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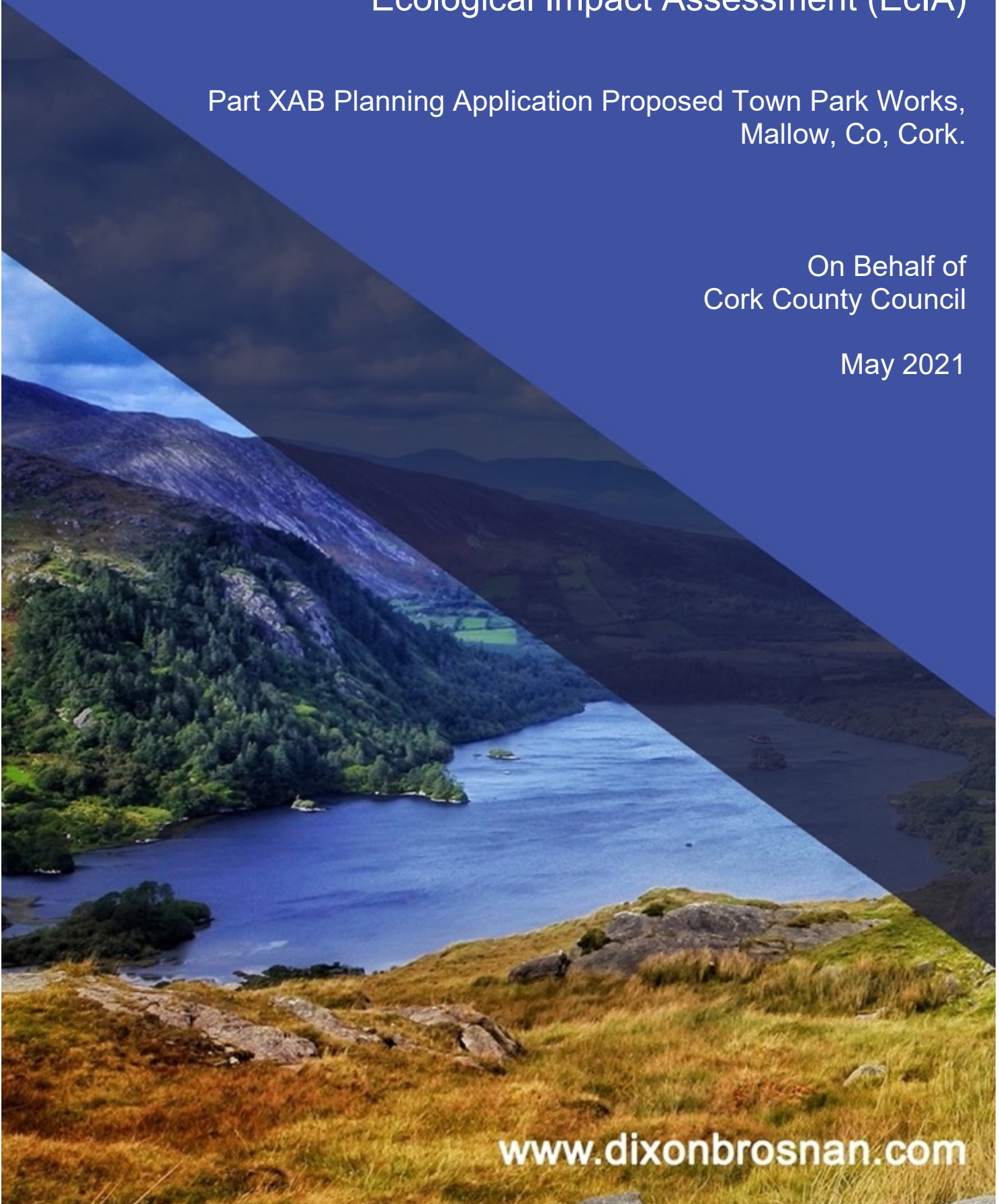
Ecological Impact Assessment (EcIA)

Part XAB Planning Application Proposed Town Park Works,
Mallow, Co, Cork.

On Behalf of
Cork County Council

May 2021

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Project	Ecological Impact Assessment (EclA) Part XAB Planning Application Proposed Town Park Works, Mallow, Co, Cork	
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1. Introduction

DixonBrosnan Environmental Consultants were commissioned to assess the potential ecological impacts of the proposed Town Park Works at Mallow, Co. Cork. This report describes and evaluates the habitats with their representative flora and fauna and addresses the potential 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 – www.biodiversityireland.ie
- *County Cork Biodiversity Action Plan 2009-2014*
- *Otter Survey in relation to the Mallow Flood Relief Scheme* (DixonBrosnan 2011a)
- *Electrofishing survey for lamprey in two minor watercourses as part of the Munster Blackwater River (Mallow South and West) Drainage Scheme* (DixonBrosnan, 2011b)
- *Freshwater Pearl Mussel Survey Blackwater [Munster] River – Mallow* (Ecofact, 2018)
- 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) and

- *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.

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

Site surveys were carried out on the 27th of September 2020, 10th of May 2021, 13th of May 2021 and 17th of May 2021:

- 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)*';
- Bat surveys along River Blackwater on the 27th of September 2020 and the 13th of May 2021;
- A general mammal survey with a particular focus on Otter;
- The proposed development area was surveyed for invasive species and
- All bird species recorded during the walkover survey and habitat survey were recorded.

This report was prepared by Carl Dixon MSc (Ecological Monitoring) and Dr. Sorcha Sheehy PhD (Ecology/ornithology). Fieldwork was conducted by Carl Dixon MSc (Ecological Monitoring), Mark Donnelly BSc (Forestry) and 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.

Mark Donnelly (Forestry) holds a BSc. Hons in Forestry from Bangor University, Wales, and is a member of the Institute of Chartered Foresters. He worked as an arboricultural consultant for the National Trust in Wales for 22 years and was a lecturer in Forest Ecology at Bangor University. In Ireland, he has completed landscape assessments for a range of projects including wind farms, quarries, local authorities, housing developments, roads and pipelines.

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. Recent projects include ecological reports for Cork-based housing and private developments.

3. Receiving Environment

3.1 Existing site

Mallow Town Park with accompanying Mallow Town Playground and Riverside Amenity Walk are situated at the south of the Mallow Town Centre and Mallow Castle grounds. The proposed development site extends along the Blackwater River, from the Railway Bridge (Blackrock Viaduct) / N20 Motorway Bridge to Lovers Leap. The overall site is approximately 23.2 ha. The Town Park itself is adjoined by Park Road (N72) from the north, Blackwater River from the south, East Baltydaniel Stream (AKA Hospital Stream) to the west and Bridge Street to the east (**Figure 1**).

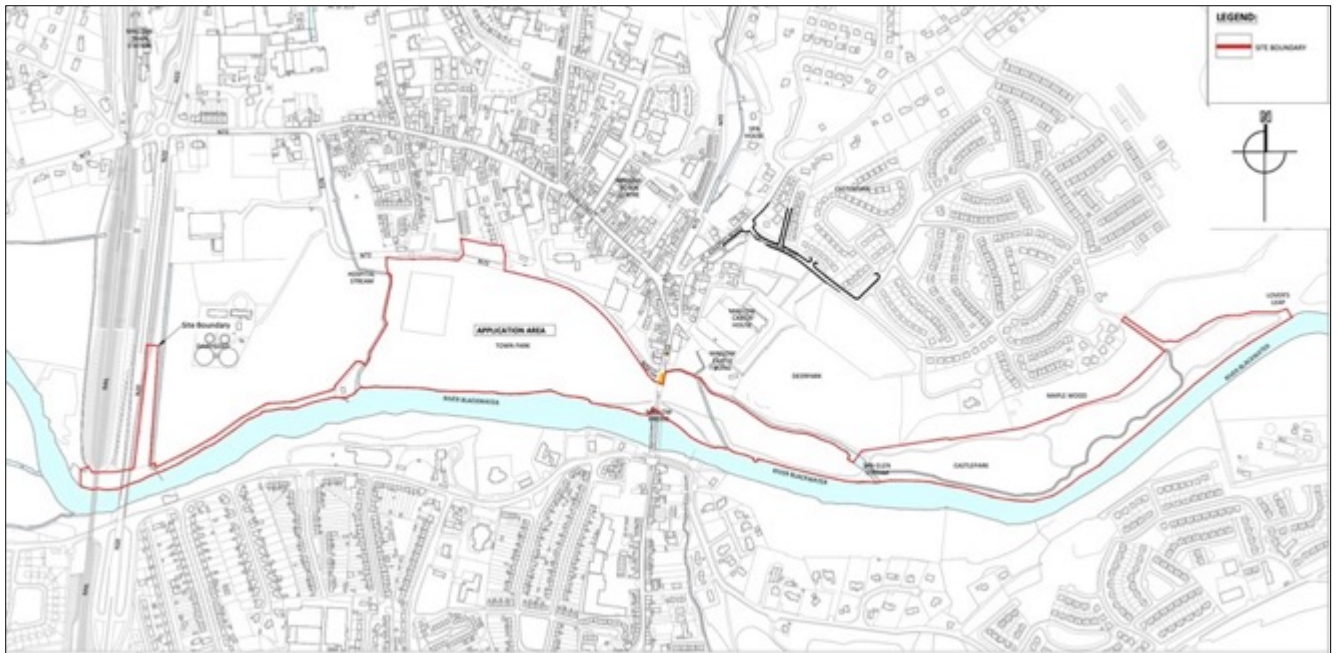


Figure 1. Site location | Source Brady Shipman Martin

3.2 Proposed Development

The objective of proposed improvement works of Mallow Town Park are to enhance the park and provide a wide range of public amenities which will be developed and integrated in a safe, sensitive, sustainable, accessible and positive manner for all ages and abilities.

In summary, the proposed improvement works include:

3.2.1 Entrances and circulation

- Enhancement/ refurbishment of existing 3 no. pedestrian and 2 no. vehicular entrances to the park from Park Road.
- Construction of 2 no. pedestrian entrances from Park Road (N72) and 1no. new entrance to the existing footpath on the N20 to the west, providing better connectivity and accessibility to Mallow Town.
- Widening of existing concrete riverside footpath from 2m to 3m along a length of c.1,540m.
- Construction of new 3m wide concrete footpaths at a total length of c.1,230m as part of circulation and access network improvements. This includes the construction of a new path from the west end of Town Park up to the existing footpath on the N20 to the west.
- Construction of a c.425m long 2m wide reinforced grass path along the northern edge of Town Park.
- Widening of the existing pedestrian bridge (c.1.2m wide) within the Town Park over the Caherduggan/Spa Glen Stream to 3m in width.

3.2.2 Play

- Refurbishment of an existing playground on the northside of the N72 to include new play equipment and a skate park.

- Construction of a 'pump' track (for non-powered bikes, skateboards, rollerblades, scooters).

3.2.3 Active sports

- Relocation of the existing GAA pitch (145m x 90m) c.15m north, including the removal of the existing mounding, including demolition of former entrance gates to GAA pitch. Entrance plaque to be relocated and incorporated into new park entrance (opposite St James Avenue). Perimeter post and rail spectator fencing to pitch and ball catch posts/netting.
- Retention and improvement of existing soccer and rugby pitches.
- Provision of a grass training area (155m x 35m).
- Provision of permanent orienteering course within the park.

3.2.4 Other amenities

- Construction of reinforced grass multi-use events area at a surface area (c.147m x 73m).
- Construction of angling stands to Inland Fisheries Ireland Standards along the banks of the Blackwater River with due consideration of the SAC designation, to include:
 - 1 no. concrete accessible stand under the Railway Viaduct/Road Bridge (N20) (measuring c. 5.2 x 2.5m), and
 - 4 no. fishing stands constructed of recycled plastic measuring c. 2.4 x 1.8m, located downstream of the Caherduggan/Spa Glen stream and Lover's Leap with Castlepark to the east of the town park.
- Construction of landscaped and permeable car park at a total surface area 2,590m² for Town Park with capacity for 96 car parking spaces, including disabled and parent and toddler spaces.
- Construction of a reinforced grass parking area (only for use only in association with authorised seasonal/summer events when the flood risk is very low). Total surface area

- 4,720m² with capacity for car parking 114 spaces, including 3no. set-down spaces, and include vehicular entrance to the car park.

3.2.5 Landscape Improvement Works

- Supporting locational and wayfinding signage, seating and services, including wayfinding signage to nearby existing car parking.
- Undergrounding of existing overhead power line in the Town Park to the west of Mallow Bridge.
- Provision of surface water detention basin.
- All associated site development, fencing, park furniture (seating, bike stands etc.), planting, landscape and biodiversity improvement works.

The proposed development will connect to existing public utilities.

3.3. Surface water drainage measures

3.3.1 Proposed Carpark - Surface & Drainage Design Details.

- The proposed new porous surface carpark is to be constructed on an open green field site to the northwest corner of the site. This area is currently used for car parking on occasions and is partly hardcore surfaces.
- The site is bounded to the north by a stone wall with existing entrances to the site. Proposed works will see these existing entrances upgraded to enhance the safety and astatic of these vehicular and pedestrian access.
- From current published floor risk assessments of the town park, it is an establish floor zone.
- The proposed development of the various surface facilities including the porous carpark will not change or intensify the current land use or create additional flood risk to the area.
- The proposed carpark area has been laid out and levels set where possible in line with the existing ground contours to mitigate against flood displacement as well as to minimise the amount of excavation and ground disturbance to the site so mitigating where possible the impact to potential below ground archaeology.
- The Carpark and road surfaces are to be constructed with a porous asphalt surface on a free draining stone base build up (**Figure 3**).

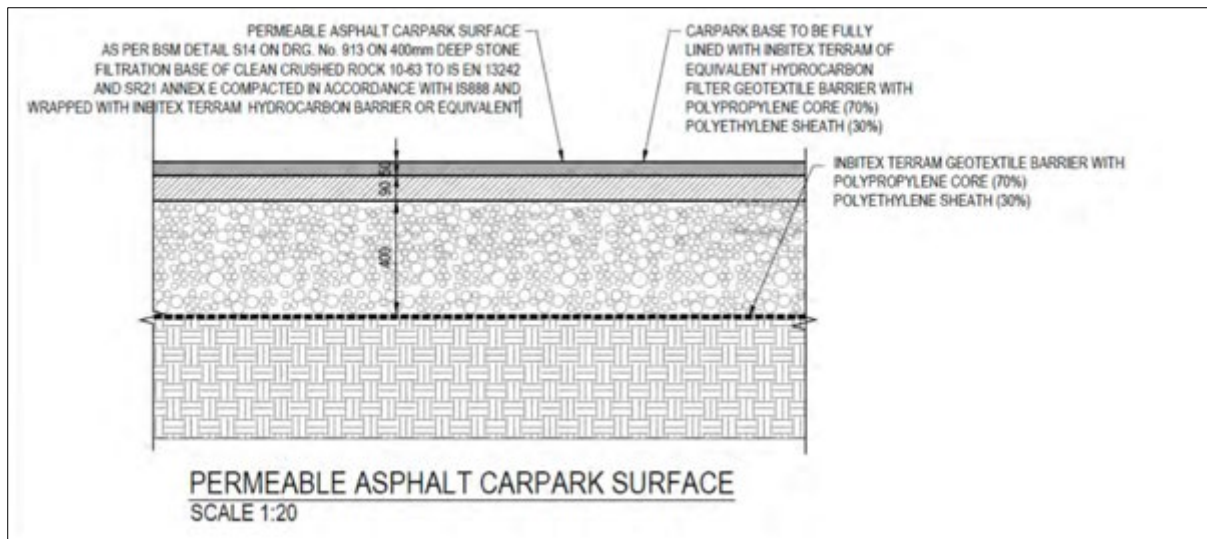


Figure 3 Porous asphalt car park surface | Source Horgan Lynch

- Hydrocarbons filtration and removal. The stone base to the carpark area is wrapped in a special 'Inbitex' geotextile filter material. The filtration membrane in conjunction with the stone build-up traps and breaks down any hydrocarbons build up within the sub-base by microbial action. The surface water is cleaned and filtered through the Inbitex Geotextile layers.
- Aco channel cut off drains are to be installed in front of the vehicle and pedestrian entrance to the carpark and these drainage channels are connected to a new 150mm dia storm drainage pipe which discharge to a proposed adjacent soakaway with-in the site.
- As noted above the use of a porous carpark surface and associated filter stone build up minimises the depth of excavation and extent of ground disturbance associated with standard hard paved carparks, piped gullies and drainage pipe network.
- This porous carpark system also allows flexibility in the depth of excavation when archology features are encountered as the stone build up can be altered as necessary without effecting the drainage flow.

3.3.2 Sustainable Drainage Design

- The carpark and site wide drainage design is based on Sustainable Drainage Design (SUDS) drainage design which both infiltrates and attenuates the surface water drainage on the site and ensures the storm water runoff from the developed site is restricted to at or below the current undeveloped green field runoff.
- This attenuation of the storm water runoff will ensure the development of the site does not contribute to increased flooding risk downstream from the area as the flow is being restricted to greenfield run-off rates. Hence there will be no increase in the overall discharge from the site as a result of the proposed development.
- As set out above and detailed in the accompanying drawings the carpark and surrounding surfaced covers approximately 4200m².

- The carpark which is a porous asphalt surface drains into a 400mm deep clean drainage stone build up with 50% voids.
- Calculation for site attenuation:

Surface paved area with attenuation under 3200m²

Soil infiltration rate – $f = 2.19 \times 10^{-6} \text{m/s}$

Wetted are of pit 50% full – $as_{50} = 74.8 \text{m}^2$

Required Storage Estimate for site = 351m³

Available storage capacity within carpark build up = $3200 \text{m}^2 \times 0.4 = 1280 \text{m}^3 \times 50\% = 640 \text{m}^3$

Time for emptying attenuation to half volume due to soil infiltration – $ts_{50} = 351 \times 10^6 \times \{0.5 / (74.8 \times 10^6 \times 2.19 \times 10^{-6})\} = 1071350 \text{ sec} = 297.6 \text{ Hours (12.4 days)}$ As can be seen from the above figures there is significant storage capacity within the carpark build up to facilitate the attenuation of storm water.

- As can be seen from the above figures there is significant storage capacity within the carpark to facilitate the attenuation of storm water.
- In addition to attenuation capacity, the proposed porous carpark surface and store build up system also provides for infiltration. The infiltration rate of the ground is sufficiently capable of handling the storm water values.

3.3.3 Proposed Skate Park - Surface Drainage Design Details.

- It is proposed to construct a new skate park in the area of the existing playground to the north of the site.
- The proposed skate park features will include a number of specific skating shapes, surface finishes and structures, including a Hags unplay buridos and Kompan triple cube play structures.
- The skate park is proposed to be installed using existing ground levels with limited excavations required.
- The new surfaces are a mix of concrete in the skate areas, tar and chip footpaths, grass and meadow areas and jungle mulch in the play areas. The concrete surfaces are laid to falls that will drain into free draining areas and localised soakaway within the site, there is an Aco-drain channel at the southern entrance to the skate park that will drain to adjacent soakaways within the site. Remaining surfaces are laid on a stone bedding which will be free draining.
- The existing playground areas are substantially covered in impermeable tarmac surfaces with marginal grass verges around the northwest perimeter of the site.
- The new proposed grass and play areas to the redeveloped playground will be permeable free draining surface.

- The total proposed new impermeable hard paved surfaces of the skate park and footpath will be substantially less than the existing impermeable tarmac surface area of the existing playground. Circa 40% reduction in hard surface area.
- The infiltration value of the ground over the areas of the surfaces are sufficient in dealing with the storm water run-off values for the area.
- There will be no additional storm water runoff generated from the development of the playground surfaces within the existing site. The provision of soakaways and the free draining stone bedding has been made to facilitate additional infiltration of surface water away from the immediate play areas to prevent ponding of same during heavy rainfall.

3.3.4 Proposed Pump Track - Surface Drainage Design Details.

- It is proposed to construct a Pump Track in an existing green field area of the site. To the south of the proposed skate park.
- The proposed pump track consists of a porous asphalt surface which is laid to fall to create the desired mounds.
- The pump track is proposed to be installed using existing ground levels with limited excavations required. Excavated material from one area of the track can be used as fill in other areas in order to create the mounds. This limits the amount of imported fill required.
- The proposed regrading of the ground at the pump track and the surrounding park areas have been laid out and levels designed so that the overall surface volumes are equivalent to the existing area so as not to create any overall flood displacement issue within the park.
- The bitumen macadam surface will be laid such that the surface water will run-off and drain locally into the surrounding grass margins.
- The mounds and levels will be shaped so water is not trapped around the pump track area and will be free to naturally drain and flow towards the river.

3.3.5 Grass Pitches & Reinforced Grass Event & Temporary car park area

- There is an existing grass soccer, rugby and GAA pitch within the town park.
- The proposed development includes a new and refurbished grass soccer, rugby and GAA playing pitches and a grass training area which are proposed to be provide under this re development of the town park.
- The soccer and rugby pitched will be retain in their existing location.
- The GAA pitch will be reoriented and moved south, and the trees and embankment mounds removed to provide space for the pump track and also to improve the general layout and presentation of the park area.

- The re-grading of the grass pitches and the removal of the grass embankment spectator mounds will also assist in the better drainage and flood flow/release from the park.
- All pitches and training area will be regraded and reseeded to provide free draining high quality sport standard grass playing surfaces.
- The sub-base to the grass surfaces will be formed with a ameliorate soil and gravel mix which will aid in the natural drainage of the surfaces into the free draining sandy gravely sub soil which underlies the park area.
- It is proposed to form new temporary seasonal event and carpark areas to the southwest of the Park by reseeding these areas with reinforced grass surfaces.
- The areas will be natural grass with reinforced polypropylene plastic mesh elements blended with in the soil to form a composite mesh reinforced rootzone capable of taking vehicle loading.
- These surfaces will be naturally free draining grass surfaces with equal or better porosity than the existing grass surfaces of the park.

3.3.6 Proposed Swale drainage Basin - Surface Drainage Design Details.

- As stated, the town park is in a flood zone and is subject to seasonal flooding. Under fluvial 1% (1 in 100 year storm) AEP the flood depth across the park is >2.0m.
- During periods of flooding the Town Park, which is part of the natural flood plain for the river black water, floods as does the N72 Park road to the northern boundary of the Park.
- When the river flooding subsides the flood waters generally flow back from the roadway and the Park to the river. However, some water ponds and is trapped from flowing directly to the river due to the higher-level of the ground along the footpath to the southern side of the park.
- This trapped surface water eventually naturally drains through the sandy gravely soil of the park.
- It is proposed to construct a swale drainage basin in an existing green field area to the southwest of the site just east of the Bridge.
- The intention of the swale drainage basin is not to prevent flooding but to provide a drainage channel to which surface water from the park and the northwest area of the Park Road can be directed and temporarily retained in periods of high river flood before discharged to the river as the flood level recede.
- The detention basin will have storage capacity is approximately 1450m³
- The swale, as detailed on the drainage drawings, shall be a formed drainage basin channel to the low lying southwest area of the park. The base of the channel shall be shaped and graded with a steady fall towards the river to the southwest.

- When not in flood, the proposed swale detention basin will form a dry grass “amphitheatre” with grass meadow planting.
- The channel shall be pipes through the raised footpath embankment and discharge on the river side of the embankment via a formed concrete outfall head wall and slip way directly to the river.
- The piped outfall from the swale detention basin shall be fitted with a Tideflex duckbill non return valve fitted to provide end of pipe backflow prevention and flooding protection to the line.

3.3.7 Widening of Existing Pedestrian Bridge

- It is proposed to widen the existing pedestrian bridge on the far East corner of the site. The existing bridge is 1665mm wide and the proposal is to add another 1770mm to the bridge width making it 3000mm wide overall.
- The construction will involve the pouring of 2 no. reinforced concrete abutments. 1 to each side of the river. Precast concrete bridge beams will be placed on these abutments and a finished screed will be poured over to complete the bridge surface. New 1.1m high powder coated railings will be provided.
- This method allows for the construction without disturbing the existing trunk watermain contained within the existing bridge deck. The bridge abutments will be kept back from the river to ensure no debris enters same.
- The proposed bridge will match the other bridges on Mallow River walkway and Town park.
- Drawings of the proposed bridge widening works are included in **Figures 4, 5 and 6**.

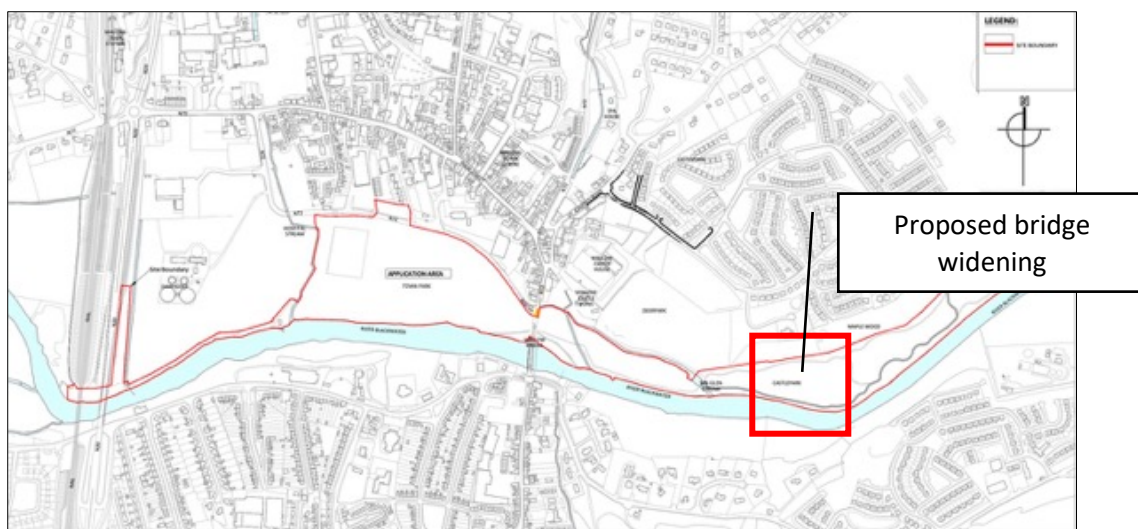


Figure 4. Location of Proposed Bridge Widening Drawing | Source Brady Shipman Martin

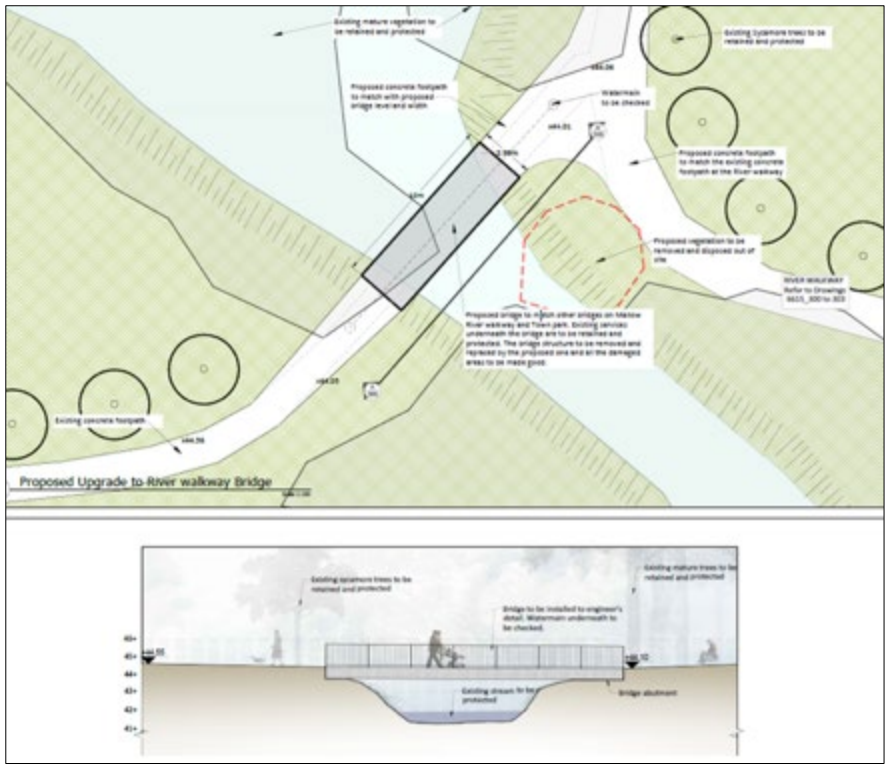


Figure 5. Extract from Architects Proposed Bridge Widening Drawing | Source Brady Shipman Martin

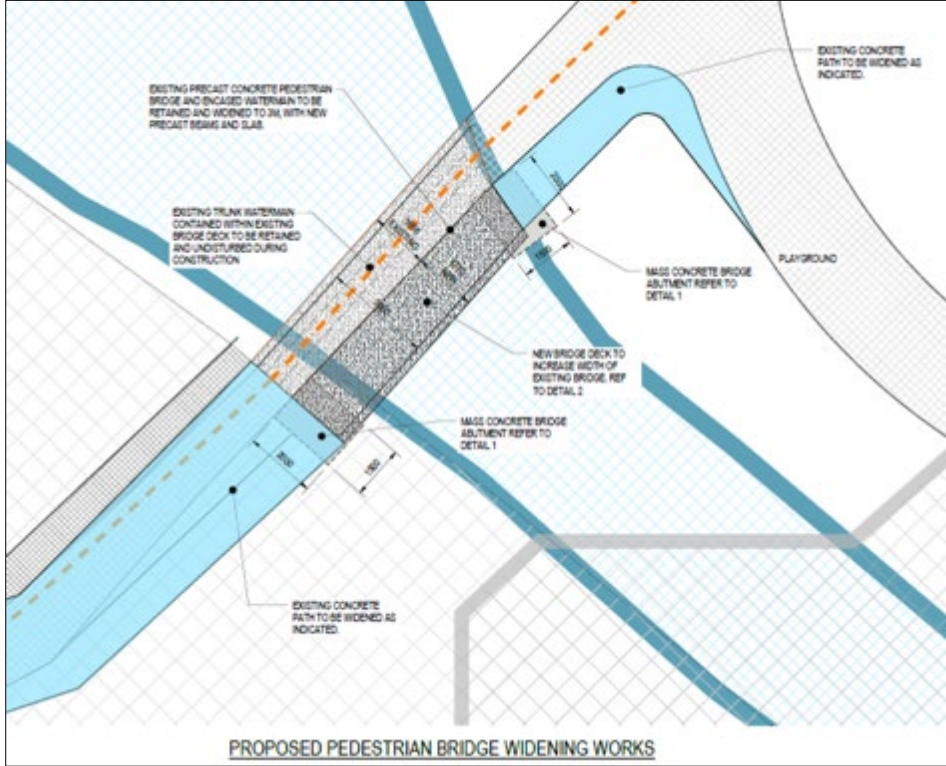


Figure 6. Proposed pedestrian bridge widening work | Extract from Horgan Lynch Drawing CQ15-024

3.3.8 Angling Stands

It is proposed to construct a series of angling stands on the Northern bank of the River Blackwater. 4 No. typical angling stands and 1 No. Accessible angling stand.

- These are to be located in the openings of the existing riverbank vegetation. This is to minimise the disruption to the existing riverbank and vegetation. Refer **Figure 7** for locations.
- Proposed grassed areas of disruption made good with geotextile protection matting (Enkamat), topsoiled and seeded with native grass / wildflower mix.
- The accessible angling stand will be formed with precast concrete slabs supported on screw piles and cantilevered reinforced ground beams. This will limit the excavation and works required along the river embankment. Refer to **Figure 8**.
- The typical angling stands will consist of 900mm wide steps leading down to the platform. This platform will be formed with black recycled plastic posts and non-slip decking boards all supported from screw piles. These are lightweight pieces and as such the disruption and excavation works adjacent the river will be minimal. Refer to **Figure 9** below.

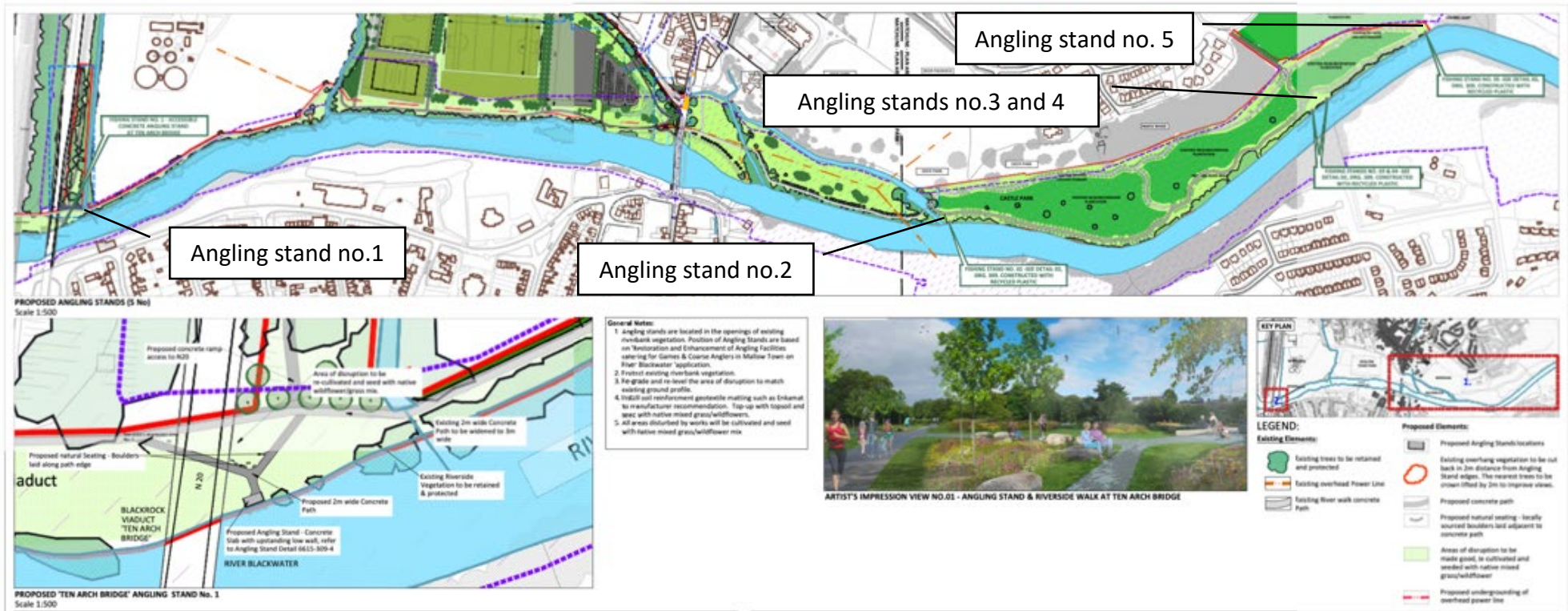


Figure 7. Angling stand locations | Source Brady Shipman Martin

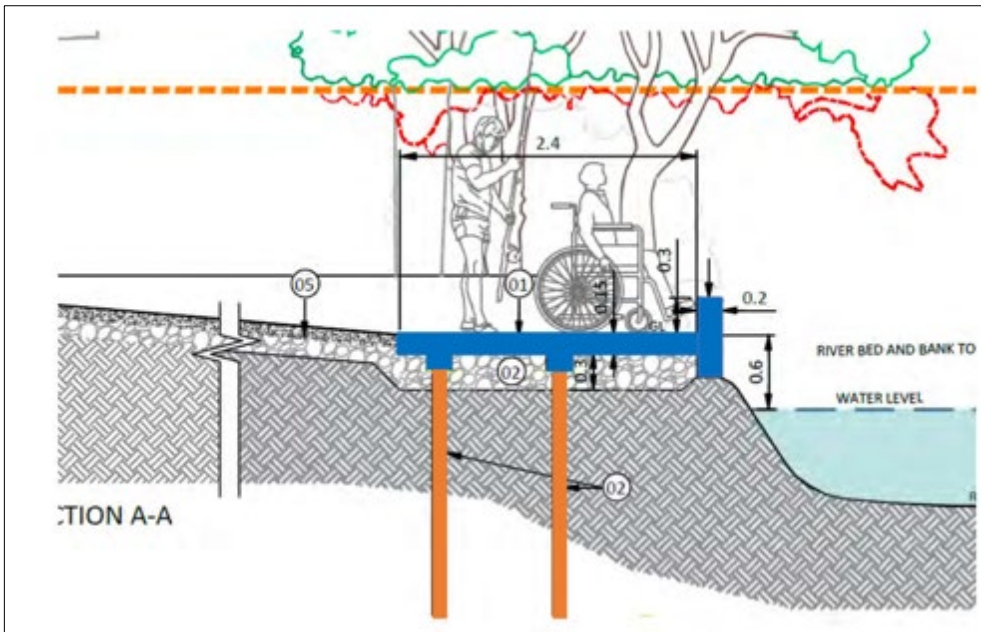


Figure 8. Angling Stand Section | Source Horgan Lynch

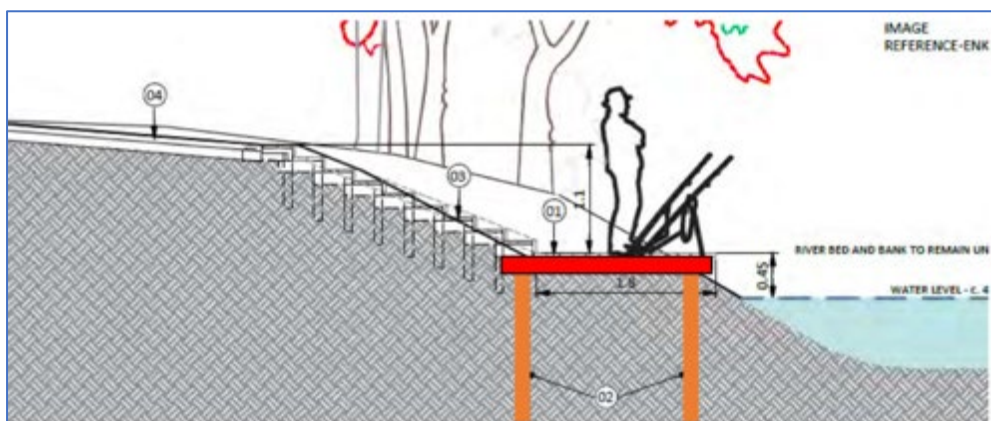


Figure 9. Typical angling stand section | Source Horgan Lynch

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.

Part of the proposed development overlaps with the Blackwater River (Cork/Waterford) SAC. The proposed development area does not form part of any Natural Heritage Area (NHA), Special Protection Area (SPA), Nature Reserve, or National Park.

4.1 European (Natura 2000) Sites

Part of the proposed development site is located within the Blackwater River (Cork/Waterford) SAC. European 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 are shown in **Figure 10**.

Table 1. Designated sites and their location relative to the proposed development site.

Site	Code	Approx. Distance at Closest Point.
Special Area of Conservation (SAC)		
Blackwater River (Cork/Waterford)	002170	0m.
Special Protection Area (SPA)		
Kilcolman Bog	004095	12.2km N.
Blackwater Callows SPA	004094	26.3km east.



Figure 10. Natura 2000 Sites within zone of influence proposed development site | Source: EPA Envision mapping (<https://gis.epa.ie/EPAMaps/>) | Not to scale

The proposed development site is potentially connected to three Natura 2000 sites listed in **Table 1** i.e. River Blackwater (Cork/Waterford) SAC, Kilcolman Bog SPA and Blackwater Callows SPA, (Refer to **Figure 10**).

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.

The River Blackwater (Cork/Waterford) SAC is a very large site drains a major part of County Cork and five mountain ranges. The site supports a high diversity of Annex I habitats and Annex II species of the E.U. Habitats Directive, including Atlantic salmon and Otter. The site designated as the Blackwater River cSAC consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond and as far downstream as the tidal stretches into Youghal Harbour as well as the many tributaries along the way, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The extent of the Blackwater and its tributaries in this site flows through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. The designated site covers a total area of 15,048 ha.

Kilcolman Bog SPA is situated on the southern foothills of the Ballyhoura Mountains in Co. Cork. The site comprises a quaking fen fed by calcareous groundwater, with areas of reed swamp, freshwater marsh and wet grassland. There is a small permanent lake but in winter a large, flooded area is usual.

The Blackwater Callows SPA is of importance for its populations of wintering waterfowl, including an internationally important population of Whooper Swan and nationally important populations of Wigeon, Teal and Black-tailed Godwit. The presence of Whooper Swan, as well as Little Egret, is of particular note as these species are listed on Annex I of the E.U. Birds Directive. Part of the Blackwater Callows SPA is a Wildfowl Sanctuary.

Potential impacts on designated Natura 2000 sites (SAC/cSAC/SPA) are specifically addressed in a Report for Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) which has been submitted as part of this application. This report concluded the following:

It has been objectively concluded following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted effects from the proposed development and with the implementation of the mitigation measures proposed, that the construction, operation and decommissioning of the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects. There is no reasonable scientific doubt in relation to this conclusion. The competent authority will make the final determination in this regard.

4.2 Nationally Protected Sites

Consultation of the NPWS online database identified eleven Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) within 15km of the proposed development. These are listed in **Table 2** and their distances from the site of the proposed development are provided. The location of these pNHAs are illustrated in **Figure 11**. The majority of these NHAs/pNHAs on the River Blackwater are located upstream of the proposed development site. Three pNHAs are located downstream within 15km i.e. Blackwater Valley (Ballincurrag Wood) pNHA, Blackwater Valley (Kilcummer) pNHA and Blackwater Valley Kilavullen pNHA. These are designated for terrestrial habitats and no potential impact pathway has been

identified. Therefore no direct source-pathway-receptor link of significance between the area of the proposed development and any NHA or pNHA has been identified.

Table 2. NHAs & pNHAs within 15km of the Proposed Development

NHAs & pNHAs	Site Code	Distance from proposed development at closest point
Blackwater Valley Kilavullen pNHA	001080	9.9km E
Awbeg Valley (Above Doneraile) pNHA	000075	10.5km NNE
Blackwater Valley (Ballincurrig Wood) pNHA	001793	11.9km E
Eagle Lough pNHA	001049	12.0km N
Kilcolman Bog pNHA	000092	12.3km N
Blackwater Valley (Kilcummer) pNHA	001794	13.2km E
Awbeg Valley (Castletownroche) pNHA	001561	13.7km NE
Awbeg Valley (Below Doneraile) pNHA	000074	14.1km NE
Ballyhoura Mountains pNHA	002036	14.5km NNE
Ballinvonear Pond pNHA	000012	14.6km NNE
Boggeragh Mountains NHA	002247	15.1km SW

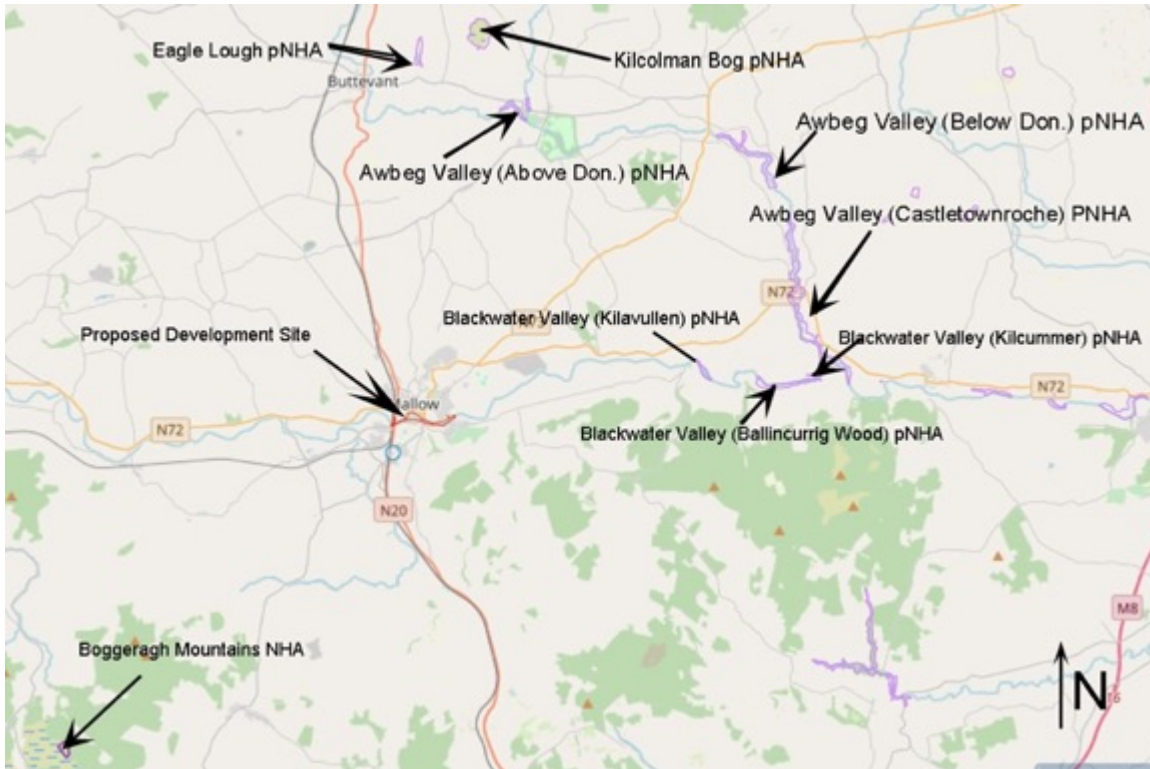


Figure 11. NHAs and pNHAs within 15 km radius of proposed development site | Source: EPA Envision mapping (<https://gis.epa.ie/EPAMaps/>) | Not to scale

4.3 Salmonid Waters – River Blackwater

The River Blackwater main channel is a designated salmonid river in accordance with EU Directive 78/659 (SI No 293 of 1988) and as such receives protection under S.I. No. 293/1988: European Communities (Quality of Salmonid Waters) Regulations, 1988.

The River Blackwater supports resident Brown Trout (*Salmo trutta fario*), a population of Sea Trout (both *Salmo trutta*) in addition to a significant and biologically valuable population of Atlantic salmon (*Salmo salar*). Atlantic Salmon is listed under Annex II and V of the EU Habitats Directive.

4.4 Important Bird Areas – Nagle Mountains

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 development site lies approximately 2km northwest of the Nagle Mountains IBA (Site Code: n/a).

While the IBA criteria from 2005 list 9 pairs as present within the Nagle Mountains, in 2015 just 5 pairs were estimated to be breeding in this area (Ruddock *et al.* 2016). Hen Harrier are listed under Annex I of the E.U. Birds Directive. In Ireland, small birds and small mammals appear to be the most frequently taken prey.

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

- C6 - The site is one of the five most important in the European region in question for a species or subspecies considered threatened in the European Union.

Table 3. Provides a summary of the Nagle Mountains IBA trigger species.

Species	Current IUCN Red List Category	Season	Year(s) of estimate	Population estimate	IBA Criteria Triggered
Hen Harrier (<i>Circus cyaneus</i>)	LC	Breeding	2005	9 breeding pairs	C6

There is no suitable nesting habitat for Hen Harrier within the proposed development site. While Hen Harrier could potentially overfly the site during the winter months, when they tend to be more widely disturbed, the proposed development site does not provide valuable foraging habitat for this species.

5. Habitats

Site surveys were carried out on the 27th of September 2020, 10th of May 2021, 13th of May 2021 and 17th of May 2021. Habitat mapping was carried out in line with the methodology outlined in the Heritage Council Publication, *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). The terrestrial and aquatic habitats within 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 Habitats where required.

A current overview of habitats recorded within the site is shown in the habitat maps below (**Figures 12-15**) and the habitats recorded on site are described in **Table 4**. Site photographs are included in **Appendix 2**. 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). No Annex I habitats were recorded within the proposed development site.

Table 4. Habitat present and their relative value.

Habitat	Comments	Habitat Value
Immature Woodland (WS2)	<p>These wide-open areas of park-like habitat, east of Mallow Bridge (Figure 14), have been recently planted with primarily native species, most of which are immature (under 5m tall). Species include Sessile Oak <i>Quercus petraea</i>, Silver Birch <i>Betula pendula</i>, Goat Willow <i>Salix caprea</i>, Alder <i>Alnus</i> sp., as well as the non-native Norway Maple <i>Acer platanoides</i>. Most of these trees are of the same age/height and have been planted as part of a planting programme, known as the Neighbourhood Plantation. The trees are planted in same species and mixed species groups. There are occasional mature trees.</p> <p>This habitat is located within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of local importance (higher value).</p>	Noted that habitats within European sites are considered of International importance. Based on the characteristics of this habitat it is considered of Local importance (higher value)
Treelines (WL2)	<p>Along both the northern and southern paths running through the area east of the Old Mallow Bridge, treelines of mature trees occur at regularly-spaced intervals, approximately 4-5m apart (Figure 14). These are composed almost entirely of Norway Maple, which are less ecologically valuable than native species but still provide habitat and foraging for birds and invertebrates.</p> <p>This habitat is located within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of local importance (higher value).</p>	Noted that habitats within European sites are considered of International importance. Based on the characteristics of this habitat it is considered of Local importance (higher value)
Recolonising Bare Ground (ED3)/ Dry Meadow/ Grassy Verges (GS2)	<p>Small areas of this habitat occur by the Viaduct and the new wooden bridge, where it occurs in conjunction with dry meadow and grassy verge (GS2) habitat (Figure 11).</p> <p>This habitat is located within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of local importance (higher value).</p>	Noted that habitats within European sites are considered of International importance. Based on the characteristics of this habitat it is considered of Local importance (higher value)
Buildings and artificial surfaces BL3	<p>This habitat includes the footpaths and occasional concrete areas within the park.</p> <p>This habitat is located within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of local importance (lower value).</p>	Noted that habitats within European sites are considered of International importance. Based on the characteristics of this habitat it is considered of Local importance (lower value)
Riparian Woodland WN5/Broadleaved Woodland WD1	<p>Prior to agricultural and (more recent) recreational improvements to the park, the alluvial soil would probably have supported a mosaic of alluvial woodland and wet oak-ash woodland. There is a small</p>	Noted that habitats within European sites are considered of International importance.

Habitat	Comments	Habitat Value
	<p>strip of broadleaved woodland remaining along the edge of the river and drainage ditches. These areas include islands in the river dominated by Reed Canary Grass with willows (<i>Salix cinerea</i> and <i>Salix fragilis</i>). There is also marsh vegetation (GM1) including meadowsweet, Purple Loosestrife <i>Lythrum salicaria</i> and Wild Angelica <i>Angelica archangelica</i> (Figure 11-14).</p> <p>Further back from the water's edge, the woodland contains Ash, Sycamore, Alder and Willow species, and is best described as mixed broadleaved woodland (WD1). Planted species include Black Poplar and Lombardy Poplar. Because of its intimate association with the riparian woodland, this woodland is classified as being of National Importance.</p> <p>East of Old Mallow Bridge, the woodland area bordering the river consists primarily of Norway Maple, Goat Willow and Silver Birch, with occasional Sycamore, Wych Elm <i>Ulmus glabra</i>, Beech <i>Fagus sylvatica</i> and Hawthorn <i>Crataegus monogyna</i>. The understory includes Creeping Buttercup <i>Ranunculus repens</i>, Cow-Parsley <i>Anthriscus sylvestris</i>, Lords and Ladies <i>Arum alpinum</i>, and Dog-Rose <i>Rosa canina</i>. Understorey species include Nettle, Hogweed <i>Heracleum sphondylium</i>, Cleavers <i>Galium aparine</i> and Alexanders <i>Smyrniolum olusatrum</i> are common (Figure 13 and 14).</p> <p>It is noted that there is no Alluvial woodland 91E0 mapped in the vicinity of the proposed development site (NPWS 2012). The closest area of this habitat is located approximately 6km downstream.</p> <p>Japanese Knotweed and Himalayan Balsam were noted within this habitat. Their positions have been marked on the Invasive Species Map (Figure 17).</p> <p>This habitat is located within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of local importance (higher value).</p>	<p>Based on the characteristics of this habitat it is considered of Local importance (national value)</p>
<p>Amenity Grassland GA2</p>	<p>The Town Park and areas east of the Old Mallow Road bridge consist of Amenity Grassland (Figure 12). Over 50% of it is within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of local importance (higher value).</p>	<p>Noted that habitats within European sites are considered of International importance. Based on the characteristics of this habitat it is considered of Local importance (higher value)</p>
<p>Scattered Trees & Parkland WD5</p>	<p>Within the town park there are individual trees and groups of trees, classified as Scattered Trees and Parkland (WD5). Trees include Ash and Birch. East of the bridge, there are individual Sessile Oaks.</p> <p>This habitat is located within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of local importance (higher value).</p>	<p>Noted that habitats within European sites are considered of International importance. Based on the characteristics of this habitat it is considered of Local importance (higher value)</p>

Habitat	Comments	Habitat Value
Drainage Ditches FW4	<p>A drainage ditch is located to the east of the Mallow Bridge and drains into the River Blackwater. This is a modified wet channel which overflows from the Spa Glen stream when flow levels rise. It is of minimal fisheries value. Japanese Knotweed was recorded both upstream and downstream of the footbridge. (Figure 13).</p> <p>This habitat is located within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of local importance (higher value).</p>	<p>Noted that habitats within European sites are considered of International importance. Based on the characteristics of this habitat it is considered of Local importance (higher value)</p>
Depositing Lowland River FW2	<p>The Spa Glen Stream is located near the eastern end of the proposed development site (Figure 14) and flows into the River Blackwater within the Blackwater River (Cork/Waterford) SAC. This is a modified waterbody with wetland vegetation and/or woodland on the banks. The crossing of this small watercourse is via an existing foot bridge. At the crossing point there is a mixture of Sycamore and Poplar with an understorey of Nettle, Ivy, Elm, Hemlock Water Dropwort, Willow, Marsh Marigold, Bramble and Rosebay Willowherb. No trees with the structural elements to be of value for bats were recorded. Levels of siltation are relatively high with filamentous algae noted. This small stream has the potential to support fish species such as eel and possibly small numbers of Brown Trout but it is not of significant value for these species. Himalayan Balsam was noted in proximity to the footbridge.</p> <p>The East Baltydaniel discharges into the River Blackwater to the east of the railway bridge (Figure 12). This is a small watercourse of minimal fisheries value with Blackthorn, Hawthorn, Ivy, Remote Sedge, Hemlock and Water Dropwort noted along its banks. Sediment levels and levels of filamentous algae are high.</p> <p>This habitat has links to the Annex I habitat <i>Watercourses of plain to montane levels with the Ranunculum fluitantis and Callitricho-Batrachion vegetation (3260)</i> which is also a qualifying interest for the Blackwater River (Cork/Waterford) SAC. This is not a significant example of this habitat type.</p> <p>This habitat is located within the Blackwater River (Cork/Waterford) SAC but is not a qualifying habitat for this SAC and is considered of Local importance (Higher value).</p>	<p>Noted that habitats within European sites are considered of International importance. Based on the characteristics of this habitat it is considered of Local importance (higher value)</p>
Eroding/upland rivers (FW1)	<p>The River Blackwater is a designated SAC and it supports resident and/or regularly occurring populations of species listed in Annex II of the Habitats Directive and habitats listed on Annex 1</p>	<p>International importance.</p>

Habitat	Comments	Habitat Value
	<p>of the Habitat Directive. The Blackwater River acts as a wildlife corridor and has high value riparian habitats along its length.</p> <p>This is located outside the proposed development site boundary.</p>	

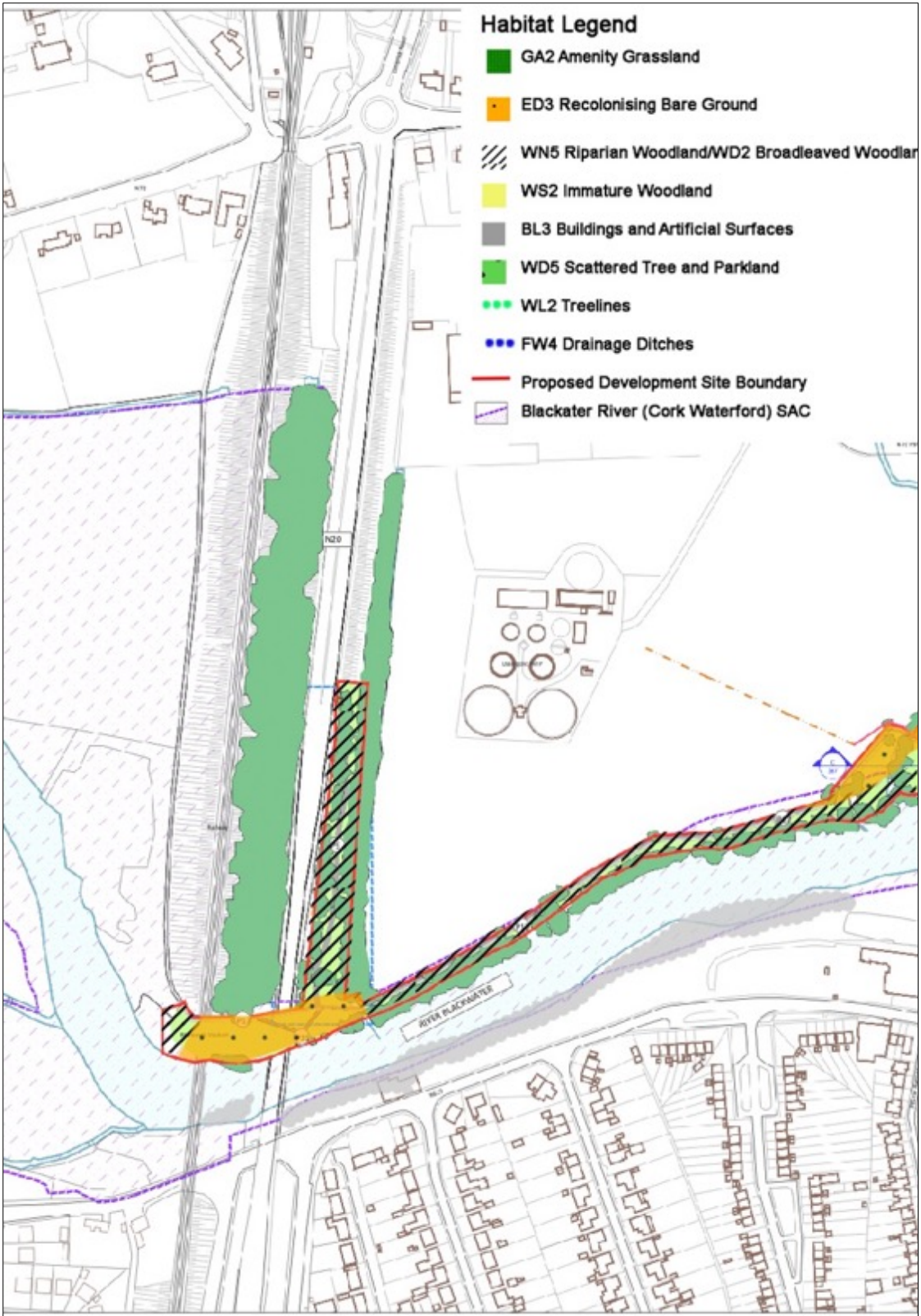


Figure 12. Habitat map from railway line to just west of East Baltydaniel Stream



Figure 13. Habitat map of central site including playing pitches

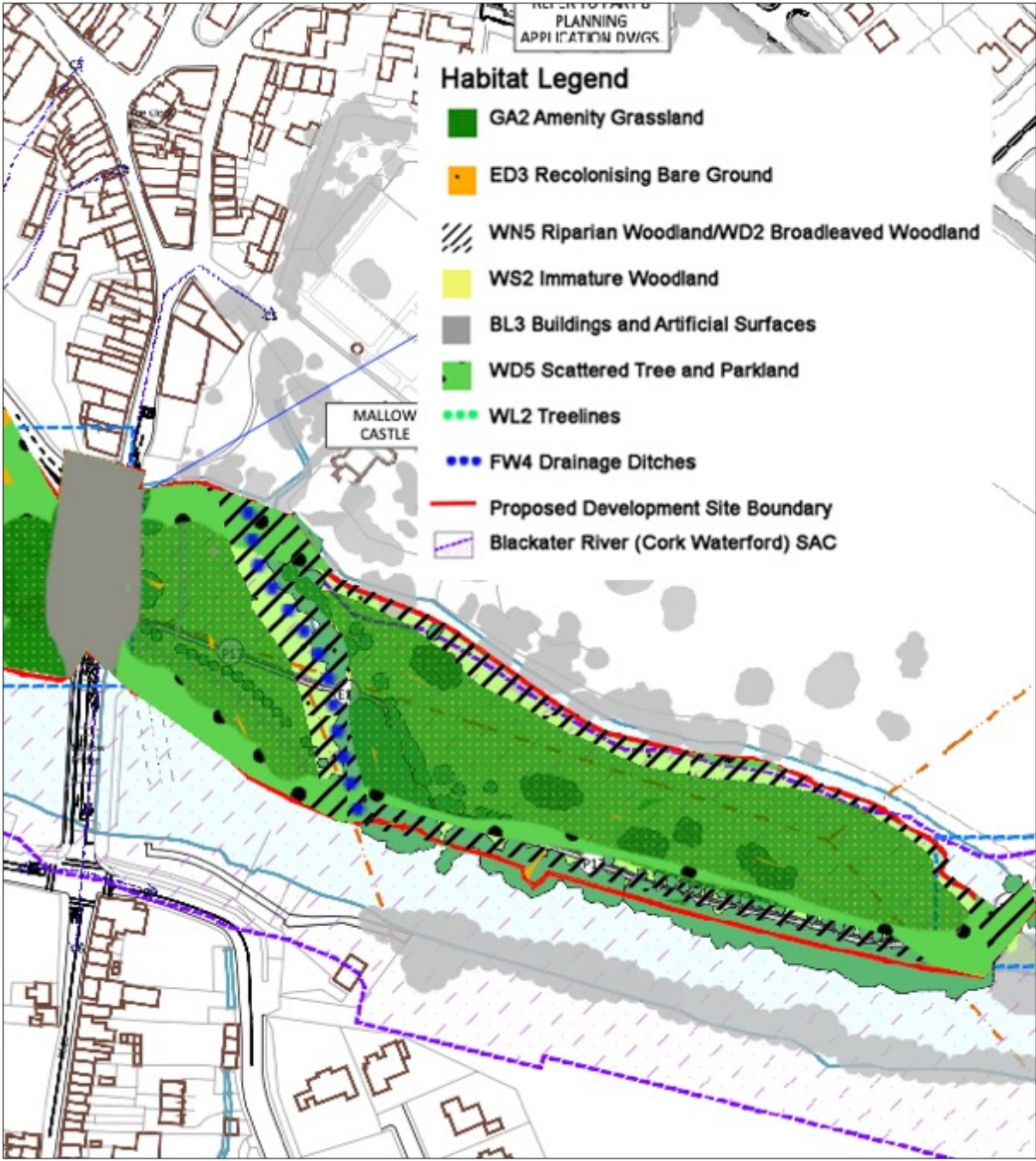


Figure 14. Habitat map from Mallow Bridge is west to Spa Glen Stream in West



Figure 15. Habitat at east of site from east Spa Glen Steam to Lovers Leap

6. Flora

The site of the proposed development lies within Ordnance Survey National Grid 10km square W59. The National Biodiversity Data Centre (NBDC) online database provides data on the distribution of mammals, birds, and invertebrates within the 10 km grid squares.

Some 176 flowering plants are listed by the NBDC as present in the grid square W59 (NBDC 12/05/21). None of these species are designated as threatened, endangered or extinct and none are protected by the Flora Protection Order 2015 (S.I. No. 356 of 2015). The National Parks and Wildlife Service (NPWS) rare plant database shows no records of protected bryophyte species within grid square W59.

7. Fauna

7.1 Otter

A review of existing NBDC records within a 10km radius of the study site (Grid Square W59) showed that Otter or signs of Otter have been recorded on 20 occasions, most recently in September 2015 (NBDC 12/05/21).

Otter is a qualifying interest for the Blackwater River (Cork/Waterford)) SAC which is one of the most important sites in Ireland for this species. The most recent national Otter Survey recorded Otter in 98.8% of the site assessed within the Blackwater catchment.

Otters are also known to frequent sections of the River Blackwater in close proximity to the proposed development site (Carl Dixon Personal observation). During surveys for the Mallow Sewerage scheme (DixonBrosnan 2019), Otter spraints were recorded on the western side of Mallow Town Bridge, within the proposed development site various locations along the southern bank of the River Blackwater (**Figure 16**). The evidence indicates that Otter utilise habitats in proximity to the River Blackwater.



Figure 16. Locations of Otter spraint sites and Otter tar markings | Source DixonBrosnan 2019

An Otter holt was recorded in February 2019 in a section of recently collapsed river embankment (**Figure 17**). A number of spraints were noted at the entrance. A holt was located within an area which was subject to high levels of disturbance and there was no tunnel system

evident. The site was not suitable as a breeding holt and was more likely to be used as a short-term resting area.



Figure 17. Otter holt location recorded February 2019 south of proposed development site | Source DixonBrosnan 2019

As noted above, Otters commonly occur along the River Blackwater and are listed as a QI for the Blackwater River (Cork/Waterford) SAC. However, levels of disturbance within the Mallow Town Park from walkers and in particular from dogs is high. This may limit the use of bankside habitats within the Mallow Town Park by Otter and no holts or signs of Otter were recorded within 150m of the proposed works. Signs of Otter are generally more prevalent on the southern bank where disturbance levels are lower.

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 *P. pygmaeus* and Nathusius' *P. nathusii*, four *Myotis*: Natterer's *Myotis nattereri*, Daubenton's *M. daubentonii*, whiskered *M. mystacinus*, Brandt's *M. 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.

A review of existing bat records within W59 showed that the Irish bat species listed in **Table 5** have been recorded.

Table 5. Presence of Irish bat species within grid squares W59.

Common name	Scientific name	Presence
Lesser Noctule	<i>Nyctalus leisleri</i>	Present
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	Present
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Present
Daubenton's Bat	<i>Myotis daubentonii</i>	Present
Natterer's Bat	<i>Myotis nattereri</i>	Absent
Brown Long-eared Bat	<i>Plecotus auritus</i>	Present
Whiskered Bat	<i>Myotis mystacinus</i>	Absent
Lesser Horseshoe	<i>Rhinolophus hipposideros</i>	Absent
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	Absent

NBDC 12/05/21

It is noted that other species which have not been included within this database are also likely to occur. Lesser horseshoe bat (*Rhinolophus hipposideros*) is the only species of bat listed on Annex II of the Habitats Directive (Directive 92/43/EEC). The closest recorded records for Lesser horseshoe bat is approximately 18km west of the proposed development site (NBDC records). While the remaining Irish bat species; Nathusius' pipistrelle, Natterer's Bat and Brandt's *M. brandtii* bats have not been recorded in the local area to date. Nathusius' pipistrelle and Brandt's bat, are rarer Irish species, which are less likely to occur.

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.

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 Mallow 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		34.89
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	49
<i>Plecotus auritus</i>	Brown long-eared bat	51
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	50
<i>Rhinolophus hipposideros</i>	Lesser horseshoe	0
<i>Nyctalus leisleri</i>	Leisler's bat	48
<i>Myotis mystacinus</i>	Whiskered bat	39
<i>Myotis daubentonii</i>	Daubenton's bat	35
<i>Pipistrellus nathusii</i>	Nathusius' pipistrelle	4
<i>Myotis nattereri</i>	Natterer's bat	38

Source: NBDC 12/05/12

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

In addition to domestic legislation, bats are also protected under the EU Habitats Directive (92/43/EEC) with all bat species listed in Annex IV of the Directive. The Irish government is also a signatory to the 1979 Bonn convention (Convention on the conservation of migratory species of wild animals) and the 1982 Bern convention (The convention on the conservation of European wildlife and natural habitats), and has a commitment to the 1991 Eurobats agreement (Agreement on the conservation of bats in Europe).

It is noted that sections of the development site contain a number of features of value for bats i.e. woodland, treelines and the River Blackwater. These provide both a foraging ground and commuting pathway into the wider landscape for bats and have the potential to provide roosting habitat. The River Blackwater is known as an important habitat for bats (NBDC). It acts as a vegetated corridor along which bats can commute from the wider countryside into the sub-urban environment. Riparian habitat along the River Blackwater also provides a sheltered foraging area, a breeding site for invertebrate prey and, at night, screening from the surrounding artificial lighting of the surrounding sub-urban environment. As a result, trees along, near and over the river offer potential roosting habitat for bats.

DixonBrosnan carried out a bat emergence survey at Mallow Castle, located just to the north of the proposed development site August and September 2019 (DixonBrosnan 2019). The purpose of the emergence survey was to determine if bats were roosting in the walls or trees to be affected by the site works. 8-12 Soprano Pipistrelle were observed foraging in the Castle gardens and surrounding area.

Soprano pipistrelle is a habitat generalist although it tends to occur more often in the vicinity of broadleaved woodland. Lintott *et al.* (2014) found that in female soprano pipistrelles typically exploit woodlands which are well connected, with lower clutter, more mature trees and a lower edge to interior ratio. Habitat quality and the composition of the surrounding landscape appears to be less limiting to males (Lintott et al. 2014). Although generally found roosting in buildings the Soprano pipistrelle also roosts in tree holes and crevices. Summer roosts support colonies of an average size of 200 bats, however this number is probably considerably less when roosting within trees.

7.2.1 Bat Activity Survey (Bat Detector Survey)

Night time bat emergence surveys were carried out on 27th of September 2020 and the 13th of May 2021 using a Batbox Duet and Echo Meter Touch Bat Detector. The survey followed the guidelines set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed)*' (Collins, 2016). The survey was carried out during suitable weather conditions for bats (air temperature of 13°C approx., still conditions) and suitable time, starting before sunset and ending over 75 minutes after sunset.

High levels of bat activity were recorded along the riparian vegetation and over the River Blackwater main channel in both 2020 and 2021. During the September 2020 survey, Soprano Pipistrelle, Brown Long Eared Bat and Daubenton's Bat were recorded. On the May 2021 visit Common Pipistrelle, Soprano Pipistrelle, Brown Long Eared Bat, Daubenton's Bat and Leisler's Bat were recorded.

Bat foraging was largely confined to the River Blackwater channel which provides the highest value resource with large numbers of macro-invertebrate prey and sheltered conditions. Bats were recorded along the length of the survey area with abundance and species linked to flow

conditions, bankside vegetation etc. The River Blackwater channel and associated riparian vegetation is considered a high value resource for bats.

7.3 Other terrestrial mammals

Sixteen other species of terrestrial mammal have been recorded within a 10km radius of the proposed development site, eight of which are protected under the Irish Wildlife Act; namely Pine Marten, Badger, Pygmy Shrew, Red Squirrel, Irish Hare, Hedgehog, Fallow Deer and Sika Deer.

7.3.1 Badger (*Meles meles*)

Badger and 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 wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. This species has been recorded 74 times in W59, with the most recent record in March 2017. Badgers are known to occur within the wider landscape (NBDC), however no signs of Badger, were recorded during the site surveys.

7.3.2 Pygmy Shrew (*Sorex minutus*)

Pygmy Shrew is common throughout mainland Ireland and prefers habitats such as hedgerows and grasslands; they have also been found utilizing stone walls. There are three records of Pygmy Shrew in W59, the most recent from July 2018. Due to the habitats present within the proposed site Pygmy Shrew are likely to be present.

7.3.3 Red Squirrel (*Sciurus vulgaris*)

Red Squirrel is listed on Appendix III of the Berne Convention can be found throughout Ireland. There are nine records of Red squirrel in the 10km grid square W59, the most recent from April 2018. Red Squirrel have been recorded within the vicinity of the Mallow Town Park on both scattered trees and parkland and on peanut feeders as recently as 2013 (NBDC). It is likely, given habitat mix within the proposed development and the connectivity to the areas where the species have been recorded, that they will use the Mallow Town Park.

7.3.4 Pine Marten (*Martes martes*)

The Pine Marten is protected in Ireland by both national and international legislation. Under the Irish Wildlife Acts it is an offence, except under licence, to capture or kill a Pine Marten, or to destroy or disturb its resting places. The European Union's Habitats & Species Directive further obliges Ireland to maintain the favourable conservation status of the Pine Marten throughout its range. There are three records of Pine Marten in W59 (NBDC), the most recent from August 2013. However, there are no records of Pine Marten in the vicinity of the park. While they generally prefer coniferous woodland, they could potentially occur within the denser woodland areas of the proposed development site.

7.3.5 Hedgehog (*Erinaceus europaeus*)

Hedgehog is protected under the Wildlife Act and is also listed on Appendix III of the Berne Convention. Hedgehogs can be found throughout Ireland, with male hedgehogs having an annual range of around 56 hectares. This species has been recorded four times on W59, the

most recent record in June 2015. Due to the habitats recorded within the site, hedgehog is likely to occur within the proposed development site.

7.3.6 Irish Hare (*Lepus timidus hibernicus*)

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. 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. According to the NBDC, hares have been recorded in W59 on three occasions, the most recent record in September 2017. No signs of Hare were recorded although this species is likely to occur in the vicinity of the site and there are no habitats of particular value onsite.

7.3.7 Fallow Deer (*Dama dama*)

Fallow deer are Ireland's second largest deer species and are the most widespread of the deer, found in nearly every county of the island. In Ireland the fallow deer mainly resides in mature deciduous or mixed woodlands which are close to open grassland. The pattern of habitat use can vary throughout the year depending on the season or the particular area in which the deer are located providing different foraging opportunities.

Fallow deer are classified as grazers or non-selective bulk feeders, although they will browse on trees and shrubs. The species has become almost nocturnal in their grazing habits in areas of high disturbance.

The grounds of the 'New' Mallow Castle to the north of the proposed development site, supports a herd of white Fallow Deer. Due to the habitats present within and in close proximity to the proposed development site, it is possible that fallow deer occur.

7.3.8 Sika Deer (*Cervus nippon*)

This species 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. They have very large daily ranges, moving up to 2.5km per day and are classified as intermediate grazer-browsers due to their highly opportunistic feeding patterns. Due to the habitats recorded within the proposed development site, sporadic usage by Sika Deer is possible.

7.4 Reptiles and Amphibians

According to records held by the NBDC, Common Frog (*Rana temporaria*) is the only amphibian species recorded within grid square W59 (Source: NBDC 12/05/21). Common Frog is listed in Annex V of the EU Habitats Directive and is protected under the Wildlife Acts. The species was not recorded during the site survey, however they could occur on the margins of the watercourses in the proposed development site.

7.5 Birds

The National Biodiversity Centre online data base lists 113 bird species in W59. Of these species, a number are listed under Annex I of the Birds Directive and/or are Red Listed Birds of Conservation Concern in Ireland (Gilbert et al. 2021) (**Table 7**).

Table 7. Annex I and Red List species recorded in W59

Species	Birds Directive Annex	BOCCI
	I	Red List
Barn owl		X
Black-tailed Godwit		X
Common Swift		X
Eurasian curlew		X
Golden plover		X
Hen harrier	X	
Kestrel		X
Kingfisher	X	
Lapwing		X
Little egret	X	
Merlin	X	
Northern lapwing		X
Peregrine falcon	X	
Pochard		X
Shelduck		X
Shoveler		X
Skylark		X

Wigeon		X
Woodcock		X
Yellowhammer		X

Source NBDC 12/05/21

Bird surveys for general bird usage were carried out in conjunction with habitat surveys within the entire development footprint on the 10th of May 2021 and 13th of May 2021. A search of the riverbanks in the vicinity of the angling stands was also carried out to determine if any Kingfisher nests or nesting habitat was recorded.

Birds 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. Bird species listed in Annex I of the Birds Directive (2009/147/EC) are considered a conservation priority. Species recorded within the proposed development footprint which were recorded during habitat surveys are shown in **Table 8**.

Table 8. Bird Species recorded during site surveys

Species	Common Name	Birds Directive Annex I	BOCCI	
			Red List	Amber List
<i>Turdus merula</i>	Blackbird			
<i>Parus caeruleus</i>	Blue Tit			
<i>Pyrrhula pyrrhula</i>	Bullfinch			
<i>Fringilla coelebs</i>	Chaffinch			
<i>Phylloscopus collybita</i>	Chiffchaff			
<i>Periparus ater</i>	Coal tit			
<i>Prunella modularis</i>	Dunnock			
<i>Carduelis carduelis</i>	Goldfinch			
<i>Parus major</i>	Great Tit			
<i>Motacilla cinerea</i>	Grey Wagtail		X	
<i>Ardea cinera</i>	Heron			
<i>Corvus cornix</i>	Hooded Crow			
<i>Delichon urbicum</i>	House Martin			X
<i>Passer domesticus</i>	House Sparrow			X
<i>Corvus monedula</i>	Jackdaw			
<i>Alcedo atthis</i>	Kingfisher	X		
<i>Pica pica</i>	Magpie			
<i>Anas platyrhynchos</i>	Mallard			X
<i>Turdus viscivorus</i>	Mistle Thrush			
<i>Erithacus rubecula</i>	Robin			
<i>Riparia riparia</i>	Sand martin			X

Species	Common Name	Birds Directive Annex	BOCCI	
			Red List	Amber List
<i>Turdus philomelos</i>	Song Thrush	I		
<i>Sturnus vulgaris</i>	Starling			X
<i>Hirundo rustica</i>	Swallow			X
<i>Apus apus</i>	Swift		X	
<i>Certhia familiaris</i>	Treecreeper			
<i>Columba palumbus</i>	Woodpigeon			
<i>Troglodytes troglodytes</i>	Wren			

Generally the mix of woodland, grassland and freshwater habitat supports a relatively diverse mix of bird species. Two Red List species were recorded i.e. Grey Wagtail and Swift. A number of Amber List species were also recorded.

The presence of a watercourse i.e. River Blackwater, does provide additional habitat for more specialised species such as Kingfisher (*Alcedo atthis*) One Kingfisher was observed flying upstream during bat surveys, but no nests were recorded in proximity to the proposed works area. Kingfisher is listed on Annex I of the EU Birds Directive and Appendix II of the Bern Convention. The species is Amber-listed in Ireland and BirdLife International has evaluated the European population as depleted, due to a moderate historical decline.

Kingfishers prefer still or gently flowing water with plenty of small fish, and with reeds, rushes or shrubs on the banks for perches. Streams, small rivers, canals and ditches are favoured to open waterbodies, but it also uses lakes, ponds and flooded gravel pits. Egg-laying occurs from March to July. Suitable banks for nesting are required in breeding season, but nest-sites can be over 250 m from foraging waters and can occur infrequently in walls, rotten tree stumps, concrete tunnels in canal banks, or in the burrow of Sand Martin (*Riparia riparia*). Suitable Kingfisher nesting banks are generally tall vertical banks with soft material into which they can dig their burrows.

The size of a Kingfisher territory depends on the amount of food available, and on the bird population in the area. Territories tend to cover at least 1km of river, but may extend over 3/5 km. Any nearby waterbody that provides good fishing will be included in the territory. Kingfishers may be found along streams of all kinds, lakes and ponds and tend to be more coastal in winter, where they may be seen in estuaries, rocky seashores and harbours.

Breeding Kingfisher has been recorded in proximity to the study area (NBDC). However, no kingfisher nesting sites were recorded by DixonBrosnan within the proposed study area.

Overall the proposed development site supports a diverse mix of bird species which are common and widespread within the county. A number of Red and Amber listed were recorded within the study area The Blackwater River supports some more specialist species including Kingfisher, Grey Heron, Mallard and Grey Wagtail and is considered an important local resources 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 which have been recorded within grid square W59 (**Table 9**).

Table 9. High impact invasive species recorded in W59

Group	Species
bird	Ruddy Duck (<i>Oxyura jamaicensis</i>)
flowering plant	Canadian Waterweed (<i>Elodea canadensis</i>)
flowering plant	Cherry Laurel (<i>Prunus laurocerasus</i>)
flowering plant	Indian Balsam (<i>Impatiens glandulifera</i>)
flowering plant	Japanese Knotweed (<i>Fallopia japonica</i>)
terrestrial mammal	American Mink (<i>Mustela vison</i>)
terrestrial mammal	Brown Rat (<i>Rattus norvegicus</i>)
terrestrial mammal	Fallow Deer (<i>Dama dama</i>)
terrestrial mammal	Sika Deer (<i>Cervus nippon</i>)

Source NBDC database 12/05/21

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 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.” Japanese Knotweed (*Fallopia japonica*) was recorded within riparian habitats at two locations (**Figure 16**). A small drainage ditch downstream of the Spa Glen Stream is located to the east of the Mallow Bridge and drains into the River Blackwater. Small numbers of Japanese Knotweed plants, generally immature, were recorded both upstream and downstream of the footbridge over this drainage ditch. A dense stand of Japanese Knotweed was recorded on the bank of the River Blackwater at the proposed angling stand No. 4. Himalayan Balsam

(*Impatiens glandulifera*), both juvenile and adult plants, is widely scattered throughout the riparian zone.

The medium impact listed species (NBDC) Old Man's Beard (*Clematis vitalba*) was recorded along the Spa Glen Stream. Old Man's Beard is not included in the Third Schedule. Therefore, its presence at the site does not have the potential to lead to an offence under the Birds and Natural Habitats Regulations 2011 (S.I. 477 of 2011). However, the National Biodiversity Centre (NBDC) notes that under the right ecological conditions this species may have an impact on the conservation goals of a European site or impact on a water body achieving good/high ecological status under the Water Framework Directive (Directive 2000/60/EC). Old Man's Beard is also included in the NRA *Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads* (NRA 2010) as this species has been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure; and is likely to be encountered during road schemes.

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.

Himalayan balsam (*Impatiens glandulifera*) is an invasive terrestrial plant species that was first introduced in the UK in 1839 as an ornamental garden plant. Since it was introduced, it has spread to most parts of Ireland. Due to the nutrient poor soil and cold temperatures in its home range, the Himalayas, it has adapted to develop thousands of seeds, which are dispersed widely as the ripe seedpods shoot their seeds up to 7m (22ft) away. Due to our warmer climate and nutrient rich soils it has thrived here and became highly invasive. Once established in the catchment of a river the seeds, which can remain viable for two years, are transported further afield by water. This species is widely distributed within the study area including proposed angling stands 2, 3 and 5 and in proximity to the footbridge over the Spa Glen Stream.

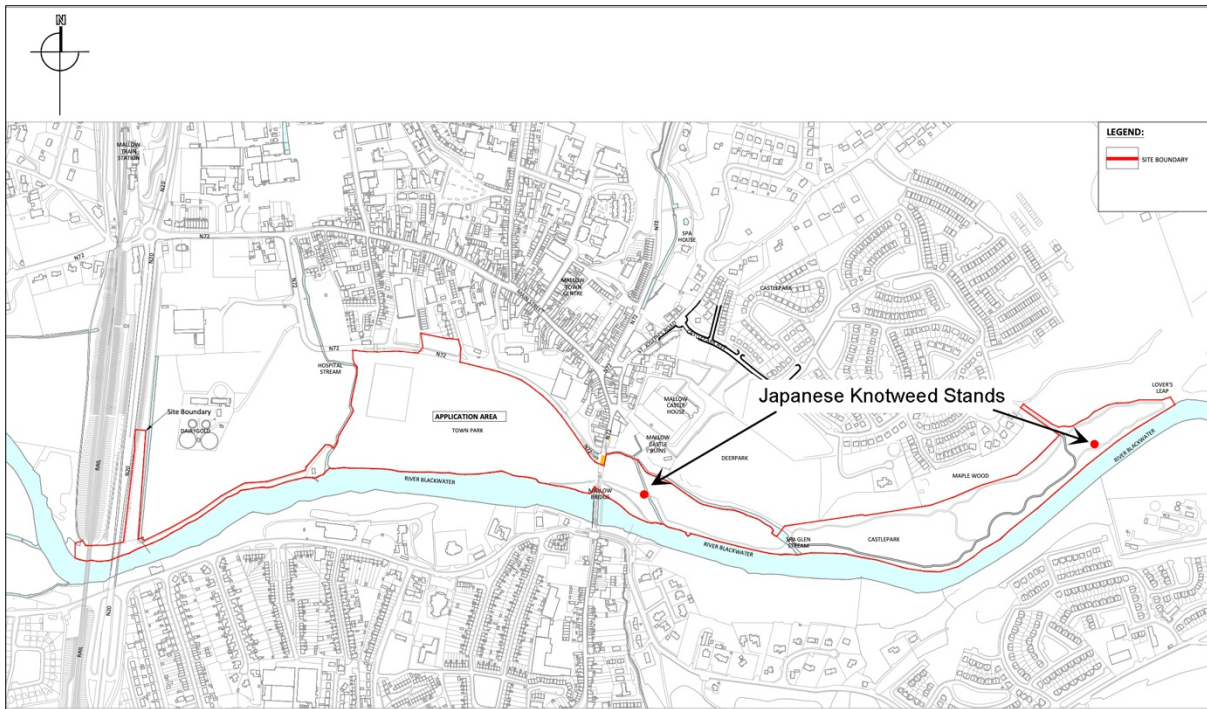


Figure 18. Japanese Knotweed recorded within proposed development site boundary

Old Man’s Beard (*Clematis vitalba*), also known as Travellers Joy, is a member of the Ranunculaceae family. It is a vigorous, deciduous climber with characteristic feathery seed heads in the late summer from which it derives its common name. In Ireland it is found in hedgerows, roadsides, riverbanks and along forest edges. The vine can form dense thickets blanketing trees and shrubs, ultimately depriving them of light. It can break limbs or cause their collapse from its sheer weight and mass. It also prevents regeneration of native vegetation by blocking light and physically oppressing young plants.

7.7 Other species listed by NBDC as present within grid square W59

Table 10 below lists other species recorded within grid square W59, along with any species considered under threat and provided with legal protection.

Table 10. Other species listed by NBDC as present within grid square W59

Species Group	Named species
Crustacean	Freshwater White-clawed Crayfish (<i>Austropotamobius pallipes</i>) Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts.
Insect (Beetle (Coleoptera))	<i>Nebrioporus (Nebrioporus) depressus</i> : Threatened Species: Data deficient
Insect Butterflies	Marsh Fritillary (<i>Euphydryas aurinia</i>): Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Threatened Species: Vulnerable Wall (<i>Lasiommata megera</i>): Threatened Species: Endangered

Species Group	Named species
	<p>Small Heath (<i>Coenonympha pamphilus</i>): Threatened Species: Near threatened</p> <p>Dark Green Fritillary (<i>Argynnis aglaja</i>): Threatened Species: Vulnerable</p>
Insect (Hymenopteran)	<p>Large Red Tailed Bumble Bee (<i>Bombus (Melanobombus) lapidarius</i>): Threatened Species: Near threatened</p> <p>Moss Carder-bee (<i>Bombus (Thoracombus) muscorum</i>): Threatened Species: Near threatened</p>
Liverwort	<p>Least Concern</p> <p>Bifid Crestwort (<i>Lophocolea bidentata</i>), Blueish Veilwort (<i>Metzgeria violacea</i>), Common Frillwort (<i>Fossombronia pusilla</i>), Common Pouchwort (<i>Calypogeia fissa</i>), Crescent-cup Liverwort (<i>Lunularia cruciata</i>), Dilated Scalewort (<i>Frullania dilatata</i>), Even Scalewort (<i>Radula complanata</i>), Fairy Beads (<i>Microlejeunea ulicina</i>), Fingered Cowlwort (<i>Colura calyptrifolia</i>), Forked Veilwort (<i>Metzgeria furcata</i>), Notched Pouchwort (<i>Calypogeia arguta</i>), Toothed Pouncewort (<i>Drepanolejeunea hamatifolia</i>), Western Pouncewort (<i>Lejeunea lamacerina</i>), Whiskered Veilwort (<i>Metzgeria consanguinea</i>), White Earwort (<i>Diplophyllum albicans</i>)</p>
Mollusc	<p>Freshwater Pearl Mussel (Margaritifera (Margaritifera) margaritifera) Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts</p> <p>Field Slug (Deroceras (Deroceras) agreste) Threatened Species: Data deficient</p> <p>Threatened Species: Endangered</p> <p><i>Pisidium pulchellum</i>, Small Amber Snail (<i>Succinella oblonga</i>)</p> <p>Small Amber Snail (<i>Succinella oblonga</i>) Threatened Species: Endangered</p> <p>Common Whorl Snail (<i>Vertigo (Vertigo) pygmaea</i>) Threatened Species: Near threatened</p> <p>Silky Snail (<i>Ashfordia granulata</i>) Threatened Species: Near threatened</p> <p>Heath Snail (<i>Helicella itala</i>) Threatened Species: Vulnerable</p> <p>Lake Orb Mussel (<i>Musculium lacustre</i>) Threatened Species: Vulnerable</p> <p>Smooth Grass Snail (<i>Vallonia pulchella</i>) Threatened Species: Vulnerable</p>
Moss	<p>Threatened Species: Least concern</p> <p>Aloe Haircap (<i>Pogonatum aloides</i>), Bird's-claw Beard-moss (Barbula unguiculata), Broom Fork-moss (<i>Dicranum scoparium</i>), Bruch's Pincushion (<i>Ulota bruchii</i>), Capillary Thread-moss (<i>Bryum capillare</i>), Clustered Feather-moss (<i>Rhynchostegium confertum</i>), Common Aloe-moss (<i>Aloina aloides</i>), Common Bladder-moss (Physcomitrium pyriforme), Common Cord-moss (<i>Funaria hygrometrica</i>), Common Feather-moss (<i>Eurhynchium praelongum</i>), Common Pottia (<i>Tortula truncata</i>), Common Striated Feather-moss (<i>Eurhynchium striatum</i>), Common Tamarisk-moss (<i>Thuidium tamariscinum</i>), Crimson-tuber Thread-moss (<i>Bryum rubens</i>), Curly Crisp-moss</p>

Species Group	Named species
	<p>(<i>Trichostomum crispulum</i>), Curve-leaved Ditrichum (<i>Ditrichum heteromallum</i>), Cylindric Beard-moss (<i>Didymodon insulanus</i>), Cylindric Ditrichum (<i>Ditrichum cylindricum</i>), Delicate Earth-moss (<i>Pseudephemerum nitidum</i>), Dusky Beard-moss (<i>Didymodon luridus</i>), Dwarf Neckera (<i>Neckera pumila</i>), Elegant Bristle-moss (<i>Orthotrichum pulchellum</i>), Elegant Silk-moss (<i>Pseudotaxiphyllum elegans</i>), <i>Ephemerum serratum</i> var. <i>minutissimum</i>, Fallacious Beard-moss (<i>Didymodon fallax</i>), Field Forklet-moss (<i>Dicranella staphylina</i>), Flat Neckera (<i>Neckera complanata</i>), Fox-tail Feather-moss (<i>Thamnobryum alopecurum</i>), Frizzled Pincushion (<i>Ulota phyllantha</i>), Great Plait-moss (<i>Hypnum lacunosum</i> var. <i>lacunosum</i>), Heath Plait-moss (<i>Hypnum jutlandicum</i>), Heath Star Moss (<i>Campylopus introflexus</i>), Intermediate Screw-moss (<i>Syntrichia intermedia</i>), <i>Isothecium myosuroides</i> var. <i>myosuroides</i>, Juicy Silk-moss (<i>Plagiothecium succulentum</i>), Lateral Cryphaea (<i>Cryphaea heteromalla</i>), Lesser Bird's-claw Beard-moss (<i>Barbula convoluta</i>), Lesser Potato Bryum (<i>Bryum subapiculatum</i>), Little Shaggy-moss (<i>Rhytidiadelphus loreus</i>), Long-beaked Thyme-moss (<i>Plagiomnium rostratum</i>), Luisier's Tufa-moss (<i>Gymnostomum viridulum</i>), Many-fruited Leskea (<i>Leskea polycarpa</i>), Neat Feather-moss (<i>Scleropodium purum</i>), Nicholson's Beard-moss (<i>Didymodon nicholsonii</i>), Pointed Spear-moss (<i>Calliergonella cuspidata</i>), Rambling Tail-moss (<i>Anomodon viticulosus</i>), Rough-stalked Feather-moss (<i>Brachythecium rutabulum</i>), Schreber's Forklet-moss (<i>Dicranella schreberiana</i>), Silky Wall Feather-moss (<i>Homalothecium sericeum</i>), Small Hairy Screw-moss (<i>Syntrichia laevipila</i>), Small-bud Bryum (<i>Bryum gemmiferum</i>), Smaller Lattice-moss (<i>Cinclidotus fontinaloides</i>), Springy Turf-moss (<i>Rhytidiadelphus squarrosus</i>), Swartz's Feather-moss (<i>Oxyrrhynchium hians</i>), Tender Feather-moss (<i>Rhynchostegiella tenella</i>), Tozer's Thread-moss (<i>Epipterygium tozeri</i>), Wall Screw-moss (<i>Tortula muralis</i>), Water Screw-moss (<i>Syntrichia latifolia</i>), Wavy Beard-moss (<i>Didymodon sinuosus</i>), White-tipped Bristle-moss (<i>Orthotrichum diaphanum</i>), Wood Bristle-moss (<i>Orthotrichum affine</i>)</p> <p>Threatened Species: Near threatened</p> <p>Bordered Screw-moss (<i>Tortula marginata</i>)</p> <p>River Bristle-moss (<i>Orthotrichum rivulare</i>)</p> <p>Tufted Feather-moss (<i>Scleropodium cespitosum</i>)</p> <p>Threatened Species: Vulnerable</p> <p>Twisting Thread-moss (<i>Bryum torquescens</i>)</p>

Source. NBDC 12/05/21

8. Water Quality

8.1 EPA Water Quality Data

The Environmental Protection Agency (EPA) carries out a biological assessment of most river channels in the country on a regular basis. The assessments are used to derive Q values, indicators of the biological quality of the water. The biological health of a watercourse provides an indication of long-term water quality. The EPA Q value scheme is summarised in **Table 11**. The relationship between the Q-rating system and the Water Framework Directive classification as defined by the Surface Waters Regulations 2009 (S.I. 272 of 2009) is shown in **Table 12**. EPA biological monitoring data for the closest freshwater monitoring sites

applicable to the development site, in relation to flow direction and topography are shown in **Table 13**.

The Q Value system, which is used by the Environmental Protection Agency, describes the relationship between water quality and the macro-invertebrate community in numerical terms. The presence of pollution causes changes in flora and fauna of rivers. Well documented changes occur in the macro-invertebrate community in the presence of organic pollution: sensitive species are progressively replaced by more tolerant forms as pollution increases. Q5 waters have a high diversity of macro-invertebrates and good water quality, while Q1 have little or no macro-invertebrate diversity and unsatisfactory water quality.

The intermediate ratings Q1-2, Q2-3, Q3-4 and Q4-5 are used to denote transitional conditions, while ratings within parenthesis indicate borderline values. Great importance is attached to the EPA biotic indices, and consequently it is these data that are generally used to form the basis of water quality management plans for river catchments.

Table 11. EPA biotic index scheme

Q value	Water quality	Pollution	Condition
5	Good	Unpolluted	Satisfactory
4	Fair	Unpolluted	Satisfactory
3	Doubtful	Moderately polluted	Unsatisfactory
2	Poor	Seriously polluted	Unsatisfactory
1	Bad	Seriously polluted	Unsatisfactory

Table 12. Correlation between the WFD classification and Q values

Ecological status WFD	Q Values
High	Q5, Q4-5
Good	Q4
Moderate	Q3-4
Poor	Q3, Q2-3
Bad	Q2, Q1

The southern boundary of the proposed development site runs along the River Blackwater. The most recent biological monitoring, conducted by the EPA in 2018 and 2020, at locations upstream and downstream of the proposed development site is presented in **Table 13**. This indicated that water quality both upstream and downstream of the proposed development site was classified as Good (**Figure 19**).

Table 13. EPA Q Values

River Blackwater EPA Station	Location at closest Point	Q Values	Status
Ne of Ballymagooly	3.1km downstream of proposed development site	Q4 (2020)	Good
Rly Br, Mallow (LHS)	0km upstream of proposed development site	Q4 (2018)	Good
Rly Br, Mallow (RHS)	0km upstream of proposed development site	Q4 (2018)	Good



Figure 19. Proposed development site in relation to relevant EPA biological monitoring sites along the River Blackwater| Source EPA envision mapping| Not to scale

8.2 River Basin Management Plan for Ireland 2018 – 2021 (2nd Cycle)

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 2nd Cycle of the WFD is provided in **Table 14** and the location of these shown in **Figure 20**. Limited results from the 3rd Cycle of the WFD have been released (via the EPA envision mapping portal). It is noted that there has been no change in the WFD status of Blackwater (Munster)_130 or Blackwater (Munster)_130 in the 3rd cycle.

Table 14. WFD Status 2nd Cycle

Catchment: Blackwater Munster (Code 18) – 2nd Cycle			
<p>This catchment includes the area drained by the River Blackwater and all streams entering tidal water between East Point and Knockaverry, Youghal, Co. Cork, draining a total area of 3,310km². The largest urban centre in the catchment is Mallow. The other main urban centres in this catchment are Fermoy, Mitchelstown, Youghal, Kanturk and Millstreet. The total population of the catchment is approximately 109,030 with a population density of 33 people per km². Several small coastal rivers drain the area to the southeast of Cork Harbour and the area at the eastern extreme of the catchment is drained by the Womanagh River which flows into the sea on the western side of Youghal Bay.</p> <p>This subcatchment comprises a portion of the Blackwater main channel (Blackwater (Munster)_100 to Blackwater (Munster)_160).</p> <p>The issues on the main channel range from the decline of a High status objective water body (Blackwater (Munster)_110) to Good, which was driven by hydromorphology pressures, to a combination of point (Section 4 and IPC) and urban diffuse sources on Blackwater (Munster)_130. On Blackwater (Munster)_160 fish is the only metric failing to reach Good status and the IFI will advise what the significant pressure is.</p> <p>Tributaries to the Blackwater (Munster)_110, Ballyclogh Stream_010 and Ballyclogh Stream_020 have consistently Poor and Moderate ecological status, respectively. On Ballyclogh Stream_010 the significant pressure is hydromorphology.</p>			
Waterbodies relevant to the proposed project			
Waterbody	WFD Status	Significant Pressure	Pressure Category
Blackwater (Munster)_130	Review	Yes	Industry, Urban runoff
Blackwater (Munster)_140	Not at risk	Na	Na
Blackwater (Munster)_150	Not at risk	Na	Na

Source: EPA envision mapping and www.catchments.ie



Figure 20. WFD 2nd cycle waterbodies in the vicinity of the proposed development | 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, including Annex I (EU Birds Directive) such as Kingfisher and Annex II (EU Habitats Directive) species such as Otter. While there will be some loss of amenity grassland habitat, there will no loss of riparian woodland. 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 and Natura Impact Statement 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 15**.

Table 15. 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.
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 for the Blackwater River SAC are specifically addressed by the Natura Impact Statement (NIS) for this development.

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

Habitat	Habitat Value	Predicted impact
Immature Woodland (WN5)	Local importance (higher value)	This habitat will be retained as part of the proposed development. No impact
Treelines (WL2)	Local importance (higher value)	This habitat will be retained as part of the proposed development. Crown reduction may be required in some areas to widen the footpaths from 2m to 3m. Negative. Slight. Permanent
Recolonising Bare Ground (ED3)/ Dry Meadow/ Grassy Verges (GS2)	Local importance (higher value)	Some of this habitat will be planted with trees as per the landscape masterplan Negative. Slight. Permanent Impact
Buildings and artificial surfaces BL3	Local importance (lower value)	This habitat will be retained as part of the proposed development. Negative. Slight. Permanent
Riparian Woodland WN5/Broadleaved Woodland WD1	National importance	This habitat will be retained as part of the proposed development. Crown reduction may be required at the angling stand locations but there will be no net loss of habitat. Negative. Slight. Permanent
Amenity Grassland GA2	Local importance (Higher value)	Part of this habitats will be lost for the provision of new pump track, carpark and extended playing area. Negative. Slight. Permanent.
Scattered Trees & Parkland WD5	Local importance (Higher value)	This habitat will be retained as part of the proposed development.

Habitat	Habitat Value	Predicted impact
		No impact
Drainage Ditches FW4	Local importance (Higher value)	This habitat will be retained as part of the proposed development. No impact
Depositing Lowland River FW2	Local importance (Higher value)	The bridge over the Spa Glen Stream will be upgraded. Negative. Slight. Temporary
Eroding/upland rivers (FW1)	The River Blackwater is a designated SAC and it supports resident and/or regularly occurring populations of species listed in Annex II of the Habitats Directive and habitats listed on Annex 1 of the Habitat Directive. The River Blackwater acts as a wildlife corridor and has high value riparian habitats along its length.	Negative. Slight. Temporary

10.1 Invasive Species

Two high-risk invasive species namely Japanese Knotweed and Himalayan Balsam were recorded within the proposed development area. The medium impact species Old Man's Beard was also recorded. Old Man's Beard is classified as a medium impact invasive species by the NBDC. There is potential during the construction phase for invasive species to be spread within the proposed development site boundary, thus impacting negatively on adjoining habitats.

Japanese Knotweed and Himalayan Balsam are spread by plant and rhizome fragments of plants or in contaminated soil. Mitigation measures during construction will ensure that no movement of soil or plant material potentially containing fragments of these species outside of the currently contaminated area will take place. An Invasive Species Management Plan (ISMP) has been prepared for the project and accompanies the consent application.

Old Man's Beard is spread by wind dispersal as well vegetative spread from fragmentation. Old Man's Beard will be removed from within the proposed development site boundary via mechanical movement and herbicide treatment if required. Therefore, there will be no risk from the spread of these species during the construction phase.

11. Potential Impacts on Fauna

11.1 Protected Mammals

Part of the proposed development site is located within the Blackwater River (Cork/Waterford) SAC. While the habitats earmarked for removal within the SAC boundary are not qualifying habitats, they will support common and protected mammal species. There will be loss of common habitat types i.e. amenity grassland and recolonising bare ground, located within the development site and thus there will be some negative impacts on fauna. Some increased noise and disturbance is predicted to occur during construction and during subsequent operational phase of the park. However, given that this is an existing park and no change of land use is proposed and taking into the account the proposed landscaping measures and biodiversity enhancements, the impact on local populations is predicted to positive.

The riparian woodland and river channel provides high value habitat for foraging bats. A bat survey carried out along the River Blackwater found high numbers of bats foraging along the river channel and the wooded areas. Species recorded were Common Pipistrelle, Leisler's, Brown Long-eared, Daubenton's and Soprano Pipistrelle bats. Mature trees in the park area are largely outside the proposed development site boundary in the vicinity of the Mallow Castle and Deerpark (See Tree & Woodland Review Mallow Castle & Town Park Mallow Co. Cork, BSM 2019 submitted with this application). A review of historical mapping (geohive.ie) indicated that the woodland along the western end of the site was not mapped between 1837 and 1913. No significant mature trees which are likely to provide significant roosting habitats for bats will be affected by the proposed development.

Lighting deters some bat species from foraging. Studies have shown that illumination levels as low as 0.06 lux can have an effect on the behaviour of bats. Even a full moon night (0.02 lux) can reduce bat activity to more sheltered, darker wildlife corridors and foraging areas (e.g. woodlands). The slower flying broad-winged species (Natterer's bats, Daubenton's bats, whiskered bats, Brandt's bats, lesser horseshoe bats and brown long-eared bats) have been shown to avoid streetlights. In a study of a roost in Suffolk, UK, the numbers of Natterer's bats, Whiskered bats, Daubenton's Bats and Brown Long-eared Bats fell after the installation of streetlights adjacent to the roost being monitored.

The lighting plan for the proposed development site includes lighting of the parking areas and an existing playing pitch. There is no lighting proposed for the paths in the vicinity of the River Blackwater or the angling stands on the River Blackwater. The proposed new lighting areas i.e. car park 1 and 2 and at the existing soccer pitch are located over 30m from the riparian woodland. During operation lighting will be shielded to ensure the light is directed downwards and the will minimise light spillage from outside the site. During construction mitigation measures will ensure that light is directed away from the riparian woodland and River Blackwater. This will ensure that there is no light spillage and/or lighting disturbance for bats within this area.

With the exception of a small number of trees at the site entrance i.e. 7 Sycamore and 4 Poplar trees, all trees within the proposed development site will be retained. The landscape plan includes additional planting of native trees, hedgerow's and wildflower meadows (Refer to BSM 2021 *Part XAB Planning Application Proposed Town Park Works, Mallow, Co, Cork*

Landscape/Planning Design Report). This is likely to further enhance the value of the site as a foraging and roosting site, for bats.

Overall, the biodiversity enhancements and landscaping plans for the site are likely to create a nett positive impact for local bats populations. The impact is predicted to be positive, permanent and slight.

No Otter breeding holts were recorded during site surveys and they are unlikely to occur within 150m of the proposed works area due to the high levels of background disturbance by walkers and dogs.

Otter are known to forage along the River Blackwater to the south of the site and could potentially forage in the Spa Glen Stream, although this small watercourse is not likely to provide critical feeding resources. The proposed works will include widening the Spa Glen stream bridge and this could potentially result in reductions in water quality and subsequently cause a loss of prey availability for Otter during the construction phase. During construction and operation there will be increased noise and activity associated with the proposed development which could result in disturbance or displacement of Otter.

The proposed construction activities will result in an increase in noise and disturbance, however it will not be significant in the context of Otter's ability to move away from and/or adapt to short-term disturbance. Construction works will take place during normal working hours which therefore will avoid the largely nocturnal foraging period of Otter. Screw piling will be used to anchor the angling stands on the boundary of the River Blackwater. This method is low in noise and vibration levels compared to other piling systems. Essentially this method involves simple pipes with screw plates which will be rotated into the soil using a hydraulic unit fixed to a small tracks machine. No significant sources of noise have been identified during the construction phase. Mitigation measures will ensure light and noise levels during construction will be kept to a minimum. Any disruption of Otter foraging behaviour will be temporary and slight. Noise will return to previous levels following construction and given there will be no habitat loss, Otter are expected to continue to use habitats within the planning boundary following construction.

The proposed construction activities will result in an increase in noise and disturbance, however it will not be significant in the context of Otter's ability to move away from and/or adapt to short-term disturbance. Construction works will take place during normal working hours which will avoid the largely nocturnal foraging habits of Otter. Mitigation measures will ensure that noise levels during construction will be kept to a minimum (Refer to **Section 14.5**). Any disruption of Otter foraging behaviour will be temporary and slight. Noise will return to previous levels following construction and given there will be no habitat loss, Otters will continue to use the site in the operational phase.

During construction there will be no artificial lighting used avoiding light disturbance upon Otters within this area.

While the use of the angling stands is likely to slightly increase the usage within the study area, given the location of these sites within an existing urban park setting no significant increase in disturbance impacts are predicted to occur.

While there will be some loss of amenity grassland habitats, there will be an net increase in woodland and hedgerow habitat, which is likely to provide additional habitat for common mammal species such as Hedgehog. As the habitat within the site matures, this could potentially provide habitat for Red Squirrel and other woodland mammal species.

Increased noise and disturbance is predicted to occur during construction phase. This is predicted to be a temporary, negative impact.

Following construction, noise and disturbance is likely to return to pre-construction levels. While there could potentially be increased use of the park, the location of playing pitches, parking etc within one core area of the site and the provision of paths will retain quieter areas within the park for wildlife. Wildlife which use the area is likely to be habituated to a similar level of disturbance. In the long term, biodiversity enhancements and landscaping means that the proposed development is likely to have a positive impact on protected mammal species.

11.2 Birds

The terrestrial bird species recorded during bird surveys are typical of the types of habitat recorded on site and are generally common. No rare or uncommon species or species of high conservation value were recorded.

Some displacement of feeding birds is predicted to occur during construction due to increased noise and disturbance. Disturbance can cause sensitive species to deviate from their normal, preferred behaviour, resulting in stress, increased energy expenditure and, in some cases, species mortality. However, this will be short-term in duration. The impact is therefore predicted to be a short-term, slight impact.

No Kingfisher breeding sites were recorded during the recent site surveys and no potential breeding habitat will be directly affected. Some impacts on feeding behaviour could result from increased noise and disturbance during construction works could occur, resulting in a temporary, minor impact. Construction methods on the banks of the River Blackwater have been chosen to minimise disturbance. Screw piling will be used to anchor the angling stands on the boundary of the River Blackwater. This method is low in noise and vibration levels compared to other piling systems. Essentially this method involves simple pipes with screw plates which will be rotated into the soil using a hydraulic unit fixed to a small tracks machine. Precast concrete stands/decked stands will be used to minimise earthworks and disturbance in the vicinity of the riverbanks. Mitigation measures will ensure light and noise levels during construction will be kept to a minimum. Any disruption of Kingfisher and other birds foraging along the River Blackwater will be temporary and slight. Noise and disturbance will return to previous levels following construction and given there will be no habitat loss. Kingfisher are expected to continue to use habitats within the proposed development site following construction.

During the operational phase, the levels of activity will stabilise and birds in the surrounding landscape will be expected to habituate to any noise and disturbance. The biodiversity enhancements and tree planting will provide additional habitat for nesting and foraging birds. The impact on terrestrial birds in habitats adjoining the proposed development site is therefore predicted to be positive, slight and permanent operation.

11.3 Impact on aquatic species

No instream works are proposed as part of the proposed development. Any impacts on aquatic species such as lamprey species, salmonid species and other freshwater species such as , Freshwater Pearl Mussel, will be restricted to indirect impacts from surface water runoff. Potential impacts from surface water runoff are discussed in **Sections 12** below.

11.4 Impacts on other fauna

A detention basin which will be constructed as part of the surface water management plan, will create an ephemeral wetland near the River Blackwater. The creation of this detention basin will also promote the biodiversity, creating habitat for amphibians, invertebrates and other wildlife.

Rabbit, Fox, Badger, Brown Rat etc have all been recorded within grid square W59. Mammal species which are protected under the Irish Wildlife Act 1976, as amended, such as Hedgehog and Stoat etc could potentially occur within the proposed development site, although no signs of these species were recorded. Likewise no evidence of amphibians or reptiles was recorded. The proposed development area is only likely to support common invertebrate species. While construction works may lead to short term displacement of fauna, in the long term, biodiversity enhancements and landscaping means that the proposed development is likely to have a positive impact on fauna.

12 Potential impact on water quality

12.1 Impacts on water quality during the construction phase

Impacts on qualifying species for the Blackwater River (Cork/Waterford) SAC, i.e. Lamprey species (*Petromyzon marinus*, *Lampetra planeri*, *Lampetra fluviatilis*) and Atlantic salmon (*Salmo salar*) etc., are specifically addressed by the NIS which has been submitted with this application. However impacts on water quality within the Blackwater River could potential impact on a range of other aquatic species including macroinvertebrates, Brown Trout and European Eel.

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 in the River Blackwater.

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.

Aquatic plant communities may also be affected by increased siltation. Submerged plants may be stunted, and photosynthesis may be reduced. Such run-off if severe could potentially impact on water quality and thus could impact on fish and invertebrate within the River Blackwater, the Spa Glen Stream and the East Baltydaniel Stream.

The construction strategy for the proposed development includes measures to minimise the excavation required during site works. Several elements of the project including the carparks, skate park and pump track will be laid out following existing ground contours to minimise excavation. The use of a porous carpark surface and associated filter stone will minimise the depth of excavation and extent of ground disturbance associated with standard hard paved carparks, piped gullies and drainage pipe network. Angling stands will use precast material to limit the excavation and works required along the river embankment.

During the construction phase the majority of surface water run-off will be absorbed grasslands within the site. However, due to the location and nature of the development, there is the potential for silt in surface water run-off to impact the River Blackwater. A range of standard mitigation procedures will be employed during construction to minimise the potential for impacts on water quality. Silt fences will be constructed with a series of silt traps installed as required to prevent uncontrolled run-off into the river network. Further details on surface water mitigation measures are included in **Section 14.2** of this report.

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.

12.2 Impacts on water quality during the operation phase

Chemical contaminants in operational surface water runoff such as hydrocarbons could potentially impact on water quality and aquatic species within the River Blackwater. The increase in hard surfaces at the site i.e., car parks, road surfaces pathways, pump track and skate park, could increase the rate of runoff into the River Blackwater, which could impact on the hydrological regimes of the river.

The proposed development site is located within Flood Zone A and flooding at the site could further increase the risk of contaminated run-off entering the River Blackwater. According to the DoEHLG (2009), if the development is in Flood Zone A i.e. an area with a high probability of flooding, any projects should:

“avoid development other than ‘water compatible development’ as described in Section 3 of The Planning System and Flood Risk Management Guidelines for Planning Authorities issued in November 2009 by DoEHLG”.

It is noted that the proposed development is a water compatible development i.e., amenity open spaces and outdoor sport and recreation facilities, which is appropriate land use within Flood Zone A. Careful consideration has been given to the design of the proposed works to ensure they do not compromise the existing Mallow Flood Defence Scheme. Entrances to the park from Park Road will be ramped to maintain the “partial” flood defence provided under the flood relief scheme. A Flood Risk Assessment which was conducted as part of this application assessed a number of features of the development in the context of potential impact on conveyance (Arup 2021). This included tree planting, landscaping adjacent to Mallow Bridge, proposed angling stands and proposed pedestrian bridge widening. The impact of such measures on flood risk was concluded to be negligible.

The carpark and site wide drainage design is based on Sustainable Drainage Design (SUDS) drainage design which both infiltrates and attenuates the surface water drainage on the site and ensures the storm water runoff from the developed site is restricted to at or below the current undeveloped green field runoff. This attenuation of the storm water runoff will ensure the development of the site does not contribute to the increase flooding risk downstream from the area as the flow is being restricted to greenfield run-off. Hence there will be no increase in the overall discharge from the site as a result of the proposed development.

A number of design measures have been included in the design of the proposed development to ensure that there is no risk to water quality in the River Blackwater during the operational phase. These include the following:

- The proposed development of the various surface facilities including the porous carpark will not change or intensify the current land use or create additional flood risk to the area.
- The proposed carparks and road surfaces are to be constructed with a porous asphalt surface on a free draining stone base build up. The stone base to the carpark area is wrapped in a special ‘Inbitex’ geotextile filter material. The filtration membrane in conjunction with the stone build-up traps and breaks down any hydrocarbons build up within the sub-base by microbial action. The surface water is cleaned and filtered through the Inbitex Geotextile layers.
- The existing playground areas are currently substantially covered in impermeable tarmac surfaces with marginal grass verges around the northwest perimeter of the site. The new proposed grass and play areas to the redeveloped playground will be permeable free draining surface.
- At the skate park, the total proposed new impermeable hard paved surfaces of the park and footpath will be substantially less than the existing impermeable tarmac surface area of the existing playground. This will result in a c.40% reduction in hard surface area. The provision of soakaways and the free draining stone bedding has been made to facilitate additional infiltration of surface water away from the immediate play areas to prevent ponding of same during heavy rainfall.

- At the pump track the mounds and levels will be shaped so water is not trapped around the pump track area and will be free to naturally drain and flow towards the river. The bitumen macadam surface will be laid such that the surface water will run-off and drain locally into the surrounding grass margins.
- At the Grass Pitches, the re-grading and the removal of the grass embankment spectator mounds will also assist in the better drainage and flood flow/release from the park. The sub-base to the grass surfaces on pitches will be formed with a ameliorate soil and gravel mix which will aid in the natural drainage of the surfaces into the free draining sandy gravely sub soil which underlies the park area.
- At the grass pitches and temporary carpark area, the area will be natural grass with reinforced polypropylene plastic mesh elements blended with in the soil to form a composite mesh reinforced rootzone capable of taking vehicle loading. The surface will be naturally free draining grass surfaces with equal or better porosity then the existing grass surfaces of the park.
- It is proposed to construct a swale drainage basin in an existing green field area to the southwest of the site just east of Mallow Bridge. The intention of the swale drainage basin is not to prevent flooding but to provide a drainage channel to which surface water from the park and the north west area of the Park Road can be directed and temporarily retained in periods of high river flood before discharged to the river as the flood level recede. The detention basin will have storage capacity is approximately 1450m³. The swale shall be a formed drainage basin channel to the low lying south west area of the park. The base of the channel shall be shaped and graded with a steady fall towards the river to the south west. When not in flood, the proposed swale detention basin will form a dry grass “amphitheatre” with grass meadow planting. The channel shall be pipes through the raised footpath embankment and discharge on the river side of the embankment via a formed concrete outfall head wall and slip way directly to the river. The piped outfall from the swale detention basin shall be fitted with a Tideflex duckbill non return valve fitted to provide end of pipe backflow prevention and flooding protection to the line.

Based on the above, it can be concluded that flooding and operational surface water runoff at the proposed development site does not pose a risk to local water quality or aquatic ecology. The operational surface water design measures will have a positive, slight, permanent impact on water quality in the vicinity of the proposed development site.

13. Cumulative Impacts

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, only a slight localised increase in traffic and noise is predicted. As this proposed development is not predicted to significantly increase long term noise and disturbance levels or impact significantly on water quality, no significant cumulative impacts have been identified.

14. Mitigation Measures

14.1 Construction phase mitigation measures

The likely success of the proposed mitigation measures is high. 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. The risk that the mitigation measures will not function effectively in preventing significant ecological impacts is low. The following mitigation measures will be implemented.

An outline Preliminary Construction Environmental Management Plan (CEMP) has been produced to accompany the Planning Application (Horgan Lynch 2021). The Construction Environmental Management Plan for the construction phase of the project will be prepared prior to execution of the works and the Preliminary Plan included here will form the basis on which the developer will be required to prepare the execution plan together with his own Environmental Quality Management Procedures.

The Preliminary CEMP takes account of CIRIA Guidelines *C532 Control of Pollution from Construction Sites* in its preparation and the execution plan shall be prepared in full compliance with these guidelines. The CEMP also takes account of CIRIA 2010 (Third Edition C692) *Environmental Good Practice on Sites CIRIA UK*.

The developer will be required to designate an Environmental Manager for the project whose duty it will be to identify and monitor all potential environmental impacts. He will be required to monitor and maintain registers for noise and dust impacts and shall be responsible for the integrity of the surrounding lands and their protection from potential impacts of the construction operations. His responsibilities will include adherence to CIRIA Guide 532.

All individual elements of work shall be covered by full method statements which shall be submitted well in advance of any works proceeding and approved prior to execution.

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.
- IFI (2016) *Guidelines on protection of fisheries during construction Works in and adjacent to waters* (IFI, 2016)
- 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.*

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of the proximity the River Blackwater and other watercourses to re-emphasize the precautions that are required as well as the mitigation to be implemented.

The site shall be fully secured at all times and a full health and Safety Management Plan shall be put in place in accordance with current HSA Health and Safety (Construction) Regulations. A site traffic management plan will be submitted for approval prior to commencement.

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of Natura 2000 sites and to re-emphasize the precautions that are required as well as the precautionary measures to be implemented. All staff and subcontractors have the responsibility to:

- Work to agreed plans, methods and procedures to eliminate and minimise environmental impacts,
- Understand the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Respond in the event of an incident to avoid or limit environmental impact;
- Report all incidents immediately to their line manager;
- Monitor the workplace for potential environmental risks and alert the immediate line manager if any are observed; and
- Co-operate as required, with site inspections.

14.2 Protection of Water Quality

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).

- Stormwater will be managed carefully during construction. In general, stormwater will be infiltrated to ground via managed gullies/soakaways. Any area used for re-fueling will be paved and bunded or fueling will take place off-site.
- Measures shall be put in place to ensure no run-off from the fill site resulting from rainfall and or construction activities. The most vulnerable element to be protected on the site is the River Blackwater which traverses the site.
- Silt fences shall be constructed with a series of silt traps installed as required to ensure against uncontrolled run-off into the river network. The silt fence shall be as shown in **Figure 21** below.

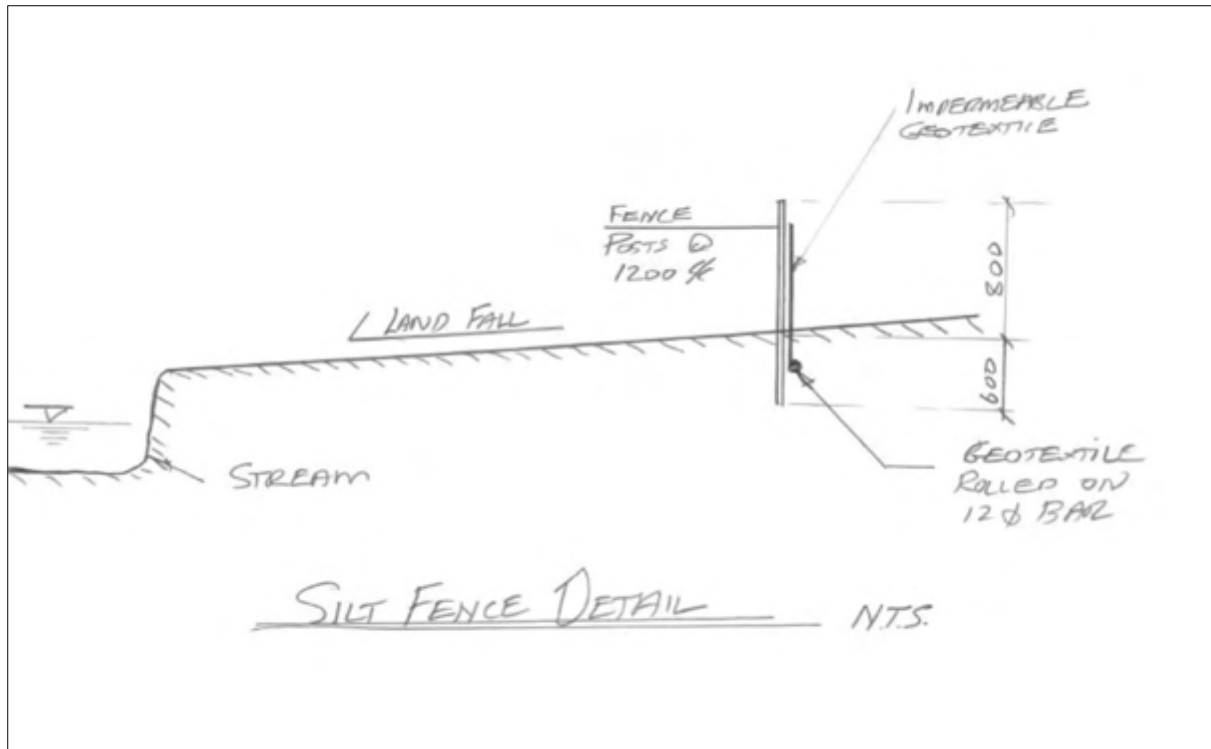


Figure 21. Silt fence detail | Source Horgan Lynch

- Facilities will be put in place to dampen fill material to prevent airborne dust during periods of dry weather. Baseline dust monitoring will be carried out and monitoring will be carried out with trigger levels put in place to either cease operations or employ damping procedures.
- Topsoil and subsoil shall not be stored on sloped areas of the site where washout could migrate and shall not be stored within 15 metres of the river. Topsoil storage areas shall be enclosed with silt fencing.
- Where existing land drains are encountered they shall be re-established so that the pre-existing hydrological regime is maintained.
- Waste separation shall follow standard construction site protocols.
- Full method statements shall be produced as regards handling and final deposition on site of excavated site materials. These method statements shall propose mitigation measures to address potential environmental issues such as dust, noise, and potential water run-off.
- A wheel washing facility shall be set up at the site entrance which shall consist of the elements set out in **Figure 22** below.



Figure 22. Example of wheel washing facility to be provide byut the contractor for the duration of the site works

- Welfare facilities shall be provided in accordance with legal requirements. Sanitary facilities shall have proprietary foul water storage facilities which shall be tankered away on a regular basis. No groundwater contamination will be tolerated.
- Waste material shall be segregated and removed off site to licenced disposal areas

14.3 Management of hydrocarbons and concrete

Oil, petrol and other fuel containers will be double-skinned and banded to be able to contain 110% volume to guard against potential accidental spills or leakages entering local watercourses linked to the European sites. Bund specification will conform to the current best practice for oil storage such as Enterprise Irelands Best Practice Guidelines. Construction materials will be stored in a secure compound to prevent the potential for vandalism and theft of material.

A hydrocarbon spill kit shall be available on site at all times to deal with any hydrocarbon spill or hydraulic fluid leakage. A detailed spillage procedure will be put in place and all will be trained with respect to the relevant procedures to be undertaken in the event of the release of any sediment, hydrocarbons into a watercourse. Spill kits will be maintained on site and relevant staff will be trained in their effective usage. 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, Environment Protection Agency, Cork County Council, Inland Fisheries Ireland and the NPWS shall be notified.

All vehicles and plant will be regularly inspected for fuel, oil and hydraulic fluid leaks. Suitable equipment to deal with spills will be maintained on site.

Dedicated fuel storage areas will be introduced on-site or fuelling will take place offsite.

It will be ensured that all staff are trained and follow vehicle cleaning procedures. Post details of the procedures in the work area for easy reference. Use of cleaning chemicals will be minimised.

Machinery including hand-tools will never be washed in watercourses or drainage ditches.

It will be ensured that all areas where liquids are stored or cleaning is carried out are in a designated impermeable area that is isolated from the surrounding area, e.g. by a roll-over bund, raised kerb, ramps or stepped access.

Concrete pouring will not take place during heavy rain when runoff is likely due to excess water. Shuttering will be designed to accommodate small increases in the volume of material contained within the shuttered area due to rainfall. Pre-cast concrete will be used where possible. Raw or uncured waste concrete should be disposed of by removal offsite.

Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at an appropriate facility offsite or at the location where concrete was sourced.

14.4 Lighting

Potentially lighting associated with the site works could cause disturbance/displacement of Otter. If of sufficient severity and duration, there could be impacts on reproductive success.

Site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas;
- Lights will be switched off when not in use; and
- Lighting will be positioned and directed so that it does not unnecessarily intrude on adjacent ecological receptors and structures used by protected species. The primary area of concern is the potential impact on the riparian woodland and the River Blackwater along the southern boundary of the site. There will be no directional lighting

focused towards the watercourses or boundary habitats respectively and cowling and focusing lights downwards will minimise light spillage.

- Works will primarily take place during hours of daylight to minimise disturbance to any nocturnal mammal species.

14.5 Noise

The development site is located in an urban setting in an existing park. Background noise levels are expected to be elevated during daytime hours. The principle sources of noise emissions from the site will be: -

- During the site clearance phase
- During excavation works.
- General construction activity, including deliveries to / from the site, use of power tools etc.
- Screw piling for positioning of angling stands

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:

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 Habitats

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of Natura 2000 sites 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.

To prevent incidental damage by machinery or by the deposition of spoil during site works, any habitats earmarked for retention in close proximity to the proposed works will be identified and will be securely fenced or sign posted early in the construction phase. These will be clearly visible to machine operators.

All trees/hedgerows to be retained to be protected in accordance with BS 5837:2012, Trees in relation to design, demolition & construction. Prior to the commencement of any work, or any materials being brought on site, existing trees to be retained are to be protected with temporary fencing. This shall be maintained in good and effective condition until the work is completed. Allow for stabiliser struts to secure fence for duration of construction. Fully remove when construction is complete/site demobilised.

The protective fencing is to coincide, as far as is practical, with the root protection area (rpa), unless otherwise agreed. all weather notices shall be securely fixed to the fence words such as 'construction exclusion zone - no access (See **Figure 23**)

The following measures are particularly important:

- Materials are never to be stacked within the root spread of the tree;
- No oil, tar, bitumen, cement or other material is to be allowed to contaminate the ground;
- No fires shall be lit beneath or in close proximity to the tree canopy;
- Trees to be retained should not be used as anchorages for equipment or for removing stumps
- Root Protection Area (RPA) Outside tree canopy dripline roots or other trees, or for other purposes;
- No notices, telephone cables or other services should be attached to any part of the tree;
- Cement mixing should not be carried out within the canopy/protected area of the tree;
- Rails clamped securely to posts
- Soil levels are to be maintained as existing within the root spread of the tree. Any alteration to soil levels in an area up to one and a half times the diameter of the tree canopy must be agreed with the ER/Architect.

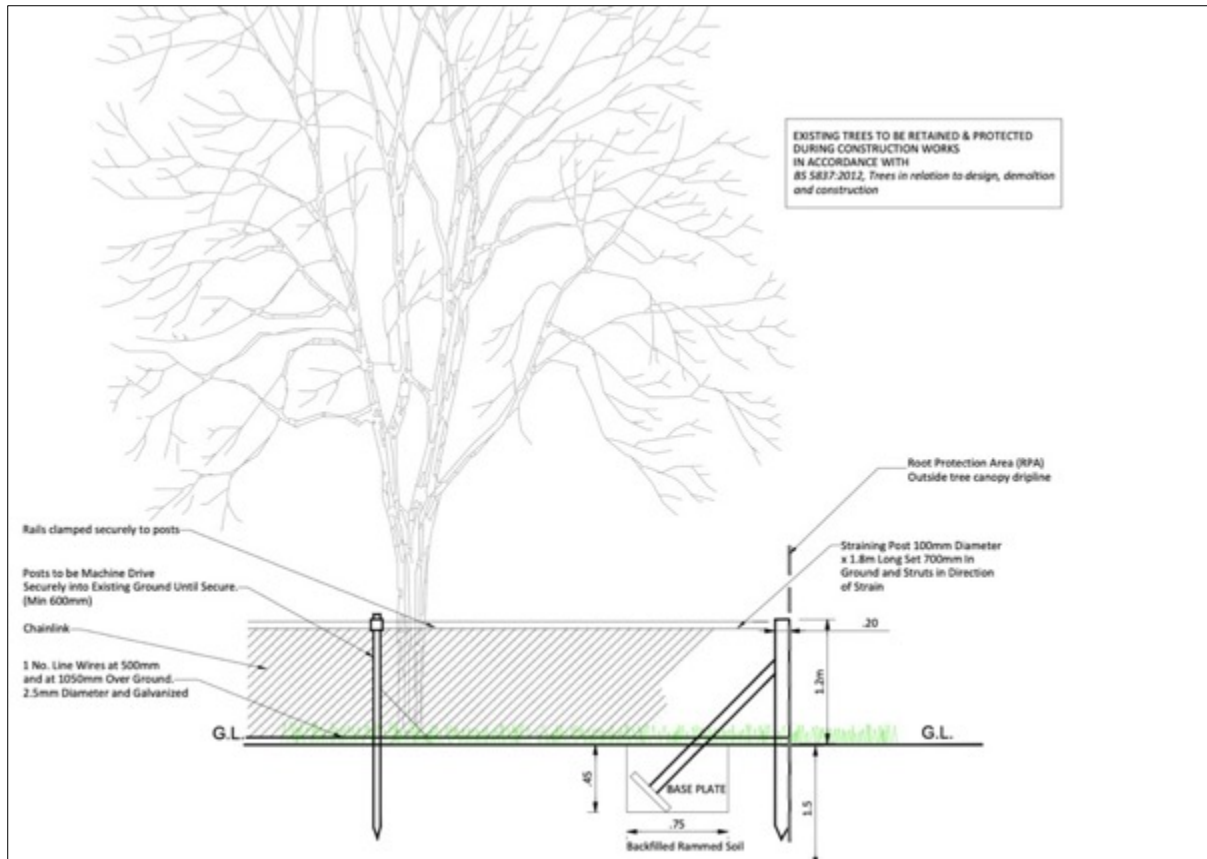


Figure 23. Tree protection construction fencing

Habitats that are damaged and disturbed will be left to regenerate naturally or will be rehabilitated and landscaped, as appropriate, once construction is complete. Disturbed areas will be seeded or planted using appropriate native grass or species native to the areas where necessary. A proposed landscape plan has been included with this application (BSM 2021) This plan also notes that plant material must be acclimatised to regional conditions and locally established stock.

To prevent Japanese Knotweed or other invasive species from outside the site being inadvertently being brought in to the site, the contractor will be required to inspect vehicles before using them on site.

If applicable, the supplier of fill will be required to provide a guarantee that the fill to be imported does not contain knotweed. In addition, the fill will be inspected for signs of knotweed, prior to importation to site.

14.7 Otter

No signs of Otter or Otter holts were noted within 150m of the planning boundary, although Otter are known to occur along the River Blackwater. A detailed pre-construction survey will be carried out no more than 10-12 months prior to the commencement of construction works to confirm the absence of Otter holts within 150m of the proposed development area.

If Otter holts are recorded at that time, a supervising ecologist will determine the appropriate means of minimising effects i.e. avoidance, moving works, timing of works etc. If required the

ecologist will obtain a derogation licence from the NPWS, to facilitate licenced exclusion from the breeding or resting site in accordance with a plan approved by the NPWS.

Any holts found to be present will be subject to monitoring and mitigation as set out in the NRA Guidelines for the *Treatment of Otter prior to the Construction of National Road Schemes* (NRA 2006a). If found to be inactive, exclusion of holts may be carried out during any season. No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, Otter holts. Light work, such as digging by hand or scrub clearance will also not take place within 15m of such holts, except under licence. The prohibited working area associated with Otter holts will be fenced and appropriate signage erected. Where breeding females and cubs are present no evacuation procedures of any kind will be undertaken until after the Otters have left the holt, as determined by a suitably qualifying ecologist. Breeding may take place at any season, so activity at a holt must be adjudged on a case by case basis. On occasion, Otter holts may be directly affected by the scheme. To ensure the welfare of Otters, they must be evacuated from any holts present prior to any construction works commencing. The exclusion process, if required, involves the installation of one-way gates on the entrances to the holt and a monitoring period of 21 days to ensure the Otters have left the holt prior to removal.

14.8 Bats

During the site works, 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 (2005c) and '*Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 25*' (Kelleher, C. & Marnell, F. (2006)). These documents outline the requirements that will be met in the pre-construction (site clearance) stage to minimise negative effects on roosting bats, or prevent avoidable effects resulting from significant alterations to the immediate landscape.

No bat roosts were recorded within the proposed planning boundary. The contractor will take all required measures to ensure works do not harm individuals by altering working methods or timing to avoid bats, if necessary. The following mitigation measures will be implemented:

- The bat specialist will work with the contractor to ensure that crown reduction on trees is minimised and that trees earmarked for retention are adequately protected.
- Tree-felling and crown reduction will be undertaken in the period September to late October/early November. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.
- Felled trees will not be mulched immediately. Such trees will be left lying several hours and preferably overnight before any further sawing or mulching. This will allow any bats within the tree to emerge and avoid accidental death. The bat specialist will be on-hand during felling operations to inspect felled trees for bats. If bats are seen or heard in a tree that has been felled, work will cease and the local NPWS Conservation Ranger will be contacted.
- Tree will be retained where possible and no 'tidying up' of dead wood and spilt limbs on tree specimens will be undertaken unless necessary for health and safety.

- Treelines outside the proposed development area but adjacent to it and thus at risk, will be clearly marked by a bat specialist to avoid any inadvertent damage.
- During construction directional lighting will be employed to minimise light spill onto adjacent areas. No directional lighting will be focused towards riparian habitat and cowling and focusing lights downwards will be utilised to minimise light spillage.
- If bats are recorded by the bat specialist within any vegetation or structure on site i.e. trees, or walls to be removed or impacted on, no works will proceed without a relevant derogation licence from the NPWS.

14.9 Invasive species

There are a number of management options that may be implemented to control and prevent the spread of invasive species. Detail on these measures is outlined in the Invasive Species Management Plan ISMP which accompanies the consent application. It may not be possible to completely eradicate the invasive species before or during the construction phase.

Those involved in the application of herbicides/pesticides will be competent to do so and will have sufficient experience and knowledge in the area of herbicides/pesticides application.

All staff involved in the application of herbicides/pesticides will have received appropriate training, which may include achieving competency certification in the safe use of herbicides/pesticides through a National Proficiency Tests Council registered assessment centre or achieving an appropriate FETAC award in this area.

Full details on invasive species control measures are outlined in the ISMP.

15. Conclusions

Overall the development will impact primarily on low value habitats. There will be a nett loss of amenity grassland and a small number of trees which could be used as nesting habitats for common bird species. No trees suitable as bat roosting habitat will be significantly affected. While works will take place adjacent to the River Blackwater for the provision of angling stands, no instream works are proposed within any watercourse and mitigation measures have been outlined to protect freshwater habitats during the construction phase. No particular difficulties in the effective implementation of the prescribed mitigation measures have been identified.

No significant impacts on water quality are predicted to occur and subsequently there will be no impact on pNHAs downstream of the proposed development site. A NIS submitted with this application concluded that following the implementation of mitigation measures, the proposed development will have no significant impact on the integrity of Natura 2000 sites.

Biodiversity enhancements will lead to a nett gain in woodland and treeline habitat at the site. A temporary wetland is likely to increase habitat for amphibians, invertebrates and other fauna. Following construction, noise and disturbance is likely to return to pre-construction levels. While there could potentially be increased use of the park, the location of playing pitches, parking etc within one core area of the site and the provision of paths will retain quieter areas within the park for wildlife. With the exception of the paths to the angling stands, no new pathways will be created, and wildlife which use the area will be habituated to a similar level

of disturbance. In the long term, biodiversity enhancements and landscaping means that the proposed development is likely to have a positive impact on local flora and fauna.

References

- CIRIA (2001). Control of water pollution from construction sites. E. Murnane, A. Heap, A. Swain (eds).
- Curtis, T.G.F.; McGough, H.N. (1988) The Irish Red Data Book - 1 Vascular Plants [400 KB]
- Cummins, S., Fisher, J., McKeever, R.G., McNaghten, L. & Crowe, O. (2010). Assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds on six SAC river systems in Ireland. A report commissioned by the National Parks and Wildlife Service and prepared by BirdWatch Ireland June 2010
- DixonBrosnan 2011. Otter Survey in relation to the Mallow Flood Relief Scheme
- DixonBrosnan, 2018. Ecological Impact Assessment - Mallow Sewerage Scheme
- DixonBrosnan 2019. Bat survey – proposed development of the former walled production gardens of Mallow Castle. On behalf of BSM
- EPA (2003) Advice notes on current practice in the preparation of Environmental Impact Statements. Environmental Protection Agency.
- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements. Environmental Protection Agency.
- EPA (2015) Revised Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency, draft September 2015);
- EPA (2015) Advice Notes for Preparing Environmental Impact Statements Draft September 2015
- Fossitt J A (2000) A Guide to Habitats in Ireland . The Heritage Council, Kilkenny
- Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - a Manual of Techniques for Key UK Species*. RSPB: Sandy.
- Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 – 2026". Irish Birds 43: 1-22
- Heritage Council, 2011. Best Practice Guidance for Habitat Survey and Mapping
- IEEM (2006) Guidelines for ecological impact assessment in the United Kingdom
- Irish Water 2020 Cork City D0033-01 Wastewater Treatment Plant (WWTP) Annual Environmental Report 2019 .
- Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals*, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

NRA (2005a). Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. National Road Authority.

NRA (2005c). Guidelines for treatment of bats during construction of National Road Schemes. National Road Authority

NRA (2009). Guidelines for assessment of ecological impacts of National Road Schemes. National Road Authority.

NRA (2006a). Guidelines for the *Treatment of Otter prior to the Construction of National Road Schemes*

NRA. (2006b). Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post construction of national road schemes. National Roads Authority.

NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

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

Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. (2016). The 2015 National Survey of Breeding Hen Harrier in Ireland. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

Sleeman, D. P and P. G. Moore (2005) Otters *Lutra lutra* in Cork City, The Irish Naturalists' Journal. Vol. 28, No. 2 (Jun. 30, 2005), pp. 73-79

Webb, D.A., Parnell, J. & Doogue, D. (1996) An Irish flora. Seventh edition. Dundalgan Press (W. Tempest), Dundalk.

Wyse Jackson, Úna FitzPatrick, Edwina Cole, Matthew Jebb, Damian McFerran, Micheline Sheehy Skeffington & Mark Wright (2016) Ireland Red List No.10: Vascular Plants

Appendices

Appendix 1. NRA 2009 Guidelines

Table 1: Examples of valuation at different geographical scales

Ecological valuation: Examples
<p>International Importance:</p> <ul style="list-style-type: none">• '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:<ul style="list-style-type: none">○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or○ 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).<ul style="list-style-type: none">• Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).<ul style="list-style-type: none">• 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
<p>National Importance:</p> <ul style="list-style-type: none">• 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:<ul style="list-style-type: none">○ Species protected under the Wildlife Acts; and/or○ 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.
<p>County Importance:</p> <ul style="list-style-type: none">• 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:<ul style="list-style-type: none">○ 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.

Appendix 2. Site Photographs



1. Amenity Grassland on the western-most end of the site, looking east, just under the viaduct.



2. Riparian woodland with drainage ditch, close to where the Spa Glen Stream joins the river



3. Treeline with riparian woodland behind, on the southern path east of the bridge.



4. Immature Woodland, with planted trees, between the north and south paths in the area labelled as Castlepark on the map, looking southwest



5. The treeline bordering the northern path, close to the north-east end of the site, looking west



6. Site for Angling stand no 1.



7. Site for Angling stand no 2.



8. Site for Angling stand no 3.



9. Site for Angling stand no 4.



10. Site for Angling stand Site no 5. (approx.).