Kintore Hydrogen Plant
Bat Activity Surveys of Buildings

December 2023

CONTROL SHEET

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EXECUTIVE SUMMARY

EnviroCentre Ltd. were commissioned by Kintore Hydrogen Limited to undertake bat surveys of three (buildings a residential building, an outbuilding and a ruined building) within the site known as Kintore Substation, in land south of Kintore. The surveys were required to inform development of a Hydrogen electrolysis plant. A preliminary roost assessment (PRA) followed by bat activity surveys of two of the buildings and endoscope inspections of the third (ruined) building were undertaken in summer 2023.

No evidence of roosting bats was identified during the PRA of the buildings.

The residential building was assessed as offering moderate suitability for summer roosting bats due to potential roost features (PRFs) including gaps under slates, under apex ridge, between bitumen felt roof and fascia boards. This building was assessed as negligible for hibernating bats. No roosting bats were identified during the activity surveys. However, both soprano and common pipistrelle were recorded commuting and foraging around the cottage and outbuilding during both activity surveys. Activity was predominantly concentrated along the treeline south of the buildings and within the garden area north of the buildings.

The outbuilding was assessed as offering low suitability for summer roosting bats due to PRFs including gaps under slates and between door slats. This building was assessed as negligible for hibernating bats.

The ruined building was assessed as offering low suitability for summer roosting bats due to PRFs including gaps in stonework, between chimney flue and stonework and under remnant slates. Gaps between wooden doorframe and stone lintel and under remnant roofline were identified and provide opportunities for hibernating bats, thus this building was assessed as offering low hibernation potential. No evidence of roosting or hibernating bats were identified during the detailed endoscope inspection in summer or winter.

The habitats surrounding the buildings were assessed as high suitability for bats, due to the presence of a range of suitable commuting and foraging habitats (treelines, woodland, watercourses, scrub, grassland, scattered trees and garden habitats), which connect to other suitable habitat in the wider area.

As no bats were identified roosting during the surveys, no further surveys are required, other than update surveys/ checks if works associated with the buildings are scheduled post March 2025.. No protected species licence from NatureScot is currently required.

Old Swallow nests were identified on the cottage building at the apex of the west gable end. Evidence of birds was also present on the outbuilding. Pre-works checks should be undertaken for nesting birds if works (e.g. demolition) are to be undertaken during the nesting bird season (March-August).

Mitigation is recommended in line with best practice guidelines, including:

- Retention of buildings (where possible) to provide roosting provisions for bats in the locale.
- Where any buildings are to be removed, this is to be undertaken between October and February (inclusive) to avoid roosting bat constraints (and nesting birds).
- Contractors should be made aware of the possibility of encountering bats on site and in the locale prior to works commencing, via an on-site toolbox talk on the first day of works.

Compensatory measures are recommended and include enhancing roosting provisions via installation of bat boxes onto new buildings or existing trees and woodland.

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1 INTRODUCTION

1.1 Terms of Reference

EnviroCentre Ltd. were commissioned by Kintore Hydrogen Limited to undertake a bat survey of three buildings; a residential building, an outbuilding and a ruined building within the site known as Kintore Substation, in land south of Kintore. The surveys were required to inform development of a Hydrogen electrolysis plant.

The full site boundary is detailed in Appendix A, however the 'Site' as referred to in this report considers only the buildings and associated grounds, as shown in Figure 2-1.

1.2 Scope of Report

The aim of the survey was to inform future development works in regards to ecological constraints pertaining to bats. The main objectives were as follows:

- To complete a desk study to identify records of bats within 2km of the site;
- Identify Potential Roost Features (PRFs) and the suitability of habitats within and adjacent to the site in order to assess the building's potential to host roosting bats;
- To search for evidence of bats internally and externally of all buildings;
- To observe and record the behaviour of any bats using habitat within and adjacent to the site;
- To ascertain the presence or absence of roosting bats for consideration within the design and future operation of the site;
- Identify any further survey and European Protected Species (EPS) licensing requirements: and
- Outline appropriate mitigation and compensation actions.

1.3 Legislation

Bats are a European Protected Species (EPS) listed in the EC Directive (92/43) The Conservation of Natural Habitats and of Wild Flora and Fauna (the "Habitats Directive"), which is transposed into Scottish law through the Conservation (Natural Habitats &c.) Regulations 1994 (the "Habitat ns") as amended. Under this legislation it is an offence to deliberately or recklessly:

- capture, injure or kill such an animal;
- harass an animal or group of animals;
- disturb an animal while it is occupying a structure or place used for shelter or protection;
- disturb an animal while it is rearing or otherwise caring for its young;
- obstruct access to a breeding site or resting place, or otherwise deny an animal use of a breeding site or resting place;
- disturb an animal in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;
- disturb an animal in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young;
- disturb an animal while it is migrating or hibernating; and
- possess, control, transport, sell or exchange specimens of any animal listed on Annex IV of the Habitats Directive. This applies to living or dead specimens and to their derivatives.

It is an offence of strict liability to damage or destroy a breeding site or resting place of such an animal. These sites and places are protected even when the animal isn't present. For example, if a bat isn't present in a summer roost in winter months the roost is still protected by law.

1.4 Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

If this report is to be submitted for regulatory approval more than 12 months following the report date, it is recommended that it is referred to EnviroCentre Limited for review to ensure that any relevant changes in data, best practice, guidance or legislation in the intervening period are integrated into an updated version of the report.

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2 METHODS

2.1 Desk Study

A desk study for the presence of bat records, statutory and non-statutory designated sites and ancient woodland in proximity to the site was carried out using the following sources:

- NatureScot Sitelink[1] for information on statutory designated sites within 5km of the site, relevant to bats;
- Scotland's Environment Map[2] website to locate and identify ancient woodland within 2km of the site;
- Aberdeenshire Local Development Plan[3] for information on non-statutory designated sites within 2km of the site, relevant to bats;
- Records request from North East Scotland Biological records Centre (NESBReC)[4] and NBN Atlas[5] for bat records within 2km of the site which are licenced for commercial use; and
- Scottish Biodiversity List (SBL[6]) and North East Scotland Biodiversity Action Plan (NESBiP) for priority species potentially relevant to the site.

2.2 Preliminary Roost Assessment

A Preliminary Roost Assessment (PRA) was undertaken by Senior Ecologist Jennifer Paterson, who is an Associate member of the Chartered Institute of Ecology and Environmental Management (CIEEM), support by Consultant Ecologist Scott Fraser. The PRA of the cottage (B1) and outbuilding (B2) was conducted on the 20th June 2023, and the ruined building was undertaken on 9th August 2023, based on the methods detailed within the Bat Conservation Trust (BCT) survey guidelines[7]. All the buildings were externally inspected and partially internally inspected (access constraints to both the cottage and outbuilding) with the aid of a torch (red light only) and close focus binoculars to identify Preliminary Roost Features (PRFs) or any field evidence such as those presented in Table 2-1.

Table 2-1: PRFs, Access Points and Evidence of Bat Presence

Frequently used roosting locations in structures	Access points in structures frequently used as bat roosts	Evidence of Bat Presence
• Top of chimney breasts, gable ends and dividing walls; • Beams including ridge, hip etc.; • Junction of timber joints, mortise and tenon joints; • Behind purlins;	• Gaps in windowsills and window panes; • Underneath peeling paintwork or lifted rendering; • Behind hanging tiles, weatherboarding, eaves, soffit boxes, fascias and lead flashing;	• Live or dead specimens; • Bat droppings; • Urine splashes; • Fur oil-staining; • Feeding remains (e.g. moth wings); • Bat fly pupal cases; and

[1] NatureScot SiteLink, available from: https://sitelink.nature.scot/map (accessed June 2023)
[2] Scotland's Environment Map - Ancient Woodland Inventory, Available at: https://map.environment.gov.scot/sewebmap/ (accessed June 2023).
[3] ALDP Appendix 12: https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/Appendix12LocalNatureConservationSites.pdf (accessed June 2023)
[4] NESBReC records obtained in 2022 for central region of site plus 2km radius. NESBReC records available from: https://nesbrec.org.uk/
[5] NBN Atlas, available from: https://nbnatlas.org/ (accessed June 2023)
[6] SBL available at: http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL (accessed June 2023).
[7] Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd edition, Bat Conservation Trust.

Frequently used roosting locations in structures	Access points in structures frequently used as bat roosts	Evidence of Bat Presence
• Between tiles/slates and the roof lining; and • Under flat roof materials.	• Under tiles and slates; • Gaps in brickwork and stonework; and • Gaps in rendering behind gutters.	• Audible 'chattering' or social calling

Habitat connectivity to the wider landscape was also considered during this assessment, via a review of aerial imagery and site observations. The suitability of the building to host roosting bats as well as commuting and foraging habitats on site were classified as outlined within Table 2-2.

Table 2-2: Suitability Classification of Roosting, Commuting and Foraging Habitats for Bats

Suitability	Roosting Features	Foraging and Commuting Habitats
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edges. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. The site is close to and connected to known roosts.
Moderate	A structure with one or more potential roost sites that could be used by bats due their size, shelter, protection, conditions and/or surrounding habitat but unlikely to support a roost of high conservation status.	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis; or	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated. Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or a patch of scrub.

Suitability	Roosting Features	Foraging and Commuting Habitats
Negligible	A structure with negligible features likely to be used by roosting bats.	Negligible habitat features likely to be used by foraging or commuting bats.

2.3 Bat Activity Survey

Bat activity surveys aim to establish roost presence or absence and characterise any roosts found within, or adjacent to the site. Foraging and commuting routes in the surrounding landscape are also noted. The resulting data is used to inform the requirement for, and design of, mitigation and/or compensation, in line with current wildlife legislation. The survey effort (i.e. number of survey visits) is scoped from the suitability of the structures to host roosting bats, as determined by the PRA results.

Frequency division bat detectors (Bat Box Duet) were utilised during the surveys, as well as time expansion detectors (Echo Meter Touch (EMT)) and an infra red camera. Observations of bat activity were recorded with species, time identified, location and behaviour all noted.

Accurate numbers of bats can be difficult to identify during flight, therefore bat passes are used as a proxy measurement for activity levels. A bat pass comprises one sound file triggered by a bat call being detected by the EMT. Post survey analysis was conducted to confirm species identification and any observed species that were not possible to identify at the time of survey.

During the activity survey, surveyors were positioned at vantage points to gain visual and audible coverage of all features which offer potential roosting sites to bats. The vantage point locations for each survey can be seen in Figure 2-1. The surveyor profiles can be found in Appendix B

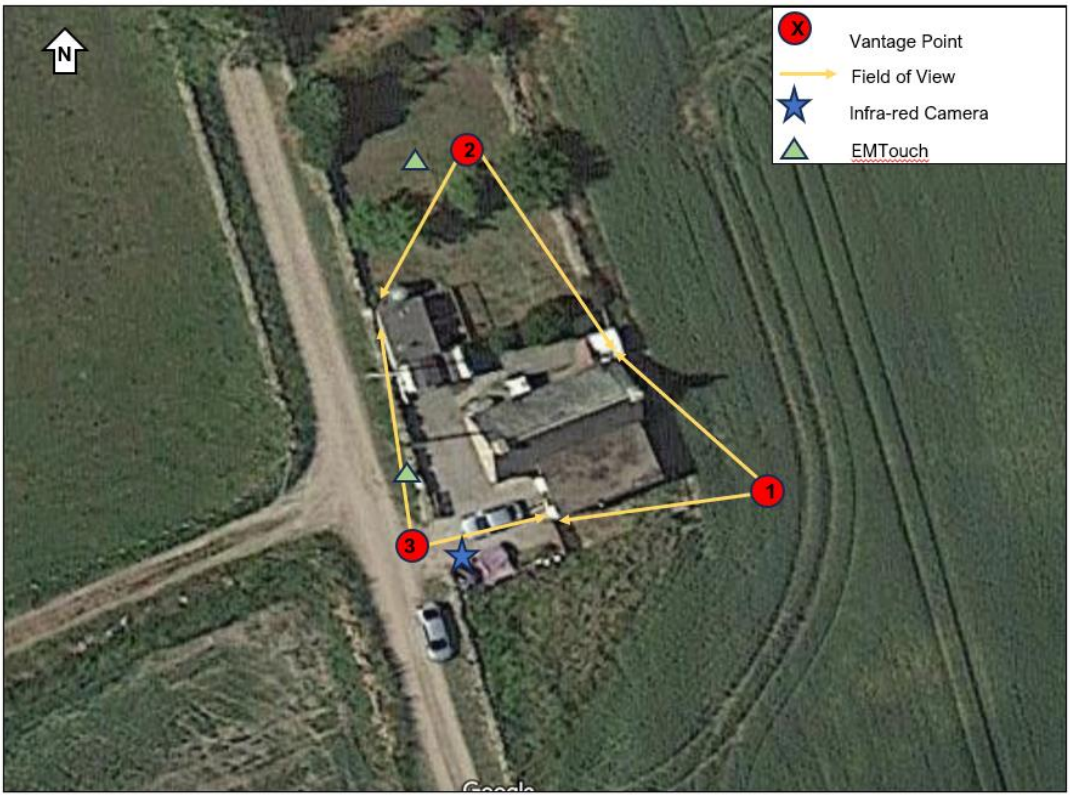


Figure 2-1: Surveyor Vantage Point Locations for the Residential and Outbuilding

2.3.1 Dusk Activity Survey

Dusk activity surveys locate bats emerging from roost sites. The dusk surveys commenced 15 minutes before sunset and ceased 1.5 hours after sunset, or when surveyors were satisfied enough time had elapsed to encapsulate any late emerging bats within the survey results.

The surveys were conducted:

- 19th July 2023
  - Start: 21:32, Sunset: 21:47, End: 23:00
  - Weather: temperature of 12°C throughout, still and 100% cloud cover. A rain shower from 22:27-23:00 occurred.
- 9th August 2023
  - Start: 20:51, Sunset: 21:06, End: 22:40
  - Weather: temperature 16°C throughout, still, 90% cloud cover.

2.4 Detailed Endoscope Inspection

A detailed endoscope inspection was undertaken during the summer and winter months for bats and aimed to identify the presence/ absence of any bats and a search for any field evidence, with the use of an endoscope.

The detailed endoscope inspection of the ruined building (B3) was undertaken by Douglas Blease Associate Director (Ecologist), a licenced bat worker (NatureScot licence: 132875) and who is experienced in searching for bat roosts in buildings. Supported by Senior Consultant Ecologist Jennifer Paterson, an experienced and competent bat ecologist.

The 1st survey was undertaken on 8th August 2023 when the weather was dry, still and 18 °C, with 20% cloud cover.

The 2nd survey was undertaken on 12th December 2023 when the weather was overcast with a light breeze and dry.

2.5 Constraints

2.5.1 Desk Study

Desk studies are limited by the reliability of third party information and the geographical availability of biological and/or ecological records and data. This emphasises the need to collate up-to-date, site-specific data based on field surveys by experienced surveyors. The absence of a species from biological records cannot be taken to represent actual absence. Species distribution patterns should be interpreted with caution as they may reflect survey/reporting effort rather than actual distribution.

2.5.2 Survey

Access into the roof space of the cottage building was constrained due to the false ceiling and small entry point, however this was unlikely to have effected survey findings due to the activity survey results.

The outbuilding was full of gardening equipment and therefore could not be fully accessed, however from the survey findings of the activity survey this is unlikely to have had any impact on the results and assessment.

During the first dusk survey, a rain shower began at 22:27 continuing until 23:00 when the survey was ended as a result. The rain shower was not considered to have impacted the survey findings due to the survey results.

3 RESULTS

The following should be read in conjunction with Appendix C: Survey Results and Appendix D: Photographs.

3.1 Desk Study

- No statutory designated sites are present within 5km of the site for bats. Only one statutory designated site is present 5km south of the site; Loch of Skene SSSI[8], RAMSAR[9] and SPA[10]. The designated features of this area refer to the presence of wintering wildfowl populations, namely greylag goose (*Anser anser*), pink-footed goose (*Anser brachyrhynchus*), common gull (*Larus canus*) and goldeneye (*Bucephala clangula*). The habitats in this area would also be suitable for bats, however this designated site is not considered to be ecologically connected to the site, for bats.
- No non-statutory designated sites are present within 2km of the site for bats.
- No ancient of native woodland is present within proximity to the buildings.
- Records from NESBReC returned the following:
    - Seven unidentified pipistrelle bats, nine common pipistrelle (*Pipistrellus pipistrellus*) and thirteen soprano pipistrelle (*Pipistrellus pygmaeus*) records were returned between 2013- 2021. These sightings were predominantly in and around residential housing 2km to the north of the site in the town of Kintore, with 15 of these records being of roosts (a mix of maternity and small likely non-breeding).
    - One record of a brown long-eared bat foraging amongst residential housing in Kintore 2km north of the site in 2021.

3.2 Preliminary Roost Assessment (PRA)

3.2.1 Residential Building and Outbuilding

Building Description
The residential building comprised a one storey stone walled and slate pitched roof cottage, with a flat bitumen felt roof and rough cast wall extension on the south aspect. A chimney stack was present on either gable end (Photograph 1).

The associated outbuilding comprised a small single storey stone walled and slate sloping roof, with two wooden doors on the east aspect (Photograph 1).

Internal Inspection
No evidence of bats was identified during the internal inspection of the residential building.

Internally, the cottage building comprised of a false ceiling of the room where the loft entry point was situated which consisted of a one foot heigh space which was covered in wood clad. The main loft area consisted of wooden sarking and wooden trusses, with insulation in floor area (Photograph 2).

[8] Loch of Skene SSSI designation available at: https://apps.snh.gov.uk/sitelink-api/v1/sites/1038/documents/1 (Accessed May 2023)
[9] Loch of Skene RAMSAR designation available at: https://apps.snh.gov.uk/sitelink-api/v1/sites/8442/documents/20 (Accessed May 2023)
[10] Loch of Skene SPA available at: https://apps.snh.gov.uk/sitelink-api/v1/sites/8536/documents/16 (Accessed May 2023)

No obvious signs of light were apparent, and the loft space appeared in good condition.

External Inspection
No evidence of bats was identified during the external inspections of the buildings.

The following PRFs were identified on the exterior of the buildings during the survey:

Residential cottage
- Gaps under slates (Photograph 3)
- Gaps under apex ridge (Photograph 3)
- Gaps between bitumen felt roof and fascia boards

Outbuilding
- Gaps under slates
- Gaps between door slats (Photograph 4)

Habitat Description
The habitat directly adjacent to the residential cottage and outbuildings comprises garden and associated shrubs and trees north of the buildings and arable field margins to the east and south of the building, with bare ground to the west. In the wider area, arable and improved grassland fields comprise the dominant habitat type, with treelines and woodland is present further afield. The Park Burn flows 530m south of the buildings.

3.2.2 Ruined Building

Building Description
The ruined building comprised a remnant one storey stone structure with small extension and a fireplace and chimney stack at each gable end. No roof was present on the ruined building and a single wooden frame of a door remained between the main building and extension (Photograph 5).

Internal and External Inspection
No evidence of bats was identified during the external and internal inspections of the building.

The following PRFs were identified on the exterior and interior of the building during the survey:

- Gaps in stonework where masonry deteriorated (Photograph 6)
- Gaps between chimney flue and stonework (Photograph 6)
- Gaps under remnant slates (Photograph 6)
- Gaps in wooden door frame and stone lintel (Photograph 7)
- Gaps under the internal remnant roofline (Photograph 6)

Habitat Description
The habitats directly adjacent to the ruined building comprise scattered trees and tall ruderal vegetation and improved grassland. In the wider area, coniferous woodland and the Dewsford Burn are present to the north, with broadleaved woodland and residential building and horse livery to the east, improved grassland fields, broadleaved woodland and residential housing to the south, and improved grassland fields to the west.

3.3 Bat Activity Survey: Residential Building and Outbuilding

No roosting bats were identified during the activity surveys.

Both soprano and common pipistrelle were recorded commuting and foraging around the building during both activity surveys. Activity was predominantly concentrated along the treeline south of the buildings and within the garden area north of the buildings, with bats regularly commuting over the cottage building.

The EMTouch recorded 11 common pipistrelle bat and 16 soprano pipistrelle bat passes during the survey on the 20th July and five common pipistrelle and five soprano pipistrelle bat passes during the survey on the 9th August.

More detailed survey results are provided in Appendix C.

3.4 Detailed Endoscope Inspection: Ruined Building

No evidence of bats or any roosting bats were identified during the detailed endoscope inspection in summer.

No evidence of bats or any hibernating bats were identified during the detailed endoscope inspection in winter.

3.5 Additional

During the PRA, old Swallow (*Hirundo rustica*) nests were identified on the cottage building at the apex of the west gable end. Evidence of birds was also present on the outbuilding.

4 ASSESSMENT, FURTHER SURVEY, AND LICENSING

4.1 Roost Assessment

Residential cottage building

The gaps under slates, between bitumen felt roof and fascia boards and gaps under apex ridge provide opportunities for crevice dwelling bats such as common and soprano pipistrelle, known to be present in the locale and would most likely be used as a day roost by individual male or non-breeding females during summer. However, no bat roosts were identified during the survey.

The enclosed roof space area may provide opportunities for cavity dwelling bats, such as brown long-eared (*Plecotus auritus*) bats.

The building was assessed as **moderate** in reference to Table 2-1: *A structure with one or more potential roost sites that could be used by bats due their size, shelter, protection, conditions and/or surrounding habitat but unlikely to support a roost of high conservation status.*

No features considered suitable for hibernation were identified and the building is currently inhabited so unlikely to provide the constant cool temperatures and humid conditions required by hibernating bats and is therefore considered to offer **negligible** potential for hibernating bats.

Outbuilding

The gaps under slates and between door slats would provide limited opportunities for common and soprano pipistrelles in the locale. However, no bat roosts were identified during the survey.

No roof space is associated with this building and therefore offering no opportunities for cavity dwelling bats.

The building was assessed as **low** in reference to Table 2-1: *A structure with features that could be used by individual bats opportunistically; PRF's not suitable for use on a regular basis or by larger numbers of bats.*

No features considered suitable for hibernation were identified and the building is highly used and therefore unlikely to provide the constant cool temperatures and humid conditions required by hibernating bats and is therefore considered to offer **negligible** potential for hibernating bats.

Ruined building

The gaps in stonework, between chimney flue and stonework and under remnant slates would provide opportunities for crevice dwelling bats such as common and soprano pipistrelle, known to be present in the locale and would most likely be used as a day roost by individual male or non-breeding females during summer. However, no bat roosts were identified during the detailed endoscope inspection.

The building was assessed as **low** in reference to Table 2-1: *A structure with features that could be used by individual bats opportunistically; PRF's not suitable for use on a regular basis or by larger numbers of bats.*

The gaps between wooden doorframe and stone lintel and under remnant roofline are considered suitable features for hibernation and the building is therefore considered to offer **low** potential for hibernating bats.

4.2 Habitat Assessment

Residential cottage and outbuilding

Moderate numbers of soprano and common pipistrelle were recorded foraging and commuting during both activity surveys. The buildings are located in a rural setting, therefore resulting in plentiful dark corridors for bats of a range of species.

The presence of arable and improved grassland fields dominating the habitat in the wider area are less suited to bats, however the presence of the garden habitat north of the site with associated trees and scrub, treelines to the south and west, and woodland to the east and west, as well as the Park Burn south of the buildings, these offer suitable habitat for foraging and commuting bats in the locale and which is well connected to other suitable habitats in the wider area. This habitat was therefore assessed as **high** in reference to Table 2-2: *'High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland'*.

Ruined building

The ruined building is surrounded by a mix of improved grassland, arable fields, scattered trees, woodland, residential houses and associated gardens and the Dewsford Burn to the north, which offer suitable habitat for foraging and commuting bats in the locale, and which is well connected to other suitable habitats in the wider area. This habitat was therefore assessed as **high** in reference to Table 2-2: *'High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland'*.

4.3 Further Survey and Licensing

The cottage building and outbuilding are to be retained in the development design and no summer roosting bats were identified within the buildings, therefore no further survey is recommended, and there are currently no requirements for a licence from Nature Scot prior to any works commencing.

The ruined building is to be retained and no summer roosting or winter hibernating bats were identified during the detailed endoscope surveys of the ruined building, therefore no further surveys are recommended and there are currently no requirements for a licence from Nature Scot prior to any works commencing.

If works do not commence prior to March 2025, then an update survey on these buildings should be undertaken.

5 MITIGATION AND COMPENSATION

5.1 Avoidance and Mitigation

As the buildings are to be retained, the following mitigation is recommended in line with best practice guidelines:

- Should any works be required on the buildings, this should be scheduled outside the bat activity season (October-March).
- Pre-works checks should be undertaken for roosting nesting birds if any works are to be undertaken during the nesting bird season (March-August).
- Pre-works bat surveys should be undertaken if works are to commence April to September inclusive.
- Contractors should be made aware of the possibility of encountering bats on site and in the locale prior to works commencing, via an on-site toolbox talk on the first day of works.
- If a bat is unexpectedly uncovered during works, works must stop and a suitably qualified ecologist to be contacted for further guidance.
- Any works causing high levels of noise or vibration should be limited to daylight hours to reduce disturbance to bats and other nocturnal or diurnal species in the locale.
- During the construction phase artificial lighting should be kept to a minimum. To minimise the impact of construction on commuting and foraging bats, any artificial lighting (required) should avoid illuminating the surrounding treelines, watercourses, scattered trees, woodland, shrubs and garden habitat.
- Any temporary or permanent lighting should be designed to be 'wildlife friendly' and should not illuminate habitats including scattered trees, scrub, wetland, watercourses and woodland. Screening techniques, dark buffer zones, low- or high-pressure sodium lamps and 'warm white' lighting (LED <2700K) are recommended.

5.2 Compensation

Where any buildings are to be removed to facilitate the design, the following compensatory measures are recommended:

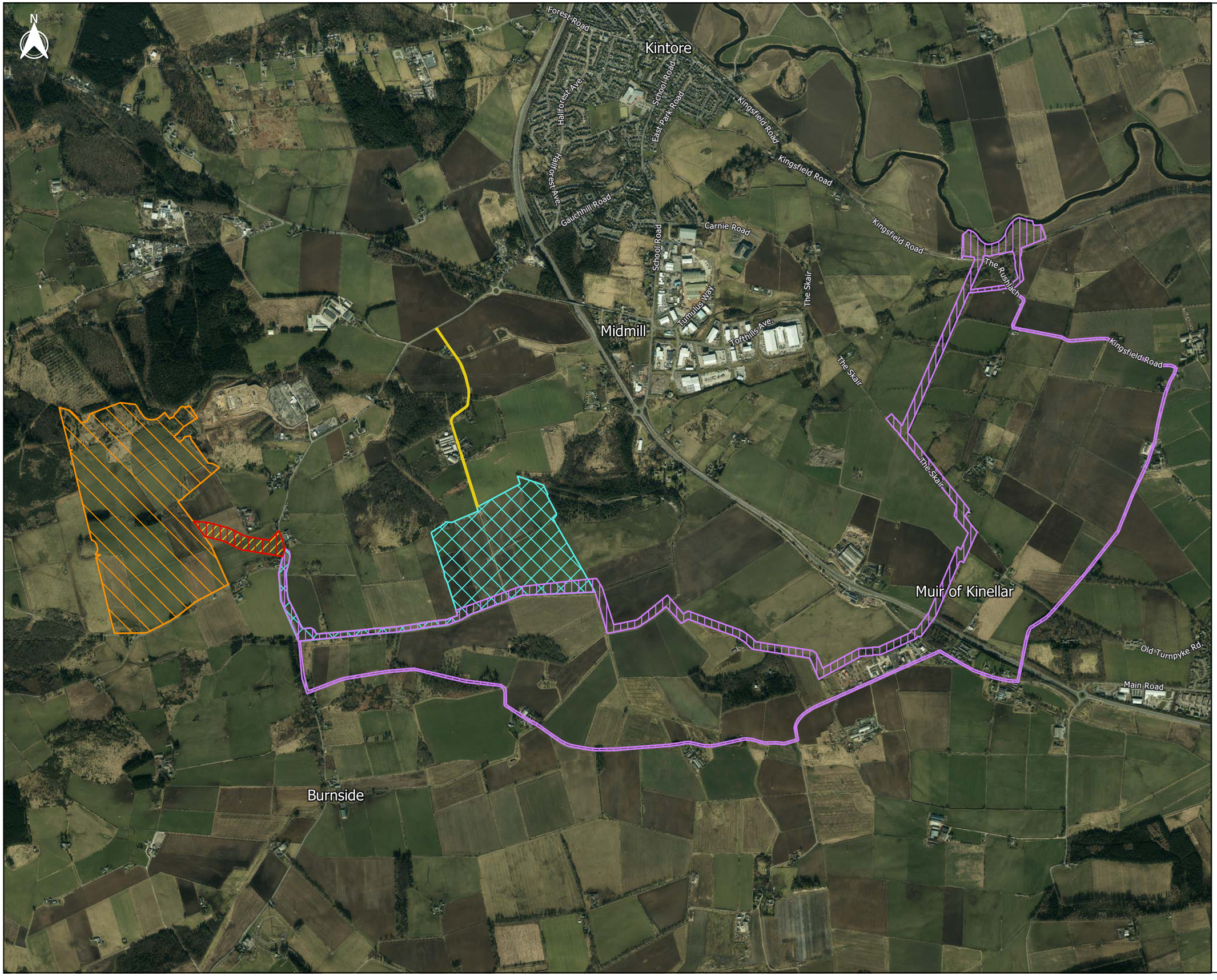
- Sensitive landscaping and planting regimes to augment retained habitat, with a wide range of wildflower mixes and shrubs of species of local provenance, including berry or nectar producing plants being planted. These will serve to increase provisions for bats, as well as encourage good conditions for invertebrates and, therefore a wider functioning ecosystem. This would comply with Aberdeenshire Council Supplementary Guidance (SG) Natural Environment2: Protection of the wider biodiversity and geodiversity C3[11].
- Enhancing roosting provisions could be achieved by installing bat boxes onto new buildings within the site or on semi-mature to mature trees and woodland. Recommended bat boxes include:
    - Beaumaris Woodstone Bat Box, found at https://www.nhbs.com/beaumaris-woodstone-bat-box
    - Large Multi Chamber WoodStone Bat Box, found at https://www.nhbs.com/large-multi-chamber-woodstone-bat-box
    - Improved Cavity Bat Box, found at https://www.nhbs.com/improved-cavity-bat-box

[11] https://www.aberdeenshire.gov.uk/media/11692/sgpolicies.pdf

- Wall Mounted Bat Shelter https://www.nhbs.com/2fe-schwegler-wall-mounted-bat-shelter-pack-of-2

APPENDICES

A SITE LOCATION



KINTORE HYDROGEN PLANT

Date:	07-07-2023
Paper size:	A3
Scale:	1:20,000

0 200 400 600 800 m

Key:

- Electrolysis plant and grid connection
- Existing and proposed access roads
- Hydrogen and water pipeline connections
- Hydrogen pipeline and gas grid connection
- Water pipeline connection options and abstraction discharge point

Kintore Hydrogen
A STATERA COMPANY

DEVELOPMENT ELEMENTS PLAN

FIGURE 4

Status:	DRAFT
Revision:	V2
Drawn by:	Rhys Williams
Approved by:	Tom Dearing

B SURVEYOR PROFILES

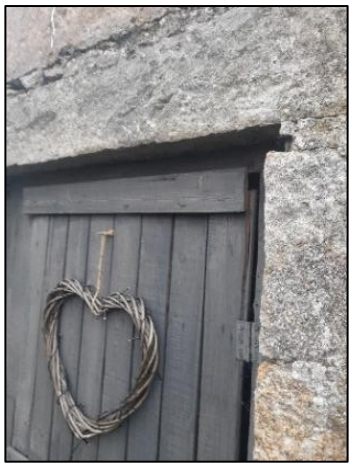
Surveyor	Role	Profile
Jennifer Paterson BSc (Hons) MSc ACIEEM	Senior Consultant Ecologist	Jennifer has experience in bat surveys through conducting emergence/re-entry surveys on multiple buildings, and activity transects for both small and large scale projects. She is competent at conducting Preliminary Roost Assessments on trees and buildings, being involved in multiple rural and urban projects to date. Jennifer is also competent in the use, assessment and interpretation of Anabat recording systems and deploying Guide TrackIR Pro 19 thermal imaging equipment as well as use of infra-red cameras
Scott Fraser	Consultant Ecologist	Scott has experience in conducting bat surveys through emergence/re-entry surveys, hibernation surveys and Preliminary Roost Assessments on buildings, structures and trees throughout Scotland. Scott also has experience in deploying Guide TrackIR Pro 19 thermal imaging equipment and anabat detectors to aid bat surveys.
Antonia Stewart	Graduate Consultant Ecologist	Antonia has experience in conducting bat surveys through emergence/re-entry surveys on buildings and trees throughout Scotland.
Gavin Morrison BSc (Hons)	Co-Consultant	Gavin is trained in the use of handheld detectors and bat ecology and has undertaken commercial bat activity surveys since 2021.

C PHOTOGRAPHIC RECORD

Photograph 1: Residential building and outbuilding (north aspect) in the central region of the site

Photograph 2: Loft area of residential cottage building

Photograph 3: Gaps under cottage roof slate and apex tile



Photograph 4: Gaps between outbuilding door frame & slats

Photograph 5: Ruined building in the west of the site (proposed electrolysis plant area)

Photograph 6: Gaps between ruined building's stonework where masonry has deteriorated, between masonry and remnant roofline and gaps between ruined building's chimney flue and stonework

Photograph 7: Gaps in ruined building's wooden frame and stone lintel

D ACTIVITY SURVEY RESULTS

BAT SURVEY FORM 2023

Risk Assessment Completed: Y / N								
Site & Job No.: Kintore	Detector Type & Serial No. Duet	Surveyor: JEP	Location Point: VP 1	PM: JEP	Date: 19/07/2023	Start Time: 21:32	Finish Time: 23:00	Sunset/~~Rise~~ Time: 21:47

Survey Type:	**Weather:**				**Data Analysed:**	
Dusk ~~/ Dawn~~	**Start**	Temp: 12	Wind: 0	Cloud: 100	Date: 27/07/2023	Initials: JEP
	Finish	Temp: 12	Wind: 0	Cloud: 100		

Ref No.	**Time**	**Species**	**Activity**							**Additional Comments** *e.g. bat numbers emerging/passing; description of roosting feature; constant activity (CA);*
			Emerg	**Re-ent**	**swarm**	**Forage**	**Pass**	**HNS**	**SNH**	
	22:04	Common pipistrelle and soprano pipistrelle					X			Commuting from north to south west of the building then back north
	22:06	Pipistrelle sp.				X			X	Bat foraging high above south aspect of the building
	22:08	Pipistrelle sp.				X				Bat foraging high above south aspect of the building
	22:08	Soprano pipistrelle					X			Commuting from north to south around the west aspect of the building
	22:09	Soprano pipistrelle				X	X			Commuting from north to south around the west aspect of the building then continuing to foraging east of the building
	22:09-10	Pipistrelle sp.				X			X	Foraging west of the building and over the garden north of the building
	22:15	Pipistrelle sp.				X	X		X	Foraging north of building and commuting south along the east aspect and continuing to forage south of the building – Non-echolocating
	22:16	Soprano pipistrelle				X	X			Commuting from east of the building (from woodland) to the south and continuing to the west aspect to forage
	22:17	Pipistrelle sp.				X	X			Commuting from west of the building towards the treeline south of the building and foraging over fields south east of the building
	22:18	Common pipistrelle				X	X			Foraging in the garden to the north of the building and commuted over the building and continuing south

*HNS = Heard Not Seen *SNH= Seen Not Heard

	22:19	Pipistrelle sp.					X			Commuting north to south via east aspect of building
	22:22	Common pipistrelle					X			Commuting south of the building to north via east aspect
	22:24	Soprano pipistrelle					X			Commuting north from the treeline south of the site to garden area north of building
Comments: *general overview of survey*										
Rain shower from 22:27-23:00 resulted in no activity. Likely that bats went to more sheltered habitat.										

*HNS = Heard Not Seen *SNH= Seen Not Heard

BAT SURVEY FORM 2023

Risk Assessment Completed: Y / N								
Site & Job No.: Kintore	Detector Type & Serial No. Duet	Surveyor: GM	Location Point: VP 2	PM: JEP	Date: 19/07/2023	Start Time: 21:32	Finish Time: 23:00	Sunset/~~Rise~~ Time: 21:47

Survey Type:	**Weather:**				**Data Analysed:**	
Dusk ~~/ Dawn~~	**Start**	Temp: 12	Wind: 0	Cloud: 100	Date: 27/07/2023	Initials: JEP
	Finish	Temp: 12	Wind: 0	Cloud: 100		

Ref No.	**Time**	**Species**	**Activity**							**Additional Comments** *e.g. bat numbers emerging/passing; description of roosting feature; constant activity (CA);*
			Emerg	**Re-ent**	**swarm**	**Forage**	**Pass**	**HNS**	**SNH**	
	22:04	Soprano pipistrelle					X			Commuting from north, circled house then headed northwards
	22:08	Soprano pipistrelle				X	X			Commuting pass west to east and foraging in field west of the building
	22:10	Pipistrelle sp.				X				Two bats foraging in garden north of building
	22:13	Soprano pipistrelle				X	X			Commuting and foraging north of the building
	22:15	Common pipistrelle				X	X			Commuting and foraging north of the building
	22:15-22:20	Soprano pipistrelle and Common pipistrelle				X	X			Continuous commuting and foraging from east to west and vice versa, north of the building
	22:20	Pipistrelle sp.					X		X	Bat observed showing interest in the chimney on the west aspect
	22:25	Common pipistrelle				X				Foraging north of building above garden

Comments: *general overview of survey*

Rain shower from 22:27-23:00 resulted in no activity. Likely that bats went to more sheltered habitat.

*HNS = Heard Not Seen *SNH= Seen Not Heard

BAT SURVEY FORM 2023

Risk Assessment Completed: Y / N								
Site & Job No.: Kintore	Detector Type & Serial No. Duet	Surveyor: ACS	Location Point: VP 1	PM: JEP	Date: 09/08/2023	Start Time: 20:51	Finish Time: 22:40	Sunset/~~Rise~~ Time: 21:06

Survey Type:	**Weather:**				**Data Analysed:**	
Dusk ~~/ Dawn~~	**Start**	Temp: 16	Wind: 0	Cloud: 90	Date: 04/09/2023	Initials: JEP
	Finish	Temp: 16	Wind: 0	Cloud: 90		

Ref No.	**Time**	**Species**	**Activity**							**Additional Comments** *e.g. bat numbers emerging/passing; description of roosting feature; constant activity (CA);*
			Emerg	**Re-ent**	**swarm**	**Forage**	**Pass**	**HNS**	**SNH**	
	21:47	Common pipistrelle				X	X			Bat commuted from north of the building, foraging in the garden, before commuting south
	22:17	Common pipistrelle					X	X		Commuting pass
	22:36	Common pipistrelle					X	X		Commuting pass
Comments: *general overview of survey*										

*HNS = Heard Not Seen *SNH= Seen Not Heard

BAT SURVEY FORM 2023

Risk Assessment Completed: Y / N								
Site & Job No.: Kintore	Detector Type & Serial No. Duet	Surveyor: GM	Location Point: VP 2	PM: JEP	Date: 09/08/2023	Start Time: 20:51	Finish Time: 22:40	Sunset/~~Rise~~ Time: 21:06

Survey Type:	**Weather:**				**Data Analysed:**	
Dusk ~~/ Dawn~~	**Start**	Temp: 16	Wind: 0	Cloud: 90	Date: 04/09/2023	Initials: JEP
	Finish	Temp: 16	Wind: 0	Cloud: 90		

Ref No.	**Time**	**Species**	**Activity**							**Additional Comments** *e.g. bat numbers emerging/passing; description of roosting feature; constant activity (CA);*
			Emerg	**Re-ent**	**swarm**	**Forage**	**Pass**	**HNS**	**SNH**	
	21:47	Common pipistrelle				X	X			Bat commuted from north of the building, foraging in the garden, before commuting south
	21:57	Common pipistrelle					X			Bat commuted from north to the south over the house
	22:08	Common pipistrelle					X			Bat commuted east to west, north of building in garden
	22:18	Common pipistrelle					X	X		Commuting pass
	22:26	Soprano pipistrelle					X	X		Commuting pass
	22:29	Common pipistrelle					X	X		Commuting pass
	22:30	Soprano pipistrelle					X	X		Commuting pass
	22:32	Soprano pipistrelle					X	X		Commuting pass
	22:36	Common pipistrelle					X	X		Commuting pass

Comments: *general overview of survey*

*HNS = Heard Not Seen *SNH= Seen Not Heard

BAT SURVEY FORM 2023

Risk Assessment Completed: Y / N								
Site & Job No.: Kintore	Detector Type & Serial No. Duet	Surveyor: SF	Location Point: VP 3	PM: SF	Date: 19/07/2023	Start Time: 21:32	Finish Time: 23:00	Sunset/~~Rise~~ Time: 21:47

Survey Type:	**Weather:**			**Data Analysed:**	
Dusk ~~/ Dawn~~	**Start**	Temp: 12	Wind: 0	Cloud: 100	Date: 27/07/2023 Initials: JEP
	Finish	Temp: 12	Wind: 0	Cloud: 100	

Ref No.	**Time**	**Species**	**Activity**							**Additional Comments** *e.g. bat numbers emerging/passing; description of roosting feature; constant activity (CA);*
			Emerg	**Re-ent**	**swarm**	**Forage**	**Pass**	**HNS**	**SNH**	
	22:04	Common pipistrelle				X	X			X 3 bats commuting from north of the building and foraging over the field west, before commuting north east and west
	22:09	Soprano pipistrelle				X	X			Commuting from south and foraging over fields west of the building, then circled the building
	22:19	Soprano pipistrelle				X	X			Continuous foraging along the treeline to the south west of the building

Comments: *general overview of survey*

Rain shower from 22:27-23:00 resulted in no activity. Likely that bats went to more sheltered habitat.

*HNS = Heard Not Seen *SNH= Seen Not Heard

BAT SURVEY FORM 2023

Risk Assessment Completed: Y / N								
Site & Job No.: Kintore	Detector Type & Serial No. Duet	Surveyor: SF	Location Point: VP 3	PM: JEP	Date: 09/08/2023	Start Time: 20:51	Finish Time: 22:40	Sunset/~~Rise~~ Time: 21:06

Survey Type:	**Weather:**				**Data Analysed:**	
Dusk ~~/ Dawn~~	**Start**	Temp: 16	Wind: 0	Cloud: 90	Date: 04/09/2023	Initials: JEP
	Finish	Temp: 16	Wind: 0	Cloud: 90		

Ref No.	**Time**	**Species**	**Activity**							**Additional Comments** *e.g. bat numbers emerging/passing; description of roosting feature; constant activity (CA);*
			Emerg	**Re-ent**	**swarm**	**Forage**	**Pass**	**HNS**	**SNH**	
	21:47	Common pipistrelle				X	X			Bat commuted from north of the building, foraging in the garden, before commuting south
	21:55	Common pipistrelle					X	X		Commuting pass
	21:56	Common pipistrelle					X			Bat commuted from treeline north of the site and headed south
	21:57	Common pipistrelle					X	X		Commuting pass
	22:18	Common pipistrelle					X	X		Commuting pass
	22:21	Common pipistrelle					X			Bat commuted from south to north
	22:23	Common pipistrelle					X	X		Bat commuted high over building
	22:28	Soprano pipistrelle					X	X		Commuting pass
	22:30	Soprano pipistrelle					X			Bat commuted from south to north over the building
	22:34	Soprano pipistrelle					X			Bat commuted south to north
	22:36	Soprano pipistrelle					X	X		Commuting pass

Comments: *general overview of survey*

Most activity was concentrated around vegetation to the west of the building, with bats commuting and foraging along linear vegetetation.

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