



Ballswood Bat Survey Report

in respect of

***Planning Application For 2No. Changes to the Limits of
Extraction within the Existing Permitted Planning Boundary of
Ballswood Quarry***

for

Cheshire and North Wales Sand and Gravel Ltd

Prepared By

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August 2020

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Figure 1: Schwegler 1FF type box suitable for roosting bats

Figure 2: Schwegler 2F type box suitable for roosting bats

1.0 INTRODUCTION

1.1 Heatons have been commissioned by Cheshire and North Wales Sand and Gravel Ltd to undertake bat activity and roost surveys at Ballswood Quarry, hereafter referred to as 'the site'.

1.2 These surveys are being undertaken to fulfil the recommendations made in the Preliminary Ecological Appraisal completed in March 2020.

Scope of Works

1.3 The scope of works is to determine:

- The movement/presence of foraging and commuting bats throughout the site.
- The presence/absence of bats roosting in the mature trees on site.

1.4 All UK bat species are fully protected under European and British law which makes it an offence to deliberately kill or injure individuals, damage their breeding or resting places, and/or obstruct access to their breeding or resting places.

1.5 Sufficient ecological information is required to fully inform the scheme design and the proposed works. Reports will enable the project to satisfy all current UK and European legal wildlife requirements, as well as national and local planning regulations. All public bodies have statutory obligations under the Nature Environment and Rural Communities Act 2006 to conserve and enhance biodiversity.

Site location and description

1.6 Ballswood Quarry is located at Gegin Lane, Wrexham, LL12 0NU, and is one of three active sand and gravel quarries in the County Borough of Wrexham (the others being Borrass Quarry and Hafod Quarry). Ballswood Quarry is operated by Cheshire and North Wales Sand and Gravel Ltd.

1.7 The majority of the site is comprised of existing quarry, with areas of scattered scrub and tall ruderal vegetation located around existing soil bunds. The boundaries of the existing quarry are comprised of broad-leaved semi natural woodland and hedgerows. There are a number of waterbodies located within the existing quarry. The eastern section of the site is comprised of arable fields and heavily grazed improved grassland.

Proposed Development

- 1.8 The proposed development is to enable 2 proposed changes to the extraction boundary of Ballswood Quarry utilising existing quarry infrastructure and access. The proposed development will release currently sterilised mineral within the permitted planning boundary of the site. Access to the site for the purpose of extending mineral extraction from the existing quarry to the west would best be supplied through the existing quarry site.

2.0 LEGISLATION

2.1 Bats are a European Protected Species under the EC Habitats Directive. In England and Wales all bat species are fully protected under The Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended).

2.2 Under this legislation, it is illegal to:

- intentionally or deliberately* kill, injure or capture (or take) bats
- deliberately disturb bats (whether in a roost or not)
- recklessly disturb roosting bats or obstruct access to their roosts
- damage or destroy bat roosts
- possess or transport a bat or any part of a bat, unless acquired legally
- sell or exchange bats, or parts of bats.

* In a court, 'deliberately' will probably be interpreted as someone who, although not intending to capture/injure or kill a bat, performed the relevant action, being sufficiently informed and aware of the consequence which his/her action will most likely have.

2.3 Some bat species are also included on the S41 list of UK Biodiversity Action Plan species. Under the Natural Environment and Rural Communities (NERC) Act 2006, local authorities must consider the conservation of these species in planning decisions.

2.4 In many cases, it should be possible to avoid harming the bats or damaging/blocking access to their habitat. If this cannot be avoided, a mitigation licence will need to be granted from Natural Resources Wales (NRW) prior to works commencing. Planning Permission will need to be granted prior to this application.

3.0 ASSESSMENT METHODOLOGY

Desktop Study

- 3.1 In order to compile background information on the site and its immediate surroundings, a desk study was undertaken in March 2020. The full results of the desk study can be found within the Preliminary Ecological Appraisal Report; pertinent records for bat species are included within the results section of this report.
- 3.2 Information on sites of nature conservation interest within a 2km radius of the centre of the site was obtained from the Countryside Council for Wales website. In addition, Cofnod (the local record centre for North Wales) was commissioned to undertake a data search for all protected and notable species and all sites of conservation importance within 2km of the site.

Habitat Assessment

Foraging Habitat

- 3.3 The initial habitat assessment was undertaken as part of the Preliminary Ecological Appraisal undertaken on the site in March 2020.
- 3.4 The assessment involved considering the suitability of the habitats and features present on the site for their potential to provide roosting, foraging and commuting habitat for bats. With respect to foraging and commuting habitat this included an assessment as to the extent, quality and diversity of habitats present and their potential importance in providing linkages within the landscape for bats.

Roosting Habitat

- 3.5 Bats can use trees to rest, give birth, raise young and/or hibernate. Bat roosts may be found in the following features –
- Woodpecker holes, natural cracks and rot holes in trunks and branches
 - Frost cracks
 - Trunk and branch splits
 - Hollow sections of trunk and branches
 - Loose bark
 - Cavities beneath old root buttresses and coppice stools
 - Dense epicormic growth

- Dense ivy cover

- 3.6 Trees were surveyed from ground level using binoculars to assess the presence of any of the above features.

Activity Transect Surveys and Roost Surveys

- 3.7 The methodology for the bat activity surveys followed that described in the Bat Conservation Trust Good Practice Guidelines (3rd Ed 2016) for transect surveys. As the habitat present within the Site was assessed to provide a moderate foraging habitat quality for bats, one transect survey per month during 2019 was conducted (May – August 2020).

- 3.8 This methodology involves identifying a suitable transect route which covers the habitats and features that have been identified from the assessment as potentially providing suitable foraging and commuting habitat for bats. For this Site, one transect route was identified to cover the Site. The transect route was approximately 3km long and covered the whole Site during each of the survey visits to reach the BCT Guidance of 2 – 3 hours per survey.

- 3.9 Walked transect surveys were completed once per month throughout the optimal bat survey season. Surveys commenced in May and concluded in August. The location and extent of the transects are shown in Appendix A.

- 3.10 Surveyors were equipped with EchoMeter Touch and Android devices with recording capability and also Duet Batbox detectors.

Tree Emergence/re-entry roost Surveys

- 3.11 The methodology for the bat emergence surveys broadly followed that described in the Bat Conservation Trust Good Practice Guidelines (3rd Ed 2016) for emergence surveys.

- 3.12 Three emergence survey were completed on the horse chestnut tree at the south side of the compound which had moderate roosting potential. Surveys commenced at sunset and continued for 1.5 hours. Surveyors were equipped with EchoMeter Touch and Android devices with recording capability and also Duet Batbox detectors. Two surveys were undertaken at dusk for the allotted time and one additional survey was undertaken at dawn, 1.5 hours before sunrise.

Surveyors

- 3.13 Bat Surveys were led by S. Pagett (NE licence number 2018 – 34022-CLS-CLS).

Accurate Lifespan of Ecological Data

- 3.14 The majority of ecological data remains valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for approximately 2 years, notwithstanding any considerable changes to the Site conditions.
- 3.15 It should also be noted that bats are highly mobile species and will move throughout the landscape using multiple available habitats/roost spaces. Therefore, bats may be found in suitable roosting spaces during any part of the year.

Ecological Survey Constraints and Limitations

- 3.16 There were no limitations or constraints during survey efforts throughout the surveys performed between May and August.

4.0 RESULTS

Desk Study

Statutory Designated Sites

- 4.1 There are three Statutory Designated Sites located within 2km of the site boundary. The closest of these is the Chwarel Singret Special Site of Scientific Interest (SSSI). This is located approximately immediately adjacent to the quarry plant site and is designated for geological interest. There were no records for bat species returned for this SSSI.
- 4.2 The Marford Quarry SSSI is located 0.6km to the south-east of the site boundary. This site contains records for two species of bats, these were for natterer's (*Myotis nattereri*) and noctule (*Nyctalus noctule*).
- 4.3 The Alyn waters Local Nature Reserve (LNR) is located approximately 1.9km to the south-west of the site boundary. The site is designated for its rich meadow habitat, variety of grassland, woodland. There were no records for bat species returned from this site.

Non-Statutory Designated Sites

- 4.4 The COFNOD search returned records for seven non-statutory designated sites within 2km of the site boundary. The closest of these is the Ballswood Quarry and Cockpit Wood Local Wildlife Site (LWS) which covers the existing quarry and the wider extending broad-leaved semi natural woodlands. There were two records for unknown bats species returned for this LWS.
- 4.5 The Marford Quarry SSSI site is also designated as a North Wales Wildlife Trust Reserve. This site returned records for natterer's and noctule bats.
- 4.6 Burton Tower Lake (LWS) is located 1km north of the site boundary. This site is a fishing lake which has ornithological importance. The lake contains marginal vegetation and is surrounded by broad-leaved semi natural woodland. The site covers approximately 3.1 hectares. There were no records for bats returned for this site.
- 4.7 The Nant-y-Gaer and Llay valley (LWS) is located approximately 1.3km to the south-west of the site boundary. The site covers approximately 12.1 hectares and is designated for its broad-leaved semi natural woodland. There were multiple records for common pipistrelle returned for this site.

- 4.8 The Bryn Alyn and Wormswood (LWS) is located approximately 1.4km to the south-west of the site boundary. This site covers approximately 49.2 hectares and is designated for broad-leaved semi natural woodlands and semi-improved grasslands located along a meander of the River Alyn. There were no records for bats returned for this (LWS).
- 4.9 The Hoseley Wood (LWS) is located approximately 1.6km to the south-east of the site boundary. This area covers approximately 16.7 hectares and the site is designated for habitats including broad-leaved semi natural woodlands, marshy grassland, semi-improved neutral grassland and standing water. One record for brown-long eared (*Plecotus auritus*) was returned within 200m of this site.
- 4.10 Rackery Wood (LWS) is located approximately 1.7km to the north of the site boundary. This site covers approximately 1.8 hectares and is designated for areas of broad-leaved semi natural woodland. There were no records for bats returned for this (LWS).

Habitat

Foraging

- 4.11 The majority of the site is comprised of the existing quarry and arable fields which are considered to provide negligible foraging habitat for bats. The boundary broad-leaved woodland and hedgerows however are considered to provide small areas of optimal foraging habitat for bats.

Roosting

- 4.12 There are four trees within the site that are considered to provide suitable roosting potential for bats. Please see details below:
- Horse chestnut – moderate suitability for roosting bats;
 - Sycamore – moderate suitability for roosting bats;
 - Pedunculate oak – moderate suitability for roosting bats; and
 - Large leaved Lime – moderate suitability for roosting bats.

Species Records

- 4.13 COFNOD retrieved a number of records within the 2km radius of the site for common pipistrelle, noctule, natterer's bat, soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long eared Bat. The closest records for bats found to the site boundary were two counts of unknown bat species (*Chiroptera*) along the southern boundary of the site.
- 4.14 NBN returned all the same species as COFNOD, however also Brandt's bat (*Myotis brandtii*) was recorded in 2016, and lesser horseshoe bats (*Rhinolophus hipposideros*) in 2017. Both located south of the site boundary in the Gresford urban area.

Activity Transect Survey Results

- 4.15 Bat activity surveys were undertaken between on the 29th May 2020, 31st July 2020 and on the 13th August 2020. Table 1 below provides an overview of the weather conditions during the surveying effort. Tables 2 - 4 detail the full activity survey results for each survey, highlighting all the bat activity detected throughout.
- 4.16 Bat activity and species abundance was moderate with common pipistrelle and soprano pipistrelle being detected throughout the site, with moderate numbers of noctule also. Constant pipistrelle foraging activity was detected along Gegin Lane, throughout all activity surveys, with social calls also being detected in this area.
- 4.17 Additionally, noctule presence was found all over the site, predominantly foraging in the north east corner of the site near the arable fields and occasionally seen over the quarry lagoons. Noctules were also detected along Gegin Lane, and foraging/commuting over the north woodland belt.
- 4.18 It is therefore considered that these above sections of the Site could provide important foraging grounds for the bats.
- 4.19 Activity for all three of the above species were found foraging around the Horse Chestnut Tree within the compound, during the activity surveys and foraging along the adjacent woodland belt.

Tree emergence/re-entry roost Surveys

- 4.20 Three bat roost surveys were undertaken on the 21st July 2020, 7th August 2020 and on the 13th August 2020. The survey visit on the 7th August was undertaken

at dawn. Table 1 again outlines the weather conditions for all of the surveys undertaken. All of the roost surveys were undertaken on the mature horse chestnut Tree in the quarry compound.

- 4.21 A brown long eared bat was detected emerging from the tree on the final survey (Table 7), as well as soprano pipistrelles' emerging on two occasions on the initial survey (Table 5). Common pipistrelles' and noctules' were also detected foraging around the tree and the adjacent woodland belt.

Table 1: Weather conditions for the six surveys throughout May-August 2020.

Date	Weather Conditions	Survey Type
29/5/2020	Sunny, 10% Cloud Cover	Bat Activity
31/7/2020	Overcast, 50% Cloud Cover	Bat Activity
13/8/2020	Sunny, 20% Cloud Cover	Bat Activity
21/7/2020	Sunny, 10% Cloud Cover	Roost Survey
7/8/2020	Clear Sky, 20% Cloud Cover	Roost Survey (Dawn)
13/8/2020	Cloudy Overcast, 90-100% Cloud Cover	Roost Survey

Table 2 – Bat Activity Survey 1

Table 2 – Bat Activity Survey 1					
Project/Location		Ballswood Quarry	Date		29/5/2020
Surveyors		SP + HH			
Sunset		21:25	Sunrise		N/A
Survey Start		21.20	Survey End		23.20
Start Temperature		20 Degrees Celsius	End Temperature		18 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		10% Cloud Cover, Sunny (2)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg. Direction of travel)
21:25 - 21:28	1 (Stop)	Noctule	Occasional	Foraging	Flying over edge of quarry/ over Gegin Lane (Seen)
21:36 – 21:39	2 (Stop)	Noctule	Rare	Foraging	Flying over quarry/field margin (Seen)
21:47 – 21:50	3 (Stop)	None	N/A	N/A	N/A
21:57 – 22:00	4 (Stop)	None	N/A	N/A	N/A
22:00	4-5	Noctule	Rare	Foraging	Foraging over near/ arable crop field HNS.
22:17	4-5	Common Pipistrelle	Rare	Foraging	Foraging overhead HNS
22:18 – 22:21	5 (Stop)	Soprano Pipistrelle (22:19)	Rare	Foraging	Foraging overhead HNS
22:25	5-6	Common Pipistrelle	Rare	Foraging	Foraging near woodland belt HNS
22:28 – 22:31	6 (Stop)	None	None	N/A	No

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22:29	6 (Stop)	Common Pipistrelle	Rare	Foraging	Foraging near woodland band
22:30	6 (Stop)	Common Pipistrelle	Rare	Foraging	Foraging near woodland band
22:39 – 22:42	7 (Stop)	None	None	N/A	No
22:46	7-8	Common Pipistrelle	Constant	Foraging	Along road, flying along woodland tunnel.
22:48	7-8	Common Pipistrelle	Rare	Feeding Buzz	Foraging along road flying along woodland tunnel.
23:10 – 23:13	8 (Stop)	None	None	N/A	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 3 – Bat Activity Survey 2					
Project/Location		Ballswood Quarry	Date		31/7/2020
Surveyors		SP			
Sunset		21:22	Sunrise		N/A
Survey Start		21.22	Survey End		23.22
Start Temperature		17.7 Degrees Celsius	End Temperature		16.5 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		50% Cloud Cover, Overcast (2)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg. Direction of travel)
21:25 - 21:28	1 (Stop)	None	N/A	N/A	N/A
21:26	1 (Stop)	Noctule	Rare	Foraging	Flying over quarry to arable fields
21:28	1 (Stop)	Noctule	Rare	Foraging	Flying over quarry
21:29	1-2	Noctule	Frequent	Foraging	Flying over quarry
21:34 – 21:37	2 (Stop)	None	N/A	N/A	N/A
21:35	2 (Stop)	Noctule	Rare	Foraging	Foraging above lagoon
21:39	2-3	Noctule	Rare	Foraging	Flying north
21:42 - 45	3 (Stop)	None	N/A	N/A	N/A
21:42-43	3 (Stop)	Noctule	Constant	N/A	Flying over quarry
21:44	3 (Stop)	Noctule + Soprano Pipistrelle	Frequent (Noctule) Rare (Soprano Pipistrelle)	Foraging	Flying over quarry
21:53 – 21:56	4 (Stop)	None	N/A	N/A	N/A
22:10 – 22:13	5 (Stop)	None	N/A	N/A	N/A
22:22 – 22:25	6 (Stop)	None	N/A	N/A	N/A



22:23	6 (Stop)	Soprano Pipistrelle	Rare	Foraging	Foraging over centre of quarry
22:32 – 22:35	7 (Stop)	None	None	N/A	N/A
22:43 – 22:46	8 (Stop)	None	N/A	N/A	N/A
22:54 – 22:57	9 (Stop)	None	N/A	N/A	N/A
22:59 – 23:02	10 (Stop)	Common Pipistrelle	Rare	Foraging	Foraging along Gegin Lane
23:04 – 23:07	10 - 11	Common Pipistrelle	Rare	Foraging	Foraging along hedgerow

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 4 – Bat Activity Survey 3					
Project/Location		Ballswood Quarry	Date		13/8/2020
Surveyors		HH			
Sunset		20:42	Sunrise		N/A
Survey Start		20:42	Survey End		22:42
Start Temperature		21 Degrees Celsius	End Temperature		19.5 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		20% Cloud Cover, Sunny (1)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg. Direction of travel
20:42 - 20:45	1 (Stop)	None	N/A	N/A	N/A
20:53 – 20:56	2 (Stop)	None	N/A	N/A	N/A
20:56 – 20:57	2-3	Noctule	Constant	Foraging	Flying high over woodland belt.
21:07 – 21:10	3 (Stop)	None	N/A	N/A	N/A
21:15	3-4	Noctule	Rare	Foraging	Foraging high above arable field
21:22	3-4	Soprano Pipistrelle	Frequent	Commuting	Flying over site
21:23	3-4	Soprano Pipistrelle	Rare	Commuting	Flying over quarry
21:27 – 21:30	4 (Stop)	Soprano + Common Pipistrelle	Both Rare	Foraging	Foraging along woodland belt nearest Gegin Lane
21:35	4-5	Common Pipistrelle	Rare	Commuting	Flying over quarry
21:39 – 21:42	5 (Stop)	None	N/A	N/A	N/A
21:48	5-6	Soprano Pipistrelle	Rare	Foraging	Foraging along woodland belt



21:50 – 21:53	6 (Stop)	Common Pipistrelle	Rare	Foraging	Foraging along woodland belt below compound
21:57	6-7	Common Pipistrelle	Rare	Foraging	Foraging along woodland belt below compound
21:58 – 22:01	7 (Stop)	Soprano Pipistrelle	Frequent	Foraging	Foraging along woodland belt below compound
22:19	7-8	Noctule	Rare	Foraging	Foraging along Gegin Lane
22:23	7-8	Noctule	Rare	Foraging	Foraging along hedgerow, Gegin Lane
22:26 – 22:30	8 (Stop)	Soprano Pipistrelle	Rare	Foraging	Foraging along hedgerow, Gegin Lane
22:31	8-9	Soprano Pipistrelle	Rare	Foraging	Foraging along hedgerow, Gegin Lane
22:33	8-9	Common Pipistrelle	Frequent	Foraging	Foraging along hedgerow, Gegin Lane
22:34	8-9	Pipistrelle	Rare	Social Calls	Social Calls along road.

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 5 – Horse Chestnut Roost Survey 1					
Project/Location		Ballswood Quarry	Date		21/7/2020
Surveyors		HH			
Sunset		21.23	Sunrise		N/A
Survey Start		21.23	Survey End		22.53
Start Temperature		17.7 Degrees Celsius	End Temperature		15 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		10% Cloud Cover, Sunny (1)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
21.24	Horse Chestnut Tree	Noctule	Occasional	Foraging	No
21.47	Horse Chestnut Tree	Soprano Pipistrelle	Rare	Foraging	No
21.59	Horse Chestnut Tree	Soprano Pipistrelle	Rare	Foraging	Yes Emerging
22:01	Horse Chestnut Tree	Soprano Pipistrelle	Rare	Foraging	Yes Emerging
22:10 -22:11	Horse Chestnut Tree	Noctule	Constant	Foraging	No
22:14	Horse Chestnut Tree	Soprano Pipistrelle	Frequent	Foraging	No
22:16	Horse Chestnut Tree	Common Pipistrelle	Rare	Foraging	No
22:18 – 22:22	Horse Chestnut Tree	Soprano Pipistrelle	Constant	Foraging	No
22:22 – 22:23	Horse Chestnut Tree	Soprano Pipistrelle	Frequent	Foraging	No
22:24 – 22:26	Horse Chestnut Tree	Soprano Pipistrelle	Constant	Foraging	No
22:28	Horse Chestnut Tree	Brown Long Eared Bat	Rare	Foraging	No
22:31	Horse Chestnut Tree	Noctule	Rare	Foraging	No
22:34	Horse Chestnut Tree	Brown Long Eared	Rare	Foraging	No
22:37	Horse Chestnut Tree	Soprano Pipistrelle	Occasional	Foraging	No

22:39 - 22:40	Horse Chestnut Tree	Noctule	Constant	Foraging	No
22:40	Horse Chestnut Tree	Common Pipistrelle	Rare	Foraging	No
22:42 – 22:44	Horse Chestnut Tree	Soprano Pipistrelle	Multiple	Foraging	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 6 – Horse Chestnut Roost Survey 2					
Project/Location		Ballswood Quarry	Date		7/8/2020
Surveyors		SP			
Sunset		N/A	Sunrise		5:39am
Survey Start		4:09	Survey End		5:39am
Start Temperature		15.1 Degrees Celsius	End Temperature		16.3 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		20% Cloud Cover, No Precipitation (2).			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
4:31	Horse Chestnut Tree	Soprano Pipistrelle	Occasional	Foraging	HNS
4:37	Horse Chestnut Tree	Common Pipistrelle	Occasional	Foraging	HNS
4:47	Horse Chestnut Tree	Noctule	Occasional	Foraging	Foraging behind hedge.

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 7 – Horse Chestnut Roost Survey 3					
Project/Location		Ballswood Quarry	Date		13/8/2020
Surveyors		SP			
Sunset		20:42	Sunrise		N/A
Survey Start		20:42	Survey End		22:12
Start Temperature		20.4 Degrees Celsius	End Temperature		18.2 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		High Cloud Cover = 90%-100% (2)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
20:52	Horse Chestnut Tree	Noctule	Occasional	Foraging	No
20:56	Horse Chestnut Tree	Noctule	Occasional	Foraging along hedgerow	No
21:01	Horse Chestnut Tree	Noctule	Occasional	Foraging along hedgerow	No
21:22	Horse Chestnut Tree	Common Pipistrelle	Rare	Foraging along hedge	No
21:23	Horse Chestnut Tree	Noctule	Rare	Foraging along hedge	No
21:25	Horse Chestnut Tree	Common Pipistrelle	Rare	Foraging along hedge	No
21:26	Horse Chestnut Tree	Common Pipistrelle	Rare	Foraging along hedge HNS	No
21:35	Horse Chestnut Tree	Common Pipistrelle	Rare	Foraging along hedgerow	No
21:44	Horse Chestnut Tree	Soprano Pipistrelle	Rare	HNS	No
21:46	Horse Chestnut Tree	Brown Long Eared Bat	Rare	Emerged from trunk hole	Yes
21:47	Horse Chestnut Tree	Soprano Pipistrelle	Rare	HNS	No
21:48	Horse Chestnut Tree	Soprano Pipistrelle	Occasional	HNS	No
21:57	Horse Chestnut Tree	Common Pipistrelle	Rare	HNS	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

5.0 IMPACTS

- 5.1 The proposed development involves 2 extensions which are within the permitted red line boundary of the existing Ballswood Quarry, although outside the extraction area on the approved plans. Access to the site for the purpose of extending mineral extraction from the existing quarry to the west would best be supplied through the existing quarry site. The proposed development will release currently sterilised mineral within the permitted planning boundary of the site. It is considered that development will impact on commuting and foraging habitat for bat species including common and soprano pipistrelle, noctule and brown long eared. Impacts will be through the removal of small areas of broad-leaved woodland and the hedgerow to the west of the existing plant site.

One tree with high and two trees with moderate bat roosting potential will be impacted through removal. The proposed development indicates that these trees will be removed to facilitate quarry operations.

Table 8 – Likely Impacts

Location	Likely Impact	Species likely to be Impacted
Located to the west of the existing plant site.	Removal of the hedgerow and broad-leaved woodland.	Common pipistrelle, soprano pipistrelle, noctule and brown-long eared.
Existing Plant site.	Removal of Horse chestnut.	Soprano pipistrelle, brown long eared.

- 5.2 It should be noted that all other trees with bat roosting potential are to be retained during the extent of the works. The RPA's for these trees are also recommended to be retained. This is detailed within the Arboricultural survey report.
- 5.3 The northern boundary woodland, southern boundary woodland and the hedgerow located in the south-western corner of the site are to be retained during the extent of this works. In addition, it is not anticipated that the proposed extension will have any impact on these habitats due to the substantial stand-off distance between the proposed extension and these habitats.

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6.0 MITIGATION

General Mitigation Measures

- 6.1 The ecological impact hierarchy requires that all steps are taken to avoid adverse impacts to habitats and species within the affected areas. Only where impacts cannot be avoided, steps should be taken to mitigate for any losses within the scheme boundary. In cases where all options for on-site mitigation are not possible, offsite compensatory measures can be considered.
- 6.2 It should be noted the majority of the boundary habitats including broad-leaved woodland and hedgerows are to be retained for the extent of the works.

Hedgerow Planting / enhancement

- 6.3 Although the majority of hedgerows within the site boundary are being maintained a small section is being removed to the west of the existing plant site. It is recommended where possible that the hedgerows have a method of replacement elsewhere on the site.
- 6.4 The majority of hedgerows are to be retained during the extent of the works, with only hedgerows located in the centre of the field to be removed.
- 6.5 Existing hedgerows should be managed to create thick hedgerows of differing heights up to 2m tall, as particularly required for yellowhammer. The hedgerows should be enhanced by additional planting to fill gaps. New sections of species-rich hedgerow should be planted to maintain and enhance connectivity around the site and the surrounding area. These enhancements should be undertaken prior to the commencement of works. This habitat should be managed for birds by trimming on a rotation of every 2-3 years in late winter and by hedge-laying and/or coppicing to restore a dense structure at the base of the hedge.
- 6.6 The hedgerow located along Gegin Lane should be enhanced as part of the proposed restoration works. This hedgerow should be 'beaten up' to encourage a denser hedgerow with a wider range of native species present. Native plants will be sourced locally wherever possible to be included within the planting regime. Species such as hawthorn (*Crataegus monogyna*), field maple (*Acer campestre*), blackthorn (*Prunus spinosa*), native rose species and honeysuckle (*Lonicera periclymenum*) could be included.

Woodland Planting

- 6.7 The restoration proposals are to include the creation of additional areas of broad – leaved woodland. This should include the planting of native species to form a linear network for commuting bird species.

Lighting Mitigation

- 6.8 To ensure that bats continue to use the commuting and foraging features that are to be retained, it is strongly recommended that any lighting used within the scheme is kept to a minimum and is carefully designed in order to prevent light spilling onto important foraging and commuting features (in particular over the River Foss).
- 6.9 Artificial lighting has been found to affect the feeding behaviour of bats in two ways; one is the attraction that light from certain types of lamps has to a range of insects; the other is the presence of lit conditions (BCT, 2009). With regard to insects, the increase in insects around certain types of lighting can favour bats which are more tolerant to light (pipistrelle species, noctule, Leisler's Bat and serotine) but is thought to cause adjacent habitats to support fewer insects, potentially resulting in less food for species which are adverse to lighting (myotis, long-eared, barbastelle and horseshoe bats) (BCT, 2009). The presence of lighting in areas where these species forage and commute has also been shown to significantly affect their typical foraging and commuting routes with lighting acting as a barrier for some species which they will not cross (BCT, 2009).
- 6.10 As one species of myotis bat have been recorded during the surveys, lighting around the external boundaries must be restricted and only used where it is an essential requirement. This includes construction lighting as well as permanent lighting as part of the new scheme.
- 6.11 The following considerations should be made within the final scheme -
- **Type of lamp (light source)** - The impact on bats can be minimised by the use of low-pressure sodium lamps or high-pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its UV filtration characteristics.
 - **Luminaire and light spill accessories** - Lighting should be directed to where it is needed, and light spillage avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting

can also be used as a barrier, or manmade features that are required as part of the works can be positioned so as to form a barrier.

- **Lighting column** - The height of lighting columns in general should be as short as is possible as light at a low level typically reduces the ecological impact. However, there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. For pedestrian lighting this can take the form of low-level lighting that is as directional as possible and below 3 lux at ground level. The acceptable level of lighting may vary dependent upon the surroundings and on the species of bat affected.
- **Predicting where the light cone and light spill will occur** - There are lighting design computer programs that are widely in use which produce an image of the site in question, showing how the area will be affected by light spill when all the factors of the lighting components listed above are taken into consideration. This should be a useful tool to inform the mitigation process.
- **Light levels** - The light should be as low as guidelines permit. If lighting is not needed, then it shouldn't be used.
- **Timing of lighting** - The times during which the lighting is on should be limited to provide some dark periods, particularly during the peak in bat activity (20.00-23.00hrs between April and September).

Roosting Bats

- 6.12 It is noted that the horse chestnut tree in the compound is to be removed, which was found to have both brown long eared bats and soprano pipistrelle bats emerging from the trunk holes. The data recorded during the roost surveys is only valid for one year as roosting bats can frequently change roosting locations on a yearly basis. Therefore, this tree will require additional emergence re-entry surveys conducted during the survey season, closer to date when the tree is to be removed.
- 6.13 In the case no roosting bats are identified during later surveys, a climbing tree inspection should be completed by a suitably licenced bat ecologist within 48 hours prior to the tree's removal. This survey can be completed alongside the tree removal as part of a soft feeling technique.
- 6.14 In the event that roosting bats are identified during any of the above surveys, a Mitigation Licence for a European Protected Species Licence (EPSL) will be required from Natural Resource Wales (NRW) prior to the tree removal being completed.

Bat Boxes

- 6.15 As the horse chestnut tree within the site is to be removed, it is recommended that bat boxes are installed within the woodlands to be retained surrounding the site boundary. Six bat boxes should be installed on trees to be planted within the landscape scheme. The bat boxes should be Schwegler types because of their durability and should include three 1FF type box (see Figure 1) and three 2FF type boxes (see Figure 2). The boxes should be installed facing south, high on the trees (above 4m) and should be positioned away from light sources.

Figure 1 - Schwegler 1FF type box suitable for roosting bats



Figure 2 - Schwegler 2F type box suitable for roosting bats



7.0 SUMMARY

- 7.1 Bat activity surveys and roost surveys have been undertaken to fulfil the requirements identified in the Ecological Appraisal Report completed in August 2020.
- 7.2 The proposed development is to enable 2 proposed changes to the extraction boundary of Ballswood Quarry utilising existing quarry infrastructure and access. The proposed development will release currently sterilised mineral within the permitted planning boundary of the site. Access to the site for the purpose of extending mineral extraction from the existing quarry to the west would best be supplied through the existing quarry site.
- 7.3 The site is generally an open quarry site with marginal woodland/scrub habitat surrounding the site, on the north boundary there is a broad-leaved semi natural woodland running along Gegin Lane. Scrub habitat and tall ruderal are found scattered around the quarry with species-poor semi improved grassland margins on the east of the site. Southern boundaries also consist of broad-leaved woodland and the River Alyn flowing through the base of the site.
- 7.4 A total of four species of bat were recorded throughout the site; these were common pipistrelle, soprano pipistrelle, noctule and brown long eared bats.
- 7.5 Mitigation recommendations and enhancements for these species have been outlined within the report above and include the plantation of woodland and hedgerows to replace the ones lost. Mitigation for the horse chestnut tree has also been described with the methods required before the tree removal can occur.
- 7.6 The hedgerows and woodlands that will be lost during development, should aim to be replaced by replanting elsewhere on site.
- 7.7 Site enhancement recommendations have also been outlined to further improve the site for foraging and roosting bats.

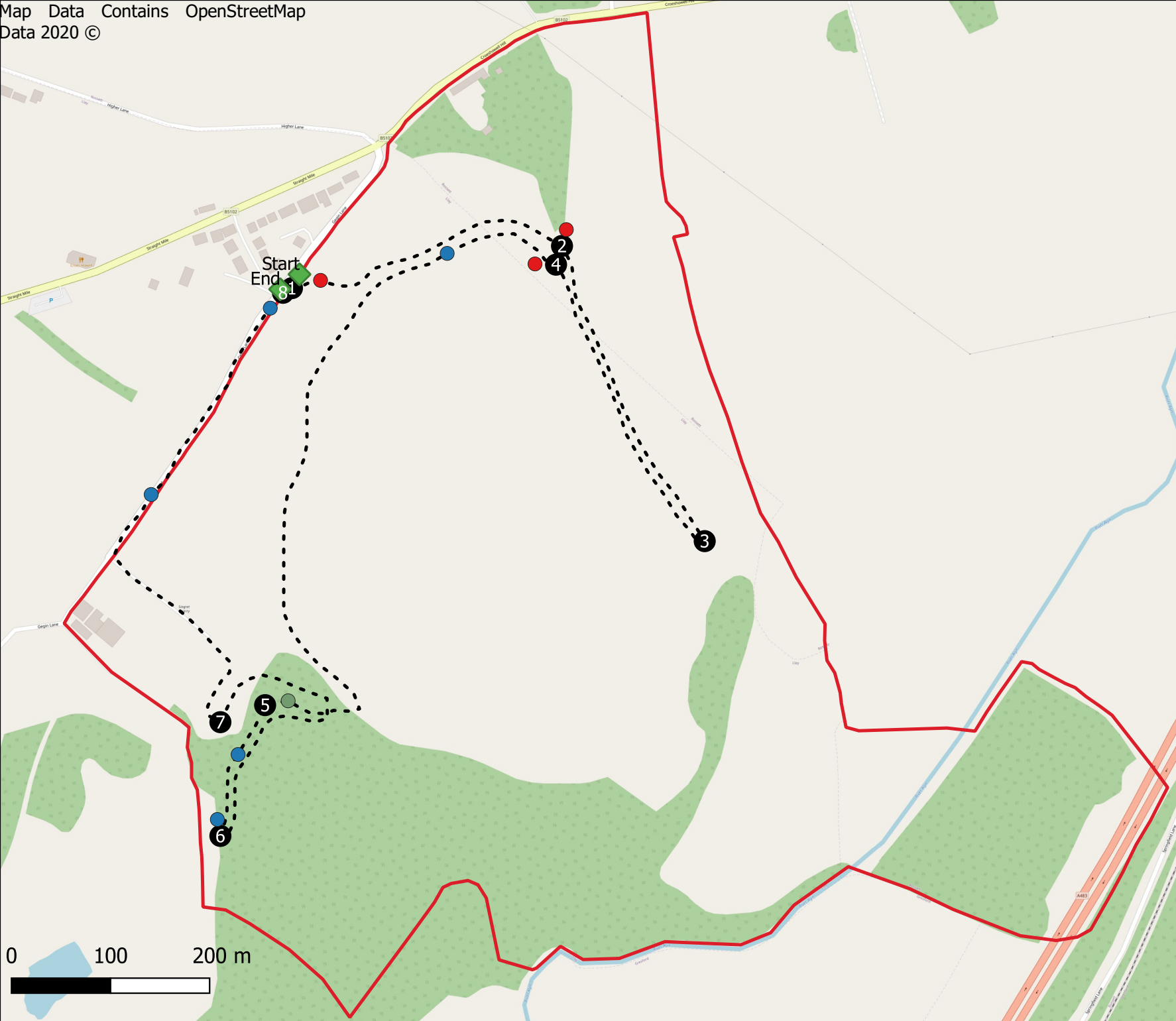
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3. Institute of Environmental Assessment. 1995. Guidelines for Baseline Ecological Assessment. London: E &FN Spon.
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Appendix A

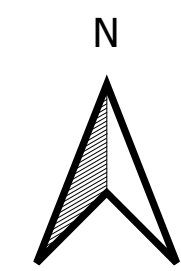
Bat Activity Survey Drawings



LEGEND

-  Soprano Pipistrelle
-  Common Pipistrelle
-  Noctule
-  Start - End Points
-  Bat Transect Route
-  Bat Listening Points
-  Site Boundary

OpenStreetMap



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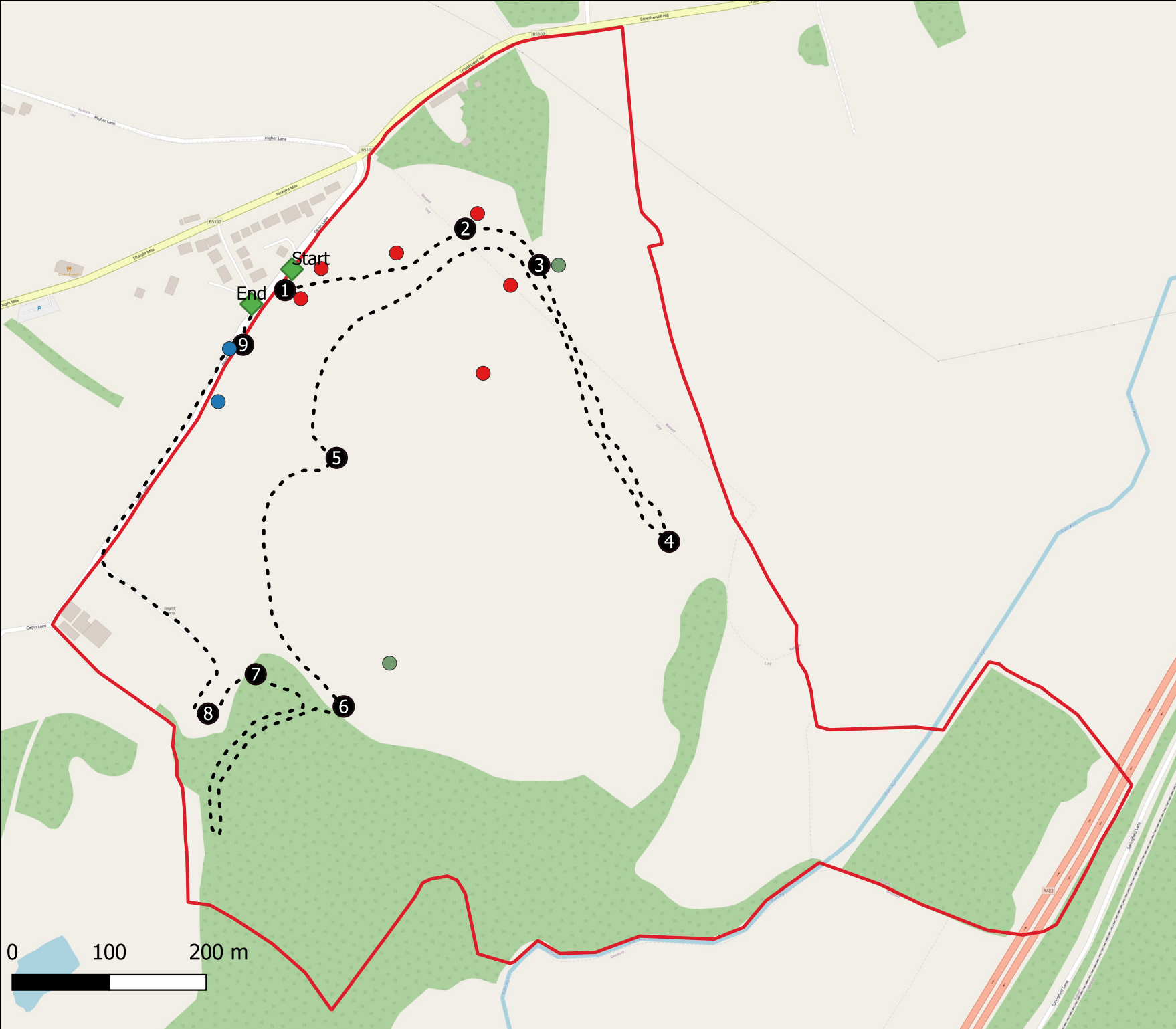
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Ballswood Quarry	
DRAWING TITLE	
Bat Activity Survey 29.5.2020	
DATE	REFERENCE
Aug 2020	KEDL-003-M (ED.006)



SCALE
See Map

STATUS
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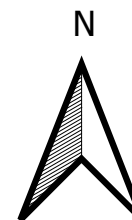
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LEGEND

-  Start-End Point
-  Noctule
-  Soprano Pipistrelle
-  Common Pipistrelle
-  Bat Transect Route
-  Bat Listening Points
-  Site Boundary

OpenStreetMap



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PROJECT

Ballswood Quarry

DRAWING TITLE

Bat Activity Survey 21.07.2020

DATE

Aug 2020

REFERENCE

KED-003-M (ED.007)

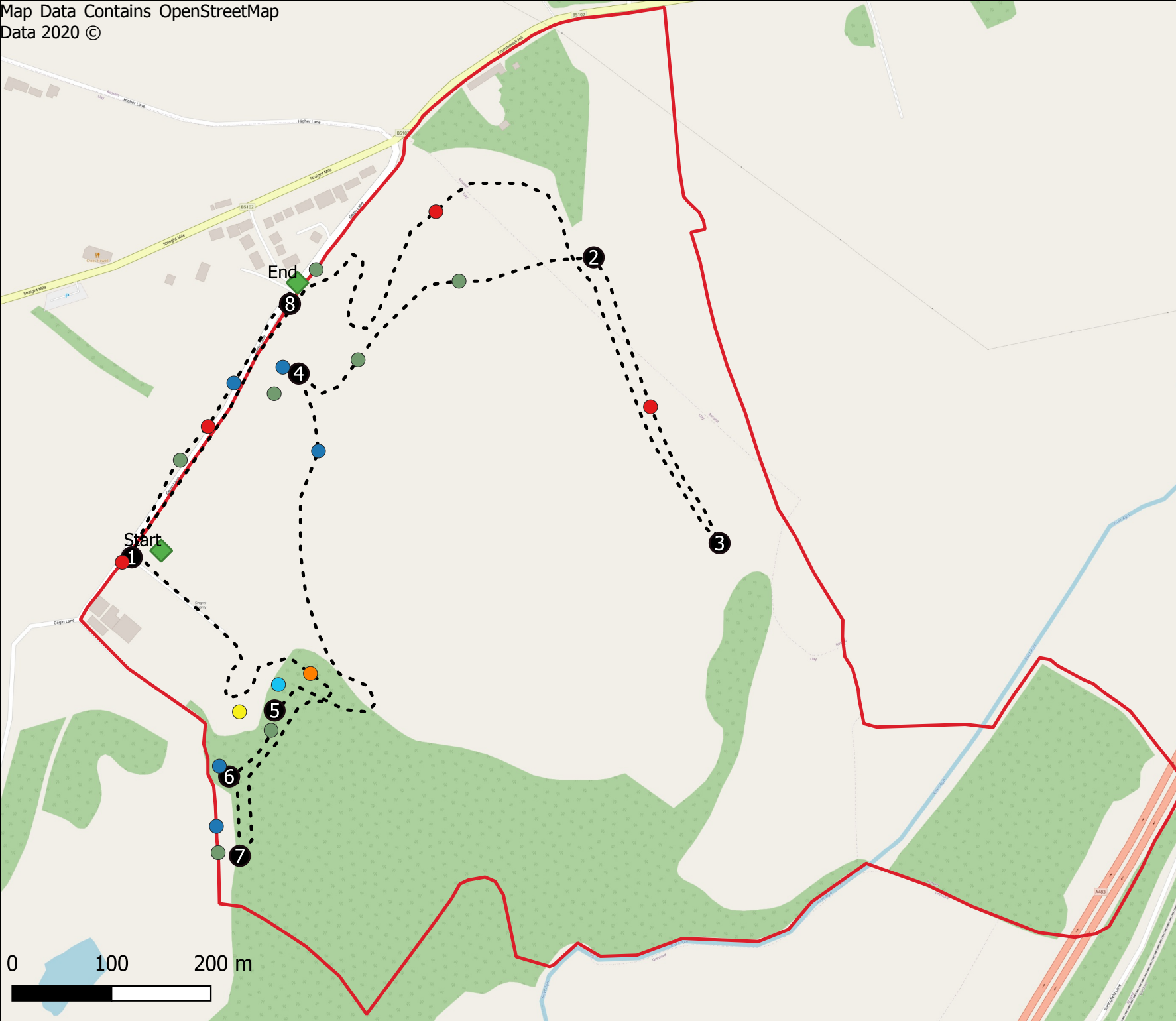
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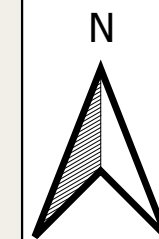
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LEGEND

- Nathusius' Pipistrelle
- Western Barbastelle
- Leisler's Bat
- Soprano Pipistrelle
- Common Pipistrelle
- Noctule
- Start-End Points
- Bat Listening Points
- Bat Transect Route
- Site Boundary

OpenStreetMap



PROJECT
Ballswood Quarry

DRAWING TITLE
Bat Activity Survey 13.8.2020

DATE
Aug 2020

REFERENCE
KEDL-003-M (ED.008)

SCALE
See Map

STATUS
FINAL