

Ratoath Pedestrian & Cycling Scheme

Ecology Report

Meath County Council

March 2022



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1. Introduction

Meath County Council (MCC) are undertaking the project in partnership with the National Transport Authority (NTA) to deliver a high-quality Pedestrian and Cycle Scheme within Ratoath. Atkins has been commissioned by Meath County Council to conduct a Stage 1 Screening for Appropriate Assessment for the proposed scheme.

Ratoath is situated on the intersection of the R125 and R155 regional roads in the south east of County Meath. The town has developed significantly over the last 20 years and acts as a commuter town with more than three quarters of the population travelling to work in Dublin. In this time the town's population has also grown significantly with a stated population of just over 1,000 inhabitants in 1996, compared to over 9,000 inhabitants per the 2011 census records.

The expansion of both residential and educational developments within Ratoath over this period has coincided with national policy to promote and encourage sustainable travel among all age groups with a particular emphasis on creating a walking and cycling culture among younger generations for the purpose of short local trips. As such, the need has arisen to provide improved pedestrian and cyclist provisions to form better connections between residential areas, schools, amenities and the town centre.

The proposed scheme will therefore aim to secure the development of pedestrian and cycle routes that will provide a high quality of service, whilst also ensuring that there remains an optimal balance between the various competing transport modes within the town and its environs.

This should be read in conjunction with the design pack which accompanies this Part 8 planning application; as well as the accompanying Part 8 Planning Report (Atkins, 2022a) and EIAR Screening Report (Atkins, 2022b) prepared by Atkins.

1.1. Scheme Objectives

The objectives of the proposed Pedestrian and Cycle Scheme are: -

- Provide appropriate pedestrian and cycle facilities within the town centre, along the Broadmeadow River and on all key approach roads;
- To provide safe route link and crossing facilities for pedestrian and cyclists;
- To provide appropriate speed and traffic management within the town centre and on approach roads;
- To facilitate national/county policies/objectives in relation to sustainable transportation;
- To facilitate the development of the Greater Dublin Area Cycle Network Plan; and
- To comply with the design standards and principles advocated within the Design Manual for Urban Roads and Streets and National Cycle Manual.

1.1.1. Proposed Project

The proposed scheme consists of improvements and upgrades to the follow key routes: -

- Town Centre Streets;
- Approach Roads;
- Distributor Roads;

- Greenway; and,
- School Access Roads.

These routes are illustrated in full on Figure 1.1. The Ratoath Pedestrian and Cycle Scheme will result in a high-quality pedestrian and cyclist network within the town of Ratoath that will create safe and comfortable routes between a number of large residential areas and key attractors such as the GAA Club, BMX Club, Soccer Club, Primary Schools, Secondary School and the town centre itself. There are a number of benefits which will be realised by all road users, including pedestrians, cyclists, public transport users and motorists through the implementation of the proposed scheme. These benefits include the following: -

- Provision of a connected, safe, high quality pedestrian and cycle network;
- Provision of key facilities to encourage an uptake in cycling particularly within the school going age group;
- Improved bus facilities within the town centre including upgrades to shelters and the provision of bicycle parking;
- Improved operational safety for all road users at the R155 / R125 junction at Supervalu;
- Implementation of traffic management measures to encourage reduced vehicular speeds thereby improving road safety for all road users; and,
- Provision of pedestrian crossing points at key desire points and facilitating safe crossing locations particularly across side road junction.

The scheme is aligned with National Policy and is in keeping with the objectives of the Meath County Development Plan and Ratoath Local Area Plan.

1.1.2. Approach to the Design

The cycling network in Ratoath consists of a series of links that must form a coherent and safe network that appropriately caters for all types of cyclists, in particular school children and other vulnerable users, whilst taking account of the constraints and opportunities that are evident from an engineering, environmental and land ownership perspective. In this context route options were developed both holistically, considering the entire network, and on a link by link basis.

The cycle network has been designed in accordance with the National Cycle Manual (NCM) and in particular and the Design Manual for Urban Roads and Streets (DMURS). It is also critical that the cycle route requirements are balanced with the needs of pedestrians and that the requirements for vehicular traffic movement and parking is appropriately considered.

There are two key considerations in the development of cycle route options. In the first instance traffic volume and speeds must be fully assessed as these are key characteristics of the road and street network. Traffic volumes and speeds have a direct impact on the second key consideration which is the provision of either an integrated or segregated cycling provision.

Integrated cycling provision requires cyclists interacting directly with vehicular traffic, either sharing the lane with traffic or in a cycle lane. In integrated provision it is critical for vulnerable cyclists that prevailing traffic speeds are low, preferably a maximum of 30kph but integrated provision can be considered up to 50kph. In this context roads and streets should operate as self-regulating environments wherein the layout of the street and the driver's visual and psychological interpretation of the street environment instinctively tell the driver the appropriate speed as opposed to a reliance on legislation and regulation such as posted speed limits.

Segregated cycling provision provides for physical separation of cyclists from motorised traffic and these can be provided in the form of cycle tracks, cycle paths or cycle ways. Depending on the volume of pedestrians and cyclists and available width, these segregated facilities can either be shared use with pedestrian and cycle or segregated from pedestrians. Shared provision is appropriate where the path width can adequately cater for the cyclist and pedestrian volumes and where movements are generally linear in nature i.e. people are generally not

crossing and are not congregating on the path. In general these should be a minimum of 3.0m in width, with allowances for pinch points, and there should be no delineation marking between pedestrian and cyclist space.

Whilst segregated provision is most desirable for vulnerable or inexperienced cyclists, experienced cyclists will often choose to cycle in the traffic lane regardless of the whether there is a segregated cycle provision along a route. Indeed cyclists who may be travelling into Ratoath along longer distance rural cycle routes would be expected to remain on road and street within the town. Within Ratoath the provision for cyclists to cycle on street throughout the town has been appropriately considered in the context of the prevailing existing 50kph speed limit.

1.2. Part 8 Planning Documentation

This Screening for Appropriate Assessment should be read in conjunction with the following complementary documentation contained under separate report heading: -

- Book of Drawings
 - Drawing 5139451/HW/0000: Cover Sheet
 - Drawing 5139451/HW/0001: Site Location Plan
 - Drawing 5139451/HW/0002: Site Extents Key Plan
 - Drawing 5139451/HW/0003: Site Extents (Sheet 1 of 3)
 - Drawing 5139451/HW/0004: Site Extents (Sheet 2 of 3)
 - Drawing 5139451/HW/0005: Site Extents (Sheet 3 of 3)
 - Drawing 5139451/HW/800: General Layout Key Plan
 - Drawing 5139451/HW/801: Site Layout Plan (Sheet 1 of 17)
 - Drawing 5139451/HW/802: Site Layout Plan (Sheet 2 of 17)
 - Drawing 5139451/HW/803: Site Layout Plan (Sheet 3 of 17)
 - Drawing 5139451/HW/804: Site Layout Plan (Sheet 4 of 17)
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 - Drawing 5139451/HW/817: Site Layout Plan (Sheet 17 of 17)
- Part 8 Planning Report
- Screening for Appropriate Assessment
- Environmental Impact Assessment Screening Report

As part of this Part 8 Report an Tree Report, Bat Report and Archaeological Report have also been provided and are presented in Appendices B, C and D respectively of the Part 8 Planning Report (Atkins, 2022a).

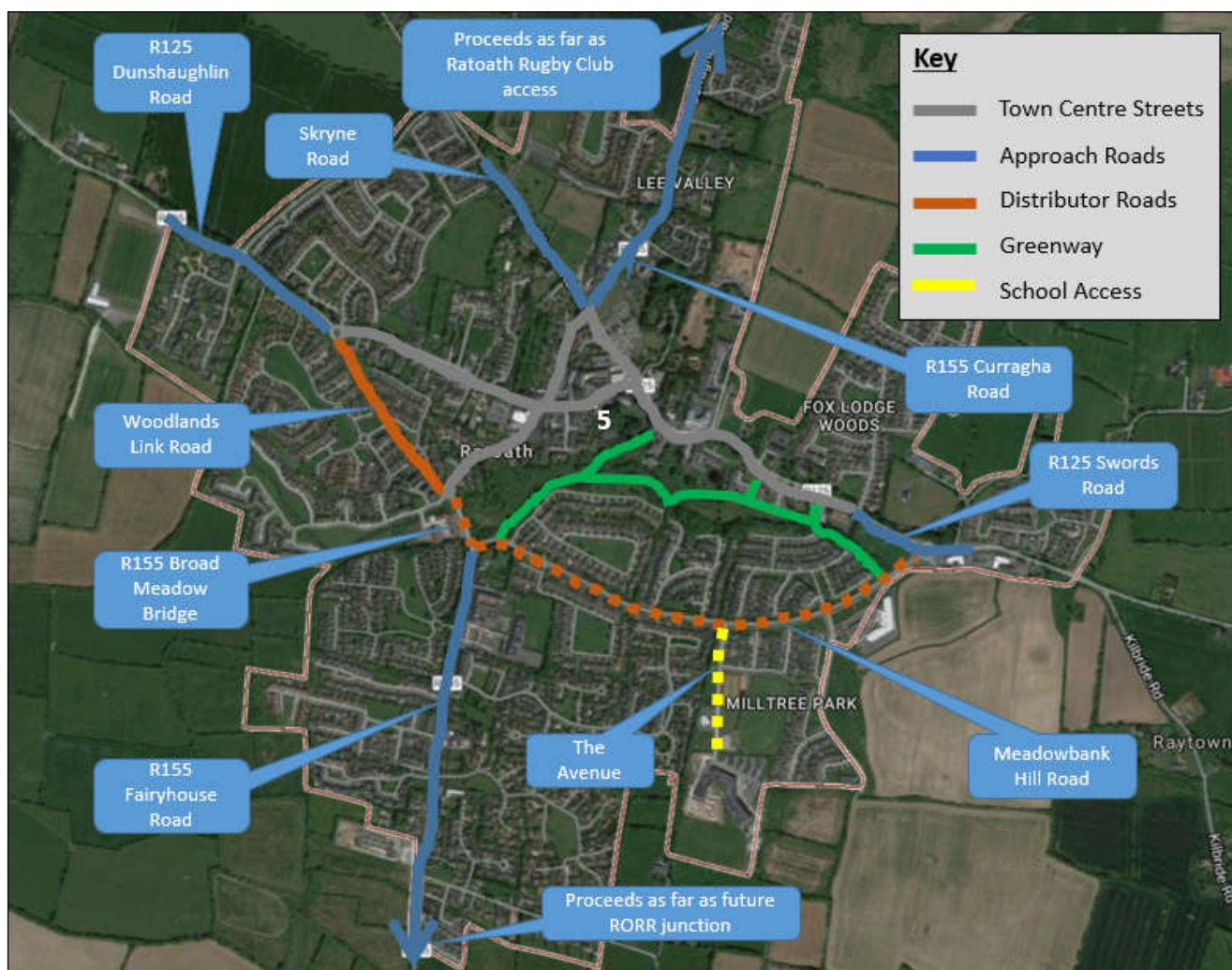


Figure 1.1 Proposed Project Location.

1.3. Project Description

Ratoath is situated on the intersection of the R125 and R155 regional roads in the south east of County Meath. As noted, the town has developed significantly over the last 20 years and acts as a commuter town with more than three quarters of the population travelling to work in Dublin. The overall development consists of cycleways on existing paths/roadways with a Pathway element adjacent to the Broadmeadow River.

The proposed scheme has been broken down into general sections (see Figure 1.1). These sections are as follows: -

- Approach Roads;
 - Skryne road
 - Curragha Road
 - Swords Road
 - Fairyhouse Road
 - Dunshaughlin Road
- Town Centre Streets;

- Woodlands Link; and,
- Broadmeadow Pathway.

The scheme incorporates a linear distance of 16.58km and a total area of 9.49ha.

The works will comprise the retrofitting of the existing road and street layout, to incorporate realignment of kerbs, widening of the pedestrian footpaths, provision of new uncontrolled and controlled pedestrian crossings, retrofitting existing priority, roundabout and traffic signal junction layouts, upgrade of existing bus stops, relocation, upgrade and installation of public lighting, and implementation of speed management measures to create a self-regulating street environment conducive to pedestrian and cyclist safety and comfort.

Certain sections of the works will also include the provision of appropriate street furniture and landscaping, removal of unnecessary street signage and furniture, installation of cycle parking and the resurfacing of road and footway pavements with appropriate materials.

The description of the proposed pedestrian and cycle facilities for each section is as follows.

1.3.1. Approach Roads

Skryne Road: The proposed pedestrian and cycle facilities along this section of the scheme consist of an existing 2.0m wide footpath on the western side of the road which will be re-designated as a shared use pedestrian and cycle path. This width of this combined pathway would be appropriate in this location which serves a limited quantum of residential development. This path will connect with existing pedestrian and cycle facilities at the Silverstream Housing estate and also connect with the facilities proposed on the Curragha Road and the town centre streets. Raised uncontrolled crossings are provided at side roads and a raised controlled crossing is provided to connect with the Pitch and Putt course and Ratoath Harps Soccer club.

R155 Curragha Road: The proposed pedestrian and cycle facilities along this section of the scheme consist of a new 2.0m footpath along the eastern side of the road from the grounds of Ratoath Rugby Club to the traffic signal junction with the Skryne Road. The road will therefore be narrowed to 6.0m and designated as a shared street with a number of traffic management measures implemented. These measures consist of raised junction tables at the entrances to Lee Valley and Glebe Park and recurrent shared street cycle symbols painted onto the carriageway. In addition, a 50kmh driver feedback sign is to be introduced at the approach to the posted 50kmh speed zone.

Minor improvements in the form of kerb realignment, footpath upgrade and tactile paving will be introduced at the Curragha Road / Skryne Road traffic signal junction.

The section from the Lee Valley housing estate to the Ratoath Rugby Club will require some minor realignment of the road on approach to the Rugby Club where the available verge space to accommodate the footpath moves from the eastern side of the existing road carriageway to the western side of the carriageway.

R125 Swords Road: The proposed pedestrian and cycle facilities along this section of the scheme consist of the upgrade of the existing footpath / cycle track located on the southern side of the road from the sewage works access lane to the controlled crossing due east of the junction with the Foxlodge Woods housing estate to a shared path. From this crossing to the roundabout, the existing footpaths and one-way cycle tracks on both sides of the road will be reconstructed to suit proposed alignment. The existing bus lane entry to the roundabout will be removed and associated bus stops on both sides of the road realigned and reconstructed as per the proposed plans. Crossings on the roundabout will be widened to a 4.0m whilst a raised zebra crossing will be introduced on the western arm.

The southern arm of the roundabout will tie in with pedestrian and cycle facilities proposed as part of the Meadowbank Hill upgrade, subject of separate planning approval process. From the roundabout to the Moulden Bridge housing estate a two-way shared pedestrian and cycle path will be introduced on the northern side of the roadway and will gain access to the estate which via a permeability access point through the existing boundary wall. Pedestrians will cross the Bourne Road via a raised uncontrolled crossing. Existing footpaths and cycle tracks to the south and southwest of the roundabout will be resurfaced and designated as a shared pedestrian and cycle path. Raised tables will be implemented at the junctions of Foxlodge Woods and the access lane to the sewage works.

R155 Fairyhouse Road: The proposed pedestrian and cycle facilities along this section of the scheme consist of a shared pedestrian and cycle path to be developed as a reconstruction of the footpath on the eastern side of the road which will include widening of the path, thereby reducing the carriageway width to 6.0m. The path will extend from the proposed RORR (Ratoath Outer Relief Road) junction north towards Gláscairn Lane directly opposite Ratoath BMX Club at the south of the town, and continue northwards towards Ratoath National School and the traffic signal junction with Meadowbank Hill where it will tie with facilities as part of the proposed Meadowbank Hill upgrade subject to a separate planning permission. The proposed path between Gláscairn Lane and Fairyhouse Lodge housing estate is a minimum of 2.5m wide while the remainder of the path is a minimum of 3.0m. Raised uncontrolled crossings are provide at all side road accesses on both sides of the road.

R125 Dunshaughlin Road: The proposed pedestrian and cycle facilities along this section of the scheme consist of a 3m wide shared use pedestrian and cycle path on the southern side of the roadway from the entrance to Ratoath GAA Club to the south eastern roundabout intersecting with the Woodlands link and providing access to Steeplechase Hill. Kerb lines are slightly modified and raised zebra crossings are provided on all arms of this roundabout whilst raised zebra crossings are provided on the southern and eastern arms only of the Brownstown / Steeplechase Wood roundabout. The proposed crossings will connect to existing pedestrian and cycle facilities on the northern side of this road. The eastern extent of this section includes removal of a certain number of trees and replacement with new tree planting. This proposal is illustrated within the Arborist Report contained under separate cover. The existing bus stop will be retained. The eastern extent of this section will connect with proposals on the Woodlands Link and the Dunshaughlin Road town centre street.

1.3.2. Distributor Road

Woodlands Link: The proposed pedestrian and cycle facilities along this section of the scheme predominantly consist one-way cycle tracks on both sides of the road adjacent to the existing footpaths. The proposed scheme predominantly avoids the removal of trees by utilising the verge to the back edge of the existing footpath to accommodate the proposed footpath provision whilst the existing footpath is to be reallocated as the proposed cycle track. This extends along the western side of the Woodlands link from the Roundabout with the R125 Dunshaughlin Road to the housing access junction into the Woodlands Estate.

The design changes again from this housing estate access to the Somerville Roundabout. A toucan crossing is provided just south of the Woodlands Estate access junction to facilitate the crossing movements onto a shared pedestrian and cyclist path on the eastern side of the Woodlands Link. The existing boundary wall to the Woodlands Park estate on the eastern side of the road is repositioned 1.0m back from its current location and a minimum width 3.0m shared facility is provided along the entire extents of this section to tie in with the proposed upgrades, subject of an approved Section 38 process, to the Somerville Roundabout and the Broadmeadow bridge link. The trees within the verge along this section are full retained.

In total only 5 no. trees are proposed to be removed to accommodate this revised design along Woodlands Link.

1.3.3. Town Centre Streets

The proposed pedestrian and cycle facilities along the town centre streets of the scheme generally incorporate traffic management measures predominantly consisting of raised platforms at uncontrolled and controlled crossings, raised junction tables and revised signage and road markings. The streets which are covered under the town centre designation are as follows and all of these streets will operate within a self-regulating 30kph speed limit: -

- R125 Dunshaughlin Road
- Main Street
- East of Main Street
- Curragha Road / Skryne Road junction to R125 / Skryne Road Junction
- Curragha Road / Skryne Road junction to R125 / R155 junction
- R125 / R155 junction to Somerville junction.

The above measures are proposed to encourage a low speed environment and to deter general eastbound / westbound traffic from the town centre and to encourage such through traffic to utilise the southern distributor route provided by the Meadowbank Hill and Woodlands Link. The proposed measures and resultant potential reduction in traffic speeds and volumes will assist in promoting a shared street mixed traffic cycling regime within the town centre.

1.3.4. Broadmeadow Pathway

The proposals for the riverside greenway are predominantly straightforward. It is proposed to upgrade the existing path to a consistent standard in terms of width (3.0m minimum), surfacing and appropriate public lighting.

It is also proposed to provide an additional path north of the river which will provide access further east towards the Meadowbank Hill, increasing permeability and offering additional walking and cycling amenity within the town.

As part of the options assessed for the Pathway, consideration was given for a formal path through the wooded area to the south of the Broadmeadows River, which would allow for an alternative walking and cycling route to the east. This path would likely consist of either a low boardwalk type facility or 'no dig' bound path construction. However, based on the findings of the Bat Report undertaken during July 2018, it has been determined appropriate not to proceed with this route for the following reasons: -

- Evidence of wooded area being a key location for feeding, roosting and commuting of bats
- Impact on bats due to significant tree removal
- Impact on bats due to Pathway lighting

Development of the route through the wooded area, regardless of construction type would require significant removal of trees. This is considered to have an unreasonable impact on the local bat population and given that an alternative route is already facilitated within proposed Part 8 scheme on the northern side of the Broadmeadow River, it is considered appropriate that the wooded section of the route is not included in this Part 8 application.

Further information on baseline ecology along the Broadmeadow Pathway is included in the accompanying Biodiversity Report (Atkins, 2022c).

1.3.1. Overview of Works Methods

During construction small plant will be used for resurfacing, widening and construction of the new paths. Plant will consist of dumper trucks, pavers and diggers. Access to the works locations will be from the existing entrances.

Works will commence with the clearance and off-site removal of redundant road signage, boundary treatment, surface materials and topsoil. The works will be undertaken using a combination of operatives using hand tools, mechanical excavators and dumper trucks. To facilitate the main works, underground utilities which conflict with the main works will be uncovered using mechanical excavators and hand digging where appropriate. The need for significant utility diversions is not envisaged as part of the works; instead a '*lower and protect*' approach will be favoured. This is likely to be restricted to locations where the walking and cycling facilities cross or interface with public roads.

Following the diversion of utilities, the initial pavement and cycle track construction phase will be undertaken. This will include the excavation and removal of the existing stone, soil, concrete and bitumen materials along the route followed by the installation of new path and track base materials. Excavations will be largely undertaken by mechanical means, with any spoil arising to be removed off site or reused locally where testing confirms its suitability. The base layers of the pavement and track are to be made of compacted stone materials.

Drainage works, likely to run in tandem with the pavement construction phase, are considered to be minimal and restricted to areas where the scheme interfaces with the public road. The drainage works at these locations are likely to be limited to the relocation of existing road gullies. The works will also involve constructing the civil engineering elements required to facilitate the commissioning of the traffic signals and the public lighting elements

at the latter stages of construction once all the heavy civil engineering works have been executed. Service chambers and underground duct sets will be laid within trenches and backfilled with granular material. Signal poles and public lighting columns will be erected, and duct connections will be made to the base of each pole unit. The final pavement surface course will be laid using an asphalt paving machine followed by compaction using a vibrating roller. For the widening and construction of the new paths, shallow excavations of topsoil will be required and then stone will be laid for the sub-base layer. The stone will be compacted and then a paver used to surface the path. 70mm of asphalt concrete base will be installed and 30mm of stone mastic asphalt will provide the surface layer. The site laydown area / site compound will not be located in proximity to the watercourse (refer to accompanying Drawing Pack which is submitted with this Part 8 application).

For soft landscaping areas topsoil profiles will be graded to tie into the new pavement levels followed by grass seeding. The top soiling and seeding will be undertaken using a combination of mechanical excavator, tractor unit drawing a rotavator / rake / seed spreader and also operatives using hand tools for areas where machinery access is unavailable.

The project will involve the removal of redundant road signage. There will be no additional demolition works associated with this project.

In order to further enhance ecological pathways within the pathway bat boxes will be erected along the cycleway. Vegetation along the pathway will be managed to promote native species-rich ground flora. Planting will seek to establish and / or maintain ecological connectivity through the site. Vegetation adjacent to the cycleway should not be mown during the summer months (Plantlife, 2021). Long grass and native plants allow insect diversity, which in turn provides food for bats. Where the cycleway runs by the river, the area between the river and the cycleway should not be sprayed or cut. A nature panel can be designed to explain the 'untidy' areas left for insect diversity and bats. All trees along the Cycle Network should be maintained and damage to root zones should be avoided by incorporating small adjustments to the path alignment as needed.

1.3.2. General Measures

All contractors and operatives on site will be advised of the environmental sensitivity of the site and should be fully appraised of this assessment prior to the commencement of works. All personnel will be required to attend a tool box talk prior to works commencing and a record of content and attendance will be kept.

Prior to commencing works on site all overhead & underground services shall be identified and clearly marked on site.

Site compounds will be required for the works. Meath County Council will agree lands with the respective landowners for the location of site compounds. These site compounds shall be located as far from a waterbody as possible, with no site compounds permitted within 20m of a waterbody (IFI, 2016; 2020). A potential compound location has been identified off the R125 Ashbourne Road. This site is currently an unused maintenance depot under the control of Meath County Council. It is currently secured with palisade fencing and is paved fully in hard standing material. Please see site location below (Figure 1.2).

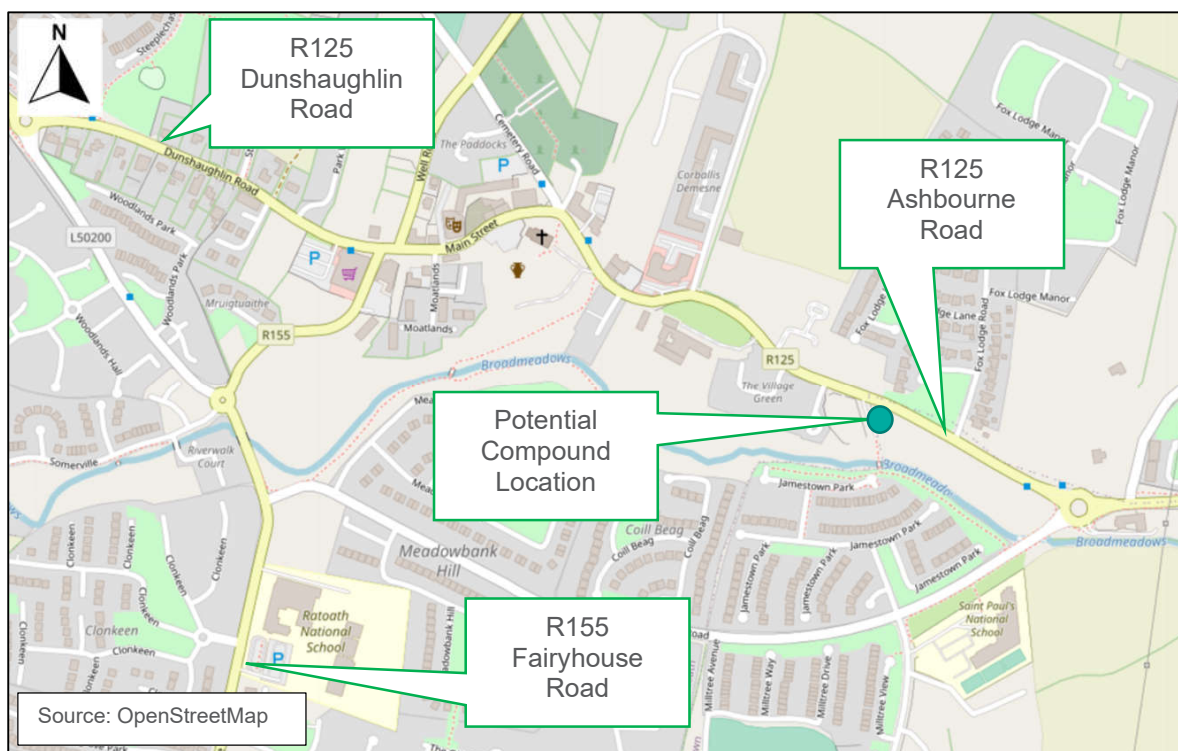


Figure 1.2 Potential Site Compound Location.

All refuelling or servicing of plant / machinery must take place within the site compound; it is not permitted within 20m of any watercourse.

Working hours shall be restricted to daylight hours only and there shall be no overnight artificial lighting of the site.

In the event of a high rainfall period in the proposed works window all operations close to the Broadmeadows Stream will cease and will not recommence until river water levels have dropped to a suitable and safe working level.

No instream works are proposed.

1.3.3. Construction of the Broadmeadows Pathway

The proposals for the riverside pathway are predominantly straightforward. It is proposed to upgrade the existing path to a consistent standard in terms of width, surfacing and appropriate public lighting. It is also proposed to provide an additional path north of the river which will provide access further east towards the Meadowbank Hill, increasing permeability and offering additional walking and cycling amenity within the town.

As part of the options assessed for the pathway, consideration was given for a formal path through the wooded area to the south of the Broadmeadows River, which would allow for an alternative walking and cycling route to the east. This path would likely consist of either a low boardwalk type facility or 'no dig' bound path construction. However, based on the findings of the Bat Report undertaken during July 2018, it has been determined appropriate not to proceed with this route for the following reasons: -

- Evidence of wooded area being a key location for feeding, roosting and commuting of bats;
- Impact on bats due to significant tree removal; and
- Impact on bats due to pathway lighting.

Development of the route through the wooded area, regardless of construction type would require significant removal of trees. This is considered to have an unreasonable impact on the local ecology and bat population and

given that an alternative route is already facilitated within proposed Part 8 scheme on the northern side of the Broadmeadow River, it is considered appropriate that the wooded section of the route is not included in this Part 8 application.

The following paragraphs describe the typical construction methodology to be employed for the works along the pathway. Works will commence with the clearance and off-site removal of redundant road signage, boundary treatment, surface materials and topsoil. The works will be undertaken using a combination of operatives using hand tools, mechanical excavators and dumper trucks. To facilitate the main works, underground utilities which conflict with the main works will be uncovered using mechanical excavators and hand digging where appropriate. The need for significant utility diversions is not envisaged as part of the works; instead a 'lower and protect' approach will be favoured. This is likely to be restricted to locations where the walking and cycling facilities cross or interface with public roads.

Following the diversion of utilities, the initial pavement and cycle track construction phase will be undertaken. This will include the excavation and removal of the existing stone, soil, concrete and bitumen materials along the route followed by the installation of new path and track base materials. Excavations will be largely undertaken by mechanical means, with any spoil arising to be removed off site or reused locally where testing confirms its suitability. The base layers of the pavement and track are to be made of compacted stone materials.

Drainage works, likely to run in tandem with the pavement construction phase, are considered to be minimal and restricted to areas where the scheme interfaces with the public road. The drainage works at these locations are to be limited to the relocation of existing road gullies to take account of adjusted levels. The works will also involve constructing the civil engineering elements required to facilitate the commissioning of the traffic signals and the public lighting elements at the latter stages of construction once all the heavy civil engineering works have been executed. Service chambers and underground duct sets will be laid within trenches and backfilled with granular material. Signal poles and public lighting columns will be erected, and duct connections will be made to the base of each pole unit. The final pavement surface course will be laid using an asphalt paving machine followed by compaction using a vibrating roller.

For soft landscaping areas topsoil profiles will be graded to tie into the new pavement levels followed by grass seeding. The top soiling and seeding will be undertaken using a combination of mechanical excavator, tractor unit drawing a rotavator / rake / seed spreader and also operatives using hand tools for areas where machinery access is unavailable. There will be no instream works.

The project will involve the removal of redundant road signage. There will be no additional demolition works associated with this project. It is estimated that works would be undertaken over a three to four years period over a number of contracts. Specifically, the works along the Broadmeadow pathway would take approximately one year to complete.

1.3.4. Works Phasing

At this preliminary juncture, it is not possible to determine the potential phasing of the project as this will be subject to available funding streams at the time. However, it is certain that the works will be split up into manageable packages of works which would seek to lessen the disturbance to the traffic operation of the local road network in Ratoath. These packages of work would most likely be as follows: -

- Town Centre streets
- Woodlands Link
- Broadmeadow Pathway
- Approach Roads
 - Dunshaughlin Road
 - Fairyhouse Road
 - Swords Road

- Curragha Road
- Skryne road

As the pathway works wont impact on the traffic of the local network there is potential that this element could be packaged in with other work packages. In addition, the works along the Skryne Road are minor and these could be amalgamated with the Town Centre package of works.

1.3.5. Biosecurity protocols

Biosecurity protocols will be implemented during the construction phase of the proposed project to prevent the introduction of invasive species listed on the third schedule of the EC (Birds and Natural Habitats) Regulations 2011, as amended, to site.

All equipment intended to be used at the site shall be dry, clean and free from debris prior to being brought to site.

If drying out of equipment is not feasible, equipment should be either:

- i. power steam washed at a suitably high temperature or at least 65 degrees, or
- ii. disinfected with an approved disinfectant, e.g. Virkon or an iodine-based product. It is important that the manufacturer's instructions are followed and if required, the correct contact times are allowed for during the disinfection process. Items that are difficult to soak should be sprayed or wiped down with disinfectant.

During the duration of the proposed project, if equipment is removed off-site to be used elsewhere, the said equipment shall be cleaned and disinfected prior to being brought back to the works area of the proposed project.

Appropriate facilities shall be used for the containment, collection and disposal of material and/or water resulting from washing facilities of vehicles, equipment and personnel.

Importation of materials shall comply with Regulation 49 of the EC (Birds and Natural Habitats) Regulations 2011. In relation to 3rd Schedule species, but notably Japanese knotweed and Himalayan balsam, the following general biosecurity and containment measures shall be undertaken during the construction phase of the project: -

- Identify and mark out areas of infestation;
- Fence off areas of infestation in advance of and during construction works;
- Erect signage identifying restricted areas;
- Avoid, where possible, using plant and machinery in areas of invasive species infestation;
- Plant and equipment used within areas if invasive species infestation should be inspected post works and washed down in a contained area;

Site staff should be aware that root zones / control zones for knotweed species extend a minimum of 7m from the extent of the invasive species' surface vegetation.

2. Methods

2.1. Desk Study

A desk study and site visits were conducted to inform the ecology report of the proposed site in Ratoath, Co. Meath.

2.2. Desk Study

A desk study was carried out to collate information available in the vicinity of the proposed project. These areas were viewed using Google Earth, Google maps¹ and Bing maps² (last accessed on 05/03/2022).

The Environmental Protection Agency (EPA) mapping³ system was used to identify any hydrological connection between the proposed project and Natura 2000 sites.

Locations and boundaries of all Natura 2000 sites within 15km of the proposed project were identified and reviewed using the NPWS online map viewer. Boundary shapefiles were also downloaded from this site to facilitate the preparation of project graphics.

Desktop information on relevant Natura 2000 sites were reviewed on the NPWS website, including the site synopsis for each SAC/SPA, the conservation objectives, the site boundaries as shown on the NPWS online map viewer, the standard Natura 2000 Data Form for the SAC/SPA which details conditions and threats of the sites, and published information and unpublished reports on the relevant Natura 2000 sites.

The Map of Irish Wetlands⁴ was reviewed for the presence of wetlands in the proximity of the proposed site.

The National Biodiversity Data Centre (NBDC) were accessed for information on protected habitats and species known from the 2 km grid square W47G within which the site is located. Bat records within 2 km of the survey area were also reviewed using the NBDC website.

The conservation status of mammals within Ireland and Europe is evaluated using one or more of the following documents; Wildlife Acts (1976 - 2012), the Red List of Terrestrial Mammals (Marnell *et al.*, 2009) and the EU Habitats Directive 92/43/EEC. Birds of Conservation Concern in Ireland (BoCCI), published by BirdWatch Ireland and the RSPB NI, is a list of priority bird species for conservation action on the island of Ireland (Gilbert *et al.*, 2021). The BoCCI lists birds which breed and/or winter in Ireland and classifies them into three separate lists; Red, Amber and Green; based on the conservation status of the bird and hence their conservation priority. Birds on the Red List are those of highest conservation concern, Amber List are of medium conservation concern and Green List are not considered threatened.

2.3. Zone of Influence

The '*zone of influence*' for a project is the area over which ecological features may be subject to significant effects because of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

It follows that given the nature of the proposed development in Ratoath the zone of influence of will be limited to the development site and immediate environs as well as areas connected via hydrological pathways (ground or surface water) and landscape features such as hedgerows, treelines and watercourses.

¹ <https://www.google.ie/maps>

² <http://www.bing.com/maps/>

³ <https://gis.epa.ie/EPAMaps/>

⁴ <http://www.wetlandsurveysireland.com/wetlands/map-of-irish-wetlands--/map-of-irish-wetlands---map/>

Determining the potential for impacts and the zone of influence is based on the source-pathway receptor chain principle and involves assessing likely significant effects on ecological receptors within the zone of influence in relation to three pathways: -

- Surface water
- Groundwater
- Land & Air

2.4. Site Visit

The site was originally visited on the 7th October 2015 to identify any ecological constraints associated with the site and the proposed development. The assessment followed CIEEM guidance (*Guidelines for Preliminary Ecological Assessment*, 2nd Edition CIEEM 2017); as well as CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland*. At that time of surveying it was proposed to develop a pathway along the banks of the Broadmeadow River and through an area of adjoining woodland. Subsequently the design was altered to avoid impacting areas of woodland along the Broadmeadow River due to the potential for loss of trees and negative impacts to bats. A bat survey focusing in particular on the Broadmeadow River corridor was undertaken by Brian Keeley (Wildlife Surveys Ireland) in 2018; the results of which informed these design changes (included in full in Appendix A).

The site was revisited in 31st May 2019 to re-examine this area and to validate earlier ecological findings. The project was then submitted for Part 8 Planning in 2020. On foot of the observations received during the display and submissions period, and in particular the concerns raised by the public in relation to the extent of tree removal along the Woodlands Link, Meath County Council undertook the decision to withdraw the Part 8 proposals.

The current Part 8 proposals have addressed the issue of tree removal through the development of an alternative proposed design layout. The alternative layout manages to avoid the vast majority of trees contained in the verge along the Woodlands link. The impact on trees is presented in full in the accompanying Tree Report and is also discussed in Chapter 5.0.

In addition to the scheme amendment on woodlands link there are a further two additions to the proposed scheme. These include an extension to the footpath along the Curraghera Road to as far as the access to the Ratoath Rugby Club grounds and an extension of the shared path facility along the Fairyhouse Road to tie-in with the future junction of the Ratoath Outer Relief Road. The site was visited again in January 2022 to update the ecological survey work undertaken and to consider these new areas. Survey works were undertaken by Dr. Caroline Sheil on behalf of Atkins.

A Phase 1 habitat survey was undertaken in line with published practice (Smith *et al.*, 2011), with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000). Dominant plant species in each habitat type were recorded. Plant nomenclature follows the Botanical Society of Britain and Ireland's List of Accepted Plant Names (Botanical Society of Britain and Ireland, 2007). Habitats were later mapped using MapInfo v16 GIS software.

Incidental sightings and signs of birds, mammals, invertebrates and amphibians were noted during the walkover survey to further evaluate the importance of the site to flora and fauna (in line with the approach set out in the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017)). The landscape value for bats was also considered (after e.g. Entwistle *et al.*, 2001; etc.). Trees or structures suitable for bat roosts within the development site and potential suitable bat foraging habitat were also noted during the daytime walkover of the Site.

During the ecological survey the presence of invasive plant species such as Japanese knotweed (*Reynoutia japonica*), Himalayan balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*) were recorded.

Aerial photos and site maps assisted the ecological walkover survey. The location of the proposed project and the surrounding areas were viewed using Google Earth, Google maps and Bing maps. The EPA online mapviewer OSI Discovery series maps were used to locate watercourse networks.

2.5. Evaluation of Ecological Receptors

The evaluation and impact assessment within this report has been undertaken with reference to relevant parts of the 2018 *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland. Terrestrial, Freshwater, Coastal and Marine* - developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case, relying on known / published accounts of distribution and rarity where available, and professional experience:

- International (European).
- National (Ireland).
- Regional (Munster).
- County (Cork)
- Townland (Coolnagearagh).
- Local (intermediate between the Site and Townland).

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained in the text. Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and / or species rarity; the extent to which such habitats and / or species are threatened throughout their range, or to their rate of decline.

2.6. Statement of Authority

The ecology report was initially undertaken by Elaine Bennett under the direction of Paul O'Donoghue. Following adjustments to the proposed Ratoath Pedestrian & Cycling Scheme route a revision to this appropriate assessment was carried out by Conor Ruane in February 2020. Survey work in 2022 was undertaken by Dr. Caroline Sheil on behalf of Atkins. The current ecology report was prepared by Emma Nickelsen and reviewed by Paul O'Donoghue. Field survey work in 2022 was undertaken by Caroline Shiel on behalf of Atkins.

Paul O'Donoghue has a BSc (Zoology), MSc (Behavioural Ecology) and a PhD in avian ecology and genetics. He is a chartered member of the Society for the Environment (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 20 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments / Natura Impact Statements (i.e. Appropriate Assessment under Article 6(3) of the EU Habitats Directive).

Emma Nickelsen has a BSc (Hons) in Environmental Biology and an MSc in Marine Biology. Emma has worked in ecological and environmental consultancy since 2017, working on a wide range of projects including bridge works, road construction, local amenity development and renewable energy. A focus of Emma's work to date has been on conducting Appropriate Assessment screenings, ecological appraisals and supporting the preparation of Natura Impact Statements and Ecological Impact Statements.

Caroline Sheil (BSc, PhD) has 30 years' experience in the field of bat research and in conducting bat surveys. Her B.Sc. thesis was an investigation of the diet of four species of Irish bat. She has extensive experience in carrying out bat surveys for building, road construction (M11 Gorey bypass, M11 Arklow bypass, M11 Enniscorthy bypass, M18 Gort bypass, N6 Galway City Transport Project and Tobercurry bypass) and windfarm construction work on behalf of many private companies.

3. Existing Environment

The proposed site is located on roads throughout and approaching Ratoath, Co. Meath (see Figure 1.1).

3.1. Statutory Conservation Sites

3.1.1. European Designated Sites

[Refer to the accompanying Screening for Appropriate Assessment; Atkins, 2022c].

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) forms the basis for the designation of Special Areas of Conservation. Similarly, Special Protection Areas are classified under the Birds Directive (Council Directive 2009/147/EEC on the Conservation of Wild Birds). The Habitats and Birds Directives are transposed into Irish law by the EC (Birds and Natural Habitats) Regulations 2011 (Statutory Instrument No. 477/2011). Collectively, Special Areas of Conservation (SAC) and Special Protection Areas (SPA) are referred to as the Natura 2000 network. In general terms, they are considered to be of exceptional importance for rare, endangered or vulnerable habitats and species within the European Community.

The 'zone of influence' (ZoI) for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The ZoI will vary for different ecological features depending on their sensitivity to environmental change (CIEEM, 2018).

Guidance on the AA process was produced by the European Commission (EC, 2001; 2018), which was subsequently used to develop guidance for Ireland by the Department of Environment, Heritage and Local Government in 2009 (DEHLG, 2009) (see also National Parks and Wildlife Service in 2018⁵; (NPWS 2018). More recently the Office of the Planning Regulator published *Appropriate Assessment Screening for Development Management* (OPR Practice Note PN01; OPR, 2021).

When considering the potential for impacts to European sites a distance of 15km was recommended (also A recommended in UK guidance; Scott Wilson *et al.*, 2006). However, for projects, the distance could be much less than 15km, and in some cases less than 100m, but National Parks and Wildlife Service guidance (DEHLG, 2009) and OPR (2021) advises that this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects.

A review of European sites (SACs and SPAs) in proximity to the development or ecologically linked to the development was conducted. There is one European site located within 15km of the works areas: - Rye Water Valley Carton SAC (site code 001398); this is located ca. 14km to the south of the proposed development. Rye Water Valley Carton SAC is designated for: -

- Petrifying springs with tufa formation (Cratoneurion) [7220]
- *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]
- *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016].

However, there is no hydrological or ecological connectivity between the proposed development and this SAC. This site is not therefore considered within the zone of influence. The only European sites which are linked to the development site are Malahide Estuary SAC (000205) and SPA (004025).

The Malahide Estuary SAC (000205) is located ca. 19.5km to the downstream of the proposed scheme. The Malahide Estuary SAC is designated for the following habitats; -

- Mudflats and sandflats not covered by seawater at low tide [1140]

⁵ <https://www.npws.ie/development-consultations>

- *Salicornia* and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]

The Malahide Estuary SPA (004025) is located ca. 20km downstream of the proposed scheme. The Malahide Estuary SPA is designated for a range of waterbirds and the wetlands upon which they depend; -

- Great Crested Grebe (*Podiceps cristatus*) [A005]
- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Shelduck (*Tadorna tadorna*) [A048]
- Pintail (*Anas acuta*) [A054]
- Goldeneye (*Bucephala clangula*) [A067]
- Red-breasted Merganser (*Mergus serrator*) [A069]
- Oystercatcher (*Haematopus ostralegus*) [A130]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Grey Plover (*Pluvialis squatarola*) [A141]
- Knot (*Calidris canutus*) [A143]
- Dunlin (*Calidris alpina*) [A149]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Redshank (*Tringa totanus*) [A162]
- Wetland and Waterbirds [A999]

Table 3.1 Natura 2000 sites within 15km from the site.

Site	Number	Distance
Special Areas of Conservation		
Malahide Estuary SAC	000205	19.5 km downstream
Special Protection Area for birds		
Malahide Estuary SPA	004025	19.8km downstream

3.1.2. Nationally Important Sites

Natural Heritage Areas (NHAs) are nationally designated sites, which are considered important for the habitat, species or geological heritage. NHAs are legally protected under the Wildlife Amendment Act 2000. Proposed Natural Heritage Areas (pNHAs) are sites that are of significance for wildlife and habitats, but which have not as yet been statutorily designated; however, their ecological value is recognised by Planning and Licencing Authorities.

Malahide Estuary pNHA (000205) is located to the east, 19.5km downstream of the proposed scheme along the Broadmeadow River. The pNHA overlaps in extent with the SAC and is designated for the same coastal habitats.

Table 3.2 Proposed Natural Heritage Areas close to the Site.

Site	Number	Distance
Malahide Estuary pNHA	000205	19.5km downstream (instream distance)

3.1.3. Nature Reserves

No nature reserves are located within the 5km of the proposed project.

3.1.4. Other non-statutory designated sites of ecological value

There are no other non-statutory sites of ecological value in the vicinity of the proposed scheme.

3.1.5. Ratoath Biodiversity Action Plan

The Ratoath Community Biodiversity Action Plan 2016-2020 was published in 2016 (D'Arcy, 2016). This includes a range of recommendations relevant to the works area; e.g.

Site 5 - Broadmeadow River Walk

- Rejuvenate river walk in village.
- Hold a community clean up, improve area as amenity and enhance for wildlife.
- Remove litter from the river.
- Erect bird and bat boxes in wooded areas and along river course.
- Woodland management: Plant native tree saplings in woodland to assist woodland regeneration.
- Protect from damage.
- Consider installing waymarking or interpretative signage.

Site 6 - Broadmeadow wildlife area

- Conduct minimal planting along walkway to river.
- Plant native bluebells in shaded grass verge.
- Manage adjacent grassland area as wildflower meadow.
- Control bramble encroachment by trimming. Remove pendulous sedge (*Carex pendula*).
- Promote area as wildlife refuge.

Site 7 - Lough Lane walk (extension of Broadmeadow river walk)

- Develop walk to provide natural amenity for village.
- Conduct an ecological survey to inform on possible impacts and interpretative signage.
- Consider extension of route to link up with Ballymore Commons.

3.2. Rare and Protected Flora and Fauna

In relation to protected species records for the site, a data request was made to NPWS in November 2021 for information on rare and protected species. There are records for hedgehog (*Erinaceus europaeus*), Irish hare (*Lepus timidus*), frog (*Rana temporaria*) and golden dock (*Rumex maritimus*) within the wider environment, but not along the corridor of the pathway, much of which comprises built land. The records for hedgehog are from Ratoath; Irish hare records are from the 10km grid square within which the study areas is located; while frog records are from Garristown, Co. Dublin. The records of golden dock are from Curragha Bog near Garristown.

The NBDC database was searched for records within the 2km grid squares within which the scheme is located. The records of flora, mammals and invertebrates returned are presented in Table 3.3, while records of rare and protected birds species are listed in Table 3.4.

Table 3.3 NBDC Rare and Protected Flora and Fauna.

Species	Grid square	Date of latest record	Designation / Status	Source
Eurasian Badger (<i>Meles meles</i>)	O05A; O05B	23/04/2010	Wildlife Acts	Road Kill Survey
Irish Hare (<i>Lepus timidus subsp. hibernicus</i>)	O05A	22/06/2014		Atlas of Mammals in Ireland 2010-2015
Red Fox (<i>Vulpes vulpes</i>)	O05A	14/06/2015		Atlas of Mammals in Ireland 2010-2015
Large Red Tailed Bumble Bee (<i>Bombus (Melanobombus) lapidarius</i>)	O05F	22/07/2018	Threatened Species: Near threatened	Bees of Ireland
Lesser Noctule (<i>Nyctalus leisleri</i>)	O05F	23/07/2013	EU Habitats Directive Annex IV Wildlife Acts	National Bat Database of Ireland
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	O05F	15/08/2014	EU Habitats Directive Annex IV Wildlife Acts	National Bat Database of Ireland

Table 3.4 NBDC Rare and Protected Birds.

Species	Grid square	Date of latest record	Designation / Status	Source
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	O05B	31/12/2011	Wildlife Acts Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Common Linnet (<i>Carduelis cannabina</i>)	O05A	31/12/2011	Wildlife Acts Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Common Pheasant (<i>Phasianus colchicus</i>)	O05B	31/12/2011	Wildlife Acts EU Birds Directive - Annex II, Section I Bird Species;	Bird Atlas 2007 - 2011

Species	Grid square	Date of latest record	Designation / Status	Source
			Annex III, Section III Bird Species	
Common Snipe (<i>Gallinago gallinago</i>)	O05A	31/12/2011	Wildlife Acts EU Birds Directive - Annex II, Section I Bird Species; Annex III, Section III Bird Species Birds of Conservation Concern - Red List	Bird Atlas 2007 - 2011
Common Starling (<i>Sturnus vulgaris</i>)	O05B	31/12/2011	Wildlife Acts Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Common Wood Pigeon (<i>Columba palumbus</i>)	O05A	31/12/2011	Wildlife Acts EU Birds Directive - Annex II, Section I Bird Species; Annex III, Section III Bird Species	Bird Atlas 2007 - 2011
House Sparrow (<i>Passer domesticus</i>)	O05B	31/12/2011	Wildlife Acts Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Lesser Black-backed Gull (<i>Larus fuscus</i>)	O05B	31/12/2011	Wildlife Acts Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Mallard (<i>Anas platyrhynchos</i>)	O05B	31/12/2011	Wildlife Acts EU Birds Directive - Annex II, Section I Bird Species; Annex III, Section III Bird Species	Bird Atlas 2007 - 2011
Northern Lapwing (<i>Vanellus vanellus</i>)	O05B	31/12/2011	Wildlife Acts EU Birds Directive - Annex II, Section I Birds of Conservation Concern - Red List	Bird Atlas 2007 - 2011
Yellowhammer (<i>Emberiza citrinella</i>)	O05A; O05B	31/12/2011	Wildlife Acts Birds of Conservation Concern - Red List	Bird Atlas 2007 - 2011

There are records of various bat species within the vicinity of the proposed site. Bat suitability mapping accessed via the NBDC (Lundy *et al.*, 2011)⁶ shows that the 2km grid squares within which the site is located, are classed as being of medium bat suitability.

The absence of recent records of species from the NBDC database or NPWS records does not necessarily mean that it does not occur within the area rather it has not formally been recorded as present.

3.3. Invasive Species

While non-native invasive species are not an ecological feature of value, they do need to be considered as a potential ecological constraint. The European Communities (Birds and Natural Habitats) Regulations 2011 S.I. 477 detail the legal context regarding the introduction and dispersal of certain non-native invasive plants and

⁶ [http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata\(v.3\).pdf](http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata(v.3).pdf)

animals. Section 49 and 50 of the Regulations specify that it is an offence to disperse or spread any plant species or associated vector material listed on the 3rd Schedule of the Regulations.

No records for invasive plant species such as Japanese knotweed, Himalayan balsam, Giant-rhubarb or Giant Hogweed were noted within the site, or in the vicinity. As the most recent survey was in December 2022, it is recommended that the corridor a seasonally appropriate survey for invasive species be undertaken prior to construction.

3.4. Aquatic Ecology

There are two rivers located within the town of Ratoath, that interact with the proposed scheme. The first is the Broadmeadow River (EPA code IE_EA_08B020400) which flows through the town. As part of the proposed scheme an existing informal pathway running close to the river is to be upgraded as a pathway. The second is the Crackenstown Stream (EPA code IE_EA_08D030300) which is culverted under the Curragha Road. Both rivers were deemed as being of Poor WFD status, while the most recent assessment by the EPA recorded a Q-value of 3 (Poor) on the Broadmeadow River in the centre of Ratoath in 2020.

4. Field Survey of Proposed Broadmeadow pathway

The proposed works are predominantly within the urban fabric of Ratoath. The following descriptions focus on those of areas of ecological interest within the works area. As noted the study area was previously surveyed; elements of these surveys are integrated with the most recent survey work as appropriate.

4.1. Broadmeadow River Walk

The proposed Broadmeadow Pathway starts at north of the junction of Meadowbrook Hill and the R155, south of the Broadmeadow River (see Figure 4.1). The route extends eastward along existing surfaced pathways and informal pathways through parkland and agricultural lands. Surfaced pathways was classified as having negligible ecological importance while the informal pathways through agricultural lands are of *Local Importance (Lower Value)*.

The wetted width of the Broadmeadow River varied between 2m – 3m. The river functions as an ecological corridor and so is evaluated as of *Local Importance (Higher Value)*. Extensive litter was evident within the river, but there was still evidence visible of varied instream habitat comprising cobbles and gravels. Inland Fisheries Ireland (IFI) have conducted surveys along this river and recorded three-spined stickleback (*Gasterosteus aculeatus*), nine-spined stickleback (*Pungitius pungitius*), eel (*Anguilla anguilla*) and stone loach (*Barbatula barbatula*).

On 13th December 2021 the length of the Broadmeadow River Walk from the western entrance on Meadowbank Hill Road (just off the R155) to the eastern entrance at the eastern end of Meadowbank Hill Road (just south of the roundabout with the Swords Road R125) was walked. This corresponds to Sections 1, 3, 4 & 5 which are labelled to correspond with Figure 1 below. The section from Bridge 1 to Holy Trinity Church on Main Street (Section 2) was also walked.

The positions of the 3 bridges crossing this section of the Broadmeadow River are also indicated in Figure 4.1.

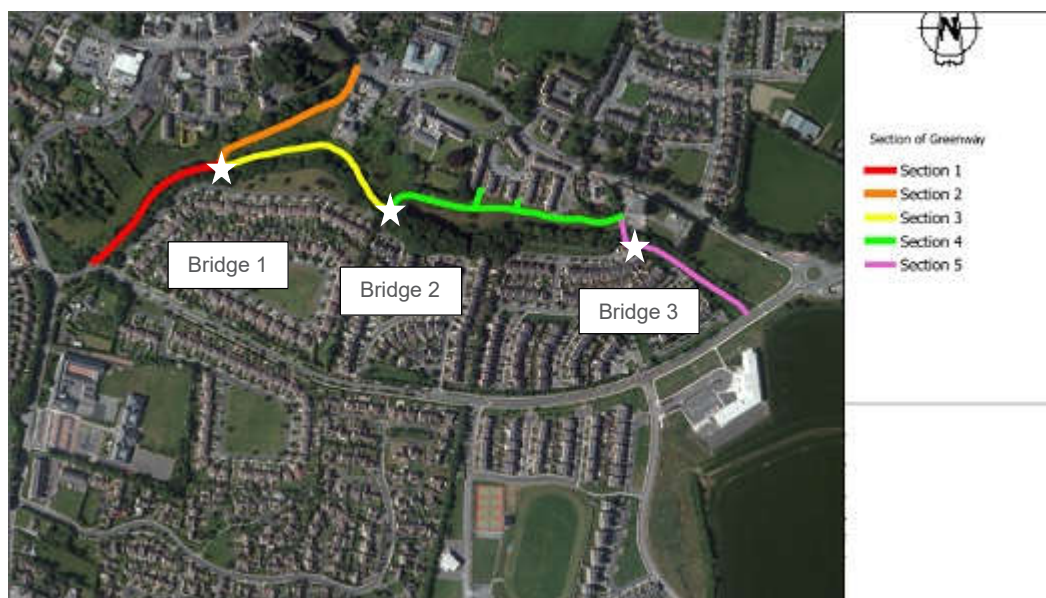


Figure 4.1 Broadmeadow River ecology field survey area.



Figure 4.2 Habitat Map (Section 1-3).

(Orange = amenity grassland, solid dark green = rank grassland, spotted green = woodland, Pale green square dots = tree line, blue = river).



Figure 4.3 Habitat Map (Section 5).

4.1.1. Section 1 (from western entrance to river walk to Bridge 1)

An existing path (BL3) is present along this section, which will require resurfacing; minor widening will be required at pinch points. The path is bordered by a grass verge (GS2) with ruderal species and treelines (WL2) on both sides. Near the western entrance there was abundant butterbur (*Petasites hybridus*), dock (*Rumex spp.*), hogweed (*Heracleum sphondylium*) and nettle (*Urtica dioica*); the butterbur had recently been cut. The treeline (WL2) to the south east consisted of sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), birch (*Betula sp.*), hawthorn (*Crataegus monogyna*), poplar (*Populus sp.*), beech (*Fagus sylvatica*) and elm (*Ulmus sp.*). The treeline along the river consisted of sycamore, ash, hawthorn and elder (*Sambucus nigra*). The habitat present in this section is of *Local Importance (Lower Value)*.

The ecological value of features along this section of pathway is summarised in a photo essay presented below.

An existing path (BL3) is present along this section of the proposed pathway, which will require resurfacing and minor widening at pinch points. The western entrance to the river walk opens from Meadowbank Hill Road. At this point the distance to the river is ca. 7m.



Plate 4.1 Western entrance to river walk - opens from Meadowbank Hill Road.

At this location, the Broadmeadow River flows in north easterly direction to north of the existing path. Immature alder and sycamore occur on river bank with an understory of bramble (*Rubus fruticosus* agg.), nettle and butterbur.



Plate 4.2 Broadmeadow River.

A small concrete shed is located on the southern side of the track. The potential for this structure to support roosting bats was considered. As it has potential to act as a bat roost, it should be surveyed for roosting bats by an appropriately qualified ecologists prior to demolition. Should any bats be recorded it will be necessary to apply for a Derogation licence under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011.



Plate 4.3 Small concrete shed on southern side of track.

In this area the southern side of the path (away from the river) is dominated by Ivy (*Hedera hibernica*) -covered ash, with species poor vegetation dominating the riverbank.



Plate 4.4 Section of existing path with Broadmeadow River to north of track, with ivy-covered ash on southern side of path.



Plate 4.5 Section of existing path with Broadmeadow River to north of track.

South of the proposed pathway is a strip of deciduous woodland (WD1) – in this area the woodland is approximately 20m in depth. A notable mature beech is located adjoining the path. A potential roost site for bats in this tree is highlighted in Plate 4.6.



Plate 4.6 Notable beech tree adjoining the path (IG ref. - 01956 51694), with potential roost features for bats.

A number photos of the Eastern part of Section 1 (see Figure 4.1) are included below, Plate 4.7 and 4.8. A mature beech can be seen on the southern side of the path in Plate 4.8 (IG ref. GPS 02015 51716).

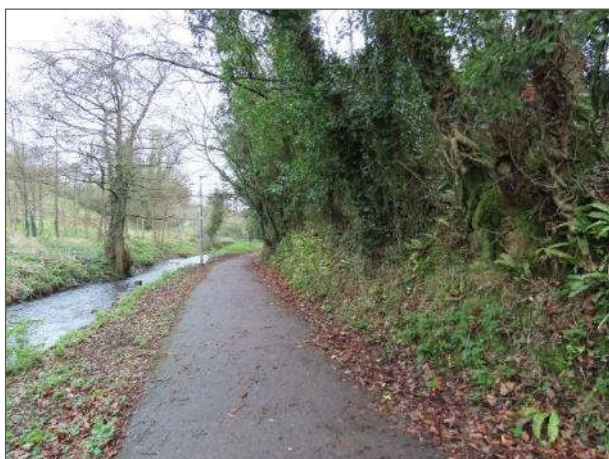


Plate 4.7 Eastern part of Section 1.

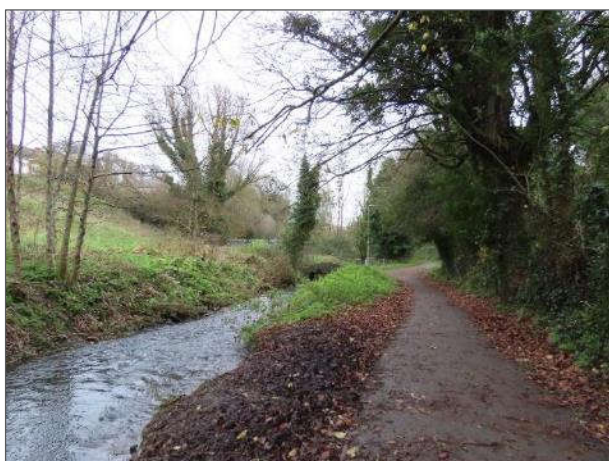


Plate 4.8 Eastern part of Section 1 with Bridge 1 in centre of photo. Mature beech on southern side of path.

Plate 4.9 illustrated the junction point between Sections 1, 2 and 3 as labelled in Figure 4.1. Here the pathway splits with one section crossing over the Broadmeadows River via Bridge no 1; an existing concrete culvert which crosses the river. It is not proposed to replace the bridge, nor are any instream works proposed.



Plate 4.9 Bridge 1 – concrete culvert spanning Broadmeadow River.

Immediately south of Bridge 1 – the embankment adjoining the existing pathway is covered by a narrow strip (ca. 20m) of deciduous woodland (WD1). Meadowbank Hill Estate is located at the top of the embankment (see Plate 4.10).



Plate 4.10 Woodland on embankment south of Bridge 1; adjoining Meadowbank Hill Estate.

There is an existing informal path up to Meadowbank Hill Estate from Bridge 1 (see Plate 4.11 and 4.12) – this path will be resurfaced and widened. Care should be taken to ensure the alignment works with the existing path line, but also is adjusted to avoid notable trees.



Plate 4.11 Existing track up to Meadowbank Hill Estate from Bridge 1.



Plate 4.12 Existing track down from Meadowbank Hill Estate to Bridge 1 (c. 25m).

4.1.2. Section 2 (from Bridge 1 to Main Street at Holy Trinity Church)

An existing path is present in this section which will require resurfacing. The following are a series of photographs illustrating existing conditions along the pathway. See Figure 4.1 for location of Sections and bridges. A habitat map is presented in Figure 4.2, above).

To the west of the existing path (BL3) is a ca. 2m palisade fence; behind which is a treeline (WL2) of sycamore, hawthorn and ash. To the east are areas of rank grassland (GA1/GS4) with some planted trees (see Plate 4.13). The grassland within 2-3m of the path is frequently cut. Dense areas of bramble are present adjacent to the river. Pockets of pendulous sedge (*Carex pendula*) are present with willow (*Salix cinerea*), vetch (*Vicia* sp.), clover (*Trifolium repens*), sedges (*Carex* spp.) and hard rush (*Juncus inflexus*), ribwort plantain (*Plantago lanceolata*), dock (*Rumex* spp.) and bramble (*Rubus fruticosus*). The habitat present in this section is evaluated as *Local Importance (Lower Value)*.



Plate 4.13 Existing path along Section 2 – immediately north of Bridge 1.

Approximately half way along Section 2, there is an area dominated by clumps of pendulous sedge.



Plate 4.14 Approximately half-way along length of Section 2 with clumps of pendulous sedge.

Further north the path is dominated on both sides by rank grassland and butterbur (see Plate 4.15 & 4.17).



Plate 4.15 Northeastern end of Section 2 (left), with butterbur growing along the edge of the path in places.



Plate 4.16 North eastern entrance to Section 2 beside Holy Trinity Church on Main Street.



Plate 4.17 Looking back south west along Section 2 towards Bridge 1.

4.1.3. Section 3 (Broadmeadow River Walk)

There is an existing path (BL3) in Section 3 (see Figure 4.1) which will require resurfacing (see Plate 4.18). A habitat map is presented in Figure 4.2, above).

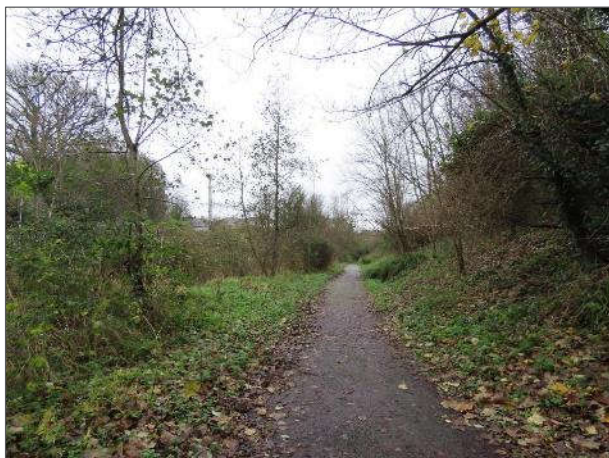


Plate 4.18 Start (western end) of Section 3.

Within Section 3, immediately east of Bridge 1, there is a band of woodland on southern side of path. This includes cherry (*Prunus* sp.), ash, willow (*Salix* sp.), sycamore, dog-rose (*Rosa canina*), dogwood (*Cornus* sp.), wood rush (*Luzula* sp.) with understorey of brambles. Further eastwards along the existing pathway occasional alder trees grow along the river bank.

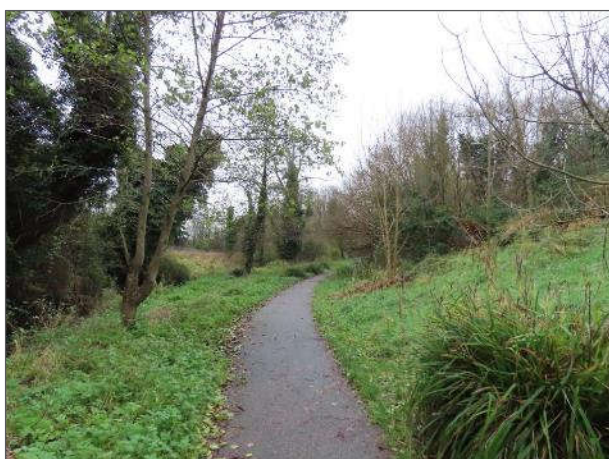


Plate 4.19 Further east along track – with occasional alder along river bank.

It was noted that an ash tree growing on the north side of the path was showing signs of severe ash-die back (IG ref. – 02213 51728). This tree is leaning across the Broadmeadow River. A bat survey would be required prior to its felling (see Plates 4.20-4.21). A second ash tree with severe die-back disease is located immediately to the east (IG ref. - 02220 51723).



Plate 4.20 Ash tree with severe ash die-back disease on northern river bank – heavily covered in ivy.



Plate 4.21 Base of same ash tree in Broadmeadow River.

An otter (*Lutra lutra*) trail was noted from the pathway into Broadmeadow River just west of Bridge 2 (see Figure 4.1 for location of Bridge 2). Bridge 2 carries a plaque dating the bridge to 1814.



Plate 4.22 Bridge 2 (James Corbally Bridge) – between Section 3 and Section 4.

To the south of the bridge there is an informal trail which runs up the hill through deciduous woodland towards Meadowbank Hill Housing estate (see Plate 4.23). A number of wooden bat boxes are attached to trees adjoining this pathway (see Plate 4.24). Wooden wedge-style bat boxes have been mounted on beech trees on southern river bank just east of Bridge 2. A single Common pipistrelle (*Pipistrellus pipistrellus*) was recorded in the westernmost box (IG ref. - 02282 51655).



Plate 4.23 Trail from the pathway uphill to Meadowbank Hill Housing estate.



Plate 4.24 Wooden wedge-style bat boxes mounted on beech trees.

The Broadmeadow River flowing under Bridge 2 is characterised by straight river banks. A Kingfisher (*Alcedo atthis*) was noted perched on a projecting over the river. Moorhen (*Gallinula chloropus*) was also noted on the river. Evidence of wren (*Troglodytes troglodytes*) having nested in a fissure under the arch last summer was noted. An area of damage section of arch was also noted; several bat droppings were recorded in this crevice. Mostly likely to be Daubenton's bat (*Myotis daubentonii*).

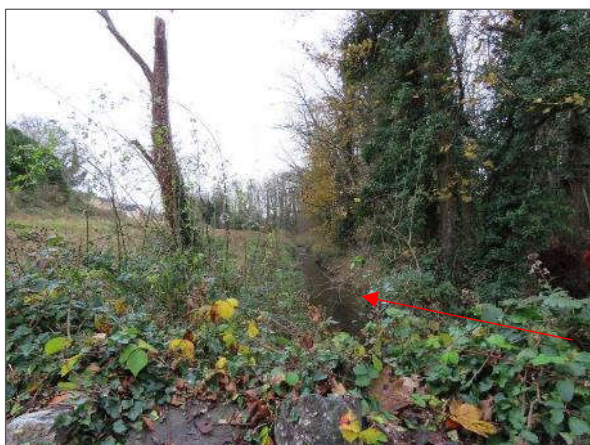


Plate 4.25 Broadmeadow River, Bridge 2 – Kingfisher recorded.



Plate 4.26 Bridge 2 (James Corbally Bridge) – upstream elevation – single masonry arch with concrete abutments.

4.1.4. Section 4 (Broadmeadow River Walk)

To the north and to the rear of some dwellings is a small patch of mixed woodland (WD1) with Lawson Cypress (*Chamaecyparis lawsoniana*), pine (*Pinus* sp.) and elder. There is an existing informal track through the grassland at this location. To the south of the proposed new track is an area of species poor wet grassland (GS4), dominated in parts by hard rush and heading in an easterly direction, the grassland is less wet. Species present include dock, creeping buttercup, thistle, patches of pendulous sedge, bindweed (*Convolvulus arvensis*), clover, sorrel (*Rumex acetosa*), vetch and in wetter areas, silverweed (*Potentilla anserina*). Towards the east, the grassland consists of Yorkshire fog (*Holcus lanatus*), perennial rye grass (*Lolium perenne*), dock and vetch and small patches of hard rush. The treeline along the river consists of ash, hawthorn, hazel (*Corylus avellana*), alder (*Alnus glutinosa*), beech and sycamore. As the wet grassland in this section is quite species poor, overall, it is classified as *Local Importance (Lower Value)*.

This section consists of unpaved track running mainly through wet grassland. A paved pathway will be constructed along the route of the current track. Close to Bridge 2, this informal pathway is bordered by rank grassland on either side of the path. Further east, there is a small area of mixed woodland to north of track comprised of Lawson cypress, pine and elder (*Sambucus nigra*) (Plate 4.28).

Further east, the informal trail is replaced by a rough track through grassland – cut up and muddy at the time of the site visit in December 2021. A notable single mature ash tree is present on northern bank of Broadmeadow River (IG ref. - 02370 51647). An area of amenity grassland is present between The Village Green housing estate and Broadmeadow River (currently being used as a a football pitch). A muddy path is present again at the eastern end close to the Council depot.

A stand of willowherb gone to seed were noted on northern river bank close to The Village Green housing estate. A flock of approximately 25 redpolls (*Carduelis flammea*) was recorded feeding on these seed heads.



Plate 4.27 Unpaved section of track running northeast from Bridge 2 (looking towards Bridge 2).



Plate 4.28 Small area of mixed woodland to north of track comprised of Lawson cypress, pine and elder.



Plate 4.29 Unpaved section of track running east towards The Village Green Housing Estate.



Plate 4.30 Single mature Ash tree on northern bank of Broadmeadow River.



Plate 4.31 One of two informal tracks running north from main track into The Village Green housing estate (this track will be paved).



Plate 4.32 Amenity area between The Village Green housing estate and Broadmeadow River.



Plate 4.33 Redpoll on willowherb.



Plate 4.34 Track continuing east past The Village Green housing estate.



Plate 4.35 Eastern end of Section 4 looking toward Council depot – muddy informal track through wet grassland.

Bridge 3 is shown in the following Plates. A significant amount of flood debris was trapped under the arch when visited in December 2021.



Plate 4.36 Broadmeadow River upstream of Bridge 3 (Section 4).

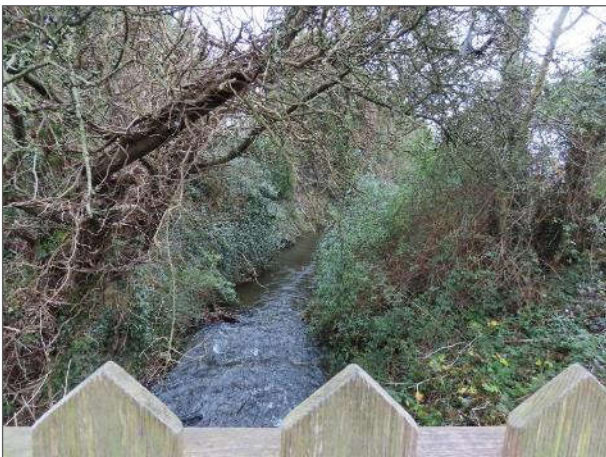


Plate 4.37 Broadmeadow River downstream of Bridge 3 (Section 5).



Plate 4.38 Bridge 3 – upstream elevation – heavily overgrown with ivy.

4.1.5. Section 5 (Broadmeadow River Walk at Broadmeadow Hill Road)

This section consists of an existing road entrance (BL3) to the pumping station. There is a grassed bank (GS2) to the east and a treeline (WL2) of sycamore and ash to the west. This section has negligible ecological value. There is an existing footpath (BL3) in this section, which will require widening and resurfacing and the western section may require a new path through amenity grassland (GA2). The habitat present consists of amenity grassland and planted laurel and dogwood hedging. This section has *negligible ecological value*.

This section consists of an existing road entrance (BL3) which leads to Bridge 3. Bridge 3 carries a paved path over the Broadmeadow River. The path then turns east to run to the entrance to the pathway at the eastern end of Broadmeadow Hill Road.



Plate 4.39 Existing road with Council depot on left (paved track turns south to cross Broadmeadow River via Bridge 3).



Plate 4.40 Paved section immediately east of Bridge 3.



Plate 4.41 Path Running south-east towards eastern entrance (with laurel hedge on northern side of track).



Plate 4.42 Eastern entrance to track from Meadowbank Hill Road.

4.2. Fairyhouse Road, Ratoath

4.2.1. Ecological consideration of 450m section of the Fairyhouse Road (R155)

This 450m stretch of Fairyhouse Road was walked from north to south on 13th December 2021. The proposed pedestrian cycle route runs on the eastern side of the road and will necessitate the removal of roadside verges in some locations. Existing hedgerows (WL1) will not be removed. The road will be narrowed where necessary. No ecological issues were identified.



Plate 4.42 Eastern side of the Fairyhouse Road.

The southern end of section on Fairyhouse Road looking north is illustrated in Plate 4.43. The pedestrian/cycle lane commences approximately at red line as indicated. Verge in this location is c. 1.5m wide. Pedestrian/cycle route to be 3m wide and paved.



Plate 4.43 Immature single ash trees in hedge alongside verge.



Plate 4.44 Route runs past the entrances to 3 individual houses on eastern side of road.



Plate 4.45 Wide verge 3-4m, outside 3 individual houses.



Plate 4.46 Wide verge 3-4m outside houses.



Plate 4.47 Plate Road narrows with practically no verge immediately east of houses at speed limit sign.



Plate 4.48 Verge north of speed limit sign with ivy covered ash in hedgerow (evidence of ash die-back disease).

A mature ivy covered ash tree is located adjacent to speed limit sign (looking south).



Plate 4.49 Verge running past entrance to row of 5 houses in Carraig na Gabhna cul-de-sac.

Beyond Carraig na Gabhna cul-de-sac the route passes entrance to L5020. The existing footpath is to be widened to facilitate 2.5m minimum width shared pedestrian and cycle path. The proposed route passes a block of commercial units with residential units above and entrance to Fairyhouse Lodge estate; the footpath is to be widened to facilitate 3m minimum width shared pedestrian and cycle path. The route continues on past the school, along Milltree Park Road and Fairyhouse Road. All this work is within the urban fabric of Ratoath; these areas are not of ecological value.



Plate 4.50 Proposed passing in front of commercial units (with residential units above) and the entrance to Fairyhouse Lodge estate.

4.2.2. Tree Survey

An updated tree survey was undertaken in February 2022 by Cunnane Stratton Reynolds on behalf of Meath County Council (CSR, 2022). The tree survey report should be read in conjunction with the following drawings which accompany the report: -

- Tree Classification (Dwg. No 22144/T/101).
- Arboricultural Impact Assessment (Dwg. No 22144/T/102).
- Tree Protection Plan (Dwg. No 22144/T/103).

This survey focused on Dunshauglin Road, Woodland Link Road and Fairyhouse Road. A total of seventy-five individual trees and four tree groups were recorded as part of the survey; their location, size and quality was recorded. Photographs of each tree and tree group are included in the Tree Report (CSR, 2022).

The following text is extracted from the Tree Report: -

“Trees 71-129 located along the Woodlands access road grass verge create a formal avenue planting of young street trees, (almost all Lime trees). These trees are well established, (it is assumed they were planted as semi mature specimens and it appears that they have been in situ for approximately 10-15 years), meaning they are still young in terms of their anticipated life cycle.

It is notable that nearly all the street trees appear to have had their leader broken or damaged at an average height of 1.3m from ground level causing them to branch heavily from this area. Consequently, most trees display overcrowding of branches which is causing structural issues such as branch rubbing and significant compression forks to develop. These issues will increasingly compromise the trees structural integrity into the future if not addressed in the short term with selective pruning works. In addition, a large proportion of trees have inclusions around this area, including parts of stakes and tree ties – further compromising their future structural integrity. However, presently the trees display good physiological health.

Tree Group 1 is located along the Dunshaughlin Road. This group contains a mix of mature and juvenile trees that are somewhat overcrowded but generally in good health.

The trees (T143-145) / tree groups (TG2-4) situated along the Fairyhouse Road are contained within hedgerows and field boundary scrub vegetation. These are a mix of relatively young trees many of which have ‘bolted’ (due to overcrowding and the resultant competition for light), interspersed with a smaller number of more mature trees. Most of the trees present are Ash, though a small number of Sycamore are also present. Some Ash trees have already succumbed to Ash dieback disease, while others appear to be displaying symptoms.

Few of the trees individually are of exceptional quality, however all of the existing trees make a positive contribution to the surrounding environment both through visual impact and ecological / habitat value.

Trees often become more valuable as collective groups, than they might be when considered solely as individuals in isolation - a grouping or woodland being generally of significant visual and ecological value. As such it should be noted that the cumulative value of evaluated Tree Groups often reflects an increased categorised value than might be awarded to the constituent trees if they were assessed in isolation as individuals.”

5. Ecological Assessment and Mitigation Measures

5.1. Potential Construction Impacts & Mitigation

Along sections 1, 2 and 3, of the Pathway (see Figure 4.1) there are existing paths in place which do not need to be widened and so will only require resurfacing. Therefore, direct impacts on semi-natural habitats of ecological value will not occur as a result of the works. The western side of section 5 will also require minor widening of the existing path at pinch points and resurfacing where necessary (refer to Chapter 4.0 for discussion of photographs of these areas). The eastern section running south of the river will be resurfaced as part of the proposed bound pathway path. Similarly, no direct impacts on semi-natural habitats of ecological value will occur as a result of the works.

Section 4 will require the construction of a new 3m wide path. It is proposed that the line of the new path will follow the existing informal track and so will result in some loss of grassland habitat, which is of low ecological value. This section is to be constructed ca. 20m – 40m from the river and for the most part will also avoid the area of species poor wetter grassland closer to the river. These areas of grassland are, however, classified as no more than *Local Importance (Lower Value)*; construction of a new path should therefore result in no more than a localised slight ecological impact. Construction methods; proposals for pollution prevention and protection of vegetation to be retained (along the river and bordering the pathway) will be set out in full by the appointed Contractor (see ecological advice below). The species poor wet grassland also offers an opportunity for biodiversity gain through appropriate landscaping / habitat management⁷.

As noted, the woodland to the south of the proposed path is heavily degraded and shows extensive sign of trampling; furthermore, there is limited evidence of either a shrub layer or a field layer. Whilst there are benefits to providing a path through the Woodland, the design in this location was informed by bat survey work undertaken in 2018 to avoid going through the woodland; proposals have not been considered any further given the likely impact on tree roots and light pollution that would impact on bats. Construction of a path away from the woodland may in fact help to reduce trampling pressures off line and allow recovery of the woodland areas (though some intervention may be needed to assist this).

As mitigation it is proposed that the small number of trees to be removed will be replaced with an equal or greater number of native trees (of local provenance) as part of the scheme – although beech could also be considered in this instance due to the prevalence of this species within the existing woodlands. No ash should be planted due to ongoing concerns over ash-dieback (as noted above a number of ash trees were recorded showing advance signs of ash-dieback). On balance removal of a small number of trees and subsequent woodland improvement should result in a slight negative to potentially positive impact on this stretch of woodland (refer to the accompanying Tree Report; CSR, 2022). The appointed Contractor will be required to prepare Landscape Plan identifying areas of vegetation to be protected; tree planting and areas of biodiversity gain.

As noted above, the bat survey report (see Appendix A), which recorded Natterer's bats, noted that Natterer's bats are rarely recorded in Meath and are light intolerant; and as such it is important to keep light pollution to a minimum. This informed the relocation of the proposed Pathway to the area of grassland further from the river corridor; the final design of lighting will also be required to minimise light levels; include for directional lighting and be designed to be bat friendly (see e.g. BCT / ILP, 2018). Also, as noted the river and surrounding vegetation provides a good feeding area for bats. It is therefore also important to retain long grasses and vegetation, particularly between the new cycleway and the river. Avoidance of such impacts have been achieved by relocating this section of the Pathway to the north and away from these areas (see Figure 3.2). Furthermore, as noted, Contractor will be required to prepare Landscape Plan identifying of biodiversity gain – this can represent one such area.

In terms of indirect impacts, there is potential for impacts on the Broadmeadow River during the works. Sections 1 and 3 which require resurfacing are located close to the river. Also, the construction of the new section of pathway proposed in Section 4 has the potential for run-off during construction which could potentially impact the river. This is considered in the accompanying Screening or Appropriate Assessment (Atkins, 2022c). It will be a

⁷ see for example <http://www.biodiversityireland.ie/projects/irish-pollinator-initiative/all-ireland-pollinator-plan/>

requirement of the Contract that all on-site works will be required to be undertaken in a manner that prevents pollutants entering the Broadmeadow River.

As noted, a new footpath is proposed on the southern side of the Dunshaughlin Road; this is to be positioned within the existing footpath and verge. The advice of an ecologist should be sought should localised relocation of lighting poles be required. The proposed work area will be limited to the existing pathway and the grass verge along this section. Following recommendations set out in the accompanying arboriculture assessment (CSR, 2022) the proposed pathway will be constructed using a non-dig cell web construction technique, whereby we would carefully lift existing concrete to expose sub-base and roots, blind off with a thin layer of sand/geotextile before laying cellweb sub base and finishing off with permeable asphalt finish. The finished path would be approximately 150mm-250mm higher than existing path level depending on depth of cellweb used. A similar no-dig approach to kerbs would also be taken to avoid the need to cut through the roots of any neighbouring tree roots. As a result, any potential impacts to the trees will be minor in nature due to mitigation measures proposed (see section 4.21). As noted, it is also a requirement of the Contract to replace the small number of trees (n =7) that need to be removed. This is discussed on detail in the accompanying Tree Report (CSR, 2022).

As noted, during the preliminary ecological survey no evidence of badger was identified along the study area. Signs of otter were noted along the Broadmeadow River just west of Bridge 2; in the form of a path leading to the river; as well as spraints Curragha Road culvert. As noted, however, there are no instream works. By restricting all works to daylight hours (as otters are most active at dawn/dusk); by minimising any overnight lighting on site and preventing negative impacts on water quality within the Broadmeadow River the potential for negative impacts on otter should be avoided. However, due to the time that could elapse between planning and site works; a pre-construction mammal survey should be undertaken within the vicinity of the proposed Pathway to ensure that there have been no changes to the status of mammals along the works corridor during this time. As noted Kingfisher was also recorded near Bridge 2; as with otter negative impacts to Kingfisher are not predicted.

There are three existing bridge crossings within the scheme, no widening works are proposed for these bridges as part of the scheme, just resurfacing.

As noted a small concrete shed is to be checked for roosting bats prior to demolition. Potential roosts have also been identified in a number of beech trees adjoining the path (see Chapter 4.0). There are no proposals to remove these trees. Bridge 2 (James Corbally Bridge) is a single arch masonry structure – cavities in the arch do offer roosting opportunities for bats. These will not be impacted by the proposed works.

No invasive species such as Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*) or Giant Hogweed (*Heracleum mantegazzianum*) were identified on the day of survey. However, due to the time that could elapse between planning and site works; it will be a requirement of the Contract, that the route of the proposed works be resurveyed for invasive plant species prior to the commencement of construction.

In conclusion, it will be a requirement of the contract that the appointed Contractor will be required to prepare a Construction and Environmental Management Plan which will focus in particular on preventing any pollutants entering the Broadmeadow River and its tributary; protect water quality; protect adjoining vegetation to be retained; inform the design of lighting and prepare a Landscape Plan. The Contractor will be required to outline how these measures will be implemented and supervised. The CEMP must be prepared with the input of a suitably qualified ecologist. The final design will also be required to identify areas of biodiversity gain within the final design; including identification of where trees can be planted (number equalling or greater than the number removed) and opportunities for inclusion of biodiversity gain within landscaping proposals can be located.

Trees

The accompanying Tree Report discusses the potential impact of the proposed development on the existing tree cover on site and considers the need for mitigation measures, in accordance with BS 5837 (2012), for sustainable development.

The following text is extracted from the Tree Report (CSR, 2022).

The proposed scheme where possible uses the alignment of an existing concrete path running parallel to the Dunshaughlin / Woodlands Road, which minimises direct conflict with existing street trees. However, in areas the path encroaches into the existing grass verge in which the street trees are located to varying degrees. It is anticipated that most if not all the adjacent street tree's root zones will extend to varying degrees below the

adjacent concrete path. To construct the new path/cycleway over this area, without damaging the existing roots, it is proposed to use a 'non-dig' construction method using 'Cellweb', (please refer to Dwg. 2144_T_103 for details).

A relatively small number of trees remain in direct conflict with the route alignment and are therefore proposed for removal to facilitate the development, however new tree planting nearby could readily mitigate against the proposed losses, particularly given the relatively young age of the trees.

Mature trees/tree groups located along the Fairyhouse Road are also in direct conflict with the proposed path/cycleway alignment. The majority of these tree are Ash and most appear to be suffering from or already succumbed to Ash Dieback disease. Given the very strong likelihood the few remaining Ash trees will also become infected and die over the short to medium term, it is not considered worthwhile using the non-dig cellweb system in this location. Replacement planting with suitable native tree species would significantly mitigate against the loss of trees and hedgerow in this location.

Category 'U' trees are recommended for immediate removal, (fell or monolith to safe height), on general management grounds, irrespective of site development – eight were identified during this survey (T144, T145, Tree Group 2, part of Tree Group 4) (refer to CSR, 2022).

Cognisance must also be given to indirect impacts - in particular care must be taken to ensure the proposed development and ancillary works do not represent an unacceptable conflict with the calculated 'Root Protection Area' of the existing trees proposed for retention. Disturbance of 'Root Protection Area' may just as readily kill or destabilise a tree over time, by means of root damage/severance and or earth compaction/covering preventing essential transfer of water and air to roots.

There are a large number of existing trees along the Dunshaughlin / Woodland Rd whose successful retention will be dependent on the use of a 'non-dig' cellweb construction methodology for the proposed path/cycleway where it passes over their root protection areas, (please refer to Dwg. 2144_T_103). Careful planning, sequencing of works and site management will be required during construction phase to ensure these areas are not adversely impacted by the scheme. It is proposed that tree protection fencing be used to help achieve this aim - as illustrated in Dwg. No 2144_T_103, to prevent both physical damage to trees and damage through ground compaction.

Provided proper tree protection measures are adhered to, it is not anticipated that any further trees will require removal due to indirect impacts.

A full summary of trees to be removed is presented in the accompanying Tree Report (CSR, 2022).

Ash Die-back

The following text is extracted from the Tree Report (CSR, 2022).

It is evident that Ash Dieback Disease had taken hold in at least eight of the trees located along the Fairyhouse Road. These trees are predicted to die over the following few years and as such it is recommended that they are felled to minimise the potential for falling deadwood as well as the spread of the disease to other trees. Unfortunately, it is considered likely that the disease may have already infected some adjacent Ash trees nearby, with possible early symptoms already suspected in some. 'Ash dieback' is a disease caused by the *Hymenoscyphus fraxineus* fungi which is developing rapidly across Ireland since its presence was first detected in Ireland in 2012. The disease is spread by windborne spores and once a tree is infected it will lead to its terminal decline within a few years.

At present there is no available remedy and the outlook for the survival of Ash trees in Ireland is poor, with infection rates appearing to accelerate over the past couple of years. It is hoped that genetic diversity may mean some trees might prove resistant to the disease, however there is still great uncertainty at this time regarding survival rates. The Woodland Trust estimate that at least 80% of Ash trees in the UK will die.

The retention or removal of Ash trees must therefore be viewed in the context of Ash Dieback disease, and the likelihood that at least 80% of Ash trees are likely to die over the coming years

5.2. Potential Operational Impacts & Mitigation

Once the paths have been resurfaced and constructed, operational impacts are limited to disturbance and light pollution impacting on wildlife along the route. Surface water drainage will be over the edge drainage / infiltration and will not be directed to adjoining watercourses.

Due to the high usage of the site at present, it is not envisaged that following the completion of the scheme that the site would be significantly impacted by disturbance over and above the existing levels of disturbance. As noted, the design changes also mean that the Broadmeadow pathway will not run directly alongside the Broadmeadow River.

As noted, there are existing paths in Sections 1, 2, 3 and 5. Of these only Section 3 is currently unlit; lighting proposals for Section 3 will be finalised at detailed design. The remaining sections are currently lit by sodium lamps. Section 4 will require the construction of a new path and associated new lights.

Lighting

The effects of lighting on bats has been investigated and studies such as Emery (2008), Fure (2006), Jones (2000), Monhemius (2001), Stone *et al.*, (2009) and the UK's Bat Conservation Trust (2008; 2018); all show that increased lighting can have a negative effect on bat behaviour. In general, artificial light can create a barrier to commuting bats (though not for all species), so lighting should be minimised where possible along the Pathway especially at areas of interest for bat species.

Studies have found that Leisler's bat and pipistrelle bats can congregate around white mercury street lights and white metal halide lamps feeding on the insects attracted to the light. However, lighting can cause avoidance of an area for commuting bats and can prevent or reduce foraging for some species, including Myotis species (Stone *et al.*, 2009). Further, even bat species that have been shown to opportunistically forage in lit conditions have subsequently been recorded being impacted by artificial lighting. In cities, for example, common pipistrelles have been recorded avoiding gaps that are well lit, thereby creating a barrier effect (BCT, 2018). Operational Lighting should not illuminate retained natural habitat features such as treelines and wooded areas. In order to minimise light pollution and impacts on bats within the proposed pathway it is recommended that the lighting within the pathway is designed in accordance with the current standards (of the time) at design stage and should include the following: -

- Lighting should be directional; only shining on the track. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. It is particularly important that light pollution is kept to a minimum near the river and areas of woodland.
- The intensity of the lighting on the pathway should be as low as guidelines permit; minimised at ground level and over-spill must be avoided.
- The National Cycle Manual quotes BS: 5489 which calls for an average luminance of 10 lux and a minimum luminance of 5 lux for footpaths and cycle paths at ground level; however, species such as e.g. Daubenton's bats seem to prefer a light level of less than 1 lux (Bat Conservation Ireland, 2010).
- There are a number of schemes (walks / cycleways) where the issue of bats and lighting is being actively assessed. The results of such work should be reviewed to inform design of an appropriate lighting option at Ratoath.

Bats

- Retain trees where possible: - Common and soprano pipistrelles were found feeding along the canopy of the trees to the south of the site. These trees provide shelter and cracks and crevices to roost in. Note: No felling of trees will be carried out in this area.
- Install Bat boxes: - Four bat boxes should be erected along the route of the cycleway – Two 2FN Schwegler bat boxes and two NHBS Kent boxes. These should be placed on trees, at least 4m high, with

a clear drop below (no underlying branches – as bats need to drop to start their flight). These can be purchased from www.nhbs.com

- Management of vegetation: - to prevent loss of feeding, grasses and vegetation adjacent to the cycleway should not be mown during the summer months. Long grass and native plants allow insect diversity, which in turn provides food for bats. In particular, where the cycleway runs by the river, the area between the river and the cycleway should not be sprayed or cut.
- Consideration should be given to use of LED lighting (Lewanzik & Voigt, 2017); directional lighting / louvers; timing controls on operation etc.

Thus, in summary, lighting must be designed to prevent overspill of light outside the footprint of the proposed path and in particular to prevent light spillage over the nearby Broadmeadow River, which most likely provides a commuting and foraging corridor for bats.

Water Quality

During construction, it is imperative that the Contractor prevents any pollutants from entering any watercourses, such as the Broadmeadow River. At a minimum the following measures should be adhered to: -

- Storage of material well away from the river;
- No refuelling of machinery in proximity to the river;
- Broken pavement and underlying fill to be stored well away from the river and to be kept covered to prevent run-off;
- Spill kits to be kept on site;
- During earth works, silt fences should be installed to prevent silts from entering the river.

The control measures for the construction stage of the proposed development will follow the following current best practice guidelines: -

- Masters-Williams, H. *et al.* (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA;
- Murnane *et al.* (2002). Control of Water Pollution from Construction Sites- Guide to Good Practice. SP156;
- NRA (2006). Guidelines for crossing of watercourses during the construction of National Road Schemes. National Roads Authority;
- IFI (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin; and
- IFI (2021). Planning for Watercourses in the Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning. A Guideline Developed by Inland Fisheries Ireland.

Vegetation Removal

In relation to the removal of trees for the works, this can only be completed outside of the bird breeding season which is 1st March – 31st August inclusive and outside the active season for bats (April – September).

Where work is necessary close to vegetation, the vegetation to be retained must be clearly marked so construction work does not extend beyond the agreed works area. Equally, when working close to mature trees appropriate care must be taken to prevent unnecessary damage to root zones or overhanging vegetation. Potential impacts on trees within the scheme have been assessed; measures to reduce impact are outlined in

the accompanying Tree Report (CSR, 2022). In general terms, when working close to vegetation the NRA's *Guidelines for the Protection and Preservation of Trees, Hedgerows, and Scrub prior to, during and post construction of National Road Schemes* should be considered to reduce impact on vegetation.

The following best practice guidance will be followed for construction in the vicinity of trees: -

- BS: 5837/2005 Trees in Relation to Construction;
- BS 998/1989 Recommendations for Tree Work; and
- NRA (2006). *Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes*.

Trees

The following text is extracted from the Tree Report (CSR, 2022).

1. Tree Works

Subject to the required permissions removal / felling works as specified on Dwg. No 2144_T_102, should be performed prior to project commencement, by reputable contractors in accordance with BS 3998:2010 and current best practice. Removal of scrub vegetation and ivy clearance should preferably be performed in winter outside of the bird nesting season. Tree felling should be preceded by a competent assessment as to the presence of any protected wildlife species, where required specialist advice should be sought if necessary.

2. Protective Fencing

Following above permitted, priority tree works, protective fencing (barriers) should be erected in the positions and alignments as indicated on the Tree Protection Plan

(Dwg. No 2144_T_103). Fencing should be in accordance with BS 5837:2012 unless otherwise agreed with the planning authority. Commencement of development should not be permitted without adequate protective fencing being in place. This fencing, enclosing the minimum tree protection areas indicated, must be installed prior to any plant, vehicle, or machinery access on site. Fencing should be signed

'Tree Protection Area – No Construction Access'. Fencing is not to be taken down or re-positioned without written approval of the project Arborist. No excavation, plant or vehicle movement, materials handling, or soil storage is to be permitted within the fenced tree protection areas indicated on plan.

3. Cellweb

The existing area of concrete paving shall be lifted in sections with care to avoid damaging the root system of trees likely to be found below it. On removal the new path/cycleway shall be constructed in strict accordance with the non-dig construction design using cellweb system or similar approved in accordance with manufacturer's specifications and to engineers and arborists satisfaction.

4. Monitoring & Compliance

A number of potentially critical future works in proximity to retained trees are potentially to be undertaken in association with the development, these should be done in accordance with approved method statements and under direct supervision by a qualified consultant Arborist. Therefore, during the development, a professionally qualified Arborist is recommended to be retained as required by the principal contractor or developer to monitor and advise on any works within the RPA of retained trees to ensure successful tree retention and planning compliance.

It is advised that tree protection fencing, any required special engineering and supervision works etc. must be included / itemised in the main contractor tender document, including responsibility for the installation, costs, and maintenance of tree protection measures throughout all construction phases.

Copies of the Tree Survey and all accompanying drawings, a copy of BS 5837:2012 and NJUG 4 (2007) 'Guidelines for the planning, installation, and maintenance of utility apparatus in proximity to trees' should all be kept available on site by the contractor during development. All works are to be in accordance with these documents

It is advised that all retained trees be subject to expert re-inspection within 12 months and/or prior to completion of development and public occupancy/access of the site

5.3. Landscaping / Biodiversity Enhancement

As noted above, the appointed Contractor will be required to prepare a Landscape Plan identifying areas of vegetation to be protected; tree planting and areas of biodiversity gain. This should be prepared in consultation with a suitably qualified ecologist, Meath County Council's heritage officer and with reference to the Ratoath Community Biodiversity Action Plan 2016-2020 (D'Arcy, 2016) – as summarised in Section 3.15.

In line with the All Ireland Pollinator plan, a wildflower meadow will be established between the compensatory tree planting on the Woodland Links Road. This meadow will be incorporated into the existing landscaping as a biodiversity enhancement feature. Areas disturbed following tree planting will be graded and seeded with an All-Ireland Pollinator Plan Wildflower mix, while existing intact grassed areas will be left unmown until September and managed annually in accordance with guidelines on the creation and management of a wildflower meadow. If the species composition is found to be dominated by ornamental species within the sward, established species-rich plugs should be incorporated into the landscape plan to enhance species diversity within the sward. Plug compositions should be in line with All-Ireland Pollinator Plan guidelines. The overall aim of this feature is to form a continuous linear meadow running along the Woodland link road within the existing grassed verge.

It is worth considering, as part of an ongoing management program, the selective thinning of a limited number of young trees within Tree Group 1 on the R125 Dunshaughlin Road (see accompanying Tree Report; CSR, 2022). Removing those specimens which have bolted, and or are of relatively poor form, will facilitate improved development of other trees within the group which are currently overcrowded and have inadequate space for strong future development. Most of the larger trees within this group are heavily obscured by ivy, (which should be carefully removed to facilitate full inspection), however they appear to be in good physiological condition. Given their roadside location it would be prudent to consider a crown cleaning exercise to remove rubbing limbs, future compression forks and reduce the length of limbs overhanging adjoining carriageway along with any other imbalances in growth. Where appropriate enforcement planting of hazel should be considered.

Post construction, it is recommended that habitat enhancement measures be implemented as part of any landscaping proposals along the Pathway. This could include sowing native wildflower and grass mixtures adjacent to the newly constructed path on the northern side of the river. The installation of new path north of the woodland, could itself benefit the regeneration of an herbaceous field layer within the woodland due to the use of a dedicated path and thereby reducing footfall through the woodland.

As noted, in order to further enhance ecological pathways within the pathway along the Meadowbrook River; bat boxes will be erected along the cycleway. Vegetation along the pathway will be managed to promote native species-rich ground flora. Planting should seek to establish and / or maintain ecological connectivity through the site. Vegetation adjacent to the cycleway should not be mown during the summer months. Long grass and native plants allow insect diversity, which in turn provides food for bats. Where the cycleway runs by the river, the area between the river and the cycleway should not be sprayed or cut. A nature panel can be designed to explain the 'untidy' areas left for insect diversity and young bats. All trees along the Cycle Network should be maintained and damage to root zones must not occur incorporating small adjustments to the path alignment.

5.4. Residual Impacts

As noted, there are no habitats on site of greater than local value. No ecological features of regional, national or European importance will be directly impacted by the proposed development. Development of this site will not have any significant impact bats using the site or on the terrestrial mammals or birds using the site. The effect of the habitat loss during the construction phase of the development will therefore be significant at Site level only.

Mitigation by avoidance is proposed for breeding birds; while strict adherence to on-site biosecurity measures would be implemented to prevent the spread of invasive species onto the site. Detailed measures to protect vegetation to be retained are set out above as are measures to protect trees. Where it is necessary to fell trees, compensatory planting is required. Recommendations are included to remove ash trees on Fairyhouse Road which were found to be suffering from ash-dieback.

Enhancement proposals incorporated include the need to develop proposed measures by preparing a Landscape Plan for the proposed scheme in order to improve the biodiversity value of the for groups such as bats, bird, and invertebrates and enhance the overall value of the site at a local level. Furthermore, bat boxes are to be provided on site in order to enhance bat roosting opportunities locally.

Overall, the residual impacts of the proposed development on ecology are likely to be slight negative impact at a site level and of short-term duration (i.e. Effects lasting one to seven years as per EPA, 2017). In the short to medium term (i.e. Medium term – seven to fifteen years) as vegetation on site mature the residual impact would change to neutral to slight positive impact at a local level.

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Appendix A. Bat Survey Report

A bat assessment of the proposed cycleway in Ratoath, Co Meath

To provide ecological data for Part 8 Planning to develop a greenway adjacent the Broadmeadow River, Ratoath, Co. Meath



By Donna Mullen M.P.P.M and Brian Keeley BSc Hons in Zool

Maio, Tierworker, Kells Co Meath

July 12th, 2018

www.wildlifesurveys.net

Summary

Bats were not found roosting in the trees on this site. However, bats were found feeding and commuting along the river. Natterer's bats were found feeding in the woodland section along the river. As Natterer's bats are rarely recorded in Meath and are light intolerant, it is important to keep light pollution to a minimum.

Young bats were seen taking their first flights along the river, feeding off the insects in the grasses. The river and surrounding vegetation provide a good feeding area for bats. It is important to retain long grasses and vegetation, particularly between the new cycleway and the river.

Bat species found feeding and commuting on the site and along the river

Common pipistrelle	<i>Pipistrellus pipistrellus</i>
Soprano pipistrelle –	<i>Pipistrellus pygmaeus</i>
Natterer's bat –	<i>Myotis nattereri</i>
Leisler's bat –	<i>Nyctalus leisleri</i>

Recommendations

(1) Avoiding light pollution- Light spillage must not occur on the river, and light pollution must be avoided. This can be achieved by using low level bollard lights, with hoods and cowls fitted to prevent light entering the river area and sky. It is particularly important that light pollution is kept to a minimum in the wooded section of the cycleway.

(2) Retain trees where possible. Common and soprano pipistrelles were found feeding along the canopy of the trees on the site. These trees provide shelter and cracks and crevices to roost in.

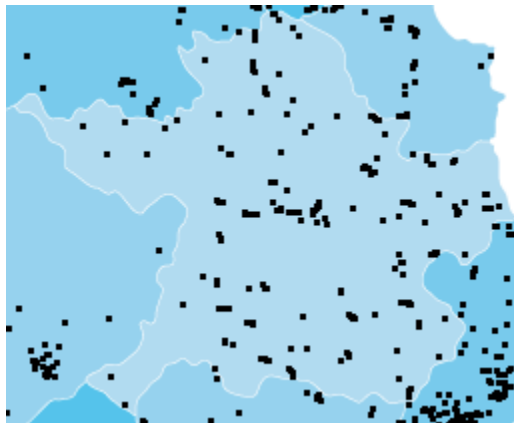
(3) Bat boxes- Four bat boxes should be erected along the route of the cycleway – Two 2FN Schwegler bat boxes and two NHBS Kent boxes. These should be placed on trees, at least 4m high, with a clear drop below (no underlying branches – as bats need to drop to start their flight). These can be purchased from www.nhbs.com.

(4) Management of vegetation- to prevent loss of feeding, grasses and vegetation adjacent to the cycleway should not be mown during the summer months. Long grass and native plants allow insect diversity, which in turn provides food for bats. In particular, where the cycleway runs by the river, the area between the river and the cycleway should not be sprayed or cut. If required, a nature panel can be designed (email info@wildlifesurveys.net) to explain the 'untidy' areas left for insect diversity and young bats.

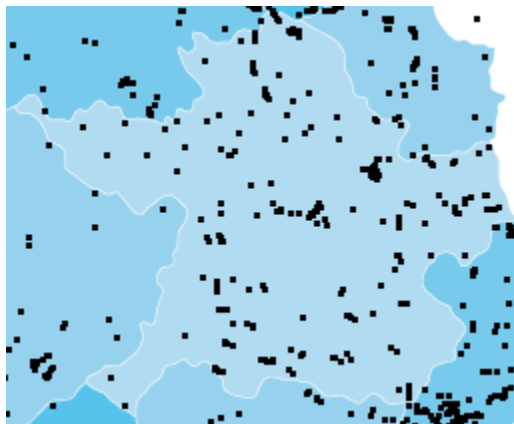
Desktop Survey



Distribution of common pipistrelle in Meath



Distribution of Leisler's bat in Meath



Distribution of soprano pipistrelle in Meath



Distribution of Natterer's bat in Meath

Thanks to Bat Conservation Ireland for their data. All data from this report will be placed on their database.

Habitat; Improved and unimproved grassland, semi -mature trees and woodland, hedges, river and treelines.

Temperature -16°C dropping to 14°C

Sunset - 21.50 hours

Methodology

Bat Survey - Equipment

LED Lamp, Petzl Tikka Head torch

Echometer 3 bat detector x 2

Two surveyors with EM3 time expansion detectors and kaleidoscope sound analysis software with GPS – hand held

Survey and recommendations;

The survey took place on July 12th, commencing at 21.30 hours. Most trees are immature and unsuitable as roosts, however there are occasional trees with deadwood, cracks and crevices which would be suitable for bat usage.



This tree has crevices suitable for bat usage.

There is considerable light pollution, particularly along the western entrance at Meadowbank.



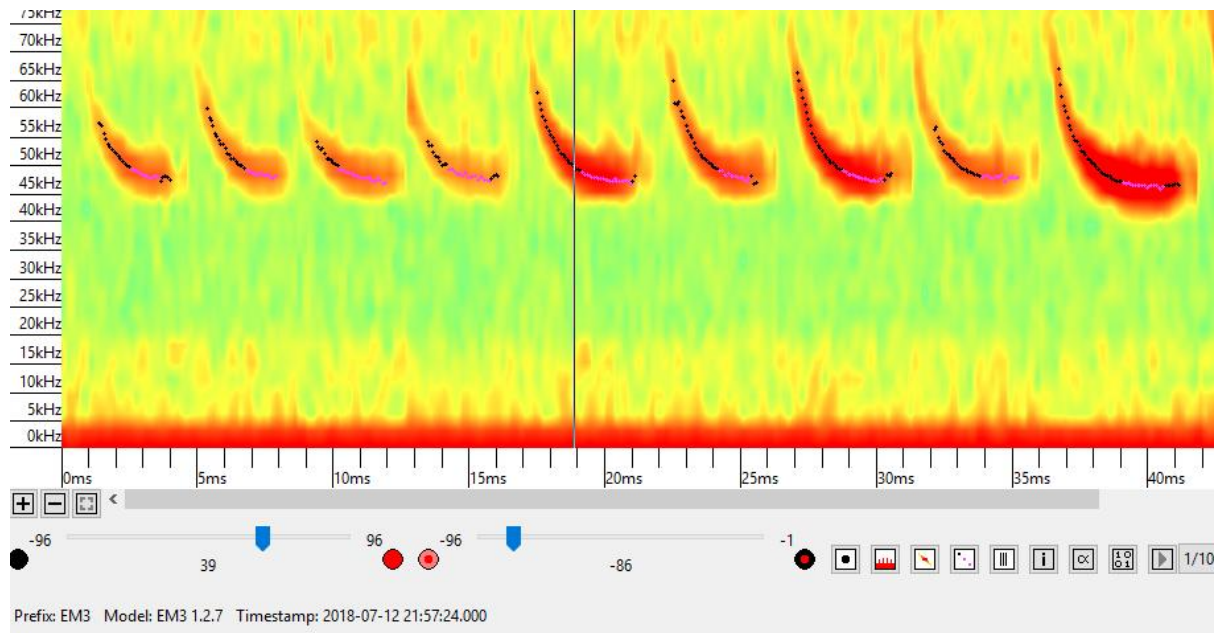
Light pollution with spillage into the sky at the western entrance

Some areas beside the river are intensively sprayed and cut and planted with laurel – which is toxic to both people and wildlife.



This area near the Jamestown estate is very poor for wildlife.

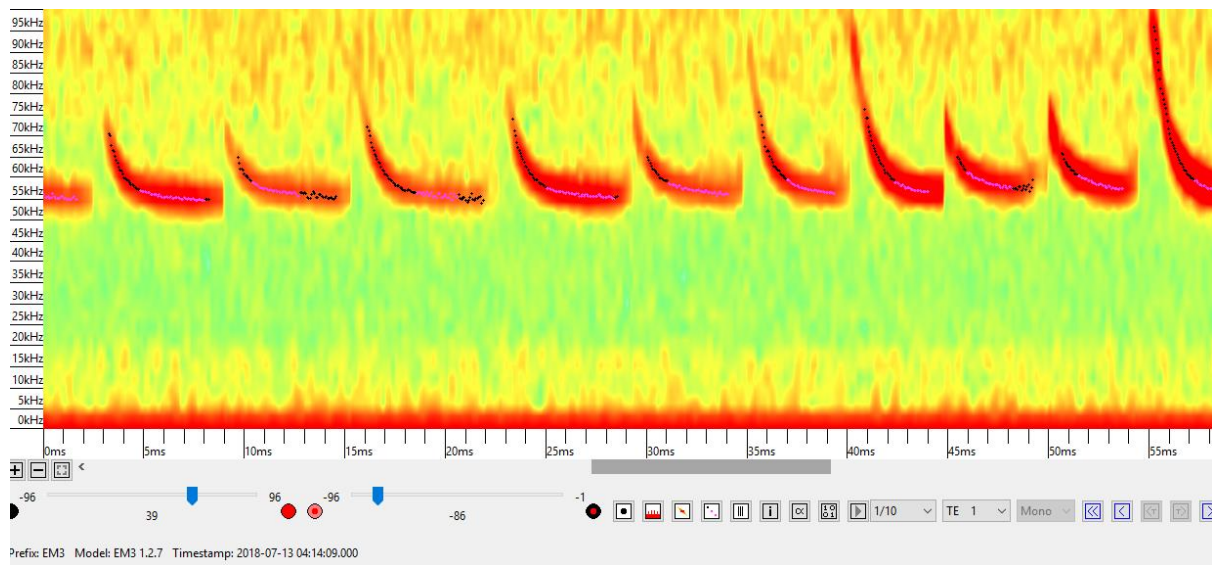
A common pipistrelle was seen in the woodland at 22.06. A second common pipistrelle was recorded at the 1st (eastern) bridge.



Common pipistrelle recorded at the eastern bridge

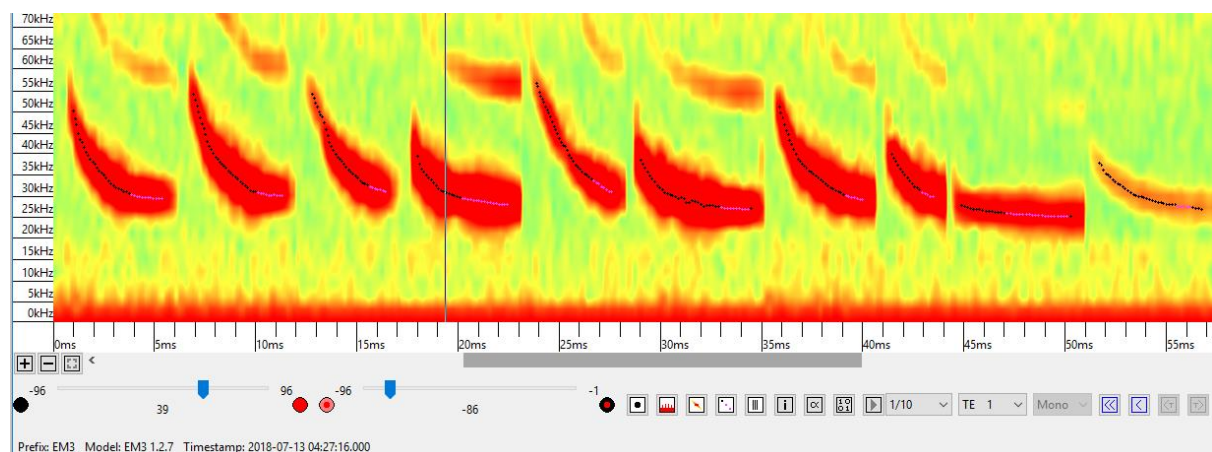
Soprano pipistrelles fed along the river at the forest area at 22.13. At 22.45, a natterer's bat flew along the wood behind Coill Beag. This bat flew in this area for several minutes, keeping to the dark areas. A common pipistrelle was seen on the entrance (west) track at 22.58

At 3.51 a common pipistrelle was seen at the eastern bridge. A Natterer's bat was seen flying north west through the woodland from 4.17 to 4.20. A stream of 5 common pipistrelles were seen passing along the laurel hedge at Jamestown Park and turning into the estate. It is likely that one of the houses in the estate is a maternity roost.

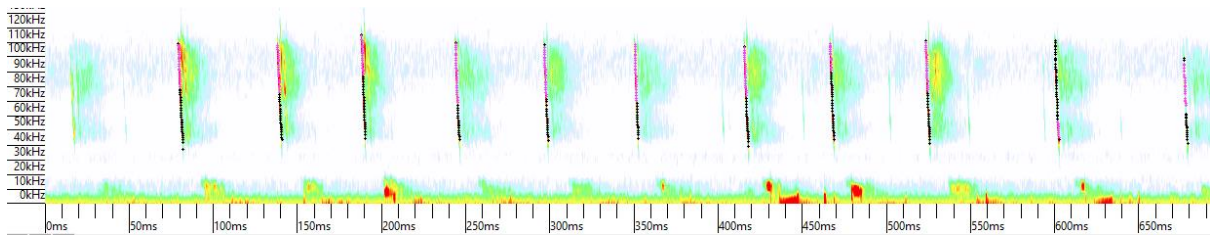


A soprano pipistrelle was recorded at 4.14 by the river

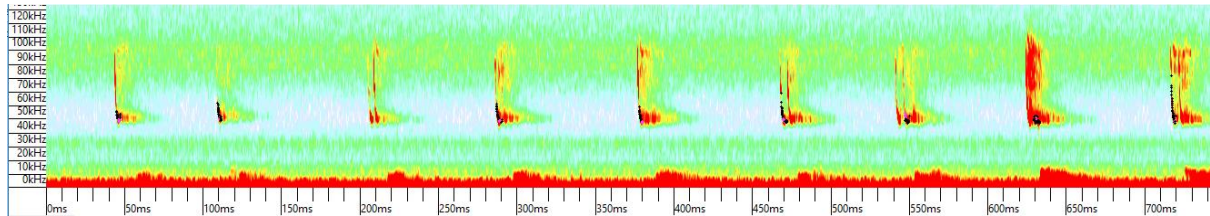
A Leisler's bat was seen feeding around a single tree in the field behind Ratoath Manor at 4.36.



Leisler's bat feeding at tree



Natterer's bat at 0414 hours along the darkest section of the river



A common pipistrelle bat at 0430 hours along the busiest section of the river

Both common and soprano pipistrelles fed under tree cover all along the river at dawn. Young bats were taking their first flights, and groups of two and three bats were seen flying together. This is clearly an important feeding area for bats taking their first flights.



This is the area where young bats were taking their first flights.

Note the tall vegetation.

Recommendations

This area is important for young common and soprano pipistrelles, and the wooded area is frequented by a Natterer's bat, which is uncommon in Meath.

(1) Avoiding light pollution- Light spillage must not occur on the river, and light pollution must be avoided. This can be achieved by using low level bollard lights, with hoods and cowls fitted to prevent light entering the river area. It is particularly important that light pollution is kept to a minimum in the wooded section of the cycleway, as this is where the Natterer's bat (a light intolerant species) was found

(2) Retain trees where possible. Common and soprano pipistrelles were found feeding along the canopy of the trees on the site. These trees provide food, shelter and cracks and crevices to roost in.

(3) Bat boxes- 4 bat boxes should be placed along the cycleway – Two 2FN Schwegler bat boxes and 2 NHBS Kent boxes. These should be placed on trees, at least 4m high, with a clear drop below (no underlying branches – as bats need to drop to start their flight). These can be purchased from online companies principally based in the UK such as www.nhbs.com.



This tree would be suitable to hang a bat box from, as it has no underlying branches

(4) Management of vegetation- to prevent loss of feeding, grasses and vegetation adjacent to the cycleway should not be mown during the summer months. Long grass and native plants allow insect diversity, which in turn provides food for bats. Whenever the cycleway runs by the river, the area between the river and the cycleway should not be sprayed or cut. If required, a nature panel can be designed (info@wildlifesurveys.net) to explain the 'untidy' areas left for insect diversity and young bats.

Bat Biology

Female bats gather in groups known as maternity roosts in summer to have their young. They generally have one baby each year, so are slow to reproduce, and disturbance of a maternity roost can be catastrophic.

In winter bats move to old stonework, trees and caves to hibernate. They are especially vulnerable here as they are slow to awaken, and if tree felling is carried out, they can easily be killed.

Legislation;

Bats are protected under the 1996 Wildlife Act, the 2000 Wildlife (Amendment) Act, Stat Ist 94 of 1997, Stat Ist 378 of 2005, The Habitats Directive, The Bonn and Bern Convention, and the Euro bats agreement.

The European Community (Natural Habitats) Regulations S.I. No 94 of 1997 states:

23(1) The minister shall take the requisite measures to establish a system of strict protection for the fauna consisting of the animal species set out in Part 1 of the First Schedule prohibiting –

a) All forms of deliberate capture or killing of specimens of those species in the wild.

1. The deterioration or destruction of breeding sites or resting places of those species.

The EU Habitats Directive

Article 12(1) of the 'Council Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora (Habitats Directive) states:

“Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV(a) and their natural range, prohibiting:

a) all forms of deliberate capture or killing of specimens of these species in the wild;

b) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration;

c) deliberate destruction or taking of eggs from the wild;

d. deterioration or destruction of breeding sites or resting places.”

The EU Habitats Directive (92/43/EEC) lists all Irish bat species in Annex IV and one Irish species, the lesser horseshoe bat (*Rhinolophus hipposideros*), in Annex II. Annex II includes animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation (SACs) because they are endangered, rare, vulnerable or endemic. Annex IV includes various species that require strict protection. Article 11 of the Habitats Directive requires member states to monitor all species listed in the Habitats Directive and Article 17 requires States to report to the EU on the findings of monitoring schemes.

The Bern and Bonn Conventions

Ireland is also a signatory to a number of conservation agreements pertaining to bats such as the Bern and Bonn Conventions.

The European Bats Agreement (EUROBATS) is an agreement under the Bonn Convention. Ireland and the UK are two of the 31 signatories. The Agreement has an Action Plan with priorities for implementation. Devising strategies for monitoring of populations of selected bat species in Europe is among the resolutions of EUROBATS.

1.3.1 The Bern Convention

Article 6 of the ‘Convention on the Conservation of European Wildlife and Natural Habitats’ (Bern Convention) reads:

“Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. The following will in particular be prohibited for these species:

- a) all forms of deliberate capture and keeping and deliberate killing;
- b) the deliberate damage to or destruction of breeding or resting sites;
- c) the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention; ...

Appendix II lists strictly protected fauna species and this list includes “Microchiroptera, all species except *Pipistrellus pipistrelles*”.

The EUROBATS Agreement

The ‘Agreement on the Conservation of Populations of European Bats’ (EUROBATS) was negotiated under the ‘Convention for the Conservation of Migratory Wild Species’ (Bonn Convention) and came into force in January 1994. The legal protection of bats and their habitats are given in Article III as fundamental obligations:

“1. Each Party shall prohibit the deliberate capture, keeping or killing of bats except under permit from its competent authority

2. Each Party shall identify those sites within its own area of jurisdiction which are important for the conservation status, including for the shelter and protection, of bats. It shall, taking into account as necessary economic and social considerations, protect such sites from damage or disturbance. In addition, each Party shall endeavour to identify and protect important feeding areas for bats from damage or disturbance.”

The Agreement covers all European bat species.

Contact Details:

The phone number for Bat Conservation Ireland is 086 4049468. Their website is www.batconservationireland.org. Wildlife Surveys can be contacted at 087 7454233 or 087 6753201. The following email addresses will ensure a response:

info@wildlifesurveys.net

donnamullen@wildlifesurveys.net

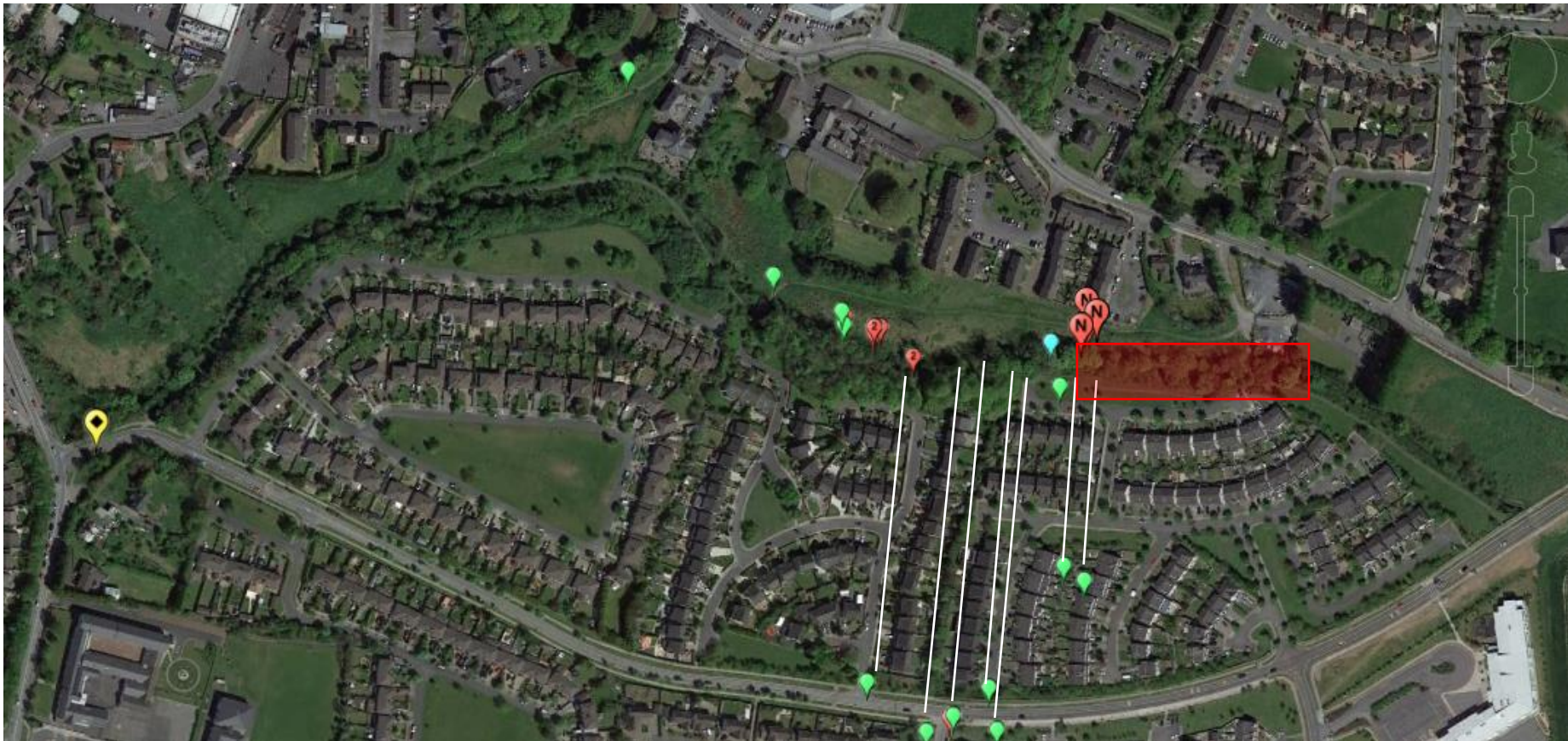
briankeeley@wildlifesurveys.net and web site is www.wildlifesurveys.net

Appendix I

Bat distribution relative to the proposed cycleway July 2018

Appendix II

EM3 detector sound analysis data – hand held



Bat activity along the Broadmeadow River July 12th and 13th 2018

Legend

<i>Yellow paddle</i>	Leisler's bat	<i>Green paddle</i>	Common pipistrelle	<i>Blue paddle</i>	Soprano pipistrelle
<i>"N" paddle</i>	Natterer's bat	<i>"2" paddle</i>	Common and soprano pipistrelles in same location		
<i>Red rectangle</i>	Area most used by Natterer's bat to feed				

Data from the 1st EM3 of the survey

	FOLDER	IN FILE	OUT FILE	AUTO ID	PULSES	MATCHING	MARGIN	MANUAL ID
1	Data	EM3__20180712_215453.wav	EM3__0_20180712_215453_000	PIPI	10	9	0.455346	PIPI
2	Data	EM3__20180712_215724.wav	EM3__0_20180712_215724_000	PIPI	18	16	0.458848	PIPI
3	Data	EM3__20180712_215755.wav	EM3__0_20180712_215755_000	PIPI	8	7	0.377854	PIPI
4	Data	EM3__20180712_220257.wav	EM3__0_20180712_220257_000	PIPI	34	31	0.481013	PIPI
5	Data	EM3__20180713_034251.wav	EM3__0_20180713_034251_000	PIPI	26	26	0.622784	PIPI
6	Data	EM3__20180713_035730.wav	EM3__0_20180713_035730_000	PIPI	36	34	0.592433	PIPI
7	Data	EM3__20180713_035800.wav	EM3__0_20180713_035800_000	PIPI	37	30	0.421092	PIPI
8	Data	EM3__20180713_035830.wav	EM3__0_20180713_035830_000	PIPI	10	10	0.600397	PIPI
9	Data	EM3__20180713_035901.wav	EM3__0_20180713_035901_000	PIPI	34	32	0.527241	PIPI
10	Data	EM3__20180713_035931.wav	EM3__0_20180713_035931_000	PIPI	96	83	0.411550	PIPI
11	Data	EM3__20180713_040102.wav	EM3__0_20180713_040102_000	PIPI	15	14	0.334730	PIPI
12	Data	EM3__20180713_040635.wav	EM3__0_20180713_040635_000	PIPI	2	2	0.741576	PIPI
13	Data	EM3__20180713_040705.wav	EM3__0_20180713_040705_000	PIPI	24	16	0.254375	PIPI
14	Data	EM3__20180713_040735.wav	EM3__0_20180713_040735_000	PIPI	16	6	0.129582	PIPI
15	Data	EM3__20180713_040806.wav	EM3__0_20180713_040806_000	PIPI	4	4	0.655759	PIPI
16	Data	EM3__20180713_040836.wav	EM3__0_20180713_040836_000	PIPI	26	26	0.693635	PIPI
17	Data	EM3__20180713_040906.wav	EM3__0_20180713_040906_000	PIPI	2	2	0.676808	PIPI
18	Data	EM3__20180713_041138.wav	EM3__0_20180713_041138_000	PIPI	2	2	0.586410	PIPI
19	Data	EM3__20180713_041208.wav	EM3__0_20180713_041208_000	PIPI	7	7	0.725034	PIPI
20	Data	EM3__20180713_041238.wav	EM3__0_20180713_041238_000	PIPI	33	32	0.540253	PIPI
21	Data	EM3__20180713_041309.wav	EM3__0_20180713_041309_000	PIPI	96	47	0.182788	PIPI
22	Data	EM3__20180713_041339.wav	EM3__0_20180713_041339_000	PIPI	18	18	0.690991	PIPI
23	Data	EM3__20180713_041409.wav	EM3__0_20180713_041409_000	PIPY	48	28	0.174249	PIPY
24	Data	EM3__20180713_042214.wav	EM3__0_20180713_042214_000	PIPI	22	22	0.667867	PIPI
25	Data	EM3__20180713_042244.wav	EM3__0_20180713_042244_000	PIPI	27	26	0.556439	PIPI
26	Data	EM3__20180713_042415.wav	EM3__0_20180713_042415_000	PIPI	38	38	0.673081	PIPI
27	Data	EM3__20180713_042445.wav	EM3__0_20180713_042445_000	PIPI	14	13	0.586045	PIPI
28	Data	EM3__20180713_042515.wav	EM3__0_20180713_042515_000	PIPI	16	13	0.364747	PIPI
29	Data	EM3__20180713_042546.wav	EM3__0_20180713_042546_000	PIPI	2	2	0.716815	PIPI
30	Data	EM3__20180713_042716.wav	EM3__0_20180713_042716_000	EPSE	31	13	0.056557	Leislars bat
31	Data	EM3__20180713_042847.wav	EM3__0_20180713_042847_000	PIPI	9	9	0.421447	PIPI
32	Data	EM3__20180713_042918.wav	EM3__0_20180713_042918_000	PIPI	8	8	0.731609	PIPI
33	Data	EM3__20180713_042948.wav	EM3__0_20180713_042948_000	PIPI	4	4	0.751933	PIPI
34	Data	EM3__20180713_043048.wav	EM3__0_20180713_043048_000	PIPI	28	27	0.622867	PIPI
35	Data	EM3__20180713_043119.wav	EM3__0_20180713_043119_000	PIPI	119	111	0.408966	PIPI
36	Data	EM3__20180713_043219.wav	EM3__0_20180713_043219_000	PIPI	2	2	0.772364	PIPI
37	Data	EM3__20180713_043250.wav	EM3__0_20180713_043250_000	PIPI	91	86	0.507242	PIPI
38	Data	EM3__20180713_043320.wav	EM3__0_20180713_043320_000	PIPI	250	198	0.324304	PIPI
39	Data	EM3__20180713_043350.wav	EM3__0_20180713_043350_000	PIPI	118	96	0.351034	PIPI
40	Data	EM3__20180713_043420.wav	EM3__0_20180713_043420_000	PIPI	115	112	0.535232	PIPI
41	Data	EM3__20180713_043451.wav	EM3__0_20180713_043451_000	PIPI	115	112	0.477278	PIPI
42	Data	EM3__20180713_043521.wav	EM3__0_20180713_043521_000	PIPI	188	182	0.449189	PIPI
43	Data	EM3__20180713_043551.wav	EM3__0_20180713_043551_000	PIPI	196	192	0.510819	PIPI
39	Data	EM3__20180713_043350.wav	EM3__0_20180713_043350_000	PIPI	118	96	0.351034	PIPI
40	Data	EM3__20180713_043420.wav	EM3__0_20180713_043420_000	PIPI	115	112	0.535232	PIPI
41	Data	EM3__20180713_043451.wav	EM3__0_20180713_043451_000	PIPI	115	112	0.477278	PIPI
42	Data	EM3__20180713_043521.wav	EM3__0_20180713_043521_000	PIPI	188	182	0.449189	PIPI
43	Data	EM3__20180713_043551.wav	EM3__0_20180713_043551_000	PIPI	196	192	0.510819	PIPI
44	Data	EM3__20180713_043622.wav	EM3__0_20180713_043622_000	PIPI	168	161	0.440781	PIPI
45	Data	EM3__20180713_043652.wav	EM3__0_20180713_043652_000	PIPI	185	181	0.429090	PIPI
46	Data	EM3__20180713_043722.wav	EM3__0_20180713_043722_000	PIPI	235	224	0.417477	PIPI
47	Data	EM3__20180713_043752.wav	EM3__0_20180713_043752_000	PIPI	150	149	0.421704	PIPI

Data from the second EM3 in the survey

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48		__20180712_215511.wav	__0_20180712_215511_000	NYLE	2	2	0.229712	NYLE
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50		__20180712_220902.wav	__0_20180712_220902_000	PIPI	25	9	0.065089	PIPI
51		__20180712_220902.wav	__0_20180712_220932_000	PIPI	2	2	0.287088	PIPI
52		__20180712_221009.wav	__0_20180712_221009_000	PIPI	140	61	0.158791	PIPI
53		__20180712_221009.wav	__0_20180712_221039_000	PIPI	13	7	0.217672	PIPI
54		__20180712_221042.wav	__0_20180712_221042_000	PIPI	76	54	0.322813	PIPI
55		__20180712_221042.wav	__0_20180712_221112_000	PIPI	4	4	0.690650	PIPI
56		__20180712_221115.wav	__0_20180712_221115_000	PIPI	108	62	0.215874	PIPI
57		__20180712_221115.wav	__0_20180712_221145_000	PIPY	30	23	0.203149	PIPI
58		__20180712_221149.wav	__0_20180712_221149_000	PIPI	50	38	0.412973	PIPI
59		__20180712_221222.wav	__0_20180712_221222_000	PIPI	57	43	0.335739	PIPI
60		__20180712_221222.wav	__0_20180712_221252_000	PIPI	4	3	0.249428	PIPI
61		__20180712_221255.wav	__0_20180712_221255_000	PIPI	175	107	0.250225	PIPI
62		__20180712_221255.wav	__0_20180712_221325_000	PIPI	46	18	0.099275	PIPI PIPY
63		__20180712_221329.wav	__0_20180712_221329_000	PIPI	57	52	0.519110	PIPI PIPY
64		__20180712_221329.wav	__0_20180712_221359_000	PIPI	5	5	0.687477	PIPI
65		__20180712_221402.wav	__0_20180712_221402_000	PIPI	16	15	0.540805	PIPI
66		__20180712_221402.wav	__0_20180712_221432_000	PIPI	21	15	0.279218	PIPI
67		__20180712_221435.wav	__0_20180712_221435_000	PIPI	6	6	0.609563	PIPI
68		__20180712_221542.wav	__0_20180712_221542_000	PIPI	3	3	0.466709	PIPI
69		__20180712_221615.wav	__0_20180712_221615_000	PIPI	80	52	0.287318	PIPI
70		__20180712_221615.wav	__0_20180712_221645_000	PIPI	17	17	0.692315	PIPI
71		__20180712_221648.wav	__0_20180712_221648_000	PIPI	161	82	0.194493	PIPI
72		__20180712_221648.wav	__0_20180712_221718_000	PIPI	9	8	0.500689	PIPI
73		__20180712_221721.wav	__0_20180712_221721_000	PIPI	37	31	0.453559	PIPI
74		__20180712_221828.wav	__0_20180712_221828_000	PIPI	17	14	0.433824	PIPI
75		__20180712_221828.wav	__0_20180712_221858_000	PIPI	15	7	0.120365	PIPI
76		__20180712_224356.wav	__0_20180712_224356_000	MYBR	23	21	0.267920	MYNA
77		__20180712_225749.wav	__0_20180712_225749_000	PIPI	18	18	0.398252	PIPI
78		__20180712_225749.wav	__0_20180712_225819_000	PIPI	3	3	0.290811	PIPI

	FOLDER	IN FILE	OUT FILE	AUTO ID	PULSES	MATCHING	MARGIN	MANUAL ID
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81		__20180713_040610.wav	__0_20180713_040640_000	PIPI	6	5	0.448864	PIPI
82		__20180713_040644.wav	__0_20180713_040644_000	PIPI	64	52	0.421020	PIPI
83		__20180713_040644.wav	__0_20180713_040714_000	PIPI	2	2	0.441822	PIPI
84		__20180713_040717.wav	__0_20180713_040717_000	PIPI	117	56	0.169801	PIPI
85		__20180713_040717.wav	__0_20180713_040747_000	PIPI	11	10	0.535107	PIPI
86		__20180713_040751.wav	__0_20180713_040751_000	PIPI	27	18	0.309315	PIPI
87		__20180713_040751.wav	__0_20180713_040821_000	PIPY	5	4	0.218133	PIP
88		__20180713_040857.wav	__0_20180713_040857_000	PIPI	27	27	0.620252	PIPI
89		__20180713_041143.wav	__0_20180713_041143_000	PIPY	26	26	0.281102	PIPY
90		__20180713_041356.wav	__0_20180713_041356_000	MYBR	26	15	0.138854	MYNA
91		__20180713_041504.wav	__0_20180713_041504_000	MYBR	10	8	0.164877	MYNA
92		__20180713_041538.wav	__0_20180713_041538_000	MYBR	6	5	0.298252	MYNA
93		__20180713_041538.wav	__0_20180713_041608_000	MYBR	11	11	0.337656	MYNA
94		__20180713_041611.wav	__0_20180713_041611_000	MYBR	18	16	0.231694	MYNA
95		__20180713_041751.wav	__0_20180713_041751_000	MYBR	5	5	0.348662	MYNA
96		__20180713_042004.wav	__0_20180713_042004_000	MYBR	24	23	0.284133	MYNA
97		__20180713_042037.wav	__0_20180713_042037_000	MYBR	8	8	0.349569	MYNA
98		__20180713_042217.wav	__0_20180713_042217_000	PIPY	11	11	0.297167	PIPY
99		__20180713_042250.wav	__0_20180713_042250_000	MYBR	10	7	0.170789	MYNA
100		__20180713_042324.wav	__0_20180713_042324_000	MYBR	8	7	0.259838	MYNA
101		__20180713_042751.wav	__0_20180713_042751_000	PIPY	2	2	0.285488	PIPY
102		__20180713_042931.wav	__0_20180713_042931_000	MYBR	2	2	0.271508	PIP
103		__20180713_042931.wav	__0_20180713_043001_000	PIPI	11	4	0.055199	
104		__20180713_043004.wav	__0_20180713_043004_000	PIPI	13	6	0.132646	PIP
105		__20180713_043037.wav	__0_20180713_043037_000	MYBR	48	27	0.106977	MYNA
106		__20180713_043111.wav	__0_20180713_043111_000	PIPY	23	19	0.207038	PIPY
107		__20180713_043144.wav	__0_20180713_043144_000	PIPY	18	15	0.233794	PIPY
108		__20180713_043217.wav	__0_20180713_043247_000	PIPY	11	10	0.257287	PIPY
109		__20180713_043251.wav	__0_20180713_043251_000	PIPY	27	22	0.188116	PIPY
110		__20180713_043644.wav	__0_20180713_043644_000	PIPY	70	70	0.298183	PIPY
111		__20180713_043644.wav	__0_20180713_043714_000	PIPY	29	29	0.353111	PIPY
112		__20180713_043718.wav	__0_20180713_043718_000	PIPY	250	238	0.289726	PIPY
113		__20180713_043718.wav	__0_20180713_043748_000	PIPY	21	21	0.307633	PIPY
114		__20180713_043752.wav	__0_20180713_043752_000	PIPY	247	219	0.260744	PIPY
115		__20180713_043752.wav	__0_20180713_043822_000	PIPY	19	18	0.296040	PIPY
116		__20180713_043825.wav	__0_20180713_043825_000	PIPY	242	230	0.288838	PIPY
117		__20180713_043825.wav	__0_20180713_043855_000	PIPI	6	3	0.165296	PIPI
118		__20180713_043859.wav	__0_20180713_043859_000	PIPI	83	49	0.265267	PIPI PIPY
119		__20180713_043859.wav	__0_20180713_043929_000	PIPY	43	40	0.267948	PIPI PIPY
120		__20180713_043932.wav	__0_20180713_043932_000	PIPY	389	270	0.165711	PIPI PIPY
121		__20180713_043932.wav	__0_20180713_044002_000	PIPY	40	35	0.264108	PIPI PIPY
122		__20180713_044005.wav	__0_20180713_044005_000	PIPY	398	323	0.220443	PIPI PIPY
123		__20180713_044005.wav	__0_20180713_044035_000	PIPY	45	35	0.175643	PIPI PIPY
124		__20180713_044038.wav	__0_20180713_044038_000	PIPY	392	314	0.216560	PIPI PIPY
125		__20180713_044038.wav	__0_20180713_044108_000	PIPY	42	27	0.153785	PIPI PIPY
126		__20180713_044112.wav	__0_20180713_044112_000	PIPI	85	55	0.307224	PIPI PIPY
127		__20180713_044145.wav	__0_20180713_044145_000	PIPI	37	15	0.177580	PIPI
128		__20180713_044252.wav	__0_20180713_044252_000	PIPI	17	11	0.210222	PIPI
129		__20180713_044432.wav	__0_20180713_044502_000	PIPI	11	5	0.167247	PIPI
130		__20180713_044505.wav	__0_20180713_044505_000	PIPI	21	16	0.427074	PIPI
131		__20180713_044539.wav	__0_20180713_044539_000	PIPI	24	19	0.339059	PIPI
132		__20180713_044612.wav	__0_20180713_044612_000	PIPI	81	39	0.210245	PIPI
133		__20180713_044612.wav	__0_20180713_044642_000	PIPI	20	13	0.290197	PIPI
134		__20180713_044646.wav	__0_20180713_044646_000	PIPY	23	20	0.278857	PIPI PIPY
135		__20180713_044719.wav	__0_20180713_044719_000	PIPY	10	10	0.351424	PIPY
136		__20180713_044752.wav	__0_20180713_044752_000	PIPI	32	18	0.189096	PIPI
137		__20180713_044825.wav	__0_20180713_044825_000	PIPI	117	93	0.301332	PIPI
138		__20180713_044825.wav	__0_20180713_044855_000	PIPI	21	15	0.225659	PIPI
139		__20180713_044900.wav	__0_20180713_044900_000	PIPY	243	165	0.160254	PIPI PIPY

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