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Written by:	C.Snowball / H.Stephenson / A.George	January 2014
Approved by:	C.Snowball / P.Massey	January 2014
Issued by:	TNEI Services Limited	January 2014

TNEI Services Limited,
Milburn House,
Dean Street,
Newcastle upon Tyne,
NE1 1LE,
United Kingdom.

Tel: +44 (0) 191 211 1400
Fax: +44 (0) 191 211 1432
Website: www.tnei.co.uk

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Summary

This report concerns a proposal by Sunderland City Council (SCC) to undertake a series of ecological surveys at a site near Ryhope to inform a strategic plan for the area, sections of which are likely to be redeveloped for housing over an anticipated 20 year period. Based on current proposals, up to 3,500 residential units may be located on the site.

The site lies to the south of Sunderland, to the south of Ryhope, Tunstall and Doxford Park, covering approximately 280ha. The North Sea coast lies approximately 0.3km east of the site at the closest point, while the Sunderland/Durham boundary forms part of the southern site boundary. Areas of residential and commercial development dominate the land to the north of the site, while the A19 severs the survey site from areas of agricultural land to the south.

A desk-top study was undertaken prior to the commencement of ecological survey work at the site, which identified a number of statutory and non-statutory sites within the site and surrounding area. This included Ryhope Dene Local Wildlife Site (LWS) and Cherry Knowle Dene LWS, which lie within and border the site to the south, and Blakeney Woods LWS, within the west of the site, which are primarily designated due to their botanical interest (ancient woodland). The desk study also highlighted records of a range of protected and notable species in the area, including bats, great crested newts, otter, water vole and badger, as well as reptile records (common lizard and slow worm) in the surrounding area.

An extended Phase 1 survey of the site was undertaken on 12th February 2013, in order to map the habitats present, identify any signs indicating the presence of protected species, and identify any further species-specific surveys which may be required in order to allow a robust assessment of the proposals to be made. Habitats within the site were found to be dominated by agricultural land which is largely under arable management, with more limited areas of semi-improved and improved grassland towards the east. Small areas of semi-improved neutral grassland and amenity grassland were noted in sections of the site, but such areas were generally found to be relatively species-poor.

Blocks of woodland, including semi-natural woodland and shelterbelt/plantations are present within the site, primarily towards the west and south east, with new, immature plantations also noted to the north of the survey area. Mature tree lines are present along some field boundaries although hedgerows, where present, are typically defunct and species-poor. A large complex of buildings (hospital) are present towards the east of the survey area, which are currently being redeveloped resulting in large sections of this area being inaccessible at the time of survey. A small farm range is located within the north of the site, while a care home lies on the eastern site boundary. A small number of waterbodies are located within the site, including two man-made ponds with blockwork sides towards the east, and two semi-natural ponds within the west of the survey area – one within Blakeney Woods and one adjacent to an area of plantation woodland.

The botanical value of such areas is considered to vary greatly – the arable habitats are considered to be of low importance, supporting monocultures of commercial crops, while the areas of semi-natural ancient woodland are considered to be of district to county importance, being mature, diverse, and impractical to recreate over a reasonable time period.

Species-specific surveys during 2013 identified the following within the site:

- Bats – some of the built structures are considered to have the potential to be used as roost sites and tree roosts were identified in 4 locations within the site. The areas of woodland, water bodies, tree lines and hedgerows provide foraging areas and commuting routes for a range of locally common species, with a particular

focus of activity upon the mature tree lines and woodland blocks within the west of the survey area, along Burdon Lane and around Ryhope Engines Museum;

- Amphibians - a number of ponds were identified within the site which were found to support low populations of breeding amphibians, although no evidence indicating the presence of great crested newts was recorded. Although the agricultural habitats which dominate the site are considered to be sub-optimal for such species, the areas of rough grassland, woodland and scrub in particular provide higher quality potential terrestrial habitat for such species;
- Badger – the agricultural land and woodlands which cover the majority of the site are considered to provide potential opportunities for both sett creation and foraging badger, although the risk of the species being present is considered to be reduced by the regular use of the site by dog walkers and the disturbance of Ryhope and Cherry Knowle Dene through the regular use of such areas by people on motorbikes. Although small numbers of mammal trails were identified in the denes, no field signs confirming the presence of badger were recorded;
- Otter – the burns within the denes to the south of the site are considered to have the potential to be used by foraging and commuting otter, with these woodlands also providing some potential rest sites for the local population. However, the risk of the species regularly utilising the area is considered to be reduced by the regular use/disturbance of the area by people on motorbikes and no field signs confirming their presence were recorded;
- Water Vole – a possible old water vole burrow was identified within Ryhope Dene at the time of the extended phase 1 survey, although no further field signs indicating the presence of the species were identified in the area and a dead rat was recorded within the dene during the subsequent water vole survey. The burns within the denes are considered to have some potential to support the species, should a population persist in the area;
- Brown Hare – small numbers of hare were recorded within the site during summer survey visits in 2013 however, no hares were seen during species-specific surveys in October – December 2013 and only a single pile of droppings was recorded at this time; and
- Birds – a range of locally common bird species were recorded on or over the site during the survey, including a number of species listed on the Birds of Conservation Concern (BoCC) Red and Amber lists and the UK and local Biodiversity Action Plans (BAPs).

1 Introduction

1.1 Overview

TNEI Services Ltd. was commissioned to undertake a series of ecological and ornithological surveys of land near Ryhope in Sunderland. Sunderland City Council (SCC) has commissioned the assessment to inform a strategic plan for the area, sections of which are likely to be redeveloped for housing.

The purpose of the surveys was to map those habitats present within the site, to record any evidence indicating the presence of protected species and to identify where habitats are potentially suitable for such species. This information was then used to assess the value of the site in terms of the habitats and protected species which it supports or may support, to ensure a robust assessment of the potential impacts of the proposals is made. A mitigation strategy was designed based on the results of the survey, which included recommendations for further surveys where necessary. Details of the survey and subsequent assessment, mitigation strategy and recommendations for future management and site design principles are included within this report.

1.2 Reasons for Survey

1.2.1 Planning Policy

A range of planning policies are in place which ensure that developers and public bodies consider the potential impacts of any development upon wildlife, and are designed to ensure that there is no net loss in biodiversity as a result of the implementation of such proposals. Key points of such policies are outlined below.

1.2.1.1 National Planning Policy Framework

The National Planning Policy Framework outlines the government's policies, including those relating to the conservation and enhancement of the natural environment (Chapter 11), in line with existing wildlife legislation, through the planning process. Planning authorities must take into account the principles detailed within the document when preparing regional strategies and assessing local development applications.

The following key principles are included within the document:

- The planning system should contribute to and enhance the natural and local environment by recognising the wider benefits of ecosystem services and minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures (Paragraph 109).
- Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged. Distinctions should be made between the hierarchy of international, national and locally designated sites, so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks (Paragraph 113).

- Local planning authorities should set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure (Paragraph 114).
- To minimise impacts on biodiversity and geodiversity, planning policies should:
    - plan for biodiversity at a landscape-scale across local authority boundaries;
    - identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation;
    - promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan; and
    - where Nature Improvement Areas are identified in Local Plans, consider specifying the types of development that may be appropriate in these Areas (Paragraph 117).
- When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:
    - if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
    - proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;
    - development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
    - opportunities to incorporate biodiversity in and around developments should be encouraged;
    - planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and
    - the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas and possible Special Areas of Conservation, listed or proposed Ramsar sites and sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites (Paragraph 118).
- The presumption in favour of sustainable development (Paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Paragraph 119).

- By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation (Paragraph 125).

1.2.1.2 Natural Environment and Rural Communities (NERC) Act (2006).

In addition to the above, public authorities have a duty to conserve biodiversity under the Natural Environment and Rural Communities (NERC) Act, which came into force in 2006. This states that 'any public body or statutory undertaker in England and Wales must have regard to the purpose of conservation of biological diversity in the exercise of their functions…and that decisions of public bodies work with the grain of nature and not against it' (Part 3, Paragraph 60). The Act also includes a range of measures to strengthen the protection of wildlife and habitats.

1.2.2 Wildlife Legislation

In addition to the above, a range of legislation is in place to ensure that habitats and species of conservation importance are protected from harm, either directly or indirectly. Key legislation is provided within the table below.

Table 1: Overview of Key Legislation

Legislation	Relevance
The Conservation of Habitats and Species Regulations 2010 (as amended)	This transposes the EC Habitats Directive 1992 (*Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna)* and the EC Birds Directive 1979 (*Council Directive 79/409/EEC on the protection of wild birds*) into UK law. Annexes I and II of the Habitats Directive list (respectively) habitats and species for which member states are required to establish and monitor SACs. The EC Birds Directive provides a similar network of sites (SPAs) for all rare or vulnerable species listed in Annex I and all regularly occurring migratory species, with particular focus on wetlands of international importance. Together with SACs, SPAs form a network of pan-European protected areas known as 'Natura 2000' sites. The Habitats Regulations also make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4.
The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1979)	The Bern Convention aims to ensure conservation and protection of all wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to afford special protection to the most vulnerable or threatened species (including migratory species).
The Wildlife and Countryside Act 1981 (as amended) (WCA 1981)	The WCA is the primary UK mechanism for statutory site designation (Sites of Special Scientific Interest, SSSIs) and the protection of individual species listed under Schedules 1, 2, 5 and 8 of the Act, each subject to varying levels of protection.

Legislation	Relevance
The Countryside and Rights of Way Act 2000	This legislation strengthens the provision of the 1981 WCA (as amended), both in respect of statutory sites such as SSSIs and protected species. It also places a statutory obligation on Local Authorities and other public bodies to further conservation of biodiversity in the exercise of their functions, thus providing a statutory basis to the Biodiversity Action Plan (BAP) process, which began in 1994. Section 74 of the Act lists the habitat types and species of principal importance in England.
Hedgerow Regulations 1997	The Hedgerow Regulations 1997 are intended to protect important countryside hedges from destruction or damage in England and Wales.
Natural Environment and Rural Communities Act 2006	The 'NERC' Act makes provision in respect of biodiversity, pesticides harmful to wildlife, protection of birds and invasive non-native species. Section 40 of the act also introduced a new duty on public bodies to have regard to the purpose of conserving biodiversity in the exercise of their functions.

A number of species protected by the above legislation have the potential to be present on a site such as this. An overview of the key legislation relating to such species is provided within the table below:

Table 2: Summary of Key Species Protection

Species	Key Legal Protection
Bats (all species)	All European species of bat are listed on Annex IV of the EC Habitats Directive as being in need of "strict protection". This is implemented in Britain under The Conservation of Habitats and Species Regulations 2010 (as amended). All British bats are included on Schedule 5 of the WCA (1981) and the whole of Section 9 of The Act applies to European bat species. In summary, the above legislation collectively prohibits the following: • Deliberately or recklessly capturing, injuring, taking or killing of a bat; • Deliberately or recklessly harassing a bat; • Intentionally or recklessly disturbing of a bat in its place of rest (roost), or which is used for protection or rearing young; • Deliberately or recklessly damaging, destroying or obstructing access to any resting place or breeding area used by bats; • Deliberately or recklessly disturbing a bat in any way which is likely to significantly affect the local populations of the species, either through affecting their distribution or abundance, or affect any individuals ability to survive, reproduce or rear young; • Possession or advertisement/sale/exchange of a bat (dead or alive) or any part of a bat. In England, licences are issued by Natural England for any actions that may compromise the protection of a European protected species, including bats, under the Habitats Regulations 2010 (as amended). This includes all developments, regardless of whether or not they require planning permission. Bats are also protected by the Wild Mammals (Protection) Act 1996 and selected species were listed on the former UK Biodiversity Action Plan (BAP)

Species	Key Legal Protection
	and Durham Local BAP (LBAP).
Great crested newt	Great crested newts are protected under European and British law, having the same level of protection as bats (see above). Licences are issued by Natural England for any actions that may compromise the protection of this species, under the Habitat Regulations 2010 (as amended). This includes all developments, regardless of whether or not they require planning permission. The species was also listed on the UK and Local BAPs.
Otter	Otter are again protected under European and British law and receive the same level of protection as bats (see above.) The species is listed under Annex II and IV of the Habitats Directive, which is implemented in Britain under The Conservation of Habitats and Species Regulations 2010 (as amended). Otter are also protected under Schedules 5 and 6 of the WCA 1981, The Wild Mammals (Protection) Act 1996 and are listed as a priority species in Appendix II of the Bern Convention. The species was also listed on the UK and Local BAPs.
Water Vole	Water voles are protected under Schedule 5 of the WCA 1981 (as amended). This makes it an offence to: • Intentionally kill, injure of take water voles; • Possess or control the species; • Damage or destroy any place used by water vole for shelter or protection; • Disturb water vole while they occupy such places of shelter; • Sell, possess or transport water vole for the purpose of sale; and • Advertise the buying or selling of water vole. The species is also protected under the Wild Mammals (Protection) Act 1996 and was listed on the UK and Local BAPs.
Birds	The majority of bird species, with the exception of some species listed on Schedule 2, are protected under the WCA 1981 (as amended). This makes it an offence to intentionally or recklessly: • Kill, injure or take any wild bird; • Take, damage or destroy any nest which is in use or being built; and • Take, damage or destroy the eggs of any such bird. Additional protection against disturbance whilst at the nest is also afforded to any bird species, whether an adult bird or their dependant young, which is listed on Schedule 1 of the Act. Certain species were also listed as being of priority conservation importance on the UK and Local BAPs.
Badger	Badger are protected under the Protection of Badgers Act 1992, which makes it an offence to: • Knowingly kill, capture, injure or disturb any individual; • Intentionally damage or destroy a badger sett, or any part thereof; • Obstruct access to an area which is used for breeding, resting or shelter; and

Species	Key Legal Protection
	• Disturb a badger while it is using any place used for breeding, resting or shelter. The species is also protected by the Wild Mammals (Protection) Act 1996 and was listed on the Durham LBAP.
Reptiles	Common reptiles (grass snake, adder, common lizard and slow-worm) receive partial protection under the WCA 1981, which makes it an offence to: • Intentionally or recklessly kill or injure these species; and • Sell, offer or advertise for sale, possess or transport for the purposes of sale these animals, whether alive or dead, or any part thereof. In addition, smooth snake and sand lizard are listed on both the WCA 1981 and The Conservation of Habitats and Species Regulations 2010 (as amended), which makes it an offence to: • Intentionally or recklessly kill, injure, capture, disturb or handle these species; • Intentionally or recklessly damage or destroy any place used by these species for shelter, protection, resting or breeding; and • Intentionally or recklessly obstruct access to any place used for shelter, protection, resting or breeding by these species. All 6 species of native reptile are listed on the UK BAP and Local BAP.

1.2.3 Non-Statutory Information

1.2.3.1 UK Post-2010 Biodiversity Framework

The UK Post-2010 Biodiversity Framework has been devised to fulfil the UK Government's role in conserving biodiversity as set out in the Strategic Plan for Biodiversity 2011-2020 and the implementation of the Convention of Biological Diversity in the UK. The UK Biodiversity Framework focuses "on managing the environment as a whole" with England, Northern Ireland, Scotland and Wales working as one.

The work carried out under the former UK Biodiversity Action Plan (UK BAP) is focussed within the UK Biodiversity Framework. For the purpose of this report, species are classified under the former UK BAP. Avian species listed under the UK BAP are currently included under the UK Biodiversity Framework and include 59 species, a number of which have the potential to be present on a site such as this.

The UK BAP is implemented at a local level through Local BAPs (LBAPs). The Durham LBAP is the relevant plan for this site, as this LBAP covers Durham, Gateshead, South Tyneside and Sunderland. Bird species included on the UK and/or LBAP are considered within the surveys and subsequent ornithological assessment for this site.

1.2.3.2 Birds of Conservation Concern, as Designated by the Birds of Conservation Concern (BoCC) Partnership

In 2002 the RSPB published a colour-coded list of UK bird species to indicate their level of national conservation status/importance, which was updated in 2009 to reflect changes in population status (Eaton *et al*. 2009). Those species on the Red List are of high conservation concern, meeting at least one of the following criteria:

- Globally threatened;
- Historical population decline during 1800-1995;
- Rapid contraction of the UK breeding range (50% or more during the last 25 years); and
- Rapid decline in the UK breeding population (50% or more during the past 25 years).

Those species of moderate conservation concern are included on the Amber List, and meet at least one of the following criteria:

- Historical population decline during 1800-1995, but now recovering, with the population size having more than doubled over the last 25 years;
- Moderate (25-49%) decline in the UK breeding population over the last 25 years;
- Moderate (25-49%) contraction of the UK breeding range over the last 25 years;
- Moderate (25-49%) decline in the UK non-breeding population over the last 25 years;
- Species with unfavourable conservation status in Europe (SPEC = Species of European Conservation Concern);
- Five-year mean of 1-300 breeding pairs in the UK;
- 50% or more of the UK breeding population in 10 or fewer sites, but not rare breeders;
- 20% or more of European breeding population in the UK; and
- 20% or more of the NW European (wildfowl), East Atlantic Flyway (waders) or European (others) non-breeding populations in the UK.

Those species on the Green List are of lowest conservation concern, there being no identified threat to the species population status at present.

2 The Proposed Development

This section provides a brief summary of the location of the site and the reasons for survey.

2.1 The Site and Locality

The site lies to the south of Sunderland, to the south of Ryhope, Tunstall and Doxford Park, around approximate central OS grid reference NZ 378 517. The North Sea coast lies approximately 0.3km east of the site at the closest point, while the Sunderland/Durham boundary forms part of the southern site boundary. The location of the site is shown in Figure 1.

Figure 1: Location of the Sunderland South Development Site

Image produced under licence from Google Earth Pro. The red line delineates the indicative site boundary while the yellow line shows an approximate 2km buffer zone around the site.

Due to the varied nature of the habitats within the survey area, the site has been divided into 5 distinct sections for the purposes of this report. The location of each section is shown in Figure 2 (Appendix 1).

2.2 Scale of the Development

SCC propose to develop a strategic plan for the area, which is likely to be redeveloped for housing over an anticipated 20 year period. Based on current proposals, up to 3,500 residential units may be located on the site, which are likely to be constructed by a number of developers.

3 Survey and Assessment Methods

3.1 Desktop Survey

Prior to the commencement of surveys at the site, consultation data was requested from a range of local and statutory bodies, in order to obtain further information regarding the presence and distribution of protected species, habitats and sites within the survey site and surrounding area. The following bodies were consulted in order to obtain such information:

- Natural England;
- Durham Bat Group;
- Durham Bird Club;
- The Royal Society for the Protection of Birds (RSPB); and
- Environmental Records Information Centre for the North East (ERIC North East).

A desk-top search/assessment was also carried out using the following web resources:

- The Government's Multi-Agency Geographic Information for the Countryside or 'MAGIC' website, which provides details of statutory sites designated for their ecological interest and identifies areas listed on the Grassland Inventory and National Inventory of Woodland and Trees;
- Natural England's Nature on the Map website which provides details of nationally and internationally designated sites and habitats listed as being of priority importance on the UK BAP, where data permits;
- The Amphibian Atlas of North East England (J.Durkin, 2010) which contains distribution maps showing the key areas of distribution for native amphibians throughout the region;
- The Reptile Atlas of North East England (J.Durkin, 2010) which contains distribution maps showing the key areas of distribution for reptiles throughout the region;
- The relevant Ordnance Survey maps, in order to gain an overview of the types of habitat likely to be present within the site and surrounding area prior to carrying out the site surveys; and
- Google Earth Pro, which provides aerial photographs of varying quality for different parts of England (and the world), in order to gain further information regarding the types of habitat likely to be present within the site and surrounding area prior to carrying out the site surveys.

A series of documents provided by SCC, including an existing phase 1 map of the site, were also reviewed prior to the commencement of surveys, along with incidental records for the area around Ryhope Dene which were provided by John Durkin Ecology.

3.2 Site Survey

3.2.1 Habitats

An initial survey of the site was undertaken on 12th February 2013, during which the existing phase 1 map of the site was checked for accuracy following the Phase 1 survey methodology outlined in the 2007 edition of the 'Handbook for Phase 1 habitat survey' by the Joint Nature Conservation Committee (JNCC). This allows habitats and boundary features to be mapped by a trained surveyor following a standardised system which can be easily interpreted. Target notes were used to record further information regarding features of interest or specific habitats and species identified during the survey.

The weather conditions at the site at the time of survey were as follows:

Table 3: Weather Conditions during the Extended Phase 1 Survey

Survey Date	Cloud Cover (%)	Precipitation	Temperature	Wind
12/02/13	90	Occasional snow/sleet showers	3°C	F1

The Phase 1 map of the site is shown in Figure 3, Appendix 1.

3.2.2 Protected Species

During the Phase 1 survey a note was made of any field signs indicating the presence of those protected species listed in the table in section 2.2.2, or those species of conservation concern (former BAP species) and the location of these signs was mapped. A record was also made of any other animal species identified within the site or adjacent areas during the survey and an assessment of the suitability of the habitats for protected species was carried out, to identify any potential impacts upon such species or requirements for further survey.

3.2.2.1 Bats

Habitat Assessment

An initial survey of the site was undertaken on 12th February 2013, which included an assessment of the potential suitability of the site for bats using the criteria set out in the Bat Conservation Trust (BCT) Survey Guidelines, as shown below.

Table 4: BCT Guidelines for Assessing the Value of Habitats for Bats.

Feature	Value
Evidence indicating that a structure/feature is used by bats, such as: • Bats seen roosting or emerging/entering a structure/ feature; • Field signs such as droppings, feeding remains or carcasses found; and/or • Bats heard calling or 'chattering' within a roost. Bats recorded/observed using an area for foraging or commuting	Confirmed Roost
• Site is close to known roosts • Site is connected with the wider landscape by strong linear features that would be used by commuting bats e.g. river/stream valleys or hedgerows • Habitat of high quality for foraging bats e.g. broadleaved woodland, tree-lined watercourses, parkland • Buildings, trees or other structures e.g. mines, caves, tunnels, ice houses and cellars, with features of particular significance for roosting bats	High Value Habitat ↓
• Site is connected with the wider landscape by linear features that could be used by commuting bats e.g. lines of trees and scrub or linked back gardens • Habitat could be used by foraging bats e.g. trees, scrub, grassland or water • Several potential roosts in the buildings, trees or other structures	↓
• Isolated site not connected by prominent linear features (but if suitable foraging habitat is adjacent it may be valuable if it is all that is available • Isolated habitat that could be used by foraging bats e.g. a lone tree or patch of scrub, but not parkland • Small number of potential roosts generally of lower conservation importance e.g. probably not maternity roosts or hibernacula	↓
• No features that could be used by roosting bats for foraging, roosting or commuting.	Low Value Habitat

The above criteria were used to provide a guide as to the potential suitability of the site for bats. It is important to note that an absence of potential commuting routes or 'good quality' foraging areas around a site cannot be used to confirm the absence of bats from a site. Bats are highly mobile animals which will use different habitats at different times

of the year, therefore an appropriate level of additional survey work must be carried out in order to determine if and how bats utilise a particular site.

The broad suitability of the habitats within the site and surrounding area for bats was assessed using the results of the Phase 1 survey, the desk study and the criteria outlined above.

Building Surveys

Structure/Field Sign Survey

An initial inspection was made of the external areas of each building/structure within the site on 12th February 2013. Notes were made regarding the structure (height, buildings materials, loft structure etc.), approximate age (where possible) and condition of the building in order to identify any areas which may allow bats access or features with the potential to be used as a roost site. Where such features/areas were recorded these were searched for evidence indicating the presence of bats, including droppings, staining, feeding remains or bats themselves. A Batbox Duet bat detector linked to an mp3 recorder was carried at all times during the survey to help pick up the calls of any bats present and, if recorded, aid with determining the roost location and identification of the species present.

Bats will roost in different features/structures/buildings depending on their requirements at different times of the year, including:

- Cool roosts – may be used regularly or intermittently by bats at times when bats are not mating, rearing young or hibernating (or by non-breeding individuals during the maternity period).
- Maternity roosts – used to rear young, typically between mid-May and mid-August inclusive. The majority of adult bats within such roosts are female, although smaller numbers of male bats are sometimes present.
- Swarming/mating roosts/lek sites – bats mate in the autumn and use a variety of sites for such purposes. This includes a number of caves where large numbers of bats are known to 'swarm' during the autumn period; although the exact purpose of this behaviour is not yet fully understood, it is believed that such sites are a meeting place for display and mating. Other species, including noctules and some pipistrelle bats are known to use lek sites, where males call loudly from a fixed position (such as a tree) in order to attract females.
- Hibernation roosts – British bats hibernate over the winter period (normally October to March inclusive, depending on weather conditions) and require relatively cool but stable air temperatures to do so. Specific hibernation roost sites are therefore used over the winter period.
- Feeding roosts – species such as brown long-eared bats, which typically feed on larger prey such as moths, will often use specific roosts or perches overnight while feeding. After catching their prey, the bat will return to the roost/perch in order to dismantle and consume them, often leaving small piles of moth wings on the ground beneath.

As bats will use different roosts at different times of the year (sometimes including different roost types within a single structure), the survey included an assessment of the likely potential use of the building at times throughout the year.

Activity Surveys

Two activity surveys were carried out on the bridge within Cherry Knowle Dene which was considered to have the potential to support roosting bats, comprising one dusk and one dawn surveys as follows:

Table 5: Conditions during Activity (Building) Surveys.

Date	Sunset/ Sunrise Time	Survey Start Time	Survey End Time	Start/ End Temp. (°C)	Wet/ Dry?	Wind (Beaufort Scale)	Cloud Cover (%)
17.06.13	21:47	21:30	23:00	14	Dry	Still	40
23.08.13	05:54	04:00	06:00	15	Dry	Still	30

Surveyors were positioned on either side of the structure to watch for bats emerging/entering the structure and allow a comparison of flight-lines between different surveyors to help identify potential roosts in other locations. Each surveyor used a Batbox Duet detector linked to a recording mp3 player to identify bats and allow subsequent analysis of calls where necessary. All bats were identified to species level in the field wherever possible.

Bat activity during the surveys was recorded on field sheets detailing the time, any bat emergence/entrance points, the number of bats, species (where possible), key flight-lines and foraging areas. A note was also made of any other activity recorded, such as chasing or social calling, and the times at which the light levels were considered suitable for bats to be expected to be emerging from or entering their roosts.

Tree Surveys

Risk Assessment

An assessment was made of the suitability of the trees within the site to support roosting bats. This involved inspecting each tree and making a note of the species, approximate height, diameter at breast height (DBH) and any features e.g. holes, splits in the trunk or limbs, flaking bark, areas covered by ivy, which may provide bats with roosting opportunities. Each tree was inspected from the ground using binoculars, with higher areas accessed using extendable ladders if necessary/safe to do so.

Where any field signs indicating the presence of bats, or bats themselves were recorded, a note was made of the location of the roost. Where roosts were not confirmed, each tree was graded according to its potential to support roosts, the risk of roosts being present being classified as negligible, low, moderate or high.

Activity Surveys

Where trees were identified through the risk assessment as having a high risk of supporting roosting bats, activity surveys were carried out in order to provide more information regarding their potential use by bats. This included three dusk surveys and a dawn survey, as follows:

Table 6: Conditions during Activity (Tree) Surveys.

Date	Sunset/ Sunrise Time	Survey Start Time	Survey End Time	Start/ End Temp. (°C)	Wet/ Dry?	Wind (Beaufort Scale)	Cloud Cover (%)
17.06. 13	21:47	21:30	23:00	14	Dry	Still	40
06.06.13	21:39	21:30	22:40	13	Dry	F2	90
23.08.13	05:54	04:00	06:00	15	Dry	Still	30
23.09.13	19:02	18:50	20:15	16	Dry	Still	90

As with the building/structure surveys, surveyors were positioned close to the trees to watch for bats emerging from/entering a roost and record other activity, such as foraging or commuting. Each surveyor used a Batbox Duet detector linked to a recording mp3 player to identify bats and allow subsequent analysis of calls where necessary. All bats were identified to species level in the field wherever possible.

Bat activity during the surveys was recorded on field sheets detailing the time, any bat emergence/entrance points (if possible), the number of bats, species (where possible), key flight-lines and foraging areas. A note was also made of any other activity recorded, such as chasing or social calling, and the times at which the light levels were considered suitable for bats to be expected to be emerging from or entering their roosts.

Site Activity Surveys

Remote Monitoring

Ten Wildlife Acoustics SongMeter 2 (SM2) detectors were placed in locations across the site in order to monitor bat activity in this area throughout the night. Data was recorded over 48 nights between:

- 24th – 30th April;
- 20th – 28th May;
- 17th – 24th June;
- 2nd – 8th July;
- 5th – 12th August;
- 2nd – 9th September; and
- 3rd – 10th October 2013.

Detectors were placed in areas likely to be of both high and low value to bats to allow a comparison to be made between the use of different habitats. The data was used to quantify the levels of bat activity across the area and provide an indication of which species, if any, may be affected by the development.

The location of each kit is described below and shown in Figure 4, Appendix 1.

Table 7: Habitat Descriptions for Remote Monitoring Kit Locations.

Location No.	Habitat Description
1	Kit 1 was located in the west of the site on the 'V' shaped tree line. Looks to have good connectivity with the residential areas and surrounding fields.
2	Kit 2 was located on the edge of Blakeney Woods, which has good connectivity with the surrounding area.
3	Kit 3 was on gappy hedgerow along Burdon Lane. Habitats along Burdon Lane vary; the hedgerows are gappy and often consist of scattered scrub and defunct fence lines.
4	This kit was placed along a gappy field boundary. This location is quite open and exposed, being slightly elevated.
5	Kit 5 was placed in immature plantation (tree guards still in place) to the west of Eltham Road, with an understorey of coarse grassland and tall ruderal vegetation.
6	This kit was located within gappy hedgerow along Burdon Lane.
7	Kit 7 was placed inside the grounds of Ryhope Engines Museum. The habitats here consist of amenity grassland and mature broadleaved trees, with two large reservoirs of water.
8	This kit was placed just within the trees in Cherry Knowle Dene, to the south east of the hospital.
9	Kit 9 was placed along the tree/field boundary of Ryhope Dene, to the south of the eastern survey section.
10	This kit was located near the roundabout to the north of the eastern survey section. This location is quite exposed with an arable field to the south and a road to the north.

Transects

A series of seven transect surveys were undertaken at the site to assess the levels of bat activity within different areas, identify potentially important foraging or commuting routes and provide an indication of which species, if any, are present within the broader site. The transects were established along linear features, such as hedgerows, woodland edges or river corridors which provide potentially suitable habitat for foraging or commuting bats, as well as areas of more open land which dominate the survey area. Although the majority of bats tend to stay close to linear features such as hedgerows when commuting, some of the larger species, such as noctules, will readily cross and forage within areas of open land.

Each transect was walked by two surveyors who used Batbox Duet detectors linked to recording mp3 players to assess and record bat activity. In order to allow for potential variations in the use of different areas of the site by bats at different times, the order in which the transects were walked was varied on each occasion.

Details of the surveys were as follows:

Table 8: Conditions During Activity (Transect) Surveys.

Date	Sunset/ Sunrise Time	Survey Start Time	Survey End Time	Temp. (°C)	Wet/ Dry?	Wind (Beaufort Scale)	Cloud Cover (%)
29.04.13	20:29	20:25	22:30	10	Dry	F3	5
03.05.13	05:22	03:00	05:00	10	Dry	F1-2	80
19.06.13	21:46	21:30	23:30	13	Dry	F1	25
24.07.13	05:00	03:00	05:00	16	Brief shower at start	F1	100
20.08.13	20:30	20:30	22:00	16	Dry	F1	90
26.09.13	19:15	19:00	20:30	13	Dry	F1	95
02.10.13	18:39	18:00	20:30	13	Dry	F1-2	95

Analysis of Results

Duet Detectors

Where necessary, recordings made using the Duet bat detectors were analysed after the survey using version 4.03 of the Bat Sound software. The programme was used to help confirm the identification of the different bats recorded to species level wherever possible, using sonograms and power spectra of the calls recorded during the activity surveys, along with the measurements of a range of variables such as inter-pulse interval, minimum and maximum frequencies and pulse length. The programme can also be used to identify other behaviour through the calls, such as foraging or social calling.

It should be noted that even when calls are recorded, it is not always possible to identify bats to species level. Different genera, such as *Pipistrelle* sp. and *Myotis sp.*, can usually be separated with a good degree of confidence, and the different pipistrelle bats can usually be identified to species level. However, many of the *Myotis sp.* of bats have very similar ultrasound calls which can be difficult to separate and some species, such as whiskered and Brandt's bats are almost impossible to differentiate except in the hand. The same can be true for the three species of 'big' bat – noctule, Leisler's and serotine (*Nyctalus/Eptesicus* sp.) - which can again have relatively similar calls, or for species with very quiet ultrasound calls, such as brown long-eared bats (*Plecotus auritus*) due to the difficulty in obtaining a strong enough recording to confirm the assessment. Where there is a degree of uncertainty in the identification to either genera or species level, this is noted within the text.

SM2 Detectors

The results of the remote SM2 surveys were analysed using version 3.5m of the AnalookW software. This again allows factors such as the inter-pulse interval, peak, maximum and minimum frequencies and pulse lengths of the calls recorded to be analysed in order to identify different species. The programme can also be used to identify other behaviour through the calls, such as foraging or social calling.

Assessment

The table below provides a broad indication of the status of different native bat species within the UK.

Table 9: Status of Native Bat Species within the UK.

Bat Species	Distribution	Status
Greater horseshoe*	Confined to south west England and south and west Wales	Very rare and threatened
Lesser horseshoe*	Wales, south west England and western Ireland	Rare (but currently increasing in no.); threatened
Bechstein's*	Confined to central to southern England and Wales	Very rare; threatened
Natterer's	Widespread throughout much of the UK, except the far north of Scotland	Common; not threatened
Daubenton's	Widespread throughout the majority of the UK	Common; not threatened
Whiskered/Brandt's	Common in north and west England, rare elsewhere	Locally common; not threatened
Alcathoe's	First recorded in caves in Yorkshire & Sussex in 2010 – distribution currently unknown, but likely to be under-recorded due to similarities with whiskered/Brandt's	Status currently unknown
Greater mouse-eared	Single individual currently known from southern England	Status currently unknown; at one time considered extinct in Britain
Serotine	Restricted to southern England and Wales	Uncommon
Noctule*	Found as far north as Central Scotland, but absent from northern Scotland and Ireland	Uncommon; threatened
Leisler's	Scattered throughout England and into south west Scotland.	Scarce in Great Britain; Common in Ireland.
Common pipistrelle	Widespread throughout the UK	Common; not threatened
Soprano pipistrelle*	Widespread throughout the UK	Common; threatened
Nathusius' pipistrelle	Found throughout Britain and Ireland, but not common	Rare
Brown long-eared*	Widespread throughout the UK	Common; threatened
Grey long-eared	Restricted to south Devon and coastal areas of Dorset and west Sussex. More common on the Isle of Wight and Channel Islands	Very rare
Barbastelle*	Restricted to southern England and Wales	Rare; threatened
* UK BAP Species		

3.2.2.2 Great Crested Newts

Six extant ponds were identified within 500m of the proposed works area by the Phase 1 survey, which were considered to have the potential to support great crested newts. Surveys for the species were undertaken at the site in 2013 by TNEI Services Ltd., following the methods outlined in the Great Crested Newt Mitigation Guidelines and the Great Crested Newt Conservation Handbook.

The ponds were located as described in the table below and as shown in Figure 5, Appendix 1:

Table 10: Pond Locations at Sunderland South.

Pond	1 - Plantation Edge Pond	2 - Blakeney Woods Pond	3 - Northern Pond	4 - Southern Pond	5 - Thristley House Pond	6 - Burdon Hall Pond
Approx. OS Grid Reference	NZ 374 514	NZ 379 517	NZ 403 525	NZ 404 524	NZ 379 512	NZ 388 513

Habitat Suitability Index (HSI)

The potential suitability of each of the waterbodies within the site was assessed on 12th February 2013 using the HSI methodology. This uses 10 factors, including geographic location of the pond, pond permanence, size, the degree of shading, macrophyte cover and water quality, to assign each waterbody a value between 0 and 1. The higher the score a pond achieves, the higher quality habitat it is considered to provide for breeding great crested newts. Although the lowest score recorded by Oldham *et al*. for a pond supporting great crested newts was found to be 0.43, the potential presence of the species cannot be ruled out completely using this method alone.

The following categories are used to describe each pond's potential suitability for great crested newts, based on the HSI score:

Table 11: Pond Suitability Based on HSI Score

HSI Score	Predicted Presence
0.00 - 0.49	Poor
0.50 - 0.59	Below Average
0.60 - 0.69	Average
0.70 - 0.79	Good
0.80 - 1.00	Excellent

Breeding Season Surveys

Four breeding season surveys were completed on each pond, as follows:

Table 12: Conditions during Great Crested Newt Surveys

Survey Area	Survey Date	Cloud Cover (%)	Precipitation	Temperature	Wind
Ponds 1-4	30/04/13	95	Dry	7°C	F1
Pond 5	07/05/13	70	Dry	8°C	F1
Ponds 1-5	10/05/13	30	Dry	12°C	F1
Ponds 1-5	16/05/13	95	Dry	8°C	F1
Ponds 1, 3-5	03/06/13	15	Dry	13°C	F1

Access was not available to the pond at Thristley House at the time of the first survey visit on 30th April 2013, therefore this pond was covered separately on 7th May 2013. The waterbody located within the south of Blakeney Woods was found to have dried out by the final survey visit on 3rd June 2013.

A small pond shown to the west of Burdon Hall on some of the OS maps was found to be dry prior to the start of surveys and did not appear to have held water for some time; this feature was therefore discounted from the field surveys. Access was not available to the large waterbody to the east of Burdon Hall however, the feature lies almost 500m from the main survey boundary and is largely surrounded by high stone walls; the risk of great crested newts being present in the feature and entering the main survey area is therefore considered to be low.

Three methods were used to survey for the species wherever access and conditions permitted, as follows:

Torching

Each of the ponds was torched between approximately 1 hour after sunset and midnight, in order to search for displaying or egg-laying adults. Clubman CB2 Clu-lights were used to carry out the torch surveys, which have a power of 1,000,000 candle power, therefore extra care was taken to avoid prolonged disturbance of any amphibians found. A single circuit was made of each pond by 2 surveyors, both starting and ending in the same location and moving around the pond in opposite directions to avoid duplicating the results. This method was used to obtain counts of the maximum number of each amphibian species recorded at any one time, with the sex of each newt also noted where possible.

Netting

A dipnet with 2mm mesh was used to carry out netting surveys of each of the ponds in areas away from waterbird[1] nests. Surveys were carried out for 15 minutes per 50m of pond shoreline and the species and sex of any amphibians caught was noted. These surveys were also used to provide an indication of the relative water quality of each of the ponds, by briefly examining any invertebrates caught in the net.

[1] Wildfowl (swans, geese & ducks), seabirds, waders including herons and gulls.

Egg Searching

Submerged vegetation within each of the ponds was examined where safe access allowed and where this could be reached without disturbing any breeding waterbirds. Any folded leaves seen were gently opened to check for eggs and a note made of the species to which the egg belonged. If great crested newt eggs were recorded, egg-searching was terminated to avoid needlessly disturbing further eggs (as breeding had already been proven) and potentially reducing their chances of survival.

3.2.2.3 Otter

An initial assessment of the suitability of the habitats within the site and surrounding area for otter was made at the time of the Phase 1 survey on 12th February 2013, which included a species-specific otter survey of areas of suitable habitat. A checking survey for the species was completed on 3rd October 2013 using the same methods. The survey aimed to determine the presence/absence of the species. Field signs searched for included spraint, paths, footprints, feeding remains, couches/lying-up sites and holts, as well as sightings of the species itself. The length of the watercourses were walked in order to search for such field signs and checks were made of any areas of standing water which may also be suitable for use by the species.

3.2.2.4 Water Vole

Initial water vole surveys were carried out on 12th February 2013 as part of the phase 1 survey of any watercourses/waterbodies identified as having the potential to support the species. This was followed by a series of checking surveys throughout the summer period, completed in conjunction with some of the bat work at the site, and a final species-specific survey on 3rd October 2013. The surveys were designed to assess the suitability of such features for water vole and to determine the presence or absence of the species within the site or adjacent areas. Field signs searched for included droppings, latrines, feeding stations/remains, lawns, nests, footprints, runways, burrows and sightings of the animals themselves. A characteristic 'plop' noise is also typically heard when water voles enter the water, which can also be used as an indication of the presence of the species at a site.

3.2.2.5 Badger

The suitability of the site for badger was determined during the Phase 1 survey, during which a note was made of any field signs recorded such as tracks, latrines, hair (which is often caught on fences), footprints, snuffle holes, bedding, trails or setts. This was followed by a species-specific survey to provide more detailed information regarding the use of the site by badger, including checks of former known sett locations on 3rd October 2013.

During the species-specific survey the site and those areas immediately adjacent were systematically searched for signs of badger activity. Linear features, such as hedgerows or fence lines, were walked and searches were made of potentially suitable habitats for sett creation or foraging, such as areas of woodland or scrub. A record was made of the location of any field signs recorded, including setts, using GPS co-ordinates where possible.

Any setts recorded were classified as one of the following four types:

- Main sett – large number of entrance holes with large spoil heaps, and generally appears to be well-used. Paths tend to link the entrance holes together and run

out into the surrounding area. Generally used year-round, although they may become disused, for example as a result of excessive disturbance.

- Annex sett – lies close to a main sett (normally less than 150m away) and is usually connected to this feature by obvious paths. Several holes are usually present, but are not in constant use.
- Subsidiary sett – typically only has a few entrances, lies over 50m from the main sett and lacks obvious paths connecting them to other setts. Used occasionally.
- Outlier sett – normally only has a small number of holes (1 or 2) with little spoil outside. There are no obvious paths linking them to other setts. Used infrequently/sporadically.

A note was made of the number of holes in each sett and the level of use of each hole (well-used, partially used or disused), as well as any other field signs associated with this feature.

3.2.2.6 Brown Hare

Three surveys for brown hare were completed, comprising monthly transects in each of October, November and December 2013, once crops had been cut back in order to aid with visual detection of the species. Transects were walked along pre-determined routes, counting the number of hares seen and estimating their perpendicular distance (when first seen) from that route. This data was then used to determine the density of hares by multiplying the length of the transects by the average perpendicular distance to those hares recorded. Other field signs confirming the presence of the species, such as droppings or forms were also mapped. The transect routes are shown in Figure 6, Appendix 1. Conditions during the surveys were as follows:

Table 13: Conditions during Brown Hare Transects

Survey Date	Cloud Cover (%)	Precipitation	Temperature	Wind	Survey Timing
10/10/13	80-100	Occasional showers (surveys only completed when dry)	7-10°C	F2-4 (gusts)	Afternoon
18/11/13	80	Dry	6-8°C	F1	Early morning & dusk
04/12/13	30	Dry	6-10°C	F1	Early morning & dusk

3.2.2.7 Birds

All bird species detailed within this report follow the sequence and taxonomy recommended by the British Ornithologists' Union (BOU) (Gill & Donsker 2010). Bird names used differ from those recommended by the BOU in that they follow the British (English) vernacular names in common usage by birders and ornithologists in the UK. These vernacular names are also detailed in Gill & Donsker (2010) and listed in Appendix

5. The raw survey data is not presented within this report. However, digital survey data is stored at TNEI for future analysis if required.

All waterbirds[2] and other species of conservation concern were mapped on to enlarged 1:25,000 Ordnance Survey maps and digitised using ARCGIS 10. All surveys were undertaken using Swarovski EL 10x42 or 8.5x42 binoculars, and Swarovski ATS 80 or Kowa TSN-883 telescopes. During the nocturnal surveys a pair of Yukon Ranger Pro 5x42 image intensifier binoculars was used.

During the course of the surveys, disturbance events (*i.e.* dog walkers and cyclists) were logged.

The dates, times and weather conditions for the ornithological surveys are detailed in Appendix 4.

Breeding Birds

Survey Area

The survey area was extended beyond the indicative site boundary to fully assess potential ornithological issues associated with the proposed development. The survey area includes land adjacent to the site that is considered to have the potential to be affected by the proposed development. The survey area thus includes the area within the indicative site boundary plus a 200m buffer zone (where access was granted), with these areas being shown in Figure 7, Appendix 1.

Survey Methods

Breeding bird surveys of the site were carried out during the period of April to June 2013, within the indicative site boundary, and the 200m buffer zone (hereon referred to as the 'Survey Area'), where access was available. Adjacent housing estates and farmland to the south of Ryhope Dene were not surveyed. The territory mapping (Common Bird Census) methodology was used and full details of this methodology can be found in both Gilbert *et al*. (1998) and Bibby *et al*. (2000).

The primary aim of the survey was to identify all breeding territories of all bird species within the survey area.

High and Low Tide Surveys

Survey Area

The survey area was extended beyond the indicative site boundary to fully assess potential ornithological issues associated with the proposed development. The survey area included land adjacent to the site that is considered to have the potential to be affected by the proposed development. The survey area was separated into two sectors, as shown in Figure 7, Appendix 1:

- The site – includes the area within the indicative site boundary plus a 200m buffer zone; and
- The coast – includes the eastern section of the site survey area and land along the Durham coastline within 1km of the indicative site boundary.

[2] Swans, geese, ducks, divers, cormorants & shags, waders, including herons, and gulls.

Nocturnal High Tide Surveys

Nocturnal high tide surveys were undertaken on a monthly basis between January and December 2013 inclusive. The survey's primary aim was to record all roosting waterbirds within the site and the coast survey area. Due to the reduced visibility conditions experienced at night, bird sightings were recorded to genus or large/small wader when species level could not be determined. Owls and other species of conservation concern were also recorded.

Diurnal High Tide Survey

A total of twelve diurnal high tide surveys were undertaken in order to log species and their abundance within the coast survey area throughout the year. Surveys were conducted two hours either side of high tide as per the standard Wetland Bird Survey (WeBS) methodology (Gilbert *et al*. 1998). The survey's primary aim was to record all waterbirds roosting within the coast survey area. The observer undertook four complete counts[3], roughly hourly over the survey period, mapping waterbirds, roost locations and disturbance events. Full details of the dates, times, weather conditions, high tide times and surveyors are shown in Appendix 4.

Diurnal Low Tide Survey

A total of twelve diurnal high tide surveys were undertaken in order to log species and their abundance within the coast survey area throughout the year. The survey's primary aim was to record all waterbirds foraging and roosting within the coast study area. Six complete counts[4], roughly hourly, were undertaken during each survey visit. Surveys were conducted three hours either side of low tide. Full details of the dates, times, weather conditions, low tide times and surveyors are shown in Appendix 4.

Winter Walkover Surveys

Monthly winter walkover surveys were undertaken in order to record bird activity within the site and 200m buffer (where access is available) between January to March 2013 and October to December 2013. Visits were undertaken around high tide where possible, thus also providing additional data on roosting species within the indicative site boundary. This type of survey is particularly useful in detecting the presence of protected birds, such as those listed on Annex 1 of the EC Birds Directive, Schedule 1 of the Wildlife and Countryside Act 1981 and Red-listed Birds of Conservation Concern. Survey consisted of walking a route across the site designed to maximize coverage of the site and to approach landscape features of particular ornithological importance. During the walkovers, the surveyor periodically scanned for birds and stopped to listen for calls, recording results using a territory mapping methodology based on the British Trust for Ornithology (BTO) Common Bird Census (CBC) methodology. Full details of the methodology used can be

[3] Excluding April and July when the survey area was walked twice during each survey.

[4] Excluding April, May and July when the survey area was walked three times during each survey.

found in both Gilbert *et al.* (1998) and Bibby *et al.* (2000). Full details of the dates, times, weather conditions, high tide times and surveyors are in Appendix 4.

3.2.3 Personnel

Surveys and assessments were led by Claire Snowball BSc MSc MCIEEM of TNEI Services Ltd., who has extensive experience of carrying out Phase 1, NVC and protected species surveys, including work on bats, great crested newts, freshwater pearl mussels, white-clawed crayfish, otter, water vole, badger, reptiles, red squirrel and a range of BAP species, including brown hare and a range of Lepidoptera. Claire has worked as an ecologist since 2005, is licensed to carry out bat and great crested newt surveys throughout Great Britain and holds a number of Schedule 1 (bird) licences.

Assistance with the surveys and assessments was provided by Hannah Stephenson BSc MSc ACIEEM, who has worked as an ecologist at TNEI since 2011. Hannah undertakes habitat and protected species surveys throughout Great Britain and has experience of working with bats, great crested newts, white-clawed crayfish, otter, water vole, brown hare and reptiles. She is licensed to work with bats and great crested newts throughout Great Britain.

The bat transect surveys were designed and led by Claire Snowball, with assistance being provided by Hannah Stephenson, Matthew Lambert BSc MSc MCIEEM (Natural England bat licence holder), Colin Bell (Natural England license trainee with 6 years experience of working with bats), Adrian George (Natural England license trainee with 2 years experience), Kate Snowball (8 years experience), Adam Little (8 years experience), Claire Hughes (5 years experience), Chris Haggon (2 years experience), Malcolm Snowball (1 year experience), Chelsea Ogle (1 year experience), Will Locking (1 year experience) and Alice Johnson (1 year experience). Survey pairs were led by surveyors with at least 5 years experience of working with bats in a wide range of habitats throughout Great Britain; roost activity surveys were completed by surveyors with a minimum of 5 years experience.

Ornithological surveys and assessments were completed by Adrian George BSc MCIEEM, Paul Massey BSc MCIEEM and Andrew Kinghorn BSc.

Adrian is a highly skilled ornithologist with over 27 years field experience, who designs and undertakes surveys and assessments to inform a wide range of development works. Recent work has included surveys and assessments of the ornithological interests of a number of Special Protection Areas (hereon referred to as SPAs) and Sites of Special Scientific Interest (hereon referred to as SSSIs) including Morecambe Bay, Eden Estuary, Duddon Estuary and Northumberland Coast. Adrian has also undertaken surveys and assessments and acted as the Ecological Clerk of Works for a series of proposed wind farms, power stations, large business parks and marinas, spread between southern England and the Scottish Highlands. Adrian holds a range of Schedule 1 (bird) licenses for work in England and Scotland and participates in the BTO ringing scheme.

Paul is a very experienced birder and ornithologist with over 27 years experience, including 17 years professional ecological experience with a variety of organisations. Recent work has included assessment of development impacts on the bird species of a number of SPAs, Ramsar sites and SSSIs, including the Northumberland Coast, the Teesmouth and Cleveland Coast, Beinn Dearg, the Muirkirk and North Lowther Uplands, the Beauly Firth, the Firth of Forth and the Humber Estuary. Paul has also undertaken ornithological surveys and assessments for a large number of wind farms, several power lines and a number of minerals extraction, opencast coal, flood defence, road and

housing sites. Paul has published a number of papers and articles in the ornithological press, including the peer reviewed *British Birds*, along with *Birding World* and *Birdwatch*.

Andrew is a competent birder with 7 years experience and is the web master for Durham Bird Club. Andrew has produced articles for *British Birds* and *The Lek* (Durham Bird Club annual newsletter).

3.3 Assessment

In order to determine the value of the habitats and species found through the surveys detailed above, the baseline and survey results were assessed against the criteria developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, formerly IEEM) (Guidelines for Ecological Impact Assessment in the United Kingdom (Version 7 July 2006)). These criteria are outlined in the table below:

Table 14: CIEEM Assessment Criteria for Ecological Receptors

Value of Feature	Key Examples
International	• An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biogenetic Reserve) or an area which meets the designation criteria for such sites. • Internationally significant and viable areas of a habitat type listed in Annexe 1 of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. • Any regularly occurring, globally threatened species. • A regularly occurring population of an internationally important species, which is threatened or rare in the UK, of uncertain conservation status • A regularly occurring, nationally significant population/number of any internationally important species.
National	• A nationally designated site (e.g. SSSI, NNR) or a discrete area which meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified. • A viable area of a UK BAP priority habitat, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. • A regularly occurring significant number/population of a nationally important species e.g. listed on the Wildlife and Countryside Act 1981 (as amended). • A regularly occurring population of a nationally important species that is threatened or rare in the county or region. • A feature identified as being of critical importance in the UK BAP.

Value of Feature	Key Examples
Regional/County	• Viable areas of key habitat identified in the Regional or County BAP or smaller areas of such a habitat, which are essential to maintain the viability of the larger whole. • Regional/county significant and viable areas of key habitat identified as being of regional value in the appropriate English Nature (now Natural England) Natural Area. • A regularly occurring significant population/number of any important species important at a regional/county level. • Any regularly occurring, locally significant population of a species which is listed in a Regional/County RDB or BAP on account of its regional rarity or localisation. • Sites of conservation importance that exceed the district selection criteria but that fall short of SSSI selection guidelines.
District/City/Borough	• Areas of habitat identified in a District/City/Borough BAP or in the relevant Natural Area profile. • Sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on District/City/Borough ecological criteria. • Sites/features that are scarce within the District/City/Borough or which appreciably enrich the District/City/Borough habitat resource. • A diverse and/or ecologically valuable hedgerow network. • A population of a species that is listed in a District/City/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation. • A regularly occurring, locally significant number of a District/City/Borough important species during key phases of its life cycle.
Parish/Local	• Areas identified in a Local BAP or the relevant natural area profile. • Sites/features which area scarce in the locality or which are considered to appreciably enrich the habitat resource within the local context, e.g. species-rich hedgerows. • Local Nature Reserves selected on Parish/Local ecological criteria. • Significant numbers/population of a locally important species e.g. one which is listed on the Local BAP. • Any species, populations or habitats of local importance.
Low	• Habitats of moderate to low diversity which support a range of locally and nationally common species, the loss of which can be easily mitigated.

The population status of the amphibian species recorded during the surveys was also assessed using the criteria set out in the Joint Nature Conservation Committee/Nature Conservancy Council's guidelines for the selection of SSSIs, as detailed in the table below.

Table 15: Scoring System to Determine the Value of Sites Supporting Amphibians.

Species	Survey Method	Low Population	Good Population	Exceptional Population
Great crested newt	Seen or netted in day	<5	5-50	>50
	Counted at night	<10	10-100	>100
Smooth newt	Netted in day	<10	10-100	>100
	Counted at night			
Palmate newt	Netted in day	<10	10-100	>100
	Counted at night			
Common toad	Estimated	<500	500-5000	>5000
	Counted	<100	100-1000	>1000
Common frog	Spawn clumps counted	<50	50-500	>500

4 Results

4.1 Desktop Study

Table 16 includes comments which were received/data collated from the consultation bodies/sources listed in section 4.1.

Table 16: Summary of Desk Study Results

Body Consulted	Comments
Natural England	During initial consultation completed by SCC, NE highlighted the presence of the Durham Coast Special Area of Conservation (SAC) and the Northumberland Coast Special Protection Area (SPA) and Ramsar site within 500m of the site boundary. They also recommended that the appropriate local groups were contacted in order to obtain further information on sites designated at a local level within the surrounding area, and that consideration was given to the potential presence of BAP priority species and habitats within the site. During consultation completed by TNEI, NE state that the proposed 1km buffer appears more than adequate to deal with urban edge effects of the new development. Consideration should be made with regard to additional recreational pressure on the Northumbria Coast SPA.
Durham Bat Group	Durham Bat Group provided bat records within 2km of the site boundary. These included 14 records of common pipistrelle, pipistrelle sp., and 'unidentified' bats. The closest records were around Burdon Hall, approximately 0.25km to the south of the site, and consisted of two common pipistrelle records, one foraging and one commuting and a possible 'unidentified' bat roost.
Durham Bird Club	Data provided includes five Schedule 1 species and one Annex 1 species (Common Tern) nesting within 10km of the indicative site boundary. Locations of breeding Schedule 1 species from the Durham Bird Club dataset are shown in a confidential appendix, which must be treated as confidential, and not distributed beyond the ecology and planning teams at Sunderland City Council, Natural England and RSPB.
Royal Society for the Protection of Birds	No response received
ERIC NE	ERIC NE provided records of protected sites within 2km of the site boundary. Those which are within or border the site included Ryhope Dene Local Wildlife Site (LWS) and Cherry Knowle Dene LWS, which lie within and border the site to the south; Blakeney Woods LWS, within the west of the site; Ryhope Denemouth LWS, bordering the site to the east; and Ryhope Dene Railway Cutting LWS, to the east of the site. A further 11 such sites were identified within 2km of the site boundary, comprising Burdon Dene LWS; The Clouds LWS, Haliwell Banks LWS; Hendon Cliffs LWS; Hendon Railway LWS; Houghton Hill Cut & Scarp LWS; Newport Dene & Tunstall Hill LWS; Newport Railway Cutting LWS; Wardon Low Quarry LWS; Byrons Dene LWS; and Seaham Dene LWS. ERIC also provided records of a range of protected and notable species identified within 2km of the site boundary, including otter (1

Body Consulted	Comments
	record from 2004); great crested newt (6 records, the most recent from 2008); water vole (16 records, 2008); badger (11 records, 2009); brown hare (7 records, 2010); red squirrel (4 records, 2000); hedgehog (25 records, 2012); common toad (2 records, 2008); common frog (5 records, 2008); palmate newt (1 record, 1986); smooth newt (6 records, 2008); and alpine newt (1 record, 2007).
'MAGIC' Website	The MAGIC website highlighted the presence of a series of statutory sites designated for their ecological interest within 2km of the site boundary. This included 3 Sites of Special Scientific Interest (SSSIs) – High Haining Hill, 1.35km south west of the site (magnesian limestone grassland); Tunstall Hills and Ryhope Cutting, 0.61km north east (magnesian limestone grassland and geological interest); and Durham Coast, 0.35km east (paramaritime magnesian limestone grassland, species-rich dune systems and ornithological interest). The Durham Coast is also designated as a Special Area of Conservation (SAC), while Tunstall Hills is listed as a Local Nature Reserve (LNR). The Northumbria Coast Special Protection Area (SPA), Ramsar site and Important Bird Area (IBA) lies approximately 0.35km east of the site at the closest point. A series of areas of ancient and semi-natural woodlands lie within 2km of the site, including Ryhope Dene (also designated as a LWS) which lies within the south east of the survey area.
Nature on the Map Website	The website highlighted the presence of the same sites as identified by 'MAGIC' as well as indicating that the areas of ancient and semi-natural woodland to the south, and areas of deciduous woodland to the south and west, are Biodiversity Action Plan (BAP) priority habitats.
Amphibian Atlas of North East England	The atlas contains a number of records of great crested newts within the area of the site and indicates that the survey area lies within the key range of the species in the region. The atlas also contains records of smooth newt, common frog and common toad in the area, although no records of palmate newt were noted. Alpine newts are also known to have been recorded in the area, including around Doxford Park between 1984 and at least until 2001.
Reptile Atlas of North East England	The atlas highlighted the presence of slow worm records from land to the east of the survey area, with this section of coast forming one of the key distribution areas for the species in the region. Although the atlas indicates that the main area of distribution is located around Hawthorn, Castle Eden and Crimdon denemouths, it also notes that the population is considered to be at risk of extinction. The atlas also indicates that the coastal cliffs and denemouths to the east form part of the key distribution zone of common lizard in the region, which extends from South Shields to Hartlepool.
Google Earth Pro	The aerial images of the site indicate that it is dominated by land under agricultural management, primarily arable, with more limited areas of undetermined grassland and scrub habitats. Field boundaries, where present, are delineated by hedgerows with scattered trees, while blocks of woodland are present within the west and south east of the survey area. A large complex of buildings lie within the east of the site, with a farm range towards the north/centre and a single building present on the eastern site boundary. A number of small roads run through the west of the site, with larger, newer roads present to the east. The north of the site abuts a series of residential areas, while part of the south western

Body Consulted	Comments
	boundary runs adjacent to the A19. Further areas of woodland and agricultural land lie to the south and east.
OS Maps	The OS maps (1:25,000) of the area confirmed the analysis of the aerial photographs, and highlighted the potential presence of a number of small ponds within the site, primarily to the west. They also indicated that a small watercourse runs through one of the areas of woodland towards the west of the survey area.
Existing Data from SCC	SCC provided boundary plans for Ryhope Dene LWS, which lies within the site to the south east, and Ryhope Dene Railway Cutting LWS and Ryhope Denemouth LWS which lie adjacent to the survey area.
Existing Data from John Durkin Ecology	John Durkin provided a wide range of plant records for Cherry Knowle and Ryhope Denes, as well as historic record (1985) of common lizard at Ryhope Denemounth (SE of the site), a record of water vole from the A1018 Bridge by Ryhope Dene from 1996, noctule bat near Ryhope Dene from 1985, otter spraint at Ryhope Denemouth in early 2013, and records of water shrew, comprising a relatively good number of the species from Ryhope Denemouth in 2005 and a single dead individual recorded in West Cherry Knowle Dene during a period of drought in 2007.

4.1.1 Nationally and Internationally Important Sites

The locations of such sites within 10km of the indicative site boundary are shown in Figure 8, Appendix 1.

4.1.1.1 Special Protection Areas (SPAs)

The Northumbria Coast SPA is the only SPA located within 10km of the indicative site boundary. The Northumbria Coast SPA qualifies under Article 4.1 (Annex 1 species) and 4.2 (migrant non-Annex 1 species) of the Birds Directive. Species listed under Article 4.1 and 4.2 are shown in the tables below (JNCC 2006). Species listed in Article 4.1 and 4.2 are here on referred to as key species.

Table 17: Northumbria Coast SPA Qualification under Article 4.1 of the Birds Directive

During the breeding season the area regularly supports:	
Little Tern (Eastern Atlantic breeding)	1.7% of the GB breeding population (5 year peak mean 1992/3 to 1996/7)

Table 18: Northumbria Coast SPA Qualification under Article 4.2 of the Birds Directive

Over winter the area regularly supports:	
Turnstone (Western Palearctic – wintering)	2.6% of the Eastern Atlantic Flyway population (5 year peak mean 1992/3 to 1996/7)
Purple Sandpiper (Eastern Atlantic – wintering)	1.6% of the Eastern Atlantic Flyway population (5 year peak mean 1992/3 to 1996/7)

4.1.1.2 Special Areas of Conservation (SACs)

The Durham Coast SAC is the only SAC located within 10km of the indicative site boundary. The Durham Coast SAC qualifies under Article 3 (Annex 1 habitats) of the Habitats Directive. Habitats listed under Article 3, Annex 1 include vegetated sea cliffs on the Atlantic and Baltic coasts (JNCC 2006).

4.1.1.3 Sites of Special Scientific Interest (SSSIs)

Two SSSIs within 10km of the indicative site boundary are designated for birds and include. The Durham Coast SSSI is designated for wintering Purple Sandpiper, Turnstone and Sanderling, breeding Little Tern and the seabird breeding colony at Marsden Rock, which includes Kittiwake, Fulmar and Cormorant. Brasside Pond SSSI is designated for two large ponds which are the least polluted open water in Durham. They are an important breeding area for wildfowl in Durham, as well as being used by passage and wintering wildfowl.

A further six SSSIs are designated for geology and habitats and include, Tunstall Hills and Ryhope Cutting SSSI, designated for geological and botanical interests; Gillylaw Quarry SSSI, designated as the best section of Magnesium Limestone patch reef in Durham; Fullwell and Carley Hill Quarry SSSI, designated for its national geological importance; Hawthorn Dene SSSI, designated for its least disturbed areas of semi-natural woodland on Magnesium Limestone and Magnesium Limestone grassland; Pig Hill SSSI, designated for the most extensive expanse of primary Magnesium Limestone grassland in Britain; and Tuthill Quarry, also designated for Magnesium Limestone grassland.

4.2 Field Survey

4.2.1 Phase 1 Habitat Survey

The phase 1 survey results are shown in the figure provided by SCC (Figure 3, Appendix 1), with site photographs provided in Appendix 2.

The site is dominated by intensively managed agricultural land, the majority of which is under arable management, with more limited areas of semi-improved and improved grassland towards the centre of the survey area. Such habitats are species-poor being dominated by a small range of species typical of such habitats, including *Lolium perenne* (perennial ryegrass), *Holcus lanatus* (Yorkshire fog), *Poa* sp. (meadow-grass), *Festuca* sp. (fescues), *Trifolium repens* (white clover), *Ranunculus repens* (creeping buttercup) and *Taraxacum* agg. (dandelion). Further areas of species-poor semi-improved/coarse grassland lie adjacent to the sections of road which have been constructed within the north and east of the site relatively recently, as well as around the hospital complex towards the south east of the survey area. The areas of improved grassland had a relatively close-cropped sward of c.5cm at the time of survey, and were being grazed by horses and sheep, while the poor semi-improved grasslands typically had a higher sward height of c.10-45cm at this time.

Amenity grassland cover is fairly limited within the site, the habitat being focused around the hospital grounds within the east of the survey area. These grasslands again support a small range of locally common species typical of such habitats, including *Lolium perenne, Poa* sp., *Taraxacum* agg. and *Bellis perennis* (daisy), and appeared to be subject to regular maintenance, with a sward height of c.4cm at the time of survey.

Two areas supporting a range of species indicative of more neutral ground conditions, including *Lotus corniculatus* (common bird's-foot trefoil), *Plantago lanceolata* (ribwort

plantain), *Cynosurus cristatus* (crested dog's-tail) and *Centaurea nigra* (common knapweed), were also identified within the site; one such area is located within the north west of the survey area, adjacent to Blakeney Woods, with the other areas to the south east, adjacent to Cherry Knowle Dene. Both such areas appeared to have suffered a degree of 'improvement' and were considered likely to be semi-improved neutral grassland, also supporting coarse grass, forb and ruderal species such as *Lolium perenne, Holcus lanatus, Dactylis glomerata* (cock's-foot), *Poa* sp., *Trifolium* sp. (clover), *Taraxacum* agg., *Cirsium arvense* (creeping thistle), *Urtica dioica* (common nettle) and *Rumex obtusifolius* (broadleaved dock). A range of further plant species may be present in such areas which were not apparent due to the winter timing of the survey.

Patches of tall ruderal vegetation are scattered around the areas of poor semi-improved grassland, which typically consist of species such as *Cirsium arvense*, *Urtica dioica* and *Rumex obtusifolius*, with some small patches of dense and scattered scrub - typically dominated by *Rubus fruticosus* agg.(bramble) - also noted in such areas. Further areas of scattered scrub, including *Ulex europaeus* (gorse) and primarily *Crataegus mongyna* (hawthorn) lie adjacent to some of the roads which cross the site, as well as long field boundaries within the agricultural areas.

The majority of field boundaries within the site are delineated by defunct and/or species-poor hedgerows, although a small number of larger (c.4m high), unintensively managed hedges are present within the west of the survey area and a small number of fencelines were also noted. Scattered mature trees are present along the length of many of the larger hedgerows, which include species such as *Acer pseudoplatamus* (sycamore), *Fraxinus excelsior* (ash), *Quercus* sp. (oak), *Fagus sylvatica* (beech), with *Prunus* sp. (cherry) also present throughout the hospital grounds.

Immature plantations are present close to some of the new roads within the site, while more mature woodlands are present to the south and west of the survey area. This includes small shelterbelts which are semi-natural and semi-mature and dominated by broadleaved species. The scrub layer in such areas is typically poorly developed, with the ground flora supporting a small range of grass, ruderal and forb species at the time of survey, along with numerous areas of bare and disturbed ground which appeared to be the result of bikes regularly passing through the plantation. Species noted include *Pinus sylvestris* (Scots pine), *Acer pseudoplatanus, Fagus sylvatica, Crataegus mongyna, Salix* sp. (willow), *Ilex aquifolium* (holly), *Anthriscus sylverstris* (cow parsley), *Taraxacum* agg., *Dryopteris* sp. (male fern), *Hedera helix* (ivy), *Geum rivale* (water avens), *Rumex obtusifolius, Urtica dioica* and *Fumaria officinalis* (common fumitory).

Blakeney Woods, within the west of the site, Cherry Knowle Dene and Ryhope Dene, towards the east, support mature, semi-natural woodland dominated by broadleaved species. *Hedera helix* becomes locally dominant in some areas, particularly the southern end of Blakeney Woods, although the ground flora and scrub layers are better developed and more diverse than in the younger plantations. Species apparent at the time of survey included *Sambucus nigra* (elder), *Crataegus monogyna, Fraxinus excelsior, Ulmus* sp. (elm), *Populus* sp. (poplar), *Betula pendula* (silver birch), *Acer pseudoplatanus, Quercus* sp., *Fagus sylvatica, Allium ursinum* (ramsons), *Viola riviniana* (dog violet), *Primula vulgaris* (primrose), *Chrysosplenium oppositifolium* (opposite-leaved golden saxifrage) and *Luzula sylvatica* (great woodrush), and further species are likely to become apparent later in the year.

Swathes of *Chrysosplenium oppositifolium* (opposite-leaved golden saxifrage) were noted within Cherry Knowle and Ryhope Denes, along the banks of the watercourse which runs west-east through the woodlands. The banks of such features were otherwise largely bare at the time of survey and, along with tracks running through the woods, which again appeared to be regularly disturbed by bikes. A further small watercourse is present within

Blakeney Woods, with a small pond at the southern end which is largely shaded and appears to have fairly variable water levels. A second, slightly better quality pond was also identified within the site, immediately to the north of the plantation which runs east-west along the south western site boundary. Marshy grassland, dominated by *Holcus* sp. is present around the edges of the pond, with stands of species including *Iris pseudacorus* (yellow flag iris) noted within the waterbody. Litter was noted within and around both such features, as well as within some sections of the burns within the site. Two man-made waterbodies are present within the grounds of Ryhope Engines Museum – a former pumping station which is now owned by Northumbrian Water – which lies adjacent to the hospital grounds. The waterbodies have steep, blockwork sides and although the southern pond generally lacks vegetation, the northern waterbody supports species such as *Lemna* sp. (duckweed).

A number of small bridges cross the burn within the denes, sections of which are also culverted, although built development is relatively limited in comparison the total site area. Further structures are present throughout and adjacent to the hospital grounds, although major redevelopment works were underway in this area at the time of survey, which appeared to include extensive demolition works. A small number of relatively new buildings are present on the eastern site boundary, while a small chicken farm is present towards the centre of the survey area.

4.2.2 Protected Species

4.2.2.1 Bats

No definite evidence confirming the presence of bats was identified during the Phase 1 survey however, the site was considered to have the potential to support roosting, foraging and commuting bats at times throughout the year. The intensively managed agricultural habitats which dominate the site are considered to provide sub-optimal foraging and commuting opportunities for such species due to their open and exposed nature. However, the tree lines, woodland edges and hedgerows which run through and adjacent to such areas provide some strong potential commuting routes through the site and surrounding area for the local bat population. Such features, along with the watercourses, ponds and more sheltered areas around some of the buildings are also considered to have the potential to be used by foraging bats, while some of the buildings, trees and features such as bridges within and adjacent to the survey area have the potential to support a range of roosting bat species. Bats have been seen within the west of the site by local people walking their dogs (*pers comm*) and the presence of bat boxes around the hospital complex indicates that such species are likely to use other sections of the survey area at times throughout the year.

Built Structures

Building Description

Three main groups of buildings are present within the site – the chicken farm towards the centre, the hospital and museum to the south east, and the care home on the eastern site boundary; it was not possible to gain full access to such structures at the time of survey. The accessible buildings at the farm are one storey in height and typically consist of timber sheds with corrugated asbestos or felt covered roofs. The structures were considered to be in relatively poor condition, with gaps noted potentially permitting bats access into the interior, although the nature of the structures (small size and building materials) is considered to slightly reduce the likelihood of bats roosting within. Although

the dominance of residential and arable areas surrounding the site both provides alternative potential roost sites and relatively low value foraging habitat for bats, full access was not available and higher risk structures may also be present, therefore there is considered to remain a risk that the farm may be used by small numbers of bats.

A wide range of structures are present within the hospital grounds and museum, from single-storey modern structures with either flat, felt-covered or pitched metal roofs and no loft void, to older two-storey brick buildings with pitched slate-covered roofs. Although a small number of the buildings are partially rendered and in good condition, the majority are considered to have some potential to support roosting bats within the roof or walls, or behind features such as cladding, lead flashing or fascia boards. The location of the buildings, immediately adjacent to areas of ancient woodland, and the presence of features such as mature tree lines and a number of waterbodies within this area are considered to increase the likelihood of bats being present in this section of the site.

The care home buildings are one storey in height and again of brick construction, with a hipped tile roof. Although largely in good condition at the time of survey, a number of small gaps were noted which may allow bats access into the roof structure. This fact, combined with the proximity of the structures to the ancient woodlands of Ryhope Dene, is considered to increase the likelihood of bats utilizing the structure at times during the year.

Small, concrete bridges were identified within Cherry Knowle Dene, adjacent to the site, which were considered to have the potential to support roosting bats, a series of cracks and crevices being apparent in the blockwork. Similarly, the culverts within the dene – particularly the brick tunnel adjacent to the concrete bridge noted above – may have the potential to support roosts at times during the year, gaps being noted in the brickwork and the feature being located in an area of high quality habitat for such species.

Activity Surveys

No roosts were located in the bridges or culvert in Cherry Knowle Dene on either of the surveys. Small numbers of bats were seen foraging within the canopy of the woodland and occasionally commuting over the bridge during the surveys. This primarily comprised individual pipistrelle bats, although low levels of *Myotis* sp. activity were also recorded during the dawn survey. One common pipistrelle was recorded foraging within the wood after sunrise during the dawn survey in August 2013 and although a roost location was not confirmed, the very late time of the activity indicated that a roost was likely to be present within one of the mature trees within the dene at this time. Details of the surveys are provided in Appendix 3.

Tree Survey

Risk Assessment

The majority of trees within the survey area were considered to be in relatively good condition (in relation to their potential to support roosting bats), either being relatively small or semi-mature, or lacking features such as holes, splits or flaking bark which may provide potential roosting opportunities. However, a number of trees were identified within the survey area which were considered to have a moderate or high risk of supporting roosts at times, details of which are provided in the table below. The locations of the trees detailed below are shown in Figures 9 and 10 in Appendix 1.

Table 19: Tree Risk Assessment Survey Results.

Tree ref.	Approx. Grid ref.	Species	Height (m)	DBH (cm)	Condition/Risk
1	NZ 37239 51756	Acer sp.	15	100	High - Hollow trunk
2	NZ 37033 51625	Beech	12	70	High - Holes and splits where branches have been lost
3	NZ 36869 51990	Beech	18	70	Moderate to high - holes in trunk
4	NZ 36869 51990	?Oak	12	60	Moderate to high - Flaking bark mostly dead
5	NZ 37001 52024	Sycamore	6	25	Moderate - Split trunk
6	NZ 37001 52024	Sycamore	16	40	Moderate to high - holes in trunk, ivy low down
7	NZ 37001 52024	Beech	6	40	Moderate - Ivy low down, trunk cracked off and holes in remains
8	NZ 37029 51799	Ash	10	70	Moderate - Hole in branch
9	NZ 37029 51799	Ash	10-12	60	Moderate - Flaking bark and holes
10	NZ 37653 51800	?Ash	12	60	High - Lots of holes in trunk
11	NZ 37723 51821	Beech	12	50	Moderate to high - Large split down trunk
12	NZ 37735 51913	Beech	15	70	Moderate to high - Split down trunk
13	NZ 37706 51904	Beech	17	120	Moderate - Fire damage at base, folds in trunk
14	NZ 37672 51903	Beech	17	90	Moderate - Split trunk
15	NZ 37783 51994	Ash	14	70	Moderate - Dense ivy
16	NZ 37859 51823	Beech	14	70	Moderate - Folds/splits in trunk
17	NZ 37905 51719	Beech	16	80	Moderate - Splits and folds in trunk
18	NZ 37887 51691	?Ash	12	50	Moderate - Ivy covered
19	NZ 38136 51584	Ash	8	50	Moderate - Holes in branches, flaking bark

Tree ref.	Approx. Grid ref.	Species	Height (m)	DBH (cm)	Condition/Risk
20	NZ 40469 51694	Ash	10	40	Moderate – Large hole in trunk
21	Ryhope Dene	Ash, beech.	Various	Various	Generally trees with moderate risk, many ivy clad trees
22	NZ 41258 51683	Beech	20	95	Moderate to high – Holes and split bark up trunk
23	NZ 41258 51683	Beech	10	95	Moderate - Ivy clad with holes
N.B. Those trees highlighted in red were considered to have a moderate-high or high risk of supporting roosting bats.					

A small number of woodcrete bat boxes were also noted on some of the trees in the hospital site within the east of the survey area. The area is currently being redeveloped and it is considered likely that the boxes have been installed as part of the mitigation strategy for these works. It was not possible to gain access to the majority of trees in this area at the time of survey because of the extensive redevelopment works which were underway at this time, with access being restricted by large areas of Heras security fencing.

Activity Surveys

Relatively low levels of activity were recorded during the tree emergence surveys, with activity primarily focused along the mature tree lines which delineate the site boundaries towards the west. Much of the activity during the emergence and re-entry surveys related to foraging common and soprano pipistrelles bats, with lower levels of *Myotis* sp. activity recorded in Cherry Knowle Dene during the dawn survey and a single noctule pass recorded in Ryhope Dene at the same time. A maximum of two bats (common pipistrelles) were recorded at any one time.

Four probable tree (cool) roosts were identified, all of which were being used by small numbers of pipistrelle bats. This included two roosts outwith the site boundary – one in an ash tree on the northern bank of Ryhope Dene, to the north west of trees 23 and 24, and a likely roost identified within Cherry Knowle Dene, identified during the survey of the bridge as discussed above. Roosts were also identified within tree 2 (single common pipistrelle) and tree 10 (up to 5 common pipistrelles) during the dusk survey in September 2013.

Details of the activity surveys are included in Appendix 3.

Site Activity Surveys

Remote Monitoring

The remote bat detectors were located in a range of habitats, including areas considered to be of both good and poor quality for such species.

A total of 10,900 bat passes were recorded across the site during the 48 nights of survey. Species recorded included common pipistrelle, soprano pipistrelle, pipistrelle bats (where

the call could not be determined to species level), noctule, *Myotis* sp. and 'query' where the calls could not be identified to genera level. Common pipistrelles were by far the most commonly recorded species, accounting for 96.78% of the total number of calls recorded. Noctule bats accounted for a further 1.35% of the calls, soprano pipistrelles 1.32%, pipistrelle sp. 0.36%, *Myotis* sp. 0.12% and 'queries' as 0.6% of the total.

Common pipistrelles and noctule bats were recorded at every location across the site, soprano pipistrelles were recorded at each location except point 4 and point 10, and *Myotis* sp. were recorded at each location except 4, 8 and 10. Activity was focused around point 7 (the Engines Museum), with 29.9% of the total number of calls recorded occurring at this point. A further 19.3% of the calls were recorded by kit 1 and 17% by kit 2, on boundary features within the west of the site, while 12.49% of the calls were recorded at kit 6, along Burdon Lane. The remaining points each accounted for less than 10% of the total number of calls, with the lowest levels of bat activity recorded at point 5, within the north of the survey area, where just 1.33% of the total was detected.

Activity levels across the site were highest during the summer months, with June and August accounting for 23% and 22% of the total number of passes respectively. Activity levels reduced significantly towards the start and end of the year, with 8% of the total recorded in each of April and May and 7% in October. The remaining calls were divided evenly between July and September, each accounting for 16% of the total number of passes recorded.

Activity occurred throughout the night, although a number of calls were recorded within the hour following sunset and prior to sunrise each month, indicating that roosts are present in the local area.

Transect Surveys

An overview of the results of the transect surveys are shown in Figures 11 - 15 in Appendix 1, with details of each survey included in Appendix 3.

Activity during the surveys was strongly focused on Section 1, to the west of the site, with small numbers of bats regularly recorded foraging along the mature tree lines and around Blakeney Woods. Activity during the spring was focused around Blakeney Woods, with activity during the summer and autumn also increasing along the boundary features within the remainder of the survey section. Activity throughout the year was focused on the linear features (tree lines, woodland edges and hedgerows), with no bats recorded in the more open arable land at any time.

Noticeably lower levels of activity were recorded in Section 2 (Centre West) during the transects. Bats were most regularly recorded along Burdon Lane, which appeared to be used for both foraging and commuting purposes throughout the active season, with activity also recorded along the edge of the immature plantation which runs east-west between Burdon Road and Blakeney Woods throughout the survey period. Occasional bat passes were also identified along the hedgerows and Nettle Lane within the east of the survey section during summer and autumn although as with Section 1, no bats were recorded within the more open arable habitats away from the boundary features.

Very low levels of activity – the lowest across the survey area – were recorded in Section 3. No bats were recorded in spring and very few bats were recorded over the remainder of the active season. Low levels of activity were recorded during the summer and autumn (primarily June and August), comprising individual bats foraging over the rough grassland to the east of the poultry farm and west of Eltham Road. Small numbers of bats were also recorded commuting across the eastern field from the housing estate to the north, towards Burdon Lane. The eastern 'field' shown on the plans was inaccessible due to

ongoing construction works associated with a new housing development in this area, while access to the field to the south of Burdon Lane was restricted at night for health and safety reasons, due to the presence of livestock (horses) within the field year-round.

Activity within Section 4 (Hospital) was strongly focused on Ryhope Engines Museum, with bats recorded foraging around the mature trees, buildings and over the areas of standing water throughout the survey season. Bats were also recorded relatively early on during the dusk transects/late on during the dawn surveys and it was considered likely that roosts were present within the museum buildings. Access across most of the survey section was restricted by high levels of redevelopment works within the hospital complex, although low levels of activity were recorded along some of the mature tree lines within the centre and south of the section. Bats were not recorded along the mature tree lines within the north of the hospital complex, where bat boxes are known to be present however, this may be the result of the very high light levels (security lights) in such area as a result of the ongoing redevelopment works.

Activity within section 5 (Western Section) was recorded along the edge of Ryhope Dene throughout the year, with a small number of calls also recorded in the more open area towards the centre of the arable field during the summer period. Low levels of foraging activity were also recorded along the path within the north of the survey section, which runs along the southern edge of the housing estate, during the autumn period.

4.2.2.2 Great Crested Newt

No evidence of great crested newt was identified on site during the Phase 1 survey and habitats within the survey area are considered to be of varying quality for the species. The areas of woodland, scrub, hedgerow and coarse grassland provide some relatively good quality terrestrial habitat for such species however, the intensively managed agricultural habitats which dominate the survey area are considered to be sub-optimal for such species, being subject to high levels of disturbance and being open and exposed at times, increasing the risk of predation or desiccation.

Habitat Suitability Index

Details of each pond, including their HSI scores, are provided in the table below. It should be noted that the scores for ponds 3-6 were altered from those completed at the time of the extended phase 1 survey due to the presence of wildfowl and fish being confirmed within a number of the waterbodies present.

Table 20: Results of the HSI Assessment for Sunderland South.

Pond	1 - Plantation Edge Pond	2 - Blakeney Woods Pond	3 - Northern Pond	4 - Southern Pond	5 - Thristley House Pond	6 - Burdon Hall Pond
Approx. OS Grid Reference	NZ 374 514	NZ 379 517	NZ 403 525	NZ 404 524	NZ 379 512	NZ 388 513
Approximate Area of Open Water (m^2)	220	80	1,150	1,150	680	875
Pond Permanence (Estimate of Years/10 it Dries Out)	3	4	0	0	3	0
Water Quality	Moderate	Poor	Moderate	Moderate	Moderate	Moderate
Shade (%)	30	90	0	0	10	30
No. of Water/wildfowl	0	0	2	4	8	6
Fish	Possible	Absent	Minor	Minor	Absent	Possible
Ponds within 1km	2	2	1	1	3	1
Area of Suitable Accessible Terrestrial Habitat within 0.5km (ha)	10	14	20	20	8	10
Macrophyte Cover (%)	30	15	50	5	30	30
HSI Score	**0.69**	**0.57**	**0.51**	**0.72**	**0.71**	**0.73**

According to the HSI scores, ponds 4, 5 and 6 are considered to be of 'good' quality for the species, while pond 1 is considered to provide 'average' conditions for great crested newts. Ponds 2 and 3 were considered to be 'below average' based on the assessment.

Breeding Season Surveys

No evidence indicating the presence of great crested newts was recorded during the surveys, although other locally common amphibian species were recorded across the site, as follows.

Table 21: Results of the Great Crested Newt Surveys at Sunderland South.

Pond Number/Date of Survey & Weather	1 - Plantation Edge Pond	2 - Blakeney Woods Pond	3 - Northern Pond	4 - Southern Pond	5 - Thristley House Pond
30/04/13 7°C, 62% cloud, still, dry	2T, 1Pa (in hand), 1Sm, 1S/P	0	0	0	No access
07/05/13 8°C, 70% cloud, still, dry	Not surveyed	Not surveyed	Not surveyed	Not surveyed	0
10/05/13 12°C, 30% cloud, F1, dry	13S/P, Tad	0	28F	0	0
16/05/13 8°C, 30% cloud, dry, still	10S/P, 13T, E	0	11F	Tad	0
03/06/13 13°C, 15% cloud, still, dry	2S/P, 1T (dead), E	Dry - unsuitable for survey	53F	2T, 12F (1 dead)	Tad
Max. count	**13S/P, 13T**	**0**	**53F**	**2T, 12F**	**0**
Key	Sm - smooth newt F - common frog Tad - Tadpoles		Pa - palmate newt T - common toad E - smooth/palmate newt eggs		

4.2.2.3 Badger

Habitats within the site are considered to have the potential to support badger, the woodland blocks, scrub and hedgerow bases providing potential opportunities for sett creation, while the grasslands, woodlands and agricultural land provide potential foraging habitat for such species. However, no definite evidence indicating the presence of the species was recorded during the phase 1 or subsequent species-specific surveys. Numerous mammal trails were recorded within the survey area which were considered to be large enough to have been made or used by the species however, the area appears to be heavily used by local dog walkers and the relatively high levels of disturbance may reduce the likelihood of the species regularly using these areas of the site.

Checks of the former known sett locations within Ryhope and Cherry Knowle Denes did not record any evidence of badger, with only a small number of mammal trails and rabbit warrens identified. The ground surrounding such areas within the denes had been heavily disturbed by motorbikes and conditions within the area were considered to be sub-

optimal for the species as a result of the associated high disturbance levels and increased risk of persecution. No field signs indicating the presence of the species were recorded and no sightings of the species were made during any of the field surveys.

4.2.2.4 Otter

No evidence indicating the presence of otter was located on site and the agricultural habitats which dominate the survey area are considered to be sub-optimal for the species, due to the poor quality foraging opportunities and lack of cover afforded by such habitats. However, some of the habitats present, particularly those in the south east of the site along Ryhope Dene, have the potential to be used for both commuting and foraging purposes by the local population. The species is known to be present in the wider area however, the high disturbance levels associated with the regular use of the denes by people on motorbikes is considered to reduce the likelihood of otter utilising the area on a regular basis.

4.2.2.5 Water Vole

No definite evidence indicating the presence of the species was recorded during the surveys however, a possible old burrow was located along on the north side of the burn running through Ryhope Dene which may have been created by the species. No further evidence of the species was identified in this area and the burrow did not appear to be in use at the time of survey, although the burns located within the denes are considered to have some potential to support the species, should a population persist in the local area. Evidence of rat activity (dead adult) was also recorded within Ryhope Dene during the species-specific water vole survey. The remainder of the site is considered to be sub-optimal for water vole due to the lack of good quality aquatic habitats.

4.2.2.6 Reptiles

No evidence indicating the presence of reptiles was recorded during the surveys and conditions across the majority of the survey area are considered to be sub-optimal for such species; the intensively managed agricultural land which dominates the site is subject to high levels of disturbance and provides little cover for such species at times during the year, increasing the risk of predation. Although the areas of rough grassland within the site provide some higher quality potential habitat for the species, such areas are relatively limited in size and largely severed from other areas of potentially suitable habitat by residential development and busy roads, reducing the likelihood of populations of such species persisting within the site.

4.2.2.7 Brown Hare

An overview of the survey results is provided in Figure 16.

Brown hares are known to be present within the site, individuals having been recorded in sections 1 and 5 during the extended phase 1 and bat surveys; however, the species was only seen (incidental records) on site on two occasions, in spite of the high level of both diurnal and nocturnal work completed within the area. Species-specific surveys did not record any hares and only a single pile of droppings was located in section 5 during one of the survey visits. As such, it is concluded that sections of the site are likely to be used on an occasional basis at times throughout the year by the local hare population, but that populations of the species are likely to be relatively low.

It should be noted that illegal hunting/coursing is potentially an issue on the site and in the surrounding area, based on observations made by the survey team throughout the year, which may be having a detrimental impact upon local populations.

4.2.2 Birds

4.2.2.1 Breeding Birds

A total of 61 species were recorded during the 2013 breeding bird surveys, of which 44 species were considered to be breeding within either the site or the survey buffer. Table 22 (page 45) provides details of all species that were recorded during the surveys, including the number of pairs of each species, in the site and buffer, plus the ornithological value and conservation status of each species.

Table 22: Results of 2013 Breeding Bird Survey.

Species	Number of territories within the site	Number of territories within the buffer	Annex 1	Schedule 1	UK BAP	D LBAP	UK Red List	UK Amber List	Notes
Mallard	0	0						✓	Recorded flying over the site.
Red-legged Partridge	0	1							Pair present in the southern buffer zone.
Grey Partridge	0	1			✓		✓		See species account.
Pheasant	2	0							Present mainly around the hospital grounds.
Sparrowhawk	0	0							An adult male was observed on Visit A & Visit C, an adult female on Visit B & an immature male on Visit D.
Buzzard	0	0							A single bird recorded hunting over the southern buffer on several dates.
Kestrel	2	0						✓	Two pairs within the site.
Moorhen	0	1							By pond in the survey buffer.
Golden Plover	0	0	✓					✓	Recorded flying over the site.
Lapwing	0	3			✓	✓	✓		See species account.
Woodcock	0	0						✓	Non-breeding. See species account.
Snipe	0	0				✓		✓	Non-breeding. See species account.
Black-headed Gull	0	0						✓	Predominantly flying over and foraging on the site. Non-breeding.
Common Gull	0	0							Predominantly flying over the site. Non-breeding.

Species	Number of territories within the site	Number of territories within the buffer	Annex 1	Schedule 1	UK BAP	D LBAP	UK Red List	UK Amber List	Notes
Herring Gull	0	0			✓		✓		Predominantly flying over and foraging on the site. Non-breeding.
Feral Pigeon	~5-10	0							No nests located, but probably breeding on/around the chimney stack within the Hospital complex.
Stock Dove	0	0							Four birds foraging in the southern buffer fields during Visit C. Not recorded previously or subsequently.
Woodpigeon	Common	Common							Predominantly recorded within Ryhope Dene and the site buffers.
Collared Dove	0	Uncommon							Breeding pairs present in Doxford Park.
Little Owl	1	0							One bred in a building within the Hospital complex on site.
Swift	0	Possible						✓	See species account.
Great Spotted Woodpecker	1	0							One pair in trees on the northern hospital complex boundary.
Magpie	Common	Common							Present throughout the site and buffers.
Jay	0	0							One heard calling in the northwest buffer during two visits but breeding not confirmed.
Jackdaw	Common	Common							Recorded throughout the site and buffer, but mostly in the horse paddocks.
Rook	0	0							Present throughout site and buffers.
Carrion Crow	Scarce	Scarce							Present throughout site and buffers.

Species	Number of territories within the site	Number of territories within the buffer	Annex 1	Schedule 1	UK BAP	D LBAP	UK Red List	UK Amber List	Notes
Blue Tit	Common	Common							Present throughout the site and buffers. Fledglings observed.
Great Tit	Common	Common							Present throughout the site and buffers. Fledglings observed.
Coal Tit	1	0							Pair present within the woodland adjacent to Doxford Park.
Skylark	4	2			✓	✓	✓		See species account.
Sand Martin	0	0							Birds recorded foraging over the site were probably from the breeding colonies on the coastal cliffs.
Swallow	0+	1						✓	See species account.
House Martin	0+	Probable (10-20)						✓	See species account.
Long-tailed Tit	1	0							A pair present within the young plantation in the north of the site.
Chiffchaff	Common	Uncommon							Present throughout the site and buffers.
Willow Warbler	3	0						✓	See species account.
Blackcap	4	2							Approximately 6 pairs within the woodlands in the survey area.
Garden Warbler	1	2							One pair within the site boundary and 2 pairs within the survey buffers.
Whitethroat	16	2						✓	See species account.

Species	Number of territories within the site	Number of territories within the buffer	Annex 1	Schedule 1	UK BAP	D LBAP	UK Red List	UK Amber List	Notes
Sedge Warbler	3	0							Three singing males in the eastern section of site.
Treecreeper	0	0							Calling in southwest corner woods on Visit D.
Wren	Common	Common							Present throughout the site and buffers.
Starling	0	Common			✓	✓	✓		Predominantly recorded in residential gardens within the buffers.
Blackbird	Common	Common							Seen carrying food within the site and buffer.
Fieldfare	0	0		✓			✓		Non-breeding migrants. Predominantly in horse paddocks north of hospital
Song Thrush	2	2			✓	✓	✓		See species account.
Redwing	0	0		✓			✓		Non-breeding migrants.
Mistle Thrush	3	0						✓	See species account.
Robin	Common	Common							Present throughout the site with fledglings observed.
Dunnock	11	0			✓			✓	See species account.
House Sparrow	0	Common			✓	✓	✓		See species account.
Pied Wagtail	2	0							Breeding within the centre of the site.
Chaffinch	Common	Common							Present throughout the site and buffers.
Greenfinch	Uncommon	Uncommon							Present throughout the site and buffers.
Goldfinch	Common	Uncommon							Present throughout the site and buffers.
Linnet	2	1			✓	✓	✓		See species account.

Species	Number of territories within the site	Number of territories within the buffer	Annex 1	Schedule 1	UK BAP	D LBAP	UK Red List	UK Amber List	Notes
Lesser Redpoll	0	0			✓		✓		See species account.
Bullfinch	1	0			✓			✓	See species account.
Yellowhammer	3	1			✓		✓		See species account.
Reed Bunting	1	1			✓	✓		✓	See species account.

N.B. Table 22 - 27

Schedule 1 = Species listed on Schedule 1 of the Wildlife & Countryside Act (as amended) 1981, and so protected by special penalties at all times.

Annex 1 = Birds listed under the EU Birds Directive

UK Red = UK Red List Species of Conservation Concern

UK Amber = UK Amber List Species of Conservation Concern

UK BAP = UK Biodiversity Action Plan Priority Species (2007 Amendment)

D LBAP = Durham Local Biodiversity Action Plan Species (Durham Biodiversity Partnership 2009)

Species Accounts

Red List Species

Grey Partridge

A pair present in the southern buffer on Visit C, had not been recorded during Visit A and B, or subsequently on Visit D. Given the secretive nature of this species, it is considered likely that this pair may have bred within the southern buffer.

Lapwing

Three pairs were nesting within the southern buffer. At least one pair bred successfully and produced two young.

Skylark

Four pairs were considered to be breeding within the northern section of the site, with a further two pairs in the southern buffer.

Song Thrush

Two pairs were recorded within the indicative site boundary, with a further two pairs in the survey buffers. The pairs within the site boundary were in woodland just south of Doxford Park and in Ryhope Dene, whilst the territories within the buffer zone were in woodland south of the hospital complex and on the southern edge of Doxford Park

Starling

No territories were located within the site boundary. However, Starling was a common breeding species within the adjacent housing estates in the buffer. Starlings were observed foraging on site and flying into the buffer with food.

House Sparrow

No territories were located within the site boundary; however this species is likely to breed within the hospital complex. House Sparrow was a common breeding species within the adjacent housing estates in the buffer.

Linnet

Three territories were located within the survey area, one in the northern section of the site, one in the southern section of the site, just south of Ryhope, and lastly one in the eastern buffer at the start of seaward section of Ryhope Dene.

Lesser Redpoll

A flock of 10 Lesser Redpoll were observed in the northern section of the site on Visit D. It is plausible that this species could have bred within the young plantations in the north of the site, but no evidence from previous visits was found to confirm this.

Yellowhammer

Four pairs were considered to be breeding within the survey area: a pair on the far western edge of the northern section, a pair within the eastern part of the northern section, a pair in the southern section in fields north of Ryhope Dene and a pair in the southern buffer near Thistley House Farm.

Amber List Species

Woodcock

A single bird was flushed in the northern central section of the site on Visit C.

Snipe

During Visit A two separate birds were flushed from field edges in the northern section of the site. Within Durham, Snipe typically breed within the uplands, with the two recorded during this survey likely to be passage birds.

Kestrel

Two pairs were considered to be breeding within the northern section of the site; one pair in woodland just south of Doxford Park and one pair just south of Tunstall.

Swift

Recorded in low numbers foraging over the site during the survey period. It is plausible that Swift breed within the residential areas in the buffer zone, but this was not possible to confirm during the surveys.

Swallow

No nests were located within the site boundary. However, breeding is likely to occur on buildings within the hospital complex and one pair was confirmed breeding within out-buildings at Thirstley House Farm in the southwest buffer zone. Birds were regularly observed foraging over the site throughout the survey period.

House Martin

No nests were located within the indicative site boundary. However, breeding is likely to occur on buildings within the hospital complex and on a number of houses within the residential areas in the buffer zone. Birds were regularly observed foraging over the site throughout the survey period.

Whitethroat

A total of 16 territories were identified from the breeding surveys within the indicative site boundary with a further two in the buffer zone. Adults were observed alarm calling and carrying food within the indicative site boundary.

Willow Warbler

Three pairs were present within the indicative site boundary. A pair on the far western boundary of the site, a pair on the southern edge of the hospital complex and a pair in Ryhope Dene, west of the railway line.

Mistle Thrush

Three pairs were present within the indicative site boundary. A pair within the western section of the site, a pair in the central northern woodland adjacent to Doxford Park and a pair in the mature trees on the northern edge of the Hospital complex.

Dunnock

A total of 11 territories were recorded within the indicative site boundary, with the majority of these being along the northern edge of the northern section of the site. No territories were recorded within the survey buffers.

Bullfinch

One pair were located within the eastern section of the site, just east of where the railway line crosses the dual carriageway.

Reed Bunting

A pair were considered to be breeding within the northern section of the site, and a single male held territory within the buffer zone on the east side of the railway line.

4.2.2.2 Tidal Surveys

The peak counts per month for the three tidal surveys (Nocturnal High Tide, Diurnal High Tide and Low Tide) are shown in Appendix 6.

Nocturnal High Tide Survey

A total of three waterbird species, Golden Plover, Lapwing and Curlew were recorded during the nocturnal high tide surveys. Three species of owl were also recorded, Little Owl, Tawny Owl and Long-eared Owl. These, along with their current UK conservation status levels, are listed in the table below. No Northumbria Coast SPA species were recorded roosting on the site during the survey period. Other avian species recorded during the nocturnal high tide surveys included Grey Partridge, Herring Gull, Grasshopper Warbler, Blackbird and Redwing.

Table 23: Nocturnal High Tide Species list and UK conservation status.

Species	Peak Count [5]	Annex 1	Schedule 1	UK BAP	D LBAP	UK Red List	UK Amber List	Notes
Golden Plover	3	✓					✓	Roosting in coastal field
Lapwing	~40			✓	✓	✓		Heading inland
Curlew	2			✓	✓		✓	Heading inland
Little Owl	2							In Cherry Knowle hospital complex and the horse paddocks in centre of site
Tawny Owl	2							In Ryhope Dene and woodland in the west of the site
Long-eared Owl	1							Female calling in dene north of Ryhope Dene.

The site has very limited nocturnal roosting habitats, for instance large ponds with islands that are free from vegetation, for waterbirds. However, species such as Golden Plover, Lapwing and Curlew will forage at night in arable and pasture fields. Three Golden Plovers were observed during the December surveys on the coast fields to the north of Ryhope Dene. Lapwings were observed outside the 200m buffer to the south of the site in a wet field. Lapwing was observed foraging within the southern buffer fields during the January survey and heard calling over the southern buffer fields by East Farm during the March survey. A flock of approximately 40 Lapwings were observed flying inland during the September survey. No other waterbirds were heard flying over the site during the survey period.

Little Owls were recorded throughout the year in three locations; the horse paddocks at an approximate OS grid ref of NZ 400 525, Cherry Knowle Hospital and on the coast to the

[5] Number of birds observed at any one moment. This is the peak number of birds counted and not the actual number of birds present within the survey area.

south of Ryhope Dene at an approximate OS grid ref of NZ 420 517. Two Tawny Owls were recorded calling from Ryhope Dene (OS grid ref of NZ 415 518 and NZ 405 516) with a third observed flying over the road at the western end of the site (OS grid ref of NZ 378 514). Tawny Owls were frequently heard calling and Little Owls were regularly recorded around the hospital during the bat surveys. A female Long-eared Owl was heard calling on the northern edge of the coastal survey area at an approximate OS grid ref of NZ 415 531 during the December survey.

Diurnal High Tide Survey

A total of 45 waterbird species were recorded during the diurnal high tide surveys. These, along with their current UK conservation status levels, are listed in Table 24, page 54.

Table 24: High Tide Species List and UK Conservation Status (key species are highlighted in bold typeface).

Species	Peak Count [6]	Annex 1	Schedule 1	Bio Frame	D LBAP	UK Red List	UK Amber List	Notes
Brent Goose	2			✓			✓	North
Shelduck	1						✓	One north
Teal	1						✓	
Eider	12						✓	One pair foraging inshore
Long-tailed Duck	2		✓					North
Common Scoter	22		✓	✓		✓		North
Red-breasted Merganser	2							On sea
Red-throated Diver	13	✓	✓				✓	On sea
Fulmar	7						✓	Flew north
Sooty Shearwater	4						✓	Flew north
Manx Shearwater	2						✓	Flew north
Gannet	124						✓	At sea
Cormorant	25							On sea
Shag	6						✓	On sea
Heron	1							
Great-crested Grebe	2							On sea
Red-necked Grebe	1						✓	Flew north

[6] Number of birds observed during a one hour count period. This is the peak number of birds counted and not the actual number of birds present within the survey area.

Species	Peak Count [6]	Annex 1	Schedule 1	Bio Frame	D LBAP	UK Red List	UK Amber List	Notes
Oystercatcher	52						✓	Foraging on shoreline
Purple Sandpiper	9		✓		✓		✓	On shoreline
Dunlin	1					✓		One north along shoreline
Woodcock	1						✓	Flushed from woods at southern end of survey area
Golden Plover	25	✓					✓	Roosting in northern end of survey area
Lapwing	245			✓	✓	✓		Roosting in northern end of survey area
Whimbrel	1		✓			✓		South
Curlew	21			✓	✓		✓	Present throughout the survey area
Common Sandpiper	1						✓	Flying along shoreline
Redshank	9				✓		✓	Foraging on shoreline
Turnstone	16						✓	Foraging on shoreline
Pomarine Skua	1							Flew north
Long-tailed Skua	1							Flew north
Great Skua	30						✓	Flew north
Kittiwake	80						✓	Foraging at inshore waters
Black-headed Gull	254						✓	Present throughout the survey area
Mediterranean Gull	1	✓	✓					Adult in Seaham car park
Common Gull	265							Present throughout the survey area
Lesser Black-backed Gull	11						✓	
Herring Gull	500			✓		✓		
Great Black-backed Gull	441						✓	Over sea
Sandwich Tern	8	✓					✓	At sea, roosting north of Pincushion
Roseate Tern	1	✓	✓	✓	✓	✓		At sea
Arctic Tern	7	✓					✓	At sea
Commic Tern	2							At sea
Guillemot	30						✓	At sea
Razorbill	20						✓	At sea

Species	Peak Count [6]	Annex 1	Schedule 1	Bio Frame	D LBAP	UK Red List	UK Amber List	Notes
Auk sp.	30							At sea
N.B. Northumbria Coast SPA citation species shown in red.								

Two Northumbria Coast SPA species, Purple Sandpiper and Turnstone, were observed during the diurnal high tide surveys. However, these were only recorded in small numbers, 9 Purple Sandpiper and 16 Turnstone, and represents only 1.18% and 1.10% respectively of the Northumbria Coast SPA population[7] (JNCC 2001). A total of six Annex 1 species were recorded and included Red-throated Diver, Golden Plover, Mediterranean Gull, Sandwich Tern, Common Tern and Arctic Tern. Herring Gull was the only BoCC Red List species recorded along with 13 BoCC Amber List waterbird species (Red-throated Diver, Fulmar, Shag, Oystercatcher, Purple Sandpiper, Woodcock, Curlew, Redshank, Turnstone, Kittiwake, Black-headed Gull, Great Black-backed Gull and Guillemot).

Common Scoter, Dunlin, Lapwing, Whimbrel and Herring Gull, were the only BoCC UK Red List waterbird species recorded during the low tide surveys. A total of 30 BoCC UK Amber List waterbird species (Brent Goose, Shelduck, Wigeon, Teal, Eider, Red-throated Diver, Fulmar, Sooty Shearwater, Manx Shearwater, Gannet, Shag, Red-necked Grebe, Oystercatcher, Purple Sandpiper, Woodcock, Golden Plover, Snipe, Curlew, Common Sandpiper, Redshank, Turnstone, Great Skua, Kittiwake, Black-headed Gull, Lesser Black-backed Gull, Great Black-backed Gull, Sandwich Tern, Arctic Tern, Guillemot and Razorbill) were also recorded.

Other birds of conservation concern recorded during the high tide surveys include Kestrel Skylark, Starling, Whitethroat, Meadow Pipit, Linnet and Reed Bunting.

Low Tide Survey

A total of 37 species of waterbird were recorded during the low tide surveys. These, along with their current UK conservation status levels, are listed in Table 25, below.

[7] Northumbria Coast SPA populations: Purple Sandpiper 763 individuals (5 year peak mean 1991/2 to 1995/6), Turnstone 1456 individuals (5 year peak mean 1991/2 to 1995/6) (JNCC 2001).

Table 25: Low Tide Species List and UK Conservation Status (key species are highlighted in bold typeface).

Species	Peak Count [8]	Annex 1	Schedule 1	Bio Frame	D LBAP	UK Red List	UK Amber List	Notes
Greylag Geese	2						✓	In off the sea
Wigeon	16						✓	Flying north
Teal	11						✓	Flying north
Mallard	12						✓	At sea
Eider	41						✓	Foraging inshore waters
Common Scoter	148		✓	✓		✓		At sea
Velvet Scoter	2		✓				✓	Flying north
Goosander	1							On sea
Red-throated Diver	11	✓	✓				✓	On sea
Fulmar	3						✓	Flew north
Manx Shearwater	1						✓	At sea
Gannet	6						✓	At sea
Cormorant	18							On sea
Shag	4						✓	On sea
Heron	1							Foraging along shoreline
Oystercatcher	57						✓	Foraging along shoreline
Purple Sandpiper	1		✓		✓		✓	On shoreline
Golden Plover	93	✓					✓	Roosting in northern end of survey area
Lapwing	222			✓	✓	✓		Roosting in northern end of survey area
Dunlin	1				✓	✓		Foraging along shoreline
Snipe	1				✓		✓	Roosting in northern end of survey area
Curlew	25			✓	✓		✓	Present throughout the survey area
Redshank	5				✓		✓	Foraging on shoreline
Turnstone	13						✓	Foraging on shoreline
Arctic Skua	1			✓		✓		Chasing Kittiwakes at sea

[8] Number of birds observed at any one moment. This is the peak number of birds counted and not the actual number of birds present within the survey area.

Species	Peak Count [8]	Annex 1	Schedule 1	Bio Frame	D LBAP	UK Red List	UK Amber List	Notes
Great Skua	2						✓	Flying north
Kittiwake	36						✓	At sea
Black-headed Gull	427						✓	Present throughout the survey area
Mediterranean Gull	1	✓	✓					At Seaham car park
Common Gull	331							Present throughout the survey area
Lesser Black-backed Gull	3						✓	Roosting with Herring Gulls
Herring Gull	480			✓		✓		Present throughout the survey area. Peak count were birds flying north in September.
Great Black-backed Gull	65						✓	Roosting in fields to south of site and at sea
Sandwich Tern	15	✓					✓	At sea, roosting on beach
Common Tern	4	✓					✓	At sea
Arctic Tern	11	✓					✓	At sea, roosting on beach
Guillemot	9						✓	At sea
Razorbill	5						✓	At sea
Auk sp.	2							Flying north
Puffin	1						✓	At sea
N.B. Northumbria Coast SPA citation species shown in red.								

Purple Sandpiper and Turnstone were the only Northumbria Coast SPA citation species observed during the low tide surveys. A single Purple Sandpiper was recorded on the December survey and represents 0.13% of the Northumbria Coast SPA population (JNCC 2001). A maximum of 13 Turnstone were observed, which represents only 0.89% of the Northumbria Coast SPA population (JNCC 2001). A total of six Annex 1 species were recorded and included Red-throated Diver, Golden Plover, Mediterranean Gull, Sandwich Tern, Common Tern and Arctic Tern. Common Scoter, Lapwing, Dunlin, Arctic Skua and Herring Gull were the only BoCC UK Red List waterbird species recorded during the low tide surveys. A total of 26 BoCC UK Amber List waterbird species (Greylag Goose, Wigeon, Teal, Eider, Velvet Scoter, Red-throated Diver, Fulmar, Manx Shearwater, Gannet, Shag, Oystercatcher, Golden Plover, Snipe, Curlew, Redshank, Turnstone, Kittiwake, Black-headed Gull, Lesser Black-backed Gull, Great Black-backed Gull, Sandwich Tern, Common Tern, Arctic Tern, Guillemot, Razorbill and Puffin) were also recorded.

Other birds of conservation concern recorded during the high tide surveys include Kestrel Skylark, Starling, Whitethroat, Meadow Pipit, Linnet and Reed Bunting.

4.2.2.3 Winter Walkover Survey

A total of 53 species were recorded during the winter walkover surveys. These, along with their current UK conservation status levels, are listed in Table 26.

Table 26: Winter Walkover Species list and UK conservation status.

Species	Peak Count [9]	Annex 1	Schedule 1	Bio Frame	D LBAP	UK Red List	UK Amber List	Notes
Mallard	2						✓	Flying over site
Grey Partridge	49			✓		✓		Present mainly within the central section of site and the eastern field
Pheasant	Common							Present mainly around hospital grounds
Sparrowhawk	2							Immature male and female
Buzzard	2							Hunting over southern buffer
Kestrel	2						✓	Hunting over site
Moorhen	2							By pond in buffer
Golden Plover	13	✓					✓	Flying over the centre of the site
Lapwing	73			✓	✓	✓		Flying over southern buffer
Woodcock	4						✓	Roosting on site within the enclosed area at Cherry Knowle Hospital
Curlew	25			✓	✓		✓	Foraging outside the 200m buffer on un-snow covered field. Up to 11 Curlew foraging on site
Black-headed Gull	50						✓	Foraging on buffer and on site
Common Gull	120							Predominantly flying over the site or foraging in southern buffer fields
Herring Gull	15			✓		✓		Predominantly flying over the site
Great Black-backed Gull	1							Flew south over site

[9] Number of birds observed at any one moment. This is the peak number of birds counted and not the actual number of birds present within the survey area.

Species	Peak Count [9]	Annex 1	Schedule 1	Bio Frame	D LBAP	UK Red List	UK Amber List	Notes
Stock Dove	1						✓	Over site
Woodpigeon	Very Common							Predominantly within Ryhope Dene and site buffer
Collared Dove	Scarce							Present in Doxford Park residential area
Great Spotted Woodpecker	1							Calling by hospital and at western end of site
Magpie	Common							Present throughout site
Jay	1							Present in central woodland
Jackdaw	Common							Predominantly in horse paddocks
Rook	Common							Present throughout site
Carrion Crow	Common							Present throughout site
Goldcrest	4							Within Ryhope Dene
Blue Tit	Common							Predominantly in residential gardens
Great Tit	Common							Predominantly in residential gardens
Coal Tit	Scarce							Within woodland adjacent to Doxford Park
Skylark	12			✓	✓	✓		Singing on site
Long-tailed Tit	Scarce							In the young plantation in the north of the site
Treecreeper	1							In central deciduous woodland
Wren	Common							Present throughout site
Starling	70			✓	✓	✓		Predominantly in residential gardens
Blackbird	49							Predominantly in residential gardens
Fieldfare	61		✓			✓		Migrants - predominantly in horse paddocks north of hospital
Song Thrush	3			✓	✓	✓		Present throughout the site and Ryhope Dene
Redwing	4		✓			✓		Migrants
Mistle Thrush	8						✓	Present throughout the site
Stonechat	2							One pair on the eastern

Species	Peak Count [9]	Annex 1	Schedule 1	Bio Frame	D LBAP	UK Red List	UK Amber List	Notes
								field boundary
Robin	16							Present throughout the site
Wheatear	2						✓	Migrants
Dunnock	5			✓			✓	Present on site
House Sparrow	Common			✓	✓	✓		Predominantly in residential gardens
Tree Sparrow	75			✓	✓	✓		Foraging in southern buffer field with winter crop and pheasant feeders
Grey Wagtail	1						✓	South over eastern field
Pied Wagtail	1							By residential area in centre of site
Chaffinch	Common							Present throughout the site
Greenfinch	Scarce							By hospital
Goldfinch	Common							In Ryhope Dene
Linnet	30			✓	✓	✓		Forage on stubble fields
Lesser Redpoll	11			✓		✓		Flew over the northern section of the site
Bullfinch	1			✓			✓	In Ryhope Dene calling
Yellowhammer	2			✓		✓		Singing on site

No Northumbria Coast SPA designated species were observed using the site or flying over the site during the winter walkover surveys. A total of 13 UK Red List species (Grey Partridge, Lapwing, Herring Gull, Skylark, Starling, Fieldfare, Song Thrush, Redwing, House Sparrow, Tree Sparrow, Linnet, Lesser Redpoll and Yellowhammer) were observed during the winter walkover surveys. A further 13 UK Amber List species were also observed: Mallard, Kestrel, Golden Plover, Woodcock, Curlew, Black-headed Gull, Great Black-backed Gull, Stock Dove, Mistle Thrush, Wheatear, Dunnock, Grey Wagtail and Bullfinch.

4.2.2.4 High Tide Roost/Foraging Locations

Two high tide roosts were identified within the coastal survey area and no roost sites were located within the indicative site boundary or the 200m buffer. These roost locations are shown in Figure 19, Appendix 1. The species of waterbird roosting during the high tide period were predominantly Oystercatcher, Purple Sandpiper and Turnstone and were located on the beach at the end of Ryhope Dene (approx grid reference NZ419519) and on the outflow pipe at Ryhope Nook (approx grid reference NZ414538).

At high tide, Curlew relocated to farmland to continue foraging. High tide foraging locations were located within the central area of the indicative site boundary and in the

southern site 200m buffer. Lapwing was not recorded along the shoreline and was only observed foraging on farmland throughout the high tide cycle. During periods when land was covered in snow both Curlew and Lapwing ranged far and wide in order to find snow free fields to forage in.

Some species of seabirds, particularly gulls, require freshwater to bath in. Concentrations of gulls were recorded on the beach at the end of Ryhope Dene. At high tide this area of beach is cut off from both the south and north and therefore experiences low levels of disturbance.

The sea state was moderate during the February high tide survey and rough during the October survey. Therefore those areas stated above, where waterbirds were regularly recorded roosting, were under water. Waterbirds, especially Oystercatcher, were recorded flying to Seaham Harbour as a safe roost site away from the breaking waves during the February and October high tide surveys. It is suspected that birds from the coastal survey area may also fly to Sunderland Harbour during such sea conditions.

4.2.2.5 Low Tide Roost Locations

Low tide roosts were also recorded within the coast survey area and are shown in Figure 20, Appendix 1. Lapwing, Golden Plover and gulls, including Black-headed, Herring and Great Black-backed were the main species that roosted during the low tide period within the coastal farmland fields. Oystercatchers were recorded roosting during the low tide surveys however these were all on the shoreline.

Gulls roosted within the 200m site buffer zone and within the coastal survey area; however the main concentration of roosting gulls was offshore on the sea.

Curlew was regularly recorded foraging in the various fields within the coast survey area, particularly those adjacent to the shoreline, during the survey period. Oystercatcher were also occasionally recorded foraging in the field to the north of Ryhope Dene and the field to the north of the car park by Seaham Hall during the low tide surveys.

4.2.2.6 Disturbance Events during Ornithological Surveys

The main disturbance to roosting and foraging waterbirds within the survey areas was from walkers, both with and without dogs. Dogs were regularly recorded chasing foraging and roosting waders and gulls on the shoreline within the coastal survey area. Therefore the waterbirds were displaced from the optimal foraging habitats onto sub-optimal habitats. Given the short time period of low tide when food resources are available to waterbirds, constant disturbance and displacement may have significant impact on a individual bird's survival. There are public rights of way (footpaths) along the cliff tops, although towards the southern end of the coastal survey area, these footpaths are closed due to land slips. Walkers and fishermen using these footpaths were recorded causing disturbance to roosting Golden Plover and gulls. Foraging Curlew and Oystercatchers within the coastal fields were also disturbed on a regular bases.

Cyclists, motor cyclists, pigeon shooters and fishermen also contributed to disturbance within the survey area. The area that experienced the majority of disturbance was the sandy beach between Seaham and Ryhope Dene, with a peak of approximately 33 people, including dog walkers, recorded within the coastal survey area during the December low tide survey.

Pigeon shooting along the southern edge of Ryhope Dene caused widespread disturbance and displacement of birds during the January high tide survey. Fishermen regularly caused low levels of disturbance when they walked to and from their fishing spot. Birds soon habituated to the fishermen once they began fishing. A small group of model

aeroplane enthusiasts who were flying their models over the southern end of the coast survey area were recorded on three occasions during the survey period. This activity displaced foraging Curlew from that area.

The main locations recreational activities and disturbance as described above are shown in Figure 21, Appendix 1.

4.2.3 BAP and Other Species/Sightings

A range of UK and Durham BAP priority species were recorded within the site during the surveys, including the birds detailed above, brown hare, bats, common toad and hedgehog.

Evidence indicating the presence of mole, rabbit and roe deer was recorded within the site during various surveys, and dead brown rats were recorded within Ryhope Dene and on Burdon Road. Numerous dog prints were also recorded across the site, indicating that much of the area is regularly used by local dog walkers.

Construction workers provided an unverified report of a Red Kite over Ryhope Dene during the early part of the winter of 2012. An NHS employee has erected a Tawny Owl box in Ryhope Dene. In 2012 this box was occupied by a pair of Tawny Owls and they fledged young, however in 2013 the box was occupied by a Grey Squirrel. The same employee was also able to provide the location of a pair of Little Owl residing in an open ventilation shaft in one the hospital buildings. A local dog walker stated that Kestrels nested within the Hospital complex in recent years however no nest was found during the survey period.

Two harbour porpoise were observed feeding close to the shore during the January high tide survey and the February low tide survey. Other cetaceans that have been recorded passing the Durham coast during the survey period included Humpback Whale *Megaptera novaeangliae*, Minkie Whale *Balaenoptera acutorostrata*, White-beaked Dolphin *Lagenorhynchus albirostris* and Bottle nosed Dolphin *Tursiops truncatus* (Hindess 2013).

5 Site Assessment

5.1 Constraints

Bats

Kit 6 was stolen twice, once in April (this was recovered and returned, including data) and once in October, which has not been recovered. As such, no data was available for the October survey period for point 6 however, this is not considered to represent a significant constraint to the assessment due to the amount of other data available for this point throughout the remainder of the year, the availability of October data for other points within the site and the fact that the October transect surveys also included this approximate location.

In addition, access was not available to all areas within the red line/survey boundary during the bat transects and tree risk assessments. However, this was primarily the result of ongoing development works within such areas and as such, any data collected regarding the behavior of bats in such areas at this stage would be likely to change as the development works progress. It is assumed in each instance that appropriate levels of bat survey work were completed prior to the commencement of works to ensure the proposals do not have a significant negative impact upon local populations of such species, their roosts or bats themselves.

Great Crested Newts

Access was not available to the large waterbody to the east of Burdon Hall for the purposed of the great crested newt breeding season surveys however, the feature lies almost 500m from the main survey boundary and is largely surrounded by high stone walls; the risk of great crested newts being present in the feature and entering the main survey area is therefore considered to be low. As such, the absence of survey data for this feature is not considered to represent a significant constraint to the assessment.

Access was not available to pond 5 during the first survey visit however, the pond was surveyed separately a few days later and all subsequent survey visits covered this feature. All surveys used an appropriate range of survey techniques, as recommended by current best-practice guidelines and were undertaken at a time when amphibians (including great crested newts) were known to be utilising other breeding ponds in the wider area. All surveys were undertaken under suitable weather conditions. As such, there are not considered to be any significant constraints to the assessment.

5.2 Assessment of Value

5.2.1 Habitats

The site is dominated by habitats of **low** botanical value, the intensively managed arable land supporting monocultures of commercial crops. The areas of scrub, semi-improved and coarse grassland and the species-poor/defunct hedgerows are considered to be of **local** importance, supporting a small range of locally common species typical of such habitats, and being relatively easy to recreate over a reasonable time period.

The small number of ponds, watercourses, larger hedgerows and the plantation woodlands are considered to be of **parish** importance due to the longer time over which it takes to recreate such features, and their relative scarcity in the surrounding area. The

ancient woodlands along Ryhope Dene are considered to be features of **district to county** importance due to the scarcity of such habitats within the wider area and the impracticalities of replacing such features within a reasonable time period.

5.2.2 Protected Species

Bats

The site as a whole varies in terms of its value for bats.

Section 1 is considered to be of at most **local to parish** value for foraging and commuting bats, this area having the highest number of bat records during the transects and having a high number of bat passes recorded during the remote monitoring periods. It is also considered to be of at least **local** value for roosting bats, with two small cool roosts of a locally common species (common pipistrelle) located within this section.

The arable habitats which dominate sections 2 and 3 are considered to be of **low** value for foraging and commuting bats, due to their open and exposed nature, while the adjacent hedgerows and plantations are considered to be of **local** importance to bats. However, Burdon Lane, which acts as a foraging area and strong commuting route through the local area, is considered to be a feature of up to **local to parish** importance, aiding the movement of local bat populations throughout the local area.

A range of potential bat roosts were located in Section 4, within the hospital and the Engines Museum, the value of which cannot not be determined without further surveys being completed. The hospital grounds are considered, under the current circumstances (mid-way through extensive development works) to be of no more than **local** importance, being used by small numbers of locally common bat species on an occasional basis. The exception is the area around the museum, which is considered to be of **local to parish** importance for bats, being used as a foraging area by a range of species at times throughout the active season.

The arable habitats which dominate Section 5 are considered to be of low value, being used on only an occasional basis by individual commuting bats. The habitats along Ryhope Dene were found to be used more regularly and the woodland edge is considered to be a feature of local importance, being used by small numbers of foraging and commuting bats at times throughout the active season. At least one bat (pipietelle cool) roost is known to be present within the wood, which is considered to be of local importance to bats.

Great Crested Newts

Based on the criteria set out in Section 4.3, pond 1 supports a low population of smooth and palmate newts and a low population of common toad; pond 3 supports a low population of common frog; and pond 4 supports a low population of common toad and common frog. The presence of tadpoles in pond 5 also infers that this waterbody supports a low population of common toad or frog. The site as a whole supports low populations of common toad, smooth and palmate newts and common frog.

No evidence indicating the presence of great crested newts was recorded during the surveys. However, populations of the species can fluctuate naturally between years, sometimes quite dramatically and the absence of the species from a particular pond can be very difficult to rule out. Should a low population of great crested newts persist on the site, the area is likely to be of no more than **local** importance to the species.

Ponds 1, 3, 4 and 5 within and adjacent to the site are considered to be of up to **parish** conservation importance due to the presence of BAP species including common toad. The areas of longer grassland, scrub, hedgerows and woodland are considered to provide some good quality habitat for such species, and are considered to be of **local to parish** conservation importance, being replicated throughout the surrounding area. The areas of hard standing, amenity grassland and agricultural land are considered to be of lower value to amphibians, providing little cover and being widely replicated throughout the surrounding area; such habitats are considered to be of **low to local** value for such species.

Otter

Habitats across the majority of the survey area are considered to be of **low** value to otter, the intensively managed agricultural habitats providing limited cover and feeding opportunities for such species. Ryhope and Cherry Knowle Dene have the potential to provide higher quality habitat for the local otter population. However, the high disturbance levels in such areas throughout the night due to the frequent use of the area by people on motorbikes, and the resultant loss of vegetation/cover is considered to reduce the suitability of the area for the species. In addition, the watercourse which runs through the denes is effectively severed by a number of culverts which are unlikely to be suitable for use by otter, reducing the suitability/availability of habitat. As such, the denes are considered to be of no more than **local** importance to otter, higher quality habitats being present in the wider area.

Water Vole

No definite evidence indicating the presence of water vole was recorded and the majority of habitats across the survey area are considered to be unsuitable for use by the species. The suitability of the watercourses within the denes are considered to be reduced by the ongoing damage to the area which is being caused by motorbikes, with both the high disturbance levels and loss of bankside vegetation reducing the suitability of the area for the species. The presence of a number of culverts may reduce the ability of the species, if present in the local area, to spread in to or out of the site and the small size of the area of potential habitat within the site is therefore considered to be limited by its small extent. The site is therefore likely to be of no more than **local** importance to the species, should a population persist in the area.

Badger

No evidence indicating the presence of badger was recorded during the survey however, the site is considered to have the potential to support the species. Should a small sett e.g. outlier or subsidiary, be present within the site, this is likely to be of no more than **local** importance, such features being used on an intermittent basis; if a main sett is present within the site, this is likely to be of no more than **parish** importance to the species, due to the relatively common nature of the species throughout the region. Habitats across the site are considered to have the potential to be used by the species at times, should a population persist in the area. Although similar quality habitats are widely replicated throughout the local area, the large size of the site is considered to increase its potential value to badger, therefore should a population be present on site, the survey area is likely to be of up to **parish** importance to the species.

Brown Hare

Very low levels of brown hare activity were recorded within the site during both the species-specific surveys and as incidental results of other work being completed on the site. Local populations of the species are likely to be low, based on the observations made throughout the assessment period and the site appears to be being used on only an intermittent basis. The site is therefore considered to be of **local** importance for brown hare.

Birds

Breeding Birds

The breeding bird community within the breeding bird survey area (redline boundary plus a 200m buffer) includes 43 species of which 18 species were of national, and/or local, conservation concern. Fourteen of these species were recorded nesting within the actual redline boundary of the site, with the other four species within the 200m buffer around this site.

Of these 18 species, eight (Grey Partridge, Lapwing, Skylark, Starling, Song Thrush, House Sparrow, Linnet and Yellowhammer) are both priority species on the UK BAP and on the BoCC Red List, whilst another three species (Dunnock, Bullfinch and Reed Bunting) are priority species on the UK BAP and listed on the UK Amber List. A further seven species are listed on the BoCC Amber List: Kestrel, Swift, Swallow, House Martin, Whitethroat, Willow Warbler and Mistle Thrush.

In a local context, six of the above species are also listed on the Durham LBAP: Lapwing, Skylark, Starling, Song Thrush, House Sparrow and Reed Bunting.

It is considered that, in the context of breeding birds, the site is of **Parish ornithological value**.

Winter Birds

The bird community within the survey area includes 42 species of national, and/or local, conservation concern. Of these, 14 species (Common Scoter, Grey Partridge, Lapwing, Herring Gull, Skylark, Starling, Fieldfare, Song Thrush, Redwing, House Sparrow, Tree Sparrow, Linnet, Lesser Redpoll and Yellowhammer) are priority species on the UK BAP and BoCC Red List species, with Common Scoter also being protected under Schedule 1. Other Schedule 1 species recorded during the surveys were Fieldfare and Redwing, although, as with Common Scoter, these were recorded as wintering only on the site. In addition, a total of 28 species recorded during the surveys are listed on the BoCC Amber List: Greylag Goose, Brent Goose, Teal, Mallard, Eider, Goldeneye, Red-throated Diver, Fulmar, Gannet, Shag, Oystercatcher, Golden Plover, Purple Sandpiper, Snipe, Woodcock, Curlew, Redshank, Turnstone, Kittiwake, Black-headed Gull, Great Black-backed Gull, Guillemot, Razorbill, Kestrel, Dunnock, Grey Wagtail, Mistle Thrush and Bullfinch.

In a local context, 12 of the above species are also listed on the Durham LBAP: Lapwing, Purple Sandpiper, Dunlin, Snipe, Curlew, Redshank, Skylark, Starling, Song Thrush, House Sparrow, Tree Sparrow and Linnet.

It is considered that, in the context of wintering birds (particularly farmland birds), the proposed development site is of **Parish ornithological value**.

5.3 Summary of Value Assessment

The surveys completed at the site to date identified the presence of a range of habitats of value in their own right, as well as for a range of protected and notable species. The table below and Figure 22 summarise the key interests of each area detailed above.

Table 27: Summary of Features of Ecological Value

Survey Area	Feature	Value of Receptor
S1 - West	Key area for foraging bats	Local to parish
	Two small pipistrelle cool roosts in trees	Local
	Blakeney Woods Local Wildlife Site (LWS)	Parish
	Mature tree lines along field boundaries	Local
	Occasionally used by small numbers of brown hare	Local
	Small pond supporting breeding populations of common toad, common frog and smooth and palmate newt	Local
	Good range of farmland and woodland bird species present, including breeding	Local
S2 – Centre West	Hedgerows along Burdon Lane used by small numbers of commuting and foraging bats	Local
	Main concentration of Grey Partridge and Skylark within the site, as well as BoCC farmland bird species	Parish
S3 – Poultry Farm	Used as a foraging area by small numbers of bats, which entered from the housing estate to the north	Local
	Hedgerows along Burdon Lane used by small numbers of commuting and foraging bats	Local
	Main concentration of Grey Partridge and Skylark within the site, as well as BoCC farmland bird species	Parish
	Pasture field to the north of S4 support good levels of foraging activity by a range of species, including declining farmland birds and a range of winter migrants	Parish
S4 - Hospital	Range of potential bat roosts present within the hospital and engines museum	Local
	Ponds and treed/grassland areas around the engines museum regularly used by foraging bats	Local to parish
	Relatively good breeding population of common frog in the ponds at the engines museum, along	Local

	with other locally common amphibian species	
	Mature tree lines running through the north of the site	Local
	Immediately adjacent to Cherry Knowle Dene LWS (ancient woodland)	District to County
	Main area within the site for roosting Woodcock and Kestrel are known to have bred on the chimney up to this year	Local
S5 - East	Occasionally used by small numbers of brown hare	Local
	Ryhope Dene LWS lies within the south of the survey area (ancient woodland)	District to County
	Good selection of BoCC breeding birds. Would be a good high tide roost area for the SPA if the field was ploughed and reseeded, which may have happened in the past.	Parish – potentially higher
	Small pipistrelle cool roosts in tree within Ryhope Dene	Local

5.4 Assessment of Impacts

Terrestrial Ecology

Based on the surveys undertaken to date, development works within the site could have the following potential impacts upon the habitats and protected species which may be present:

- The loss or disturbance of habitats of low to local botanical importance, comprising areas of arable, scrub, semi-improved and coarse grassland and species-poor/defunct hedgerows;
- The loss or disturbance of habitats of parish to county importance, comprising areas of woodland (including ancient woodland), ponds, watercourses and larger hedgerows;
- The loss, harm or disturbance of habitats of low to local value to local amphibian populations, comprising areas of hard standing, amenity grassland and agricultural land;
- The loss, harm or disturbance of habitats of local to parish value to local amphibian populations, comprising areas of areas of rough grassland, scrub, hedgerows and woodland;
- The loss, harm or disturbance of a series of ponds of up to parish conservation importance for local amphibian populations;
- A low risk of harming or disturbing great crested newts, should a low population of the species persist in the area;
- The harm or disturbance of low populations of a number of locally common amphibian species, including common toad, common frog, smooth and palmate newts;

- The loss or disturbance of habitats of low to parish importance for foraging and commuting bats;
- The harm or disturbance of bats, should any work be undertaken on roost sites without proper precautions being taken;
- The loss of a small number of bat roost sites of local importance to such species;
- The loss or disturbance of habitats of local to parish importance for badger;
- The harm or disturbance of badger setts, should such features be established within the site between the date of these surveys and the commencement of development works on site;
- The loss or disturbance of habitats of up to local importance to otter and water vole;
- The severance of potential wildlife corridors, such as Ryhope Dene and Burdon Lane; and
- The harm or disturbance of a number of Local Wildlife Sites which lie within or immediately adjacent to the site boundary – Cherry Knowle Dene, Blakeney Woods, Ryhope Dene, Ryhope Dene Railway Cutting and Ryhope Denemouth.

No significant impacts are predicted upon the statutory ecological sites present in the surrounding area based upon the information gathered to date (ornithological impacts/sites are discussed below). However, the development of the entire red line boundary may have the potential to result in increased visitor numbers to such sites in the local area e.g. Tunstall Hills and access studies should be completed to determine whether the redevelopment of the area has the potential to result in increased visitor levels which may be detrimental to such sites. In order to help minimise the potential risk to such sites while benefitting the ecological interests of the proposed development area, areas of open/amenity space should be included within the masterplan for the site. Paths should be created/desire lines cut through selected areas within the site to encourage their use by local residents, while aiming to encourage them away from areas of value for protected species, which will instead act as small 'reserves' within the wider site. Measures should also be implemented to control access to existing local wildlife sites within and adjacent to the survey boundary in order to minimise the risk of such areas being further detrimentally affected by their use by local residents.

Ornithology

During the 2013 breeding season, 34 species were considered to be breeding within the redline boundary of the proposed development site. As a worst-case scenario, development of the site may see all of these species displaced outside the site. It is concluded therefore, prior to the sight of any development plans, that the proposed development could have a detrimental impact on the local breeding bird population, particularly those species that nest and forage within farmland. Development of the site could see many of the breeding farmland species permanently displaced from the site.

Based on the data gathered, it is considered that development works on the site could have a negative impact on the integrity of the Northumbria Coast Special Protection Area (SPA), through an increase in indirect disturbance on the adjacent coastline. The Northumbria Coast SPA is designated for breeding Little Tern and wintering Purple Sandpiper and Turnstone. The three key SPA species are rarely, if ever, recorded within the site, therefore development within this area will have no direct impact on these

three species. However, the development of the site may result in an increase in usage of the adjacent coastline, for instance for dog walking etc. and the proposed development could have an indirect impact on these three species and therefore the integrity of the SPA through increased disturbance levels.

The Northumbria Coast SPA is not designated for its assemblage of wintering birds as it doesn't reach the 20,000 individuals threshold, therefore any displacement or indirect disturbance of waders, such as Lapwing and Curlew, roosting or feeding within the site or along the adjacent coastline could not be considered to have an impact on the integrity of the SPA. However, this is not to say that such displacement or disturbance would not have a negative effect on local wintering wader populations.

In order to provide a buffer between the development and the SPA we would recommend that no development is undertaken within 1km of the coastline. This would help to reduce the indirect impacts of the proposed development on the integrity of the SPA, through a reduction in noise and recreational disturbance to the birds using the coast. This buffer would also help to reduce impacts on local wintering wader and gull populations, through both reducing indirect disturbance and protecting a number of key fields used by roosting and foraging waterbirds from development.

The implementation of mitigation and compensation proposals, particularly targeted towards UKBAP / BoCC Red List farmland species, is strongly recommended to support any planning application. Potential mitigation and compensation is discussed further in Section 7 of this report.

This assessment of impacts on the ornithological interest of the site and area is provided prior to sight of any development plans, either a masterplan or more detailed proposals, but in the knowledge that the proposed development is predominantly residential housing.

6 Site Design, Mitigation, Compensation and Monitoring

A robust mitigation strategy cannot be devised until a masterplan has been finalised. However, a range of design, mitigation and compensation measures are likely to be required to ensure development works do not have a negative impact upon the ecological interests of the area. Those measures outlined in section 7.1 should be considered as part of any works across the site, while section-specific measures are provided in section 7.2, below.

6.1 General Principles

6.1.1 Site Design & Habitats

1. Should it be proposed to develop the majority of the site, **S1 (the western section of the site) should be retained and habitats improved** for a variety of wildlife. This section currently supports the greatest range of protected species within the site and, with the exception of the ancient woodlands within the east of the site, is considered to be of the greatest ecological value in the context of the site and surrounding area;
2. Depending upon the results of the winter ornithological work, it may be necessary to **restrict or prevent development works on S5** (the eastern survey area) due to the potential for this field to either be used by key species or act as a disturbance buffer around key areas used by qualifying features of the nearby Special Protection Area (SPA);
3. Efforts should be made to both strengthen and extend existing wildlife corridors within and around the site, in order to maintain the potential for species to move within and through the area following on from any redevelopment works. Particular efforts should be made to enhance the habitats/corridor along Burdon Lane and around the existing local wildlife sites, to provide habitats for a range of species while enhancing connectivity for such species throughout the local area. Potential habitat links/areas for improvement are shown in Figure 24, Appendix 1;
4. Where buffer zones of 15m or more are created around key features, these should support species-rich grasslands which are subject to an appropriate management regime to maximise their value for a range of protected species. Limited levels of scrub cover (grasslands still dominant) could also be allowed to develop in selected areas to provide additional breeding habitat for a range of bird species and a more diverse foraging habitat for bats;
5. Where large tracts of farmland will be lost to development works, enhancement must be undertaken elsewhere to ensure the area retains the potential to support a range species dependant on such habitats, such as declining species of farmland bird and brown hare. Key measures could include the provision of beetle banks and set-aside plots, planting of new hedgerows and the inclusion of wild bird crops for key species such as Grey Partridge. The **eastern side of S5 is recommended** for such use due to the proximity of the area to the SPA. The Environment Bank (the UK's first independent biodiversity offsetting broker) recommends:
    - A ratio of at least 2:1 for compensation provided for easily restored/created habitats contiguous to the development site or on similar physical terrain;
    - A ratio of at least 3:1 for higher risk restoration/creation options, where there is less certainty in being able to closely replicate the habitats lost; and

- A ratio of at least 4:1 for habitat enhancement options.

6. Where habitats of particular importance to locally important or protected species are identified, measures should be put in place to ensure such features are retained or enhanced through the proposals;
7. Measures should be put in place to minimise potential disturbance impacts, such as light spill or increased visitor access, upon any features of value to locally important or protected species;
8. Areas of open/amenity space should be included within the masterplan for the site which will benefit both wildlife and local residents, with the aim of also minimising the risk visitor levels on surrounding ecologically important sites increasing to the point that they suffer detrimental impacts. Paths should be created/desire lines cut through selected areas within the site to encourage their use by local residents, while aiming to encourage them away from areas of value for protected species, which will instead act as small 'reserves' within the wider site;
9. Habitats of value, both in their own right and for protected species, should be created within the area as part of any masterplan. This may include areas of species-rich grassland or hedgerow, broadleaved woodland, ponds or swales, amongst others. By placing such features in close proximity to one another, the redevelopment works can result in the creation of a series of stepping stones or wildlife corridors which link together habitats of value and aid the movement of local wildlife throughout the area;
10. Habitats within the site which are either retained or created for their ecological importance should be subject to an appropriate management regime, in order to ensure the value of such habitats is maintained in the long-term;
11. Wherever possible, priority within the planting schemes should be given to the use of native species which are ideally of local provenance. This should include a range of nectar and fruit-bearing species in order to help maximise their value to local wildlife;
12. The inclusion of nectar- and fruit-bearing species which are of value to invertebrates within the planting scheme will help to provide an increased food supply for a range of protected and notable species;
13. A series of 'habitat piles' comprising dead wood, brash/scrub and turf/arisings from vegetation clearance works should be created across the survey area, within a variety of habitats, including the woodlands, rough grassland and close to the existing waterbodies to provide shelter and foraging opportunities for a range of species. Ideally, such features should measure at least 1m x 2m. Materials that will decompose should not be placed close to the base of the structure to avoid it collapsing a crushing any animals present at the time;
14. Wherever health and safety issues allow, standing deadwood should be maintained where arboricultural works are required, as such features provide habitat for a wide range of invertebrate, bird and mammal species;
15. The edges of existing woodlands could be improved through appropriate zoning, which may require additional clearance works or planting. To be of most value, the centre of a ride or very edge of the wood should support grassland and forb species (ideally species-rich grassland), which then grades into areas of shrubs and scrub with occasional trees before grading into a final zone where trees dominate;
16. Any new trees planted should be protected by plastic guards until established, at which point the guards should be removed;

17. Hedgerows across the site would benefit from 'gapping up' using a range of locally appropriate native plant species. As well as increasing the botanical value of such features, the implementation of such measures would help to increase the availability of breeding and foraging habitat for a range of protected species and increase connectivity between habitats of ecological value throughout the area;
18. The creation of new waterbodies (ponds, ditches and swales), hedgerows, tree lines and species-rich grassland within the area will help to further increase the quality of the foraging resource and connectivity between habitats within the site for a range of protected species;
19. The creation of further, new fish-free waterbodies across the site which are too small for use by waders and wildfowl would benefit a range of amphibians and potentially other species, such as dragonflies and damselflies. Information regarding pond creation can be found on the 'Pond Conservation' website:
    - http://www.pondconservation.org.uk/millionponds/pondcreationtoolkit/#Core_factsheets;
20. Habitats subject to minimal management, such as swales or strips of rough grassland, should be created where possible between the ponds within the site, to facilitate the movement of amphibians and other species between the waterbodies within the survey area;
21. Although less botanically diverse than hay pastures, for example, areas of rough grassland contain coarse and ruderal species which provide habitat for a number of species which could not otherwise persist on the site, including a range of Lepidoptera such as Small Skipper (Yorkshire fog), Small Copper (common sorrel) and Red Admiral (common nettle). Although such species are relatively common, their presence adds to the overall biodiversity value of the site and should be encouraged where possible;
22. The creation of beetle banks and set-aside plots within the areas of agricultural land and lower quality grassland within the area would provide alternative foraging habitat for a range of passerines throughout the year;
23. Particular care should be given to the lighting design as part of any redevelopment works. Low level lighting which minimises spill should be used, with the use of high intensity lighting being avoided near any existing or new habitat of value to bats or breeding and wintering birds;
24. A monitoring strategy should be implemented to highlight the presence of invasive species, either plant or animal, which could be detrimental to the long-term biodiversity of the site. Should such species be recorded, early identification increases the likelihood of appropriate measures being implemented which will allow the successful removal, or at least control of such species before they can cause significant harm;
25. The use of fertilizers, pesticides and herbicides should be minimised across the site, to help increase the range of species which the site is able to support. Such chemicals should not be used at all within at least 3m of any waterbodies or watercourses, or 2m of areas of more diverse grassland;
26. When undertaking management work on the waterbodies, it is recommended that such operations are undertaken on a rotational basis, to ensure some of the ponds remain undisturbed each year. On larger waterbodies, the same principle should be applied to pond itself, where only part of the feature is affected each year; and

27. Where it is not possible to secure on site mitigation/enhancement works which are considered appropriate to the scale of development, mitigation/compensatory measures should be applied off site, as close to the proposed development area as possible; this is in order to minimise impacts upon local populations of protected species and key habitats, as oppose to simply dealing with impacts at a site-specific level. The implementation of such works needs to be secured through either an approved biodiversity offsetting scheme, or appropriate legal documents (Section 106 Agreement).

6.1.2 Protected Species

28. The presence – either known or potential – of protected species will be given key consideration in the design and planning process for any new developments on the site. This includes the establishment of buffer zones around key features within the site, in which development activities are either prevented or heavily restricted (see Figures 23 and 24) and the establishment or strengthening of key wildlife corridors through the area;
29. Works, including hedgerow or tree trimming and ground clearance operations, will not be undertaken within the site between March and August inclusive unless a checking survey by an appropriately qualified ornithologist has shown active nests to be absent within the 3 days prior to the commencement of works;
30. Where vegetation clearance works are undertaken, the arisings should be left in situ for 24 hours to allow any animals within them to move into areas of remaining habitat. The arisings should then be removed to, wherever possible, a compost heap or 'habitat piles' created within the site;
31. Where aquatic vegetation is removed as part of the ongoing management of such features, it should be left ideally no more than 0.5m from the pond edge for at least 24 hours to allow any animals present the opportunity to return to the pond. After this time, the arisings should be removed and composted where possible;
32. As great crested newts are relatively mobile and populations can fluctuate naturally between years, great crested newt surveys will be completed during the breeding season prior to the start of any works/the submission of a planning application where works are proposed within 500m of any of the ponds within the area;
33. Works will not commence on any building or mature tree within the area without surveys first being undertaken by an appropriately qualified ecologist to establish whether any bat roosts are present. Where such features are identified which may be affected by the proposals, works will not commence until a licence has been obtained from Natural England;
34. Works will not be undertaken within 50m of any waterbody or watercourse without checking surveys for otter and water vole first being completed, to ensure the situation with regard to such species remains the same. Should the proposals have the potential to affect features such as an otter holt, works will not commence until a licence has been obtained from Natural England;
35. Development works will not commence on the site until a checking survey for badger has been completed within 50m of the works area. The species is highly mobile and can open up new setts literally overnight, therefore checking surveys are considered necessary to ensure such works do not affect badger. Should a sett prove to be present, works will not proceed until a licence has been obtained from Natural England;

36. Works will proceed to method statements to minimise the risk of protected or locally important species being adversely affected by the development;
37. Wherever possible, features such as bat roosts and bird nest boxes e.g. terrace boxes for Starlings or House Sparrows, should be included within the construction of new buildings within the site;
38. The inclusion of nest boxes suitable for use by a variety of species (hole, open-fronted, terraced and specialist boxes) across the site would help to further increase the availability of breeding habitat for a range of both common and declining (BAP, red and amber list) bird species. All boxes should be woodcrete and placed at eaves level on the two-storey (or higher) properties and at least 4m up in mature trees within the site. This could also include the installation of Barn Owl and Kestrel boxes, although such features would have to be carefully positioned to ensure they are both effective and not adversely affected by vandalism (ideally located in safe locations off site). Boxes should be included on site as follows:
    - Swallow nest boxes (groups of 3) at eaves level (just under the soffit) on one in every 10 new houses on the southern and eastern elevations;
    - House Marten nest boxes (groups of 3) at eaves level (just under the soffit) on one in every 10 new houses on the southern and eastern elevations. Only to be placed on white fascia boards;
    - Swift boxes (groups of 3) at eaves level on the eastern elevation of one in every 20 new houses;
    - Starling terraces built in to one of every 10 new houses on the eastern elevation at eaves height;
    - House Sparrow terrace boxes built in to one of every 10 new houses on the eastern elevation at eaves height; and
    - A combination of hole-fronted (26mm and 32mm) and open-fronted boxes placed in the existing mature woodlands within the site. 200 boxes should be installed in total.
39. Where possible, access routes/culverts beneath any new roads should be included if protected or BAP species such as amphibians or hedgehogs are identified within the survey area, to help minimise the potential impacts of increased traffic movements;
40. New roosting opportunities for bats should be included within any new buildings within the site wherever opportunity allows. This should include a combination of bat boxes on trees or the side of buildings and the inclusion of integrated roost sites within new structures:
    - Boxes should be installed on at least one in every 10 houses, located close to the eaves and primarily comprise built-in Woodstone boxes/Type 27 Schwegler boxes or similar;
    - One in every 30 houses structures built within 200m of existing mature woodland should also include a bat loft (4m x 4m x 2m high) suitable for use by *Myotis* sp., which have been found to be present in the area;
    - Tree boxes should be woodcrete, installed in groups of 3 around the trees and comprise a combination of Schwegeler 2F and 2FN or similar, which are suitable for use by a range of species;

- Roosts should be located on a variety of elevations to provide different climatic conditions for such species at times throughout the year and should be placed at least 4m up in trees and at eaves level in new buildings; and

41. Roof timbers must not be treated with chemicals with the potential to harm bats, including treatments for wet or dry rot and woodworm. Permethrin or cypermethrin based chemicals may be used – further information on suitable products is available from Natural England.

6.1.3 Protection Measures during Development

42. Appropriate working methods will be implemented to ensure there are no adverse impacts, either direct or indirect, on any of the Local Wildlife Sites within or adjacent to the site boundary. This also applies to the existing and any new wildlife corridors/features created within the site as part of any phased development works in the area;
43. No fires will be lit as part of any development proposals;
44. Any chemical required will be locked away in appropriately secure containers when not in use and spill kits will be kept nearby at all times;
45. Works will not be undertaken between sunset and sunrise during spring to autumn (April to October inclusive) to minimise the risk of disturbing species such as bats and breeding birds;
46. No high powered lighting will be installed as part of any of the construction works across the site;
47. Wherever trenches or holes are to be opened, efforts will be made to ensure these are closed on the same day. Where this is not possible, the trench/hole will be covered when not in use or a plank will be placed inside which is large enough for a person to walk up or (preferably), one side will be cut at a 45^{o} angle to allow any wildlife which may fall in a safe route out. Any such holes will be checked each morning prior to the recommencement of works to ensure no wildlife has been trapped inside;
48. Appropriate working methods must be implemented to ensure invasive species are not spread through any of the onsite operations;
49. In order to minimise the risk of wildlife being adversely affected by the proposals, vegetation within the proposed works area will be cut back by hand to a height of c.5cm, under the supervision of an appropriately qualified ecologist, and the arisings removed immediately prior to the start of any other works. These areas will be left for 24 hours before works commence, to encourage any wildlife present to move into adjacent areas;
50. Any sightings of protected species within the site during the construction period should be noted in the site diary. If any evidence of such species becomes apparent within 30m of the works area during the construction phase (or 500m in respect of great crested newts), works in that area will stop and the project ecologist will be contacted immediately;
51. Protection/exclusion zones will be established around features of ecological value which lie within or adjacent to any of the works areas to ensure such features are not adversely affected by construction operations; and
52. Vegetation clearance works, soil stripping works and off-track vehicle movements will not be undertaken during the bird breeding season (March to August inclusive),

unless a checking survey by an appropriately experienced ornithologist has shown active nests to be absent immediately prior to the start of works.

6.2 Section-specific Measures

6.2.1 S1 – West

53. Appropriately precautionary stand-off distances (a minimum of 50m) should be implemented between any new development and those habitats which have been shown to be regularly used by bats, namely the mature tree lines, hedgerows and woodland edges within the section. Such measures will also benefit populations of breeding birds;
54. No lighting will be installed as part of any development works which would encroach/spill into the bat buffers around those features shown to be regularly used by such species;
55. No works will be permitted which will result in the severance of any features shown to be of importance for commuting or foraging bats due to the higher levels of activity recorded in S1 in comparison to the rest of the survey area;
56. A 100m stand-off should be maintained around the edges of Blakeney Woods LWS to help minimise potential impacts on this area. This is in line with current guidelines (Corney *et. al.* 2008) on minimising potential development impacts upon ancient woodland;
57. Blakeney Woods should be extended south to Burdon Lane as both areas have been shown to be regularly used by foraging and commuting bats. Increasing the availability of woodland habitat within this area will benefit both the local bat population and a range of other protected species (including breeding birds), through the increased availability of suitable habitat and linking together the Blakeney Woods and Burdon Lane wildlife corridors;
58. Efforts should be made to improve the quality of the ponds in this area (adjacent to the southern plantation and within Blakeney Woods) as their shallow nature makes them likely to dry out on a relatively regular basis;
59. Due to the presence of Tree Sparrow within the area, 4no. hole-fronted boxes suitable for use by the species should be installed *per tree* at 11no. locations within the mature tree lines within the arable fields within S1;
60. The hedgerows within this section would benefit from gapping-up using a range of locally appropriate native plant species, and the implementation of an appropriate management regime to help create/maintain an A-shaped profile;
61. The areas of rough/unmanaged grassland would benefit from being cut/grazed on a rotational basis, with arisings removed after 24 hours (to allow seed settlement) to help ensure the nutrient levels in the soil are not increased as a result of such practices. Planting of *Rhinanthus minor* (yellow-rattle) would help to reduce the dominance of grasses, allowing further improvements in time. More diverse grasslands would then benefit from being cut over half to three quarters of the site twice during the year, the first cut being in the first two weeks of April (with care taken to avoid breeding birds), with the second during September, to allow seeds time to set between cuts;
62. Access control measures should be implemented around Blakeney Woods and the plantation within the south of S1 which runs along Burdon Lane/Hangmans Lane to help reduce vandalism (including arson), motor biking and fly tipping in these areas; and

63. Should any works (development or management) be proposed upon those trees shown to support roosting bats, a licence will be required from Natural England prior to the start of works. If such works do not commence within 12 months of the date of the bat report, updating surveys (including on other moderate-high and high risk trees in the area) will be required to ensure the situation remains the same.

6.2.2 S2 – Centre West

64. A 100m stand-off should be maintained around the edges of Blakeney Woods LWS (see point 54), which will encroach into this section, to help minimise potential impacts on this feature;
65. Appropriately precautionary stand-off distances (a minimum of 15m) should be implemented between any new development and those habitats which have been shown to be regularly used by foraging and commuting bats, namely the hedgerows which run along Burdon Lane. Such measures will also benefit populations of breeding birds;
66. No lighting will be installed as part of any development works which would encroach/spill into the bat buffers around those features shown to be regularly used by such species;
67. Measures should be implemented to strengthen the existing Burdon Lane wildlife corridor, which has been found to be regularly used by foraging and commuting bats. This will include strengthening/gapping up the existing hedgerows and the establishment of adjacent species-rich grasslands. Other enhancement measures could include the construction of swales and small ponds within the grasslands, potentially as part of a sustainable urban drainage system (SUDS);
68. No works will be permitted which will result in the severance of any features shown to be of importance for commuting or foraging bats due to the higher levels of activity recorded in S1 in comparison to the rest of the survey area; and
69. Due to the presence of Tree Sparrow within the area, 4no. hole-fronted boxes suitable for use by the species should be installed *per tree* at 8no. locations within the mature tree lines within the arable fields within S2.

6.2.3 S3 – Poultry Farm

70. Appropriately precautionary stand-off distances (a minimum of 15m) should be implemented between any new development and those habitats which have been shown to be regularly used by foraging and commuting bats, namely the hedgerows which run along Burdon Lane. Such measures will also benefit populations of breeding birds;
71. No lighting will be installed as part of any development works which would encroach/spill into the bat buffers around those features shown to be regularly used by such species;
72. Measures should be implemented to strengthen the existing Burdon Lane wildlife corridor, which has been found to be regularly used by foraging and commuting bats. This will include strengthening/gapping up the existing hedgerows and the establishment of adjacent species-rich grasslands. Other enhancement measures could include the construction of swales and small ponds within the grasslands, potentially as part of a sustainable urban drainage system (SUDS);

73. No works will be permitted which will result in the severance of any features shown to be of importance for commuting or foraging bats, due to the higher levels of activity recorded in S1 in comparison to the rest of the survey area; and
74. Due to the presence of Tree Sparrow within the area, 4no. hole-fronted boxes suitable for use by the species should be installed *per tree* at 2no. locations within the mature tree lines to the south east of the poultry farm within S3.

6.2.4 S4 - Hospital

75. No development works will be undertaken on any of the buildings, mature trees or bat boxes within the site without full bat surveys being completed which follow current best-practice guidelines;
76. No development works will be undertaken within 15m of the engines museum boundary due to the relative importance of this as a foraging area for the local bat population;
77. A buffer of 50m will be implemented along the edges of Cherry Knowle Dene into which no development works will extend, due to the intrinsic value of the habitats present;
78. Access control measures should be implemented around Cherry Knowle Dene to help reduce vandalism, motor biking and fly tipping in the area;
79. No lighting will be installed as part of any development works which would encroach/spill into the 15m bat buffers around those features shown to be regularly used by such species;
80. High levels of algae were recorded within the ponds at the engines museum and water quality and depth were found to be very variable throughout the survey period, the southern pond being completely dry during the winter. If possible, control measures should be implemented to maintain a good water quality and depth in these waterbodies throughout the year;
81. A number of dead hedgehogs were recorded within the northern pond at the engines museum. The species is listed on the UK BAP and although the buildings and features within the grounds at the museum are Grade II listed, the potential implementation of measures which prevent such species drowning within the waterbodies should be investigated. As hedgehogs are good climbers, this may include something as simple as installing small boards within the ponds which the species can use to climb out of the waterbodies; and
82. The areas of rough and species-rich grassland adjacent to Cherry Knowle Dene may benefit from being cut/grazed on a rotational basis, with arisings removed after 24 hours (to allow seed settlement) to help ensure the nutrient levels in the soil are not increased as a result of such practices. The species-rich grasslands in particular would benefit from being cut over half to three quarters of the site twice during the year, the first cut being in the first two weeks of April, with the second during September, to allow seeds time to set between cuts.

6.2.5 S5 - East

83. No development works will be undertaken within 15m of those features shown to be of importance to the local bat population;

84. A buffer of 500m will be implemented along the edge of the nearby SPA in which no development works should be undertaken. This buffer will extend into the eastern section of S5;
85. Should any works (development or management) be proposed upon those trees shown to support roosting bats, a licence will be required from Natural England prior to the start of works. If such works do not commence within 12 months of the date of the bat report, updating surveys (including on other moderate-high and high risk trees in the area) will be required to ensure the situation remains the same;
86. No lighting will be installed as part of any development works which would encroach/spill into the 15m bat buffers around those features shown to be regularly used by such species;
87. A buffer of 100m will be implemented along the edges of Ryhope Dene into which no development works will extend, due to the intrinsic value of the habitats present;
88. Access control measures should be implemented around Ryhope Dene to help reduce vandalism, motor biking and fly tipping in the area;
89. Due to the extensive damage to the ground flora within Ryhope Dene, an appropriate mitigation and planting strategy should be implemented to help ensure a good quality ground flora is reinstated. This may include spot-treating undesirable plant species while the ground flora is re-established and if a suitable level of natural regeneration does not occur, planting of locally appropriate native species in key areas; and
90. The areas of rough/unmanaged grassland would benefit from being cut/grazed on a rotational basis, with arisings removed after 24 hours (to allow seed settlement) to help ensure the nutrient levels in the soil are not increased as a result of such practices. Planting of *Rhinanthus minor* (yellow-rattle) would help to reduce the dominance of grasses, allowing further improvements in time. More diverse grasslands would then benefit from being cut over half to three quarters of the site twice during the year, the first cut being in the first two weeks of April (with care taken to avoid breeding birds), with the second during September, to allow seeds time to set between cuts.

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8 Appendix 1 – Figures

Figure 2 – Survey Sections

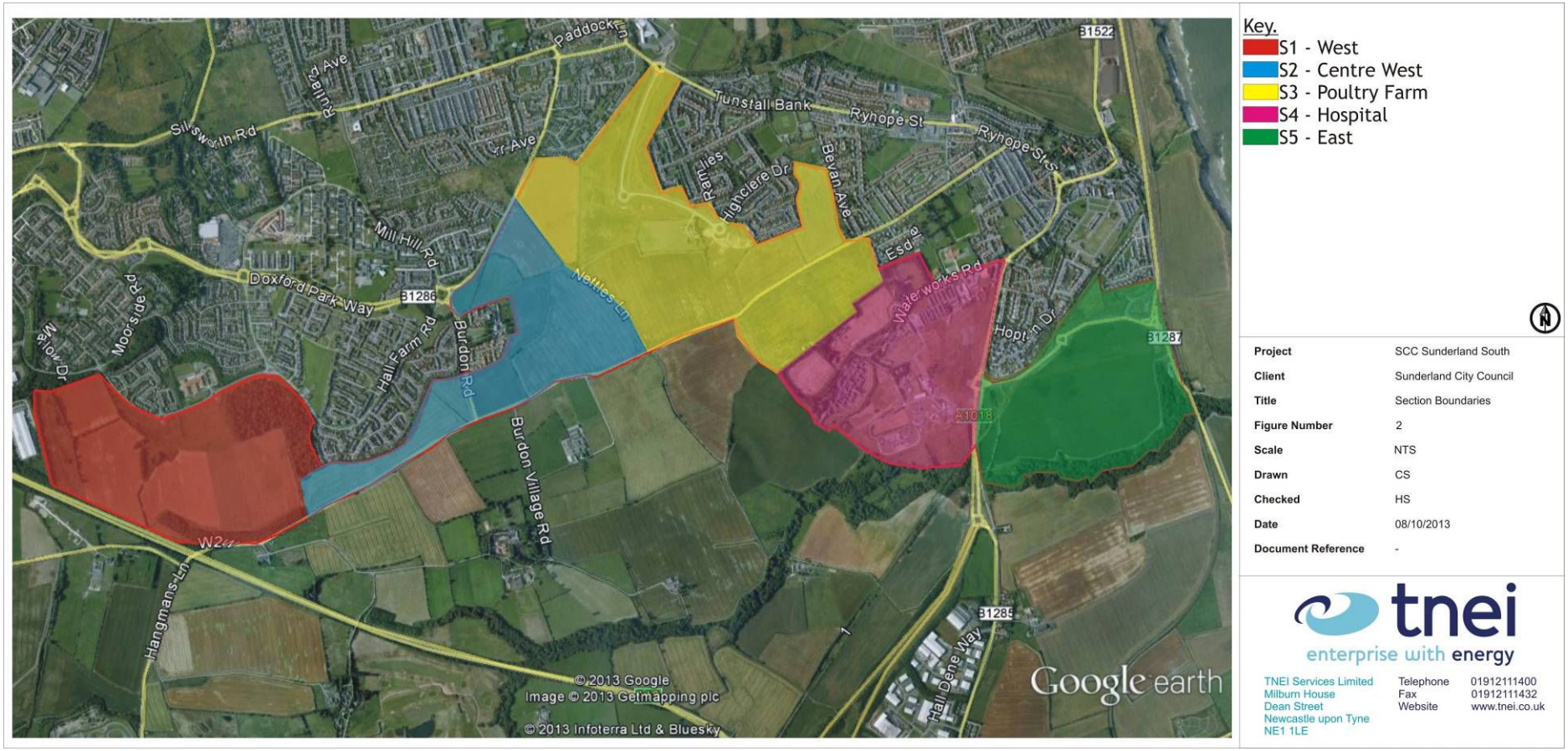


Figure 3 – Extended Phase 1 Habitat Plan

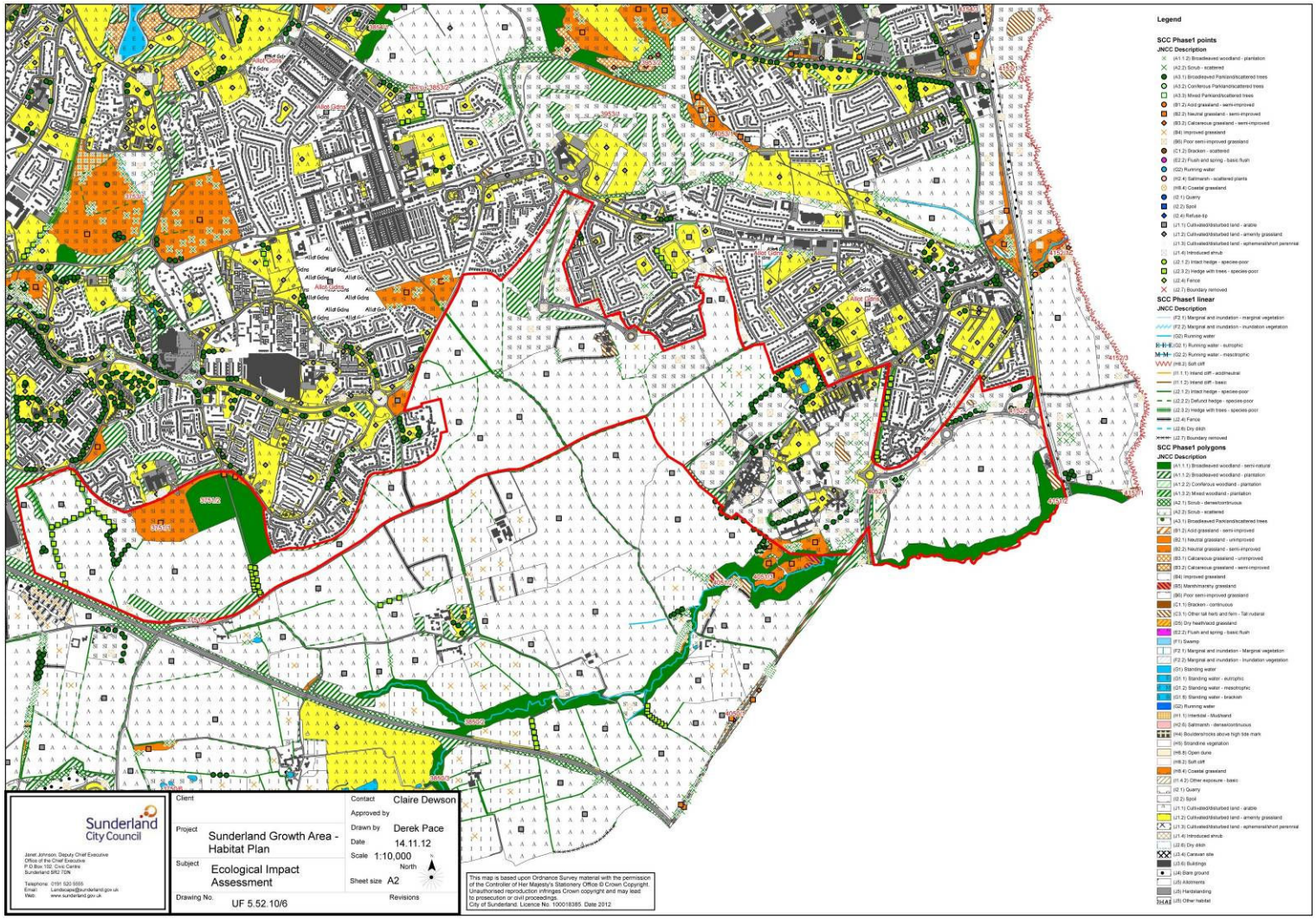


Figure 4 – Remote Bat Detector Locations

Figure 5 – Pond Locations

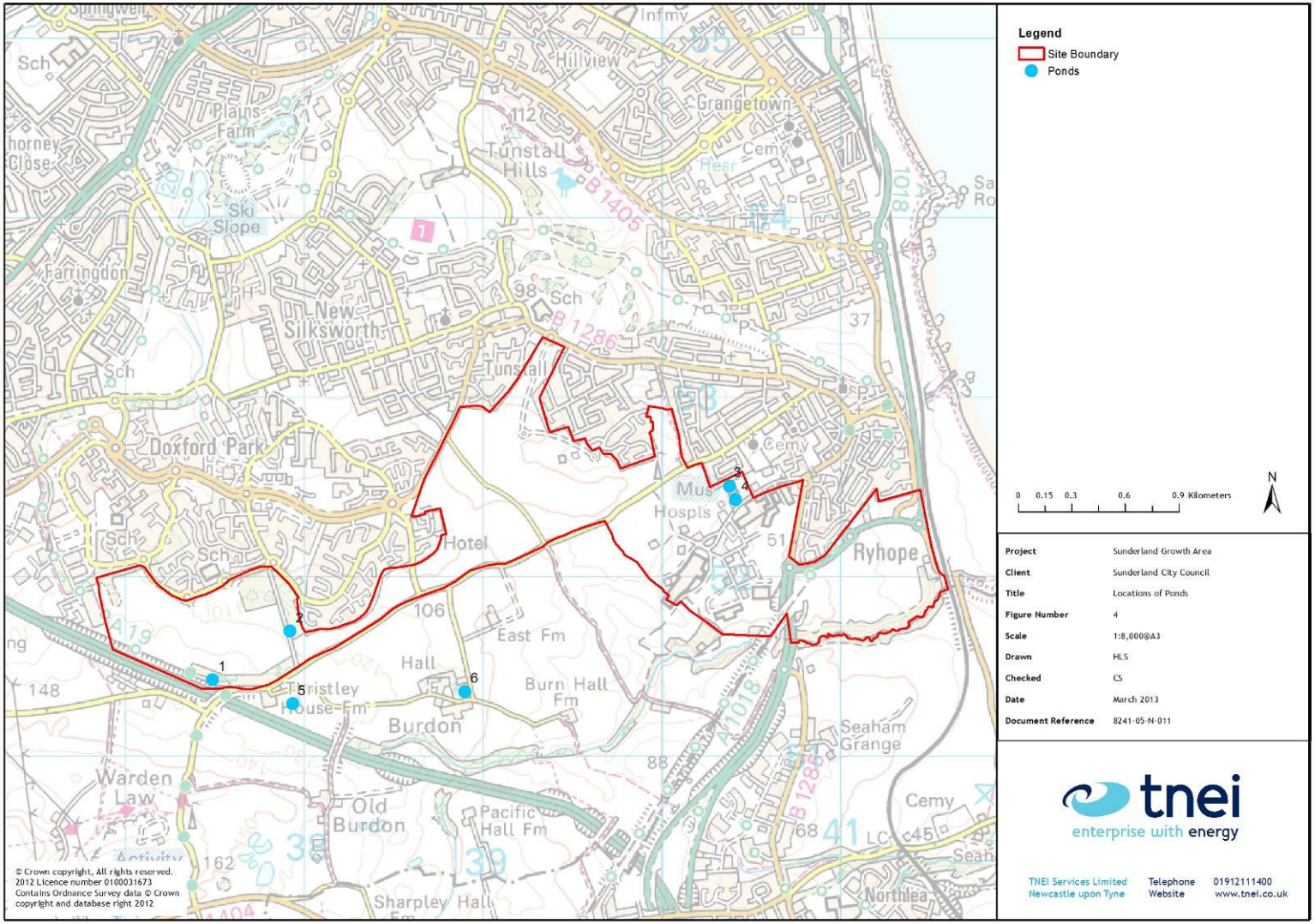


Figure 6 – Brown Hare Transect Locations

Figure 7 – Ornithological Survey Areas, including Buffer Zone and Coast

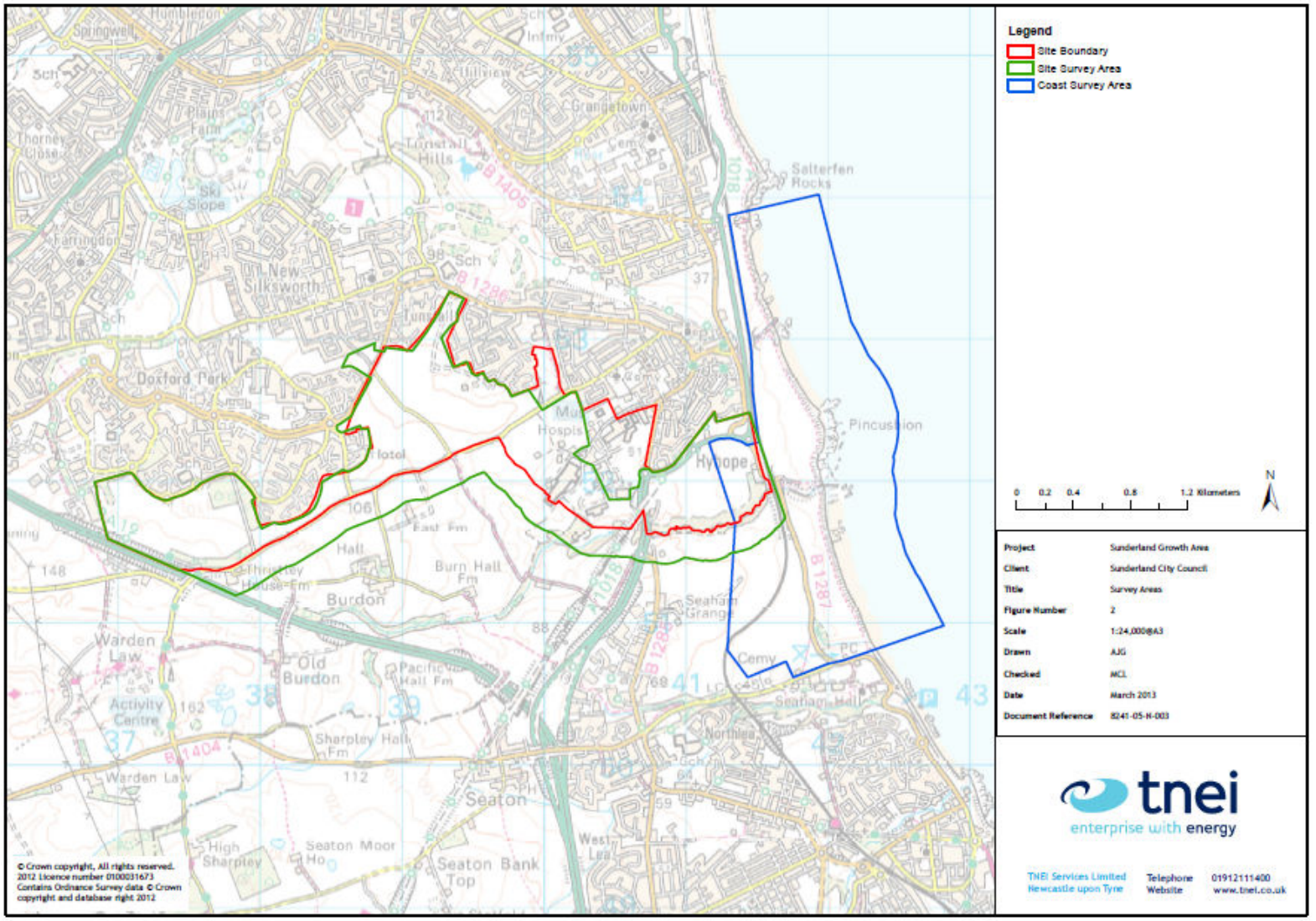


Figure 8 – Statutory Designations Map

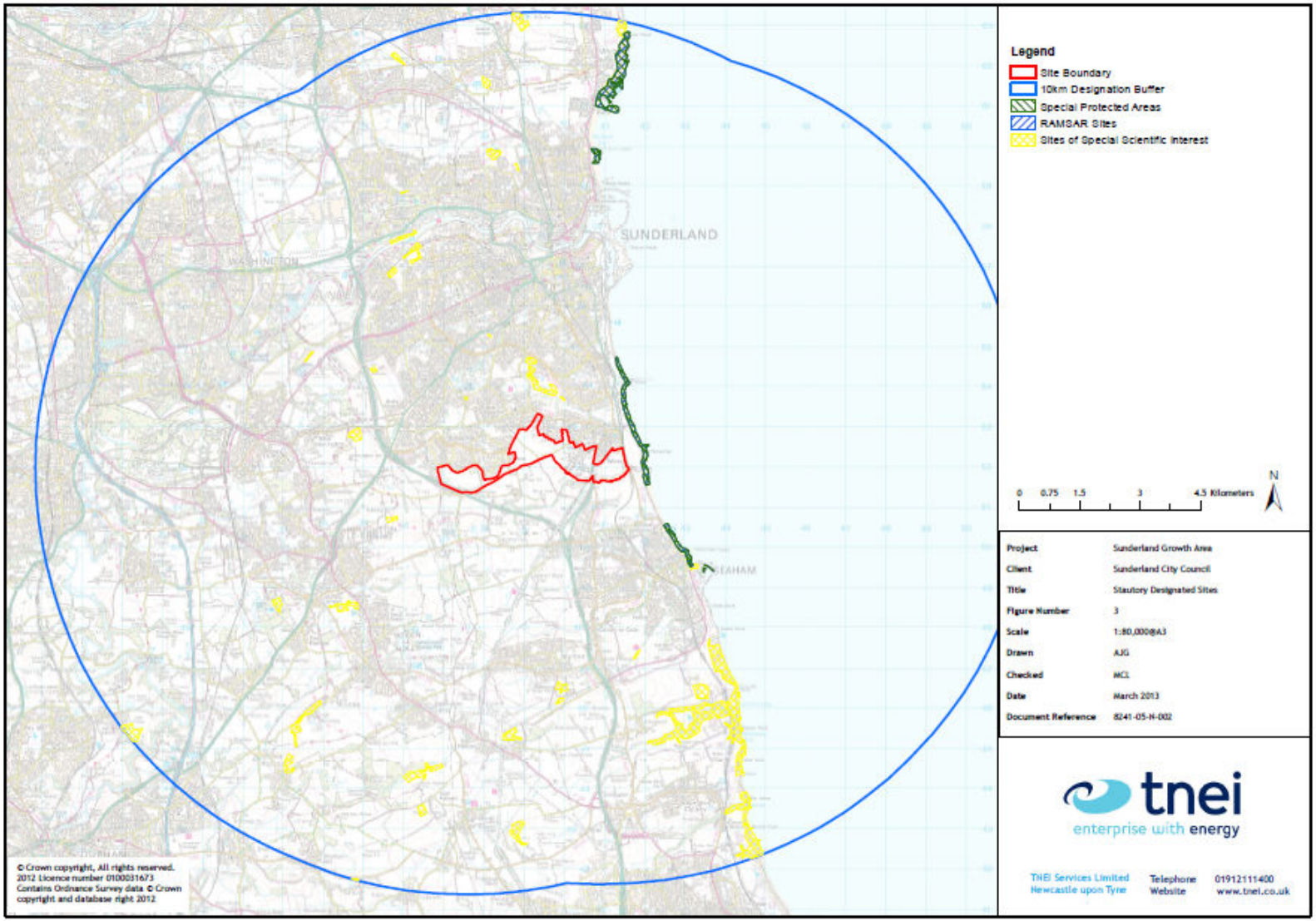


Figure 9 – Bat Tree Risk Assessment Results Overview (West)

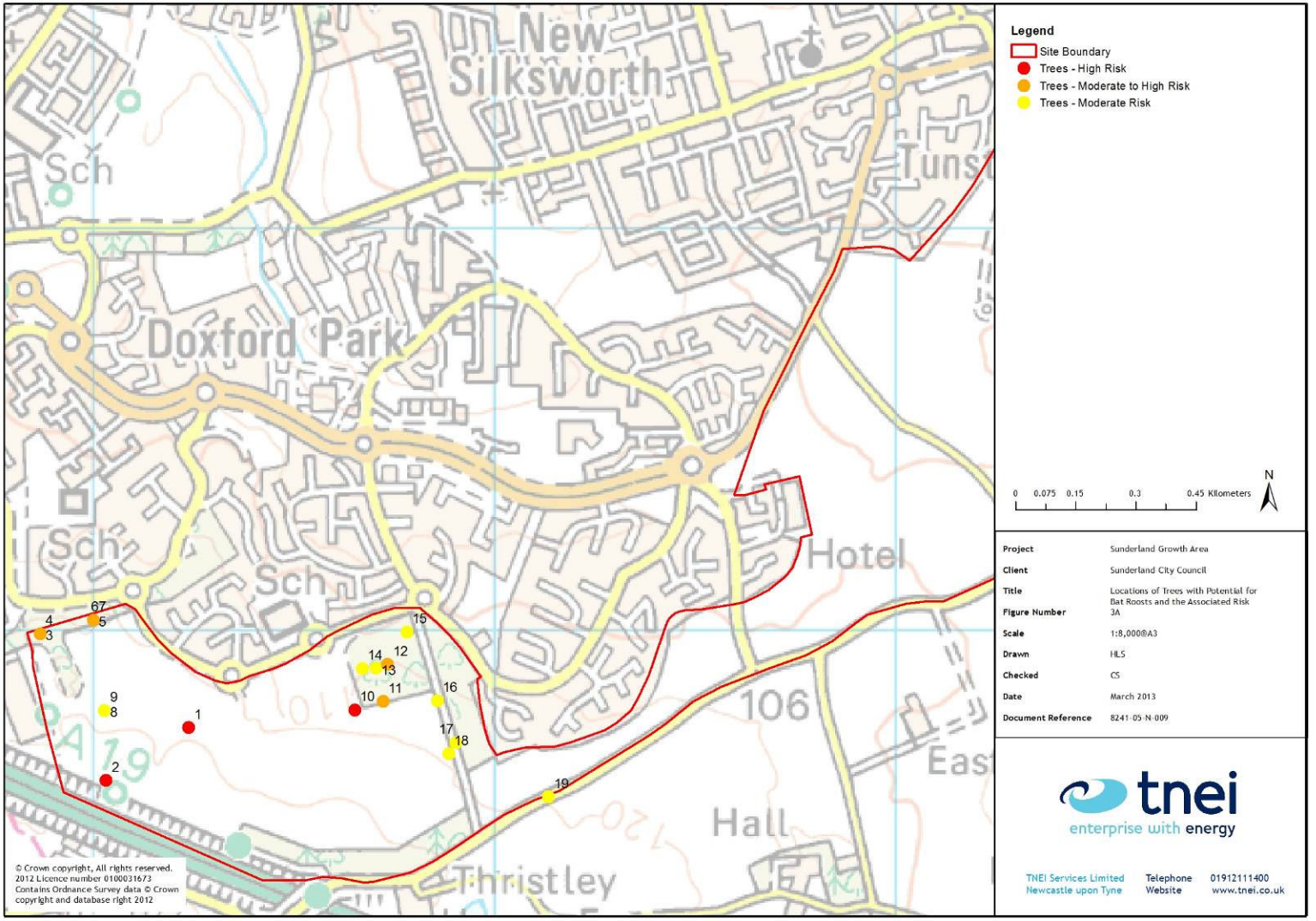


Figure 10 – Bat Tree Risk Assessment Results Overview (East)

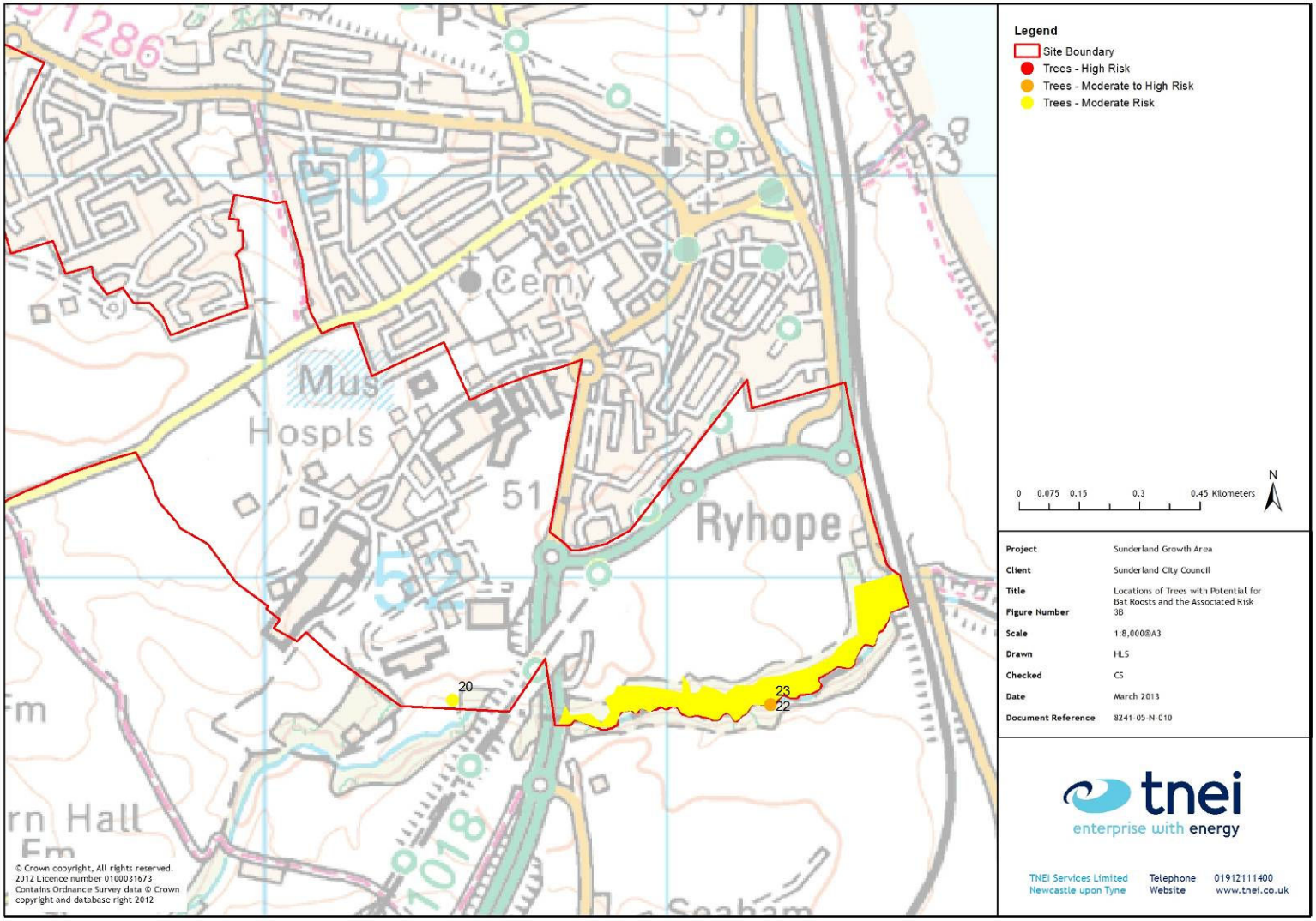


Figure 11 – Bat Transect Results Overview (Section 1)

Figure 12 – Bat Transect Results Overview (Section 2)

Figure 13 – Bat Transect Results Overview (Section 3)

Figure 14 – Bat Transect Results Overview (Section 4)

Figure 15 – Bat Transect Results Overview (Section 5)

Figure 16 – Brown Hare Survey Results

Figure 17 – BoCC UK Red List Bird Species Territories (Approx. Central Territory Location)

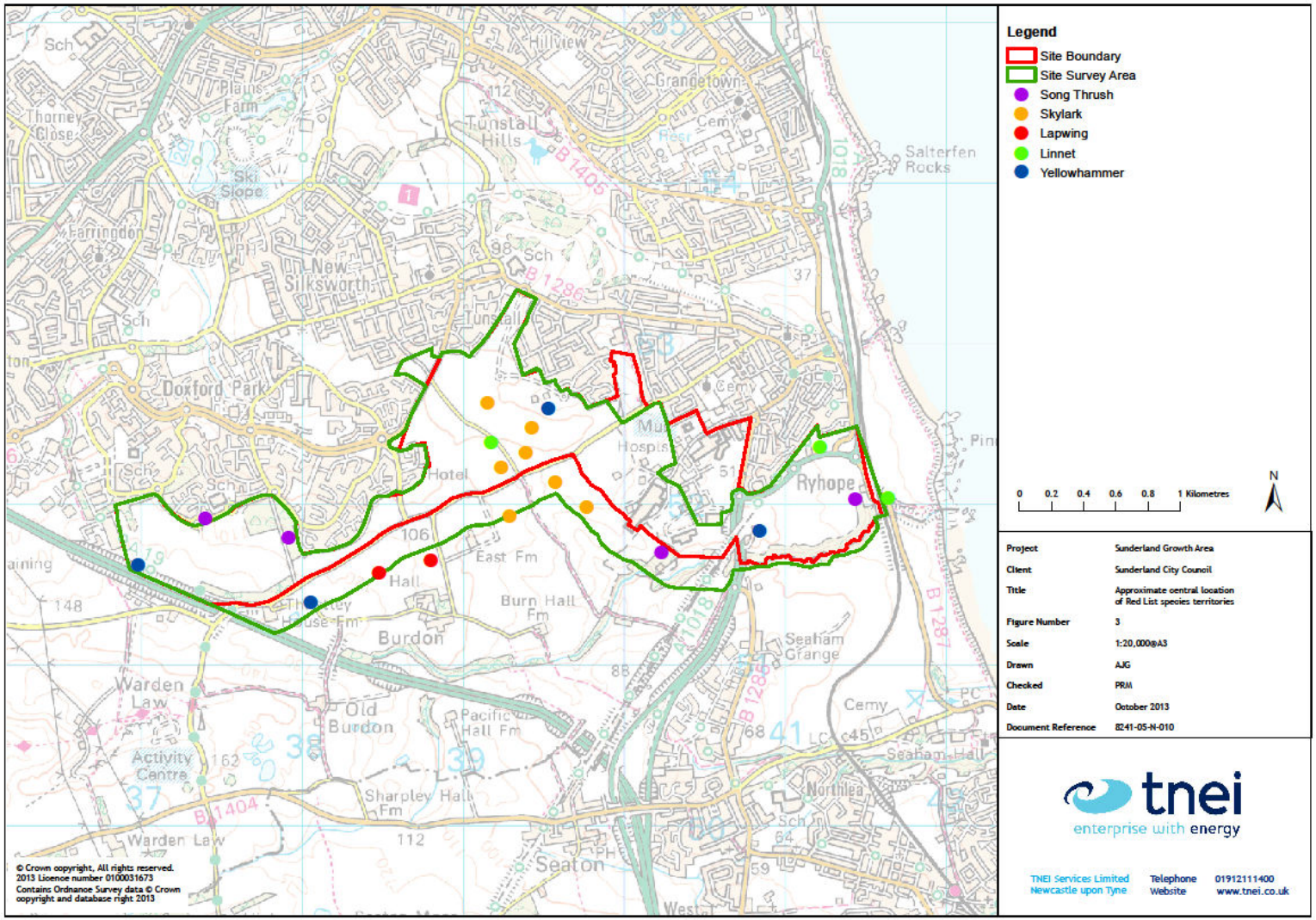


Figure 18 – BoCC UK Amber List Bird Species Territories (Approx. Central Location)

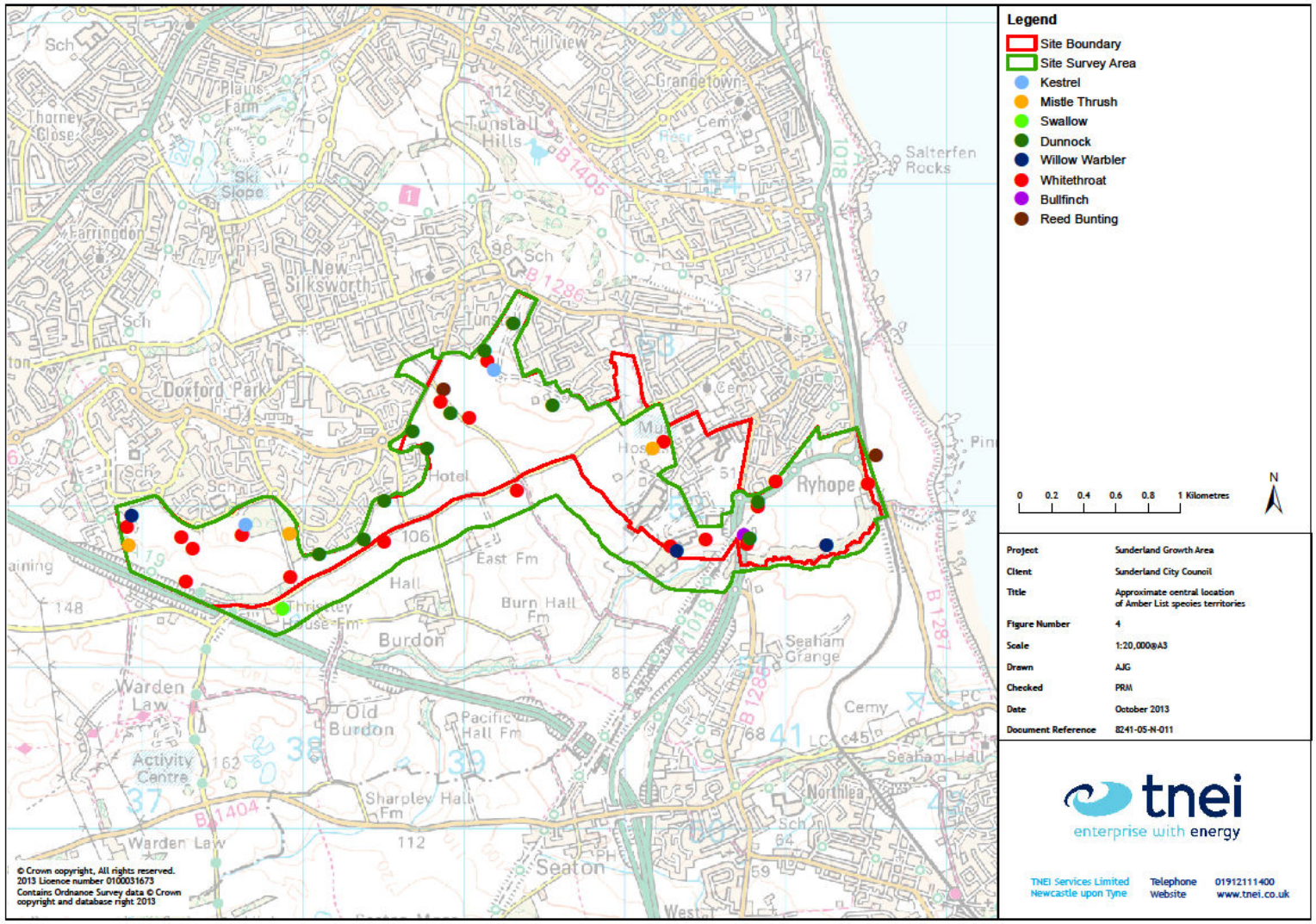


Figure 19 – High Tide Roost and Foraging Locations

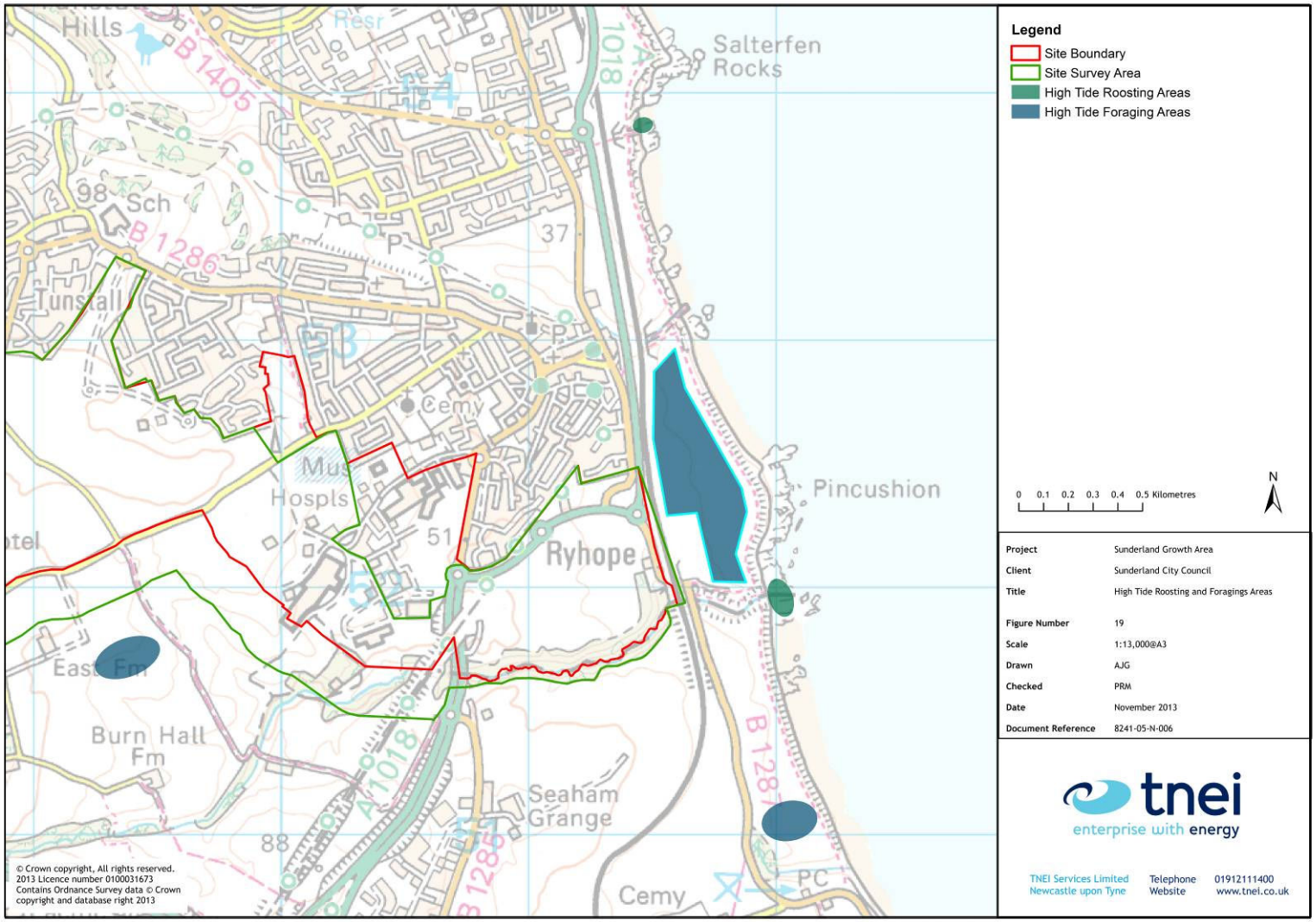


Figure 20 –Low Tide Roost Locations

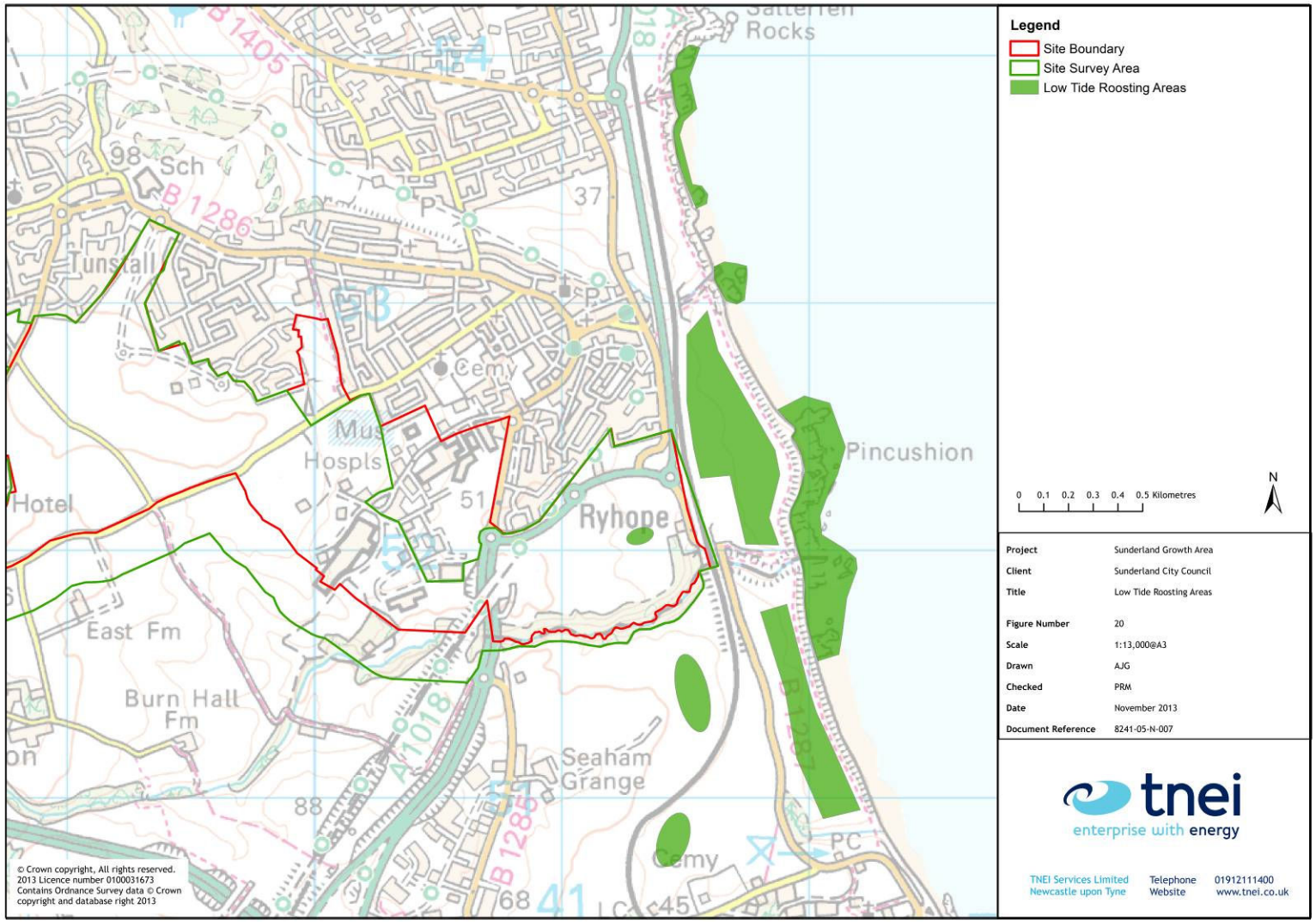


Figure 21 – Bird Disturbance (Recreational) Activities

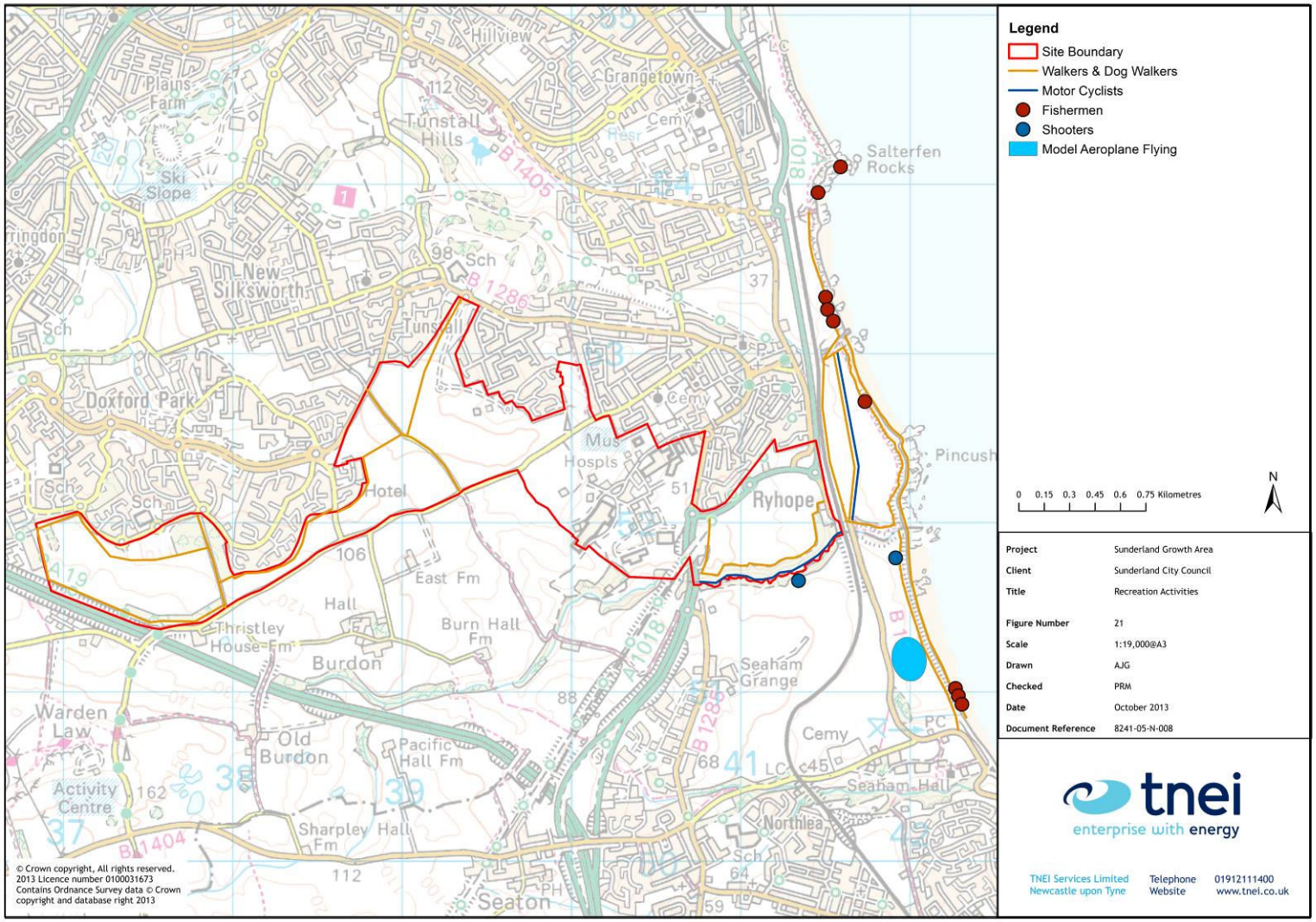


Figure 22 – Key Ecological and Ornithological Interests/Areas

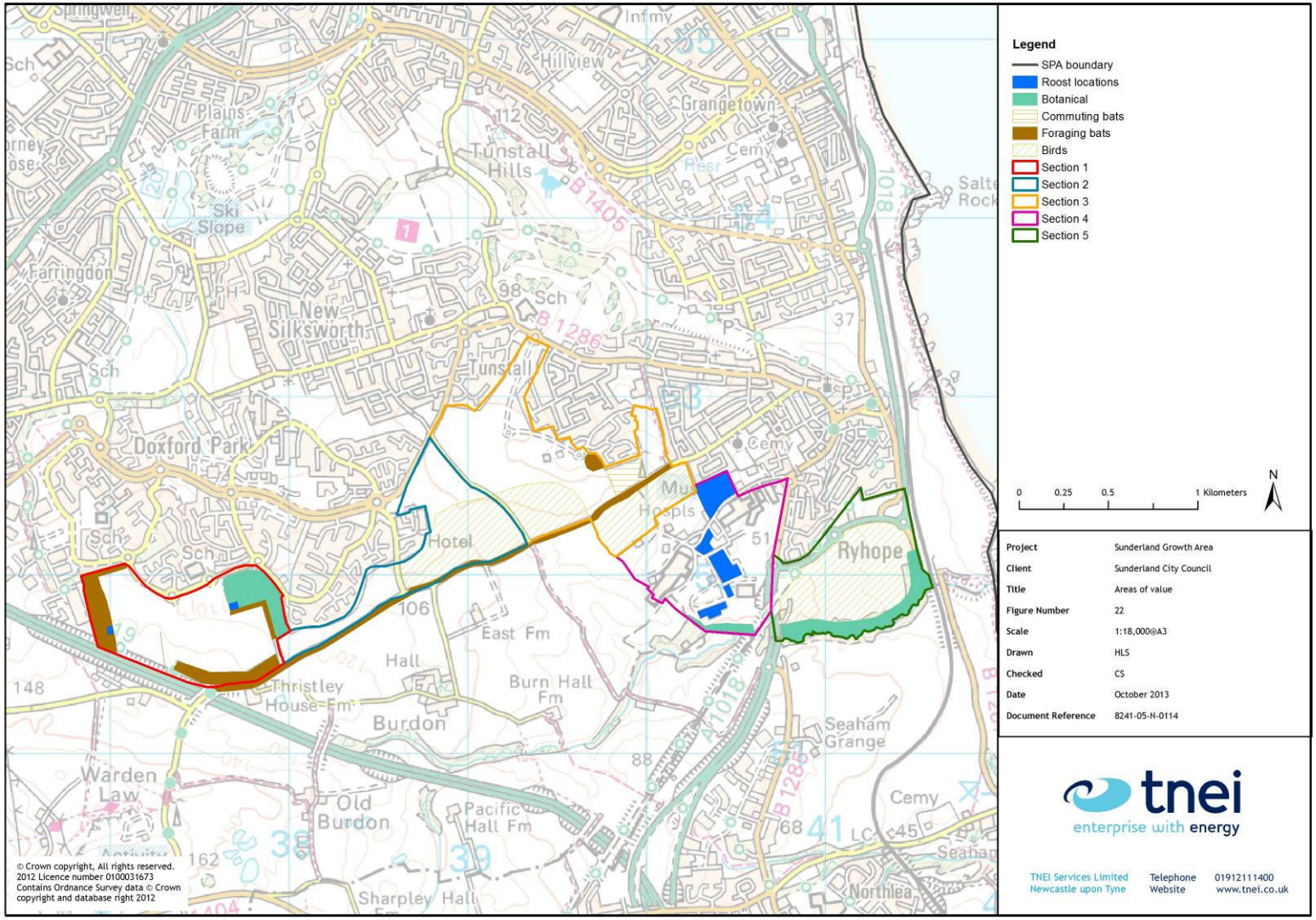


Figure 23 – Ecological and Ornithological Buffer Zones

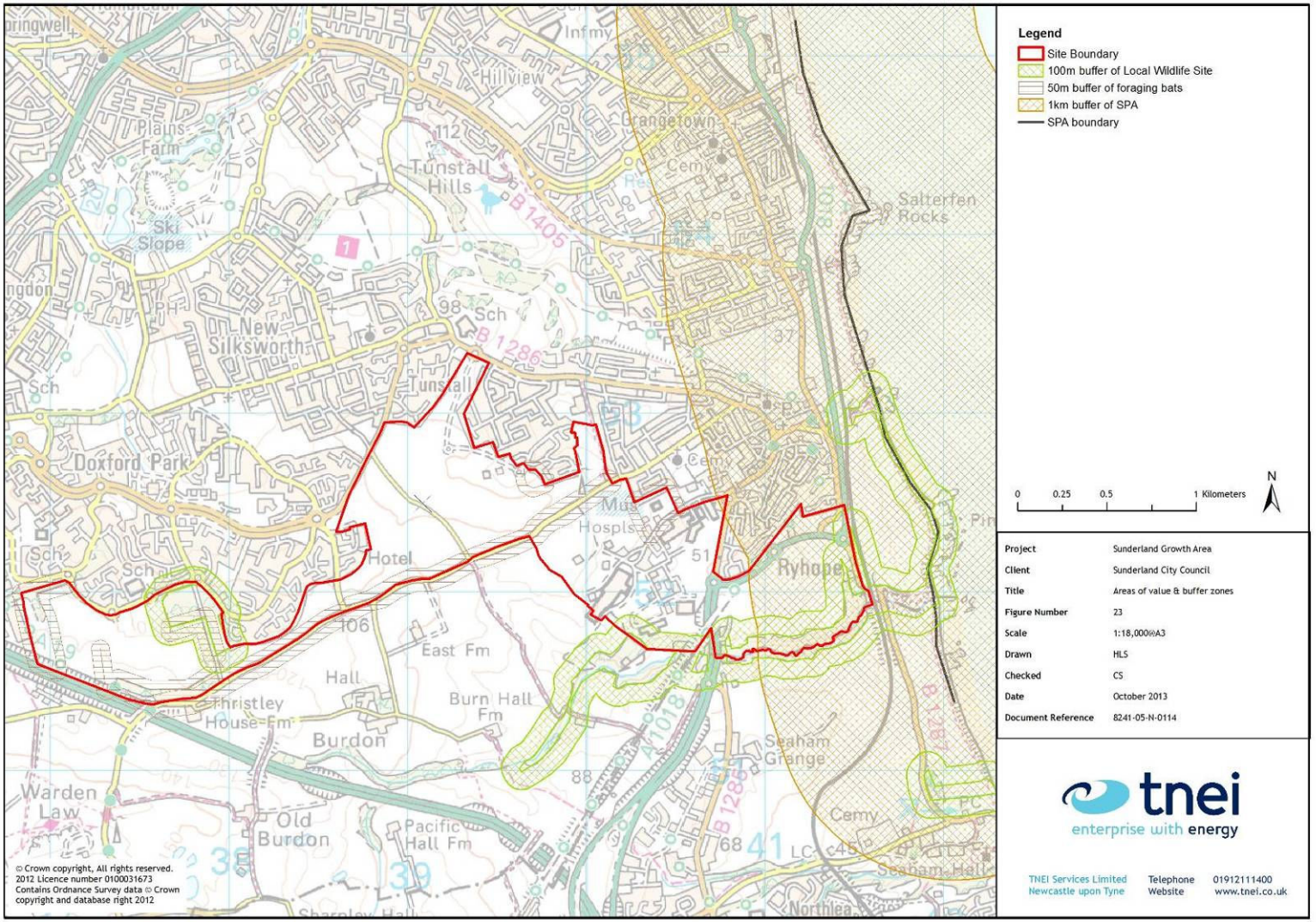
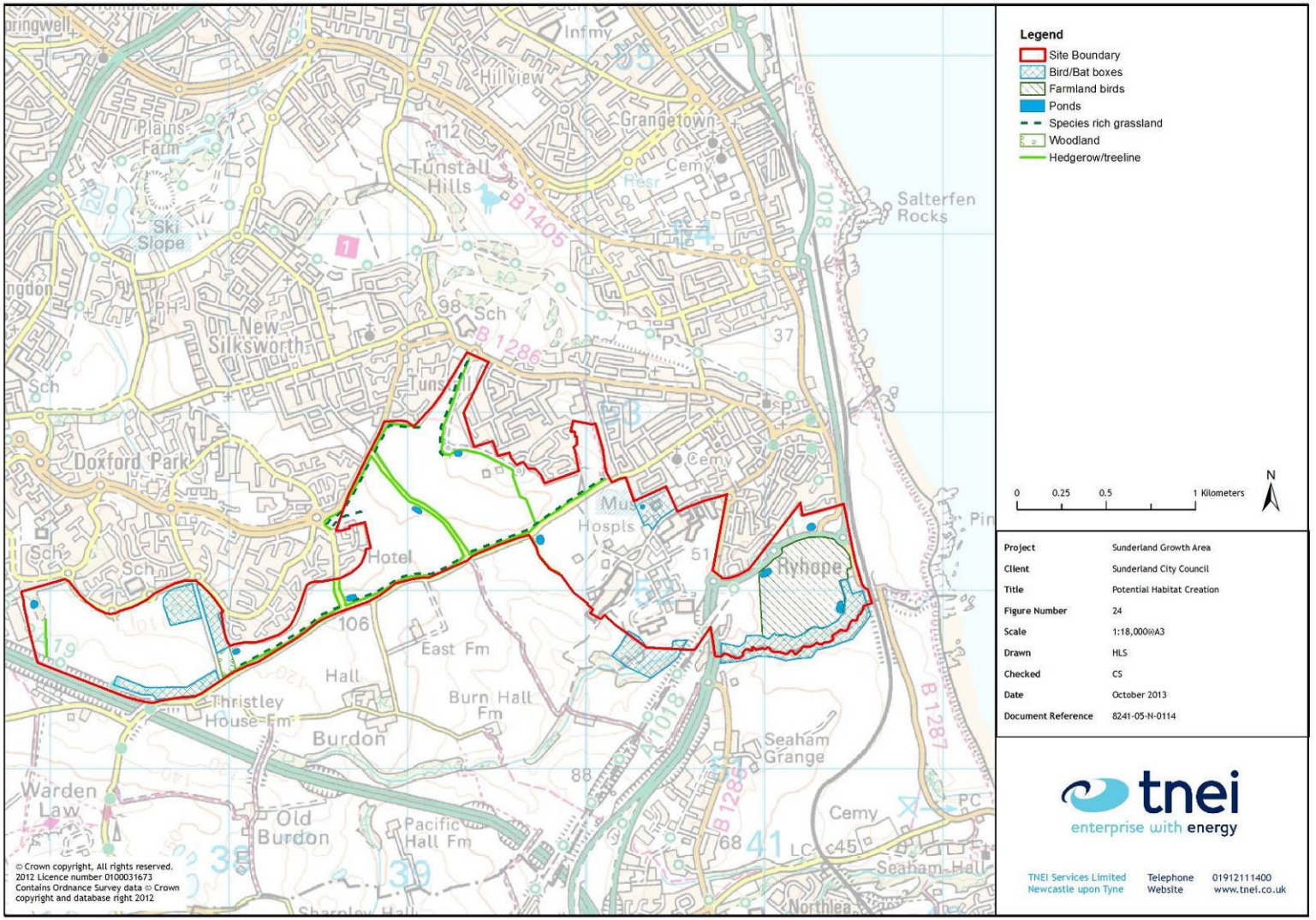


Figure 24 – Potential Options for Ecological Enhancement



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9 Appendix 2 – Site Photographs

P1: Plantation to the SW

P2: Pond to the SW

P3: Agricultural land to the W

P4: Mammal trail crossing mature hedge

P5: Defunct hedge and plantation to W

P6: High risk bat roost tree to W

P7: Arable to the W of the site

P8: Grassland and scrub habitats to the W

P9: Mature plantation to the NW

P10: Arable and woodland to the NW

P11: High risk bat features to the NW

P12: Track through Blakeney Woods

P13: Blakeney Woods

P14: Pond within Blakeney Woods

P15: SI-neutral grassland to the N

P16: Defunct hedgerow to the centre

P17: Arable land and PBW to the centre

P18: Chicken farm buildings

P19: Hospital trees with bat boxes

P20: Hospital construction & clearance works

P21: Heras fencing and hospital demolition

P22: Hospital buildings

P23: Range of hospital buildings

P24: Hospital buildings

P25: Modern hospital buildings

P26: Hospital redevelopment works

P27: Hospital grounds buildings

P28: Building in hospital grounds

P29: Cherry Knowle Dene

P30: Culvert in Cherry Knowle Dene

P31: Bridge in Cherry Knowle Dene

P32: Ryhope Engines Museum and pond

P33: Ryhope Dene

P34: Ryhope Dene

10 Appendix 3 – Bat Activity Survey Results

Transect Surveys

29.04.2013									
Section 1		**Section 2**		**Section 3**		**Section 4**		**Section 5**	
Time	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**
2112	Single common pipistrelle foraging along the woodland edge in the west of the site	2125	Single common pipistrelle foraging along Burdon lane.	NO BATS		2057	Pipistrelle commuting, HNS, around road by hospital buildings.	2110	A single common pipistrelle commuting along the field edge the most easterly roundabout
2118	Single common pipistrelle foraging, HNS.					2105	Common pipistrelle foraging over pond		
2127	Single common pipistrelle commuting along the eastern boundary of the transect area.					2109	Common pipistrelle commuting and foraging along trees near engine museum		
						2117	Two common pipistrelle bats foraging		

							in trees by engine museum.		
04.05.2013									
Section 1		**Section 2**		**Section 3**		**Section 4**		**Section 5**	
Time	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**
410	Common pipistrelle HNS commuting along track in wood in west of transect route.	440	Common pipistrelle commuting in west of transect along tree line near the edge of residential area.	NO BATS		338	Myotis sp (maybe Wh/Br) foraging in south of hospital buildings.	334	Nathusius pipistrelle HNS in west of transect along field edge.
414	Common pipistrelle HNS commuting along track in wood in west of transect route.	447	Common pipistrelle commuting in west of transect along residential edge.			437	Common pipistrelle commuting along tree line in engine museum.	340	Common pipistrelle HNS along the edge of Ryhope Dene.
						442	Common pipistrelle foraging along Burdon lane.	342	Common pipistrelle foraging along the edge of Ryhope Dene.
								348	Common

									pipistrelle foraging along the edge of Ryhope Dene towards the east.
19.06.2013									
Section 1		**Section 2**		**Section 3**		**Section 4**		**Section 5**	
Time	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**
2220	Common pipistrelle commuting along woodland edge in E of transect route.	2229	Soprano pipistrelle commuting along nettles lane.	2235	Common pipistrelle commuting along Burdon lane.	2229	Common pipistrelle foraging over pond and around trees in engine museum.	2232	Pipistrelle HNS near far east roundabout within field.
2223	Common pipistrelle foraging in trees in woodland in E of transect route.	2240	Common pipistrelle commuting along Burdon lane.	2242	Common pipistrelle commuting across field towards Burdon lane coming from residential area.	2231	Common pipistrelle foraging around trees in engine museum.		
2231	Two soprano pipistrelles foraging under tree and social			2244	Common pipistrelle commuting across field towards Burdon lane	2234	Common pipistrelle commuting along waterworks		

	calling in E of transect along woodland edge.				coming from residential area.		road.		
2231	Soprano pipistrelle commuting up and down path along the edge of woodland in E of transect route.			2245	Common pipistrelle HNS commuting, quick pass.				
2237	Soprano pipistrelle commuting along E of transect route near Burdon lane.			2245	Two common pipistrelle commuting for approx. four minutes in coarse grassland near E roundabout.				
2242	Soprano pipistrelle foraging along woodland edge near Burdon lane			2251	Common pipistrelle foraging around lights on road near E roundabout				
2243	Common pipistrelle								

	commuting along woodland edge near Burdon lane.								
2244	Common pipistrelle commuting in woods along Burdon lane.								
2245	Common pipistrelle commuting in woods along Burdon lane.								
24.07.2013									
Section 1		**Section 2**		**Section 3**		**Section 4**		**Section 5**	
Time	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**
330	Common pipistrelle HNS commuting near hedgerow going from the southern boundary of the site	356	Common pipistrelle HNS, faint, distant call near housing estate to E of Burdon road.	332	Common pipistrelle commuting in coarse grassland in field between W roundabout and nettles lane.	340	Common pipistrelle foraging along wood near Cherryknowle Dene.	343	Pipistrelle along path in west of site near A1018.

	north.								
331	Soprano pipistrelle HNS commuting on hedgerow going from the south of the site boundary towards the north.	405	Common pipistrelle HNS near nettles lane.	400	Common pipistrelle commuting in between housing area and Burdon lane.	350	Common pipistrelle foraging around trees/ pond at the Engine Museum.	351	Pipistrelle near tree outcrop along Ryhope Dene.
332	Soprano pipistrelle HNS commuting on hedgerow going from the south of the site boundary towards the north.	422	Common pipistrelle commuting E along Burdon lane.			356	Three common pipistrelle and one soprano pipistrelle foraging around trees/pond at engine museum.	400	Pipistrelle in middle of field.
336	Common pipistrelle HNS commuting along V shaped tree line in north west of transect route.					431	Two common pipistrelle foraging around trees/pond at engine museum.	405	Pipistrelle along Ryhope Dene tree line.

350	Soprano pipistrelle commuting, HNS, along tree line near Weymouth Road.							417	Pipistrelle foraging near house in east of transect route.
412	Common pipistrelle commuting, HNS, in far west of transect route, near Burdon lane.							422	Pipistrelle foraging near road in north of transect route.
20.08.2013									
Section 1		**Section 2**		**Section 3**		**Section 4**		**Section 5**	
Time	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**
2050	Common pipistrelle commuting along hedgerow along A19.	2046	Common pipistrelle foraging at start of transect near start of the residential area to N.	2112	Common pipistrelle foraging along Burdon lane.	2056	Common pipistrelle HNS	2107	Common pipistrelle HNS commuting along Ryhope Dene tree line.
2053	Common pipistrelle commuting along hedgerow	2053	Common pipistrelle foraging along tree line south	2117	Common pipistrelle HNS along field boundary	2111	Pipistrelle heard not seen on Waterworks road near	2109	Common pipistrelle HNS commuting along

	along A19.		of the residential area.		near Nettles lane.		entrance to hospital.		Ryhope Dene tree line.
2057	Common pipistrelle commuting along hedgerow along A19.	2055	Two common pipistrelle foraging along tree line south of the residential area.	2122	Common pipistrelle HNS along field boundary near Nettles lane.	2130	Common pipistrelle foraging near trees along waterworks road near engine museum.	2121	Common pipistrelle commuting along eastern site boundary near to house.
2059	Common pipistrelle and soprano pipistrelle HNS along tree line in far west of site	2057	Common pipistrelle foraging near to Burdon lane to N.	2127	Common pipistrelle HNS in field south of Eltham Road.	2137	Bat SNH near hospital buildings at Cherryknowle Dene.	2131	Common pipistrelle in middle of field commuting eastwards.
2101	Common pipistrelle commuting along tree line in far west of site	2121	Common pipistrelle HNS, along Burdon lane.	2135	Common pipistrelle HNS west of Eltham road in coarse grassland.				
2105	Common pipistrelle commuting along tree line in far west of site	2124	Common pipistrelle foraging along Burdon lane.	2148	Two common pipistrelle commuting past along Eltham Road from west to east.				

2012	Common pipistrelle commuting along tree line at northern site boundary.	2133	Common pipistrelle in south west of transect area along Burdon road.						
2114	Common pipistrelle commuting along tree line at northern site boundary.	2138	Pipistrelle in south west of transect area along Burdon road.						
2116	Common pipistrelle commuting along tree line near the western section of Weymouth Road.								
2120	Common pipistrelle commuting along tree line running parallel with Weymouth Road								
2121	Common								

	pipistrelle commuting along tree line running parallel with Weymouth Road								
2124	Common pipistrelle commuting near woodland in east of transect route.								
2127	Common pipistrelle commuting near woodland in east of transect route.								
2133	Common pipistrelle commuting near woodland in east of transect route.								
2134	Common pipistrelle commuting								

	near woodland in east of transect route.								
2141	Common pipistrelle commuting near woodland in east of transect route.								
2144	Common pipistrelle commuting near south east corner of transect route								
2147	Common pipistrelle commuting near south east corner of transect route								
2149	Common pipistrelle commuting near south east corner of transect route								

26.09.2013									
Section 1		**Section 2**		**Section 3**		**Section 4**		**Section 5**	
Time	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**
1916	Common pipistrelle foraging along far east boundary.	1920	Two common pipistrelle commuting and foraging in the north of the transect route south of the residential area.	1928	Common pipistrelle foraging west of Eltham road.	1938	Common pipistrelle HNS foraging in hospital grounds near horse field.	1943	Common pipistrelle HNS along road in north of transect area.
1920	Noctule flying overhead in north east of site boundary.	1924	Common pipistrelle foraging near Burdon road.	2000	Common pipistrelle foraging along Burdon land in east of site.			1947	Common pipistrelle HNS along road in north of transect area.
1935	Common pipistrelle foraging along 'V' shaped tree line.	1928	Common pipistrelle foraging in north of field east of Burdon road.					1951	Common pipistrelle HNS along road in north of transect area.
1937	Common pipistrelle foraging along hedgerow	1939	Soprano pipistrelle commuting along nettles						

	running north from southern site boundary.		lane.						
1940	Common pipistrelle foraging along hedgerow running north from southern site boundary.	1945	Common pipistrelle commuting along nettles lane.						
1941	Common pipistrelle foraging along hedgerow running north from southern site boundary.								
1942	Common pipistrelle foraging along hedgerow running north from southern site boundary.								

1946	Bat foraging in woods along Burdon lane.								
2003	Common pipistrelle foraging in north east of transect area.								
2004	Common pipistrelle foraging in north east of transect area.								
2005	Common pipistrelle foraging in north east of transect area.								
2010	Common pipistrelle foraging in north east of transect area.								
2012	Common pipistrelle foraging in woods along Burdon								

	lane.								
02.10.2013									
Section 1		**Section 2**		**Section 3**		**Section 4**		**Section 5**	
Time	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**	**Time**	**Behaviour**
1909	Common pipistrelle foraging on woodland (along Burdon lane) edge	1914	Common pipistrelle HNS near eastern boundary of transect area.	1919	Common pipistrelle foraging on coarse grassland near roundabout.	1930	Common pipistrelle foraging around trees on road running towards Cherryknowle Dene.	1945	Two common pipistrelles foraging in Ryhope Dene trees HNS.
1910	Common pipistrelle commuting on woodland (along Burdon lane) edge	1915	Common pipistrelle foraging in north east corner of transect route.	1946	Common pipistrelle commuting west of Eltham Road.	1936	Common pipistrelle foraging over trees/pond in Engine Museum.	1947	Soprano pipistrelle HNS foraging in Ryhope Dene Trees.
1914	Common pipistrelle foraging on woodland (along Burdon lane) edge	1930	Common pipistrelle foraging in the field to the east of Burdon road.			1949	Common pipistrelle foraging over trees/pond in Engine Museum.	1949	Soprano pipistrelle foraging along Ryhope Dene to the east.
1918	Common pipistrelle foraging along hedgerow	1952	Common pipistrelle foraging along Burdon			1953	Common pipistrelle foraging over trees/pond in Engine	1952	Common pipistrelle foraging along the east of

	running from the southern site boundary north.		lane.				Museum.		Ryhope Dene
1920	Common pipistrelle foraging in field to the west of the 'V' shaped tree line.	1957	Common pipistrelle foraging along Burdon lane.					1955	Common pipistrelle foraging along the east of Ryhope Dene
1923	Common pipistrelle foraging north of the hedgerow running east/west in the north west corner of the site.	2001	Common pipistrelle foraging along Burdon lane.						
1948	Common pipistrelle foraging in the north of the arable field where it meets the coarse grassland.								
1959	Common pipistrelle foraging								

	along the woodland at the east boundary of the transect route.								
2001	Common pipistrelle foraging along the south eastern boundary of the transect area.								
2003	Common pipistrelle foraging in the south of the south eastern field.								

Tree and Structure Surveys

Tree 1	
Emergence	**06.06.2013**
Time	**Behaviour**
2215	Common pipistrelle HNS commuting
2219	Bat HNS commuting
2227	Two common pipistrelle commuting along trees.
2229	Common pipistrelle commuting
2233	Two common pipistrelle commuting
2235	2 common pipistrelle feeding above trees
2237	2 common pipistrelle
2238	Common pipistrelle commuting towards A19.
2239	Common pipistrelle foraging.
Emergence	**23.09.2013**
Time	**Behaviour**
1933	Common pipistrelle HNS
1934	Common pipistrelle HNS foraging around tree
1938	Common pipistrelle commuting and foraging along treeline towards A19.
1940	Common pipistrelle commuting and foraging along tree line towards A19.
1943	Common pipistrelle commuting and foraging along tree line towards A19.
1947	Common pipistrelle commuting and foraging along tree line towards A19.
1948	Common pipistrelle commuting and foraging along tree line towards A19.
1951	Common pipistrelle commuting, foraging then commuting.

Tree 2	
Emergence	**06.06.2013**
Time	**Behaviour**
2136	Common pipistrelle HNS.
Emergence	**23.09.2013**
Time	**Behaviour**
1932	Common pipistrelle commuting off site
1935	Common pipistrelle foraging over coarse grassland.
1941	Common pipistrelle HNS
1942	Common pipistrelle commuting off site
1945	Common pipistrelle HNS

Emergence	23.09.2013
Time	Behaviour
1946	Common pipistrelle commuting E
1948	Common pipistrelle commuting off site

Tree 3 & 4	
Emergence	06.06.2013
Time	Behaviour
2202	Common pipistrelle commuting and foraging - maybe over from houses
2203	pipistrelle foraging over trees
2206	soprano pipistrelle commuting high along treelike
2207	HNS common pipistrelle brief forage
2210	HNS common pipistrelle commuting
2212	Common pipistrelle foraging along treelike
2213	Common pipistrelle foraging along treelike
2217	Common pipistrelle foraging along treelike
2218	Common pipistrelle HNS commuting briefly.
2220	Common pipistrelle foraging from north over trees
2229	HNS common pipistrelle commuting and foraging along treelike.
Emergence	23.09.2013
Time	Behaviour
1931	Common pipistrelle commuting over, high.
1933	Soprano pipistrelle commuting over, high.
1935	Common pipistrelle commuting over, high.
1936	Common pipistrelle commuting over, high.
1938	Common pipistrelle commuting over, high.
1940	HNS soprano pipistrelle commuting, brief call.
1941	Common and soprano pipistrelle commuting along tree line to W.
1942	Common pipistrelle commuting and foraging along tree line.
2001	HNS common pipistrelle commuting and foraging.

Trees 5, 6 & 7	
Emergence	**06.06.2013**
Time	**Behaviour**
2212	Common pipistrelle HNS
2214	Common Pipistrelle HNS
2215	Common pipistrelle foraging over wheat in field
2217	Common pipistrelles foraging over hedge along road
2217	Common pipistrelles foraging over hedge along road
2220	Common pipistrelle foraging over wheat in field
2222	Common pipistrelle commuting along hedge
2225	Common pipistrelle commuting along hedge
2228	Two common pipistrelle foraging near tree
2231	Common pipistrelle foraging over wheat in field
2235	Common pipistrelle commuting.
Emergence	**23.09.2013**
Time	**Behaviour**
1931	Common pipistrelle HNS
1941	Common pipistrelle commuting from wood into field.
1943	Common pipistrelle HNS
1950	Common pipistrelle HNS

Blakeney Woods - Trees 10, 11, 12	
Emergence	**06.06.2013**
Time	**Behaviour**
2158	Pipistrelle HNS Very faint/distant within wood
2205	Pipistrelle HNS Very faint/distant within wood
2205	Common pipistrelle HNS
2206	Common pipistrelle foraging HNS near corner
2209	Pipistrelle HNS Very faint/distant within wood
2211	Common pipistrelle foraging along edge of wood then went into the wood.
2214	Common pipistrelle foraging HNS near corner
2214	Common pipistrelle HNS
2215	Common pipistrelle HNS
2216	Common pipistrelle foraging HNS near corner
2222	Common pipistrelle HNS, continuous during surveys near E of wood.

Blakeney Woods - Trees 10, 11, 12	
Emergence	**06.06.2013**
Time	**Behaviour**
2223	Common pipistrelle HNS
2224	Common pipistrelle HNS
2225	Common pipistrelle foraging HNS near corner tree
2227	Two common pipistrelle HNS
2229	Common pipistrelle foraging along edge of wood for 5 minutes.
2233	Common pipistrelle HNS
Emergence	**23.09.2013**
Time	**Behaviour**
1928	Common pipistrelle commuting along woodland edge the HNS for 5 minutes
1930	Common pipistrelle foraging in wood on N side
1935	Common pipistrelle commuting and foraging over woodland then HNS for 5 minutes probably foraging over woodland.
1937	Common pipistrelle foraging on edge of wood on N side
1940	Common pipistrelle flying into wood on N side
1945	common pipistrelle foraging along woodland edge
1955	Common pipistrelle foraging over woodland.
2000	Common pipistrelle commuting along N side.
1929	Common pipistrelle commuting HNS, sounds originating at corner tree
1934	Common pipistrelle commuting HNS
1940	Common pipistrelle commuting HNS
1942	Common pipistrelle commuting HNS
1944	Common pipistrelle commuting HNS
1950	Common pipistrelle commuting HNS
1957	Common pipistrelle commuting HNS

Trees 22, 23 in Ryhope Dene			
17.06.2013	**Emergence**		
Time	**Behaviour**	**Time**	**Behaviour**
2221	Foraging in woods, HNS.	-	
2229	Foraging on north bank of Ryhope Dene, behind the trees being observed.	-	

Trees 22, 23 in Ryhope Dene			
23.08.2013	**Re-entry**		
Time	**Behaviour**	**Time**	**Behaviour**
437	HNS - Brief and distant pass common pipistrelle	-	
440	HNS - Brief and distant pass common pipistrelle	-	
455	HNS - Brief and distant pass common pipistrelle	-	
456	HNS - Brief and distant pass soprano pipistrelle	-	
458	HNS - Brief and distant pass common pipistrelle	-	
500	HNS - Brief and distant pass common pipistrelle	-	
502	Two common pipistrelle bats chasing each other, not calling very much.	-	
505	Common pipistrelle flying over tree tops.	-	
518	Common pipistrelle flying over tree tops.	-	
519	Common pipistrelle foraging, HNS.	-	
530	Common pipistrelle circling a tree on the northern bank of Ryhope Dene - likely to be a tree roost.	-	
533	Noctule flew over canopy towards the west.	-	

Bridge in Cherry Knowle Dene			
17.06.2013	**Emergence**		
Time	**Behaviour**	**Time**	**Behaviour**
2205	Foraging in surrounding canopy for 5 minutes, HNS	2210	Foraging for 5 minutes.
2212	Foraging in surrounding canopy.	2215	Commuting along side of bridge.
2223	HNS, commuting, brief pass	2223	Commuting over water.
2227	HNS, commuting, brief pass	2228	Commuting over water.
2239	HNS, commuting between the two surveyors.	2241	HNS, foraging over bridge.
23.08.2013	**Re-entry**		
Time	**Behaviour**	**Time**	**Behaviour**
422	Soprano pipistrelle foraging high in canopy	424	Soprano pipistrelle foraging
453	Myotis HNS Commuting	454	Myotis HNS commuting
459	Myotis HNS Commuting	502	Myotis HNS commuting
502	Myotis HNS commuting and briefly foraging.	505	Myotis HNS foraging
538	Soprano pipistrelle foraging over canopy.	541	Soprano pipistrelle HNS foraging until 0544

Bridge in Cherry Knowle Dene			
23.08.2013	**Re-entry**		
Time	**Behaviour**	**Time**	**Behaviour**
541	Soprano pipistrelle foraging over canopy.	547	Soprano pipistrelle HNS foraging
545	Soprano pipistrelle commuting over canopy.	548	Soprano pipistrelle commuting and foraging until 0559.
547	Soprano pipistrelle commuting over canopy.		
552	Soprano pipistrelle foraging over canopy until 0558, roost in nearby tree?		

11 Appendix 4 – Ornithological Survey Dates, Weather and Surveyors

Breeding Bird Survey Dates and Weather Conditions.

Visit	Date	Time (hours)	Visibility	Wind	Rain	Cloud	Temp.	Surveyor
A	24.04.13	05.00-12.30	Good	W3	Nil	5/8	10°c – 14°c	PM
B	03.05.13	05.00-12.15	Good	NNW3	Nil	5/8	8°c – 15°c	PM
C	21.05.13	05.10-12.00	Good	N2-3	Nil	8/8	10°c – 13°c	AG
D	11.06.13	05.15-12.20	Excellent	Calm	Nil	5/8 inc to 8/8	8°c - 15°c	AG
Surveyor – Adrian George (AG) & Paul Massey (PM)								

Nocturnal High Tide Survey dates and weather conditions

Visit	Date	Time (hours)	Visibility	Wind	Rain	Cloud	Temp.	High Tide Time	Surveyor
A	17.01.13	18:45-20:20	Good	SW 3	Snow flurry	8/8	0°C	19:15	AG & HS
B	05.02.13	21:00-00:00	Good	W 3-4	Rain & heavy drizzle throughout	6/8	4°C	22:53	AG & HS
C	05.03.13	19:50-22:50	Good	NE 2	Nil	6/8	4°C	21:20	AG & HS
D	19.04.13	21:00-01:30	Moderate	W 2	Nil	4/8	7°C	23:17	PM
E	17.05.13	20:00-23:00	Good	N 4	Nil	8/8	9.5°C	21:28	AG
F	17.06.13	22:00-01:00	Good	S 1	Nil	7/8	14°C	22:50	AG
G	23.07.13	02:00-06:00	Good	SW 1-2	Nil	2/8	17°C	04:11	PM
H	15.08.13	21:00-00:00	Good	SW 3	Light drizzle	8/8	17°C	22:43	AG

Visit	Date	Time (hours)	Visibility	Wind	Rain	Cloud	Temp.	High Tide Time	Surveyor
I	26.09.13	20:00-01:00	Good	ENE 2-3	Nil	4/8 inc to 6/8	13°C	20:50	PM
J	11.10.13	19:00-22:00	Good	NE 5	Nil	7/8	10.5°C	20:50	AG
K	11.11.13	20:00-23:00	Good	SW 2-3	Nil	2/8	8°C	21:57	AG & AK
L	09.12.13	19:00-22:00	Good	SW1-2	Nil	4/8	8.5°C	20:50	AG & AK
Surveyors: Adrian George (AG), Hannah Stephenson (HS), Paul Massey (PM) & Andrew Kinghorn (AK)									

High Tide Surveys dates and weather conditions.

Visit	Date	Time (hours)	Visibility	Wind	Rain	Cloud	Temp.	High Tide Time	Surveyor
A	24.01.13	11:55-15:55	Good	O	Nil	8/8	1°C	13:53	AG
B	07.02.13	10:45-14:45	Excellent	SW 2-3	Nil	5/8	0.5°C	12:43	AG
C	06.03.13	07:55-11:55	Moderate - hazy	SW 1	Nil	8/8	3.5°C	09:54	AG
D	24.04.13	13:05-17:10	Good	SW 3-4	Nil	7/8 inc to 8/8	12°C	15:08	PM
E	17.05.13	06:45 - 10:45	Moderate	N 2-3	Nil	8/8	1°C	08:47	AG
F	10.06.13	15:30-19:30	Excellent	SE3 inc to SE4	Nil	2/8 dec to 0/8	16°C dec to 12°C	17:31	AG
G	18.07.13	09:40-13:40	Good	SW 1	Nil	2/8	19°C inc to 27°C	11:41	PM
H	19.08.13	12:54-16:54	Excellent	SW3-4	Nil	6/8 inc to 7/8	18°C inc to 20.5°C	14:54	AG
I	16.09.13	11:50-15:50	Excellent	W5 inc to W6	Nil	6/8	12°C inc to 14°C	13:50	AG
J	11.10.13	06:30-10:30	Good	NNE 6 dec to 4/5	Nil	5/8 dec to 3/8	10°C inc to 14°C	08:27	AG
K	12.11.13	09:00-12:00	Excellent	SW 3-4 inc to 4-5	Nil	0/8 inc to 4/8	7.5°C inc to 8°C	11:02	AG & AK

Visit	Date	Time (hours)	Visibility	Wind	Rain	Cloud	Temp.	High Tide Time	Surveyor
L	13.12.13	10:30-14:30	Good	W to SW 3 inc to 4-5	Nil	6/8 inc to 7/8	10°C inc to 12.5°C	11:35	AG
Surveyor – Adrian George (AG), Paul Massey (PM) & Andrew Kinghorn (AK)									

Diurnal Low Tide Survey dates and weather conditions.

Visit	Date	Time (hours)	Visibility	Wind	Rain	Cloud	Snow cover %	Temp.	Low Tide Time	Surveyor
A	16.01.13	09:30-15:30	Excellent	SW 2-3	Nil	1/8 inc to 5/8	80	-1.5°C	12:34	AG
B	14.02.13	09:00-15:00	Excellent	W to SW 1-2 inc to 3-4	Nil	1/8 inc to 5/8	0	3°C inc to 9°C	12:04	AG
C	05.03.13	11:45-17:45	Moderate - hazy	NE 2	Nil	0/8	0	2.5°C inc to 4°C	13:44	AG
D	30.04.13	10:30-16:30	Moderate	NE 4-5	Light drizzle	8/8	0	8°C inc to 9°C	13:39	PM
E	03.05.13	14:05-20:05	Excellent	S 2	Nil	4/8 inc to 6/8	0	16°C inc to 20°C	17:03	PM
F	10.06.13	08:30-15:30	Excellent	0 inc to E 3	Nil	7/8	0	13°C inc to 15°C	11:30	AG
G	18.07.13	04:00-08:30	Good	SW 1	Nil	2/8	0	17°C	05:30	PM
H	15.08.13	13:30-19:30	Excellent	SW4	Nil	5/8 inc to 7/8	0	22°C dec to 20°C	18:31	AG
I	20.09.13	08:00-14:00	Excellent	W3-4	Nil	1/8 inc to 8/8	0	10.5°C inc to 12 °C	10:55	AG
J	07.10.13	08:40-14:40	Excellent	SW 4 inc to 6	Nil	4/8	0	17°C inc to 19°C	11:39	AG
K	21.11.13	08:15-14:15	Good - Excellent	NE - NNE 4	Nil	6/8 dec to 3/8	0	5.5°C inc to 7°C	11:14	AG
L	22.12.13	09:00-15:00	Good	W 4-5 gust 6	Occasional wintery showers	5/8 dec to 3/8	0	5.5°C dec to 4.5 °C	12:03	AG
Surveyor – Adrian George (AG) & Paul Massey (PM)										

Winter Walkover dates and weather conditions.

Visit	Date	Time (hours)	Visibility	Wind	Rain	Cloud	Temp.	High Tide Time	Surveyor
A	23.01.13	09:00-15:00	Excellent, poor in snow	SW 2-3 dec to 0	Freq. snow showers in am	8/8	0°C inc to 1°C	12:05	AG
B	08.02.13	09:10-14:50	Excellent	NW2-3 inc to 3-4	Shower 09.10-09.20	6/8	1°C inc to 5.5°C	13:46	AG
C	07.03.13	08:30-14:00	Poor – foggy	E2-3	Nil	8/8	4°C	11:16	AG
D	23.09.13	07:45-13:15	Poor inc to excellent	0 inc to W2	Nil	0/8 fog patches	10°C inc to 19°C	13:15	AG
E	08.10.13	07:45-13:30	Excellent	SW 2 inc to 4-5	Nil	3/8	14°C inc to 18°C	05:52	AG
F	13.11.13	07:45-13:45	Good	WNW 3 inc to 4 gust 5	Nil	3/8 inc to 7/8	4.5°C inc to 10°C	12:10	AG
G	04.12.13	08:20-14:10	Excellent	WNW 4	Nil	1/8	3°C inc to 7°C	16:01	AG
Surveyor – Adrian George (AG)									

12 Appendix 5 - Bird Species

British (English) vernacular name 2010	IOC International English name 2010 Gill & Donsker (2010) when different to vernacular	Scientific name 2010
Greylag Goose		*Anser anser*
Brent Goose	Brant Goose	*Branta bernicla*
Shelduck	Common Shelduck	*Tadorna tadorna*
Wigeon	Eurasian Wigeon	*Anas Penelope*
Teal	Eurasian Teal	*Anas crecca*
Mallard		*Anas platyrhynchos*
Eider	Common Eider	*Somateria mollissima*
Common Scoter		*Melanitta nigra*
Velvet Scoter		*Melanitta fusca*
Red-breasted Merganser		*Mergus serrator*
Goosander	Common Merganser	*Mergus merganser*
Red-legged Partridge		*Alectoris rufa*
Grey Partridge		*Perdix perdix*
Pheasant	Common Pheasant	*Phasianus colchicus*
Red-throated Diver	Red-throated Loon	*Gavia stellata*
Fulmar	Northern Fulmar	*Fulmarus glacialis*
Sooty Shearwater		*Puffinus griseus*
Manx Shearwater		*Puffinus puffinus*
Gannet	Northern Gannet	*Morus bassanus*
Cormorant	Great Cormorant	*Phalacrocorax carbo*
Shag	European Shag	*Phalacrocorax aristotelis*
Grey Heron		*Ardea cinerea*
Great-crested Grebe		*Podiceps cristatus*
Red-necked Grebe		*Podiceps grisegena*
Sparrowhawk	Eurasian Sparrowhawk	*Accipiter nisus*
Buzzard	Common Buzzard	*Buteo buteo*
Kestrel	Common Kestrel	*Falco tinnunculus*
Peregrine	Peregrine Falcon	*Falco peregrinus*
Oystercatcher	Eurasian Oystercatcher	*Haematopus ostralegus*
Golden Plover	European Golden Plover	*Pluvialis apricaria*
Lapwing	Northern Lapwing	*Vanellus vanellus*
Purple Sandpiper		*Calidris maritima*
Dunlin		*Calidris alpina*
Snipe	Common Snipe	*Gallinago gallinago*

Woodcock	Eurasian Woodcock	*Scolopax rusticola*
Whimbrel		*Numenius phaeopus*
Curlew	Eurasian Curlew	*Numenius arquata*
Common Sandpiper		*Actitis hypoleucos*
Redshank	Common Redshank	*Tringa tetanus*
Turnstone	Ruddy Turnstone	*Arenaria interpres*
Pomarine Skua		*Stercorarius pomarinus*
Arctic Skua	Parasitic Jaeger	*Stercorarius parasiticus*
Long-tailed Skua	Long-tailed Jaeger	*Stercorarius longicaudus*
Great Skua		*Stercorarius skua*
Kittiwake	Black-legged Kittiwake	*Rissa tridactyla*
Black-headed Gull	Common Black-headed Gull	*Chroicocephalus ridibundus*
Mediterranean Gull		*Larus melanocephalus*
Common Gull	Mew Gull	*Larus canus*
Lesser Black-backed Gull		*Larus fuscus*
Herring Gull		*Larus argentatus*
Great Black-backed Gull		*Larus marinus*
Sandwich Tern		*Sterna sandvicensis*
Common Tern		*Sterna hirundo*
Roseate Tern		*Sterna dougallii*
Arctic Tern		*Sterna paradisaea*
Guillemot	Common Murre	*Uria aalga*
Razorbill		*Alca torda*
Puffin	Atlantic Puffin	*Fratercula arctica*
Rock/Feral Pigeon	Common Pigeon	*Columba livia*
Stock Dove		*Columba oenas*
Woodpigeon	Common Wood Pigeon	*Columba palumbus*
Collard Dove	Eurasian Collard Dove	*Streptopelia decaocto*
Barn Owl		*Tyto alba*
Little Owl		*Athene noctua*
Tawny Owl		*Strix aluco*
Long-eared Owl		*Asio otus*
Swift	Common Swift	*Apus apua*
Great Spotted Woodpecker		*Dendrocopos major*
Magpie	Eurasian Magpie	*Pica pica*
Jay	Eurasian Jay	*Garrulus glandarius*
Jackdaw	Western Jackdaw	*Corvus monedula*
Rook		*Corvus frugilegus*
Carrion Crow		*Corvus corone*
Goldcrest		*Regulus regulus*
Blue Tit		*Cyanistes caeruleus*

Great Tit		*Parus major*
Coal Tit		*Periparus ater*
Skylark	Sky Lark	*Alauda arvensis*
Sand Martin		*Riparia riparia*
Swallow	Barn Swallow	*Hirundo rustica*
House Martin	Common House Martin	*Delichon urbicum*
Long-tailed Tit		*Aegithalos caudatus*
Chiffchaff	Common Chiffchaff	*Phylloscopus collybita*
Willow Warbler		*Phylloscopus trochilus*
Blackcap	Eurasian Blackcap	*Sylvia atricapilla*
Garden Warbler		*Sylvia borin*
Whitethroat	Common Whitethroat	*Sylvia communis*
Grasshopper Warbler	Common Grasshopper Warbler	*Locustella naevia*
Sedge Warbler		*Acrocephalus schoenobaenus*
Treecreeper	Eurasian Treecreeper	*Certhia familiaris*
Wren	Winter Wren	*Troglodytes troglodytes*
Starling	Common Starling	*Sturnus vulgaris*
Blackbird	Common Blackbird	*Turdus merula*
Fieldfare		*Turdus pilaris*
Song Thrush		*Turdus philomelos*
Redwing		*Turdus iliacus*
Mistle Thrush		*Turdus viscivorus*
Robin	European Robin	*Erithacus rubecula*
Stonechat	Eurasian Stonechat	*Saxicola torquatus*
Wheatear	Northern Wheatear	*Oenanthe oenanthe*
Dunnock		*Prunella modularis*
House Sparrow		*Passer domesticus*
Tree Sparrow	Eurasian Tree Sparrow	*Passer montanus*
Grey Wagtail		*Motacilla cinerea*
Pied Wagtail	White Wagtail	*Motacilla alba*
Meadow Pipit		*Anthus pratensis*
Rock Pipit	Eurasian Rock Pipit	*Anthus petrosus*
Chaffinch		*Fringilla coelebs*
Greenfinch	European Greenfiinch	*Carduelis chloris*
Goldfinch	European Goldfinch	*Carduelis carduelis*
Linnet	Common Linnet	*Carduelis cannabina*
Lesser Redpoll		*Carduelis cabaret*
Bullfinch	Eurasian Bullfinch	*Pyrrhula pyrrhula*
Yellowhammer		*Emberiza citrinella*
Reed Bunting	Common Reed Bunting	*Emberiza schoeniculus*

13 Appendix 6 – Peak Counts during Tidal Surveys

Nocturnal High Tide Survey

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grey Partridge							2					
Golden Plover												3
Lapwing	3		2						40	10+	4	
Curlew				1					2			
Redshank									1			
Herring Gull				10								
Little Owl	1	1					2		1			1
Tawny Owl			1	1			2		1			1
Long-eared Owl												1
Grasshopper Warbler				1			1					

High Tide Survey

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Brent Goose										2		
Shelduck				1								
Eurasian Teal										1		
Mallard										1		
Common Eider						2	4	12	3	2		
Long-tailed Duck										2		
Common Scoter	2							4		22		7
Common Goldeneye											2	
Red-breasted Merganser		2										

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grey Partridge	3		4									
Red-throated Diver	3	1	2	3	2				13		2	12
Fulmar	1	1	3	4	4	7	3	1				
Sooty Shearwater										4		
Manx Shearwater										2		
Northern Gannet					5	6		2		124	4	
Great Cormorant	5				4	3	2	25	8	4	2	1
European Shag	3	6	2									
Grey Heron				1								
Great Crested Grebe	2											
Red-necked Grebe										1		
Common Buzzard										1		
Common Kestrel										1		
Peregrine Falcon										1		
Oystercatcher	45	30	49	52	12				25	12	36	22
Golden Plover									25			
Lapwing				17	1				205	245		
Purple Sandpiper	4		9	2								
Dunlin									1			
Eurasian Woodcock		1										
Whimbrel								1				
Curlew	21	14	13	16					2	2	16	20
Common Sandpiper								1				
Redshank	1							9	1			
Turnstone	6	3	6	16								
Pomarine Skua										1		

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Long-tailed Skua										1		
Great Skua										30		
Kittiwake	1			24	80	4	2	3		1		
Black-headed Gull	182	70	68	106				102	254	130	167	69
Mediterranean Gull	1								1			
Common Gull	265	13	6	9						17	7	5
Lesser black-backed Gull				1	1		1	11				
Herring Gull	42	15	57	34	70	71	59	91	261	500	27	27
Great black-backed Gull	20	4	1	3	2	6	1	1	3	441		3
Sandwich Tern				8	4	8		5	5			
Roseate Tern								1				
Arctic Tern					3			7				
Commic Tern								2				
Guillemot	1	1	1	7	30	1		8	3			
Razorbill					20			9	3			3
Auk *sp*					30	4						

N.B. *Northumbria Coast SPA citation species shown in red*

Low Tide Survey

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Greylag goose												2
Wigeon						4					16	
Eurasian teal							2		11			
Mallard											12	
Common eider		2		6	8	3		10	1	3	41	

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common scoter		4		24	4	148		3	6			8
Velvet scoter											2	
Goosander						1						
Red-throated diver		6	1		1	2			11	2	1	1
Fulmar		2	1	3	2	3	3	1				
Manx shearwater						1						
Northern gannet						6		1			3	
Great cormorant			2	2	2	7	2	18	3	1	2	3
European shag		4	1		1							
Grey heron				1	1	1			1		1	1
Common kestrel	2	1				1		1	1			
Oystercatcher	23	57	37	8	5	14	7	50	25	30	46	50
Purple Sandpiper												1
Golden plover	93	70							12			12
Lapwing	60	1						1	222	177		
Dunlin					1							
Common snipe	1											
Curlew	8	25	9					1	3	2	17	22
Redshank	4	4	5					1	1	5	3	2
Turnstone	8	6	13				2	3			1	9
Arctic skua								1				
Great skua											2	
Kittiwake				15	10	10		36			30	
Black-headed gull	43	82	226	2	16		2	125	413	427	161	189
Mediterranean gull					1					1		

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common gull	331	30	34		1			5	5	20	18	9
Lesser black-backed gull				2	2	1		3		1		
Herring gull	2	17	28	57	44	59	32	134	480	225	78	180
Great black-backed gull		3	1	16	11	13	2	8	4	4	65	51
Sandwich tern				4	15	4	6	7	2			
Common tern					4		1					
Arctic tern					2	1	5	11				
Guillemot		1		9			2	4				
Razorbill				1		4	1	5	1			
Auk sp								17			2	
Puffin					1							

N.B. *Northumbria Coast SPA citation species shown in red*

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