



Sirius Planning

Land off Goat Mill Road, Merthyr Tydfil

ECOLOGICAL APPRAISAL

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FPCR Environment and Design Ltd

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1.0 EXECUTIVE SUMMARY

- 1.1 A Phase 1 Habitat survey and subsequent protected and notable species investigations have been conducted to assess the ecological constraints of a proposed plastic recycling and processing facility at land off Goat Mill Road, Merthyr Tydfil.
- 1.2 Extensive ecology surveys were conducted in 2019 and 2020 for habitats and botanical interest, badger, bats (manual and automated surveys), breeding and wintering birds, great crested newt, reptiles, and the results are detailed in this report. A separate report also details the results of invertebrate surveys conducted on the Site.
- 1.3 The c.22ha survey Site was comprised of an open mosaic of sparsely vegetated substrate, grassland and marshy grassland surrounded by broadleaved woodland plantation. Small pockets of scattered scrub, bare ground scattered trees were located centrally within the Site. A stream with running water bordered the north and eastern boundary of the Site.
- 1.4 The Site qualifies as Open Mosaic Habitat owed to the industrial history of the Site and the mix of habitats present. This is a common habitat type in the local area. Detailed botanical surveys have identified that the Site is in a deteriorating condition with scrub encroachment and grassland establishing across the Site. Under current management, the Open Mosaic Habitat is likely to be lost to established permanent grassland and scrub.
- 1.5 No reptiles, great crested newt or badger were recorded, and the breeding bird assemblage was comprised only of small numbers of common and widespread species. The bat assemblage included a wide range of species typical for south Wales, including lesser horseshoe which was assessed as district value.
- 1.6 The proposed scheme retains the majority of broadleaved woodland plantation and a significant area of grassland. Open Mosaic Habitat will be retained, managed and enhanced both in the north and south of the Site. Key bat habitat features will be retained and subject to lighting level controls.
- 1.7 A surface water lagoon will be provided giving ample opportunities for aquatic habitat creation and enhancement. Further enhancements have been proposed including the management of the retained woodland, and a bat and bird box scheme.
- 1.8 The success of ecological recommendations will be secured through the provision of a Landscape and Ecological Management Plan (LEMP) to be submitted prior to construction. Implementation of the LEMP will be overseen by an Ecological Clerk of Works.

2.0 INTRODUCTION

- 2.1 This report has been prepared by FPCR Environment and Design Ltd on behalf of Sirius Planning. It details the results of a Phase 1 and 2 Habitat Surveys and Protected Species Surveys undertaken at Land off Goat Mill Road, Merthyr Tydfil (hereafter referred to as the 'Site').
- 2.2 The report has been produced to accompany a planning application for a proposed plastic recycling and processing facility with associated office accommodation, external storage area, vehicular parking and weighbridge, surface water lagoon.
- 2.3 The Site is located east of Merthyr Tydfil (central grid reference: SO062069) south of Dowlais. It is bound to the east by A4060, the west and north by Goat Mill Road and mount view residential estate below. The land comprises a flat area of reclaimed land, formerly the Site of the Dowlais Great Tip associated with Dowlais Iron Works. The reclaimed land is classified as open mosaic habitat on previously developed land, composed of broadleaved semi-natural and plantation woodland, grassland, marsh grassland, scattered scrub and bare ground. Engineered watercourses are present throughout the Site, though during the majority of surveys only a single water course was in flow along the north western boundary.

3.0 AIMS AND OBJECTIVES

Phase 1 Habitat and Preliminary Protected Species Survey

- 3.1 The aim was to conduct an extended Phase 1 Habitat and Preliminary Protected Species Survey of the application Site using both a desk study and a walk over survey, to present and discuss the results and recommend any further surveys that may be required.
- 3.2 The objectives were to:
- Map the broad habitat types within the survey area;
 - Determine the presence or potential presence of legally protected, rare or otherwise notable species;
 - Assess the potential nature conservation importance of the recorded habitats;
 - Identify designated sites of nature conservation value; and
 - Identify the potential legal ecological constraints on development and propose any further surveys that may be required.

Further Surveys

- 3.3 The aim of further survey work is to establish the presence or absence, and if possible / appropriate a population estimation, of legally protected, rare or notable habitats / species identified as being present or potentially present during the initial extended Phase 1 Habitat and Preliminary Protected Species Survey; and to determine if the proposed application is likely to adversely affect these species.
- 3.4 The further surveys also aimed to provide a more detailed understanding of the flora of the Site and classify habitat that may be of higher ecological value according to the National Vegetation

Classification (NVC) System. Suitable mitigation will be outlined where appropriate to minimise impact on habitats and species to a level considered acceptable by the local planning authority.

3.5 The objectives were to:

- Survey the Site / suitable habitats using recommended survey guidelines where appropriate for each of the protected species / habitats identified for further survey during the Phase 1 Habitat and Preliminary Protected Species Survey.
- Use the results and desk study data to determine the likely presence or otherwise of protected species, and if possible / appropriate estimate population size.
- Determine the likelihood of the proposed application affecting protected, rare or notable habitats / species.
- Produce an Ecological Appraisal that presents the results gathered and details appropriate mitigation and / or enhancements to reduce any potential impact from the proposed application on protected, rare or notable habitats / species to an acceptable level.

4.0 LEGISLATION

4.1 Detail on the relevant national policy and legislation for ecology in relation to development sites are provided *Appendix A*. The national policy and legislation most relevant here are:

- The Conservation of Habitats and Species Regulations (“The Habitats Regulations”) (Amendment) 2017 in relation to the European Protected Species (EPS) great crested newt, (GCN), bats (all species) and dormouse; and European protected sites i.e. Special Areas of Conservation (SAC), Special Protection Areas (SPAs) and Internationally protected “Ramsar sites” (collectively known as “Natura 2000 sites”). Annex II bat species of particular relevance in relation to SACs designated for bats.
- The Wildlife and Countryside Act 1981 (WCA) (as amended) in relation to all wild birds (including Schedule 1 species), other animals (notably Schedule 5 species), flora (those listed in Schedules 8 and 9) and Sites of Special Scientific Interest (SSSI);
- Protection of Badgers Act 1992;
- Environment (Wales) Act (EW) 2016 in relation to various priority species and habitats;
- Hedgerow Regulations 1997 made under Section 97 of the Environment Act 1995;
- Planning Policy Wales (PPW) (2021);
- Local Nature Reserves (LNR) as designated most recently by the EW Act 2016;
- Non-statutory protected local sites including County Wildlife Sites (CWS), Sites of Importance for Nature Conservation (SINC), Local Wildlife Sites (LWS) and Ancient Woodland Inventory (AWI) sites;
- Local Biodiversity Action Plans (LBAP) i.e. Neath Port Talbot Biodiversity Action Plan; and
- Birds of Conservation Concern (BoCC).

5.0 METHODOLOGY

Desk study

- 5.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations including:
- South East Wales Biodiversity Records Centre (SEWBRc).
- 5.2 Further inspection of colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.
- 5.3 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:
- European Protected Sites - 10km search around the Site for sites of International Importance (e.g. SACs, SPAs and Ramsar sites).
 - Nationally Protected Sites - 2km search around the Site for sites of National Importance (e.g. SSSIs). Sites of importance outside of the 2km range may also be highlighted if a potential impact is perceived.
 - Local Protected Sites - 2km search around the Site for locally protected sites (e.g. LNRs).
 - Non-statutory Designated Sites - 2km search around the Site.
 - Legally Protected and Notable Species - 2km search around the Survey Area.
- 5.4 When handling data species data:
- a) All results were filtered to include records from the previous ten years only (since 2010).
 - b) Results are plotted to identify any records falling within the Site boundary.
 - c) The remainder of results are filtered, separating (from those listed in d.) all WCA Schedule 5 species, all likely breeding or over wintering WCA Schedule 1 birds, any EPS species and any Nationally Rare and scarce plants.
 - d) All remaining species including, but not limited to non-WCA / EPS, (Section 7 of the Environment (Wales) Act, 2016), BoCC Red and Amber listed species are listed in *Appendix B*.

Field survey

Habitats/flora

Phase 1

- 5.5 A field survey was conducted on 31st July 2019.
- 5.6 The survey was conducted using the methodology outlined in the Handbook for Phase 1 Habitat Survey (JNCC 2010)¹. This involved a systematic walkover of the Site to classify the habitat types present (using the standardised Phase 1 Habitat classification system) and mapping these onto an OS base map. Each habitat was described based on the botanical merits and target notes used to

¹ JNCC, (2010). Handbook for Phase 1 habitat survey – a technique for environmental audit, ISBN 0861396367.

record features of habitats of particular interest, as well as any sightings, evidence of, or potential for protected or notable species. A full botanical species list (*Appendix C*) was compiled during the survey, and a Phase 1 plan of all major habitat types produced (*Figure 3 and Figure 4*). Where necessary, the abundance of species was quantified using the DAFOR scale, ranging from Dominant (>75%) to Abundant (75-51%), through Frequent (50-26%) and Occasional (25-11%) to Rare (10-1%).

Phase 2 – National Vegetation Classification and Condition Assessments

- 5.7 The presence of indicator species recorded during the Phase 1 survey highlighted the possibility of calcareous grassland on Site. Further, due to the Site's historical background it was necessary to consider the presence of calaminarian grassland on Site. Consequently, the potential presence of higher value "Priority" grasslands on Site was assessed.
- 5.8 Certain habitats are considered Habitats of Principal Importance under Environment (Wales) Act 2016. Potential higher value grasslands, and other habitats, can be assessed by standard methods using the National Vegetation Classification (NVC) to identify the habitat type. These can also be assessed against the Priority Habitat status in accordance standardised condition assessment methods.
- 5.9 On 9th June 2020, areas of homogenous grassland within five distinct areas of the Site were subject to National Vegetation Classification Surveys (NVC) – for quadrat locations see *Figure 6*. Sampling of grasslands was carried out as recommended in the National Vegetation Classification: Users' handbook² and was used to assess vegetation types present as described in British Plant Communities Volume 2 and British Plant Communities Volume 3³.
- 5.10 The survey methodology requires sampling to be undertaken in homogenous stands of vegetation (e.g. uniform in both its species composition and structure). Using this methodology up to five and no less than three 2m x 2m quadrats were recorded in each sampled stand. A species list was compiled of all vascular plants within each quadrat and an estimate made of each species' cover/abundance using the Domin scale⁴ (See Appendices A and C).
- 5.11 The data gathered during the survey was analysed using a vegetation key, comparison of floristic tables and community descriptions and computer analysis (TABLEFIT⁵). This vegetation analysis software package provides a Mean Goodness-of-Fit value to NVC vegetation types, which can then be analysed for the most likely community matches. *Table 1* provides details to enable interpretation of mean Goodness-of-Fit values.

² Rodwell J. S (2006) National Vegetation Classification: Users' handbook. JNCC, Peterborough.

³ Rodwell, J S (ed.) (1992) British Plant Communities, Vol. 3: grasslands and montane communities. Cambridge University Press, Cambridge.

⁴ Allaby M. (2010) A Dictionary of Ecology – Domin Scale. Fourth Edition

⁵ Marrs, R.H., Smart, S.M., Jones, M. & Hill, M.O. (2019). TABLEFIT v. 3.0 & v.4, programs for the identification of vegetation types according to the British National Vegetation Classification. Available at: <https://www.ceh.ac.uk/services/tablefit-and-tablcom> (Last accessed: 07.10.2020.)

Table 1: Interpretation of the Mean Goodness-of-Fit values⁶.

Goodness-of-Fit	Interpretation
80-100	Very good
70-79	Good
60-69	Fair
50-59	Poor
0-49	Very poor

Condition Assessments

5.12 Following the NVC survey, the grassland forming Habitats 2, 4 and 5, as shown on *Figure 5*, were subject to Condition Assessments. This was to quantify their condition and to determine whether they met the criteria as priority habitat. Condition Assessments broadly followed methodology described in the Farm Environment Plan (FEP) Manual⁷. Each habitat was randomly walked. Surveyors stopped ten times in each and recorded all vascular plant species present within a square metre. The presence of priority habitat indicator species were recorded. So too was the percentage cover of wildflowers and sedges; bare ground; invasive trees and shrubs; and undesirable species. Undesirable species were as follows:

- creeping thistle *Cirsium arvense*;
- spear thistle *Cirsium vulgare*;
- curled dock *Rumex crispus*;
- broad-leaved dock *Rumex obtusifolius*;
- common ragwort *Jacobaea vulgaris*; and
- common nettle *Urtica dioica*
- White clover *Trifolium repens*
- Creeping buttercup *Ranunculus repens*
- Meadow buttercup *Ranunculus acris*

Invasive plants, notifiable weed species and other notable flora

5.13 Consideration was given as to the presence of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (WCA 1981)⁸ and the presence of any notable weeds including those covered under the Weed Act 1959⁹ (where population is significant enough to be considered injurious).

5.14 In addition, any rare or notable flora including those listed in the following policies as priorities were duly noted:

⁶ Hill, M.O. (2015). *TABLEFIT: TABLEFIT version 2.0 for identification of vegetation types*. Centre for Ecology and Hydrology, Wallingford.

⁷ Natural England (2010). Higher Level Stewardship Farm Environment Plan (FEP) Manual Technical guidance on the completion of the FEP and identification, condition assessment and recording of HLS FEP features. Third Edition. Available at: <http://adlib.eversite.co.uk/resources/000/251/202/NE264.pdf> (Last accessed: 02.12.2020).

⁸ Act of Parliament, (1981). The Wildlife and Countryside Act 1981 (as amended), London: HMSO.

⁹ Act of Parliament, (1959). The Weed Act 1959. London: HMSO.

- Post 2010 UK Biodiversity Framework¹⁰ priority species;
- EW S7 species of principal importance;
- Merthyr Tydfil Biodiversity Action Plan (BAP) priority species;
- International Union for the Conservation of Nature (IUCN) Red listed¹¹ species;
- Red Data Book (RDB)¹² species; and
- National, regional, county or vice-county (VC41) rarities.

Fauna

Badger

- 5.1 A survey of the Site for the presence of badgers was conducted on 31st July 2019.
- 5.2 As part of the survey all hedgerows, woodlands, scrub and other suitable habitats within the Site and immediately adjacent to the Site boundary, were searched for evidence of badger activity. The standard methodology was used, as outlined by Harris, Creswell and Jefferies (1991)¹³. This involved a thorough search for evidence indicating the presence of badgers, including:
 - setts, including earth mounds, evidence of bedding and runs between setts;
 - latrines, often located close to setts, at territory boundaries or adjacent to favoured feeding areas;
 - prints and paths or track ways;
 - hairs caught on rough wood or fencing; and
 - other evidence including snuffle holes, feeding and playing areas and scratching posts.
- 5.3 The identification of snuffle holes, scratching posts or feeding signs on their own is not necessarily conclusive evidence of the presence of badgers. A number of such signs may need to be seen in conjunction before they can be said to be conclusive of badger activity.
- 5.4 Where setts are found, their status and level of activity is noted. Sett status is broadly categorised as follows:
 - *Main sett* – usually continuously used with many signs of activity around, a large number of holes and conspicuous spoil mounds.
 - *Annexe sett* – usually located close to a main sett and connected to it by well used paths. Annexes may not be continuously occupied.
 - *Subsidiary sett* – lesser used setts comprising a few holes and without associated well-used paths. Subsidiary setts are not continuously occupied.
 - *Outlier sett* – one or two holes without obvious paths. These are used sporadically.
- 5.5 Level of activity is described as:

¹⁰JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). (2012). UK Post-2010 Biodiversity Framework. July 2012.

¹¹ International Union for Conservation of Nature (IUCN), (2012). Red List 2012.

¹² Cheffings, C.M. & Farrell, L. (Eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I. (2005). The Vascular Plant Red Data List for Great Britain. Species Status 7: 1-116. Joint Nature Conservation Committee, Peterborough.

¹³ Harris, S., Creswell, P. and Jefferies, D., (1991). (Report) Surveying Badgers. The Mammal. Society, Bristol.

- *Well used* – clear of debris, trampled soil mounds and obviously active, with signs of activity such as presence of prints, dislodged guard hairs around the entrances.
- *Partially used* – some associated debris or plants at the entrance. Could be used with minimal excavation and usually with signs of activity within the vicinity, for example, badger pathways.
- *Disused* – partially or completely blocked entrances.

Bats

Bat Activity Surveys

Activity Survey Rationale

- 5.6 The Site was considered to be of low to moderate value for bats based on criteria in the Bat Conservation Trust guidance (Collins 2016)¹⁴
- 5.7 Survey effort was increased from “seasonal” to “monthly” due to the presence of Annex II lesser horseshoe roosts being identified within 3km (data obtained within the records provided by SEWBRc) of the Site during the Desk Study. Surveys were therefore conducted as follows: one transect conducted per month (April- October) and two automated static detectors deployed per transect route each month.

Manual Activity Survey

- 5.8 The manual surveys were undertaken by appropriately experienced ecologists from FPCR Environment and Design Ltd. Each transect was walked at a steady pace using full spectrum Wildlife Acoustic Inc. Echo Meter Touch bat detectors in conjunction with Echo Meter Touch app and Apple Inc. iPad to provide back-up information and enable identification of bats encountered. When a bat pass was registered, the species, time and behaviour was recorded manually on a site plan.
- 5.9 The manual activity surveys were undertaken by appropriately experienced ecologists from FPCR Environment and Design Ltd. Each transect was walked at a steady pace using full spectrum Wildlife Acoustic Inc. Echo Meter Touch bat detectors in conjunction with Echo Meter Touch app and tablet device. When a bat pass was registered, the species (or *bat sp.?* if unknown at the time), time and behaviour was recorded manually on a site plan. On each survey the detector was set to record all data including noise files, and auto ID was turned off. Surveys were conducted in suitable conditions (little or no rain / wind and temperatures above 10°C) in order to provide a full cross-section of the use of the Site by bats. Transects were started at sunset and lasted for three hours. See *Table 2* for survey dates and weather conditions. Transect routes were chosen that incorporated as many favourable habitats features for bats as possible. Point counts were included at staggered intervals, usually around suitable features for bat activity such as connecting hedgerows and tree-lines.

¹⁴ Collins, J. (ed.) 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.). The Bat Conservation Trust, London.

Table 2: Transect survey dates and weather conditions

Date	Sunset	Wind	Temperature	Cloud Cover	Rain
06.04.2020	20:47	1	14	10	0
19.05.2020	21:07	1	11	10	0
09.06.2020	21:30	2	17	80	0
29.07.2020	21:08	0	14	70	0
20.08.2020	20:25	2	19	100	0
17.09.2020	19:22	1	17	0	0
18.09.2020	04:54	1	10	50	0
14.10.2020	18:21	5	13	70	0

Automated (Passive) Activity Survey

- 5.10 Static (passive) recording broadband detectors were deployed to supplement the manual activity surveys. These automated logging systems Wildlife Acoustics Inc. Song Meter SM4BAT FS detectors, (herein referred to as SM4BAT detectors) save all recordings onto an internal storage device for analysis. These were positioned at locations where habitats would likely be impacted as a result of development, and at any locations where habitats would likely be impacted as a result of development, and at locations that provide suitability for navigation/ foraging routes.
- 5.11 The devices were placed in a location for five nights of suitable and/or typical weather conditions. The units were programmed to activate 30 minutes before dusk and record continuously until 30 minutes following sunrise. The output from this was subject to manual (not automated) analysis using Wildlife Acoustics Kaleidoscope software. Analysis was undertaken by experienced ecologists from FPCR Environment and Design Ltd.
- 5.12 The analysis of the SM4BAT files recorded can highlight the presence of more than one bat if they are recorded simultaneously on the same sound file. However, it is not possible to determine whether consecutive sound files have been recorded as the result of a single bat passing the detector as it commutes across the landscape or by one bat repeatedly triggering the detector as a single bat registration. The number of bat registrations does, however, reflect the relative importance of the location of the detector by calculating the number of bat registrations per hour.

Birds**Scoping Wintering Bird Survey (WBS)**

- 5.13 The survey was conducted to ascertain the Sites potential to support wintering bird species with an associated conservation status as WCA Schedule 1, EW S7 species and/or BoCC Red or Amber list species. These species are likely to be of the greatest threat in relation to further decline, and are commonly referred to as 'notable' species. The survey was undertaken during the 2020 winter season to determine the population status of wintering birds on Site.

- 5.14 The survey methodology employed was broadly based on the British Trust for Ornithology (BTO) Winter Farmland Birds Survey¹⁵. A route was mapped out prior to the survey being undertaken, with particular attention to linear features, such as hedgerows and tree lines, and natural features such as areas of scrub and waterbodies.
- 5.15 The Site was walked over a one-day period by an ecologist experienced in bird survey, between 09:00 and 16:00. All birds encountered (seen or heard) were recorded on a field survey plan, using BTO species codes and symbols for bird activities where appropriate. Bird survey was not undertaken in unfavourable conditions such as heavy rain or strong wind, which may negatively affect the results. For survey details and conditions see *Table 3* below.

Table 3: Scoping WBS survey date and weather conditions

Date	Cloud Cover (%)	Rain	Wind	Visibility
4 th March 2020	0	0	2	Very good

Breeding Bird Survey (BBS)

- 5.16 Two surveys were conducted to ascertain the Sites potential to support bird species with an associated conservation status as WCA Schedule 1, EW S7 species and/or BoCC Red or Amber list species. These species are likely to be of the greatest threat in relation to further decline, and are commonly referred to as 'notable' species.
- 5.17 The survey methodology employed was broadly based on that of territory mapping (Bibby *et al.*, 2000)¹⁶ as developed by the British Trust for Ornithology (BTO). Standard BTO species codes and symbols for bird activities were used to identify birds and denote activity, sex and age where appropriate.
- 5.18 The criteria used in the assessment of breeding birds has been adapted from the standard criteria proposed by the European Ornithological Atlas Committee (EOAC 1979)¹⁷ and are grouped into three categories:
- *Possible breeder* e.g. birds observed in suitable habitat or singing male recorded;
 - *Probable breeder* e.g. pair in suitable habitat, territory defended, agitated behaviour or nest building;
 - *Confirmed breeder* e.g. recently fledged young observed, adult birds carrying food for young; and
 - Birds that were considered to be not using the Site for breeding were categorised as *non-breeders* e.g. flying over the Site, migrant, habitat not suitable.
- 5.19 The Site was walked over by an ecologist experienced in bird surveying, between 05:00 and 11:00. A route was mapped out prior to the surveys being undertaken, and surveys paid particular attention to linear features, such as hedgerows and tree lines, and natural features such as areas of scrub and waterbodies. Bird surveys were not undertaken in unfavourable conditions such as

15 Gillings, S., Wilson, A.M., Conway, G.J., Vickery, J.A., Fuller, R.J., Beavan, P., Newson, S.E., Noble, D. G. and Toms, M. P. (2008). BTO Research Report No. 494: Winter Farmland Bird Survey. British Trust for Ornithology. Thetford, Norfolk.

16 Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H. (2000). Bird Census Techniques, 2nd Edition. Academic Press, London.

17 EOAC (1979). Categories of Breeding Bird Evidence. European Ornithological Atlas Committee.

heavy rain or strong wind, which may negatively affect the results. *Table 4* details the dates and weather conditions observed during surveys.

Table 4: BBS survey dates and weather conditions

Date	Cloud Cover (%)	Rain	Wind	Visibility
31.07.2019	100	None	1	Very good
22.08.2019	100	Light drizzle	1	Good

Great Crested Newt (GCN)

- 5.20 A total of twelve waterbodies were identified within 500m of the Site boundary (see *Figure 5*). Two waterbodies were identified within the Site boundary. Access was possible to both waterbodies on Site and Habitat Suitability Index (HSI) assessments were conducted followed by eDNA tests.

Habitat Suitability Index (HSI)

- 5.21 The HSI instrument (Oldman *et al.* 2000)¹⁸ assesses waterbodies against ten pre-determined criteria, producing a score which indicates the degree of suitability for occupation by great crested newts. In general, waterbodies with a higher HSI score are more likely to support great crested newts than those with a lower score and there is a positive correlation between HSI scores and waterbodies with newts recorded. The ten separate attributes assessed for each waterbodies are as follows:
- geographic location;
 - waterbody area;
 - frequency of drying;
 - water quality;
 - shade;
 - presence of waterfowl;
 - presence of fish;
 - number of linked waterbodies;
 - terrestrial habitat; and
 - macrophytic coverage.
- 5.22 A score is assigned according to the most appropriate criteria level set within each attribute and a total score calculated of between 0 and 1. Suitability is then determined according to the following scale shown in *Table 5*. It should be noted that a low HSI does not necessarily rule out the possibility great crested newts are present, although it does aid in informing the decision as to whether a given waterbody should be selected for further survey, or the likely presence of populations within the wider area.

¹⁸ Oldham, R.S., Keeble, J., Swan, M. J. S. and Jeffcote, M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal*, 10 (4), 143-155.

Table 5: Great crested newt habitat suitability index

HSI	Waterbody Suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Reptiles

- 5.23 Presence/absence surveys have been undertaken in specific locations identified as offering potential habitat. Surveys were based on methodology detailed in the Herpetofauna Workers Manual (2003)¹⁹ and the Froglife Advice Sheet 10 (1999)²⁰.
- 5.24 On 7th May 2020, 60 reptile tiles were placed within suitable habitat on Site and left to bed in (*Figure 7*). Seven surveys were subsequently conducted. Methods involved a search for basking reptiles on/under naturally occurring and strategically positioned artificial refugia (0.5 x 0.5 metre roofing felt). Refugia were placed in locations that offered the most suitable habitat for common reptiles, i.e. structurally diverse grassland habitats with areas of bare ground/short vegetation, wetland or scrub features.
- 5.25 Artificial refugia were located within the application Site and wider survey area in habitats considered most suitable for reptiles.
- 5.26 All survey visits have been undertaken in suitable weather conditions within the recommended survey period by suitably experienced FPCR ecologists. On each of these occasions the number of reptiles associated with each artificial refuge was recorded.
- 5.27 Surveys also followed the guideline recommendations by:
- approaching refugia downwind and avoiding casting a shadow and with care so as to not disturb basking animals when checking; and
 - that when lifting and replacing the refugia, to check for the presence of reptiles underneath in hot weather is undertaken with care, to avoid potential harm or injury to animals beneath.
- 5.28 Any alternative basking material present within the Site (e.g. fallen deadwood, tipped and demolition materials etc) were also checked for the presence of reptiles.
- 5.29 Reptile populations were assessed in accordance with population level criteria as stated in the Key Reptile Site Register. This system classifies populations of individual reptile species into three population categories assessing the importance of the population (*Table 6*). These categories are based on the maximum total number of adult animals observed during an individual survey occasion across the seven or more surveys.

¹⁹ Gent, T. and Gibson, S. (2003). Herpetofauna Workers Manual.

²⁰ Froglife (1999). Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

Table 6: Key reptile Site survey assessment categories

Species	Low Population (No. of individuals)	Good Population (No. of individuals)	Exceptional Population (No. of individuals)
Adder	<5	5 - 10	>10
Common lizard	<5	5 - 20	>20
Grass snake	<5	5 - 10	>10
Slow worm	<5	5 - 20	>20

Invertebrates

- 5.30 The Site has been assessed by an independent invertebrate specialist during the summer of 2020 for the potential to support protected, rare or notable invertebrates. The invertebrate report is provided in full as Appendix H of the present report.

Limitations and Modifications to methodologies**Desk study**

- 5.31 The species data collated for the desk study is derived from records submitted by members of the public and from specialist volunteer group surveys. It does not represent a definitive list of species that occur in the local area, and the absence of records does not necessarily imply absence of such species.

Bat surveys

- 5.32 The two automated bat detectors deployed in August did not record due to an unknown fault. Despite this, the minor loss of data on the August deployment would not have affected the results. This is because there has been an intensive survey effort for a Site of this value to bats, where (in the absence of lesser horseshoe roosts within 3km of the Site) “seasonal” surveys would have normally been considered appropriate.

Bird surveys

- 5.33 The breeding bird surveys were conducted outside of the optimal survey period in 2019. Experienced bird surveyors were present on Site throughout Spring, Summer and Autumn 2020 and no evidence (from sight and call) of breeding birds outside of the species assemblage outlined above were noted. The dates of the breeding bird surveys are therefore not considered a limitation for this reason.

Great Crested Newt Surveys

- 5.34 Three separate eDNA samples were obtained for P2. Each were returned as indeterminate. Surveyors were experienced in using the technique and therefore surveyor error is deemed unlikely to have caused an indeterminate result on three separate occasions. Results from analysis indicated an unusual water chemistry (possibly as a result of the Site’s industrial heritage), which is assumed to have caused the indeterminate result. The shallow, clear nature of P2 and the fact

that palmate newts were easily observed using standard methods indicate that GCN were not present. The indeterminate eDNA results from P2 are therefore not considered a significant limitation.

6.0 RESULTS

Desk study

Statutory designated sites of nature conservation interest

- 6.1 One international statutory designated Site, Cwm Cadlan a Special Area of Conservation, was found within 10km of the Site boundary. One national statutory designated Site, Cwm gloa glyndyrys SSSI, was found within 2km of the Site boundary. Both sites are described in *Table 7* and shown in *Figure 1*.

Table 7: Statutory site

Site Name	Site Reference	Proximity to Site (approximate)	Description
Cwm Glo A Glyndyrys SSSI	SO 040052	1.9km South-west	The SSSI has an area of 203.1ha and was designated for its extensive areas of marshy grassland, species-rich neutral grassland and acid grassland. Also, of interest due to the large diversity of fungi including 32 species of waxcap species.
Cwm Cadlan SAC	UK 0013585	9.3km North-west	The Site has an area of 84.2km and is primarily designated for its selection of Annex I habitats consisting of Molinia meadows on calcareous, peaty or clayey-silt-laden soils and Alkaline ferns.

Non-statutory sites of nature conservation interest

- 6.2 Three local non-statutory designated sites, identified as Sites of Importance for Nature Conservation (SINC), were located within 1km of the Site boundary and are detailed in *Table 8* and presented in *Figure 2*.

Table 8: Non-statutory sites

Site Name	Site Reference	Proximity to Site (approximate)	Description
Glynmil SINC	SO00NE/5	800m South-east	This site was designated for its mosaic of semi-upland valley habitats comprised of mainly acid grasslands with some areas of marshy grassland, acid flush, dry heath, bracken slopes and scrub. Areas of ancient semi-natural oak woodland and Carr woodland are also located on Site.
Merthyr Common Central SINC	SO00NE/4	440m East	The SINC is designated for its large area of common land comprising a range of habitats including marshy and acidic grasslands, dry heath, acid flush and wet heaths supporting a population of Great Crested Newt are present. Other species of interest include floating bur-reed, shore weed, grayling butterfly, scarce blue-tailed damselfly, and a range of breeding birds including snipe and curlew.
Merthyr Common South SINC	SO00SE/5	800m South-east	The Site comprises of an extensive upland and semi-upland common along a hill of ridge between two rivers. The mosaic of habitats includes marshy grassland, acid grassland, wet heath, dry heath and bracken slopes. There are also areas of acid flushes, broad leaved woodland and gorse scrub. The Site is important for ground nesting birds along with Peregrine falcon on the high cliffs to the south.

Protected rare and otherwise notable species

- 6.3 All WCA, EPS and Nationally Rare species as defined in *Paragraph 5.4* are presented below in *Table 9* and *Figure 2*. For reference, other notable species found within 2km of the Site boundary are listed in *Appendix B*.

Table 9: Species records

Species	Conservation Status	Total Number of Records within 2km	Location / Minimum distance of records from Site boundary
Mammals - bats			
Common Pipistrelle	EPS, WCA Sch5	6	5 records with nearest being 300m north-west 1 bat roost 1.2km west
Long-eared species	EPS, WCA Sch5	3	2 records with nearest being 1.2m south-west 1 bat roost 1km west
Noctule	EPS, WCA Sch5	2	Nearest record 1.1km West
Pipistrelle species	EPS, WCA Sch5	6	4 records with nearest being 300m North-West 2 bat roosts with the nearest 1.1km west
Serotine	EPS, WCA Sch5	1	1.1km north-west
Soprano pipistrelle	EPS, WCA Sch5	3	Nearest record 1km west
Unidentified bat species	EPS, WCA Sch5	2	1.3km west 1 bat roost 1.1km west

Status Key: EPS = European Protected Species. WCA = Wildlife and Countryside Act 1981 (as amended). Sch5 = Schedule 5 of WCA, Sch1 Schedule 1 of the Wildlife and Countryside Act, 1981.

Field survey

Habitats and flora

- 6.4 The grassland on Site was observed to be transitional. Large areas of internal grassland were characterised by bare ground and substrate with vegetation becoming established. Moving away from these areas the sward typically became more established and densely vegetated. Moving further outwards again, established swards were present on the peripheries of the plateau. None of the substrate within the Site appeared to be prohibiting establishment due to contamination etc. Rather, the more sparsely vegetated areas appeared to be behind the more established swards in developmental terms due to varying degrees of exposed rocks and gravel.

Open Mosaic Habitat

- 6.5 The Site qualifies as 'Open Mosaic Habitat on Previously Developed Land' (OMH) – a Section 7 Priority Habitat as specified under the Environment (Wales) Act 2016. OMH can be classified according to the following criteria²¹:
- The area of open mosaic habitat is at least 0.25ha in size.
 - Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials/substrates such as industrial spoil may have been added.

²¹ JNCC (2010). UK Biodiversity Action Plan Priority Habitat Descriptions Open Mosaic Habitats on Previously Developed Land. Available at: <http://jncc.defra.gov.uk/page-5706> (Accessed: 01.10.2020).

- c) The site contains some vegetation. This will comprise early successional communities consisting mainly of stress-tolerant species (e.g. indicative of low nutrient status or drought). Early successional communities are composed of (a) annuals, or (b) mosses/liverworts, or (c) lichens, or (d) ruderals, or (e) inundation species, or (f) open grassland, or (g) flower-rich grassland, or (h) heathland.
- d) The site contains unvegetated, loose bare substrate and pools may be present.
- e) The site shows spatial variation, forming a mosaic of one or more of the early successional communities (a)–(h) above (criterion 3) plus bare substrate, within 0.25ha.

6.6 The Site fulfils each of these criteria.

Grassland NVC Results

6.7 Based on these observations the grassland on site was divided into five distinct habitat types and subject to NVC surveys and condition assessments, the results of which are provided in Appendix G. NVC quadrat locations are given in *Figure 5* (Quadrat Location Plan), with the species recorded provided in Appendix B. The five areas can be broadly entitled as follows:

- Habitat 1: Marshy grassland;
- Habitat 2: Calcareous grassland 1 (early establishment, sparsely vegetated swards, relatively high % cover of bare ground/substrate);
- Habitat 3: Mesotrophic grassland 1 (successional sward, more developed than Habitat 2, but not as established as Habitat 4);
- Habitat 4: Mesotrophic grassland 2 (established sward); and
- Habitat 5: Calcareous grassland 2 (established sward with calcareous indicators).

6.8 Habitat 1 was located in the north west of the Site. The area was characterised by large percentages of rush *Juncus* sp. It was wet in nature for most of the year and was observed to be retaining moisture, though not standing water, throughout the summer of 2020. Species present within the sward included soft rush *Juncus effusus*, many stemmed spike rush *Eleocharis multicaulis*, black sedge *Carex nigra* and tussocks of tufted hair grass *Deschampsia cespitosa*. Herbs included frequent meadow *Ranunculus acris* and creeping buttercup *Ranunculus repens*, marsh bedstraw *Galium palustre* and lesser spearwort *Ranunculus flammula*. Occasional southern marsh orchids *Dactylorhiza praetermissa* were also present in the early summer.

6.9 Habitat 1 was undoubtedly marshy grassland (rush pasture) in nature. The NVC analysis however showed no strong affinity with any particular NVC community. The closest match provided a goodness of fit measure of 31 (very poor) with MG8b *Cynosurus cristatus*–*Carex panicea*–*Caltha palustris* grassland. However, this is undoubtedly a result of the poor affinity to any particular community. The second closest fit was to community M23 *Juncus effusus*/acutiflorus–*Galium palustre* rush-pasture. This fits more to the habitat observed on Site. However, the mean goodness-of-fit to M23 was only 28, so Habitat 1 was very poorly matched to this community.

6.10 Habitat 2 was present on the barest ground within the central plateau, sometimes up to 75% total ground cover. Calcareous grassland indicator species were noted to be colonising these areas. Presumably due to the chemistry of the substrate in certain areas of the Site. Grasses were limited and included red *Festuca rubra* (agg.) and sheep *Festuca ovina* fescues and occasional sporadic

patches of cock's-foot *Dactylis glomerata* and false oat grass *Arrhenatherum elatius*. Herbs included blue fleabane *Erigeron acris*, fairy flax *Linum catharticum*, rough hawkbit *Leontodon hispidus* and mouse-ear hawkweed *Pilosella officinarum*. A hawkweed *Heiracium* sp. was recorded to be common throughout the sparsely vegetated grassland. A review of literature²² has narrowed this to *Hieracium breviglandulosum*, though this has not been corroborated with an external source. *H. breviglandulosum* is noted to be present within VC42 and in Britain is least concern in terms of its IUCN conservation status.

- 6.11 Habitat 2 had a very poor match to NVC community CG1f *Festuca ovina*–*Carlina vulgaris* grassland (Goodness-of-Fit 47). Further, the condition assessment indicates that whilst Habitat 2 does meet requirements to be classified as species-rich grassland; it does not qualify as a priority habitat.
- 6.12 Habitat 3 formed the intermediate successional sward falling between Habitats 2 and 4 in terms of development. The sward therefore also fell between these two habitats in terms of composition. The cover of bare ground was relatively less than observed within Habitat 2, and was no more than 25% of total cover. Grasses included red fescue, common bent *Agrostis capillaris*, crested dog's-tail *Cynosurus cristatus*, cocks-foot and false-oat grass. Amongst the herbs, oxeye daisy *Leucanthemum vulgare*, red clover *Trifolium pratense*, rough hawkbit, mouse-ear hawkweed, fairy flax and bird's-foot trefoil *Lotus corniculatus* were all commonly recorded.
- 6.13 Habitat 3 had a very poor match to NVC community MG5a *Cynosurus cristatus*–*Centaurea - Lathyrus pratensis* with a goodness-of-fit of 44. This was closely followed by MG5 *Cynosurus cristatus*–*Centaurea* and MG5b *Cynosurus cristatus*–*Centaurea - Galium verum* both with a very poor goodness-of-fit measure of 42.
- 6.14 Habitat 4 was observed to form the most established grassland on site. Habitat 4 was restricted more towards the peripheries of the Site. Bare ground was sparse. In one NVC quadrat bare ground was noted to be no more than 4% of ground cover. In the two other NVC quadrats surveyed no bare ground was recorded. Crested dog's-tail, red fescue and Yorkshire fog *Holcus lanatus* were the most commonly recorded grasses. Herbs included common knapweed *Centaurea nigra*, red clover, bird's-foot trefoil and ribwort plantain *Plantago lanceolata*.
- 6.15 Habitat 4 had a good match (goodness-of-fit 71) to NVC community MG5a *Cynosurus cristatus*–*Centaurea nigra - Lathyrus pratensis*. Habitat 4 matched the criteria for species-rich grassland. Habitat 4 also reached the criteria for Priority Habitat. However, is considered poor condition on account of the relatively high percentages of undesirable species recorded within the sward.
- 6.16 Habitat 5 was well established, akin to Habitat 4 in terms of development. It was notable for an obvious localised presence of quaking grass *Briza media*, a species that was absent elsewhere on the Site. Other grasses included heath grass *Danthonia decumbens*, crested dog's-tail and red fescue. Herbs included rough hawkbit, fair flax, bird's-foot trefoil, mouse-ear hawkweed, common knapweed and black medic *Medicago lupulina*.
- 6.17 Habitat 5 had a poor match to NVC community CG3c *Bromus erectus*- *Knautia arvensis*-*Bellis perennis*, with a goodness-of-fit measure of 51. Habitat 5 neither met the criteria for species-rich grassland or a Priority Habitat.

²² McCosh, d.J. & Rich, T. C. G. (2018). Atlas of British and Irish Hawkweeds (*Pilosella* Hill and *Heiracium* L.). Second edition. Botanical Society of Britain and Ireland. Bristol.

- 6.18 In summary, excepting Habitat 4, all data for the remaining 4 habitats surveyed (Habitats 1, 2, 3, 5) provided poor or very poor matches to any particular NVC community. Habitat 4 was the only habitat considered to meet Priority Habitat status, though its condition was noted to be poor.

Woodland

- 6.19 Located primarily on the boundaries of the Site were stands of broadleaved woodland. Principally this was formed by plantation woodland, which has presumably been planted historically to screen the Site from adjacent roads and the settlement of Merthyr Tydfil.
- 6.20 The plantation woodland comprised dense stands of mixed species composition (upwards of 18 woody species in some cases), which included both native and ornamental trees. Canopy species included Ash *Fraxinus excelsior*, Norway maple *Acer platanoides*, aspen *Populus tremula*, Italian alder *Alnus cordata* and Red oak *Quercus rubra*. Understorey planting was also present in the form of species such as guelder rose *Viburnum opulus*, dogwood *Cornus sanguinea* and Osier *Salix viminalis*. Structural form aside, the plantation woodland provided limited habitat value. It was densely planted, to such an extent that canopy trees were crowded and therefore unlikely to reach full growing potential. The density of planting had also prevented the majority of light reaching the ground; therefore, a shrub and ground layer was largely absent.
- 6.21 A small stand of semi-natural broadleaved woodland had established in the east of the Site between two stands of plantation woodland. This semi-natural woodland was essentially a more developed stand of scrub trees (see descriptions of scrub below) rather than true broadleaved woodland. Nevertheless, the biodiversity value of such habitat is high. The broadleaved woodland was dominated by willow *Salix caprea* and *Salix cinerea*. Given the open canopy nature of these species' a shrub and ground layer (albeit limited in diversity) had been allowed to develop. Primarily this was characterised by wet tolerant species (the woodland stood in a depression) such as bramble *Rubus fruticosus*, tall fescue *Schedonorus arundinaceus*, soft rush *Juncus effusus* and willowherbs *Epilobium* sp.

Scrub - scattered

- 6.22 Scattered scrub encroached into the bare ground and grassland forming the plateau which occupied the vast majority of the Site. Dense stands were establishing closer to the peripheries where the grassland was also more established. Whilst in the barer areas of the plateau the scrub was sparse and scattered.
- 6.23 Scrub was formed principally from European gorse *Ulex europeaus*, willow, silver birch *Betula pendula* and downy birch *Betula pubescens*. Given the bare nature of much of the substrate, the presence of typical pioneer species such as these would be expected.
- 6.24 The presence of non-native, invasive species was also noted interspersed with the "native" scrub. This included occasional Japanese rose *Rosa rugosa* and cotoneaster *Cotoneaster* spp.

Watercourses and ditches

- 6.25 Pockets of ephemeral standing water were present on site, especially during winter and spring. These were largely restricted to the marshy grassland in the north west of the Site, and a ditch running north/south parallel to the eastern boundary of the Site, along the eastern edge of the plateau.

- 6.26 Engineered ditches and watercourses were also noted. A fast-flowing watercourse was present on the north and west boundaries of the Site. This was channelled from offsite, below the A4060, and flowed west and then south. The watercourse was noted to be in flow during all survey occasions except for during the final bat survey in October 2020. Presumably, the offsite source had been shut down at this time. It was assumed that the watercourse was an industrial outflow and no aquatic vegetation was recorded in the stream.
- 6.27 Ditches were present across the Site. Largely these were dry, except for occasional areas of standing water during wetter times of the year. One exception was a short section of ditch which connected to the aforementioned watercourse in the north of the Site. This held at least some water throughout the year, though the volume was much decreased in late summer. Species present throughout the wetter sections of ditch included common reed mace *Typha latifolia*, false watercress *Apium nodiflorum*, greater willowherb *Epilobium hirsutum*, soft and hard rush *Juncus inflexus*. Adjacent to the ditches were wet tolerant species such as sneezewort *Achillea ptarmica*, ragged robin *Lychnis flos-cuculi* and orchids, both southern marsh *Dactylorhiza majalis praetermissa* and early marsh *Dactylorhiza majalis*.
- 6.28 Dense stands of Japanese knotweed *Reynoutria japonica* were recorded on site, primarily associated with the engineered drainage features (see separate FPCR Japanese Knotweed report for further details and recommendations).

Field survey

Fauna

Badger

- 6.29 Although habitat suitable for the presence of or occupation by badgers was present within the application boundary in the form of broadleaved woodland, scrub and grassland, no evidence indicating the presence or occupation of the application Site by badgers was recorded during the survey.

Bats

- 6.30 Records of common pipistrelle, long-eared species, noctule, pipistrelle species, serotine, soprano pipistrelle and unidentified bat species were returned within 2km of the Site by SEWBRcC. There were no Annex II species recorded within the standard 2km search area, but a roost was noted c.3km from the Site.

Manual Activity Survey

- 6.31 A table of the full results for each of the manual bat activity surveys undertaken is provided in *Appendix E* and illustrated at *Figures 8-15*. A summary of survey results is provided in *Table 10* below.

Table 10: Manual bat activity survey summary

Survey Occasion	Number of bat contacts (including point counts)	Species recorded (in order of abundance)	Summary of activity
6 th April 2020	54	Common pipistrelle, <i>Myotis</i> sp., <i>noctule</i> , <i>Plecotus</i> sp., serotine, soprano pipistrelle.	Activity was recorded across the whole Site. Common pipistrelle, soprano pipistrelle, <i>Plecotus</i> sp. and <i>Myotis</i> sp. were all recorded foraging,
19 th May 2020	16	Common pipistrelle, <i>Plecotus</i> sp.	Relatively low activity was recorded, primarily focused in the Site's north and north eastern corner following the semi-improved grassland and broadleaved woodland plantation.
9 th June 2020	20	Common pipistrelle, <i>noctule</i> , <i>Plecotus</i> sp.	Activity was recorded along the Sites boundary habitats mostly focused in the north and north eastern corner of the Site. Social behaviour was recorded for common pipistrelle.
29 th July 2020	20	Common pipistrelle, <i>noctule</i> .	Activity during this survey was recorded across the Site with higher numbers recorded along the Sites western boundary. Common pipistrelle was recorded commuting through the south of the Site as well as foraging in the broadleaved woodland plantation.
20 th August 2020	11	Common pipistrelle	Relatively low levels of activity were recorded during this survey with common pipistrelle being the only species recorded on Site, primarily restricted to the north and north eastern boundary habitats.
17 th September 2020	35	Common pipistrelle, nathusius pipistrelle,	Higher levels of bat activity were recorded during this survey, with

Survey Occasion	Number of bat contacts (including point counts)	Species recorded (in order of abundance)	Summary of activity
		soprano pipistrelle, <i>Myotis</i> sp.	most contacts recorded along the north, east and south Site boundary. One nathusius pipistrelle was recorded within the centre of the Site. Social and foraging behaviour was recorded for common pipistrelle as well as foraging for soprano pipistrelle. <i>Plecotus</i> sp. and common pipistrelle were recorded commuting.
18 th September 2020	8	Common pipistrelle, soprano pipistrelle, unknown bat species	Very low bat activity was recorded during this survey. Common and soprano pipistrelle were both recorded commuting along the north eastern corner of the Site.
14 th October 2020	12	Common pipistrelle, soprano pipistrelle, pipistrelle species.	Low bat activity was recorded during this survey mostly concentrated along the western boundary of the Site. The predominant species recorded was common pipistrelle, with just one record soprano pipistrelle in the north western corner of the Site.

Static (Passive) Activity Survey

- 6.32 The following details the results of static monitoring of bat activity in 2020 with *Appendix F* showing a full table of results including peak counts, average bat passes per hour and total registrations. *Figure 16* shows the locations of all units.
- 6.33 Overall, during the surveys, a total of ten bat species/species groups were recorded including (in order of abundance); common pipistrelle (85.3%), soprano pipistrelle (7.4%), Nathusius' pipistrelle (2.5%), *Myotis* sp. (2.1%), *Pipistrellus* sp. (1.1%) and *Plecotus* sp., noctule, *Nyctalus* sp, lesser horseshoe and serotine making up <1% each.
- 6.34 The unit with the highest assemblage of species was July Unit 1 which recorded eight species/species groups and was located in the south eastern corner of the Site at the edge of the broadleaved woodland plantation, semi-improved calcareous grassland and scrub. The highest level of activity was recorded on April Unit 2 on the upper eastern boundary of the Site along the edge of the broadleaved woodland plantation and watercourse bordering semi-improved grassland

and scrub, 2122 registrations were recorded, 1906 of which were common pipistrelle. The second highest activity levels were present at Unit 2 in September which was located centrally on site and positioned at the edge of an area of broadleaved woodland plantation and there were a total of 971 registrations, 801 of which were also common pipistrelle. The lowest activity levels were recorded on June Unit 2 which was located amongst the broadleaved woodland plantation of the lower eastern boundary of the Site and recorded just 95 registrations which again was dominated by common pipistrelle by 73 registrations. June Unit 2 also recorded the lowest assemblage with only five species/species groups recorded, along with April Unit 1, April Unit 2, May Unit 1, July Unit 2 and September Unit 1 (See *Figure 16*). The second lowest activity levels were present at Unit 1 in April with 158 registrations, 131 of which were again common pipistrelle.

- 6.35 Lesser horseshoe was the only notable species recorded across the 2020 survey period. This Annex II species was recorded at two units, July Unit 1 and October Unit 2, both recording just one registration over the survey period. As mentioned previously, July Unit 1 was located on southern corner of the Site at the north eastern edge of the broadleaved woodland plantation. October Unit 2 was placed centrally on the northern boundary of the Site along the broadleaved woodland plantation and watercourse.

Breeding Bird Survey (BBS)

- 6.36 No protected bird species were identified following consultation with SEWBRc within 2km of the survey area.
- 6.37 The Site provides suitable habitat for breeding birds in the form of broadleaved woodland, riparian habitat, scrub, semi-improved grassland and marshy grassland.
- 6.38 A total of 24 bird species were recorded during the two BBS. Full results of the surveys are detailed in Appendix D. Of the 24 bird species which were recorded, six of them were considered notable (BoCC red/Amber list, NERC S41, LBAP or WCA Schedule 1), listed below in *Table 11* below. The location of territories / individual birds (depending on breeding status) is mapped and presented in the BBS plan (*Figure 17*).

Table 11: Protected and/or notable bird species recorded during breeding bird surveys as well as breeding non-protected species.

Species	Scientific Name	Survey 1	Survey 2	Conservation Status	Breeding Status on Site	County Status according to the Glamorgan Bird Report 2018
Bullfinch	<i>Pyrrhula pyrrhula</i>	1	1	Amber List NERC	Possible breeder	Common resident breeder
Dunnock	<i>Prunella modularis</i>	0	3	NERC	Possible breeder	Common resident breeder
Herring gull	<i>Larus argentatus</i>	24	12	Red List NERC	Non breeder	Common resident breeder
Meadow pipit	<i>Anthus pratensis</i>	3	3	Amber List	Possible breeder	Common resident breeder

Species	Scientific Name	Survey 1	Survey 2	Conservation Status	Breeding Status on Site	County Status according to the Glamorgan Bird Report 2018
Peregrine falcon	<i>Falco peregrinus</i>	4	0	WCA Sch1	Non-breeder	Locally common resident breeder that continues to suffer persecution
Song thrush	<i>Turdus philomelos</i>	0	1	NERC	Possible breeder	Common resident breeder

Scoping Wintering Bird Survey (WBS)

- 6.39 A total of 26 bird species were recorded during the wintering bird survey, with a total of nine being recorded as notable species, listed in *Table 12* below. The locations and conservation status for each one is presented in the WBS plan (*Figure 18*).

Table 12: WCA Schedule 1, NERC S41, and BoCC red and amber listed bird species recorded in the 2020 wintering season.

Species		Scientific Name	Survey	Conservation Status	
Dunnock		<i>Prunella modularis</i>	3	Amber List NERC	Common resident breeder
Herring gull		<i>Larus argentatus</i>	1	Red List NERC	Common resident breeder
House sparrow		<i>Passer domesticus</i>	1	Red List NERC	Common resident breeder
Lesser black-backed gull		<i>Larus fuscus</i>	15	Amber List	Common resident breeder, passage migrant and winter visitor, breeder on flat holm and on rooftops mainly in Cardiff city centre, but occasionally inland
Mistle thrush		<i>Turdus viscivorus</i>	3	Amber List	Common resident breeder
Peregrine falcon		<i>Falco peregrinus</i>	2	WCA Sch1	Locally common resident breeder that continues to suffer persecution
Redshank		<i>Tringa totanus</i>	1	Amber List	Scarce and declining resident breeder at coastal sites, though common winter visitor and passage migrant.
Redwing		<i>Turdus iliacus</i>	12	Red List WCA Sch1	Common winter visitor and passage migrant
Song thrush		<i>Turdus philomelos</i>	3	Red List NERC	Common resident breeder

Great Crested Newt (GCN)

- 6.40 Consultation with SEWBRc did not return any GCN records within 2km of the Site.
- 6.41 A total of twelve waterbodies were located within 500m of the Site boundary (*Figure 5*), two of which were on site (P1 and P2). The waterbodies on site consisted of P1, an area of marshy grassland with standing water, and P2, a drainage ditch with standing water. The open nature of pond P1 and drainage ditch P2 on site has resulted in a substantial amount of aquatic and marginal vegetation. However, both waterbodies are very shallow in size and the water is patchily distributed providing less suitable habitat for GCN breeding requirements.
- 6.42 An HSI was conducted on the two waterbodies, the results of which are in *Table 13*. The two waterbodies on site were found to be suitable to support GCN. The remaining waterbodies that were all located off site were all separated from the Site by physical barriers including dual carriageway A4060, A4102 and Goat Mill Road and were subsequently excluded from surveys.
- 6.43 P1 and P2 were eDNA tested. P1 results were returned as negative. P2 results were returned as indeterminate. No great crested newt DNA was identified within the three separate samples obtained from P2; however, on each occasion the sample was classified as indeterminate rather than negative. ADAS testing centre stated that the three indeterminate test results were unusual and suggested water chemistry was the cause.
- 6.44 On each occasion both P1 and P2 were searched for GCN using two standard methods, namely egg searches and torch surveys. No evidence of GCN were observed from either of these methods, however palmate newts *Lissotriton helveticus* were observed in P2.

Table 13: HSI assessment results

Ref	Waterbody description	HSI Score & GCN suitability
1	 The ephemeral waterbody was located in the marshy grassland and had a very low water level but was vast, measuring 20m by 20m. Aquatic and terrestrial vegetation encroached the waterbody.	0.79 Good
2	 The ephemeral waterbody functioned as a drainage ditch for the bordering river and measured 40m by 2m. The water quality was moderate and terrestrial habitat was good. Aquatic vegetation was present in the majority of the waterbody.	0.55 Average

Reptiles

- 6.45 Consultation with SEWBRc provided no records of the common reptile species (slow worm) within the surrounding 2km survey area.
- 6.46 No reptiles or sloughed skins were observed during the Phase 1 survey. The survey identified optimal reptile habitat with the Site mostly consisting of semi-improved grassland, semi-improved calcareous grassland, marshy grassland and scattered scrub. Areas of scrubby understory encroached the eastern border of the bank also offering good refuge for reptiles, creating a mosaic of relatively suitable habitats for basking, foraging and sheltering.
- 6.47 No reptiles were found throughout the survey period (*Table 14*). This shows that the Site supports a negligible reptile population.

Table 14: Reptile survey results

Visit Number	Date	Weather	Species Recorded
1	19 th May 2020	Temp: 16°C; Cloud: 10-20%; Wind: 1-2; Conditions: Clear, bright, sunny; Time: 18:30	No reptiles found. Common toad
2	28 th May 2020	Temp: 19°C; Cloud: 0-10%; Wind: 1-2; Conditions: Clear, bright, sunny; Time: 16:30	No reptiles found.
3	2 nd June 2020	Temp: 16°C; Cloud: 0-10%; Wind: 1-2; Conditions: Clear, bright, sunny; Time: 08:13	No reptiles found.
4	12 th June 2020	Temp: 13°C; Cloud: 60-70%; Wind: 3-4; Conditions: Bright, sunny, post rain; Time: 07:30	No reptiles found.
5	15 th June 2020	Temp: 18°C; Cloud: 30-40%; Wind: 2-3; Conditions: Clear, bright, sunny; Time: 10:30	No reptiles found.
6	22 nd June 2020	Temp: 19°C; Cloud: 70-80%; Wind: 2-3; Conditions: Clear, bright, sunny; Time: 14:01	No reptiles found. Common toad
7	1 st July 2020	Temp: 16°C; Cloud: 30-40%; Wind: 3-4; Conditions: Clear, bright, sunny; Time: 18:12	No reptiles found. Common toad

Invertebrates

- 6.48 A detailed assessment of the invertebrate interest at the Site was conducted by an experienced independent invertebrate specialist during 2020. The results of this assessment are reported in Appendix H.

7.0 DISCUSSION

- 7.1 The following text discusses the implications of the proposals in relations to the findings of the ecological surveys conducted across the Site. Expected impacts are described where appropriate. Following this, recommendations and methods for mitigating impacts during the construction and operation phases of the proposals are given.
- 7.2 Recommendations include the designation of an Ecological Clerk of Works (ECoW) to assist with all ecological matters as the scheme progresses.

Ecological Clerk of Works - Role

- 7.3 A suitably qualified Ecological Clerk of Works (ECoW) will be designated to be responsible and the main point of contact for ensuring matters in relation to all habitat prescriptions and legally protected species are properly dealt with during the pre-construction and construction phases.
- 7.4 The role of the ECoW has clearly been defined for each of the sub-sections of the discussion below. So too is the evidence of where and how mitigation and enhancements may be achieved. To this end, where appropriate, recommendations for Construction Methods, Mitigation and Compensation and Enhancements have been separated into separate sub-sections.

- 7.5 The management prescriptions discussed below should be secured in the long term via Condition of any future planning permission, through inclusion within an appropriate Landscape and Ecological Management Plan (LEMP).

Protected Sites

Statutory Protected Sites

- 7.6 Two statutory designated sites were located within the respective search areas of 10km for international and 2km for nationally designated sites. Both sites were primarily designated for their extensive selection of protected habitats. The Cwm Glo A Glyndyrys SSSI was found 1.9km southwest of the Site and the Cwm Cadlan SAC was located 9.3km northwest. On the basis of their reason for designation, as well as their significant distance from the Site, it is determined that the proposed industrial development will have no significant negative effect on the surrounding statutory designated sites.

Non-statutory Protected Sites

- 7.7 There are three non-statutory designated sites located within 2km of the survey area, all of which were SINCs primarily designated for their heath and grassland habitats. The most likely potential effect of the proposed development on the Site is physical impacts, such as increased waste and water. All physical impacts are expected to be dealt with on site once operational and subsequently no offsite impacts are anticipated. Given that the non-statutory protected sites are not connected to the proposed development site, with the nearest being 440m east, the impact on any single protected site will likely be negligible.

Habitats

- 7.8 The Site as described in the Results section above and discussed below was formed from a mosaic of grassland swards of varying stages of establishment; small patches of sparsely vegetated substrate (rock and stone); and pockets of scrub. It qualifies as OMH. OMH can be considered locally common in Merthyr Tydfil, with some 153ha of Mineral Spoil habitat recorded throughout the area²³.
- 7.9 The plantation woodland forming much of the external boundaries of the Site, while valuable as structural habitat was relatively low value ecologically. This was largely due to the ornamental nature of many of the trees contained within.
- 7.10 Of the Site's c.22ha it is proposed that c.10ha will be lost to development. Of the developable area it has been calculated that c.0.6ha or 5.93% is currently formed by scrub. Scrub forms c.0.64ha or 2.84% of the total site area, so is concentrated within the land proposed to be lost to development.
- 7.11 The OMH nature of the Site appears to be losing out to successional grassland and scrub encroachment. In time it is expected that permanent grassland and scrub would form the "climax" communities on site.
- 7.12 The transition from OMH to grassland and scrub dominated habitat is being accelerated by current management, or more specifically lack of management. Gorse *Ulex europaeus* is present within the central plateau. The presence of this nitrogen fixing legume is enriching the substrate where it

²³ Merthyr Tydfil Biodiversity Partnership (No Date). The Merthyr Tydfil Biodiversity Action Plan 2014-2019. Wales Biodiversity Partnership.

is growing enabling the growth of other plants. This is evident by the localised denser grassland found adjacent to the pockets of scrub located on the plateau, where otherwise the vegetation would be expected to be sparser.

- 7.13 Similarly, the most densely vegetated grasslands were located on the boundaries of the Site. Anecdotally it was noted that these areas were the most used areas for dog walking. Despite the Site being privately owned, it was open access and during all surveys of the Site during daylight hours, dog walkers were observed. It would follow that the more established grasslands in these areas are being facilitated by nutrient enrichment from the urine and faeces of visiting dogs.
- 7.14 Despite the presence of calcareous indicator species, the grasslands on site were of a relatively poor baseline condition. None, apart from Habitat 4 matched strongly with any particular NVC community.
- 7.15 As indicated above, the grasslands on site were observed to be at varying stages in terms of their development. Habitat 4, the most diverse and well-established grassland appeared to be the “climax” grassland on site. Areas characterised by Habitats 2,3 and to a large extent 5 simply appeared to be behind Habitat 4 in terms of their development and species-richness.
- 7.16 As discussed above, Habitat 4 did meet the criteria to be deemed species rich grassland. It also met the criteria to be deemed a Priority Habitat, however it fell under the category of Poor condition on account the cover of undesirable species recorded.
- 7.17 Protected species surveys are discussed further below. However, to briefly summarise, the Site was deemed to be no more than low to moderate value for common and widespread bat species; the bird assemblage comprised common and widespread species; no evidence of great crested newts on site were noted; no reptiles were recorded; and the Site was considered of Low to Local importance for its invertebrate assemblage.
- 7.18 Consequently, the Site is not a good example of OMH. Recreational use, scrub encroachment, invasive species (of note dense stands of Japanese knotweed), and a lack of management have resulted in a relatively Low baseline habitat value. This assertion is enforced by the results of both the habitat and protected species surveys conducted across the Site. Given the Site's current condition, usage and lack of management, it is considered that this value will only deteriorate in time.

Calaminarian Grassland

- 7.19 In addition to the presence of OMH, consideration was given as to whether habitats on the Site qualified as calaminarian grassland. Neither of the two vascular plants which are key Welsh indicator species, sea campion *Silene maritima* or sheep's-bit *Jasione montana* were recorded on site. Further, species recorded on site common to calaminarian grassland in the rest of Britain were limited; specifically, to sheep's fescue *Festuca ovina* and common bent *Agrostis capillaris*. However, these are both relatively common and widespread species, typical of less improved grasslands, i.e. they are not just restricted to calaminarian grassland.
- 7.20 No metallophyte species typical of calaminarian grasslands were recorded on site. Further, whilst many of the areas of ground were sparsely vegetated, they appeared to be following the establishment of the more vegetated areas of the Site – no areas of ground appeared to be prohibiting succession due to contamination. However, the variation in substrate present (size of material, soil depth (if any) etc.) will certainly be inhibiting vegetation growth in places. In most

areas the grassland across the Site was observed to be transitional. Some areas were sparsely vegetated and these areas graduated into more densely vegetated, established swards. It has therefore been determined that the more sparsely vegetated areas are simply less developed in comparison to the denser swards in terms of their establishment.

- 7.21 Calaminarian grassland is therefore not considered to be present on site and is therefore not considered a constraint to the proposals.

OMH Mitigation

- 7.22 There is no defined metric for the calculation of OMH replacement. Recommendations outlined below for habitat mitigation on site are therefore based on the following reasoning:

- Brownfield sites and sites with industrial heritage are locally common in the Merthyr Tydfil area. The Site is therefore not rare in terms of the habitat or opportunities that it provides locally.
- The condition of the habitat present on site are relatively low. No Nationally or Locally rare habitats were identified on site.
- The baseline condition of the Site and the assemblage of species (both botanical and faunal) that it supports are relatively low.
- The Site appears to be deteriorating in condition. Scrub is establishing across the central plateau. Grassland swards have established on the boundaries of the Site and appear to be establishing throughout the more central areas of the plateau.

- 7.23 C.10ha of land is proposed for loss to development. The bulk of this developable area is formed by OMH. It is proposed that three areas (north and south of the developable area respectively) of OMH will be retained and enhanced as part of the proposals. In total these three areas will retain c.1.7ha of OMH (two areas in the north (c.0.45ha and 0.25ha) and c.1ha in the south). Whilst being smaller in area to that which is being lost, the retained areas will be managed such that their condition will be maintained in the long term. This is something that can not be assured with the current land use/management of the Site.

- 7.24 The following points outline proposed habitat mitigation, see *Figure 19* for proposed mitigation areas:

- The plantation woodland on the outer boundaries of the Site will be retained.
 - Trees within the retained woodland will be selectively thinned to promote the development of the woodland and to allow individual trees to reach maturity.
 - Wood produced from tree management will be retained on site as habitat piles.
- The established grassland adjacent to the boundary woodland will also be retained and will form a functional link to the areas of retained OMH in the north and south of the Site.
- Areas both north and south of the proposed development will be retained and managed as OMH.
- Scrub will be managed in the retained OMH areas to prevent encroachment and succession.
- Small volumes of cut surface material taken from the development footprint will be spread in the retained OMH areas.

- In order to carry the existing seedbank diversity across to the retained areas substrate from Habitats 2, 3 and 4 will be spread in separate patches.
- Substrate will be spread in patches and not uniformly be laid across the entire areas in order to maintain the habitat mosaic.
- Substrate piles will be created to provide a variation in levels; undulations will be created and flat areas be retained.
- The retained OMH areas will be subject to managed disturbance.
 - Grasslands will be rotationally cut or rotavated, but not uniformly. Cutting will always retain some areas of longer swards to ensure heterogeneity.
 - Rocky substrate and earth will be rotationally moved around the retained OMH areas to prevent total succession into grassland. The maintenance of areas of bare ground will be prioritised.
- A new surface water lagoon will be instated in the south of the Site. It will be encompassed by the southern retained area of OMH. It would be recommended that this lagoon is designed in a manner that does not preclude biodiversity.
 - The edges should be sloped in a manner which allows terrestrial animals to enter and escape.
 - Native aquatic and riparian planting should be provided to enhance the value of this feature. To ensure early establishment plants and seeds will be collected from Habitat 1 as well as from the wet ditches already present on site.

7.25 All retained areas will be fenced off prior to construction commencing to prevent harm from construction activities. The only exception to this will be the allowance of vehicles to access the mitigation areas to move the translocated substrate as discussed above. A Heras type fence following the outer edge of the working area would be sufficient to prevent harm from construction activities.

7.26 It would be recommended that each of the management recommendations described above be detailed in the LEMP, which would be conditioned as part of permission granted for the scheme. The management plan should be produced by the ECoW and submitted to the Local Authority and approved prior to the commencement of the development.

Fauna

Badger

7.27 No signs of badger were recorded on the Site and badgers are not considered a current constraint to development. Despite this, precautionary measures are provided below given the Site supports suitable habitat for badgers.

Construction Methods

7.28 Badgers are a mobile species and as such a pre-commencement badger check prior to works commencing will be conducted to search for any new evidence of activity / occupation. If, during this check signs of badger occupation are identified then the ECoW will provide further advice as to how to allow works to be conducted legally.

- 7.29 To prevent accidental harm to any badgers casually using the Site, all excavations should be covered at night, or a ramp provided to prevent them from getting trapped. This will also protect other, less notable large mammals such as fallow deer *Dama dama* and fox *Vulpes vulpes*, which may be utilising the Site.

Bats

- 7.30 A small number of common and widespread bat species records were returned following consultation with SEWBRc from within 2km of the survey area. No records of Annex II bat species were found within 2km of the Site boundary.
- 7.31 The Site was considered to be of low to moderate value to bats, with the broadleaved woodland, semi-improved grassland, semi-improved calcareous and marshy grassland, stream and hedgerows forming the highest value habitats. Greatest activity of common species was recorded centrally along the western wooded riparian corridor and along the wooded linear features that bordered the grassland habitat. Two individual records of Annex II lesser horseshoe were recorded on site, the first of which was recorded in the southern corner of the Site at the north western edge of broadleaved woodland plantation within a matrix of semi-improved grassland, semi-improved calcareous grassland and scrub. The second recording was found centrally along the edge of the wooded riparian corridor at the northern site boundary. The vast majority of woodland on site is to be retained. The majority of woodland areas will be buffered from the development by retained habitat. Primary vehicular and pedestrian access will be provided through pre-existing roads.
- No trees on site were identified as having bat roost potential and as such no further surveys are required.
- 7.32 Protection and management of woodland features can be suitably conditioned for the Site. Based on the mitigation within the proposed development the effect of the proposals is likely to be insignificant.

Construction Methods

- 7.33 During the construction phase of the proposed development, the impacts of disturbance by illumination of retained habitats and subsequent effects on foraging light sensitive species through security lighting, location of construction compounds and vehicular lighting, can be reduced through appropriate siting of construction/ security compounds, site offices etc. away from sensitive retained habitats and restriction of construction activities to normal working hours.
- 7.34 The proposed scheme borders existing developments to the north of the Site as well as main roads A4060, A4102 and Goat Mill Road surrounding the remaining boundaries. The Site's boundaries are already subject to low levels of light disturbance. It is therefore considered that moderate increases in lighting by the proposed development will not have an adverse effect on more light tolerant species.
- 7.35 For the light sensitive species, such as the Annex II greater horseshoe & lesser horseshoe, brown long-eared and *Myotis* sp., low lighting levels will be implemented around the edge of the development to protect existing habitats such as the broadleaved woodland and semi-improved grassland as well as the proposed surface water lagoon. The scheme should account for buildings facing onto or situated close to retained habitat and surface water lagoon by reducing light spill onto these areas through the use of cowls or hoods on lights. The lighting used should be no to

low UV type such as LED lamps. In areas for site access, lighting should be designed in line with guidance provided by the Institute of Lighting Engineers (2018)²⁴ in order to reduce the potential effects upon bats and other local wildlife. Lighting levels in these areas should be reduced to the lowest level achievable.

Mitigation and Compensation

- 7.36 The stream and broadleaved woodlands are to be retained in addition to areas of semi-improved grassland, and OMH. The enhancement and management of these habitats combined with the creation of a surface water lagoon will increase food resources.
- 7.37 To ensure biodiversity gains, a bat box scheme will increase roosting habitat on site comprising of a minimum of six tree mounted boxes as per the Merthyr Tydfil Natural Recovery Action Plan (2019)²⁵. These will include following, or similar:
- Schwegler 2FN bat boxes or similar, suitable for woodland species. All located on single tree within the broadleaved woodland at a unique height and orientation at least 3m from the ground.
 - Ibstock enclosed bat box 'C' or similar, which will be used by crevice dwelling species such as common pipistrelle.

Bird

- 7.38 Bird nesting habitat on site was limited to the broadleaved woodland, scrub, semi-improved grassland, semi-improved calcareous grassland and marshy grassland, with the open ground offering little nesting or foraging resource potential for birds.
- 7.39 The bird assemblage recorded on the Application Site was typical with those associated with disturbed grassland, woodland and associated edge-of-settlement habitat. NERC S41 species and/or BoCC Red or Amber list species such as bullfinch, dunnock, meadow pipit, herring gull and song thrush were observed on site during breeding season. Of these, bullfinch, dunnock, meadow pipit and song thrush can be considered possible breeders on site. Overall, the assemblage is considered to be no greater than local nature conservation value. Currently the Site is used for recreational activities, such as dog walking and off-road motor cycling, subsequently the ground is exposed to significant disturbance making it unsuitable for ground nesting birds such as meadow pipit. The proposed development would reduce visitor pressure and foot fall on the retained habitat improving its suitability for ground nesting birds.
- 7.40 No suitable habitat with the potential to support significant populations of overwintering waterfowl nor large flocks of farmland birds was present within the Application Site.
- 7.41 The majority of suitable bird vegetative nesting habitat on the Site will be retained, protected and enhanced within the proposed development (*Figure 19*), ensuring continued use of the Site by local bird populations. The calcareous semi-improved grassland and marshy grassland to be lost through the development offers little nesting resource potential for ground nesting birds due to its frequent recreational foot traffic and disturbance by dog walkers. The proposed development will restrict public access and subsequently reduce the high levels of disturbance currently experienced. Overall, the proposed mitigation and enhancement measures are predicted to have

²⁴ Institute of Lighting Professionals. (2018) Guidance Notes for the Bats and artificial lighting in the UK GN08:2018.
²⁵ Merthyr Tydfil County Council (2019) Merthyr Tydfil Nature Recovery Action Plan 2019-2024

a minor positive overall effect on ground nesting birds such as the meadow pipet, offering habitat protection and enhancement.

Construction Methods

- 7.42 Where removal of vegetation is required, it is recommended that this is carried out outside of the nesting season (March – September inclusive) as all birds are protected whilst on the nest under the Wildlife and Countryside Act 1981 (as amended). If removal outside the nesting season is not possible, all vegetation to be removed will be checked by an experienced ecologist for the presence of active nests. Should active nests be discovered, detailed advice would be provided by the supervising ecologist. Advice is likely to include a buffer zone around any located nests until all young have fledged.
- 7.43 It should be noted that no skylark was recorded on site and the possibility of the presence ground nesting birds is currently low. This should be reassessed prior if ground works is the Site is left unmanaged prior to development.

Mitigation and Compensation

- 7.44 Both the retained woodland, grassland and OMH will continue to provide foraging and nesting resources for birds. Additional habitat including the surface water lagoon will increase both food resources available on site for birds.
- 7.45 A nest box scheme will be detailed within the LEMP that will include no less than six tree mounted boxes including:
- 3S Schwegler Starling Nest Box to be installed on trees. Boxes will be oriented between north and east and be at least 3m from ground level.
 - 1B Schwegler of varying hole size to be mounted on trees. Boxes will be oriented between north and east and be at least 3m from ground level. For common hole dwelling species such as tits.

Great Crested Newt (GCN)

- 7.46 No records of GCN were found within 2km of the Site, however, Merthyr Common Central SINC did support a population of GCN. Although this SINC is located 440m east of the Site, none of the waterbodies on the SINC are within 500m of the Site boundary (See *Figure 5*). Furthermore, the Site is separated from the SINC by significant physical barriers including main road A4060 and therefore, any GCN from the SINC are not considered a constraint to proposed works. The stream following the northern and western boundaries of the Site was considered unsuitable to support GCN due to the poor aquatic habitat and fast flowing nature of the waterbody.
- 7.47 The HSI assessment found that waterbody P1 had good GCN suitability and P2 had average GCN suitability and therefore further surveys were required. No great crested newt DNA was identified within P1 or P2. Three eDNA surveys of P2 all revealed inconclusive results with evidence of degradation in the sample, thought to be due to the water chemistry because of the nature of the brownfield site. The inconclusive result is not considered a constraint due to the Site's separation from other suitable habitat in addition to the negative result from P1.
- 7.48 The remaining ten waterbodies were located within 500m of the site boundary (see *Figure 5*), six of which were ponds (P3-P8) and four of which were ditches (D1-D4). The only waterbodies within 250m were P5, P6, D1 and D4, all of which were separated from the Site by physical barriers.

Waterbodies P5 and P6 were separated by the dual carriageway A4060 and additionally surrounded by an expanse of open bare ground previously disturbed for coal mining. Waterbodies D1 and D4 and separated from Site by main roads A4102 and Goat Mill Road.

- 7.49 Waterbodies greater than 250m from the Site boundary were not considered for surveys given that scientific literature has found maximum routine migratory ranges of GCN have been estimated as approximately 250m from breeding ponds^{26,27,28}, with much reduced distances recorded where adjacent habitats are of good quality²⁹. Furthermore, this literature goes on to suggest that GCN are only normally found at greater distances (150-200m) where continuous linear features are present. Following the breeding season 64% of newts have been observed to be present in refuges located within 20m of the pond edge³⁰. Based on this scientific literature in relation to the migration of GCN, it suggests that individuals rarely move further than 200-250m from ponds and in these circumstances would require continuous linear features. Given the distance from the Site and the separation from the Site from the main roads A4040, A4102 and Goat Mill Road, which form a barrier to dispersal, it is therefore not deemed necessary to undertake any surveys at P3, P4, P7, P8, D2, D3 or any surrounding water bodies outside of the 250m buffer zone. Therefore, GCN are not considered a constraint to the proposed works.

Mitigation and Compensation

- 7.50 Due to the sub-optimal habitat present on site, the risk of offence of GCN at present is low with provision of woodland retention within the proposals. Enhancement for GCN and other herpetofauna, so as not to preclude future occupation, beyond the resources currently provided by the Site will be fulfilled by retaining the broadleaved plantation woodland and semi-improved grassland as well as the inclusion of the surface water lagoon.

Reptiles

- 7.51 No records of reptile species were returned from consultation.
- 7.52 Following a full reptile presence / absence survey no reptiles were recorded.
- 7.53 Reptiles are therefore not considered a constraint to the proposals.

Invertebrates

- 7.54 The invertebrate assemblage of the Site following the survey conducted in 2020 was found to be of Local to County Importance. Species of note were primarily associated with the OHM forming the central plateau of the Site (SU1 as per invertebrate survey report Appendix H); grassland in the south of the Site (SU2 as per invertebrate survey report Appendix H); and grassland forming the embankment on the eastern boundary of the Site (SU3 as per invertebrate survey report Appendix H). Of these three areas, habitat will be lost to the developable area from SU1 and a section of SU2 to accommodate the surface water lagoon.

26 Franklin, P. M. (1993). The migratory ecology and terrestrial habitat preferences of the crested newt *Triturus cristatus*, at Little Wittenham Nature Reserve. Phil Thesis, De Montfort University, Dept of Applied Biology & Biotechnology.

27 Oldham, R. S & Nicholson, M (1986) Status and Ecology of the Warty Newt (*Triturus cristatus*). Nature Conservancy Council, Peterborough.

28 Jehle, R (2000). The terrestrial summer habitat of radio-tracked great crested newts (*Triturus cristatus*) and marbled newts (*Triturus marmoratus*). Herpetological Journal 10(4): 137-142.

29 Cresswell, W & Whitworth, R (2004). An assessment of the efficiency of capture techniques and the value of different habitats for great crested newts. English Nature Research Reports 576. English Nature, Peterborough.

30 Jehle, R. and Arntsen, J.W., (2000). Post-breeding migrations of newts with contrasting ecological requirements. Journal of Zoology, London: 251: 297 - 306.

- 7.55 Despite these losses, the retention of the entirety of SU3 and the retention and enhancement of three areas of OMH as proposed above will see suitable invertebrate habitat maintained on site during the operation phase of the scheme.

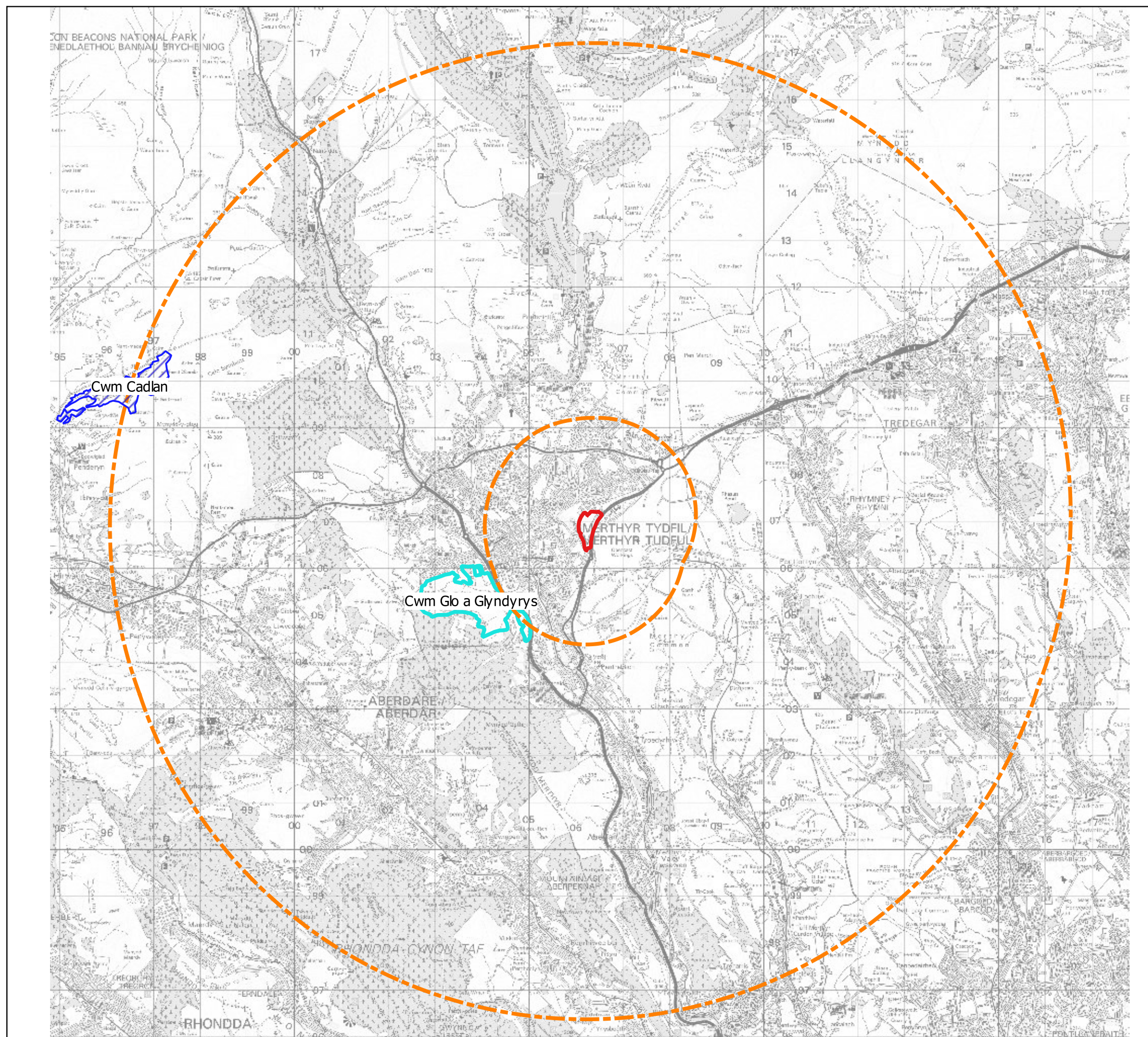
Other Notable Species

- 7.56 Common toad *Bufo bufo* will benefit from measures proposed to enhance habitats within the scheme for including provision of aquatic and marginal communities through the proposed surface water lagoon, together with retaining and enhancing significant areas of suitable terrestrial habitat providing foraging and hibernacula features.

End of Report

FIGURES

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Key

-  Site Boundary
-  10km buffer
-  2km Buffer
-  Site of Special Scientific Interest
-  Special Area of Conservation



client
Sirius Planning
project
Land Off Goat Mill Road,
Merthyr Tydfil
drawing title
SITE LOCATION AND STATUTORY SITES PLAN

1:85000
scale

drawn
KO / JRM

issue
21/9/2021

drawing / figure number

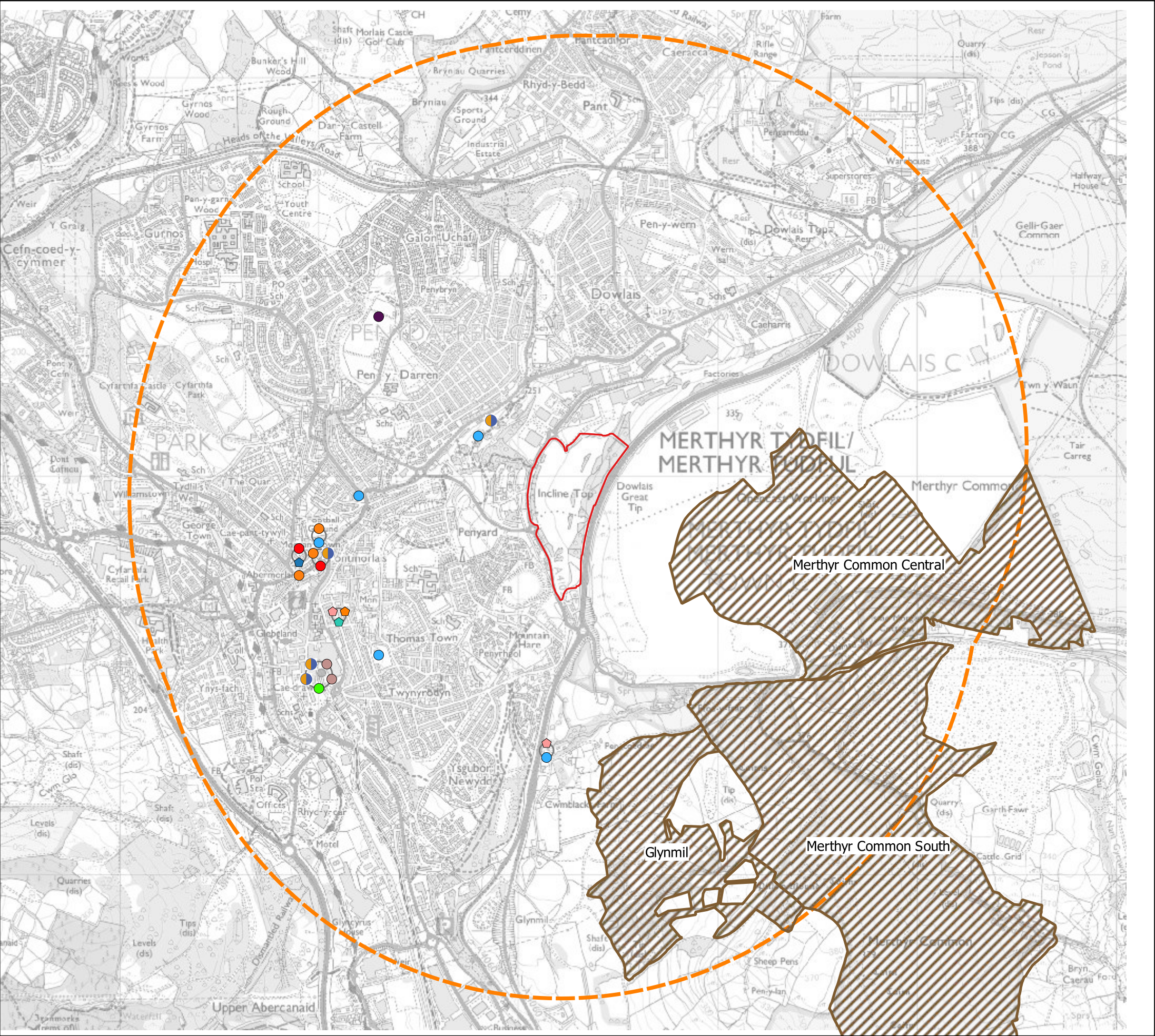
Figure 1

rev

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masterplanning ■ environmental assessment ■ landscape design ■ urban design ■ ecology ■ architecture ■ arboriculture



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Key

- Site Boundary
- 2km Buffer
- Site of Importance for Nature Conservation (SINC)

Protected Species 2020 KO

Protected Species within 2km KO

- Common Pipistrelle
- Long-eared Bat species
- Noctule Bat
- Pipistrelle Bat species
- Serotine
- Soprano Pipistrelle
- Unidentified Bat
- Common Pipistrelle Roost
- Long-eared Bat species Roost
- Pipistrelle Bat species Roost
- Unidentified Bat Roost



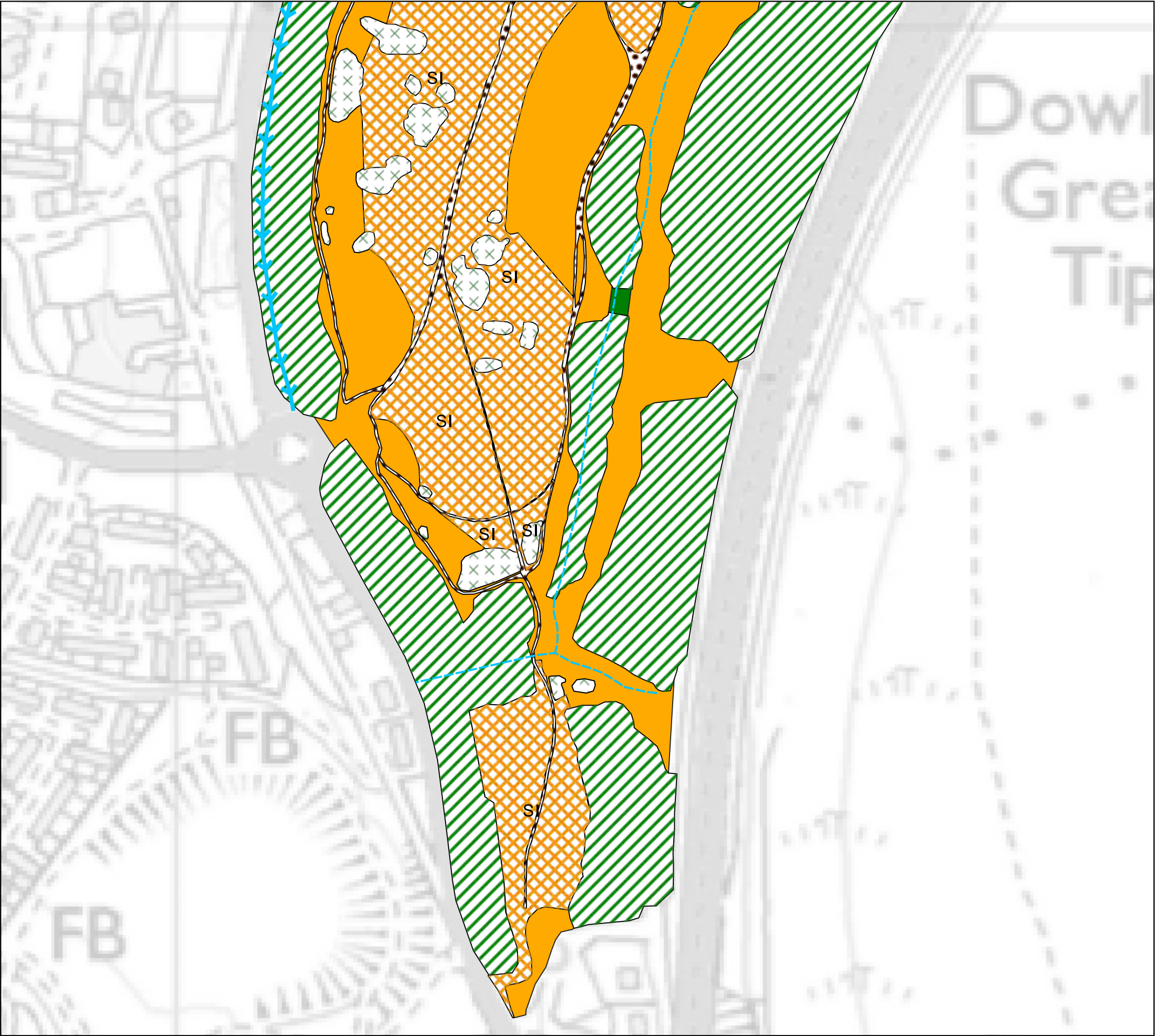
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Key

Phase 1 Habitats

-  Bare ground
-  Broadleaved woodland - plantation
-  Broadleaved woodland - semi-natural
-  Calcareous grassland - semi-improved
-  Marsh/marshy grassland
-  Scrub - scattered
-  Neutral grassland - semi-improved
-  Standing water
-  Running water
-  Dry ditch



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Key

Phase 1 Habitats

-  Bare ground
-  Broadleaved woodland - plantation
-  Broadleaved woodland - semi-natural
-  Calcareous grassland - semi-improved
-  Marsh/marshy grassland
-  Scrub - scattered
-  Neutral grassland - semi-improved
-  Standing water
-  Running water
-  Dry ditch

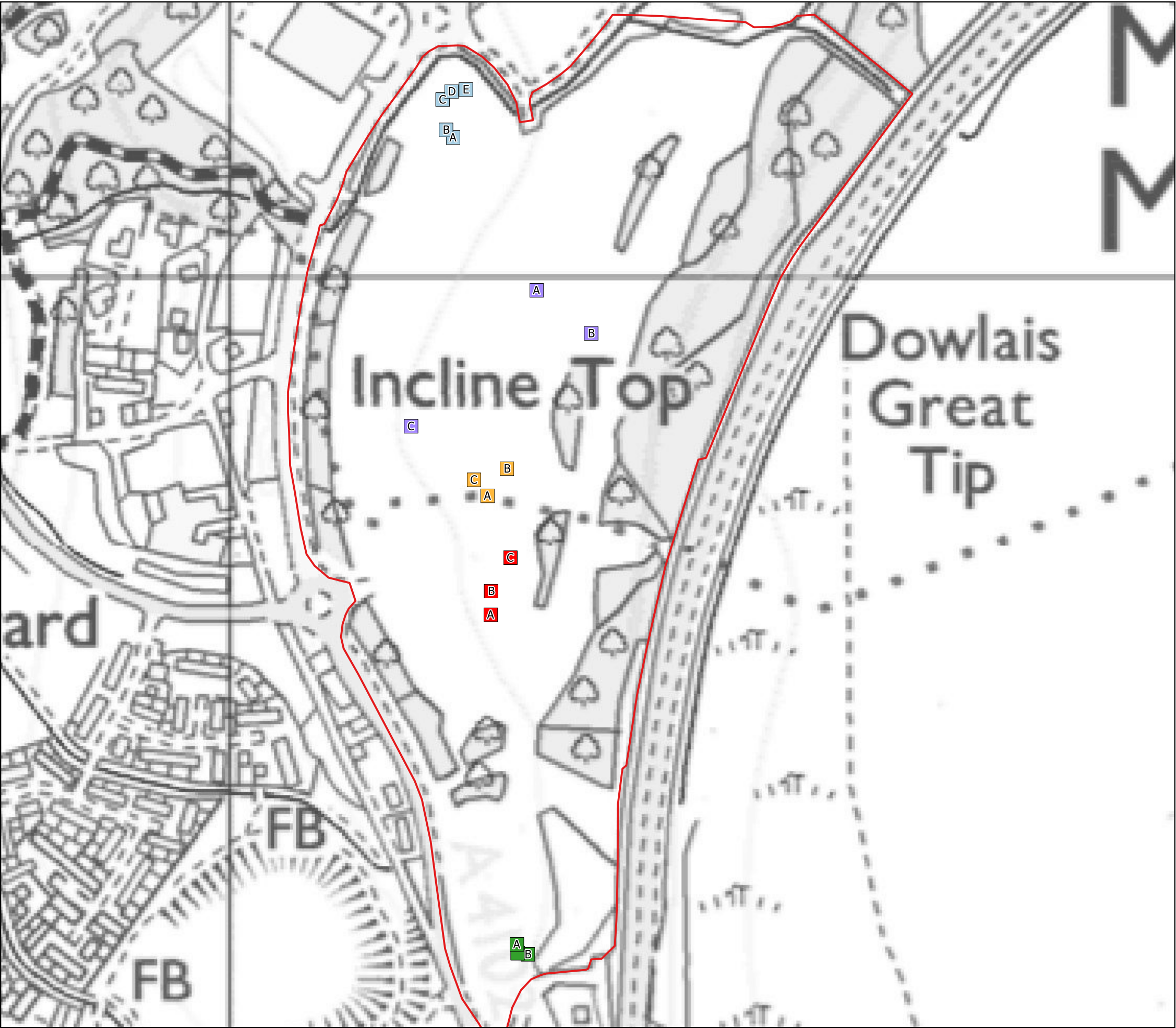


client
Sirius Planning
project
**Land off Goat Mill Road,
Merthyr Tydfil**
drawing title
PHASE 1 HABITAT PLAN - SOUTH



scale
1:2500
drawn
JRM / MEL
issue
21/9/2021

drawing / figure number
Figure 3
rev
9131-E-03B



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Key:

Site Boundary

Quadrat Locations

- Habitat 1- Marshy Grassland
- Habitat 2- Calcareous Grassland 1
- Habitat 3- Mesotrophic Grassland 1
- Habitat 4- Mesotrophic Grassland 2
- Habitat 5- Calcareous Grassland 2



client
Sirius Planning
project
Land Off Goat Mill Road,
Merthyr Tydfil
drawing title
QUADRAT LOCATION PLAN

scale @ A3
1:3200

drawn
KO / JRM

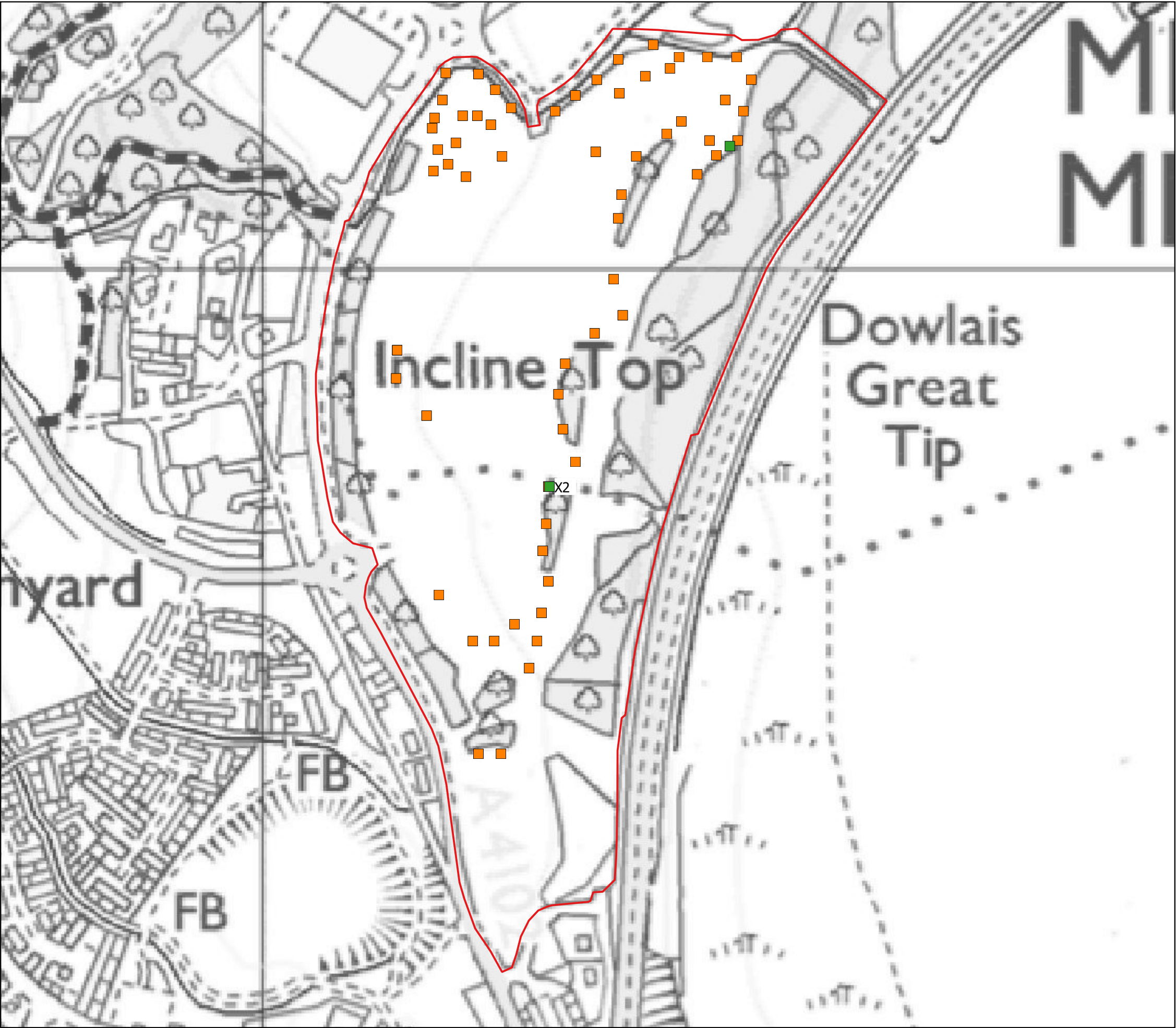
issue
21/9/2021

drawing / figure number

Figure 06

rev

9131-E-06A



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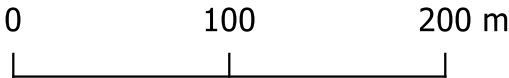
Key:

Site Boundary

Reptile Survey Results

Adult Female Toad

Refugia Location



client
Sirius Planning
project
Land Off Goat Mill Road,
Merthyr Tydfil
drawing title
REPTILE REFUGIA LOCATION PLAN

scale @ A3
1:3500

drawn
KO / JRM

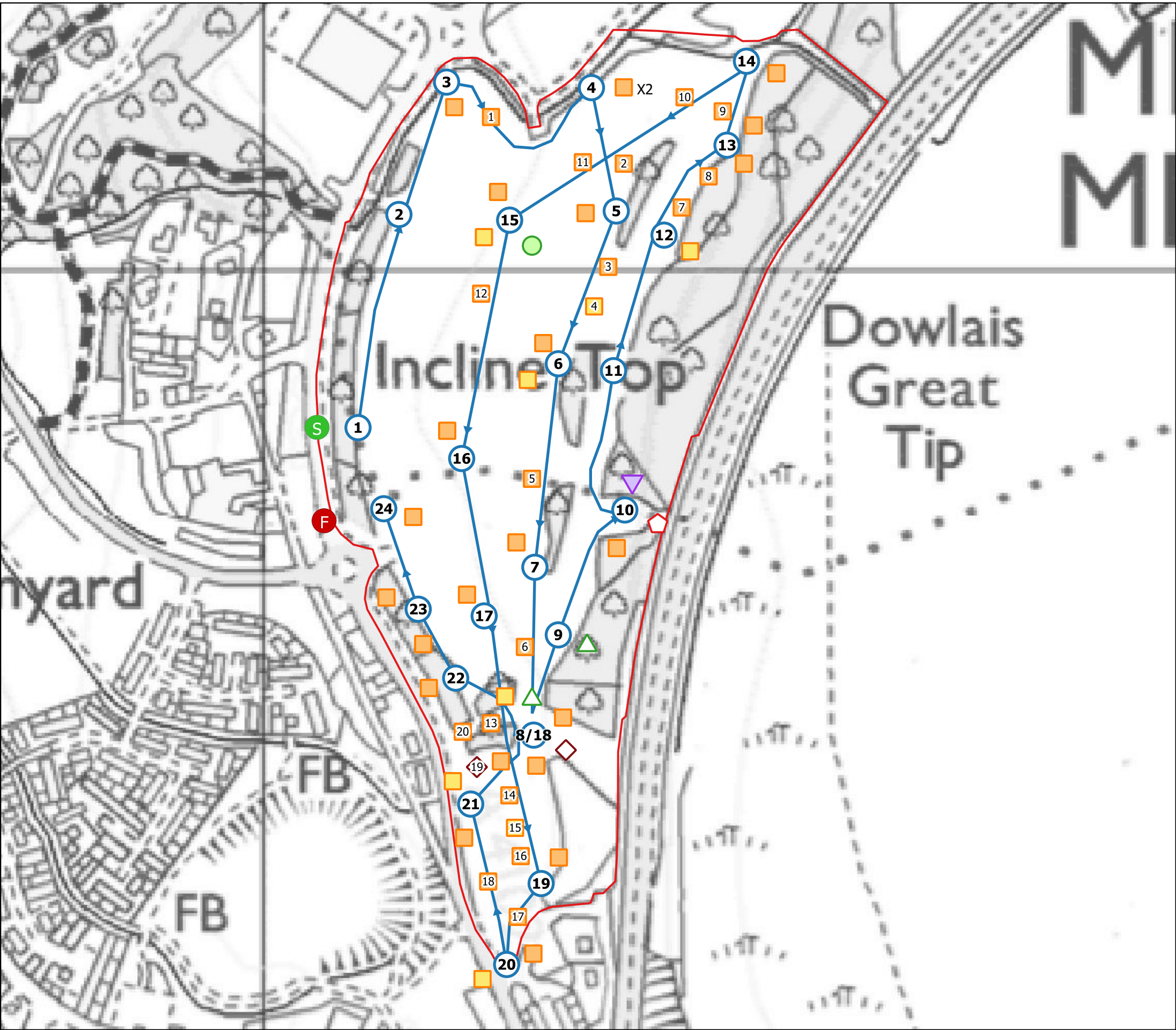
issue
21/9/2021

drawing / figure number

Figure 07

rev

9131-E-07A

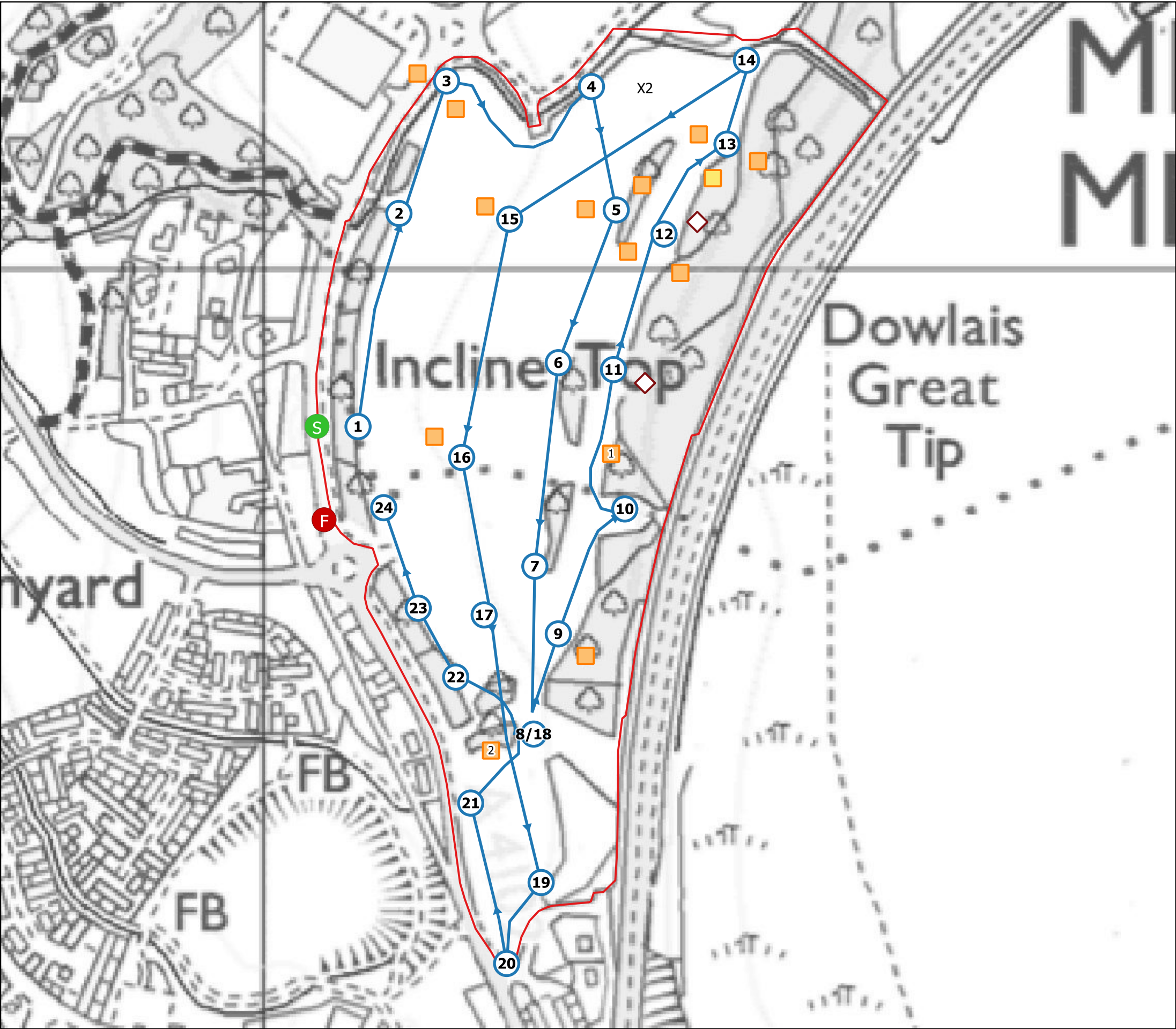


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Key

- Site Boundary
- Transect Route
- Point Count Locations
- Start point
- Finish point
- Bat Contacts
 - Common Pipistrelle
 - Soprano Pipistrelle
 - Myotis Species
 - Noctule
 - Plecotus Species
 - Serotine
 - Bat Species

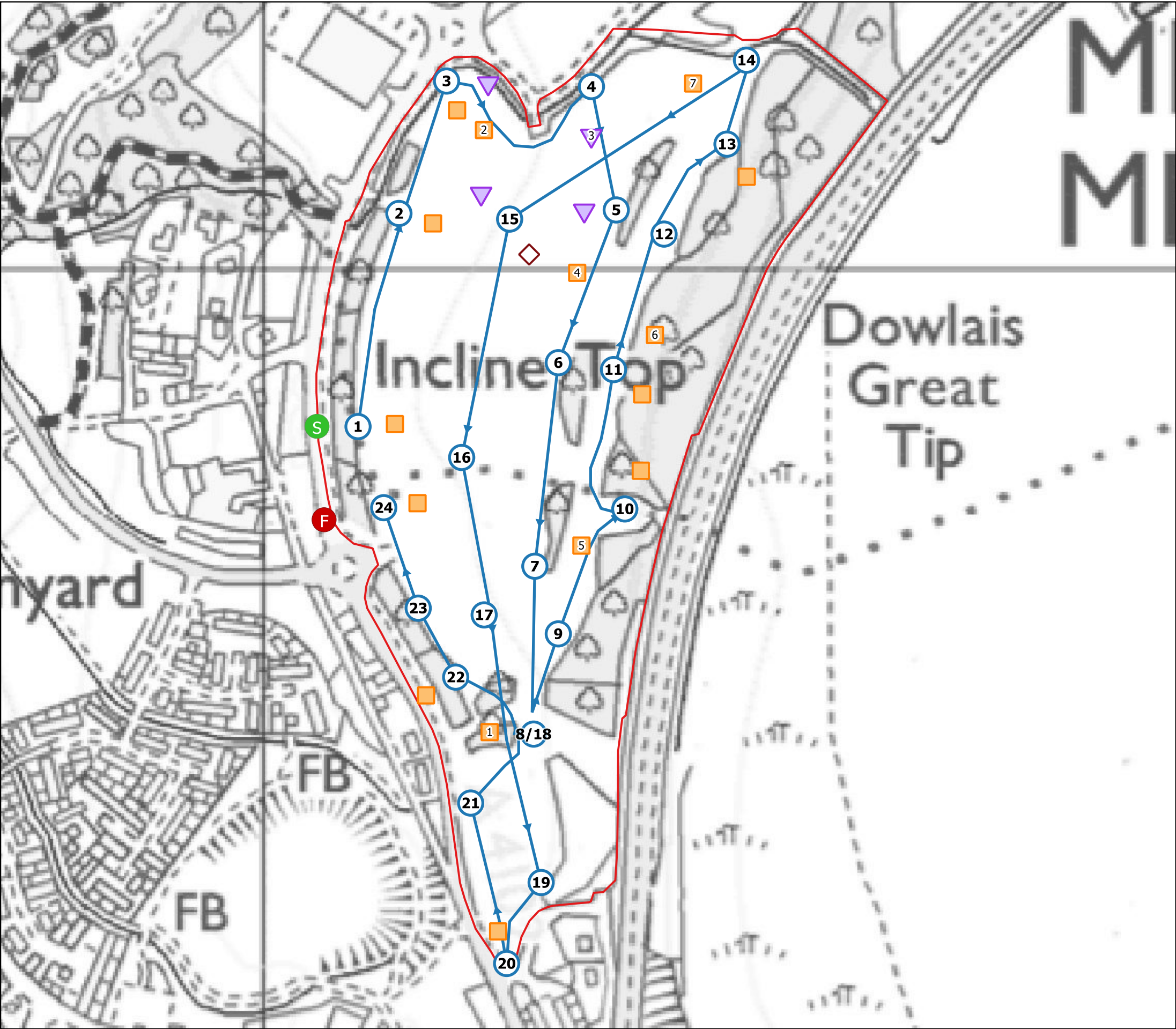


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Key

- Site Boundary
- Transect Route
- Point Count Locations
- Start point
- Finish point
- Bat Contacts
 - Common Pipistrelle
 - Soprano Pipistrelle
 - Plecotus Species

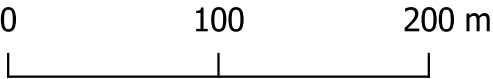


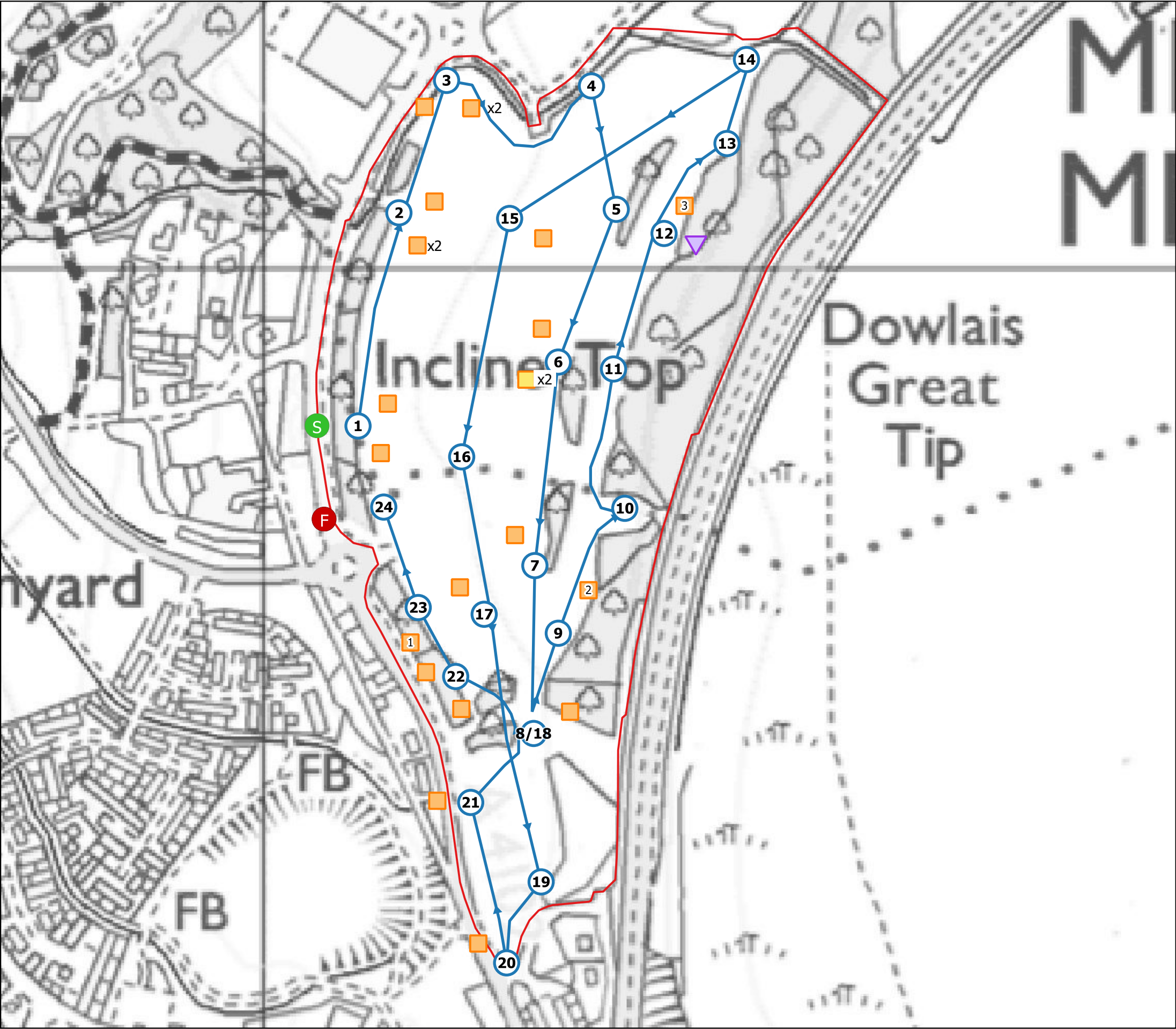
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Key

- Site Boundary
- Transect Route
- Point Count Locations
- Start point
- Finish point
- Bat Contacts
 - Common Pipistrelle
 - Noctule
 - Plecotus Species



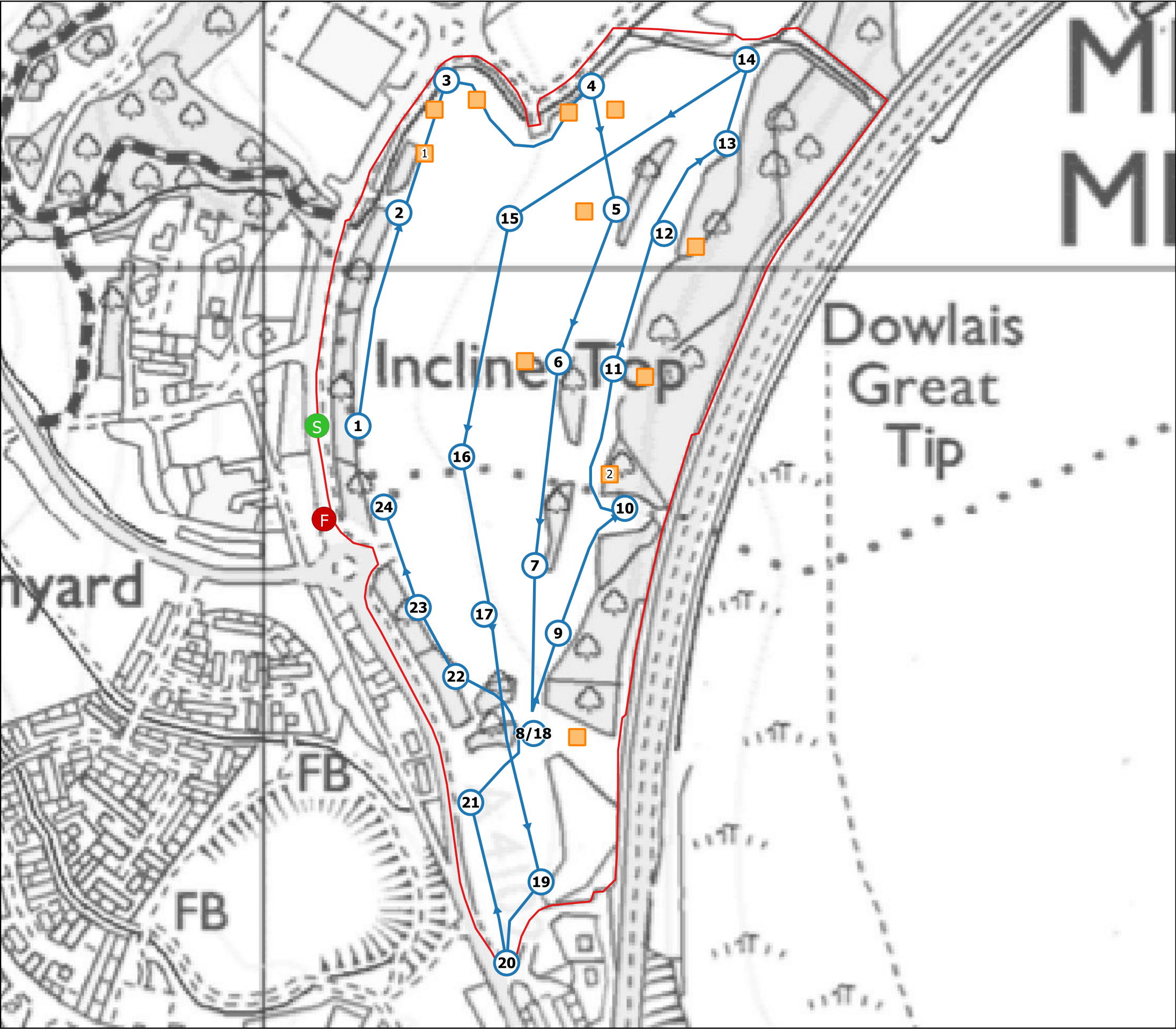


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Key

- Site Boundary
- Transect Route
- Point Count Locations
- Start & Finish Points 19.05.20
 - Start point
 - Finish point
- Bat Contacts
 - Common Pipistrelle
 - Soprano Pipistrelle
 - Noctule



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Key

Site Boundary

Transect Route

Start & Finish Points April 2020

Point Count Locations

Bat Contacts April 2020

Start & Finish Points 19.05.20

Start point

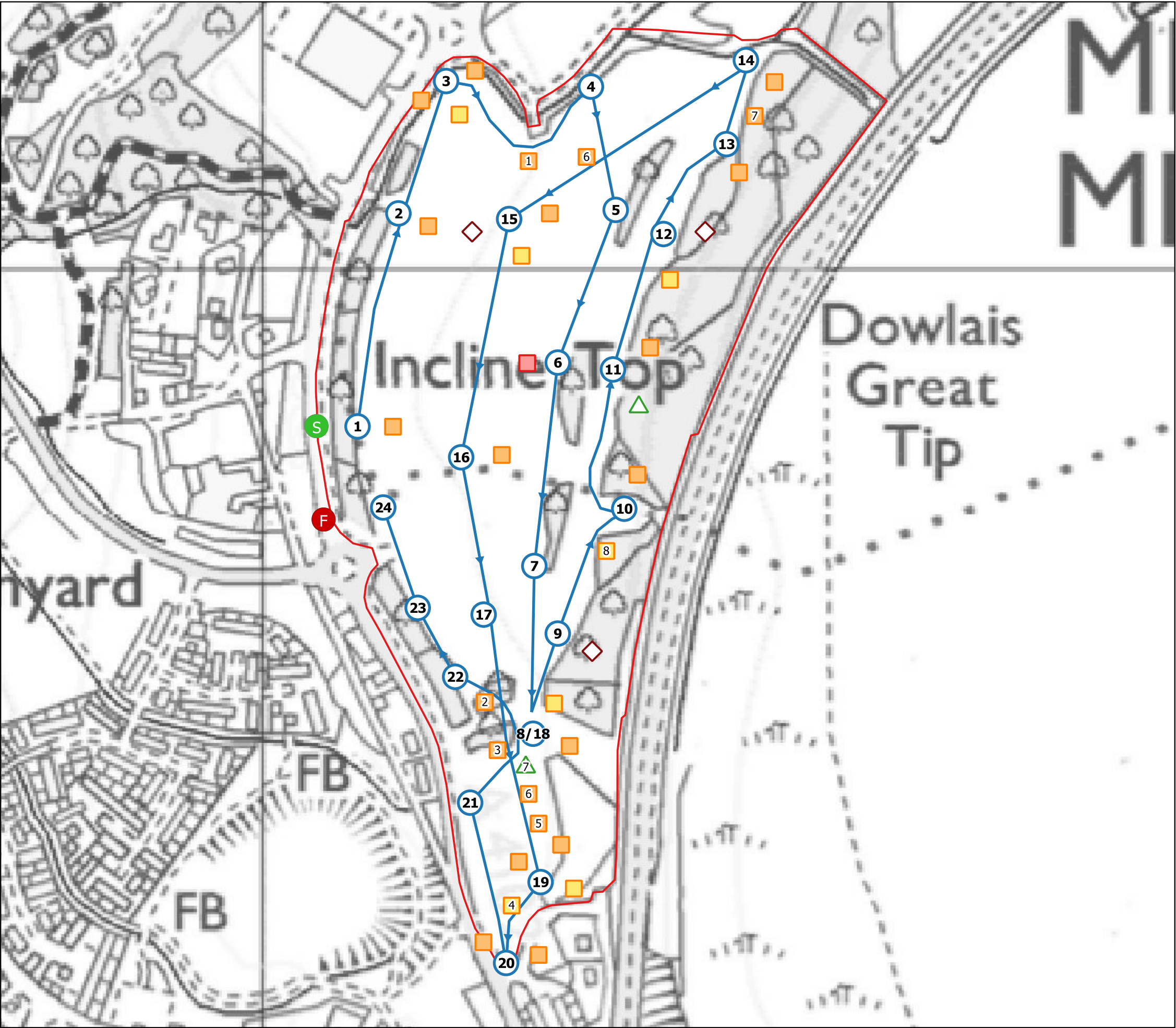
Finish point

Bat Contacts 09.06.20

Bat Contacts 29.07.20

Bat Contacts 20.08.20

Common Pipistrelle



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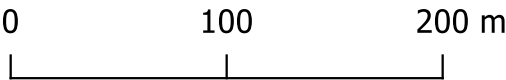
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Key:

- Site Boundary
- Transect Route
- Point Count Locations
- Start point
- Finish point

Bat Contacts

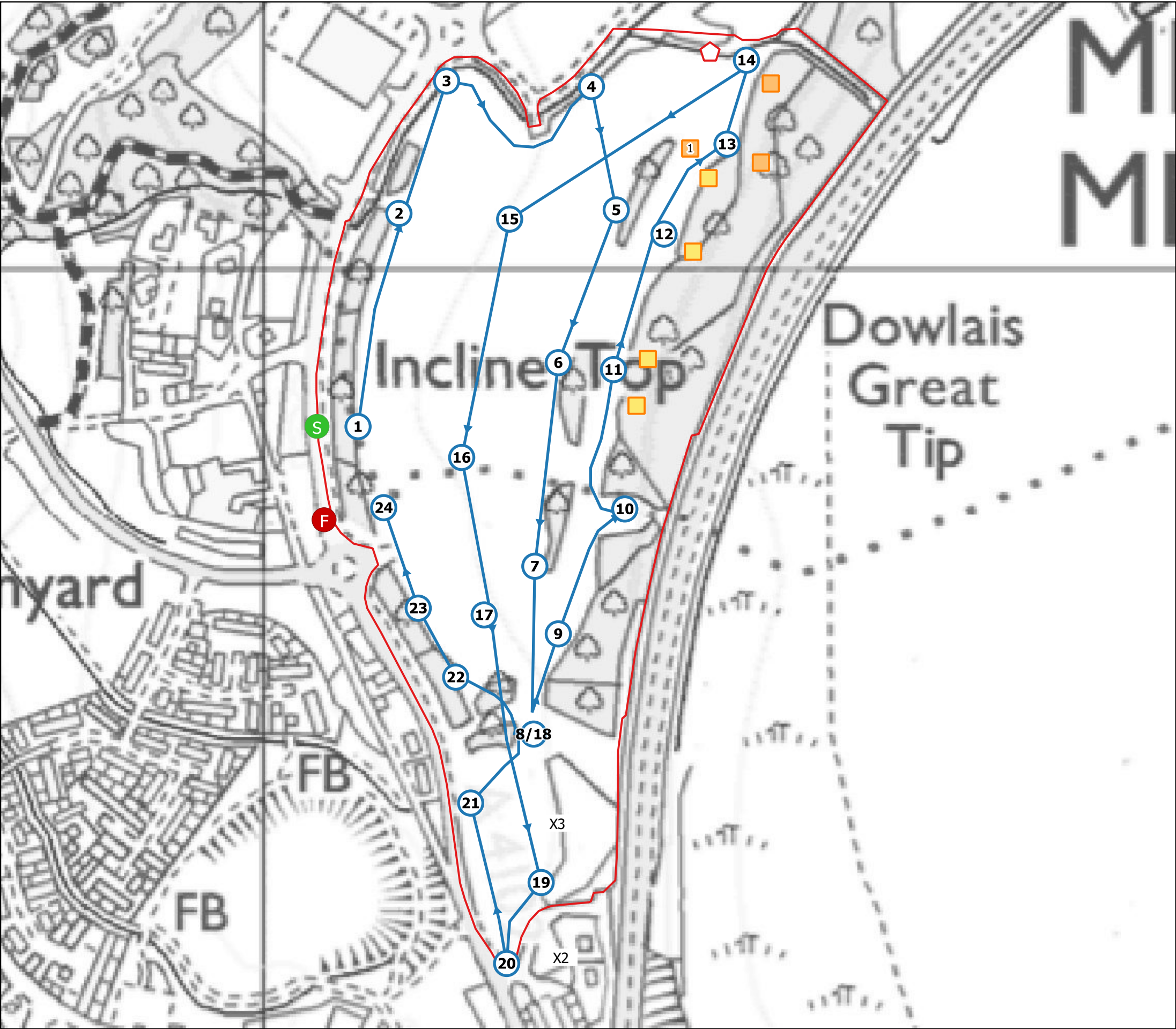
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius Pipistrelle
- Myotis Species
- Plecotus Species



client
Sirius Planning
project
Land off Goat Mill Road,
Merthyr Tydfil
drawing title
BAT TRANSECT PLAN (17.09.2020)

scale @ A3
1:3500
drawn
SCB / MEL
issue
21/9/2021

Figure 13 9131-E-13B

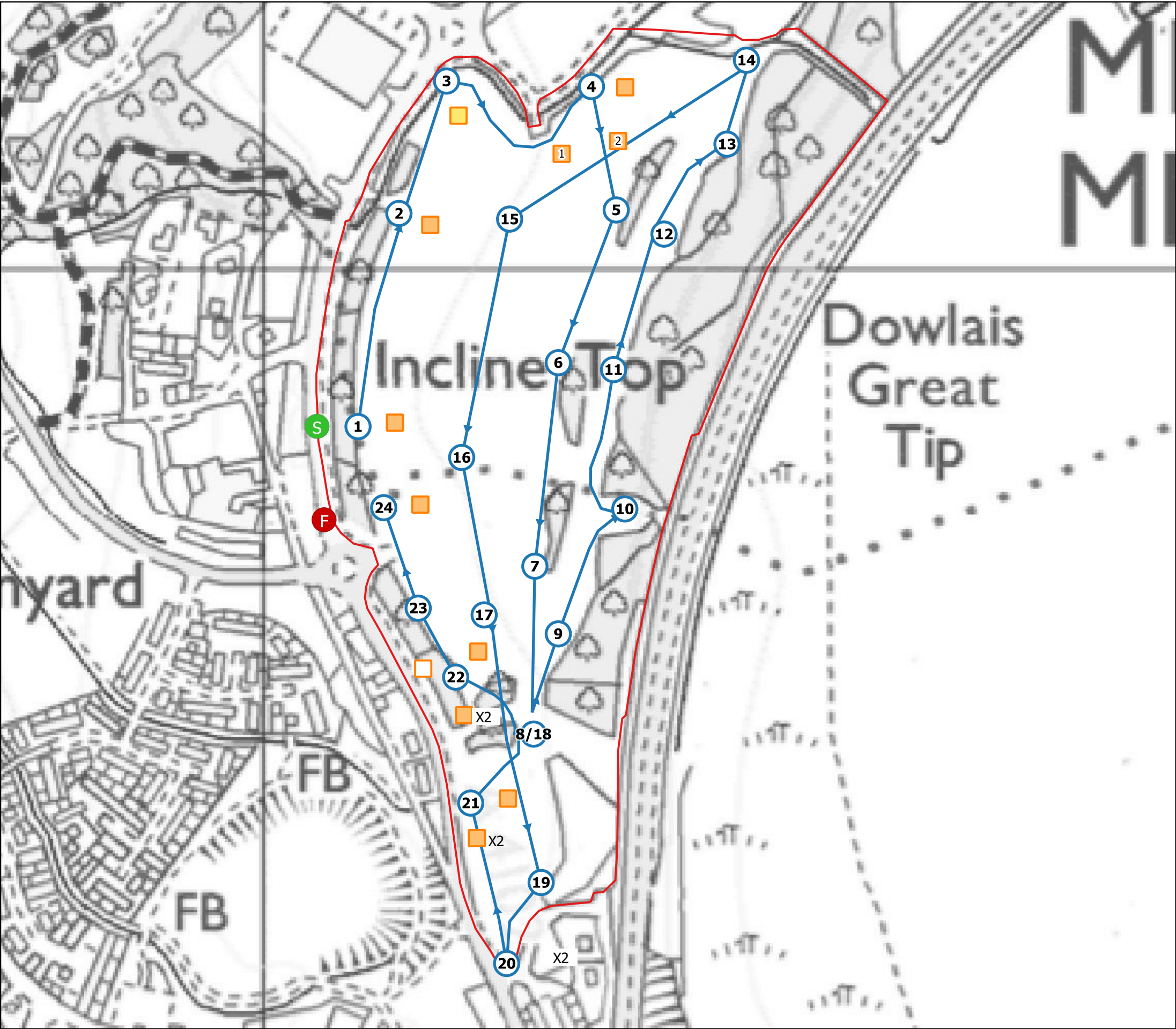


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Key

- Site Boundary
- Transect Route
- Point Count Locations
- Start point
- Finish point
- Bat Contacts 18.09.20
 - Common Pipistrelle
 - Soprano Pipistrelle
 - Bat Species



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Key

- Site Boundary
- Transect Route
- Point Count Locations
- Start point
- Finish point
- Bat Contacts
 - Common Pipistrelle
 - Soprano Pipistrelle
 - Pipistrelle Species