

Newcastle Village, Co. Wicklow

Biodiversity Action Plan

Report Prepared for Newcastle Tidy Towns Group
with funding from Community Foundation Ireland Environment and Nature-
Biodiversity Grants 2021.



DRAFT REPORT

29th September 2023



Faith Wilson
ECOLOGICAL CONSULTANT

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

Newcastle Village, Co. Wicklow

Biodiversity Action Plan

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Newcastle Village, Co. Wicklow

Biodiversity Action Plan

1. INTRODUCTION

1.1 Background

Faith Wilson Ecological Consultant was commissioned by Newcastle Tidy Towns Group to prepare a biodiversity action plan for Newcastle Village in Co. Wicklow as shown on **Figure 1** below. The Newcastle Tidy Towns Group successfully received funding for the study from the Community Foundation Ireland under Strand 1 of the Environment and Nature Fund 2021. The proposed study area is shown on **Figure 2** below.

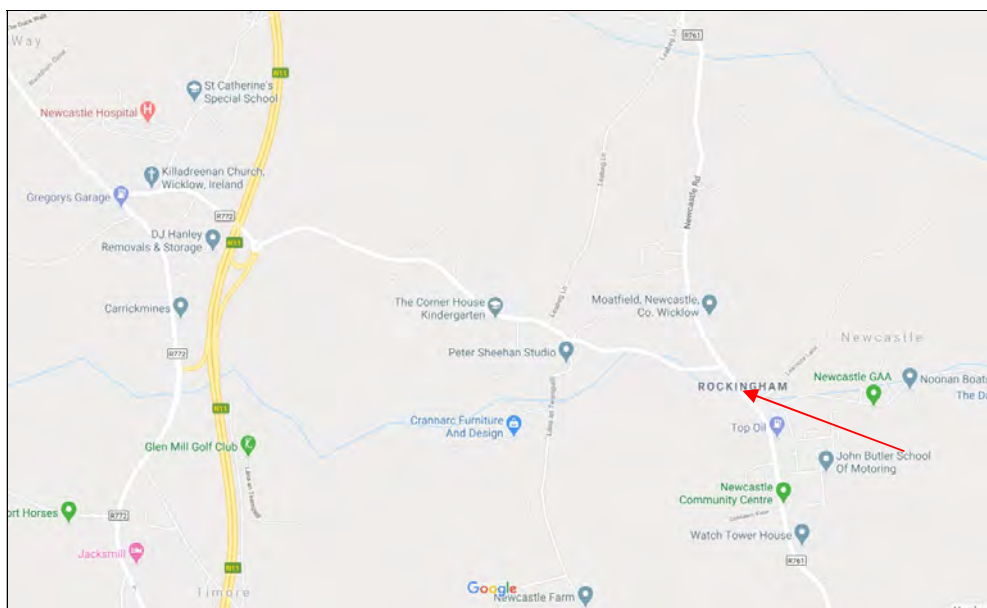


Figure 1. Newcastle Village, Co. Wicklow.

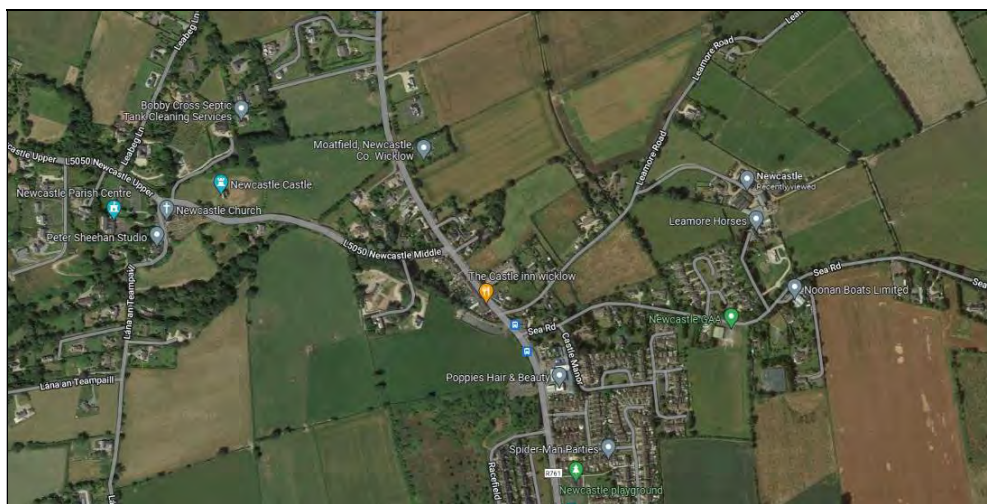


Figure 2. Newcastle Village (Google Maps imagery).

2. METHODOLOGY

2.1 Desktop Research

A desk study was carried out to collate the available information on the ecological environment within the study area in Newcastle Village as shown on **Figure 3** below. 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 was checked. 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, the National Biodiversity Data Centre and published sources. Recent, high resolution, colour aerial photographs were also used to identify and map habitats.

Various ecological surveys conducted in the vicinity of the village as part of other developments and projects were also reviewed to see if any of the ecological information related to this area.

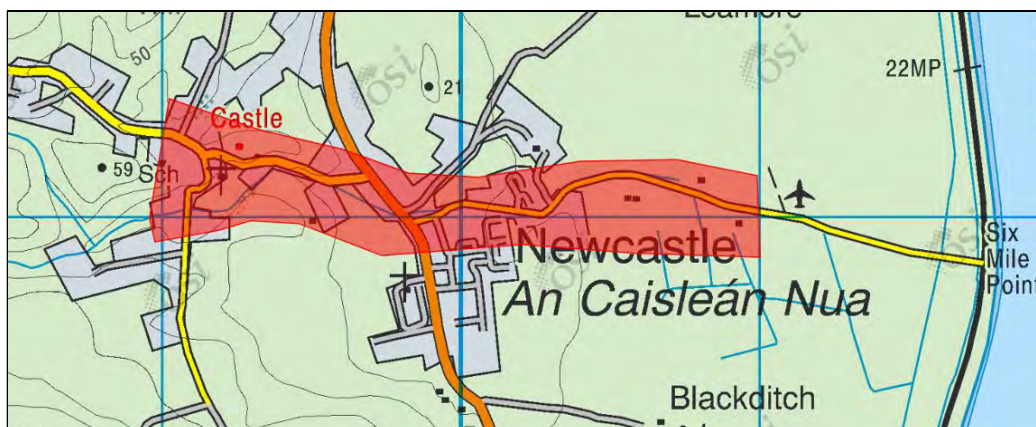


Figure 3. Newcastle Village Study Area - shown in red (Source: National Biodiversity Data Centre).

Consideration was also given to other flora and fauna as defined under the following legislative instruments and red data books:

- species protected under the **Wildlife Act (1976 (amended 2000))**, such as bats, badger, pine marten and common frog,
- plant species listed under the **Flora (Protection) Order (2022)**,
- vascular plant species listed in the **Irish Red List for Vascular Plants**¹.
- bird species listed under the '**Birds of Conservation Concern in Ireland**' document²,
- mammals listed in the **Irish Red List for Terrestrial Mammals**³,

¹ 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.

² Gilbert G, Stanbury A and Lewis L.J. 2021. Birds of Conservation Concern in Ireland 2020 –2026. Irish Birds 43, 1-22.

³ 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.

- amphibians and reptiles listed in the **Irish Red List for Amphibians, Reptiles & Freshwater Fish**⁴,
- invasive species listed under Schedule 3 of the '**Birds and Natural Habitats Regulations 2011**' and the **EU Regulation on Invasive Alien Species (EU Regulation 1143/2014)**⁵.

2.2 Field Surveys

The flora and habitats within the environs of Newcastle Village were surveyed over several visits in 2023 using the Phase 1 habitat survey methodology (JNCC, 1993) and Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.*, 2011) to map the vegetation communities and habitats present. These are described using Fossitt (2000)⁶. Plant identification follows Parnell *et al* (2012)⁷, and species nomenclature follows Scannell & Synnott (1987)⁸.

2.3 Relevant Legislation

2.3.1 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 (Amendment) Act, 2000.

⁴ King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., Fitzpatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011). Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

⁵ S.I. No. 477 of 2011. The European Communities (Birds and Natural Habitats) Regulations 2011. Irish Government, Government Publications Office, Molesworth Street, Dublin 2.

⁶ Fossitt, J. (2000) A Guide to Habitats in Ireland. The Heritage Council, Ireland.

⁷ Parnell, J. and Curtis, T. (2012). An Irish flora (8th edn). Cork University Press.

⁸ Scannell, M. and D. Synnott (1987). Census Catalogue of the Flora of Ireland - Clár de Phlandaí na hÉireann. Stationery Office Dublin, Dublin.

2.3.2 Bats

Eleven species of bats occur in Ireland and all are protected under both national and international law. Nine species are resident and have confirmed breeding populations while two species are deemed to be vagrants as set out in **Table 1** below.

Table 1. Legal protection and status of the Irish bat fauna.

Common and scientific name	Wildlife Act 1976 & Wildlife (Amendment) Acts 2000 & 2010	Irish Red List status	Habitats Directive	Bern & Bonn Conventions
Common pipistrelle <i>Pipistrellus pipistrellus</i>	Yes	Least Concern	Annex IV	Appendix II
Soprano pipistrelle <i>P. pygmaeus</i>	Yes	Least Concern	Annex IV	Appendix II
Nathusius' pipistrelle <i>P. nathusii</i>	Yes	Not referenced	Annex IV	Appendix II
Leisler's bat <i>Nyctalus leisleri</i>	Yes	Near Threatened	Annex IV	Appendix II
Brown long-eared bat <i>Plecotus auritus</i>	Yes	Least Concern	Annex IV	Appendix II
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	Yes	Least Concern	Annex II Annex IV	Appendix II
Greater horseshoe bat <i>Rhinolophus ferruginous</i>		Data Deficient	Annex II Annex IV	Appendix II
Daubenton's bat <i>Myotis daubentonii</i>	Yes	Least Concern	Annex IV	Appendix II
Natterer's bat <i>M. nattereri</i>	Yes	Least Concern	Annex IV	Appendix II
Whiskered bat <i>M. mystacinus</i>	Yes	Least Concern	Annex IV	Appendix II
Brandt's bat <i>M. brandtii</i>	Yes	Data Deficient	Annex IV	Appendix II

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 is a species of the western seaboard of Ireland and has not yet been recorded on the east coast.

Eurobats

This is a Europe-wide (and neighbouring jurisdictions including North Africa and the Middle East) agreement that originates from efforts to apply the Bonn Convention to the protection of bats within areas to which they may migrate from their European summer or winter sites. There are 33 parties (including Ireland) that have entered into a UN forum to protect the 52 species of bat (based on current knowledge) of Europe.

Threats to Irish bats:

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.

2.3.3 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 are protected legally 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.

2.3.4 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)⁹). A Species Action Plan and a Threat Response Plan has been prepared for the otter by NPWS (2008 & 2009)¹⁰.

Otters tend to occupy linear territories along watercourses and are rarely found far away from water. There have been a number of national surveys of otters in Ireland¹¹¹² which have been conducted for National Parks and Wildlife Service.

(Bailey (2006)) surveyed 35 sites within the Eastern River Basin District, of which 22 (62.9%) recorded the presence of otter, the lowest rate in the country. A more recent survey conducted in 2010 (Reid *et al.* (2013)) surveyed 65 sites within the Eastern River Basin District, of which 34 (52.3%) recorded the presence of otter.

2.3.5 Kingfisher

The kingfisher (*Alcedo atthis*) is a species listed under Annex I of the EU Birds Directive for which EU nations must designate Special Protection Areas (for birds) (SPAs).

2.3.6 Invasive Species

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.

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.

⁹ NPWS (2008). The status of EU protected species and habitat in Ireland. NPWS, Dublin.

¹⁰ NPWS (2009). Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.

¹¹ Bailey, M & Rochford, J., (2006). Otter survey of Ireland 2004/2005. Irish Wildlife Manual, No 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin.

¹² Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013). National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

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

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 the EU Invasive Alien Species Regulation 1143/2014 applies. The associated restrictions and obligations came into force on 3rd August 2016.

Three distinct types of measures are envisaged under the Directive, which follow an internationally agreed hierarchical approach to combatting IAS:

- Prevention: a number of robust measures aimed at preventing IAS of Union concern from entering the EU, either intentionally or unintentionally.
- Early detection and rapid eradication: Member States must put in place a surveillance system to detect the presence of IAS of Union concern as early as possible and take rapid eradication measures to prevent them from establishing.
- Management: some IAS of Union concern are already well-established in certain Member States and concerted management action is needed so that they do not spread any further and to minimize the harm they cause.

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 all of these invasive species was conducted within the environs of Newcastle Village.

3. RESULTS - DESKTOP RESEARCH

3.1 Underlying Geology & Soils

Newcastle Village is underlain by greywacke and quartzites, which are Cambrian rocks and form part of what is known as the Bray Head Formation as can be seen on **Figure 4** below. The upper part of the catchment is overlain by glacial till in a soil formation known as the 'Clonroche soil association' which consists of a fine loamy drift with siliceous stones. Below the village the soils here are coarser and are part of the 'Puckane Association', while towards the coast they are alluvial in nature, with fen peat deposits at the East Coast Nature Reserve at Blackditch as shown on **Figure 5** below.

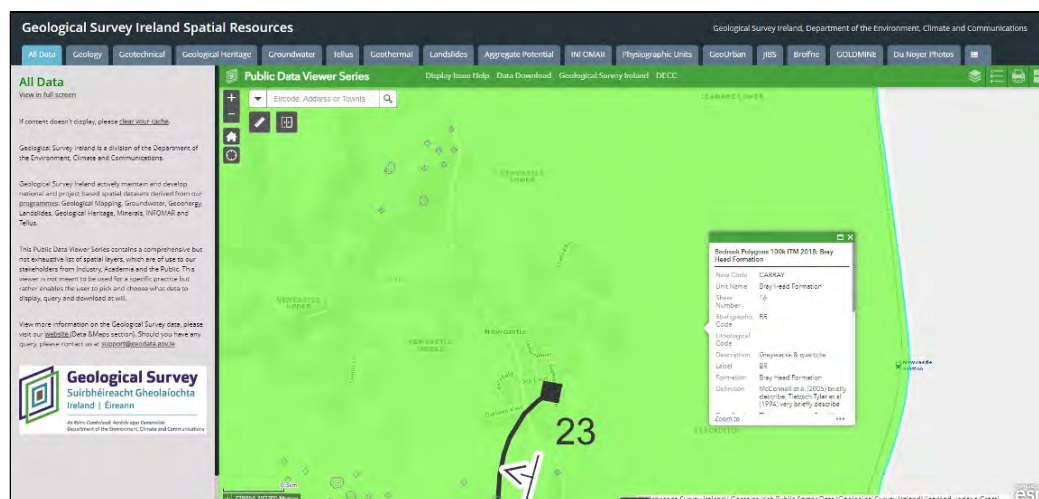


Figure 4. Geology of Newcastle Village (Source: Geological Survey of Ireland).

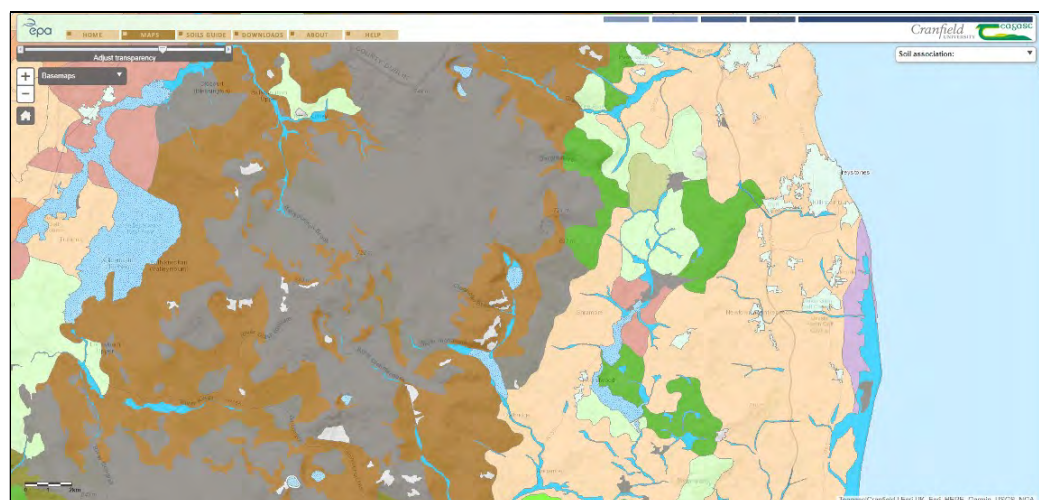


Figure 5. Soils of Newcastle Village (Source: EPA).

3.2 Nature Conservation Designations

The lands within and adjoining Newcastle Village are not currently the subject of any of the formal proposed nature conservation designations as described above in **Section 2.3.1**. There are a number of areas designated for nature conservation within

the wider environs of the village – the locations of these are shown on **Figure 7** below.

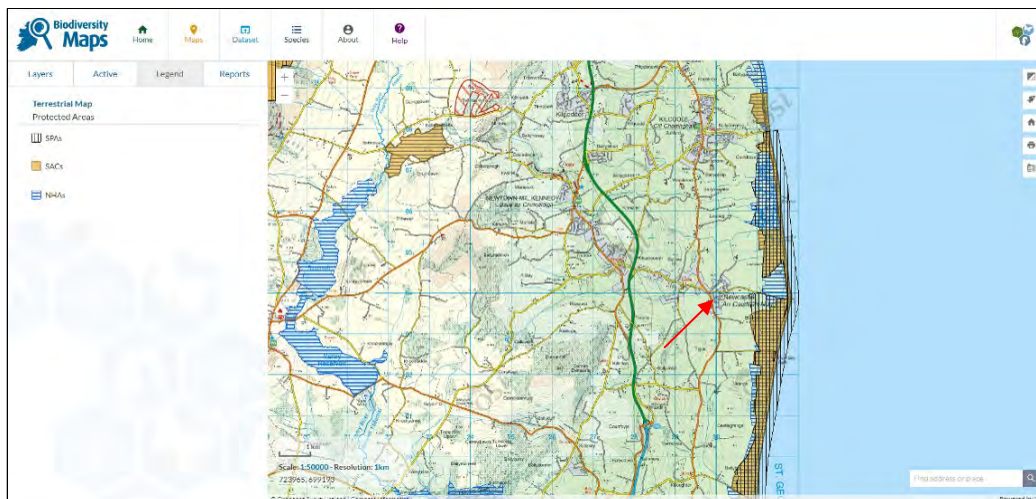


Figure 6. Areas legally designated for nature conservation within the environs of Newcastle Village (indicated by the red arrow).

The most important of these is The Murrough, which is designated as both a Special Area of Conservation (The Murrough Wetlands SAC (Site Code: 002249)), a Special Protection Area (for Birds) (The Murrough Wetlands SPA (Site Code: 004186)) and a proposed Natural Heritage Area (The Murrough NHA (Site Code: 000730)). The site synopsis, which is a document that summarises the conservation interest of these designated sites, is presented in **Appendix 1** and **2**.

The Newcastle Stream acts as an important wildlife corridor linking the village to these designated areas.

3.3 The development of Newcastle Village

A review of historic mapping for the environs of Newcastle Village was completed. The first edition Ordnance Survey Ireland 6" series map shows that the village consisted of a small number of buildings clustered around the church and castle as shown on **Figure 7** below and included a corn mill, mill race and mill pond which was fed from a reservoir in Newcastle Upper as shown on **Figure 8** below.



Figure 7. The undeveloped nature of Newcastle Village in the mid-1800s (OSI First Edition 6" Map Series).

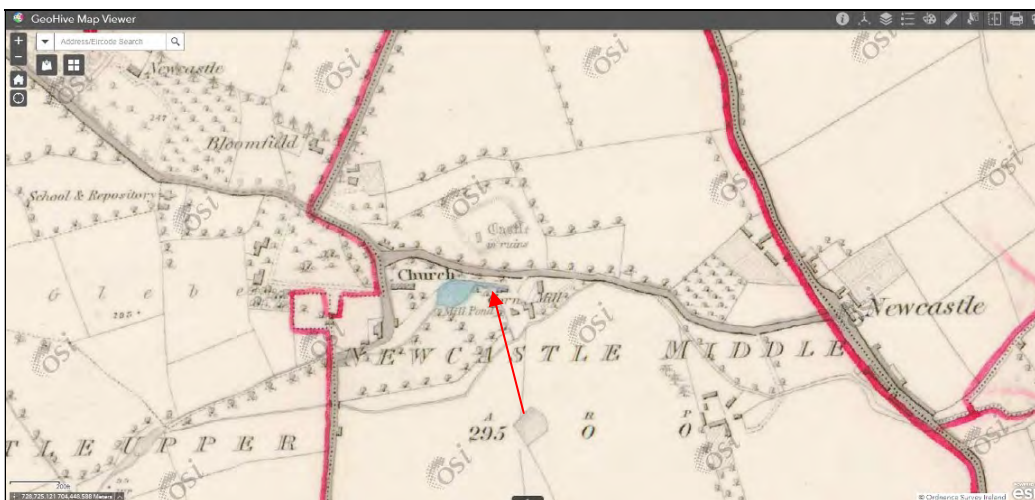


Figure 8. Mill pond, mill race and corn mill in Newcastle Village in the mid-1800s (OSI First Edition 6" Map Series).

By the early 1900s very little had changed in the area with the addition of new buildings and houses in the village at the junction of the coast road as seen on the last 6" edition mapping (Figure 9).

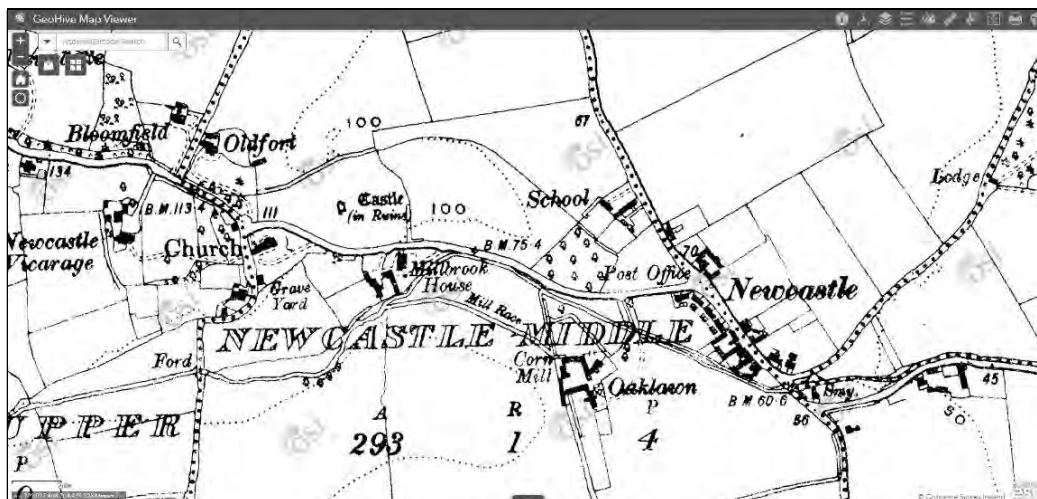


Figure 9. The OSI Last Edition 6" Map Series.

By the time the 25" maps were produced (Figure 10) the village remained relatively unchanged.

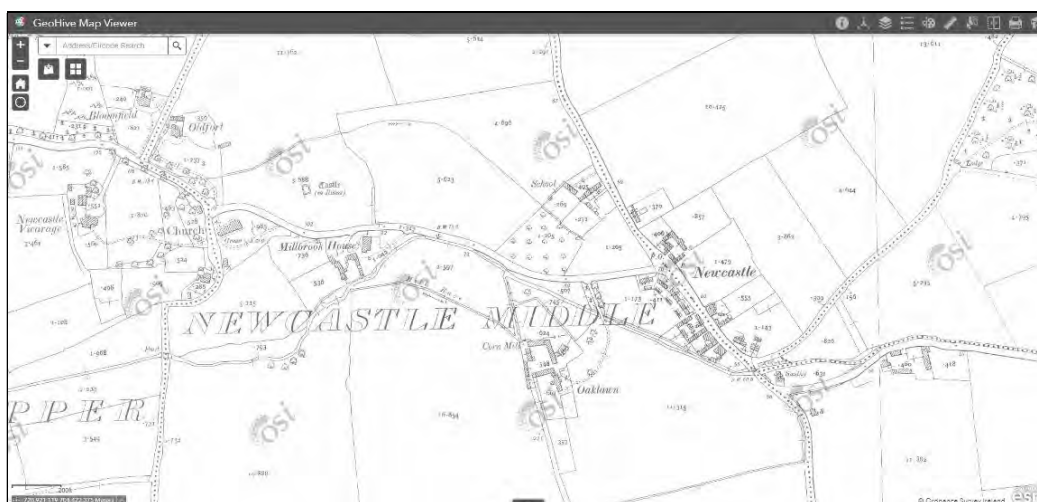


Figure 10. The OSI 25" Map Series.

The village has since hugely expanded with the development of housing estates such as Hunters Leap, Castlemanor, Seacourt, Seamount Drive, Oaklawn, and Racefield as can be seen on Figures 11 and 12 below.

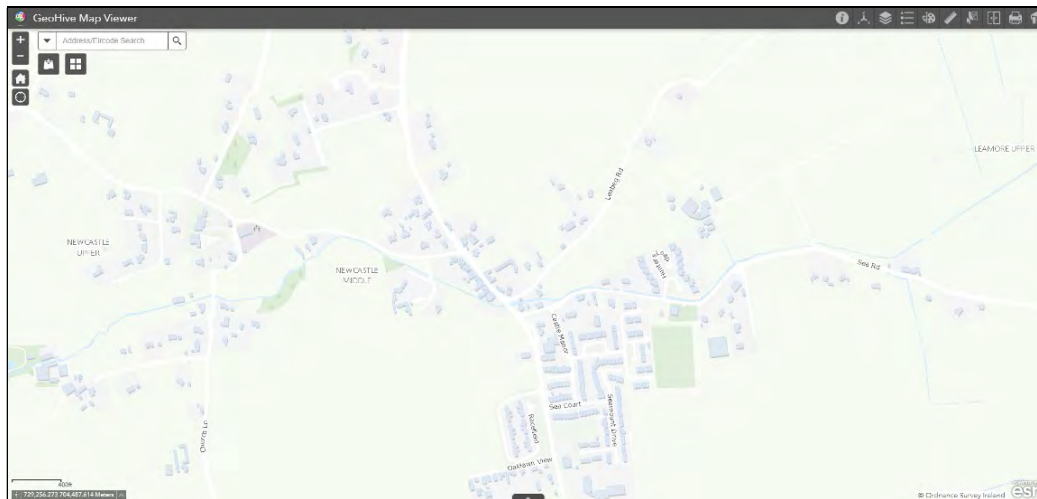


Figure 11. Current mapping.

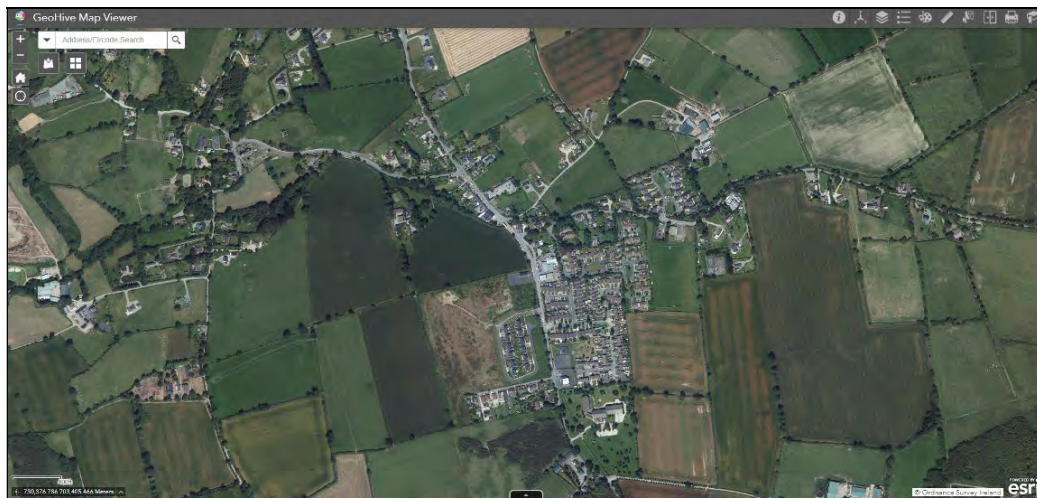


Figure 12. Aerial view showing green spaces, agricultural lands and developed areas. Note that this map is already out of date as it does not show the new developments of Oaklawn and Hunters Leap.

3.3 Newcastle River

The Newcastle River is located within the Ovoca Vartry Catchment (010) and within the Newcastle (Wicklow) Sub catchment (SC_010). The Newcastle River rises on Callow Hill above Newtownmountkennedy before flowing in an easterly direction to the coast, under the M11 motorway and through Newcastle Village to the East Coast Nature Reserve at Blackditch where it enters a series of drains before flowing north to enter the sea at The Breaches. There are five tributary streams of the Newcastle River as shown on **Figure 13** below.

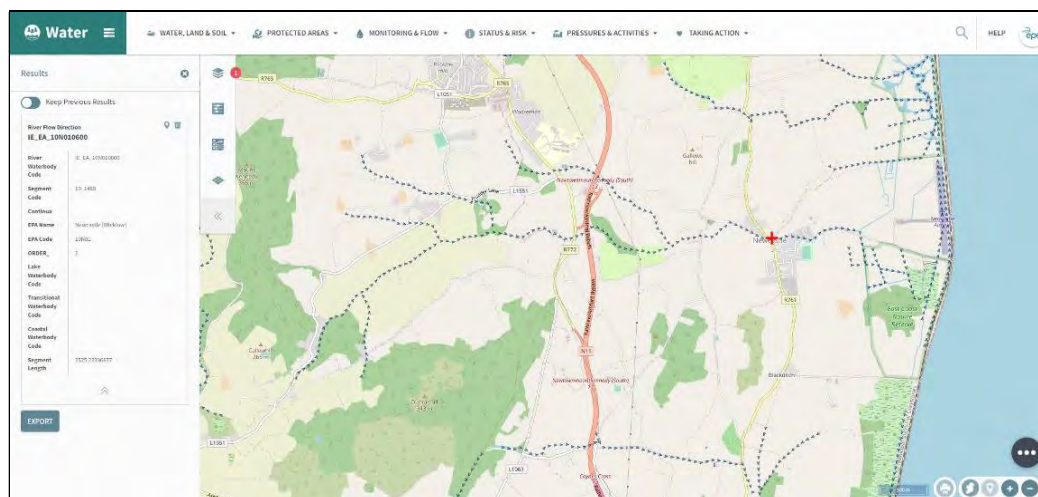


Figure 13. The Newcastle River.

Habitat Classification

Within the environs of the village the Newcastle River is best classified as a lowland depositing watercourse.

Lowland Depositing Rivers (FW2) are described by Fossitt (2000) as follows:

“This category includes watercourses, or sections of these, where fine sediments are deposited on the river bed. Depositing conditions are typical of lowland areas where gradients are low and water flow is slow and sluggish. These rivers vary in size but are usually larger and deeper than those above. In a natural state these rivers erode their banks and meander across floodplains. Because of this, most have been modified to some extent to control water flow, facilitate navigation or prevent flooding and erosion. Canalised or walled sections of rivers are included here, as are natural watercourses that have been dredged or deepened, and those with artificial earth banks. If channels have been excavated to divert water away from the main watercourse, these should be considered under canals - FW3. Tidal sections of rivers with brackish water influence are excluded (see tidal rivers - CW2). Rejuvenated sections of lowland rivers associated with rapids, waterfalls and weirs should be considered under **eroding/upland rivers - FW1** if eroding conditions predominate.

Plant and animal communities are influenced by numerous factors including substratum type, water force, nutrient status, water quality, channel size, water depth, human impact, disturbance and shade. Within a river channel there may be deep pools, backwaters, banks or mid-channel bars of gravel, sand or mud, in addition to vegetated islands and fringing reedbeds. The substratum of depositing/lowland rivers comprises mainly fine alluvial or peaty sediments. Vegetation may include floating and submerged aquatics, with fringing emergents in shallow water or overgrowing the banks. Floating aquatics can include water-lilies (*Nuphar lutea*, *Nymphaea alba*), pondweeds (*Potamogeton* spp.), water-starworts (*Callitriche* spp.) and Unbranched Bur-reed (*Sparganium emersum*). Tall emergents such as Common Club-rush (*Schoenoplectus lacustris*), Common Reed (*Phragmites australis*) and Yellow Iris

(*Iris pseudacorus*) may also be present. Large areas of fringing reedbed should be considered under **reed and large sedge swamps - FS1**”.

3.5 Newcastle River – Water Quality

Newcastle River rises west and northwest of Newcastle Village as shown on **Figure 13** above – it is 26.42km in length. Water quality in the Newcastle River is monitored as part of Ireland’s reporting obligations under the Water Framework Directive. Samples are taken at a standard sampling location (RS10N010600) which is located 0.5km downstream of Newcastle Bridge as shown on **Figure 14** below.

Between 2007 and 2009 water quality in the stream was assessed as ‘Moderate’ and in 2010 – 2012 this had improved to ‘Good’ and overall remained at ‘Good’ status in the period 2010 - 2015. Water quality showed some declines during the 2013 – 2018 period when it was assessed as ‘Moderate’ and has further declined during the 2016 – 2021 period and is now assessed as ‘Poor’. These are shown on **Figures 15 to 19** below.

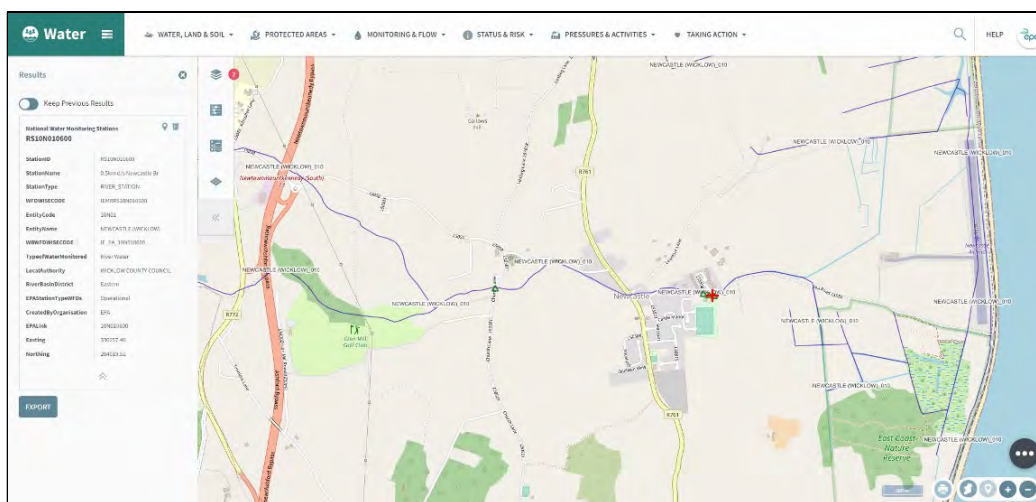


Figure 14. Water sampling location on the Newcastle River.

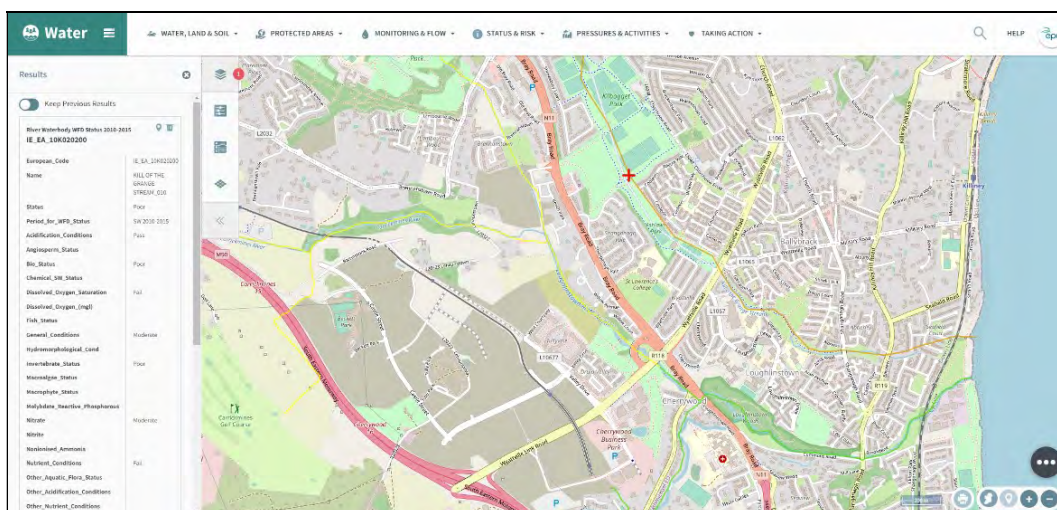


Figure 15. The Newcastle River was assessed as ‘Good’ status during the 2010 – 2015 round of the Water Framework Directive (Source: www.catchments.ie).

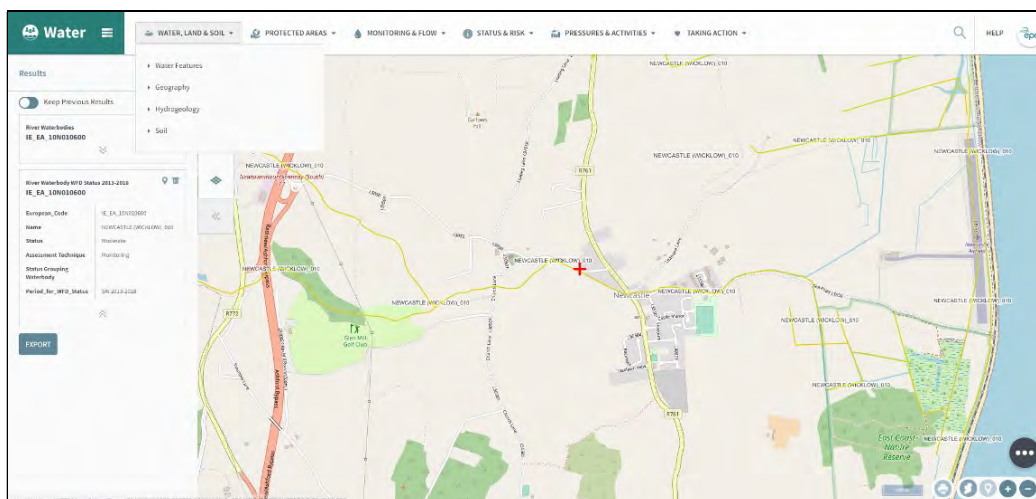


Figure 16. The Newcastle River was assessed as 'Moderate' status during the 2013 – 2018 monitoring period (Source: www.catchments.ie).

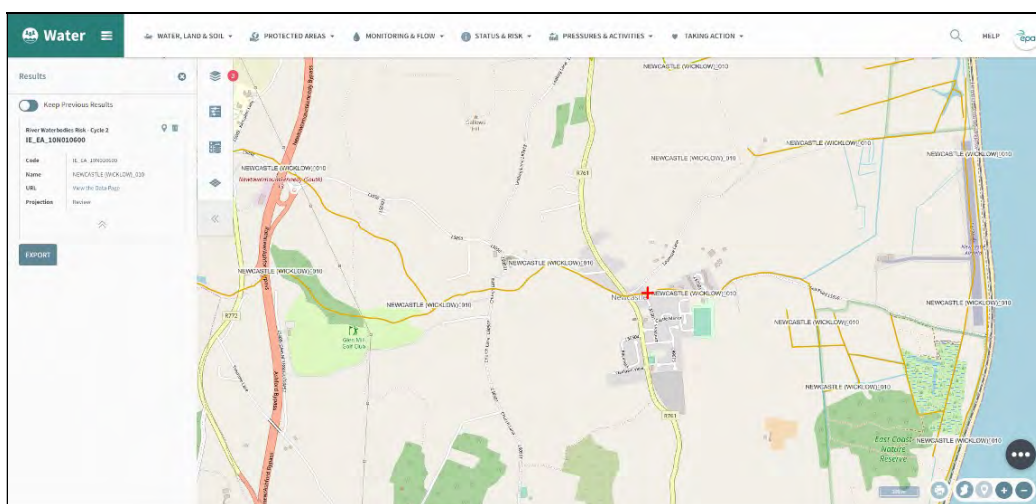


Figure 17. The status of the Newcastle River was under 'Review' during the 2nd cycle of the Water Framework Directive (Source: www.catchments.ie).

The Newcastle River (IE_EA_10N010600) therefore remains classified as “at risk” of failing to meet the Water Framework Directive (WFD) objective of at least “good” ecological status by 2027.

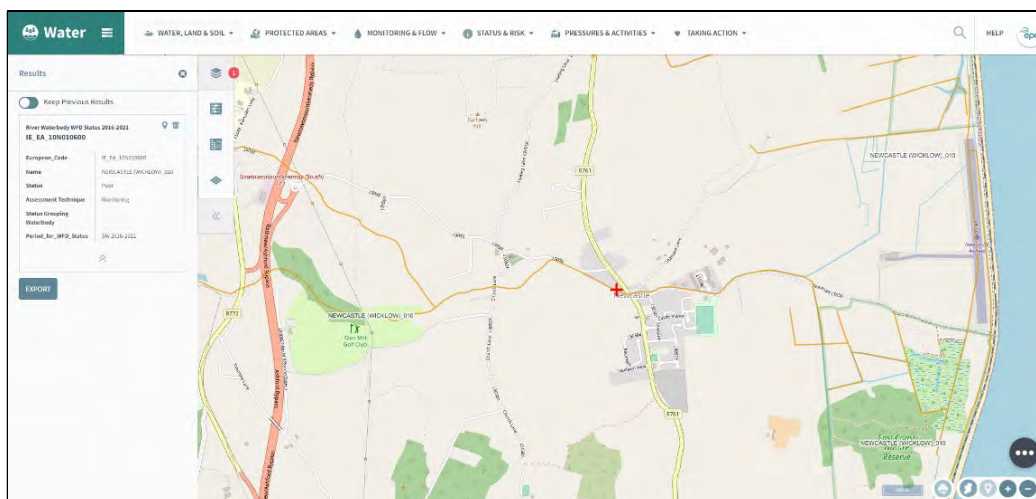


Figure 18. The Newcastle River was assessed as 'Poor' status during the 2016 – 2021 monitoring period (Source: www.catchments.ie).

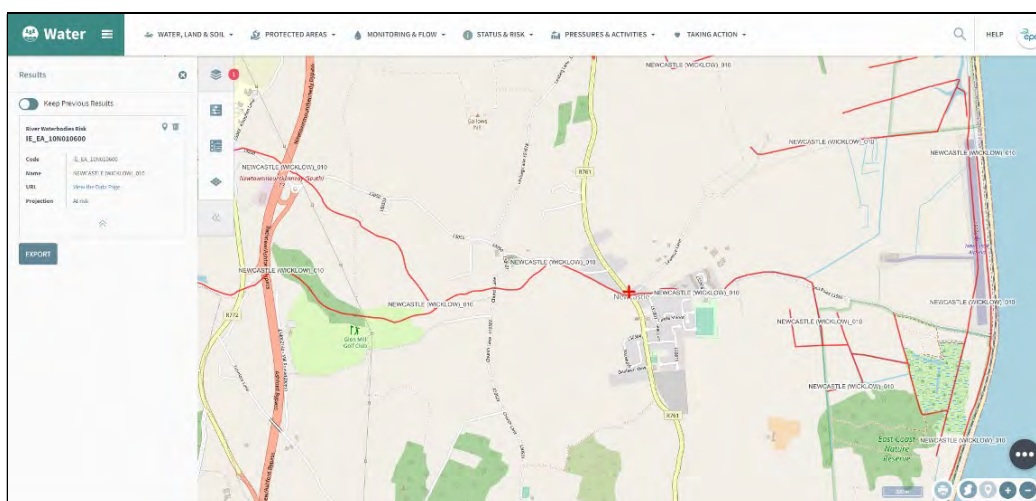


Figure 19. The status of the Newcastle River remains 'At Risk' during the 3rd cycle of the Water Framework Directive (Source: www.catchments.ie).

3.6 Biodiversity Records

A review of biodiversity records from within the study area held by the National Biodiversity Data Centre was completed. These are presented in **Table 1** in **Appendix 1**. They include records of:

- Worms
- Birds
- Crustaceans
- Insects – beetles
- Insects – butterflies
- Insects – caddis fly, may fly, stone fly and true flies
- Molluscs, and
- Mammals

4. RESULTS – FIELD SURVEYS

Various sites in Newcastle Village were surveyed during the project and a number of community events were held. The opportunities for biodiversity action in the village are mostly limited to community spaces and public areas as the majority of lands are in private ownership. However if everyone took one or two actions in their back garden or communal space where they live, work, are educated or play those actions would really add up. These are explored below.



Plate 1. If you are planting a hedge if you use native species you will support more biodiversity than non-native ornamental species.



Plate 2. Old stone walls such as this provide habitats for many invertebrates and nesting birds as well as wall flora such as the common polypody fern.



Plate 3. Coppicing broad-leaved trees does not kill them – in some instances it can increase their longevity as can be seen in this magnificent sycamore.



Plate 4. Wild garlic – foragers delight but make sure you leave some for the wildlife.



Plate 5. The similar looking Three cornered leek... This is an invasive species so eat as much of this one as you like and try to control its spread in the village.



Plate 6. It is widespread in the graveyard of the church.



Plate 7. Stone arches and structures such as these can be used by roosting bats if we leave crevices for them to use. Could you provide them with a home?



Plate 8. Could you create a mini woodland in the village with native species such as our beautiful violets below the trees?



Plate 9. Leaving dandelions to flower offers early pollinators such as bumblebees somewhere to forage in the spring.



Plate 10. Cornsalad – a native plant growing in the graveyard.



Plate 11. Butterfly bush or buddleia – famous for attracting butterflies who feed on the nectar but did you know that it supports much fewer invertebrate species than a native species like willow?



Plate 12. Could you consider planting native primroses instead of non-native daffodils for spring planting?



Plate 13. Ivy – a really important food plant for wildlife – used by Holly blue butterflies and many birds and small mammals eat the berries.



Plate 14. Lesser celandine, nettles and hogweed all support invertebrates below an old hedgerow.



Plate 15. Reducing or ideally eliminating herbicide use protects both our own health and that of wildlife.



Plate 16. These 'weeds' are actually the food plant of the orange tip butterfly - could you leave them for them?



Plate 17. Remove grass cuttings to reduce fertility if you want to get more wildflowers into your lawn and create your own natural wildflower meadow.



Plate 18. The lichens on the gravestones in the churchyard are a symbiotic relationship between a fungus and an algae. Some are indicators of good air quality. Please don't go cleaning them off.



Plate 19. Biodiversity loss and pressures on wildlife in the village as lands are developed for housing – everyone needs a place to live – humans and wildlife alike.



Plate 20. If you are lucky enough to have a garden could you deliver an action for biodiversity in it? If we all did something it would add up.



Plate 21. Bramble tangles such as these are where birds naturally nest, small mammals forage and invertebrates live. Could you allow a natural nesting area to develop?



Plate 22. Our hedgerows act as nature's highways for wildlife and are of huge importance in our landscape.



Plate 23. Ivy has huge biodiversity value – sometimes people worry that it kills a tree but this is not the case – our native trees and ivy have co-evolved. If it gets very large it can make a tree vulnerable to wind throw in a storm.



Plate 24. The Newcastle Stream forms an important ecological corridor through the village and is in need of our help.



Plate 25. Could your communal open area be managed as a short mow meadow?



Plate 26. Native spring flora on roadside verges. No herbicide use here!



Plate 27. Open roadside ditches provide freshwater habitats for a variety of species.



Plate 28. Will our ash trees go the way our elm? This is a flowering Wych elm.

5. RECOMMENDATIONS FOR BIODIVERSITY ACTION

Forty actions and ideas for how to respond to the biodiversity crisis in Newcastle Village are set out below. Which will you do?

5.1 Meadow management

This action can be undertaken by anyone with a small area of grass, a local housing estate or a larger piece of land and will provide habitat for a wide variety of invertebrates including many pollinators.

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 allowing dandelions to flower (an important resource for pollinators to forage on in spring) and then cut every six weeks – see **Figure 15** 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.

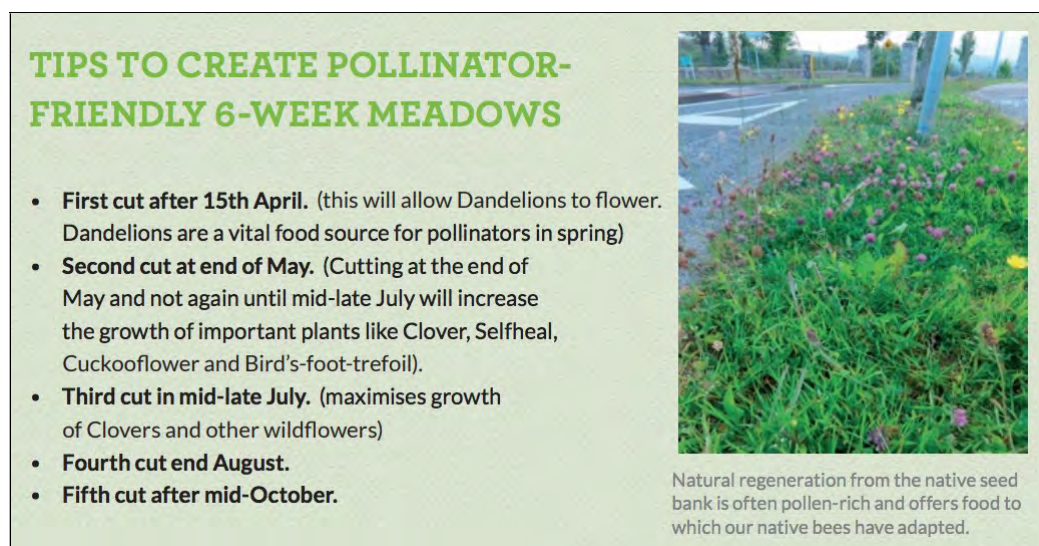


Figure 15. Managing a short flowering meadow.

5.2 Create a Wildlife Pond

A garden wildlife pond could also be something that people might be interested in doing in their back garden or elsewhere in the village such as in the school grounds. A pond is a great way to attract wildlife. Something as small as 1-2m² could provide frogs with somewhere to breed.

The pond should be designed to provide habitat for breeding frogs in that they need to have a minimum depth of 60cm of water present all year round following the advice provided by the amphibian conservation charity Froglife as set out below:

When thinking about a wildlife pond, the primary concern should be the source of clean water. This can be achieved by locating the pond in woodland, rough grassland with low nutrient input or, if this is not possible, by surrounding the pond with a grassy buffer zone at least six metres wide. For amphibians, it seems that a pond's proximity (approx. 100m) to a copse or woodland is especially beneficial for hibernation purposes. Alternatively, large (at least 1.5m high) hibernacula made of wood or bricks, covered with some rainproof material and soil, can be provided. The pond should be located at the lowest point of the chosen area, where any surface water collects. Usually, if a site is occasionally flooded, it is a good indication that a pond will hold water there without an artificial liner.

Suitable species for planting in a pond include:

- Marginals - Yellow flag iris (*Iris pseudacorus*), Marsh marigold (*Caltha palustris*), Water plantain (*Alisma plantago-aquatica*), Water forget-me-not (*Myosotis scorpioides*), Brooklime (*Veronica beccabunga*), and Ragged robin (*Lychnis flos-cuculi*).
- Emergents - Greater spearwort (*Ranunculus lingua*), Branched bur-reed (*Sparganium erectum*), Purple loosestrife (*Lythrum salicaria*), Water mint (*Mentha aquatica*).

Care should be taken when purchasing aquatic plants from nurseries as many species have the potential to become invasive. Attention is drawn to the invasive species listed under the Birds and Natural Habitats Regulations 2011.

Pond features important for amphibians:

Ponds of all sizes are valuable but for amphibians the best are those larger than 100m². If possible, several ponds should be created no more than 250m from each other.

The pond should be up to 1.5m deep, with a few depressions of different depths. In the summer, shallower areas may dry out with only the deepest point holding water. This can be beneficial, creating a variety of conditions to suit different plants, invertebrates and larger animals.

Shallow slopes, which become exposed or flooded depending on the weather, allow a dynamic process which seems to be beneficial for many invertebrate species.

A variable shoreline helps to create different niches and maximises the number of species that will benefit from the pond.

Ponds should not be planted up as they will quickly be colonised by native plants from surrounding areas.

Preferably rainfall or ground water should be the only source of water.

No more than 30% of the pond should be shaded by surrounding shrubs or trees, and preferably there should be no shade on the southern edge of the pond. While shading provides a beneficial variation of microclimate on larger ponds, it should not be encouraged on small ponds below 100m².

No more than 60% of the pond should be covered by emergent vegetation such as reeds and bulrushes (reedmace). Whilst vegetation is very important as cover for amphibians such as great crested newts, ponds that exceed this threshold are more vulnerable to succession and a decline in water quality.

Fish ponds and wildlife ponds have different roles and should be kept separate.

Only larger ponds should be used for watering cattle, and access should be restricted (either in terms of time or by limiting the area which can be accessed). While cattle definitely help to keep vegetation both in and around the pond in check, too much pressure can result in complete destruction of the vegetation and a decline in water quality.

4

5.3 Hibernaculum for Frogs

In addition to the design recommendations for the pond/water feature above it is also recommended that a hibernaculum for frogs is created. This is done by creating a pile of stones or logs with gaps between them in a mound in an undisturbed part of the property – preferably near a pond/water feature that could be used for breeding.



5.4 Native Tree and Shrub Species Suitable for Planting in Gardens or in the Village

Any native species used for planting in the environs of Newcastle should be suitable for neutral/calcareous soils. There is little point in planting species such as *Rhododendron* or other acid loving plants as they will not thrive.

Suitable shrub/small tree species include: Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Guelder rose (*Viburnum opulus*), Spindle (*Euonymus europaeus*), Elder (*Sambucus nigra*), Hazel (*Corylus avellana*), Wych elm (*Ulmus glabra*), Crab apple (*Malus sylvestris*), Dog rose (*Rosa canina*).

Suitable tree species include; Oak (*Quercus robur*), Whitebeam (*Sorbus aria*), Silver birch (*Betula pendula*), Willows (*Salix cinerea*, *Salix caprea*, *Salix aurita*).

All species should be of certified Irish genetic provenance as they are best adapted to Irish growing conditions – nurseries that supply the Forest Service native woodland scheme grow stock from Irish collected seed.

5.5 Measures for Butterflies in Newcastle

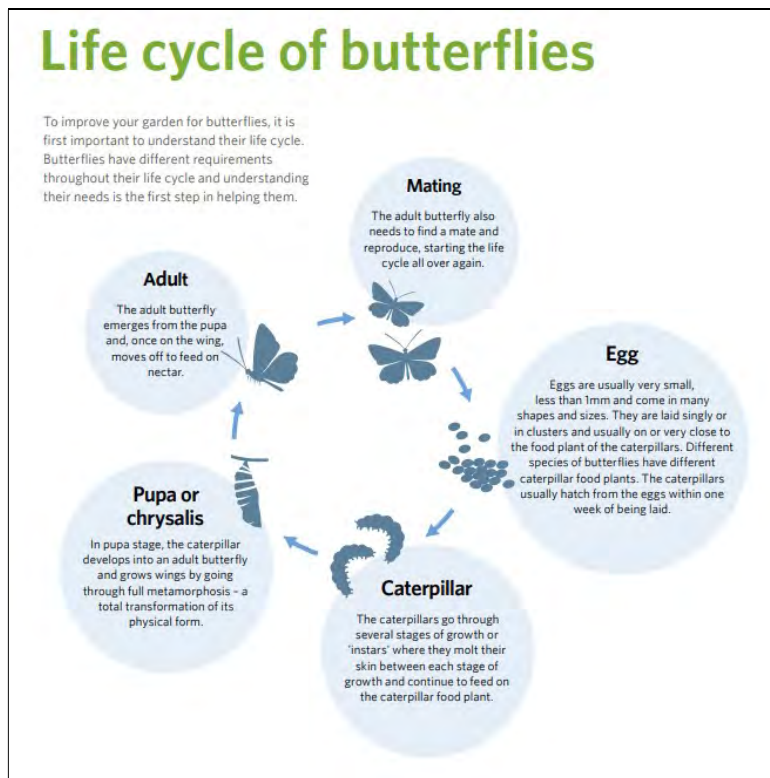
Butterflies present in Newcastle Village include;

- Comma (*Polyommia c-album*)
- Common Blue (*Polyommatus icarus*)
- Green-veined White (*Pieris napi*)
- Holly Blue (*Celastrina argiolus*)
- Large White (*Pieris brassicae*)
- Orange-tip (*Anthocharis cardamines*)
- Painted Lady (*Vanessa cardui*)
- Peacock (*Inachis io*)
- Red Admiral (*Vanessa atalanta*)
- Ringlet (*Aphantopus hyperantus*)
- Small Tortoiseshell (*Aglais urticae*)
- Small White (*Pieris rapae*)
- Speckled Wood (*Pararge aegeria*)

We need to consider the life cycle of butterflies and some other principles to conserve them in our communities. 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



5.6 Food Plants and Habitat for Butterflies and Invertebrates

Several plant species used by butterflies, moths and other insects for their food plant already exist within Newcastle Village and could be confused for 'weeds'.

On the island of Ireland, 18% of butterflies and 8% of macro-moths are threatened with extinction. By planting suitable food plants and native species that support them we can help reverse this decline.

A list of the food plants used by the various species of butterfly is outlined below.

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>)

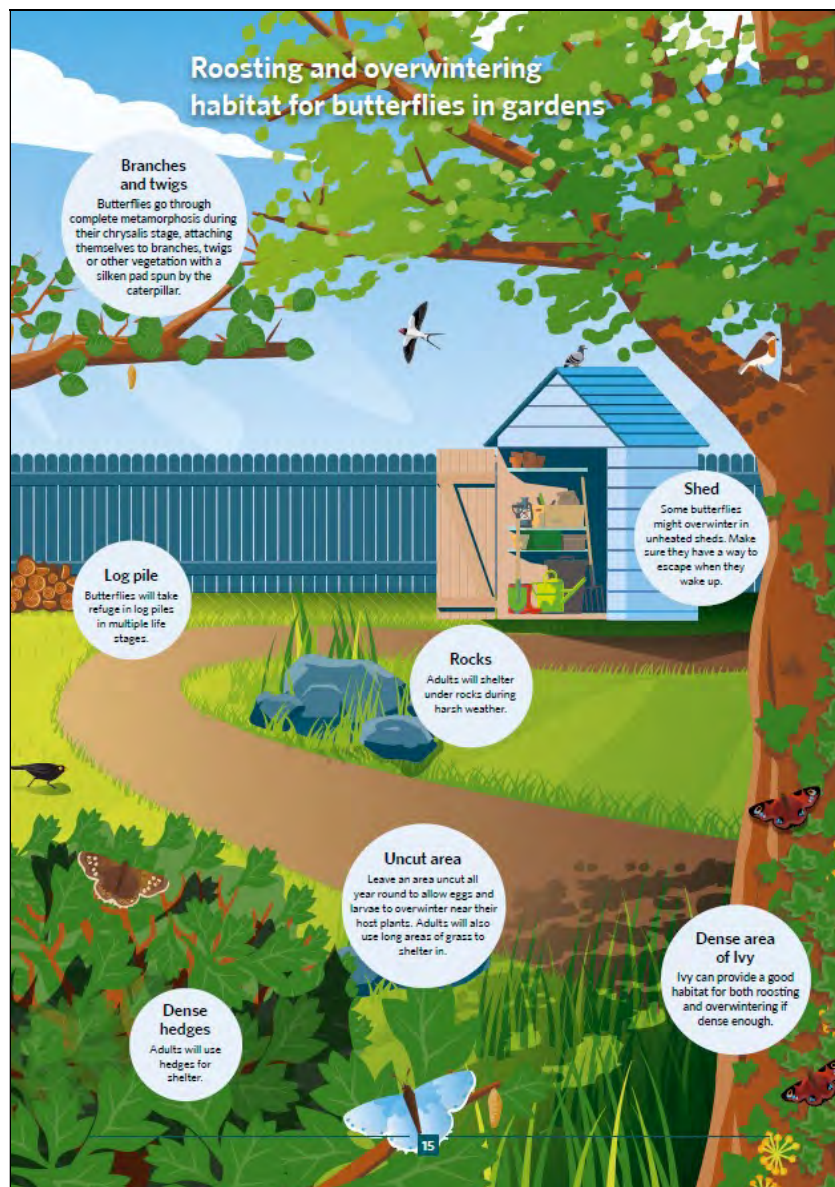
5.7 Roosting Habitats for Butterflies

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 our homes and in our landscape there is nowhere for them to roost.

5.8 Overwintering Habitats for Butterflies

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 in one of their immature stages are:

- Leaf litter
- Thick/uncut vegetation
- Log piles



5.9 Ornamental Pollinator Planting

There are a wide variety of species currently planted by people in their gardens and in Newcastle Village by Tidy Towns for ornamental purposes. Many of these were

completely alive with insects during the site visits. Other species that could be considered include:

Shady areas - *Anemone*, *Aquilegia*, *Dicentera*, *Digitalis*, *Erythronium*, *Geranium*, *Hellebore*, *Pulmonaria*, *Trillium*.

Dry areas - *Bergenia*, *Echinops*, *Echinacea*, *Kniphofia*, *Sedum*, *Stachys*, *Verbena*.

Damp areas - *Helenium*, *Astrantia*, *Astilbe*, *Euphorbia*, *Heuchera*, *Hosta*, *Achillea*, *Ligularia*, *Rudbeckia*.

5.10 Management of Stone Walls

The old walls in and around the village (those built with stone and lime mortar) as opposed to those that are pointed in concrete or made out of blocks and rendered provide a rich habitat for a variety of species including nesting birds and invertebrates. They should not be cleaned of their vegetation (unless tackling an invasive species).

The sections of concrete/block walls which are ugly to look at and offer no biodiversity value could be planted up with native climbers such as:

- Dog Rose (*Rosa canina*)
- Ivy (*Hedera helix*)
- Honeysuckle (*Lonicera periclymenum*)

5.11 Pesticides

Pesticides (herbicides, insecticides and fungicides) and chemicals such as fertilisers are used by many gardeners and landowners. They can cause huge damage to butterflies, other insects, and the plants they feed on. Please set out to make Newcastle Village a pesticide free zone.

5.12 Composting

Compost heaps can not only sustainably reduce green waste from the garden but can also provide homes for many insects including:

- Springtails
- Woodlice
- Earthworms
- Millipedes
- Centipedes
- Beetles

Maybe you could develop a compost heap in your garden?

4.13 Woodland Planting

Trees are often planted by community groups but are then managed with mown grassland (or even worse circles of dead vegetation sprayed with herbicide). Why not consider instead developing natural looking mini-woodland by establishing native species under the trees such as:

- Foxglove – introduced by seed collected at the end of the summer from nearby woodland tracks
- Primrose

- Common Dog Violet
- Red Campion
- Wood Anemone
- Lesser celandine
- Native bluebells (from seed – please do not dig them up from the wild)
- Ferns

5.14 Citizen Science

Members of the community could help monitor and identify species within the village and in their gardens and record their findings with the National Biodiversity Data Centre. There are a number of schemes that could be implemented in the village. These include:

- The Garden Butterfly Monitoring Scheme
- Complete a Flower Insect Timed Count
- Map your actions for pollinators
- The Irish Garden Bird Survey

The Garden Butterfly Monitoring Scheme

The Garden Butterfly Monitoring Scheme helps to keep track of which butterflies regularly use gardens, and how numbers vary across the country year on year. Participants make regular 15-minute counts of the 20 most common butterflies found in Ireland. No expert knowledge is required, and it's perfect for beginners.

This recording scheme is a great way of finding out which butterflies are visiting your garden, and how you can support them.

The National Biodiversity Data Centre have developed a free online course for the Garden Butterfly Monitoring Scheme. By going through this eCourse you will learn:

1. How to identify the 20 most common garden butterfly species
2. How to take part in the Garden Butterfly Monitoring Scheme
3. How to register your garden on the National Sampling Framework
4. How to submit your data

If you would like to get involved, please email the NBDC at butterflies@biodiversityireland.ie

Complete a Flower Insect Timed Count

- Flower Insect Timed (FIT) Counts are an initiative of the All Ireland Pollinator Plan.
- FIT Counts are open to everyone
- You can do a 10-minute FIT Count at any time between the 1st April and the 30th September
- Your location can be anywhere e.g., garden, farm, park, school, business site
- You don't need to identify the insects to species level, but only to tally within broad groups e.g., bumblebee, butterflies & moths, wasp, beetle
- Watch the short video for more details and see the step-by-step guide and resources sections at <https://biodiversityireland.ie/surveys/fit-counts/>
- From 2022, a new FIT Count app allows you to take a FIT Count and upload the results in one go.

Map your actions for Pollinators

It is great to see that Newcastle Village has mapped areas being managed for pollinators. Could you add your garden, could the local sports clubs do a bit? What about the church grounds? See the maps and add new areas on <https://pollinators.biodiversityireland.ie/>

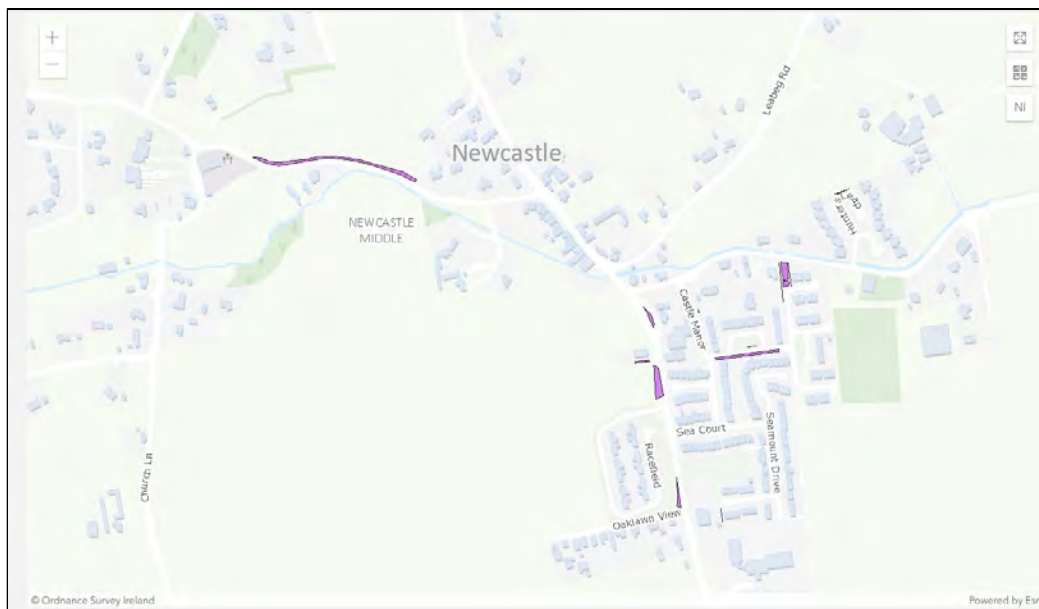


Figure 16. Mapped locations of actions for pollinators in Newcastle.

The Irish Garden Bird Survey

Why not take part in the BirdWatch Ireland annual Irish Garden Bird Survey, which takes place over the winter months. The Irish Garden Bird Survey is BirdWatch Ireland's most popular citizen science survey, with around two thousand gardens taking part each year. Between December and February each year, members of the public keep note of the highest number of each bird species visiting their garden every week. Information on the size of the garden being surveyed, the kinds of food, if any, being offered to the birds, and so on is also collated. Taking part is fun, easy and an ideal way to get to know your garden birds better. As the Irish countryside changes, gardens are becoming increasingly important havens for many species. The Irish Garden Bird Survey can give us a good idea of how the garden birds themselves are doing, but also an indication of how the biodiversity actions at Newcastle are delivering for wildlife.

5.15 Measures for Roosting Bats

A number of bat boxes could be erected within the general environs of the village. These can be either wooden boxes or woodcrete 'Schwegler' bat boxes (which are composed of a mixture of concrete and wood shavings) and are available online from <http://www.jacobijayne.co.uk/nest-boxes-by-species/bats/>.

Maybe these could be built by a local men's shed or school woodworking class and erected within the village or in peoples back gardens.

5.16 Conservation of Water

The water running off the roof of your house, school, office, garage, garden shed, etc. could be collected in rainwater butts or diverted to feed a pond or to create a rainwater garden or bog garden.

5.17 Measures for Nesting Birds

The breeding success of many of our suburban birds can be improved by the provision of artificial breeding boxes made from timber. These could be built by a local men's shed or school woodworking class and erected within gardens or around the village. Leave areas where brambles have become established to develop further into a natural area of bramble scrub with a sign to show that this area is being left for nesting birds. The insects will appreciate it too.

5.18 Invasive Species

The study completed on the Newcastle River highlighted the threat that invasive species pose to our native habitats and biodiversity in general. Try to make sure that you aren't part of the problem – don't dump your garden waste into the countryside and try and control or stop the spread of invasive species where you live.

An inventory and map of the locations of invasive species within the environs of the village should be completed and a number of awareness events held to disseminate same.

A targeted action plan for their control and eradication can then be developed by the community in collaboration with the relevant authorities.

5.19 Bat Survey

The bat walk was a great success – it was wonderful that so many people came to learn about bats. Maybe this could become an annual event in the village?

If you have a bat roost you can report it to Bat Conservation Ireland and national Parks and Wildlife Service so it is registered on the National Database.

5.20 Development Pressures

Development pressures have really increased in Newcastle Village in the last number of years. Once land is zoned it is very difficult to conserve biodiversity in these lands. Submissions to the local authority at planning stage requesting that native species are used in the landscaping planting proposals and that lighting is wildlife friendly can help to ameliorate some of these impacts.

5.21 Measures for Hedgehogs

The retention of the area of old cuttings, leaves and branches provides cover and shelter for hedgehogs and other species in the garden. Could you make a small area for them to hibernate safely in? Maybe they are under your shed?

Can hedgehogs move through your garden or the gardens in your housing estate?

Could you make a small opening in your fence for them, which would them to move safely through back gardens in your community?

5.22 Signage

Many of these actions are already taking place in the village, and those that are proposed, could benefit from signage so people understand why they are being done and what species will benefit. There is also a need for signage where the Sea Road meets the Murrough to explain how this coastline is a protected site for nature conservation and how you can help to protect it.

5.23 Ash Dieback Disease

Ash dieback is a serious disease of Ash trees caused by the invasive fungal pathogen *Hymenoscyphus fraxineus* (previously known as *Chalara fraxinea*), which originated in Asia and was brought to Europe in the 1990's. The pathogen has now spread across most of the natural range of Ash in Europe causing high mortality rates of Ash trees. Ash dieback was first detected in 2012 in Ireland on plants imported from continental Europe. The disease is now prevalent across Ireland and will likely cause the death of over 90% of Ash trees here in the next decade. The disease can affect Ash trees of any age and in any setting. The disease can be fatal, particularly among younger trees. A number of Ash trees in the environs of the village show signs of ash die back. Where safe to do a proportion of this Ash could be allowed to transition naturally to standing deadwood which has a high biodiversity value. It is recommended that summer survey of healthy Ash trees not displaying Ash dieback symptoms is carried out in the environs of the village. These trees should be recorded and mapped and protected from any knee jerk tree felling as they could have a natural resilience to the disease.

5.24 Educational Resources

The National Biodiversity Data Centre have produced a series of very useful and attractive swatches which help in identifying various species groups such as ladybirds, shield bugs, dragonflies, butterflies, moths, etc. Having these resources to hand help in identifying species and understanding more about the world we share with them.

5.25 Keeping the Wild 'Wild'

Please refrain from introducing non-native and ornamental species into the countryside and along roadside verges and edges particularly in a rural area such as Newcastle.

5.26 Engaging Children with Nature

Recently there has been a trend for the development of 'Fairy Walks and trails' in many woodlands and natural areas. These invariably involve painted doors, plastic items, glitter and other unnatural materials. Please do not promote or encourage fairy doors or trails in your local wild area. Why not teach children to engage directly with the natural world around them by observing and learning about where they are and how to protect it instead.

5.27 Leave No Trace

Our visits and actions when we visit wild places can have a variety of impacts. These include:

1. Wildlife Impacts

Disturbance, altered behaviour

2. Vegetation Impacts

Vegetation loss, the introduction of invasive species.

3. Water Resource Impacts

Siltation, sedimentation, pollution.

4. Cultural Resource Impacts

Congestion, theft or damage to cultural feature.

5. Soil Impacts

Soil compaction

6. Social Impacts

Crowding, conflicts between groups.

Visitors to the coast at Newcastle Beach should be encouraged to follow the 7 Leave no trace Principles. The 7 Principles are:

1. Plan Ahead and Prepare
2. Be Considerate of Others
3. Respect Farm Animals and Wildlife
4. Travel and Camp on Durable Ground
5. Leave What You Find
6. Dispose of Waste Properly
7. Minimise the Effects of Fire

Practising a Leave No trace ethic is very simple: Make it hard for others to see or hear you and LEAVE NO TRACE of your visit.

5.28 Lighting

Consider the impacts of lighting on wildlife in your community. The church which was illuminated during the bat survey was a case in point – we had practically no bat activity here as a result despite the graveyard containing a suite of native plant species which could support invertebrates on which the bats hunt. We should be conserving energy and only illuminating what is really necessary for health and safety purposes.

5.29 Educational Walks and Talks

It is recommended that a series of educational biodiversity based walks and talks continue in Newcastle Village. Education is key to improving our understanding of the natural world. These could be seasonally themed or have a particular focus such as fungi, bats, moths, breeding birds, spring flowers, autumn leaves, winter bark, etc.

5.30 Community Events

The Newcastle Tidy Towns and Community Group is very active and it would great to see some of that energy focused on helping to do our bit for the biodiversity and climate change crisis. Get involved – don't just leave it all up to the great team who got the funding and commissioned this report.

5.31 Develop a Sense of Wonder

The more you spend time in the natural world the more engaged you become with it. Spending time in nature be it walking, sitting and sketching, gardening, watching the

activity at a bird feeder from your sofa or looking at the night sky will improve your mental health and offer you a perspective on our time on the planet – use it wisely.

5.32 Be an Ambassador for the Newcastle Little Terns

The Little Terns are ‘your’ birds. Be an ambassador for them and help protect them during the breeding season by asking people to make sure they keep their dog on a lead during the nesting season and giving the birds the protection they need.

5.33 Action for Swifts

There are a number of locations in the village which would be a great place to erect swift boxes. The Heritage Office in Wicklow County Council have swift boxes available for groups to avail of.

Swifts will nest even on a two storey house if given a suitable location and some encouragement. Could you provide a home for them?

Swift Conservation Ireland provides really great advice on how to offer swifts a home as follows:

‘Artificial nest boxes can be used very successfully for Swifts if they are placed in the correct location.

LOCATION OF BOXES

They should be at least 4 metres above ground level and placed such that they do not receive full sun in summer. There must be a clear flyway in front.

BUILT-IN OR EXTERNAL?

While it is preferable to incorporate nesting places into a building structure, external nest boxes placed near to nest sites that have been lost can be particularly effective to mitigate the loss.

HOW MANY BOXES? Swifts are colonial nesters so you need more than one nest box at your chosen location, however, that being said they need to have the own nest space. Nest boxes come as either a single boxes or with multiple cavities (that have a dividing wall between each nest area).

SIZE OF ENTRANCE HOLE

The entrance hole size is critical and should ideally be 28mm x 60mm but no bigger than 30mm x 65mm. If the hole is bigger than this then starlings can enter the box and they out compete the swift and will take over a nest box. Other birds, such as sparrows, will be able to get in to the 30mm x 65mm hole but this is not a problem because the swift is able to evict them’.

You could make a swift box at home using the design template below on **Figure 17**.

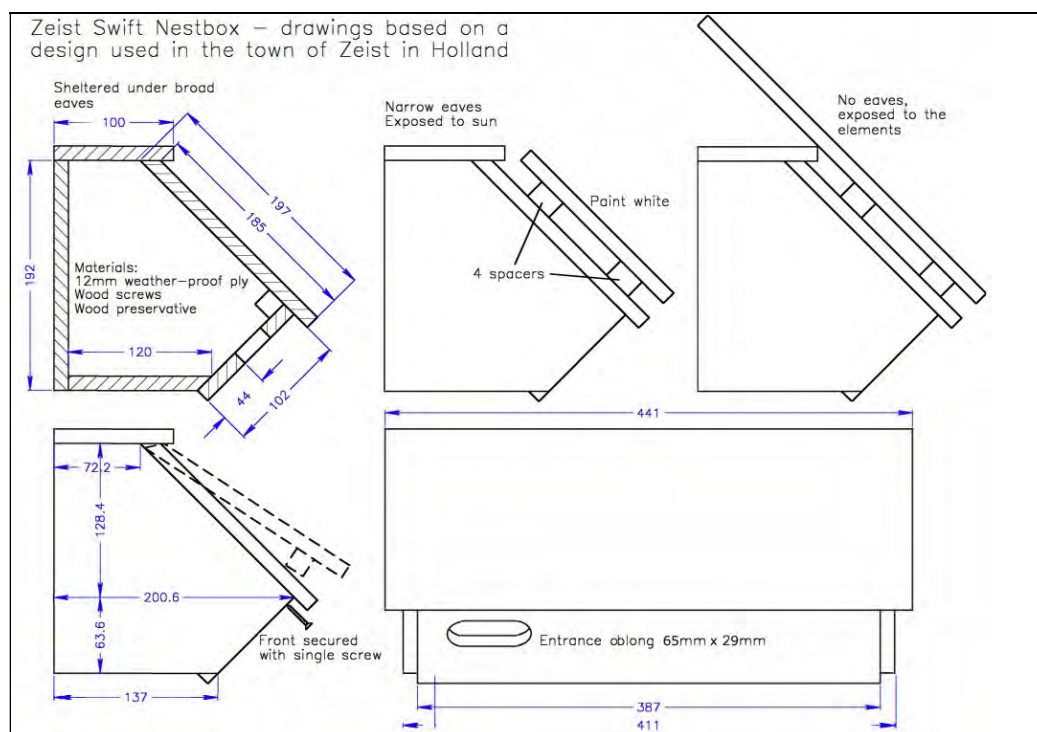


Figure 17. Swift box design.

To increase the chance of swifts finding your box you can play a call to attract them as outlined by Swift Conservation Ireland:

'PLAYING ATTRACTION CALLS

Speed of occupancy of a nest box can be considerably accelerated by playing swift attraction calls. The attraction calls make the swift think that other swifts are nesting in this location and so indicate that this is an attractive place to breed. So any swift looking for a nest site will explore this area for a vacant place.

Whichever sound system you are using should be placed as near as possible to the nest boxes e.g. on a window sill or attached to the box. The calls should be played for as long as possible during the day from mid-April to end August. Playing the calls 24 hours a day is best but if not then as long as possible from 8.00 am to 11am and 8.00 pm to 11pm.

Patience is essential, it could take a year or three for swifts to find the boxes even when playing the calls. You will need to play calls from mid-April until end August each year until the swifts have started to breed in one or more of the boxes'.

Further advice on using a swift caller can be obtained from Swift Conservation Ireland: swiftconservationireland@gmail.com

If you know of a nesting site for swifts in the village please log it here
<https://records.biodiversityireland.ie/record/common-swift#7/53.455/-8.016>

5.34 Action for Barn Owls

Erecting a barn owl box could help improve the breeding success of this iconic species in the environs of Newcastle. The Wicklow Barn Owl Project can assist with supplying a suitable box that can be erected in either an outdoor or indoor (in an open hay barn shed) site.

5.35 Native Hedgerow Establishment

If you are considering planting a hedge on your property could you use native species such as Hawthorn, Blackthorn, Holly, Spindle and Guelder rose? Typical hedging species such as Laurel, Beech, Hornbeam, or even worse Leylandii offer little for our native species.

The establishment of a hedgerow along the northern verge of the road (below the retaining wall of the Newcastle Castle Field) from the village to the church would help to create a wildfire corridor for invertebrates, small mammals, birds and other species such as foraging bats. This would need to be discussed with the local area engineer.

5.36 Actions for the Newcastle River

A number of recommendations were identified for the Newcastle River to restore and enhance the ecological quality of the watercourse in the study completed in 2023. These should be actioned.

5.37 Household Check – Are You Part of the Problem?

Everyone in the community can make a difference by checking their own home to see if it too could be contributing to poor water quality in the Kilcoole River. This is known as a misconnection survey.

A property is typically serviced by two types of drains namely **foul** and **surface water**.

The **foul** drain conveys wastewater from foul appliances such as washing machines, dishwashers and toilets to the wastewater treatment plant.

The **surface water** drain conveys “clean” rainwater from your roof and hard standing to local rivers and streams.

When correctly plumbed the foul water does not enter a local drain or watercourse and goes to the waste water treatment plant, which once it has capacity and is properly operated ensures that the waste is treated before discharge as shown on **Figure 18**.

A misconnection occurs when a foul drain is incorrectly plumbed to the surface water network, causing pollution of nearby surface waters.

During construction or following renovations or repairs a misconnection can occur where a foul drain is incorrectly plumbed into a surface water drain as shown on **Figure 19** below. It can also commonly occur if an existing foul appliance is moved to a new location i.e. moving a washing machine from a kitchen to an outbuilding.

Similarly if surface waters are plumbed to the foul network it can result in the wastewater treatment system being overloaded and discharging in storm events.

A good place to start is to inspect your rainwater downpipes. If there is any additional pipework connected to the downpipe, this could indicate a misconnection.

Shampoos, soaps, chemicals & detergents can have a detrimental effect on the flora & fauna in our rivers.

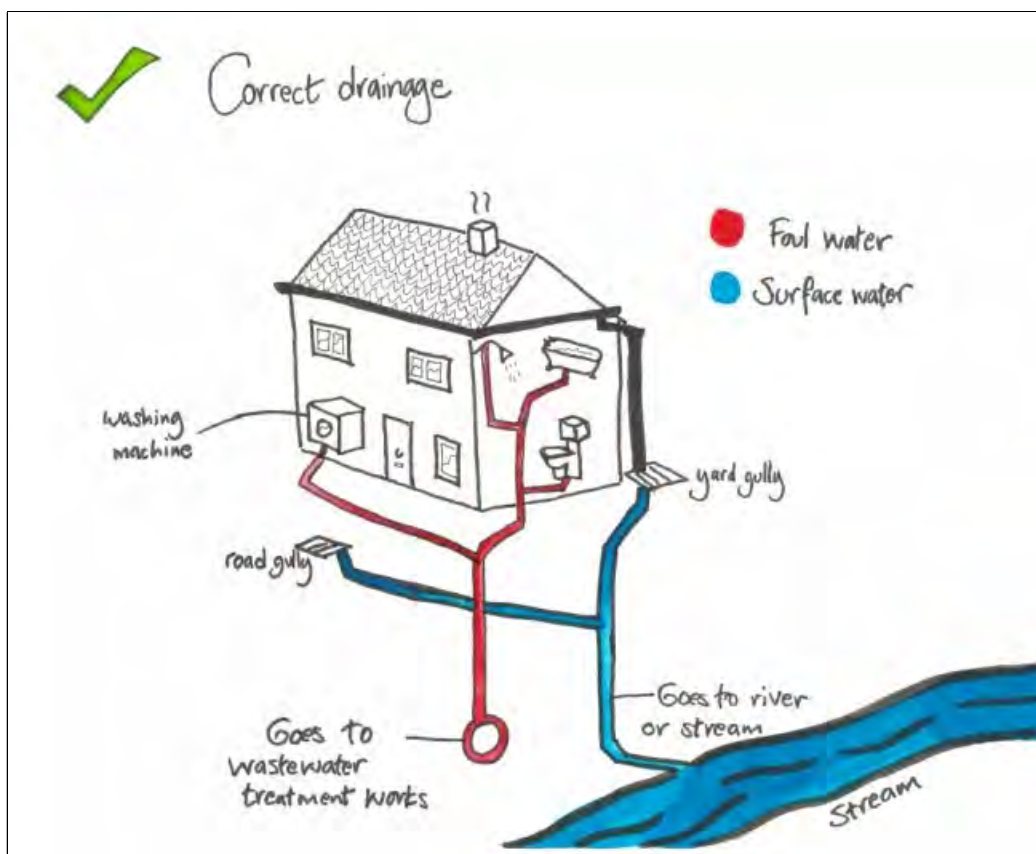


Figure 18. Correctly plumbed house where only clean surface water enters the river.

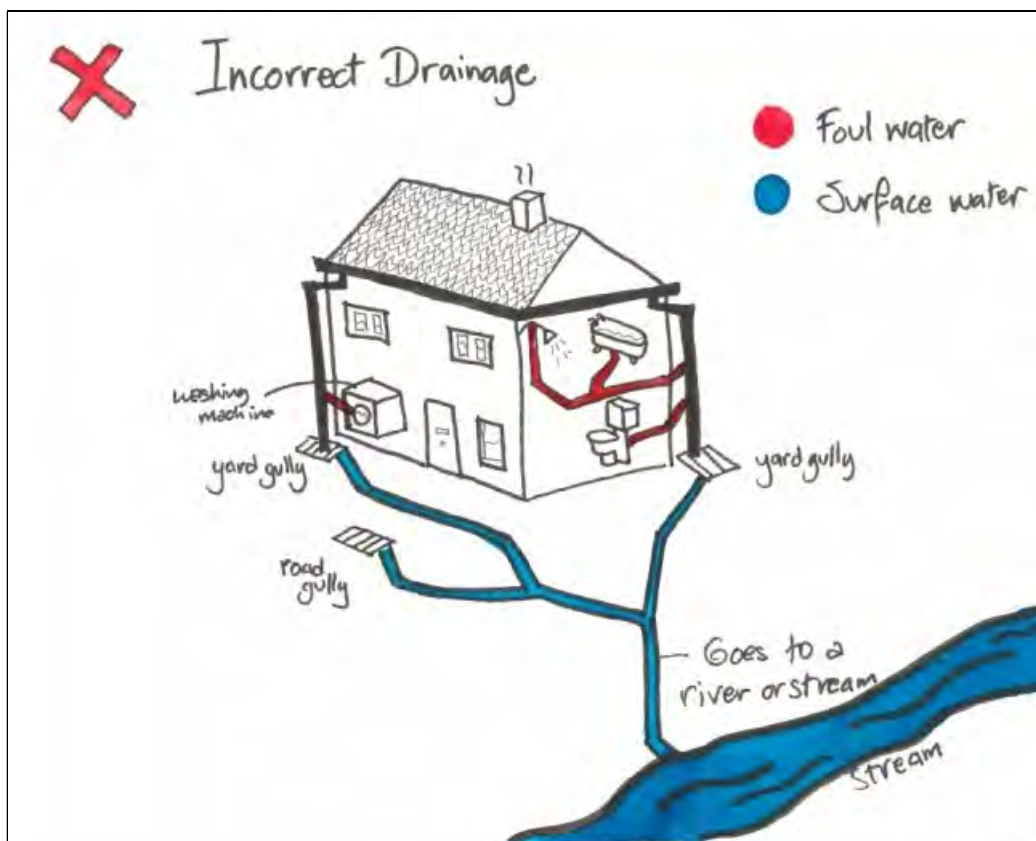


Figure 19. Incorrect drainage showing possible misconnections from washing machines, baths and toilets which can enter surface water systems.

Take a look at the pipework at your home or business and see if anything is going where it shouldn't and get it fixed!



Figure 20. Correctly plumbed premises.

5.38 People Pressures and the Proposed Greystones – Wicklow Murrough Greenway

The numbers of people accessing and using the coast at Newcastle and Kilcoole has increased significantly in recent years, both as a result of increasing human populations in north eastern Wicklow, social media promotion and the global Covid pandemic when people explored and discovered wild places on their doorsteps. The track along the shingle ridge north of the Breaches has been widened and increasingly braided with subsequent losses in dune habitat and vegetation. The East Coast Nature Reserve is increasingly used for amenity purposes and as a place for a walk/exercise.

The proposed greenway between Wicklow and Greystones, which is an objective of the Wicklow County Development Plan can seem like a lovely idea but it has negative impacts for both birds and coastal habitats.

Greenways should result in a net biodiversity gain for nature – not further erode and impact on those increasingly fragmented and degraded natural areas in our landscapes.

As BirdWatch Ireland recently stated in their response to proposals for a greenway through bird habitat in Co, Meath:

‘There is a clear need for strategic guidance on greenway proposals, guidance which gives equal footing to biodiversity, climate and the needs of local residents. Not only would this approach prevent environmental damage, it would also reduce the amount of time and public money spent deliberating such proposals.

BirdWatch Ireland fully supports the development of greenways and initiatives that promote a modal shift in transport. These have obvious important benefits to climate but also economic and well-being benefits. However, it is vital that such developments do not come at a cost to our biodiversity, which is already experiencing pressures from all sides. In May 2019, Dail Éireann declared a climate and a biodiversity emergency. Both must be addressed together’.

5.39 Support Nature Conservation Charities

Join and support the nature conservation charities who do tremendous work in our society for nature conservation and sustainability. You can also take part in many recording events, monitoring studies, fund raising actions or other activities with them. Be a voice for nature in your community.

5.40 Be An Active Citizen at Planning Stage

Wicklow County Council will be commencing the pre-draft public consultation for the next Greystones – Delgany & Kilcoole Local Area Plan soon. Make your voice for nature be heard at planning stage and to your local elected councillors and TDs.

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7. APPENDICES

7.1 Appendix 1 – Site Synopsis for The Murrough SAC

Site Name: The Murrough Wetlands SAC

Site Code: 002249

The Murrough is a coastal wetland complex which stretches for 15 km from Ballygannon to north of Wicklow town, and in parts, extends inland for up to 1 km. A shingle ridge stretches the length of the site and carries the mainline Dublin-Wexford railway.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- [1210] Annual Vegetation of Drift Lines
- [1220] Perennial Vegetation of Stony Banks
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [7210] *Cladium* Fens*
- [7230] Alkaline Fens

On the seaward side of the shingle bank which runs along The Murrough Wetlands SAC site drift line vegetation includes species such as Sea Rocket (*Cakile maritima*), Sea Sandwort (*Honkenya peploides*), Sea-holly (*Eryngium maritimum*) and Yellow Horned-poppy (*Glaucium flavum*). The rare and legally protected Oysterplant (*Mertensia maritima*) (Flora (Protection) Order, 1999) has been recorded on the gravelly shore in the past but is now considered to be extinct from this locality.

Low sand hills occur at Kilcoole, with Marram (*Ammophila arenaria*) and Lyme-grass (*Leymus arenarius*). In other areas and further inland a rich grassy sward, which is most extensive at the south of the site, has developed. Typical species include Sweet Vernal-grass (*Anthoxanthum odoratum*), Crested Dog's-tail (*Cynosurus cristatus*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Burnet Rose (*Rosa pimpinellifolia*) and Pyramidal Orchid (*Anacamptis pyramidalis*). A community dominated by Silverweed (*Potentilla anserina*) and Strawberry Clover (*Trifolium fragiferum*) occurs in some of the wetter, grassy areas. In some places, particularly at the south of the site, a gorse (*Ulex* sp.) heath has developed on the stony ridge.

Saltmarsh is present within the site in two distinct areas. At the southern end of the site is found Broad Lough. This is a brackish, partly tidal lake, and has a well developed saltmarsh community which includes Saltmarsh Rush (*Juncus gerardi*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Sea Purslane (*Halimione portulacoides*) and Common Scurvygrass (*Cochlearia officinalis*).

Common Reed (*Phragmites australis*) is abundant along the western shore, along with some Sea Club-rush (*Scirpus maritimus*). Saltmarsh is also present in the northern end of the site in the vicinity of The Breaches. Though this has been greatly affected by drainage in the late 1980s and early 1990s, localised Sea Couch (*Elymus pycnanthus*) still occurs. The grassland which was created and improved as a result of the drainage is now influenced by seepage and flooding of saline waters.

Fen vegetation is well developed in the Murrough wetlands, with both alkaline and calcareous fen with Great Fen-sedge (*Cladium mariscus*) represented. The fens occur mostly between Five Mile Point and Six Mile Point, especially in the townland of Blackditch and also in the Leamore and Grange areas. The alkaline fen is dominated by Black Bog-rush (*Schoenus nigricans*), with Marsh Pennywort (*Hydrocotyle vulgaris*), Purple Moor-grass (*Molinia caerulea*), Devil's-bit Scabious (*Succisa pratensis*), Heather (*Calluna vulgaris*), Cross-leaved heath (*Erica tetralix*), and a wide variety of orchids also present. The rare, Narrow-leaved Marsh-orchid (*Dactylorhiza traunsteineri*) has also been recorded here. Great Fen-sedge occurs in mosaic with several vegetational elements but chiefly with alkaline fen. Its many forms can range from pure stands of Great Fen-sedge, through to occurring as a dominant with Greater Tussock-sedge (*Carex paniculata*) and Blunt-flowered Rush (*Juncus subnodulosus*). *Cladium* fen also occurs at Blackditch within stretches of swamp woodland or fen carr dominated by Rusty Willow (*Salix cinerea* subsp. *oleifolia*) and Downy Birch (*Betula pubescens*).

A fine wet woodland occurs at Blackditch. Downy Birch is the dominant species, with some Alder (*Alnus glutinosa*), willows (*Salix* spp.) and Ash (*Fraxinus excelsior*) also present. The ground flora of this wooded area is often quite dense. This wood also contains a rich invertebrate community with at least eight rare or notable species of fly (Order Diptera) occurring, including *Syntormon setosus*, a species unknown elsewhere in Britain or Ireland.

A wide range of freshwater and brackish marsh habitats occur within the site. These vary from reed-marsh dominated by reeds and rushes (*Juncus* spp.), to those of sedges (*Carex* spp.), with other areas supporting a mixture of sedges and Yellow Iris (*Iris pseudacorus*). A wide variety of grasses and herbs are also found. These include Meadowsweet (*Filipendula ulmaria*), Silverweed and Common Spike-rush (*Eleocharis palustris*). The scarce Red Data Book species Marsh Pea (*Lathyrus palustris*) occurs in one area. The marshes merge into wet grassland in many areas. Where grazing pressure is low, a herb-rich sward occurs with species such as Ragged-Robin (*Lychnis flos-cuculi*), Cuckooflower (*Cardamine pratensis*), Meadowsweet and Heath Spotted-orchid (*Dactylorhiza maculata*) occurring. Sedges are abundant in the wetter areas. Where drains have been cut, there are many other species such as Greater Spearwort (*Ranunculus lingua*), Bogbean (*Menyanthes trifoliata*) and the scarce Reed Sweet-grass (*Glyceria maxima*).

The Murrough is an important site for wintering waterfowl and breeding birds. Species listed on Annex I of the E.U. Birds Directive include Little Egret, Whooper Swan, Greenland White-fronted Goose, Golden Plover, Kingfisher and Little Tern. Average peak winter counts from 1994/95 - 1997/98 showed the site to have an internationally important population of Brent Goose (1,318, higher than in the early 1990s), nationally important populations of Wigeon (1,518), Teal (772) and Lapwing (3,140), and regionally or locally important populations of Whooper Swan (80), Little Grebe (22), Shelduck (95), Gadwall (9), Mallard (391), Shoveler (22), Golden Plover (615), Curlew (605) and Redshank (181). Greylag Goose numbers were nationally important in the early 1990s but these numbers have dropped off. The average peak is now 213.

Little Tern breed on the shingle beach near The Breaches and this is the largest colony on the east coast (approx. 50 pairs in 1993, an average of 37 pairs over the ten

year period 1988-1998). Redshank, Oystercatcher, Ringed Plover and Water Rail also breed. The reedbeds at Broad Lough provide habitat for Reed Warbler and the rare Bearded Tit has bred here.

Otter has been reported regularly from the Murrrough. This is a Red Data Book Species, and is also listed on Annex II of the Habitats Directive.

Recent farming and drainage practices and afforestation have greatly reduced the area and quality of the wetlands habitats - the area between Kilcoole and Newcastle is particularly affected. In 1997 there was some levelling of the sand hills below Killoughter station. Pollution, reclamation and further drainage would adversely affect this site. A section of the wetlands at Blackditch, which includes alkaline and *Cladium* fen, has been acquired by BirdWatch Ireland and is being managed for nature conservation.

This site is of importance as it is the largest coastal wetland complex on the east coast of Ireland. Although much affected by drainage, it still contains a wide range of coastal and freshwater habitats, including six listed on Annex I of the E.U. Habitats Directive, some of which contain threatened plants. Areas on the site contain a rich invertebrate fauna, including several rarities. It is an important site for both wintering and breeding birds and supports a variety of species listed on Annex I of the E.U. Birds Directive.

4.01.2014

7.2 Appendix 2 – Site Synopsis for The Murrough SPA

SITE SYNOPSIS

SITE NAME: THE MURROUGH SPA

SITE CODE: 004186

The Murrough SPA comprises a coastal wetland complex that stretches for 13 km from Kilcoole Station, east of Kilcoole village in the north to Wicklow town in the south, and extends inland for up to 1 km in places. The site includes an area of marine water to a distance of 200m from the low water mark. A shingle ridge runs along the length of the site and carries the Dublin-Wexford railway line.

Beside the shingle shore is a stony ridge supporting perennial vegetation. Driftline vegetation on the seaward side includes species such as Sea Rocket (*Cakile maritima*), Sea Sandwort (*Honkenya peploides*), Sea Holly (*Eryngium maritimum*) and Yellowhorned Poppy (*Glaucium flavum*). Low sand hills occur at Kilcoole, with Marram (*Ammophila arenaria*) and Lyme-grass (*Leymus arenarius*). In other areas and further inland a rich grassy sward, which is most extensive in the south end of the site, has developed. A community dominated by Silverweed (*Potentilla anserina*) and Strawberry Clover (*Trifolium fragiferum*) occurs in some of the wetter, grassy areas. In some places, particularly at the south of the site, a Gorse (*Ulex*) heath has developed on the stony ridge.

At the southern end of the site, Broad Lough, a brackish, partly tidal lake, has a well developed saltmarsh community. Common Reed (*Phragmites australis*) is abundant along the western shore, along with some Sea Club-rush (*Scirpus maritimus*). Saltmarsh is also present in the northern end of the site in the vicinity of the Breaches. An area of fen occurs at Five Mile Point. Here, Black Bog-rush (*Schoenus nigricans*) is dominant. Fen Sedge (*Cladium mariscus*) is present where the ground is wetter. This merges into areas dominated by Common Reed. A wide range of freshwater and brackish marsh habitats occur within the site. These vary from reed-marsh dominated by reeds and rushes (*Juncus* spp.), to those of sedges (*Carex* spp.) with other areas supporting a mixture of sedges and Yellow Iris (*Iris pseudacorus*) also occurring. The marshes merge into wet grassland in many areas and where grazing pressure is low, a herb-rich sward occurs. Sedges are abundant in the wetter areas. Where drains have been cut, there are many other species such as Greater Spearwort (*Ranunculus lingua*), Bogbean (*Menyanthes trifoliata*) and Reed Sweet-grass (*Glyceria maxima*).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Red-throated Diver, Greylag Goose, Light-bellied Brent Goose, Wigeon, Teal, Black-headed Gull, Herring Gull and Little Tern. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The shingle ridge at Kilcoole is a traditional nesting area for Little Tern, and the site now supports one of the largest colonies in the country. Numbers vary between years, with 36 pairs recorded in 1995 and 106 pairs in 2006. A tern protection scheme

and research programme, co-ordinated by BirdWatch Ireland and the National Parks and Wildlife Service, has been in operation since 1985. Breeding success varies from year to year, largely due to predation by foxes, crows and other species.

During the winter this site is important for a number of waterbirds - all population sizes are the mean of peak counts for the 5 years, 1995/96 – 1999/2000. Light-bellied Brent Goose occurs here in internationally important numbers (859). Other species that visit here in nationally important numbers are Red-throated Diver (32), Greylag Goose (300), Wigeon (1,209), Teal (644), Black-headed Gull (997) and Herring Gull (506). Other species that are known to occur here are Little Grebe, Grey Heron, Cormorant, Mute Swan, Whooper Swan, Greenland White-fronted Goose, Shelduck, Gadwall, Shoveler, Mallard, Golden Plover, Ringed Plover, Lapwing, Dunlin, Curlew, Greenshank and Redshank.

Short-eared Owl is recorded here during the winter. Little Egret has bred locally in recent years and this site is a main feeding area, with several birds present regularly. While formerly a rare bird in Ireland, Little Egret is now well-established with most birds occurring in the south-east and south (Counties Wexford, Waterford and Cork). The Murrough is presently at the edge of the species' range. This site is one of the few sites in Ireland where Reed Warbler breeds regularly. It is considered that 1-4 pairs bred each year during the 1980s and early 1990s, with a minimum of 6 birds in song in 1993. An absence of records since 1996 may be due to under-recording. Kingfisher regularly uses the site. Sandwich Tern are recorded from the site during the autumn.

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. Part of the Murrough SPA is a Wildfowl Sanctuary.

15.5.2015

7.3 Appendix 3 - Records held by the National Biodiversity Data Centre

Table 1. Records held by the National Biodiversity Data Centre from the study area.

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
acarine (Acari)	Acari	1	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
annelid	Lumbriculidae	1	17/07/2009	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
annelid	Tubificidae	3	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
bird	Black-billed Magpie (<i>Pica pica</i>)	2	31/03/2012	Birds of Ireland	
bird	Chaffinch (<i>Fringilla coelebs</i>)	1	11/12/2020	Birds of Ireland	
bird	Coal Tit (<i>Periparus ater</i>)	1	15/03/2012	Birds of Ireland	
bird	Common Blackbird (<i>Turdus merula</i>)	2	11/12/2020	Birds of Ireland	
bird	Common Buzzard (<i>Buteo buteo</i>)	1	26/05/2019	Birds of Ireland	
bird	Common Chiffchaff (<i>Phylloscopus collybita</i>)	1	02/04/2012	Birds of Ireland	
bird	Common Swift (<i>Apus apus</i>)	1	29/05/2012	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Eurasian Collared Dove (<i>Streptopelia decaocto</i>)	5	10/08/2012	Birds of Ireland	
bird	Eurasian Jackdaw (<i>Corvus monedula</i>)	5	25/12/2012	Birds of Ireland	
bird	Eurasian Treecreeper (<i>Certhia familiaris</i>)	1	02/04/2012	Birds of Ireland	
bird	European Goldfinch (<i>Carduelis carduelis</i>)	1	31/03/2012	Birds of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
bird	European Greenfinch (<i>Carduelis chloris</i>)	4	11/12/2020	Birds of Ireland	
bird	Great Spotted Woodpecker (<i>Dendrocopos major</i>)	1	26/05/2019	Birds of Ireland	
bird	Great Tit (<i>Parus major</i>)	1	11/12/2020	Birds of Ireland	
bird	Grey Heron (<i>Ardea cinerea</i>)	1	10/07/2012	Birds of Ireland	
bird	Hedge Accentor (<i>Prunella modularis</i>)	1	10/07/2012	Birds of Ireland	
bird	House Sparrow (<i>Passer domesticus</i>)	1	02/04/2012	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Long-tailed Tit (<i>Aegithalos caudatus</i>)	1	15/03/2012	Birds of Ireland	
bird	Mistle Thrush (<i>Turdus viscivorus</i>)	3	02/04/2012	Birds of Ireland	
bird	Rook (<i>Corvus frugilegus</i>)	5	11/04/2012	Birds of Ireland	
bird	White-throated Dipper (<i>Cinclus cinclus</i>)	2	11/12/2020	Birds of Ireland	
bird	Yellowhammer (<i>Emberiza citrinella</i>)	1	09/03/2012	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bony fish (Actinopterygii)	Brown Trout (<i>Salmo trutta</i> subsp. <i>fario</i>)	1	03/06/2016	General Biodiversity Records from Ireland	
crustacean	Asellus	1	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
crustacean	Gammarus	1	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	

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crustacean	Gammarus duebeni	3	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
flatworm (Turbellaria)	flatworms (Tricladida)	1	30/05/2012	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
flowering plant	Winter Heliotrope (Petasites fragrans)	2	03/02/2018	National Invasive Species Database	
insect - beetle (Coleoptera)	Dytiscidae	1	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - beetle (Coleoptera)	Elmis aenea	1	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - beetle (Coleoptera)	Hydrophilidae	1	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - beetle (Coleoptera)	Limnius volckmari	4	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - beetle (Coleoptera)	Silpha tristis	3	02/07/1932	Carrion Beetles of Ireland	
insect - butterfly	Comma (Polygonia c-album)	4	25/10/2020	Butterflies of Ireland	
insect - butterfly	Common Blue (Polyommatus icarus)	1	01/09/2013	Butterflies of Ireland	
insect - butterfly	Green-veined White (Pieris napi)	7	26/09/2018	Irish Butterfly Monitoring Scheme	
insect - butterfly	Holly Blue (Celastrina argiolus)	3	23/07/2017	Butterflies of Ireland	
insect - butterfly	Large White (Pieris brassicae)	28	01/10/2018	Butterflies of Ireland	
insect - butterfly	Orange-tip (Anthocharis cardamines)	5	26/04/2021	Butterflies of Ireland	
insect - butterfly	Painted Lady (Vanessa cardui)	3	20/09/2019	Butterflies of Ireland	
insect - butterfly	Peacock (Inachis io)	2	23/09/2013	Butterflies of Ireland	
insect - butterfly	Red Admiral (Vanessa atalanta)	12	06/08/2019	Butterflies of Ireland	
insect - butterfly	Ringlet (Aphantopus hyperantus)	1	07/07/2019	Butterflies of Ireland	
insect - butterfly	Small Tortoiseshell (Aglais urticae)	28	14/04/2020	Butterflies of Ireland	
insect - butterfly	Small White (Pieris rapae)	11	18/08/2018	Irish Butterfly Monitoring Scheme	
insect - butterfly	Speckled Wood (Pararge aegeria)	14	26/04/2021	Butterflies of Ireland	
insect - caddis fly (Trichoptera)	Drusus annulatus	1	30/05/2012	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	

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insect - caddis fly (Trichoptera)	Glossosomatidae	3	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - caddis fly (Trichoptera)	Goeridae	2	30/05/2012	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - caddis fly (Trichoptera)	Hydropsyche	3	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - caddis fly (Trichoptera)	Limnephilidae	4	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - caddis fly (Trichoptera)	Odontocerum albicorne	1	30/05/2012	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - caddis fly (Trichoptera)	Rhyacophila	1	17/07/2009	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - caddis fly (Trichoptera)	Rhyacophila dorsalis	2	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - caddis fly (Trichoptera)	Sericostoma	3	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - dragonfly (Odonata)	Common Darter (Sympetrum striolatum)	4	29/09/2012	Dragonfly Records	
insect - hymenopteran	Bombus (Bombus) lucorum	3	15/03/2014	Bees of Ireland	
insect - mayfly (Ephemeroptera)	Alainites muticus	2	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - mayfly (Ephemeroptera)	Baetidae	1	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - mayfly (Ephemeroptera)	Baetis	4	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	

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insect - mayfly (Ephemeroptera)	Ecdyonurus	4	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - mayfly (Ephemeroptera)	Rhithrogena	2	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - mayfly (Ephemeroptera)	Serratella ignita	4	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - moth	Flounced Rustic (Luperina testacea)	1	07/09/1997	Moths Ireland	
insect - stonefly (Plecoptera)	Chloroperlidae	1	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - stonefly (Plecoptera)	Leuctra	1	17/07/2009	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - true bug (Hemiptera)	Velia	1	30/05/2012	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - true fly (Diptera)	Chironomidae	3	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - true fly (Diptera)	Dicranota	3	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - true fly (Diptera)	Diptera larva (Diptera)	1	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
insect - true fly (Diptera)	Simuliidae	3	23/06/2015	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
mollusc	Ancylus fluviatilis	1	30/05/2012	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
mollusc	Jenkins' Spire Snail (Potamopyrgus antipodarum)	4	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species

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mollusc	Physella	1	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
mollusc	Wandering Snail (Radix balthica)	1	26/07/2018	A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007-2018 (EPA)	
terrestrial mammal	Eastern Grey Squirrel (Sciurus carolinensis)	3	26/09/2015	Atlas of Mammals in Ireland 2010-2015	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> EU Regulation No. 1143/2014 Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
terrestrial mammal	Eurasian Badger (Meles meles)	1	02/04/2014	Atlas of Mammals in Ireland 2010-2015	Protected Species: Wildlife Acts
terrestrial mammal	Soprano Pipistrelle (Pipistrellus pygmaeus)	1	18/06/2011	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts