

Kilpipe Church and Graveyard, Co. Wicklow

Ecological Survey



FINAL REPORT

October 2023

Amended 30th April 2026



Faith Wilson

ECOLOGICAL CONSULTANT

*Faith Wilson Ecological Consultant BSc (Hons) CEnv MCIEEM
Kestrel Ridge, Tigroney West, Avoca, Co. Wicklow*

Kilpipe Church and Graveyard, Co. Wicklow

Ecological Survey

Table of Contents

1. INTRODUCTION	4
1.1 Background	4
1.2 Relevant Legislation	5
1.2.1 Nature Conservation Designations	5
1.2.2 Bats	5
1.2.3 Badgers	6
1.2.4 Invasive Species	7
2. METHODOLOGY	10
2.1 Desk Study and Consultation	10
2.2 Field Survey	10
3. ECOLOGY	12
3.1 Kilpipe Church and Graveyard	12
3.2 Kilpipe Church and Graveyard in a Wider Ecological Context	12
3.2.1 Landscape & Setting	12
3.2.2 Geology	15
3.2.3 Soils	16
3.2.4 Nature Conservation Designations	17
3.3 Biological Records held by The National Biodiversity Data Centre	18
3.4 Receiving Environment – Habitats and Flora	21
3.5 Rare, Scarce and Threatened Flora	28
3.6 Invasives	28
3.7 Watercourses and Fisheries	28
3.8 Faunal Interest	30
3.9 Bats	30
3.10 Birds	32
4. MEASURES TO PROTECT/CONSERVE/ENHANCE BIODIVERSITY	34
4.1 General Recommendations	34
4.2 Tree & Vegetation Retention and Protection	34
4.3 Protection of Breeding Birds	34
4.4 Grassland Management	35
4.5 Protection of Confirmed Bat Roost – Bat Derogation Licence	35
4.6 Resurvey of Potential Bat Roosts prior to Works	38
4.7 Creation of nesting/roosting opportunity within restored/repaired stonework	40
4.8 Provision of Bird Boxes	42
4.9 Bryophyte Survey	43
4.10 Lichen Survey	43
4.11 Conservation of Vegetation on Stonework	43
4.12 Invasive Species	43
4.13 Lighting	43
4.14 Measures for Butterflies in Kilpipe Church and Graveyard	43
5. REFERENCES	47
6. APPENDIX I: SITE SYNOPSIS FOR DESIGNATED SITE	50

All Ordnance Survey Ireland Mapping presented in this report are copyright Ordnance Survey Ireland and Government of Ireland and are protected under the terms of the Copyright Acts.

They are reproduced here under licence CYAL50183710
© Ordnance Survey Ireland/Government of Ireland.

Kilpipe Church and Graveyard, Co. Wicklow

Ecological Survey

1. INTRODUCTION

1.1 Background

This report has been prepared by Faith Wilson (an independent ecological consultant and licensed bat specialist) who was appointed by Yvonne Whitty Archaeology, to prepare a baseline ecological survey and report as part of a Conservation Management Plan for Kilpipe Church and Graveyard, Co. Wicklow (**Figure 1**).

This conservation management plan was commissioned by Wicklow County Council Heritage Office with funding under the Community Monuments Fund 2023, administered by the National Monuments Service in the Department of Housing, Local Government & Heritage. This historic graveyard is managed by members of the local community.

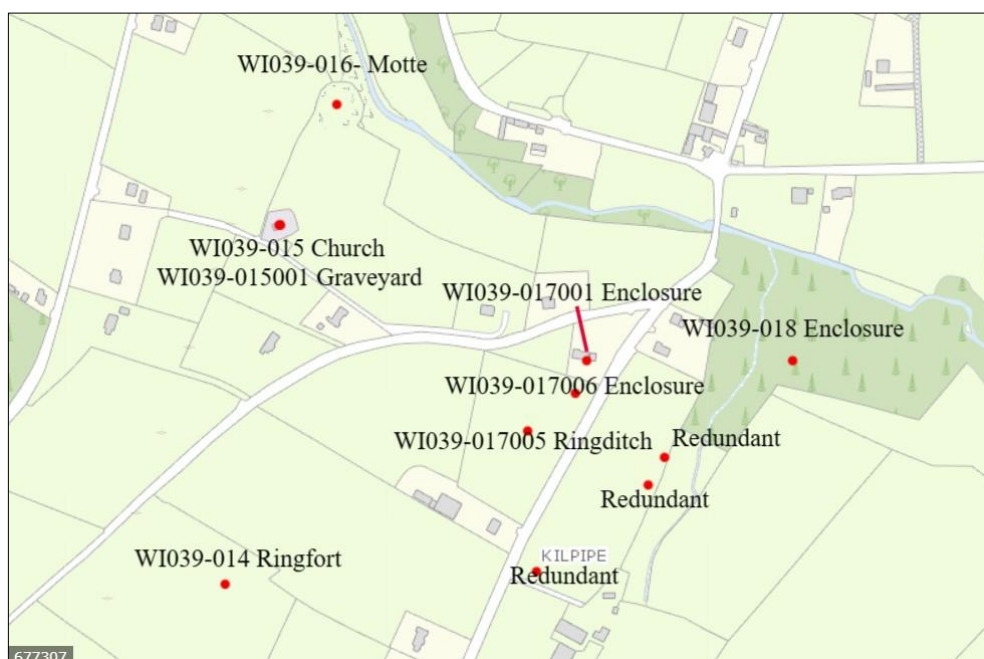


Figure 1. Kilpipe Graveyard National Monument WI-039-015001 and Kilpipe Church National Monument WI039-015.

The scope of works included:

- A botanical and habitat survey
- An invasive species survey
- A mammal survey
- A bird survey
- A preliminary bat survey

1.2 Relevant Legislation

1.2.1 Nature Conservation Designations

International Conservation Designations

Special Areas of Conservation (SACs) are habitats of international significance that have been identified by NPWS and submitted for designation to the EU. SAC is a statutory designation, which has a legal basis under the EU Habitats Directive (92/43/EEC) as transposed into Irish law through the European Communities (Natural Habitats) Regulations, 1997, which were amended in 1998, 2005 and 2011. The European Communities (Birds and Natural Habitats) Regulations 2011 consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats)(Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in the Court of Justice of the European Union (CJEU) judgements.

A Special Protection Area (SPA) is a statutory designation, which has a legal basis under the EU Birds Directive (79/409/EEC). The primary objective of SPAs is to maintain or enhance the favourable conservation status of the birds for which the SPAs have been designated.

National Conservation Designations

Proposed NHAs are habitats or sites of interest to wildlife that have been identified by NPWS. These sites become NHAs once they have been formally advertised and land owners have been notified of their designation. NHAs are protected under the Wildlife (Amendment) Act, 2000, from the date they are formally proposed. NHA is a statutory designation according to the Wildlife (Amended) Act, 2000 and requires consultation with NPWS if any development impacts on a pNHA.

1.2.2 Bats

Eleven species of bats occur in Ireland and all are protected under both national and international law.

Wildlife Act 1976

In the Republic, under Schedule 5 of the Wildlife Act 1976, all bats and their roosts are protected by law. It is unlawful to disturb either without the appropriate licence. The Act was amended in 2000.

Bern and Bonn Convention

Ireland has also ratified two international conventions, which afford protection to bats amongst other fauna. These are known as the 'Bern' and 'Bonn' Conventions. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), exists to conserve all species and their habitats, including bats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries, which covers certain species of bat.

EU Habitats Directive

All bat species are given strict protection under Annex IV of the EU Habitats Directive, whilst the lesser horseshoe bat (*Rhinolophus hipposideros*) and greater horseshoe bat (*Rhinolophus ferrumequinum*) are given further protection under Annex II of the EU Habitats Directive. Both are listed as a species of community interest that is in need of strict protection and for which E.U. nations must designate Special Areas of Conservation (SACs). The latter is only known from a single site and no breeding populations have been recorded to date. The former are a species of the western seaboard of Ireland and have not yet been recorded on the east coast.

The principal pressures on Irish bat species have been identified as follows:

- urbanized areas (e.g. light pollution);
- bridge/viaduct repairs;
- pesticides usage;
- removal of hedges, scrub, forestry;
- water pollution;
- other pollution and human impacts (e.g. renovation of dwellings with roosts);
- infillings of ditches, dykes, ponds, pools and marshes;
- management of aquatic and bank vegetation for drainage purposes;
- abandonment of pastoral systems;
- speleology and vandalism;
- communication routes: roads; and
- inappropriate forestry management.

1.2.3 Badgers

Badgers (*Meles meles*) are common and widespread in Ireland, and are found in all lowland habitats where the soil is dry and not subject to flooding (Hayden and Harrington, 2000). Badgers are social animals that live in complex underground tunnel systems called setts. Badger territories may vary in size from about 60-200 ha (Smal, 1995).

Badgers and their setts legally are protected under the provisions of the Wildlife Act, 1976, and the Wildlife Amendment Act, 2000. It is an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. It is standard best practice to ensure that mitigation measures are taken to limit impacts on badgers and badger populations during developments.

1.2.4 Invasive Species

The legal framework for the control or eradication of non-native invasive species in the Republic of Ireland is the Birds and Habitats Regulations (2011), which include legislation on invasive and non-native species in Sections 49 and 50.

Since then the EU Regulation on Invasive Alien Species (EU Regulation 1143/2014) also came into force on the 3rd August 2016.

The plant and animal species to which the Birds and Habitats Regulations (2011) apply are presented in Schedule Three. Part 1 details the plants species, while Part 3 outlines those animal or plant vector materials and are presented below.

Third Schedule: Part 1 Plants

Non-native species subject to restrictions under Regulations 49 and 50.

First column	Second column	Third column
Common name	Scientific name	Geographical application
American skunk-cabbage	<i>Lysichiton americanus</i>	Throughout the State
A red alga	<i>Grateloupia doryphora</i>	Throughout the State
Brazilian giant-rhubarb	<i>Gunnera manicata</i>	Throughout the State
Broad-leaved rush	<i>Juncus planifolius</i>	Throughout the State
Cape pondweed	<i>Aponogeton distachyos</i>	Throughout the State
Cord-grasses	<i>Spartina</i> (all species and hybrids)	Throughout the State
Curly waterweed	<i>Lagarosiphon major</i>	Throughout the State
Dwarf eel-grass	<i>Zostera japonica</i>	Throughout the State
Fanwort	<i>Cabomba caroliniana</i>	Throughout the State
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	Throughout the State
Fringed water-lily	<i>Nymphoides peltata</i>	Throughout the State
Giant hogweed	<i>Heracleum mantegazzianum</i>	Throughout the State
Giant knotweed	<i>Fallopia sachalinensis</i>	Throughout the State
Giant-rhubarb	<i>Gunnera tinctoria</i>	Throughout the State
Giant salvinia	<i>Salvinia molesta</i>	Throughout the State
Himalayan balsam	<i>Impatiens glandulifera</i>	Throughout the State
Himalayan knotweed	<i>Persicaria wallichii</i>	Throughout the State
Hottentot-fig	<i>Carpobrotus edulis</i>	Throughout the State
Japanese knotweed	<i>Fallopia japonica</i>	Throughout the State
Large-flowered waterweed	<i>Egeria densa</i>	Throughout the State
Mile-a-minute weed	<i>Persicaria perfoliata</i>	Throughout the State
New Zealand pigmyweed	<i>Crassula helmsii</i>	Throughout the State
Parrot's feather	<i>Myriophyllum aquaticum</i>	Throughout the State
Rhododendron	<i>Rhododendron ponticum</i>	Throughout the State
Salmonberry	<i>Rubus spectabilis</i>	Throughout the State
Sea-buckthorn	<i>Hippophae rhamnoides</i>	Throughout the State
Spanish bluebell	<i>Hyacinthoides hispanica</i>	Throughout the State

First column	Second column	Third column
Common name	Scientific name	Geographical application
Three-cornered leek	<i>Allium triquetrum</i>	Throughout the State
Wakame	<i>Undaria pinnatifida</i>	Throughout the State
Water chestnut	<i>Trapa natans</i>	Throughout the State
Water fern	<i>Azolla filiculoides</i>	Throughout the State
Water lettuce	<i>Pistia stratiotes</i>	Throughout the State
Water-primrose	<i>Ludwigia</i> (all species)	Throughout the State
Waterweeds	<i>Elodea</i> (all species)	Throughout the State
Wireweed	<i>Sargassum muticum</i>	Throughout the State

EU Regulation 1143/2014 on Invasive Alien Species

On 14 July 2016 the European Commission published Commission Implementing Regulation 2016/1141 which set out an initial list of 37 species to which EU Invasive Alien Species Regulation 1143/2014 will apply. The associated restrictions and obligations came into force on 3rd August 2016.

Plant species listed on the directive include:

- American skunk cabbage *Lysichiton americanus*
- Asiatic tearthumb *Persicaria perfoliata* (*Polygonum perfoliatum*)
- Curly waterweed *Lagarosiphon major*
- Eastern Baccharis *Baccharis halimifolia*
- Floating pennywort *Hydrocotyle ranunculoides*
- Floating primrose willow *Ludwigia peploides*
- Green cabomba *Cabomba caroliniana*
- Kudzu vine *Pueraria lobata*
- Parrot's feather *Myriophyllum aquaticum*
- Persian hogweed *Heracleum persicum*
- Sosnowski's hogweed *Heracleum sosnowskyi*
- Water hyacinth *Eichhornia crassipes*
- Water primrose *Ludwigia grandiflora*
- Whitetop weed *Parthenium hysterophorus*

Animal species listed on the directive include:

- Amur sleeper *Perccottus glenii*
- Asian hornet *Vespa velutina*
- Chinese mitten crab *Eriocheir sinensis*
- Coypu *Myocastor coypus*
- Fox squirrel *Sciurus niger*
- Grey squirrel *Sciurus carolinensis*
- Indian house crow *Corvus splendens*
- Marbled crayfish *Procambarus* spp.
- Muntjac deer *Muntiacus reevesii*
- North american bullfrog *Lithobates* (*Rana*) *catesbeianus*
- Pallas's squirrel *Callosciurus erythraeus*
- Raccoon *Procyon lotor*
- Red swamp crayfish *Procambarus clarkii*
- Red-eared terrapin/slider *Trachemys scripta elegans*

- Ruddy duck *Oxyura jamaicensis*
- Sacred ibis *Threskiornis aethiopicus*
- Siberian chipmunk *Tamias sibiricus*
- Signal crayfish *Pacifastacus leniusculus*
- Small Asian mongoose *Herpestes javanicus*
- South American coati *Nasua nasua*
- Spiny-cheek crayfish *Orconectes limosus*
- Topmouth gudgeon *Pseudorasbora parva*
- Virile crayfish *Orconectes virilis*

On 13 July 2017 the European Commission published Commission Implementing Regulation 2017/1263 which added a further 12 species to the current list of 37 species regulated under the EU Invasive Alien Species Regulation (1143/2014).

These are:

Plant species

- Alligator weed (*Alternanthera philoxeroides*)
- Milkweed (*Asclepias syriaca*)
- Nuttall's waterweed (*Elodea nuttallii*)
- Chilean rhubarb (*Gunnera tinctoria*)
- Giant hogweed (*Heracleum mantegazzianum*)
- Himalayan balsam (*Impatiens glandulifera*)
- Japanese stiltgrass (*Microstegium vimineum*)
- Broadleaf watermilfoil (*Myriophyllum heterophyllum*)
- Crimson fountaingrass (*Pennisetum setaceum*)

Animal species

- Egyptian goose (*Alopochen aegyptiacus*)
- Raccoon dog (*Nyctereutes procyonoides*)
- Muskrat (*Ondatra zibethicus*)

The associated restrictions and obligations came into force from 2 August 2017 for all these species apart from the Raccoon dog, which came into force on 2 February 2019.

Other Invasive Species

The main guidance document that has been prepared dealing with invasive species/noxious weeds on sites is the NRA 'Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads' which was published in 2010. This document details other non-native species of note.

A detailed survey for such species within the environs of Kilpipe Church was conducted in order to ensure that any proposed works do not result in the disturbance and spread of any invasive species.

2. METHODOLOGY

2.1 Desk Study and Consultation

A desk study was carried out to collate any available information on the ecological environment of Kilpipe Church and Graveyard.

The National Parks and Wildlife Service (NPWS) of the Department of Housing, Local Government and Heritage (DHLGH) database of designated conservation areas and NPWS records of rare and protected plant species were checked with regard to the location of Kilpipe Church.

Information on protected species of fauna and flora listed for protection under Annex II of the EU Habitats Directive (92/43/EEC), Annex I of the Birds Directive (79/409/EEC) and the Wildlife (Amendment) Act (2000) was also sought from NPWS and published sources. A data search was made for any biological records held by the National Biodiversity Data Centre from the vicinity of the monument.

2.2 Field Survey

A field survey was conducted in Kilpipe Church and Graveyard on 31st August 2023.

Habitats and Flora

Kilpipe Church was visited to survey the habitats present, using the habitat survey and mapping techniques described by Smith *et al.* (2011) and described using the Heritage Council Habitat Classification (Fossitt, 2000). The habitats present were described to Fossitt Level 3 and any correspondence or potential correspondence to habitats listed under Annex I of the EU Habitats Directive were considered and assessed.

A particular focus of the surveys was to determine if any protected species of plant under the Flora (Protection) Order (2022) or listed in the Irish Vascular Plants Red Data Book are present within the environs of Kilpipe Church.

Any invasive species present in the environs of Kilpipe Church were also identified. A particular focus of the surveys was for those invasive species listed in the Birds and Habitats Regulations 2011.

Mammals

Bats

In accordance with best practice, preliminary bat surveys of the general environs of Kilpipe Church were conducted.

The church building and stone walls within the graveyard were examined for signs of bat use. Bat usage of structures is usually detected by the following signs (though direct observations are also occasionally made):

- bat droppings (these will accumulate under an established roost or under access points);
- insect remains (under feeding perches);

- oil (from fur) and urine stains;
- scratch marks; and
- bat corpses.

The nature and type of habitats present are also indicative of the species likely to be present. Trees within the graveyard were assessed for their potential use by bats using the following standard criteria, which were created by bat specialists from Bat Conservation Ireland for use in the assessments of tree roosts on large infrastructural projects and are summarised in NRA (2006):

- Presence or absence of bat droppings (these can be hard to find amongst leaf litter or may be washed away following periods of wet weather),
- Bat droppings may also be seen as a black streak beneath holes, cracks, branches, etc.,
- Presence or absence of smooth edges with dark marks at potential entrances to roosts,
- Presence or absence of urine stains at potential entrances to roosts,
- Presence of natural cracks and rot holes in the trunk or boughs of the tree,
- Hollow trees,
- Presence or absence of creepers such as ivy or honeysuckle on trees (ivy clad trees are often used by bat species such as pipistrelles as roosts),
- Presence or absence of loose bark such as that of sycamore, or flaky bark on coniferous species such as cedars, cypress and Scot's pine,
- Presence or absence of bracket fungi which may indicate a rotten or potentially hollow centre to the tree,
- Known bat roosts previously identified,
- Trees with storm or machinery damage or broken boughs,
- Clutter level - where the branches and trunk are easily accessible, this is considered a better tree for bat roosts,
- Adjoining habitat - if there are a variety of feeding opportunities for bats, this increases the potential of a tree as a bat roost,
- Adjoining potential roosts / known roosts. This raises the likelihood of a tree being of benefit as bats may move roosts if the roost becomes too hot or cold during roosting and a nearby alternative roost is highly desirable.

Other mammals

A dedicated large mammal survey was carried out by Faith Wilson during the site visit using the techniques as prescribed in Ecological Survey Techniques for Protected Flora and Fauna (NRA, 2008).

This entailed searching for and identification of signs, tracks and droppings of various mammals (potential/likely species include badger, fox, hedgehog, brown rat, house mouse and pygmy shrew along with non-native species such as grey squirrel and rabbit) within the environs of Kilpipe Church and graveyard. Direct observations of fauna were also made.

3. ECOLOGY

3.1 Kilpipe Church and Graveyard

Kilpipe Church is listed in the Record of Monuments and thus is subject to a preservation order made under the National Monuments Acts 1930 to 2014 (PO no. 131/1940). The church and graveyard RMP monument numbers are WI039-015 and WI039-015001 respectively. A motte is located 150m north east of the church and graveyard.

The church is in ruins and it and the graveyard are currently totally overgrown (**Figure 2**).

The graveyard is surrounded by an earth and stone bank, with dry stone walling on the outside; outside that is a fosse (or trench).

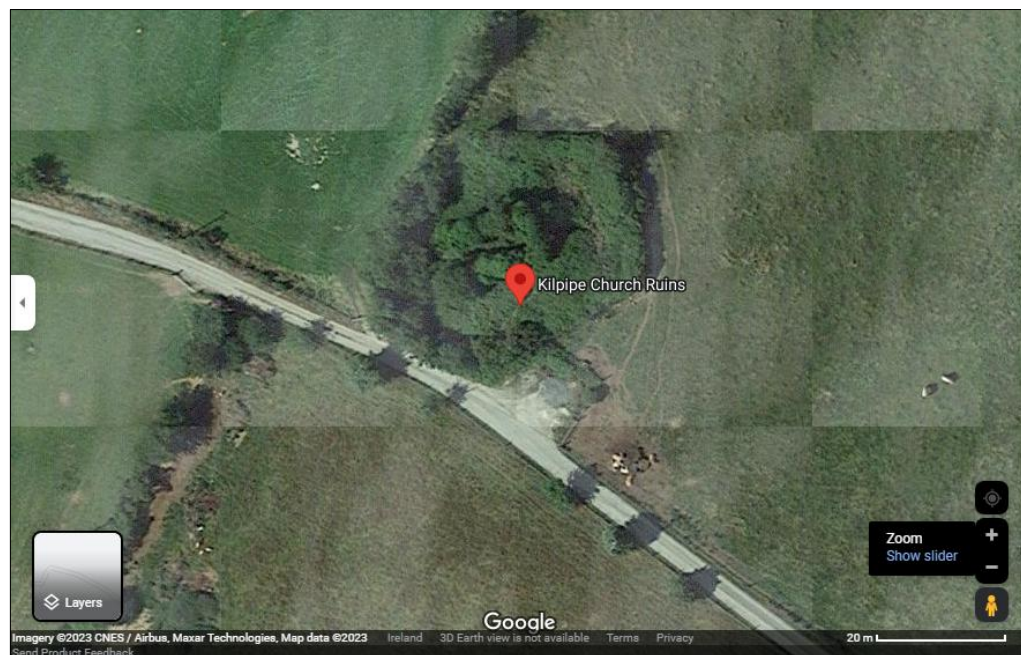


Figure 2. Kilpipe Church and Graveyard are overgrown and surrounded by vegetation.

3.2 Kilpipe Church and Graveyard in a Wider Ecological Context

3.2.1 Landscape & Setting

Kilpipe Church and Graveyard, Co. Wicklow, is located just south of Annacurragh and less than 4km south south west of Aughrim and 17km west north west of Arklow. It lies on high ground in an agricultural area (**Figure 3**). The church and graveyard, with the motte to the north east, are marked clearly on the first edition Ordnance Survey of Ireland (OSI) maps, both in black and white and colour (**Figures 4 & 5**) and also on subsequent second edition 6" and 25" OSI maps (**Figures 6 & 7**). A small tributary of the Derry Water River flows very close to the motte. The Derry Water River flows towards Aughrim, where it meets the Ow River and thereafter continues as the Aughrim River until it meets the Avoca River at Woodenbridge. From there it flows as the Avoca River to Arklow.

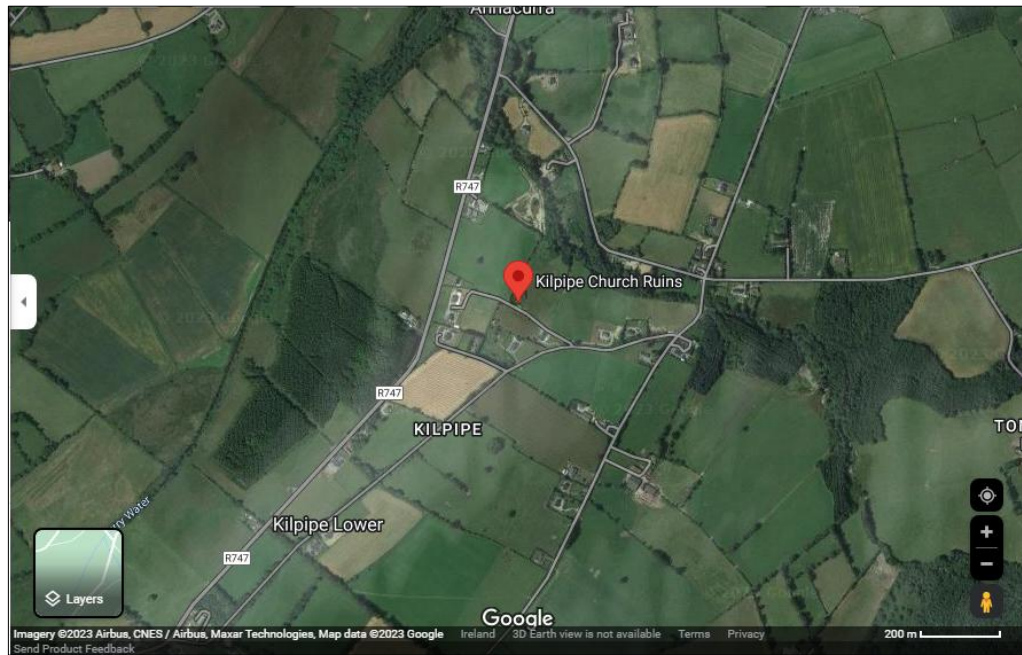


Figure 3. Kilpipe Church and Graveyard, surrounded by agricultural land.



Figure 4. Ordnance Survey Ireland First Edition 6'' series mapping (OSI), showing Kilpipe Church and Graveyard, with motte to the north east.

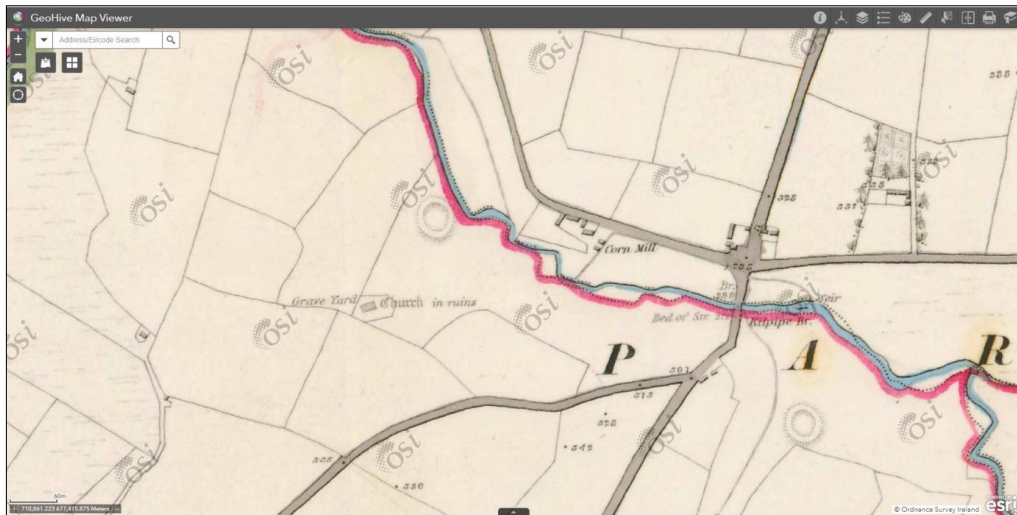


Figure 5. Ordnance Survey Ireland First Edition 6'' series mapping - colour edition (OSI), showing Kilpipe Church and Graveyard, with motte to the north east.

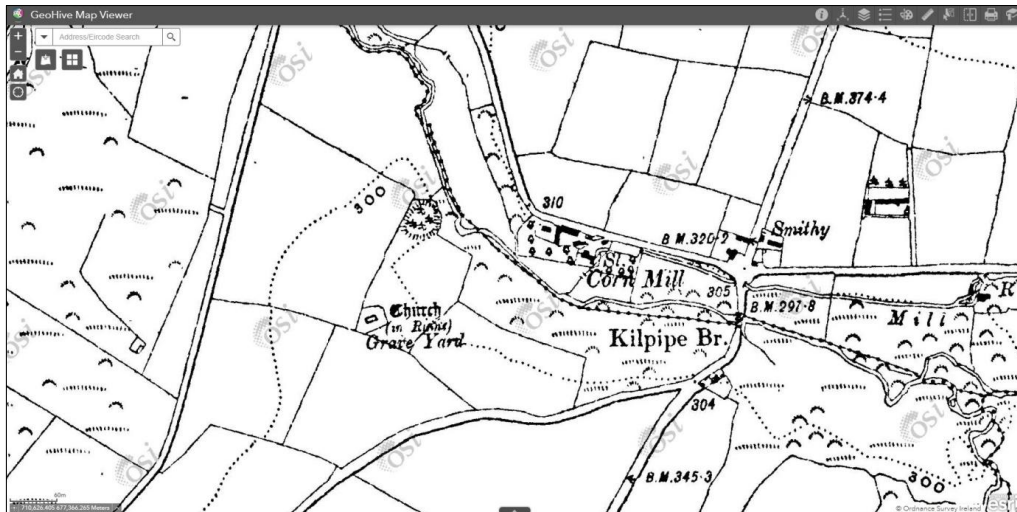


Figure 6. Ordnance Survey Ireland Second Edition 6'' series mapping OSI), showing Kilpipe Church and Graveyard, with motte to the north east. Note the drainage of the lands to west.

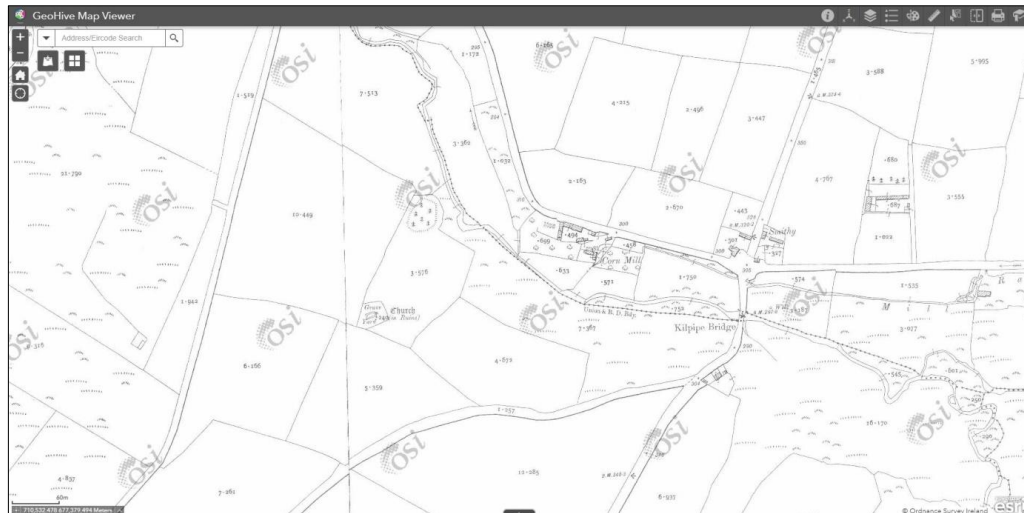


Figure 7. Ordnance Survey Ireland Second Edition 25'' series mapping OSI), showing Kilpipe Church and Graveyard, with motte to the north east.

3.2.2 Geology

The geology in the environs of Kilpipe is underlain by dark blue-grey slate, phyllite & schist (known as the Maulin Formation) (Source: GSI) (Figure 8).

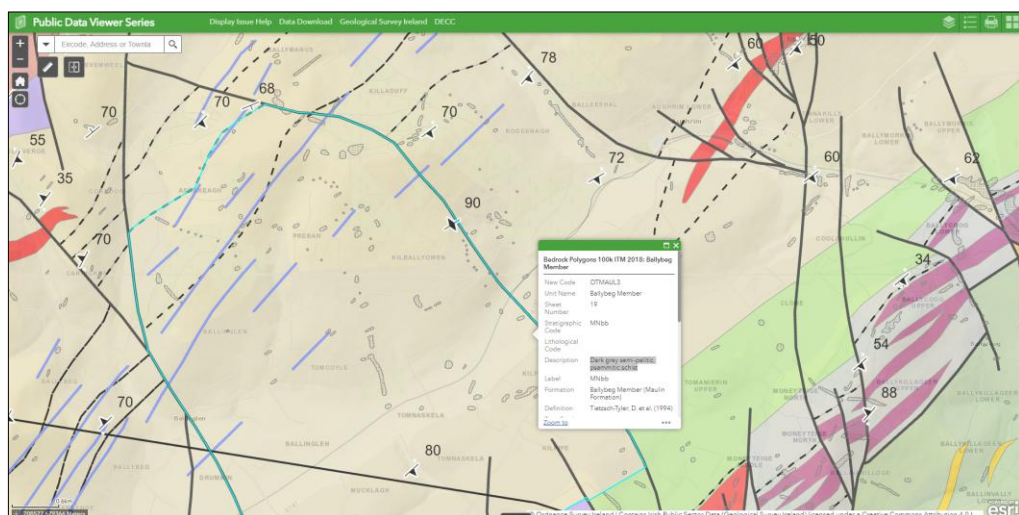


Figure 8. Kilpipe is underlain by dark blue-grey slate, phyllite & schist (known as the Maulin Formation) (Source: GSI).

3.2.3 Soils

The soils at Kilpipe are a fine loamy drift with siliceous stones (known as the Clonroche Association) (Source: Teagasc/EPA) (**Figure 9**). The soils along the nearby Derry Water River are alluvial (**Figure 10**).

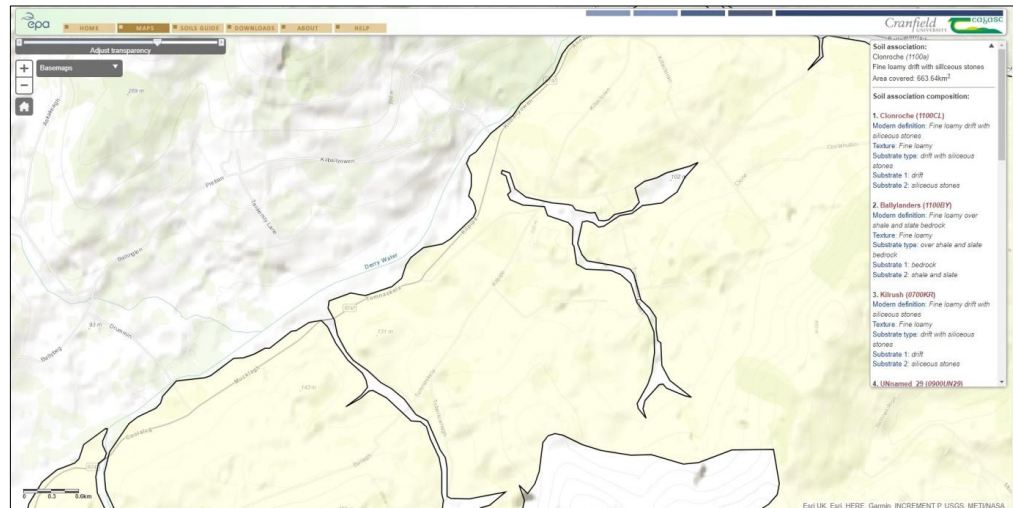


Figure 9. The soils at Kilpipe are a fine loamy drift with siliceous stones (known as the Clonroche Association) (Source: Teagasc/EPA).

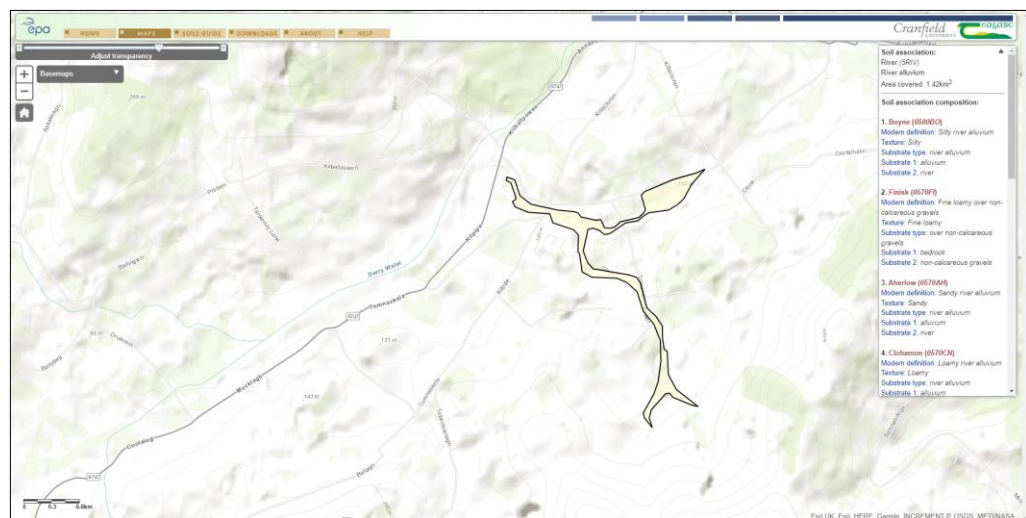


Figure 10. Soils along the Derry River are alluvial in nature (Source: Teagasc/EPA).

3.2.4 Nature Conservation Designations

The lands at Kilpipe are not the subject of any nature conservation designations. The closest designated site is the Avoca River Valley pNHA (Site Code: 001748) which is found downstream of the monument on the Aughrim River (site synopsis in **Appendix 1**). The lands here are designated on account of its woodland habitat.

The Derry Water (via the Aughrim River) links the site to this protected area – see **Figure 11** below.

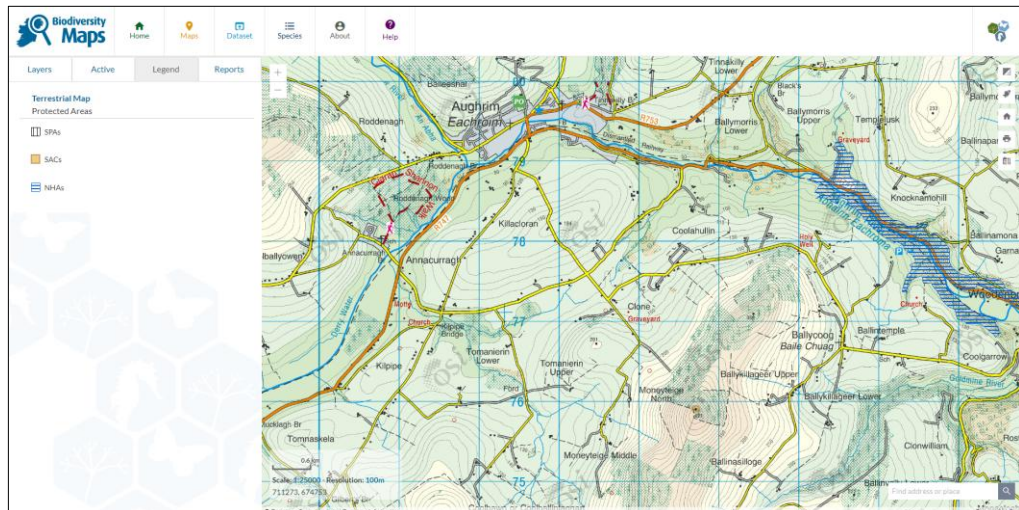


Figure 11. Avoca River Valley pNHA (Site Code: 001748) is the only designated site in any way close to Kilpipe Church and Graveyard.

3.3 Biological Records held by The National Biodiversity Data Centre

The National Biodiversity Data Centre (NBDC) provides information on biological records submitted throughout Ireland. It does not have any records from the actual monument itself. Kilpipe lies within the NBDC 1km square T1177 (Figures 12, 13 & 14).

Only nine biological records have been submitted for this square, including one bird species, namely red kite (*Milvus milvus*), one flowering plant, six moth species and one mammal, the badger.

There are many more records from T17, the 10km square in which Kilpipe is located, with nearly 1,350 different species being reported (Table 1).

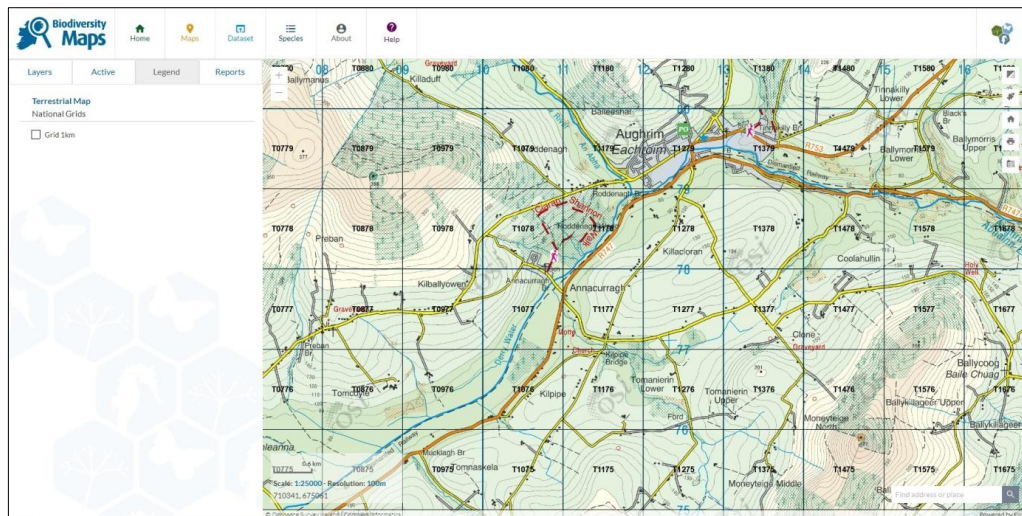


Figure 12. Location of T1177, NBDC 1km square in which Kilpipe Church and Graveyard is located.

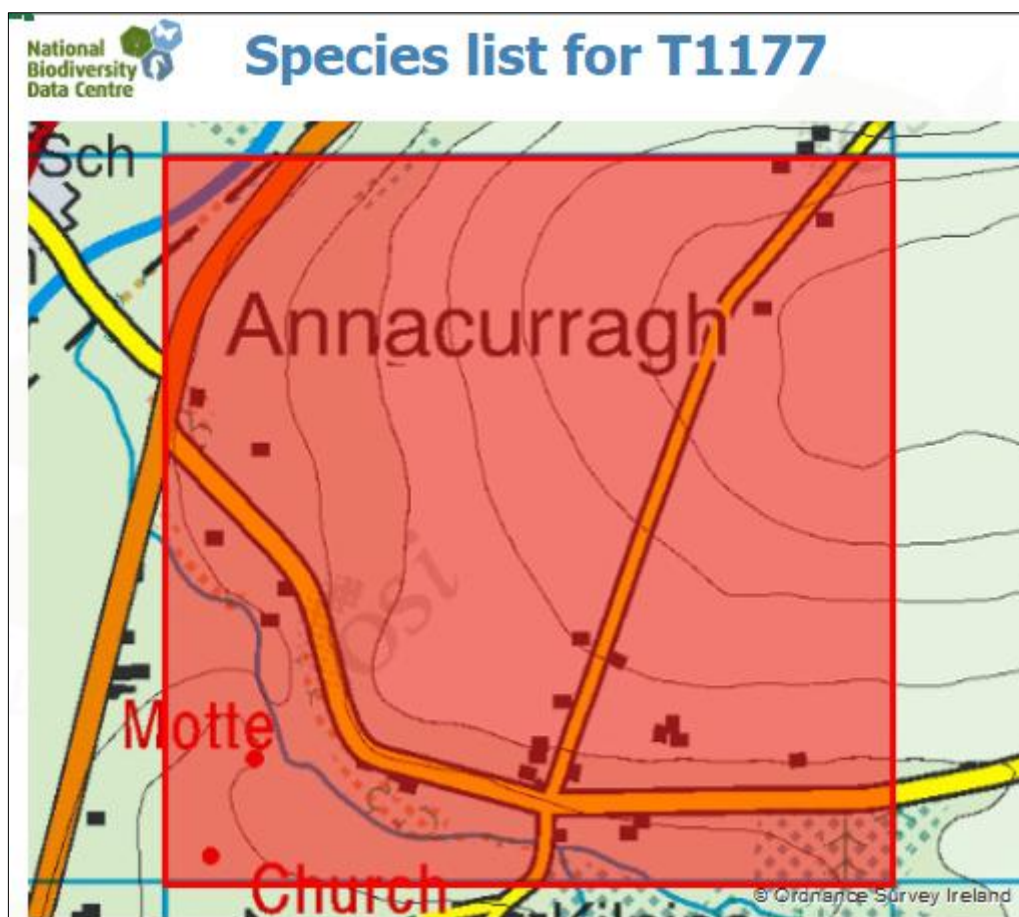


Figure 13. T1177, the NBDC 1km square surrounding Kilpipe Church and Graveyard.

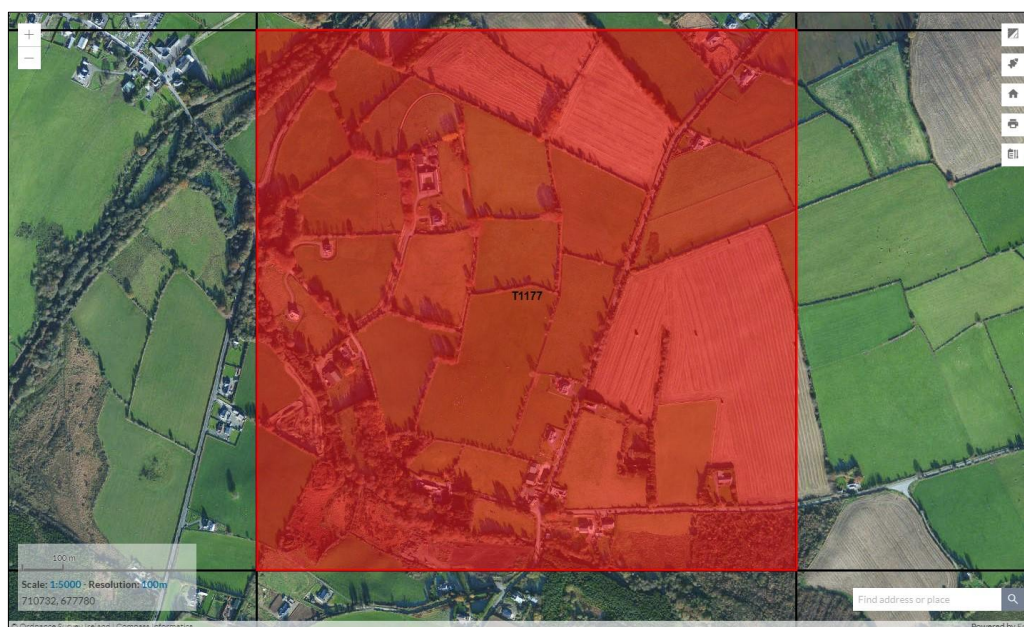


Figure 14. Landuse in NBDC 1km square T1177.

**Table 1. Number of species in each organism group recorded in square T17.
(Source: NBDC).**

Organism group	Number of records in T17
Acarine	1
Amphibian	1
Annelid	12
Bird	86
Conifer	7
Crustacean	3
Fern	17
Flatworm	2
Flowering plant	351
Fungus	25
Hairworm	1
Horsetail	3
Insect	578
Liverwort	38
Mollusc	54
Moss	131
Slime mould	11
Spider	3
Mammal	24

3.4 Receiving Environment – Habitats and Flora

The small graveyard is very overgrown, so there is little in the way of managed grassland, in contrast to most graveyards.

A cleared, grassy track leads from the road through the ring fort to the church ruins.

The grassland around the church and gravestones has not been mown or grazed in a long time and is now dominated by dense bracken (*Pteridium aquilinum*) with brambles (*Rubus fruticosus* agg.), nettle (*Urtica dioica*), and hogweed (*Heracleum sphondylium*).

Lichens are abundant on the gravestones within the graveyard.

The church is dominated by mature ivy (*Hedera helix*) which is rich with berries supporting many insects at this time of year and offering nesting habitat for birds and roosting opportunities for bats.

A magnificent ancient hedgerow (WL1) surrounds the graveyard on the bank of the ring fort with hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), bramble, and elder (*Sambucus nigra*). Elder is also found adjoining the church.

Insect life was abundant.

There was no evidence of weed killing.

The absence of spraying and the lush vegetation provide abundant food for insects and birds.

The ivy, elder, bramble, blackthorn and hawthorn are all native shrubs which are excellent for biodiversity.



Plate 1. Bracken grows in abundance within the ring fort surrounding the church.



Plate 2. A recently mown grassy path, bordered by bracken, leads through the ring fort from the local road to the church ruins.



Plate 3. Nettles, brambles, native grasses, hogweed, ferns, and hawthorn all provide good habitat for insects and birds.



Plate 4. A recently cleared track through the bracken with blackthorn on the adjoining ring fort surrounding the church.



Plate 5. Church ruin, with prolific ivy.



Plate 6. Blackthorn is abundant. Sloes in autumn are a good source of food for wildlife.



Plate 7. Graveyard is overgrown, with ferns, ivy, nettles.



Plate 8. Gravestones are now visible owing to some recent judicious clearance of grass and bracken. Metal railings surround an old gravestone. The church ruins are nearly totally covered in ivy.



Plate 9. Gravestone with ferns, grass and other vegetation growing around them. These support rich lichen communities.



Plate 10. Elder bush growing in the collapsed church wall.



Plate 11. Ivy growing up the church wall and then cascading down on top of it.



Plate 12. Metal railings surrounding an old gravestone at the rear of the church.



Plate 13. Extent of ivy on church walls obvious.

3.5 Rare, Scarce and Threatened Flora

There are no records of any rare, scarce or threatened plant species from Kilpipe Church and Graveyard.

3.6 Invasives

There were no observations of any invasive species from within the environs of the church and graveyard.

3.7 Watercourses and Fisheries

The Derry Water is found to the north and west of the church and graveyard.

The Derry Water (IE_EA_10D020800) is located within the Ovoca Vartry Catchment (010) and within the Derry Water Sub catchment (SC_010).

The Derry Water rises on the slopes of Monalee and Ballythomas Hill and also drains from the Knockannana and Askanagap Valleys to the west of Kilpipe before flowing east through Aughrim village to join the Ow River.

The river is then known as the Aughrim River and continues to flow south east before joining the Avoca River at Woodenbridge and passes under the M11 motorway and through Arklow Town where it enters the sea.

Water quality in the Derry Water was assessed during the 2013 – 2018 monitoring period as ‘Good’ and has remained ‘Good’ during the 2016 – 2021 monitoring period (**Figures 15, 16 & 17**).

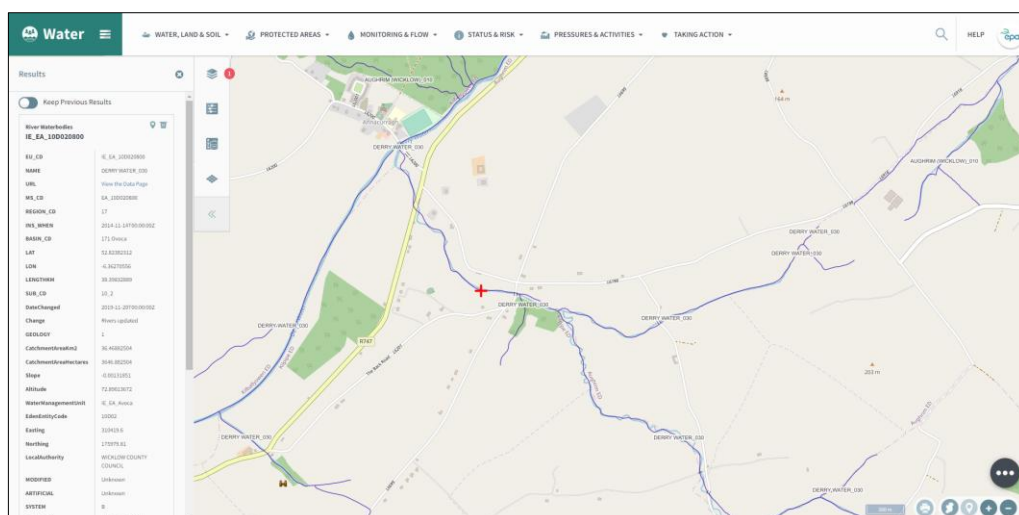


Figure 15. The Derry Water is found to the north and west of the site.

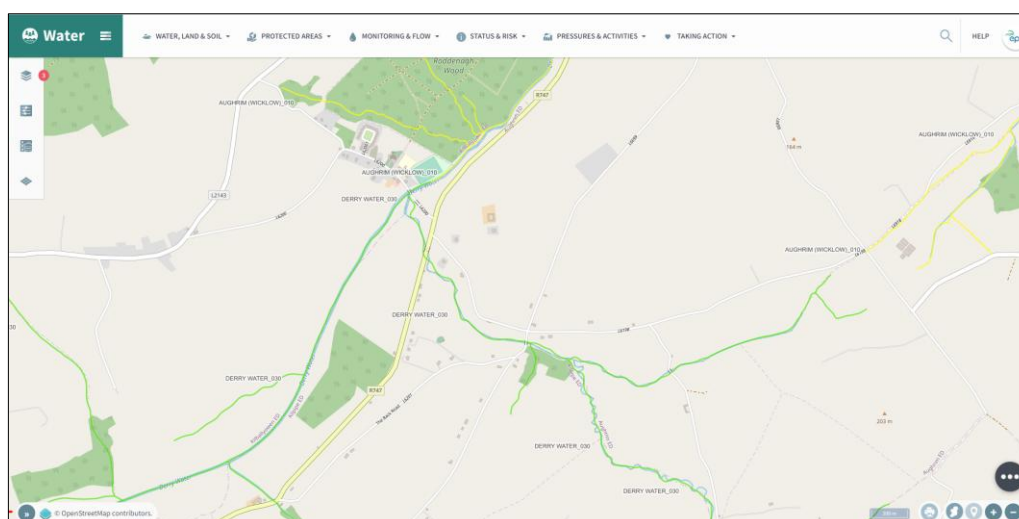


Figure 16. Water Quality in the Derry Water in the monitoring period 2013 – 2018 was assessed as ‘Good’.

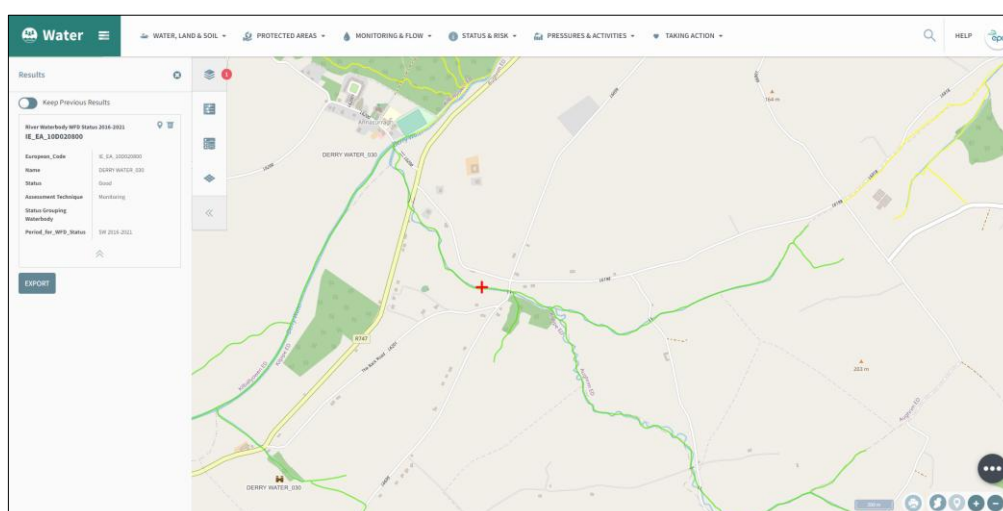


Figure 17. Water Quality in the Derry Water in the last monitoring period 2016 – 2021 remained assessed as ‘Good’.

3.8 Faunal Interest

On the day of the site visit, signs of a badger were recorded and a frog (*Rana temporaria*) was seen.

However, the usual complement of other species that would be expected in such a habitat include fox (*Vulpes vulpes*), hedgehog (*Erinaceus europaeus*), brown rat (*Rattus norvegicus*) and house mouse (*Mus musculus*).

Rabbits (*Oryctolagus cuniculus*), a Norman introduction to Ireland, are also likely to occur.

3.9 Bats

The Bat Conservation Ireland Database of bat records was searched for records of bats from the Kilpipe area. The database does not hold any records in the 1km square (T1177) surrounding the church and graveyard, but five bat species have been recorded in the 10km square (T17). These include:

- Common pipistrelle (*Pipistrellus pipistrellus*),
- Soprano pipistrelle (*Pipistrellus pygmaeus*),
- Leisler's bat (*Nyctalus leisleri*),
- Natterer's bat (*Myotis nattereri*), and
- An unidentified *Myotis* bat.

No bats were recorded during visual inspections of the stonework of the church during the visual survey of the building.

Suitable crevices, holes, gaps in stonework, etc. were inspected with an endoscope to check for the presence of roosting bats. Roosting was confirmed, with droppings in the stone work in the ruins of the church. The church is therefore a confirmed bat roost and a bat derogation licence will be required for any repair or repointing works to the structure.

A dedicated bat survey using was conducted at Kilpipe Church given the potential for bats to utilise the ruined church structure for roosting purposes. A bat detector survey was carried out at dusk on 31st August 2023 using several types of bat detectors – an Echometer Touch Pro, two Batbox Duet Heterodyne/Frequency Division detectors and a Pettersson D100 Heterodyne detector. The emergence of bats from the church at dusk was monitored and a walkover survey of the general environs of the graveyard and adjoining lane was conducted. Weather conditions were initially suitable for bat surveys with temperatures of 16°C and it was overcast, dry and calm. However it began raining heavily at 23.20 so the study was concluded.

Bat activity is predominantly bi-modal, with bats taking advantage of increased insect numbers on the wing during the periods after dusk and before dawn, (there is usually a lull in activity in the middle of the night). While this holds true for 'hawking' species (bats that capture prey in the open air), 'gleaning' species such as brown long-eared (*Plecotus auritus*), Natterer's (*Myotis nattereri*) and Whiskered/Brandt's bats (*Myotis mystacinus/brandtii*) remain active throughout the night, as prey is available on foliage for longer periods.



Plate 14. Bat droppings within the stone wall.



Plate 15. Bat droppings were noted within the stone wall along with mouse droppings.

Bats would be expected at the site as there is so much available habitat for them, in ivy, trees and crevices in the church ruins. The landscape around Kilpipe Church offers a darkened and safe hunting area for bats with a diversity of

natural vegetation, which in turn supports a variety of insects on which bats feed.

During the detector surveys of Kilpipe Church and Graveyard, common pipistrelle and soprano pipistrelle were both recorded foraging in the vicinity of the church – see **Figures 18** and **19**. There was a lot of activity on the western side of the church and many pipistrelle social calls were recorded. Leisler’s bat would also be expected.

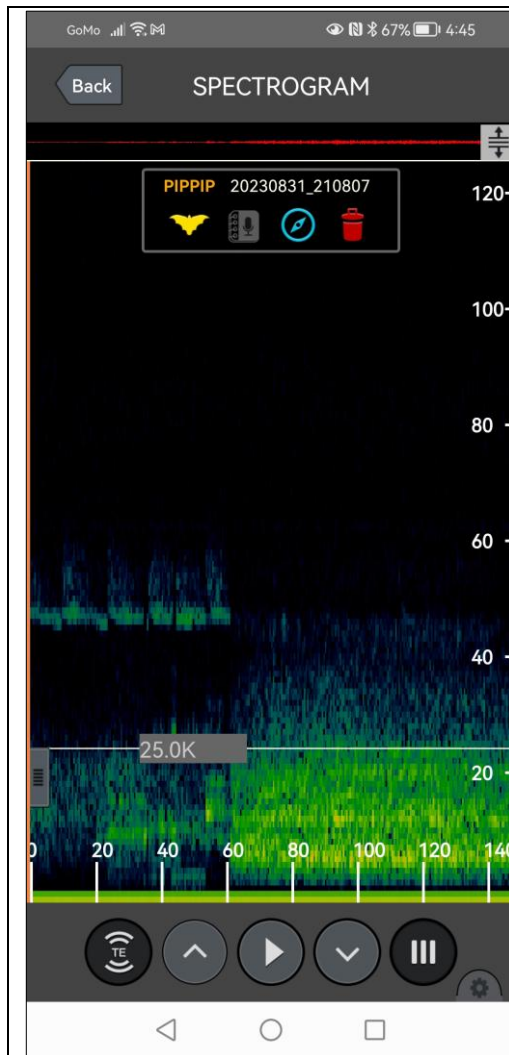


Figure 18. Sonogram of Common pipistrelle at Kilpipe.

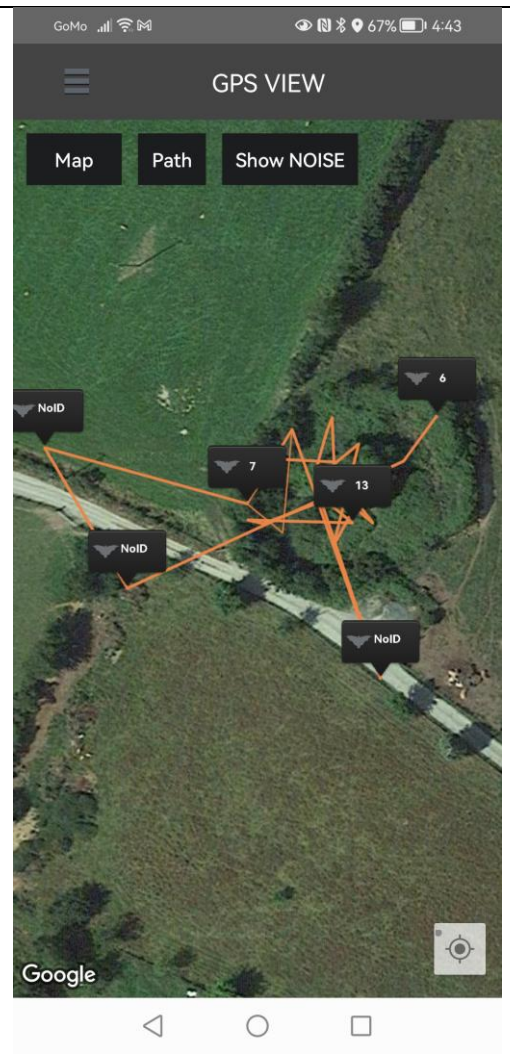


Figure 19. Bat activity at Kilpipe.

3.10 Birds

The site visit was brief (owing to rain) and no birds were recorded, but in this habitat one would expect many species to occur, including birds such as robin (*Erithacus rubecula*), blackbird (*Turdus merula*), dunnock (*Prunella modularis*), song thrush (*Turdus philomelos*), great tit (*Parus major*), coal tit (*Parus ater*), goldfinch (*Carduelis carduelis*), chaffinch (*Fringilla coelebs*), goldfinch (*Carduelis carduelis*), wren (*Troglodytes troglodytes*), magpie (*Pica pica*), woodpigeon (*Columba palumbus*) and starling (*Sturnus vulgaris*).

Rook (*Corvus frugilegus*) and jackdaw (*Corvus monedula*) could also occur in the vicinity.

Wood pigeon frequently feed on both ivy berries and sloes (berries of blackthorn).

Blackbirds and thrushes, in particular, feed on autumn hawthorn berries.

4. MEASURES TO PROTECT/CONSERVE/ENHANCE BIODIVERSITY

4.1 General Recommendations

Any work undertaken within the graveyard to conserve the monument there should be mindful of the natural heritage and character of the place and should enhance the character and setting of the monument.

Equally, any habitat work must be mindful of the state of the stonework of old walls and the church ruins.

Collaboration will be important.

It will be important not to pull ivy away from any stonework as this could cause collapse.

If work is being undertaken to conserve the church and promote the area, then access will undoubtedly need to be improved. This should be done by strimming or mowing the vegetation, and removing the cuttings as has previously occurred, but no weed killers should be used.

4.2 Tree & Vegetation Retention and Protection

It is important that the surrounding trees and shrubs on the earthen bank surrounding the church are protected during any works and retained in full as this provides foraging habitat for bats supporting a diversity of invertebrates. These areas of natural vegetation also help to maintain and create a corridor which allows bats (and other fauna) to forage and commute through the landscape.

If any test trenching or excavation works are to take place near trees, protective fencing should be erected in advance of any construction works commencing outside the drip-line of the canopy of retained trees to prevent damage by machinery, compaction of soil, etc. in accordance with BS 5837:2012. This should be signed off on by a qualified arborist or ecologist to ensure it has been erected properly before any machinery is allowed in the vicinity/work commences.

4.3 Protection of Breeding Birds

If any vegetation clearance works are proposed (for example from a built heritage perspective) this will be undertaken outside of the breeding bird season from March 1st to August 31st (in accordance with the Wildlife (Amendment) Act (2000)) to avoid direct impacts on breeding birds.

Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, restricts the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches during the nesting and breeding season for birds and wildlife, from 1 March to 31 August. **No clearance of vegetation suitable for nesting birds within the site (shrubs, bramble tangles, etc.) should take place during this period. Should such clearance be required then the area proposed for clearance should be inspected by an ecologist to ascertain if any nesting birds are present.**

4.4 Grassland Management

Where possible some areas of grass and other vegetation in the graveyard should continue to be left long to allow plants to flower and set seed and provide cover for small mammals, feeding opportunities for birds, small mammals and insects and habitat for invertebrates. Bats feed on insects, so maintaining feeding areas for them is critical.

At the end of the summer (once the breeding season is complete) these areas can be cut/stripped and the cuttings should be removed.

Other areas such as the path, or in the vicinity of the headstones, could be managed as a short mow meadow throughout the season.

Guidance is available from the All Ireland Pollinator Plan on how to manage both long flowering and short flowering meadows. Short flowering meadows shouldn't be cut until after the 15th April to allow dandelions to flower (an important resource for pollinators to forage on in spring) and then cut every six weeks – see **Figure 20** below. Long flowering meadows can be left till the autumn, the seeds allowed to fall and all the cuttings then removed to reduce fertility over time.



Figure 20. Managing a short flowering meadow.

4.5 Protection of Confirmed Bat Roost – Bat Derogation Licence

Bats have been confirmed roosting within the church, so this building is a confirmed bat roost.

A bat derogation licence from NPWS will therefore be required for any works that could disturb the bats.

This must be applied for and granted in advance of any permissions or funding for the works to take place.

The bat derogation licence normally has a period of validity for the works – this depends on what type of roost is encountered and what the proposed

works are. The aim of this is to avoid impacting the bats during the most vulnerable periods in their life cycle – breeding or hibernation.

In order for a bat derogation licence to be granted the application must undergo three tests. They are:

- Test 1: Reason for the Derogation
- Test 2: Absence of Alternative solutions
- Test 3: Impact of a Derogation on Conservation Status

These are detailed below.

Test 1: Reason for the Derogation

A bat derogation licence application for this project qualifies under Section 2c (ii) as set out below.

Response:

2c) In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment:

- ii) Where the reason is for “other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment”, summarise the nature of the public interest and how this outweighs the conservation interest of the species under strict protection.

Response:

A conservation management plan has been developed for Kilpipe Church and Graveyard, Annacurra, Co. Wicklow (WI039-015----Church and WI039-015001-Graveyard), which is a national monument under the ownership of Wicklow County Council. The plan is supported by National Monuments, Wicklow County Council and the local community.

This plan states that:

‘Kilpipe currently presents conservation issues which, if left un-remedied, will lead to the eventual collapse of the surviving masonry of the church.

The main issues of threat to this monument are:

- Ongoing deterioration of the overall fabric of the church; missing or decayed mortar for example.
- Lack of maintenance – historic graveyards require regular care and attention. Lack of maintenance for even a short time can result in further deterioration.
- The medieval church is in danger of collapse from ivy growth.
- Deterioration of grave memorials, grave furniture - the restoration of these graveyards and the transcription of information from the gravestones provide advantages over written church records. Firstly, they go back much further in time than written church records. Secondly, the headstone inscriptions, in most instances, provide continuity of links between the generations in any given family.

- Lack of knowledge of the graveyard – there is no interpretive signage to tell people of the significant role the graveyard has as one of the few remaining early medieval church sites in the county. A graveyard plan with transcribed graves would greatly assist people tracing their family history.
- Invasive vegetation, particularly ivy’.

The proposed works which will be funded by the Community Monuments Fund are repair-led, conservative and non-invasive, confined entirely to the above-ground fabric of the medieval church.

This study confirmed that bats were roosting in the stonework in the church (night roost and potential hibernation roost) and set out a series of measures to ensure the conservation of bats during the works and the creation of bat roosts within the repaired structure.

Test 2: Absence of Alternative solutions

Please summarise the alternative solutions that have been considered and why these solutions are deemed unsatisfactory. This must include the option of the “do-nothing” alternative and evidence should be objective and robust.

Response:

A number of alternative solutions were proposed and a response to same was prepared as detailed below. They are:

Do-Nothing - Kilpipe Church survives as a roofless but substantially intact medieval ruin. While the monument retains considerable architectural and archaeological value, ongoing deterioration due to vegetation growth, mortar loss and weather exposure has placed sections of the fabric at risk. The works seek to stabilise and conserve this significant historic structure, ensuring its continued survival within its historic setting.

Kilpipe currently presents conservation issues which, if left un-remedied, will lead to further deterioration of the surviving masonry. A structural assessment and condition report has been prepared by Dermot Nolan Historic Buildings Consultant and Consulting Engineer. The main issues of threat to this monument have been identified as:

- Ongoing deterioration of the overall fabric of the building.
- Collapsed masonry
- Invasive vegetation

The Do-Nothing option is not in the interest of the bats as if the works are not completed the monument will continue to collapse and the bat roosts will be lost.

The works will ensure the long-term conservation of roosting locations for bats in the stonework and the conservation of the monument.

Erection of bat boxes - whilst offering some roosting potential for small numbers of bats the conservation of an existing structure with dedicated roosting locations for bats retained is always a preferable outcome in terms of

their long term conservation and has the potential to support a diversity of bat species

Allow storms and weather to impact the building allowing it to deteriorate - this is not favourable to the conservation of bats as the roost structure will be lost.

Test 3: Impact of a Derogation on Conservation Status

Please summarise the possible impacts on the population of the species that is subject to this application, taking into account all the mitigation and/or compensation measures that are to be undertaken. Evidence that such mitigation has been successful elsewhere should be provided where relevant. Mitigation measures being relied upon must ensure that the derogation will not be detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.

Response

The fabric of the church offers numerous opportunities for roosting bats and these will be identified and conserved during the works.

The proposed conservation works and mitigation measures set out in the ecological report 'Kilpipe Church & Graveyard Ecological Survey Final Report 02.11.2023' ensure the protection of the bats during the works and the long-term conservation of their roosting locations within the structure as well as the structure itself.

All three species of bats utilising the structure are widespread species in Ireland and are listed as 'Least Concern' on the Ireland Red List No. 12: Terrestrial Mammals (Marnell et al., 2019), meaning they are not in any threatened category.

The proposed conservation works to Kilpipe Church will not be detrimental to the maintenance of populations of these species at a favourable conservation status in their natural range as required under Section 54 (2) of the European Communities (Birds and Natural Habitats) Regulations.

A range of roosting locations will be retained within the monument to provide continued access to roosting sites for bats.

4.6 Resurvey of Potential Bat Roosts prior to Works

There are a series of suitable crevices, holes and areas of dense ivy on the church within the graveyard. These offer roosting potential for bats and should not be refilled, repointed or otherwise repaired or restored without consultation with a suitable qualified bat specialist.

These works will need to be conducted outside the bat breeding season as shown on **Figure 21** below.

Given that it is likely that some time will have passed between the current survey and any proposed conservation works the church will need to be resurveyed for roosting bats to inform the works and potentially to reapply for the bat derogation licence if required.

These surveys are seasonally constrained so they will need to be scheduled accordingly. The recommended time period for bat surveys is shown on **Figure 21** and **Table 2** below (Source: NPWS Bat Mitigation Guidelines).

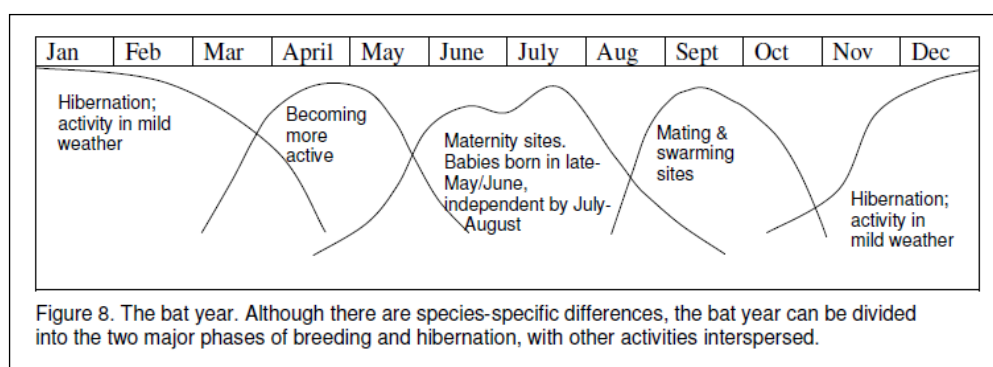


Figure 21. The Bat Year (Source: NPWS Bat Mitigation Guidelines).

Once the bat derogation licence is granted and the works are due to commence any features within the structure which have been identified as having potential for roosting bats will be re-examined prior to any works commencing to ensure that bats have not taken up residence within same in the intervening period.

These should be inspected using an endoscope by a bat specialist to determine if any bats are present. Suitable bat access points will be shown to the project stone mason and the potential for their retention discussed.

Any areas which do not require pointing from a structural perspective can then be lightly blocked with hessian cloth to ensure that bats cannot re-enter these crevices during the works.

This will then be removed as repointing takes place or on completion leaving these crevices accessible to bats in the future.

Table 2. The appropriate months for bat surveys (Source: NPWS Bat Mitigation Guidelines).

Season	Roost Type	Inspection	Bat detectors and emergence counts
Spring (Mar – May)	Building	Suitable (signs, perhaps bats)	Limited, weather dependent
	Trees	Difficult (best for signs before leaves appear)	Very limited, weather dependent
	Underground	Suitable (signs only)	Static detectors may be useful
	Building	Suitable (signs and bats)	Suitable
	Trees	Difficult	Limited; use sunrise survey

Summer (June- August)	Underground	Suitable (signs only)	Rarely useful
Autumn (September - November)	Building	Suitable (signs and bats)	Limited, weather dependent
	Trees	Difficult	Rather limited, weather dependent; use sunrise survey?
	Underground	Suitable (signs, perhaps bats)	Static detectors may be useful
Winter (December - February)	Building	Suitable (signs, perhaps bats))	Rarely useful
	Trees	Difficult (best for signs after leaves have gone)	Rarely useful
	Underground	Suitable (signs and bats)	Static detectors may be useful

4.7 Creation of nesting/roosting opportunity within restored/repared stonework

Where structures are to be rebuilt/repared provision for nesting birds/roosting bats can be incorporated into the stonework without compromising the structure or longevity of the repair. **Figures 22 and 23** below give an idea of how to accommodate same for bats.

These roosting locations will be checked during the works and signed off on by the bat specialist who will be engaged to oversee the works.

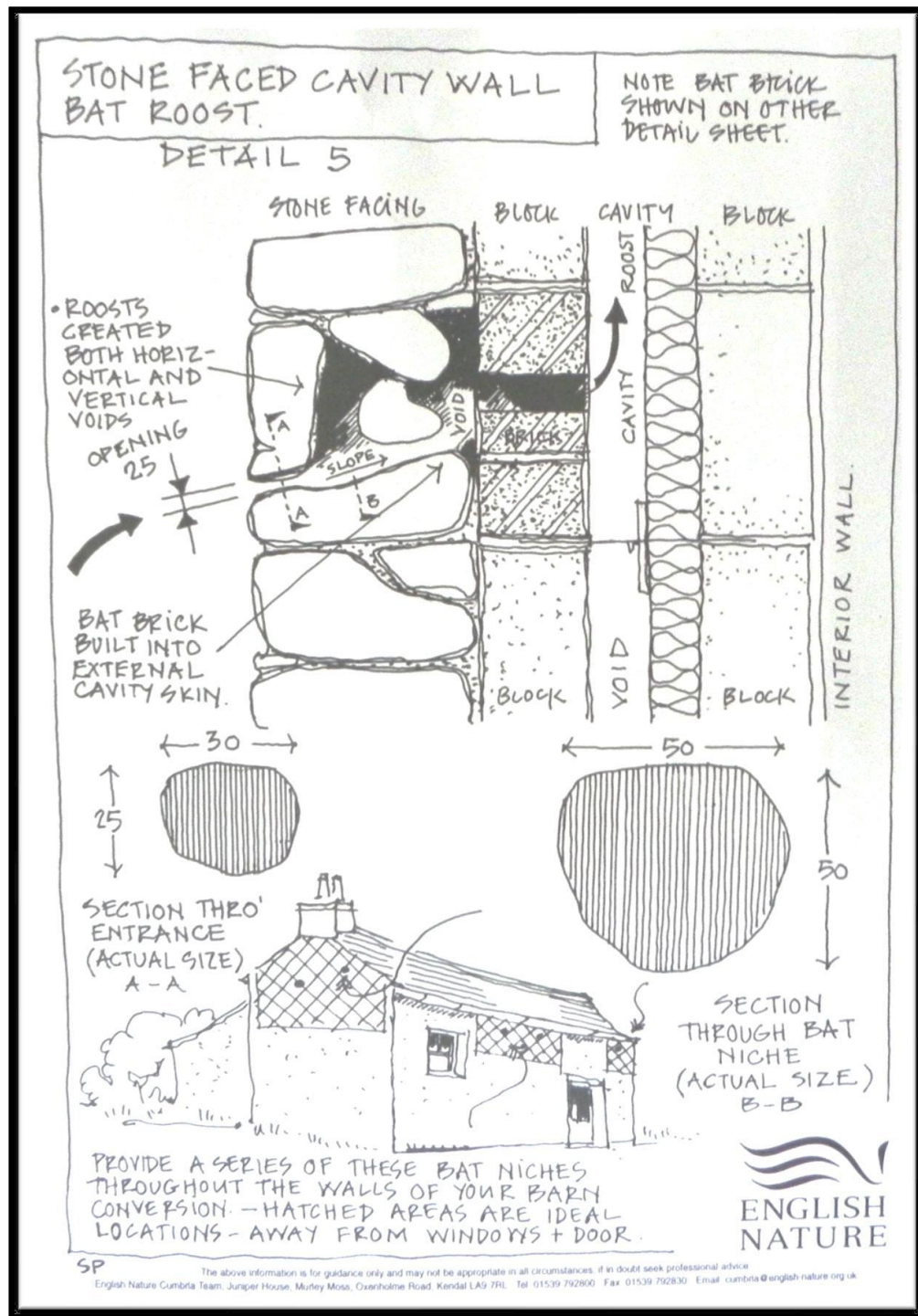


Figure 22. Accommodating roosting spaces for bats in stonework.

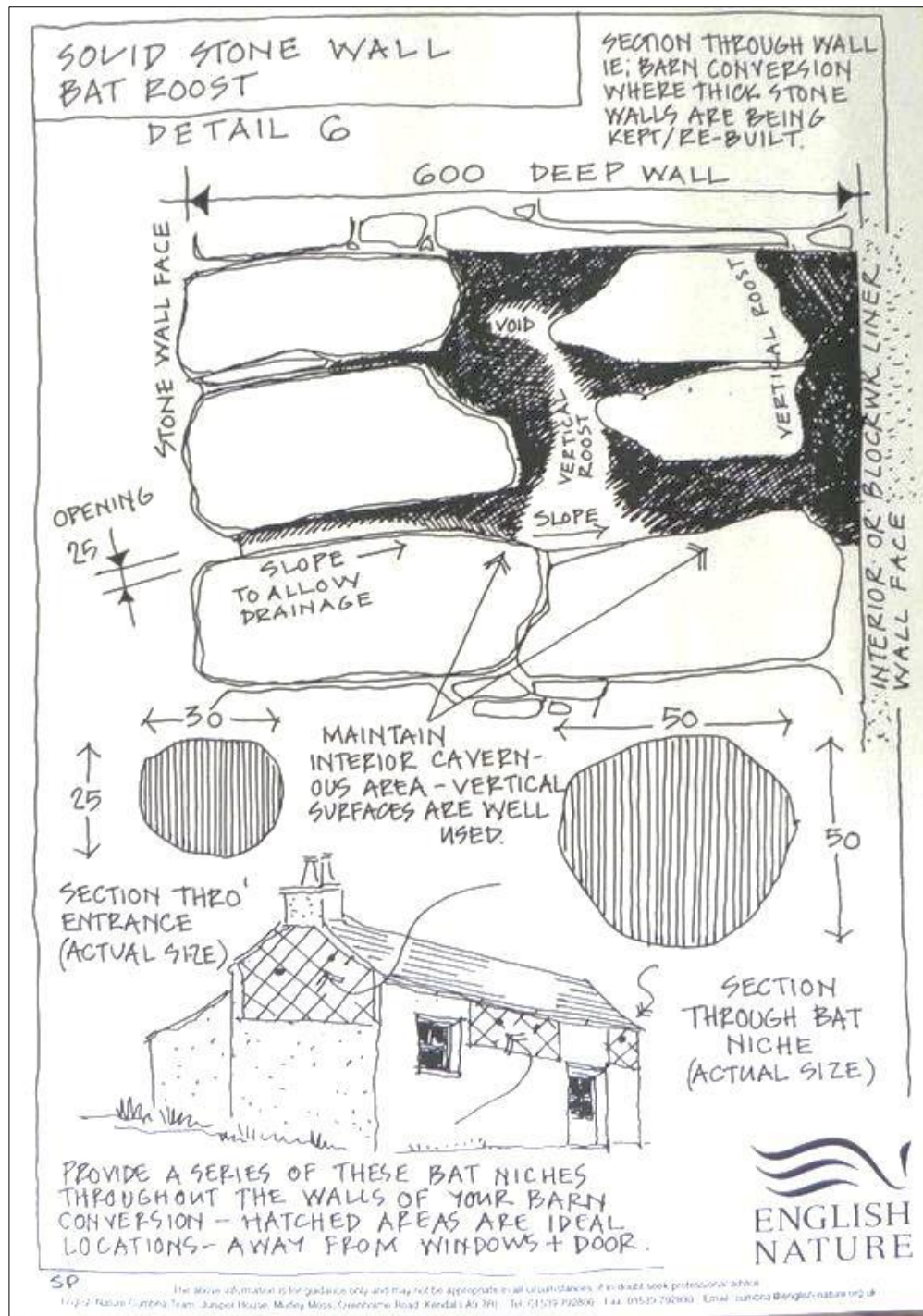


Figure 23. Accommodating roosting spaces for bats in stonework.

4.8 Provision of Bird Boxes

At present there is somewhat limited nesting opportunity for birds in the graveyard and the removal of ivy cover on the church will further decrease this. It is recommended that a series of artificial boxes are erected on trees surrounding the graveyard or on walls - a mixture of boxes should be provided. These should be specified by an ecologist and erected under their supervision.

4.9 Bryophyte Survey

A survey of the stonework for bryophytes (mosses and liverworts) is recommended.

4.10 Lichen Survey

The rich lichen flora on the gravestones should be retained. A detailed survey of the stonework for lichens is recommended.

4.11 Conservation of Vegetation on Stonework

A population of bryophytes (mosses, liverworts and lichens) and ferns is present on the stonework of the church and should be conserved during any works. Where such stones need to be removed and reset/ reconstructed they can be kept with the mosses/lichens intact and then reinstated with this vegetation facing outwards so they can still recolonise the structure.

4.12 Invasive Species

Any tools or equipment brought to the monument must be fully cleaned prior to use to ensure that it does not inadvertently introduce any invasive species to the area.

4.13 Lighting

The area is away from habitation, thus currently there is no lighting in the graveyard. This should continue so that Kilpipe is kept a dark space to enjoy the night sky (**Figure 24**). Artificial lighting is also detrimental to bats as it interferes with their feeding at night.

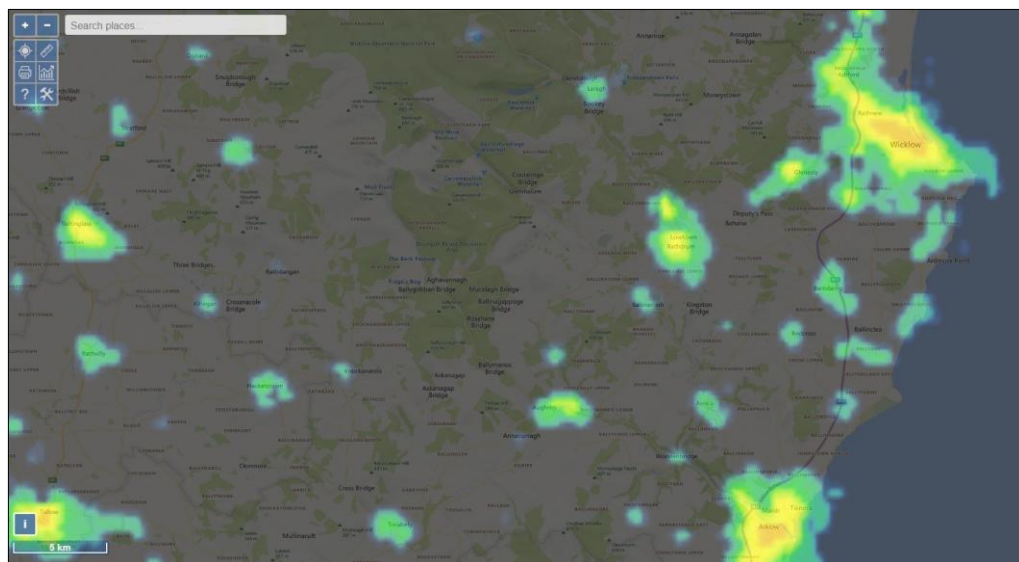


Figure 24. Kilpipe should be retained as a dark sky area.

4.14 Measures for Butterflies in Kilpipe Church and Graveyard

On the island of Ireland, 18% of butterflies and 8% of macro-moths are threatened with extinction. We need to consider the life cycle of butterflies and some other principles to conserve them in our landscape, gardens and parish. This is shown on **Figure 25** below.

Therefore we need to think about:

- Providing food plants for caterpillars
- Nectar supply for adult butterflies
- Keeping ivy (both immature and mature) on trees and walls
- Providing shelter for butterflies – roosting habitat
- Providing overwintering habitats for butterflies
- Do not buy a “butterfly kit” with caterpillars or release adult butterflies

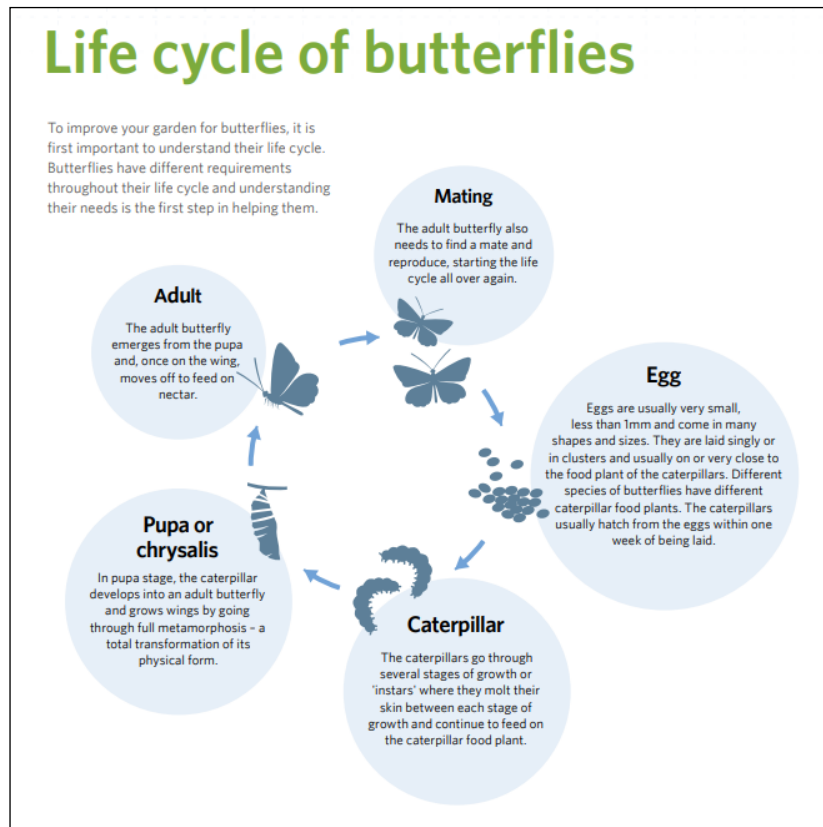


Figure 25. The life cycle of butterflies.

A list of the food plants used by the various species of butterfly is outlined below on **Figure 26**. Some of these are present in Kilpipe church and graveyard and should be retained, not mown or sprayed.

Butterflies roost on the underside of leaves, in long grass, rock crevices or similar sheltered places. Butterflies roost with their wings closed, often their wings camouflage with their background to protect them from predators while they sleep. If we mow and tidy away everywhere around these monuments and graveyards, in our gardens and in our landscape there is nowhere for them to roost.

Butterfly	Caterpillar foodplant
Brimstone	Buckthorn (<i>Rhamnus cathartica</i>) and Alder Buckthorn (<i>Frangula alnus</i>)
Clouded Yellow*	Clovers (<i>Trifolium</i> spp.)
Comma	Nettle (<i>Urtica dioica</i>)
Common Blue	Bird's-foot-trefoil (<i>Lotus corniculatus</i>)
Green-veined White	Garlic Mustard (<i>Alliaria petiolate</i>), Cuckooflower (<i>Cardamine pratensis</i>), Water- cress (<i>Rorippa-nasturtium aquatica</i>) and other members of the Brassicaceae family
Holly Blue	Holly (<i>Ilex aquifolium</i>) and Ivy (<i>Hedera helix</i>)
Large White	Brassicaceae family
Meadow Brown	Grasses: Fescues (<i>Festuca</i> spp.), Meadow-grasses (<i>Poa</i> spp.) and Bents (<i>Agrostis</i>)
Orange-tip	Cuckooflower (<i>Cardamine pratensis</i>) and Garlic Mustard (<i>Alliaria petiolate</i>)
Painted Lady*	Thistles (<i>Cirsium</i> spp. and <i>Carduus</i> spp.)
Peacock	Nettle (<i>Urtica dioica</i>)
Red Admiral*	Nettle (<i>Urtica dioica</i>)
Ringlet	Grasses: Cock's-foot (<i>Dactylis glomerata</i>), False Brome (<i>Brachypodium sylvaticum</i>), Tufted Hair-grass (<i>Deschampsia cespitosa</i>) and Common Couch (<i>Elymus repens</i>)
Silver-washed Fritillary	Common Dog-violet (<i>Viola riviniana</i>)
Small Copper	Common Sorrel (<i>Rumex acetosa</i>) and Sheep's Sorrel (<i>R. acetosella</i>)
Small Heath	Fine grasses, especially fescues (<i>Festuca</i> spp.), Meadow-grasses (<i>Poa</i> spp.)
Small Tortoiseshell	Nettle (<i>Urtica dioica</i>)
Small White	Brassicaceae family and nasturtiums (<i>Tropaeolum</i>)
Speckled Wood	Feed a on a variety of grasses but most commonly on: False Brome (<i>Brachypodium sylvaticum</i>), Cock's-foot (<i>Dactylis glomerata</i>) and Yorkshire Fog (<i>Holcus lanatus</i>)
Wood White	Meadow Vetchling (<i>Lathyrus pratensis</i>), Bitter-vetch (<i>Lathyrus linifolius</i>), Tufted Vetch (<i>Vicia cracca</i>) and Common Bird's-foot-trefoil (<i>Lotus corniculatus</i>)

Figure 26. The food plants butterflies need for their caterpillars to complete their lifecycles on.

Butterflies can enter diapause (overwinter) in all four stages, but the majority will overwinter in their caterpillar stage. Before diapause, butterflies produce a form of internal antifreeze to protect them from the cold weather. Because diapause is triggered by shorter day lengths and lower temperatures, they generally overwinter outside. The habitats that butterflies need for overwintering, as shown on **Figure 27** below, in one of their immature stages are:

- Leaf litter
- Thick/uncut vegetation

- Log piles

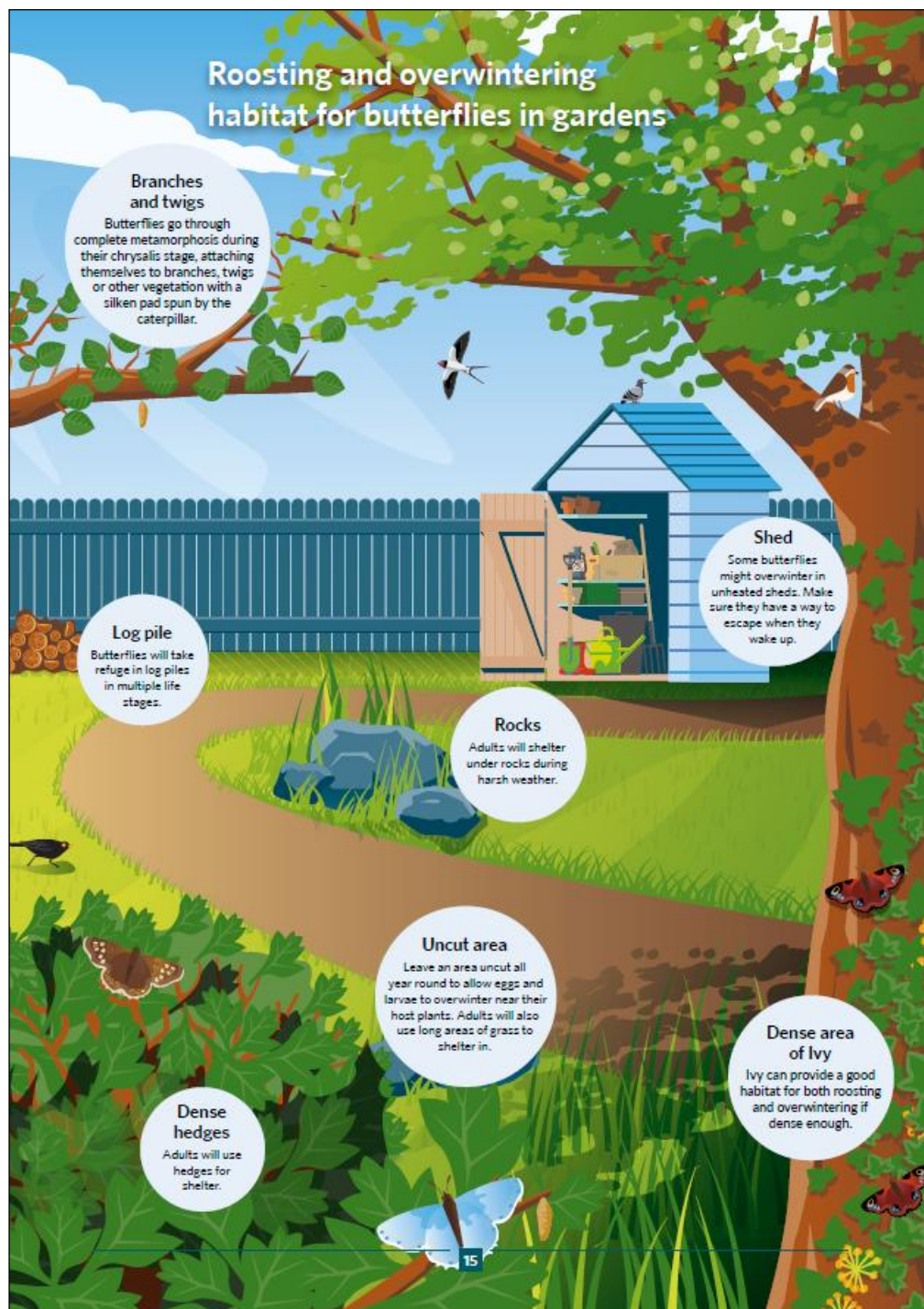


Figure 27. Roosting and overwintering habitat for butterflies.

5. REFERENCES

- Anon. (1996). *Interpretation Manual of European Union Habitats*. Version EUR 15, European Commission, Brussels.
- Altringham, J. D. (1996) *Bats: Biology and Behaviour*. Oxford University Press.
- Altringham, J. D. (2003) *British Bats*. HarperCollins Publishers.
- Aughney, T., C. Kelleher and D. Mullen (2008). *Bat Survey Guidelines: Traditional Farm Buildings Scheme*. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny.
- Bat Conservation Ireland (2023). Data on known bat roosts and bat records held by Bat Conservation Ireland. Available from <<http://www.batconservationireland.org/>>.
- Bat Conservation Ireland (2010). *Bats in Buildings. Guidance Notes for: Planners, engineers, architects and developers*. December 2010. Available from <<http://www.batconservationireland.org/>>.
- Bat Conservation Ireland (2010). *Bats and Lighting. Guidance Notes for: Planners, engineers, architects and developers*. December 2010. Available from <<http://www.batconservationireland.org/>>.
- Bat Conservation Ireland (2010). *Bats and Waterways. Guidance Notes for: Planners, engineers, architects and developers*. December 2010. Available from <<http://www.batconservationireland.org/>>.
- Collins, J. (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition*. The Bat Conservation Trust. London.
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1982.
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979.
- Council of the European Communities (1992). *Council Directive of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (92/43/EEC)*. O.J. L 206/35, 22 July 1992.
- Council of the European Communities (1979). *Council Directive of 02 April 1979 on the conservation of wild birds (79/409/EEC)*. O.J.L. 103, 25 April 1979.
- Curtis, T.G.F. and J. Parnell (2012). *Webb's An Irish Flora*. Cork University Press.
- Curtis, T. G. F., and H. N. Mc Gough (1988). *The Irish Red Data Book I. Vascular Plants*. Stationery Office, Dublin.

- European Commission (2001). *Assessment of plans and projects significantly affecting Natura 200 sites- methodological guidance on the provisions of Article 6(3) and 6 (4) of the Habitats Directive 92/43/EEC*.
- European Commission (2002). *Managing Natura 2000 sites - the provisions of Article 6 of the Habitats Directive 92/43/EEC*.
- Flora (Protection) Order (2022). Government of Ireland.
- Fossitt, J. (2000). *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.
- Hayden, T. & R. Harrington (2000). *Exploring Irish mammals*. Dúchas. Town House, Dublin.
- Kelleher, C. & Marnell, F. (2006). *Bat Mitigation Guidelines for Ireland*. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- Marnell, F., Looney, D. & Lawton, C. (2019). *Ireland Red List No. 12: Terrestrial Mammals*. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.
- Marnell, F., Kelleher, C. & Mullen, E. (2022). *Bat mitigation guidelines for Ireland v2*. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland
- McAney, K. (2006). *A Conservation Plan for Irish Vesper Bats*. Irish Wildlife Manuals, No. 20. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- National Parks and Wildlife Service Online Database. Available online at www.npws.ie
- Natura 2000 Sites - Site Synopsis. Available online at www.npws.ie
- NRA (2006). *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes*. National Roads Authority. www.nra.ie
- NRA (2009). *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*. Available online at www.nra.ie
- NRA, (2010). *Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*. Available online at www.nra.ie
- OPW (1995). *The Care and Conservation of Graveyards*. The Office of Public Works.
- Planning and Development Act, 2000 (No. 30 of 2000). The Stationery Office, Dublin, Ireland.

- Ramoa, C. (2003). *Interpretation Manual of the European Union Habitats Version Eur* 25. European Commission DG Environment Nature and Biodiversity. Brussels.
- Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010). *Ireland Red List No. 4 Butterflies*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.
- Reynolds, S.C.P. (2002). *A Catalogue of Alien Plants in Ireland*. National Botanic Gardens. Glasnevin, Dublin.
- Scannell, M.J.P. and Synnott, D.M. (1987). *Census Catalogue of the Flora of Ireland – Clár de Phlandaí na hÉireann*. The Stationary Office, Dublin.
- S.I. No. 477 of 2011. The European Communities (Birds and Natural Habitats) Regulations 2011. Irish Government, Government Publications Office, Molesworth Street, Dublin 2.
- The Heritage Council (2011). *Guidance for the Care, Conservation and Recording of Historic Graveyards*. September 2011, second edition.
- Wildlife Act, 1976 including all other amendments 1976–2010 Number 39 of 1976 and Number 38 of 2000. Dublin: Office of the Attorney General. Wildlife (Amendment) Act (2000). Government of Ireland.
- Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016). *Ireland Red List No. 10: Vascular Plants*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

6. APPENDIX I: SITE SYNOPSIS FOR DESIGNATED SITE

SITE SYNOPSIS

Site Name: Avoca River Valley pNHA

Site Code: 001748

The Avoca River Valley is a large mixed woodland located in the valleys of the Avoca and Aughrim Rivers, both of which flow through the site and on towards the estuary at Arklow. The steep slopes of these deep valleys contain both coniferous and deciduous woodland.

The best examples of relatively pure deciduous woods are found around Shelton Abbey, with several other smaller areas throughout the site. Oak (*Quercus petraea*) is the dominant tree species, with Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*) and Birch (*Betula pubescens*) locally abundant. In places there is a well-developed shrub layer of Hazel (*Corylus avellana*), Holly (*Ilex aquifolium*) and Honeysuckle (*Lonicera periclymenum*).

The ground flora is variable and is usually predominated by Wood Rush (*Luzula sylvatica*) or Bluebells (*Hyacinthoides non-scripta*). Other species present include Lords and Ladies (*Arum maculatum*), Wood Sorrel (*Oxalis acetosella*), Wood Anemone (*Anemone nemorosa*) and Wood Sanicle (*Sanicula europaea*). Ferns are abundant and include Buckler Fern (*Dryopteris dilatata*), Male Fern (*Dryopteris filix-mas*) and Soft Shield Fern (*Polystichum setiferum*).

A large area of the site consists of broadleaved woods which have been underplanted with a variety of conifers. Here, the understorey is generally similar to the broadleaved woods, but as the conifers become more abundant the ground flora becomes less diverse with Ivy (*Hedera helix*), Brambles (*Rubus* agg.) and some ferns replacing the other species. There are a few blocks of commercial conifer plantations throughout the site, managed for forestry.

Small areas of wet woodland with Alder (*Alnus glutinosa*), Willow (*Salix atrocinerea*) and Birch (*Betula pubescens*) occur on the lower gradients adjacent to the rivers.

A study on the birds of this area has shown the commonest species to be Goldcrest, Robin, Wren, Coal Tit and Chaffinch. The rare Redstart has also been recorded.

This area has been subject to great disturbance from the mines at Avoca, the planting of conifers and from air pollution emanating from the fertiliser factory downstream, near Arklow. The eastern part of the site has been more affected by pollution than the western end.

It remains however, a site of considerable importance as it contains good examples of deciduous woodland with a typical flora and fauna and some rare species occurring. These areas are remnants of more extensive deciduous

woodland coverage throughout these valleys and it is important to conserve this dwindling resource.

Synopsis date: 23/11/1995