

APPLIED ECOLOGY

Queensberry Brae, Thornhill

Preliminary Ecological Appraisal and Badger Survey

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1 Introduction

Background

- 1.1 In September 2023, Applied Ecology Ltd (AEL) was commissioned by ECD Architects Ltd to carry out a Preliminary Ecological Appraisal (PEA) and badger survey of land adjacent to Kinnell Street in Thornhill, Dumfries and Galloway ("the Site"). A plan showing the location of the Site is provided in **Figure 1.1**.
- 1.2 The study was required in order to determine the likely ecological constraints associated with a residential development on the Site to be known as 'Queensberry Brae' ("the Development"), and to establish the potential scope of any further, more detailed ecological surveys which may be needed to support a planning application in this respect. The study was an update to a similar piece of work carried out by AEL in 2020, for both the Site and a proposed access road through Boatbrae Wood. These earlier surveys are reported elsewhere¹.

Purpose of this report

- 1.3 This report provides details of an updated PEA and badger survey undertaken for the Site in September 2023. It includes a description of the Site's current habitat mosaic and its likely faunal interest, including a dedicated search for signs of badger activity. Based on these surveys, a summary of its biodiversity opportunities and constraints has been provided, with recommendations for further survey or other actions described where these were considered relevant.

Report qualification

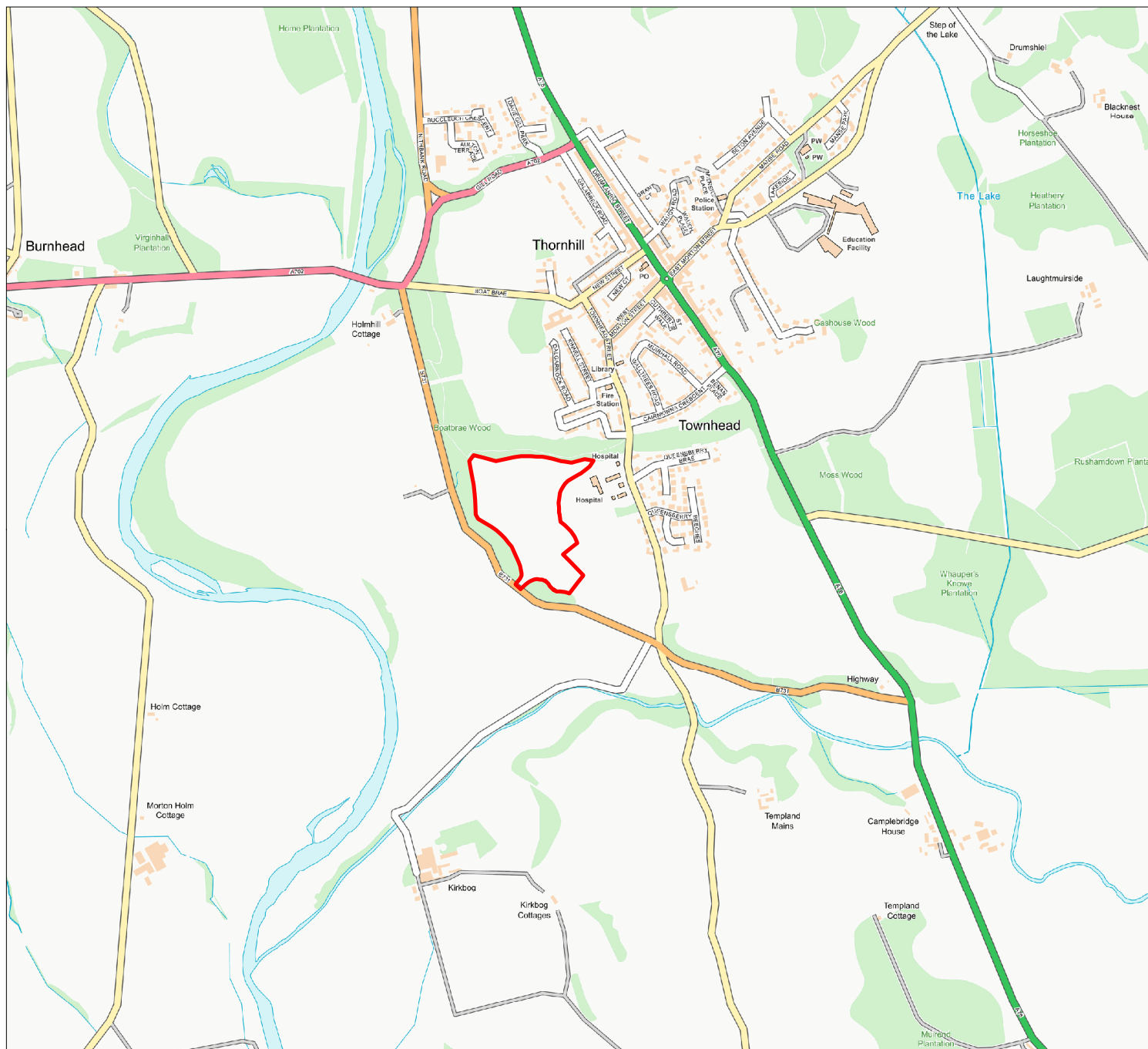
- 1.4 The surveys described here were undertaken in accordance with the best practice methodologies current at the time of commissioning. Site circumstances, scientific knowledge or methodological requirements can change during the course of a project, and these external factors may impact on the scope of subsequent work requirements.
- 1.5 All survey work and reporting were undertaken by experienced and qualified ecologists in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM), as well as guidance contained within BS 42020:2013 (Biodiversity).
- 1.6 All ecological surveys have an expected validity period, owing to the tendency of the natural environment to change over time. This validity period varies from feature to feature, and is also dependent on the degree of change in a site's management and overall landscape ecology. Where the potential for change is considered to be relevant to the Site, this is highlighted in the appropriate section.

¹ **AEL (2020).** *Land at Boatbrae Wood, Thornhill – Preliminary Ecological Appraisal, Badger, Red Squirrel and Aerial Tree Bat Roost Survey.* Unpublished contract report produced for The Wheatley Group. June 2020.



- 1.7 This report does not purport to provide detailed, specialist legal advice. Where legislation is referenced, the reader should consult the original legal text, and/or the advice of a qualified environmental lawyer.





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Site Location

 Site boundary

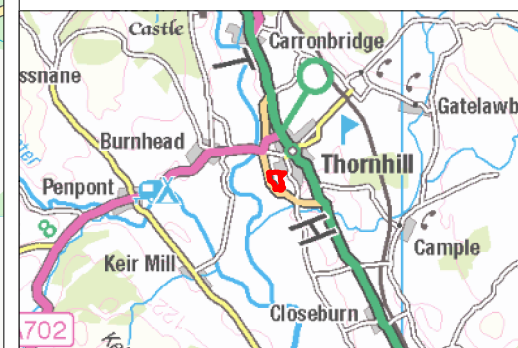


Figure 1.1

Map Scale @ A4: 1:15,000



Surveyed by: -

Survey date: -

Drawn by: DS

Checked by: RAH

Status: Final



2 Preliminary Ecological Appraisal

Methodology

Pre-existing data records

- 2.1 Details of nearby statutory sites designated for nature conservation were obtained from the NatureScot Natural Spaces website² and plotted in a Geographical Information System (GIS). Sites listed on the NatureScot Ancient Woodland Inventory (AWI) were also obtained from this source and plotted in GIS. Dumfries and Galloway Council maintains a register of local non-statutory designated sites known as Local Nature Conservation Sites (LNCSSs). These were searched for in the Development Plan (LDP)³, and if present within a 2 km buffer of the Site were subsequently plotted in GIS.
- 2.2 Other pre-existing biological data relevant to the Site were also searched for in online databases to which the authors had access and for which there were no issues associated with their use in a commercial setting.

Scottish EUNIS habitat survey

- 2.3 NatureScot has adopted EUNIS, the European Nature Information System, as the standard habitat classification scheme for terrestrial habitat data and mapping in Scotland⁴. The habitat survey of the Site was therefore undertaken on 27 September 2023 using Scottish EUNIS, during which all habitats present within the Site were classified and mapped according to the standard EUNIS categories. Habitat patches were mapped as polygon features, and linear features (such as walls and fences) as lines where this provided added value and if sufficient space on the map. Point features were recorded where there were notable isolated trees or scrub. Target notes were used to describe areas of both typical and unique botanical character. Plant species abundance was noted using the DAFOR⁵ system, and the minimum mappable unit (MMU) was 10 x 10 m except where features marked on the base map allowed mapping to be more precise.
- 2.4 The survey was carried out in dry and bright conditions.
- 2.5 The habitat map was subsequently digitised using GIS.
- 2.6 The standard habitat survey approach was "extended" to include a search for evidence of or potential for the presence of protected species or species of nature conservation interest within and close to the Site. This was not a detailed survey for such species (except for badger covered in **Section 3**), but included noting the presence of habitats suitable to support specific protected species, and where seen, any evidence of presence such as

² <https://gateway.snh.gov.uk/natural-spaces/> accessed October 2023.

³ https://www.dumgal.gov.uk/media/19849/LDP2-Local-Nature-Conservation-Sites-technical-paper/pdf/Local_Nature_Conservation_Sites_Jan2018.pdf?m=636827083976200000 accessed October 2023.

⁴ **Strachan, I.M. (2017)** *Manual of terrestrial EUNIS habitats in Scotland*. Version 2. Scottish Natural Heritage Commissioned Report No. 766.

⁵ DAFOR: whereby species occurrence may be classified as being **d**ominant, **a**bundant, **f**requent, **o**ccasional or **r**are. Rare in the context of a DAFOR score should not be confused with species rarity in the more widely accepted meaning of general scarcity.



droppings, mammal tracks and footprints, shelters (or nests/roosts), hair caught on fence-wire, foraging signs, and so on.

Potential limitations of the Scottish EUNIS habitat survey

- 2.7 All of the Site was fully accessible and the survey was undertaken in dry conditions. The survey was however undertaken outwith the core botanical survey period. Nevertheless, all plant species observed could be identified by the surveyor, and this was sufficient to provide diagnostic information for the habitat types present. As the purpose of the survey was not a botanical audit, there were therefore no significant methodological limitations to the survey.

Results

Designated sites

- 2.8 A map showing the location of designated sites within 2 km of the Site is provided in **Figure 2.1**. There were no statutorily designated sites within the search area, nor any LNCSS. However, the northern and western boundaries of the Site were formed by the edge of Boatbrae Wood which is designated as an ancient woodland of semi-natural origin. A network of other woodlands listed on the AWI was also present within the 2 km search area, primarily of plantation origin.

Habitats

- 2.9 The Scottish EUNIS habitat map for the Site is shown in **Figure 2.2**, and a summary of the habitats present is provided in **Table 2.1** below. Target notes can be found in **Appendix B**, and a selection of survey photographs in **Figure 2.3**.

Table 2.1: Summary of habitat types recorded within the Site

Habitat	Area (ha)	% of Site
E2.13: Abandoned pasture	0.48	7.3
E2.6: Improved grassland	5.67	85.9
E5.1: Tall ruderal	0.45	6.8
Totals	6.60	100.0

Grasslands

- 2.10 The majority of the Site (93 %) comprised grassland habitats, as it was primarily a species-poor **improved grassland** grazed by livestock. Yorkshire fog *Holcus lanatus*, red fescue *Festuca rubra* and perennial rye-grass *Lolium perenne* were the dominant grasses, along with frequent common bent *Agrostis capillaris*. Forb species were limited to creeping buttercup *Ranunculus repens*, white clover *Trifolium repens*, ribwort plantain *Plantago lanceolata* and occasional broad-leaved dock *Rumex obtusifolius*.



- 2.11 The field boundaries were lined with strips of mesotrophic grassland, classified as **abandoned pasture** along the northern boundary, and as **tall ruderal** along the western boundary. The areas of abandoned pasture were generally similar to the improved grassland areas in terms of the dominant grass species, with additional Timothy *Phleum pratense*, cock's-foot *Dactylis glomerata*, abundant creeping thistle *Cirsium arvense* and common nettle *Urtica dioica*, and occasional curled dock *Rumex crispus*, patches of bramble *Rubus fruticosus* agg. and common broom *Cytisus scoparius* (TN 2) scrub, and common chickweed *Stellaria media* (TN 4). The tall ruderal habitat along the western boundary tended to be overwhelmingly dominated by creeping thistle, common nettle and rosebay willowherb *Chamaenerion angustifolium*.

Wider ecological context

- 2.12 The woodland along the northern and western boundaries was listed on the AWI as being an ancient woodland of semi-natural origin (see above). None of the woodland fell within the Site boundary, but the canopy of some trees did overhang the field. These woodlands are described in more detail in TNs 6-8 in **Appendix B**.

Linear features

- 2.13 The northern and western boundaries of the Site were marked by **lines of trees** comprising the woodland edge.

Non-native plant species

- 2.14 No areas of Japanese knotweed *Reynoutria japonica*, giant hogweed *Heracleum mantegazzianum* or Himalayan balsam *Impatiens glandulifera* were noted within the Site.

Faunal signs and potential

- 2.15 The only dedicated faunal survey undertaken as part of this appraisal was with respect to the potential for the Site to support badger, and this is covered in **Chapter 3**. However, in addition to this, a range of signs of or potential for notable faunal species were searched for.

Mammals

- 2.16 The Site was an open improved grassland field and there were no ditches or watercourses suitable for **otter** or **water vole**.
- 2.17 In 2020⁶, full **red squirrel** survey was undertaken by AEL within the woodlands surrounding the Site, utilising transects and camera monitoring of feeder boxes. Only grey squirrel was recorded, and this was also the case for woodlands bordering the Site for which records were available within the Saving Scotland's Red Squirrels (SSRS) database⁷. Two grey squirrels were seen in the woodland during the 2023 badger survey described in **Chapter 3**. Taking this into consideration, red squirrel was considered likely to be still absent from

⁶ AEL (2020). *Land at Boatbrae Wood, Thornhill – Red Squirrel Survey*. Unpublished contract report produced for Dumfries and Galloway Housing Partnership. December 2020.

⁷ <https://scottishsquirrels.org.uk/> Accessed October 2023.



woodland areas along the northern and western boundary of the Site, and no direct impacts on the woodlands are anticipated from this phase of the Development. Therefore, no further survey is required for this species and red squirrel is not considered further in this report.

- 2.18 The woodland along the Site boundary connected to other ancient woodlands to the north and west. The mature tree canopies and woodland edges offered excellent, high quality foraging and commuting habitats for **bats**, with continuous connective habitat available along the woodland and into the wider area, including along the nearby River Nith. A number of bat species were considered likely to utilise the long-established woodland for foraging and commuting, and Dumfries and Galloway is known to be an area where a high diversity of bat species can be found.

Birds

- 2.19 The Site itself offered little in terms of habitat for **nesting birds**. However, the mature trees and lower canopy within the woodland edges along the Site boundary offered nesting locations for a range of breeding bird species, as well as bird foraging within the shrub layer and woodland floor.

Herpetofauna

- 2.20 The open, improved grassland field and narrow field edge mesotrophic grassland/tall ruderal habitats offered limited suitable habitat for **reptiles**. The adjacent woodland was heavily shaded and lacked areas that reptile species could make use of for basking and shelter. There were also no suitable breeding habitats for specially protected **amphibians** such as great crested newt, neither within the Site nor within appropriate buffers of it.



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Designated Sites

-  Site boundary
-  2 km from Site boundary

Ancient Woodland Inventory:

-  Ancient (semi-natural origin)
-  Long-established (plantation origin)
-  Other (on Roy map)

AWI data copyright NatureScot. Contains Ordnance Survey data © Crown copyright and database right (2023).

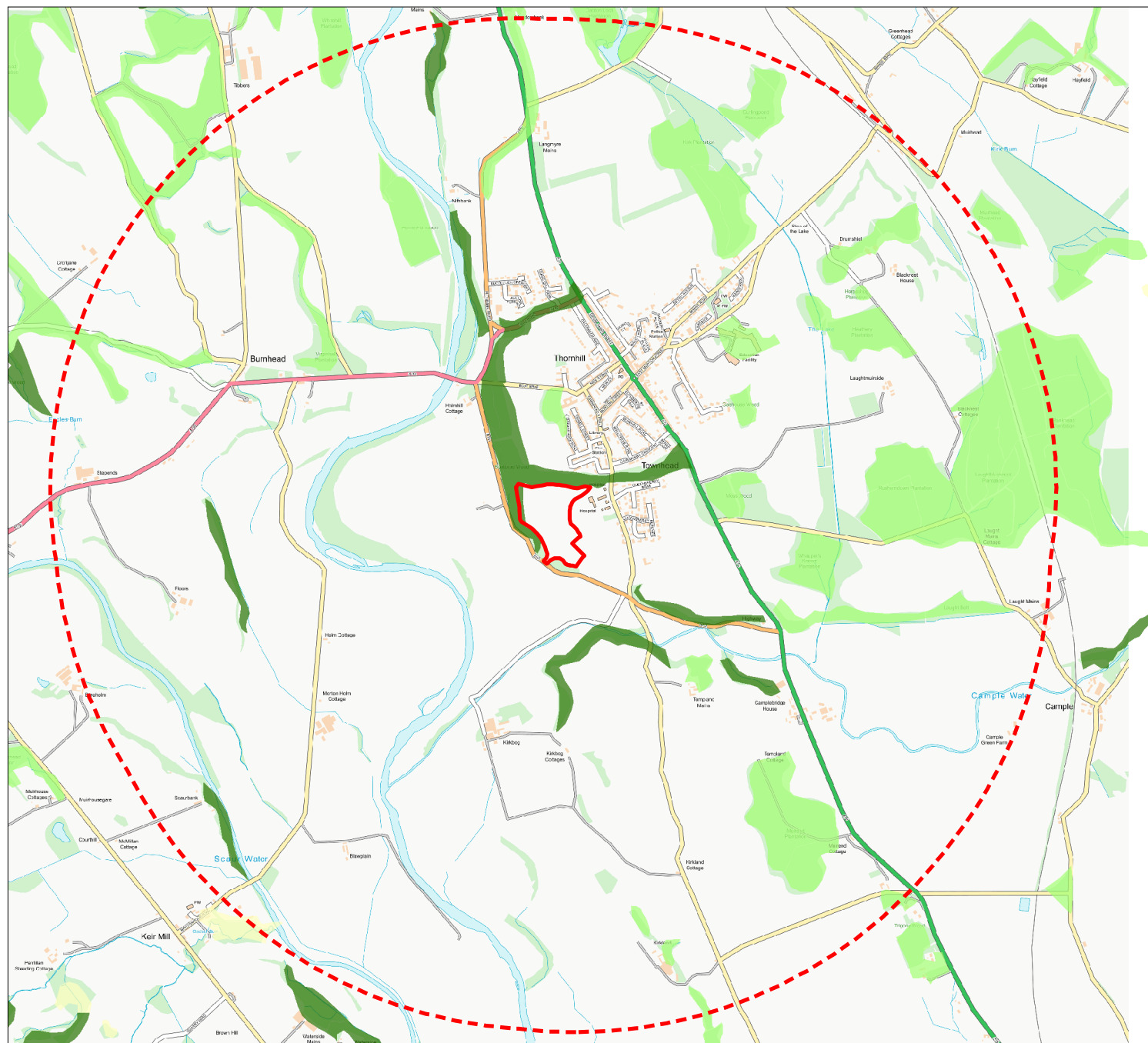
Ancient Woodland data may exclude some woodlands present on 1st Edition OS maps.

Figure 2.1

Map Scale @ A4: 1:25,000



Surveyed by: -
Survey date: -
Drawn by: DS
Checked by: RAH
Status: Final





Queensberry Brae, Thornhill

Scottish EUNIS Habitat Map

- Site boundary
- Habitat types:**
- E2.13: Abandoned pasture
 - E2.6: Improved grassland
 - E5.1: Tall ruderal
 - G5.1: Line of trees
 - Target note

Figure 2.2

Map Scale @ A4: 1:2,500



Surveyed by: DS
Survey date: 27 September 2023
Drawn by: DS
Checked by: RAH
Status: Final



Figure 2.3: Selection of habitat survey photographs



(a) Improved grassland field, with abandoned pasture along the northern boundary of the Site.



(b) More extensive area of abandoned pasture in the west of the Site.



(c) Tall ruderal habitat along the western boundary.



(d) Mixed woodland to the west of the Site, described in TN 6.



(e) Mixed woodland to the west of the Site, described in TN 7.



(f) Mixed mesotrophic woodland to the north of the Site, described in TN8.

Discussion and recommendations

National Planning Framework 4

- 2.21 In February 2023, the Scottish Government approved National Planning Framework 4 (NPF4). This now forms part of LDPs and must be taken in to account in determining planning applications. NPF4 has resulted in a significant shift in the approach to planning in Scotland, placing climate and biodiversity at the centre of the planning system. In particular, Policy 3 of NPF4 will play a critical role in ensuring developments secure positive effects for biodiversity, and Policy 4 provides the framework for sites statutorily designated for nature conservation.
- 2.22 The main aims of NPF4 Policy 3 are to protect biodiversity, reverse biodiversity loss, deliver positive effects from development including biodiversity net gain, and strengthen nature networks. NatureScot has produced a useful guide to this, aimed at situations where full Environmental Impact Assessment (EIA) is not necessarily needed, and this is available online⁸. The majority of the commentary provided in this section of the report is therefore based on the requirements of this new policy, alongside that provided by local policies and current wildlife legislation.

Designated sites

- 2.23 The woodland bordering the Site is listed on the AWI as ancient woodland of semi-natural origin. This means that woodland has persisted on this Site since at least 1750, and likely longer than this. This does not necessarily mean that trees are ancient or veteran specimens per se, but that there has been a continuity of woodland cover since the date thresholds set for the inventory. As a result of this longevity, ancient woodland sites are associated with unique and complex communities of plants, fungi, soil biota, insects and other animal species, and are hence priorities for preservation. Ancient woodland is listed as a priority habitat within the Dumfries and Galloway Local Biodiversity Action Plan (LBAP)⁹, and as a material consideration for planning in the Dumfries and Galloway Local Development Plan (LDP - Policy NE8)¹⁰. Under this policy there is a presumption against loss of ancient woodlands, and a need to demonstrate how development proposals have been designed so as to minimise the loss of such woodlands and trees. Ancient woodland adjacent to the Site would be considered to be Important Ecological Features (IEFs) at the **Council** level in the context of an ecological appraisal (see **Appendix C**).
- 2.24 The Woodland Trust's 2017 guidance for planners¹¹ recommends that there is at least a 50 m stand-off from the canopy edge of mature woodland habitats classified as ancient woodland. This buffer zone should be designed so as to prevent anti-social use of the designated woodland, using fencing, path creation and planting to limit access to specific

⁸ <https://www.nature.scot/doc/developing-nature-guidance> Accessed October 2023.

⁹ https://www.dumgal.gov.uk/media/19945/Local-Biodiversity-Action-Plan/pdf/Local_Biodiversity_Action_Plan.pdf?m=636561914667330000. Accessed October 2023.

¹⁰ https://www.dumgal.gov.uk/media/21885/Adopted-Local-Development-Plan-2/pdf/Adopted_LDP2_OCTOBER_2019_web_version.pdf?m=637060550180970000 Accessed October 2023.

¹¹ **Woodland Trust (2017)** *Planning for Ancient Woodland: Planners' Manual for Ancient Woodland Veteran Trees*. Woodland Trust, Grantham, UK.



key locations to avoid uncontrolled informal access into the woodland. The landscape plan for the Development has sought to include these features wherever practicable.

Habitats

- 2.25 Habitats within the Site were of generally of low ecological value, with the exception of the strips of longer grassland and tall ruderal habitats along the boundary offering cover for small mammals. However, the habitats present would be considered to be IEFs only at the **Site or Less than Site** level in the context of an ecological appraisal.
- 2.26 The need for a stand-off from the ancient woodland is described above. No impacts on the wider woodland habitat beyond the Site boundary are anticipated, provided the recommendations outlined above are followed.
- 2.27 In accordance with the spirit of NPF4, as a general principle, any loss of boundary abandoned pasture and tall ruderal habitat, would require compensation, and enhancement of the biodiversity value of habitats within the Development should be considered. The soft landscaping scheme associated with the Development should therefore aim to enhance the surrounding habitat mosaic. It is understood that the masterplan for the Development will include wildflower meadow creation along the northern and western boundaries, in addition to small areas of wetland. This will help to maintain a buffer between the Development and the woodland habitats. Species-rich native grassland mixes should be used, with an associated appropriate management regime to maximise their potential value for biodiversity.
- 2.28 Trees and shrub planting are also proposed across the Development. These should include appropriate native species such as elder *Sambucus nigra*, blackthorn *Prunus spinosa*, rowan, dog-rose *Rosa canina* agg., hawthorn *Crataegus monogyna* and holly *Ilex aquifolium*, as well as an appropriate management regime for any new species-rich, native hedgerows to maximise berry production and availability (e.g. through use of a 1 year in 3 rotation side/face cut in late winter (February) each year).
- 2.29 A statement regarding compliance with Policy 3 of NPF4 will be needed to support the planning application, once the measures to be adopted for delivering biodiversity net gain have been agreed.

Bats

Relevant legislation

- 2.30 All British bats are European Protected Species (EPS), protected in Scotland by the Conservation (Natural Habitats &c.) Regulations (1994) (as translated into domestic legislation post-Brexit) and the Wildlife and Countryside Act (1981, as amended). This legislation makes it an offence to capture, harass, injure or kill a bat; obstruct access to, damage or destroy a breeding or other resting place of a bat; disturb bats in such a way as is likely to affect their distribution or abundance, or disturb bats in such a way as is likely to impair their ability to survive or breed. Each of these actions is considered to be an offence whether the action is deliberate or reckless, except in the case of damaging or destroying a breeding site or resting place which is a strict liability offence. A licence is required for all developments which will affect areas known to contain bat roosts.



- 2.31 A bat roost is defined as any structure or place which is used for shelter or protection by bats, irrespective of whether or not bats are resident. Buildings and trees may be used by bats for a number of different purposes throughout the year including resting, sleeping, breeding, raising young and hibernating. Roost use depends on bat age, sex, condition and species as well as the external factors of season and weather conditions. A roost used during one season is therefore protected throughout the year whether or not bats are actually present at the time of inspection, and any proposed works that may result in disturbance to bats, or loss, obstruction of or damage to a roost are licensable.

Recommendations relating to bats

- 2.32 With respect to bats, the Dumfries and Galloway LBAP lists eight species as being priorities, all of which could be expected to use surrounding woodlands and the boundary features of the Site for commuting, foraging or roosting. Foraging and commuting bats would be considered to be an IEF at the **Site** level.
- 2.33 Consideration of potential impacts of the Development on bats is therefore needed, including the maintenance of a dark, unlit buffer between the woodland and built features. Fragmentation of traditionally used bat commuting or foraging routes must be avoided. The requirements for further bat survey in relation to the proposed access road through Boatbrae Wood should be adhered to, as detailed in previous reporting.
- 2.34 To that end, there are a number of standard best practice procedures which should be incorporated into the Development to minimise their impact on roosting, commuting and foraging bats. Such measures should include *inter alia*:
- maintaining existing linear commuting and foraging features along the northern and western boundary,
 - introducing new linear foraging and commuting routes across the Development;
 - well-designed night lighting schemes which must retain dark corridors along the woodland edges using low level, directional lighting and if possible, timers. The BCT and the Institute of Lighting Professionals (ILP) provide a range of information sources relating to bats and lighting¹²
 - use of integrated bat boxes on new buildings;
 - use of tree-mounted bat boxes.
- 2.35 Incorporation of these measures will represent best practice as well as the enhancement required by NPF4, regardless of whether or not bats are currently using the Site.

Nesting birds

Relevant legislation

- 2.36 All wild birds in the UK, their nests and their eggs are protected by the Wildlife and Countryside Act 1981, (as amended). Under this legislation it is an offence, with certain exceptions, to:

¹² <https://www.bats.org.uk/news/2023/08/bats-and-artificial-lighting-at-night-ilp-guidance-note-update-released> accessed October 2023.



- intentionally or recklessly kill, injure or take any wild bird;
- intentionally or recklessly take, damage or destroy the nest of any wild birds while it is in use or being built;
- intentionally or recklessly take or destroy the egg of any wild bird.

2.37 A number of bird species have been highlighted as priorities for bird conservation in the UK (Stanbury *et al.*, 2021¹³), and allocated Red or Amber status. All other species not of conservation concern are considered to be Green-listed. Certain bird species also have additional protection under the terms of the EC Birds Directive, and may be local priorities for conservation action via local BAPs.

Recommendations relating to nesting birds

- 2.38 Buffering the existing woodland edges will help to reduce the potential impacts on birds arising from the Development. However, legislation relating to nesting birds will still be applicable within the bird breeding season when conducting site clearance or construction works. Nesting birds would be considered to be an IEF at the **Site** level. Any works undertaken in close proximity to the woodland edges where breeding birds may be present should therefore be executed outwith the breeding bird season¹⁴. Requirements for further actions relating to nesting birds associated with the Boatbrae Wood access road should be followed, as detailed in previous reporting.
- 2.39 If works cannot be scheduled so as to avoid the nesting bird season, the relevant areas will need to be inspected by a suitably qualified ecologist in advance of the works, to ensure that no breeding birds are present. If nesting is noted or suspected, works will need to cease until it has been ascertained that all fledglings have hatched and have left the nest(s). The time required for this varies between bird species.
- 2.40 New areas of soft landscaping and buildings should take into consideration the potential for incorporating enhancement measures for birds (and other wildlife). These should include:
- use of native tree species, such as hazel, rowan and downy birch, with under-planting of appropriate native shrub species such as bramble, hawthorn and elder (see above);
 - provision of nest boxes on new buildings, suitable for use by a range of species. This could include integrated boxes (e.g. for house sparrow) as these are unobtrusive, as well as swift boxes;
 - provision of new nest boxes on suitable woodland trees for use by tree nesting bird species.
- 2.41 The incorporation of such measures would represent best practice for the enhancement of biodiversity as promoted by NPF4.

¹³ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

¹⁴ The breeding bird season is usually considered to be mid-March through to mid-August, although some species can start to nest earlier than this, and some continue later. In all cases timings are dependent on the prevailing weather conditions each spring. Advice should be sought from a Suitably Qualified Ecologist.



3 Badger Survey

Introduction

- 3.1 The woodlands surrounding the Site contained habitats suitable for badger sett creation within a 30 m licensable distance of the Development. A formal survey for badger was therefore necessary.

Methodology

Pre-existing data

- 3.2 In May 2020, a badger survey of the Site, and the adjacent access road corridor through Boatbrae Wood, were surveyed by AEL. These survey data were reviewed to provide context for the 2023 update survey.

2023 field survey

- 3.3 On 27 September 2023, searches for badger field signs were undertaken for the Site and a 100 m buffer of this where access allowed (“the Study Area”, as shown in **Figure 3.1**), as per the survey guidelines promoted by Scottish Badgers¹⁵. Features such as setts, latrines and dung pits, badger hair, footprints, trails and evidence of foraging were all searched for¹⁶.
- 3.4 The survey concentrated on areas potentially suitable for sett excavation, including woodland habitats, their margins and embankments. All badger signs, confirmed or potential, were noted and their locations recorded using a hand-held GPS. Any relevant survey findings were subsequently digitised in GIS.

Categorisation of badger setts

- 3.5 Whilst badger setts are usually categorised according to their present use and appearance, this can be dynamic, particularly with regard to the prevalence of supplementary setts and the fact that their status can change over relatively short periods of time. For the purposes of the survey reported here, the conventions shown in **Table 3.1** were used to describe setts.
- 3.6 In addition to sett classification, the level of badger activity is conventionally recorded for each sett by classifying each sett entrance hole according to one of three categories, as follows:
- well-used: an entrance free of leaf-litter and showing recent signs of excavation;
 - partly-used: an entrance with some debris and leaf-litter but also showing some signs of recent digging;

¹⁵ **Scottish Badgers (2018)** *Surveying for Badgers: Good Practice Guidelines*. Online publication at www.scottishbadgers.org.uk

¹⁶ **Harris, S., Cresswell, P. & Jefferies, D. (1989)** *Surveying for Badgers*. Occasional Publication of the Mammal Society No. 9. Mammal Society, Bristol.



- disused: an entrance with debris and leaf-litter partially obscuring the hole, with no recent signs of digging, or a hole that exhibits the characteristics of a badger sett entrance hole (large and D-shaped entrance and old spoil piles at the entrance), but with no other signs of badger activity.

Table 3.1: Conventions used to classify badger setts.

Sett type	Characteristics
Main	The continuously used breeding and over-wintering sett for a social group of badgers. Only one main sett will exist in each social group's territory and will be relatively centrally located within the group's range. Several holes with large spoil heaps and obvious paths between sett entrances.
Annex	Linked by well-used paths to the main sett but not connected underground and not continuously used. Normally less than 150 m from the main sett, comprising several holes. May not be in use all the time, even if the main sett is very active.
Subsidiary	Distant from the main sett. Several entrances but with no well-used paths connecting to a main sett, and used only seasonally.
Outlier	Distant from main sett. Small, with one or two entrances only. Used for short periods sporadically, with no obvious well-used paths connecting to other setts. Little spoil outside holes.

Potential limitations of the badger survey

- 3.7 Badger surveys can be undertaken at any time of year, although the optimal times are March-June and September-November when badgers are particularly active but vegetation is lower. Badger latrines are reliably maintained by badgers in early spring, and at other times of year can be harder to locate. The survey was therefore undertaken within the optimal autumnal window.

Results

2020 survey

- 3.8 No signs of badger were found during the 2020 field survey, neither within the Site nor within the 100 m survey buffer. However, the habitat within the wider Study Area was noted as being highly suitable for this species, with steep, dry slopes for sett excavation, and extensive fields and woodland for foraging. It was thought likely that even if not resident, badger may be using ground within the Site for commuting between parts of off-site territory(ies), and that given its high suitability it was possible that the ground could be occupied by badger in the future.

2023 survey

- 3.9 During the 2023 survey, no signs of badger were again found, neither within the Site, nor within the 100 m buffer. The slopes within woodland areas were still considered to be ideal for sett creation, especially in the north-west of the Study Area, and the woodland floor and surrounding improved grassland fields also still provided good badger foraging opportunities. However, there were no well-used mammal paths or latrines/foraging signs along the field boundaries of the Site. Although the woodland strips were relatively narrow



and divided by pedestrian paths, there was still sufficient cover for badger to establish territories, particularly as the woodland widened and continued northwards.

Discussion and recommendations

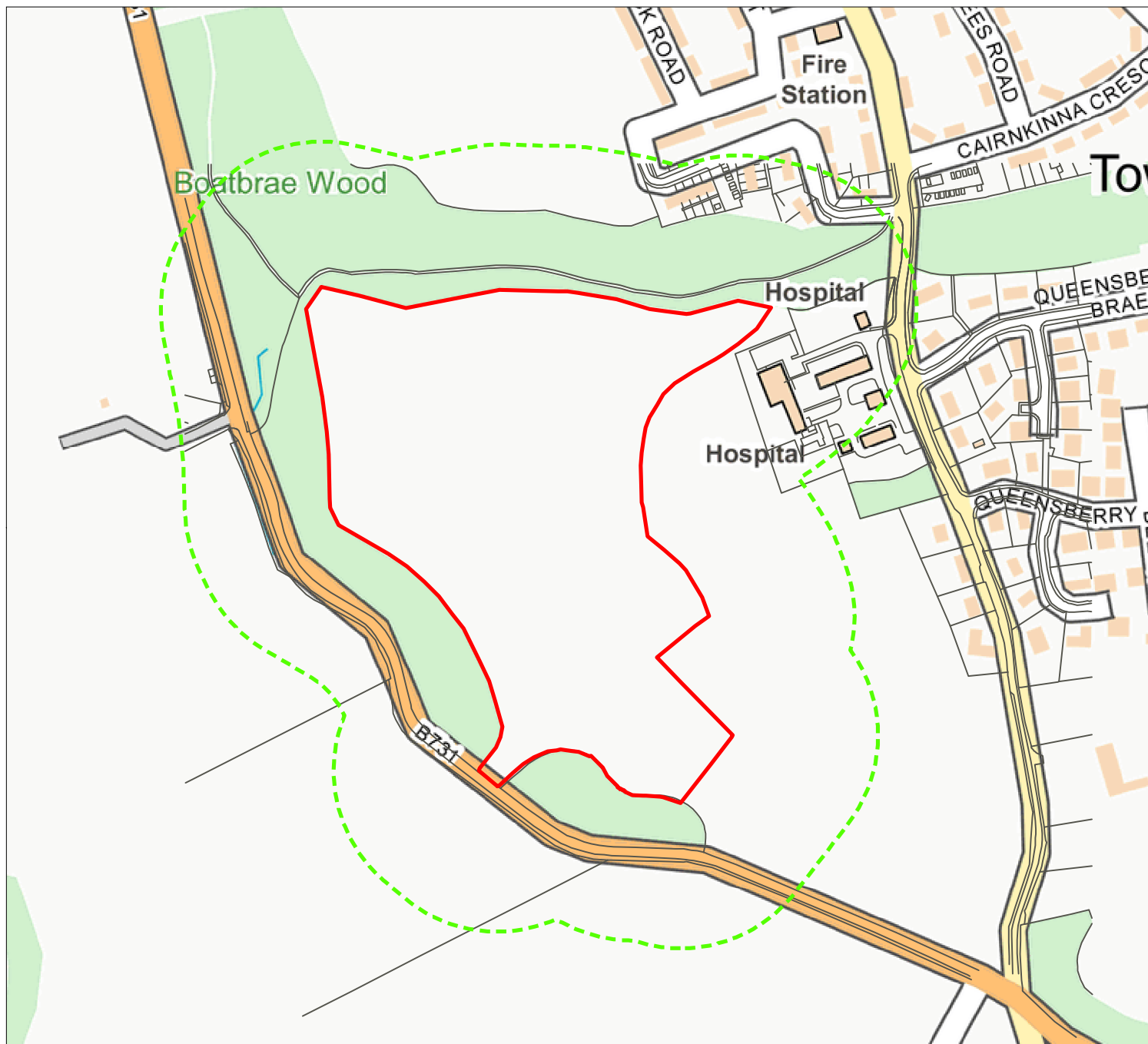
Relevant legislation

- 3.10 The badger and its setts are protected in Scotland by the Protection of Badgers Act 1992 (as amended) and strengthened by the Wildlife and Natural Environment (Scotland) Act (2011). This makes it illegal to wilfully kill, injure or take a badger, or attempt to do so, cruelly ill-treat a badger, interfere with a sett by damaging it or any part of it, destroying it, obstructing access to it or disturbing a badger while it is occupying a sett.
- 3.11 NatureScot is responsible for issuing licences under the Badgers Act for the purpose of development. Generally, it is considered that development using heavy machinery within at least 30 m of a badger sett entrance could result in disturbance and would therefore be licensable.

Badger at the Site

- 3.12 No signs of badger were found within the Study Area, in neither 2020 nor 2023. However, connectivity between the Site and extensive woodland habitat means that badger were still considered likely to use the woodland and Site boundaries on a transient basis, and the habitat was still suitable for the species. Badger are highly a mobile species and can move into previously unoccupied areas within a short period of time. Therefore, badger should be considered an IEF in the context of the Development, although only at a **Site** level (the legal protection afforded to badger is for animal welfare reasons rather than conservation purposes).
- 3.13 At this time, there are no specific badger licensing issues associated with the Development, as it is highly unlikely that setts will be affected by the proposals. Nevertheless, given that the species is protected, general precautions and good practice measures should be adhered to during the works, and this will be important due to the potential proximity of the works to woodlands and linear features that badger may use. Measures to be incorporated into the Construction Environmental Management Plan (CEMP), should include:
- pre-construction update survey for badger no earlier than 3 months in advance of construction, to determine whether or not there have been any changes in the distribution or nature of badger activity in the vicinity of the Site between the date of the survey reported here and the commencement of works;
 - in the unlikely event that during the works a badger sett is discovered within 100 m, all work should stop and advice should be sought from a Suitably Qualified Ecologist (SQE);
 - trenches and excavations will be covered at the end of each working day, or will include ramps, and stored pipes will be capped (or stored vertically), to prevent entrapment of animals. During longer periods of Site shut down, trenches and excavations will be infilled or covered;
 - in the unlikely event of any Site activity being carried out during the hours of darkness, machinery and floodlights will be directed away from woodland and field edges.





Queensberry Brae, Thornhill

Badger Study Area

- Site boundary
- 100 m from Site boundary

Figure 3.1

Map Scale @ A4: 1:4,000



Surveyed by: -

Survey date: -

Drawn by: DS

Checked by: RAH

Status: Final



4 Summary and Conclusions

- 4.1 In August 2023, a Preliminary Ecological Appraisal and badger survey was carried out for land adjacent to Kinnel Street in the Thornhill area of Dumfries and Galloway, to inform proposals for a residential Development known as 'Queensberry Brae'. The survey work sought to update similar surveys undertaken in 2020.
- 4.2 All of the habitats within the Site were considered to be of low ecological importance overall, and no specific ecological constraints were identified. However, the woodland surrounding the Site was designated as ancient, semi-natural woodland and a number of green infrastructure recommendations have been included within this report.
- 4.3 Recommendations have also been included in relation to foraging and commuting bats and actions needed in order to avoid contravention of the legislation relating to the protection of nesting birds. Suggestions for biodiversity mitigation or enhancement measures which could be incorporated into the proposals have been described, to ensure compliance with both national and local biodiversity policy. A formal statement regarding the Development's compliance with NPF4 will be needed.
- 4.4 No active badger setts were found within 100 m of the Site, although badger were thought likely to be using the landscape around the Site for foraging and/or commuting. At this time, no further actions in relation to badger are needed.
- 4.5 The findings and recommendations made in this report will remain valid for a period of 18-24 months, after which time a review will be necessary.



Appendix A

List of Initialisms, Acronyms and Abbreviations Used in this Report



Short form	Full terminology
AEL	Applied Ecology Ltd
AWI	Ancient Woodland Inventory
BCT	Bat Conservation Trust
CIEEM	Chartered Institute of Ecology and Environmental Management
DAFOR	Dominant, abundant, frequent, occasional or rare
EPS	European Protected Species
EUNIS	European Nature Information System
GIS	Geographical Information System
GPS	Global Positioning System
IEF	Important Ecological Feature
ILP	Institute of Lighting Professionals
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LDP	Local Development Plan
LNCS	Local Nature Conservation Site
MMU	Minimum Mappable Unit
NPF4	National Planning Framework 4
PEA	Preliminary Ecological Appraisal
SBL	Scottish Biodiversity List
SQE	Suitably Qualified Ecologist
SSRS	Saving Scotland's Red Squirrels



Appendix B

Habitat Survey Target Notes



Target note	Description
1	Improved grassland field known to be at least historically grazed. Yorkshire fog, red fescue and perennial rye-grass were the dominant grasses, along with frequent common bent. Forb species were limited to creeping buttercup, white clover, ribwort plantain and occasional broad-leaved dock.
2	Area of mesotrophic grassland around the northern edge of the field, which was classified as abandoned pasture. Similar grasses to TN 1 with the addition of occasional Timothy grass and cock's-foot. Abundant creeping thistle and nettle in places with occasional curled dock and patches of bramble and common broom.
3	Strip along the western boundary with dominant creeping thistle and common nettle with patches of rosebay willowherb.
4	Larger area of abandoned pasture which had been spared from recent cutting or grazing, and was transitioning more to mesotrophic grassland. Similar grasses as TN 2 but relatively species poor with forbs limited to those outlined in TN 1, but with the addition of frequent common chickweed.
5	Strip of tall ruderal habitat with dominant creeping thistle and common nettle.
6	Mixed woodland with mature Scots pine <i>Pinus sylvestris</i> , oak <i>Quercus</i> sp., beech <i>Fagus sylvatica</i> , sycamore <i>Acer pseudoplatanus</i> and a lower canopy of occasional hawthorn <i>Crataegus monogyna</i> and hazel <i>Corylus avellana</i> . Ground layer was heavily shaded in places with dense bracken <i>Pteridium aquilinum</i> occurring in areas with more light penetration.
7	Mixed woodland with mature oak, beech and Scots pine. Ash <i>Fraxinus excelsior</i> and elm <i>Ulmus glabra</i> were also frequent. There was a lower canopy of occasional holly <i>Ilex aquifolium</i> and elder <i>Sambucus nigra</i> .
8	Mixed broad-leaved woodland with oak, beech, elm, sycamore and birch <i>Betula</i> sp.. Scots pine and larch <i>Larix decidua</i> were occasional, but not at a density to classify as mixed woodland. Holly, hawthorn, elder and hazel were all present in the lower canopy. This section of woodland was less shaded and therefore be expected to have a more diverse ground layer within the right season.



Appendix C

Defining Important Ecological Features



Identifying Important Ecological Features (IEFs)

The sensitivity, value or importance of ecological features can be related to a wide range of ecosystem services that they can provide to the environment, people or wider society. These benefits can include the conservation of genetic diversity, people's enjoyment or understanding of biodiversity, or the health benefits of biodiversity. A summary of an approach to valuing ecological features in Scotland can be found in the Table below. The table shows how ecological importance can be ascertained using a combination of statutory measures (legally protected sites and species) and non-statutory but widely accepted measures, such as the presence of notable habitats and species listed in biodiversity lists of local Biodiversity Action Plans (LBAPs). Use can also be made of the Ratcliffe assessment criteria for the selection of sites with nature conservation value (Ratcliffe, 1977) and certain protected species have their own frameworks for the assessment of the importance of on-site populations. All these criteria can vary at different geographical scales.



Level of sensitivity or value	Examples (not exhaustive)
International (including European)	An internationally designated site or candidate site (SPA¹⁷, proposed SPA (pSPA)¹⁸, Special Area of Conservation (SAC)¹⁹, candidate SAC (cSAC)²⁰, pSAC²¹, Ramsar site²², Biogenetic Reserve²³) or an area which NatureScot has determined meets the published selection criteria for such designations, irrespective of whether or not it has yet been notified. A viable area of a habitat type listed in Annex 1 of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource. A regularly occurring population representing >1 % of the European resource of a species listed in Schedules 2 or 4 of the Habitat Regulations (as amended post-Brexit).
National	A nationally designated site (Site of Special Scientific Interest (SSSI)²⁴, National Nature Reserve (NNR)²⁵, Marine Nature Reserve) or a discrete area which NatureScot has determined meets the published selection criteria for national designation irrespective of whether or not it has yet been notified. A viable area of a priority habitat identified in the former UK BAP or Scottish Biodiversity List, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource. A regularly occurring population representing >1 % of the national population of a nationally important species, i.e., a priority species listed in the former UK BAP or Scottish Biodiversity List and/or Schedules 1, 5 (S9 (1, 4a, 4b)) or 8 of the Wildlife and Countryside Act, or Schedules 2 or 4 of the Habitat Regulations (as amended post-Brexit). A regularly occurring and viable population of a UK Red Data Book species.
Council/Regional	Viable areas of key habitat identified in Council LBAP or Scottish Biodiversity List, or smaller areas of such habitats that are essential to maintain the viability of that ecological resource. Any regularly occurring, locally significant population of a species listed as being nationally scarce (occurring in 16-100 10 km squares in the UK) or in a relevant Council LBAP or Natural Heritage Zone profile on account of its rarity or localisation. Non-statutory designated wildlife sites including semi-natural ancient woodland greater than 0.25 ha. Networks of species-rich hedgerows.
Local	Locally important habitats or species such as: - semi-natural ancient woodland smaller than 0.25 ha; - features that are scarce within the local area or which appreciably enrich the local habitat resource e.g. networks of hedgerow/ditches not considered to be species-rich; - small populations of notable species (e.g., SBL or LBAP species) regularly resident on or using the site.
Site	Commonplace and widespread habitats or species which contribute to the functioning or value of the wider ecological landscape, such as: - scrub, poor semi-improved grassland, coniferous plantation woodland, intensive arable farmland etc.; - common and widespread faunal species, or occasional individuals of more notable species such as SBL or LBAP species, either resident on or using the site.

¹⁷ Special Protection Area classified under the EU Birds Directive for importance to birds.

¹⁸ Potential Special Protection Area.

¹⁹ Special Area of Conservation Area classified under the EU Habitats Directive for important habitat or non-bird species.

²⁰ Candidate Special Area of Conservation.

²¹ Potential Special Area of Conservation.

²² Wetland of international importance designated under the Ramsar Convention.

²³ Sites deemed representative examples of particular habitats in Europe.

²⁴ Site of Special Scientific Interest.

²⁵ National Nature Reserve.



