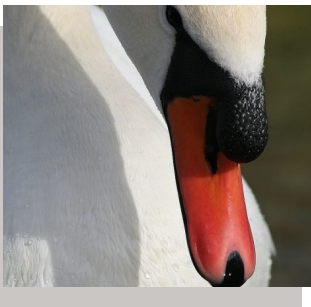


ECOLOGICAL ASSESSMENT OF THE MILLTOWN FEEDER



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Waterways Ireland

Ecological Assessment Report

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Waterways Ireland

Ecological Assessment Report

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1. INTRODUCTION

1.1 Background

Roughan & O'Donovan Environmental were appointed by Waterways Ireland to undertake an Ecological Survey and Assessment of the Milltown Feeder branch of the Grand Canal in order to update and enhance current ecology records of the section of the canal. The overall purpose of updating ecology records of the Grand Canal is to inform maintenance and capital projects, as necessary.

The study area, Milltown Feeder branch of the Grand Canal (hereafter referred to as the "Site"), involves an approximately 13km stretch of canal from the junction with the Grand Canal Main Line at Lowtown Lock to Pollardstown Fen, as presented in Figure 3.1. The Site was divided into 8 sections, (hereafter referred to as "canal markers"), for surveying and reporting purposes. The Site comprises mainly the canal channel, the canal verge and adjoining towpath including the boundary; however certain areas included adjacent fields under the ownership of Waterways Ireland were included.

A full consultation, desk study and ecological survey were carried out to enhance the current knowledge of fauna, flora and habitats within the Site.

1.2 Report Content and Structure

This report contains a summary of the ecological survey and assessment of the Milltown Feeder branch of the Grand Canal. The assessment comprises a desk study which reviews publicly available records on protected species within 2km of the Site and that may be present and/or likely to use the Site. A comprehensive walkover survey of the entire Site was undertaken to record all habitats and species, identifying any protected habitats, higher plants, red listed vascular plants and species to inform an evaluation of their conservation status. The content and structure of the report includes:

- Chapter 2: Methodology – an outline of the desk study and field survey methods used;
- Chapter 3: Ecological Overview – a presentation of the main findings on designated areas, species and habitats;
- Chapter 4: Survey Results – the results of the field surveys for each of the 8 sections of the Milltown Feeder are provided by canal section;
- Chapter 5: Ecologically Sensitive Areas – a description of areas of high ecological value in the Site;
- Chapter 6: References; and,
- Appendix A: Habitat Maps

1.3 Objectives

The objectives of this assessment include:

- To map, classify and describe the habitats within the boundary of the Study Area using the Fossitt classification system (Heritage Council, 2011);
- To identify and evaluate the flora and fauna (including mammals and birds) present within each section of the Study Area according to the best practice Environmental Impact Assessment Guidelines (CIEEM, 2016) and to present objective, relevant, accurate, fair and impartial information pursuant to Guidelines for Ecological Report Writing (CIEEM, 2015);
- To identify Ecologically Sensitive Areas and any particularly important habitats or species with the Study Area (e.g. Priority Habitats and Red List species); and
- To prepare a database of habitat maps, rare species, invasive species and ecological features of interest.

2. METHODOLOGY

2.1 Consultation and Desk Study

The purposes of the desk study were to review information available in the public domain and to obtain information held by statutory and non-statutory consultees. A 15km and 2km buffer zone for designated sites and protected species records respectively was considered to be sufficient for the desk study based on the size of the Site (13km in length and 0.7km in width at the widest section).

ArcView software using Ordnance Survey maps and NPWS shapefiles were used to identify the boundary Waterways Ireland property at the Milltown Feeder of the Grand Canal in relation to Natura 2000 sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)), and, other sites of conservation importance (e.g. Natural Heritage Areas (NHA) and proposed Natural Heritage Areas (pNHA)). The location of the Milltown Feeder in relation to designated areas within a 15km buffer zone is shown below in Figure 3.1.

As part of the information gathering process, a desk study was carried out to identify recent and historical records of protected species within and adjacent to the Site. The desk study was conducted using the following sources:

- National Biodiversity Data Centre (NBDC Online Interactive Map);
- OSi vector mapping;
- OSi aerial photography;
- NPWS designated area shapefiles, conservation objectives, management plans and other data for designated areas in the vicinity;
- NPWS data on Annex I habitats, any other habitat data available and species of conservation interest;
- National Parks & Wildlife Service (2013) *The Status of EU Protected Habitats and Species in Ireland. Volume 2 & 3: Article 17 Assessments.* Department of Arts, Heritage and Gaeltacht.

Additionally, consultation with relevant bodies was undertaken to obtain records of species and information about the ecology of the area. The following bodies were contacted:

- National Parks & Wildlife Service (Ms. Ciara Flynn, Mr. Noel Bugler, Mr. Colm Malone, Mr. Roy Thompson and Mr. Jason Monaghan)
- Kildare County Council (Ms. Bridget Loughlin, Heritage Officer)
- Offaly County Council (Ms. Amanda Pedlow, Heritage Officer)
- Bat Conservation Ireland (Ms. Tina Aughney)
- Tree Council of Ireland (Mr. Brendan Fitzsimons and Ms. Kay Hartigan)
- BirdWatch Ireland (Ms. Olivia Crowe)
- Inland Fisheries Ireland (Mr. Paul McLoone and Ms. Tara Gallagher)

As with all desk studies, the data considered were only as good as the data supplied by the recorders and recording schemes. The recording schemes provide disclaimers in relation to the quality and quantity of the data they provide and these were considered when examining out-puts of the desk study.

2.2 Field Surveys

2.2.1 Habitats and Flora

A Habitat Survey was conducted on Site during August and September 2015 by suitably qualified ecological surveyors. The vegetation was described and mapped following the methods described in the Heritage Council *Best Practice Guidance for Habitat Survey and Mapping* (2011) using the Fossitt Classification system (Fossitt, 2000) and adhering to the Chartered Institute for Ecology and Environmental Management (CIEEM) best practice guidelines (CIEEM, 2006).

Survey sheets were prepared using 1:2000 scale Ordnance Survey maps and cross referenced with publicly available topographical maps and orthophotography. These maps were used in the field for assigning and mapping habitat types as part of the Fossitt habitat survey. The smallest habitat sizes typically mapped were c.20m². A species list was compiled and the presence and location of natural features with potential to support protected species within each canal marker noted during the site walkover. A hand-held Garmin geographical positioning system (GPS) was used to take 10 figure grid reference readings at the relevant locations. The towpath along both sides of the canal was walked at a slow pace to accurately map all habitats patches to the highest resolution possible.

The habitat study was conducted using the following guides:

- Poland, J., & Clement, E. J. (2009). *Vegetative key to the British Flora*. John Poland; Botanical Society of the British Isles.
- Sterry, P., (2010). *Collins Complete Guide to Irish Wildlife*. London;
- Streeter, D., Hart-Davies, C., Hardcastle, A., Cole, F. and Harper, L. (2009). *Collins Flower Guide*. London;
- Fossitt, J. (2000). *A Guide to Habitats in Ireland*. The Heritage Council. Dublin.

2.2.2 Mammals

A review of satellite imagery during the desk study showed that habitats on Site could potentially support a wide range of protected mammals, notably Otter. Evidence of mammals was assessed along the towpath and upto and beyond the canal boundary during the field survey. Signs of mammals were recorded and mapped. In particular, signs of Otter within the Site were recorded including spraints, couches, holts, hairs on wire fences and possible trackways. Otter spraints and potential Otter resting places were recorded during the survey and their locations mapped using GPS.

Additionally, all fence lines, woodland, and scrub habitats were systematically surveyed for evidence of Badger in the form of latrines, trackways, snuffle holes, setts etc. The potential for structures or natural features to support bat roosts was considered during the walkover survey. The physical presence of bats was recorded, notably any bat droppings, insect wings and urine stains. On built structures, holes, gaps, cracks and crevices in masonry walls, stone and brickwork that could provide potential access points for bats were given particular attention.

2.2.3 Birds

A bird survey was concomitantly carried out during the habitat survey in which the presence, location and abundance of bird species were recorded. A modified standard methodology for surveying wintering and breeding birds of open habitats was considered the most appropriate for the flat and linear canal environment (Brown & Shepherd, 1993). Standard survey techniques were amended to suit the restricted survey area along the waterway. At regular intervals, the surveyor would scan the area for species and also listen out for calls and songs. All records were annotated on a 1:10,000 scale map using British Trust of Ornithology (BTO) symbols and a note of the species activity. Due to seasonal constraints the bird survey determined presence/absence of species only rather than assigning any weighting to breeding status.

2.2.4 Terrestrial & Aquatic Invertebrates

No specific targeted survey methods were used for terrestrial or aquatic invertebrates, however during the habitat survey, casual records of any invertebrate species detected were noted and where possible identified to the lowest possible taxonomical level.

2.3 Survey Limitations

Standard survey methods were followed (Heritage Council, 2011) however, any biases or limitations associated with these methods could potentially affect the results collected. While every effort was made to provide a full assessment and comprehensive description of the site, it is unlikely that one survey can achieve full characterization due to temporal variation.

The Fossitt Habitat survey was conducted in August and September and would be considered an optimal time of year for habitat surveys. The optimum time of year for broad habitat surveys is considered to be between May and September. It is recognised that whenever a survey is carried out (within the defined season), it is a compromise, suitable for the vast majority of species, but possibly too early or too late for some species. This is certainly a consideration when assigning criterion on the ecological quality of dry neutral or calcareous grassland within the canal corridor and boundary. The flowering periods for many positive indicator and diagnostic Orchids species corresponding to Orchid-rich priority habitat [Annex listed habitat: 6210*] had passed during the time of the survey. Subsequently there may have been reduced detectability of indicator species that finish flowering in June/July such as *Listera ovate*, *Neotinea maculate*, *Ophrys apifera*, *O. insectifera*, *Orchis morio*, *Plantanthera bifolia* and *P. chlorantha*.

The timing of the surveys likely restricted the detectability of certain terrestrial invertebrates of conservation interest, notably species with a short flight periods (e.g certain *Odonata*, such as Hairy Dragonfly *Brachytron pretense*; and, *Lepidoptera*: Marsh Fritillary *Euphydryas aurinia*, Small Blue *Cupido minimus*, Cryptic Wood White *Leptidea juvernica*).

3. ECOLOGICAL OVERVIEW

3.1 Designated Sites

A review of all designated sites within a 15km radius of the Milltown Feeder branch of the Grand Canal was undertaken to identify habitats and species of conservation importance within the wider area and to ensure that any designated features linked to these sites and that have potential to occur within the Site were a material consideration during the survey. Within 15km of the Milltown Feeder branch of the Grand Canal, there are:

- 6 Special Areas of Conservation (SACs)
- 2 Natural Heritage Areas (NHAs)
- 12 proposed Natural Heritage Areas (pNHAs)

Six Natura 2000 sites occur within 15km of the Site, namely Ballynafagh Bog SAC (Site Code: 000391), Ballynafagh Lake SAC (Site Code: 001387), Pollardstown Fen SAC (Site Code: 000396), The Long Derries SAC (Site Code: 000925), River Barrow and River Nore SAC (Site Code: 002162) and Mouds Bog SAC (Site Code: 004063).

NHAs are sites considered important for the habitats present or which hold species of plants and animals whose habitat needs protection. Proposed NHAs are sites which support habitats and species of significant conservation interest and have been identified for protection, however currently have no statutory protection in place. All NHAs and pNHAs were published on a non-statutory basis in 1995. Two NHAs and 12 pNHAs occur within 15km of the Milltown Feeder branch of the Grand Canal. The entire study area is covered by the Grand Canal pNHA (Site Code: 002104) and with the exception of this site Mouds Bog pNHA is the next closest pNHA to the Study Area (Figure 3.1).

The designated sites within 15km of the Study Area are protected for the following listed qualifying interests:

Table 3.1.1 Designated Sites within 15km of the Study Area and their Main Features

Designated Area	Site Code	Main Features
Ballynafagh Bog pNHA / SAC	000391	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150]
Curragh (Kildare) pNHA	000392	Limestone geology
Liffey Valley Meander Belt pNHA	000393	Chironomid communities Ash-woods and marshy areas
Mouds Bog pNHA / SAC	002331	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150]
Pollardstown Fen pNHA / SAC	000396	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210] Petrifying springs with tufa formation (Cratoneurion) [7220] Alkaline fens [7230] <i>Vertigo geyeri</i> (Geyer's Whorl Snail) [1013] <i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail) [1014] <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]

Designated Area	Site Code	Main Features
The Long Derries, Edenderry pNHA / SAC	000925	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]
Ballynafagh Lake pNHA / SAC	001387	Alkaline fens [7230] <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016] <i>Euphydryas aurinia</i> (Marsh Fritillary) [1065]
Donadea Wood pNHA	001391	Old woodland
Liffey at Osberstown pNHA	001395	Riverside vegetation
Liffey Bank Above Athgarvan pNHA	001396	Flora of unstable soils
Grand Canal pNHA	002104	Habitat and species diversity Ecological corridor
Dunlavin Marshes pNHA	001772	Areas of semi-natural vegetation
River Barrow and River Nore SAC	002162	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] European dry heaths [4030] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016] <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092] <i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Alosa fallax fallax</i> (Twaite Shad) [1103] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355] <i>Trichomanes speciosum</i> (Killarney Fern) [1421] <i>Margaritifera durrovensis</i> (Nore Pearl Mussel) [1990]
Carbury Bog NHA	001388	Peatlands [4]
Hodgestown Bog NHA	001393	Peatlands [4]

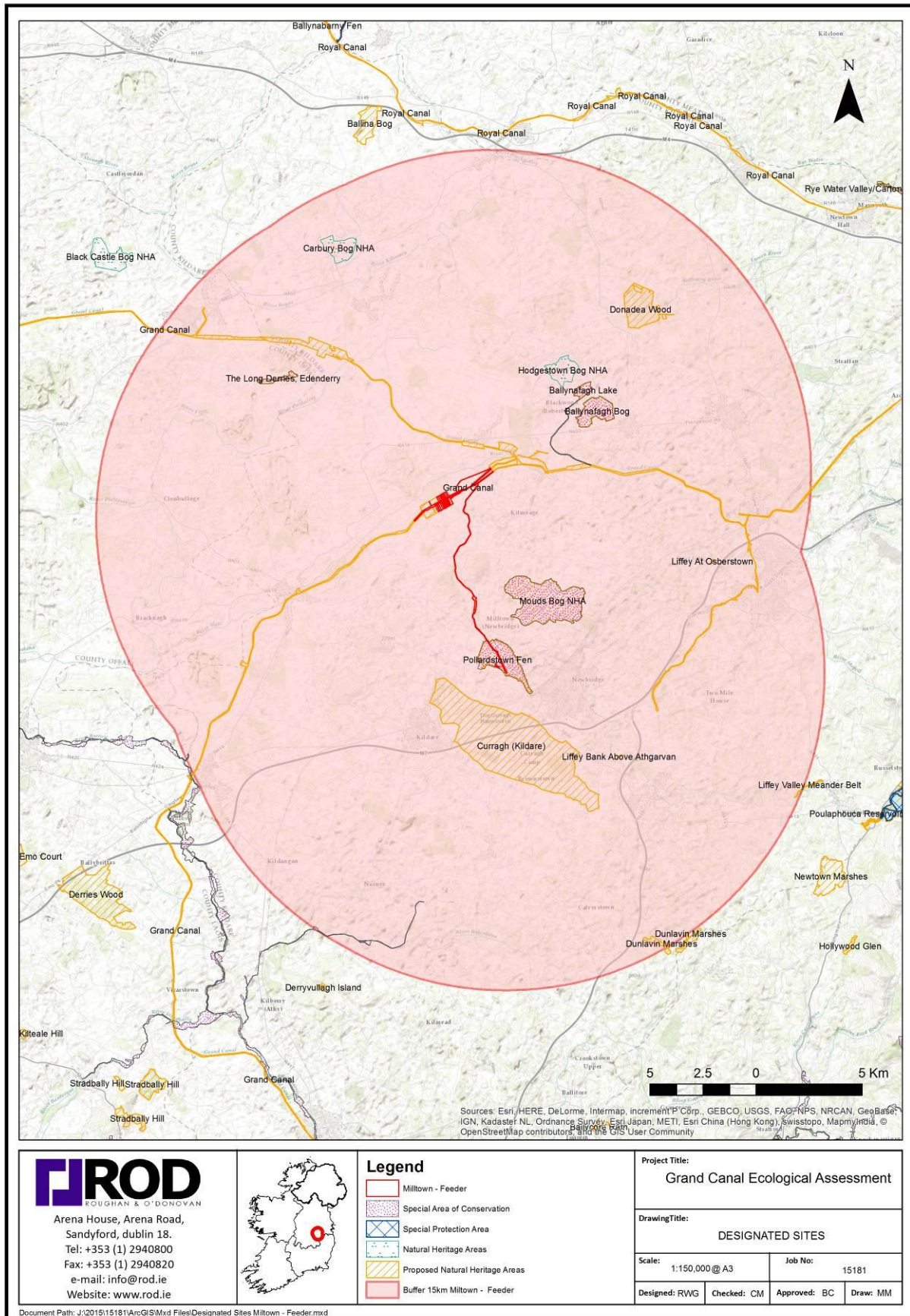


Figure 3.1 Designated Sites within 15km of the Site

3.2 Habitats

The Fossitt habitat categories identified on Site are provided in Table 3.2.1 and are presented in the maps provided in Appendix A. Overall, the Site largely comprises canal, dry meadows and grassy verges, wet grassland and improved agricultural grassland. The dominant classifications found on Site are described below.

Table 3.2.1: Fossitt Habitat Classifications found within the Site.

Code	Fossitt Habitat Classification
TM*	Towpath Mosaic
FRESHWATER HABITATS	
FW3	Canal
FW4	Drainage ditch
FS1	Reed and large sedge swamp
FS2	Tall herb swamp
GRASSLAND AND MARSH	
GA1	Improved agricultural grassland
GA2	Amenity grassland
GS1	Dry neutral & calcareous grassland
GS2	Dry meadow and grassy verge
GS2/WS1	Mosaic: Dry meadow and grassy verge / Scrub
GS4	Wet grassland
GM1	Marsh
HEATH AND DENSE BRACKEN	
HD1	Dense bracken
PEATLANDS	
PB4	Cutover bog
PF1	Rich fen and flush
PF2	Poor fen and flush
WOODLAND AND SCRUB	
WN6	Wet willow-alder-ash woodland
WD1	Mixed broadleaved woodland
WD2	Mixed broadleaved/conifer woodland
WD4	Conifer plantation
WD5	Scattered trees and parkland
WS1	Scrub
WS1/FS1	Mosaic Scrub / Reed swamp
WS2	Immature woodland
WS3	Ornamental/non-native shrub
WL1	Hedgerows
WL2	Treelines
EXPOSED ROCK AND DISTURBED GROUND	
ED2	Spoil & bare ground
ED3	Recolonising bare ground
CULTIVATED AND BUILT LAND	
BC1	Arable crops
BC2	Horticultural land
BC3	Tilled land
BL1	Stone walls and other stonework
BL3	Buildings

TM Towpath Mosaic*

Towpath Mosaic is a bespoke habitat category developed by Waterways Ireland to describe the uniform habitat components that occur between open canal (FW3) and the vegetation either side of the towpath including the canal verge. This approach and habitat category is consistent with other Waterways Ireland canal surveys (see also Smith & Gittings, 2014). Due to the narrow bands of varying habitats along the canal bank, a towpath mosaic was used to map the transition from emergent vegetation at the edge of the canal to the semi-natural neutral/calcareous dry grassland communities found consistently throughout the canal towpath and boundary. This zonation in habitat was typically categorised as incorporating grading habitat types, notably reed and large sedge swamp (FS1) to marsh (GM1) to wet grassland (GS4) and then to dry meadows and grassy verges (GS2) at the edge of the towpath. The towpath mosaic occurs over a width of approximately 2-3 m or less. Additionally, a towpath mosaic consisting of amenity grassland (GA2), spoil and bare ground (ED2), dry meadows and grassy verges (GS2) and scrub (WS1) was often a common zonation identified along the canal bank near to residential properties (see Plate 3.2.1).



Plate 3.2.1 Towpath Mosaic

FW3 Canal

Canals are artificial waterways that form part of the navigable waterway system. The canal environment is typically within a maintained and modified state to accommodate largely seasonal and recreational boat traffic. Canals need a reliable supply of water in order for locks to function. The Milltown Feeder is a branch of the Grand Canal Main Line however is included in the The Grand Canal pNHA, a site designated for canal flora, fauna and semi-natural habitats and the heritage value of the variety of canal structures (locks, tunnels, bridges). In addition to the main channel of the canal there are towpaths, hedgerows, scrub, woodland, feeder streams, side arms, swamps or fen. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. The Grand Canal pNHA crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.



Plate 3.2.2 Canal environment

Canal environments are mainly lowland, mesotrophic to eutrophic, base rich waterbodies and, as such, support a wide range of intermediate communities' characteristic of both lakes and rivers. Canals therefore have a high biodiversity interest. The particular ecology in an individual canal may show limited regional influences or habitat heterogeneity due to its open, uniform and linear function as an ecological corridor. Channel dredging and maintenance to retain canal function for boat traffic typically removes shallower, marginal areas within the channel. Subsequently, there is a sharp transition between the grassy verge/emergent vegetation and aquatic macrophyte communities of the deeper channel.

FW4 Drainage Ditches

Ditches are an abundant feature along the base of canal embankments and link the edge of the canal towpath mosaic to land parcel boundaries and adjacent areas of wet grassland, mire and woodland. They are often associated with fields and field boundaries and lead into natural watercourses, which also form most of the main continuous corridors within the Site. The most diverse drainage channel flora are found on sites with extensive networks of drainage channels, a wide range of drainage channel types and a range of seral stages, representing habitats from open water to drainage channels choked with well established emergent vegetation. Typical zonations include *Phragmites-Glyceria* and *Filipendulo-Iridetum* in open ditches at field margins beyond the canal boundary. At the base of embankments with well established scrub or treelines, much of this emergent community is lacking.

FS1 Reed and tall sedge swamp

This category includes species-poor stands of herbaceous vegetation that are dominated by reeds *Phragmites* and other large grasses *Glyceria* or large, tussock-forming sedges. Most reed and large sedge swamps are overwhelmingly dominated by one or a small number of species, as in the case of reedbeds. Stands of vegetation can range from very dense to open. The broadleaved herb component is relatively minor. Vegetation typically lacks stratification as there is little or no development of an understory element. This habitat classification is a consistent feature along large parts of the canal, found in narrow strips along the verges of the canal and recorded on the majority of sections.



Plate 3.2.3 *Phragmites* dominated fringe at canal transition into Pollardstown Fen

FS2 Tall-herb swamps FS2

Tall-herb swamps are comparatively species-rich stands of herbaceous vegetation that occur in wet areas where the water table is above the ground surface for most of the year, or where water levels fluctuate regularly as in the case of tidal sections of rivers. Tall or robust broadleaved herbs dominate and common components include Lesser Waterparsnip (*Berula erecta*), Fool's Water-cress (*Apium nodiflorum*), Gipsywort (*Lycopus europaeus*), Brooklime (*Veronica beccabunga*), Hemlock Water-dropwort (*Oenanthe crocata*), Hemp-agrimony (*Eupatorium cannabinum*) and Water Forget-me-not (*Myosotis scorpioides*). These swamps may also support Yellow Iris (*Iris pseudacorus*), Water-plantain (*Alisma plantago-aquatica*) and Water Horsetail (*Equisetum fluviatile*), in addition to occasional reeds, large grasses (*Glyceria maxima*, *Festuca arundinacea*) and sedges. This habitat is most frequent as a transitional habitat forming part of the zonation within the Towpath Mosaic (TM).

GA1 Improved agricultural grassland

This category is used for intensively managed or highly modified agricultural grassland that has been reseeded and/or regularly fertilized, and is now heavily grazed and/or used for silage making. It includes regularly-reseeded monoculture grasslands and rye-grass leys that are planted as part of an arable rotation. These differ significantly from areas of permanent grassland. Improved agricultural grassland is typically species-poor. As agriculture is the predominant land use in the area, a large proportion of the land outside the canal and its verges and towpaths is classified as Improved Agricultural Grassland.

GA2 Amenity grassland (Improved)

This type of grassland is improved, or species-poor, and is managed for purposes other than grass production. It includes amenity, recreational or landscaped grasslands, but excludes farmland. Small sections of amenity grassland were identified along the verges of the canal, often adjacent to buildings.

GS1 Dry calcareous and neutral grassland

This encompasses all unimproved and semi-improved grasslands on both calcareous and neutral soil. It is associated with freedraining mineral soils and low intensity agriculture. Calcareous grassland is restricted in its distribution and is now largely confined to the steep slopes of esker ridges and moraines in the midlands, and to other areas with shallow and

rocky limestone soils. Management and fertiliser use makes calcareous grasslands more like neutral grasslands in character and these have a wider distribution. Dry calcareous and neutral grassland may comprise a wide range of grasses and broadleaved herbs. Species richness varies and can be high. This habitat occurs on open embankments and ridges along the canal boundary and also in suitable conditions at the towpath verge.

GS2 Dry meadows and grassy verges

This habitat occurs in more exposed and open areas of the canal in the form of a later successional stage of colonising bare ground and often also grading from and within a mosaic of scrub (WS1) at the towpath verge and canal boundaries. This habitat also occurs in areas that are occasionally mown and where there is limited management or low intensity grazing regime. The development of grasslands with a high proportion of tall, coarse and tussocky grasses such as False Oat-grass (*Arrhenatherum elatius*) and Cock's-foot (*Dactylis glomerata*) is typical. Other grasses may include Yorkshire-fog (*Holcus lanatus*), Smooth Meadow-grass (*Poa pratensis*), Barren Brome (*Anisantha sterilis*) and Meadow Foxtail (*Alopecurus pratensis*). A broadleaved herb component is characterised by a range of species that either grow tall, such as Cow Parsley (*Anthriscus sylvestris*), Hogweed (*Heracleum sphondylium*), Nettle (*Urtica dioica*) and Common Knapweed (*Centaurea nigra*), or climb the stems of others, as in the case of Bush Vetch (*Vicia sepium*) and Meadow Vetchling (*Lathyrus pratensis*). Grassy verges may support other smaller broadleaved herbs such as Pignut (*Conopodium majus*), Creeping Cinquefoil (*Potentilla reptans*) and clovers (*Trifolium* spp.).



Plate 3.2.4 Dry meadows and grassy verges (GS2) at the top of the towpath mosaic (TM) and on the left-hand side of the towpath

GS4 Wet grassland

This type of grassland is frequent throughout the Site and can be found on flat or sloping ground in low intensity managed agricultural grassland beyond the canal boundary. Wet grassland occurs on wet or waterlogged mineral or organic soils that are poorly-drained or, in some cases, subjected to seasonal or periodic flooding, occurring some cases on less managed canal towpaths. On sloping ground, wet grassland is mainly confined to clay-rich gleys and loams, or organic soils that are wet but not waterlogged. Wet grassland often contains abundant rushes (*Juncus effusus*, *J. acutiflorus*, *J. articulatus*, *J. inflexus*) and/or small sedges (*Carex flacca*, *C. hirta*, *C. ovalis*), in addition to grasses such as Yorkshire-fog

(*Holcus lanatus*), Creeping Bent (*Agrostis stolonifera*), Marsh Foxtail (*Alopecurus geniculatus*), Rough Meadow-grass (*Poa trivialis*) and Tufted Hair-grass (*Deschampsia caespitosa*). Purple Moor-grass (*Molinia caerulea*) may also be present but should not dominate. The proportion of broadleaved herbs is often high.



Plate 3.2.5 Wet grassland (GS4) and the bottom of the embankment and in the field beyond the fence, containing abundant rushes

GM1 Marsh

Marsh is found on level ground near river banks, lakeshores, and in other places where mineral or shallow peaty soils are waterlogged, and where the water table is close to ground level for most of the year. Unlike swamps, standing water is not a characteristic feature except, perhaps, during very wet periods or in winter months. Marsh is comparatively species-rich and supports a high proportion of wetland species in addition to the typical dominants: rushes (*Juncus* spp.), sedges (*Carex* spp.) and Meadowsweet (*Filipendula ulmaria*). Grasses such as Creeping Bent (*Agrostis stolonifera*), Tall Fescue (*Festuca arundinacea*) and Purple Moor-grass (*Molinia caerulea*) may be present but not abundant. To be considered as marsh, the proportion of sedges and grasses should not exceed 50%. Marsh communities are often represented within the zonation of Towpath Mosaic (TM) however, often recorded at seeps or saturated corners of field boundaries beyond the canal boundary.



Plate 3.2.6 Marsh (GM1) at base of canal embankment grading into Wet Grassland (GS4)

HD1 Dense Bracken

This habitat is dominated by dense stands of Bracken (*Pteridium*). In most areas where Bracken was recorded it formed uniform patchwork at the edge of the towpath or within the understory of Scrub (WS1) or mixed Birch or broadleaved woodland (WD1).

PF1 Rich fen and flush

Rich fens and flushes are fed by groundwater or flowing surface waters that are at least mildly base-rich or calcareous, and are usually found over areas of limestone bedrock. The substratum is waterlogged peat (except in the case of some flushes) and this usually has a high mineral content. Vegetation is typically dominated by Black Bog-rush (*Schoenus nigricans*) and/or small to medium sedges such as *Carex viridula*, *C. nigra*, *C. dioica* and *C. panicea*. Other prominent components of the vegetation include rushes, particularly Blunt-flowered Rush (*Juncus subnodulosus*), Purple Moor-grass (*Molinia caerulea*), Marsh Pennywort (*Hydrocotyle vulgaris*), Lesser Spearwort (*Ranunculus flammula*), Water Mint (*Mentha aquatica*), Common Marsh-bedstraw (*Galium palustre*), Grass-of parnassus (*Parnassia palustris*), Common Butterwort (*Pinguicula vulgaris*) and Devil's-bit, Scabious (*Succisa pratensis*). Rich fen and flush can be important for orchids such as *Epipactis palustris* and *Dactylorhiza spp.* An internationally important example of fen communities occur at Pollardstown Fen at the southern extent of the Milltown Feeder (See description of Ecologically Sensitive Area (ESA) 1 (Section 5 and Appendix A, Map 1)).



Plate 3.2.7 Pollardstown Fen contained large areas of rich fen and flush (PF1)

PF2 Poor fen and flush

This category includes peat-forming fens and flushes that are fed by groundwater or flowing surface waters that are acid. Flushes that are acidic but not peat-forming should also be considered here. In most cases the substratum is acid peat which has a higher nutrient status than that of ombrotrophic bogs. The vegetation of poor fens and flushes is typically dominated by sedges (particularly *Carex rostrata*, *C. nigra*, *C. curta*, *C. lasiocarpa* and *C. echinata*) and/or rushes (*Juncus effusus*, *J. articulatus*, *J. acutiflorus*).

Due to the modified nature of the canal embankment, adjacent field boundaries and peatlands in the study area, frequently strips and blocks of woodland did not tend to neatly fit into any particular Fossitt category. This was particularly the case with wide strips of woodland that extended from the dry, and often calcareous, embankment onto lands below which were often more acidic or wetter. In addition, a lot of wooded strips and larger areas had been planted with non-native species such as beech and sycamore mixed in with species that aligned more closely with a Fossitt category. Categories assigned were those that most aligned with the mix of species present.

WN6 Wet willow-alder-ash woodland

This broad category includes woodlands of permanently waterlogged sites that are dominated by willows (*Salix* spp.), Alder (*Alnus glutinosa*) or Ash (*Fraxinus excelsior*), or by various combinations of some or all of these trees. It includes woodlands of lakeshores, stagnant waters and fens, known as carr, in addition to woodlands of spring-fed or flushed sites. The modified and linear canal environment lacks any extensive stands of WN6 with the constant species of this habitat dominant along the canal boundary and along embankments in association with Drainage Ditches (FW4).

WD1 (Mixed) Broadleaved woodland

This general category includes woodland areas with 75-100% cover of broadleaved trees, and 0-25% cover of conifers. It should be used in situations where woodland stands cannot be classified as semi-natural on the basis of the criteria outlined above. Trees may include native and non-native species. Plantations of broadleaved trees are included if the canopy height is greater than 5 m, or 4 m in the case of wetland areas. Mixed Broadleaved woodland occurs frequently within the Site along the Grand Canal boundary often forming important corridors with adjacent land parcel boundaries, treelines and hedgerows.

WD2 Mixed broadleaved/conifer woodland

This category includes woodland areas with mixed stands of broadleaved trees and conifers, where both types have a minimum cover of 25%, and a maximum cover of 75%. Trees may be either native or non-native species. Mixed broadleaved/ conifer plantations are included if the canopy height is greater than 5 m, or 4 m in the case of wetland areas.



Plate 3.2.8 Mixed broadleaved/conifer woodland (WD2) adjacent to the Milltown Feeder

WD4 Conifer plantation

This category is used for areas that support dense stands of planted conifers where the broadleaved component is less than 25% and the overriding interest is commercial timber production. Conifer plantations are characterised by even-aged stands of trees that are usually planted in regular rows, frequently within angular blocks. Species diversity is low and single species stands are common. The majority of planted conifers are non-native species such as Sitka Spruce (*Picea sitchensis*), Lodgepole Pine (*Pinus contorta*), Norway Spruce (*Picea abies*) and larches (*Larix* spp.). Conifer plantations may be fringed with narrow bands of broadleaved trees, most of which are also planted.

WD5 Scattered trees and parkland

This category can be used in situations where scattered trees, standing alone or in small clusters, cover less than 30% of the total area under consideration but are a prominent structural or visual feature of the habitat. This usually occurs in areas of cultivated grassland, particularly amenity areas. In the case of parkland or parks which originate from former planting and landscaping, the proportion of non-native trees is typically high

WS1 Scrub

This broad category includes areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. The canopy height is generally less than 5 m, or 4 m in the case of wetland areas. Scrub frequently develops as a precursor to woodland and is often found in inaccessible locations, or on abandoned or marginal farmland. In the absence of grazing and mowing, scrub can expand to replace grassland or heath vegetation. Trees are included as components of scrub if their growth is stunted as a result of exposure, poor soils or waterlogging. If tall trees are present, these should have a scattered distribution and should not form a distinct canopy. This classification is ubiquitous throughout the canal boundary often forming the towpath verge often in combination with treelines or as the transitional zone and understorey of broadleaved woodland (WD1) largely comprising *Crataegus-Prunus* associations. Scrub can be either open, or dense and impenetrable, and it can occur on areas of dry, damp or waterlogged ground. Common components include spinose plants such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Gorse (*Ulex europaeus*), Juniper (*Juniperus communis*), Bramble (*Rubus fruticosus agg.*) and erect or scrambling roses (*Rosa spp.*), in addition to a number of willows (*Salix spp.*), small birches (*Betula spp.*) and stunted Hazel (*Corylus avellana*).



Plate 3.2.9 Willow-dominated scrub (WS1) encroaching into the canal towpath

WS2 Immature Woodland

Immature woodland includes areas that are dominated by young or sapling trees that have not yet reached the threshold heights (5 m, or 4 m in the case of wetland areas) for inclusion in the woodland categories previously described. This habitat occurs infrequently in the Site and typically beyond the canal boundary.

WS3 Ornamental/non-native shrub

This category covers areas dominated by ornamental and non-native shrubs. Most of these originate from planting and can be found in formal beds and borders in gardens, parks and other landscaped areas in association with Amenity Grassland (GA1).

WL1 Hedgerows

Where they exist, hedges are an important feature of the local canal corridor network. In some areas they are the only direct link between disparate habitats. In general a greater variety of hedgerow species produces a broader range of hedge structure and niches. Hedgerows are linear strips of shrubs, often with occasional trees, that typically form field or property boundaries. Most hedgerows originate from planting and many occur on raised banks of earth that are derived from the excavation of associated Drainage Ditches (FW4). Species composition varies with factors such as age, management, geology, soils and exposure. Hedgerows share many constant species and commonly support a high proportion of spinose plants such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Gorse (*Ulex europaeus*), Holly (*Ilex aquifolium*), Dog-rose (*Rosa canina*) or Bramble (*Rubus fruticosus* agg.), in addition to many other native and non-native trees and shrubs including, for example, Ash (*Fraxinus excelsior*), Hazel (*Corylus avellana*), Beech (*Fagus sylvatica*), Elder (*Sambucus nigra*), elms (*Ulmus spp.*) and willows (*Salix spp.*).



Plate 3.2.10 Hedgerow (WL1) and Treeline (WL2) on the edge of the canal towpath

WL2 Treelines

A treeline is a narrow row or single line of trees that is greater than 5 m in height and typically occurs along field or property boundaries. This category includes tree-lined roads or avenues, narrow shelter belts with no more than a single line of trees, and overgrown hedgerows that are dominated by trees. Most treelines are planted and trees are often regularly spaced. Treelines are found usually along the canal boundary or delineating public road and land parcels.

ED1 Exposed sand, gravel or till

This category includes natural or artificial exposures of unconsolidated coarse or mixed sediment. Sand and gravel are mostly made up of sediment particles that are less than 16mm in diameter. Till, or boulder clay, is an unsorted mixture of peddles, cobbles or boulders in a matrix of finer material such as sand, silt or clay. Most exposures of these sediments are associated with sand and gravel pits, or with excavated glacial landscape features such as eskers, drumlins or moraines, and include road cuttings or construction sites.

ED3 Recolonising bare ground

This category is used for any areas where bare or disturbed ground, derelict sites or artificial surfaces of tarmac, concrete or hard core have been invaded by colonising opportunistic herbaceous plants.

BC1 Arable crops

Agricultural land that is cultivated and managed for the production of arable crops, including cereals (wheat, barley, oats, maize), and root, leaf, energy or fibre crops such as sugar beet, turnips, rape and flax. Fields of potatoes can be included here, but most other vegetable crops are excluded, as are market gardens. Much of the existing land surrounding the canal is used for agriculture and this habitat category featured frequently in adjacent fields beyond the canal boundary.

BC2 Horticultural land

This category includes areas of land that are cultivated and managed for the production of vegetables, fruit crops, culinary or aromatic herbs, flowers and other ornamental plants. It should also be used for market gardens, tree nurseries, garden centres, greenhouses, polythene tunnels and smaller vegetable plots in gardens and allotments.

BC3 Tilled land

This category should be used in situations where land has been tilled and prepared for planting but where the type of crop, or future use of the land, cannot be established.

BL1 Stone walls and other stonework

This category incorporates stone walls and most other built stone structures in rural and urban situations. It includes dry stone and old mortar walls that occur as field or property boundaries; retaining walls against banks of soil; stone walls that rise from rivers, canals or moats; stone bridges, viaducts and aqueducts; stone jetties or piers in lakes or rivers; derelict or ruinous buildings made of stone; and old stone monuments, fortifications or ruins. Note that modern or intact buildings made of stone are excluded.

BL3 Buildings and artificial surfaces

This broad category incorporates areas of built land that do not fit elsewhere in the classification. It includes all buildings (domestic, agricultural, industrial and community). It also includes areas of land that are covered with artificial surfaces of tarmac, cement, paving stones, bricks, blocks or Astroturf (e.g. roads, car parks, pavements, runways, yards, and some tracks, paths, driveways and sports grounds). This classification comprises paths, roads, bridges, houses and farm buildings along the canal.

3.3 Protected Species

Online sources of publicly available data provided by the National Biodiversity Centre (NBDC) informed the desk study with regards to protected species and the results are presented in Table 3.3.1.

Table 3.3.1 Notable Protected Species Records within 2km of the Site (NBDC)

Species	Most Recent Date Recorded	Suitable Habitat Within the Site
Wildlife Act		
Eurasian Red Squirrel (<i>Sciurus vulgaris</i>)	2014	Yes
EU Directive		
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	2009	Yes
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	2008	Yes
Lesser Noctule (<i>Nyctalus leisleri</i>)	2008	Yes

Species	Most Recent Date Recorded	Suitable Habitat Within the Site
Brown Long-eared Bat (<i>Plecotus auritus</i>)	2005	Yes
Daubenton's Bat (<i>Myotis daubentonii</i>)	2008	Yes
Eurasian Curlew (<i>Numenius arquata</i>)	1991	Yes
Freshwater White-clawed Crayfish (<i>Austropotamobius pallipes</i>)	2006	Yes
Pine Marten (<i>Martes martes</i>)	2014	Yes
European Golden Plover (<i>Pluvialis apricaria</i>)	2011	Yes
Marsh Fritillary (<i>Euphydryas aurinia</i>)	2014	Yes
Northern Lapwing (<i>Vanellus vanellus</i>)	2011	Yes
Peregrine Falcon (<i>Falco peregrinus</i>)	2015	Yes

National Parks and Wildlife Service provided results from the Badger and Habitat Survey of Ireland (Smal, 1995). The two National Otter Surveys in Ireland undertaken by NPWS (Bailey & Rochford, 2006; Reid et al., 2013) identified two otter records. The protected species Marsh Fritillary butterfly has also been recorded at the southern extreme of the study area at Pollardstown Fen SAC.

Table 3.3.2 Protected Mammal Records within 1km of the Site (NPWS)

Species	Sample Location	Survey Name	Date
Marsh Fritillary (<i>Eurodryas aurinia</i>)	Pollardstown main	Marsh Fritillary records Brian Nelson	2010
Otter (<i>Lutra lutra</i>)	Within 1km of Site	Badger and Habitat Survey of Ireland	1991
Pine Marten (<i>Martes martes</i>)	Within 1km of Site	Badger and Habitat Survey of Ireland	1991

Table 3.3.3 Bat Species Records within 1km of the Site

Species	Sample Location	Most Recent Date Recorded
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	Within 1km of Site	2009

3.4 Invasive Species

Publicly available data offered online by the NBDC identified the presence of invasive alien species (IAS) within 2km of the site, most recently in 2015. These invasive species are listed in Table 3.4.1.

Table 3. 4.1 National Biodiversity Data Centre Invasive Species Records within 2km of the Site

Invasive Species	Most Recent Date Recorded
Canadian Waterweed (<i>Elodea canadensis</i>)	1999

4. SURVEY RESULTS

4.1 Junction with Grand Canal Main Line at Lowtown Lock – Harbertown Bridge (Distance:1.4km)

See Appendix A, Maps 1-5

Habitats and Flora

The towpath and canal verge at this section are mostly classified as towpath mosaic (TM) and woodland (WD1) along the west verge. A treeline (WL2) runs along the east verge of the canal throughout this section. Close to the Leinster Mill Bridge and Lock 2, both towpaths comprise dry meadows and grassy verges (GS2). Sections of built ground were found at both sides of the canal as a housing estate is located nearby. Improved agricultural grassland is located to the west of this section of the canal.

Table 4.1.1 Habitats recorded from the Grand Canal Main Line at Lowtown Lock to Harbertown Bridge

Habitat Code	Habitat Name
FW3	Canals
GS2	Dry meadows and grassy verges
GA1	Improved agricultural grassland
TM	Towpath mosaic
WL2	Treelines
WL1	Hedgerows
GA2	Amenity grassland (improved)
WS1	Scrub

Table 4.1.2 Species recorded from the Grand Canal Main Line at Lowtown Lock to Harbertown Bridge

Species	Scientific
Vascular Plants	
Field Maple	<i>Acer campestre</i>
Sycamore	<i>Acer pseudoplatanus</i>
Yarrow	<i>Achillea millefolium</i>
Horse Chesnut	<i>Aesculus hippocastanum</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Water Plantain	<i>Alisma plantago-aquatica</i>
Alder	<i>Alnus glutinosa</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>
Wild Angelica	<i>Angelica sylvestris</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>
False Oat Grass	<i>Arrhenatherum elatius</i>
Wall-Rue	<i>Asplenium ruta-muraria</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>
Daisy	<i>Bellis perennis</i>
Lesser Water-parsnip	<i>Berula erecta</i>
Quaking Grass	<i>Briza media</i>
Starworts	<i>Callitriche</i> spp.
Hedge Bindweed	<i>Calystegia sepium</i>

Species	Scientific
Cuckoo Flower	<i>Cardamine pratensis</i>
Black Sedge	<i>Carex nigra</i>
Knapweed	<i>Centaurea nigra</i>
Rustyback	<i>Ceterach officinarum</i>
Charophytes	<i>Charophyta</i>
Creeping Thistle	<i>Cirsium arvense</i>
Marsh Thistle	<i>Cirsium palustre</i>
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Crested Dog's-tail	<i>Cynosurus cristatus</i>
Cock's-foot grass	<i>Dactylis glomerata</i>
Tufted Hair Grass	<i>Deschampsia cespitosa</i>
Canadian Waterweed	<i>Elodea canadensis</i>
Nuttall's Waterweed	<i>Elodea nutallii</i>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Field Horsetail	<i>Equisetum arvense</i>
Water Horsetail	<i>Equisetum fluviatile</i>
Petty Spurge	<i>Euphorbia peplus</i>
Eyebright	<i>Euphrasia</i> spp.

Species	Scientific
Red Fescue	<i>Festuca rubra</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Ash	<i>Fraxinus excelsior</i>
Cleavers	<i>Galium aparine</i>
Lady's Bedstraw	<i>Galium verum</i>
Herb-Robert	<i>Geranium robertianum</i>
Reed Sweet Grass	<i>Glyceria maxima</i>
Ivy	<i>Hedera helix</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Flag Iris	<i>Iris pseudacorus</i>
Sharp-flowered Rush	<i>Juncus acutiflorus</i>
Soft Rush	<i>Juncus effusus</i>
Hard Rush	<i>Juncus inflexus</i>
Blunt-flowered Rush	<i>Juncus subnodulosus</i>
Field Scabious	<i>Knautia arvensis</i>
Meadow Vetchling	<i>Lathyrus pratensis</i>
Ox-eye Daisy	<i>Leucanthemum vulgare</i>
Fairy Flax	<i>Linum catharticum</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Black medick	<i>Medicago lupulina</i>
Purple Moor Grass	<i>Molinia caerulea</i>
Whorled Water Milfoil	<i>Myriophyllum spp.</i>
Yellow Water-lily	<i>Nuphar lutea</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Common Reed	<i>Phragmites australis</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Greater Plantain	<i>Plantago major</i>
Silverweed	<i>Potentilla anserina</i>
Blackthorn	<i>Prunus spinosa</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Lesser Spearwort	<i>Ranunculus flammula</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Buckthorn	<i>Rhamnus cathartica</i>
Roses	<i>Rosa spp.</i>
Bramble	<i>Rubus fruticosus agg.</i>
Common Sorrell	<i>Rumex acetosa</i>
Rusty Willow	<i>Salix cinerea oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Ragwort	<i>Senecio jacobaea</i>
Smooth Sow Thistle	<i>Sonchus oleraceus</i>
Marsh Woundwort	<i>Stachys palustris</i>
Devilsbit Scabious	<i>Succisa pratensis</i>

Species	Scientific
Dandelions	<i>Taraxacum spp.</i>
Red Clover	<i>Trifolium pratense</i>
White Clover	<i>Trifolium repens</i>
Coltsfoot	<i>Tussilago farfara</i>
Nettle	<i>Urtica dioica</i>
Common Valerian	<i>Valeriana officinalis</i>
Tufted Vetch	<i>Vicia cracca</i>
Bush Vetch	<i>Vicia sepium</i>
Violets and Pansies	<i>Viola spp.</i>
Horned Pondweed	<i>Zannichellia palustris</i>
Birds	
Goldfinch	<i>Carduelis carduelis</i>
Rook	<i>Corvus frugilegus</i>
Jackdaw	<i>Corvus monedula</i>
Robin	<i>Erithacus rubecula</i>
Kestrel	<i>Falco tinnunculus</i>
Swallow	<i>Hirundo rustica</i>
Blue tit	<i>Parus caeruleus</i>
Great tit	<i>Parus major</i>
Coal Tit	<i>Parus ater hibernicus</i>
Chiffchaff	<i>Phylloscopus collybita</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Magpie	<i>Pica pica</i>
Duncock	<i>Prunella modularis</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Odonata	
Brown Hawker	<i>Aeshna grandis</i>
Common Hawker	<i>Aeshna juncea</i>
Variable Damselfly	<i>Coenagrion puella</i>
Common Blue Damselfly	<i>Enallagma cyathigerum</i>
Blue tailed Damselfly	<i>Ischnura elegans</i>
Large Red Damselfly	<i>Pyrrhosoma nymphula</i>
Common Darter	<i>Sympetrum striolatum</i>
Lepidoptera	
Meadow Brown	<i>Maniola jurtina</i>
Speckled Wood	<i>Pararge aegeria</i>
Large White	<i>Pieris brassicae</i>

4.2 Harbertown Bridge – Huband Bridge (Distance:1km)

See Appendix A - Map 5

Habitats and Flora

Along the northern bank of the canal the towpath mosaic (TM) was characterised by a transition from treeline (WL2) comprising ash and hawthorn to road (BL3) to grassy verges (GS2) to *Phragmites* along the edges of the canal. Along the southern bank of the canal the towpath mosaic was characterized by a transition from immature treeline (WL2) comprising ash and *Acer* to grassy verges (GS2) to *Phragmites* along the edge of the canal (Plate 3.2.3). The invasive species Snowberry was found approximately 100 metres to the west of Huband Bridge.

Table 4.2.1 Habitats recorded from Harbertown Bridge to Huband Bridge

Habitat Code	Habitat Name
FW3	Canals
GS2	Dry meadows and grassy verges
BC3	Tilled land
BL3	Buildings and artificial surfaces
GA2	Amenity grassland (improved)
WS1	Scrub
GA1	Improved agricultural grassland
GS4	Wet grassland
WL1	Hedgerows
WL2	Treelines
FL8	Other artificial lakes and ponds

Table 4.2.2 Species recorded from Harbertown Bridge to Huband Bridge

Species	Scientific
Vascular Plants	
Field Maple	<i>Acer campestre</i>
Sycamore	<i>Acer pseudoplatanus</i>
Yarrow	<i>Achillea millefolium</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Water Plantain	<i>Alisma plantago-aquatica</i>
Alder	<i>Alnus glutinosa</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>
Wild Angelica	<i>Angelica sylvestris</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>
False Oat Grass	<i>Arrhenatherum elatius</i>
Wall-Rue	<i>Asplenium ruta-muraria</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>
Daisy	<i>Bellis perennis</i>
Lesser Water-parsnip	<i>Berula erecta</i>
Quaking Grass	<i>Briza media</i>
Starworts	<i>Callitriche</i> spp.
Hedge Bindweed	<i>Calystegia sepium</i>
Cuckoo Flower	<i>Cardamine pratensis</i>

Species	Scientific
Black Sedge	<i>Carex nigra</i>
Knapweed	<i>Centaurea nigra</i>
Rustyback	<i>Ceterach officinarum</i>
Charophytes	<i>Charophyta</i>
Creeping Thistle	<i>Cirsium arvense</i>
Marsh Thistle	<i>Cirsium palustre</i>
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Crested Dog's-tail	<i>Cynosurus cristatus</i>
Cock's-foot grass	<i>Dactylis glomerata</i>
Tufted Hair Grass	<i>Deschampsia cespitosa</i>
Canadian Waterweed	<i>Elodea canadensis</i>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Field Horsetail	<i>Equisetum arvense</i>
Eyebright	<i>Euphrasia</i> spp.
Red Fescue	<i>Festuca rubra</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Ash	<i>Fraxinus excelsior</i>
Cleavers	<i>Galium aparine</i>

Species	Scientific
Common Darter	<i>Sympetrum striolatum</i>
Lepidoptera	
Grass moth species	<i>Catoptria pinella</i>
Peacock	<i>Inachis io</i>

Species	Scientific
Meadow Brown	<i>Maniola jurtina</i>
Small White	<i>Pieris rapae</i>
The Cinnabar (larva)	<i>Tyria jacobaeae</i>
Red Admiral	<i>Vanessa atalanta</i>

4.3 Huband Bridge – Kilmeage Wooden Bridge (Distance: 1.7km)

See Appendix A - Maps 5 & 6

Habitats and Flora

The towpath and canal verge at this section is mostly classified as a combination of amenity grassland (GA2) and regenerating ash treeline (WL2) transitioning into (GS2) along the southern bank. The northern bank of this section is classified as a combination of scrub (WS1) comprising elder and bramble and treeline (WL2). These habitats are surrounded mainly by improved agricultural grassland (GA1) and amenity grassland (GA2), segregated by hedgerow (WL1).



Plate 4.3.1 View of towpath mosaic at the Kilmeage Wooden Bridge

Table 4.3.1 Habitats recorded from Huband Bridge to Kilmeage Wooden Bridge

Habitat Code	Habitat Name
FW3	Canals
GS2	Dry meadows and grassy verges
GA1	Improved agricultural grassland
TM	Towpath mosaic
WL2	Treelines
WL1	Hedgerows
GA2	Amenity grassland (improved)
WS1	Scrub

Table 4.3.2 Species recorded from Huband Bridge to Kilmeage Wooden Bridge

Species	Scientific
Vascular Plants	
Sycamore	<i>Acer pseudoplatanus</i>
Yarrow	<i>Achillea millefolium</i>
Common Bent	<i>Agrostis capillaris</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Water Plantain	<i>Alisma plantago-aquatica</i>
Alder	<i>Alnus glutinosa</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>
Wild Angelica	<i>Angelica sylvestris</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>
False Oat Grass	<i>Arrhenatherum elatius</i>

Species	Scientific
Wall-Rue	<i>Asplenium ruta-muraria</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>
Daisy	<i>Bellis perennis</i>
Lesser Water-parsnip	<i>Berula erecta</i>
Quaking Grass	<i>Briza media</i>
Starworts	<i>Callitriche</i> spp.
Hedge Bindweed	<i>Calystegia sepium</i>
Black Sedge	<i>Carex nigra</i>
Knapweed	<i>Centaurea nigra</i>
Rustyback	<i>Ceterach officinarum</i>
Charophytes	<i>Charophyta</i>
Creeping Thistle	<i>Cirsium arvense</i>
Marsh Thistle	<i>Cirsium palustre</i>

Species	Scientific
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Crested Dog's-tail	<i>Cynosurus cristatus</i>
Cock's-foot grass	<i>Dactylis glomerata</i>
Common Spotted-orchid	<i>Dactylorhiza fuschii</i>
Tufted Hair Grass	<i>Deschampsia cespitosa</i>
Canadian Waterweed	<i>Elodea canadensis</i>
Nuttall's Waterweed	<i>Elodea nutallii</i>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Field Horsetail	<i>Equisetum arvense</i>
Water Horsetail	<i>Equisetum fluviatile</i>
Eyebright	<i>Euphrasia spp.</i>
Red Fescue	<i>Festuca rubra</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Ash	<i>Fraxinus excelsior</i>
Cleavers	<i>Galium aparine</i>
Herb-Robert	<i>Geranium robertianum</i>
Reed Sweet Grass	<i>Glyceria maxima</i>
Ivy	<i>Hedera helix</i>
Hogweed	<i>Heracleum sphondylium</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Perforate St John's-wort	<i>Hypericum perforatum</i>
Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Flag Iris	<i>Iris pseudacorus</i>
Sharp-flowered Rush	<i>Juncus acutiflorus</i>
Toad Rush	<i>Juncus bufonius</i>
Soft Rush	<i>Juncus effusus</i>
Hard Rush	<i>Juncus inflexus</i>
Field Scabious	<i>Knautia arvensis</i>
Meadow Vetchling	<i>Lathyrus pratensis</i>
Ox-eye Daisy	<i>Leucanthemum vulgare</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Black medick	<i>Medicago lupulina</i>
Water Mint	<i>Mentha aquatica</i>
Purple Moor Grass	<i>Molinia caerulea</i>
Whorled Water Milfoil	<i>Myriophyllum spp.</i>
Watercress	<i>Nasturtium officinale</i>
Yellow Water-lily	<i>Nuphar lutea</i>
Red Bartsia	<i>Odontites verna</i>
Amphibious bistort	<i>Persicaria amphibia</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Timothy	<i>Phleum pratense</i>
Common Reed	<i>Phragmites australis</i>

Species	Scientific
Hart's-tongue	<i>Phyllitis scolopendrium</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Greater Plantain	<i>Plantago major</i>
Broad-leaved Pondweed	<i>Potamogeton natans</i>
Silverweed	<i>Potentilla anserina</i>
Cowslip	<i>Primula veris</i>
Primrose	<i>Primula vulgaris</i>
Blackthorn	<i>Prunus spinosa</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Lesser Spearwort	<i>Ranunculus flammula</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Buckthorn	<i>Rhamnus cathartica</i>
Roses	<i>Rosa spp.</i>
Bramble	<i>Rubus fruticosus agg.</i>
Common Sorrell	<i>Rumex acetosa</i>
Procumbent Pearlwort	<i>Sagina procumbens</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Rusty Willow	<i>Salix cinerea oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Ragwort	<i>Senecio jacobaea</i>
Smooth Sow Thistle	<i>Sonchus oleraceus</i>
Devilsbit Scabious	<i>Succisa pratensis</i>
Dandelions	<i>Taraxacum spp.</i>
Red Clover	<i>Trifolium pratense</i>
White Clover	<i>Trifolium repens</i>
Gorse	<i>Ulex europaeus</i>
Nettle	<i>Urtica dioica</i>
Common Valerian	<i>Valeriana officinalis</i>
Tufted Vetch	<i>Vicia cracca</i>
Bush Vetch	<i>Vicia sepium</i>
Violets and Pansies	<i>Viola spp.</i>
Horned Pondweed	<i>Zannichellia palustris</i>
Birds	
Mallard	<i>Anus platyrhynchos</i>
Buzzard	<i>Buteo buteo</i>
Linnet	<i>Carduelis cannabina</i>
Goldfinch	<i>Carduelis carduelis</i>
Greenfinch	<i>Carduelis chloris</i>
Woodpigeon	<i>Columba palumbus</i>
Rook	<i>Corvus frugilegus</i>
Jackdaw	<i>Corvus monedula</i>
Yellowhammer	<i>Emberiza citrinella</i>
Robin	<i>Erithacus rubecula</i>

Species	Scientific
Swallow	<i>Hirundo rustica</i>
Blue tit	<i>Parus caeruleus</i>
Great tit	<i>Parus major</i>
Coal Tit	<i>Periparus ater hibernicus</i>
Magpie	<i>Pica pica</i>
Goldcrest	<i>Regulus regulus</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Odonata	
Brown Hawker	<i>Aeshna grandis</i>
Common Hawker	<i>Aeshna juncea</i>

Species	Scientific
Variable Damselfly	<i>Coenagrion puella</i>
Common Blue Damselfly	<i>Enallagma cyathigerum</i>
Blue tailed Damselfly	<i>Ischnura elegans</i>
Large Red Damselfly	<i>Pyrrhosoma nymphula</i>
Common Darter	<i>Sympetrum striolatum</i>
Diptera	
Tipulidae	<i>Tipula maxima</i>
Tipulidae	<i>Tipula paludosa</i>

4.4 Kilmeague Wooden Bridge – Pim Bridge (Distance: 0.65km)

Appendix A - Map 6

Habitats and Flora

The towpath and canal verge along the southern bank at this section is mostly classified as towpath mosaic consisting of a treeline (WL2) comprising ash and elder transitioning to dry meadows and grassy verges (GS2) along the edge of the canal. The northern bank of the canal was classified as hedgerows (WL1) comprising elder, hawthorn and bramble transitioning to dry meadows and grassy verges (GS2) along the edge of the canal. Within this section of canal, small areas of mixed broadleaved woodland (WD1), wet grassland (GS4) and tilled land (BC3) were also found. The predominant habitat surrounding the edge of the canal was improved agricultural grassland (GA1).

Table 4.4.1 Habitats recorded from Kilmeague Wooden Bridge to Pim Bridge

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
FW3	Canals
TM	Towpath mosaic
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
WD1	Broadleaved woodland (mixed)
GS4	Wet grassland
BC3	Tilled land
WL2	Treelines

Table 4.4.2 Species recorded from Kilmeague Wooden Bridge to Pim Bridge

Species	Scientific
Vascular Plants	
Yarrow	<i>Achillea millefolium</i>
Common Bent	<i>Agrostis capillaris</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Alder	<i>Alnus glutinosa</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>
Wild Angelica	<i>Angelica sylvestris</i>

Species	Scientific
Cow Parsley	<i>Anthriscus sylvestris</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>
Lesser Burdock	<i>Arctium minus</i>
False Oat Grass	<i>Arrhenatherum elatius</i>
Wall-Rue	<i>Asplenium ruta-muraria</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>
Daisy	<i>Bellis perennis</i>

Species	Scientific
Lesser Water-parsnip	<i>Berula erecta</i>
Quaking Grass	<i>Briza media</i>
Starworts	<i>Callitriche</i> spp.
Hedge Bindweed	<i>Calystegia sepium</i>
Black Sedge	<i>Carex nigra</i>
Remote Sedge	<i>Carex remota</i>
Knapweed	<i>Centaurea nigra</i>
Rustyback	<i>Ceterach officinarum</i>
Creeping Thistle	<i>Cirsium arvense</i>
Marsh Thistle	<i>Cirsium palustre</i>
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Crested Dog's-tail	<i>Cynosurus cristatus</i>
Cock's-foot grass	<i>Dactylis glomerata</i>
Tufted Hair Grass	<i>Deschampsia cespitosa</i>
Canadian Waterweed	<i>Elodea canadensis</i>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Hoary Willowherb	<i>Epilobium parviflorum</i>
Field Horsetail	<i>Equisetum arvense</i>
Eyebright	<i>Euphrasia</i> spp.
Red Fescue	<i>Festuca rubra</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Ash	<i>Fraxinus excelsior</i>
Cleavers	<i>Galium aparine</i>
Herb-Robert	<i>Geranium robertianum</i>
Reed Sweet Grass	<i>Glyceria maxima</i>
Ivy	<i>Hedera helix</i>
Hogweed	<i>Heracleum sphondylium</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Imperforate St John's Wort	<i>Hypericum maculatum</i>
Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Flag Iris	<i>Iris pseudacorus</i>
Sharp-flowered Rush	<i>Juncus acutiflorus</i>
Bulbous Rush	<i>Juncus bulbosus</i>
Soft Rush	<i>Juncus effusus</i>
Hard Rush	<i>Juncus inflexus</i>
Field Scabious	<i>Knautia arvensis</i>
Meadow Vetchling	<i>Lathyrus pratensis</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Pineappleweed	<i>Matricaria discoidea</i>
Black medick	<i>Medicago lupulina</i>
Water Mint	<i>Mentha aquatica</i>

Species	Scientific
Purple Moor Grass	<i>Molinia caerulea</i>
Whorled Water Milfoil	<i>Myriophyllum</i> spp.
Watercress	<i>Nasturtium officinale</i>
Yellow Water-lily	<i>Nuphar lutea</i>
Amphibious bistort	<i>Persicaria amphibia</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Timothy	<i>Phleum pratense</i>
Common Reed	<i>Phragmites australis</i>
Hart's-tongue	<i>Phyllitis scolopendrium</i>
Burnet Saxifrage	<i>Pimpinella saxifraga</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Greater Plantain	<i>Plantago major</i>
Annual Meadow Grass	<i>Poa annua</i>
Smooth Meadow Grass	<i>Poa pratensis</i>
Broad-leaved Pondweed	<i>Potamogeton natans</i>
Silverweed	<i>Potentilla anserina</i>
Primrose	<i>Primula vulgaris</i>
Blackthorn	<i>Prunus spinosa</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Lesser Spearwort	<i>Ranunculus flammula</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Weld	<i>Reseda luteola</i>
Buckthorn	<i>Rhamnus cathartica</i>
Roses	<i>Rosa</i> spp.
Bramble	<i>Rubus fruticosus</i> agg.
Common Sorrell	<i>Rumex acetosa</i>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Wood Dock	<i>Rumex sanguineus</i>
Procumbent Pearlwort	<i>Sagina procumbens</i>
Rusty Willow	<i>Salix cinerea oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Ragwort	<i>Senecio jacobaea</i>
Smooth Sow Thistle	<i>Sonchus oleraceus</i>
Rowan	<i>Sorbus aucuparia</i>
Dandelions	<i>Taraxacum</i> spp.
Red Clover	<i>Trifolium pratense</i>
White Clover	<i>Trifolium repens</i>
Gorse	<i>Ulex europaeus</i>
Nettle	<i>Urtica dioica</i>
Common Valerian	<i>Valeriana officinalis</i>
Wood Speedwell	<i>Veronica montana</i>
Tufted Vetch	<i>Vicia cracca</i>
Bush Vetch	<i>Vicia sepium</i>
Violets and Pansies	<i>Viola</i> spp.

Species	Scientific
Birds	
Goldfinch	<i>Carduelis carduelis</i>
Woodpigeon	<i>Columba palumbus</i>
Rook	<i>Corvus frugilegus</i>
Jackdaw	<i>Corvus monedula</i>
Robin	<i>Erithacus rubecula</i>
Swallow	<i>Hirundo rustica</i>
Pied Wagtail	<i>Motacilla alba yarrellii</i>
Great tit	<i>Parus major</i>
Coal Tit	<i>Periparus ater hibernicus</i>
Magpie	<i>Pica pica</i>
Dunnock	<i>Prunella modularis</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Goldcrest	<i>Regulus regulus</i>
Starling	<i>Sturnus vulgaris</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>

Species	Scientific
Odonata	
Brown Hawker	<i>Aeshna grandis</i>
Variable Damselfly	<i>Coenagrion puella</i>
Common Blue Damselfly	<i>Enallagma cyathigerum</i>
Blue tailed Damselfly	<i>Ischnura elegans</i>
Large Red Damselfly	<i>Pyrrhosoma nymphula</i>
Lepidoptera	
Speckled Wood	<i>Pararge aegeria</i>
Large White	<i>Pieris brassicae</i>
Diptera	
Syrphidae	<i>Melanostomna scalare</i>
Syrphidae	<i>Myathropa florum</i>
Mammals	
Otter	<i>Lutra lutra</i>
Badger	<i>Meles meles</i>

4.5 Pim Bridge – Pluckerstown Bridge (Distance 1.75km)

See Appendix A - Maps 7 & 8

Habitats and Flora

The northern bank of this section of canal was characterized by a towpath mosaic comprising a treeline (WL2) consisting mainly of ash, transitioning into an artificial surface (BL3) and to dry meadows and grassy verges (GS2) along the edge of the canal (see Plate 4.5.1). Similarly, the southern edge of the canal comprised a towpath mosaic of treeline (WL2) made up mainly of ash, transitioning to dry meadows and grassy verges (GS2) along the edge of the canal (FW3).



Plate 4.5.1 View of towpath mosaic along this section of canal

Within this section of canal, small areas of tilled land (BC3) and mixed broadleaved woodland (WD1) were found. The predominant habitat surrounding the edge of the canal was improved agricultural grassland (GA1).

Table 4.5.1 Habitats recorded from Pim Bridge to Pluckerstown Bridge

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
FW3	Canals
TM	Towpath mosaic
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
WD1	Broadleaved woodland (mixed)

Habitat Code	Habitat Name
BC3	Tilled land
WL1	Hedgerows
WL2	Treelines

Table 4.5.2 Species recorded from Pim Bridge to Pluckerstown Bridge

Species	Scientific
Vascular Plants	
Field Maple	<i>Acer campestre</i>
Yarrow	<i>Achillea millefolium</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Alder	<i>Alnus glutinosa</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>
Wild Angelica	<i>Angelica sylvestris</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>
Lesser Burdock	<i>Arctium minus</i>
False Oat Grass	<i>Arrhenatherum elatius</i>
Wall-Rue	<i>Asplenium ruta-muraria</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>
Daisy	<i>Bellis perennis</i>
Lesser Water-parsnip	<i>Berula erecta</i>
Downy Birch	<i>Betula pubescens</i>
Quaking Grass	<i>Briza media</i>
Starworts	<i>Callitriche</i> spp.
Hedge Bindweed	<i>Calystegia sepium</i>
Cuckoo Flower	<i>Cardamine pratensis</i>
Black Sedge	<i>Carex nigra</i>
Remote Sedge	<i>Carex remota</i>
Knapweed	<i>Centaurea nigra</i>
Rustyback	<i>Ceterach officinarum</i>
Creeping Thistle	<i>Cirsium arvense</i>
Marsh Thistle	<i>Cirsium palustre</i>
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Crested Dog's-tail	<i>Cynosurus cristatus</i>
Cock's-foot grass	<i>Dactylis glomerata</i>
Common Spotted-orchid	<i>Dactylorhiza fuschii</i>
Tufted Hair Grass	<i>Deschampsia cespitosa</i>
Canadian Waterweed	<i>Elodea canadensis</i>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Hoary Willowherb	<i>Epilobium parviflorum</i>
Field Horsetail	<i>Equisetum arvense</i>
Common Whitlowgrass	<i>Erophila verna</i>
Eyebright	<i>Euphrasia</i> spp.

Species	Scientific
Red Fescue	<i>Festuca rubra</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Common Water Moss	<i>Fontinalis antipyretica</i>
Ash	<i>Fraxinus excelsior</i>
Cleavers	<i>Galium aparine</i>
Herb-Robert	<i>Geranium robertianum</i>
Reed Sweet Grass	<i>Glyceria maxima</i>
Ivy	<i>Hedera helix</i>
Mare's-tail	<i>Hippuris vulgaris</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Perforate St John's-wort	<i>Hypericum perforatum</i>
Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Catsear	<i>Hypochaeris radicata</i>
Flag Iris	<i>Iris pseudacorus</i>
Sharp-flowered Rush	<i>Juncus acutiflorus</i>
Jointed Rush	<i>Juncus articulatus</i>
Toad Rush	<i>Juncus bufonius</i>
Bulbous Rush	<i>Juncus bulbosus</i>
Soft Rush	<i>Juncus effusus</i>
Hard Rush	<i>Juncus inflexus</i>
Field Scabious	<i>Knautia arvensis</i>
Meadow Vetchling	<i>Lathyrus pratensis</i>
Common Duckweed	<i>Lemna minor</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Honeysuckle	<i>Lonicera periclymenum</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Black medick	<i>Medicago lupulina</i>
Bogbean	<i>Menyanthes trifoliata</i>
Purple Moor Grass	<i>Molinia caerulea</i>
Whorled Water Milfoil	<i>Myriophyllum</i> spp.
Watercress	<i>Nasturtium officinale</i>
Yellow Water-lily	<i>Nuphar lutea</i>
Amphibious bistort	<i>Persicaria amphibia</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Common Reed	<i>Phragmites australis</i>
Hart's-tongue	<i>Phyllitis scolopendrium</i>
Burnet Saxifrage	<i>Pimpinella saxifraga</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Greater Plantain	<i>Plantago major</i>

Species	Scientific
Smooth Meadow Grass	<i>Poa pratensis</i>
Broad-leaved Pondweed	<i>Potamogeton natans</i>
Silverweed	<i>Potentilla anserina</i>
Tormentil	<i>Potentilla erecta</i>
Primrose	<i>Primula vulgaris</i>
Selfheal	<i>Prunella vulgaris</i>
Blackthorn	<i>Prunus spinosa</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Lesser Spearwort	<i>Ranunculus flammula</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Buckthorn	<i>Rhamnus cathartica</i>
Roses	<i>Rosa</i> spp.
Bramble	<i>Rubus fruticosus</i> agg.
Common Sorrell	<i>Rumex acetosa</i>
Wood Dock	<i>Rumex sanguineus</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Rusty Willow	<i>Salix cinerea oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Ragwort	<i>Senecio jacobaea</i>
Smooth Sow Thistle	<i>Sonchus oleraceus</i>
Rowan	<i>Sorbus aucuparia</i>
Unbranched Bur-reed	<i>Sparganium emersum</i>
Devilsbit Scabious	<i>Succisa pratensis</i>
Dandelions	<i>Taraxacum</i> spp.
Upright Hedge-parsley	<i>Torilis japonica</i>
Red Clover	<i>Trifolium pratense</i>
White Clover	<i>Trifolium repens</i>
Bulrush	<i>Typha latifolia</i>
Gorse	<i>Ulex europaeus</i>
Nettle	<i>Urtica dioica</i>
Common Valerian	<i>Valeriana officinalis</i>
Tufted Vetch	<i>Vicia cracca</i>
Bush Vetch	<i>Vicia sepium</i>
Violets and Pansies	<i>Viola</i> spp.
Horned Pondweed	<i>Zannichellia palustris</i>

Species	Scientific
Birds	
Sparrowhawk	<i>Accipiter nissus</i>
Goldfinch	<i>Carduelis carduelis</i>
Greenfinch	<i>Carduelis chloris</i>
Woodpigeon	<i>Columba palumbus</i>
Rook	<i>Corvus frugilegus</i>
Jackdaw	<i>Corvus monedula</i>
Yellowhammer	<i>Emberiza citrinella</i>
Robin	<i>Erithacus rubecula</i>
Swallow	<i>Hirundo rustica</i>
Tree Sparrow	<i>Passer montanus</i>
Coal Tit	<i>Periparus ater hibernicus</i>
Chiffchaff	<i>Phylloscopus collybita</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Magpie	<i>Pica pica</i>
Dunnock	<i>Prunella modularis</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Starling	<i>Sturnus vulgaris</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Odonata	
Brown Hawker	<i>Aeshna grandis</i>
Common Hawker	<i>Aeshna juncea</i>
Variable Damselfly	<i>Coenagrion puella</i>
Common Blue Damselfly	<i>Enallagma cyathigerum</i>
Blue tailed Damselfly	<i>Ischnura elegans</i>
Large Red Damselfly	<i>Pyrrhosoma nymphula</i>
Lepidoptera	
Small Tortoiseshell	<i>Aglais urticae</i>
Speckled Wood	<i>Pararge aegeria</i>
Large White	<i>Pieris brassicae</i>
Small White	<i>Pieris rapae</i>

4.6 Pluckerstown Bridge – Milltown Accommodation Bridge (Distance 3.4km)

See Appendix A – Maps 8-10

Habitats and Flora

A large proportion of the towpath and canal bank on both edges of the canal comprises a combination of treelines (WL2) transitioning to artificial surfaces (BL3) to dry meadows and grassy verges (GS2) along the edge of the canal (FW3). A leached esker ridge along the west bank between Pluckerstown and Milltown Bridges supports a high diversity of species characteristic of nutrient poor soils

Both the north and south verges of the canal are surrounded by sections of wet grassland (GS4) and improved agricultural grassland (GA1). A section of mixed conifer woodland (WD3) is located close to Pluckerstown Bridge.



Plate 4.6.1 View of towpath mosaic

Table 4.6.1 Habitats recorded from Pluckerstown Bridge to Milltown Accommodation Bridge

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
FW3	Canals
TM	Towpath mosaic
GS4	Wet grassland
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
WD1	Broadleaved woodland (mixed)
WD2	Mixed broadleaved/conifer woodland
WD3	(Mixed) conifer woodland
WL2	Treelines
WL1	Hedgerows

Table 4.6.2 Species recorded from Pluckerstown Bridge to Milltown Accommodation Bridge

Species	Scientific
Vascular Plants	
Field Maple	<i>Acer campestre</i>
Yarrow	<i>Achillea millefolium</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Water Plantain	<i>Alisma plantago-aquatica</i>
Alder	<i>Alnus glutinosa</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>
Wild Angelica	<i>Angelica sylvestris</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>
False Oat Grass	<i>Arrhenatherum elatius</i>
Wall-Rue	<i>Asplenium ruta-muraria</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>
Daisy	<i>Bellis perennis</i>

Species	Scientific
Lesser Water-parsnip	<i>Berula erecta</i>
Quaking Grass	<i>Briza media</i>
Starworts	<i>Callitriche</i> spp.
Hedge Bindweed	<i>Calystegia sepium</i>
Black Sedge	<i>Carex nigra</i>
Remote Sedge	<i>Carex remota</i>
Knapweed	<i>Centaurea nigra</i>
Rustyback	<i>Ceterach officinarum</i>
Creeping Thistle	<i>Cirsium arvense</i>
Marsh Thistle	<i>Cirsium palustre</i>
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Crested Dog's-tail	<i>Cynosurus cristatus</i>
Cock's-foot grass	<i>Dactylis glomerata</i>
Tufted Hair Grass	<i>Deschampsia cespitosa</i>

Species	Scientific
Canadian Waterweed	<i>Elodea canadensis</i>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Field Horsetail	<i>Equisetum arvense</i>
Eyebright	<i>Euphrasia spp.</i>
Red Fescue	<i>Festuca rubra</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Common Water Moss	<i>Fontinalis antipyretica</i>
Ash	<i>Fraxinus excelsior</i>
Cleavers	<i>Galium aparine</i>
Herb-Robert	<i>Geranium robertianum</i>
Reed Sweet Grass	<i>Glyceria maxima</i>
Ivy	<i>Hedera helix</i>
Hogweed	<i>Heracleum sphondylium</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Imperforate St John's Wort	<i>Hypericum maculatum</i>
Perforate St John's-wort	<i>Hypericum perforatum</i>
Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Catsear	<i>Hypochaeris radicata</i>
Flag Iris	<i>Iris pseudacorus</i>
Sharp-flowered Rush	<i>Juncus acutiflorus</i>
Bulbous Rush	<i>Juncus bulbosus</i>
Soft Rush	<i>Juncus effusus</i>
Hard Rush	<i>Juncus inflexus</i>
Blunt-flowered Rush	<i>Juncus subnodulos</i>
Field Scabious	<i>Knautia arvensis</i>
Meadow Vetchling	<i>Lathyrus pratensis</i>
Common Duckweed	<i>Lemna minor</i>
Ivy-leaved Duckweed	<i>Lemna trisulca</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Purple-loosestrife	<i>Lythrum salicaria</i>
Black medick	<i>Medicago lupulina</i>
Water Mint	<i>Mentha aquatica</i>
Bogbean	<i>Menyanthes trifoliata</i>
Purple Moor Grass	<i>Molinia caerulea</i>
Water-forget-me-not	<i>Myosotis scorpioides</i>
Whorled Water Milfoil	<i>Myriophyllum spp.</i>
Watercress	<i>Nasturtium officinale</i>
Yellow Water-lily	<i>Nuphar lutea</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Timothy	<i>Phleum pratense</i>
Common Reed	<i>Phragmites australis</i>
Hart's-tongue	<i>Phyllitis scolopendrium</i>

Species	Scientific
Ribwort Plantain	<i>Plantago lanceolata</i>
Greater Plantain	<i>Plantago major</i>
Annual Meadow Grass	<i>Poa annua</i>
Smooth Meadow Grass	<i>Poa pratensis</i>
Silverweed	<i>Potentilla anserina</i>
Tormentil	<i>Potentilla erecta</i>
Selfheal	<i>Prunella vulgaris</i>
Blackthorn	<i>Prunus spinosa</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Bulbous Buttercup	<i>Ranunculus bulbosus</i>
Fan-leaved Water Crowfoot	<i>Ranunculus circinatus</i>
Lesser Spearwort	<i>Ranunculus flammula</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Buckthorn	<i>Rhamnus cathartica</i>
Roses	<i>Rosa spp.</i>
Bramble	<i>Rubus fruticosus agg.</i>
Common Sorrell	<i>Rumex acetosa</i>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Wood Dock	<i>Rumex sanguineus</i>
Rusty Willow	<i>Salix cinerea oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Ragwort	<i>Senecio jacobaea</i>
Smooth Sow Thistle	<i>Sonchus oleraceus</i>
Rowan	<i>Sorbus aucuparia</i>
Unbranched Bur-reed	<i>Sparganium emersum</i>
Devilsbit Scabious	<i>Succisa pratensis</i>
Dandelions	<i>Taraxacum spp.</i>
Red Clover	<i>Trifolium pratense</i>
White Clover	<i>Trifolium repens</i>
Bulrush	<i>Typha latifolia</i>
Nettle	<i>Urtica dioica</i>
Common Valerian	<i>Valeriana officinalis</i>
Tufted Vetch	<i>Vicia cracca</i>
Bush Vetch	<i>Vicia sepium</i>
Violets and Pansies	<i>Viola spp.</i>
Birds	
Long-tailed Tit	<i>Aegithalos caudatus</i>
Linnet	<i>Carduelis cannabina</i>
Goldfinch	<i>Carduelis carduelis</i>
Woodpigeon	<i>Columba palumbus</i>
Jackdaw	<i>Corvus monedula</i>
Reed Bunting	<i>Emberiza schoeniclus</i>
Robin	<i>Erithacus rubecula</i>

Species	Scientific
Swallow	<i>Hirundo rustica</i>
Blue tit	<i>Parus caeruleus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Magpie	<i>Pica pica</i>
Starling	<i>Sturnus vulgaris</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Odonata	
Brown Hawker	<i>Aeshna grandis</i>
Variable Damselfly	<i>Coenagrion puella</i>
Common Blue Damselfly	<i>Enallagma cyathigerum</i>
Blue tailed Damselfly	<i>Ischnura elegans</i>
Large Red Damselfly	<i>Pyrrhosoma nymphula</i>

Species	Scientific
Ruddy Darter	<i>Sympetrum sanguineum</i>
Common Darter	<i>Sympetrum striolatum</i>
Lepidoptera	
Small Tortoiseshell	<i>Aglais urticae</i>
Small Copper	<i>Lycaena phlaes</i>
Speckled Wood	<i>Pararge aegeria</i>
Large White	<i>Pieris brassicae</i>
Diptera	
Syrphidae	<i>Melanostomna scalare</i>
Syrphidae	<i>Myathropa florum</i>
Tipulidae	<i>Tipula maxima</i>

4.7 Milltown Accommodation Bridge – Milltown Bridge (Distance 0.55km)

See Appendix A – Map 10

Habitats and Flora

Along this section of the Milltown Feeder branch of the Grand Canal those habitats present include Towpath mosaic (TM), with sections of stone walls (BL1) and artificial ground (BL3). This section is mainly surrounded by improved agricultural grassland (GA1). The verge within this area comprises a treeline (WL2) transitioning to dry meadow and grassy verge (GS2). The predominant habitats surrounding the canal were amenity grassland (GA2) and improved agricultural grassland (GA1). A section of wet grassland (GS4) was also found within this section surrounding the edge of the canal.



Plate 4.7.1 View of canal showing towpath mosaic

Table 4.7.1 Habitats recorded from Milltown Accommodation Bridge to Milltown Bridge

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
FW3	Canals
FS1	Reed and large sedge swamp
TM	Towpath mosaic
GS4	Wet grassland
GS2	Dry meadows and grassy verges
GA2	Amenity grassland (improved)
BL3	Buildings and artificial surfaces
BL1	Stone walls and other stonework
WL1	Hedgerows
WL2	Treelines

Table 4.7.2 Species recorded from Milltown Accommodation Bridge to Milltown Bridge

Species	Scientific	Species	Scientific
Vascular Plants		Yorkshire Fog	<i>Holcus lanatus</i>
Yarrow	<i>Achillea millefolium</i>	Perforate St John's-wort	<i>Hypericum perforatum</i>
Creeping Bent	<i>Agrostis stolonifera</i>	Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Alder	<i>Alnus glutinosa</i>	Flag Iris	<i>Iris pseudacorus</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>	Sharp-flowered Rush	<i>Juncus acutiflorus</i>
Wild Angelica	<i>Angelica sylvestris</i>	Jointed Rush	<i>Juncus articulatus</i>
Cow Parsley	<i>Anthriscus sylvestris</i>	Toad Rush	<i>Juncus bufonius</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	Bulbous Rush	<i>Juncus bulbosus</i>
False Oat Grass	<i>Arrhenatherum elatius</i>	Soft Rush	<i>Juncus effusus</i>
Wall-Rue	<i>Asplenium ruta-muraria</i>	Hard Rush	<i>Juncus inflexus</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>	Blunt-flowered Rush	<i>Juncus subnodulosus</i>
Daisy	<i>Bellis perennis</i>	Field Scabious	<i>Knautia arvensis</i>
Lesser Water-parsnip	<i>Berula erecta</i>	Meadow Vetchling	<i>Lathyrus pratensis</i>
Downy Birch	<i>Betula pubescens</i>	Perennial Ryegrass	<i>Lolium perenne</i>
Quaking Grass	<i>Briza media</i>	Bird's foot trefoil	<i>Lotus corniculatus</i>
Starworts	<i>Callitriche</i> spp.	Purple-loosestrife	<i>Lythrum salicaria</i>
Hedge Bindweed	<i>Calystegia sepium</i>	Field Woodrush	<i>Luzula campestris</i>
Black Sedge	<i>Carex nigra</i>	Black medick	<i>Medicago lupulina</i>
Bottle Sedge	<i>Carex rostrata</i>	Water Mint	<i>Mentha aquatica</i>
Knapweed	<i>Centaurea nigra</i>	Bogbean	<i>Menyanthes trifoliata</i>
Rustyback	<i>Ceterach officinarum</i>	Purple Moor Grass	<i>Molinia caerulea</i>
Creeping Thistle	<i>Cirsium arvense</i>	Water-forget-me-not	<i>Myosotis scorpioides</i>
Marsh Thistle	<i>Cirsium palustre</i>	Whorled Water Milfoil	<i>Myriophyllum</i> spp.
Hazel	<i>Corylus avellana</i>	Watercress	<i>Nasturtium officinale</i>
Hawthorn	<i>Crataegus monogyna</i>	Yellow Water-lily	<i>Nuphar lutea</i>
Crested Dog's-tail	<i>Cynosurus cristatus</i>	Butterbur	<i>Petastes hybridus</i>
Cock's-foot grass	<i>Dactylis glomerata</i>	Reed Canary Grass	<i>Phalaris arundinacea</i>
Tufted Hair Grass	<i>Deschampsia cespitosa</i>	Timothy	<i>Phleum pratense</i>
Canadian Waterweed	<i>Elodea canadensis</i>	Common Reed	<i>Phragmites australis</i>
Rosebay	<i>Epilobium angustifolium</i>	Ribwort Plantain	<i>Plantago lanceolata</i>
Great Willowherb	<i>Epilobium hirsutum</i>	Greater Plantain	<i>Plantago major</i>
Hoary Willowherb	<i>Epilobium parviflorum</i>	Annual Meadow Grass	<i>Poa annua</i>
Field Horsetail	<i>Equisetum arvense</i>	Silverweed	<i>Potentilla anserina</i>
Hemp Agrimony	<i>Eupatorium cannabinum</i>	Tormentil	<i>Potentilla erecta</i>
Eyebright	<i>Euphrasia</i> spp.	Blackthorn	<i>Prunus spinosa</i>
Red Fescue	<i>Festuca rubra</i>	Meadow Buttercup	<i>Ranunculus acris</i>
Meadowsweet	<i>Filipendula ulmaria</i>	Fan-leaved Water Crowfoot	<i>Ranunculus circinatus</i>
Ash	<i>Fraxinus excelsior</i>	Lesser Spearwort	<i>Ranunculus flammula</i>
Cleavers	<i>Galium aparine</i>	Creeping Buttercup	<i>Ranunculus repens</i>
Dove's-foot Crane's-bill	<i>Geranium molle</i>	Buckthorn	<i>Rhamnus cathartica</i>
Herb-Robert	<i>Geranium robertianum</i>	Roses	<i>Rosa</i> spp.
Reed Sweet Grass	<i>Glyceria maxima</i>	Bramble	<i>Rubus fruticosus</i> agg.
Ivy	<i>Hedera helix</i>	Common Sorrell	<i>Rumex acetosa</i>
Hogweed	<i>Heracleum sphondylium</i>		

Species	Scientific
Broad-leaved Dock	<i>Rumex obtusifolius</i>
White Willow	<i>Salix alba</i>
Rusty Willow	<i>Salix cinerea oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Biting Stonecrop	<i>Sedum acre</i>
Ragwort	<i>Senecio jacobaea</i>
Smooth Sow Thistle	<i>Sonchus oleraceus</i>
Rowan	<i>Sorbus aucuparia</i>
Irish Whitebeam	<i>Sorbus hibernica</i>
Unbranched Bur-reed	<i>Sparganium emersum</i>
Devilsbit Scabious	<i>Succisa pratensis</i>
Dandelions	<i>Taraxacum spp.</i>
Red Clover	<i>Trifolium pratense</i>
White Clover	<i>Trifolium repens</i>
Bulrush	<i>Typha latifolia</i>
Gorse	<i>Ulex europaeus</i>
Nettle	<i>Urtica dioica</i>
Common Valerian	<i>Valeriana officinalis</i>
Tufted Vetch	<i>Vicia cracca</i>
Bush Vetch	<i>Vicia sepium</i>
Violets and Pansies	<i>Viola spp.</i>
Birds	
Heron	<i>Ardea cinerea</i>
Greenfinch	<i>Carduelis chloris</i>
Jackdaw	<i>Corvus monedula</i>
Coot	<i>Fulica atra</i>
Swallow	<i>Hirundo rustica</i>
Blue tit	<i>Parus caeruleus</i>
Coal Tit	<i>Periparus ater hibernicus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>

Species	Scientific
Magpie	<i>Pica pica</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Goldcrest	<i>Regulus regulus</i>
Starling	<i>Sturnus vulgaris</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Odonata	
Brown Hawker	<i>Aeshna grandis</i>
Common Hawker	<i>Aeshna juncea</i>
Variable Damselfly	<i>Coenagrion puella</i>
Common Blue Damselfly	<i>Enallagma cyathigerum</i>
Blue tailed Damselfly	<i>Ischnura elegans</i>
Large Red Damselfly	<i>Pyrrhosoma nymphula</i>
Common Darter	<i>Sympetrum striolatum</i>
Lepidoptera	
Peacock	<i>Inachis io</i>
Speckled Wood	<i>Pararge aegeria</i>
Large White	<i>Pieris brassicae</i>
Small White	<i>Pieris rapae</i>
The Cinnabar (larva)	<i>Tyria jacobaeae</i>
Diptera	
Syrphidae	<i>Syrphus ribesii</i>
Syrphidae	<i>Myathropa florum</i>
Tipulidae	<i>Tipula paludosa</i>

4.8 Milltown Bridge – Pollardstown Fen (Distance 2.45km)

See Appendix A - Map 11

Habitats and Flora

This section forms ESA1 (see Section 5). This section of the Milltown Feeder branch of the Grand Canal comprises a wide variation of habitats. A diverse *Phragmites* reed fringe is located south of Milltown Bridge (FS1) (see Plate 4.8.1). The towpaths and canal verges are mainly classified as dry meadows and grassy verges (GS2) along with treelines (WL2) and reed and large sedge swamps (FS1). Drainage ditches (FW4) and reed and large sedge swamps (FS1) were found along the section close to Pollardstown Fen. Sections of mixed conifer woodland (WD3), wet willow-alder-ash woodland (WN6), improved agricultural grassland (GA1) and wet grassland (GS4) were found in the area surrounding the canal.



Plate 4.8.1 View along the canal showing the towpath mosaic

Table 4.8.1 Habitats recorded from Milltown Bridge to Pollardstown Fen

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
FW3	Canals
TM	Towpath mosaic
GS4	Wet grassland
GS2	Dry meadows and grassy verges
GA2	Amenity grassland
BL3	Buildings and artificial surfaces
FS1	Reed and large sedge swamps
WN6	Wet willow-alder-ash woodland
WD3	(Mixed) conifer woodland
FW2	Depositing/lowland rivers
FW4	Drainage ditches
WL1	Hedgerows
WL2	Treelines

Table 4.8.2 Species recorded from Milltown Bridge to Pollardstown Fen

Species	Scientific
Vascular Plants	
Yarrow	<i>Achillea millefolium</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Alder	<i>Alnus glutinosa</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>
Wild Angelica	<i>Angelica sylvestris</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>
False Oat Grass	<i>Arrhenatherum elatius</i>
Wall-Rue	<i>Asplenium ruta-muraria</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>
Daisy	<i>Bellis perennis</i>
Lesser Water-parsnip	<i>Berula erecta</i>

Species	Scientific
Downy Birch	<i>Betula pubescens</i>
Quaking Grass	<i>Briza media</i>
Starworts	<i>Callitriche</i> spp.
Hedge Bindweed	<i>Calystegia sepium</i>
Cuckoo Flower	<i>Cardamine pratensis</i>
Black Sedge	<i>Carex nigra</i>
Greater Tussock-sedge	<i>Carex paniculata</i>
Flea Sedge	<i>Carex pulicaris</i>
Knapweed	<i>Centaurea nigra</i>
Rustyback	<i>Ceterach officinarum</i>
Creeping Thistle	<i>Cirsium arvense</i>
Marsh Thistle	<i>Cirsium palustre</i>
Great Fen-sedge	<i>Cladium mariscus</i>

Species	Scientific
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Crested Dog's-tail	<i>Cynosurus cristatus</i>
Cock's-foot grass	<i>Dactylis glomerata</i>
Tufted Hair Grass	<i>Deschampsia cespitosa</i>
Canadian Waterweed	<i>Elodea canadensis</i>
Couch Grass	<i>Elymus repens</i>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Hoary Willowherb	<i>Epilobium parviflorum</i>
Field Horsetail	<i>Equisetum arvense</i>
Hemp Agrimony	<i>Eupatorium cannabinum</i>
Eyebright	<i>Euphrasia spp.</i>
Red Fescue	<i>Festuca rubra</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Ash	<i>Fraxinus excelsior</i>
Cleavers	<i>Galium aparine</i>
Common Marsh-bedstraw	<i>Galium palustre</i>
Herb-Robert	<i>Geranium robertianum</i>
Reed Sweet Grass	<i>Glyceria maxima</i>
Ivy	<i>Hedera helix</i>
Hogweed	<i>Heracleum sphondylium</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Imperforate St John's Wort	<i>Hypericum maculatum</i>
Perforate St John's-wort	<i>Hypericum perforatum</i>
Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Catsear	<i>Hypochaeris radicata</i>
Flag Iris	<i>Iris pseudacorus</i>
Sharp-flowered Rush	<i>Juncus acutiflorus</i>
Jointed Rush	<i>Juncus articulatus</i>
Toad Rush	<i>Juncus bufonius</i>
Bulbous Rush	<i>Juncus bulbosus</i>
Soft Rush	<i>Juncus effusus</i>
Hard Rush	<i>Juncus inflexus</i>
Blunt-flowered Rush	<i>Juncus subnodulosus</i>
Field Scabious	<i>Knautia arvensis</i>
Meadow Vetchling	<i>Lathyrus pratensis</i>
Common Duckweed	<i>Lemna minor</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Honeysuckle	<i>Lonicera periclymenum</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Purple-loosestrife	<i>Lythrum salicaria</i>
Black medick	<i>Medicago lupulina</i>

Species	Scientific
Water Mint	<i>Mentha aquatica</i>
Bogbean	<i>Menyanthes trifoliata</i>
Purple Moor Grass	<i>Molinia caerulea</i>
Water-forget-me-not	<i>Myosotis scorpioides</i>
Whorled Water Milfoil	<i>Myriophyllum spp.</i>
Yellow Water-lily	<i>Nuphar lutea</i>
Grass-of-Parnassus	<i>Parnassia palustris</i>
Marsh Lousewort	<i>Pedicularis palustris</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Timothy	<i>Phleum pratense</i>
Common Reed	<i>Phragmites australis</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Greater Plantain	<i>Plantago major</i>
Annual Meadow Grass	<i>Poa annua</i>
Silverweed	<i>Potentilla anserina</i>
Tormentil	<i>Potentilla erecta</i>
Blackthorn	<i>Prunus spinosa</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Fan-leaved Water Crowfoot	<i>Ranunculus circinatus</i>
Lesser Spearwort	<i>Ranunculus flammula</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Buckthorn	<i>Rhamnus cathartica</i>
Roses	<i>Rosa spp.</i>
Bramble	<i>Rubus fruticosus agg.</i>
Common Sorrell	<i>Rumex acetosa</i>
White Willow	<i>Salix alba</i>
Rusty Willow	<i>Salix cinerea oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Ragwort	<i>Senecio jacobaea</i>
Smooth Sow Thistle	<i>Sonchus oleraceus</i>
Rowan	<i>Sorbus aucuparia</i>
Irish Whitebeam	<i>Sorbus hibernica</i>
Unbranched Bur-reed	<i>Sparganium emersum</i>
Devilsbit Scabious	<i>Succisa pratensis</i>
Dandelions	<i>Taraxacum spp.</i>
Red Clover	<i>Trifolium pratense</i>
White Clover	<i>Trifolium repens</i>
Marsh Arrowgrass	<i>Triglochin palustre</i>
Bulrush	<i>Typha latifolia</i>
Nettle	<i>Urtica dioica</i>
Common Valerian	<i>Valeriana officinalis</i>
Tufted Vetch	<i>Vicia cracca</i>
Bush Vetch	<i>Vicia sepium</i>
Violets and Pansies	<i>Viola spp.</i>

Species	Scientific
Birds	
Sparrowhawk	<i>Accipiter nissus</i>
Long-tailed Tit	<i>Aegithalos caudatus</i>
Meadow Pipit	<i>Anthus pratensis</i>
Heron	<i>Ardea cinerea</i>
Buzzard	<i>Buteo buteo</i>
Linnet	<i>Carduelis cannabina</i>
Goldfinch	<i>Carduelis carduelis</i>
Greenfinch	<i>Carduelis chloris</i>
Raven	<i>Corvus corax</i>
Hooded Crow	<i>Corvus corone cornix</i>
Jackdaw	<i>Corvus monedula</i>
Reed Bunting	<i>Emberiza schoeniclus</i>
Robin	<i>Erithacus rubecula</i>
Kestrel	<i>Falco tinnunculus</i>
Snipe	<i>Gallinago gallinago</i>
Swallow	<i>Hirundo rustica</i>
Grasshopper Warbler	<i>Locustella naevia</i>
Pied Wagtail	<i>Motacilla alba yarrellii</i>
Coal Tit	<i>Parus ater hibernicus</i>
Chiffchaff	<i>Phylloscopus collybita</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Magpie	<i>Pica pica</i>
Duncock	<i>Prunella modularis</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Water Rail	<i>Rallus aquaticus</i>
Goldcrest	<i>Regulus regulus</i>
Starling	<i>Sturnus vulgaris</i>
Whitethroat	<i>Sylvia communis</i>
Blackcap	<i>Sylvia communis</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Odonata	
Brown Hawker	<i>Aeshna grandis</i>
Common Hawker	<i>Aeshna juncea</i>
Variable Damselfly	<i>Coenagrion puella</i>
Common Blue Damselfly	<i>Enallagma cyathigerum</i>
Blue tailed Damselfly	<i>Ischnura elegans</i>
Four spotted Chaser	<i>Libellula quadrimaculata</i>
Large Red Damselfly	<i>Pyrrhosoma nymphula</i>
Black Darter	<i>Sympetrum danae</i>
Ruddy Darter	<i>Sympetrum sanguineum</i>
Common Darter	<i>Sympetrum striolatum</i>

Species	Scientific
Lepidoptera	
Silver Y	<i>Autographa gamma</i>
Grass moth species	<i>Catoptria pinella</i>
Broom Moth (larva)	<i>Ceramica pisi</i>
The Drinker	<i>Euthrix potatoria</i>
Meadow Brown	<i>Maniola jurtina</i>
Oblique Carpet	<i>Orthonama vittata</i>
Speckled Wood	<i>Pararge aegeria</i>
Large White	<i>Pieris brassicae</i>
Green veined White	<i>Pieris napi</i>
Small White	<i>Pieris rapae</i>
Diptera	
Syrphidae	<i>Syrphus ribesii</i>
Syrphidae	<i>Myathropa florum</i>
Tipulidae	<i>Tipula maxima</i>
Tipulidae	<i>Tipula paludosa</i>
Mammals	
Otter	<i>Lutra lutra</i>

5. ECOLOGICALLY SENSITIVE AREAS

5.1 ESA1 Pollardstown

(Maps 10 & 11)

This ESA comprises an internationally important calcareous spring fed fen at the southern limit of the Milltown Feeder. This site is designated as a Special Area of Conservation for *Cladium* Fens, Petrifying Springs, Alkaline Fens, and for three species of Whorl Snail (*Vertigo geyeri*; *V. angustior*, and *V. moulinsiana*).

Pollardstown Fen is unusual in Ireland as it is an extensive area of primary and secondary fen peat, lacking scrub vegetation on its surface. The fen vegetation is generally from 0.5 - 1.5 m high and consists mainly of Great Fen-sedge (*Cladium mariscus*), Common Reed (*Phragmites australis*), Blunt-flowered Rush (*Juncus subnodulosus*) and a variety of sedges (*Carex* spp.). The vegetation is quite varied and species-rich, with numerous well-defined plant communities and several rare or scarce species. These include Narrow-leaved Marsh-orchid (*Dactylorhiza traunsteineri*), Fly Orchid (*Ophrys insectifera*) and Broad-leaved Cottongrass (*Eriophorum latifolium*). Of particular interest is the occurrence of the moss, *Homalothecium nitens* - a boreal relict species which is rare in Ireland.



Plate 5.1 ESA1 (Pollardstown Fen) exhibiting large areas of rich fen and flush (PF1)

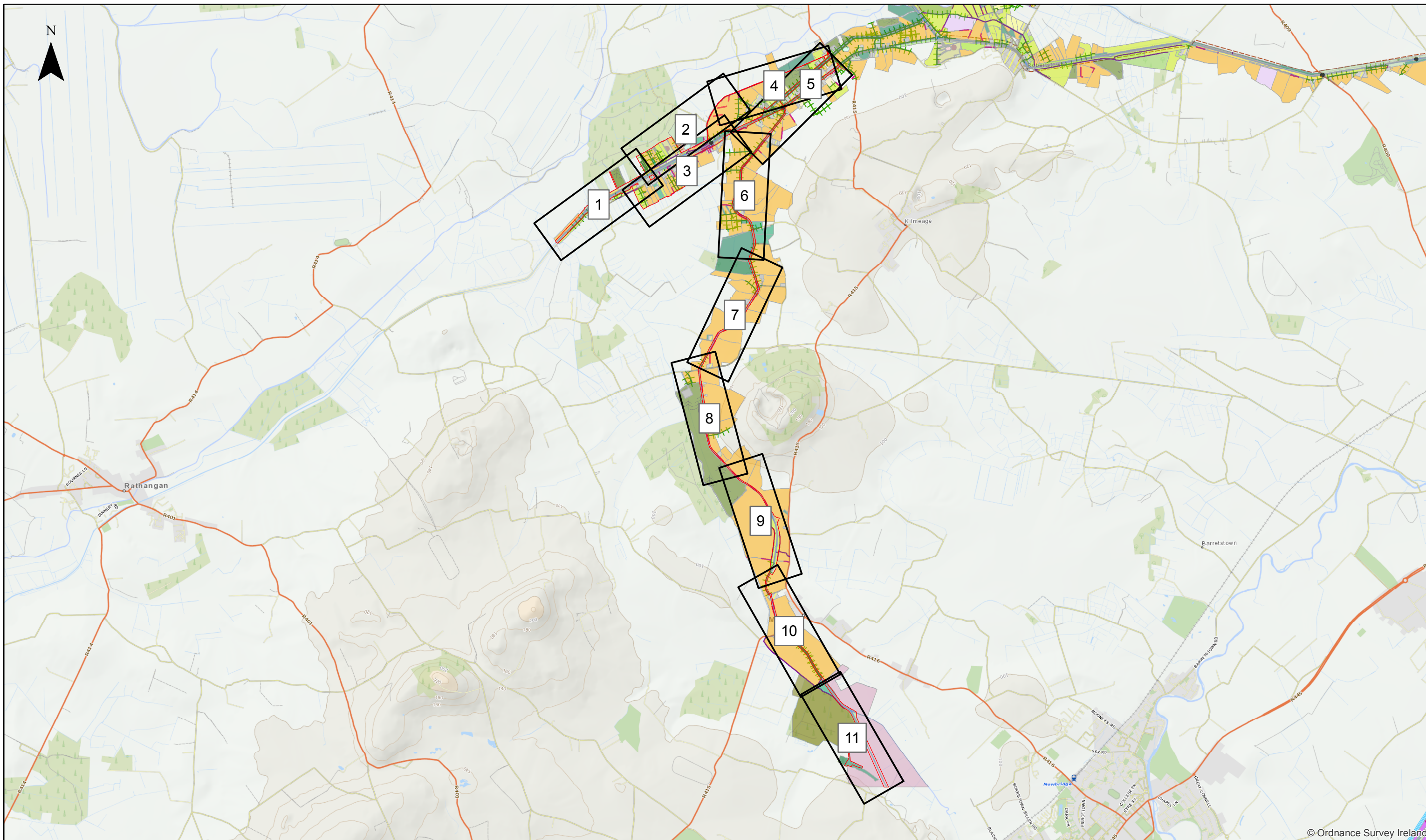
The fen has ornithological importance for both breeding and wintering birds. Pollardstown fen is the largest spring-fed fen in Ireland and has a well-developed and specialised flora and fauna. Owing to the rarity of this habitat and the numbers of rare organisms found there, the site is rated of international importance.

6. REFERENCES

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APPENDIX A

**MILLTOWN FEEDER
HABITAT MAPS**



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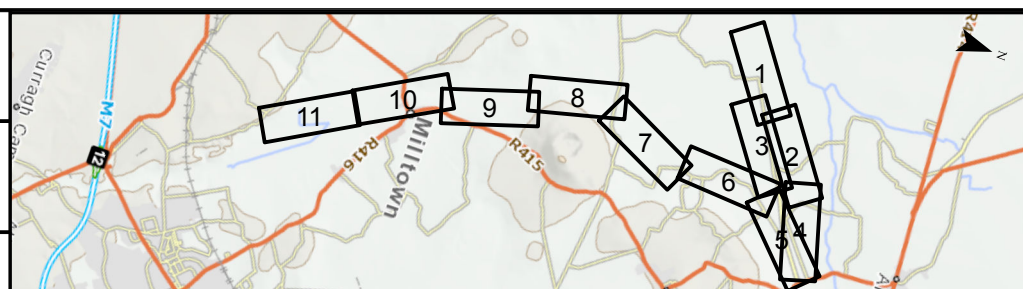
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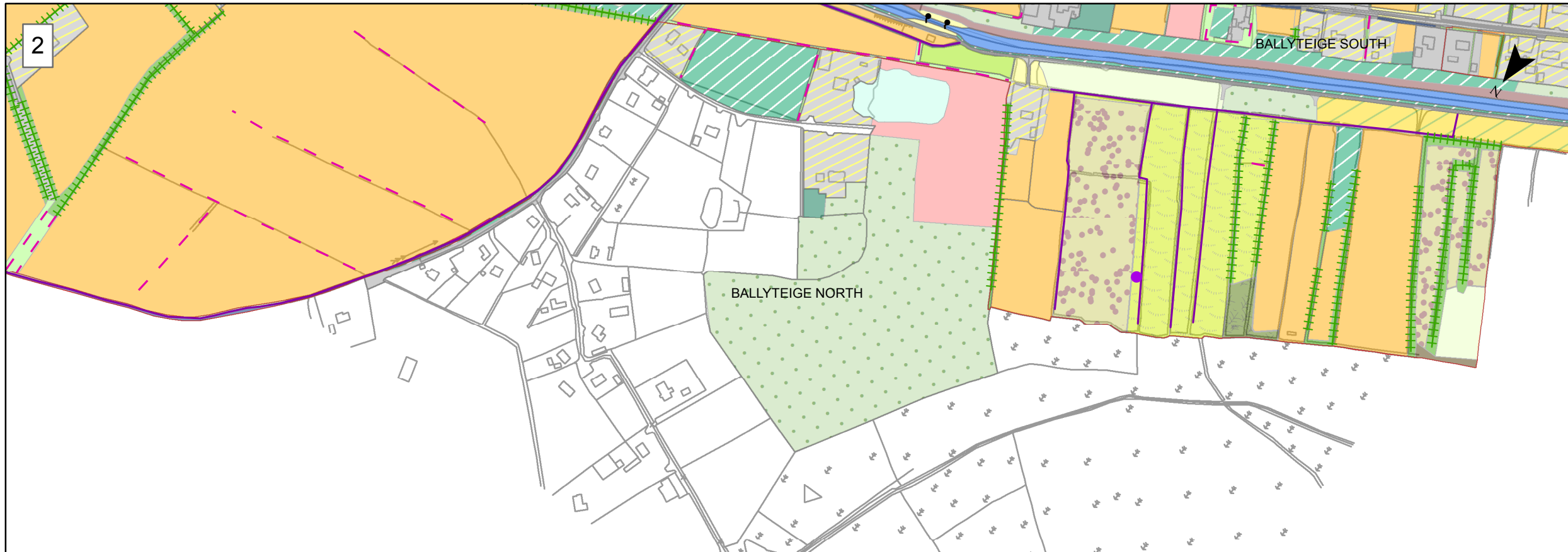
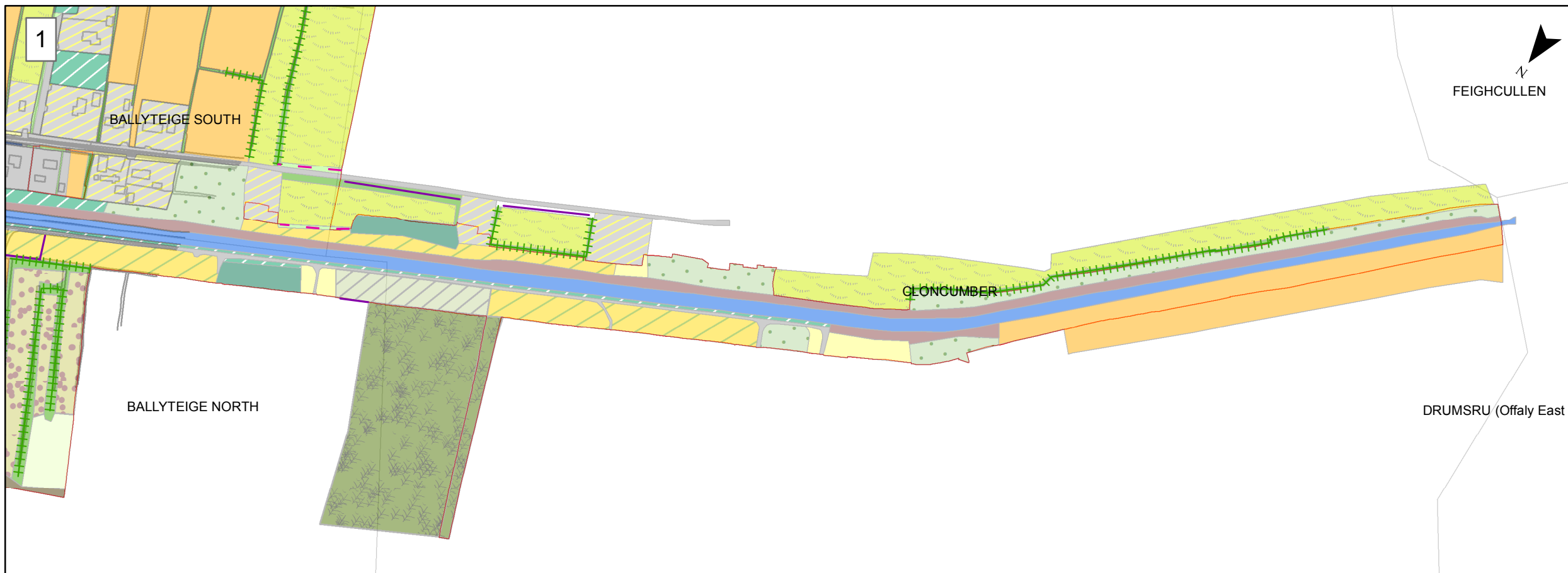


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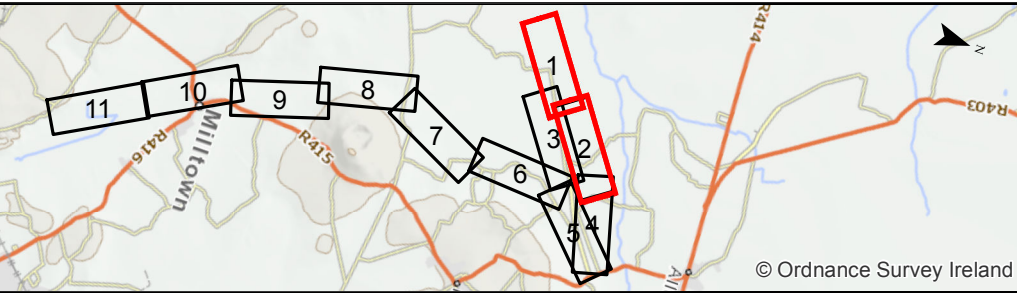
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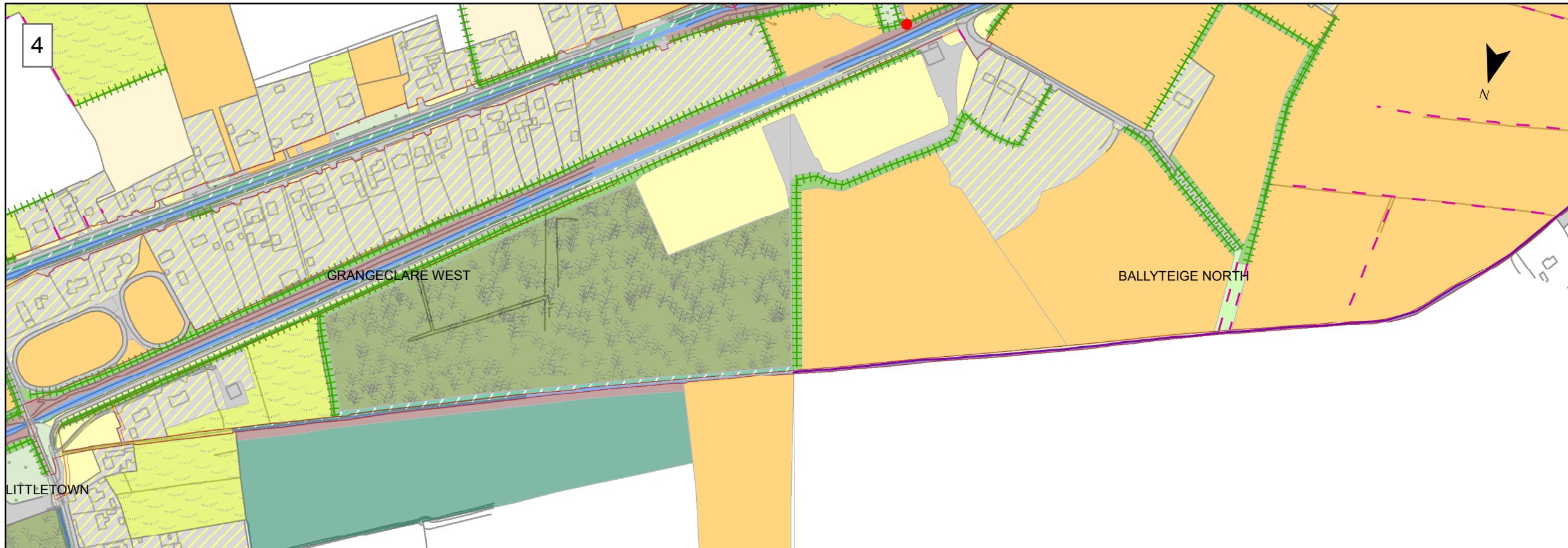
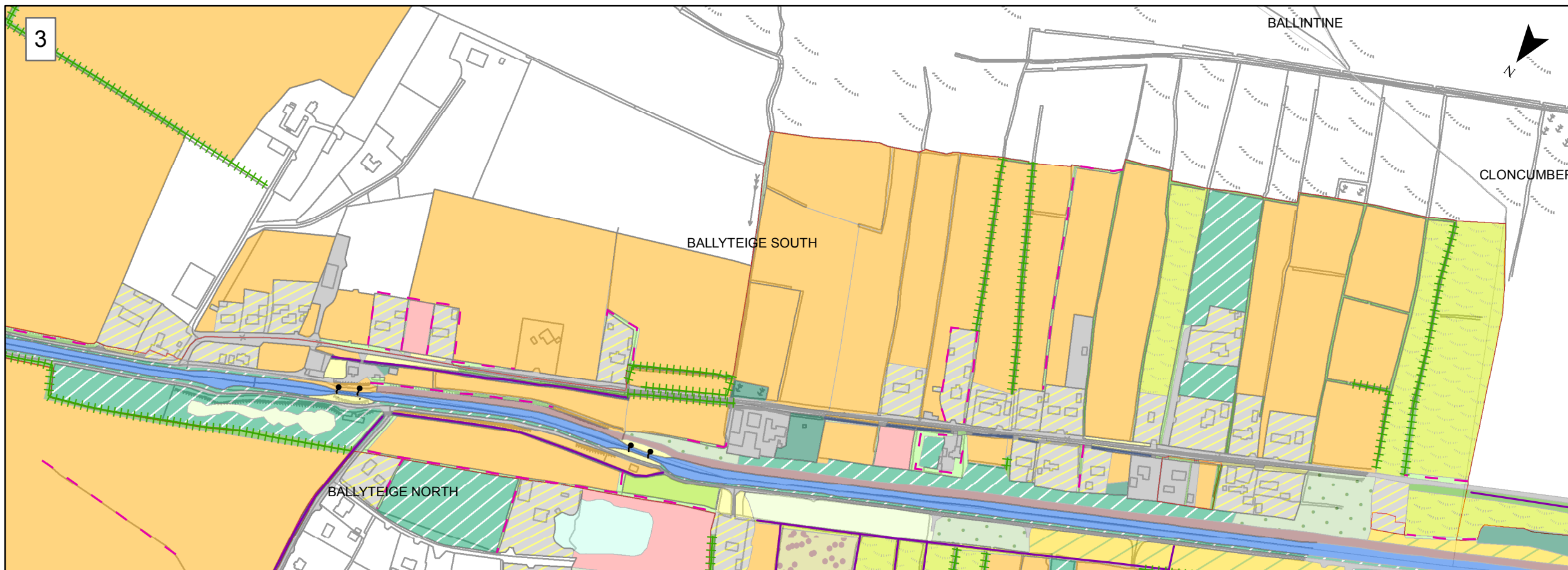
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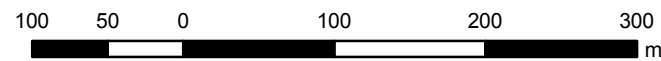
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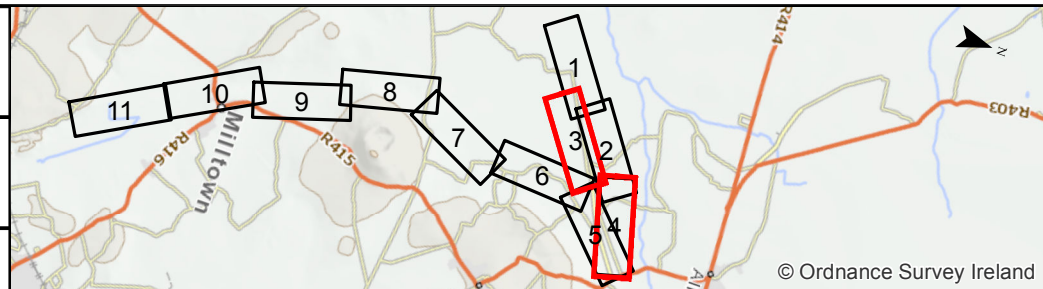
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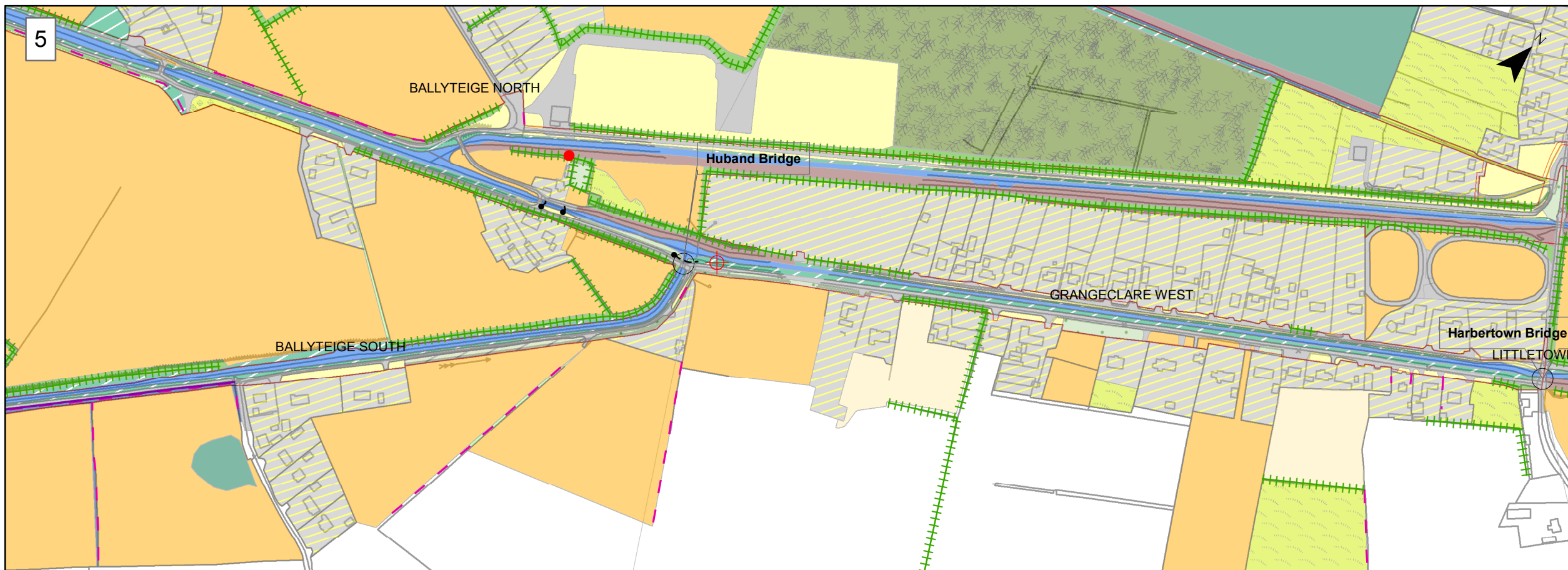
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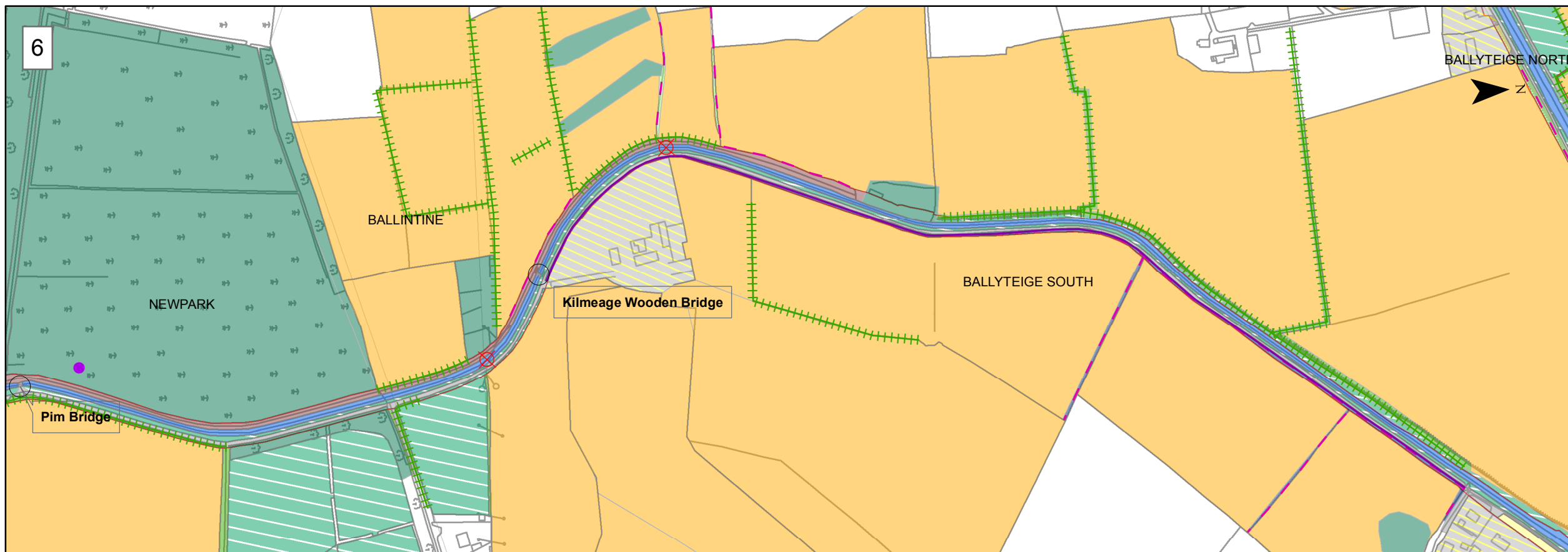
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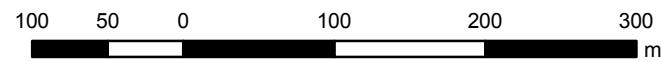




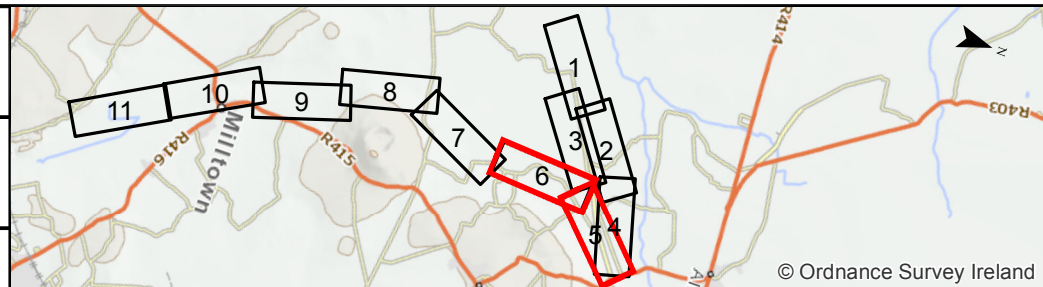
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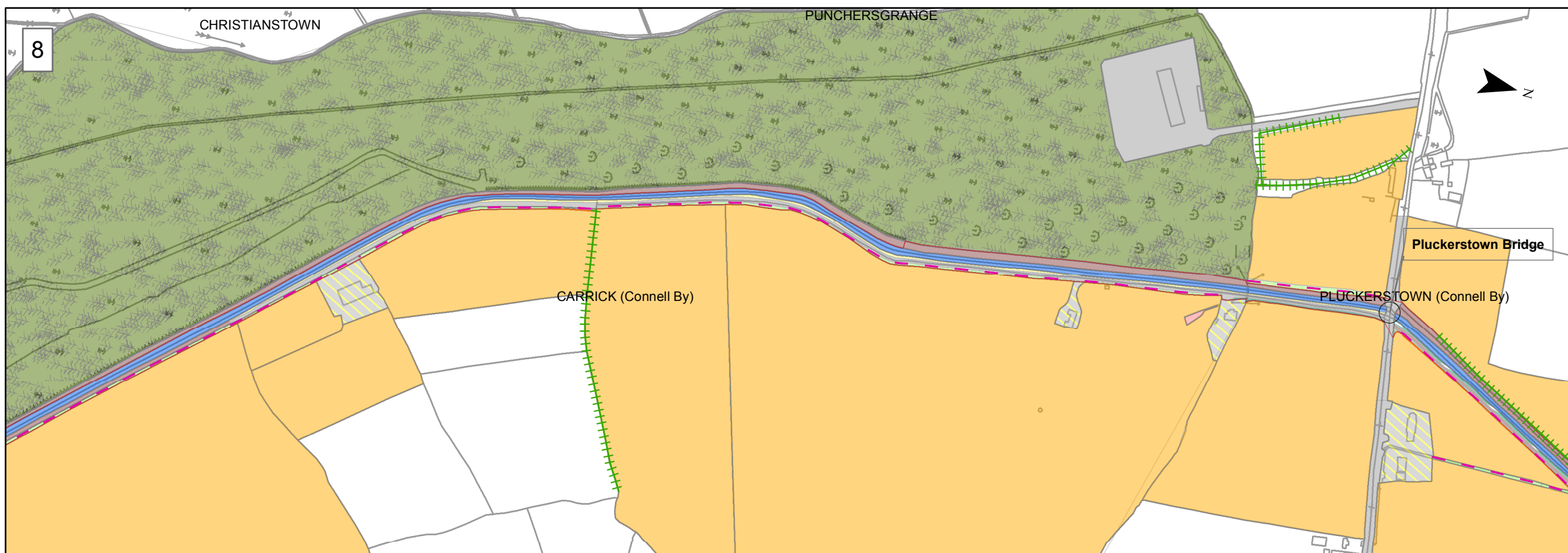
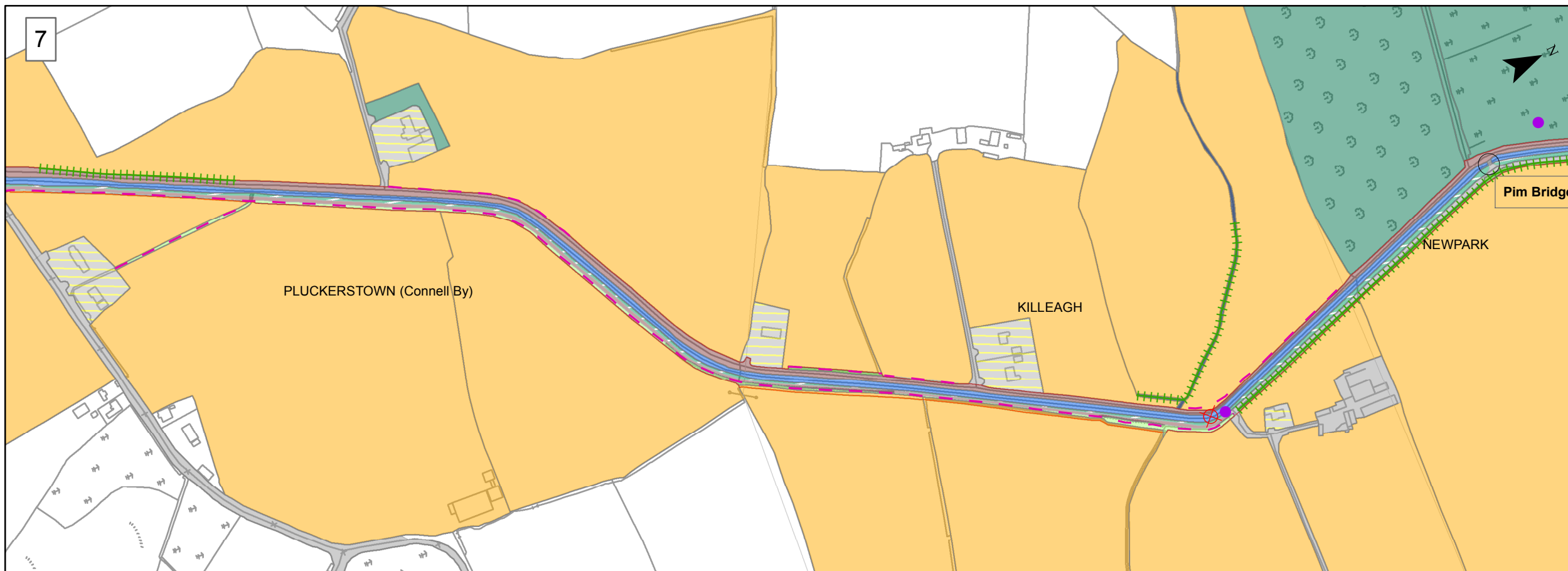
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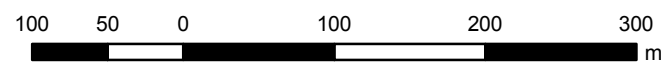




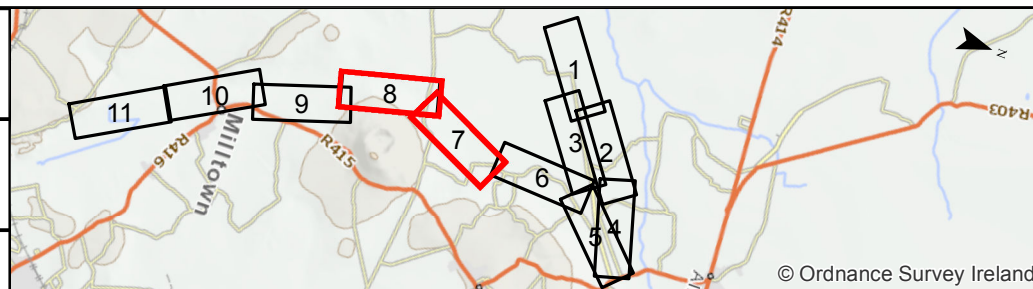
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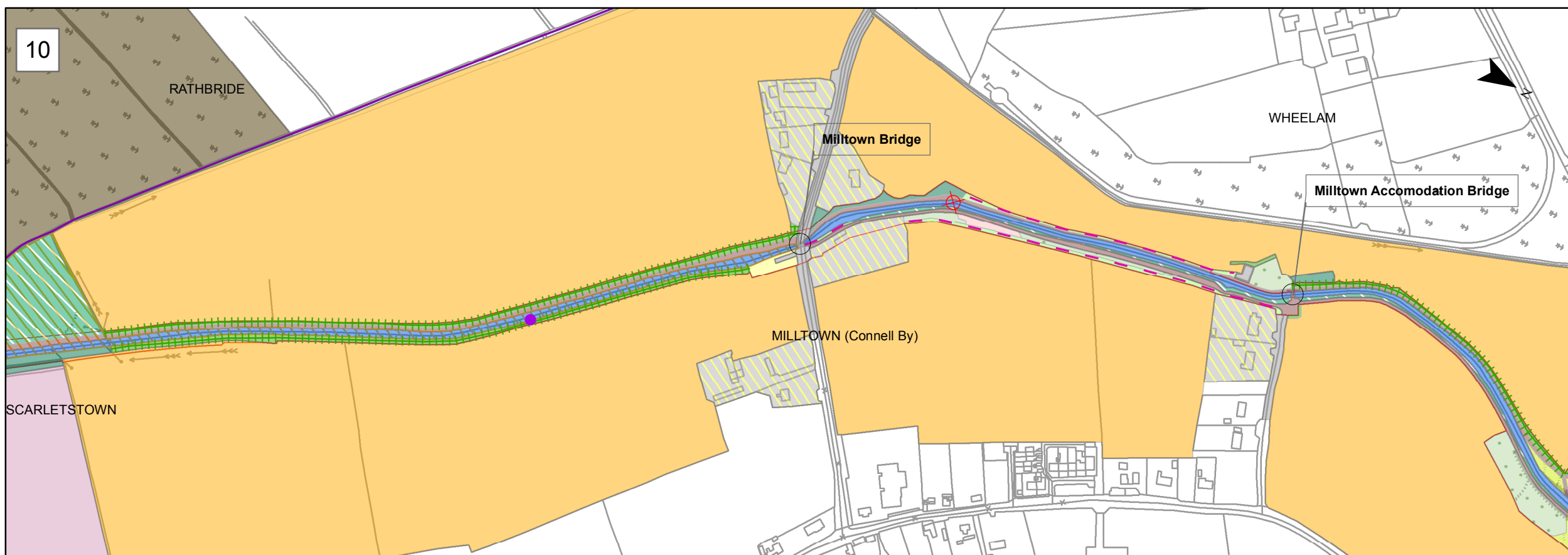
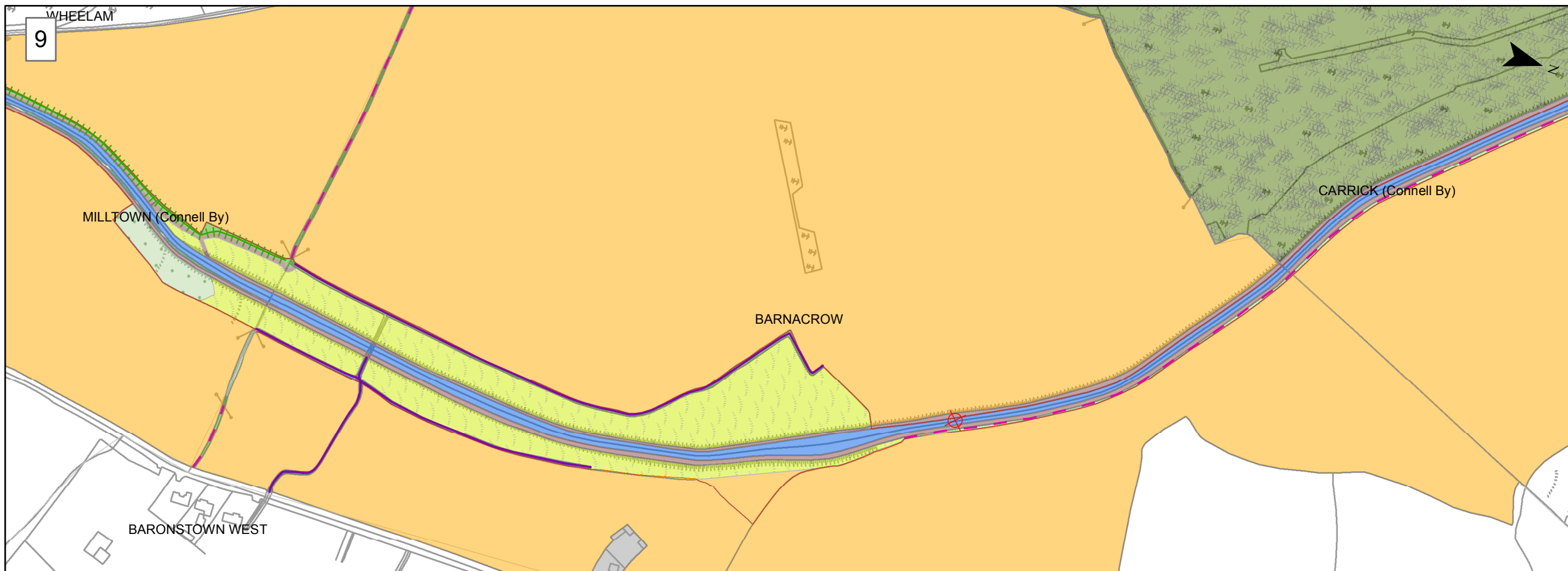
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 - FW4, Drainage ditches
 - GA1, Improved agricultural grassland
 - GA1/GS4, Improved agricultural grassland/Wet grassland
 - GA2, Improved amenity grassland
 - GM1, Marsh
 - GM1/GS4, Marsh/Wet grassland
 - GS1, Dry calcareous and neutral grassland
 - GS1/GA1, Dry calcareous/Improved agricultural grassland
 - GS1/GA2, Dry calcareous/Improved amenity grassland
 - GS1/GS4, Dry calcareous/Wet grassland
 - GS2, Dry meadows and grassy verges
 - GS2/WS1, Dry meadows/Scrub
 - GS4, Wet grassland
 - GS4/WS1, Wet grassland/Scrub
 - HD1, Dense bracken
 - HH1, Dry siliceous heath
 - PB1, Raised Bog
 - PB4, Cutover bog
 - PF1, Rich fen and flush
 - TM, Towpath habitat mosaic
 - WD1, Broadleaved woodland
 - WD1/WS1, Broadleaved woodland/Scrub
 - WD2, Mixed broadleaved/conifer woodland
 - WD3, (Mixed) conifer woodland
 - WD4, Conifer plantation
 - WD5, Scattered trees and parkland
 - WL1, Hedgerows
 - WL2, Treeline
 - WN5, Riparian woodland
 - WN6, Wet willow-alder-ash woodland
 - WN7, Bog Woodland
 - WS1, Scrub
 - WS2, Immature woodland

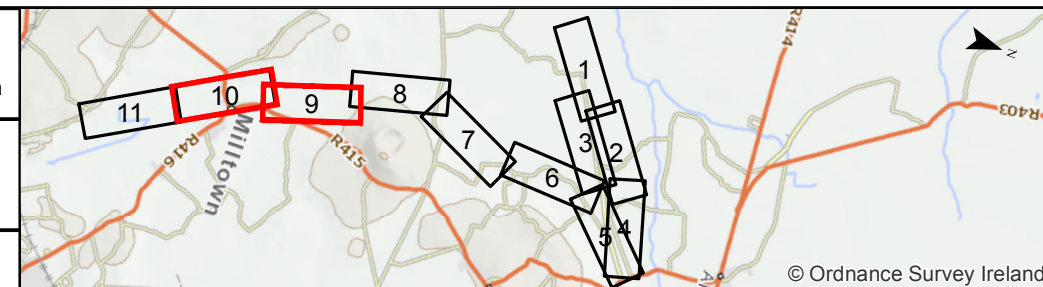


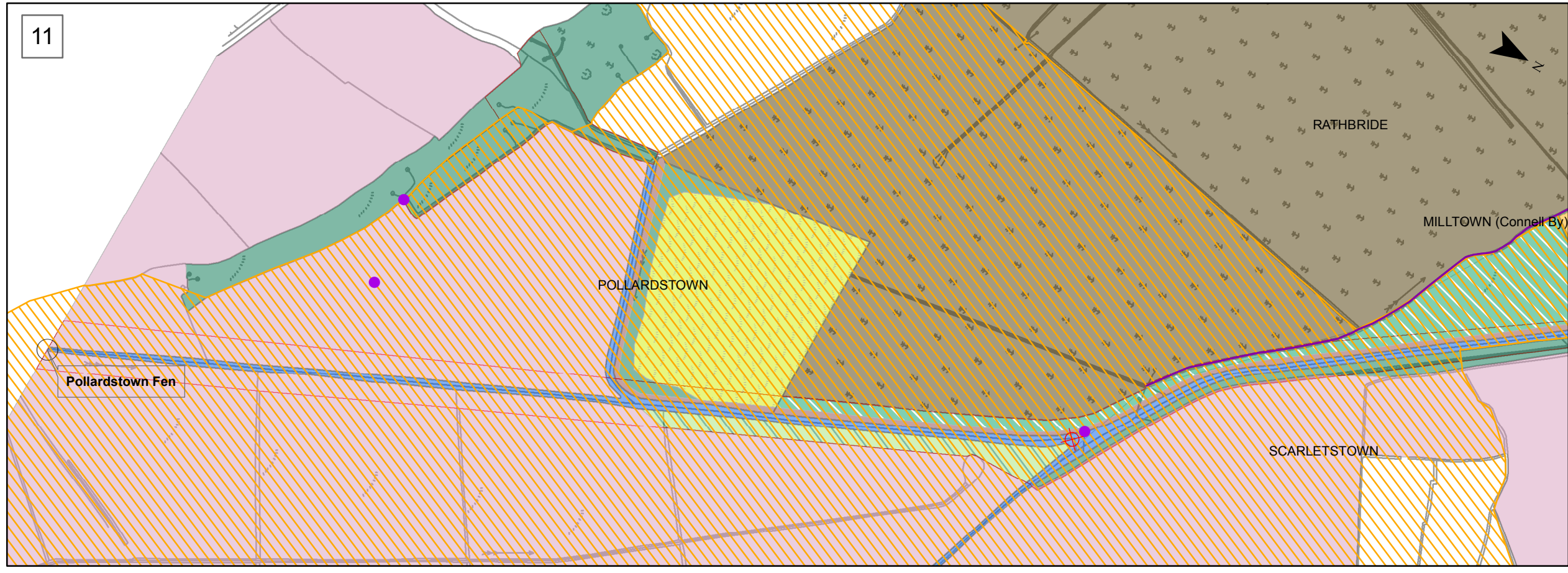
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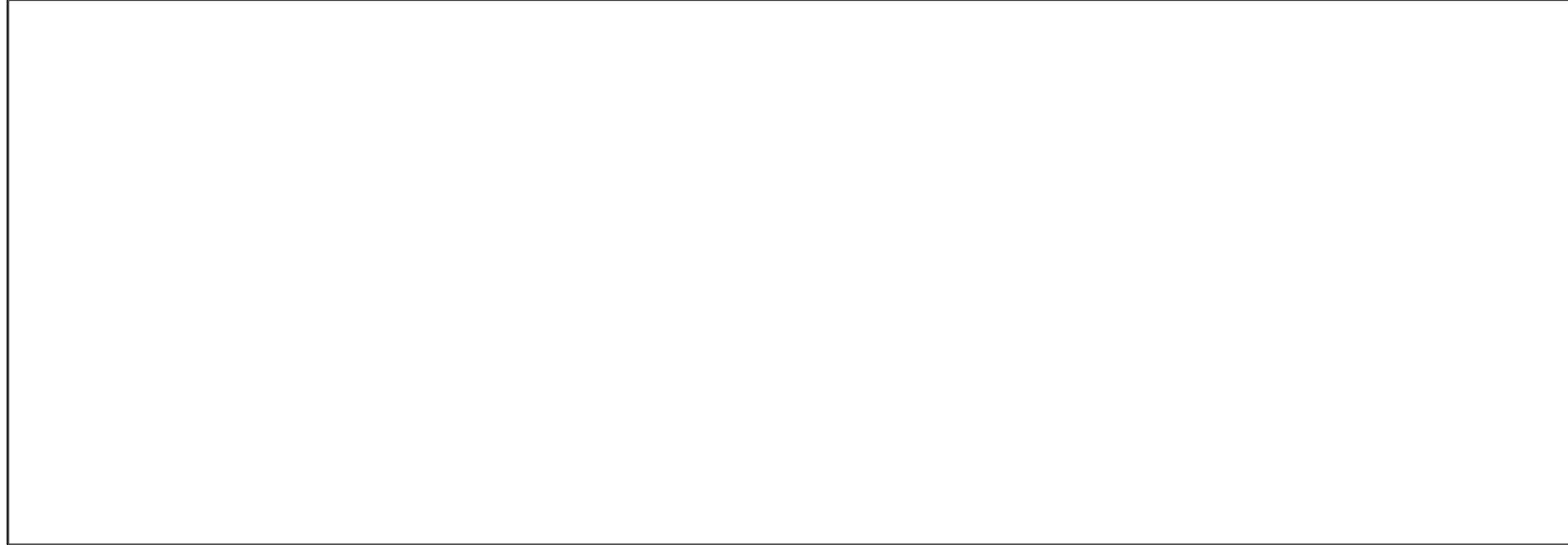
Project Title
GRAND CANAL MILLTOWN FEEDER

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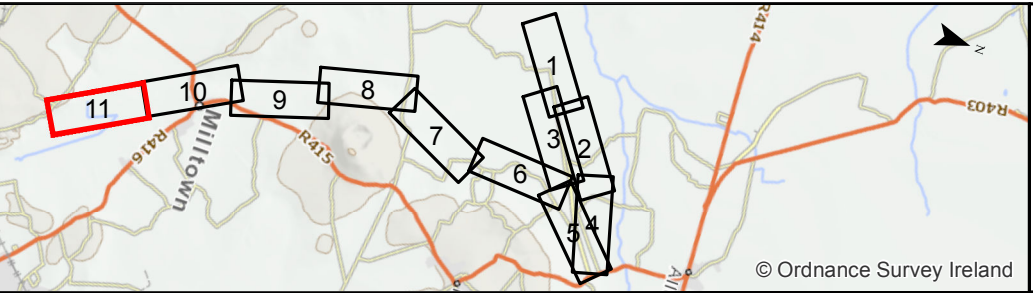
- Legend**
- ⊗ Aquatic Macrophyte Sample Locations
 - Protected Mammal Activity
 - IAS - Invasive Plants Species
 - Bridges
 - Property Boundary
 - ▨ ESA - Ecologically Sensitive Areas
 - Fossitt Habitat Code Polyines**
 - WL1, Hedgerows
 - BL1, Stone walls
 - WL2, Treelines
 - FW4, Drainage ditch
 - Fossitt Habitat Code Polygons**
 - BC1, Arable crops
 - BC2, Horticultural land
 - BC3, Tilled land
 - BL3, Buildings and artificial surfaces
 - BL3/GA2, Buildings and gardens
 - ED1, Exposed sand gravel or till
 - ED3, Recolonising bare ground
 - ED4, Active quarries and mines
 - FL8, Artificial ponds
 - FS1, Reed and tall sedge swamp
 - FW2, Depositing/lowland rivers
 - FW3, Canal
 - FW4, Drainage ditches
 - GA1, Improved agricultural grassland
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