DixonBrosnan
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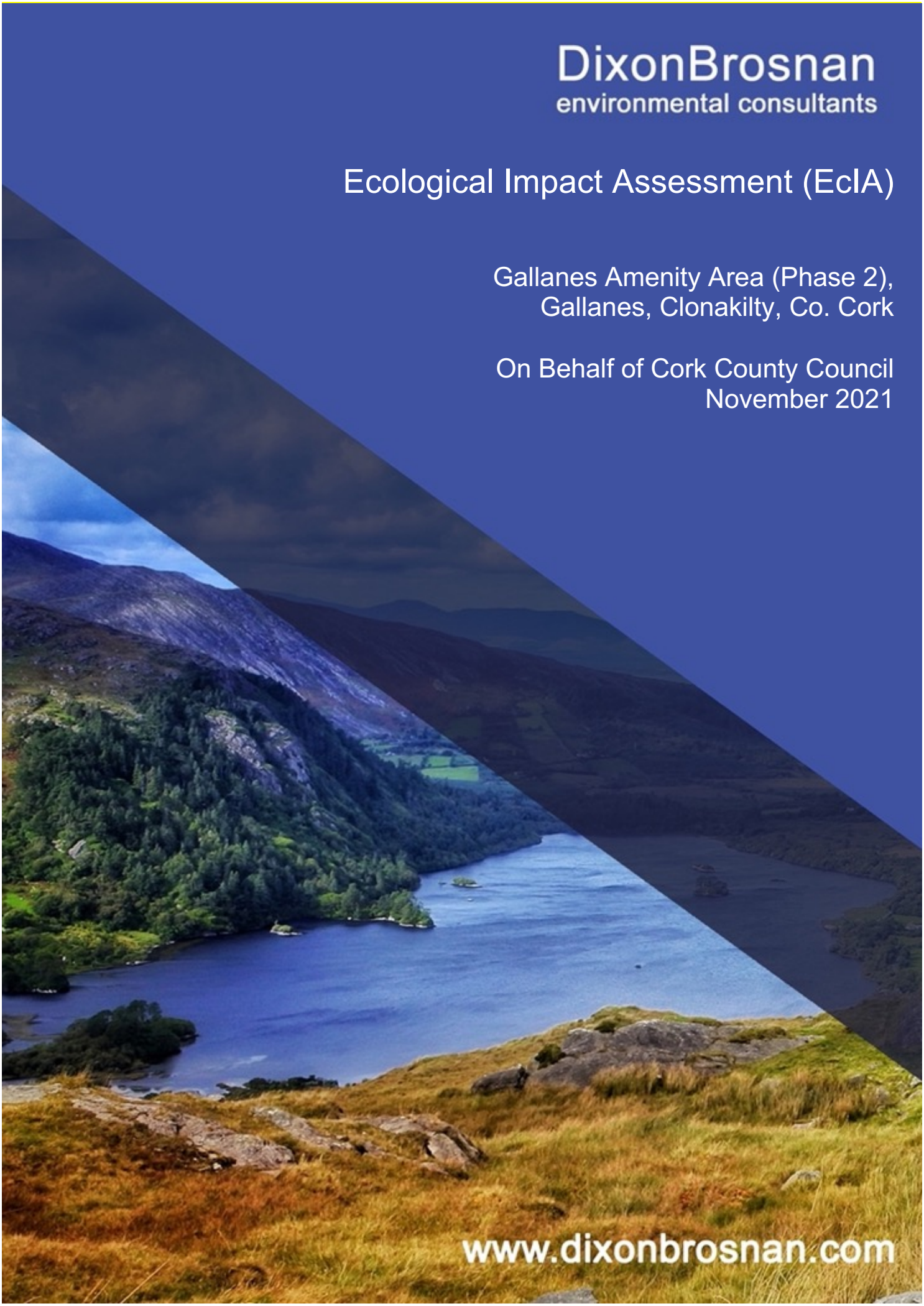
Ecological Impact Assessment (EcIA)

Gallanes Amenity Area (Phase 2),
Gallanes, Clonakilty, Co. Cork

On Behalf of Cork County Council
November 2021



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Project	Ecological Impact Assessment (EcIA) Proposed Gallanes Amenity Area (Phase 2) Gallanes, Clonakilty, Co. Cork	
Client	Cork County Council	
Project Ref.	21105	
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Date	**Revision**	**Prepared By**
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1. Introduction

The proposed development involves the development of Gallanes Amenity Area (Stage 2), Gallanes, Clonakilty, Co. Cork. This is an extension to an existing walkway/cycle path at Gallanes. DixonBrosnan Environmental Consultants have assessed the potential impacts from the proposed development and all associated site works, on terrestrial and aquatic flora and fauna. This report describes and evaluates the habitats with their representative flora and fauna and addresses the potential ecological impacts of the development on the ecology of the site and the surrounding area.

2. Methodology

2.1 Introduction

This appraisal is based on surveys of the proposed works area and a review of desktop data. Although not part of an Environmental Impact Assessment Report (EIAR) this report follows the structure and protocols detailed in Advice notes for preparing Environmental Impact Statements (EPA Draft, 2015) and Draft Guidelines on the Information to *be Contained in Environmental Impact Assessment Reports'* (EPA, May 2017).

2.2 Desktop Review

A desktop study was carried out identify features of ecological value occurring within the proposed development site and those occurring in close proximity to it. A desktop review also allows the key ecological issues to be identified early in the appraisal process and facilitates the planning of surveys. Sources of information utilised for this report include the following:

- National Parks & Wildlife Service (NPWS) - www.npws.ie
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre (NBDC) – www.biodiversityireland.ie
- *County Cork Biodiversity Action Plan 2009-2014*
- Bat Conservation Ireland – http://www.batconservationireland.org
- Birdwatch Ireland - http://www.birdwatchireland.ie/
- Invasive Species Ireland - http://www.invasivespeciesireland.com/
- *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011)
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009)
- *Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)* European Union, 2017

- *Appropriate Assessment Screening Report for the Clonakilty Greenway (Stage 1 – Gallanes Lake proposed walkway/cycleway and amenity area) at Gallanes, Clonakilty, Co. Cork* (DixonBrosnan 2018) and

- *Ecological Impact Assessment for the Clonakilty Greenway (Stage 1 – Gallanes Lake proposed walkway/cycleway and amenity area)* (DixonBrosnan 2018).

The appraisal of impacts follows the protocols outlined in guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009) and CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*.

2.2.1 Relevant Legislation

Flora and fauna in Ireland are protected at a national level by the Wildlife Acts, 1976 to 2000 and the European Communities (Birds and Natural Habitats) Regulations 2011. They are also protected at a European level by the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (79/409/EEC) amended in 2009 as the Directive 2009/147/EC.

Under this legislation, sites of nature conservation importance are then designated in order to legally protect faunal and floral species and important/vulnerable habitats.

The categories of designation are as follows:

- Special Areas of Conservation (SAC) are designated under the European Communities (Birds and Natural Habitats) Regulations 2011 to comply with the EU Habitats Directive (92/43/EEC);
- Special Protection Areas (SPAs) and designated under the EU Birds Directive (79/409/EEC) amended in 2009 as the Directive 2009/147/EC; and
- Proposed Natural Heritage Areas (pNHA) are listed under the Wildlife (Amendment) Act, 2000. They have limited legal protection under Local Authority Development Plans.

2.3 Survey Overview

A site survey was carried out on the 4th November 2021. The following surveys were carried out at the site:

- Habitats were mapped according to the classification scheme outlined in the Heritage Council publication '*A Guide to Habitats in Ireland* (Fossitt, 2000)' and following the guidelines contained in '*Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011)';
- A general mammal survey;
- The proposed development area was surveyed for invasive species and
- All bird species observed/heard during the walkover survey were recorded.

This report was prepared by Carl Dixon MSc (Ecological Monitoring) and Dr. Sorcha Sheehy PhD (Ecology/ornithology). Survey work was carried out by Cian Gill MSc (Ecological Monitoring).

Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc.

Dr. Sorcha Sheehy PhD (ecology/ornithology) is an experienced ecological consultant with over ten years' experience. She has worked on Screening/NIS's for a range of small and large-scale projects with particular expertise in assessing impacts on birds. Recent projects include bird risk assessments for Dublin and Cork Airports, Waste to Energy Facility Ringaskiddy and Water Storage Schemes for Irish Water.

Cian Gill MSc (Ecology) is a qualified ecologist with ten years' experience working with wildlife and ecology-based NGOs and public bodies in Ireland, the UK and the US. Past projects include invasive species planning for the city of Rosemount, Minnesota, and the Under The Sea project for Essex Wildlife Trust. Cian has been involved in the compilation of a range of NIS and EIAR for large- and small-scale developments throughout Ireland.

3. Receiving Environment

3.1 Existing site

The proposed development site is located approximately 1.5km north of Clonakilty town. The site runs parallel to the national route N71. The existing Clonakilty Greenway and Gallanes Lake are located to the southwest of the site. The proposed route passes an area of farmland, and through the West Cork Business and Technology Park, before crossing a local road L-4032 and passing through Clonakilty Rugby Club playing pitches.

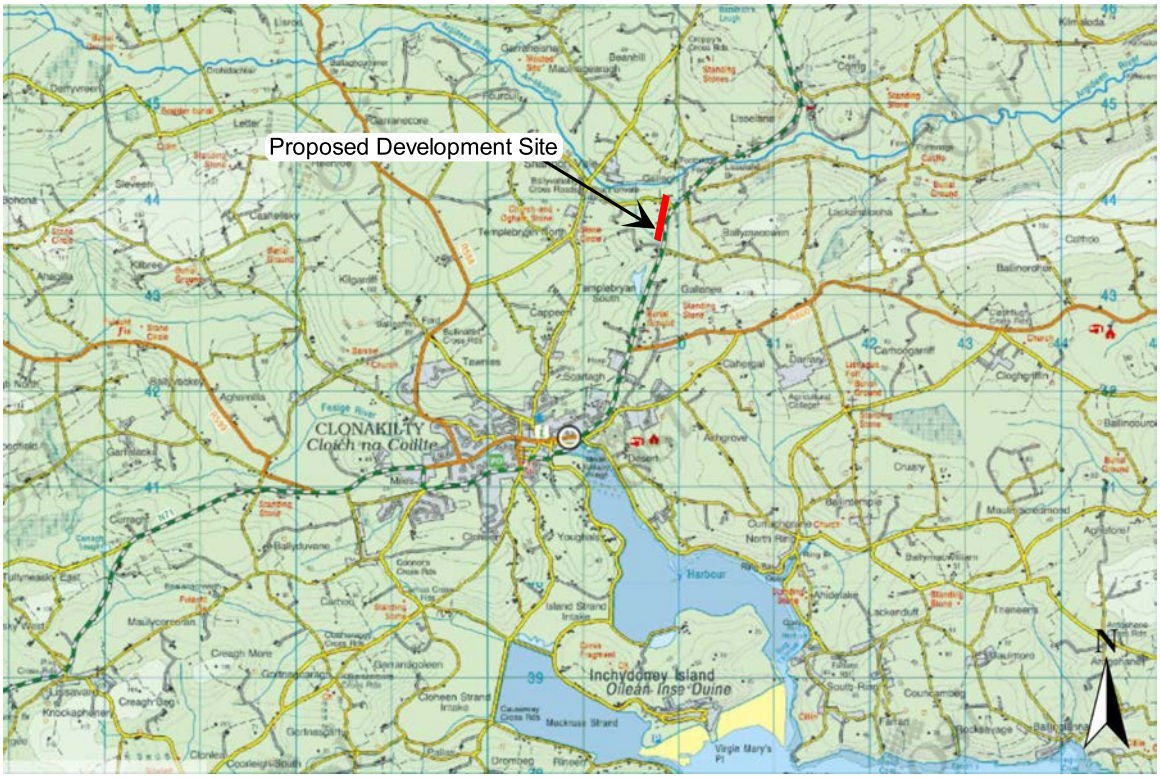


Figure 1. Overview of proposed development site | Source OSI

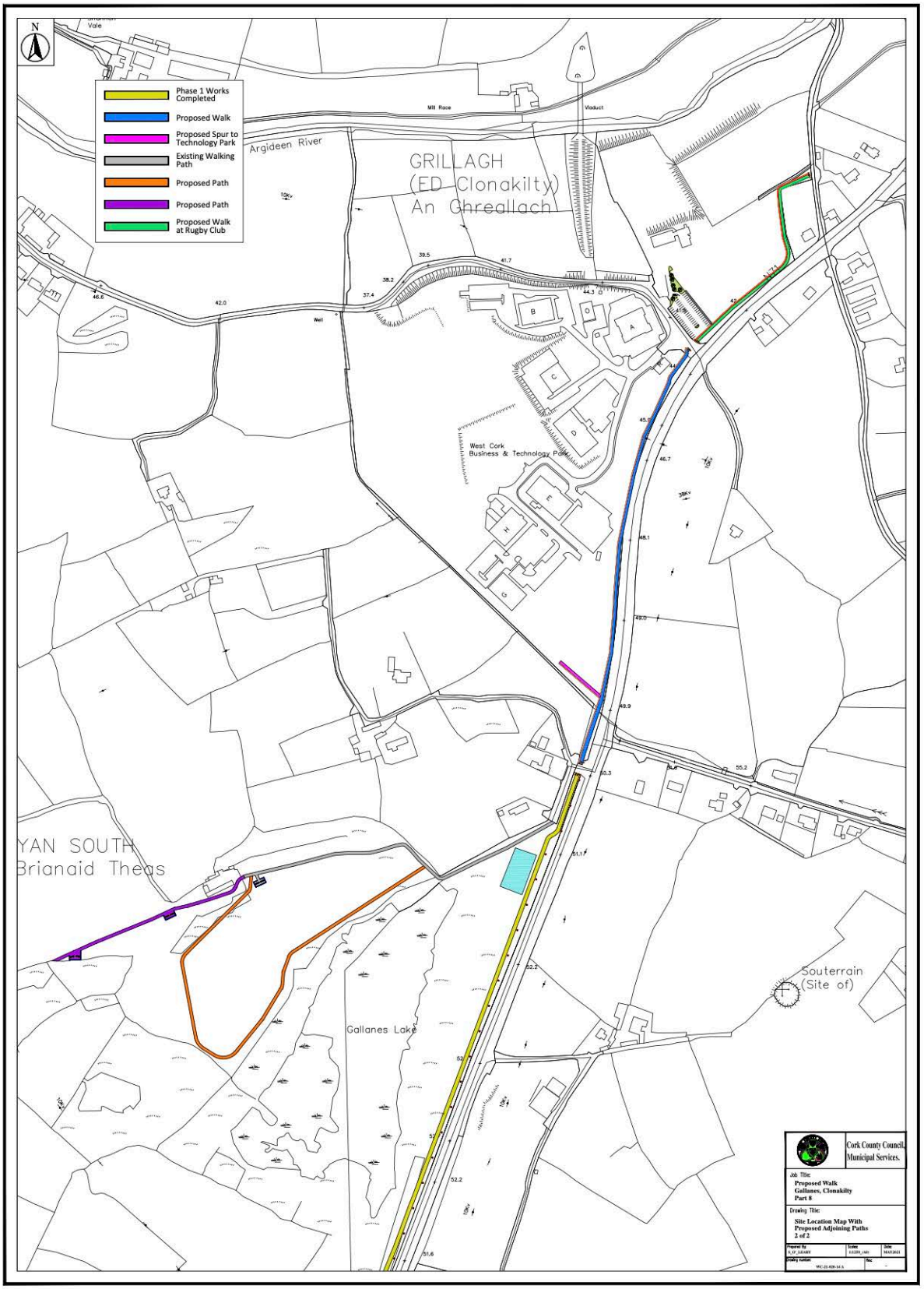


Figure 2. Proposed development (blue line, pink line and green line) | Source Cork County Council

3.2. Proposed Development

The proposed development includes walkway/cycle pathway within the Local Authority owned lands to run parallel to the N71.

Stage 1 of the development, which has been partly completed. Stage 1 of the development (the Clonakilty Greenway) included the following:

- A pathway commencing at the hospital junction on Convent Hill and continues east along the N71 before diverting into the local authority owned lands at Gallanes The pathway will be finished in black-top surfacing. Public lighting using low spillage LED lights is to be provided along the route at a medium height level. A 2.5m buffer zone will be provided in the local authority lands between the stream and the pathway. The buffer zone is to be planted with wild flora. Respite areas with picnic tables will be provided at intervals along the pathway. These will be raised and to the Northern side of the pathway.

- The development of a natural recreational and play area towards the east of the local authority owned lands at Gallanes.

- The fencing of some 5 acres of Local Authority lands to secure the lands.

- The demolition of the existing dwelling house (in ruins) and adjoining outhouses (in ruins) at the North end of the Local Authority owned lands.

- The construction of low-level feature stone walls using the stone reclaimed from the demolition of the buildings on the site.

- The development of a number of hard surface hiking trails from the east of the local authority owned lands towards the North of the Local Authority owned lands to a number of viewing points at a higher level.

State 2 of the proposed development, which is the focus of this Ecological Impact Assessment (EcIA), includes the following:

- The proposal is to extend the existing amenity area which incorporates the Joe Walsh Walkway to link it with the existing pathways within the West Cork Technology Park. The project also provides for the creation of a walkway along the N71 towards the Rugby Grounds in the event of the pathways within the West Cork Technology Park being unavailable. A walkway through the rugby grounds is proposed which exits onto local road L-80611.

- The pathway will be finished in black-top surfacing. Public lighting using low spillage LED lights is to be provided along the route at a medium height level. A 3m wide spur from this walkway/cycleway will connect to the Technology Park.

- The development of a 53-space carpark at the south western corner of the Clonakilty Rugby Grounds. Public lighting using low spillage LED lights to be provided to the carpark.

- The development of an amenity area towards the east of the existing amenity area.

- The demolition of the existing dwelling house (in ruins) and adjoining outhouses (in ruins) at the North end of the site.
- The construction of low level feature stone walls using the stone reclaimed from the demolition of the buildings on the site.
- The development of hard surface hiking trails from the east of the site towards the North of the site to a number of viewing points at a higher level.

An overview of the proposed development site is included in **Figure 2.**

4. Designated Conservation Areas

Special Areas of Conservation (SACs) and candidate SACs are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 sites or European sites. Natural Heritage Areas and proposed Natural Heritage Areas (NHAs/pNHAs) are national designations under the Wildlife Act 1976, as amended. A NHA/pNHA is designated for its wildlife value and receives statutory protection. A list of pNHAs was published on a non-statutory basis in 1995, but these have not since been statutorily proposed or designated. Consultation with the NPWS is still required if any development is likely to impact on a pNHA.

4.1 European (Natura 2000) Sites

European sites (Natura 2000 sites) within the zone of influence of the proposed development site, along with their distance from the proposed development site, are listed in **Table 1** and their location shown in **Figure 3.**

The proposed development site does not form part of any Special Protection Area (SPA) or Special Area of Conservation (SAC). The proposed development site is located within the zone of influence of a number of designated sites and a potential source-pathway-receptor link has been identified with three Natura 2000 sites i.e. Courtmacsherry Bay SAC, Courtmacsherry Bay SPA and Clonakilty Bay SPA. No pathway exists by which the proposed development could impact on any other Natura 2000 site due to the distances involved and/or the lack of any significant hydrological, hydrogeological or any other relevant connection pathways.

Table 1. Designated areas and their location relative to the proposed work site

Site	Code	Distance at closest point
Special Area of Conservation (SAC)		
Clonakilty Bay SAC	000091	1.8km SW
Courtmacsherry Estuary SAC	001230	7.0km SE
Kilkeran Lake and Castlefreke Dunes SAC	001061	9.7km SW
Special Protection Area (SPA)		
Clonakilty Bay SPA	004081	1.9km SW
Galley Head to Duneen Point SPA	004190	6.7km SW
Courtmacsherry Bay SPA	004219	7.0km SE
Seven Heads SPA	004191	7.9km SE
Natural Heritage Areas (NHAs) and Proposed Natural Heritage Area (pNHA)		
Gallanes Lough pNHA	001052	150m SW
Batemans Lough pNHA	001037	2.4km N
Dirk Bay pNHA	001498	7.0km SE
Courtmacsherry Estuary pNHA	001230	7.3km E
Seven Head and Dunworly Bay pNHA	001077	7.7km SE
Kilkeran Lake and Castlefreke Dunes pNHA	001061	8.6km SW
Rosscarbey Estuary pNHA	001075	12.6km SW

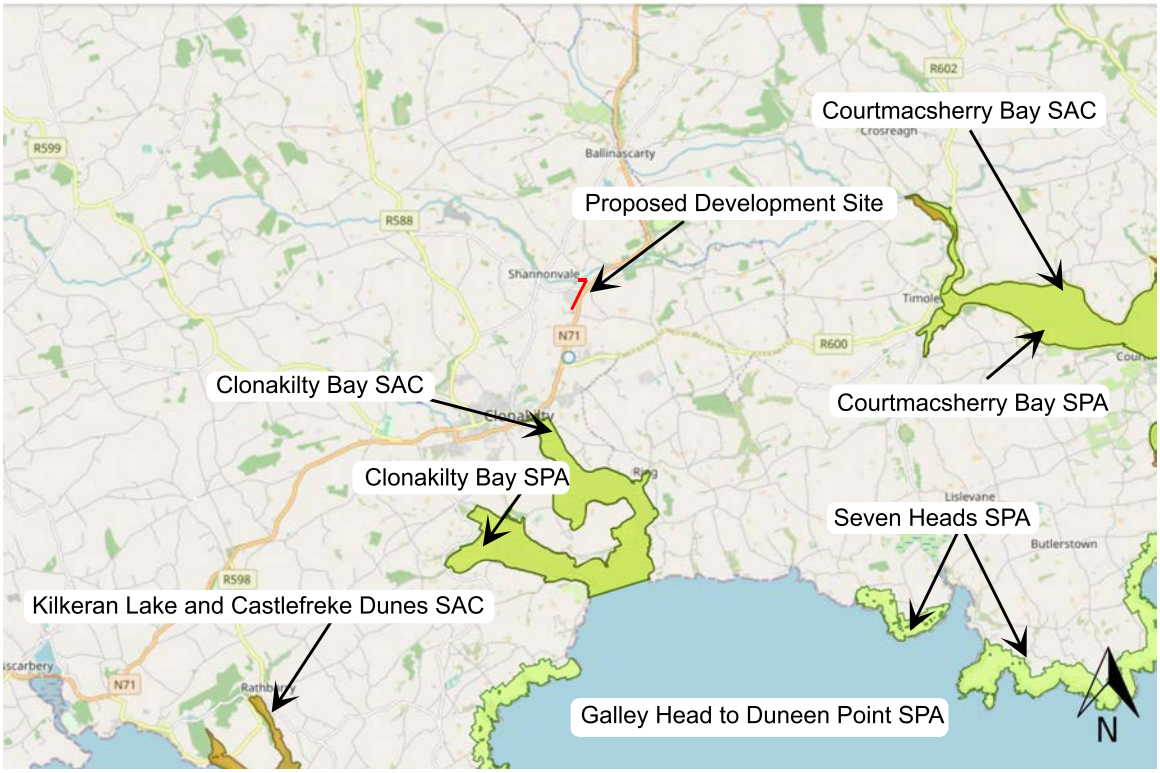


Figure 3. Natura 2000 Sites within zone of influence of proposed development site | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | Not to scale

Courtmacsherry Estuary SAC is an estuary at the mouth of a valley which opens into the Celtic sea. The estuary is ria-like with a salt water influence which extends far inland. The site includes large areas of sand and mudflats as well as small sand dune systems and shingle ridges at the mouth of small streams. Interesting salt and freshwater marshes flank the river banks of the main river. Courtmacsherry Estuary SAC is an attractive area of coastal scenery and interesting landforms (sunken river valley or ria). The transition from salt marsh to freshwater marsh is well developed and a small sandspit and associated salt marsh also occur. Several rare plants have been recorded in the past. The estuarine mud and sand flats support duck and wader winter populations.

Courtmacsherry Bay SPA is situated approximately 12 km south of Bandon and immediately west of the village of Timoleague in west Co. Cork. This is an important site for wintering waterfowl. It supports internationally important numbers of *Limosa limosa* and nationally important numbers of eleven other species: *Gavia immer, Pluvialis apricaria, Tadorna tadorna, Anas penelope, Mergus serrator, Vanellus vanellus, Calidris alpina, Limosa lapponica, Numenius arquata, Larus ridibundus* and *Larus canus*. It is among the top ten Irish sites for Larus canus. The population of *Limosa limosa* is substantial (3.7% of the all-Ireland total) and of special note because, despite its relatively small size, the site is among the top ten Irish sites for this species. *Haematopus ostralegus* and *Tringa nebularia* also occur in significant numbers.

Clonakilty Bay SPA is a wetland complex that stretches from the town of Clonakilty to the open sea. Clonakilty Bay SPA supports an internationally important population of *Limosa limosa, and nationally important numbers of Tadorna tadorna, Charadrius hiaticula* and *Tringa nebularia.* A range of other species occur in numbers of regional importance, including *Anas penelope, Pluvialis apricaria, Pluvialis squatarola, Vanellus vanellus, Calidris alpina* and

Numenius arquata. A small population of *Limosa lapponica* is present. The site is visited by passage waders, with regular concentrations of *Calidris minuta* and *Calidris ferruginea*. In recent years *Egretta garzetta* has become regular at the site. *Asio flammeus* is a regular winter visitor.

An Appropriate Assessment (AA) Screening was carried out for the proposed development and submitted with this application: *Report in Support of Appropriate Assessment Screening for Gallanes Amenity Area (Stage 2) at Gallanes, Clonakilty, Co. Cork*. (DixonBrosnan 2021).

The conclusions of the report were as follows:

Through an assessment of the source-pathway-receptor model, which considered the ZoI of effects from the proposed development and the potential in-combination effects with other plans or projects, the following findings were reported:

- *The proposed development at Gallanes, Clonakilty, Co. Cork either alone or in-combination with other plans and/or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives.*

Therefore, a Stage 2 Appropriate Assessment is deemed not to be required.

4.2 Nationally Protected Sites

Consultation of the NPWS online database identified one proposed Natural Heritage Area (pNHA) in the vicinity of the proposed development, i.e. Gallanes Lough pNHA. NHAs and pNHAs located in the vicinity of the proposed development site are listed in **Table 1**. The location of this site is illustrated in **Figure 4**.

Little published information is available on Gallanes Lough pNHA. Goodwillie (1986) published a report on Areas of Scientific Interest in County Cork, and gave the following description of the site:

“Gallanes Lough covers an areas of approximately 9ha and is located beside the Clonakilty-Ballinascarty Road that occurs in a flat part of a stream valley. It is fringed by reedswamp with much *Typha latifolia* (bulrush), *Equisetum fluviatile* (water horsetail), *Potentilla palustris* (marsh cinquefoil) and *Carex rostrata* (a sedge). Much of this vegetation is in the form of a floating mat which is being colonised by wet grassland on its landward side. It is slightly acid and *Osmunda regalis (*royal fern), *Rumex acetosa* (sorrel), *Lychnis flos-cuculi* (ragged robin) were noted along with rushes and the grass Agros tis stolonifera. There is a limited amount of willow (*Salix aurita*) colonisation. Aquatic bird species find this lake attractive and lapwing, curlew, snipe and mallard were present in spring. Up to 500 wildfowl occur at times, including mallard, wigeon and sometimes whooper swans. They are thought to have introduced a -small water boatman of interest *Microvelia nygmaea.* Evaluation: The bird populations occurring at this site are high for such a small area and, in addition, are easily visible to people on the road.

Vulnerability & Recommendations: Some infilling of the lake margin has taken place beside the road and since it covers feeding grounds it should not be allowed elsewhere. As with most wetlands, drainage would be very detrimental and would alter both plant and bird communities.”

The proposed development site is potentially connected to this pNHA via surface water discharges during construction and operation as well as potential disturbance impacts to waterfowl.

The Courtmacsherry Estuary pNHA is located approximately 8.9km downstream of the proposed development site via the Templebryan South stream. This site overlaps with the Courtmacsherry Bay SAC and Courtmacsherry Bay SPA which are described in more detail in **Section 4.1** above. The proposed development site is potentially connected to this pNHA via surface water discharges during construction and operation.

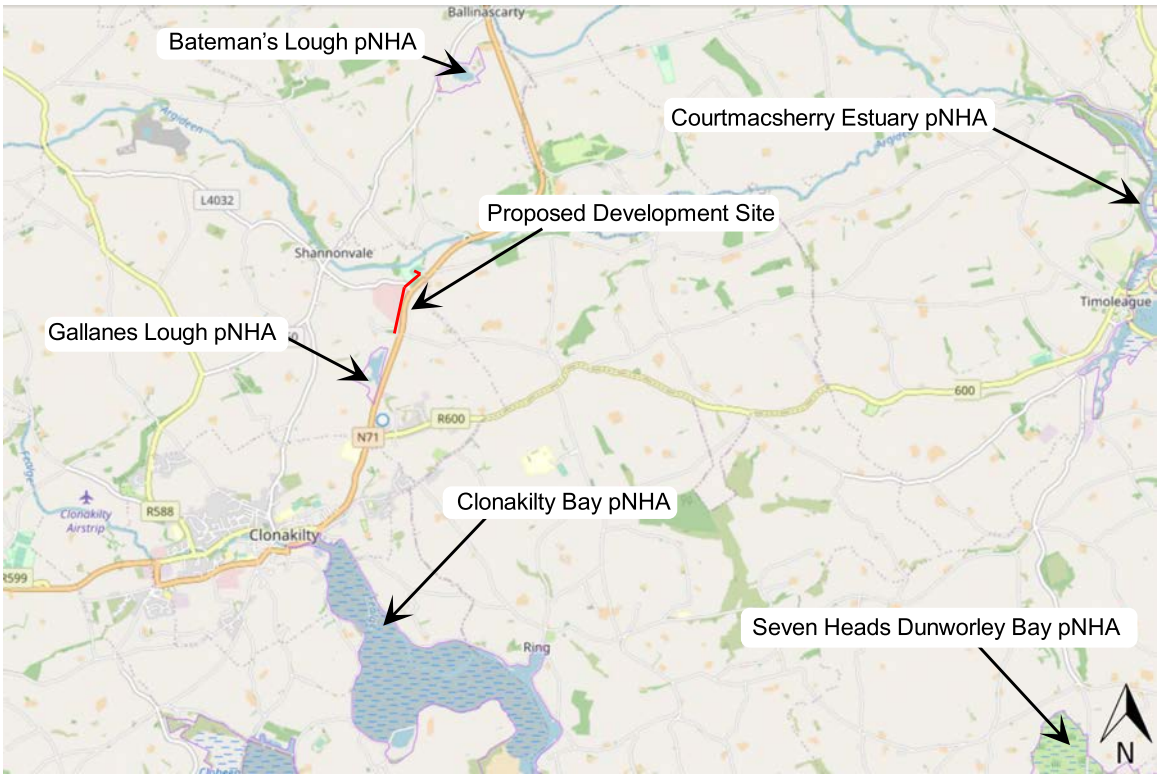


Figure 4. NHAs and pNHAs in the vicinity of proposed development site | Source: EPA Envision mapping (https://gis.epa.ie/EPAMaps/) | Not to scale

4.3 Important Bird Areas – Clonakilty Bay

Important Bird and Biodiversity Areas (IBAs) are sites selected as important for bird conservation because they regularly hold significant populations of one or more globally or regionally threatened, endemic or congregator bird species or highly representative bird assemblages. The European IBA programme aims to identify, monitor and protect key sites for birds all over the continent. It aims to ensure that the conservation value of IBAs in Europe (now numbering more than 5,000 sites or about 40% of all IBAs identified globally to date) is maintained, and where possible enhanced. The programme aims to guide the implementation of national conservation strategies, through the promotion and development of national protected-area programmes. Through their designation they aim to form a network of sites ensuring that migratory species find suitable breeding, stop-over and wintering places along their respective flyways.

The function of the Important Bird Area (IBA) Programme is to identify, protect and manage a network of sites that are important for the long-term viability of naturally occurring bird

populations, across the geographical range of those bird species for which a site-based approach is appropriate. The proposed redevelopment site lies approximately 1.7km from the Inner Clonakilty Bay IBA (Site Code: IE083).

The site qualifies for designation under the following IBA Criteria (2000):

- B1i - The site is known or thought to hold ≥ 1% of a flyway or other distinct population of a waterbird species
- B2 - The site is one of the most important in the country for a species with an unfavourable conservation status in Europe and for which the site-protection approach is thought to be appropriate.
- C3 - The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (not listed on Annex 1 of The Birds Directive).

Table 2. Summary of the Inner Clonakilty Bay IBA trigger species.

Species	Current IUCN Red List Category	Season	Year(s) of estimate	Population estimate	IBA Criteria Triggered
Eurasian Curlew (*Numenius arquata*)	NT	winter	1995	1844 individuals	B2
Black-tailed Godwit (*Limosa limosa*)	NT	winter	1995	945 individuals	B1i, C3

5. Habitats

A site inspection was carried out on the 4th November 2021 to identify the habitats, flora and fauna present at the site. The terrestrial and aquatic habitats within or adjacent to the proposed development site were classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex I/qualifying habitats, where required.

The ecological value of habitats has been defined using the classification scheme outlined in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009) which is included in **Appendix 1**. It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape. Habitats that are considered to be good examples of Annex I and Priority habitats are classed as being of International or National Importance. Semi-natural habitats with high biodiversity in a county context and that are vulnerable, are considered to be of County Importance. Habitats that are semi-natural, or locally important for wildlife, are considered to be of Local Importance (higher value) and sites containing small areas of semi-natural habitat or maintain connectivity between habitats are considered to be of Local Importance (lower value).

A current overview of habitats recorded within and adjacent to the proposed development site are shown in **Figure 5** and **Figure 6** and these habitats are described in **Table 3**. Site photographs are included below.

Table 3. Habitat recorded within the proposed development site and their relative value.

Habitat	Comments	Ecological value (NRA guidelines)
Buildings and Artificial Surfaces BL3	The proposed walkway/cycle path runs parallel to the National Route N71 for most of its length. Various built areas are also located in the immediate vicinity of the proposed walkway/cycle path: including the West Cork Business and Technology Park and carpark, private dwellings, and Clonakilty Rugby club. Some common weed species such as Dandelion *spp*, Ribwort Plantain *Plantago lanceolata* and Groundsel *Senecio vulgaris* grow within these areas. This is a highly modified and disturbed habitat, with low species diversity and minimal ecological value.	Local importance (Lower value)
Spoil and bare Ground ED2	Southwest of the Rugby Club pitches is an area which has been cleared of vegetation. This currently consists of bare ground, with piles of earth spoil at its southern end. This earth has recently been moved/exposed so little vegetation was growing here at the time of survey. This is a highly modified habitat which is dominated by a low number of species and has little value for wildlife.	Local importance (Lower value)
Amenity Grassland (Improved) GA2	The northern section of the proposed track runs alongside the pitches of the Clonakilty Rugby Club. This managed grassland is species poor and is regularly mown with a short sward. Daisy *Bellis perennis* and White Clover *Trifolium repens* are common. This is a highly modified and disturbed habitat, with low species diversity and minimal ecological value	Local importance (Lower value)
Treelines WL2	Treelines run adjacent to the proposed walkway/cycle path between the proposed development site and the N71. The treelines adjacent to the northern part of the track/path, in the vicinity of the Rugby Club, are dominated by non-native species. Lawson Cypress *Chamaecyparis lawsoniana* and Leyland Cypress *Cupressocyparis leylandii* are dominant. The understory includes Dock *Rumex* spp, Rosebay	Local importance (Lower value)

Habitat	Comments	Ecological value (NRA guidelines)
	WIllowherb *Chamaenerion angustifolium*, Ivy *Hedera helix*, Cleaver *Galium aparine*, and Hedge Woundwort *Stachys sylvatica*. Treelines are dominated by Willow *Salix* species, Beech *Fagus sylvatica*, Sycamore *Acer pseudoplanatus*, and Hawthorn *Crataegus monogyna*. The understory consists of Nettle *Urtica dioica*, Bramble *Rubus fruticosus* and Ivy. The southern end of the proposed trail is flanked by patchy treelines adjacent to the N71. These are dominated by Beech, Sycamore, Willow and Hawthorn and Scots pine *Pinus sylvestris*. Although some of the trees within these treelines such as hawthorn and willow are mature, there are no large or over-mature trees with the potential to be of high value for roosting bats. The treelines occurring within the site are of local value for wildlife. These mature, native hedgerows can provide important habitats for local wildlife such as birds, insects, mammals and commuting routes and nesting habitat. This habitats in close proximity to road networks i.e. N71, can also provide useful screening for fauna from anthropogenic disturbance.	
Stone Walls and Other Stonework BL1	Old stone walls in the northern section of the study area. Species growing here include Harts Tongue *Asplenium scolopendrium*, Privet *Lugustrum* species, and Soft Shield Fern *Polystichum setiferum*. This habitat type is considered to be of local importance (lower value).	Local importance (Lower value)
Scattered Trees and Parkland WD5	This habitat is present within the West Cork Business and Technology Park to the west of the proposed walkway/cycle path. This habitat comprises species-poor grassy islands among the buildings and carparks, with planted trees. Species include Willow, Horse Chestnut *Aesculus hippocastanum*, patches of Gorse *Ulex europaeus*, and Scots Pine. This is a highly modified habitat which is dominated by a low number of species and has little value for wildlife.	Local importance (Lower value)
Other Artificial Lakes and Ponds FL8	A stagnant, triangular-shaped pond is located to the immediate west of the proposed walkway/cycle path within the boundaries of the West Cork	Local importance (Lower value)

Habitat	Comments	Ecological value (NRA guidelines)
	Business and Technology Park. A drainage ditch flows into this pond from the south. This habitat is choked with Fool's Watercress *Heloscadium nodiflorum*. Wooden walkways surround the pond which is artificial in construction and forms part of the surface drainage network for the park. This is a highly modified and disturbed habitat, with low species diversity and minimal ecological value.	
Depositing/Lowland Rivers FW2	The Templebryan South stream forms the southern border of the scrub/willow woodland area. This is a long, straight-cut section of waterway which has been highly modified. The channel is approximately 1m in width with no shade or overhanging vegetation and with well-defined riffle and pools. Banks are overgrown with low growing scrub vegetation. The Templebryan Stream is a tributary of the Argideen which has a salmonid population (see **section 7.7**).	Local importance (Higher value)
Drainage ditch FW4	A small drainage ditch from the artificial pond on the eastern boundary of the West Cork Business and Technology Park. Maximum width is 2mand the depth is approximately 30cm.. Banks are clear of vegetation and easily accessible. This habitat does not have links to Annex I habitats.	Local importance (Lower value)
Scrub WS1	Occurs at the eastern edge of the West Cork Business and Technology Park. Gorse is the dominant species, and overall canopy height is below 5m. Hawthorn, Willow and Bramble are also common. *Fuchsia* spp is occasional. These species can provide good habitat for invertebrates, birds and mammals, and this habitat type is considered to be of local importance.	Local importance (Lower value)
Scrub WS1/ Wet willow-alder-ash woodland WN6	this habitat occurs north of the Templebryan South stream where the ground is waterlogged.. Creeping Bent *Agrostis stolonifera* and Soft Rush *Juncus effusus* as well as *Climacium dendroides* moss are common. Scrub species such as Gorse and Bramble are also present.	Local importance (Lower value)
Improved Agricultural Grassland GA1	The dominant habitat on the eastern side of the main road. The species noted here are common and include Nettle, Dock, Soft Rush, Rosebay	Local importance (Lower value)

Habitat	Comments	Ecological value (NRA guidelines)
	Willowherb, Bramble, Hogweed and common grass species such as Yorkshire Fog *Holcus lanatus*, Perennial Ryegrass *Lolium perenne* and Cocksfoot *Dactylus glomerata*. This is a highly modified and disturbed habitat, with low species diversity and minimal ecological value.	

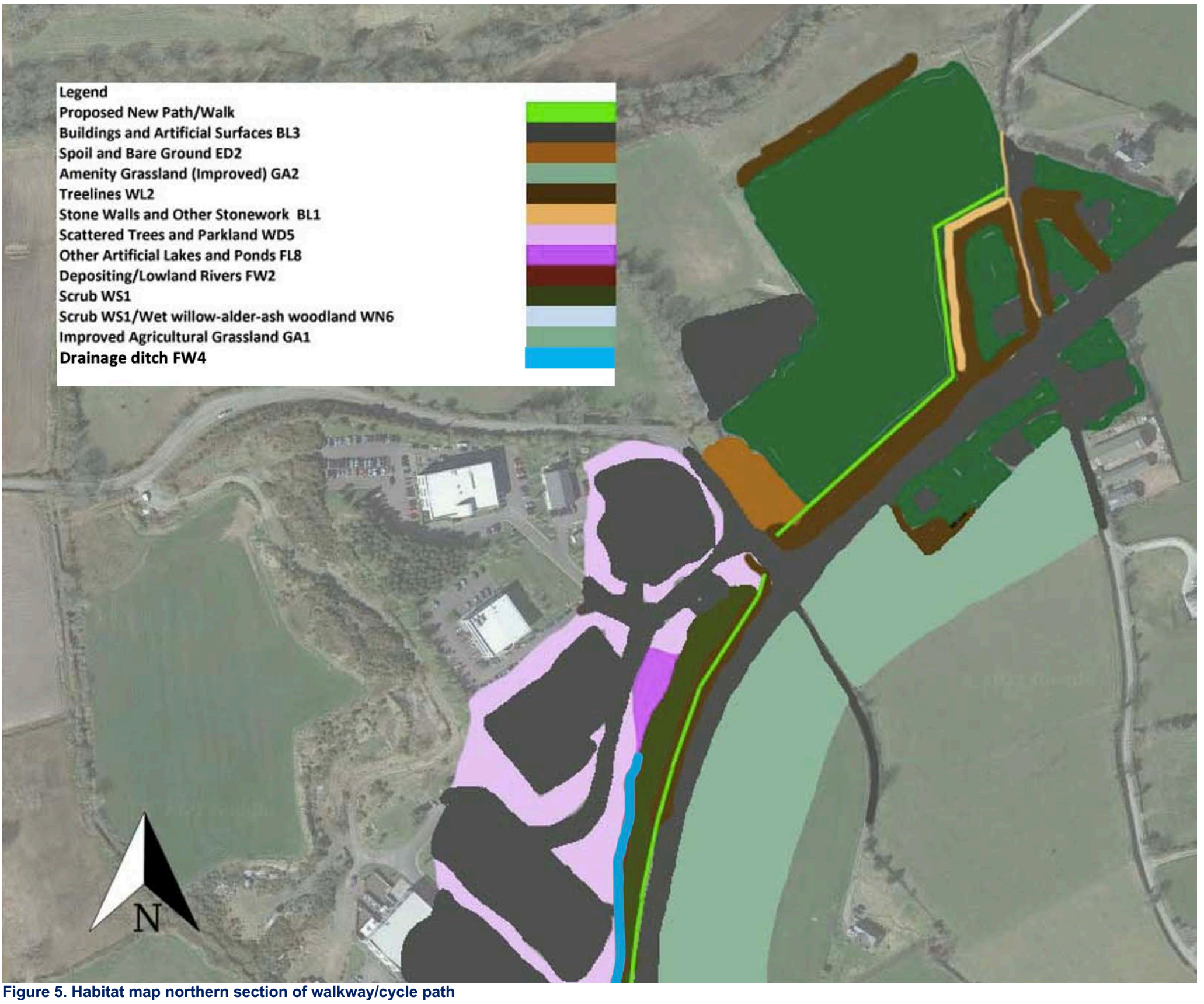


Figure 5. Habitat map northern section of walkway/cycle path

Figure 6. Habitat map southern section of walkway/cycle path

Photograph 1: Sports pitches near the Rugby club with treeline to the right.

Photograph 2. Scattered trees within the West Cork Business and Technology Park.

Photograph 3. Pond choked with vegetation.

Photograph 4. Drainage ditch flowing into the pond.

Photograph 5. Area of scrub vegetation.

Photograph 6. Looking towards wet willow-dominated woodland.

Photograph 7. Templebryan South stream flowing at the south end of the scrub/woodland.

Photograph 8. N71 running alongside the proposed route with agricultural fields to the east.

Photograph 9. Scrub and wetland north of the Templebryan South stream.

6. Flora

The site of the proposed development lies within Ordnance Survey National Grid 10km square W34. The National Parks and Wildlife Service (NPWS) rare plant database notes the presence of a single protected plant species within grid square W34; Penny Royal *Mentha pulegium*. This species is protected by the Flora Protection Order 2015 (S.I. No. 356 of 2015)). This species was not recorded within study area during site survey.

The National Biodiversity Data Centre (NBDC) online database provides data on the distribution of mammals, birds, and invertebrates within the 10km grid squares. Some 199 flowering plants are listed by the NBDC as present in the grid square W34. **Table 4** lists threatened species and designations recorded in W34. No rare species were recorded during

the site survey, nor are they expected to occur given that the habitats within the works area are common.

Table 4. NBDC flowering and endangered flowering plants for grid square W34.

Flowering plant Species	Latin Name	Designations
Penny Royal	*Mentha pulegium*	Protected Species: Flora Protection Order & Threatened Species: Endangered

Source: NBDC 10/11/21

7. Fauna

7.1 Otter

Otters *Lutra lutra*, along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Direct which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

Although rare in parts of Europe they are widely distributed in the Irish countryside in both marine and freshwater habitats. Otters are solitary and nocturnal and as such are rarely seen. Thus, surveys for Otters rely on detecting signs of their presence. These include spraints (faeces), anal gland secretions, paths, slides, footprints and remains of prey items. Spraints are of particular value as they are used as territorial markers and are often found on prominent locations such as grass tussocks, stream junctions and under bridges. In addition, they are relatively straightforward to identify.

Otters occasionally dig out their own burrows but generally they make use of existing cavities as resting placing or for breeding sites. Suitable locations include eroded riverbanks, under trees along rivers, under fallen trees, within rock piles or in dry drainage pipes or culverts etc. If ground conditions are suitable the holt may consist of a complex tunnel and chamber system. Otters often lie out above ground especially within reed beds where depressions in the vegetation called “couches” are formed. (NRA 2008). Generally, holts or resting areas can be located by detecting signs such as spraints or tracks.

In contrast natal holts which are used by breeding females can be extremely difficult to locate. They are often located a considerable distance from any aquatic habitats and Otters may also use habitats adjoining small streams with minimal or no fish populations. In addition, natal holts are usually carefully hidden and without obvious sprainting sites. Otters do not have a well-defined breeding season.

It is noted that Otters are largely nocturnal, particularly in areas subject to high levels of disturbance as evidenced by the presence of Otters in the centre of Cork and Limerick City. Thus, Otters are able to adapt to increased noise and activity levels; however, breeding holts are generally located in areas where disturbance is lower.

A review of existing records within a 10km radius of the study site (Grid Square W34) showed that Otter or signs of Otter have been recorded on eight occasions, the most recent being in December 2010. Otter could forage within the Templebryan South Stream near the southern boundary of the site and within Gallanes Lake, located to the approximately 250m south of the proposed walkway/cycle path provide suitable habitat for this species. Smooth Newt are known to occur in the vicinity of the existing Clonakilty Greenway and could potentially utilise the drainage ditch and artificial pond at the West Cork Business and Technology Park. Smooth Newt species are prey species for Otter (Parry *et al.* 2015). However, no signs of Otter were recorded during the site survey and no signs of Otter (i.e. spraints, track, holts, couches, feeding signs etc.) were recorded within 150m of the proposed development site. Overall the proposed development site is of Local importance (Lower value) for Otter.

7.2 Bats

In Ireland, nine species of bat are currently known to be resident. These are classified into two Families: the *Rhinolophidae* (Horseshoe bats) and the *Vespertilionidae* (Common bats). The lesser horseshoe bat *Rhinolophus hipposideros* is the only representative of the former Family in Ireland. All the other Irish bat species are of the latter Family and these include three pipistrelle species: common *Pipistrellus pipistrellus*, soprano *Pipistrellus pygmaeus* and Nathusius' *Pipistrellus nathusii*, four *Myotids*: Natterer's *Myotis nattereri*, Daubenton's *Myotis daubentonii*, whiskered *Myotis mystacinus*, Brandt's *Myotis brandtii*, the brown long-eared *Plecotus auritus* and Leisler's *Nyctalus leisleri* bats.

Whiskered and Natterer's bats are listed as '*Threatened in Ireland*', while the other species are listed as 'Internationally Important' in the Irish Red Data Book 2: Vertebrates (Whilde, 1993). The population status of both Whiskered and Natterer's bats was considered '*indeterminate*' because of the small numbers known of each, a few hundred and approximately a thousand respectively. Ireland is considered to be an international stronghold for Leisler's bat, whose global status is described as being at '*low risk, near threatened*' (LR; nt) by the IUCN (Hutson, *et al*., 2001).

Near threatened status is applied to those taxa that are close to being listed as vulnerable (facing a high risk of extinction in the wild in the medium-term future on the basis of a range of criteria defined by the IUCN). The Irish population of the Lesser Horseshoe Bat is estimated at 14,000 individuals and is considered of International Importance because it has declined dramatically and become extinct in many other parts of Europe. Data collected shows that the species increased significantly between from the early 1990's to present.

All bat species are protected under the Wildlife Acts (1976 & 2000) which make it an offence to wilfully interfere with or destroy the breeding or resting place of all species; however, the Acts permit limited exemptions for certain kinds of development. All species of bats in Ireland are listed in Schedule 5 of the 1976 Act and are therefore subject to the provisions of Section 23 which make it an offence to:

- Intentionally kill, injure or take a bat;
- Possess or control any live or dead specimen or anything derived from a bat;
- Wilfully interfere with any structure or place used for breeding or resting by a bat; or

- Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose.

All bats are listed on Annex IV of the EU Habitats Directive. The domestic legislation that implements this Directive gives strict protection to individual bats and their breeding and resting places. It should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS. Furthermore, on 21st September 2011, the Irish Government published the European Communities (Birds and Natural Habitats) Regulations 2011 which include the protection of the Irish bat fauna and further outline derogation licensing requirements.

In addition to domestic legislation bats are also protected under the EU Habitats Directive (92/43/EEC) with all bat species are listed in Annex IV of the Directive. Lesser Horseshoe Bat is s further listed in Annex II of the EU Habitats Directive The level of protection offered to Lesser Horseshoe Bats effectively means that areas important for this species are designated as Special Areas of Conservation. The domestic legislation that implements this Directive gives strict protection to individual bats and their breeding and resting places. It should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate under the European Communities (Birds and Natural Habitats) Regulations 2011 (which transposed the EU Habitats Directive into Irish law) issued by the National Parks and Wildlife Service (NPWS). These designations are usually roost or hibernacula centered and focus on large roosting sites for the species, usually with >50 individuals in winter or >100 individuals in summer.

The review of existing bat records, in proximity to the study site showed that the following Irish bat species have been recorded locally (**Table 5**). Lesser Horseshoe Bat, which was not listed, is the only species of bat listed on Annex II of the Habitats Directive. It is noted that other species which have not been included within this database may also occur.

Table 5. Presence of Irish bat species within grid square W34.

Common name	Scientific name	Presence
Lesser Noctule	*Nyctalus leisleri*	Present
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	Present

Source NBDC 10/11/21

A study by Lundy *et al*. (2011) examined the relative importance of landscape and habitat associations across Ireland. Maximum Entropy Models (MEM) were constructed for each bat species using records from the National Bat Database from 2000-2009. This method allows species' records that have not been collected in a systematic survey to be analysed. The results help explain patterns of species' occurrence and predict where species might occur. Landcover (CORINE), topography, climate, soil pH, riparian habitat and human bias factors were incorporated into the models. The analyses provide a picture of the broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species. This also provides a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats.

The habitat indices for all Irish bats for the landscape at the proposed development site is shown in **Table 6.**

Table 6. Model Predicted Habitat suitability indices for All Irish bat species

Bat species	Common Name	Habitat indices
All Bats		27.89
Pipistrellus pygmaeus	Soprano pipistrelle	37
Plecotus auritus	Brown long-eared bat	43
Pipistrellus pipistrellus	Common pipistrelle	37
Rhinolophus hipposideros	Lesser horseshoe	2
Nyctalus leisleri	Leisler's bat	34
Myotis mystacinus	Whiskered bat	32
Myotis daubentonii	Daubenton's bat	24
Pipistrellus nathusii	Nathusius' pipistrelle	6
Myotis nattereri	Natterer's bat	36

Source: NBDC 10/11/21

Bats generally make use of large mature trees that contain natural holes, cracks/splits in major limbs, loose bark, hollows/cavities, dense epicormic growth (bats may roost within it) and bird and bat boxes. The importance of trees to bats varies with species, season and foraging behaviour. For Leisler's bats, trees are essential for both summer and winter roosts while Daubenton's and Natterer's bats utilise trees more often during the summer months. Other species such as brown long-eared bats and pipistrelle bats avail of trees in the winter months. In general, individual males throughout the season use tree roosts, more often, while females will use trees for temporary night roosts or night perches for consuming prey. Hollow trees are widely used by bats for both summer and winter roosts (weather dependent) and bats will roost in 'sound' trees in crevices, holes and under split bark. Bats rest, give birth, raise young and hibernate in tree holes, crevices and beneath loose bark. Species of trees utilised by bats include oak, ash, beech and Scots pine. No buildings and no mature trees with potential for bat roosts are located within the proposed development.

Trees, especially native ones also play host to numerous insect species which are prey items for bat species. Trees also provide shelter for swarming insects which bats will avail of. In addition, trees are important commuting routes for bats. A gap in a hedge/treeline of greater than 10m may force some species of bats to seek an alternative commuting route.

Bats may forage and commute along the treelines and scrub habitat and therefore the proposed development site may be of local value for feeding bats. Treelines and scrub/woodland habitat at the site provide potential foraging habitat for bats. Bat activity surveys were not carried out at the proposed development site as the survey period was outside the survey season for bats. However a bat emergence survey was carried out at a dwelling to the north of Gallanes Lake approximately 480m southwest of the proposed

development site in August 2018, as part of the planning application for the other sections of the Gallanes walkway/cycle path (DixonBrosnan 2018). This survey recorded four species of bat i.e. Soprano Pipistrelle, Brown Long-Eared Bat, Common pipistrelle and Leisler's bat. It was concluded that Soprano Pipistrelle and Brown Long-eared Bat were roosting in this building. A bat activity survey along the treelines to the south of Gallanes Lake to the immediate southwest of the proposed development site, also during August 2018, recorded four species foraging along this habitat i.e. Common pipistrelle, Soprano pipistrelle, Leisler's bat and Daubenton's Bat. Bat species recorded in the vicinity of Gallanes Lake are likely to forage along treelines/scrub habitat of the southern section of the proposed walkway/cycle path. Although the site is located in the vicinity of residential/industrial developments, illumination of the southern section of the site is currently low and the site contains dark areas which could provide bat foraging habitat. However, lighting in the vicinity of the Clonakilty Rugby Club and West Cork Business and Technology Park (including floodlighting at the Rugby Club and lighting of the junction on the N71) means bats are less likely to forage on the northern section of the proposed walkway/cycle path.

Overall the proposed development are unlikely to provide significant foraging habitat bats.

7.3 Other terrestrial mammals

Ten other species of terrestrial mammal have been recorded within a 10km radius of the proposed development site. Six of which are protected under the Irish Wildlife Act; namely Badger *Meles meles*, Pygmy Shrew *Sorex minutus*, Irish Hare *Lepus timidus subsp. hibernicus*, Irish Stoat *Mustela erminea subsp. hibernica*, Sika Deer *Cervus nippon* and Hedgehog *Erinaceus europaeus*.

7.3.1 Badger

Badgers their setts are protected under the provisions of the Wildlife Act 1976, as amended, and it is an offence to intentionally, knowingly or unknowingly kill or injure a protected species, or to willfully interfere with or destroy the breeding site or resting place of a protected wild animal. Badger setts are formed by a complex group of interlinked tunnels, and therefore works in proximity to setts can potentially cause damage a protected species. Badgers are also protected under Appendix III of the Berne. Badgers are known to occur within the wider landscape (NBDC). However, no signs of Badger, setts or otherwise were recorded during the site visit and the site is of negligible value for this species.

7.3.2 Sika Deer

Sika Deer prefer forest with dense understorey, thickets, natural woodlands and commercial plantations, but will also forage in open grassy areas with dense cover nearby. Sika Deer are highly opportunistic feeders, foraging on grasses to a range of shrubs and tree species. However, no signs of Sika Deer were recorded during the site visit and the site is of negligible value for this species.

7.3.3 Pygmy Shrew

Pygmy Shrew is common throughout mainland Ireland and has a preference for habitats such as hedgerows and grasslands; they have also been found utilizing stone walls. Due to the

habitats present within the proposed site it is possible that Pygmy Shrew may occur. The site is of Local importance (Lower Value) for Pygmy Shew.

7.3.4 Hedgehog

Hedgehog is also listed on Appendix III of the Berne Convention can be found throughout Ireland, with male Hedgehogs having an annual range of around 56 hectares. Generally, Hedgehogs prefer edge habitat and pasture but in recent years have begun to colonize urban areas. It is likely that Hedgehog will occur within the proposed development site. The site of Local importance (Lower Value) for Hedgehog.

7.3.5 Irish hare

Irish Hare is one of three lagomorphs found on the Island of Ireland and the only native lagomorph. It is listed on Appendix III of the Berne Convention, Annex V(a) of the EC Habitats Directive (92/43/EEC) and as an internationally important species in the Irish Red Data Book.

The Irish hare is adaptable and lives in a wide variety of habitats from heaths, upland grasslands to coastal sand dune systems. It typically reaches its highest densities on farmland, particularly where there is a mix of grassland and arable fields along with hedgerows and other cover. Hare are likely to occur in the vicinity but the proposed development site is of negligible value for this species.

7.3.6 Irish Stoat

Irish Stoat is one of the species protected under regulations (Protection of Wild Animals) in 1980 which enabled Ireland to comply with the provisions of the Bern Convention of European Wildlife and Natural Habitats, which was ratified by Ireland in April 1982. Irish stoats occur in most habitats with sufficient cover, including urban areas. It is likely that stoat will occur in this area. The site of Local importance (Lower Value) for Irish Stoat.

7.4 Reptiles and Amphibians

According to records held by the NBDC, Common Frog *Rana temporaria* is the only amphibian recorded in grid square W34. Common Frog is listed in Annex V of the EU Habitats Directive and is protected under the Wildlife Acts. The species was recorded during the site visit, within an area of Bullrush along the margins of Gallanes Lake and could potentially occur within the drainage ditch and artificial pond in the West Cork Business and Technology Park.

Smooth Newt, is commonly encountered near waterbodies, adult newts are actually terrestrial, only returning to water bodies to breed, although the NBDC has no records of this species within W34.

Smoot Newt *Lissotriton vulgaris* can be found in a diversity of terrestrial and aquatic habitats including uplands, woodlands, marshland, farmland, open moorland and urban areas. They are also widespread in agricultural lowlands (O'Neil *et al*., 2004).

Courting, mating and egg-laying occur both day and night during the breeding season March - June (Inns, 2009). Females conceal each of their several hundred eggs individually in the folds of broad-leaved vegetation in or near the water using their hind feet. The eggs take two weeks to hatch, and are often rarely seen in the field. Larvae are solitary and secretive

remaining near the waterbody bottom to avoid predation by birds and mammals. They develop slowly with the majority emerging between July and September (Inns, 2009). During the breeding season males are distinguished from females based on the presence of a conspicuous dorsal crest and heavily and darkly spotted throat (Inns, 2009).

Smooth Newts hibernate on land during the winter months (under logs, hedgerows, or other well-hidden sites), returning to wetlands sites to breed in February and March, remaining there until June (O'Neil *et al.,* 2004; Inns, 2009). Breeding habitats are also variable, but typically include waterbodies with still or very slow flowing water and range from large lakes, to small and medium ponds and densely weeded ditched (O'Neil *et al*., 2004; Buckley, 2012). Generally newts are more likely to be found in ponds (non-linear) than ditches (linear), with small ponds (<200m^2) between 0.5-1.0m deep and partly vegetated being the ideal breeding habitat for Smooth Newts (O'Neil *et al.,* 2004). The most recent national Irish survey of Smooth Newts undertaken by the Irish Wildlife Trust in 2012 following a pilot study in 2010 found that the Smooth Newt remains relatively widespread throughout the Irish Republic (Buckley, 2012). Smooth Newt use the areas in the vicinity of the existing walkway/cycle route (Dr. Sorcha Sheehy pers. comm). They are unlikely to breed within the drainage ditch adjacent to the West Cork Business and Technology Park due to the fast flows. The artificial pond may provide some breeing habitat for newt. However, this pond is unlikely to provide valuable breeding habitat due to its depth (>1m) and the high nutrient content of the water (as evidenced by the level of vegetation). The proposed development site is of Local importance (Lower value) for amphibian species.

Common Lizard *Zootoca vivipara* is protected under the Wildlife Act. is Ireland's only native terrestrial reptile and is so protected under the Wildlife Act. Unlike the vast majority of reptiles, it has been found that the common lizard often frequents damp habitats, as the humidity has a beneficial effect on growth rate and activity. Ideal habitats for the species are south-facing, damp tussocky grassland, scrub covered hillsides, dunes or banks, and woodland tracks, and it also resides in peat bogs, dry grasslands and heathlands. The species is tolerant, to a degree, of habitat disturbance (it may even use artificial habitats, e.g., railway embankments, hedgerows, and gardens. This species was not recorded during site surveys. The proposed development site is of negligible value for Common Lizard.

7.5 Birds

Bird surveys for general bird usage were carried out in conjunction with habitat surveys along the proposed walkway/cycle path on the 4th of November 2021.

Bird species listed in Annex I of the Birds Directive are considered a conservation priority. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation (Gilbert *et al*. 2021). Green listed species are regularly occurring bird species whose conservation status is currently considered favourable. Species recorded within the proposed development footprint which were recorded during habitat surveys are shown in **Table 7**.

Table 7. Bird Species recorded during site survey

Species		Birds Directive Annex	BOCCI	
Common name	***Latin name***	**I**	**Red List**	**Amber List**
Wood Pigeon	*Columba palumbus*			
Goldfinch	*Carduelis carduelis*			
Hooded Crow	*Corvus cornix*			
Raven	*Corvus corax*			
Chaffinch	*Fringilla coelebs*			
Rook	*Corvus frugiligus*			
Wren	*Troglodytes troglodytes*			
Dunnock	*Prunella modularis*			

The proposed development site is of local value for a range of terrestrial bird species that are relatively common in the Irish countryside. Trees and scrub habitat provide nesting and roosting habitat for birds. Gallanes Lake, the west of the site is known to attract a range of aquatic bird species including Lapwing *Vanellus vanellus*, Curlew *Numenius arquata* and Mute Swan *Cygnus olor*. However, there are no habitats within the proposed development site which provide habitat for aquatic bird species. The proposed development site is of Local importance (lower value) for birds.

7.6. Invasive Species

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and/or re-growth from plant fragments; (2) rapid growth patterns; and, (3) resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and, (3) have an adverse effect on landscape quality.

The NBDC lists a number of both aquatic and terrestrial high impact invasive species from grid square W34 (**Table 8**).

Table 8. NBDC list of high impact invasive species.

Common Name	Latin Name
Japanese Knotweed	*Fallopia japonica*
Rhododendron	*Rhododendron ponticum*
Canadian Waterweed	*Elodea canadensis*
Indian Balsam	*Impatiens glandulifera*
New Zealand Flatworm	*Arthurdendyus triangulatus*

Source NBDC database 10/11/21

The control of invasive species in Ireland comes under the Wildlife (Amendment) Act 2000, where it states that

'Any person who— [...] plants or otherwise causes to grow in a wild state in any place in the State any species of flora, or the flowers, roots, seeds or spores of flora, ['refers only to exotic species thereof'][...] otherwise than under and in accordance with a licence granted in that behalf by the Minister shall be guilty of an offence.'

The Birds and Natural Habitats Regulations 2011 (SI 477 of 2011), Section 49(2) prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed *Fallopia japonica* as follows: "any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence."

The Third schedule species Japanese Knotweed was recoded within a treeline at the West Cork Business and Technology Park to the west of the proposed development site. There is an area on the opposite side of the scrub/hedgerow at this point which has been treated for knotweed in the past (**Figure 7**).

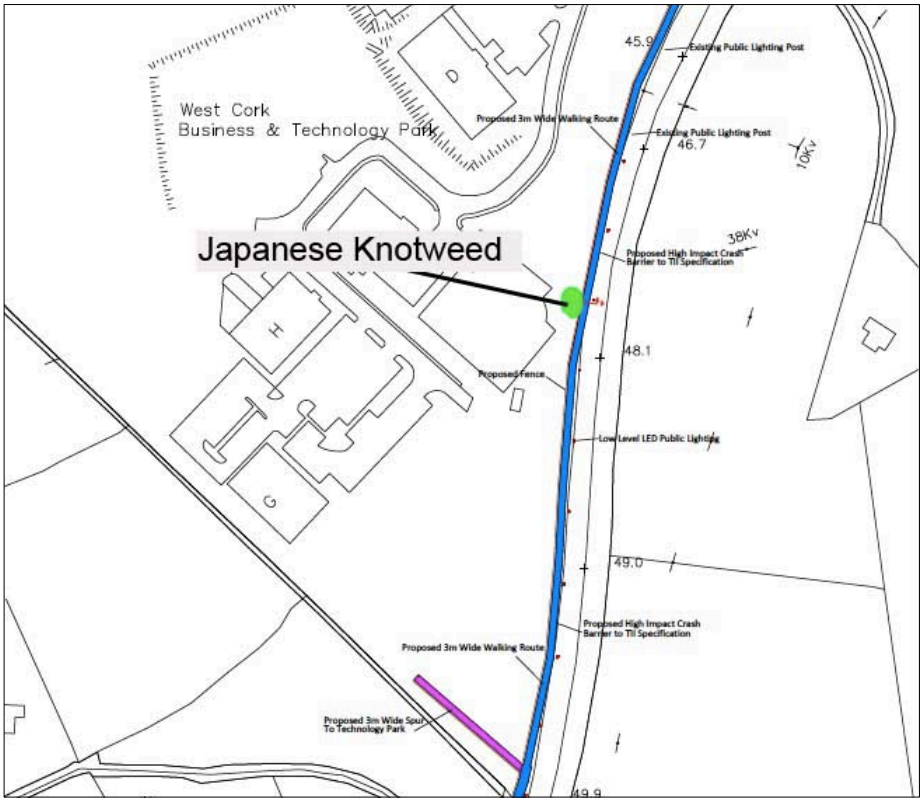


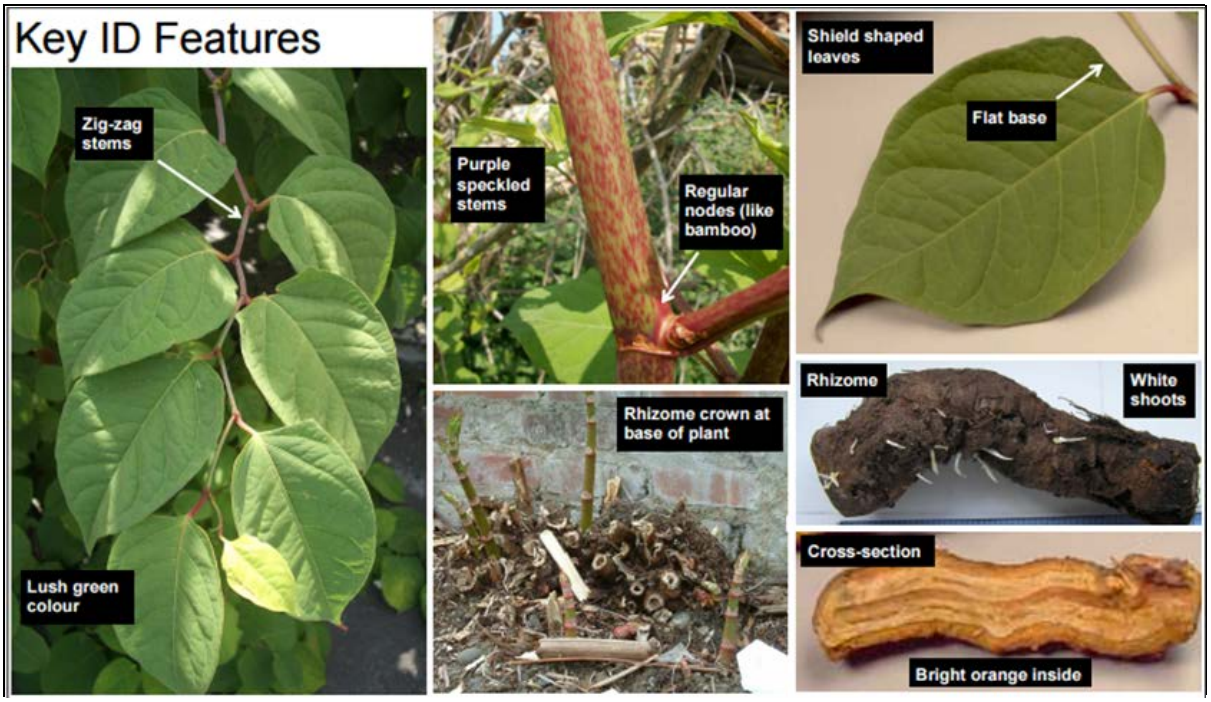
Figure 7. Location of Japanese Knotweed in the vicinity of the proposed walkway/cycle path

Japanese knotweed is a highly invasive, non-native species which was originally introduced as an ornamental plant but has since spread along transport routes and rivers to become a serious problem. From an ecological viewpoint it out-competes native species by forming dense stands which suppresses growth of other species. It grows extremely vigorously and can penetrate through small faults in tarmac and concrete and thus can damage footpaths, roads and flood defence structures. As it can survive in poor quality soils, including spoil, it often thrives in brownfield sites and in urban areas. The key features of the plant are summarised below:

- Produces fleshy red tinged asparagus like shoots when it first breaks through the ground in an established stand.
- Has large, heart or spade-shaped green leaves which are approximately the size of your hand.
- Has leaves arranged in a zig-zag pattern along the stem.
- Grows up to 3 metres in height.
- Yellow / cream flowers in late summer (Typically the start forming from late July onwards).
- Hollow bamboo like stems which have distinctive ring like nodules at regular intervals along it.
- Brown stem remain in winter once it has died back.
- Extensive rhizome system (roots) (7m radius x 3m depth approximately)

- Orange centred rhizome.
- Spread entirely via the movement of plant and rhizome fragments.

The plant has woody underground rhizomes which can extend 7m laterally from a parent plant. The leaves and stems die back during winter, but growth is extremely rapid during spring. The plants spread mainly through fragments of rhizomes -as little as 0.7g of material or the size of a small fingernail is sufficient-and through cut stems. Stem material cannot regenerate once it has dried, but rhizome material may be viable for up to 20 years in the soil. Thus, control of this species is very difficult. The characteristics of this species is shown in **Photograph 10**.



Photograph 10. Key identification features of Japanese Knotweed.

7.7 Other species

A search of the NBDC database was carried out to determine if any protected, rare or notable species of invertebrates within 2km of the proposed development site (W34X and W34W).

Two threated species have been recorded within W34W i.e. Gatekeeper *Pyronia Tithonus* and Wall *Lasiommata megera*. During the habitats survey no rare or notable species of invertebrate were observed within the application site. Whilst no site is without invertebrate interest, it is considered unlikely, given the habitat types, that the proposed development site would support any protected invertebrate species. While the loss of some grassland habitat and/or early successional species at the site may lead to a short-term loss of invertebrate foraging habitat the retention of dry meadows and grassy verges habitat as well as treelines/ and scrub likely to maintain some habitat for invertebrate species at the site.

A number of threated bryophyte species have been recorded within W34W i.e. mosses and liverworts. However, no notable species of bryophyte were recorded during site surveys.

The Templebryan South stream is a tributary of the Argideen River. The Argideen River is known to support Salmon *Salmo salar* as well as Minnow *Phoxinus phoxinus*, European eel *Anguilla anguilla*, Brown Trout *Salmo trutta*, Stoneloach *Barbatula barbatula* and 3-spined stickleback *Gasterosteus aculeatus* (CRFB 2009).

8. Water Quality

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin Management Plan (RBMP) is to set out priorities and ensure that implementation is guided by these priorities.

The second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former measure has resulted in significant progress in terms both of compliance levels, and of the impact of urban waste-water on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that sufficient progress has not been made in developing and implementing supporting measures during the first cycle.

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are At Risk of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the watercourses within the study area is provided in **Table 9**. The relevant waterbodies are shown below in **Figure 8**. It is noted that limited date from the 3rd cycle of the RBMP have been released through the EPA envision mapping portal and these are reported below where relevant. There has been no change in the status of local waterbodies since between the 2nd cycle and 3rd cycle.

Table 9. Water Framework Directive Data – Relevant data

Bandon Ilen (HA 20) – 2nd cycle		
This catchment includes the area drained by the Rivers Bandon and Ilen and all streams entering tidal water between Templebreedy Battery and Mizen Head, Co. Cork, draining a total area of 1,803km². The largest urban centre in the catchment is Bandon. The other main urban centres in this catchment are Kinsale, Clonakilty, Skibbereen and Dunmanway. The total population of the catchment is approximately 71,211 with a population density of 39 people per km². Similarly to the surrounding Munster catchments, this catchment is dominated by east–west trending sandstone ridges. In this catchment the low lying parts are predominantly underlain by mudstones and the mountainous peninsular areas by old red sandstone.. **The proposed development site is located within the Argideen_SC 010 sub catchment. All water bodies within this subcatchment are NOT AT RISK..**		
Sub-catchment: Argideen SC_010		
Name	**Status**	**Risk**
Argideen_030	Good	Not at risk
Argideen_040	Good	Not at risk

Source: wfdireland map system & www.catchments.ie

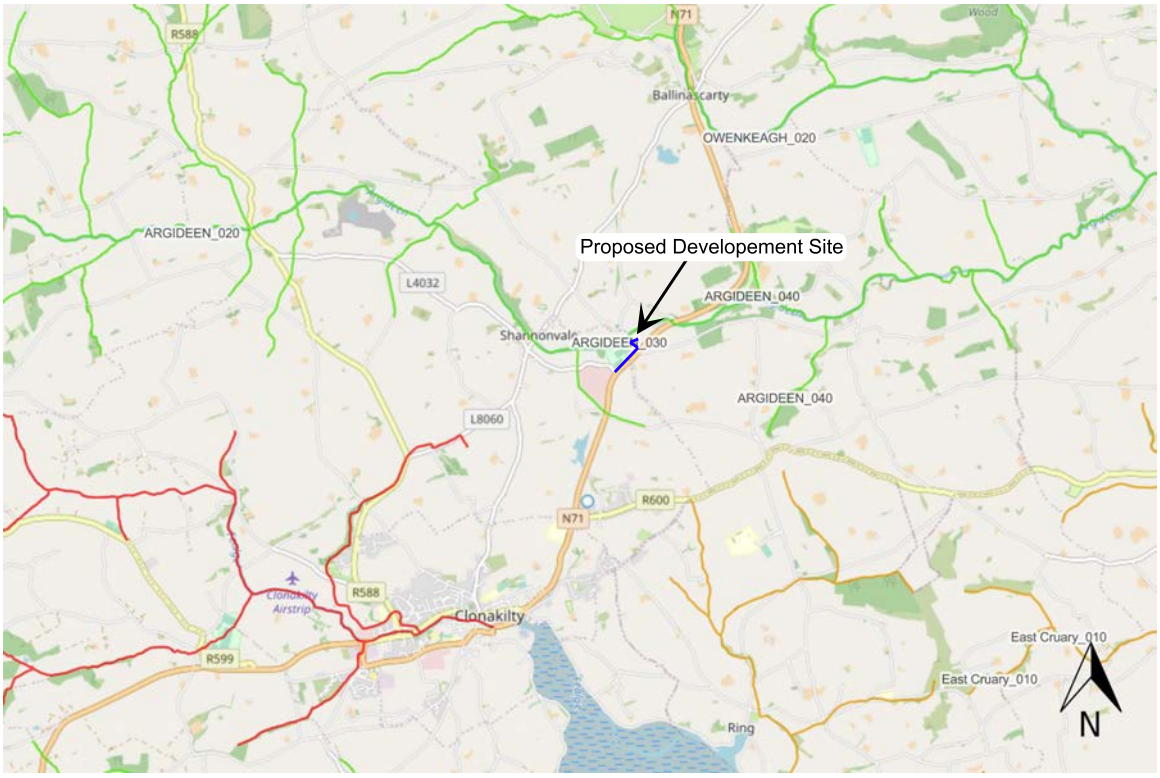


Figure 8. WFD catchments (3rd cycle) in the vicinity of the proposed development site Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | not to scale

9. Evaluation of Potential Impacts

During construction, potential impacts could arise from increased noise and disturbance which could result in the disturbance/displacement of birds and mammals. While there will be some loss of common habitats i.e. treelines, grassland, spoil and bare ground. Increased traffic and

noise associated with the site works could potentially increase levels of disturbance which could result in the disturbance/displacement of birds and mammals. Increased dust levels during construction could have localised impacts on vegetation and habitats.

Discharges of silt, were they to occur through inadequate control of surface water run-off, could impact on fisheries habitat and aquatic ecology in local waterbodies. Minor spills of hydrocarbons during construction could impact on groundwater or surface water quality with resultant impacts on aquatic ecology.

Potential impacts on designated European sites (SAC/cSAC/SPA) are specifically addressed in an Appropriate Assessment Screening Report which have been submitted as part of this application.

9.1 Do Nothing' Impact

Most of the habitats to be affected have been significantly modified from the natural state by human activity. If habitats were left unmanaged a general pattern of succession from grassland to scrub would be expected to occur. If sufficient time elapsed without development, the unused areas of the proposed development area would be expected to develop a covering of woodland with a mix of native and introduced species.

9.2 Impact Appraisal

When describing changes/activities and impacts on ecosystem structure and function, important elements to consider include positive/negative, extent magnitude, duration, frequency and timing, and reversibility (IEEM, 2018).

Section 3.7 of the *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'*, (EPA, August 2017) provides standard definitions which have been used to classify the effects in respect of ecology. This classification scheme is outlined below in **Table 10**.

Table 10. EPA Impact Classification

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment.
Significance	Imperceptible	An effect capable of measurement but without significant consequences.
	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends.
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.

Impact Characteristic	Term	Description
Duration and Frequency	Momentary Effects	Effects lasting from seconds to minutes.
	Brief Effects	Effects lasting less than a day.
	Temporary Effects	Effects lasting less than a year.
	Short-term	Effects lasting one to seven years.
	Medium-term	Effects lasting seven to fifteen years.
	Long-term	Effects lasting fifteen to sixty years.
	Permanent	Effects lasting over sixty years.
	Reversible Effects	Effects that can be undone.
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.
	'Worst Case'	The effects arising from a development in the case where mitigation measures substantially fail.

10. Potential Impacts on Terrestrial Habitats

Impacts on terrestrial habitats are generally restricted to direct removal of habitats. Indirect impacts may occur via damage and disturbance arising from vehicular activities and storage of overburden and materials. Levels of dust during construction are predicted to be low and effectively managed by mitigation. The impact on vegetation in adjoining habitats from wind-blown dust is predicted to be imperceptible. No rare floral species were recorded within the study area. Based on the criteria outlined by EPA, 2017, as described above, the predicted impacts are detailed in **Table 11.** No Annex I terrestrial habitats or other high value terrestrial habitats will be directly or indirectly impacted. It is noted that impacts on qualifying species and habitats within nearby Natura 2000 sites are specifically addressed by the AA screening for this development.

Table 11. Predicted impacts as a result of the proposed development

Habitat	Ecological value (NRA guidelines)	
Buildings and Artificial Surfaces BL3	Local importance (Lower value)	Small areas of this habitat may be impacted. Imperceptible impact
Spoil and bare Ground ED2	Local importance (Lower value)	Small areas of this habitat may be impacted. Imperceptible impact
Amenity Grassland (Improved) GA2	Local importance (Lower value)	Small areas of this habitat may be impacted.

Habitat	Ecological value (NRA guidelines)	
		Imperceptible impact
Treelines WL2	Local importance (Lower value)	Small areas of this habitat may be impacted. However the majority of this habitat will be maintained. Negative, slight, long term
Stone Walls and Other Stonework BL1	Local importance (Lower value)	Small areas of this habitat may be impacted. Imperceptible impact
Scattered Trees and Parkland WD5	Local importance (Lower value)	Small areas of this habitat may be impacted. Imperceptible impact
Other Artificial Lakes and Ponds FL8	Local importance (Lower value)	This habitat will not be impacted
Depositing/Lowland Rivers FW2	Local importance (Higher value)	This habitat will not be impacted
Drainage ditch FW4	Local importance (Lower value)	This habitat will not be impacted
Scrub WS1	Local importance (low value)	Small areas of this habitat may be impacted. However the majority of trees and scrub habitat will be maintained. Negative, slight, long term
Scrub WS1/ Wet willow-alder-ash woodland WN6		Small areas of this habitat may be impacted. However the majority of trees will be maintained. Negative, slight, long term
Improved Agricultural Grassland GA1	Local importance (low value)	Small areas of this habitat may be impacted. However Imperceptable impact

10.1 Invasive Species

The Birds and Natural Habitats Regulations 2011 (SI 477 of 2011), Section 49(2) prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed and Himalayan Balsam, as follows: “any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence.”

The spread of Japanese Knotweed outside its current distribution could potentially impact on local ecology. The area supporting this species will be fenced off at a distance of 7m prior to

the commencement of works and this area will remain undisturbed for the duration of site works. Thus, no ecological impact from the spread of this species is predicted to occur.

11. Potential Impacts on Fauna

11.1 Otter

There are no records of the Otter in the vicinity of the proposed development site and no signs of Otter recorded during site visits. Otter are likely to use Gallanes Lake to the south west of the site and may forage in the Templebryan South stream. Otter could potentially pass through the proposed development site while travelling between foraging/breeding grounds. The proposed works will result in an increase in noise and disturbance during the construction phase during daytime hours. However, given Otter's largely nocturnal habits, ability to move away from short-term disturbance and ability to habituate to anthropogenic noise and disturbance, the impact on Otter during construction will not be significant.

Increased noise and disturbance will also occur during recreational usage of the walkway/cycle path and this has the potential to cause localised disturbance/displacement of this species. Whilst increased recreational usage could theoretically disrupt feeding patterns, it is noted that Otters are largely nocturnal, particularly in areas subject to high levels of disturbance as evidenced by the presence of Otters in the centre of Cork and Limerick City. Thus, Otters are able to adapt to increased noise and activity levels. In relation to breeding habitat, no Otter holts were noted during the site surveys. It is therefore concluded that the long-term impact on this species will be negative, slight and long-term.

11.2 Bats

There are no buildings or mature trees recorded within the proposed development site which would provide suitable roosting sites for bats. The treelines at the site may provide commuting/foraging routes for local bat populations and connect the site to foraging habitat outside the site boundary. Treelines along the walkway/cycle path will be largely retained, the removal of the internal hedgerow/treeline will not lead to a loss of connectivity for foraging bats.

Lighting deters some bat species in particular Myotis species, from foraging. Studies have shown that illumination levels as low as 0.06 lux can influence the behaviour of bats. Even a full moon night (0.02 lux) can reduce bat activity within more sheltered, darker wildlife corridors and foraging areas (e.g., treelines). It is noted that pipistrelle species appear to be more tolerant of light and disturbance (Speakman 1991; Stones et al. 2009; Haffner 1986). All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Many species of bats are known to sample the light levels before emerging from their roost; only emerging for their night's hunting when the light intensity outside reaches a critical level after sunset (Swift 1980). When bats emerge from roosts early in the evening, they tend not to echolocate but rely on eyesight to fly from the roost to adjoining treelines or hedgerows. Where there is too much luminance near exist points, a bats vision can be reduced resulting in disorientation. Light near a roost access point will delay bats from emerging and shorten the amount of time available to them for foraging. Any delays of emergence can reduce feeding periods and affect the overall survival rate of bats. Bright light may reduce social flight activity and cause bats to move away from the light area to an alternative dark area. Illuminating a bat roost creates disturbance and may cause the bats to desert the roost. In

addition to causing disturbance to bats in the roost, artificial lighting can also affect the feeding behaviour of bats. In most bat species, there is an evening period of activity followed by another at dawn. These two flights correlate with the peak flight times of nocturnal insect prey. Insects are attracted to light particularly if it is a single light source in a dark area. Artificial lighting can also increase the chances of predation. It is believed that Myotis species shun bright light as a predator avoidance strategy. Many avian predators will hunt bats which may be one reason why bats avoid flying in the day. Lighting can be particularly harmful to bat populations along river corridors, woodland edges, along hedgerows and treelines and at lake edges.

As construction works will largely be confined to daytime hours, lighting during the construction phase will be minimal and there will no impact on foraging bats.

During operation, lighting at the site will increase from current levels, particularly on the southern section of the walkway/cycle path. This may result in a loss of dark areas for foraging bats. Bats are likely to continue to forage in dark areas within and adjacent to the proposed development site.

It is noted that as part of the landscape plan for the development, boundary treelines at the site will be retained. This will minimise light spillage onto the adjoining habitats. Public lighting using low level LED lights is planned for the main walkway/cycle path which will minimise light spillage from the site. It is therefore concluded that the impact on this bat species will be negative, minor to moderate and long-term.

11.3 Other Mammals

Badger, Hedgehog, Irish Hare etc have all been recorded within grid square V94. Mammal species which are protected under the Irish Wildlife Act 1976, as amended, such as Hedgehog could potentially occur within the proposed development site, although no signs of these species were recorded. Although the habitats to be directly affected may form part of the territories of various mammal species, they do not provide critical resources and direct impacts on these habitats will be localised and temporary. Whilst increased noise and disturbance is predicted to occur during construction and operation. The predicted noise level will not be excessive in the context of normal domestic and road traffic levels. The impact on other mammals is predicted to be slight in the short-term and imperceptible in the long-term.

11.4 Birds

The terrestrial bird species recorded within the proposed development site are typical for the habitats onsite and are generally common. No rare or uncommon bird species or species of high conservation value were recorded. However, there will be a small net loss of common bird breeding and foraging habitat within the proposed development site i.e., grassland and scrub habitat.

The landscape plan for the proposed development includes the retention of hedgerows/treelines along the boundary of the site as well as native and non-native planting. The retention of the treelines along the walkway/cycle path will ensure that the proposed development will be largely screened from any species which may forage on the margins of the proposed development.

Some displacement of feeding birds may occur during construction due to increased noise and disturbance. Increased operational disturbance with increase pedestrian and cycle traffic as well as lighting is also likely to create disturbance impacts. Disturbance can cause sensitive species to deviate from their normal, preferred behaviour, resulting in stress, increased energy expenditure and, in some cases, species mortality.

It is noted that the area in proximity to the proposed development is subject to disturbance from surrounding residential and industrial developments and therefore any birds which utilise this area will have habituated to high levels of daytime disturbance. Whilst works could potentially disrupt feeding patterns, given the availability of similar habitat in the surrounding area and the ability of birds to move away from disturbance, the impact on the feeding behaviour of these species is predicted to be imperceptible.

During the operational phase, the levels of activity will stabilise and birds in the surrounding landscape will be expected to habituate to any increased noise and disturbance levels. The impact on terrestrial birds, in habitats adjoining the proposed development site is therefore predicted to be negative, not significant and long-term.

11.5 Other species

No signs of amphibians were recorded, although Common Frog and Smooth Newt could potentially use the artificial pond near the proposed development site. Dead Smooth Newt have been commonly recorded on the existing Clonality Greenway, apparently due to collision with cycle or pedestrian traffic (Dr. Sorcha Sheehy pers. comm.). Comparable levels of mortality would be expected for newts using waterbodies/watercourses near the proposed walkway/cycle path. The impact on Smooth Newt is predicted to be negative, moderate and long term at a local level.

The proposed development area is only likely to support common invertebrate species. Planting of native and pollinator species along the proposed walkway/cycle path is likely to be favourable for invertebrates. Therefore impacts on invertebrate populations will be neutral.

The Templebryan South stream which flows through the southern section of the site could potential support a small population of fish such as European Eel. Mitigation measures during construction will ensure there is no impact on water quality and/or fish and invertebrates which use these local watercourses. Given that the habitats which will be affected are relatively common in the surrounding landscape, any impact will be slight to not significant.

12 Potential impact on water quality

Potential impacts on aquatic habitats which can arise from surface water emissions associated with the construction phase of the proposed development include increased silt levels in surface water run-off, inadvertent spillages of hydrocarbons from fuel and hydraulic fluid and spillage of cement.

Inadvertent spillages of hydrocarbon and/or other chemical substances during construction could introduce toxic chemicals into the aquatic environment via direct means, surface water run-off or groundwater contamination. Some hydrocarbons exhibit an affinity for sediments and thus become entrapped in deposits from which they are only released by vigorous erosion or turbulence. Oil products may contain various highly toxic substances, such as benzene,

toluene, naphthenic acids and xylene which are to some extent soluble in water; these penetrate fish and can have a direct toxic effect. The lighter oil fractions (including kerosene, petrol, benzene, toluene and xylene) are much more toxic to fish than the heavy fractions (heavy paraffins and tars). In the case of turbulent waters, the oil becomes dispersed as droplets into the water. In such cases, the gills of fish can become mechanically contaminated and their respiratory capacity reduced (Svobodova *et al*, 1993). However, any such spills, in the unlikely event of their occurrence, would be minor in the context of the available dilution within local watercourses and Courtmacsherry Bay.

High levels of silt can impact on fish species, in particular salmonids. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels and aquatic invertebrates may be smothered by excessive deposits of silt. In areas of stony substrate, silt deposits may result in a change in the macro-invertebrate species composition, favouring less diverse assemblages and impacting on sensitive species. Significant impacts on fish stocks could impact on Otter due to a reduction in prey availability.

During construction there may be an increased probability of silt discharging from the proposed development site. In the absence of appropriate design and mitigation, high levels of silt in surface water run-off could theoretically arise. However, as part of the proposed construction process, several mitigation measures have been specified to ensure that water quality within the local streams is not impacted during construction works (**Section 14**). Therefore, there will be no significant impact on surface water from the from the proposed development during the construction phase. No significant impact on downstream aquatic receptors will occur i.e. Courtmacsherry Bay SPA, Courtmacsherry Bay SAC and Courtmacsherry Estuary pNHA.

During operation there will be an increase in hard surfaces along the proposed walkway/cycle path. However, given usage will be confined to pedestrian and cycle traffic no impact from hydrocarbons or other chemical will occur. A stone buffer (0.5m-1m) will be provided on either side of the walkway to control surface water runoff. Surface water runoff will be largely absorbed by surrounding buffer and grassland habitat and no significant impact on local watercourses is predicted to occur.

Following the implementation of mitigation measures, no significant impact on water quality and aquatic ecology during construction is predicted to occur. The impact on aquatic habitats is predicted to be minor in the short term and imperceptible in the long term.

13. Cumulative Impacts

Cumulative impacts refer to a series of individually modest impacts that may in combination produce a significant impact. Cumulative impacts on fauna chiefly relate to increased noise and activity levels and potential impacts on water quality. In-combination impacts from noise/disturbance are likely to be most pronounced during construction. This is a short-term impact which will be localised. During operation a localised increase in noise and disturbance is predicted. As this proposed development is not predicted to significantly increase long term noise and disturbance levels no significant cumulative impacts have been identified.

14. Mitigation Measures

The mitigation measures have been drawn up in line with current best practice and include an avoidance of sensitive habitats at the design stage. It is clear that the mitigation measures are designed to achieve a lowering or reducing of the risk of impact to acceptable levels. Whilst the proposed methods of mitigation may be amended and supplemented, the risk that the mitigation measures will not function effectively in preventing significant ecological impacts is low. The likely success of the proposed mitigation measures is high, either in their current form or as they will be adapted on-site to achieve the desired result.

Construction best practice measures (of relevance in respect of any potential ecological impacts) will be implemented throughout the project, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below:

- NRA (2010) *Guidelines for the Management of Noxious Weeds and Non- Native Invasive Plant Species on National Roads. National Roads Authority, Dublin.*
- Murphy, D. (2004) *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.*
- H. Masters-Williams et al (2001) *Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA.*
- E. Murnane, A. Heap and A. Swain. (2006) *Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA.*
- E. Murnane et al., (2006) *Control of water pollution from linear construction projects. Site guide (C649). CIRIA.*
- *Guidelines on protection of fisheries during construction Works in and adjacent to waters (IFI, 2016)*

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of local watercourses and waterbodies, to re-emphasise the precautions that are required as well as the mitigation to be implemented.

A detailed Construction and Environmental Management Plan (CEMP) will be developed by the appointed Contractor. This CEMP will comprise all of the construction mitigation measures. The principal measures which will be set out in the CEMP are summarised below.

14.1 Protection of habitats

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of the Gallanes Lake pNHA and the proximity of aquatic habitats.

The Wildlife Amendment Act 2000 (S.46.1) provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land or such growing in any hedge or ditch from the first of March to the 31st of August. Exemptions include the clearance of vegetation in the

course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. None the less it is recommended that vegetation be removed outside of the breeding season where possible. In particular, removal during the peak-breeding season (April-June inclusive) should be avoided. Such a timeframe would also minimise the potential disturbance of breeding birds outside of the proposed development site boundary.

Works will primarily take place during hours of daylight to minimise disturbance to any roosting birds or feeding nocturnal mammal species.

Mature trees, particularly over mature trees with the potential to provide bat roosts will be avoided where possible. Treelines or scrub habitat disturbed during construction will be replanted using a suitable mix of native species.

Vegetation will be cleared only when required. The amount of bare soil on site will be kept to a minimum at any given time. Where topsoil is stored for long periods it should be covered and allowed to vegetate naturally or reseeded to prevent run-off.

A 2.5m buffer zone will be provided between the Templebryan South stream and drainage ditch and the proposed walkway/cycle path. This buffer zone will be planted with native wild flora. This will help enhance its ecological value.

14.2 Protection of Water Quality

A secure area will be provided for the builder's site establishment as shown in **Figure 9**.

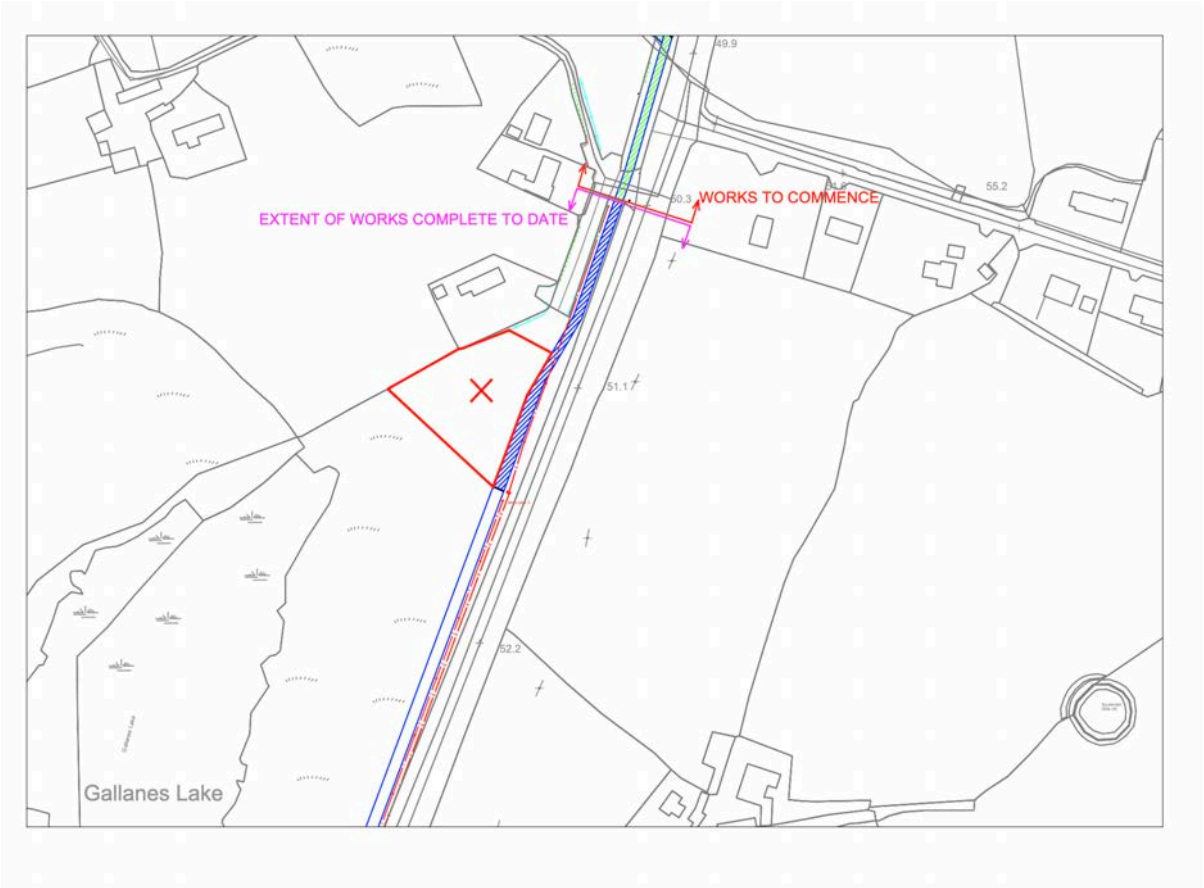


Figure 9. General location of builder's compound indicated by red X

The employment of good construction management practices will minimise the risk of pollution of soil, storm water run-off, seawater or groundwater. The Construction Industry Research and Information Association (CIRIA) in the UK has issued a guidance note on the control and management of water pollution from construction sites, Control of Water Pollution from Construction Sites, guidance for consultants and contractors (Masters-Williams et al 2001).

During the construction phase all necessary precautions will be put in place to ensure that there is no run-off to nearby watercourses. During the construction phase all necessary precautions will be put in place to ensure that there is no run-off to the Templebryan South stream, drainage ditch or Gallanes Lake.

The working area used during construction will be clearly outlined prior to the commencement of works and will be kept to the minimum area necessary to effectively complete the works. Vegetation should be retained where possible.

All construction support activities will be controlled within the site construction compound including office facilities, toilets, canteen etc. Materials and waste handling and storage will be within the confines of the site with exception of road widening works.

All site personnel will be trained and aware of the appropriate action in the event of an emergency, such as the spillage of potentially polluting substances. In the event of spillage of any polluting substance and/or pollution of a watercourse, Cork County Council, Inland Fisheries Ireland and the NPWS shall be notified.

Spill kits will be retained on site to ensure that all spillages or leakages are dealt with immediately and staff are trained in their proper use.

All equipment will be maintained in good condition to prevent impacts on water quality. All equipment and machinery will have regular checking for leakages and quality of performance.

All vehicles used on site will be inspected on a daily basis to ensure there are no minor leaks of hydrocarbons. Refuelling of machinery will occur in designated areas on an impermeable surface away from any drains or watercourses.

Construction works should be scheduled during dry conditions where practical. Works will be suspended during severe flood events or when such events are forecast. This makes all activities and measures easier to implement and manage and limits the potential for generation of sediment and mobilisation of both sediment and pollutants downstream.

Storm water will be managed carefully during construction. In general, storm water will be infiltrated to ground via silt traps and managed soakaways.

Oil, petrol and other fuel containers will be double-skinned and bunded to be able to contain 110% volume to guard against potential accidental spills or leakages. Bund specification will conform to the current best practice for oil storage such as Enterprise Irelands Best Practice Guidelines.

It is possible that there will be some surface water ingress into the excavations. Should water ingress occur, water from the excavations will be pumped to a silt settlement tank as necessary. Pumps are to be set-up in such a manner so as to avoid the removal of an excessive number of fines i.e. within a filter pipe/clean stone etc. Clean water exiting the

primary settlement tank will be discharged into the local surface water network following appropriate settlement and suitable filtration.

Stockpiles will be graded to a <1:4 profile. Topsoil and subsoils will be stored separately. Stockpiles of mineral soils and peat will be <2m and <1m respectively. Stockpiles will be covered with plastic sheeting during wet weather to prevent run-off of silt and will be located on flat ground where possible. Excavated material will used for backfill where possible. Surplus material will be removed from site.

14.3 Air Quality

Construction activities have the potential to generate dust emissions, particularly during the site clearance and excavation stages. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with ambient conditions, including rainfall, wind speed, wind direction and on the distance to potentially sensitive locations.

Most of the dust would be deposited close to the potential source and any impacts from dust deposition would typically be within a hundred metres or so of the construction area. However, in order to ensure that no dust nuisance occurs, a series of measures will be implemented:

- Vehicles within the site shall have their speeds restricted where there is a potential for dust generation. This speed restriction will be enforced rigidly.
- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind.

14.4 Invasive species

To prevent Japanese Knotweed or other invasive species from outside the site being inadvertently being brought into the site, the contractor will be required to inspect vehicles before using them on site and will pay particular attention to caterpillar tracks and where trucks and dumpers are stowed.

All stands of Japanese Knotweed which could be potentially affected by the works will be clearly marked with hazard tape and signage.

Prior notification will be given to all contractors that parts of the works area are contaminated with Japanese Knotweed and that they must adhere to this protocol to avoid the spread of the plant within and more importantly, outside of the works area. This includes any site investigation works in advance of commencement of excavation works.

It is noted that the stands of Japanese knotweed are not located within the proposed development area. However as a precaution treatment will begin prior to the commencement of construction. No works will be carried out within 7m of a viable stand of Japanese Knotweed. The viability of Japanese Knotweed stands potentially affected will be assessed by the supervising ecologist following completion of the treatment programme. Where viable stands are identified a detailed up to date and site-specific Invasive species management plan will be drawn up and implemented.

Post development of any Amber Listed invasive species remaining on the site will be treated via a standard herbicide programme.

14.5 Noise

Best practice noise and vibration control measures will be employed by the contractor. The best practice measures set out in BS 5228 (2009) Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site environmental measures, including, but not limited to the following:

- All contractors will ensure that the plant and construction methods employed are the quietest available for the required purpose insofar as practicable.
- The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected.
- If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control “at source”. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.
- Mobile plant will be switched off when not in use and will not be left idling.
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

14.6 Bird Mitigation Measures

The Wildlife Act 1976, as amended, provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land, or any such growing in any hedge or ditch from the 1st of March to the 31st of August. Exemptions include the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. Nonetheless, it is recommended that vegetation be removed outside of the breeding season where possible.

Retention of the hedges, treelines and woodland within the site will reduce the loss of breeding and nesting habitat for birds. NRA guidelines on the protection of trees and hedges prior to and during construction should be followed (NRA, 2006b).

14.7 Bat Mitigation Measures

The first aim of the developer should be to entirely avoid or minimise the potential impact of a proposed development on bats and their breeding and resting places. Current NPWS advice is that there should be no net loss in local bat population status taking into account factors such as population size, viability and connectivity. During the construction of the proposed development, general mitigation measures for bats will follow the National Road Authority’s ‘Guidelines for the Treatment of Bats during the Construction of National Road Schemes’ NRA (2005) and 'Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 25' (Kelleher, C. & Marnell, F. (2006)). These documents outline the requirements that should be met in the pre-construction (site clearance) and construction phases of developments to minimise negative impacts on roosting bats, or prevent avoidable impacts resulting from significant

alterations to the immediate landscape. The developer should take all reasonable steps to ensure works do not harm individuals by altering working methods or timing to avoid bats.

Specific mitigation measures are required to protect the on-site bat populations and a derogation licence will be necessary from NPWS to legally allow such works to proceed. The following mitigation is proposed:

- External lighting during construction and operation i.e. lighting near or focused around mature trees, treelines or woodland areas, should be kept to a minimum at locations where it is likely to disturb bats, and will follow the Bat Conservation Ireland Lighting Guidelines (i.e. Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers December 2010).
- No white light should be used along peripheral habitats, as this has the greatest impact on bats. Low pressure sodium lights have a minimum impact on bats. Lighting that has little or no UV content have the least impact on bats.
- It is important to maintain Dark Zones for foraging bats in areas where lighting is not necessary. However, where lighting is required, this lighting should be placed at a minimum height using the lowest lux value permitted for health and safety.
- The lighting should be directionally focused, onto pedestrian areas to provide a safe means of traversing the site, with no spillage of light to adjoining habitats.

15. Conclusions

Overall, the development will impact primarily on habitats of local importance. There will also be a loss of common, semi-natural habitats which have limited use as foraging grounds for common bird, amphibian and mammal species. There will be a small loss of treeline and scrub habitat which may be used as nesting habitat for common bird species. However the majority of treelines, trees and scrub habitat will be retained. Additional planting of native species will help to mitigate against any habitat loss at the site. No trees suitable as bat roosting habitat were identified within the site. No instream works are required and following mitigation measures no impact on aquatic habitats or local water quality is predicted to occur. No particular difficulties in the effective implementation of the prescribed mitigation measures have been identified. No impact from the spread of invasive species will occur.

No significant impacts on designated sites which are hydrologically connected to the site have been identified i.e. Argideen River, Courtmacsherry Bay SPA, Courtmacsherry Bay SAC and Courtmacsherry Estuary pNHA.

During construction, there will be increased lighting, noise and disturbance which could potentially impact on birds and mammals including Otter and bat species. There is likely to be a loss of bat foraging habitat on the boundary of the site due to operational lighting. However lighting will be directionally focused onto pedestrian areas to provide a safe means of traversing the site, with no spillage of light to adjoining habitats, which will minimise the impact on foraging bats. Given the availability of alternative nesting habitat in the vicinity, the impact on nesting birds is likely to be slight and short-term. With the exception of localised impacts and short-term impacts during construction, no significant impacts on fauna are envisaged.

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Appendices

Appendix 1. NRA 2009 Guidelines

Table 1: Examples of valuation at different geographical scales

Ecological valuation: Examples
International Importance: • 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. • Proposed Special Protection Area (pSPA). • Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). • Features essential to maintaining the coherence of the Natura 2000 Network.[4] • Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations (assessed to be important at the national level)5 of the following: o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). • Biosphere Reserve (UNESCO Man & The Biosphere Programme). • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • Biogenetic Reserve under the Council of Europe. • European Diploma Site under the Council of Europe. • Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).[6]
National Importance: • Site designated or proposed as a Natural Heritage Area (NHA). • Statutory Nature Reserve. • Refuge for Fauna and Flora protected under the Wildlife Acts. • National Park. • Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); • Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. • Resident or regularly occurring populations (assessed to be important at the national level)7 of the following: o Species protected under the Wildlife Acts; and/or o Species listed on the relevant Red Data list. • Site containing 'viable areas'[8] of the habitat types listed in Annex I of the Habitats Directive.

County Importance:

- **Area of Special Amenity.[9]**
- **Area subject to a Tree Preservation Order.**
- **Area of High Amenity, or equivalent, designated under the County Development Plan.**
- **Resident or regularly occurring populations (assessed to be important at the County level)[10] of the following:**
  - **Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;**
  - **Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;**
  - **Species protected under the Wildlife Acts; and/or**
  - **Species listed on the relevant Red Data list.**
- **Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.**
- **County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, 11 if this has been prepared.**
- **Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.**
- **Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.**

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)12 of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

4 See Articles 3 and 10 of the Habitats Directive.
5 It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.
6 Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).
7 It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.
8 A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).
9 It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.
10 It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.
11 BAP: Biodiversity Action Plan
12 It is suggested that, in general, 1%of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle