may be species-rich but many swards are dense, coarse and species-poor. Modified neutral grassland naturally regenerates on disturbed ground and is unmanaged. It most commonly occurs in urban areas and on post-industrial land'.

Marshy grassland

4.33 The land generally is very wet, and areas of marshy grassland dominated by soft rush are found frequently across the site. Tufted hair grass *Deschampsia caespitosa* is also common in these areas. These areas of grassland are most diverse where they are not grazed. Species recorded in the less disturbed areas (TN7, 15, 17, 18, 20, 24) include orchid species, hard rush *Juncus inflexus*, compact rush *Juncus conglomeratus*, hemp agrimony *Agrimonia eupatoria*, wild angelica *Angelica sylvestris*, knapweed *Centaurea nigra* and sedge species *Carex* sp.

4.34 The band of marshy grassland at TN21, which separates a horse-grazed field from the existing housing estate is heavily used by dog walkers and contains a number of ornamental species, which are likely to have either been fly-tipped or escaped from adjacent gardens. Despite the heavily disturbed nature and relatively small size of this habitat, it supports a surprisingly diverse flora, including orchid species, and occasional clumps of heather, which are a possible relict from when the land was a heath. Although diverse, the habitat does not constitute Section 41 Priority habitat.

4.35 A small unmanaged area at TN20 is a mosaic of marshy grassland, swamp, tall ruderal herb and modified neutral grassland, with scattered trees and scrub. Tufted hair-grass *Deschampsia caespitosa*, great willowherb *Epilobium hirsutum* and soft rush were frequent here, with occasional reed canary-grass *Phalaris arundinacea*. Introduced species such as yellow loosetrife *Lysimachia vulgaris* and montbretia *Crocosmia* x *crocosmiflora*.

4.36 A detailed grassland NVC survey was conducted in August 2018 and detailed results are reported at Appendix F. The survey found that although some areas were particularly diverse, the match to recognised NVC communities was low.

Bracken

4.37 A large patch of continuous bracken *Pteridium aquilinum* is found adjacent to the turning circle at the end of Caldbeck Road. Bracken is also found scattered occasionally throughout other habitats across the site.

Tall ruderal herb

4.38 Tall ruderal herb is found as a mosaic with other habitats in unmanaged areas of the site, such as at TN2, 6, 20, and the margins of TN14. There is also a large patch of tall ruderal herb dominated by rosebay willowherb at the edge of the former playing fields.

Hedgerows

4.39 There is an old defunct hedgerow along the northern border of the site (TN12) that is dominated by hawthorn *Cratageus monogyna*. There is a wall/bank along the base of the hedgerow, upon which species such as broad buckler fern *Dryopteris dilatata* and foxglove *Digitalis purpurea* were growing.

4.40 Defunct hawthorn dominated hedgerows are also found along the boundary between the site and Midgey Wood (TN11), in the corner of the field at TN6, and along the boundary of the former playing field at TN16.

4.41 A hedgerow assessment was carried out on 17th April 2018 and is reported in detail at Appendix C. No hedgerows were found to be species rich, or 'Important' under the ecology criteria of the Hedgerow Regulations (1997).

Standing water

4.42 Although there are no permanent ponds on site, partially wet ditches are found in the west of the site at TN18, and small areas of shallow water are found at TN9, 21 and 22. These features do not appear to permanently hold water, and do not contain a diverse flora.

Walls

4.43 Stone walls define some of the boundaries on site, including the boundary along Harras Road, and the western boundary of the field at TN10. There are also banks reinforced with stone along the hedgerows at TN12 and TN16. Rabbit burrows were noted in these areas.

Hardstanding

4.44 Caldbeck Road runs through the centre of the site. This area has no ecological value.

Protected and Non-native Invasive Plants

4.45 Native bluebell *Hyacinthoides non-scripta* was noted in Midgey Wood. No other protected (Schedule 8 of the Wildlife and Countryside Act 1981, as amended) plant species were noted during the survey.

4.46 A species of cotoneaster was recorded on the site boundary in Midgey Wood. Due to a lack of berries the cotoneaster could not be identified to species level. Many cotoneaster species are listed under Schedule 9 species of the Wildlife and Countryside Act. Therefore we would recommend that a precautionary approach should be taken and this should be treated as a Schedule 9 invasive species.

4.47 The Schedule 9 non-native species monbretia and Himalayan balsam *Impatiens glandulifera* were recorded in areas around the site. See habitat survey drawing for locations.

4.48 Rhododendron *Rhododendron ponticum* appeared to dominate the understorey of Midgey Wood in places. This rhododendron is also a non-native species listed on Schedule 9 of the Wildlife and Countryside Act.

Bat Assessment

4.49 No evidence of bats was found and none of the trees on site were considered to have value for roosting bats, including the trees to be removed to facilitate the proposed road crossing points (shown in parameters plan), however, several trees in the adjacent woodland (Midgey Wood) were noted to have low to moderate suitability for roosting bats.

4.50 The site contains foraging and commuting habitat suitable for use by the local populations of bats within their CSZ, in particular the blocks of woodland, unmanaged grassland and marshy areas. As the parameters plan shows that the woodland is to be retained (excluding the small section to be removed to facilitate road access), there is no planning requirement for bat activity transect surveys, however these were undertaken to inform habitat design. The activity transects and static surveys revealed at least three confirmed species of bat across the site;

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Brown long-eared bat *Plecotus auritus;*
- Unidentified Pipistrelle species
- Noctule bat *Nyctalus noctula*
- Unidentified Myotis species.

4.51 Bat activity was focussed around the woodland edge habitats.

Amphibians

4.52 There are no recent records of amphibians within 1km of the site. The ditches and ephemeral pools may provide some sub-optimal breeding habitat for frogs, but would not be suitable for toads or great crested newts. There are five ponds within 250m, associated with the golf course to the east of site. These ponds have moderate connectivity to site with areas of unmanaged semi improved grass and woodland that provide habitat corridors for amphibians. Desktop study included an appraisal of a recent planning approval on adjacent land (Copeland BC ref4/16/2416/0O1 and 4/16/2415/0O1)) which included a 2016 great crested newt survey of one of the waterbodies and concluded no GCN were present. The other four off-site waterbodies are understood to be relatively recently created on Whitehaven Golf Course, for which no permission to access was given. One common toad was recorded during the reptile surveys.

Winter birds

4.53 The winter bird survey results are reported in full at Appendix D.

4.54 The site supports flocks of snipe in early winter and a migratory flock of twite in late winter, the latter presumably moving northwards. In terms of raptors associated with the Cumbrian fells and waterbirds associated with the Solway Firth pSPA, individual peregrine and kestrel were seen flying over the site on single occasions indicating low interest for birds of prey. No relevant waterbirds were seen on site, indicating no functional link with the pSPA.

Breeding birds

4.55 The mosaic of grassland, scrub, hedgerow, woodland, scattered trees and marshy habitats across the site provide habitat for a range of bird species offering nesting, foraging and commuting opportunities. A total of 38 species were recorded within the site boundary and 100m buffer during the breeding bird survey, nine of which were confirmed to be breeding within the site boundary and 100m buffer. These are blackbird, blue tit, goldfinch, great tit, house martin, house sparrow, robin, starling and wren. Of these, three are considered to be notable (Birds of Conservation Concern – BoCC), these are house martin, house sparrow and starling. BoCC which were recorded as probably breeding within the site were dunnock, mistle thrush, song thrush and willow warbler.

Water vole and Otter

4.56 Water vole field signs have been found throughout the wetland areas on site, particularly throughout the marshy grassland. Feeding remains, droppings, terrestrial nests and burrows were observed during field surveys in October 2017 and April 2018. An incidental sighting of a water vole was made by a surveyor during one of the reptile survey visits.

4.57 No signs of water vole were found within the water courses in Midgey Wood, and the habitat here was found to be sub-optimal for this species.

4.58 Because of the unusual distribution of the water vole fieldsigns (being almost totally terrestrial), droppings were collected in April 2018 and sent for eDNA analysis at Warwick University to confirm if they were of water vole. However, the results of the analysis were inconclusive so additional survey visits were carried out in June and August 2018. No conclusive signs of this species were found during these visits, however water voles are a dynamic species (on water courses they can be present one year and absent the next due to the expansion and contraction of the metapopulation).

4.59 Although there are records of otter within 1km of site there is no riparian habitat on site. No signs of otter were recorded on the watercourses within Midgey Wood.

Badger

4.60 The site provides foraging and possible sett building habitat for badger, however no evidence of badger was found on site or within Midgey Wood.

Other mammals (brown hare, hedgehog, red squirrel)

4.61 No evidence of hare was recorded during the survey, however the site has value to hare as a foraging area and as a breeding area within longer grass.

4.62 There are records of hedgehog within 1km of the site. The grassland, scrub and woodland provide suitable nesting and foraging opportunities for hedgehog.

4.63 No evidence of red squirrel was observed, however there is woodland habitat on and adjacent to the site that is of value to red squirrel for both foraging and for drey construction. There are records of red squirrel in areas of woodland connected to site.

Reptiles

4.64 There are numerous records of common lizard and slow worm approximately 800m west of the site. The stone walls, along with the mosaic of wetland areas, unmanaged grassland, scrub and woodland provide habitat for these species. No reptiles were found during the seven survey visits in April and May 2018.

5.0 CONCLUSIONS

Desk Study

Designated Sites

5.1 The site is not covered by any nature conservation designations.

5.2 There are three national and internationally designated sites within 10km:

- St Bees Head Site of Special Scientific Interest (SSSI) 1.7km Southwest;
- Solway Firth proposed Special Protection Area (pSPA) 1.8km west;
- River Ehen Special Area for Conservation (SAC) and SSSI 5.3km Southeast.

5.3 Specifically in relation to the Solway Firth pSPA, winter bird surveys undertaken by TEP in 2017/18 (Appendix D) showed that there is no use of the site by SPA-qualifying bird species. Thus the development has no habitat loss implications in terms of the Habitats Regulations. The type of development proposed will not cause any indirect effects to this marine pSPA off the coast of Whitehaven and TEP concludes there is no likely significant effect on the pSPA or its conservation objectives and no requirement for any special measures to prevent adverse effects. The requirement for a Habitat Regulations Assessment can therefore be screened out.

5.4 The location of the application site is within an IRZ for St Bees Head SSSI and River Ehen SSSI and SAC, however the proposals are not listed as a likely risk and therefore mandatory consultation with Natural England is not required.

5.5 There are five locally designated sites within 1km of the site including three County Wildlife Sites (CWS), one Local Geological Site (LGS) and one Site of Invertebrate Significance (SIS). There are significant functional links between the application site and the locally designated sites and the distance between the closest sites (Midgey Gill and Castle Park Woods CWS) is considered small enough for there to be possible impacts as a result of the proposals. Any potential impacts can be mitigated against and do not preclude development.

5.6 An area of the woodland called "Midgey Wood" adjacent to the site is classified as ancient woodland. This will be will be appropriately protected through a 15m buffer of new planting and semi natural vegetation. This will protect the wood and also reduce any risk of indirect effect to the CWS which is downstream of Midgey Wood.

Habitat Changes

5.7 Table 3 indicates the expected changes to habitats that are anticipated to occur, based on the parameters plan and the illustrative masterplan. Drawing 2 enables the changes to be visualised

Table 3: Habitat Changes

Habitat	Current Area (ha)	Lost to housing or infrastructure (ha)	Retained or transfomed to POS (ha)	Used in Ecological Area (ha)
Continuous Bracken	0.109	0.109	0	0
Dense/Continuous Scrub	0.527	0.423	0.104	0
Ephemeral Pool	0.141	0.141	0	0
Hardstanding	0.311	0.226	0.085	0
Marsh/Marshy Grassland	3.544	2.871	0.424	0.249
Modified Neutral Grassland	1.949	1.154	0.791	0.004
Plantation Broad-leaved Woodland	0.524	0.138	0.040	0.346
Plantation Mixed Woodland	2.334	0.201	0	2.133
Poor Semi-improved Grassland	11.844	9.250	0.957	1.638
Semi-improved Neutral Grassland	2.123	2.091	0.009	0.002
Semi-natural Broad Leaved Woodland *	2.918	0	2.918	0
Species-poor Modified Neutral Grassland	0.089	0.089	0	0
Tall ruderal herbs	0.17	0.17	0	0

*=Midgey Wood - included in survey area, but not in ownership of Homes England and not affected by development.

Priority Habitat

5.8 One corner of a mature plantation woodland shown as S41 habitat in the habitat inventory will be lost to enable the creation of an access road. The habitat survey and arboricultural assessment found that this block of woodland does not differ significantly in species composition or age structure to the remainder of the plantation woodland on site Magic Map reports that the confidence in this habitat classification is 'Low'. The balance of the woodland will be retained and protected, in line with the Arboricultural Impact Assessment.

5.9 One hedgerow will be removed to facilitate the creation of a development parcel. The estimated length of hedgerow to be lost is 160m out of the total of approximately 730m (22%).

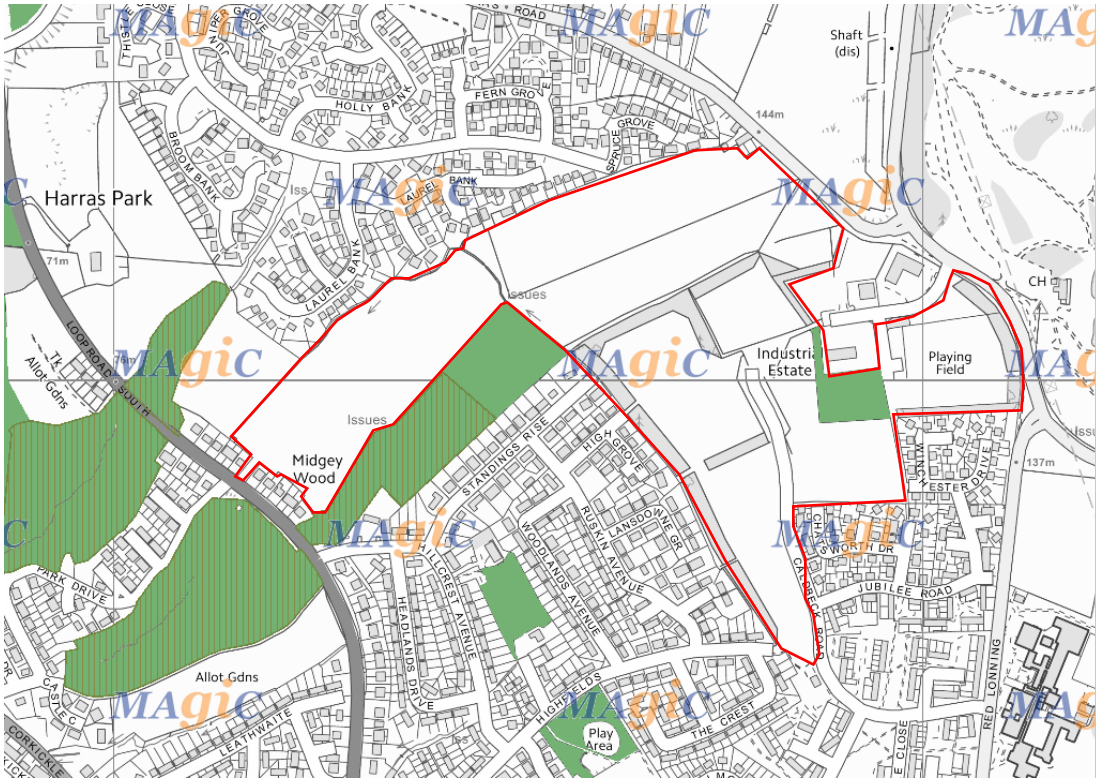


Figure 2. Map indicating Priority Woodland Habitats

Relevant Planning Policies and Guidance

5.10 The majority of the site is designated as "New housing allocations". The westernmost section of site is allocated as Urban Greenspace recreation and landscape. The remaining areas of site have no allocation within the latest Copeland Council unitary development plan.

Habitats and Flora

5.11 The network of woodland and unmanaged grassland areas form a habitat mosaic across the site. The woodlands and associated edge zones have been used in masterplanning to form an ecological network that connects Midgey Wood with open land to the east of the site.

5.12 The mitigation hierarchy has been followed in the design of the scheme, with the result that the core ecological network has been strengthened, Midgey Wood is protected and buffered and there is no loss of S41 habitat except for hedgerows which are readily replaceable and are not species-rich.

5.13 The parameters plans show that 6.782ha of green spaces will be retained and long-term management will be secured through a Landscape and Habitat Management Plan that can be developed under a planning condition.

5.14 Some of these green spaces will be used for public open spaces with biodiversity in mind and others will be managed exclusively for ecological benefit.

5.15 The detailed grassland survey confirmed that although none of the grassland areas qualify as S41 habitat, some of the Parcels surveyed are particularly diverse and provide a variety of niches for a range of invertebrates and other animals.

Protected and Non-native Invasive Plants

5.16 Native bluebell was recorded in Midgey Wood. No bluebell was recorded in the other woodland areas on site, or along the hedgerows.

5.17 Rhododendron, montbretia, cotoneaster and Himalayan balsam are all listed under Schedule 9 of the Wildlife and Countryside Act, 1981 (as amended) and were found on or adjacent to the site. It is an offence to facilitate the spread of these species into the wild.

Bats

5.18 Several trees were noted in the adjacent woodland as having low or moderate potential for roosting bats. These are off site and are unlikely to be impacted by the development but some trees may require soft felling under supervision of overhanging limbs.

5.19 The habitats on site provide good foraging and commuting habitat. The Parameters Plan confirms that the woodlands on site are to be retained, generally within a buffer zone, other than at two specific points of road access through young plantation. The trees that would be affected by the road access were assessed by a licenced bat consultant who confirmed no roosts or potential roosting features were present.

5.20 Since bats are mobile species, and age-ing or weather damage can create roost opportunities in trees, a planning condition can ensure that future reserved matters applications are accompanied by an updated bat survey, as and when any trees are proposed to be affected.

5.21 Full results of the bat activity surveys are reported at Appendix G. Bat activity transect surveys were undertaken to determine the foraging use of the habitats on site by bats in order to inform the habitat creation design process and to inform a proposed planning condition for the provision of bat boxes within and adjacent the site's green infrastructure.

5.22 This approach to survey and assessment is consistent with Natural England's Standing Advice[10] on dealing with bats in planning applications. As there are no roosts and no long-term impacts on bat commuting corridors, the potential adverse impact is less than "low".

5.23 Applying Wray *et. al*. (2010)[11], the site is valued as of county importance for pipistrelle species and local importance for noctule, brown long-eared and Myotis species, however overall, considering the site location, small assemblage and the wider landscape, the site is considered to be of local value to bats. The woodland edge habitats are of highest value to foraging and commuting bats.

Amphibians

5.24 The semi-wet ditches and ephemeral pools on site are not considered to hold water consistently enough or be deep enough to support breeding great crested newts or common toad. As there are no records from the local area for great crested newt, this species is not considered to be a concern for the development.

5.25 Common toad may be present, however on-site habitat creation, including wetland areas, will compensate for loss of habitat for common toad and other amphibians. A Reasonable Avoidance Measures (RAMs) method statement for common amphibians should be produced and followed during site clearance and construction. This can be a matter for planning condition, with the expectation that RAMs are produced for each reserved matters application.

Birds

5.26 A winter bird survey was carried out in 2017 and 2018 and confirms that the site is of less than local winter bird interest. The surveys specifically investigated whether the site might be important for a) birds of prey associated with the Cumbrian fells or b) waterbirds and wintering gulls associated with the Solway Firth pSPA. Single peregrine and kestrel were seen flying over the site on single occasions indicating low interest for birds of prey. No relevant waterbirds were seen on site, indicating no functional link with the pSPA.

5.27 Retention of areas of marshy grassland and pools in the green infrastructure will retain some habitat of value, but the overall interest will decline.

5.28 The 38 bird species recorded within the site boundary and 100m survey buffer during the spring 2018 breeding bird survey represents a moderate species diversity with the majority of species recorded being commonplace and widespread. This indicates that the site is of less than local significance for breeding birds.

[10] https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects

[11] Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2011). Valuing bats in ecological impact assessment. In practice. pg. 23-27.

Otter and water vole

5.29 No signs of otter or water vole were found on the water courses within Midgey Wood, however as water vole signs were noted in marshy grassland, mitigation/avoidance measures for this species will be required. This is detailed in chapter 6. This is likely to include a combination of displacement, trapping and translocation and would require a Natural England licence, as the species is protected under the Wildlife and Countryside Act, 1981.

Badger

5.30 The site and adjacent woodland provides good foraging habitat for badger and some habitat suitable for sett construction, however no signs have been found and it is unlikely that the site is heavily used by this species. The proposed green infrastructure shown on the Ecology Mitigation Plan will ensure that that any interest for this species is retained.

5.31 Since badgers are mobile species, a planning condition can ensure that future reserved matters applications are accompanied by an updated badger survey,

Hedgehog

5.32 There are records of hedgehog within 1km of the site and suitable habitat within the site. Hedgehogs are listed under Section 41 of the NERC Act. There will be inevitable habitat loss as a result of the proposals. The habitats which are retained should be managed in order to avoid a decline in the population of hedgehogs in the area.

Red squirrel

5.33 There are records of red squirrel within 1km of the site, including in woodland to the southwest with good connectivity to site. The site has habitat suitable for red squirrel foraging and trees suitable for squirrel dreys. However, none of the trees affected by the development support red squirrel dreys. Since squirrels are mobile species, a planning condition can ensure that future reserved matters applications are accompanied by an updated squirrel survey,

Hare

5.34 There are extensive habitats on site suitable for foraging hare *Lepus europaeus* and several records of hare within 1km of the site. Development of the site will require removal of areas of habitat suitable for both foraging and breeding hare.

Reptiles

5.35 As the reptile surveys in 2018 did not find reptiles, it is unlikely that they are present on site, and no specific mitigation measures are required.

6.0 RECOMMENDATIONS

Designated sites

6.1 There are five locally designated sites within 1km of the site. These sites have moderate to good connectivity to each other and the site through areas of woodland and hedgerow. Woodland and hedgerows have been retained to maintain connectivity within the wider landscape. Enhancements in the form of native species planting to "gap up" hedgerows ad woodland and increase the connectivity of the site internally and within the wider area should be undertaken.

6.2 A Construction Environment Management Plan (CEMP) should be implemented to limit pollution, including noise and dust, affecting the closest CWSs, in particular Midgey Gill, which is connected to Midgey Wood adjacent to the site.

6.3 The CEMP would include measures to minimise risk of emissions, pollution, sediment run-off and encroachment into protective buffer zones, thereby reducing risk of adverse effects on the offsite designated sites.

6.4 The Ecology Mitigation Plan shows a 15m zone of native planting would be established along the boundary between the proposed development site and Midgey Wood.

6.5 The SuDS for the site should aim to maintain the current hydrology within Midgey Wood, including maintaining the flows of the streams within the wood.

Habitats

6.6 In line with Standing Advice recently produced by the Natural England and Forestry Commission[12], a 15m buffer of semi-natural vegetation e.g. native woodland planting and/or species-rich grassland, will be created around Midgey Wood ancient woodland. Within this buffer zone there should be no significant ground-level changes.

6.7 There are no 'Important' hedgerows on site, however as native hedgerows are Section 41 priority habitat, any hedgerow removal will require 2 for 1 replacement.

6.8 It is recommended that the grassland at Parcels 6 and 8 (see drawing G5810.66.008 for locations) should be retained or translocated if necessary. These areas should be protected through maintenance of current hydrology and fencing to prevent encroachment by machinery and vehicles. They should also be enhanced through a combination of the measures outlined below. It may also be appropriate to fence some areas during the operation phase of development to protect them from encroachment.

[12] Ancient Woodland and Veteran Trees: protecting them from development https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences

6.9 All parcels of grassland surveyed have the potential to be enhanced and managed to improve their biodiversity interest, through measures such as control of garden escapes and invasive plant species, reduction of nutrient load from animal waste, seeding or plug planting with locally appropriate grassland species and implementing a management regime which supports biodiversity. This may include measures such as scrub control in certain areas and mowing in late summer after plants have set seed.

Invasive species

6.10 There are a number of invasive plant species present on and adjacent to site. It is an offence to allow these species to spread, therefore an invasive species management plan detailing removal and control methods will be required.

Bats

6.11 Brown long-eared bat and Myotis species are present on site. These are generally woodland specialist species and known to be highly light sensitive. Indirect impacts on bats are possible as a result of light pollution of the woodland and will need to be minimised through sensitive design of the lighting scheme.

6.12 The majority of the woodland on site will be retained in the current development proposals (Drawing no: A090070-410 004). An unlit buffer should be maintained, where possible, between the proposed development and retained woodland for it to continue to provide commuting and foraging opportunities for bats. Where an unlit buffer cannot be maintained a sensitive lighting strategy should be adopted to reduce light spill on to tree canopies.

6.13 To compensate for the small loss of woodland, replacement planting of native trees will be provided within the scheme. Provision of newly created grassland habitat, including planting wildflower seeds, will encourage insect assemblage and abundance and create eco-passages for foraging bats.

6.14 Bat boxes should be installed on mature trees that are retained on site (Schwegler 2F Bat Box or similar) to provide roosting opportunities for bats.

Amphibians

6.15 Due to the unsuitability of the aquatic habitats on site for great crested newts or toads, and the lack of great crested newt records or recent toad records in the local area, amphibian surveys are not required, however on-site habitat creation, including wetland areas, will compensate for any loss of habitat for these species.

6.16 Where features suitable for amphibians are to be removed, a RAMs method statement should be produced and followed. This may include measures such as:

(i) dismantling refugia by hand under supervision of an ecologist;

(ii) strimming vegetation to 100mm which is then left overnight, before being hand-searched by an ecologist and any animals moved to suitable habitat.

Birds

6.17 Retention of areas of marshy grassland and pools in the green infrastructure will retain some habitat of value for snipe and twite, but the overall wintering bird interest will decline.

6.18 The woodland and scrub areas within and adjacent to the proposed site provide habitat for dunnock, mistle thrush, song thrush and willow warbler. These areas should be retained as far as possible in order to prevent the loss of nesting habitat for these notable bird species.

6.19 If trees and scrub are to be removed, they should be replaced using a range of native species to create a varied vegetation structure and suit a wider range of breeding bird species. Fruiting tree and shrub species and/or species that are attractive to insects will also provide additional foraging resources for numerous bird species.

6.20 A nest box scheme undertaken as part of the development, including small nest boxes with holes and open fronted nest boxes, would provide additional nesting sites for a number of species such as blue tit and robin. As house sparrow, house martin and starling were confirmed to be nesting within site and the surrounding area, specialised nest boxes for these species should also be provided within the development.

6.21 Any vegetation clearance undertaken in the nesting bird season (March to August inclusive) must be subject to a nesting bird check prior to works. The nesting feature will be checked by a suitability qualified ecologist no more than 24 hours prior to any clearance works. If nests are identified, works must cease in that area and an appropriate buffer zone established around the nest until the young have fledged. This will require monitoring by an ecologist who will advise when works within the buffer zone can proceed.

Water vole

6.22 A water vole conservation scheme will be required under planning condition to move voles from development footprints into favourable retained habitat.

6.23 This is likely to include a combination of displacement, trapping and translocation and will require a Natural England licence, as the species is protected under the Wildlife and Countryside Act, 1981.

6.24 This approach to survey and assessment is consistent with Natural England's Standing Advice on dealing with water voles[13], insofar as it can be because the Standing Advice is targeted at managing aquatic populations.

6.25 The scheme will require a Natural England licence in respect of water voles. Since the species is using terrestrial areas of the site and there would be no adverse effect on any watercourses (the ditches at TN18 are shown as retained in the Draft Illustrative Masterplan), it is likely that a "trap and translocate" method of conservation will be needed, to move voles from development footprints to permanent green infrastructure. This approach is used in Scotland where the species occurs in urban areas. Advice will be sought from Natural England and surveys will continue to monitor the presence and distribution of voles.

Badgers

6.26 Though no evidence of badgers was observed on site, there is suitable habitat on and adjacent to site for badgers. A pre-commencement inspection should be conducted to ensure badgers have not established in the intervening period. Retention and management of the woodland/rough grassland habitat network across the site will ensure that opportunities for this species are maintained.

Hare and hedgehog

6.27 Boundary habitats should be managed to provide foraging and commuting habitats for both hare and hedgehogs. A Reasonable Avoidance Measures (RAMs) method statement should be produced to outline measures to limit potential impact upon hedgehog during scrub removal within hibernation period, which typically runs from November to mid-March. These methods may include the destructive search of scrub and an initial "strim" of vegetation to 30mm to allow hedgehogs to move from the scrub before the complete removal of the vegetation.

Red squirrel

6.28 The retention of the network of woodland across the site (apart from where crossings are required) will avoid significant adverse impacts on this species. A pre-commencement inspection of any trees that will be removed during the works is required to assess for the presence of any squirrel dreys.

Reptiles

6.29 As no reptiles were found during the reptile surveys, there are no specific recommendations for this species group. The amphibian RAMs method statement will ensure reptiles are protected, in the unlikely event that they are present.

[13] Water voles: surveys and mitigation for development projects https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences

Biodiversity Opportunities

6.30 The NPPF requires biodiversity enhancement measures to be implemented on new development sites. The following measures are appropriate to the proposed housing development at Harras Moor.

6.31 The existing network of woodland across the site can be enhanced by the creation of grassland, wetland and woodland edge habitats within buffers. Depending on the results of further botanical surveys, and the positioning of the development footprint, it may be appropriate to translocate turves taken from more diverse areas of grassland to the new habitat creation areas.

6.32 Loss of grassland could be compensated through the creation of grassy swales along roadways and footpaths.

6.33 Enhancements for birds and bats can be achieved by installing bat and bird boxes on suitable retained trees or integrating bat tubes and bird boxes on new buildings, boxes into the exterior walls of the new builds; and two house sparrow boxes installed onto north or west facing exterior walls (for example Schwegler sparrow terrace or Woodstone sparrow box).

6.34 The landscaping proposals should take into account the possible presence of hedgehogs in the area and encourage use within the site. Planting hedges as property boundaries as opposed to fences will create suitable habitat. Hedgehog boxes will provide areas for shelter and breeding and should be sited out of direct sunlight with the entrance facing away from prevailing winds, in or under thick vegetation.

6.35 If fences are used, non-toxic preservative should be used on fences (and any other wooden furniture) to avoid the use of chemical treatments. Any wood panel fencing should include small gateways (13cm x 13cm) to allow dispersal of hedgehogs across the site.

6.36 During the site clearance works, consideration should be given to chipping or composting vegetation for re-use on the new habitats on site, or creation of brash piles on the periphery of the site as a further aid to increasing biodiversity. This could also enhance the site for hedgehogs by providing additional refuge opportunities for this S41 species which is frequently recorded in residential gardens.

6.37 The use of Breathable Roofing Membrane (BRM) must not be installed in the construction of roof spaces where bats will be intended to access, in accordance with best practice guidance from BCT:

http://www.bats.org.uk/pages/breathable_roof_membranes.html

6.38 BRMs are made from non-woven plastic fibres that are known to abrade over time, forming loose fibres, in which bats may become entangled. BCT recommends that only bituminous roofing felt that does not contain polypropylene filaments should be used. For example, bitumen felt type 1F, which is hessian reinforced. High resistance bitumen underlays are acceptable under BS 5250:2011 (recommended in Part C of the Building Regulations) as long as appropriate ventilation is provided.

7.0 REFERENCES

Chartered Institue of Ecology and Environmental Management. *Guidelines for Preliminary Ecological Appraisal*. (CIEEM http://www.cieem.net/), 2013.

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

Committee, Joint Nature Conservation. *Handbook for Phase 1 Habitat Surveys - A technique for environmental audit*. Peterborough, 2010.

Dean, M., Strachan, R., Gow, D. and Andrews, R. *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. The Mammal Society, London, 2016.

Nature, English. *Great Crested Newt Mitigation Guidelines.* Peterborough: English Nature, 2001.

Oldham R.S., Keeble J., Swan M.J.S & Jeffcote M. “Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus).” *Herpetological Journal 10 (4)* (2000): 143-155.

APPENDIX A: Desk based ecological assessment

Add appendix content here.

APPENDIX B: Phase 1 Habitat Survey Report

Add appendix content here.

APPENDIX C: Woodland and Hedgerow Survey

Add appendix content here.

Add appendix content here.

APPENDIX D: Winter Bird Survey 2017/18

Add appendix content here.

APPENDIX E: Breeding Bird Survey

Add appendix content here.

APPENDIX F: Grassland Survey

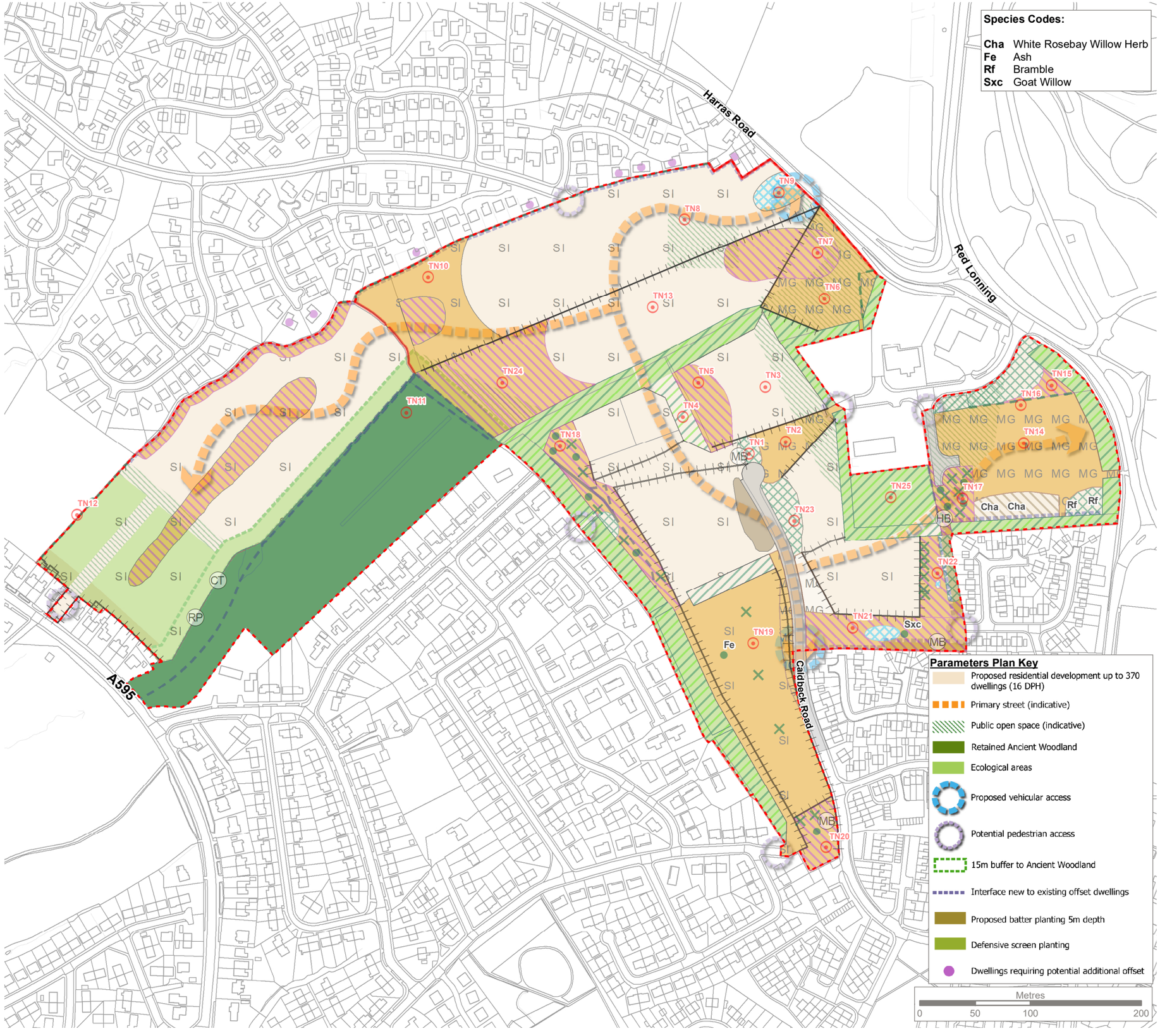
Add appendix content here.

APPENDIX G: Bat Activity Surveys

Add appendix content here.

DRAWINGS

Drawing 1 - G5060 Eco.HarrasMoor.012 Parameters Plan with Phase 1 Habitat Survey
Drawing 2 - G5060.HarrasMoorEcoand Arb.013 Reptile Survey



Species Codes:

Cha	White Rosebay Willow Herb
Fe	Ash
Rf	Bramble
Sxc	Goat Willow

KEY

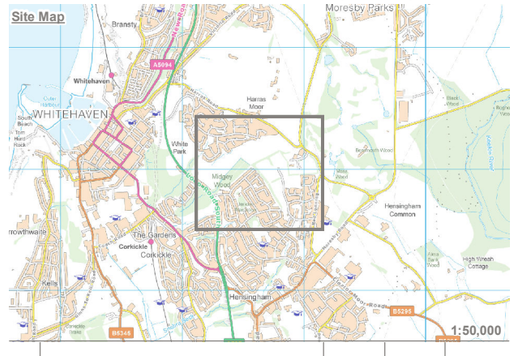
- Site Boundary
- Target Note
- Cotoneaster
- Himalayan Balsam
- Montbretia
- Rhododendron Ponticum
- Scattered Scrub
- Scattered Broad-leaved Trees
- Standing Water
- Species-poor Defunct Hedge
- Fence
- Wall
- Dry Ditch
- Semi-natural Broad-leaved Woodland
- Plantation Broad-leaved Woodland
- Plantation Mixed Woodland
- Dense/Continuous Scrub
- Semi-improved Neutral Grassland
- Modified Neutral Grassland
- Species-poor Modified Neutral Grassland
- Marsh/Marshy Grassland
- Poor Semi-improved Grassland
- Continuous Bracken
- Tall Ruderal
- Ephemeral Pool
- Hardstanding

Parameters Plan Key

- Proposed residential development up to 370 dwellings (16 DPH)
- Primary street (indicative)
- Public open space (indicative)
- Retained Ancient Woodland
- Ecological areas
- Proposed vehicular access
- Potential pedestrian access
- 15m buffer to Ancient Woodland
- Interface new to existing offset dwellings
- Proposed batter planting 5m depth
- Defensive screen planting
- Dwellings requiring potential additional offset

Metres
0 50 100 200

Site Map



Rev	Description	Drawn	Approved	Date

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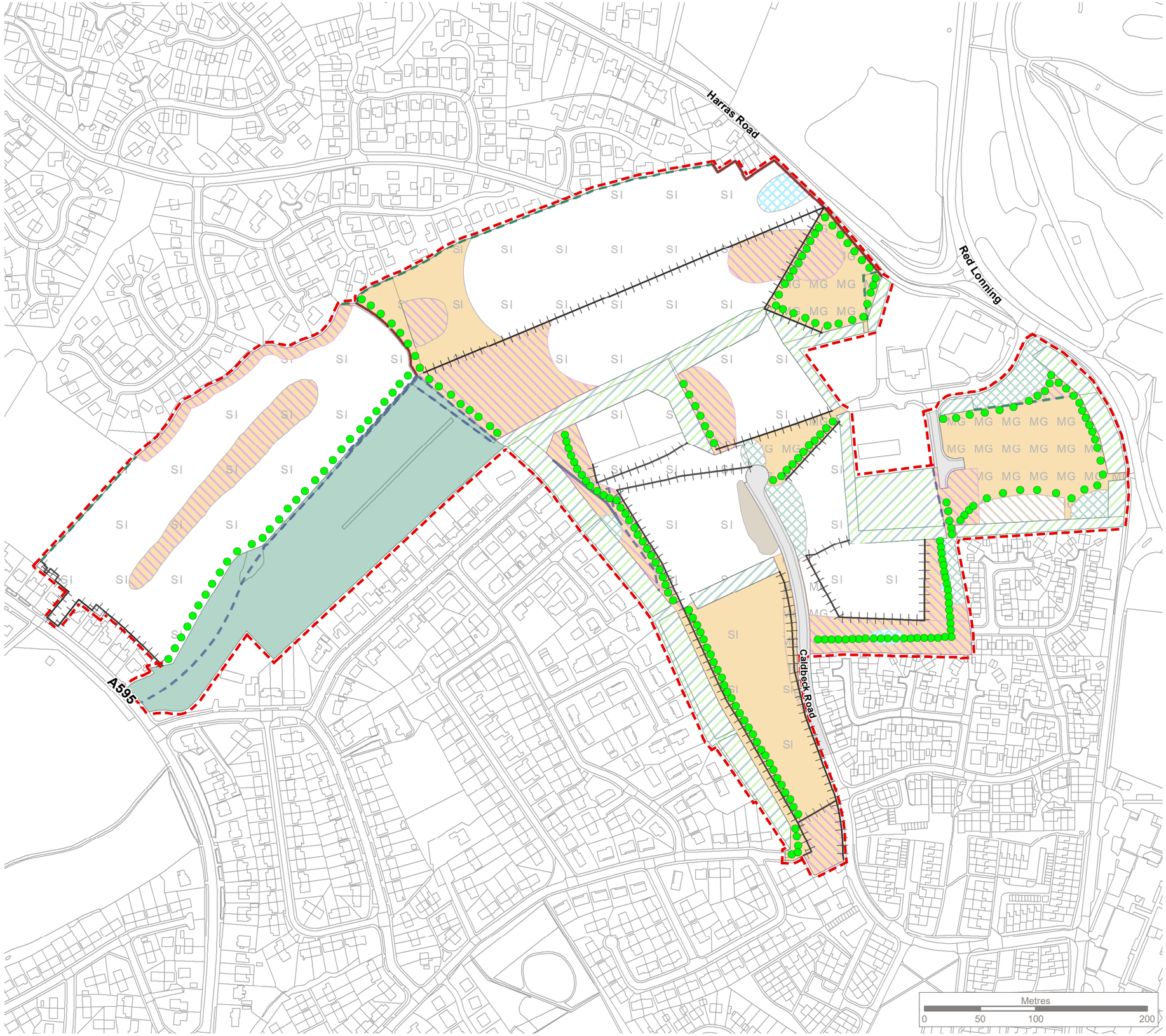
Project
Harras Moor, Cumbria

Title
Parameters Plan with Phase 1 Habitat Survey

Drawing Number
G5060.Eco.HarrasMoorEcoandArb.012

Drawn	Checked	Approved	Scale	Date
JS	FBH	FBH	1:3,500 @ A3	11/05/2018

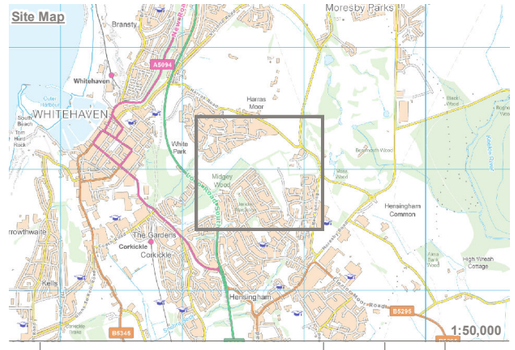


KEY

Site Boundary

Reptile Tin Locations (230 Tins)

Site Map



Rev	Description	Drawn	Approved	Date

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Title
Reptile Survey

Drawing Number
G5060.Eco.HarrasMoorEcoandArb.013

Drawn	Checked	Approved	Scale	Date
RH	LC	KS	1:3,500 @ A3	17/05/2018

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