



# ECOLOGICAL ASSESSMENT OF THE NAAS CORBALLY BRANCH



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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 Assessment of the Naas Corbally Branch of the Grand Canal, Co. Kildare in order to update current ecology records of the Site. The overall purpose of updating ecology records of the Naas Corbally Branch is to inform maintenance and capital projects, as necessary.

The study area, the Naas Corbally branch of the Grand Canal (hereafter referred to as the "Site"), involves an approximately 12km stretch of canal from the junction with the Grand Canal Main Line at Railway Bridge to Corbally Harbour, as presented in Figure 3.1. The Site was divided into 7 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 Site. The findings of the desk study and ecological survey are presented in this report. The assessment reviews publicly available records on protected species within 2km of the Site and considers the potential for other protected species to be present 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 7 sections of the Naas Corbally Branch 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, 2006) 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. During preparation of the desk study, the statutory consultee National Parks & Wildlife Service (NPWS) provided data on designations and species of nature conservation interest within proximity to the Site. 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 (approximately 11.9km in length and 0.8km 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 Naas Corbally Branch 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 Naas Corbally Branch 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.20m<sup>2</sup>. 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 Site of the Naas Corbally 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 Site, there are:

- 5 Special Areas of Conservation (SACs)
- 1 Special Protected Area (SPA)
- 1 Natural Heritage Area (NHA)
- 17 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), Red Bog, Kildare SAC (Site Code: 000397), Wicklow Mountains SAC (Site Code: 002122), Pollardstown Fen SAC (Site Code: 000396) and Poulaphouca Reservoir SPA (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. The entire study area is covered by the Grand Canal pNHA (Site Code: 002104). One NHA and 17 pNHAs (many overlap existing SAC boundaries) occur within 15km of the Site (Figure 3.1).

The designated sites within 15km of the Study Area are protected for the following listed habitats and species (“Qualifying interests”):

**Table 3.1.1 Designated Sites within 15km of the Site and their Qualifying Interests (QI)**

Designated Site	Site Code	Main Features
Ballynafagh Bog SAC / pNHA	000391	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150]
Ballynafagh Lake SAC / pNHA	001387	Alkaline fens [7230] <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016] <i>Euphydryas aurinia</i> (Marsh Fritillary) [1065]
Red Bog, Kildare SAC / pNHA	000397	Transition mires and quaking bogs [7140]



Designated Site	Site Code	Main Features
Wicklow Mountains SAC	002122	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Lutra lutra (Otter) [1355]
Poulaphouca Reservoir SPA / pNHA	004063	Greylag Goose ( <i>Anser anser</i> ) [A043] Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183]
Pollardstown Fen SAC / pNHA	000396	Calcareous fens with Cladium mariscus and species of the Caricion davallianae [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]
Hodgestown Bog NHA	001393	Peatlands [4]
Dunlavin Marshes pNHA	001772	Areas of semi-natural vegetation
Curragh pNHA	000392	Limestone geology
Liffey Bank Above Athgarvan pNHA	001396	Flora of unstable soils
Moud's Bog pNHA	000395	Raised bog habitat
Grand Canal pNHA	002104	Habitat and species diversity Ecological corridor
Donadea Wood pNHA	001391	Old woodland
Royal Canal pNHA	002103	Aquatic Flora and Fauna, Corridor value
Slade of Saggart and Crooksling Glen pNHA	000211	Wooded river valley and wetland system. Rare plant and invertebrate species.
Kilteel Wood pNHA	001394	Deciduous Woodland
Liffey Valley Meander Belt pNHA	000393	Chironomid communities Ash-woods and marshy areas
Newtown Marshes pNHA	001759	Freshwater marsh and ponds within area of calcareous eskers
Hollywood Glen pNHA	002053	Glacial meltwater erosion

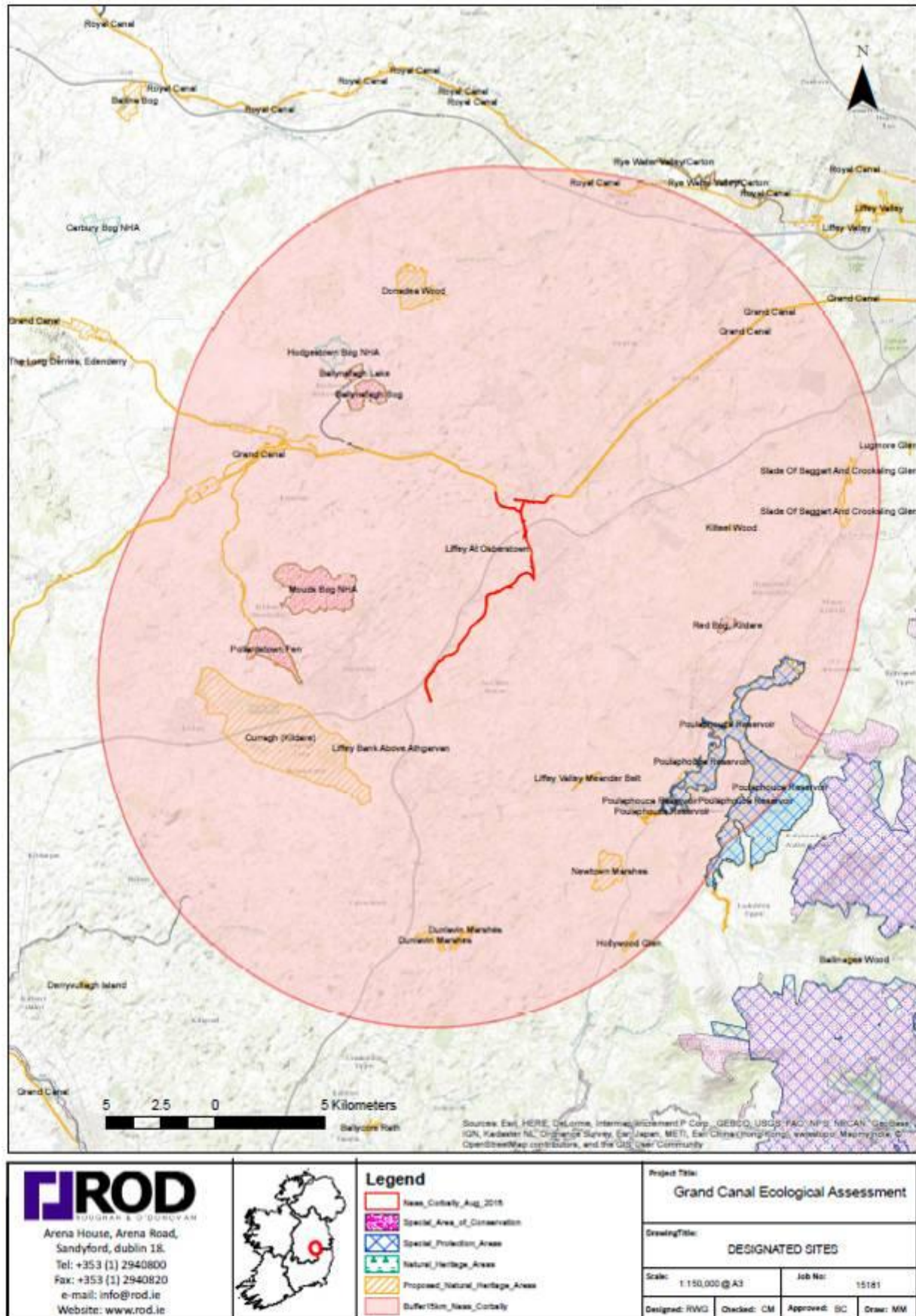


Figure 3.1 Designated Sites within 15km of the Site

### 3.2 Habitats

The Fossitt habitat categories identified on Site are provided in Table 3.2.1 and presented 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
<b>FRESHWATER HABITATS</b>	
FW3	Canal
FW4	Drainage ditch
FS1	Reed and large sedge swamp
FS2	Tall herb swamp
<b>GRASSLAND AND MARSH</b>	
GA1	Improved agricultural grassland
GA2	Amenity grassland
GS1	Dry calcareous & neutral grassland
GS2	Dry meadow and grassy verge
GS4	Wet grassland
GM1	Marsh
<b>WOODLAND AND SCRUB</b>	
WN5	Riparian woodland
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
WS2	Immature woodland
WL1	Hedgerows
WL2	Treelines
<b>EXPOSED ROCK AND DISTURBED GROUND</b>	
ED3	Recolonising bare ground
<b>CULTIVATED AND BUILT LAND</b>	
BC1	Arable crops
BC2	Horticultural land
BC3	Tilled land
BL1	Stone walls and other stonework
BL3	Buildings

\*Towpath Mosaic is a bespoke habitat category developed by Waterways Ireland to describe the uniform habitat components between open canal and the vegetation either side of the towpath (For description see Towpath Mosaic below).

### **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 habitat types 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 (see Plate 3.1).



**Plate 3.1 Towpath mosaic (TM) showing the transition from reed and large sedge swamp (FS1) to marsh (GM1) to wet grassland (GS4) and then to dry meadows and grassy verges (GS2)**

### **FW3 Canal**

Canals are artificial waterways that form part of the navigable waterway system. The canal environment is typically within a maintained modified state to accommodate largely seasonal and recreational boat traffic. Canals need a reliable supply of water in order for locks to function. The Grand Canal pNHA is 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, swamp 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.

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 communities of the deeper channel. In total there was 11.9km of canal habitat extending from the Junction with the Grand Canal Main Line at Railway Bridge to Corbally Harbour. The Naas Corbally is open only to small boats and is not currently accessible by larger barges and cruisers.



**Plate 3.2 Typical canal (FW3) habitat on the Naas Corbally Branch exhibits abundant submerged macrophytes as well as floating and emergent vegetation**

#### **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 minor. Vegetation typically lacks stratification as there is little or no development of an understory element. This habitat classification was found in narrow strips along the verge of the canal in the majority of sections.

## **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 forms 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.



**Plate 3.3 Improved agricultural grassland (GA1) along the Naas Corbally Branch**

## **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.



**Plate 3.4 Amenity grassland (improved) (GA2) is often dominant on the canal towpath**

#### **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 occurs within the zonation of Towpath Mosaic (TM) and also is recorded at seeps or saturated corners of field boundaries beyond the canal boundary.



**Plate 3.5  
The marsh (GM1)  
habitat type can be  
seen within the  
towpath mosaic (TM)  
of the Naas Corbally  
Branch, represented  
by rushes, sedges  
and irises**

### **GS1 Dry calcareous and neutral grassland**

This encompasses all unimproved and semi-improved grasslands on both calcareous and neutral soil. It is associated with free-draining 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 3.6 Dry meadows and grassy verges (GS2) can be seen on the embankment on the left-hand side of the canal 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 in 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.

#### **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.

#### **WD3 (Mixed) conifer woodland**

This general category includes woodland areas with 75-100% cover of conifers, other than conifer plantation - WD4. The broadleaved component should be less than 25%. Woodlands that belong in this category are most likely to be found in parks or gardens, or in the grounds of old estates and institutions where there has been a history of planting. Non-native trees usually dominate. The term 'mixed' should be used in the habitat title if woodland stands comprise a number of different conifer species.

#### **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.

### **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*)

### **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.).

### **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.



**Plate 3.7 Treelines (WL2) were a common feature bordering the canal towpath**

**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 pebbles, 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.



Plate 3.8 Paved towpath and bridge representing BL3 on the Naas Corbally Branch

## 3.3 Protected Species

Online sources of publicly available data provided by 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
<b>Wildlife Act</b>		
West European Hedgehog ( <i>Erinaceus europaeus</i> )	2013	Yes
Eurasian Badger ( <i>Meles meles</i> )	1992	Yes
<b>EU Directive</b>		
Lesser Noctule ( <i>Nyctalus leisleri</i> )	2008	Yes

Species	Most Recent Date Recorded	Suitable Habitat Within the Site
Pipistrelle ( <i>Pipistrellus pipistrellus sensu lato</i> )	2008	Yes
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	2008	Yes
European Otter ( <i>Lutra lutra</i> )	2013	Yes
Desmoulin's Whorl Snail ( <i>Vertigo (Vertigo) moulinsiana</i> )	1971	Yes
Freshwater White-clawed Crayfish ( <i>Austropotamobius pallipes</i> )	2012	Yes

The NPWS 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 just one observation within 2km. Records relevant to the Naas Corbally Branch are listed in tables 3.3.2 and 3.3.3 below.

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

Species	Sample Location	Survey Name	Date
Otter ( <i>Lutra lutra</i> )	Within 1km of Site	Badger and Habitat Survey of Ireland	1991
Irish stoat ( <i>Mustela erminea subsp. hibernica</i> )	Dunstown, Co. Kildare	Animal Survey IBRC Species Records	1985
	Russborough House, Co. Wicklow	Mustela erminea subsp. hibernica Records	1969

**Table 3.3.3 Bat Species Records within 1km of the Site**

Species	Sample Location	Most Recent Date Recorded
Brown Long-eared Bat ( <i>Plecotus auritus</i> )	Within 1km of Site	2007
Common Pipistrelle ( <i>Pipistrellus pipistrellus</i> )	Within 1km of Site	2008
Daubenton's Bat ( <i>Myotis daubentonii</i> )	Within 1km of Site	2007
Leisler's Bat ( <i>Nyctalus leisleri</i> )	Within 1km of Site	2008
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	Within 1km of Site	2008

### 3.4 Invasive Species

Publicly available data offered online by the NBDC identified the presence of invasive species within 2km of the site, most recently in 2015. These Invasive Alien Species (IAS) are listed in Table 3.4.1. The invasive plant species Cotoneaster and Snowberry were recorded along this branch of the canal, typically associated with residential boundaries or amenity areas/gardens. Neither of these terrestrial species are subject to restrictions under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 (Third Schedule: Part1); in particular Snowberry is present in large stands between Hoare's Bridge and Connaught Bridge. All Waterweeds (*Elodea*) are listed on the Third Schedule: Part 1 and two non-native species are known to occur in the Grand Canal system. Sika Deer was also recorded during field surveys.

**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> )	2010
Nuttall's Waterweed ( <i>Elodea nuttallii</i> )	2010
American Mink ( <i>Mustela vison</i> )	2015
Eastern Grey Squirrel ( <i>Sciurus carolinensis</i> )	2007
Brown Rat ( <i>Rattus norvegicus</i> )	2012

## 4. SURVEY RESULTS

### 4.1 Junction with Grand Canal Main Line at Railway Bridge – Leinster Mill Bridge and Lock 2 (Distance: 0.9km)

See Appendix A, Map 1

#### Habitats and Flora

The canal bank is 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 (BL3) were found at both sides of the canal in this section in the form of surfaced towpath and older industrial buildings (e.g. Leinster Mill). Improved agricultural grassland is located to the west of this section of the canal.



Plate 4.1 Area of BL3 at Leinster Mill

Table 4.1.1 Habitats recorded from the Grand Canal Main Line at Railway Bridge to Leinster Mill Bridge & Lock 2

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 Huband Bridge to Kilmeage Wooden Bridge

Species	Scientific
<b>Vascular Plants</b>	
Field Maple	<i>Acer campestre</i>
Sycamore	<i>Acer pseudoplatanus</i>
Yarrow	<i>Achillea millefoium</i>
Horse Chestnut	<i>Aesculus hippocastanum</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>
Downy Birch	<i>Betula pubescens</i>
False Brome	<i>Brachypodium sylvaticum</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>
Knapweed	<i>Centaurea nigra</i>
Hornwort	<i>Ceratophyllum demersum</i>
Rustyback	<i>Ceterach officinarum</i>

Species	Scientific
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>
<b>Canadian Waterweed</b>	<b><i>Elodea canadensis</i></b>
<b>Nuttall's Waterweed</b>	<b><i>Elodea nutallii</i></b>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Hoary Willowherb	<i>Epilobium parviflorum</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>
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>
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>
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>
Ivy-leaved Duckweed	<i>Lemna trisulca</i>
Ox-eye Daisy	<i>Leucanthemum vulgare</i>
Wild Privet	<i>Ligustrum vulgare</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Field Woodrush	<i>Luzula campestris</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>

Species	Scientific
Butterbur	<i>Petastes hybridus</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>
Silverweed	<i>Potentilla anserina</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 spp.</i>
Bramble	<i>Rubus fruticosus agg.</i>
Common Sorrell	<i>Rumex acetosa</i>
Wood Dock	<i>Rumex sanguineus</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Rusty Willow	<i>Salix cinerea subsp oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Ragwort	<i>Senecio jacobaea</i>
Corn Sow Thistle	<i>Sonchus arvensis</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>
Coltsfoot	<i>Tussilago farfara</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>
<b>Birds</b>	
Heron	<i>Ardea cinerea</i>
Goldfinch	<i>Carduelis carduelis</i>
Robin	<i>Erithacus rubecula</i>
Blue tit	<i>Parus caeruleus</i>
Great tit	<i>Parus major</i>
Coal Tit	<i>Periparus ater hibernicus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Magpie	<i>Pica pica</i>
Dunnock	<i>Prunella modularis</i>



<b>Species</b>	<b>Scientific</b>
Goldcrest	<i>Regulus regulus</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
<b>Amphibians</b>	
Common Frog	<i>Rana temporaria</i>
<b>Odonata</b>	
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>
<b>Lepidoptera</b>	
Speckled Wood	<i>Pararge aegeria</i>
Large White	<i>Pieris brassicae</i>
Small White	<i>Pieris rapae</i>
Garden Carpet	<i>Xanthorhoe fluctuata</i>
<b>Diptera</b>	
Syrphidae	<i>Syrphus ribesii</i>
Tipulidae	<i>Tipula paludosa</i>

## 4.2 Leinster Mill Bridge and Lock 2 – Lock 4 (Distance: 1.45km)

See Appendix A, Maps 1 & 2

### Habitats and Flora

The towpath and canal verge at this section is mostly classified as reeds and tall sedge swamps (FS1), a combination of scrub and broadleaved woodland, amenity grassland and artificial surfaces. At Lock 2, the predominant habitat is classified as amenity grassland (GA2) with sections of built land at both sides of the canal and planted treelines in places (WL2). The towpath consists largely of dry meadows and grassy verges (GS2), bordered by a hedgerow (WL1). As the canal progresses south towards Lock 4, the main habitats along its verge are classified as a combination of scrub and broadleaved woodland with reeds and tall sedge swamps. Surrounding lands are categorised as largely improved agricultural grassland. Additionally, an artificial lake (FL8) was identified within a broadleaved woodland along the verge of the canal.



**Plate 4.2 Treeline and amenity grassland adjacent to canal near Naas town**

**Table 4.2.1 Habitats recorded from the Leinster Mill Bridge & Lock 2 to Lock 4**

Habitat Code	Habitat Name
FW3	Canals
FL8	Other Artificial Lakes and Ponds
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
BL3/GA2	Buildings and artificial surfaces / Amenity grassland
GA2	Amenity grassland
WD1/WS1	Broadleaved woodland (mixed) / scrub
GA1	Improved agricultural grassland
WD1	Broadleaved woodland (mixed)
BC3	Tilled land
ED3	Recolonised bare ground
WS1	Scrub
WL2	Treeline

**Table 4.2.2 Species recorded from Leinster Mill Bridge & Lock 2 to Lock 4**

Species	Scientific
<b>Vascular Plants</b>	
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>
Downy Birch	<i>Betula pubescens</i>
False Brome	<i>Brachypodium sylvaticum</i>
Quaking Grass	<i>Briza media</i>
Barren brome	<i>Bromus sterilis</i>
Starworts	<i>Callitriche spp.</i>
Hedge Bindweed	<i>Calystegia sepium</i>
Black Sedge	<i>Carex nigra</i>
Knapweed	<i>Centaurea nigra</i>

Species	Scientific
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>
<b>Canadian Waterweed</b>	<b><i>Elodea canadensis</i></b>
<b>Nuttall's Waterweed</b>	<b><i>Elodea nutallii</i></b>
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 spp.</i>
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>
Hogweed	<i>Heracleum sphondylium</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>
Field Scabious	<i>Knautia arvensis</i>
Meadow Vetchling	<i>Lathyrus pratensis</i>
Ivy-leaved Duckweed	<i>Lemna trisulca</i>
Ox-eye Daisy	<i>Leaucanthemum vulgare</i>
Fairy Flax	<i>Linum catharticum</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Field Woodrush	<i>Luzula campestris</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>
Common Reed	<i>Phragmites australis</i>

Species	Scientific
Ribwort Plantain	<i>Plantago lanceolata</i>
Greater Plantain	<i>Plantago major</i>
Annual Meadow Grass	<i>Poa annua</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>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Wood Dock	<i>Rumex sanguineus</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Rusty Willow	<i>Salix cinerea subsp 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>
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>
Coltsfoot	<i>Tussilago farfara</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>
<b>Birds</b>	
Woodpigeon	<i>Columba palumbus</i>
Rook	<i>Corvus frugilegus</i>
Hooded Crow	<i>Corvus corone cornix</i>
Jackdaw	<i>Corvus monedula</i>
House Martin	<i>Delichon urbica</i>
Great tit	<i>Parus major</i>
Coal Tit	<i>Periparus ater hibernicus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Magpie	<i>Pica pica</i>
Dunnock	<i>Prunella modularis</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Mistle Thrush	<i>Turdus viscivorus</i>

<b>Species</b>	<b>Scientific</b>
<b>Amphibians</b>	
Common Frog	<i>Rana temporaria</i>
<b>Odonata</b>	
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>
Common Darter	<i>Sympetrum striolatum</i>
<b>Mammals</b>	
Otter	<i>Lutra lutra</i>

### 4.3 Lock 4 – Naas Harbour (Distance: 0.75km)

See Appendix A, Maps 2 & 3

#### Habitats and Flora

The towpath and canal verge at this section is mostly classified as a combination of artificial land (BL3) and dry meadows and grassy verges (GS2) with sections of *Phragmites* fringe (FS1) in places. The habitat close to Naas Harbour in this section of the canal includes dry meadow and grassy verges and a combination of artificial land and amenity grassland (GA2). The emergent vegetation within this canal marker is well developed with a dominant fringe of *Phragmites* reed bed with a diverse and abundant *Nuphar – Potamogeton* community. Small sections of broadleaved woodland (WD1) were also found along the verge of the canal within this section.



**Plate 4.3 Section of canal on outskirts of Naas**

**Table 4.3.1 Habitats recorded from Lock 4 to Naas Harbour**

Habitat Code	Habitat Name
FW3	Canals
FS1	Reed and large sedge swamp
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
BL3/GA2	Buildings and artificial surfaces / Amenity grassland
GA2	Amenity grassland
WD1/WS1	Broadleaved woodland (mixed) / scrub

**Table 4.3.2 Species recorded from Lock 4 to Naas Harbour**

Species	Scientific
<b>Vascular Plants</b>	
Sycamore	<i>Acer pseudoplatanus</i>
Yarrow	<i>Achillea millefolium</i>
Horse Chesnut	<i>Aesculus hippocastanum</i>
Brown Bent	<i>Agrostis canina</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>
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>
Downy Birch	<i>Betula pubescens</i>
False Brome	<i>Brachypodium sylvaticum</i>
Quaking Grass	<i>Briza media</i>

Species	Scientific
Starworts	<i>Callitriche</i> spp.
Hedge Bindweed	<i>Calystegia sepium</i>
Black Sedge	<i>Carex nigra</i>
Bottle Sedge	<i>Carex rostrata</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>
Spear Thistle	<i>Cirsium vulgare</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>
<b>Canadian Waterweed</b>	<b><i>Elodea canadensis</i></b>
<b>Nuttall's Waterweed</b>	<b><i>Elodea nutallii</i></b>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Field Horsetail	<i>Equisetum arvense</i>
Eyebrigt	<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>
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>
Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Toad Rush	<i>Juncus bufonius</i>
Soft Rush	<i>Juncus effusus</i>
Hard Rush	<i>Juncus inflexus</i>
Meadow Vetchling	<i>Lathyrus pratensis</i>
Common Duckweed	<i>Lemna minor</i>
Ivy-leaved Duckweed	<i>Lemna trisulca</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>
Bogbean	<i>Menyanthes trifoliata</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>
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>
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>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Procumbent Pearlwort	<i>Sagina procumbens</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Rusty Willow	<i>Salix cinerea subsp 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>

Species	Scientific
Unbranched Bur-reed	<i>Sparganium emersum</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>
<b>Birds</b>	
Heron	<i>Ardea cinerea</i>
Woodpigeon	<i>Columba palumbus</i>
Rook	<i>Corvus frugilegus</i>
Jackdaw	<i>Corvus monedula</i>
Robin	<i>Erithacus rubecula</i>
Pied Wagtail	<i>Motacilla alba yarrellii</i>
Great tit	<i>Parus major</i>
Coal Tit	<i>Periparus ater hibernicus</i>
Dunnock	<i>Prunella modularis</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
<b>Amphibians</b>	
Common Frog	<i>Rana temporaria</i>
<b>Odonata</b>	
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>
<b>Lepidoptera</b>	
Peacock	<i>Inachis io</i>
<b>Mammals</b>	
Sika Deer	<i>Cervus nippon</i>

#### 4.4 Naas Harbour – Jigginstown Bridge (Distance: 1.55km)

See Appendix A, Maps 3 & 4

##### Habitats and Flora

The canal west of Naas Harbour has a dense and well developed aquatic macrophyte community including many *Charophyte spp.* The north bank west and opposite the Harbour is accessible however the pathway is narrow and overgrown with Scrub (WS1) in some places. The canal verge consists of diverse calcareous grassland. Within this section of canal, a small area of mixed broadleaved woodland (WD1) and adjacent open scattered trees and parkland (WD5) were also found. Additionally, buildings and gardens (BL3/GA2) are present to the south of the canal at this section. The towpath and canal verge on the south bank consists of hedgerows (WL1), scrub (WS1) with improved amenity grassland verge. A fresh Otter spraint was recorded along this section of the Site on the west bank of the canal.



**Plate 4.4 View northeast along the canal from Jigginstown Bridge**

**Table 4.4.1 Habitats recorded from Naas Harbour to Jigginstown Bridge**

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
WS1	Scrub
FW3	Canals
TM	Towpath mosaic
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
BL3/GA2	Buildings and artificial surfaces / Amenity grassland
GA2	Amenity grassland
WD1	Broadleaved woodland (mixed)
WD1/WS1	Broadleaved woodland (mixed) / scrub
GS1	Dry calcareous and neutral grassland
WD5	Scattered trees and parkland

**Table 4.4.2 Species recorded from Naas Harbour – Jigginstown Bridge**

Species	Scientific
<b>Vascular Plants</b>	
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>
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>

Species	Scientific
Daisy	<i>Bellis perennis</i>
Lesser Water-parsnip	<i>Berula erecta</i>
Quaking Grass	<i>Briza media</i>
Starworts	<i>Callitriche spp.</i>
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>
Hazel	<i>Corylus avellana</i>

Species	Scientific
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>
<b>Canadian Waterweed</b>	<b><i>Elodea canadensis</i></b>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Hoary Willowherb	<i>Epilobium parviflorum</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>
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>
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>
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>
Pineappleweed	<i>Matricaria discoidea</i>
Black medick	<i>Medicago lupulina</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>
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>
Smooth Meadow Grass	<i>Poa pratensis</i>
Broad-leaved Pondweed	<i>Potamogeton natans</i>
Silverweed	<i>Potentilla anserina</i>
Blackthorn	<i>Prunus spinosa</i>

Species	Scientific
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>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Rusty Willow	<i>Salix cinerea subsp 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>
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>
<b>Birds</b>	
Buzzard	<i>Buteo buteo</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>
Robin	<i>Erithacus rubecula</i>
Swallow	<i>Hirundo rustica</i>
Blue tit	<i>Parus caeruleus</i>
House Sparrow	<i>Passer domesticus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Magpie	<i>Pica pica</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Starling	<i>Sturnus vulgaris</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
<b>Amphibians</b>	
Common Frog	<i>Rana temporaria</i>



Species	Scientific
<b>Odonata</b>	
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>
<b>Lepidoptera</b>	
Meadow Brown	<i>Maniola jurtina</i>
Speckled Wood	<i>Pararge aegeria</i>

Species	Scientific
Small White	<i>Pieris rapae</i>
<b>Diptera</b>	
Syrphidae	<i>Syrphus ribesii</i>
Syrphidae	<i>Myathropa florum</i>
<b>Coleoptera</b>	
7-Spot Ladybird	<i>Coccinella 7-punctata</i>
<b>Mammals</b>	
Sika Deer	<i>Cervus nippon</i>

## 4.5 Jigginstown Bridge – Connaught Bridge (Distance: 2.5km)

Appendix A, Maps 4 & 5

### Habitats and Flora

A wide variety of habitats were found at this section of the canal. The towpath and canal verge at the section close to Jigginstown Bridge is mostly classified dry meadows and grassy verges (GS2) with the canal boundary dominated by scrub (WS1) and mixed broadleaved woodland (WD1) with occasional strips of amenity grassland (GA2). The surrounding land parcels beyond the boundary consist of improved agricultural grassland (GA1) and wet grassland (GS4). Sections of artificial land (BL3) and buildings and gardens (BL3/GA2) are also present along the canal marker. The towpath and canal verge within the section close to Connaught Bridge mainly comprised hedgerow (WL1) and towpath mosaic (TM) along the south bank and broadleaved woodland intermixed with scrub along the northern bank. Both verges were surrounded by improved agricultural grassland. The aquatic macrophyte community in the canal channel is well developed with a fringe dominated by a *Phragmites – Glyceria* mosaic. Physical signs of Sika Deer were recorded along habitats adjacent to the canal towpath.



**Plate 4.5 Section of canal close to Connaught Bridge**

**Table 4.5.1 Habitats recorded from Jigginstown Bridge to Connaught Bridge**

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
WS1	Scrub
FW3	Canals
TM	Towpath mosaic
GS4	Wet grassland
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
BL3/GA2	Buildings and artificial surfaces / Amenity grassland
GA2	Amenity grassland
WD1	Broadleaved woodland (mixed)
WD1/WS1	Broadleaved woodland (mixed) / scrub
FS1	Reed and large sedge swamps
FL8	Artificial lakes and ponds
ED3	Recolonising bare ground
GS1	Dry calcareous and neutral grassland

**Table 4.5.2 Species recorded from Jigginstown Bridge to Connaught Bridge**

Species	Scientific
<b>Vascular Plants</b>	
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>
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>
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>
<b>Canadian Waterweed</b>	<b><i>Elodea canadensis</i></b>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Hoary Willowherb	<i>Epilobium parviflorum</i>
Field Horsetail	<i>Equisetum arvense</i>
Water Horsetail	<i>Equisetum fluviatile</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>
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>
Hogweed	<i>Heracleum sphondylium</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Perforate St John's-wort	<i>Hypericum perforatum</i>

Species	Scientific
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>
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>
Pineappleweed	<i>Matricaria discoidea</i>
Black medick	<i>Medicago lupulina</i>
Whorled Water Milfoil	<i>Myriophyllum</i> spp.
Watercress	<i>Nasturtium officinale</i>
Yellow Water-lily	<i>Nuphar lutea</i>
Red Bartsia	<i>Odontites verna</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>
Smooth Meadow Grass	<i>Poa pratensis</i>
Broad-leaved Pondweed	<i>Potamogeton natans</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</i> spp.
Bramble	<i>Rubus fruticosus</i> agg.
Common Sorrell	<i>Rumex acetosa</i>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Rusty Willow	<i>Salix cinerea</i> subsp <i>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>
Devilsbit Scabious	<i>Succisa pratensis</i>
Dandelions	<i>Taraxacum</i> spp.
Red Clover	<i>Trifolium pratense</i>
White Clover	<i>Trifolium repens</i>
Bulrush	<i>Typha latifolia</i>

Species	Scientific
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.
<b>Birds</b>	
Buzzard	<i>Buteo buteo</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>
Robin	<i>Erithacus rubecula</i>
Swallow	<i>Hirundo rustica</i>
Blue tit	<i>Parus caeruleus</i>
House Sparrow	<i>Passer domesticus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Magpie	<i>Pica pica</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Starling	<i>Sturnus vulgaris</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
<b>Amphibians</b>	
Common Frog	<i>Rana temporaria</i>

Species	Scientific
<b>Odonata</b>	
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>
<b>Lepidoptera</b>	
Meadow Brown	<i>Maniola jurtina</i>
Speckled Wood	<i>Pararge aegeria</i>
Small White	<i>Pieris rapae</i>
<b>Diptera</b>	
Syrphidae	<i>Syrphus ribesii</i>
Syrphidae	<i>Myathropa florum</i>
<b>Coleoptera</b>	
7-Spot Ladybird	<i>Coccinella 7-punctata</i>
<b>Mammals</b>	
<b>Sika Deer</b>	<b><i>Cervus nippon</i></b>

#### 4.6 Connaught Bridge – Hoare’s Bridge (Distance: 2.7km)

Appendix A, Maps 6 & 7

##### Habitats and Flora

A large proportion of the towpath and canal verge and boundary on the south side of the canal is categorised as combination of treeline (WL2) and dry meadows and grassy verges (GS2) The towpath and canal bank on the north side of the canal has been categorised as towpath mosaic (TM) and hedgerow (WL1). Both the north and south verges of the canal are surrounded by sections of wet grassland (GS4) and improved agricultural grassland (GA1). Tilled land (BC3) occurs in adjacent lands at Connaught Bridge on the south side of the canal whilst small sections of the canal marker are lined by buildings and gardens (BL3/GA2). The invasive plant species Cotoneaster and Snowberry were recorded along this section of canal associated with gardens or as colonisers within scrubby field boundaries.



**Plate 4.6 Wet grassland field located adjacent to canal in this section.**

**Table 4.6.1 Habitats recorded from Connaught Bridge to Hoare’s Bridge**

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
WS1	Scrub
FW3	Canals
TM	Towpath mosaic
GS4	Wet grassland
GS2	Dry meadows and grassy verges
BL3	Buildings and artificial surfaces
BC3	Tilled land
BL3/GA2	Buildings and artificial surfaces / Amenity grassland
GA2	Amenity grassland
WD1	Broadleaved woodland (mixed)
WD1/WS1	Broadleaved woodland (mixed) / scrub

**Table 4.6.2 Species recorded from Connaught Bridge to Hoare’s Bridge**

Species	Scientific
<b>Vascular Plants</b>	
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>
Wild garlic	<i>Allium ursinum</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>

Species	Scientific
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>
Black Sedge	<i>Carex nigra</i>
Remote Sedge	<i>Carex remota</i>
Knapweed	<i>Centaurea nigra</i>
Rustyback	<i>Ceterach officinarum</i>

Species	Scientific
Charophytes	<i>Charophyta</i>
Creeping Thistle	<i>Cirsium arvense</i>
Marsh Thistle	<i>Cirsium palustre</i>
Hazel	<i>Corylus avellana</i>
<b>Cotoneaster</b>	<b><i>Cotoneaster horizontalis</i></b>
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>
<b>Canadian Waterweed</b>	<b><i>Elodea canadensis</i></b>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Hoary Willowherb	<i>Epilobium parviflorum</i>
Field Horsetail	<i>Equisetum arvense</i>
Water Horsetail	<i>Equisetum fluviatile</i>
Petty Spurge	<i>Euphorbia peplus</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>
Mare's-tail	<i>Hippuris vulgaris</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Square-stalked St John's Wort	<i>Hypericum tetrapterum</i>
Catsear	<i>Hypochaeris radicata</i>
<b>Himalayan Balsam</b>	<b><i>Impatiens glandulifera</i></b>
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>
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>
White Dead-nettle	<i>Lamium album</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>
Honeysuckle	<i>Lonicera periclymenum</i>
Bird's foot trefoil	<i>Lotus corniculatus</i>
Field Woodrush	<i>Luzula campestris</i>
Black medick	<i>Medicago lupulina</i>
Water Mint	<i>Mentha aquatica</i>

Species	Scientific
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>
Common Reed	<i>Phragmites australis</i>
Scots Pine	<i>Pinus sylvestris</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>
Tormentil	<i>Potentilla erecta</i>
Cowslip	<i>Primula veris</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>
Arrowhead	<i>Sagittaria sagittifolia</i>
Rusty Willow	<i>Salix cinerea subsp 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>
<b>Snowberry</b>	<b><i>Symphoricarpos albus</i></b>
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>
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>
<b>Birds</b>	

Species	Scientific
Kingfisher	<i>Alcedo atthis</i>
Mallard	<i>Anus platyrhynchos</i>
Buzzard	<i>Buteo buteo</i>
Linnet	<i>Carduelis cannabina</i>
Goldfinch	<i>Carduelis carduelis</i>
Woodpigeon	<i>Columba palumbus</i>
Rook	<i>Corvus frugilegus</i>
Hooded Crow	<i>Corvus corone cornix</i>
Jackdaw	<i>Corvus monedula</i>
Robin	<i>Erithacus rubecula</i>
Kestrel	<i>Falco tinninulus</i>
Swallow	<i>Hirundo rustica</i>
Blue tit	<i>Parus caeruleus</i>
Chiffchaff	<i>Phylloscopus collybita</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Goldcrest	<i>Regulus regulus</i>
Starling	<i>Sturnus vulgaris</i>
Blackcap	<i>Sylvia communis</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
<b>Amphibians</b>	
Common Frog	<i>Rana temporaria</i>
<b>Odonata</b>	
Brown Hawker	<i>Aeshna grandis</i>

Species	Scientific
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>
<b>Lepidoptera</b>	
Grass moth species	<i>Catoptria pinella</i>
Small Copper	<i>Lycaena phlaes</i>
Meadow Brown	<i>Maniola jurtina</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>
Garden Carpet	<i>Xanthorhoe fluctuata</i>
<b>Diptera</b>	
Syrphidae	<i>Syrphus ribesii</i>
Syrphidae	<i>Melanostomna scalare</i>
<b>Mammals</b>	
Grey Squirrel	<i>Sciurus carolinensis</i>

#### 4.7 Hoare's Bridge – Corbally Harbour (Distance: 2.0km)

Appendix A, Maps 7 & 8

##### Habitats and Flora

This section of the Naas Corbally Branch forms ESA1 (See description in Section 5) due its diverse canal vegetation and associated well developed fringe and swamp communities. Close to Hoare's Bridge, the towpaths and canal verges are mainly classified as artificial ground (BL3) and buildings and gardens (BL3/GA2) surrounded by improved agricultural grassland (GA1). The eastern canal verge opposite the line of residential properties is unmanaged. The south-western verge along this section at Lewinstown comprises hedgerows (WL1) and Treelines (WL2).



**Plate 4.7.1 Diverse channel and emergent vegetation at Hoare's Bridge.**



**Plate 4.7.2 *Glycerio-Sparganium* water margin vegetation within canal channel.**

Further south the canal passes through largely agricultural grassland, improved and wet grassland. The eastern canal verge and boundary between Hoare's Bridge and Corbally Harbour consists of predominantly open *Crataegus-Prunus* scrub (WS1) and wet grassland (GS4). Along the south-western verge the towpath mosaic (TM) is flanked by a canal verge of dry meadows and grassy verges (GS2), dense *Crataegus-Prunus-Ulex* scrub (WS1) and Hedgerow (WL1). Close to Corbally Harbour, scrub is the dominant habitat classification on both sides of the canal verge and boundary. Adjacent land parcels comprise a variety of tilled land (BC3) with strips of dry calcareous and neutral grassland (GS1) and improved agricultural grassland.

Otter signs were recorded at the old bridge at Clownings and the entire section provides excellent foraging, commuting and cover for Otter. A Kingfisher was recorded commuting along the canal marker.

**Table 4.7.1 Habitats recorded from Hoare's Bridge to Corbally Harbour**

Habitat Code	Habitat Name
GA1	Improved agricultural grassland
WS1	Scrub
FW3	Canals
TM	Towpath mosaic
GS4	Wet grassland
GS2	Dry meadows and grassy verges
GS1	Dry calcareous and neutral grassland
BC3/GA2	Tilled land/ amenity grassland
BL3	Buildings and artificial surfaces
WD1/WS1	Broadleaved woodland (mixed) / scrub



**Table 4.7.2 Species recorded from Jigginstown Bridge to Connaught Bridge**

Species	Scientific
<b>Vascular Plants</b>	
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>
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>
<b>Canadian Waterweed</b>	<b><i>Elodea canadensis</i></b>
Rosebay	<i>Epilobium angustifolium</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Hoary Willowherb	<i>Epilobium parviflorum</i>
Field Horsetail	<i>Equisetum arvense</i>
Water Horsetail	<i>Equisetum fluviatile</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>
Common Marsh-bedstraw	<i>Galium palustre</i>
Herb-Robert	<i>Geranium robertianum</i>
Floating Sweet Grass	<i>Glyceria fluitans</i>
Reed Sweet Grass	<i>Glyceria maxima</i>

Species	Scientific
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>
<b>Himalayan Balsam</b>	<b><i>Impatiens glandulifera</i></b>
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 subnodolus</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>
Gipsywort	<i>Lycopus europaeus</i>
Purple-loosestrife	<i>Lythrum salicaria</i>
Black medick	<i>Medicago lupulina</i>
Water Mint	<i>Mentha aquatica</i>
Purple Moor Grass	<i>Molinia caerulea</i>
Water-forget-me-not	<i>Myosotis scorpioides</i>
Whorled Water Milfoil	<i>Myriophyllum</i> spp.
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>
Hart's-tongue	<i>Phyllitis scolopendrium</i>
Scots Pine	<i>Pinus sylvestris</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>
Tormentil	<i>Potentilla erecta</i>
Cowslip	<i>Primula veris</i>
Primrose	<i>Primula vulgaris</i>
Selfheal	<i>Prunella vulgaris</i>
Blackthorn	<i>Prunus spinosa</i>
Meadow Buttercup	<i>Ranunculus acris</i>

Species	Scientific
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</i> spp.
Bramble	<i>Rubus fruticosus</i> agg.
Common Sorrell	<i>Rumex acetosa</i>
Rusty Willow	<i>Salix cinerea</i> subsp <i>oleifolia</i>
Elder	<i>Sambucus nigra</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Common Figwort	<i>Scrophularia nodosa</i>
Ragwort	<i>Senecio jacobaea</i>
Smooth Sow Thistle	<i>Sonchus oleraceus</i>
Rowan	<i>Sorbus aucuparia</i>
Irish Whitebeam	<i>Sorbus hibernica</i>
Marsh Woundwort	<i>Stachys palustris</i>
Devilsbit Scabious	<i>Succisa pratensis</i>
<b>Snowberry</b>	<b><i>Symphoricarpos albus</i></b>
Dandelions	<i>Taraxacum</i> spp.
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>
Germander Speedwell	<i>Veronica chamaedrys</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>
<b>Birds</b>	
Sparrowhawk	<i>Accipiter nissus</i>
Kingfisher	<i>Alcedo atthis</i>
Heron	<i>Ardea cinerea</i>
Greenfinch	<i>Carduelis chloris</i>
Woodpigeon	<i>Columba palumbus</i>
Jackdaw	<i>Corvus monedula</i>
Mute Swan	<i>Cygnus olor</i>
Reed Bunting	<i>Emberiza schoeniclus</i>
Moorhen	<i>Gallinula chloropus</i>
Swallow	<i>Hirundo rustica</i>
Chiffchaff	<i>Phylloscopus collybita</i>

Species	Scientific
Magpie	<i>Pica pica</i>
Starling	<i>Sturnus vulgaris</i>
Whitethroat	<i>Sylvia communis</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
<b>Amphibians</b>	
Common Frog	<i>Rana temporaria</i>
<b>Odonata</b>	
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>
Common Darter	<i>Sympetrum striolatum</i>
<b>Lepidoptera</b>	
Peacock	<i>Inachis io</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>
Red Admiral	<i>Vanessa atalanta</i>
<b>Diptera</b>	
Syrphidae	<i>Syrphus ribesii</i>
Syrphidae	<i>Myathropa florum</i>
Tipulidae	<i>Tipula maxima</i>
<b>Hymenoptera</b>	
Tenthredinidae	<i>Thenthredo arcuata</i>
<b>Mammals</b>	
Otter	<i>Lutra lutra</i>
<b>Grey Squirrel</b>	<b><i>Sciurus carolinensis</i></b>

## 5. ECOLOGICALLY SENSITIVE AREAS

### 5.1 ESA1 Hoare's Bridge to Corbally Harbour (Maps 7 & 8)

This ESA comprises a diverse aquatic plant community within the channel and a high species richness of submerged, floating-leaved and emergent vegetation. The ESA covers approximately 2km of the canal channel from the terminal end of the system at Corbally Harbour north to Hoare's Bridge. This stretch of the canal has been subject to little recent management or trafficking, allowing a late successional stage of emergent vegetation to develop throughout. The emergent vegetation is dominant in many stretches (>70% cover).



**Plate 5.1 *Glycerio-Sparganion* dominated channel with *Phragmites* fringe. Neutral grassland verge on the eastern bank.**

*Sparganion* swamp chokes and dominates in the less open areas of channel, and extensive examples of this community are rare within the Grand Canal system. Where the open water becomes variably deeper with less of a silty substrate the community transitions into a dense *Potamogeton natans* and *Elodea* sub-community and associated various starworts *Callitriche* spp. With varying and increased depth, the *Sparganion* becomes less frequent, and more associated with an abundant growth of *Hippuris vulgaris*.

Moving northward away from Corbally Harbour the channel opens up and the patterns of patchy swamp form more discrete and regular zonations of *Phragmites*, *Glycerietum* and *Sparganion*, with occasional pockets of *Schoenoplectus* at the fringes. In these open stretches the dominant aquatic community is predominantly a *Nuphar-Potamogeton* community. The Annex I listed species, Kingfisher (*Alcedo atthis*) was recorded along the canal at Herberstown, the only recorded sighting within the Naas Corbally Branch during field surveys.

On the eastern canal verge beyond the *Phragmites* fringe, the sloping bank consists of a narrow strip and damp patchwork of Purple Moor Grass-Sweet Vernal Grass *Molinia-Anthoxanthum* grading into a more free draining embankment covered in *Crataegus-Prunus - Ulex* scrub. The scrub is open and fragmented, compared to the opposite bank. The eastern canal bank is variably grazed by sheep with a heterogeneous grassy field layer within the patchy scrub typical of drier sloped and disturbed *Cynosurus cristatus-Centaurea nigra* communities.

A number of Birds of Conservation Concern were recorded along this canal marker, notably Sparrowhawk (*Accipiter nissus*), Starling (*Sturnus vulgaris*), Greenfinch (*Carduelis chloris*), Swallow (*Hirundo rustica*) and Mute Swan (*Cygnus olor*). The scrub patchwork provides excellent nesting habitat for other species not directly observed during field surveys, notably Yellowhammer *Emberiza citronella* and Linnet *Carduelis cannabina*.

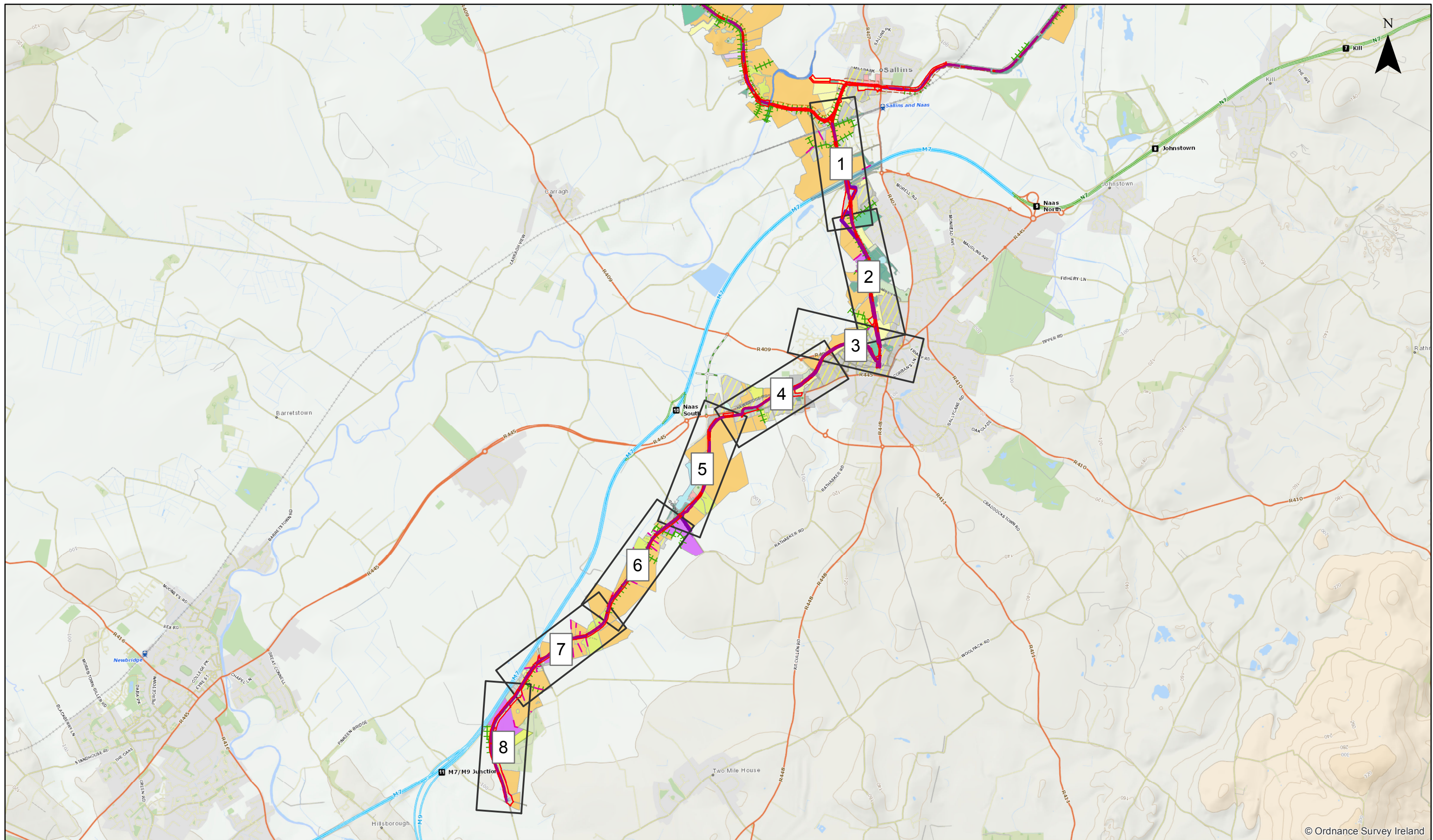
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**APPENDIX A**

**NAAS CORBALLY BRANCH**  
**HABITAT MAPS**

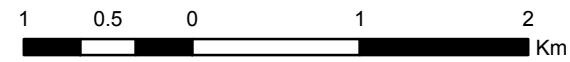




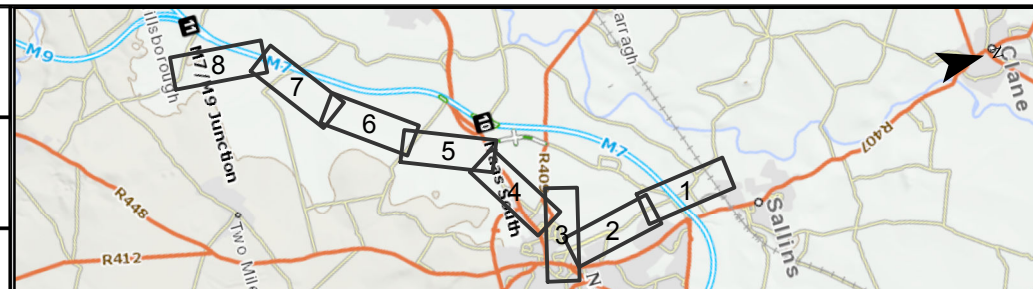
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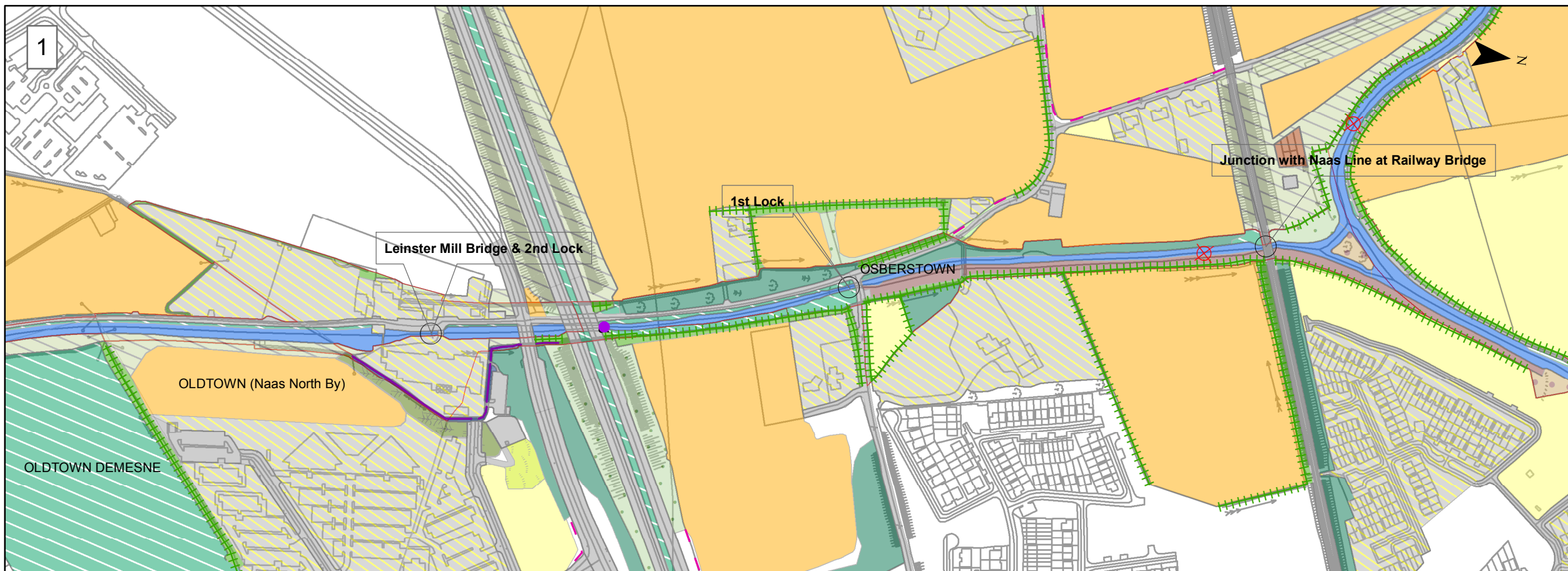
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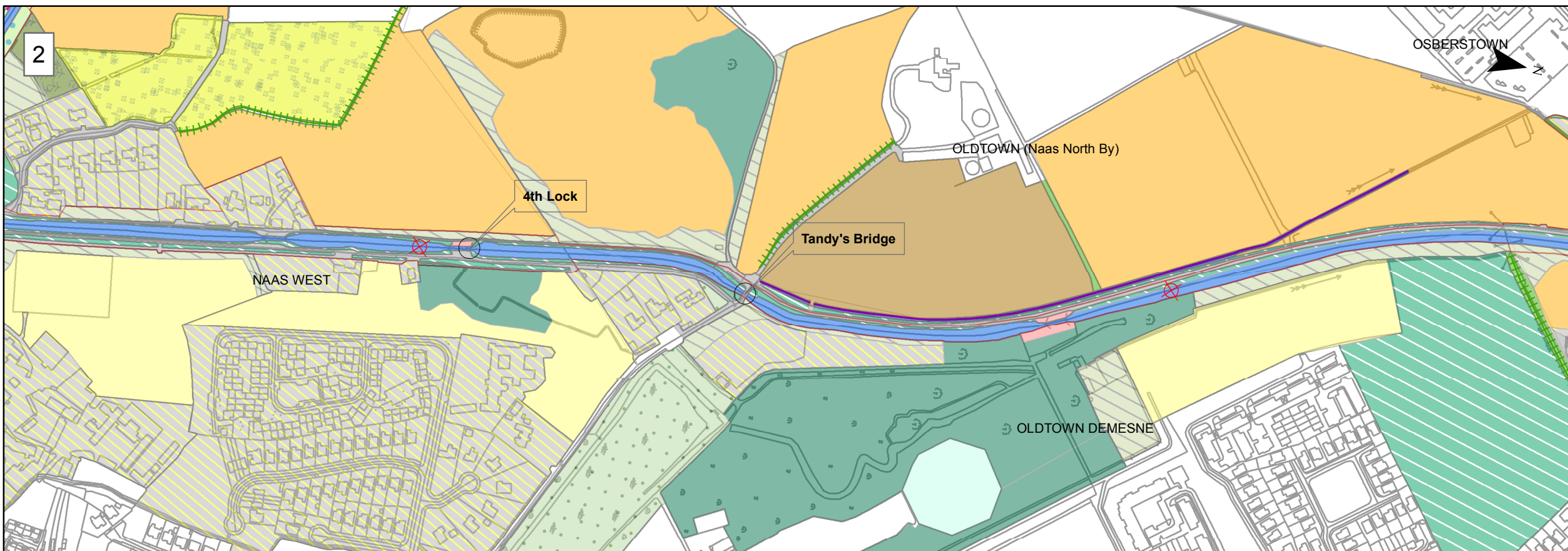
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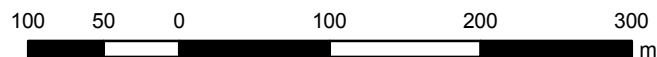


- Legend**
- Aquatic Macrophyte Sample Locations
  - Protected Mammal Activity
  - IAS - Invasive Plants Species
  - Bridges
  - Property Boundary
  - ESA - Ecologically Sensitive Areas
  - Fossitt Habitat Code Polygons**
  - WL1, Hedgerows
  - BL1, Stone walls
  - WL2, Treelines
  - FW4, Drainage ditch
  - Fossitt Habitat Code Polygons**
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  - BC3, Tilled land
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  - BL3/GA2, Buildings and gardens
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  - ED3, Recolonising bare ground
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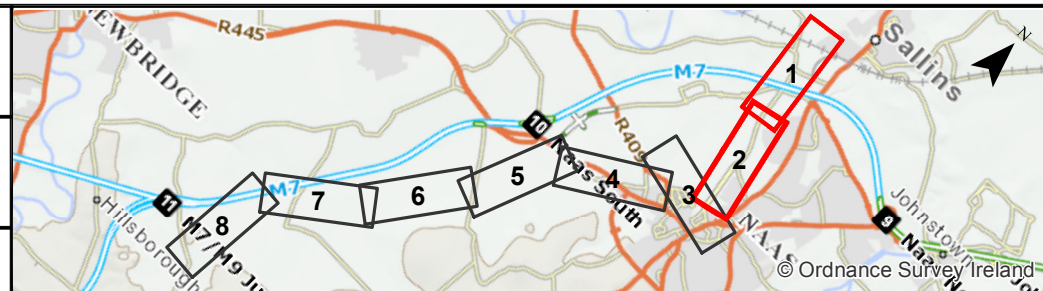


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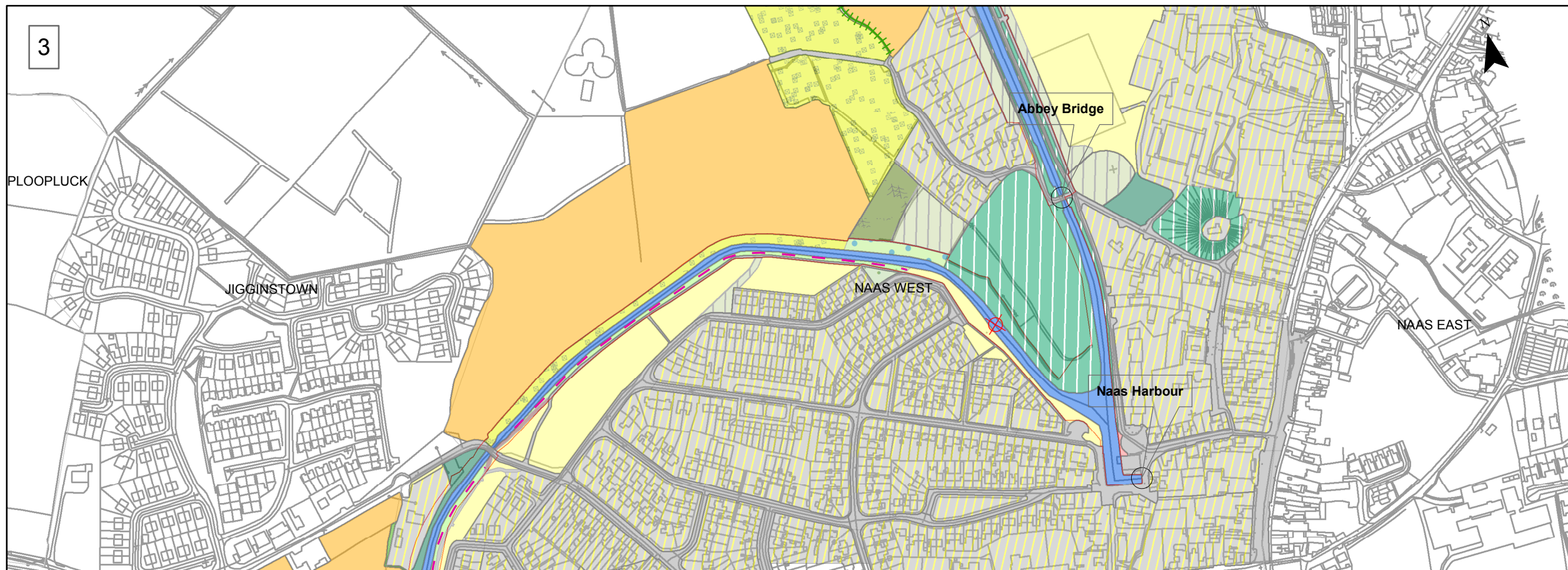


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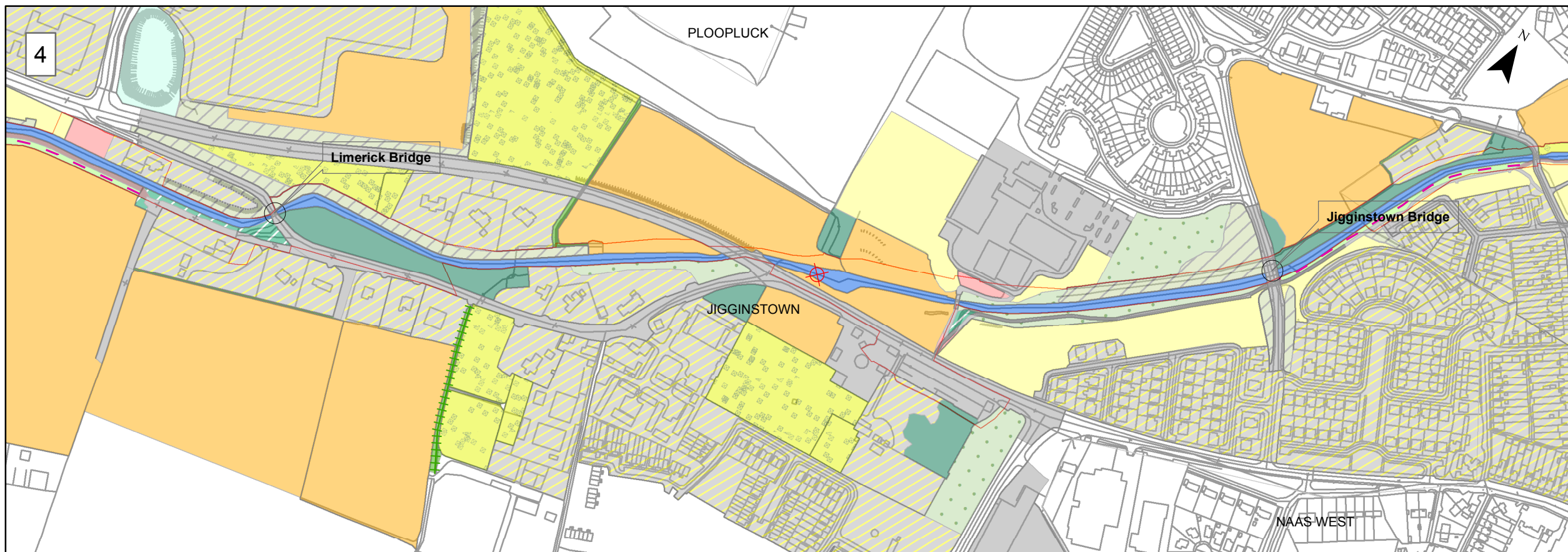
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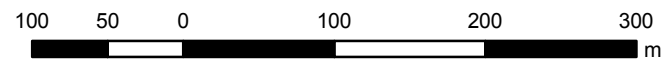


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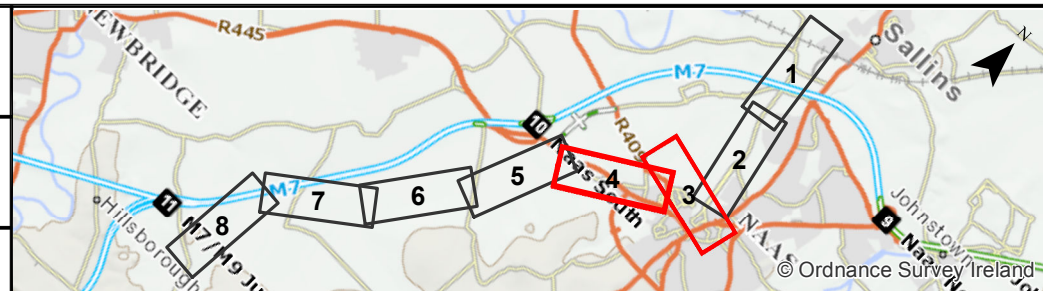


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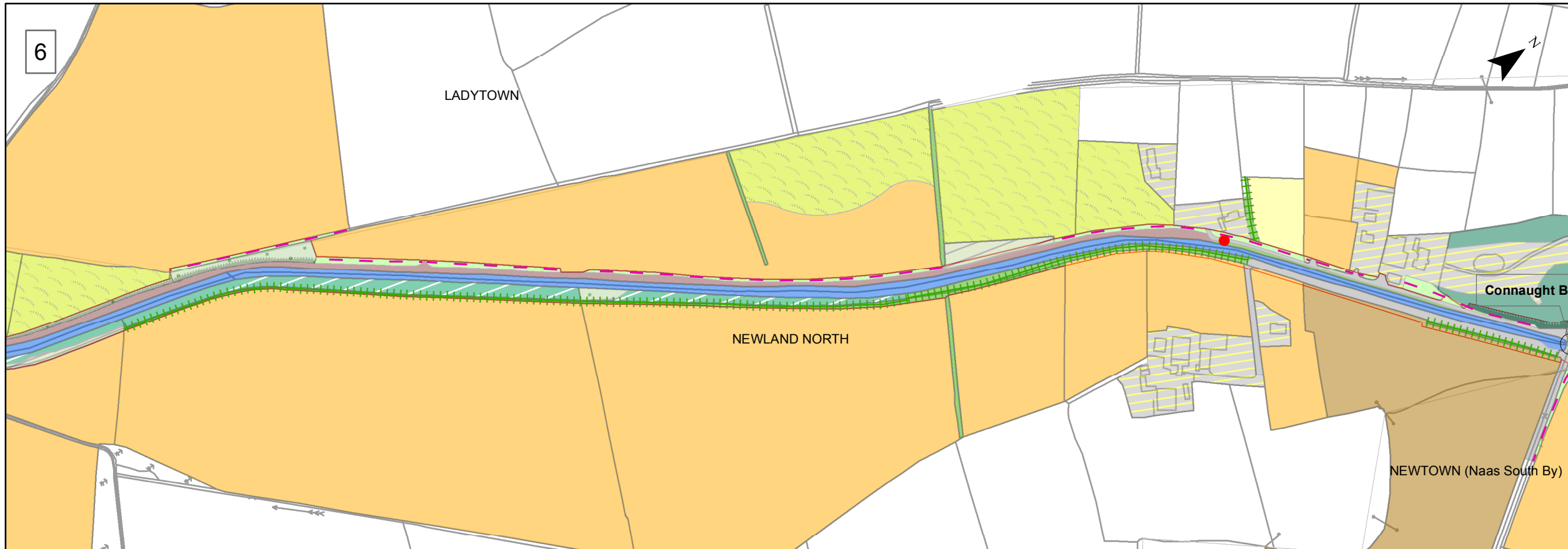
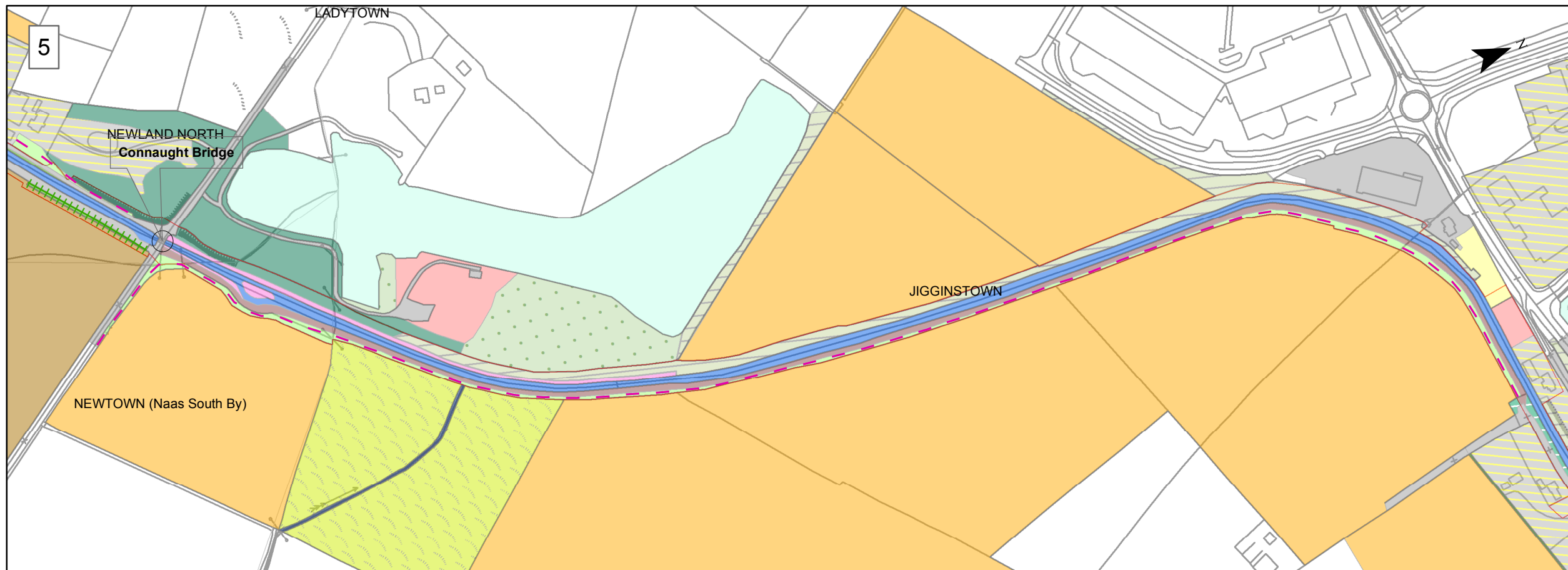


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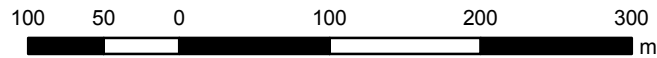


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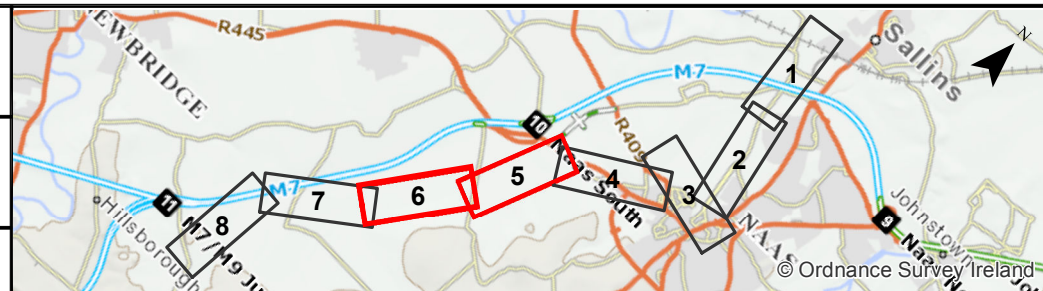


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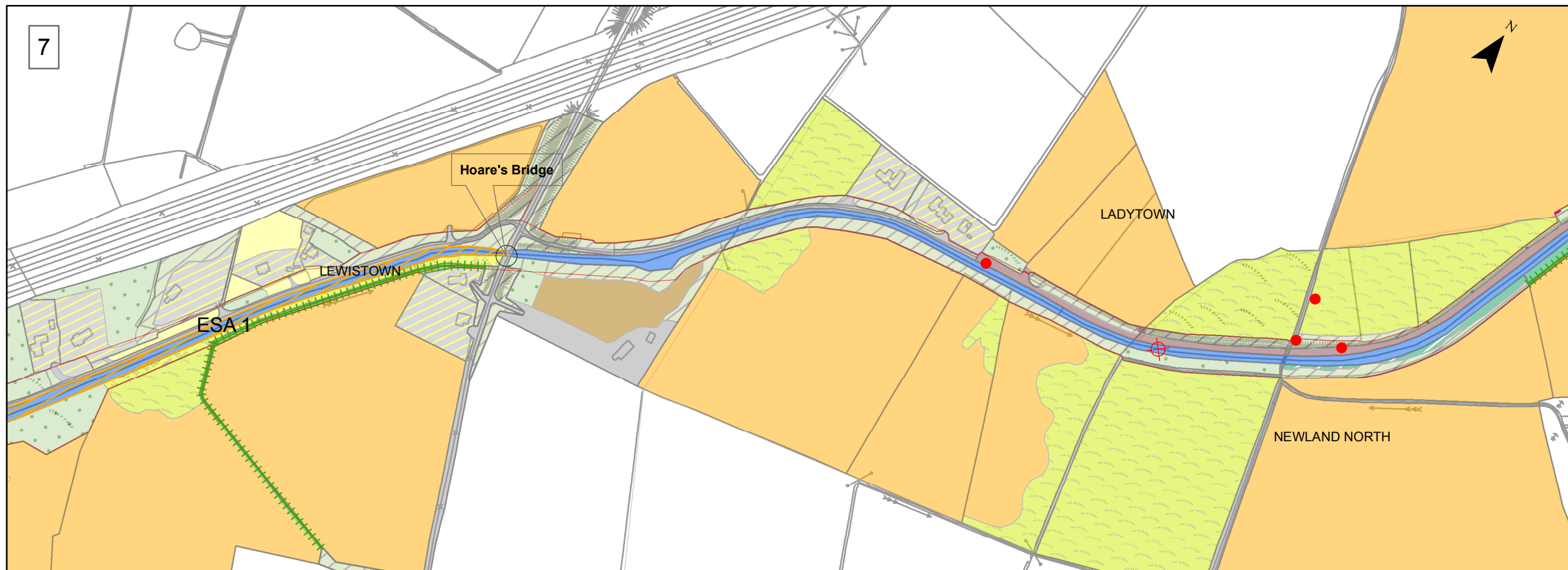
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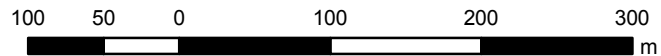
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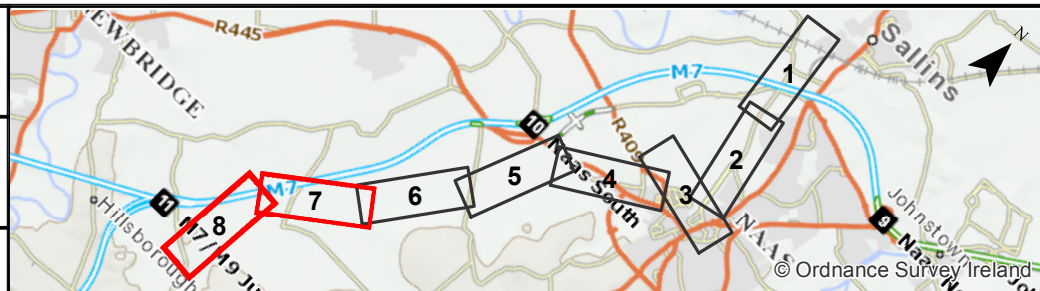
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