

Appendix 7A

Sources of Baseline Data

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Table 7.10: Sources of baseline information including timing and survey effort. Further details on methods and results can be found in the respective ecological baseline reports in Appendices C-P.

Ecological Feature	Date	Summary of method	Survey boundary
Desk study (including review of up to date local biodiversity records centre, existing relevant reports and online sources)	November 2018	A desk study was undertaken to identify any existing ecological information for the Site (i.e. red line boundary) and surrounding area. Existing ecological data that informed the 2011 Environmental Statement³⁴, including previous desk study results, habitat and species surveys, were reviewed. A search was undertaken to identify statutory designated sites within 5 km of the Site boundary. Online searches were carried out using the Multi Agency Geographic Information for the Countryside (MAGIC)³⁵, Natural Resources Wales website³⁶ and the Joint Nature Conservation Committee (JNCC) website³⁷. In addition to this, protected and notable³⁸ species, Schedule 9 invasive non-native species and non-statutory site data within 5 km of the Site centre point were obtained from the Aderyn³⁹ (which includes records from the Biodiversity Information Service for Powys & Brecon Beacons National Park (BIS)⁴⁰ and South East Wales Biodiversity Records Centre (SEWBRc⁴¹)) on 21st November 2018.	The Study Area as defined in 7.4.

³⁴ Environmental Statement (2011), Celtic Energy.

³⁵ <http://magic.defra.gov.uk/> Accessed online 12/11/2019.

³⁶ <https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-sites-search/?lang=en> Accessed online 21/11/2019.

³⁷ <http://jncc.defra.gov.uk> Accessed online 12/11/2019.

³⁸ 'Notable' species and habitats considered in this report include species and habitats of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales, under section 7 of the Environment (Wales) Act 2016, in addition to any species considered to be of significance for nature conservation such species listed in red data books, the Royal Society for the Protection of Birds (RSPB) 'Birds of Conservation Concern' lists and or Local Biodiversity Action Plans (LBAPs).

³⁹ <http://www.sewbrec.org.uk/aderyn.page#:~:text=Aderyn%3A%20LERC%20Wales%20Biodiversity%20Information,recording%20community%20and%20decision%20makers> [accessed online 21.11.2018].

⁴⁰ <https://www.bis.org.uk/home>

⁴¹ <http://www.sewbrec.org.uk/>

Ecological Feature	Date	Summary of method	Survey boundary
		The following reports (produced to meet conditions of the Celtic Energy 2011 ES) were also reviewed including: Update Habitat Survey (2016) ⁴² , National Vegetation Classification Survey (2013) ⁴³ and Bryophyte and Lichen Survey (2012) ⁴⁴ , and Further addendum to Original Environmental Statement and Supporting Information submitted under Planning reference 18/1070/REM including revised LVIA ⁴⁵ .	
Extended Phase 1 Habitat survey	26 th November 2018, 25 th April 2019, 26 th April and 29 th May 2019	An Extended Phase 1 Habitat survey⁴⁶ and protected species walkover was completed of the Study Area in suitable conditions by two Suitably Qualified Ecologists (SQE). Further details are provided in the Extended Phase 1 report in Appendix 7C. Phase 1 habitat survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation present. Incidental records of flora and fauna were also made during the survey including any invasive species listed under Schedule 9 of the wildlife and countryside act 1981 (as amended), in the form of Target Notes, and the habitats identified were evaluated for their potential to support protected species and other species of conservation concern, including those listed above.	The Study Area as defined in 7.4.
NVC	June and July 2019	The objective was to describe the plant communities in habitats judged to be of highest value for nature conservation using NVC methods⁴⁷. The vegetation types initially selected for study were identified from a Phase 1 Habitat Survey report. Other habitats were also present but considered less likely to be of nature conservation significance, and although initially not included in the scope for the NVC survey, some were later included. The survey was undertaken over several days in June and July 2019. A total of 127 quadrats were recorded. The quadrat areas were generally selected as being representative samples of the stand in which they occurred. The survey aimed to collect a minimum of five quadrats from each of the main plant communities, aiming to provide a reasonable representation of the vegetation type. Some unusual or poorly represented communities were sometimes described by just one or two quadrats.	The Study Area as defined in 7.4.

⁴² Wardell Armstrong (2016). Nant Helen, Coelren. Update Habitat Survey. Letter Report.

⁴³ URS (2013). Nant Helen Remainder. Survey of Grassland within Restored Area.

⁴⁴ Smith, P. L. (2012). Nant Helen Abercraf (Powys). Bryophyte and Lichen Survey.

⁴⁵ Celtic Energy (2019). S73 Application for Variation of Condition 45 of planning application 18/1070/REM – further addendum to original Environmental Statement and supporting Information submitted under Planning Reference 18/1070/REM including revised LVIA.

⁴⁶ Joint Nature Conservation Council (2010) Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit (ISBN 0 86139 636 7).

⁴⁷ Joint Nature Conservation Committee (JNCC), 2006: National Vegetation Classification: A User's handbook.

Ecological Feature	Date	Summary of method	Survey boundary
		The quadrat data was analysed using the appropriate software and published reference sources, to determine NVC communities and sub communities present. Further details are provided in the NVC report in Appendix 7D.	
Fungi	September, October and November 2019	A survey was undertaken to identify notable fungi species Three walk-over survey visits were spread between September and November 2019, and which coincided with the main fungi fruiting season. Each visit involved a walk-through survey of the fungi survey plots, through vegetation considered to be of highest potential value for grassland fungi, such as old, short-grazed, semi-improved acid grassland (especially where anthills were present, indicating a long history without disturbance). The survey was restricted to three target groups that are generally recognised as being good indicators of nature conservation value for grassland fungi; namely waxcap fungi (<i>Hygrocybe</i> spp.), earth tongues (<i>Geoglossaceae</i>) and fairy clubs (<i>Clavariaceae</i>). Other fungi were also noted incidentally during the survey, but as a lower priority and most were not identified to species level except where they were readily identifiable in the field. Further details are provided in the Fungi report in Appendix 7E.	The Study Area as defined in 7.4.
Invertebrates	A walkover was undertaken on the 10 th May 2019. Four sampling sessions were undertaken in May, June July and September 2019.	An initial site visit identified habitats likely to be of greatest importance for invertebrates. Sampling sessions were undertaken between spring and early autumn and timed to coincide with the peak periods of invertebrate activity. The main emphasis for more detailed invertebrate surveys was on those habitats likely to have the greatest invertebrate interest Other less promising habitat types were also surveyed in less detail, with the aim being to ensure complete coverage of the whole range of main invertebrate habitats represented across the site. In addition to general spot-searching techniques, some more specialised sampling methods were used to ensure all potentially important habitat features were sampled effectively including using sweep nets, pond nets and light traps. Where subsequent microscopic examination was required in order to ensure an accurate identification, specimens were collected into tubes with either ethyl acetate or iso-propyl alcohol. Further details are provided in the Invertebrate report in Appendix 7F.	The Study Area as defined in 7.4.
Amphibians surveys	April 2019	Seventy-six waterbodies within the Study Area were subject to a Habitat Suitability Assessment (HSI) ⁴⁸ . Waterbodies scoring above 0.5 (equating to below average and above) were then sampled for the presence	The Study Area as defined in 7.4.

⁴⁸ Amphibian and Retile Groups of the UK (2010) Great crested Newt Habitat Suitability Index. Froglife.

Ecological Feature	Date	Summary of method	Survey boundary
		of great crested newt environmental DNA (eDNA) in accordance with the approved methodology endorsed by the Statutory Environmental Bodies ⁴⁹ . Ten waterbodies were subject to eDNA surveys. Further details are provided in the Amphibian report in Appendix 7G.	
Reptile survey	Seven checks of each refugia undertaken between 6 th June 2019 and 25 th September 2019.	A reptile survey was carried with the aim of determining the presence or likely absence of reptiles within the Study Area. Habitats, which were considered most suitable for reptiles, were identified during the Extended Phase 1 Habitat survey. 250 refugia (roofing felt) were deployed in late spring 2019. Seven checks were undertaken in suitable weather, with the last check at the end of September 2019. During each survey artificial refugia was carefully checked for signs of reptiles. In addition, any natural refugia within the area, were checked for signs of reptiles. This is in line with best practice survey guidance ⁵⁰ . Further details are provided in the Reptile survey report in Appendix 7H.	The Study Area as defined in 7.4.
Breeding bird survey	Transect surveys completed between April and June 2019.	Breeding bird surveys were undertaken within the Study Area, by SQE, in accordance with current best practice including the CBC ⁵¹ Techniques and Bird Monitoring methods ⁵² . This comprised walking transects (the same as those used for bat surveys) to sample all accessible habitat and recording all signs of breeding using the BTO standard activity recording codes. Surveys were undertaken on three occasions between April and June 2019, between dawn and 10 am. One of the three visits was walked in the opposite direction, to balance any temporal variation in behaviour levels. All breeding bird surveys were carried out by a team of two surveyors, with at least one experienced in undertaking ornithological survey work and able to identify birds by calls and songs, as well as visually. The transect route is walked at a slow pace, with all birds seen and heard mapped in accordance with the BTO standard activity recording codes. Focused surveys were also undertaken for Goshawk (<i>Accipiter gentilis</i>) and Honey buzzard (<i>Pernis apivorus</i>) between March and July 2019. In addition, a search for barn owl was undertaken during bat surveys of trees and buildings. Further details are provided in the Breeding bird survey report in Appendix 7I.	The Study Area for breeding birds surveys as defined in 7.4, with the exception of Goshawk and Honey buzzard. Goshawk surveys comprised the Study area and a 1 km buffer zone. Honey buzzard surveys comprised a wide area around the Study area including the Crynant valley.

⁴⁹ Biggs *et al.*, (2014) Using eDNA to develop a national citizen science-based monitoring programme for the great crested newt (*Triturus cristatus*), biological conservation.

⁵⁰ Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

⁵¹ Bibby, B.B., (2000). Bird Census Techniques. London: Academic Press.

⁵² Gilbert, G.G., Gibbons, D.W. and Evans, J., (1998). Bird Monitoring Methods: A manual of techniques. Bedfordshire, RSPB.

Ecological Feature	Date	Summary of method	Survey boundary
Wintering bird survey	December 2018 to March 2019.	A wintering bird survey, comprising monthly visits between December 2018 and March 2019, was undertaken across the site. Transects were walked, and any bird species noted. This was undertaken in accordance with best practice survey guidance^{22,23}. All Wintering bird surveys were carried out by a team of two surveyors, with at least one experienced in undertaking ornithological survey work and able to identify birds by calls and songs, as well as visually. Further details are provided in the Wintering bird report in Appendix 7J.	The Study Area as defined in 7.4.
Riparian mammal (otter and water vole) survey	Three surveys undertaken of suitable waterbodies in spring, summer and autumn 2019 (between May and September 2019)	The otter/water vole field survey involved surveying all waterbodies (25 ponds and nine streams/ditches) present within the Study Area that had been identified during the Phase 1 habitat survey or Ordnance Survey data. Three otter/water vole surveys (spring, summer and autumn) were completed of each of these waterbodies between May and September 2019 (inclusive). Due to the cross-over in habitat requirements and survey methodology both species were surveyed for at the same time. The water vole survey was completed in accordance with the standard survey guidelines^{53,54}. The survey comprised walking the ditch banks to search for signs of water vole presence, including but not limited to burrows, latrines, footprints, feeding remains and sightings of animals. The otter survey was conducted in line with relevant survey guidance⁵⁵. This involved accessing the watercourse and walking in-channel (where possible), to search for evidence of otter presence such as resting places, spraints, food remains, prints, slides and holts. Camera traps (Minox DTC 650) were installed at four locations within the Study Area to provide additional data on usage of identified features, or where a complete survey of waterbodies/courses was difficult (due to dense vegetation). The images obtained were checked for otter and water vole. Further details are provided in the Riparian mammal report in Appendix 7K.	The Study Area as defined in 7.4
Bat roost survey (buildings/structures and trees)	Preliminary roost assessment survey undertaken in June and July 2019. Emergence and re-entry surveys	All trees, buildings and structures within the Study Area were assessed for their suitability to support roosting bats as well as checking for signs of bats (such as dead specimens, droppings, urine splashes, fur oil -staining and/or squeaking noises by bat squeaking noises) in accordance with published guidance⁵⁶, in summer 2019. Potential roost features in either trees, buildings or structures were categorised as being of high, moderate or low suitability for use by bats in accordance with the Bats: Good Practice Survey Guidelines²⁴.	The Study Area as defined in 7.4.

⁵³ Strachan R, Moorhouse T and M Gelling (2011). Water vole conservation handbook, Third edition, Wild Cru.

⁵⁴ Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). The Mammal Society.

⁵⁵ Chanin, P. (2003). Monitoring the Otter *Lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10. English Nature. Peterborough.

⁵⁶ Bat Conservation Trust (2016). Bat Surveys for Professional Ecologists (3rd Edition); Good Practice Guidelines.

Ecological Feature	Date	Summary of method	Survey boundary
	undertaken between July and September 2019. Ground level inspection of trees in August 2019, and aerial inspections in September 2019.	Trees, buildings and structures with potential roosting features were subject to further assessment. Trees were subject to aerial inspections by bat licensed tree climbers, to inspect these features more closely. Buildings and structures were subject to nocturnal surveys i.e. either a dawn re-entry survey or a dusk emergence survey. Those assessed as having low potential were subject to one nocturnal survey, and those of moderate potential were subject to two nocturnal surveys (a minimum of two weeks apart). Further details are provided in the bat roost survey report in Appendix 7L.	
Bat activity (static and transects)	Monthly surveys between April and October 2019.	Bat transect surveys were undertaken monthly from April to October 2019 (inclusive) in accordance with best practice survey guidance. Five transect routes, which covered the Study Area, were walked each month, and all bat activity recorded using bat detectors (Echo Meter touch and bat loggers). Static bat activity monitoring was also undertaken between April to October 2019, in accordance with best practice survey guidance ⁵⁷ . Sixteen ultrasonic bat detectors are deployed in suitable habitat within the site and left in-situ for five consecutive nights to record calls by foraging/commuting bats within the site. Data recorded by the detectors (as Wildlife Acoustic Compression files i.e. .wac files), were downloaded and processed using Kaleidoscope Pro Software to produce audio files (.wav) and zero crossing files. The processing also included the automatic identification of bat species based on the classifiers developed by Wildlife Acoustics (Bats of Europe 3.0.0). these files were then reviewed by a bat specialist to ensure the correct identification of species. A Bat Activity Index (BAI) was then calculated for each bat species at each location during each session. Further details are provided in the bat activity survey report in Appendix 7P.	The Study Area as defined in 7.4.
Badger survey	16 th , 17 th and 22 nd May 2019	A badger survey was conducted within the Study Area, by SQE, to identify evidence of badger activity in accordance with the standard methodology ⁵⁷ and the principles of other published guidance ⁵⁸ . Dedicated searches were made for signs of badger activity such as sett holes, footprints, latrines, hairs and paths which constitute characteristic evidence of badger presence. Further details are provided in the badger survey report in Appendix 7M.	The Study Area as defined in 7.4.

⁵⁷ Harris, S. Cresswell, P and Jefferies, D. (1989) Surveying Badgers. The Mammal Society Publication No. 9. Mammal Society.

⁵⁸ Neal, W. and Cheeseman, C. (1996) badgers. Published by Poyser. 1st Edition.

Ecological Feature	Date	Summary of method	Survey boundary
Dormouse	Monthly checks between April and November 2019.	Dormouse surveys were undertaken using nest tubes and boxes (279 tubes and 20 boxes), installed in suitable habitat on site during spring 2019. The tubes and boxes were carefully checked on a monthly basis by a dormouse licenced ecologist to record dormice or their nests, if present, in accordance with best practice survey guidance ⁵⁹ . Further details are provided in the dormouse survey report in Appendix 7N.	The Study Area as defined in 7.4.
Arboreal mammals	Transects were completed monthly between May and October 2019.	Transect and feeding stations were set up within suitable habitat identified during the Extended Phase 1 Habitat Survey ⁶⁰ (i.e. woodland) in early summer 2019: surveys and associated baiting were undertaken monthly until October 2019, by SQE. Signs of target species (i.e. red squirrel, pine martin (<i>Martes martes</i>) and polecat (<i>Mustela putorius</i>)) were searched for during transects, and in video footage (including red squirrel nests, paw prints, pine martin scats, and sightings). Any mustelid scats identified were collected and sent for DNA analysis at EcoWarwicker Ecological Forensics ⁶¹ . Further details are provided in the Arboreal mammal report in Appendix 7O.	The Study Area as defined in 7.4.

⁵⁹ Bright, P, Morris, P, & Mitchell-Jones, T. (2006). The Dormouse Conservation Handbook (2nd ed.). English Nature.

⁶⁰ Arup (2018). Nant Helen Complementary Restoration Works; Extended Phase 1 Habitat Survey.

⁶¹ https://warwick.ac.uk/fac/sci/lifesci/research/archaeobotany/ecological_forensics/.