

Wicklow Abbey, Wicklow Town
Ecological Impact Assessment Report



FINAL REPORT

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Faith Wilson

ECOLOGICAL CONSULTANT

*Faith Wilson Ecological Consultant B.Sc. (Hons) CEnv MCIEEM
Kestrel Ridge, Tigrooney West, Avoca, Co. Wicklow*

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Wicklow Abbey, Wicklow Town

Ecological Impact Assessment Report

1. INTRODUCTION

1.1 Background

This report has been prepared by Faith Wilson (an independent ecological consultant and licensed bat specialist).

MOSART were recently appointed by Wicklow County Council to develop a master plan for its future use and management as a public space and amenity and this report feeds into that plan. Faith was appointed by MOSART to advise on the ecological sensitivities of the Wicklow Abbey Grounds in Wicklow Town, Co. Wicklow to inform the design of its development as a public space and to provide an ecological impact assessment on the final masterplan.

1.2 Project Brief

The project brief as set out by Wicklow County Council for the design team was to enhance this key open space in order to maximise its function as a public amenity and a heritage asset.

It is considered that the final output for Abbey Gardens should include, but is not limited to, the following:

- Creation of a high quality, attractive public open space with appropriate, safe, universal access and increased pedestrian circulation routes throughout
- New fully accessible pedestrian entrance from the site into the Abbey Street car park
- Specific and accessible outdoor performance/multi-use space with options provided for roof/shade/canopy along with designated and fully accessible seating area. The area should be provided with electrical supply points
- Assessment of conservation and consolidation works to existing Abbey masonry ruins (as required)
- A high quality and attractive planting and landscaping scheme which is informed by the historical context of the site. A focus on medicinal plants and biodiversity enhancement is favoured
- Design proposals to convert the existing Coach House at main entrance to Abbey Grounds into a café/retail and exhibition space
- Provision of new public toilets in/near the Coach House
- Parochial House and associated access to be accommodated with defined boundary wall/fence/other, as appropriate
- Provision for possible access to Parochial House through Abbey Street car park for potential future use
- Provision for a new shed to be erected within the curtilage of the Parochial House (replacing current function of Coach House)

- Provision for a new storage shed for Abbey Grounds with sufficient space and security for equipment such as tables, chairs, temporary stage, rigging, lighting, etc.
- Vehicular access to and on the site is important for setting up of festivals, markets or other events. (This must be considered particularly for access during wetter months and allowing for larger vehicles to access the site)
- Heritage interpretation and orientation
- Provision of appropriate backlighting of Abbey ruins, in line with other historical sites in Wicklow town.
- Provision of suitable public lighting at entry/exit points and within the site.
- Provision for public WiFi.
- Suitable seating and shelters (canopies etc.) on site
- Community engagement with the design plan and proposals
- Assessment of the condition of boundary walls and associated trees and identification of a programme of remedial works as required.

The location of the Abbey Grounds in Wicklow Town is shown on **Figure 1.1** below. The green open nature of the lands is evident in the aerial imagery for the area as shown on **Figure 1.2** below.

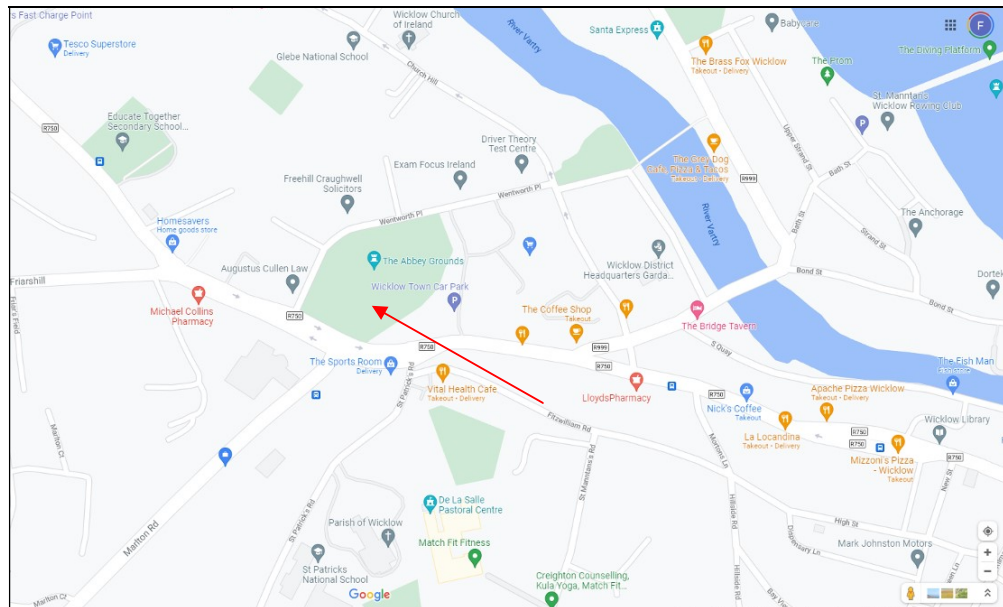


Figure 1.1 The Abbey Grounds within Wicklow Town (indicated by the red arrow). Source: Google Maps.



Figure 1.2 The Abbey Grounds. Source: Google Maps.

1.2 Relevant Ecological 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.

NHAs are considered to be of national importance, while SACs and SPAs are of international importance for nature conservation.

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 Otter

The otter (*Lutra lutra*) is a legally protected species under the EU Habitats Directive (where it is listed under Annex II) and is found throughout Ireland (Hayden and Harrington, 2000). The otter is listed as internationally important in the Irish Red Data book (Whilde, 1993), is classified as 'near threatened' in Ireland (Marnell, et al. 2009), on a European scale (Temple & Terry, 2007) and on a global scale by the IUCN (2009). It is listed as a strictly protected species under Appendix II of the Bern convention (Council of Europe, 1979). Because it is listed in Appendix 1 of CITES (1979), trade in otter specimens is permitted only in exceptional circumstances.

Annexes II and IV of the E.U. Habitats Directive (92/43/EEC) list the otter 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 E.U. Habitats Directive was transposed into Irish law in the European Union (Natural Habitats) Regulations, (SI 94/1997) and 40 candidate SACs have been designated for the otter in Ireland (NPWS (2008)). A Species Action Plan and a Threat Response Plan has been prepared for the otter by NPWS (2008 & 2009).

Otters tend to occupy linear territories along watercourses and are rarely found far away from water. A recent national survey of otters in Ireland (Bailey (2006)) surveyed 37 sites within the Eastern River Basin District, of

which 22 (59.46%) recorded the presence of otter, the lowest rate in the country.

1.2.4 Invasive Species

Until recently there has been no legal framework for the control or eradication of non-native invasive species in the Republic of Ireland. The Birds and Habitats Regulations (2011) which were signed on 21st September 2011 by the then Minister for Arts, Heritage and the Gaeltacht Jimmy Deenihan, included new legislation on invasive and non-native species in Sections 49 and 50. Sections 49 and 50 have not yet been legally implemented as they have implications for members of the pet and horticultural trades and consultation with these groups is ongoing. It is expected that these new regulations will come into place soon.

The plant and animal species to which the regulations 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
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

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.

1.2.5 Fisheries

Wicklow Town is located within the Avoca river catchment. As shown on the EPA Envision Map Viewer, the Ashtown Stream flows through the Abbey Grounds before being culverted for it's last section before entering the River Vartry (see **Figure 1.3** below). The water quality of the Ashtown Stream is currently unknown.

The water quality of the Vartry River is classified as 'Good' (i.e. Q4). The water quality of the Broadlough transitional waterbody is assessed as 'Moderate'.

The main channel of the River Vartry is designated as a Salmonid Watercourse under the EU Freshwater Fish Directive. The Directive was transposed into Irish law in 1988 through the European Communities Regulation on Quality of Salmonid Waters (S.I. No. 293/1988). The Regulation designates waters in order to protect and improve "Salmonid Waters." Salmonid waters must be able to sustain Atlantic salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*). The Vartry River is one of only 22 watercourses in Ireland designated under this legislation.

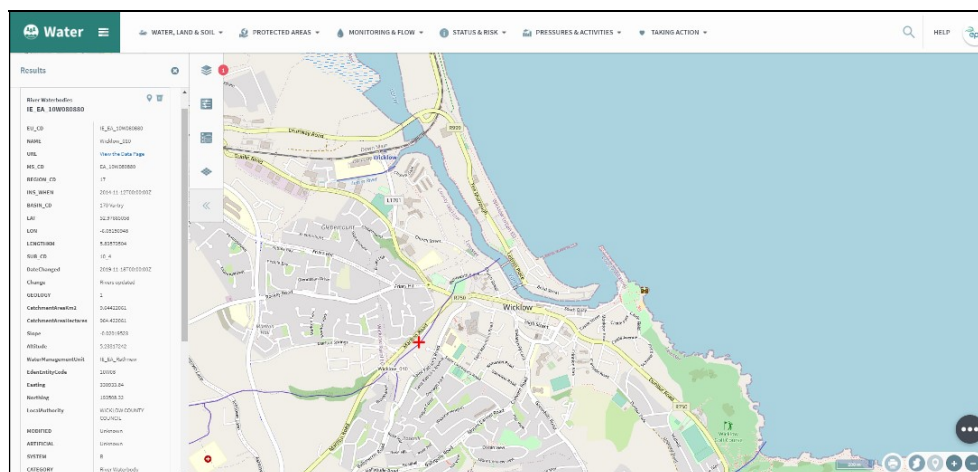


Figure 1.3. EPA Map Viewer showing the watercourses and water quality in Wicklow Town.

2. METHODOLOGY

2.1 Project Description

Wicklow County Council is developing a planning strategy and master plan for the future use and management of the Abbey Grounds as a public space and amenity. An ecological constraints study set out to outline the main features of ecological significance in the Abbey Grounds and to make some recommendations in terms of habitats or species in the property which should be considered by the design team in the context of any new plans for the design or management of the grounds. This was done through desktop research and consultation and a series of visits to the property during July and August 2021. The impacts of the proposed design were then assessed from the perspective of ecology.

2.2 Desk Study

A desk study was carried out to collate the available information on the ecological environment of the Abbey Grounds and wider environs. 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 Wicklow Town.

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. Recent, high resolution, colour aerial photographs were also used to identify and map potential habitats.

2.3 Field Surveys

The Abbey Grounds were visited on several occasions by the report author during July and August 2021.

Habitat & Botanical Survey

The habitats within the site were described to level three using the Heritage Council Guide to Habitats of Ireland (Fossitt (2000)). Plant species within the site were identified using Parnell and Curtis (2012).

A particular focus of the survey was to determine if any protected species of plant under the Flora Protection Order (2015) or listed in the Irish Vascular Plants Red Data Book are present on the site.

A check was made for the presence of any invasive species as described above.

Mammal Surveys

Bat Survey

The bat survey consisted of several elements – a desktop review and consultation with Bat Conservation Ireland, an inspection of trees within the grounds for their potential to support roosting bats, an inspection of the coach house building and a bat detector activity survey of the property.

The aims of the surveys were to:

- a) To determine what species of bats are known from the Abbey Grounds and the immediate environs.
- b) To identify roosting sites in the coach-house building.
- c) To determine the use of the mature trees, stream and other habitats in the Abbey Grounds as feeding and commuting areas for bats.
- d) To ensure that bats are considered in any proposals for the development of the grounds.

The bat surveys were carried out by Faith Wilson, a licensed bat specialist.

Trees within the site were assessed 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.

A bat detector survey was carried out at dusk on 25th August 2021 using three types of bat detectors - two *Batbox Duet* Heterodyne/Frequency Division detectors, a Pettersson D100 Heterodyne detector and an Echometer Touch Pro. The potential emergence of bats from trees and buildings within the site at dusk was monitored and a walkover survey of the lands to determine bat activity was conducted.

The exterior and interior of the coach house was examined for evidence of roosting bats on the 25th August 2021. Bat activity is usually detected by the following signs in buildings (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.

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.

Otter Survey

An otter survey was conducted along the watercourse within the grounds. This was surveyed for signs indicative of the presence of otters, including:

- otter spraints;

- footprints;
- actual, possible or potential resting sites, (these include underground 'holts' e.g. beneath the roots of bankside trees; or above ground 'couches' e.g. in reedbeds);
- slides or other well-used access points to watercourses (though additional evidence would be required to positively confirm such as indicative of otter presence);
- feeding remains e.g. fish carcasses (though additional evidence would be required to positively confirm such as indicative of otter presence); and/or sightings, including otter Road Traffic Accidents (RTAs).

The surveys were carried out in accordance with best practice as described in the 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (NRA 2009), 'Otter Breeding Sites. Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5, (Liles, 2003)' and 'Guidelines for the treatment of otters prior to the construction of National Road Schemes' (NRA 2006).

Badger Survey

A badger survey was undertaken within the grounds by searching for signs of badger activity. These include setts, old bedding material, feeding signs, latrines, badger tracks or paw prints, badger paths and badger hair caught on vegetation or fences. The survey was carried out by Faith Wilson, an experienced mammal specialist in accordance with best practice as described in the 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (NRA 2009) and 'Guidelines for the treatment of badgers prior to the construction of National Road Schemes' (NRA 2005).

Breeding Birds

The breeding bird season was well underway and birds were recorded during the course of the ecological survey visits. The coach house building was searched for signs of breeding birds such as swallows and owls.

3. RESULTS

3.1 Nature Conservation Designations

The Abbey Grounds are not currently designated for any nature conservation purposes under either international or national conservation legislation

A number of sites of international conservation importance adjoin Wicklow Town. These are:

- Wicklow Head Special Protection Area (SPA) – Site Code: 004127
- Wicklow Reef Special Area of Conservation (SAC) – Site Code: 002274
- The Murrough Wetlands Special Protection Area (SPA) - Site Code: 004186
- The Murrough Wetlands Special Area of Conservation (SAC) - Site Code: 002249)

Some of these sites are also of national conservation importance and hence are designated as proposed Natural Heritage Areas (pNHAs). They include:

- The Wicklow Town Sites proposed Natural Heritage Area (pNHA) (Site Code: 001929
- Wicklow Head proposed Natural Heritage Area (pNHA) – Site Code: 000734
- The Murrough proposed Natural Heritage Area (pNHA) – Site Code: 000730

The Wicklow Head Special Protection Area (SPA) – Site Code: 004127, which is also designated as a proposed Natural Heritage Area (pNHA) – Site Code: 000734, and the Wicklow Reef Special Area of Conservation (SAC) – Site Code: 002274 are located to the South of the town.

The Murrough Wetlands Special Protection Area (SPA) (Site Code: 004186) is within 150m of the Abbey Grounds and is hydrologically linked to it by the Ashdown Stream. The boundary of the Murrough Wetlands Special Area of Conservation (SAC) (Site Code: 002249), is found further to the north and east of the Abbey Grounds.

The Wicklow Town Sites proposed Natural Heritage Area (pNHA) (Site Code: 001929), is found to the north east of the Abbey Grounds where it is located on the eastern side of the River Leitrim and to the east at Black Castle.

The locations of these sites are shown on **Figure 1.4** below.

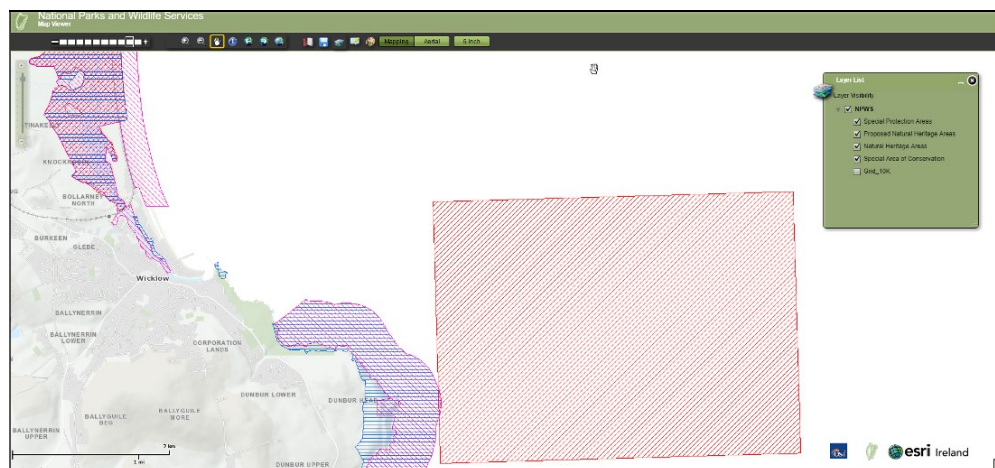


Figure 1.4. Site Designations and boundaries at Wicklow Town. SPA site boundary shown by pink hatching, pNHA site boundary shown by blue hatching and SAC site boundary shown by red hatching.

Best practice recommends assessing Natura 2000 sites located within 15km of a proposed plan or project. Those Natura 2000 sites occurring within a 15km radius of the site are detailed in **Table 3.1** below. These include;

- The Murrough SPA (Site Code: 004186)
- The Murrough Wetlands SAC (Site Code: 002249)
- Wicklow Head SPA (Site Code: 004127)
- Wicklow Reef SAC (Site Code: 002274)
- Magherabeg Dunes SAC (Site Code: 001766)
- Buckronev-Brittis Dunes And Fen (Site Code: SAC 000729)
- Deputy's Pass Nature Reserve SAC (Site Code: 000717)
- Vale Of Clara (Rathdrum Wood) (Site Code: SAC 000733)
- Wicklow Mountains SAC (Site Code: 002122)

There are no other designated biodiversity areas potentially affected by the proposed development that have a recognised European Union or International protection status beyond those listed above.

The importance of the Abbey Grounds as a green open space for both people and biodiversity has been highlighted in a number of studies including:

- Preliminary Study - A Green Infrastructure Plan for Wicklow Town (Austen & Associates (2011))
- Meehan, S. and D. D'Arcy (2017). A Local Biodiversity Action Plan for Wicklow Town 2017 - 2020.
- The Wicklow Urban Habitat Study

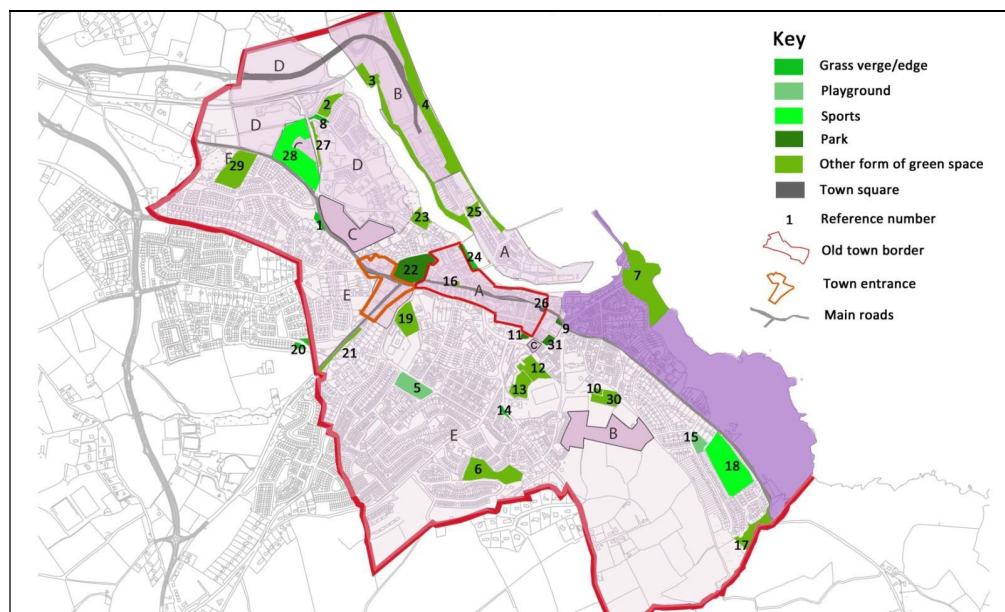


Figure 1.5. Wicklow green spaces surveyed as part of the 2011 study (Austen Associates, 2011)

Some of the Natura 2000 sites listed above are also designated as proposed Natural Heritage Areas, these include:

- Avondale pNHA (Site Code: 002093),
- Buckronev-Brittis Dunes And Fen pNHA (Site Code: 000729),
- Devil's Glen pNHA (Site Code: 000718),
- Glenealy Woods pNHA (Site Code: 001756),
- Magherabeg Dunes pNHA (Site Code: 001766),
- The Murrough pNHA (Site Code: 000730),
- Vale Of Clara (Rathdrum Wood) pNHA (Site Code: 000733),
- Varray Reservoir pNHA (Site Code: 001771).

Table 3.1 Natura 2000 sites within 15km of the Abbey Grounds.

Site Code	Site Name and Designation	Approximate distance from the Abbey Grounds	Qualifying Interest <i>Priority Habitats are indicated with an asterisk</i>	Conservation Objectives
004186	The Murrough SPA	Within 150m	<ul style="list-style-type: none"> • Red-throated Diver (<i>Gavia stellata</i>) • Greylag Goose (<i>Anser anser</i>) • Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) • Wigeon (<i>Anas penelope</i>) • Teal (<i>Anas crecca</i>) • Black-headed Gull (<i>Chroicocephalus ridibundus</i>) • Herring Gull (<i>Larus argentatus</i>) • Little Tern (<i>Sterna albifrons</i>) • Wetlands & Waterbirds 	<p>Source: NPWS (2021) Conservation objectives for The Murrough SPA [004186]. Generic Version 8.0. Department of Housing, Local Government and Heritage. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the wetland habitat at The Murrough SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.</p> <ul style="list-style-type: none"> • Red-throated Diver (<i>Gavia stellata</i>) • Greylag Goose (<i>Anser anser</i>) • Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) • Wigeon (<i>Anas penelope</i>) • Teal (<i>Anas crecca</i>) • Black-headed Gull (<i>Chroicocephalus ridibundus</i>) • Herring Gull (<i>Larus argentatus</i>) • Little Tern (<i>Sterna albifrons</i>) • Wetlands & Waterbirds

Site Code	Site Name and Designation	Approximate distance from the Abbey Grounds	Qualifying Interest <i>Priority Habitats are indicated with an asterisk</i>	Conservation Objectives
002249	The Murrough Wetlands SAC	0.8km N	<ul style="list-style-type: none"> • (1210) Annual vegetation of drift lines • (1220) Perennial vegetation of stony banks • (1330) Atlantic salt meadows (<i>Glauco Puccinellietalia maritimae</i>) • (1410) Mediterranean salt meadows (<i>Juncetalia maritimi</i>) • (7210) * Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> • (7230) Alkaline fens 	<p>Source: NPWS (2021) Conservation objectives for The Murrough Wetlands SAC [002249]. Generic Version 8.0. Department of Housing, Local Government and Heritage. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected:</p> <ul style="list-style-type: none"> • (1210) Annual vegetation of drift lines • (1220) Perennial vegetation of stony banks • (1330) Atlantic salt meadows (<i>Glauco Puccinellietalia maritimae</i>) • (1410) Mediterranean salt meadows (<i>Juncetalia maritimi</i>) • (7210) * Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> • (7230) Alkaline fens
004127	Wicklow Head SPA	1.8km SE	<ul style="list-style-type: none"> • A188 Kittiwake <i>Rissa tridactyla</i> 	<p>Source: NPWS (2021) Conservation objectives for Wicklow Head SPA [004127]. Generic Version 8.0. Department of Housing, Local Government and Heritage. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:</p> <ul style="list-style-type: none"> • A188 Kittiwake <i>Rissa tridactyla</i>

Site Code	Site Name and Designation	Approximate distance from the Abbey Grounds	Qualifying Interest <i>Priority Habitats are indicated with an asterisk</i>	Conservation Objectives
002274	Wicklow Reef SAC	3.7km E	<ul style="list-style-type: none"> • Reefs [1170] 	<p>Source: NPWS (2013) Conservation Objectives: Wicklow Reef SAC 002274. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected:</p> <ul style="list-style-type: none"> • Reefs [1170]
001766	Magherabeg Dunes	5.5km S	<ul style="list-style-type: none"> • Annual vegetation of drift lines [1210] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]* • Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]* • Petrifying springs with tufa formation (Cratoneurion) [7220]* 	<p>Source: NPWS (2017) Conservation Objectives: Magherabeg Dunes SAC 001766. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected:</p> <ul style="list-style-type: none"> • Annual vegetation of drift lines [1210] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]* • Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]* • Petrifying springs with tufa formation (Cratoneurion) [7220]*

Site Code	Site Name and Designation	Approximate distance from the Abbey Grounds	Qualifying Interest <i>Priority Habitats are indicated with an asterisk</i>	Conservation Objectives
000717	Deputy's Pass Nature Reserve	8.3km SW	<ul style="list-style-type: none"> • 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles 	<p>Source: NPWS (2021) Conservation objectives for Deputy's Pass Nature Reserve SAC [000717]. Generic Version 8.0. Department of Housing, Local Government and Heritage. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected:</p> <ul style="list-style-type: none"> • 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
000729	Buckroneys-Brittans Dunes And Fen	9.2km S	<ul style="list-style-type: none"> • Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]* • Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]* • Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) [2170] • Humid dune slacks [2190] 	<p>Source: NPWS (2017). Conservation Objectives: Buckroneys-Brittans Dunes and Fen SAC 000729. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected:</p> <ul style="list-style-type: none"> • Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]* • Atlantic decalcified fixed dunes (Calluno-Ulicetea)

Site Code	Site Name and Designation	Approximate distance from the Abbey Grounds	Qualifying Interest <i>Priority Habitats are indicated with an asterisk</i>	Conservation Objectives
			<ul style="list-style-type: none"> • Alkaline fens [7230] 	<p>[2150]*</p> <ul style="list-style-type: none"> • Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (Salicion arenariae) [2170] • Humid dune slacks [2190] • Alkaline fens [7230]
000733	Vale Of Clara (Rathdrum Wood)	11.6km W	<ul style="list-style-type: none"> • 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles 	<p>Source: NPWS (2021) Conservation objectives for Vale of Clara (Rathdrum Wood) SAC [000733]. Generic Version 8.0. Department of Housing, Local Government and Heritage. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected:</p> <ul style="list-style-type: none"> • 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
002122	Wicklow Mountains SAC	15km NW	<ul style="list-style-type: none"> • (3130) Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea • (3160) Natural dystrophic lakes and ponds, • (4010) Northern Atlantic wet heaths with <i>Erica tetralix</i>, • (4030) European dry heaths, • (4060) Alpine and Boreal heaths, • (6230) Species-rich Nardus grasslands, on siliceous substrates in mountain areas, 	<p>Source: NPWS (2017). Conservation Objectives: Wicklow Mountains SAC 002122. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Accessed 20th September 2021.</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitats or Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> • (3130) Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea • (3160) Natural dystrophic lakes and ponds, • (4010) Northern Atlantic wet heaths with <i>Erica</i>

Site Code	Site Name and Designation	Approximate distance from the Abbey Grounds	Qualifying Interest <i>Priority Habitats are indicated with an asterisk</i>	Conservation Objectives
			<ul style="list-style-type: none"> • (7130) Blanket bog (*active only), • (8110) Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani), • (8210) Calcareous rocky slopes with chasmophytic vegetation, • (8220) Siliceous rocky slopes with chasmophytic vegetation, • (9990) Blanket bog (not active), • (1355) Otter (<i>Lutra lutra</i>), • Peregrine falcon (<i>Falco peregrinus</i>), • Merlin (<i>Falco columbarius</i>) 	<p><i>tetralix</i>,</p> <ul style="list-style-type: none"> • (4030) European dry heaths, • (4060) Alpine and Boreal heaths, • (6230) Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas, • (7130) Blanket bog (*active only), • (8110) Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani), • (8210) Calcareous rocky slopes with chasmophytic vegetation, • (8220) Siliceous rocky slopes with chasmophytic vegetation, • (9990) Blanket bog (not active), • (1355) Otter (<i>Lutra lutra</i>), • Peregrine falcon (<i>Falco peregrinus</i>), • Merlin (<i>Falco columbarius</i>)

3.2 Rare, Scarce and Threatened Flora

There are a number of recent and historic records of Protected, Threatened and Scarce Vascular Plant Species from the 10km square (T39) in which the Abbey Grounds are located. These include:

- Subterranean Clover (*Trifolium subterraneum*)
- Clustered Clover (*Trifolium glomeratum*)
- Bird's-foot Clover (*Trifolium ornithopodioides*)
- Knotted Clover (*Trifolium striatum*)
- Round Prickly-headed Poppy (*Papaver hybridum*)
- Meadow Barley (*Hordeum secalinum*)
- Basil Thyme (*Acinos arvensis*)
- Annual Knawel (*Scleranthus annuus*)
- Spring Vetch (*Vicia lathyroides*)

The records for these species do not relate to the Abbey Grounds, although some species have been recorded in close proximity to the site (on the eastern bank of the Leitrim River) (Curtis & Wilson, 2008).

3.3 Habitats

The main habitats present within the Abbey grounds include the abbey and the coach house (BL3), which are surrounded by mature trees in open parkland (WD5) and areas of grassland which are closely mown and managed as amenity grassland (GA1). A small watercourse, the Ashtown Stream, which is best described as a lowland depositing stream (FW2), flows through the property and is a tributary of the Vartry River. These are mapped below on **Figure 1.6**.

Species recorded in unmown grassland within the site, along the watercourse and on the edges of the site boundaries include; red clover (*Trifolium pratense*), white clover (*Trifolium repens*), bush vetch (*Vicia sepium*), Yorkshire fog (*Holcus lanatus*), creeping cinquefoil (*Potentilla reptans*), yarrow (*Achillea millefolium*), crested dog's tail grass (*Cynosurus cristatus*), ragwort (*Senecio jacobaea*), yellow clover (*Trifolium dubium*), oxeye daisy (*Leucanthemum vulgare*), common figwort (*Scrophularia nodosa*), angelica (*Angelica sylvestris*), hogweed (*Heracleum sphondylium*), water dropwort (*Oenanthe crocata*), prickly sow-thistle (*Sonchus asper*), rough hawkbit (*Leontodon hispidus*), rosebay willow herb (*Epilobium angustifolium*), dandelion (*Taraxacum agg*), fool's watercress (*Apium nodiflorum*), ground elder (*Aegopodium podagraria*), ribwort plantain (*Plantago lanceolata*), tufted vetch (*Vicia cracca*), lords and ladies (*Arum maculatum*), rosebay willow herb (*Chamerion angustifolium*), meadow buttercup (*Ranunculus acris*), meadowsweet (*Filipendula ulmaria*), creeping buttercup (*Ranunculus repens*), nettle (*Urtica dioica*), meadow vetchling (*Lathyrus pratensis*), St. John's-wort (*Hypericum androsaemum*), selfheal (*Prunella vulgaris*), hairy willow herb (*Epilobium hirsutum*), bird's foot trefoil (*Lotus corniculatus*) and red fescue (*Festuca rubra*).

In disturbed ground within the gravel at the entrance greater plantain (*Plantago major*), annual meadow grass (*Poa annua*), Canadian fleabane (*Conyza canadensis*), groundsel (*Senecio vulgaris*), common speedwell (*Veronica arvensis*), daisy (*Bellis perennis*), mouse ear chickweed (*Cerastium fontanum*), common knotgrass (*Polygonum aviculare*), field penny-cress (*Thlaspi arvense*), corn chamomile (*Anthemis arvensis*), spear thistle (*Cirsium vulgare*) and nipplewort (*Lapsana communis*).

The treeline bounding the site contains sycamore (*Acer pseudoplatanus*), bramble (*Rubus fruticosus* agg.), elder (*Sambucus nigra*), ivy (*Hedera helix*). A double treeline of yew (*Taxus baccata*) are a notable feature of the grounds. A number of other planted specimen trees are recorded including Sycamore (*Acer pseudoplatanus*), Monterey cypress (*Cupressus macrocarpa*), Wild cherry (*Prunus avium*), NZ Cabbage Tree (*Cordyline australis*) and some ornamental shrubs. These include; Cherry laurel (*Prunus laurocerasus*), Himalayan honeysuckle/pheasant berry (*Leycesteria formosa*), Honey spurge (*Euphorbia mellifera*) and Fuchsia (*Fuchsia* sp.).



Figure 1.6. A habitat map (to Fossitt Level 3) of Wicklow Abbey.

The stone walls within and surrounding the site are often covered in dense ivy (*Hedera helix*) which provides habitat for nesting birds, foraging habitat for bats, refugia for invertebrates, flowers for pollinators and seeds for birds and other fauna.

Other species recorded here include common polypody fern (*Polypodium vulgare*), red valerian, ivy leaved toadflax (*Cymbalaria muralis*) and dense ivy.

3.4 Invasive Species

There are a number of species present within the Abbey Grounds some of which would have been deliberately planted within the gardens of the Parochial House and are now recognised as being invasive in nature.

These include Cherry laurel (*Prunus laurocerasus*), Himalayan honeysuckle/pheasant berry (*Leycesteria formosa*), Canadian fleabane (*Conyza canadensis*), red valerian (*Centranthus ruber*), and winter heliotrope (*Petasites fragrans*). Honey spurge (*Euphorbia mellifera*) was also recorded and can be invasive.

3.5 Birds

A good variety of common bird species were recorded during the surveys. These include blackbird (*Turdus merula*), wren (*Troglodytes troglodytes*), robin (*Erithacus rubecula*), dunnock (*Prunella modularis*), chaffinch (*Fringilla coelebs*), greenfinch (*Carduelis chloris*), song thrush (*Turdus philomelos*), and mistle thrush (*Turdus viscivorus*).

Other common species recorded include; great tit (*Parus major*), coal tit (*Parus ater*), blue tit (*Cyanistes caeruleus*), long tailed tit (*Aegithalos caudatus*), goldcrest (*Regulus regulus*), rook (*Corvus frugilegus*), jackdaw (*Corvus monedula*), pied wagtail (*Motacilla alba yarrellii*), hooded crow (*Corvus cornix*) and magpie (*Pica pica*). Both feral pigeon (*Columba columba domest.*) and woodpigeon (*Columba palumbus*) were also encountered and flocks of starlings (*Sturnus vulgaris*) may also occur.

Species typically associated with buildings include swifts (*Apus apus*) and boxes are erected for these on the Parochial House, while swallows (*Hirundo rustica*) and house martins (*Delichon urbicum*) are likely to feed over the grounds.

Species associated with the Ashtown Stream include grey wagtail (*Motacilla cinerea*) and moorhen (*Gallinula chloropus*).

Likely birds of prey include sparrowhawk (*Accipiter nisus*) while buzzard (*Buteo buteo*) and red kite (*Milvus milvus*) are also seen in the environs of Wicklow Town.

The Leitrim River to the north of the Abbey Grounds and connected to it via the Ashdown Stream supports a number of bird species, including many of those associated with Broadlough and The Murrough SPA. Species frequently observed here include;

- Kingfisher (*Alcedo atthis*), which is regularly recorded on this stretch of the Leitrim River and may breed nearby
- Little Egret (*Egretta garzetta*), which is regularly recorded on this stretch of the Leitrim River
- Stonechat (*Saxicola torquata*), which are frequent along the Murrough
- Linnet (*Carduelis cannabina*), which are frequent along the Murrough
- Whitethroat (*Sylvia communis*), which are frequent along the Murrough
- Goldfinch (*Carduelis carduelis*), which are frequent along the Murrough
- Wren (*Troglodytes troglodytes*), which are frequent along the Murrough
- House martin (*Delichon urbica*), which nest on the cliffs at Bride's Head
- Swift (*Apus apus*), which breed in Wicklow Town
- Swallow (*Hirundo rustica*), which breed in Wicklow Town

Other species associated with Wicklow Head and recorded in the environs of The Murrough include;

- A variety of rare and uncommon gull species have been recorded from the environs of Wicklow town, these include: Little Gull (*Larus minutus*), Mediterranean Gull (*Larus melanocephalus*), Glaucous Gull (*Larus hyperboreus*), Iceland Gull (*Larus glaucoides*)
- Kittiwake (*Rissa tridactyla*), regularly seen feeding offshore, large breeding colony on Wicklow Head
- Hooded Crow (*Corvus cornix*), which are frequent along the Murrough
- Raven (*Corvus corax*), breed on Wicklow Head
- Peregrine Falcon (*Falco peregrinus*), breed on Wicklow Head
- Shag (*Phalacrocorax aristotelis*), breed on Wicklow Head and feed offshore
- Fulmar (*Fulmarus glacialis*), breed on Wicklow Head and feed offshore
- Herring gull (*Larus argentatus*), breed on Wicklow Head and feed offshore
- Guillemot (*Uria aalge*), breed on Wicklow Head and feed offshore
- Razorbill (*Alca torda*), breed on Wicklow Head and feed offshore
- Black Guillemot (*Cepphus grylle*), breed on Wicklow Head and feed offshore
- Cormorant (*Phalacrocorax carbo*), seen feeding offshore

The site synopsis for The Murrough SPA reports the following:

'The Murrough SPA is an important site for wintering waterbirds, being internationally important for Light-bellied Brent Goose and nationally important for Red-throated Diver, Greylag Goose, Wigeon, Teal, Black-headed Gull and Herring Gull. It is probably the most important site in the country for nesting Little Tern. The regular occurrence of Red-throated Diver, Little Egret, Whooper Swan, Greenland White-fronted Goose, Golden Plover, Little Tern, Sandwich Tern, Short-eared Owl and Kingfisher is of note as these species are listed on Annex I of the E.U. Birds Directive'.

3.6 Bats

The Bat Conservation Ireland Database of bat records was searched for records of bats from Wicklow Town. The database contains records of roosts, ad hoc observations and the results of surveys such as the BATLAS 2010 project and the All Ireland Daubenton's Monitoring Project. There are currently no records of bat species recorded from Wicklow Town.

Three species of bats were recorded from the Abbey Grounds. These were

- Common pipistrelle (*Pipistrellus pipistrellus*),
- Soprano pipistrelle (*Pipistrellus pygmaeus*),
- Leisler's bat (*Nyctalus leisleri*),
- an unidentified pipistrelle species (*Pipistrellus* sp.).

The three species of bats were all recorded foraging over the grounds and hunting. A large number of social calls were heard indicating that a roost was nearby. There was no evidence of any roosting bats within the coach house but it offers good potential as does the ruined Abbey walls and the Parochial House.

Many of the mature sycamore trees and yews within the yew walk offer roosting potential for bats.

The buildings within the Abbey Grounds all offer potential to support roosting bats. All bat surveys, unless repeated throughout the year, are snapshots of bat activity in a particular location and are influenced by the time of year, climate and detection efficiency.

Many of the trees within the grounds offer high roosting potential for bats and these and the watercourse form an important habitat for foraging and commuting bats in the site.

3.7 Badger

No evidence of badger (*Meles meles*) was recorded within the Abbey Grounds.

3.8 Otter

No evidence of otter (*Lutra lutra*) was recorded on the Ashtown Stream but their presence is not ruled out. The invasive species American mink (*Neovison vison*) may also occur.

3.9 Other Mammals

The habitats in the environs of Wicklow Town, which have been mapped as sites of local biodiversity importance in the Wicklow Urban Habitat Mapping project provide good habitat for a range of common and ubiquitous mammal species.

Mammals known from the general Leitrim River area within the town include;

- Red fox (*Vulpes vulpes*)
- Rabbit (*Oryctolagus cuniculus*)
- Otter (*Lutra lutra*)
- Brown Rat (*Rattus norvegicus*)
- House Mouse (*Mus musculus*)
- Field Mouse (*Apodemus sylvaticus*)
- Grey seal (*Halichoerus grypus*)

The grey seal (*Halichoerus grypus*) is one of two seal species which breed around the Irish coast. Records of its occurrence in the Republic of Ireland date to 1837. Like the smaller harbour seal (*Phoca vitulina vitulina*), grey seals have established terrestrial colonies (or *haul-outs*) around the island, which they leave when foraging or transiting between sites, for example, and to which they return to breed, rest, moult, engage in social activity, etc.

Grey seal have in recent years been recorded in increasing numbers at Lime Kiln Bay on Wicklow Head and breed there annually. The 2005 All Ireland Seal Survey reported a single pup at this location (O’Cadhla *et al.* 2005)¹. The grey seal moult population surveys in 2007 estimated haul-out group sizes of 22 at Wicklow Head (O’Cadhla *et al.* 2007)². A local seal known as ‘Sammy’ regularly travels up the Vartry (Leitrim) River into the town.

4. ASSESSMENT OF ECOLOGICAL SIGNIFICANCE

The Abbey Grounds were included in the Local Biodiversity Action Plan for Wicklow Town 2017 – 2020 study and a number of recommendations were made in relation to improving the biodiversity and wildlife value of this site. The results of that study are presented below in **Figures 1.7 to 1.9**.

This site would be deemed of high local biodiversity importance within the environs of Wicklow Town.

¹ Oliver Ó Cadhla, Denis Strong, Ciarán O’Keeffe, Mary Coleman, Michelle Cronin, Callan Duck, Tony Murray, Pascal Dower, Richard Nairn, Paul Murphy, Pat Smiddy, Cyril Saich, David Lyons, Lex Hiby (2005). Grey seal breeding population assessment in the Republic of Ireland, 2005. Final Project Report for National Parks and Wildlife Service.

² Oliver Ó Cadhla and Denis Strong (2007). Grey seal moult population survey in the Republic of Ireland, 2007. Final Project Report for National Parks and Wildlife Service.



Figure 1.7. Wicklow Abbey (Local Biodiversity Action Plan for Wicklow Town 2017 - 2020 study).

The Abbey is a particularly unique space within the centre of Wicklow Town and although privately owned, the grounds are open to the public. This is an historic site hosting the ruins of the Franciscan Friary built around 1265. The site is laid out as parkland with some very old impressive yew trees, areas of lawn and some planting schemes although these are not extensive. The boundary of the site is a stone wall clad with polypody ferns, ivy and moss and lined with a treeline of sycamore, oak and rowan with holly and elderberry. A crab apple tree was also noted. A stream runs through the parkland adding additional wildlife and visual interest.

This parkland presents as an excellent opportunity for enhancement both for wildlife and for aesthetics in keeping with its historic importance. Some tree planting choosing native oak as the main species would enhance the tree line already and make an historic reference to the use of oak galls as a source of ink by monks. Orchard or fruit tree planting along with an herb garden would also be very appropriate for this historic site. The back drop of the historic ruins with herb and pollinator planting in the flower beds in front would be a stunning view.



Linear woodland planting is suggested for along the boundary wall



The abbey walls would make an exciting and appropriate back drop to a pollinator friendly planting scheme with an herb garden

Figure 1.8. Description of Wicklow Abbey (Local Biodiversity Action Plan for Wicklow Town 2017 - 2020 study).

A. The Abbey Biodiversity Enhancement Project

Objective: To enhance the Abbey parkland for wildlife regarding its historic importance

Partners: Wicklow Tidy Towns, Wicklow Abbey Caretaker

Actions:

- Plant oak, rowan, wild cherry, elder and holly as a linear woodland along the boundary of the existing treeline. Plant pedunculate oak as the main species with smaller amounts of the other species. The aim would be to create a linear woodland.
- Remove the small non-native shrubbery (e.g. cordylines) from the treeline with the aim of encouraging a more natural, native understorey and ground flora.
- Plant native bluebells and primroses in the woodland.
- Plant an herb garden in the disused flower beds next to the Abbey ruins. Herbs are a good source of nectar for pollinating insects. The flower bed could also be planted up with a range of other pollinator friendly perennial plants.
- Reduce the mowing frequency of grass and other vegetation along the stream to create a soft edge which would allow the natural streamside vegetation to proliferate. Some plug planting of native wetland plants would enhance the area. Purple loosestrife and wild angelica would be appropriate and seed could be collected from local riversides or streams.
- Consider planting some fruit trees. Espalier fruit trees could be grown on the rear of the outbuildings and would be another historic reference for this site.
- Reduce the mowing frequency of some areas of lawn to allow some wildflowers such as clover to grow. Alternatively, plant crocuses in some areas of the lawn. A wildflower lawn should be first cut in April after the dandelions have flowered and thereafter every 6 weeks or so. Paths can be cut through the wildflower lawn to maintain a neat and maintained appearance.
- Erect bird and bat boxes in the trees at the periphery of the site.

Evaluation: Observe and enjoy the enhanced appearance of the garden!

Resources:

- See Appendix A-D for guidance on tree planting, pollinator friendly plants and bird and bat boxes.
- Gardens actions to help pollinators
http://www.biodiversityireland.ie/wordpress/wp-content/uploads/Gardens_actions-to-help-pollinators-July-2016.pdf
- Local communities: Actions to help pollinators
http://www.biodiversityireland.ie/wordpress/wp-content/uploads/Local%20communities_actions%20to%20help%20pollinators_April%202016.pdf

Figure 1.9. Recommendations for Biodiversity Enhancement at Wicklow Abbey (Local Biodiversity Action Plan for Wicklow Town 2017 – 2020 study).

5. PRELIMINARY RECOMMENDATIONS

This survey and ecological study has identified the main features of importance from the perspective of biodiversity within the Wicklow Abbey grounds. The following ecological enhancement proposals and recommendations for habitat management were presented to the design team to inform the design for the development of the grounds as a park/public space as shown on **Figure 1.10** below. They were to:

- Create a sense of calm, a green oasis, a green lung to the town, shelter from the noise and busyness of the town and a place of tranquillity and peace filled with bird song
- Opportunity to enhance open realm space of the car park and connect to the park through, removal of block wall, landscaping with native species and creation of a natural edge
- Strengthen ecological corridor along the boundary of the park to improve biodiversity value through planting of native hedgerow species
- Retention of ecological connectivity of native species along eastern edge of the Abbey Grounds
- Strengthen ecological corridor along the watercourse through the Abbey Grounds
- Ensure the protection of bats utilising the grounds
- Develop an appropriate grassland and habitat management regime for the Abbey Grounds



Figure 1.10. Ecological design principles.

Any proposals for the development of the Abbey Grounds must be in line with the Green Infrastructure Policy Objectives as set out in the County Development Plan. These include:

1. To recognise the importance and contribution of Green Infrastructure throughout the region for the maintenance of biodiversity and ensuring that the region will be able to, or be ecologically robust enough to, adapt and respond to climate change issues.

4. New development and redevelopment proposals, where considered appropriate, are required to contribute towards the protection, management and enhancement of the existing green infrastructure of the local area in terms of the design, layout and landscaping of development proposals.

5. To facilitate the development and enhancement of suitable access to and connectivity between areas of interest for residents, wildlife and biodiversity, with focus on promoting river corridors, Natura 2000 sites, nature reserves and other distinctive landscapes as focal features for linkages between natural, semi natural and formalised green spaces where feasible and ensuring that there is no adverse impact (directly, indirectly or cumulatively) on the conservation objectives of Natura 2000 sites.

6. To identify and facilitate the provision of linkages along and between river corridors within the county and adjoining counties to create inter connected routes and develop riverside parks and create linkages between them to form 'necklace' effect routes including development of walkways, cycleways and wildlife corridors where feasible and ensuring that there is no adverse impact (directly, indirectly or cumulatively) on the conservation objectives of Natura 2000 sites.

NH1. To ensure that the impact of new developments on biodiversity is minimised and to require measures for the protection and enhancement of biodiversity in all proposals for large developments.

NH12. To support the protection and enhancement of biodiversity and ecological connectivity within the plan area in accordance with Article 10 of the Habitats Directive, including linear landscape features like watercourses (rivers, streams, canals, ponds, drainage channels, etc), woodlands, trees, hedgerows, road and railway margins, semi-natural grasslands, natural springs, wetlands, stonewalls, geological and geo-morphological systems, features which act as stepping stones, such as marshes and woodlands, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones that taken as a whole help to improve the coherence of the Natura 2000 network in Wicklow.

6. ECOLOGICAL IMPACTS

A number of impacts on the local biodiversity, habitats and species associated with the Abbey Grounds arise from it's development and future use as a public space as shown on **Figure 1.11** below.

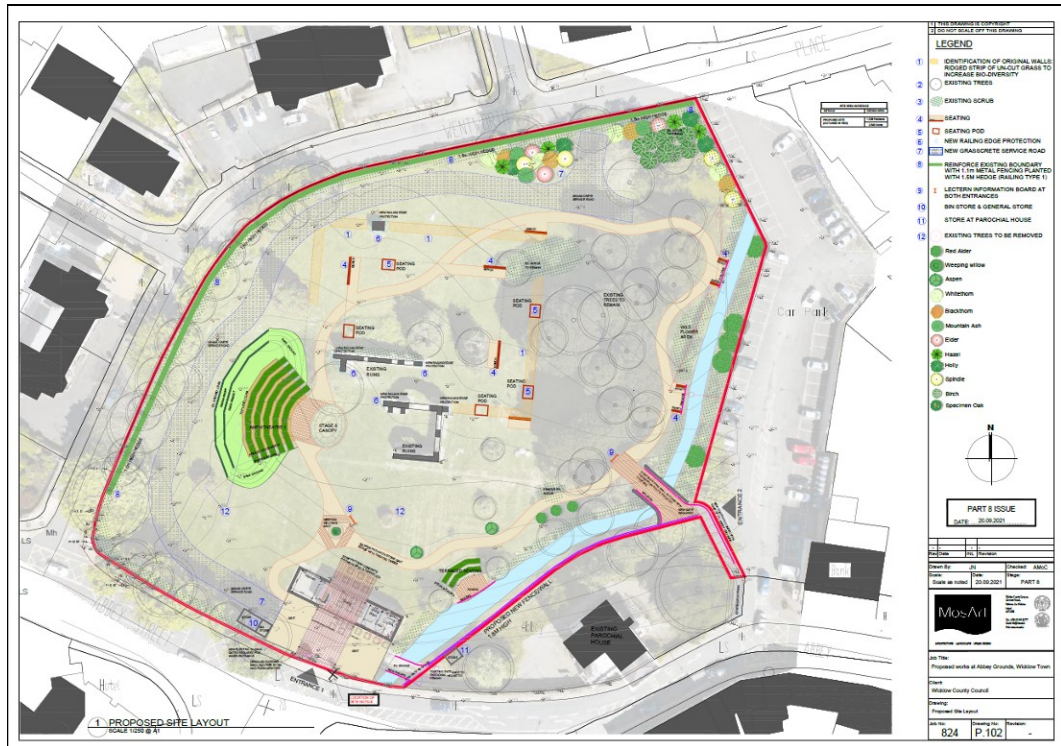


Figure 1.11. Site Layout.

The design proposals include:

- change of use for the Coach House building to a Café/Retail/Exhibition space and extension to same
- the provision of public toilets
- the development of an amphitheatre
- the development of a vehicular service route and pedestrian pathways
- the development of a terraced area adjoining the stream
- the provision of park benches and pods
- lighting
- landscaping and associated planting.

The main potential impacts arising from the proposed development of the Abbey Grounds during the construction period are assessed as follows:

- Potential damage to the habitats within the grounds from the construction works.
- Potential for the spread of invasive species if biosecurity measures are not implemented.

- Potential impacts on breeding birds through removal of vegetation used for nesting and feeding purposes.
- Potential impacts on bats which may use the coach house for breeding purposes.
- Potential impacts on bats which may use the bridge for breeding purposes.
- Potential impacts on bats which may use the abbey walls for breeding purposes.
- Potential impacts on bats potentially utilising trees for roosting purposes.
- Potential for disturbance to bats from lighting including loss of hunting habitat and barriers to the movement of bats through the site.
- Potential for disturbance to fauna using the Ashtown Stream.
- Potential for loss of feeding and shelter for fauna using the Ashtown Stream.
- Potential loss of ecological corridor of the Ashtown Stream.
- Potential impacts on water quality within the Ashtown Stream through siltation and runoff from site during the works.

Potential impacts during the operational phase of the development of the Abbey Grounds may include the following:

- Potential disturbance to bats from lighting.
- Potential sanitisation of the stream corridor through removal of vegetation, trampling pressure, etc.
- Disturbance to breeding birds through increased public use.
- Disturbance to fauna utilising the stream corridor.
- Inappropriate mowing regime of grassland areas and park margins.

The following mitigation measures are recommended to avoid/reduce these impacts. They also include and strengthen the previous biodiversity enhancement proposals set out in the 2017 study.

7. MITIGATION MEASURES

7.1 Mitigation by Avoidance

The principal mitigation that should be considered in any development is avoidance of impact. Direct impacts on the majority of trees, treelines and areas of scrub within and bounding the site have been avoided. It is proposed to retain all of these areas and strengthen them with additional planting of native species and to manage them appropriately in the future. This has ameliorated some of the potential impacts for both flora and fauna within the red line boundary of the site.

Before any construction related works begin on site these areas need to be clearly marked out on the ground and afforded suitable protection. This will be done by the ecological clerk of works with the project architect and contractor.

7.2 Sediment Control

Sediment control practices are used on building sites to prevent sand, soil, cement and other building materials from reaching streams and ditches. Even a small amount of pollution from a site can cause significant environmental damage by killing aquatic life, silting up streams and blocking storm water pipes. Storm water can contain many pollutants which can enter our local drainage ditches, streams, rivers and marine systems, causing harm to native animals, plants, fish breeding habitats and recreational areas.

Soil erosion, sediment and litter from building sites can be major sources of storm water pollution, and can cause:

- significant harm to the environment
- weed infestation of waterways caused by sediment settling in watercourses and ditches and transporting nutrients
- loss of valuable topsoil
- significant public safety problems when washed onto roads and intersections
- blocked drains creating flooding and increased maintenance costs
- damage to recreational and commercial fishing downstream.

Sediment control usually requires little effort and results in:

- Cleaner waterways and healthier aquatic life.
- Improved site conditions.
- Improved wet weather working conditions.
- Reduced wet weather construction delays.
- Reduced losses from material stockpiles.
- Fewer mud and dust problems.

Good site management in relation to sediment control during the construction phase should prevent this from occurring and possible mitigation measures for consideration are outlined below. Other measures to be implemented on site include briefing of all site contractors regarding the sensitivity of the watercourse within the site and the need for strict site management in relation to potential run off.

Minimising site disturbance:

Prevention is better than cure. Careful design and an efficient construction sequence will minimise disturbance to the site. This will save money and reduce environmental impact.

Clear only those areas necessary for building work to occur. Preserve grassed areas and vegetation where possible. This helps filter sediment from storm water run off before it reaches the watercourse and stops rain turning exposed soil into mud. Delay removing vegetation or commencing earthworks until just before building activities start. Avoid building activities that involve soil disturbance during periods of expected heavy or lengthy rainfall.

Implement sediment control:

Install sediment control measures along the watercourse using techniques such as silt fencing before commencing any excavation or earth moving. Regularly maintain them until construction is complete and the site is stabilised.

7.3 Contractor Briefing

All site contractors will be briefed regarding the biodiversity value of the boundary hedgerows and retained trees to ensure that there are no accidental or unintentional actions conducted during the project construction that could lead to a reduction in water quality/damage to same. Such matters often arise through ignorance or by accident rather than as a result of an intentional action.

7.4 Protection Measures for 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.) will 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.

7.5 Measures for Birds

A variety of artificial nesting opportunities for birds (bird boxes) will be erected on the retained trees and treelines within the development. A nesting box for grey wagtail will be erected under the bridge.

The biodiversity enhancement measures set out in the 2017 study recommended:

- 'Erect bird and bat boxes in the trees at the periphery of the site'.

7.6 Protection Measures for Bats

Bat Foraging Habitat

It is important that all trees, treelines and boundary vegetation (including bramble scrub) along the site boundary and along the watercourse is retained in full as this provides foraging habitat for bats supporting a diversity of invertebrates. These trees and vegetation also help to maintain and create a corridor which allows bats (and other fauna) to forage and commute through these lands.

These areas of retained trees and vegetation must be fenced and protected during the construction phase to ensure that they are not damaged during the works. Protective fencing will be erected in advance of any construction works commencing in order to prevent damage to these retained habitats during construction in accordance with BS 5837:2012. This will be signed off on by a qualified ecologist to ensure it has been erected properly and the vegetation has been protected before any machinery/works are allowed on site. No ground clearance, earth moving, stock-piling or machinery movement will occur within these protected areas.

Potential Bat Roosts

A number of mature trees on the site boundaries have been identified as having the potential to support roosting bats. The majority of these trees are to be retained in full and will be afforded protection during construction as set out above.

The structural engineers report (Trevor Woods Consulting Engineers, 2021) recommends the removal of two of these trees as they are causing the boundary walls of the grounds to lean.

These trees will be further assessed by a licensed bat specialist prior to removal to check for the presence of bats. If any bats are encountered during the assessment a bat derogation licence for the works will be sought from NPWS. The results of the survey will determine how they should be felled. Tree felling of potential bat roosts will be conducted during the winter months of October and November to avoid both the bird breeding season and the maternity/hibernation periods for bats.

Reduction of light disturbance

The Abbey Grounds are currently unlit at night and provide an important dark habitat for hunting bats and other fauna.

Design recommendations from the BCT (2010) for wildlife-friendly lighting include:

1. Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. Use only the minimum amount of light needed for safety. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light.
2. Eliminate any bare bulbs and any light pointing upwards. The spread of light should be kept near to or below the horizontal.
3. Use narrow spectrum bulbs to lower the range of species affected by lighting.
4. Use light sources that emit minimal ultra-violet light. Insects are attracted to light sources that emit ultra-violet radiation.
5. Reduce light-spill so that light reaches only areas needing illumination. Shielding or cutting light can be achieved through the design of the

luminaire or with accessories, such as hoods, cowls, louvers and shields to direct the light.

6. Reduce the height of lighting columns. Light at a low level reduces ecological impact. However, higher mounting heights allow lower main beam angles, which can assist in reducing glare.
7. For pedestrian lighting, use low level lighting that is directional as possible and below 3 lux at ground level.
8. Limit the times that lights are on to provide some dark periods for wildlife.
9. Use lighting design computer programs and professional lighting designers to predict where light spill will occur.
10. In general any lighting used in the development should not overspill onto the adjoining trees and woodland thereby ensuring that a dark corridor for foraging and commuting bats and movement for other wildlife is maintained.

In addition:

11. Luminaires will be dimmable LED (light emitting diode) fittings with High performance optics to provide high visual comfort.
12. Luminaires will be selected to ensure that when installed there shall be zero direct upward light emitted to the sky (all output shall be at or below 90° to the horizontal to help prevent sky glow from light pollution of the night sky).
13. Luminaires will be selected to ensure that there is no light spill from the proposed development onto the retained areas of linear vegetation and boundary features.
14. The light emitted from these fittings shall have no photo biological risk and shall be categorised as “Exempt Group” in relation to emissions of Blue light, Infrared and Ultra Violet Radiation in accordance with EN 62741:2008.
15. All luminaires shall have a Luminous intensity Classification of between G4 and G6 to IS EN 13201-2:2003(E) / BS 5489-1:2013.
16. The recommendations of the Institution of Lighting Professionals and Bat Conservation Trust “Bats and Lighting in the UK” documentation and Bat Conservation Ireland Guidance Notes for planners, engineers, architects and developers December 2010 will be met.

These guidelines have been implemented in the project lighting design.

7.7 Measures for Bats - Erection of Bat Boxes

The biodiversity enhancement measures set out in the 2017 study recommended:

- ‘Erect bird and bat boxes in the trees at the periphery of the site’.

It is recommended that five no. Schwegler 2F bat boxes are erected on trees on site to provide roosting potential for bats. These will be sited by the contractor under the supervision of a suitably qualified ecologist.

7.8 Biosecurity

Should earth or other material be brought to site this material should be screened to confirm that no invasive species such as Japanese knotweed or other species as described on <http://www.invasivespeciesireland.com/> are present. All machinery and plant entering the site should be cleaned to ensure that no fragments of Japanese knotweed or seeds of other invasive species are brought on to the site in line with the Birds and Natural Habitats Regulations 2011.

The landscaping plan needs to be updated to reflect these requirements.

7.9 Planting proposals

The landscaping proposals for the development (including the planting of trees and shrubs to enhance the existing boundary planting) were developed in conjunction with the project ecologist and are shown on **Figure 1.12** below.

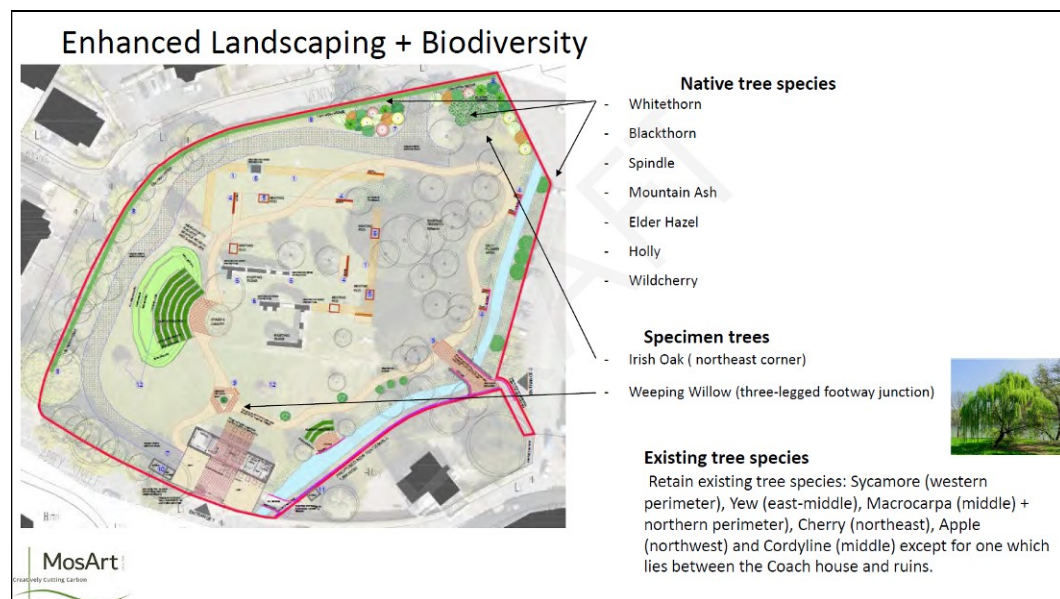


Figure 1.12. Landscaping proposals (MOSART).

The planting proposals set out to strengthen these existing areas within the site for wildlife and biodiversity and to reinstate green infrastructure across the site post construction. They include the use of native and local plant species such as oak, hawthorn, blackthorn, holly, hazel, guelder rose and dog rose within the proposed hedgerow planting.

Suitable species for planting along the stream include: willow (*Salix alba*, *Salix fragilis*, *Salix cinerea*, *Salix caprea*) and Alder (*Alnus glutinosa*).

The species used will be native and of local origin, certified stock is available from nurseries who supply stock for the Native Woodland Scheme.

The biodiversity enhancement measures set out in the 2017 study recommended:

- 'Plant oak, rowan, wild cherry, elder and holly as a linear woodland along the boundary of the existing treeline. Plant pedunculate oak as the main species with smaller amounts of the other species. The aim is to create a linear woodland/areas of scrub surrounding the grounds'.

Other suggestions included:

- 'Consider planting some fruit trees. Espalier fruit trees could be grown on the rear of the outbuildings and would be another historic reference for this site'.
- 'Plant native bluebells and primroses in the woodland'.
- 'Plant an herb garden in the disused flower beds next to the Abbey ruins. Herbs are a good source of nectar for pollinating insects. The flower bed could also be planted up with a range of other pollinator friendly perennial plants'.

7.10 Grassland Management/Creation

Remnants of a diverse grassland flora were recorded during in unmown areas within the site and this type of grassland management should be encouraged in some parts of the site as set out in the project proposals (Figure 1.13).

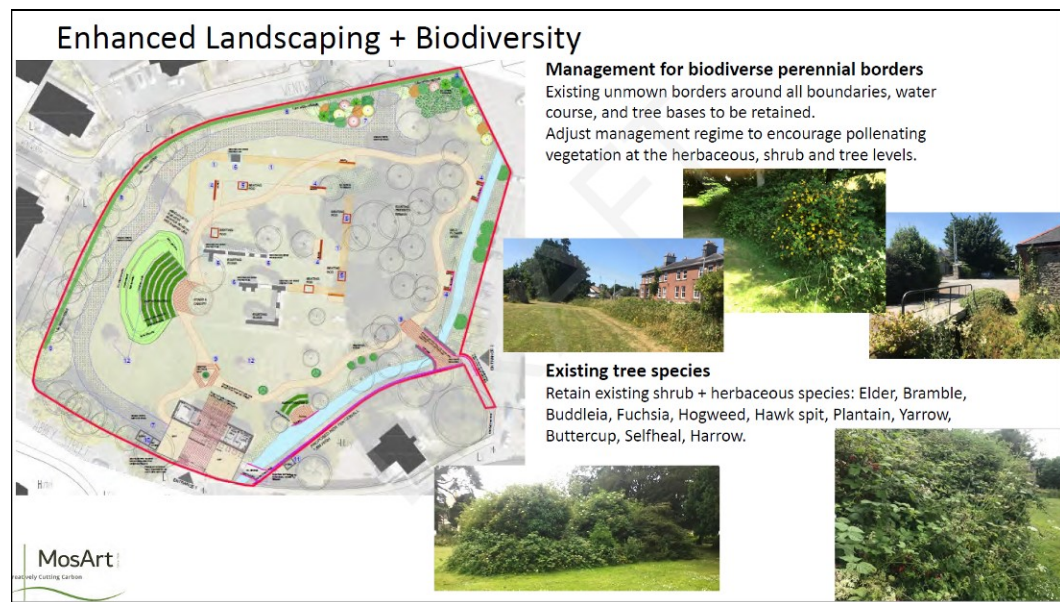


Figure 1.13. Landscaping and biodiversity proposals.

It is recommended that some grassland areas in the park (a minimum of a 2m buffer from the boundary treeline/hedgerow vegetation and the watercourse) can be left uncut and where long grass can be maintained as a meadow for pollinators and other invertebrates during the summer months. These areas will

require annual cutting and removal of the meadow cuttings to ensure diversity within the sward.

The biodiversity enhancement measures set out in the 2017 study recommended:

- 'Reduce the mowing frequency of some areas of lawn to allow some wildflowers such as clover to grow. Alternatively, plant crocuses in some areas of the lawn. A wildflower lawn should be first cut in April after the dandelions have flowered and thereafter every 6 weeks or so. Paths can be cut through the wildflower lawn to maintain a neat and maintained appearance'.

Following construction areas of disturbed ground will be reseeded with an appropriate native grassland/wildflower mix to be specified by the project ecologist.

The proposed landscaping plan needs to be updated to reflect these planting and habitat management requirements.

7.11 Invasive Species

It is recommended that the Cherry laurel (*Prunus laurocerasus*), Himalayan honeysuckle/pheasant berry (*Leycesteria formosa*), red valerian (*Centranthus ruber*), Canadian fleabane (*Conyza canadensis*) and winter heliotrope (*Petasites fragrans*) are removed and any regeneration of same controlled.

The biodiversity enhancement measures set out in the 2017 study also recommended:

- 'Remove the small non-native shrubbery (e.g. cordylines) from the treeline with the aim of encouraging a more natural, native understorey and ground flora'.

7.12 Measures for the Watercourse

Suitable species for planting along the stream include: willow (*Salix alba*, *Salix fragilis*, *Salix cinerea*, *Salix caprea*) and Alder (*Alnus glutinosa*). These will be added to the existing vegetation along the watercourse to strengthen the ecological corridor this habitat provides for faunal species.

The biodiversity enhancement measures set out in the 2017 study recommended:

- 'Reduce the mowing frequency of grass and other vegetation along the stream to create a soft edge which would allow the natural streamside vegetation to proliferate. Some plug planting of native wetland plants would enhance the area. Purple loosestrife and wild angelica would be appropriate and seed could be collected from local riversides or streams'.

The proposed landscaping plan needs to be updated to reflect these planting requirements.

The sediment control measures outlined above also need to be implemented in full.

7.13 Building/Structure Resurvey - Bat Protection

It is recommended that the coach house building is resurveyed for bats prior to any proposed works as some time will have lapsed between the present survey and then. If the bridge or any of the Abbey Walls require remedial works such as vegetation removal or repointing they should be surveyed for bats prior to same.

If bats are discovered a bat derogation licence can then be sought for the proposed works.

7.14 Tree Survey

It is recommended that an arborist is engaged to review any works proposals which could impact on the root protection zone of the trees within the site and any pruning/tree health measures to ensure their retention and future longevity.

7.15 Ecological Clerk of Works

An ecological clerk of works will be appointed to oversee the construction of the park and the implementation of the mitigation measures and recommendations set out in this report and to sign off on same.

7.16 Screening for Appropriate Assessment

A report for Screening for Appropriate Assessment has also been completed as part of the Part VIII planning process.

7.17 Park Habitat Management Plan

A wildlife friendly habitat management plan needs to be developed with the contractor/local authority staff to ensure that the future management of the rounds remains friendly to wildlife.

8. PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

When assessing the ecological impacts and effects, reference was made to the following characteristics as required:

- positive or negative
- extent
- magnitude
- duration
- frequency and timing
- reversibility.

The proposed development of the Abbey Grounds as a public park have been assessed from the perspective of ecology and detailed mitigation measures have been presented to reduce impacts on species of European and national conservation interest using these lands.

The increased public access and utilisation of the Abbey Grounds as a public park will have negative consequences for wildlife as until relatively recently these lands were private and undisturbed which ensures that they became a haven for fauna. They were recognised as such in the recently published report 'A Local Biodiversity Action Plan for Wicklow Town 2017 - 2020' and in previous ecological surveys of the town.

The proposed development design for the Abbey Grounds takes into account the ecology and biodiversity present with a view to minimising the ecological effects of developing these lands. The project team of architects, conservation engineers, archaeologists and landscape architects have worked to reduce the effects of this development on wildlife within the site.

Significant mitigation measures have been implemented through the development of the project layout and design to avoid and reduce direct impacts (for example on the boundary treelines, scrub and the stream), to ameliorate impacts (through the timing of works, lighting design, etc.) and to ensure that the design protected these areas and the watercourse, the strengthening and creation of existing habitat (through planting a new native hedgerow to complement the site boundary and existing trees) and to ensure the appropriate grassland management of the lands in the future.

The efficacy of these measures will be monitored at both construction stage and post construction to ensure they are delivering for biodiversity in response to the declaration of both a County and a National Biodiversity Crisis in Ireland.

No habitat designated for nature conservation purposes, or plant species protected under the Floral Protection Order 2015, will be impacted by the proposed development of these lands, which would be deemed of high importance for biodiversity within the town.

The landscape architects design proposals include significant tree planting and the planting of native hedgerow and pollinator friendly planting within the development in addition to enhancements along the watercourse within the site.

Ultimately the Abbey Grounds will be developed as a public space within the town rendering what was a previously undisturbed environment for wildlife to one utilised by people. Species which adapt readily to urban and developed environments will remain in the general area.

Given the implementation of the above mitigation measures the overall impacts on flora and fauna have been reduced.

9. CONCLUSION

The proposed development of the Abbey Grounds as a public park has been assessed from the perspective of ecology and detailed mitigation measures have been presented to reduce impacts on same within the lands.

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11. PHOTOGRAPHIC RECORD















