CORBALLY CANAL & LIFFEY CORRIDOR ENHANCEMENT FEASIBILITY STUDY

BASELINE REPORT

December, 2024

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prepared for:

Kildare County Council

IAC Archaeology

John Ruddle TOURISM DEVELOPMENT CONSULTANT

JBA consulting

Comhairle Contae Chill Dara
Kildare County Council

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Revision History

Revision Ref/Date	Amendments	Issued to
S3-P01 - 17/10/2024	Baseline Report	Kildare County Council
S3-P02 - 11/12/2024	Revised Baseline Report	Kildare County Council

Contract

This report describes work commissioned as per contract signed on June 28th, 2024. This report was prepared by JBA Consulting, IAC Archaeology and John Ruddle Tourism.

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Purpose

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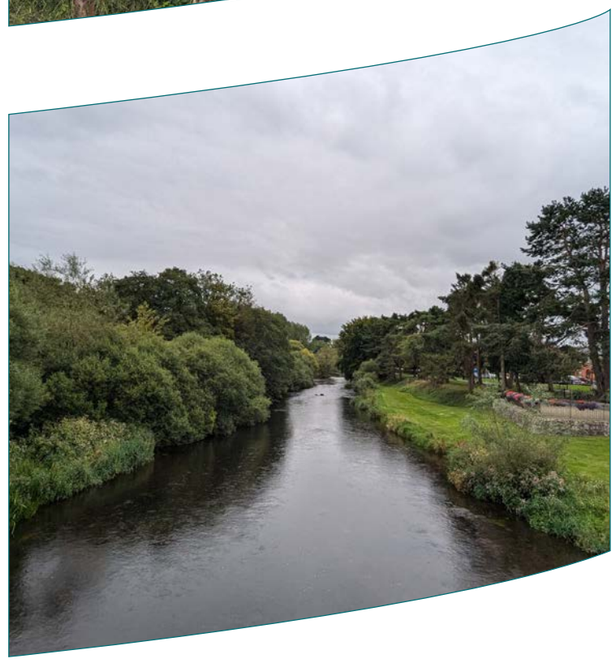

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1.0 INTRODUCTION

JBA Consulting was commissioned by Kildare County Council for the Preparation of the Corbally Canal & Liffey Corridor Enhancement Feasibility Study, County Kildare.

The team that will carry out this study led by JBA Consulting' landscape team includes JBA's Landscape, Ecology and Engineering teams, IAC Archaeology, John Ruddle tourism consultant and CuddyQS Quantity Surveyors.

The Feasibility Study (hereafter referred to as 'the Study') aims to assess the opportunity for future amenity uses on and along the Corbally Canal Branch, including the opportunity to repair and repurpose the existing Corbally Harbour and its basin for recreation use. The River Liffey recreational trail from Kilcullen to Newbridge would provide a 10.75km route that has the potential to form part of a future consolidated strategic River Liffey Valley Park enhancing a network of recreational trails / greenways in County Kildare and beyond. The objectives for the Liffey Valley Park include the investigation of the potential provision of pocket parks / open spaces along the Liffey corridor between Newbridge and Kilcullen. The Study also aims to include an assessment of a proposed recreational trail / greenway connection from the Corbally Harbour to the River Liffey to facilitate connections from the Harbour to the settlements of Newbridge, Kilcullen and Athgarvan along the River

The study area comprises approximately 8.64 km of the Corbally Canal from Naas to Corbally Harbour, approximately 10.75 km of the Liffey Corridor, between Newbridge and Kilcullen, and connecting areas between both corridors.

This report was prepared to describe the opportunities and constraints identified during the baseline assessment for the Corbally Canal and Liffey Corridor Enhancement Feasibility Study. The information necessary to identify existing conditions in the study area has been gathered from:

- Desktop studies of existing and historical information; and
- Site surveys: note that surveys will continue throughout the Study duration when and where required, as dictated by relevant legislation, guidance documents, and recommendations from specialist advisors on the Study . The information gathered in this report will be updated where necessary to reflect survey results as they become available.

The report has been structured according to each subject, as follows:

- Site Location and Context
- Population & Human Health
- Landscape, Green & Blue Infrastructure
- Biodiversity
- Land, Soils & Geology
- Drainage & Structure
- Climate Action
- Traffic & Transport
- Built Heritage, Archaeology & Cultural Heritage
- Recreation & Tourism
- Baseline Assessment

Relevant documents were considered in this study such as, but not limited to, the Kildare County Development Plan 2023-2029, Naas Local Area Plan (LAP), Newbridge LAP, Athgarvan LAP, Kilcullen LAP, Sustainable Drainage Systems Guidance by Kildare County Council (KCC) and Kildare Climate Change Adaptation Strategy. Additionally, assessments carried out within the management remit of Waterways Ireland, the Inland Waterways Association of Ireland and Fisheries Ireland were also considered.

This report relates to **Stage 2 - Baseline Report**, as part of the Feasibility Study. The current and upcoming stages will be carried out in the following order:

- Stage 2 - Baseline Report
- Stage 3 - Engagement Report
- Stage 4 - Principles, Parameters and Options Report
- Stage 5 - Draft Feasibility Report
- Stage 6 - Final Feasibility Report

Abbreviations

ACA - Architectural Conservation Area
AOD - Above Ordnance Datum
CAP - Climate Action Plan
CDP - County Development Plan
CIEEM - Chartered Institute of Ecology and Environmental Management
EPA - Environmental Protection Agency
GHG - Greenhouse gas
GHS - Geological Heritage Sites
GIS - Geographic Information Systems
GSI - Geological Survey Ireland
INNS - Invasive Non-Native Species
IWAI - Inland Waterways Association of Ireland
LAP - Local Area Plan
LCA - Landscape Character Assessment
KCDP - Kildare County Development Plan
NBDC - National Biodiversity Data Centre
NPWS - National Parks and Wildlife Services
OD - Ordnance Datum
OPW - Office of Public Works
QI - Qualifying Interest
RBMP - River Basin Management Plan
pNHA - Proposed Natural Heritage Area
SAC - Special Area of Conservation
SCI - Special Conservation Interest
SPA - Special Protection Area
WFD - Water Framework Directive
ZoI - Zone of Influence

2.0 SITE LOCATION & CONTEXT

The study area is located between Naas, Newbridge and Kilcullen, Co. Kildare and includes three overall areas, as shown in Figure 2-1 and listed below.

- Liffey Corridor between Newbridge & Kilcullen, with a length of approximately 10.75 km;
- Corbally Canal between Naas (at R445 regional road) and Corbally Harbour, with a length of approx. 8.64 km;
- Lands between Liffey Corridor & Corbally Canal – within the townlands of Great Connell, Hillsborough, Oldtown and Rosetown.

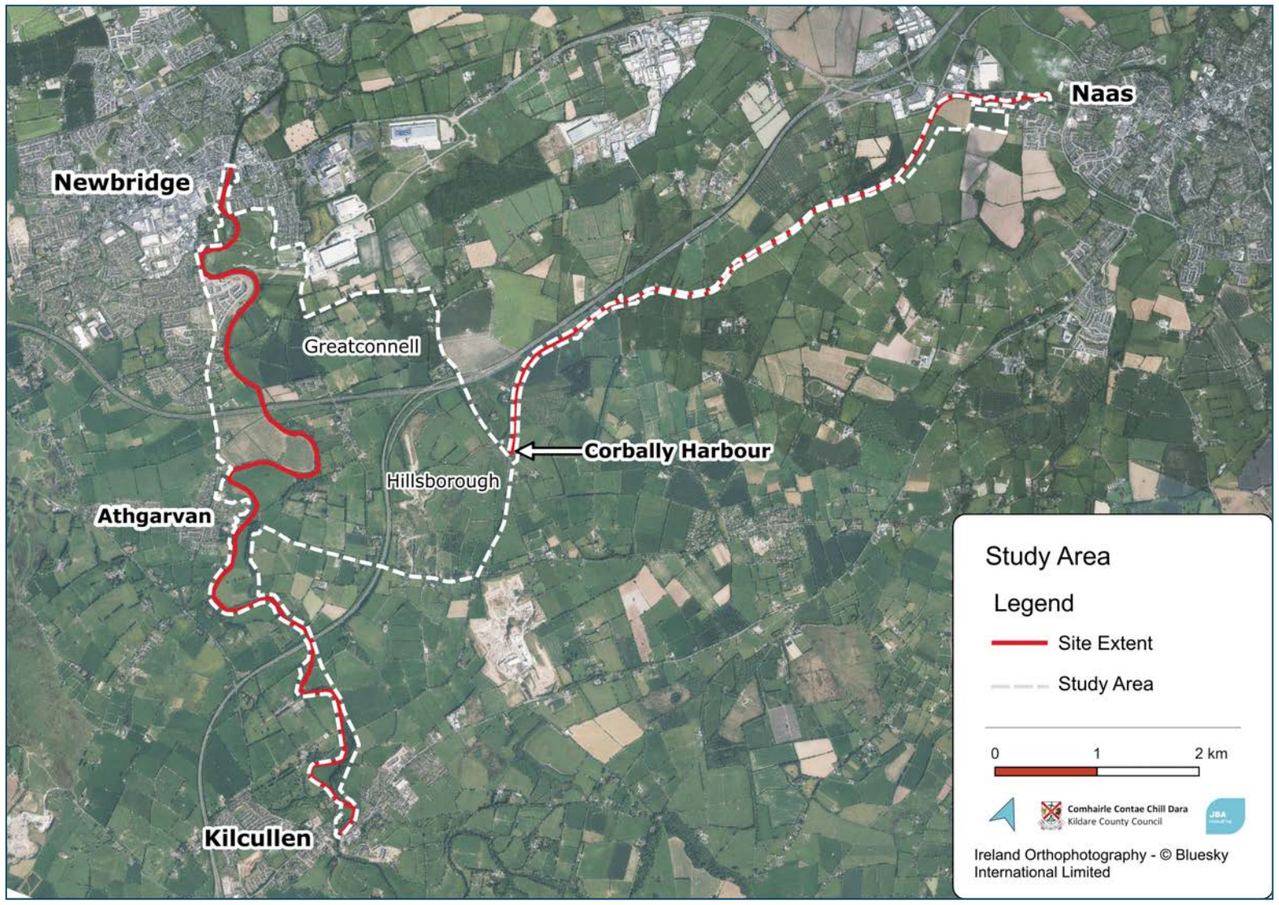
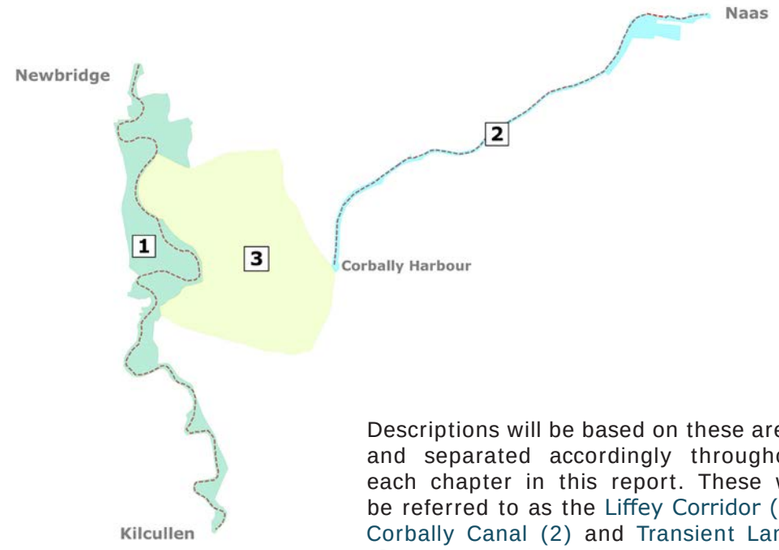


Figure 2-1 Study Area



Descriptions will be based on these areas and separated accordingly throughout each chapter in this report. These will be referred to as the Liffey Corridor (1), Corbally Canal (2) and Transient Lands (3), respectively, as illustrated above.

The character of the landscape within the study area is of mixed typology. Each corridor connects urban fabric via rural landscapes, with some residential and industrial amenity present in some locations.

The Liffey Corridor is aligned with farmlands while crossing through local settlements such as Newbridge, Athgarvan and Kilcullen. Publicly accessible river frontage is scarce within this corridor, with connectivity occurring uniquely at residential developments and public open spaces such as the Liffey Valley Park in Newbridge or the Valley Walk in Kilcullen.

The Corbally Canal is an existing linear waterway that extends from Naas to Corbally Harbour. The Corbally branch of the Grand Canal, also known as Corbally Canal, is included under the statutory obligations of the Canals Act. The Corbally Canal is wholly managed and maintained by Waterways Ireland, the national authority with responsibility for inland waterways. The canal is a publicly accessible route that is surrounded by residential and industrial amenity within the Naas boundary, but transitions to a more rural context for the majority of the canal to the west. The route is interrupted by existing carriageways, bridges and residential clusters. The canal is a man-made feature but houses rich biodiversity in the form of flora and fauna as well as heritage structures.

The Transient Lands comprise multiple townlands and is generally rural in character. There is a quarry in a central location (between Corbally Harbour and Athgarvan). The M9 motorway divides the townlands between east and west, with crossings available at the L2032 local road in Rosetown, via an access road from L2028 local road towards the quarry at Hillsborough, and at Harbour Road (local road L6063). The Greatconnell townland is recognised locally for its built heritage value, with multiple designated monuments located on the lands at the western end of the L6064 local road.

2.1 Zoning

The land use zoning provided in the Kildare County Development Plans and relevant Local Area Plans (LAP) set out the location and objectives for the types of development that the Council recognises to be suitable for each zone.

The study area comprises a combined land use zoning as mapped by the LAP for each town. This includes Newbridge, Athgarvan, Kilcullen and Naas.

In general, the zoning surrounding the existing Liffey River and Corbally Canal is dedicated to Open Space and Amenity, followed by New / Existing Residential and Agriculture, as shown in Figure 2-2.

The land use for each town comprises mixed uses with an extensive area allocated to existing residential / infill. The lands surrounding the study area in Newbridge also comprise industry, community and commercial uses, whereas smaller towns like Athgarvan and Kilcullen mostly include existing residential & town/village centre uses with some industry.

Similarly to Newbridge, Naas urban fringe is dedicated to industry and commercial zoning, together with a large land zoned for data centres. This site, immediately south of Corbally Canal at Jigginstown, is currently under Pre-Planning for a data centre and associated landscape proposals.

The provision of open space within the study area and each LAP is an important one. The objectives set out by the Council for the Open Space zoning are focused on protecting and catering to open space, amenity and recreational provision, especially within Newbridge where there is a demand for public open spaces. The aim of this land use zoning objective is to "*protect and provide for recreation, open space and amenity provision*".

The LAP for each settlement provides specific objectives for each area, which is in alignment with the main CDP policies.

2.1.1 Newbridge

It is an objective of the Newbridge LAP (2013-2019) "*to maintain and improve amenity lands, to preserve private open space and to provide recreational facilities. Existing agricultural uses in open spaces area will continue to be permitted and reasonable development proposals in relation to this issue will be considered on their merits*".

2.1.2 Athgarvan

It is an objective of Athgarvan LAP (CDP Variation No. 1, 2012) to "*protect recreation, open space and amenity areas, to maintain and improve amenity lands, to preserve private open space and to provide recreational facilities*".

The land use matrix provided in the CDP Variation 2012 recognises that Open Space & Amenity can receive community, recreational, sports, cultural developments, as well as having the potential to receive utility structures.

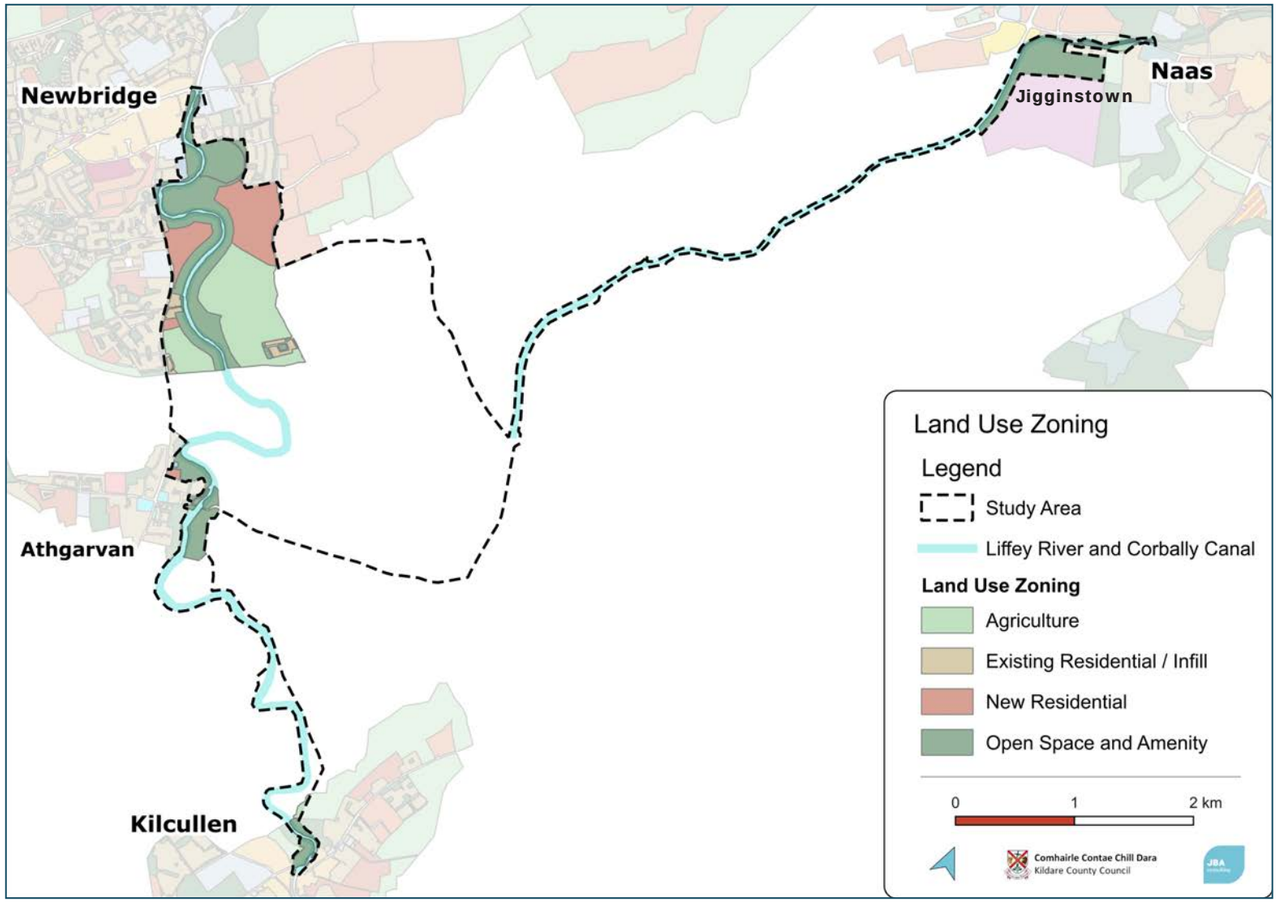


Figure 2-2 Land Use Zoning

2.1.3 Kilcullen

It is an objective of the Kilcullen LAP (2014-2020) to "*protect improve and maintain public open space and to provide for recreational and sports facilities."* It is also notes that "*existing agricultural uses in open space areas will continue to be permitted, and reasonable development proposals in relation to this use will be considered*".

2.1.4 Naas

The zoning objectives for Naas LAP are specified for each zone, as well as in general. The study area includes the 'F1 Open Space and Amenity' zoning, which refers to Jigginstown Linear Park. These lands comprise 21ha and are "i*dentified for the development of a linear park/neighbourhood park providing for active and passive recreation adjacent to an expanding residential area. A 50 metres setback is required from the bank of the Grand Canal. It is envisaged that this site could also provide for approximately four soccer pitches, two rugby pitches and two GAA pitches*".

2.2 Surrounding Developments

There are several developments within and surrounding the study area that may influence the provision of potential additional amenity.

The map on the right and Table 2-1 shown overleaf includes a selection of planning applications and future development that has been identified as relevant for the feasibility study.

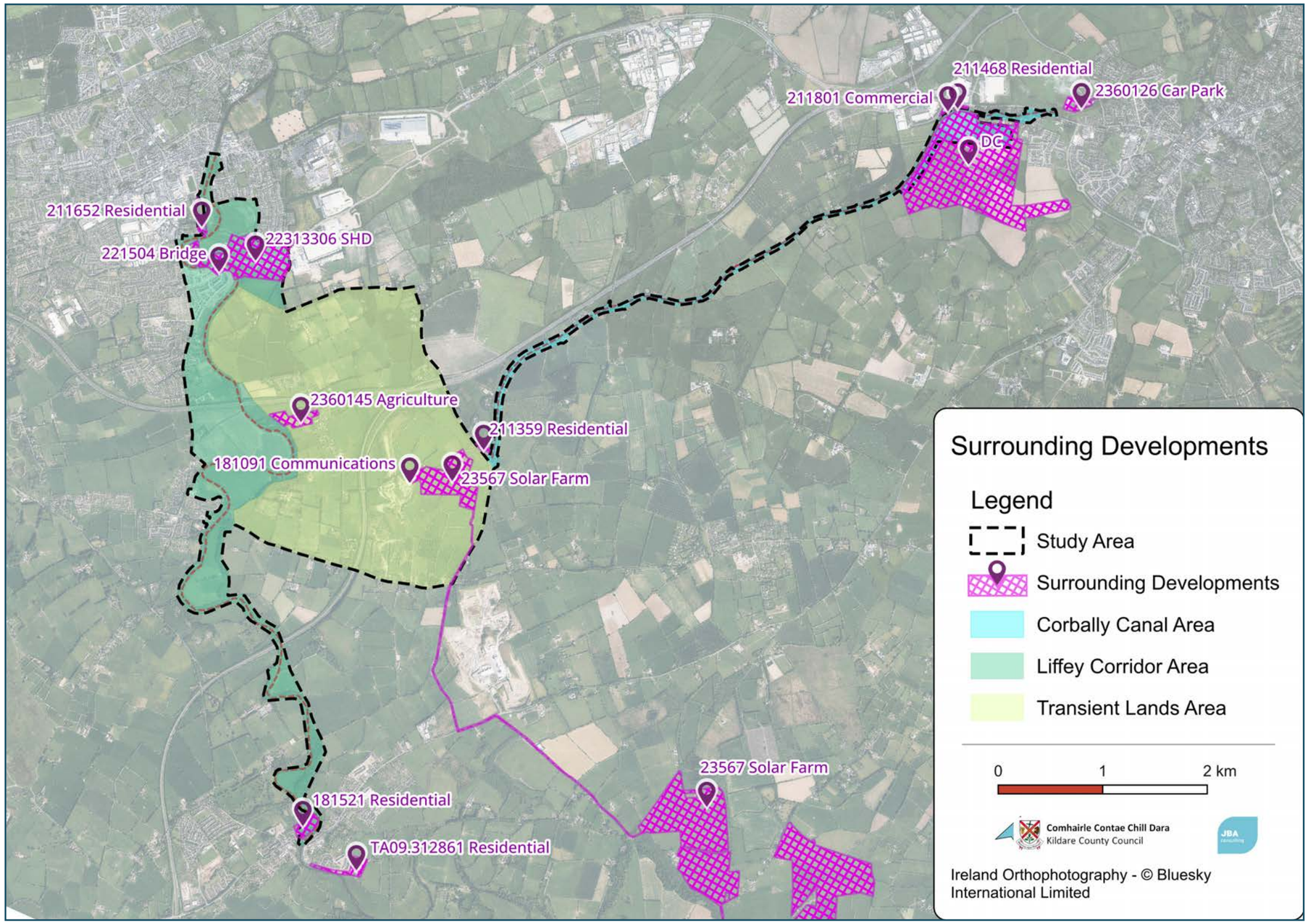


Figure 2-3 Location of Permitted and Proposed Developments

Table 2-1 Permitted and Proposed Developments

Planning Application Ref.	Development Type	Description
Liffey Corridor		
22313306	SHD / Residential	**Permitted** Strategic Housing Development (ABP DECISION) - demolition of existing site structures (2,622.3 sqm) and the construction of 569 no. Residential units, a neighbourhood centre with 11 no. units and a childcare facility, a circa 350 metre section of distributor road, and all ancillary and associated works on a site of 27.64 ha surrounding and including the dwellings of "Greatconnell" and "Valencia Lodge".
221504	Infrastructure (Bridge & Road)	**Permitted** development consisting of the provision of approximately 790m of new Distributor Road, including a new bridge over the River Liffey, forming part of the Newbridge South Outer Orbital Road (NSOOR) linking the Great Connell Road to the section of the NSOOR permitted under ABP Reg. Ref. 302141-18 (Belin Woods) and will comprise of the provision of a single carriageway road, with cycleways and footpaths in both directions, including a five-span bridge of approximately 170m over the River Liffey, with provision for future bus stops and associated toucan pedestrian crossing; Tie-in of the proposed section of Distributor Road with the Great Connell Road including upgrade of the existing roundabout to a signal control junction including toucan crossings on all arms of the junction; Provision of a proposed River Park of approximately 9.2 ha as a multi-use recreational amenity, including pedestrian and cycle routes connecting to existing public space network, a multi-use games area (MUGA) and incorporating biodiversity and water management features; Provision of 2 No. new agricultural entrances from the proposed Distributor Road to adjoining lands; and All associated earthworks, signage, lighting, drainage works, services and connections, landscaping works, environmental measures and all ancillary works above and below ground level.
211652	Residential	**Permitted** development on lands to the south of Ryston Pitch and Putt course and east of Ryston Avenue. The proposed development involves the construction of a two storey, detached dwelling and a single storey gate lodge, along with a new vehicular entrance off Ryston Avenue, car parking, driveway, landscaping (including ponds) and all associated site works.
181521	Residential	**Permitted** construction of a part single storey and part two-storey development, adjacent to the western site boundary and located between the existing "Artaban Hall" building and the Shed / Barn building. The proposed development will consist of 3 no. self-contained 1 bedroom living units for relatively independent and mobile people with an intellectual disability, 1 no. self-contained 2 bedroom living unit for a mobile person with an intellectual disability that requires an aspect of live in support through a personal assistant, 1 no. 3 bedroom living unit, for a couple or a family to serve as part of a co-housing strategy that serves to provide a "drop in service" for informal support for the tenants of the other four units, together with a shared communal facility / space for Camphill Communities of Ireland, and all associated siteworks.
TA09.312861	Residential	**Permitted** Strategic Housing Development (SHD) with conditions by ABP. 125 no. residential units (107 no. houses, 18 no. apartments), crèche and associated site works.
Corbally Canal		
2360126	Car Park Extension	**Permitted** new extension to existing public car park at K Leisure. This includes the relocation of entrance to existing car park and permanently closing existing entrance; Reconfiguration of existing car park layout to create a one-way system within complete car park area; Amendments to other entrance to car park to create an exit only; Provision of 7 No. Electric car charging points; Provision of extra bicycle parking; Provision of public lighting to car park; Provision of maintenance access route to existing 3G pitch; Relocation of pedestrian entrance to public play area; Provision of passively safe pencil bollards and reflective signage placed in the centre of the minor road to deflect traffic to the left on approach. 15. Provision of passively safe pencil bollards along the centreline of the R409 and parallel to the STOP line of the junction to discourage motorists from attempting an illegal right turn and all other associates site works.
DC	Data Centre	**Proposed** Data centre currently at pre-planning stage for the site zoned for data centres south of Jigginstown residential area. The proposed development will be required to provide a landscape buffer between the existing Canal and the proposed data centre buildings and associated works (Policy NE2 – Green Infrastructure - Naas LAP).
211468	Residential	**Permitted** 2 No. two storey houses, connection to mains sewer, modifications to existing roadside entrance to dual type entrance, extensive landscaping and all associated site development works.
211801	Commercial	**Permitted** development consisting of the construction of a new Discount Foodstore Supermarket with ancillary off-licence sales. The proposed development includes the redevelopment/reconfiguration of existing site layout, car parking and hard and soft landscaping; reconfigured existing vehicular access (to provide for delivery/service access only) and creation of new main vehicular access from Naas Retail Park Access Road, and a new pedestrian access point from Newbridge Road (replacing existing); Provision and renewal of boundary treatments, electricity sub-station, public lighting, electric vehicle charging infrastructure, roof mounted solar panels, cycle parking, modification of existing drainage, utility and services infrastructure and connections, and all other associated and ancillary development works above and below ground level.
211359	Residential	**Permitted** construction of two rural houses: House no. 1 is a one and half storey detached house with single storey element, single storey domestic garage, secondary effluent treatment system with shared access road and entrance utilising existing family entrance all associated site works. House no. 2 is a one and half storey detached house with single storey element, single storey domestic garage, secondary effluent treatment system with shared access road and entrance utilising existing family entrance all associated site works.

Continues overleaf

Planning Application Ref.	Development Type	Description
Transient Lands		
23567	Solar Farm	**Permitted** 10 Year Planning Permission for a solar farm with a total area of circa 246 hectares in the townlands of Brannockstown, Brownstown, Carnalway, Coghlanstown West, Corbally, Delamain, Dunnstown, Gaganstown, Greenhills, Harristown, Hillsborough, Moorhill and Rochestown in County Kildare. The solar farm will consist of solar photovoltaic panels with a surface area of 1,130,000m2 on ground mounted frames, 40 no. single storey electrical inverter/transformer stations, 4 no. single storey spare parts containers, 19 no. Ring Main Units, 9 no. weather stations underground electrical ducting and cabling within the development site, private lands and within the L6063, L2032, L6071, R448, L6072, R412, L6074, L6047 and R413 public roads to connect solar farm field parcels, security fencing, CCTV, access tracks, 5 no. stream and drain deck crossings, temporary construction compounds, landscaping and all associated ancillary development and drainage works. Construction and operational access will be via entrances from the R412, R413, L6044, L6047 and L6063. The solar farm will have a maximum export capacity of circa 210 megawatts. The operational lifespan of the solar farm will be 40 years and planning permission is requested for this duration. Revised by significant Further Information consisting of revised site layout plans to reduce panelled areas in Parcels 1 and 2, relocation of meteorological mast in Parcel 1 and all associated landscaping and ancillary works.
1811091	Communications	**Permitted** retention of an existing telecommunications installation comprised of a 30m monopole, antennas, dishes, associated equipment, cabinets and fencing. The development is required to maintain existing/provide additional mobile and broadband services.
2360145	Agriculture	**Permitted** application for A) Extension to the side of the existing barn building to provide 153 sqm sheep housing unit, B) New 50 sqm cattle shelter to be located to the rear of the overall site, along with all associated site development and facilitating works.

2.3 Landownership

The landownership for the transient lands were mapped (Figure 2-4) due to the wide agricultural use in this area to better understand the landholdings in this location. Assessing the landholdings will inform the following Stages of the Feasibility Study and help identify the opportunities arising from these lands.

Figure 2-4 shows landholdings within the same owner(s) and have been labelled as anonymous, with exception to lands owned by Kildare County Council (KCC).

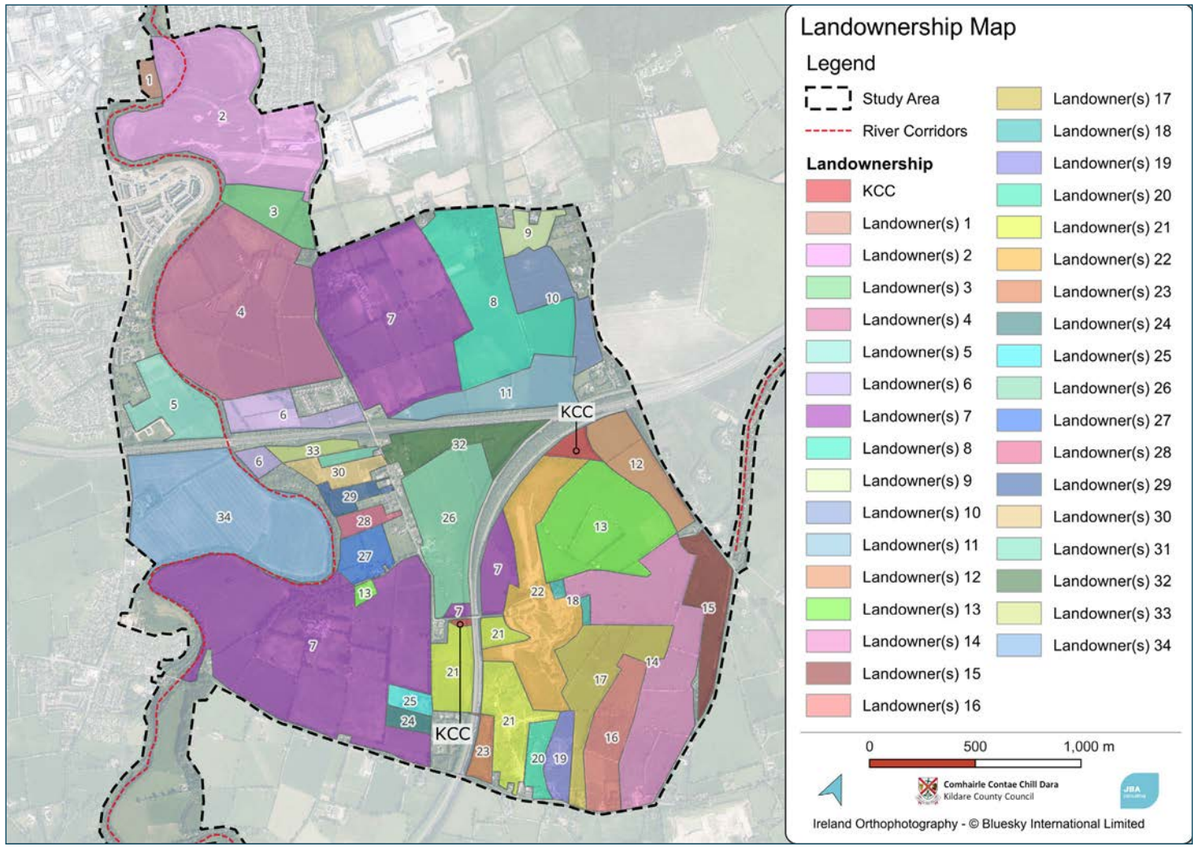


Figure 2-4 Landownership of the Transient Lands

2.4 Site Visits

The site visits carried out between July and August 2024 were used to identify key characteristics of the study area. Some of these findings are shown below, including existing structures such as bridges, gates and communication masts, as well as conditions of the available paths.
Other elements more specific to biodiversity, engineering or archaeology are described in detail in chapters 5, 7 and 9, respectively.

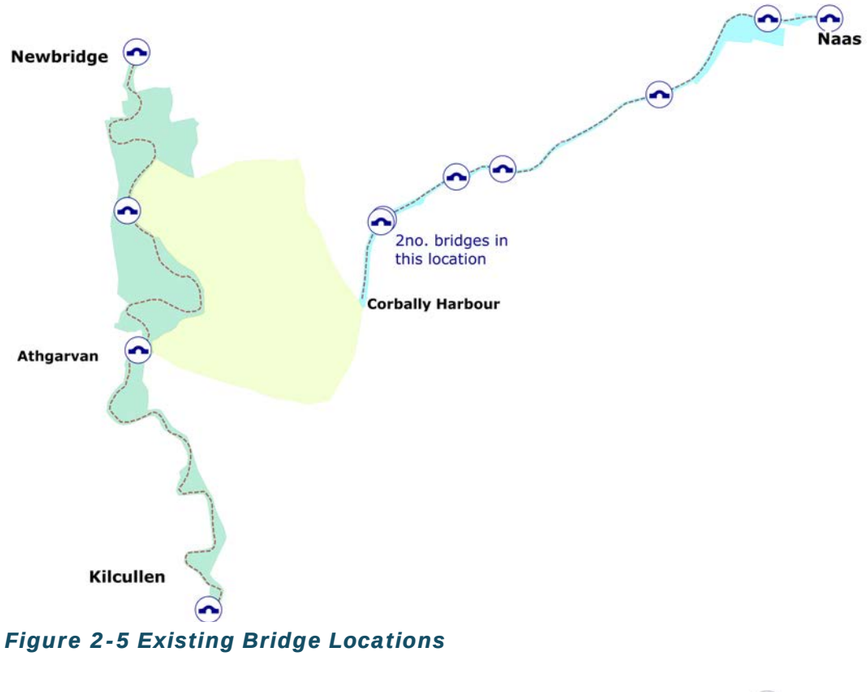


Figure 2-5 Existing Bridge Locations

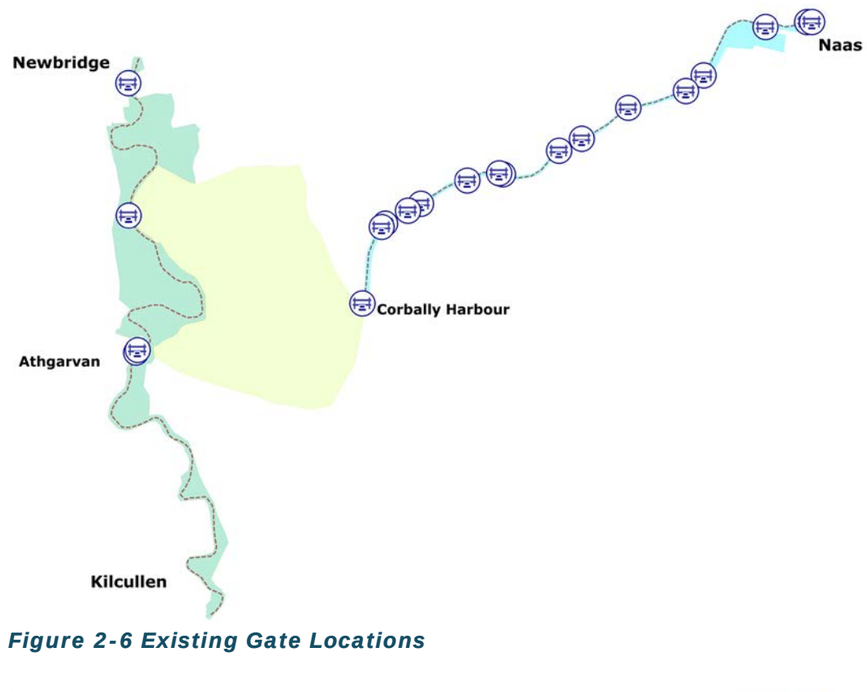


Figure 2-6 Existing Gate Locations

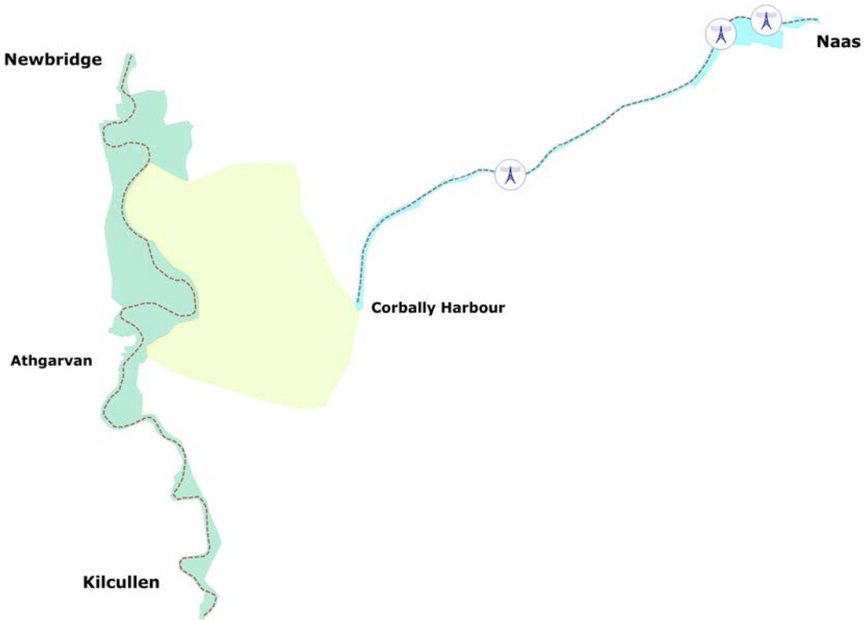


Figure 2-7 Existing Locations with Overhead Wires

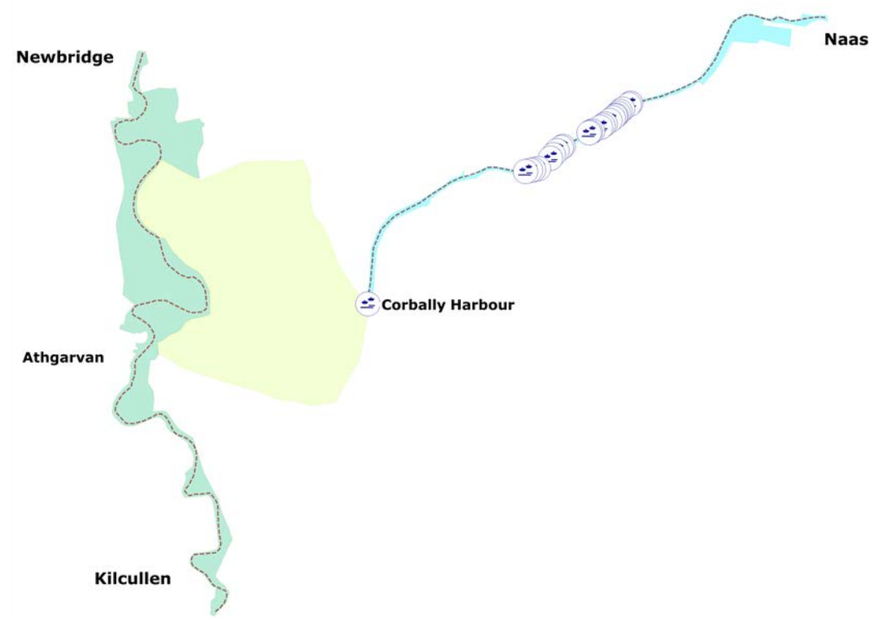


Figure 2-8 Existing Locations where paths become waterlogged

3.0 POPULATION & HUMAN HEALTH

3.1 Development Plans and Development Pressures

The site for the Corbally Canal & Liffey Corridor Feasibility Study stretches from the Naas Municipal District to the Kildare-Newbridge Municipal District, in central County Kildare. The Study will aim to connect the towns of Naas, Newbridge, Kilcullen and Athgarvan. Naas has been identified as a Key Town in the Kildare CDP 2023-2029 while Newbridge has been identified as a Self-Sustaining Growth Town. Both towns are recognised for their importance in relation to the provision of jobs and services and as growing residential areas. A significant expansion of the populations of these towns is expected based on the provision of key employment services in manufacturing and distribution. Key to this expansion will be the provision of sustainable transport corridors. Some areas in Kildare have been designated as commuter towns, with high rates of population growth but with limited services for resident populations. Sustainable mobility options will be required to enable these towns to reach sufficient levels of local employment and services, and to deliver 10-minute settlements.

All urban areas situated along the Corbally Canal & Liffey Corridor have experienced population growth since the 2016 Census, shown in Table 3-1. To accommodate this, the proposed residential density target for the larger towns of Newbridge and Naas will be 30 to 50 dwellings per hectare, while Kilcullen will be 30-40 dwellings per hectare.

Table 3-1 Population growth of towns located within study area

Town	2016 Census	2022 Census	Population Growth %
Naas	21,393	26,180	23
Newbridge	22,742	24,366	7
Kilcullen	3,473	3,815	9
Athgarvan	1,176	1,193	1.5

3.1.1 Transport

The Kildare CDP (2023-2029) addresses the importance of integrating sustainable mobility and transport options into the county to provide more sustainable modes of travel and transition towards a lower carbon transport system. Chapter 5 of the Kildare CDP outlines the 'Avoid-Shift-Improve' policy which will be taken which aims to avoid or reduce the need for motorised travel, shift towards more sustainable travel modes and improve the energy efficiency of motorised transport modes. A key component of this policy will be improving and developing sustainable cycling pathways and facilities. This will also contribute to creating 10-minute settlements and reducing traffic congestion. Developing the Naas to Corbally harbour greenway is mentioned in several objectives in the Kildare CDP (TM O24, TM O25, TM O28) and in the Naas Local Area Plan 2021-2027 (MTO 1.3, EDO 2.1, CQ 1.3).

3.1.2 Housing

Within the Liffey Corridor section of the Study, a Strategic Housing Development has been granted planning permission by An Bord Pleanála for the construction of 569 no. residential units, 11 no. retail units and a childcare facility. Located approx. 1.5km to the west of the Liffey Corridor in Newbridge are two Strategic Housing Developments consisting of 204 no. units and 316 no. units, respectively.

3.1.3 Enterprise

The Newbridge to Naas corridor is identified as a Strategic Economic and Employment Zone in the Kildare CDP (Section 2.13.1), which includes the Ladytown Industrial Zone and the industrial zone north of Newbridge. Located within this zone are Pfizer Pharmaceuticals, the Lidl Distribution Centre, the Primark Distribution Centre and Dr. Pepper. The Industrial Development Authority (IDA) has acquired a stretch of land which will connect the Ladytown Industrial Zone to the industrial zone in Newbridge. Both areas are strategically located within a short distance of the M7 and M9. As part of this Zone, planning permission has been sought for the construction of a data centre which consists of 6 no. two-storey buildings and is located approx. 650m to the northwest of the Corbally Canal in Naas. Developing a sustainable transport corridor between Naas and Newbridge will enable sustainable travel to occur between the two towns, which both offer a growing range of services and employment opportunities.

3.1.4 Amenities

The Curragh, located to the south-west of Newbridge Town, is a significant recreational amenity and tourist attraction. It is the largest unenclosed natural grassland in the country and includes the Curragh Camp, an army base and military college, and the Curragh Racecourse. The Curragh and Curragh Racecourse are popular destinations with both locals and tourists, providing scenic walks and several prominent horse races taking place annually. Additionally, the Royal Curragh Golf Club is located within the area and is also a popular tourist destination. The 18-hole golf course is the oldest golf club in Ireland and overlooks the historic Curragh plains.

Several sports clubs and community amenities are close to the proposed routes. These include the Ryston Sports and Social Club in Newbridge, the Kilcullen Community Centre in Kilcullen and the K Leisure Centre in Naas, and others which are in the area but not immediately adjacent to the site.

3.1.5 Environment

The CDP incorporates biodiversity and environment objectives discussed in Chapter 12 of the plan. There are a range of aims that include protecting the natural environment, biodiversity and ecosystems (BI O2, BI O15, BI O18, BI O22), delivering benefits for all sectors of society (BI O64, BI O69), and to improve efforts halting biodiversity loss and degradation of ecosystems in the environment (BI O5, BI O16, BI O30). The Grand Canal running from Naas Town to Corbally Harbour, and the River Liffey provide important habitats which have high conservation value and should be taken into account when developing any project.

3.1.6 Cultural Heritage

Chapter 11 of the Kildare CDP (2023-2029) recognises the importance of built and cultural heritage, requiring the appropriate protection, management and enhancement measures. Naas Town is a former 'Walled Town' and contains an Architectural Conservation Area (ACA). The Naas ACA includes the area of Naas Harbour and part of the Grand Canal. Following the aims of the County Development Plan, identified built and cultural heritage must be protected and maintained during the enhancement of the Corbally Canal & Liffey Corridor. This is discussed in more detail in Chapter 9 of this Baseline Report.

3.1.7 Climate

Climate Action is addressed in Chapter 6 of the Kildare CDP (2023-2029) which provides planning principles to be incorporated into developments to minimise the negative impact on climate change and enhance climate resilience and contribute the transition towards a low carbon society. Flood Risk Management is an integral part of climate adaptation, as outlined in Section 6.7 of the Kildare CDP. More intense rainfall and weather events and increased likelihood of fluvial flooding will have to be considered in proposed works which occur along the Corbally Canal & Liffey Corridor to remain in line with the objectives of the Kildare CDP.

3.2 Community Facilities

Across the four urban areas located along the Corbally Canal & Liffey Corridor, there are a range of community services including Naas General Hospital, several nursing homes, Garda and Fire Stations, libraries, cinemas, Newbridge Silverware Style Icon Museum, community centres and churches. In addition to these there are several primary and secondary schools spread across Naas, Newbridge, Athgarvan and Kilcullen. Future expansion of school sites will be based on population growth in the town.

Over the lifetime of the CDP, it is expected that the range of educational, sporting and community facilities will be expanded.

3.3 Recreational Amenities

The study area is home to several sports facilities and clubs, including GAA, rugby, soccer and golf. The area also contains a number of children's playgrounds, multi-use games areas, and walking and cycling routes.

In addition to these larger facilities, there are numerous smaller public open spaces within the Study area, which provide essential amenity value to residents. The 'Strand' Liffey Linear Park is located directly adjacent to the Liffey Corridor and consists of a green open space, with paved pathways, benches and outdoor gym machines. This park provides routes across but also the opportunity to rest and linger.

Recreational amenities and tourism are discussed in more detail in Chapter 10 of this Baseline Report.

3.4 Public Consultation

Contact will be made with individual landowners where necessary as surveys progress. Further engagement with the scheme will be encouraged.

3.5 Potential Constraints and Opportunities

Constraints which will be considered in the development of the Study include public support and engagement and public access to local amenity areas. Engagement with the local community is important for gaining support for an assessment such as this. Recreational amenities that fall within the study area will need to be considered so that access is not disturbed, and relevant parties consulted with.

The Study may provide positive opportunities and benefits for the local population in regard to improved recreational amenities and community spaces. Additionally, there is a potential increase in tourism and income for the nearby urban areas from increased footfall and users on the canal.

4.0 LANDSCAPE, GREEN & BLUE INFRASTRUCTURE

4.1 Landscape Character

The landscape of County Kildare is composed of a central plain surrounded by uplands to the east, which lie at the foothills of the Wicklow and Dublin Mountains, and hills at the Chair of Kildare and the Newtown Hills. The main watercourses include the River Liffey, River Barrow, River Slate, River Boyne, Royal Canal, Grand Canal and Rye Water River, providing essential landscape features.

The Landscape Character Assessment (LCA) for county Kildare was prepared in 2004, focusing on the "*the discernment of the character of the landscape based on its land cover and landform, but also on its values, such as historical, cultural, religious and other understandings of the landscape*" (KCDP, 2023-2029). The LCA is currently under review with expected completion on Q2, 2025.

The study area includes three LCAs according to landscape context, as shown in Figure 4-1 below. The Liffey River corridor is located within the River Liffey LCA, whereas the transient lands at Greatconnell and Hillsborough areas are sited within the Central Undulating Lands and Northern Lowlands LCAs. The entirety of the Corbally Canal is located within the Northern Lowlands LCA.

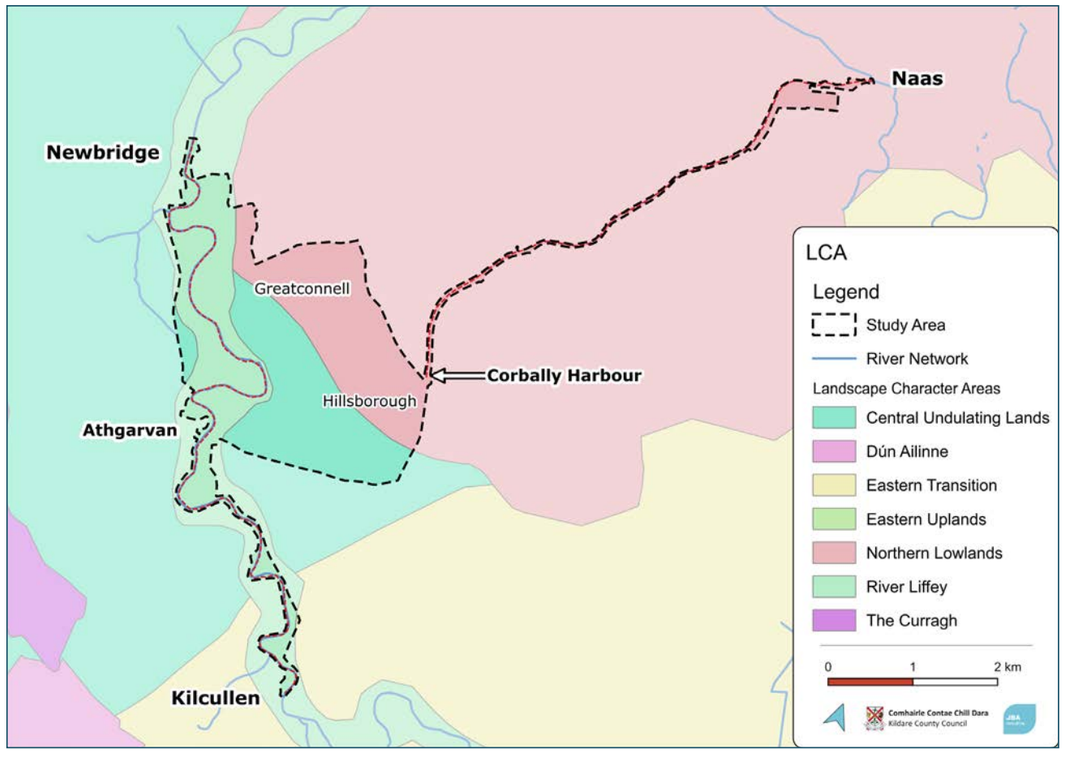


Figure 4-1 Landscape Character Assessment of the study area

The findings of the LCA also inform the Landscape sensitivity rating, which is measured by "*the ability of the landscape to accommodate change or intervention without suffering unacceptable effects to its character and values. It is determined using the following factors: slope, ridgeline, water bodies, land use and prior development*." (KCDP, 2023-2029)

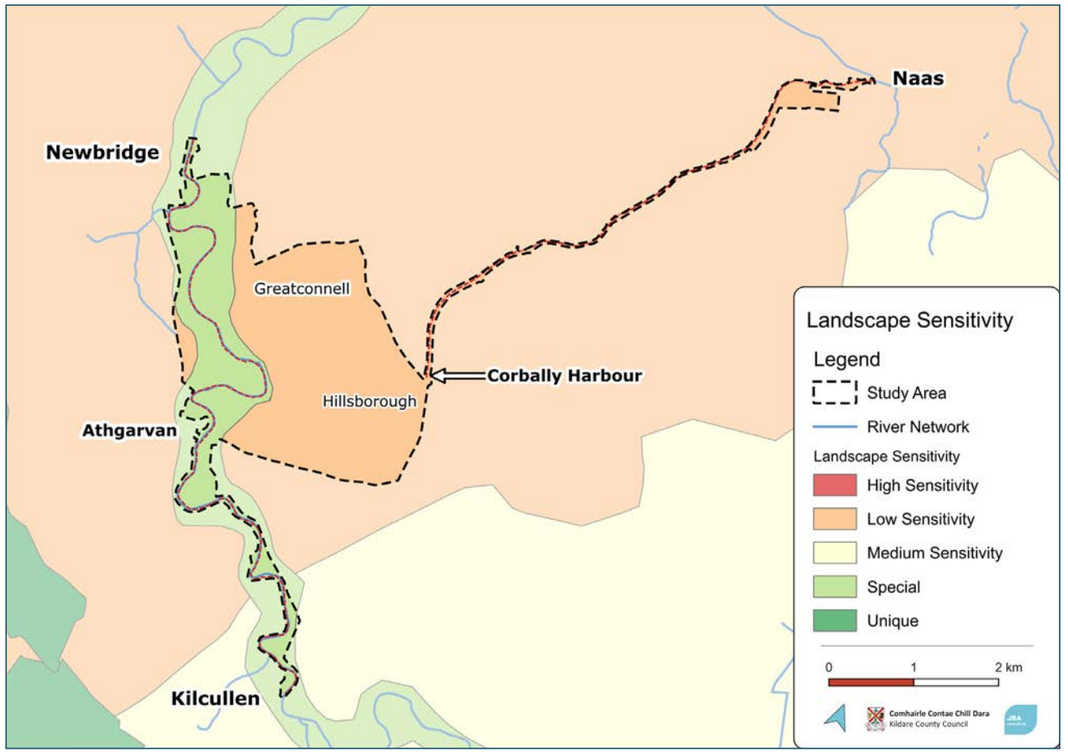


Figure 4-2 Landscape Sensitivity of the study area

The landscape sensitivity of the study area is generally identified as Class 1 - Low, apart from the River Liffey riparian zone which is rated as Class 4 - Special sensitivity.

Class 1 comprises the areas with the capacity to generally accommodate a wide range of uses without significant adverse effects on the appearance or character of the area. Class 4 does not allow for such a wide variety of new uses, as it is deemed susceptible to significant effects on the appearance or character of the landscape.

According to the Kildare County Development Plan (KCDP) the Northern Lowlands are most suitable for agricultural uses but can accommodate agricultural, forestry, housing, tourism, infrastructure, extraction or energy developments. The Liffey River only allows for agriculture, forestry or tourism s, and has low to least compatibility with any other land use.

Canals and Green Urban Areas are acknowledged as being compatible with agricultural, forestry and even tourism s to a lower extent.

It is a policy of Kildare County to "*protect and enhance the county's landscape, by ensuring that development retains, protects and, where necessary, enhances the appearance and character of the existing local landscape.*"

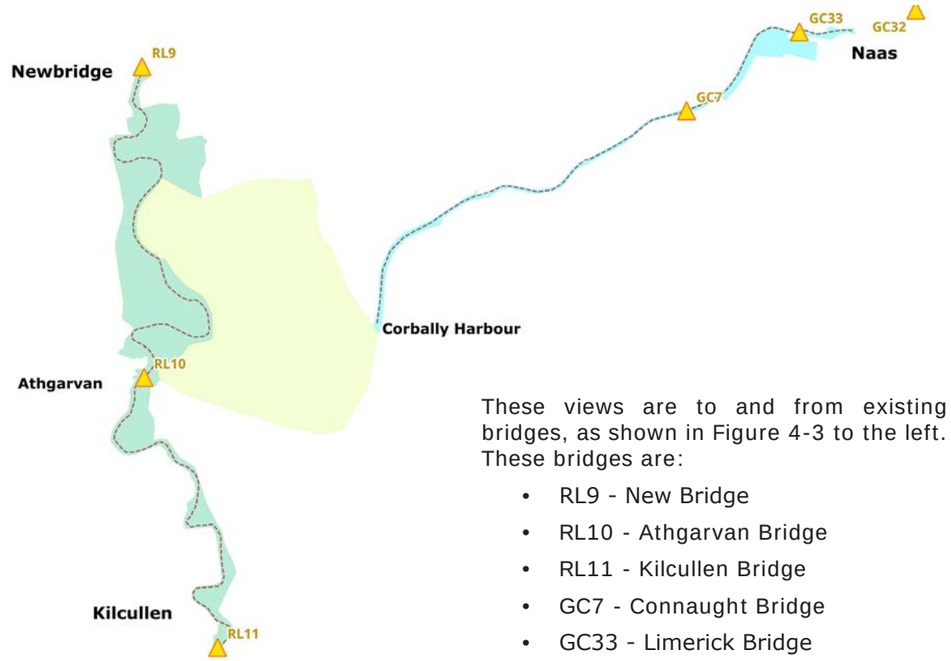
The objectives are consistent with the council's policy, aiming to ensure the character of the landscape and visual amenity is protected and not significantly impacted. The objectives applicable to the study area are as shown in Table 4-1 overleaf.

Table 4-1 Landscape Objectives of KCC applicable to the Study Area

Objective	Description
LR O1	Ensure that consideration of landscape sensitivity is an important factor in determining development uses. In areas of high landscape sensitivity, the design, type and the choice of location of the proposed development in the landscape will be critical considerations.
LR O4	Ensure that local landscape features, including historic features and buildings, hedgerows, shelter belts and stone walls, are retained, protected and enhanced where appropriate, so as to preserve the local landscape and character of an area.
LR O9	Continue to support development that can utilise existing structures, settlement areas and infrastructure, whilst taking account of local absorption opportunities provided by the landscape, landform and prevailing vegetation.
LR O59	Facilitate the delivery of the (i) Naas to Sallins Greenway and (ii) Naas to Corbally Harbour Greenway, in co-operation with landowners, Waterways Ireland and Government Departments.
LR O60	Explore the feasibility of developing a greenway/cycle for amenity purposes, in cooperation with Waterways Ireland and Government Departments. (a) Naas to Corbally harbour (b) Corbally Harbour to Newbridge.
LR O60	Explore, in conjunction with Waterways Ireland, the feasibility of reopening the canal between Naas and Corbally Harbour for navigation, mooring and launching vessels, to encourage its use for recreational water sports.

4.1.1 Protected Views

River floodplains and canal banks are generally sensitive to development to varying degrees. Both the rivers and the canal corridors provide a contrast of form and colour in the landscape. The designated views within the study area are located along River Liffey and Corbally Canal, as shown in Figure 4-3 below.



These views are to and from existing bridges, as shown in Figure 4-3 to the left. These bridges are:

- RL9 - New Bridge
- RL10 - Athgarvan Bridge
- RL11 - Kilcullen Bridge
- GC7 - Connaught Bridge
- GC33 - Limerick Bridge

Figure 4-3 Scenic Views within the study area

Although there are no further protected views identified in the Kildare CDP along Corbally Canal, the extent of the Canal should be protected under the same relevant policies, due to its scenic value throughout.

It is the policy of the Council to "*protect, sustain and enhance the established appearance and character of all important views and prospects*", and objective to "*avoid any development that could disrupt the vistas or have a disproportionate impact on the landscape character of the area, particularly upland views, river views, canal views, views of historical or cultural significance (including buildings and townscapes), views of natural beauty*" and specifically designated views as listed in the KCDP.

4.1.2 High Amenity

There are also certain special landscape areas within the council defined as High Amenity. The River Liffey valleys are of significance in terms of landscape and amenity value and as such are sensitive to development. The river valleys are characterised by smooth terrain and low vegetation, with extensive upland views. The topography is such that it allows vistas over long distances without disruption along the river corridor. However, undulating topography and existing shelter vegetation along some stretches of the valleys provide filtering and the potential to enclose the built form within the river valley. This is further enhanced by the presence of natural and native woodland that grows on the floodplains of the rivers, as well as by conifer plantation in adjacent lands.

It is the policy of the Council to "*protect High Amenity areas from inappropriate development and reinforce their character, distinctiveness and sense of place*".

4.2 Trees, Woodlands and Hedgerows

Trees, woodlands and hedgerows make a valuable contribution to the landscape and visual amenity of County Kildare and provide wider environmental benefits that include carbon storage, habitats for wildlife, biodiversity protection and enhancement, as well as producing oxygen, absorbing pollutants and providing food sources.

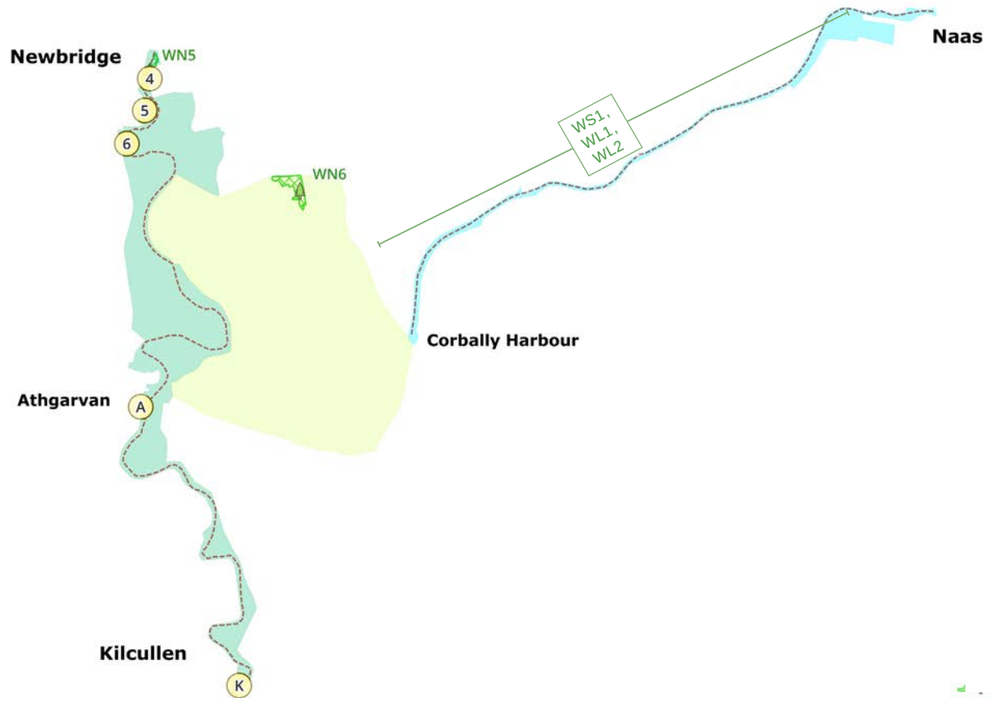


Figure 4-4 Protected Tree Groups and Woodlands within the study area

The Fossitt designation within the study area includes two woodland areas (Figure 4-4), WN5, a semi-natural riparian woodland, within the Liffey Corridor, and WN6, a semi-natural wet willow-alder-ash woodland within the Transient Lands at Greatconnell. The canal also comprises WS1 scrub woodland, WL1 treeline and WL2 hedgerows; however, specific locations are not mapped.

The category WN5 includes wet woodlands of river margins (gallery woodland) and low islands that are subject to frequent flooding, or where water levels fluctuate as a result of tidal movement (in the lower reaches of rivers). According to Fossitt, 2000, the riparian woodland is dominated by stands of willows that may include native (*Salix cinerea, S. purpurea, S. triandra*) and non-native (*Salix fragilis, S. alba, S. viminalis*) species. Alder (*Alnus glutinosa*) is occasional.

The category WN6 comprises woodlands of permanently waterlogged sites that are, according to Fossitt, 2000, 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 spring-fed or flushed sites.

Tree or tree groups to be protected have been identified in the Newbridge LAP, these are as listed below.

- 4 - Trees in the park along the east and west bank of the Liffey Valley Park
- 5 - Trees in grounds of Ryston along Athgarvan Road and at main entrance. Also includes trees along boundary to residential development to the south.
- 6 - Trees along west bank of River Liffey on Athgarvan Rd.

The Athgarvan LAP and Kilcullen LAP have additionally identified locations for Tree and Woodland Preservation, as shown in Figure 4-4 as number A and K respectively.

It is the objective of the Council to prohibit developments where it is likely that damage would be caused either to trees protected by a Tree Preservation Order or, to those which have a particular local amenity or nature conservation value.

In urban settings trees or groups of trees can contribute considerably to the local landscape or townscape and to the successful integration of new buildings into the landscape. The provision or retention of mature trees and hedgerow planting can support the amenity of developments as well as providing important wildlife habitats and corridors.

4.3 Riparian Zones

Riparian zones are vegetated areas bordering rivers and other bodies of surface water. These are specifically important due to the rich habitat provision along water bodies, which enable wildlife corridors to establish, facilitating species movements from place to place. The landscape of riparian corridors can vary between flood plains to steep embankments, while functioning as buffer zones that protect / improve the water quality in associated watercourses. The natural presence and the protection of existing riparian vegetation plays an important role in the successful establishment and flow of the existing watercourses.

Riparian zones are particularly vulnerable to damage from inappropriate development. A key requirement of an integrated watercourse protection strategy is the set aside of sufficient land along the river margin or corridor, as shown in Figure 4-5. The buffer zone, if sufficiently large and managed will:

- *"Filter out pollutants and sediments from overland surface run off;*
- *Provide bank stabilisation which can assist in preventing fluvial erosion;*
- *Provide a refuge for animals with close affinity to rivers;*
- *Create habitat necessary for aquatic life;*
- *Provide amenity and recreation to local people and visitors to the area;*
- *Enhance flood alleviation".* (KCDP, 2023-2029)

Where developments are proposed adjacent to waterways, on private or publicly owned land, the Planning Authority will require a setback distance of "*an absolute minimum of 10m from the water's edge, however, the actual set-back will be determined by the scale and importance of the River, with up to 100m or more being required along the larger and more important rivers such as the Liffey (except on town centre/regeneration sites where there is a history of development or where there is a key public infrastructure required for public benefit).*" (KCDP, 2023-2029)

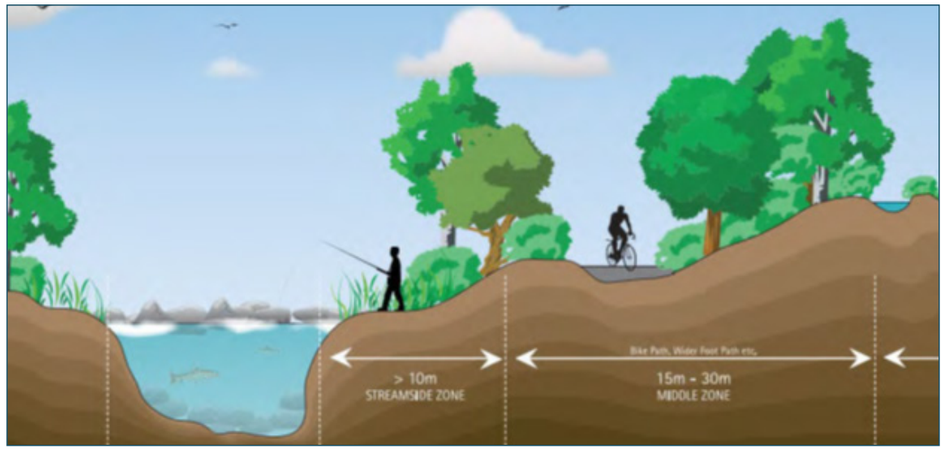


Figure 4-5 Riparian Buffer zones (Source: Planning for Watercourses in the Urban Environment, IFI, 2020

Riparian Zones are defined in Planning for Watercourses in the Urban Environment (IFI, 2020) as having three zones. These zones have distinct characteristics and can facilitate different uses. The buffer zone is dependent on the nature and design of the development, with development only occurring within 48m from the water's edge. Figure 4-5 above shows the guidelines for a riparian zone within a natural river embankment. Although the objective of vegetation and habitat retention and protection will be applicable to riparian zones for all watercourses, the distances for embankment stabilization and protection would be adjusted for built canals.

It is imperative that the **streamline zone** (<10m) is protected with very restricted use except for fishing or waking trails, if properly installed. This area should comprise native riparian vegetation in order to ensure the physical and ecological integrity of the stream ecosystem is maintained. The streamside zone should support Biodiversity including the EU Habitats Directive objectives.

The **middle zone** provides distance between upland development and streamside zone and acts and a filter for nutrients and sediment and should be kept within a 15 to 30m width. The vegetation in this section can include managed woodland with some clearing / open space allowed. Native species should be a priority, although appropriate non-native broadleaved and evergreen vegetation can be considered. Uses in this location are restricted, but some recreational routes such as cycle tracks or footpaths which can also function as a flood zone.

The **outer zone**, with a minimum of 8m width, is aimed to prevent encroachment of developments and filter hard surface runoff. Calcareous grassland, scrub and woodland planting are encouraged but turfgrass is usually utilised. Native planting should be prioritised, in the interest of climate action and the All-Ireland Pollinator recommendations. Uses in this location are unrestricted, and can accommodate residential uses, including lawn and swales. Stormwater treatments will usually occur in the outer zone.

In general, the width of the riparian/buffer zone will depend on factors such as existing land use, land topography, soil type, channel width/gradient and critical habitats to be protected. The buffer zone should be large enough to protect the ecological integrity of the river, including vegetation, and the riparian zone, bankside vegetation including trees, and the historical use of the area.

Waterways Ireland includes the requirement for amenity access of mixed use, comprising recreation elements such as boating, angling, as well as walking / cycling.

The Council recognises that "*key public infrastructures may be permitted within the riparian zone where there are no alternatives available or where it enhances the public and civic amenity or tourist potential of a site*" (KCDP, 2023-2029).

The study area comprises two main watercourses, River Liffey and Corbally Canal, with the latter being a man-made feature in the landscape.

The riparian corridor along the Corbally Canal is consistent, with a grass or planted verge adjacent to the canal structure, followed by mature tree line and hedgerows accompanied by standalone dwellings or industrial sites. The riparian zone includes a reed fringe, as per Waterways Ireland requirements for the canal, in conjunction with the historic towpath on the upper bank.

The River Liffey extent varies in use and thus comprises different riparian widths. Where the landscape is agricultural, field boundaries made of native hedgerow and tree lines also form part of the vegetated riparian strip along the Liffey River. Urbanised areas such as Newbridge, Athgarvan and Kilcullen include a narrower green corridor across the river border. Residential estates include an open space allowance between river and buildings, with different levels and sizes of vegetation provided. Newbridge's Liffey Valley Park includes a multi-use amenity along a portion of the river. This comprises play and exercise spaces, footpaths and seating. Some locations in Newbridge and Athgarvan include an informal connection to the river, but not developed to an extent to be identified as a formal recreational link.

It is the policy of the Council to "*recognise and promote inland waters, natural environmental assets and to protect rivers, streams and other watercourses and, wherever possible, maintain them in an open state capable of providing suitable habitats for fauna and flora while discouraging culverting or realignment.*"

The Newbridge LAP also states that "*no development will be permitted on either bank within 80m of the River Liffey, unless as part of the redevelopment of an existing site/development. Development along the river should front onto the river so as to ensure the passive supervision of the proposed linear park.*"

4.4 Green Infrastructure (GI)

4.4.1 GI General

Green infrastructure refers to the network of linked high quality green spaces and other environmental features within an urban setting. This strategically planned and delivered network should be designed and managed as a multifunctional resource, able to provide a wide range of environmental and quality of life uses for local communities. This comprises, but not limited to, climate change adaptation, recreation, waste and water management, food production and health benefits, biodiversity corridors and economic benefits.

The benefits of Green Infrastructure include the following, according to KCDP 2023-2029:

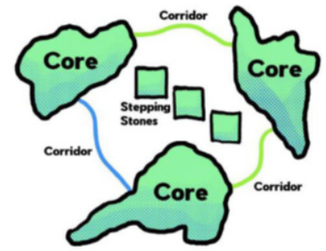
- Attracting businesses and inward investment by creating an attractive environment;
- Access nature, outdoor recreation and for social interaction;
- Space for nature and wildlife to flourish;
- Recreational, tourism and cultural roles;
- Climate change adaptation - for example flood alleviation and cooling urban heat islands,
- Forestry, crop production, agriculture and energy development;
- Local food production - in allotments, gardens and through agriculture;
- Provides green buffers /green wedges between built up areas;
- Improves air quality;
- Environmental education
- Improves health and well-being;
- Creating a sense of place and local distinctiveness
- Encouraging physical activity and improved health and well-being by providing quality green spaces for walking and cycling and other physical activity.

It is the policy of the Council to "i*dentify the key elements of the green infrastructure network in Kildare; and seek to protect, enhance, and expand the County's green infrastructure network, through informed, evidence-based methods, which do not threaten the integrity of existing native biodiversity*" and to "*recognise the importance of Green Infrastructure in Kildare and protect this valued biological resource, the ecosystem services it provides and the contribution to climate resilience*".

It is also an objective of the Council to "*encourage the provision, improvement and expansion of more varied social, cultural, recreational and sporting facilities to serve the needs of the town.*"

4.4.2 GI Strategy

The GI can be described in three key elements. Core or hub areas work as anchors within a GI network. They are large geographical areas that function as the point of origin and destination for wildlife and are sites at which essential ecological processes occur. Corridors symbolise the physical links that join the network together. They can include linear open spaces, watercourses and hedgerows and allow for the migration of species between core habitats. Stepping-stones are smaller areas of public and private open space. They offer complementary routes for the movement of species within the whole network and contribute to local biodiversity.



The study area comprises an extensive agricultural land use, which provides for a rich green infrastructure network. By assessing the landscape elements of the study area, it is possible to identify River Liffey and Corbally Canal as corridors. The existing riparian and wetland woodlands fall under the stepping stones grade together with the extensive network of field boundaries (as shown in Figure 4-6). The Corbally Canal is identified as a pNHA (refer to chapter 5 in this report), which according to KCDP would be designated as a stepping stone, when located outside of a core area. Given this pNHA is located along the Corbally Canal, it will provide benefits as a corridor as opposed to stepping stones. According to the core areas identified by KCC, there are none within the study area, with the nearest located at the Curragh, 1.5km west of Athgarvan, and Pollardstown Fen, 3km west of Newbridge. The GI of the study area is therefore composed of a dense network for nature and wildlife provided by two corridors and multiple stepping stones.

Waterways Ireland have a remit for conservation of natural and cultural heritage in conjunction with the pNHA of the canal. It is their objective to fully retain the integrity of this ecological corridor.

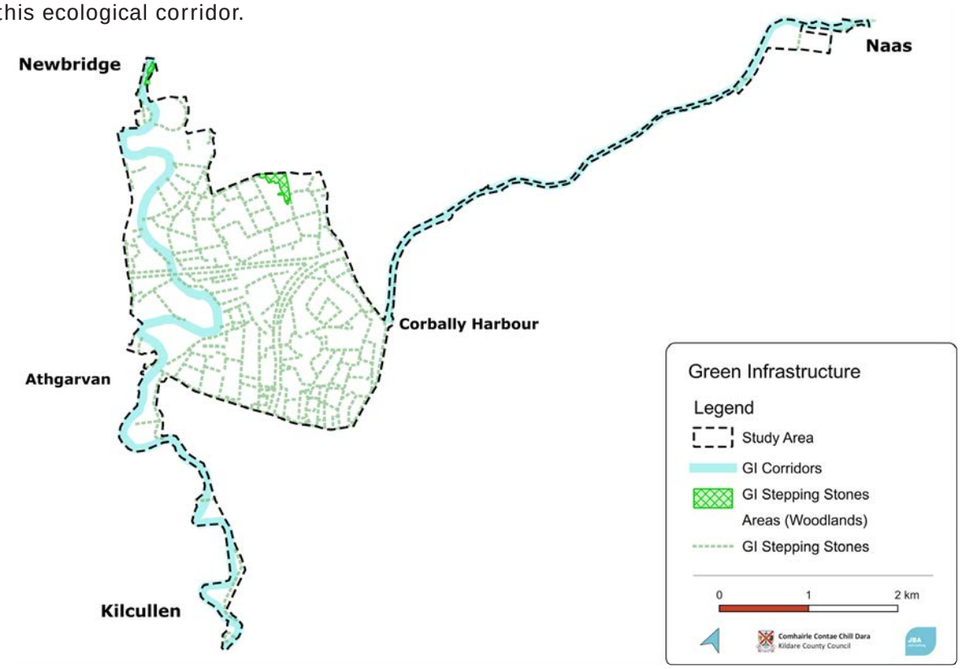


Figure 4-6 Green Infrastructure assessment of the study area

Areas where the green infrastructure is reduced can be developed to enhance the existing network. Providing additional landscape amenities in these spaces will benefit the community and the existing biodiversity. The locations identified in Figure 4-7 below are along the Liffey River, as cognisant of the objectives of the Newbridge LAP, east of Liffey at the Tougher Quarries (after decommission) and in Naas, within the Jigginstown land zoned for Data Centres.

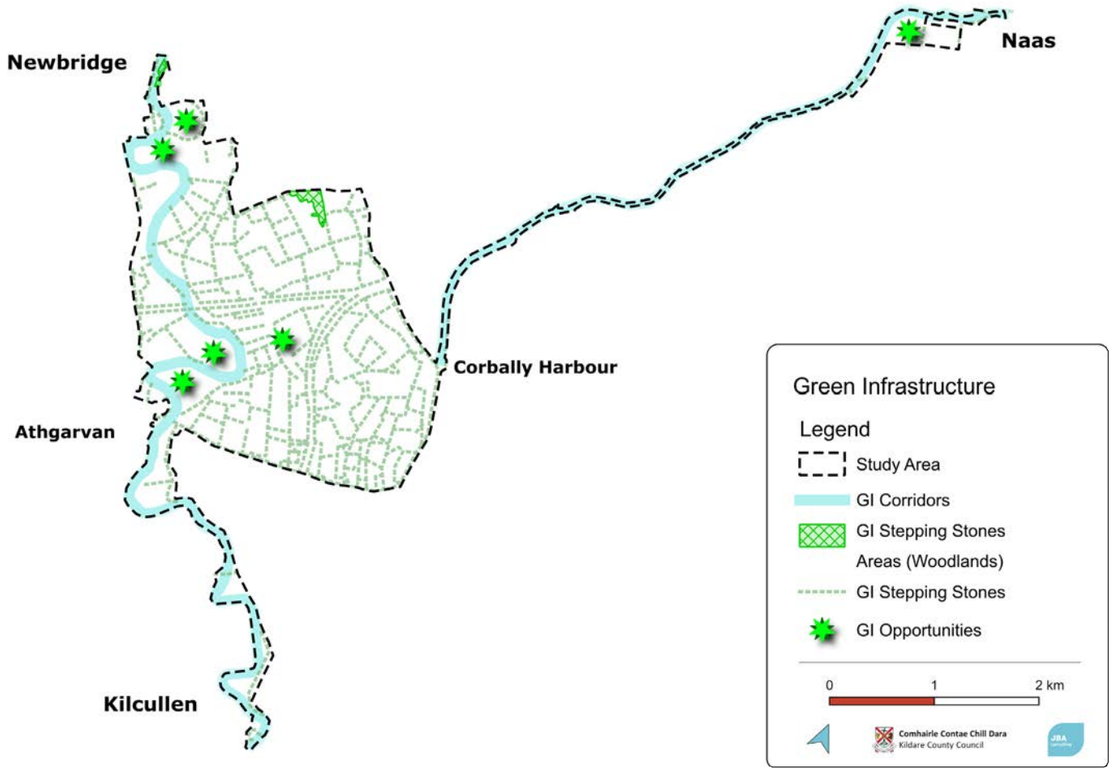


Figure 4-7 Green Infrastructure opportunity sites within the study area

The GI can be further enhanced by catering to additional active travel infrastructure such as footpaths and cycle lanes which would benefit the human connection with nature and improve health and wellbeing. An example of this will be connecting the GI of the study area to the wider context, including the Naas to Sallins greenway.

4.4.3 Urban & Public Open Spaces Green Infrastructure

Urban Green Infrastructure includes residential gardens, the parkland settings of enterprise parks and employment areas, street verges, open spaces and parks, woodlands, hedgerows, cemeteries and allotments. These areas, in combination with the local network of sports and recreational facilities, collectively contribute to strengthened Green Infrastructure network and the living environment in the county.

These areas cater to habitats for ecological processes, for active and passive recreation, promote community interaction and facilitate mitigation of the impacts of climate change.

The western and eastern end of the study area are generally urban, including the towns of Newbridge, Athgarvan, Kilcullen and Naas, which benefit from the inclusion of urban green infrastructure elements such as street trees and verges, which connect to other landscape features such as hedgerows and habitats at the existing river, canal and farmland.

Newbridge has the objective to develop a linear park through the town, having identified lands adjoining the Liffey to link the existing open spaces and create a pedestrian crossing across the river. KCC has identified the need to expand the footprint of the open space areas in the town and intensify the use (nature trails, walking, cycling, water sports etc) and functions (passive and/or active) within the necklace of green spaces along the river.

The existing Liffey Valley Park / 'Strand' Liffey Linear Park in Newbridge offers a starting point for the GI in the area, providing a network of trails, some of which immediately adjacent to the River Liffey (Figure 4-8) and thus enhancing the scenic quality in this location.

Figure 4-8 Footpath along River Liffey in Liffey Valley Park, Newbridge

The development to build a bridge over the Liffey has been granted planning permission, which will be able to connect between the east and west embankment via the residential lands at Belin Woods. Additionally, the lands on the northeastern border of the Liffey within the study area has also been granted permission for a strategic housing development (SHD) which will include a riparian open space along the Liffey River. North of this SHD are lands zoned for open space within the Newbridge LAP, which will connect to the proposed open space network, as compliant with the KCC zoning and open space objectives. The creation of new open spaces will also provide for flood risk management along the river.

4.4.4 Sustainable Urban Drainage Systems and Green Infrastructure

Sustainable Urban Drainage Systems (SuDS) seek to collect, store and release surface water back to the environment using natural systems in a slow and controlled way, thus reducing the risk of fluvial and pluvial flooding. SuDS represents a change in drainage by getting water to be infiltrated or conveyed more slowly to water courses via constructed wetlands, permeable surfaces, filter strips, ponds, swales and basins, all of which contribute to more environmentally friendly and aesthetically pleasing approaches of controlling surface water.

Nature based solutions such as SuDS include flood risk management benefits, but will also improve water quality, protect biodiversity and provide to climate adaptation and mitigation. The role of green infrastructure in nature-based solutions includes the urban greening into designs, planning and construction of roads, community, and public realm s, and as a mechanism to promote biodiversity, reduce habitat fragmentation, and for carbon sequestration.

The recently adopted Kildare County Council Sustainable Drainage Systems Guidance Document will be utilised in this Study.

It is the policy of the Council to "*promote and support the development of Sustainable Urban Drainage Systems (SuDS) to ensure surface water is drained in an environmentally friendly way by replicating natural systems*".

4.4.5 Transport Strategy

The transport strategy included in the Local Area Plans and County Development Plan seek to provide active travel routes and road / path improvement works. The provision of universally accessible paths and bicycle lanes caters to the facilitated circulation and well-being of the user. The opportunity to connect the existing and planned routes will enhance the already rich green infrastructure of the study area. For example, by selecting a desired route between Naas and Newbridge, via the Corbally Canal and transient lands.

Figure 4-8 below shows the existing objectives included in the County plans and proposed Newbridge Cycle Network.

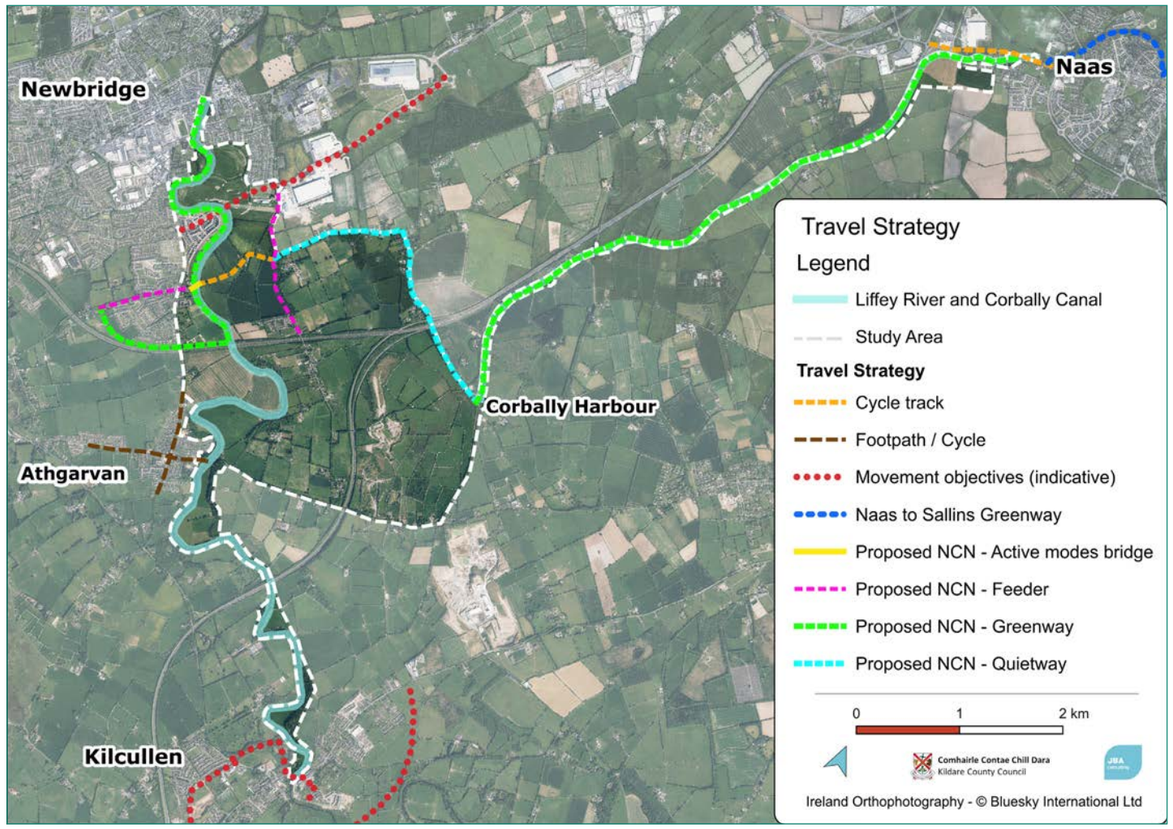


Figure 4-8 Transport Strategy

There is currently a proposed Newbridge Cycling Network (NCN) which was considered in the mapped assessment above. This network provides a detailed proposal for Newbridge, while also considering a connection between Newbridge and Corbally Canal via existing roads. The NCN elements shown above are proposals only and do not reflect what is on the ground. Waterways Ireland has not established the Corbally Canal as a greenway.

The quietway utilises the existing road network, comprising local roads of low widths, and may not be suitable for shared motorised and cycle traffic.

Should a greenway via the transient lands be provided, it will create a direct sustainable transport route between east and west. This will be further assessed during the process of the Corbally Canal and Liffey Corridor Enhancement Feasibility Study.

4.5 Existing Site

The study area is divided between rural and urban land use, with the urban setting being located in the existing towns. The Corbally Canal is enclosed by vegetation and gives a sense of privacy and proximity to nature. The existing towpath is grassed, with some tarmac sections at residential zones, and gives public access to each side of the canal. Crossings occur at each bridge. Access is done via Naas (at Limerick Bridge) and at Corbally Harbour. Parking is not readily available, although informal parking is available at the Harbour. The Corbally Branch is a walk of scenic quality, with some heritage features throughout, such as the multiple bridges and the old harbour building (RPS no. B23-12) and hardstand.

The Liffey Corridor is located along the meandering Liffey River and is framed by agricultural fields in the majority of the landscape in the study area. Kilcullen and Newbridge include parks with some proximity to the river. Newbridge's Liffey Valley Park comprises a network of paths that cater to amenities in this location. Some of these paths come in proximity to the River, adding to the scenic aesthetics of this location while also providing a sense of well being to the community.

The transient lands comprise farmlands throughout, Ladytown Industrial Zone at Ladytown and a heritage / archaeological hub at Greatconnell.

Figure 4-9 Corbally Canal

Figure 4-10 Liffey Corridor

4.6 Summary

The study area is divided between low and special sensitivity, with the latter being focused on the Liffey Corridor. The existing green infrastructure is rich due to the existing field boundary hedgerow and tree line network as well as the two riparian corridors within the Liffey Corridor and Corbally Canal. There are also two designated woodlands at Liffey Corridor and Greatconnell, as well as relevant vegetation groups at the Corbally Canal.

There is opportunity for the existing GI to be enhanced, while taking careful consideration of the ecological value and proximity to open spaces, tree groups and hedgerows within the landscape fabric along the existing watercourses. Active and sustainable travel routes are also a key component of GI, which existing in short supply within the study area.

Riparian zones are particularly vulnerable to damage from inappropriate development. A key requirement of an integrated watercourse protection strategy is the set aside of sufficient land along the river margin or corridor. The buffer zone, if sufficiently large and man-aged will:

- *"Filter out pollutants and sediments from overland surface run off;*
- *Provide bank stabilisation which can assist in preventing fluvial erosion;*
- *Provide a refuge for animals with close affinity to rivers;*
- *Create habitat necessary for aquatic life;*
- *Provide amenity and recreation to local people and visitors to the area;*
- *Enhance flood alleviation".* (KCDP, 2023-2029)

The Planning Authority requires a setback distance of "*an absolute minimum of 10m from the water's edge, however, the actual set-back will be determined by the scale and importance of the River, with up to 100m or more being required along the larger and more important rivers such as the Liffey (except on town centre/regeneration sites where there is a history of development or where there is a key public infrastructure re-quired for public benefit).*" (KCDP, 2023-2029)

The rich biodiversity of the landscape and wildlife along the watercourses and canals are protected by KCC and WI policies and objectives and as defined in the National Biodiversity Action Plan.

There are 5no. protected views identified in the Kildare CDP within the study area. The extent of the Canal should be protected under the same relevant policies, due to its scenic value throughout.

It is the policy of the Council to "*protect, sustain and enhance the established appearance and character of all important views and prospects*", and objective to "*avoid any development that could disrupt the vistas or have a disproportionate impact on the landscape character of the area, particularly upland views, river views, canal views, views of historical or cultural significance (including buildings and townscapes), views of natural beauty*" and specifically designated views as listed in the Kildare CDP.

The Liffey River is generally not accessible to the public, with only some locations comprising proximity to the river such as Liffey Valley Park in Newbridge and Kilcullen Valley Park. The landscape context along the Liffey River and wider catchment area is mostly agricultural.

The Feasibility Study will need to take into consideration the policies and objectives, as defined in the KCDP, on riparian zones, scenic views, open space, SuDS and green infrastrucure. Furthermore, objectives applicable to the Corbally Canal as set out by Waterways Ireland will also be considered.

5.0 BIODIVERSITY

5.1 Methodology

5.1.1 Ecological baseline

To determine the ecological baseline conditions within the study area, a review of all available information was made. When determining the conditions within the proposed study area, including the presence or absence of protected habitats and/or species, the precautionary principle was used where limited information was available. This review included the following:

- A desk-based assessment was carried out to collate information regarding protected/notable species and statutorily designated nature conservation sites in, or within close proximity to, the study area.
- A data search for protected and notable species was conducted using the National Biodiversity Data Centre (NBDC) Mapping System (NBDC, 2024). A area encompassing a 5km radius from the study area was used.
- Information for statutory designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, National Heritage Areas (NHAs) and proposed NHAs (pNHAs) was collected from the online resources provided by the National Parks and Wildlife Service (NPWS).

In addition, the following existing reports were also used to inform the baseline of the study area:

- Delanty, K., Feeney, R. Shephard, S. (2022). Fish Stock Survey of the River Liffey 2021. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.
- Roughan & O'Donovan Consulting Engineer (2015) Ecological Assessment of the Naas Corbally Branch. Waterways Ireland: Ecological Assessment Report.
- Triturus Environmental Ltd. (2020) Fisheries assessment of the River Liffey, Co. Kildare. Unpublished report prepared by Triturus Environmental Ltd. North Kildare Trout & Salmon Anglers Association. December 2020.

Other information on the local area was obtained, including information from the following sources:

- NPWS (2019a). The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- NPWS (2019b). The Status of EU Protected Habitats and Species in Ireland. Habitats Assessment Volume 2. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- NPWS (2019c). The Status of EU Protected Habitats and Species in Ireland. Species Assessment Volume 3. Habitats Assessment Volume 2. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland Environmental Protection Agency online databases on water quality (Available online at *https://gis.epa.ie/EPAMaps/*).
- Aerial photography available from www.osi.ie and Google Maps *http://maps.google.com/*; All Ireland Red Data lists for vascular flora, mammals, butterflies, various invertebrate classes, amphibians and fish.
- Water Framework Directive water maps (available online at *http://www.wfdireland.ie/maps.html* and *https://www.catchments.ie/*);
- International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species; and
- Irish Birding (*https://www.irishbirding.com/birds/web*)

5.1.2 WFD Objectives

The third cycle of the River Basin Management Plan (2022-2027) has been adopted by all local authorities in order to achieve the aims of the WFD (DHLGH, 2022). The Plan sets out the new approach that Ireland will take to enhance protection, prevention, and monitoring of Irish waterbodies. The main actions include:

- Improve wastewater treatment;
- Conservation of leakage reduction;
- Scientific assessment of waterbodies and implementation of local measures;
- A new collaborative Sustainability and Advisory Support Programme;
- Dairy Sustainability Initiative;
- Development of water and planning guidance for local authorities;
- Extension of Domestic Waste Water Treatment Systems grant schemes;
- Control of pressures on Hydromorphology;
- Maintain Canals at Good Status or higher (given their ecological potential);
- Maintain High status and improve Good status sections along the River Liffey; and
- A new Community Water Development Fund.ww

Regardless of their current quality, surface water should be treated the same in terms of the level of protection and mitigation measures employed, i.e., there should be no negative change in status.

5.1.3 Field Surveys

Two ecological walkover surveys were conducted on 09/08/2024 and 13/09/2024 by JBA Ecologists Matt Hosking and Michael Coyle, including the recording of any evidence of the presence of protected, priority and/or Invasive non-native species (INNS). The survey methods were in general accordance with those outlined in the following documents:

- Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council. (Smith et al., 2011).

5.1.4 Zone of Influence

The Zone of Influence (ZoI) is based on a judgement of the likely extent of the ecological impacts on key ecological receptors. This will vary for different ecological features, depending on their sensitivities to environmental change.

This baseline assessment uses the source-pathway-receptor (S-P-R) model as outlined in guidance (OPR, 2021). Using the source-pathway-receptor model allows for the potential significant effects to be eliminated if no viable source, pathway, or receptor is present.

The S-P-R method uses an examination of potential future construction activities to allow sources of potential future impacts to be determined. This also allows a ZoI for the study area to be generated based on the size, scale and nature of potential future works. The pathways for impact are also analysed to see if a functional pathway for impact is present. This methodology allows one to assess the potential presence of surface water, groundwater, land and air impact pathways between the proposed site of development or works and ecologically designated sites and other areas known to support protected species within the ZoI. If any of the three parts to the model are not present (source-pathway-receptor) the potential for negative impacts from the proposed development or works on the local designated sites and valued ecologically areas can be discounted.

5.1.5 Limitations and Assumptions

This report is based on the two ecological walkovers within the study area and existing data from the above-mentioned sources. The report relies on some assumptions and is subject to some limitations. These do not affect the conclusion, but the following points are recorded in order to ensure the basis of the assessment is clear:

- The walkover survey was carried out for all areas within the study area, i.e., the Corbally Canal, River Liffey riparian zone and the corridor section bridging these two areas. Field data from outside this area but within the zone of influence (e.g., agricultural grasslands) is limited and was not the subject of the walkover survey. Available desktop data complements the survey data, and the gathered data is considered to be sufficient to carry out the assessment.
- The ecological walkovers were carried out at the end of the 2024 summer period and the data does not reflect the whole ecology of the study area throughout the year. The precautionary principle is used at all times when determining potential ecological sensitivity of the study area.

5.2 Existing Environment

5.2.1 Designated Sites

The preliminary ZoI for this Study is a 5km general radius and any downstream hydrological connection (including transitional waters buffer) for statutory Natura 2000 sites. Within the ZoI, two Natura 2000 sites were recorded (Table 5-1) and mapped in relation to the boundaries of the study area (Figure 5-1), with potential pathways from the site indicated.

Connections are assessed for impacts relating to noise disturbance (400m), air pollution (emissions and dust) (250m), and any supporting habitat for SAC/SPA species beyond these distances that may have Qualifying Interest (QI) / Special Conservation Interests (SCI), species that utilise the site. The ZoI for air pollution was considered as per the Institute of Air Quality Management (IAQM)

Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024), including ex-situ habitats used by QI species associated with local Natura 2000 sites. The QIs of the Natura 2000 sites are listed in Table 5-2.

Proposed and existing Natural Heritage Areas, sites which are considered of significance for wildlife and habitats, are also included within Table 5-1. These are mapped in relation to the study area in Figure 5-2, with their respective site descriptions and ecological features listed in Table 5-3.

Table 5-1 Local designated sites within the locality of the study area

Site Name	Code	Direct Distance from Study Area	Hydrological Connection Distance
Mouds Bog SAC	002331	2.52km	None - located upstream
Pollardstown Fen SAC	000396	2.32km	None - located upstream
Liffey at Osberstown pNHA	001395	1.85km	5.04km - downstream
Grand Canal pNHA	002104	Within Study area	Within Study area
Mouds Bog pNHA	002331	2.52km	None - located upstream
Pollardstown Fen pNHA	000396	2.32km	None - located upstream
Curragh (Kildare) pNHA	000396	1.23km	None
Liffey Bank Above Athgarvan pNHA+	001396	Within Study area	Within Study area
Liffey Valley Meander Belt pNHA	000393	6.61km	None - located upstream

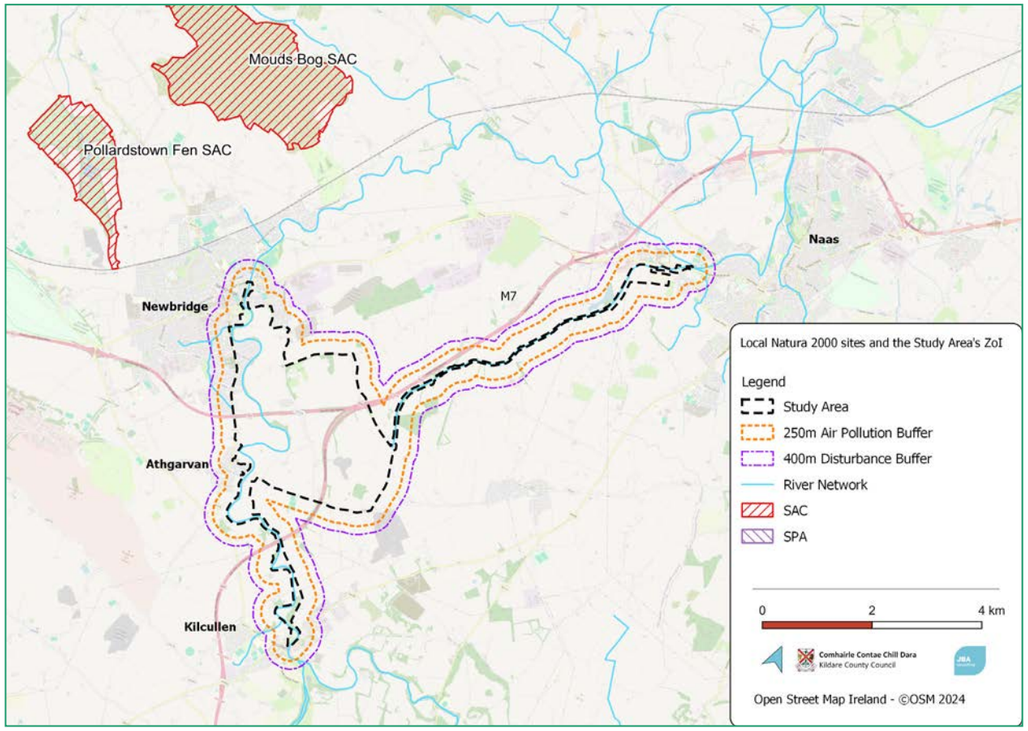


Figure 5-1 Natura 2000 sites within ZoI of the proposed Study Area

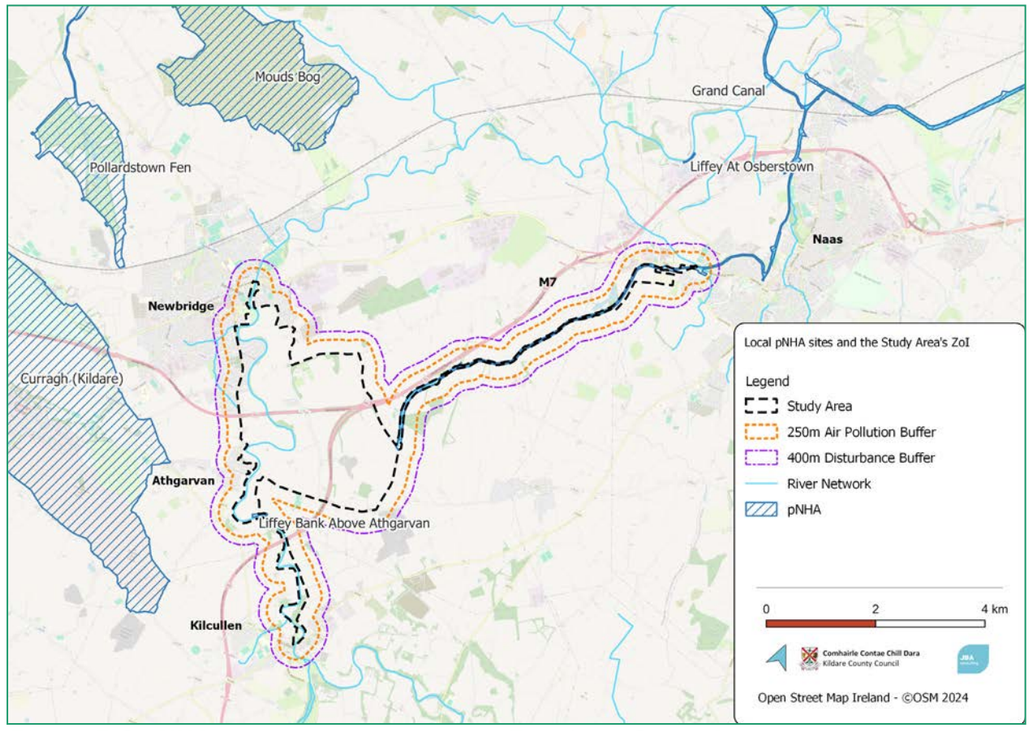


Figure 5-2 pNHA designated sites within ZoI of the Study Area

Table 5-2 Site Briefs; QIs / SCIs; and -relevant threats / pressures and their impacts and sources to the local Natura 2000 sites

Site Name	Brief	Qualifying Interests / Special Conservation Interests	Relevant Threats / Pressures to the Study: Impact (Source)
Mouds Bog SAC	Mouds Bog is located about 3 km north-west of Newbridge in Co. Kildare, close to the Hill of Allen, and includes amongst others, the townlands of Grangehiggin, Barretstown and Hawkfield. The site comprises a raised bog that includes both areas of high bog and cutover bog. Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, Sphagnum lawns, flushes and soaks. Active raised bog is listed as a priority habitat on Annex I of the E.U. Habitats Directive. Red Grouse *Lagopus lagopus scotica*, a Red Listed species and one that is becoming increasingly rare in Ireland, has been recorded on this site. Other birds noted on the site include Skylark *Alauda arvensis*, Meadow Pipit *Anthus pratensis*, Curlew *Numenius arquata* and Kestrel *Falco tinnunculu*s. The conservation objectives of the site are to restore favourable conservation condition of Active raised bogs, and the associated degraded raised bogs. (NPWS, 2014)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150] (NPWS, 2015)	Invasive non-native species: Moderate (Inside) Industrial or commercial areas: High (Inside) Grazing: Low (Inside) Fire and fire suppression: High (Inside) Cultivation: Low (Inside) Sylviculture, forestry: Moderate (Inside) Mechanical removal of peat: High (Inside) (EEA, 2023)
Pollardstown Fen SAC	Pollardstown Fen is situated on the northern margin of the Curragh of Kildare, approximately 3 km north-west of Newbridge. It lies in a shallow depression, running in a north-west/south-east direction. About 40 springs provide a continuous supply of water to the fen. Pollardstown Fen is unusual in Ireland as it is an extensive area of primary and secondary fen peat, lacking scrub vegetation on its surface. The fen has ornithological importance for both breeding and wintering birds. Garganey *Spatula querquedula* and Reedwarbler *Acrocephalus scirpaceus* have been recorded here, alongside two very specialised bird species associated with fens, Marsh Harrier *Circus aeruginosus* and Savi's Warbler *Locustella luscinioides*. Otter *Lutra lutra* and Brook Lamprey *Lampetra planeri*, two species listed in Annex II of the E.U. Habitats Directive, occur at Pollardstown. Various groups of the invertebrate fauna have been studied and the system has been shown to support a true fen fauna. Of particular conservation importance, however, is the occurrence of all three of the Whorl Snails *Vertigo* spp. that are listed in Annex II of the E.U. Habitats Directive. Pollardstown is the only known site in Ireland (or Europe) to support all three species *Vertigo geyeri, V. angustior* and *V. moulinsiana*, and it therefore provides a unique opportunity to study their different habitat and hydrological requirements. The conservation objectives are to 1) restore the favourable condition of the Calcareous fens, Petrifying springs with tufa formation, Alkaline fens, and Geyer's Whorl Snail *Vertigo geyeri*, and 2) maintain the favourable conservation condition of Desmoulin's Whorl Snail *Vertigo moulinsiana* (NPWS, 2013). The fen supplies water to feed the Grand Canal and is therefore indirectly connected to Corbally Canal hydrologically.	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] Petrifying springs with tufa formation (*Cratoneurion*) [7220] Alkaline fens [7230] Geyer's Whorl Snail *Vertigo geyeri* [1013] Narrow-mouthed Whorl Snail *Vertigo angustior* [1014] Desmoulin's Whorl Snail *Vertigo moulinsiana* [1016] (NPWS, 2022)	Grazing: Moderate (Inside) Dispersed habitation: Moderate (Outside) Leisure fishing: Low (Inside) Hunting: Low (Inside) Electricity and phone lines: Low (Inside) Fire and fire suppression: Low (Inside) Sylviculture, forestry: Low (Inside) (EEA, 2020)

Table 5-3 Site Briefs and ecological features of note for local proposed Natural Heritage Areas

Site Name	Brief	Ecological Features of Note
Liffey at Osberstown pNHA	This site is located about 2km north-west of Naas, on the east bank of the River Liffey. The site, which was surveyed in 1976, is on a steep bank about 10m in height. It is formed of a wet boulder-clay surface covered by mosses, willow *Salix* spp. scrub and some herbaceous species. The main plant of interest at the site was Dark-leaved Willow *Salix myrsinifolia*, a rare plant in Ireland. By 1983 this site had been cleared of woodland and no Dark-leaved Willow was found. Ground flora included Bugle *Ajuga reptans*, Primrose *Primula vulgaris*, Marsh Hawk's-beard *Crepis paludosa*, False Brome *Brachypodium sylvaticum*, Common Sedge *Carex nigra* and Hart's-tongue *Phyllitis scolopendrium*. The scarce Variegated Horsetail *Equisetum variegatum* also occurred at the site. Plants found on the riverbank included Hemlock Water-dropwort *Oenanthe crocata*, Cow Parsley *Anthriscus sylvestris* and Water Mint *Mentha aquatica*. (NPWS, 2009)	Otter *Lutra lutra*
Grand Canal pNHA	The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. A number of different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. The hedgerow, although diverse, is dominated by Hawthorn *Crataegus monogyna*. On the limestone soils of the midlands Spindle *Euonymus europaeus* and Guelderrose *Viburnum opulus* are present. The vegetation of the towpath is usually dominated by grass species. The diversity of the water channel is particularly high in the eastern section of the Main Line - between the Summit level at Lowtown and Inchicore. Arrowhead Sagittaria sagittifolia and Watercress *Rorippa nasturtium-aquaticum* are more common in this stretch than on the rest of the system. All sites for Hemlock Water-dropwort *Oenanthe crocata* on the Grand Canal system are within this stretch. Otter spraints are found along the towpath, particularly where the canal passes over a river or stream. The Smooth Newt *Lissotriton vulgaris* breeds in the ponds on the bank at Gollierstown in Co. Dublin. The rare and legally protected Opposite-leaved Pondweed *Groenlandia densa* (Flora Protection Order 2022) is present at a number of sites in the eastern section of the Main Line, between Lowtown and Ringsend Basin in Dublin. 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. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods (NPWS, 2009). The Pollardstown Fen SAC supplies water to feed the Grand Canal pNHA and is therefore indirectly connected to Corbally Canal hydrologically.	Opposite leaved Pondweed *Groenlandia dense* Otter *Lutra lutra* Smooth Newt *Lissotriton vulgaris*
Mouds Bog pNHA	Mouds Bog is located about 3km north-west of Newbridge in Co. Kildare, close to the Hill of Allen, and includes amongst others, the townlands of Grangehiggin, Barretstown and Hawkfield. The site comprises a raised bog that includes both areas of high bog and cutover bog. Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses *Sphagnum* spp. is high, and where some or all of the following features occur: hummocks, pools, wet flats, Sphagnum lawns, flushes and soaks. Active raised bog is listed as a priority habitat on Annex I of the E.U. Habitats Directive. Red Grouse, a Red Listed species and one that is becoming increasingly rare in Ireland, has been recorded on this site. Other birds noted on the site include Skylark *Alauda arvensis*, Meadow Pipit *Anthus pratensis*, Curlew *Numenius arquata* and Kestrel *Falco tinnunculus*. The conservation objectives of the site are to restore favourable conservation condition of Active raised bogs, and the associated degraded raised bogs. (NPWS, 2014)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150] Meadow Pipit *Anthus pratensis* Skylark *Alauda arvensis* Curlew *Numenius arquata* Kestrel *Falco tinnunculus* Red Grouse *Lagopus lagopus scotica*
Pollardstown Fen pNHA	Pollardstown Fen is situated on the northern margin of the Curragh of Kildare, approximately 3 km north-west of Newbridge. It lies in a shallow depression, running in a north-west/south-east direction. About 40 springs provide a continuous supply of water to the fen. Pollardstown Fen is unusual in Ireland as it is an extensive area of primary and secondary fen peat, lacking scrub vegetation on its surface. The fen has ornithological importance for both breeding and wintering birds. Garganey *Spatula querquedula* and Reed Warbler *Acrocephalus scirpaceus* have been recorded here, alongside two very specialised bird species associated with fens, Marsh Harrier *Circus aeruginosus* and Savi's Warbler *Locustella luscinioides*. Otter and Brook Lamprey *Lampetra planeri*, two species listed in Annex II of the E.U. Habitats Directive, occur at Pollardstown. Various groups of the invertebrate fauna have been studied and the system has been shown to support a true fen fauna. Of particular conservation importance, however, is the occurrence of all three of the Whorl Snails *Vertigo* spp. that are listed in Annex II of the E.U. Habitats Directive. Pollardstown is the only known site in Ireland (or Europe) to support all three species *Vertigo geyeri, V. angustior* and *V. moulinsiana*, and it therefore provides a unique opportunity to study their different habitat and hydrological requirements. (NPWS, 2013)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150] Otter *Lutra lutra* Garganey *Spatula querquedula* Marsh Harrier *Circus aeruginosus* Brook Lamprey *Lampetra planeri* Geyer's Whorl Snail *Vertigo geyeri* Narrow-mouthed Whorl Snail *Vertigo angustior* Desmoulin's Whorl Snail *Vertigo moulinsiana* Brook Lamprey *Lampetra planeri*

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Site Name	Brief	Ecological Features of Note
Curragh (Kildare) pNHA	The Curragh is an extensive open plain which lies about 3km southwest of Newbridge in Co. Kildare. It is bisected by the M7/N7 motorway and a railway line. The Curragh Camp and Curragh Racecourse are located within the plain. The site extends for some 10km in a north-west/south-east direction and is approximately 5km at its widest. The town and most of the racecourse are not included in the site. Lowland acid grassland is the dominant habitat at the site. There is, however, variation in the grassland which is due in part to the soil variation and to the grazing regime. The grasslands on level ground are continually grazed throughout the year. Leaching takes place, which further depletes the nutrient levels. Throughout the unfertilised grasslands, surface acidification is reflected in the abundance of such mosses as *Rhytidiadelphus squarrosus* and *Pseudoscleropodium purum*. The Red Data Book species, Blue Fleabane *Erigeron acer* has been found within the site. Small areas of wet heath are found throughout the site, but especially west of the racecourse. These have been found to be associated with a perched water table. At the east of the site, in the vicinity of the gravel and till mounds at Rabbit Hill, at Donnelly's Hollow and in the extreme east of the Military Ranges, the grassland of the slopes is very nutrient-poor, and the soil layer is extremely shallow. Species diversity is quite high. The area known as Donnelly's Hollow appears to be situated in a disused gravel pit. Dry Heath of the Ulex formation covers approximately 10-20% of the site and is associated mainly with the undulating hills within the site. West of the motorway and on the approximately 800ha of racecourse property there are bands of dry heath which support Heather *Calluna vulgaris*, Heath Spotted-orchid *Dactylorhiza maculata*, Common Twayblade *Listera ovata* and Butterfly orchids *Platanthera* spp.. The site is most unusual in an Irish, European and even global context, in that it is an extensive open plain area of lowland acid grassland, succeeding to dry heath in places. It has been grazed but unfertilised for hundreds, perhaps even thousands of years. Because of the management regime on the open grassland, nationally important populations of rare fungi are found. Their presence best highlights the continuity of the area as a grazed, unfertilised grassland for centuries, as these fungi cannot tolerate soil disturbance or fertilising. They are only found in ancient grasslands. The Curragh is also of ornithological importance. It supports populations of wintering Golden Plover, a species that is listed on Annex I of the E.U. Birds Directive - flocks of 3000 birds have been recorded regularly since the winter of 1994/95. Lapwing, in flocks of approximately 200 birds, also occur regularly on the site. The ungrazed grasslands of the Turf Club are used by nesting Meadow Pipit and Skylark. Irish Hare *Lepus timidus hibernicus*, a Red Data Book species, was plentiful on The Curragh in the 17th and 18th centuries – it still uses the site. (NPWS, 2009)	Blue Fleabane *Erigeron acer* Golden Plover *Pluvialis apricaria* Irish Hare *Lepus timidus hibernicus* *Lapwing Vanellus vanellus* Skylark *Alauda arvensis* Meadow Pipit *Anthus pratensis*
Liffey Bank Above Athgarvan pNHA	This site is located on the River Liffey about 3km north-west of Kilcullen in Co. Kildare. On one of the meanders above Athgarvan, the Liffey has cut into a very sandy patch of boulder clay, steepening its banks beyond the point where continuous vegetation can exist. The resulting unstable sandy slope faces south and is colonised by an interesting flora characteristic of unstable soil. Beds of harder rock boulder clay make small cliffs in places and the grassland above these is of Red Fescue *Festuca rubra* with Wild Garden *Thymus polytrichus*, Oxeye Daisy *Leucanthemum vulgare*, Carline Thistle *Carlina vulgaris* and Spring-sedge *Carex caryophyllea*. The scarce Common Calamint *Clinopodium menthifolium* has been recorded in the open grassland area lower down and towards the river. Patches of scrub occur on the slope, mostly of Ash *Fraxinus excelsior,* Hawthorn *Crataegus monogyna* and Blackthorn *Prunus spinosa*. The scientific interest of this site lies in the occurrence of an assemblage of plants typical of disturbed and unstable habitats. Such areas of natural habitats are rare in Co Kildare. (NPWS, 2009)	Otter *Lutra lutra*
Liffey Valley Meander Belt pNHA	This site is located on the north bank of the River Liffey, about 1km west of Ballymore Eustace in Co. Kildare. In this area the Liffey meanders through a broad flood plain bordered in places by steep slopes. The site, which was surveyed in 1975, is an Ash wood which runs down from the road. Apart from Ash *Fraxinus excelsior* the tree species include Beech *Fagus sylvatica*, Sycamore *Acer pseudoplatanus*, Hawthorn *Crataegus monogyna*, Elder *Sambucus nigra* and Alder *Alnus glutinosa*. The woodland is grazed but includes a wide variety of herbs such as Sanicle *Sanicula europaea*, Pignut *Conopodium majus*, Bugle *Ajuga reptans*, and Red Campion *Silene dioica*. A calcicolous seepage line along the base of the slope is included within the site. The Ash wood merges into a dense growth of Lesser Pond-sedge *Carex acutiformis*, which grows with Marsh-marigold *Caltha palustris*, Yellow Iris *Iris pseudacorus*, Meadowsweet *Filipendula ulmaria*, Golden-saxifrage *Chrysosplenium oppositifolium*, and the rushes *Juncus effusus* and *J. inflexus*. Important chironomid communities have been recorded from this area. This site is of scientific interest as Ash woods and marshy areas of this type are rare in Co Kildare. (NPWS, 2009)	Otter *Lutra lutra* *Notable chironomid communities (aquatic invertebrates)*

5.3 Surface Water Catchments

The study area is located in the Water Framework Directive (WFD) Liffey_SC_060, Liffey_SC_030, and Liffey_SC_040 sub catchments, within the Liffey and Dublin Bay catchment (EPA, 2024). The study area includes the catchment along the Grand Canal Naas Line (Liffey and Dublin Bay) WFD waterbody, and to the along Liffey_060, Liffey_070, and Liffey_080 WFD waterbodies. The WFD status and current risk levels of these waterbodies are shown in Table 5-4 and Figure 5-3 below.

Table 5-4 The WFD waterbodies within the ZoI of the proposed works

WFD Waterbody	WFD Status (2016-2021)	Risk Status
Awillyinish Stream_010	Moderate	Review
Grand Canal Main Line (Liffey and Dublin Bay)	Good	Not at risk
Grand Canal Naas Line (Liffey and Dublin Bay)	Good	Review
Liffey_050	Good	Not at risk
Liffey_060	Moderate	At risk
Liffey_070	High	Not at risk
Liffey_080	Good	Not at risk
Liffey_090	Good	Not at risk
Liffey_100	Good	Not at risk
Liffey_110	Good	Review
Liffey_120	Good	Not at risk

5.4 Groundwater

The study area is located within the WFD groundwater bodies Kilcullen (IE_ EA_G_003) and Curragh Gravels East (IE_EA_G_017) (Figure 5-4). The Kilcullen groundwater body has a "Good" WFD Status (2016-2021), while its risk status is "At risk". The Curragh Gravels East groundwater body has a "Good" WFD Status (2016-2021), while its risk status is "Not at risk" (EPA, 2024).

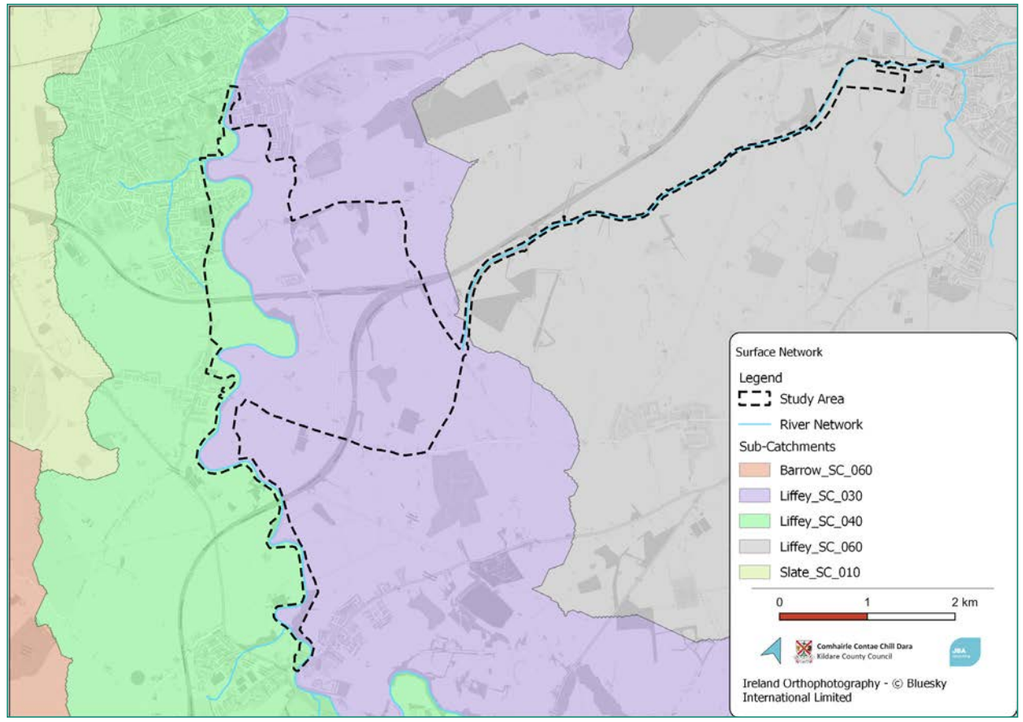


Figure 5-3 Sub-catchments and watercourse within the study area

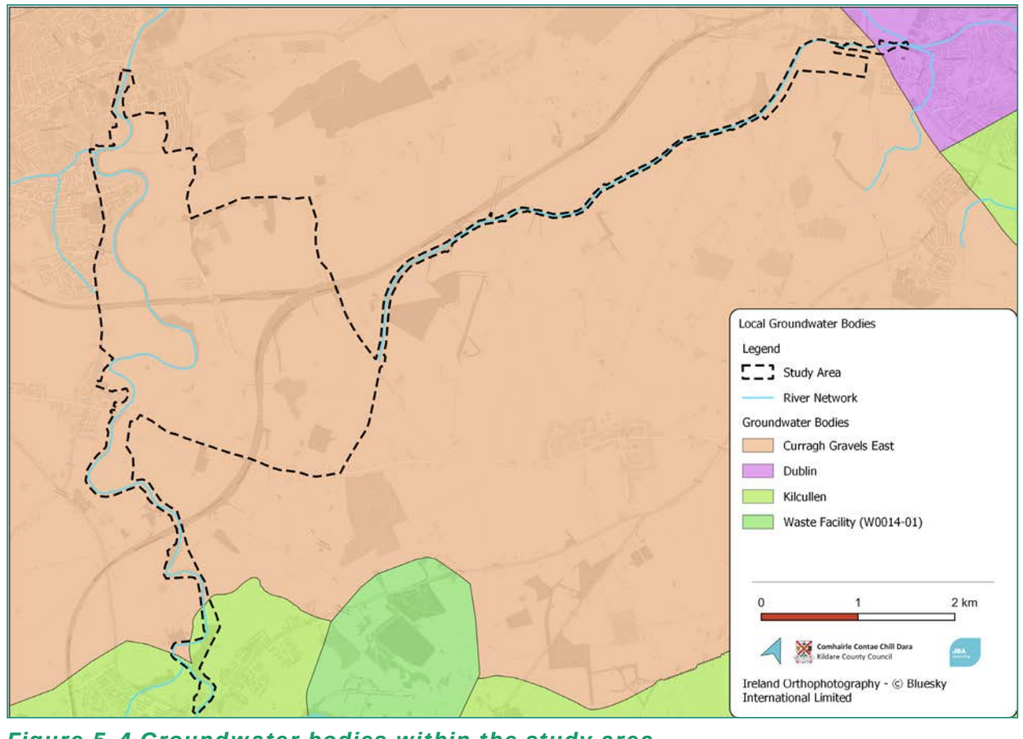


Figure 5-4 Groundwater bodies within the study area

5.4.1 Underlying Geology & Aquifer Vulnerability

The study area crosses multiple geologies. The western section of the study area (along the Liffey) starts at Kilcullen where the underlying geology is made up of calcareous greywacke siltstone & shale. Travelling north, the study area crosses a geological area dominated by lenticular mudstone & coarse siltstone, and to the north of this, just south of Athgarvan, the geology is made up of skeletal, oolitic & micritic limestone. The next section of the study area has an underlying geology of dark muddy limestone and shale. The northern extent of the study area along the Liffey has a mixed underlying geology, to the south of Newbridge being cherty often dolomitised limestone, while to the north of Newbridge being made up of massive, unbedded lime-mudstone.

The study area's eastern extent, along the Grand Canal Naas Line, has an underlying geology largely comprised of skeletal, oolitic & micritic limestone. The subsoil permeability for most of the study area is moderate, with the area around Athgarvan and Newbridge having high subsoil permeability. Most of the study area has 'High' aquifer vulnerability as a result, with the most southern section of the study area by Kilcullen having a mix of 'Extreme' and 'Moderate' aquifer vulnerability (Figure 5-5) (GSI, 2024).

There are four different aquifers underlying bedrock beneath the study area. Around Newbridge, the underlying aquifer is a regionally important karstified bedrock aquifer, dominated by diffuse flow. The landscape is characterised by largely underground drainage, with most flow occurring through the more permeable, solutionally-enlarged, interconnected fissure/conduit zones, which may be several kilometres long. Groundwater velocities through fissures/conduits may be high and aquifer storage is frequently low. Groundwater often discharges as large springs (>2,000 m3/d), which range from regular and dependable to highly variable ('flashy'). Therefore, there is strong interconnection between surface water and groundwater (GSI, 2024).

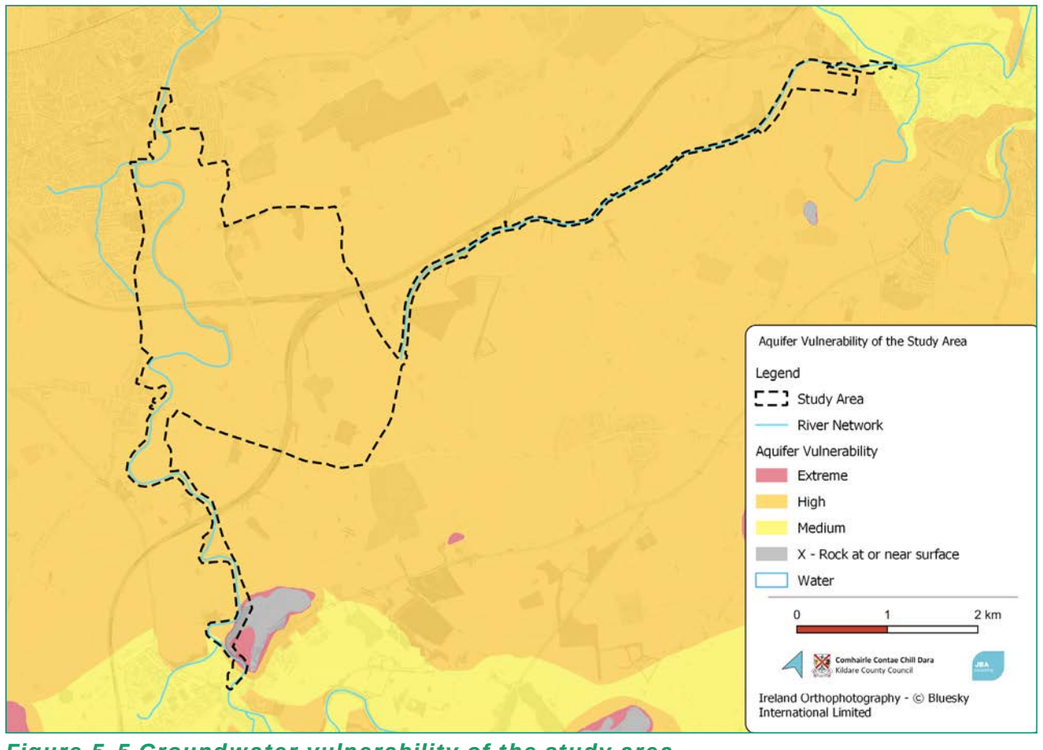


Figure 5-5 Groundwater vulnerability of the study area

The underlying aquifer for the area around Athgarvan, between Newbridge and the M9 extending along the M7 up to Naas, is locally important and moderately productive, but only in local zones. The aquifer has a limited and relatively poorly connected network of fractures, fissures and joints, giving a low fissure permeability which tends to decrease further with depth. A shallow zone of higher permeability may exist within the top few metres of more fractured/ weathered rock, and higher permeability may also occur along fault zones. These zones may be able to provide larger 'locally important' supplies of water. In general, the lack of connection between the limited fissures results in relatively poor aquifer storage and flow paths that may only extend a few hundred metres. Due to the low permeability and poor storage capacity, the aquifer has a low 'recharge acceptance'. Some recharge in the upper, more fractured/ weathered zone is likely to flow along the relatively short flow paths and rapidly discharge to streams, small springs and seeps. Groundwater discharge to streams ('baseflow') can significantly decrease in the drier summer months (GSI, 2017).

The next aquifer extends parallel to the M7 just north of Kilcullen and extends up until Naas. This is a poor aquifer which is generally unproductive except for in local zones. This aquifer is similar to the locally important bedrock aquifer to the north, but with fewer and more poorly-connected fractures, fissures and joints, and with less permeable and/or more limited zones of higher permeability. Overall permeability, storage capacity, recharge acceptance, length of flow path and baseflow are likely to be less than in locally important aquifers (GSI, 2017).

The aquifer underlying Kilcullen is a poor bedrock aquifer which is generally unproductive. This aquifer has generally few fractures, fissures and joints which are poorly connected. This low fissure permeability tends to decrease further with depth. A shallow zone of slightly higher permeability may exist within the top few metres of more fractured/weathered rock, and higher permeability may rarely occur along large fault zones. In general, the poor fissure network results in poor aquifer storage, short flow paths (tens of metres) and low 'recharge acceptance'. Groundwater discharge to streams ('baseflow') is very limited (GSI, 2017).

5.5 NBDC database

5.5.1 Protected Species

Records of protected flora and fauna including invertebrates, amphibians, reptiles, fish, birds and mammals collated from the NBDC (2024) database, present within the surrounding 2km within the past 10 years are listed in Section 5.10. This list includes their level of protection, if they are red or amber listed on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List or the Birds of Conservation Concern in Ireland (2020-2026) and the date of the last record of this species at this location.

While no QI species (Annex species listed in the EU Habitats Directive) associated with the SAC sites within the ZoI were identified during this data search, several species of conservation concern associated with the pNHAs within the ZoI were identified. Notable mammal species recorded included Irish Hare Lepus timidus subsp. hibernicus and Otter Lutra lutra, with the former protected under the Irish Wildlife Act 1976 (and subsequent amendments), and the latter protected under Annexes II and IV of EU Habitats Directive, as well as the Irish Wildlife Act. Several bird species of conservation concern present with the pNHAs were also recorded. Table 5-5 lists these bird species, and the designations associated with them.

Table 5-5 Bird species of conservation concern present within the pNHAs and the NBDC records

Species	Birds of Conservation Concern Status (BOCCI)	EU Birds Directive Annex
Black-headed Gull *Larus ridibundus*	Amber (B & W)	N/A
Common Kestrel *Falco tinnunculus*	Red (B)	N/A
European Golden Plover *Pluvialis apricaria*	Red (B & W)	I, II, III
Northern Lapwing *Vanellus vanellus*	Red (B & W)	II
Skylark *Alauda arvensis*	Amber (B)	N/A
Designated category within BOCCI; B = Breeding, W = Wintering		

5.5.2 Invasive Non-Native Species

Certain invasive non-native animals and plants are listed under the Third Schedule of S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011. This makes it an offence to release, plant them in the wild or cause them to disperse, spread or otherwise cause them to grow. If these species occur on a site proposed for development or other work which may disturb the ground, control of these species is likely to be required.

European Council's Regulation on the prevention and management of the introduction and spread of invasive alien species [1143/2014] sets out to prevent, minimise and mitigate the adverse impacts of the introduction and spread, both intentional and unintentional, of invasive alien species on biodiversity and the related ecosystem services as well as on human health and the economy.

Table 5-6 provides a list of invasive non-native species (INNS) recorded within 2km (NBDC, 2024) of the study area. It includes species, their level of impact, and whether they are listed on the third schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/2011. For a full list of INNS recorded within 2km of the study area, see Section 5.10.

5.6 Irish Birding Database

Irish Birding's online database contains a record of bird sightings across Ireland since its inception in 2000. This database provides information on the location and timing of each individual sighting.

A search of this database for the Newbridge and Naas areas identified several bird species of conservation that had been recorded within the Zol in the past 10 years. These included Barn Swallow *Hirundo rustica*, Green Sandpiper *Tringa ochropus*, Little Egret *Egretta garzetta*, Merlin *Falco columbarius*, Northern Lapwing *Vanellus vanellus*, Osprey *Pandion haliaetus*, Peregrine Falcon *Falco peregrinus*, Red Kite *Milvus milvus*, Swift *Apus apus*, and White-tailed Eagle *Haliaeetus albicill*a. Additionally, there was a sighting of Cattle Egret *Bubulcus ibis* within this period, a rare vagrant species in Ireland (Irish, Birding, 2024).

Table 5-6 INNS recorded within or immediately adjacent to the study area

Invasive Non-native species (INNS)	Impact	Regulation S.I. 477/2011
American Mink *Mustela vison*	High	Yes
American Skunk-cabbage *Lysichiton americanus*	Medium	Yes
Arthurdendyus triangulatus	High	No
Butterfly-bush *Buddleja davidii*	Medium	No
Cherry Laurel *Prunus laurocerasus*	High	No
Eastern Grey Squirrel *Sciurus carolinensis*	High	Yes
European Rabbit *Oryctolagus cuniculus*	Medium	Yes
Giant Hogweed *Heracleum mantegazzianum*	High	Yes
Greater White-toothed Shrew *Crocidura russula*	Medium	No
Harlequin Ladybird *Harmonia axyridis*	High	Yes
Himalayan Balsam *Impatiens glandulifera*	High	Yes
Japanese Knotweed *Fallopia japonica*	High	Yes
Japanese Rose *Rosa rugosa*	Medium	No
Jenkins' Spire Snail *Potamopyrgus antipodarum*	Medium	No
Rose-ringed Parakeet *Psittacula krameri*	High	No
Sika Deer *Cervus nippon*	High	Yes
Spanish Bluebell *Hyacinthoides hispanica*	N/A	Yes
Sycamore *Acer pseudoplatanus*	Medium	No
Three-cornered Garlic *Allium triquetrum*	Medium	Yes

5.7 ROD Consulting Engineers report summary

5.7.1 Habitats

Roughan & O'Donovan Environmental (ROD) were appointed by Waterways Ireland to undertake an Ecological Assessment of the Naas Corbally Branch of the Grand Canal, Co. Kildare (ROD, 2016). ROD Ecologists conducted a detailed habitat survey along thise stretch of the canal using the Fossitt (2000) Habitat Classification methodology.

Table 5-7Habitats (Fossitt classification) recorded from Jigginstown Bridge to Corbally Harbour

Fossitt Habitat Code	Fossitt Habitat Name
BC3	Tilled Land
BL3	Buildings and artificials surfaces
ED3	Recolonising bare ground
FL8	Artificial lakes and ponds
FS1	Reed and large sedge swamps
FW3	Canals
GA1	Improved agricultural grassland
GA2	Amenity (improved) grassland
GS1	Dry calcareous and neutral grassland
GS2	Dry meadow and grassy verges
GS4	Wet grassland
WD1	(Mixed) broadleaved woodland
WS1	Scrub

5.7.2 FLora

ROD ecologists recorded a wide range of flora species within the above habitats. All species are displayed in Table 5-8.

Table 5-8 Flora recorded between Jigginstown Bridge and Corbally Harbour

Flora (Common & Species Names)		
Trees		
Field Maple *Acer campestre*	Ash *Fraxinus excelsior*	Hawthorn *Crataegus monogyna*
Sycamore *Acer pseudoplatanus*	Scots Pine *Pinus sylvestris*	Elder *Sambucus nigra*
Horse Chestnut *Aesculus hippocastanum*	Blackthorn *Prunus spinosa*	Alder *Alnus glutinosa*
Rusty Willow *Salix cinerea* subsp. *oleifolia*	Rowan *Sorbus aucuparia*	Hazel *Corylus avellana*
Irish Whitebeam *Sorbus hibernica*		
Graminoids		
Creeping Bent *Agrostis stolonifera*	Meadow Foxtail *Alopecurus pratensis*	Sweet Vernal Grass *Anthoxanthum odoratum*
False Oat-grass *Arrhenatherum elatius*	Quaking Grass *Briza media*	Black Sedge *Carex nigra*
Crested Dog's-tail *Cynosurus cristatus*	Cock's-foot *Dactylis glomerata*	Tufted Hair Grass *Deschampsia cespitosa*
Red Fescue *Festuca rubra*	Floating Sweet Grass *Glyceria fluitans*	Reed Sweet Grass *Glyceria maxima*
Yorkshire Fog *Holcus lanatus*	Sharp-flowered Rush *Juncus acutiflorus*	Jointed Rush *Juncus articulatus*
Toad Rush *Juncus bufonius*	Bulbous Rush *Juncus bulbosus*	Soft Rush *Juncus effusus*
Hard Rush *Juncus inflexus*	Blunt-flowered Rush *Juncus subnodolus*	Perennial Ryegrass *Lolium perenne*
Purple Moor Grass *Molinia caerula*	Common Bent *Agrostis capillaris*	Timothy *Phleum pratense*
Field Woodrush *Luzula campestris*	Remote Sedge *Carex remota*	Annual Meadow Grass *Poa annua*
Smooth Meadow Grass *Poa pratensis*		

Continues overleaf

Continued...

Flora (Common & Species Names)		
Forbes		
Yarrow *Achillea millefoium*	Lesser Water-parsnip *Berula erecta*	Hedge Bindweed *Calystegia sepium*
Wild Angelica *Angelica sylvestris*	Knapweed *Centaurea nigra*	Creeping Thistle *Cirsium arvense*
Cow Parsley *Anthriscus sylvestris*	Marsh Thistle *Cirsium palustre*	Rosebay Willowherb *Epilobium angustifolium*
Daisy *Bellis perennis*	Great Willowherb *Epilobium hirsutum*	Hoary Willowherb *Epilobium parviflorum*
Field Horsetail *Equisetum arvense*	Water Horsetail *Equisetum fluviatile*	Eyebright *Euphrasia* spp.
Meadowsweet *Filipendula ulmaria*	Cleavers *Galium aparine*	Herb-Robert *Geranium robertianum*
Lady's Bedstraw *Galium verum*	Ivy *Hedera helix*	Hogweed *Heracleum sphondylium*
Perforate St John's-wort *Hypericum perforatum*	Square-stalked St John's-wort *Hypericum tetrapterum*	Flag Iris *Iris pseudacorus*
Field Scabious *Knautia arvensis*	Meadow Vetchling *Lathyrus pratensis*	Ox-eye Daisy *Leaucanthemum vulgare*
Bird's-foot Trefoil *Lotus corniculatus*	Pineappleweed *Matricaria discoidea*	Black Medick *Medicago lupulina*
Red Bartsia *Odontites verna*	Ribwort Plantain *Plantago lanceolata*	Greater Plantain *Plantago major*
Silverweed *Potentilla anserina*	Meadow Buttercup *Ranunculus acris*	Creeping Buttercup *Ranunculus repens*
Bramble *Rubus fruticosus* agg.	Common Sorrell *Rumex acetosa*	Broad-leaved Dock *Rumex obtusifolius*
Ragwort *Senecio jacobaea*	Smooth Sowthistle *Sonchus oleraceus*	*Devil's-bit Scabious* *Succisa pratensis*
Dandelions *Taraxacum* spp.	Red Clover *Trifolium pratense*	White Clover *Trifolium repens*
Nettle *Urtica dioica*	Common Valerian *Valeriana officinalis*	Tufted Vetch *Vicia cracca*
Bush Vetch *Vicia sepium*	Violets and Pansies *Viola* spp.	Wild Garlic *Allium ursinum*
Cuckoo Flower *Cardamine pratensis*	Petty Spurge *Euphorbia peplus*	Cat's-ear *Hypochaeris radicata*
White Dead-nettle *Lamium album*	Water-forget-me-not *Myosotis scorpioides*	Tormentil *Potentilla erecta*

Flora (Common & Species Names)		
Cowslip *Primula veris*	Honeysuckle *Lonicera periclymenum*	Marsh Woundwort *Stachys palustris*
Marsh Arrowgrass *Triglochin palustre*	Water Mint *Mentha aquatica*	
Shrubs		
Buckthorn *Rhamnus cathartica*	Roses *Rosa spp.*	Gorse *Ulex europaeus*
Ferns		
Wall-Rue *Asplenium ruta-muraria*	Maidenhair Spleenwort *Asplenium trichomanes*	Rustyback Fern *Ceterach officinarum*
Macrophytes		
Common Reed *Phragmites australis*	Common Club-rush *Schoenoplectus lacustris*	Bulrush *Typha latifolia*
Reed Canary Grass *Phalaris arundinacea*	Starworts *Callitriche* spp.	Whorled Water Milfoil *Myriophyllum* spp.
Watercress *Nasturtium officinale*	Yellow Water-lily *Nuphar lutea*	Broad-leaved Pondweed *Potamogeton natans*
Lesser Spearwort *Ranunculus flammula*	Arrowhead *Sagittaria sagittifolia*	Water Plantain *Alisma Plantago-aquatica*
Mare's-tail *Hippuris vulgaris*	Common Duckweed *Lemna minor*	Ivy-leaved Duckweed *Lemna trisulca*
Fan-leaved Water Crowfoot *Ranunculus circinatus*	Horned Pondweed *Zannichellia palustris*	Bogbean *Menyanthes trifoliata*
Algae		
Charophytes *Charophyta* spp.		

5.7.3 Rare and protected Fauna

In addition to the recording of habitats, ROD ecologists observed numerous protected and/or red-listed species of conservation concern, which are listed in Table 5-9.

Table 5-9 Red-listed and Annex protected fauna recorded by ROD (2016)

Species	NPWS Red-lists / BoCCI	Habitats Directive Annex	Birds Directive Annex
Mammals			
Otter *Lutra lutra*	Least Concern	II & IV	-
Birds			
Kestrel *Falco tinninculus*	Red listed (B)	-	-
Common Wood Pigeon *Columba palumbus*	Green listed	II & III	II & III
Goldcrest *Regulus regulus*	Amber listed (B)	-	-
Greenfinch *Carduelis chloris*	Amber listed (B)	-	-
House Sparrow *Passer domesticus*	Amber listed (B)	-	-
Kingfisher *Alcedo atthis*	Amber listed (B)	I	-
Linnet *Carduelis cannabina*	Amber listed (B)	-	-
Mallard *Anus platyrhynchos*	Amber listed (B & W)	-	II & III
Mute Swan *Cygnus olor*	Amber listed (B & W)	-	II
Starling *Sturnus vulgaris*	Amber listed (B)	-	I
Swallow *Hirundo rustica*	Amber listed (B)	-	-
Willow Warbler *Phylloscopus trochilus*	Amber listed (B)	-	-
Amphibians			
Common Frog *Rana temporaria*	Least Concern	V	-
Designated category within BOCCI; B = Breeding, W = Wintering			

Table 5-10 INNS recorded by ROD Ecologists

Invasive Non-native species (INNS)	Impact	Regulation S.I. 477/2011
Canadian Waterweed *Elodea canadensis*	High	Yes
Cotoneaster *Cotoneaster horizontalis*	Medium	No
Grey Squirrel *Sciurus carolinensis*	High	Yes
Himalayan Balsam *Impatiens glandulifera*	High	Yes
Nuttall's Waterweed *Elodea nutallii*	High	Yes
Sika Deer *Cervus nippon*	High	Yes
Snowberry *Symphoricarpos albus*	N/A	No
Sycamore *Acer pseudoplatanus*	Medium	No

5.8 Fish Surveys

5.8.1Triturus Environmental Ltd (2020)

In 2020, Triturus Environmental Ltd. were contracted by North Kildare Trout & Salmon Anglers Association (NKTSAA) to undertake a baseline fisheries assessment of numerous sites along the River Liffey (EPA code: 09L01) within North Kildare Trout & Salmon Anglers Association (NKTSAA) club jurisdiction throughout Co. Kildare. Three fish species of conservation concern were recorded, including Atlantic Salmon *Salmo salar* (only salmon parr were recorded), European Eel *Anguilla anguilla*, and lamprey species *Lampetra* sp. (only ammocoetes were recorded in the sediment). Excellent habitat was recorded across the Liffey for both European Eel and lamprey species. Additionally, Freshwater White-clawed Crayfish *Austropotamobius pallipes* was recorded (Triturus Environmental, 2020).

5.9 Study Areav Walkover Surveys (JBA Consulting)

5.9.1 Habitats

JBA Ecologist observations of the habitats present along the Corbally Canal section of the study area aligned with those that were recorded within the ROD report (Sub-section 5.7).

5.9.2 Mammals

During the ecological walkover surveys, an Otter spraint was recorded below Limerick Bridge. No other signs of Otter or any other mammals were recorded by JBA Ecologists.

Figure 5-6 Location of Otter sprainting site (latrine) along Corbally Canal

5.9.3 Bats

JBA Ecologists noted that the Corbally Canal and River Liffey, and their associated habitats, were highly suitable for foraging by a wide range of bat species, including the locally recorded Common Pipistrelle Pipistrellus pipistrellus; Soprano Pipistrelle Pipistrellus pygmaeus; Leisler's Bat Nyctalus leisleri; and Daubenton's Bat Myotis daubentonii (NBDC, 2024). These waterbodies are also highly valued commuting corridors for local bats to navigate the wider landscape. Furthermore, the hedgerow and treeline habitats between the two waterbodies are also valued commuting and foraging corridors for the local bat populations.

5.9.4 Birds

During the walkover surveys, six bird species were recorded, of which two are on the list for Birds of Conservation Concern in Ireland (BoCCI), one of which is an Annex species in the EU Birds Directive. The two species of conservation concern recorded were Mute Swan and Yellowhammer *Emberiza citrinella*. Table 5-11 below lists the bird species recorded during the ecological walkover surveys that were recorded within the study area and the designations associated with them.

Figure 5-7 Location of bird species of conservation concern recorded within the study area

Table 5-11 Bird species recorded by JBA Ecologists.

Species	Birds of Conservation Concern Status (BOCCI)	EU Birds Directive Annex
Buzzard *Buteo buteo*	Green	N/A
Collard Dove *Streptopelia decaocto*	Green	N/A
Grey Heron *Ardea cinerea*	Green	N/A
Moorhen *Gallinula chloropus*	Green	N/A
Mute Swan *Cygnus olor*	Amber (B & W)	II
Yellowhammer *Emberiza citrinella*	Red (B)	N/A
Designated category within BOCCI; B = Breeding, W = Wintering		

5.9.5 Terrestrial Invertebrates

A total of three terrestrial invertebrate species, namely Brown Hawker dragonfly *Aeshna grandis*, solitary bee species (and burrows), and a Wasp *Vespula species* (hive), were recorded by JBA surveyors during the ecological walkover of the study area (see Figure 5-7).

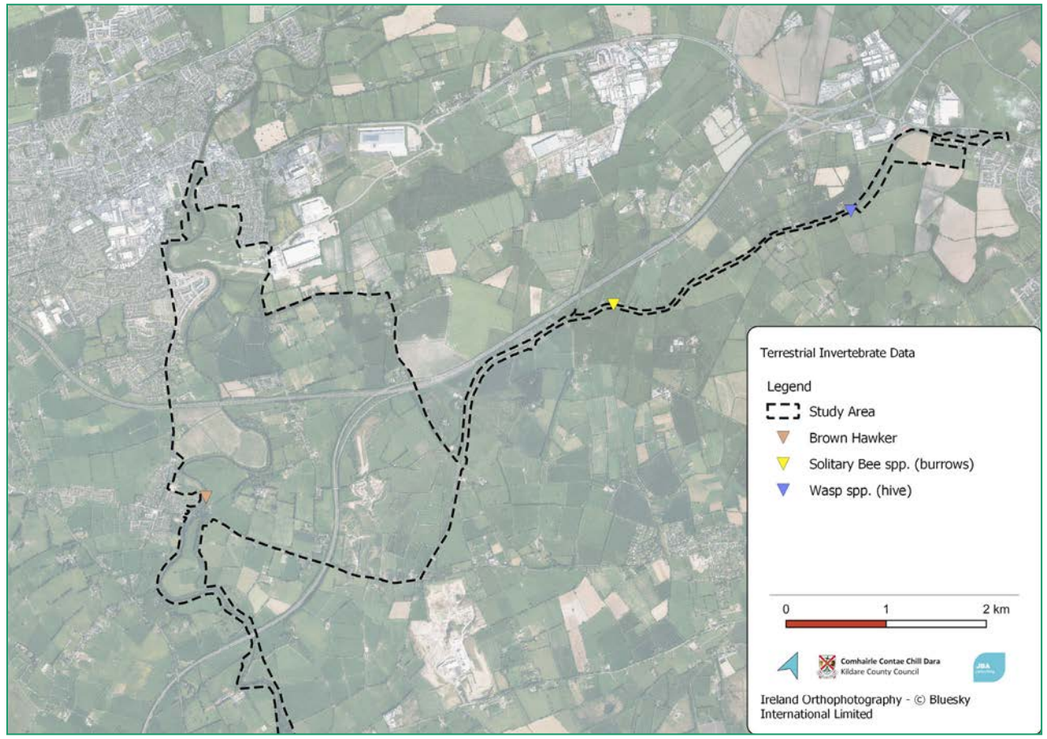


Figure 5-8 Location of terrestrial invertebrate species recorded within the study area

5.9.6 Invasive non-invasive species (INNS)

During the ecological walkover surveys, four species of invasive non-native species were recorded within the study area. These are listed below in Table 5-10 with their impact and whether they are a Third Schedule species. Notably, a Gunnera species was identified at a distance, meaning JBA Ecologists were unable to discern if the species was Brazilian Giant-rhubarb *Gunnera manicata* (Medium Impact Invasive), or Giant-rhubarb *Gunnera tinctoria* (High Impact Invasive). However, both species are listed on the Third Schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/2011, meaning it is illegal to facilitate their spread.

Table 5-12 INNS recorded by JBA Ecologists

Invasive Non-native species (INNS)	Impact	Regulation S.I. 477/2011
Butterfly-bush *Buddleja davidii*	Medium	No
Gunnera spp.	Medium/High	Yes
Himalayan Balsam *Impatiens glandulifera*	High	Yes
Montbretia *Crocosmia* spp.	N/A	No

The majority of INNS were identified along the Liffey section within the study area, with three of the four INNS identified near Kilcullen (Figure 5-6). Himalayan Balsam *Impatiens glandulifera* was found at several locations between Athgarvan and Newbridge (Figure 5-7). One stand of Butterfly Bush *Buddleja davidii* was identified along the study area's eastern extent (Corbally Canal Corridor section) near Naas (Figure 5-8).

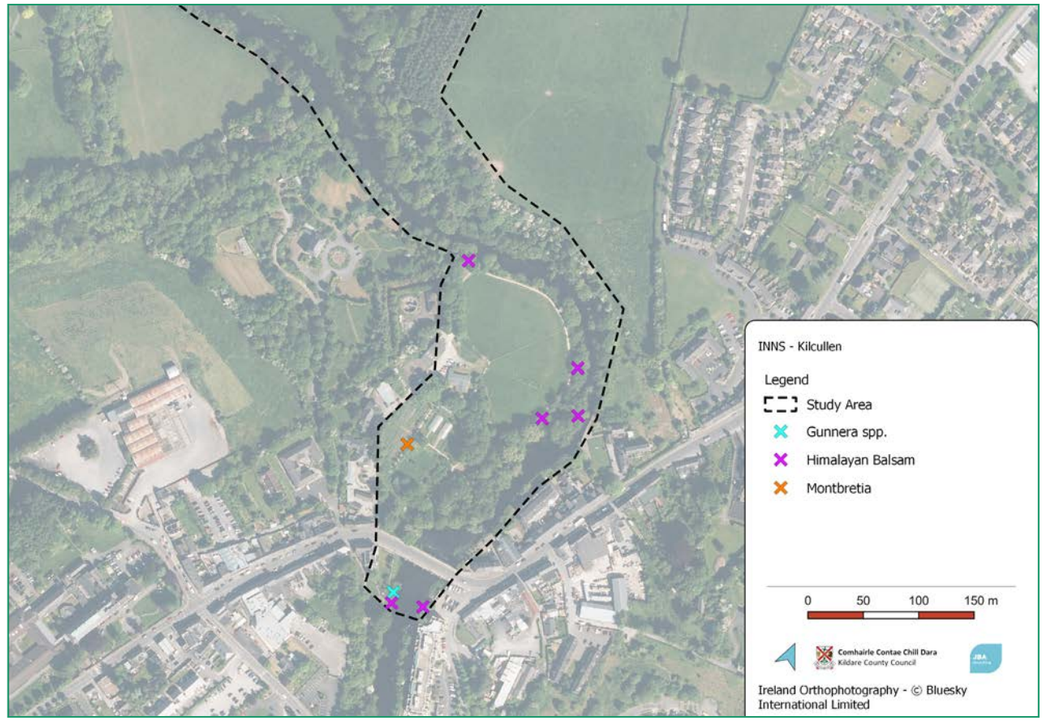


Figure 5-9 INNS identified by JBA Ecologists during walkover survey at Kilcullen

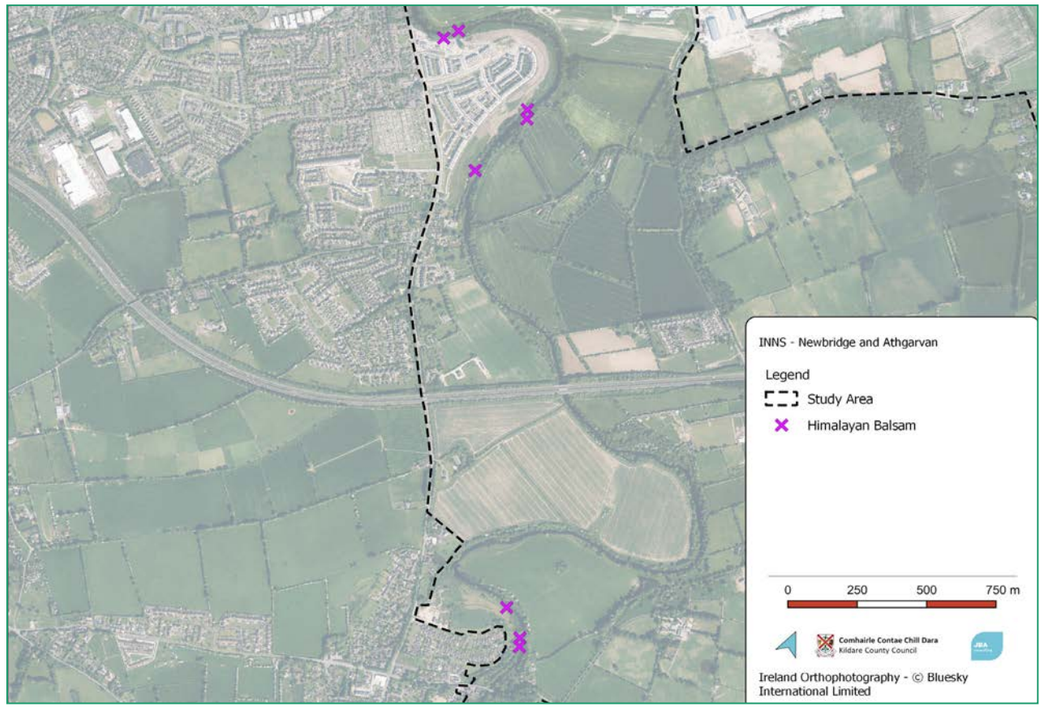


Figure 5-10 INNS identified by JBA Ecologists during walkover survey at Athgarvan and Newbridge

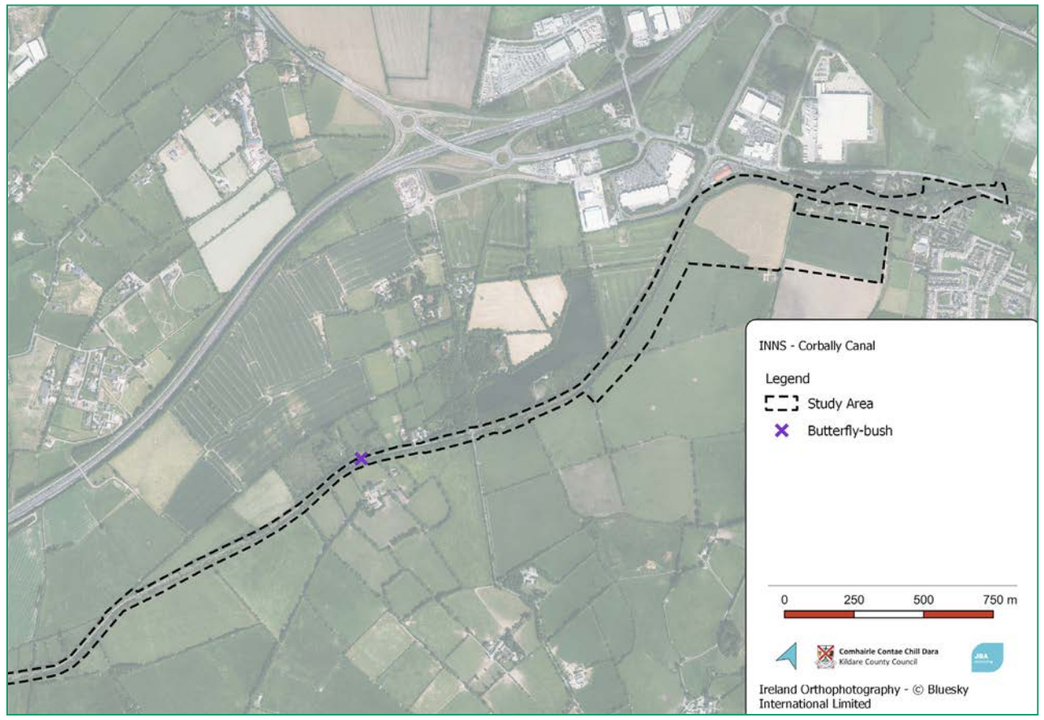


Figure 5-11 INNS identified by JBA Ecologists during walkover survey at Grand Canal (Corbally Branch)

5.10 Additional Information

Table 5-13 Protected species recorded within 2km of the study area within the last 10 years.

Species name	Date of last record	Designation
Amphibians		
Common Frog *Rana temporaria*	13/03/2023	EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Birds		
Barn Owl *Tyto alba*	19/02/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Red List
Barn Swallow *Hirundo rustica*	12/04/2019	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Black-headed Gull *Larus ridibundus*	09/03/2019	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Coot *Fulica atra*	02/01/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, III Birds of Conservation Concern - Amber List
Common Kestrel *Falco tinnunculus*	23/11/2020	Protected Species: Wildlife Acts Birds of Conservation Concern - Red List
Common Kingfisher *Alcedo atthis*	20/05/2022	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Birds of Conservation Concern - Amber List
Common Linnet *Carduelis cannabina*	03/03/2022	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Pheasant *Phasianus colchicus*	14/04/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, III
Common Starling *Sturnus vulgaris*	05/02/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Swift *Apus apus*	28/05/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Wood Pigeon *Columba palumbus*	10/04/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, III
European Golden Plover *Pluvialis apricaria*	01/11/2018	Protected Species: Wildlife Acts EU Birds Directive >> Annex I, II, III Birds of Conservation Concern - Red List
European Greenfinch *Carduelis chloris*	07/05/2023	Birds of Conservation Concern - Amber List
Goldcrest *Regulus regulus*	05/03/2023	Birds of Conservation Concern - Amber List
Great Black-backed Gull *Larus marinus*	13/05/2019	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Great Cormorant *Phalacrocorax carbo*	27/02/2019	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Grey Wagtail *Motacilla cinerea*	03/05/2023	Birds of Conservation Concern - Red List
Hen Harrier *Circus cyaneus*	05/01/2017	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Birds of Conservation Concern - Amber List
Herring Gull *Larus argentatus*	13/05/2019	Protected Species: Wildlife Acts Birds of Conservation Concern - Red List
House Martin *Delichon urbicum*	20/05/2022	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
House Sparrow *Passer domesticus*	12/05/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Lesser Black-backed Gull *Larus fuscus*	23/07/2019	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Little Egret *Egretta garzetta*	24/02/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Bird Species
Little Grebe *Tachybaptus ruficollis*	09/03/2019	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Mallard *Anas platyrhynchos*	20/04/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, III
Merlin *Falco columbarius*	19/12/2017	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Birds of Conservation Concern - Amber List
Mute Swan *Cygnus olor*	21/05/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Northern Lapwing *Vanellus vanellus*	04/05/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II Birds of Conservation Concern - Red List
Red Kite *Milvus milvus*	04/06/2022	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Sand Martin *Riparia riparia*	09/06/2020	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Skylark *Alauda arvensis*	15/06/2019	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Yellowhammer *Emberiza citrinella*	30/06/2021	Protected Species: Wildlife Acts Birds of Conservation Concern - Red List

Continues overleaf

Species name	Date of last record	Designation
Crustacean		
Freshwater White-clawed Crayfish *Austropotamobius pallipes*	31/12/2019	EU Habitats Directive >> Annex II, V Protected Species: Wildlife Acts
Flora		
Cornflower *Centaurea cyanus*	23/10/2020	Threatened Species: Waiting list
Green-flowered Helleborine *Epipactis phyllanthes*	23/07/2018	Threatened Species: Endangered
Invertebrates		
Dark Green Fritillary *Argynnis aglaja*	18/07/2020	Threatened Species: Vulnerable
Gipsy Cuckoo Bee *Bombus (Psithyrus) bohemicus*	16/06/2019	Threatened Species: Near threatened
Large Heath *Coenonympha tullia*	02/07/2019	Threatened Species: Vulnerable
Large Red Tailed Bumble Bee *Bombus (Melanobombus) lapidarius*	24/06/2024	Threatened Species: Near threatened
Megachile (Megachile) centuncularis	18/07/2021	Threatened Species: Near threatened
Moss Carder-bee *Bombus (Thoracombus) muscorum*	30/08/2019	Threatened Species: Near threatened
Terrestrial mammals		
Common Pipistrelle *Pipistrellus pipistrellus sensu stricto*	27/08/2018	EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Daubenton's Bat *Myotis daubentonii*	20/08/2022	EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Eurasian Badger *Meles meles*	14/09/2017	Protected Species: Wildlife Acts
Eurasian Pygmy Shrew *Sorex minutus*	08/04/2019	Protected Species: Wildlife Acts
Eurasian Red Squirrel *Sciurus vulgaris*	12/09/2014	Protected Species: Wildlife Acts
European Otter *Lutra lutra*	14/05/2016	EU Habitats Directive >> Annex II, IV Protected Species: Wildlife Acts
Irish Hare *Lepus timidus* subsp. *hibernicus*	08/06/2023	Protected Species: Wildlife Acts
Lesser Noctule *Nyctalus leisleri*	20/08/2022	EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Pine Marten *Martes martes*	06/03/2021	EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Pipistrelle *Pipistrellus pipistrellus sensu lato*	20/08/2022	EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Soprano Pipistrelle *Pipistrellus pygmaeus*	20/08/2022	EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
West European Hedgehog *Erinaceus europaeus*	30/10/2023	Protected Species: Wildlife Acts

Table 5-14 Invasive species recorded within 2km of the site within the last 10 years

Species name	Date of last record	Designation
Birds		
Rose-ringed Parakeet *Psittacula krameri*	17/05/2024	High Impact Invasive Species
Flatworm		
Arthurdendyus triangulatus	18/08/2018	High Impact Invasive Species
Flora		
American Skunk-cabbage *Lysichiton americanus*	31/05/2023	Medium Impact Invasive Species EU Regulation No. 1143/2014 Regulation S.I. 477 (Ireland)
Butterfly-bush *Buddleja davidii*	16/07/2023	Medium Impact Invasive Species
Cherry Laurel *Prunus laurocerasus*	05/08/2015	High Impact Invasive Species
Giant Hogweed *Heracleum mantegazzianum*	15/06/2018	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Indian Balsam *Impatiens glandulifera*	11/08/2023	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Japanese Knotweed *Fallopia japonica*	04/06/2020	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Japanese Rose *Rosa rugosa*	01/05/2019	Medium Impact Invasive Species
Spanish Bluebell *Hyacinthoides hispanica*	02/04/2021	Regulation S.I. 477 (Ireland)
Sycamore *Acer pseudoplatanus*	05/08/2015	Medium Impact Invasive Species
Three-cornered Garlic *Allium triquetrum*	27/04/2024	Medium Impact Invasive Species Regulation S.I. 477 (Ireland)
Invertebrates		
Harlequin Ladybird *Harmonia axyridis*	27/10/2023	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Mollusc		
Jenkins' Spire Snail *Potamopyrgus antipodarum*	29/08/2016	Medium Impact Invasive Species
Terrestrial mammals		
American Mink *Mustela vison*	13/09/2017	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Eastern Grey Squirrel *Sciurus carolinensis*	24/01/2015	High Impact Invasive Species EU Regulation No. 1143/2014 Regulation S.I. 477 (Ireland)
European Rabbit *Oryctolagus cuniculus*	01/07/2015	Medium Impact Invasive Species
Greater White-toothed Shrew *Crocidura russula*	27/07/2020	Medium Impact Invasive Species
Sika Deer *Cervus nippon*	21/09/2018	High Impact Invasive Species Regulation S.I. 477 (Ireland) Protected Species: Wildlife Acts

6.0 WATERBODIES, SOILS & GEOLOGY

6.1 Waterbodies

6.1.1 Surface Water

The study area is situated along two waterbodies, the River Liffey and the Corbally Canal, a branch of the Grand Canal. The River Liffey rises approx. 28km upstream of the study area, in the Wicklow Mountains. It flows through Poulaphouca Reservoir and Golden Falls Reservoir before flowing to the site. Tributaries of the River Liffey include the River Dodder, the River Poddle, the River Camac, the King's River and Rye Water. It primarily flows through agricultural land and also some urban areas. The Grand Canal extends from Dublin and was originally constructed to connect Dublin to the River Shannon. It is fed from an abstraction at Pollardstown Fen and other feeders flowing east to Dublin and West to the River Shannon. At present, the Grand Canal is navigable from Dublin to Naas. Similar to the River Liffey, the Grand Canal flows through agricultural land and some built up areas. Corbally Canal is a non-navigable branch of the Grand Canal and is owned and maintained by Waterways Ireland. It is fed from the south by a minor watercourse through abstraction. The Corbally Canal has been non-navigable since 1954, when a culvert was installed to facilitate the Limerick Road bypass.

6.1.1.1 Water Framework Directive

The Corbally Canal & Liffey Corridor study area is part of the Water Framework Directive (WFD) Liffey and Dublin Bay catchment (09). The Corbally Canal section is within the Liffey_SC_060 sub-catchment and the Liffey Corridor section is between the Liffey_SC_040 and Liffey_SC_030 sub-catchments (Figure 6-1). The WFD is discussed in Chapter 6 of the Kildare CDP 2023-2029.

There are three WFD river waterbodies within the study area: LIFFEY_060, LIFFEY_070, and LIFFEY_080. Grand Canal Naas Line (Liffey and Dublin Bay) in an artificial waterbody located within the study area. These are shown below in Figure 6-1

The LIFFEY_060 waterbody is a Moderate status waterbody under the WFD for 2016-2021 and is *At risk* of not meeting its WFD objectives. Pressures acting on this waterbody include Waste, Urban Waste Water, Urban Run-off and Anthropogenic Pressures.

The LIFFEY_070 waterbody is a High status waterbody under the WFD for 2016-2021. Just 14% of Ireland's surface waterbodies were at *High* status for the 2016-2021 reporting period, and therefore it is of the utmost importance that the Liffey waterbody is protected. The LIFFEY_70 is *Not at risk* of not meeting its WFD objectives, according to the EPA. Pressures acting on this waterbody include Extractive Industry, Hydromorphology, Agriculture, Industry and Anthropogenic Pressures.

The LIFFEY_080 waterbody is a *Good* status waterbody under the WFD for 2016-2021 and is *Not at risk* of not meeting its WFD objectives. Pressures acting on this waterbody include Domestic Waste Water, Agriculture, Urban Run-off and Anthropogenic Pressures.

The Grand Canal Naas Line (Liffey and Dublin Bay) is a *Good* ecological potential waterbody under the WFD for 2016-2021 and its risk status for meeting WFD objectives is currently under review. Pressures acting on this waterbody include Agriculture, Waste, Hydromorphology, Urban Waste Water, Urban Run-off and Anthropogenic Pressures.

6.1.2 Groundwater

The main WFD Groundwater body within the study area is Curragh Gravels East (European code: IE_EA_G_017). The Curragh Gravels East groundwater body has a 'Good' WFD status and is Not at risk of not meeting its WFD objectives, according to the EPA.

A section of the Liffey Corridor is within the Kilcullen Groundwater body (European code: IE_EA_G_003). The Kilcullen groundwater body has a 'Good' WFD status and is At Risk of not meeting its WFD objectives.

Groundwater vulnerability is primarily 'High' across the site. The east section of the Liffey Corridor crosses areas of 'Extreme' and 'Moderate' vulnerability, with a small section consisting of 'Rock at or near Surface or Karst'.

6.1.3 Potential Constraints and Opportunities

Constraints on the Corbally Canal and Liffey Corridor related to waterbodies are the potential construction impacts on surface water and groundwater from runoff of contaminated water and accidental spillage, and possible release and/or mobilisation of nutrients and suspended solids. Any impacts of the study area on hydromorphology of the existing rivers will need to be considered. Also of relevance are existing pressures on water quality, namely hydrology (culverts and artificial channels at various points throughout the study area), and urban runoff entering the watercourses. The addition of hard surfaces associated with construction activities as part of future proposals within the study area would need to be mitigated with sustainable drainage systems. This is to prevent any potential impacts to flow paths or drainage regimes along he canal. Adverse effects from potential construction related activities such as realignment of the canal channel, bank works, erosion and dredging may lead to deterioration of the quality of the surrounding waterbodies

The high ecological status of the Liffey Catchment needs to be considered when developing the design for the Corbally Canal and Liffey Corridor Study. Any adverse impact on water quality could result in the waterbody failing to achieve its WFD objectives and negatively impact its WFD status. Some construction activities could have the potential at construction stage for accidental release of contaminants into surface and groundwater, or the mobilisation of nutrients and suspended solids.

There is the potential for the improvement in local water quality, with the addition of planting trees and remediation works included in the Study. Improving water quality is an objective of the Kildare CDP 2023-2029 and is also in line with the National Planning Framework.

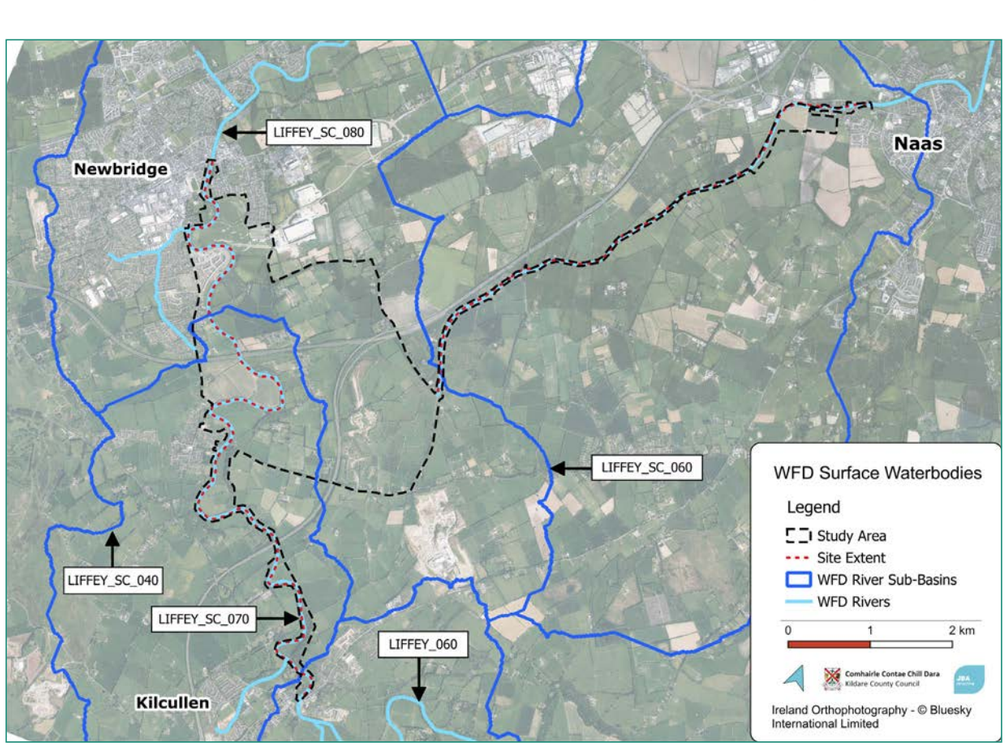


Figure 6-1 Hydrological sub-catchments and watercourses in the study area

6.2 Soils & Geology

6.2.1 Subsoils, Geological Bedrock, and Aquifer Vulnerability

Soils and geology have been assessed within a 2km buffer of the study area. This is in line with guidance from the Institute of Geologists of Ireland (IGI) 2013 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'.

All data on subsoils and geological bedrock was obtained through the Geological Survey Ireland (GSI) website and its interactive mapping section (GSI, 2021).

There are several subsoils present within the 2km study area (Figure 6-2). Most of the Liffey corridor is underlain by alluvium, which would be expected of a typical river corridor. Corbally Canal is lined and perched above the surrounding geology, with the underlying material consisting of limestone till, with sections of other subsoils including alluvium. Subsoils within the 2km study area are as follows:

- Alluvium
- Basic esker sands and gravels
- Cutover Peat
- Limestone sands and gravels
- Lake sediments
- Made ground
- Marl (shell)
- Limestone till
- Bedrock at surface
- Bedrock types in the study area are (Figure 6-3):
- Cherty often dolomitised limestone
- Massive unbedded lime-mudstone
- Dark muddy limestone and shale
- Skeletal, oolitic and micritic limestone
- Lenticular mudstone and coarse siltstone
- Calcareous greywacke siltstone and shale

Groundwater vulnerability is primarily 'High' across the study area and 2km buffer (Figure 6-4). The east section of the Liffey Corridor crosses areas of 'Extreme' and 'Moderate' vulnerability, with a small section consisting of 'Rock at or near Surface or Karst'. In general, this indicates that there is a high possibility of groundwater contamination by human activities in the area. The bedrock aquifer underlying the majority of the study area is Locally Important – a bedrock aquifer which is moderately productive in local zones only. A section of the study area west of the Corbally Canal is Regionally Important and a section to the east is Poor (generally unproductive aquifer).

There are no group water schemes, public supply source protection areas, or group water scheme abstraction points in the immediate vicinity of the development area. The Pollardstown Fen – Hangedmans Arch groundwater zone of contribution is to the west of the study area and the Curragh Camp groundwater source protection area is to the southwest of the study area.

The EPA groundwater abstractions register was also consulted. This shows all registered groundwater abstractions which are above 25m3 per day, with grid locations rounded to the nearest kilometre (for privacy reasons). There are seven registered groundwater abstractions within 2km of the FRS area (plus 1km to account for grid location rounding). None of these abstractions are for the purpose of drinking water or residential use.

The subsoil permeability across the study area is a mixture of high and moderate, and thus the groundwater recharge is high and moderate. The recharge coefficient varies between 85% and 20% throughout the scheme area, with the majority of land at 42%.

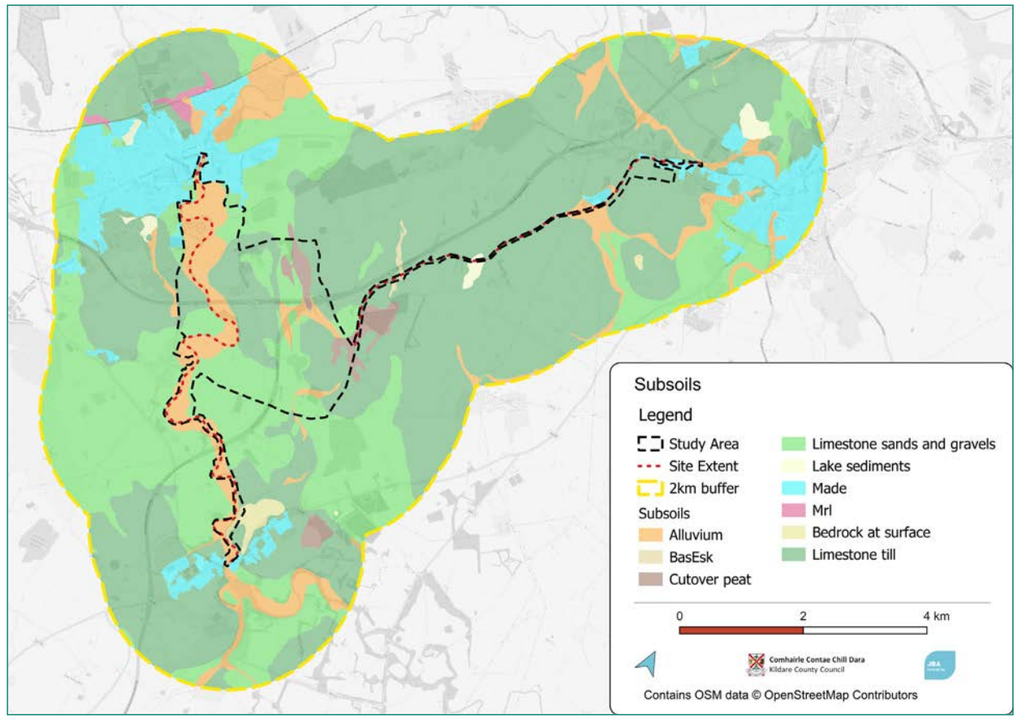


Figure 6-2 Subsoils in the study area

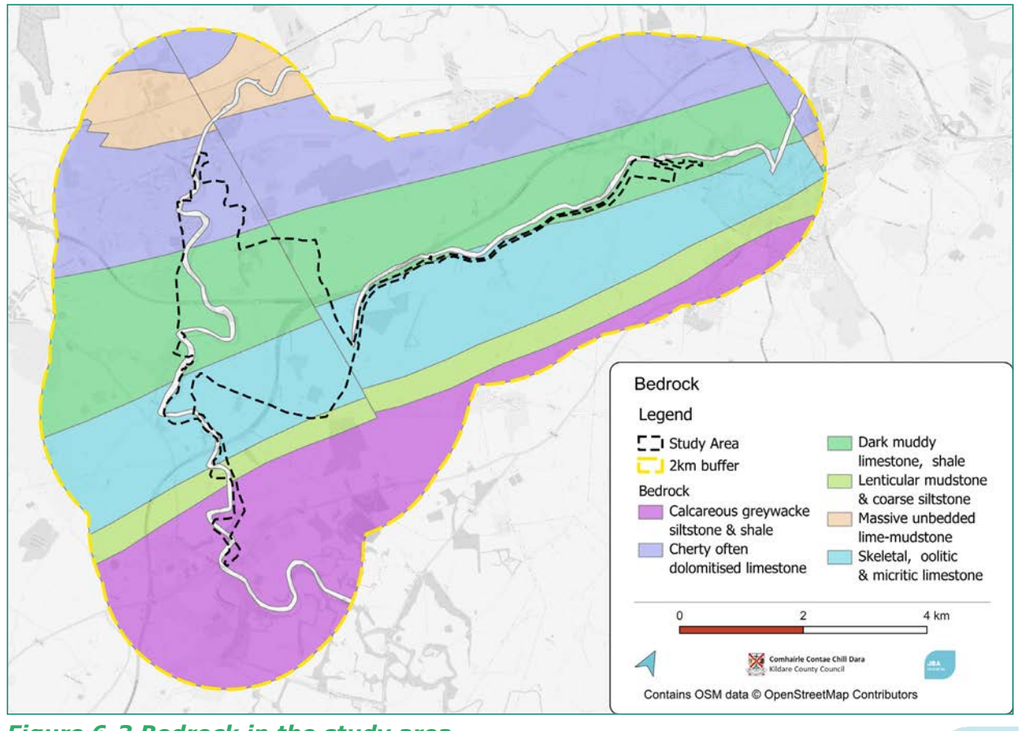


Figure 6-3 Bedrock in the study area

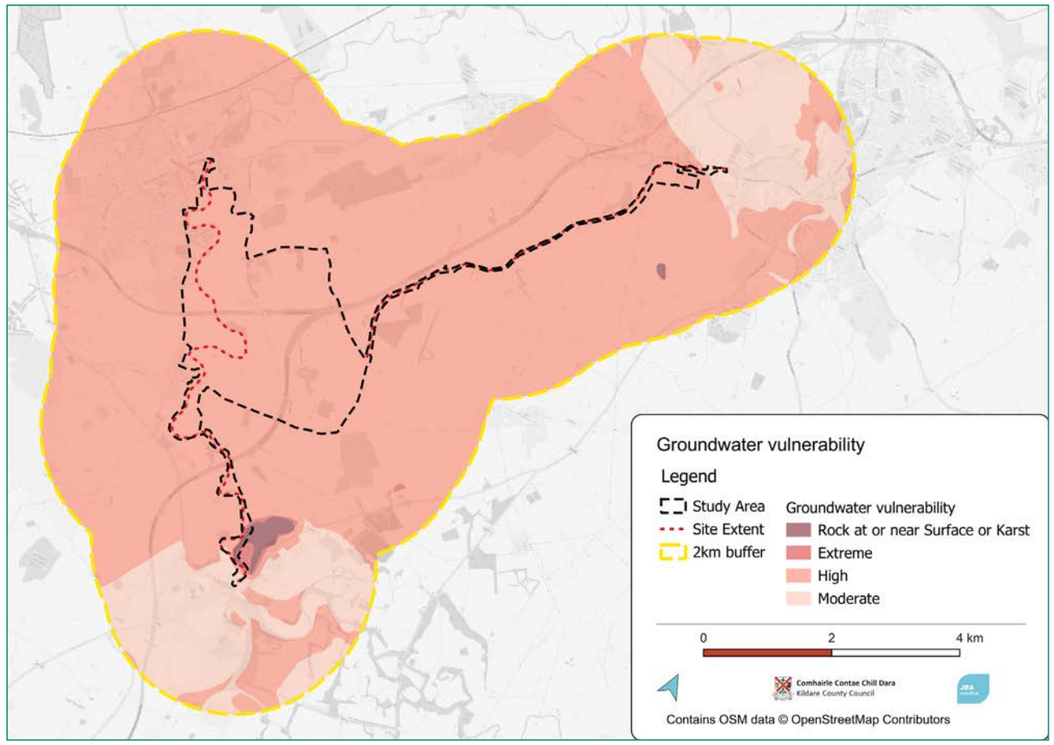


Figure 6-4 Groundwater vulnerability in the study area

6.2.2 Geological Heritage Sites

An audit of Geological Heritage Sites (GHS) in County Kildare was completed in 2005. The Liffey Valley GHS overlaps with the Liffey Corridor section of the study area. Liffey Valley is recognised for its broad floodplains and large meanders formed following the overlaying of post-glacial material of the Holocene.

The Curragh GHS is within 2km of the study area. The pro-glacial fluvial landscape is of both agricultural and geomorphological significance and holds an NHA designation for its biodiversity.

6.2.3 Contaminated Land

A former illegal landfill is situated approximately 4.5km northeast from the Corbally Canal section of the study area, in Kerdiffstown. The site was operated illegally between 2003 and 2008 before a large fire occurred at the site in 2011. The property is now owned and managed by Kildare County Council, with remediation works beginning in 2020 to turn the site into a multi-use public park. Without the management and remediation that is currently taking place, the site at Kerdiffstown poses a risk to contaminating groundwater and the River Morell, a tributary of the River Liffey, with landfill leachate.

6.2.4 Active Quarry Sites

There is an active quarry site within the study area. Seamus Tougher Sand and Gravel is located in Hillsborough, within the Transient Lands between the Corbally Canal and Liffey Corridor. Sand, stone and gravel are quarried at this location and the underlying bedrock is limestone.

There is a secondary active quarry located adjacent to the Transient Lands area. Kilsaran Brownstown supplies concrete products from the quarry on site and the underlying bedrock is calcareous greywacke siltstone and shale.

6.2.5 Potential Constraints

Constraints relating to soils and geology on the Corbally Canal and Liffey Corridor Study relate to changes in groundwater quality or levels, which could lead to adverse impacts on the locally important bedrock aquifer. Heavy machinery used during the construction period could cause compaction of the soil, and in areas of high and extreme aquifer vulnerability a pollution event could be spread to the surroundings and could be difficult to contain.

There is the potential for promotion of Geological Heritage Sites along the greenway route (e.g. along the Liffey Corridor), in the form of information boards highlighting nearby sites.

7.0 DRAINAGE, STRUCTURES & TRANSPORT

7.1 Relevant policies and procedures

The following policies and procedures are relevant for this element of the study:

- TII Rural Cycleway Design (Offline and Greenway) Section 4.5.3.2
- TII Rural Cycleway Design (Offline and Greenway) Section 4.7
- TII Rural Cycleway Design (Offline and Greenway) Section 3.4
- The Irish Wheelchair Associations 'Great Outdoors Access Guidelines' Section 4 - Trails, Greenways & Public Parks.
- Kildare County Development Plan 2023 – 2029 Chapter 6
- Kildare County Council Urban Drainage Systems Guidance Document
- Waterways Ireland Structural Assessment

7.2 Site Topography

An assessment of the general topography surrounding the study area was carried out. The topography is key to understanding the ground levels along any identified route / corridor and any possible surface water overland flow paths. The topography of the existing lands play a key role in the Feasibility Study, including the upcoming Options Stage.

TII Rural Cycleway Design(Offline and Greenway) Section 4.5.3.2 states "*The overall gradient along a cycle route is an important design consideration. Comfort and attractiveness of a cycleway will be greatly increased if the route follows a shallow gradient.*"

The Irish Wheelchair Associations 'Great Outdoors Access Guidelines' Section 4 for Trails, Greenway & Public Parks shall also be referenced.

7.2.1 Corbally Canal

The general topography along the Corbally Canal is indicated below on Figure 7-1. The topography of the adjacent lands southeast of the Corbally Canal falls towards the canal from elevations of up to 100m OD to 87m OD (Ordnance Datum). Generally, lands northwest of the canal appear to be relatively flat or slope away from the canal from elevations of 94m OD to 83m OD. There are raised areas along both the southeast and north west banks of the canal as illustrated on Figure 7-2 below, suggesting the canal is 'perched' above the topography.

An area northwest of Corbally Harbour (RPS no. B23-12) appears to be elevated with ground levels c.101m OD at its peak. A paved laneway surrounds the base of this elevated area. Some isolated elevated areas are present along the northwest side of the canal but should not impact the proposals.

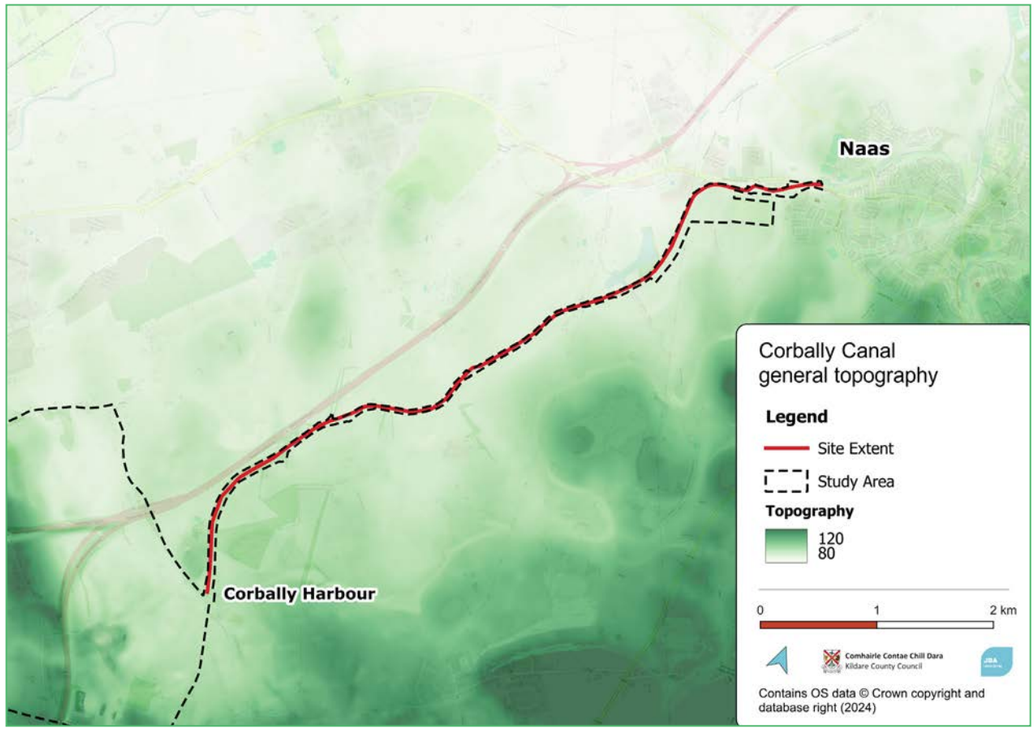


Figure 7-1 Corbally Canal general topography

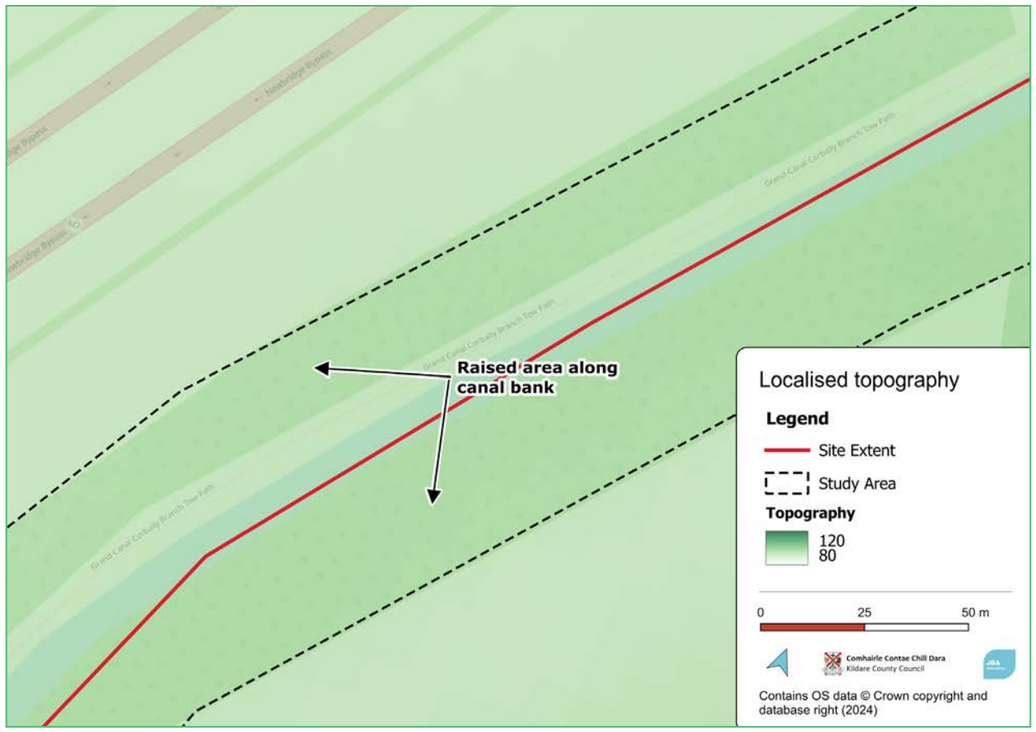


Figure 7-2 Corbally Canal localised topography

7.2.2 Liffey Corridor

The general topography surrounding the Liffey Corridor slopes towards the Liffey from elevations ranging from 83m OD to 125m OD. A small area to the northeast of the study area appears relatively flat c.87mOD. The general topography surrounding the Liffey Corridor is indicated on Figure 7-3 below.

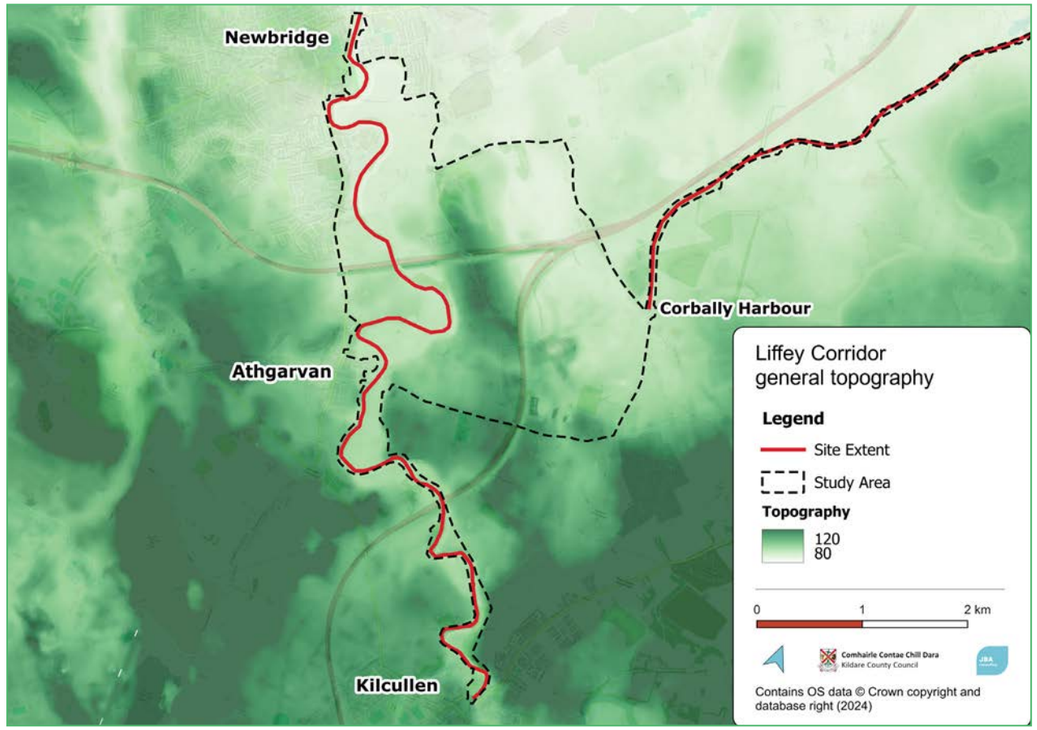


Figure 7-3 Liffey Corridor general topography

7.2.3 Transient Lands

The general topography of the Transient Lands connecting the Corbally Canal to the Liffey Corridor is considerably elevated with high points of 126m OD. The topography northeast of the Liffey, southwest of Newgrange is relatively flat. The general topography surrounding the Transient Lands is indicated below on Figure 7-4.

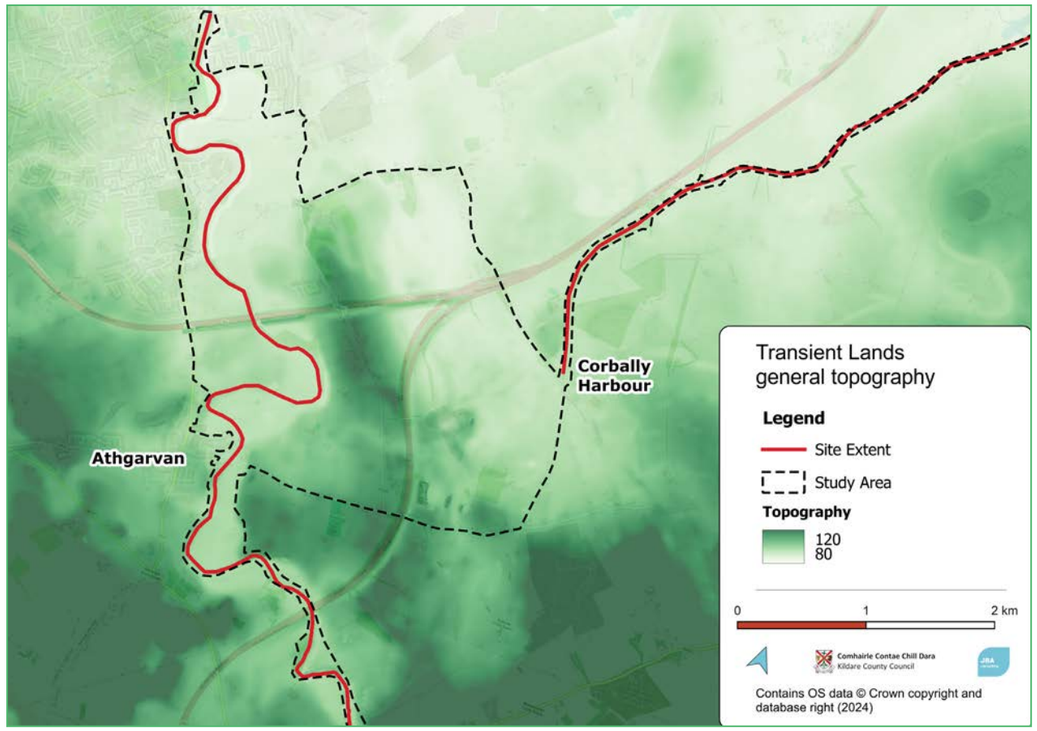


Figure 7-4 Transient Lands general topography

7.3 Drainage

At present the study area is mostly of rural setting, primarily consisting of agricultural lands adjacent to both the Corbally Canal, the River Liffey and the Transient Lands between. The existing general topography varies throughout the study area resulting in various natural and existing drainage techniques.

7.3.1 Existing Drainage

Ad-hoc field drains bound the fields within the study area varying in width and depth conveying surface water runoff from adjacent lands. With the lands being rural and agricultural in nature it is expected that land drains will convey surface runoff to these ad-hoc field drains.

The canal is 'perched' above the landscape and sealed with puddle clay liner to avoid leakages. The embankments isolate the canal from the surrounding drainage. There is a backdrain system draining surrounding lands either side of the canal corridor.

Some manholes and outfalls were identified during the site visit however further investigation may be required to identify any existing drainage elements which may impact future design proposals. Existing surface water drainage networks are expected to traverse the study area outfalling to the River Liffey along the Liffey Corridor and historically directed to the back drain network parallel to the Corbally Canal. Infiltration is taking place in low lying areas prone to surface water accumulation.

Currently there are existing paths waterlogged along the canal as shown on Figure 7-5 and 7-6. These areas can be seen to be rutted by vehicles, resulting in surface water runoff ponding. Ideally the canal embankment and historical towpath needs to be repaired and the design freeboard for water level maintained with a suitable crossfall conveying surface water runoff over the pavement edge towards a receiving drainage element.

Given the nature of the study area, existing drainage network will only be utilised in areas where infiltration and attenuation isn't feasible.

Figure 7-5 Photo showing wet path at central location of the Corbally Canal trail during site visit in July 2024

Uisce Éireann records were requested and reviewed for possible existing drainage networks within the study area with none being identified at present.

7.3.2 Proposed Drainage

Kildare County Development Plan 2023 – 2029 doesn't specifically reference footway drainage in rural environments and their design, however the following will be considered – "*The Council will seek to ensure the sustainable management of surface water discharges through Sustainable Urban Drainage Systems (SuDS). SuDS is a nature-based solution to water management that aims to manage surface water as close as possible to its origin by replicating the natural characteristics of rainfall run-off from any site ensuring water is infiltrated or conveyed more slowly to the drainage system and ultimately to water courses via permeable paving, swales, green roofs, rainwater harvesting, detention basins, ponds, and wetlands*."

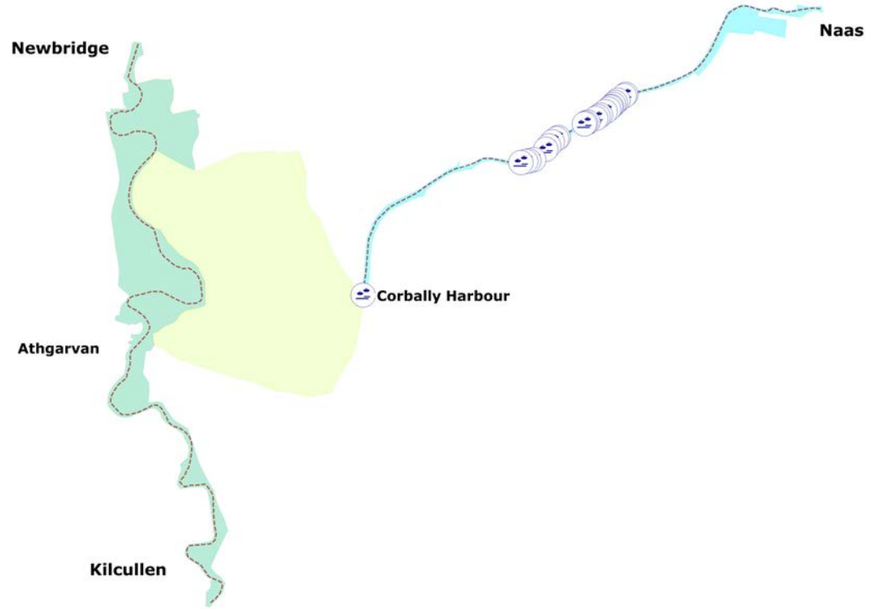


Figure 7-6 Existing Locations where paths become waterlogged

Future designs shall comply with the Kildare County Council Urban Drainage Systems Guidance Document "*This guide supports the delivery of the Kildare County Development Plan (2023-2029), the Kildare Strategic Flood Risk Assessment (2023) and is complementary to the CIRIA 2015 SuDS Manual (C753) and 'Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas Water Sensitive Urban Design Best Practice Interim Guidance Document (2023).*"

SuDS measures should be considered where any proposed work interferes with natural overland flow paths and infiltration. Where the route is located at the base of an elevated area a filter drain at the upstream end of the pathway would be a suitable method of intercepting this runoff and conveying it to the nearest watercourse/ detention basin, drain or infiltrating it to ground if the conditions allow.

Detentions basins may be viable in areas where the banks are elevated between the adjacent lands and canal/river, these areas naturally act as a catchment of surface water runoff and utilise infiltration and evapotranspiration. This may also be the case in areas where the general topography slopes away from the receiving watercourse. Areas which are prone to waterlogging should be utilised as natural features along the route. These can be enhanced by further draining the footpath runoff towards these areas. Detention basins may also be utilised in areas with potential for public use, these areas will generally be relatively flat with reduced overland flow and more susceptible to accumulation of runoff, a detention basin would in turn attenuate this runoff whilst providing an attractive feature within the space.

TII Rural Cycleway Design (Offline and Greenway) Section 4.7 specifies "*Over-the-edge drainage is the preferred arrangement for a rural offline cycleway, where possible. Where over the edge drainage is used it is important to ensure that the surface water runoff flows off the cycleway towards the drainage ditch and does not pond. A suitable crossfall of between 1% and 3% should be provided on the cycleway pavement. Cycleway drainage shall be in accordance with Edge of Pavement Design (DN-DNG-03062) where applicable.*"

Given the rural setting, existing field drains may traverse the proposed route. Where this is the case, the open field drain may need to be culverted to allow any works to travel across it. The size and shape of the culvert shall not interrupt the existing flow in the drain.

7.4 Infrastructure

In determining suitable design parameters for the study TII Rural Cycleway Design(Offline and Greenway) has been adopted taking into account but not limited to vertical and horizontal alignment, surface crossfalls, cross-section widths, over the edge drainage and pavement and foundation construction.

The Irish Wheelchair Associations access guidelines for Trails, greenway, and Public Parks shall also be referenced.

7.4.1 Traffic and Transport

TII Rural Cycleway Design(Offline and Greenway) Section 3.4 "Existing local and Unclassified Road Infrastructure". states the following;

"*In rural locations it may be necessary to use existing local or undesignated road infrastructure as part of the rural offline cycleway, including national and regional greenways. This may present in two principal guises; firstly, utilisation as part of the mainline cycleway (including national and regional greenway) corridor and secondly, utilisation to provide connectivity from the mainline cycleway corridor to the surrounding environs (e.g. link routes).*

Where the use of existing local or undesignated road infrastructure, including unclassified roads, forms part of the mainline cycleway corridor Departure approval is required from TII (where vehicular traffic will mix with cyclists and pedestrians). As part of the required Departure application, the Designer shall outline and demonstrate the measures which are to be implemented to make the intervention suitable for inexperienced cyclists.

The Designer, when evaluating as to whether existing local or undesignated road infrastructure will form part of the overall , shall take due care in evaluating and identifying appropriate measures. In relation to corridors, measures may include but are not limited to the following:

- *Introducing / utilising special speed limits;*
- *Speed control and management, via enforcement and design interventions (intuitive layouts) and self-enforcing environment for drivers, where the priority of walkers and cyclists is readily apparent;*
- *Utilising appropriate regulatory and advisory traffic signage to communicate road functionality. For example:*
    - ◇ *The rural speed limit sign (RUS041A)*
    - ◇ *Shared space signage*
    - ◇ *Regulatory signage to support special speed limits*
- *Filtered permeability, such as local access restrictions and diversionary routes*
- *Provision of refuge areas, to enhance safety of interactions between users. For example, widening to enable agricultural traffic to pass safely (i.e. passing bays)*
- *Reallocation of road space, such as road narrowing and changed priorities (e.g. shuttling movements)*
- *Designation or re-designation of existing infrastructure as cycleway*
- *Apt supporting interventions and infrastructure, such as lighting*
- *Regard and reference shall be had to the Traffic Management Guidelines (https://assets.gov.ie/30277/e3faaeaef9f74832947150bd6de1fae2.pdf)."*

There are instances within the study area where it may be necessary to use existing local or undesignated road infrastructure as part of the walkway/cycleway. There are various bridges along the Corbally Canal where this may be the case should the study area cross over one, example shown on Figure 7-7.

Figure 7-7 Existing bridge (Connaught Bridge) over Corbally Canal

An example of possible shared use of existing road infrastructure between Corbally Harbour (RPS no. B23-12) and the Liffey Corridor is the L6063 which crosses over the M7 (Newbridge Bypass) via an existing flyover of limited width, location shown on Figure 7-8 below.

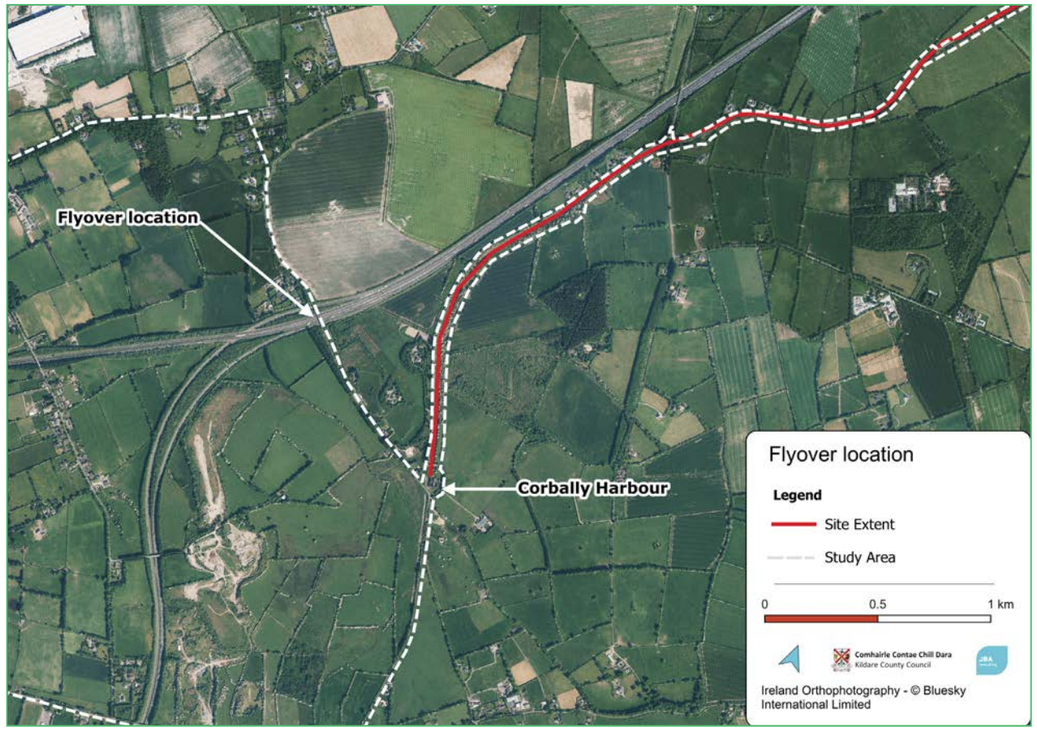


Figure 7-8 Flyover location

7.4.2 Road Network

The M7 motorway runs parallel to the Corbally Canal section of the study area. It links Kildare to Limerick and originates as the N7 national primary road which connects Dublin to Limerick. In the mid-section of the study area the M7 splits to form the M9. The M9 motorway links Naas and Kilcullen to Waterford. At one section of the Liffey Corridor, the M9 passes over the River Liffey by a bridge.

The R416 regional road runs parallel to part of the Liffey Corridor section of the study area. This road passes through Newbridge and links to Athgarvan, then converging with the R413. The R413 regional road also runs parallel to the Liffey Corridor section before passing through Kilcullen.

The rest of the road network in the study area is a mix of small urban roads in Newbridge, Naas, Athgarvan and Kilcullen, and quiet rural roads in the areas between the towns. Several rivers and streams cross under these roads at various points by way of bridges, culverts, and pipes.

The road network in the area is shown in Figure 7-9.

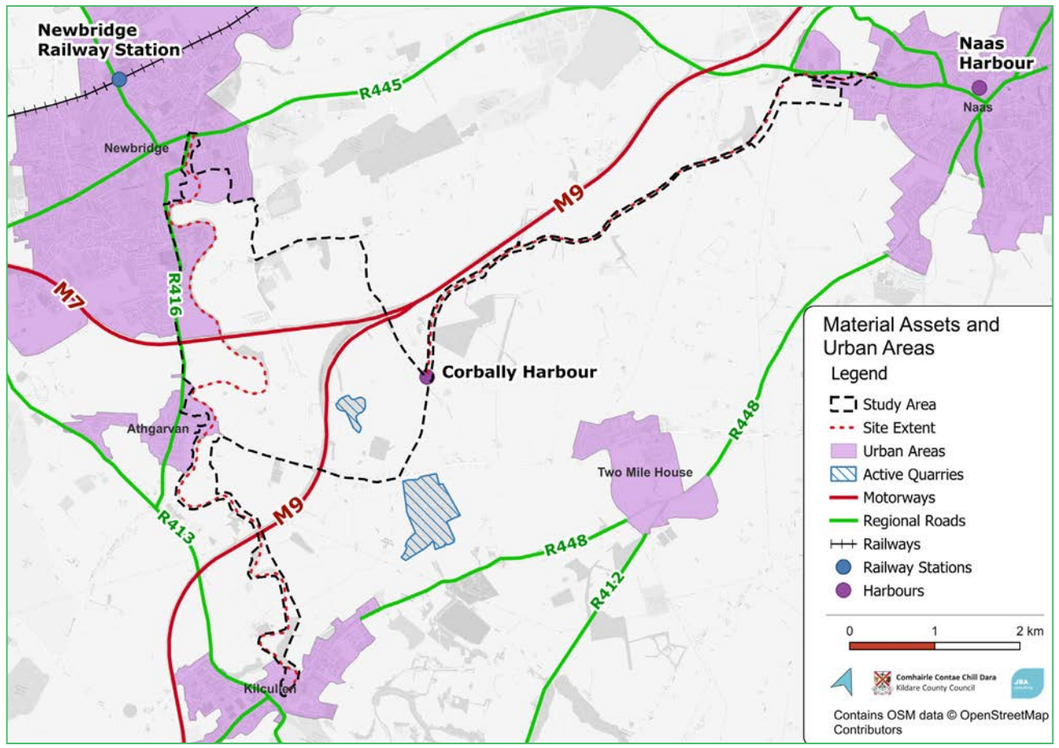


Figure 7-9 Material assets and urban areas adjacent to the study area

7.3.3 Railway Network

Newbridge train station offers direct routes to Dublin, Cork, Galway, Limerick, Ennis, Nenagh, Tralee, Waterford, Westport and Portlaoise (Figure 7-9). As part of the Dart+ South West , the electrification of train lines will be extended to neighbouring Sallins and Naas train station, providing an increased frequency of services. Included in the objectives of the Kildare CDP is to investigate the feasibility of a Park and Ride facility at Newbridge station, and a new train station in the Curragh.

7.4.4 Utilities

7.4.4.1 Water Supply

Irish Water, Kildare County Council and Dublin City Council are ensuring the progression of works to the Barrow Water Supply Scheme Area Extension . This aims to facilitate the connection between Srowland Water Treatment Plant, located 21km to the southeast of the Liffey Corridor, and Ballymore Eustace Water Treatment Plant, located 9km east of the Liffey Corridor. On completion, the will increase the security and resilience of the drinking water supply for Kildare and decrease dependence on water supply from the River Liffey.

7.4.4.2 Surface and Foul Water

The layout of foul and storm water within and around the study area will be provided by Irish Water to identify existing drainage infrastructure.

Information on surface and foul water is available from the Kildare CDP 2023-2029. Kildare County Council will aim to manage surface water sustainably through the use of Sustainable Urban Drainage Systems (SuDS).

Foul water generated in the scheme area is treated both in the public foul water system and privately. Private septic tanks and other potential private sources are present and will require further assessing where necessary in lands that may be developed in the future. Other foul water produced within the study area is conveyed via a combined sewer system to the Osberstown Wastewater Treatment Plant (WWTP), which has a design capacity of 130,000 population equivalent (PE) and is situated approximately 7km west of Naas town centre. In 2016, the WWTP underwent construction works to expand the PE capacity from 80,000PE to 130,000PE.

Sewage treatment discharge locations were gathered from EPA maps (2021b). There are several discharge locations for foul water spread across the urban areas included in the Study in Naas, Newbridge, Athgarvan and Kilcullen. All discharge locations are part of the Upper Liffey Valley Sewerage Scheme.

7.4.4.3 Other Utilities

The areas of Naas, Newbridge, Athgarvan and Kilcullen are served by ESB Networks, Gas Networks Ireland, and various telephone providers. There is potential for the location of any future infrastructure to conflict with the location of existing utility infrastructure. Detailed surveys of such infrastructure will be required when specific works areas are known.

A 110kV electricity substation is situated to the northwest of Newbridge town. Overhead power lines of different voltages cross the site at various locations. Consultation with ESB Networks will be necessary for the design of any future proposals near to this infrastructure.

7.4.4.4 Outline Site Survey during Site Visit

The appropriate records were requested to determine the presence of utilities within the study area. An assessment of the available information was carried out with some utilities identified during the site visit the following was noted:

Watermain pipes crosses Hoare's Bridge (Corbally Canal) and east of Walshtown Crossroads (Liffey Corridor).

Overhead powerlines traverse the study area in various locations (Figure 7-10). An example of one crossing the Corbally Canal shown in Figure 7-11.

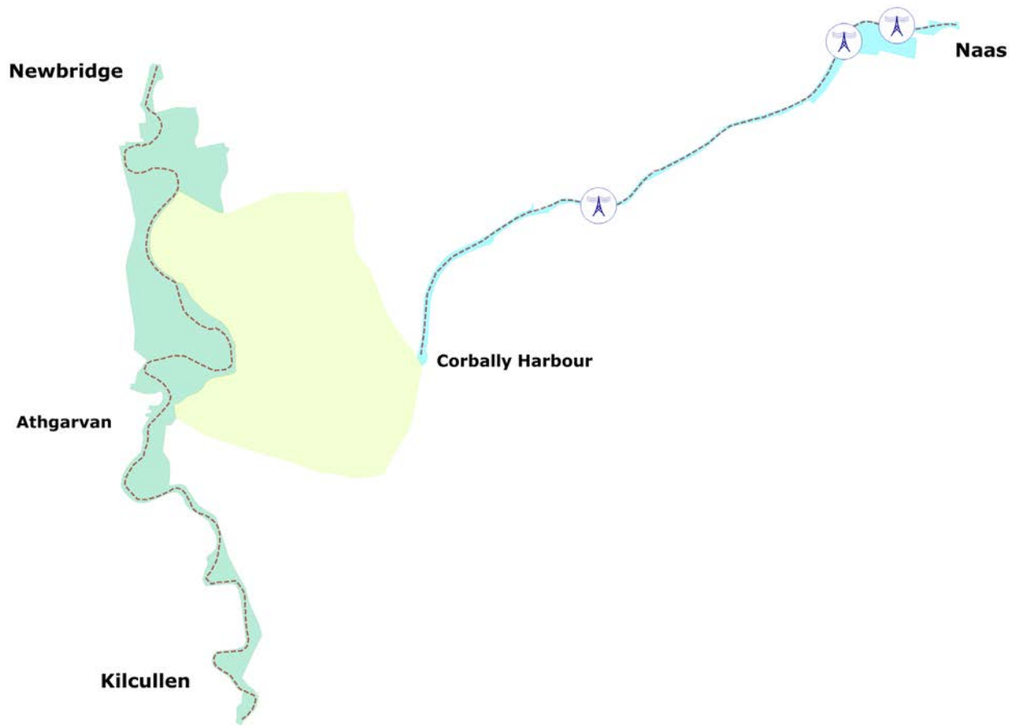


Figure 7-10 Overhead poweline locations identified during site visit on July 2024

There are Gas pipes in the vicinity of the study area however they should have little to no impact on the proposals.

A detailed review will be required when specific routes are identified and prior to future detail designs.

Figure 7-11 Overhead Powerlines

7.5 Waste Management

Litter bins located at key points with the Study area include Linear Park and Naas Harbour. Additionally, there is a Deposit Return Scheme point located at Lidl in Newbridge, within the Study area. Litterbins are more readily available within the urban areas of the Study area, while there are currently no bins along the Corbally Canal section, in line with Waterways Ireland's policy of not installing bins at inaccessible points along canals. Adequate waste management sites will need to be provided within the Study area to prevent littering or environmental degradation from increased footfall.

7.6 Structures

There are various existing structures along the Corbally Canal which include canal walls, bridges, sluices, and ancillary infrastructure. The location and condition of the existing bridges along the Corbally Canal are shown in Figure 7-12 below. Other structures that may require additional assessment, will be reviewed during the Options Stage.

A high level review of condition surveys completed on the bridges by Waterways Ireland was carried out to assess the existing structural condition and possible impacts potential future uses may have on them.

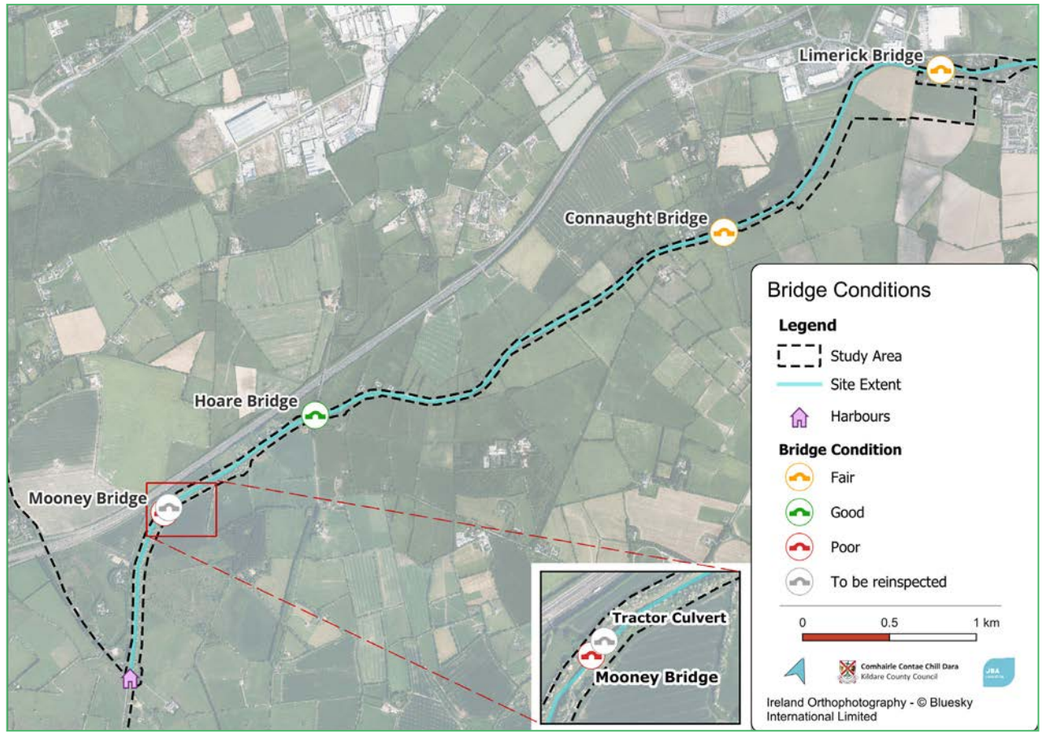


Figure 7-12 Bridge locations and conditions

7.6.1 Limerick Bridge

A stationary single span masonry road overbridge as presented in Figure 7-13.

Overall condition rating of **2** (Fair) *"Generally in fair condition with loss of mortar and overgrown vegetation throughout"*.

Figure 7-13 View of Limerick Bridge

7.6.2 Connaught Bridge

A stationary single span masonry road overbridge as presented in Figure 7-14 below.

Overall condition rating of **2** (Fair) *"Mortar loss and vegetation growth"*.

The carriageway surface rating was noted as **3** "*Grass verge both sides of carriageway. Ravelling, scarring and rutting noted*".

Figure 7-14 View of Connaught Bridge

7.6.3 Hoare Bridge

A stationary single span concrete road overbridge as presented in Figure 7-15 below.

Overall condition rating of **1** (Good) "*Bridge in good condition with vegetation growth*".

Figure 7-15 View of Hoare Bridge

7.6.4 Tractor Culvert at Mooney Bridge

A stationary multi span concrete road/access overbridge as presented in Figure 7-16 below.

Overall condition rating of **3** "*To be reinspected once vegetation is cleared"*.

Figure 7-16 View of Tractor Culvert at Mooney Bridge (visible beneath Mooney Bridge)

7.6.5 Mooney Bridge

A stationary single span masonry road/access overbridge as presented in Photo 5 below.

Overall condition rating of **3** (Poor) "*Bridge in poor condition generally*".

Waterways Ireland have noted the bridge as being in poor condition generally.

Figure 7-17 View of Mooney Bridge

7.6.6 Naas Harbour and Corbally Harbour

The Corbally Harbour (RPS no. B23-12), shown in Figure 7-18 below, is located in a townland known as Herbertstown east of Athgarvan, adjacent to Harbour Road and the terminus for the Naas and Corbally branch of the Grand Canal. Corbally Harbour and the Naas and Corbally Branch is fed from the Rathcore Spring ultimately acting as the Feeder for the Naas Canal. This part of the Grand Canal branch was built in the early 1800s, with the Harbour being used for loading and unloading goods and supplies in the area.

Figure 7-18 View of Corbally Harbour (Photo taken in July 2024)

This section of the canal has been closed for use since 1954 when the Newbridge Road (R445) was constructed with the canal culverted beneath, preventing people and vessels from making their way along the canal past this point. Although the culvert is impassable for people and vessels, it still remains in water. The pathed embankment running alongside the canal is also a popular route with runners and walkers.

The Corbally Canal and the harbour (RPS no. B23-12) are key cultural heritage sites (refer to Chapter 9), with an post medieval industrial heritage, with importance for the local community. There is strong interest from the local community to have the harbour restored and repurposed with Inland Waterways Ireland (IWAI) noting "*an immediate next step would be to cut back all the undergrowth, weeds, briars and tall grasses to reveal the full extent of the site and to demonstrate the potential of preserving this important location in Kildare's built and industrial heritage. With a concerted effort by volunteers, the permission of Waterways Ireland (WI) and with guidance from KCC and WI Engineers, this could take place over a few weeks. We would envisage the work party being made up of members of IWAI Kildare and local voluntary groups. Removing the resulting debris from the site might be achieved with the help of KCC. A few weekends of hard graft would provide an immediate amenity for people to visit, while the more serious efforts to survey, plan and finance the restoration of the Corbally Canal and Harbour could continue in the background.*"

The canal towpath is a busy walking trail stretching from Newbridge Road (R445) to the harbour. The canal and harbour supports a diverse mosaic of habitats and wildlife population which are of high value in the local context.

Continual maintenance is carried out along the canal and harbour by Waterways Ireland, notably weed growth within the channel is cut approximately twice per year in order to allow free flow of water. No dredging has been undertaken on the Branch for many years however Corbally Harbour was dredged in winter 2023 to restore depth, capacity and improved water flow. The entry pipe to the harbour had to be replaced a few years ago as it had failed structurally and was partially collapsed.

Corbally Harbour is not listed as a recorded archaeological site but is included in Appendix 6 of the KCDP 2023-2029 Record of Protected Structures (RPS no. B23-12). The harbour and its ancillary structures is protected and therefore subject to statutory protection under the Planning and Development Act.

IWAI notes "*Corbally Harbour remains largely mainly intact but is in need of immediate preservation and restoration. The basin stonework is all there though some quoin stones and stone dressings that have fallen into the harbour.*"

Figure 7-19 Corbally Harbour facing south - 1978 vs 2024
Reference: 1978 - Ian Bath Collection, Waterways Ireland
2024 - Photo taken by JBA Consulting on July 2024

The abstract from 'The Grand Canal Architectual, Engineering and Industrial Heritage Assessment 2007" by Headland Archaeology Ltd also highlights the following items in relation to the Corbally Harbour.

Corbally Harbour (WIIAH634)

Rectangular plan cut block lined harbour area, has been abandoned for some time and is heavily overgrown. Cut block lining and coping stones still in place although this is loose in places. Small feeder to south but only visible as a disturbance in the water due to overgrowth. Harbour stands in an enclosed area which contains several buildings including a small lime kiln, storehouse and a concrete floored area to the west side of the harbour. All buildings within the harbour are derelict and in ruins.

Corbally Harbour Buildings (WIIAH634)

Two large buildings within the harbour are as follows; a two-bay, two storey rubble work storehouse with central segmental arched entrance with yellow brick surrounds and remains of wooden frame. Square headed window openings, no frames, stone block sills with large open loading bay above gate/doorway. Single storey extension/section attached at southern gable end, again of rubble work, this building acts as part of the enclosing wall with part of a block work gate pillar attached at the southwest corner of the extension, enclosure continues as a stand alone wall to the west for approx. 5 metres before this wall disappears, presumably collapsed some time ago. The second main building stands on the northeast bank of the harbour, two-bay, single storey building of rubble work construction, is heavily over grown and thoroughly ruined, windows appear to have been square headed with stone sills and red brick surrounds. Still visible are some oversized quoin stones which seem disproportionate to the size of the building, gives the impression that the structure was built from left over materials. Finally behind this structure is a small rubblework lime kiln with red brick segmental arch to front, again this is pretty overgrown and ruinous.

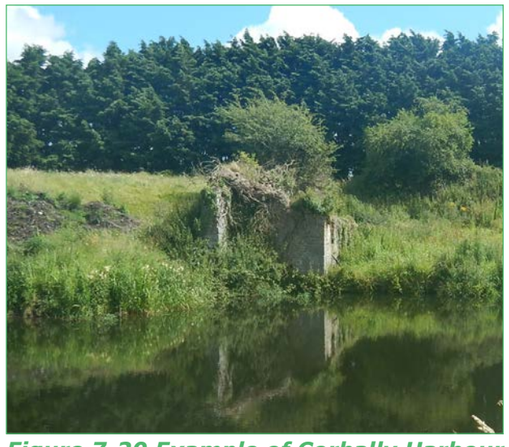


Figure 7-20 Example of Corbally Harbour buildings (Photos by JBA Consulting on July 2024)

7.6.6.1 Corbally Harbour Timeline

The timeline presented on the right considered references from Kildare County Development Plan 2023-2029, information available online by Inland Waterways Association of Ireland (IWAI), reports provided by Waterways Ireland, and information presented on Chapter 9 of this report.

1786 Set up of the County of Kildare Canal Company

1788 Works reached Oldtown

1789 Works reached Naas

1808 The Grand Canal Company is purchased by the Naas Branch

1810 **Branch completed up to Corbally**

1852 **Last of the passenger boats decommissioned**

1954 Construction of the Newbridge Road (R445) across the Canal

1961 The Naas Branch officially closed to navigation

1977 Restoration began on Naas Canal

1978 Photographical resource of the state of Corbally Canal & Harbour (Reference: Ian Bath Collection, Waterways Ireland)

1987 Naas Canal reopened

2000 Responsibility for the Grand Canal was transferred to Waterways Ireland

2002 Naas Harbour reopened

2023 Dredging of Corbally Harbour and some remedial works
Reference: Photo by Herbert Sheehan / Kilcullen Diary

7.6.7 General Summary

Mortar loss and vegetation growth was noted across most of the bridge structures. Vegetation should be removed, missing masonry replaced and masonry repointed to maintain the integrity of the structures overall improving their condition. This is likely to be captured in the general maintenance of these WI structures.

Graffiti was present on part of the structures, although it may not affect the structural integrity of the bridge, it is not aesthetically pleasing.

Some ravelling, scaring and rutting is present on the carriageway surface. Should the carriageway become a shared space remedial works may be necessary to remove grass verges and resurface.

Further recommendations may be required when the preferred route is finalised. A conservation engineer and structural engineer will be engaged, as applicable, to undertake condition assessments and provide specialist advice on any mitigation measures that may be required.

7.7 Potential Constraints

Material assets which could constrain the Feasibility Study are, principally, the underground utilities i.e., sewers, electricity, water, and telephone networks. The location of most utilities is not known at present and will require consultation with service providers when detailed works areas are known.

Local traffic may be impacted by potential construction traffic to and from a future site within the study area, including road closures, and construction works. While there are generally good road connections to the study area via the M7 and M9 motorways, the immediate connections are via smaller local roads which may constrain capacity for future design deliveries.

There is a potential for the improvement to cyclist and pedestrian amenity, and increased connectivity between urban areas within the study area, including Waterways Ireland, who owns Corbally Canal and any associated infrastructure in this location.

The existing structures along Corbally Canal are of heritage relevance, especially Corbally Harbour, which is a protected structure (RPS no. B23-12).

7.7.1 Gaps in information

The following information will be necessary for the development of a detailed design of the preferred option:

- To improve the topography and identify field drainage at route locations, a topographic survey will be required along the preferred route corridor.
- Topographical surveys will be required on the roads where connectivity will be via shared surfaces.
- A detailed review of existing utility records (ESB, GNI etc.) to be undertaken along the preferred route corridor to ensure any interactions are identified.
- Condition assessments of existing structures impacted by future designs & works, and any mitigation measures that may be required.

8.0 AIR, NOISE & CLIMATE

8.1 Air Monitoring Sites

The EPA maintains air monitoring sites across the country, for the purpose of collecting air quality data which informs reporting and assessment. There are two of these sites within the study area, in Naas and Newbridge. These are background sites, generally representative of overall area-wide exposure, and measure concentrations of particulate matter (PM2.5 and PM10).

At the time of writing, the Naas site has an Air Quality Index for Health (AQIH) of 1 (Good), with a 24-hour PM10 average of 14.18 µg/m³ and a PM2.5 average of 7.63 µg/m³.

The Newbridge site has not been updated since 2023 but the most recent readings are a PM10 average of 27.67 µg/m³ and a PM2.5 average of 57.89 µg/m³.

In Ireland, the 24-hour average limits for particulate matter are set by the EU's Ambient Air Quality Directive (2008/50/EC). The limits are 50 µg/m³ for PM10, which is not to be exceeded more than 35 times per year, and 25 µg/m³ for PM2.5, which is not to be exceeded more than three times per year. Based off these thresholds, the Naas air monitoring site is within particular matter limits while the Newbridge site has exceeded the PM2.5 24-hour average limit. However, current data for Newbridge is not available.

Particulate matter is the main pollutant of concern in Ireland (EPA, 2021a), causing a range of health impacts. The main source for particulate matter in Ireland is solid fuel for heating homes, and as such levels vary widely throughout the day and in different parts of the year. Levels are typically higher in the winter months and in the afternoons and evenings.

It is hoped that by moving away from solid fuel for home heating, the levels of particulate matter across the country can be reduced.

While the main source of particulate matter in Ireland is from solid fuel heating, other sources include construction sites (dust), and vehicle traffic.

Individual figures are not available for the study area, but it is assumed that solid fuel and vehicle traffic contributes the largest portion of particulate matter pollution, followed by other sources.

8.2 Noise Pollution

Noise pollution sources within the study area include construction activities and vehicle traffic. Noise pollution is likely greatest along the M7 and M9 motorway routes. Using noise data from the EPA, the proposed route for the Corbally Canal and Liffey Corridor will experience a minimum of 40-45dB and a maximum of over 70dB of noise from the M7 and M9 roads (Figure 8-1). Additionally, built-up parts of the study area will likely experience greater noise pollution than rural areas.

8.3 Climate

Any construction works carried out within the study area will have the potential to lead to short-term temporary emissions, due to the operation of machinery and transport of materials and personnel to and from specific sites. In addition, the chosen measures can have varying levels of associated carbon footprint. For example, a concrete path would have a greater carbon footprint than, for example, an earthed path.

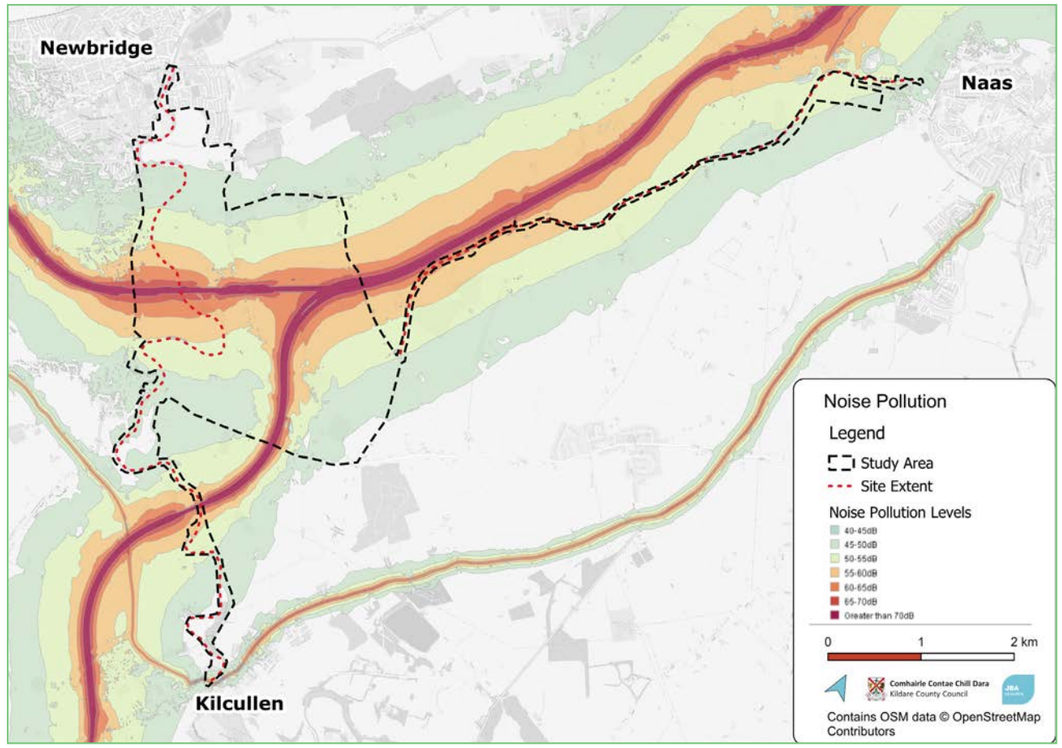


Figure 8-1 Noise pollution in study area

8.4 Potential Constraints

Temporary disturbance, such as noise and dust, during construction could have an impact on the surroundings and the residential population. Construction works associated with the enhancement of Corbally Canal and Liffey Corridor could lead to increased particulate matter pollution and a resultant decrease in air quality, as well as greenhouse gas emissions. However, such impacts would be temporary, during the construction phase only.

Once operational, a constraint on the use new designs within the study area would be noise pollution from other sources, in particular the M7 and M9 motorways. Consideration could be given to materials or planting which would reduce the exposure of a new development to this noise pollution.

9.0 BUILT HERITAGE, ARCHAEOLOGY & CULTURAL HERITAGE

This chapter was prepared by IAC Archaeology and includes the Archaeological Constraints Study, Corbally Canal, Liffey Corridor Enhancement, County Kildare.

9.1 Introduction

The following report details the archaeological constraints identified within a study area for the proposed Corbally Canal Liffey Corridor Enhancement Scheme, County Kildare (Figure 9-1; ITM 681609, 712691 - 687849, 719033. This assessment includes all recorded archaeological sites and areas of archaeological potential within the study area. The report has been carried out by Jacqui Anderson of IAC Archaeology on behalf of Kildare County Council.
The constraints study involved a detailed assessment of the archaeological and historical baseline of the surrounding area. This included information from the Record of Monuments and Places (RMP)/ Sites and Monuments Record (SMR) of County Kildare and a review of the Excavations Bulletin (1970–2024).

9.2 Methodology

Research for this constraints study comprised a paper survey of all available archaeological, historical and cartographic sources. The following sources were consulted in order to identify archaeological and cultural heritage constraints.

- Record of Monuments and Places for County Kildare;
- Sites and Monuments Record for County Kildare;
- National Monuments in State Care Database;
- Preservation Orders List;
- Topographical files of the National Museum of Ireland;
- Kildare County Development Plan (2023–2029);
- Aerial photographs;
- Excavations Bulletin (1970–2024).

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on a website maintained by the Department of Housing, Local Government and Heritage (DoHLGH) – *www.archaeology.ie*.

Record of Protected Structures (RPS) are designated buildings and structures that are identified in the County Development Plan as containing special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument. The Minister for the DoHLGH may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

The topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The Kildare County Development Plan (2023–2029) was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development area.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Ordnance Survey and Google Earth.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online (*www.excavations.ie*) from 1970–2024.

9.3 Archaeological & Historical Background

The constraints study area is located between Newbridge to the northwest, Kilcullen to the southwest and Naas to the northeast (Figure 9-2). It includes large sections of the River Liffey and the Grand Canal (Corbally Branch), including the Corbally Harbour.
The existing M9 motorway and the M7 Newbridge Bypass traverse the study area. All or part of 21 townlands, across nine parishes and four baronies, are included within the study area (Table 9-1).

Table 9-1 Townlands, Parishes and Baronies located within the Scheme Study Area

Townland	Parish	Barony
Rosetown	Great Connell	Connell
Kilbelin		
Brackrath and Athgarvan		
Walshestown		
Greatconnell		
Millsborough		
Clownings		
Oldtown		
Herbertstown		
Oldconnell	Oldconnell	
Piercetown	Morristownbiller	
Greenhills	Kildare	
Corbally		
Lewistown	Ladytown	
Ladytown		
Kineagh	Kilcullen	Kilcullen
Castlemartin		
Jigginstown	Naas	North Naas
Kilcullenbridge	Kilcullen/ Carnalway	South Naas
Newland North	Killashee	
Newtown		

A number of recorded monuments (both RMP and SMR) have been identified within the study area which provide an indication of the archaeological and historical context of the landscape (Table 9-2, Figures 9-2a, 2b, and 2c).

While County Kildare has a rich prehistoric heritage, evidence of prehistoric activity is relatively limited within the study area. An early Bronze Age cemetery (KD023-026) is recorded in the townland of Oldtown (within the study area) and represents the remains of at least three graves. A group of three burials were noted within a 7m stretch on the summit of a ridge. These burials included a crouched inhumation with a food vessel, a crouched
inhumation associated with a food vessel and cremated bone and an inhumation accompanied by both a food vessel and a vase urn (SMR file). A mound (KD023-024) is also recorded within the study area, which has the potential to date to the prehistoric period. The centre of this mound has been 'dug out' and it is unclear what the function of the mound was (SMR file).

County Kildare was well-settled during the early medieval period, situated as it was along important routeways. A ringfort (KD023-030) and two enclosures (KD023-126 and KD023-127) are recorded within the study area. Ringforts represent early medieval farmsteads and enclosures may be the remains of similar sites, although it is possible that some enclosures might have a prehistoric origin.

Situated as it was, in the hinterland of Medieval Dublin, many affluent settlements, both secular and religious, were located in County Kildare. The study area contains a large complex of archaeological features (KD023-016001–8) associated with the Augustinian Abbey (KD023-016) at Greatconnell. The abbey was founded in 1202 and dedicated to the Blessed Virgin Mary and St David (SMR file). The abbey buildings were largely demolished in the early 19th century and the stone reused in the construction of the military barracks at Newbridge. In 2006, a geophysical survey was carried out which targeted the seven hectares surrounding the abbey (Licence No. 06R0098, Bonsall and Grimson 2006). The survey identified extensive archaeological remains throughout the survey area, including sub-surface masonry remains, a probable burial ground, the monastic enclosure, a street layout and burgage plots and evidence of agricultural cultivation. In addition, a canalised river or possible mill stream was noted likely associated with KD023-016006. The surveyors concluded that the full extent of the archaeological remains extents outside of the surveyed area. A number of the features are also visible as crop marks in recent satellite imagery from Google Earth (2018).

The study area is located along the western boundary of the Pale, an area surrounding the administrative centre of Dublin which was fortified by structures and earthworks. The site of a castle (KD023-023) is recorded within the study area, in the townland of Walshestown. There are no visible surface remains of the castle, and little is known, other than that it was annotated on the historic OS map of 1909 as a rectangular structure.

A gatehouse (KD019-032/ Pres. Order 3/2000) is located within the study area at Jigginstown; however, it may represent one of two castles (including KD019-034, outside of the study area) in existence by 1486. These features and the zone of notification for Jigginstown House (KD019-033001, Nat. Mon 528, 78/1939) are notable in relation to the study area, although Jigginstown House itself is located outside the study area.

A church (KD023-029) and graveyard (KD023-029001) are recorded at Blackrath and Athgarvan. The remains of the church consist of heavily overgrown ruins of the west gable wall, a section of the south wall and foundations of the north wall. The date of the church is unclear, however the earliest legible gravestones date to the 18th century. Later 19th century gravestones are also present (SMR file).

During the 18th and 19th centuries the study area was subject to advances in transport and infrastructure, associated with the growing industrialisation of food and textile production. The Grand Canal (Corbally Branch) is located within the study area. While work on the Grand Canal began in the late 18th century, the Corbally Branch (Naas Harbour to Corbally Harbour) was completed in 1810. There were initially plans to extend the canal to Kilcullen, but these plans were never implemented. By 1852, all of the passenger boats had been decommissioned, due to competition from the railway industry and this section of the canal has been closed to navigation since 1954.

9.3.1 The Grand Canal and Corbally Harbour

During the 18th and 19th centuries the Study Area was subject to advances in transport and infrastructure, associated with the growing industrialisation of food and textile production. The Grand Canal (Corbally Branch) is located within the study area. While work on the Grand Canal began in the late 18th century, the Corbally Branch (Nass Harbour to Corbally Harbour) was initially planned independently of the Grand Canal by an entity known as the County of Kildare Canal Company, which was established by an act of 1786 to link the Grand Canal to Kilcullen. The Grand Canal Company took it over in 1808 and reached Corbally in 1810. John Killaly surveyed a route from Corbally to Kilcullen and on to Baltinglass, but these plans were ultimately not carried out to completion.

During the peak of the canal trade, one of the key goods transported on the canal was malting barley which was destined for Reeve's Mill in Athgarvan to the west of Corbally Harbour. By 1852, all of the passenger boats had been decommissioned, due to competition from the railway industry. It was used during the Emergency to transport coal to the Curragh Camp, when petrol and diesel were in limited supply.

This section of the canal has been closed to navigation since 1954. A photograph from the Ian Bath Collection shows the environs of the harbour in 1978 (Plate 9-1, *https://archive.waterwaysireland.org/collections/6/ian-bath-collection*).

Plate 9-1 Corbally Harbour facing south, 1978 (Ian Bath Collection, Waterways Ireland)

The Corbally Canal and the harbour are key cultural heritage sites with importance for the local community. The canal towpath is a well-used walking trail and since the canal closed to navigation it has been dredged regularly to prevent flooding of neighbouring lands. The canal and harbour provide a habitat for a diverse wildlife population. Local tradition also maintains that the Corbally Canal was used to transport the construction materials for the Curragh Camp, although there is no documentary evidence for this.

Corbally Harbour is not listed as a recorded archaeological site but is listed as protected structure in the Kildare County Development Plan (RPS B23-12). Today the canal and harbour survive in poor condition with the building shown in Plate 9-1 being in ruins and the ruinous remains of other structures also present within the site.

9.4 Constraints Study

9.4.1 Recorded Monuments

The study area contains 23 recorded archaeological sites (Table 9-2), 21 of which are RMPs and two of which are SMRs. There is one recorded monument subject to a Preservation Order within the study area, a gatehouse in Jigginstown (KD019-032/Pres. Order 3/2000). This Preservation Order also covers a castle (KD019-034) to the south, which is located outside the study area. Furthermore, the zone of notification for these monuments is shared with Jigginstown House (KD019-033001, Nat. Mon 528, 78/1939), a National Monument, which is located in close proximity, but just outside the study area.

Table 9-2 Recorded Monuments located within the Study Area

RMP No.	Location	Classification	Status
KD019-032/3/2000	Jigginstown	Gatehouse	Preservation Order
KD023-016	Greatconnell	Religious house - Augustinian canons	RMP
KD023-016001	Greatconnell	Graveyard	RMP
KD023-016002	Greatconnell	Sheela-na-gig	RMP
KD023-016003	Greatconnell	Dovecote	RMP
KD023-016004	Greatconnell	Settlement deserted - medieval	RMP
KD023-016005	Greatconnell	Town defences	RMP
KD023-016006	Greatconnell	Water mill - unclassified	RMP
KD023-016007	Greatconnell	Ford	RMP
KD023-016008	Greatconnell	Tomb - effigial	RMP
KD023-017	Greatconnell	Ritual site - holy well	RMP
KD023-021	Kilbelin	Burial	RMP
KD023-023	Walshestown (Newbridge Rural Ed)	Castle - unclassified	RMP
KD023-024	Hillsborough	Mound	RMP
KD023-025	Hillsborough	Well	RMP
KD023-026	Oldtown (Newbridge Rural Ed)	Burial	RMP
KD023-029	Blackrath And Athgarvan	Church	RMP
KD023-029001	Blackrath And Athgarvan	Graveyard	RMP
KD023-030	Rosetown (Newbridge Rural Ed)	Ringfort - rath	RMP
KD023-126	Greatconnell	Enclosure	SMR
KD023-127	Greatconnell	Enclosure	SMR
KD028-022001	Castlemartin	Tomb - effigial	RMP
KD028-022002	Graveyard	Tomb - effigial	RMP

In addition, it should be noted that Town Defences (KD023-016005) at Greatconnell may be subject to the National Policy on Town Defences (2008). This policy generally applies to sections of medieval town wall in public ownership and grants them national monument status. It may also be applied to upstanding remains in private ownership. In this instance, the town defences (KD023-016005) relate to remains discovered by geophysical survey and represent the town walls of a medieval settlement (KD023-016004) associated with an Augustinian Abbey (KD023-016) and should be considered a key constraint.

It should be noted that the zones of notification shown on the accompanying Figures 9-2a to 9-2c reflect those shown on the 1998 RMP mapping, as this is the statutory instrument. Those shown on the Historic Environment Viewer differ from the published maps but will not become the statutory instrument until the enactment of the new Heritage Act.

9.4.2 Summary of Previous Archaeological Fieldwork

A review of the Excavations Bulletin (1970–2024) and the available reports has revealed that only three previous investigations have been carried out in the study area to date. These are briefly described below in Table 9-3.

Table 9-3 Archaeological Fieldwork carried out within the study area

Ex. Bulletin Ref.	Licence	Townland	Results
2017:673	17E0606	Kilbelin	Archaeological testing was carried out following geophysical survey adjacent to the River Liffey, however, nothing of archaeological potential were identified in any of the 26 excavated trenches.
2016:335	16E0418	Greatconnell and Newhall	Archaeological testing was carried out in five areas within the townlands of Greatconnell (within the study area) and Newhall (outside of the study area) as part of the Upper Liffey Valley Sewerage Scheme. No features or deposits of archaeological significance were identified.
-	06R0098	Greatconnell	A geophysical survey was carried out at lands surrounding Greatconnell Abbey (KD023-016) and identified the SW corner of the enclosing ditches of the monastic settlement and a large number of internal features. An extent of 7ha was identified from the geophysical survey; however, it is possible the features extend outside of the surveyed area. The features identified include a canalised river or mill stream, settlement plots, a burial ground and possible town defences.

9.4.3 Summary of Previous Archaeological Fieldwork

A review of the files held by the National Museum of Ireland revealed that no stray archaeological finds have been recorded from the study area to date.

9.4.4 Aerial Photographical Analysis

Inspection of the aerial photographic coverage of the study area held by the Ordnance Survey (1995–2013), Google Earth (2003–2022) and Bing Maps revealed a number of anomalies which may represent unrecorded archaeological features. These are listed as Areas of Archaeological Potential with a brief description below in Table 9-4.

Table 9-4 Archaeological Fieldwork carried out within the study area

AAP No.	Townland	Results
AAP1	Greatconnell	Two sub-circular anomalies, possible enclosures, c. 22m apart (Plate 9-2), visible on Google Earth imagery of 2019. The larger eastern example is c. 30m in diameter, while the smaller western example is c. 15m in diameter.  *Plate 9-2 AAP1 (Google Earth, 2019)*
AAP2	Greatconnell	Two circular anomalies, possible enclosures (Plate 9-3), visible on the Google Earth imagery of 2019. The larger example is c. 22m in diameter, while the smaller example to the northeast is c. 13m in diameter. The larger anomaly appears to be truncated by a field boundary at its northwest quadrant.  *Plate 9-3 AAP2 (Google Earth, 2019)*

9.5 Built heritage

There are a total of 14 protected structures (RPS) within the study area. Figure 9-1 includes the location of each RPS within and immediately outside of the study area (within 150m). Table 9-5 lists and describes each of these protected structures.

Table 9-5 Recorded Protected Structures within Study Area

RPS no.	Name	Townland	Description
NS19-060	Jigginstown Bridge, Jigginstown	Jigginstown	Single-arch rubble stone hump back road bridge over canal, c. 1880
NS19-058	Jigginstown Castle and Environs	Jigginstown	Detached red-brick country house built c.1630 by the Lord Deputy of Ireland, the Earl of Stafford. Now in ruins comprising a long central block largely surviving to ground floor/piano nobile level over exposed basement flanked by projecting pavilions.
NS19-079	Castle Rag, Limerick Road	Jigginstown	Tower house in ruins located in pasture to west of Jigginstown Castle with commanding views of the surrounding landscape. Remains consist of rectangular tower house surviving to c.three storeys in height.
NS19-059	Limerick Bridge, Old Limerick Road	Jigginstown	Single-arch rubble stone hump-back road bridge over canal, c.1800, with limestone ashlar voussoirs, cut-stone stringcourse and rubble stone parapet walls.
NS19-109	Oak Lodge, Old Limerick Road	Naas	Detached four-bay two-storey house built, c. 1840 originally conceived as three-bays and extended to the west c.1880 having lean-to addition to south and two-storey addition further to west.
B23-12	Corbally Harbour	Herbert	
B28-16	Kilcullen Credit Union, Main Street	Kilcullen-bridge (Kilcullen Ed)	House
B28-08	Castlemartin House: inc.gates, restored church and icehouse	Castlemartin	House
B23-26	Athgarvan Malthouse (former), Athgarvan	Blackrath and Athgarvan	Malt House
B23-27	Athgarvan Bridge, Athgarvan	Blackrath and Athgarvan	Bridge
B23-28	Athgarvan	Walshestown	Bridge
B23-08	Ruins of Great Connell Abbey and Medieval Carved Stone	Greatconnell	Abbey and Standing Stone
B23-41	Newbridge (County) Library, Main St., Newbridge	Greatconnell	Library/ archive
B23-42	Saint Conleth's Catholic Church, Newbridge	Piercetown	Church

The KCDP identifies 9no. conservation policies as part of the County Kildare Heritage Plan 2019-2025.

Policy - AH P1 - *Recognise the value and opportunity of Kildare's unique heritage resource and to manage, conserve, promote and protect it, for present and future generations*

Policy - AH P2 - *Protect and enhance archaeological sites, monuments and where appropriate and following detailed assessment, their setting, including those that are listed in the Record of Monuments and Places (RMP) or newly discovered archaeological sites and/or subsurface and underwater archaeological remains.*

Policy - AH P3 - *Support the protection and conservation of the medieval fabric and form of walled towns in the county.*

Policy - AH P4 - *Recognise and respect potential World Heritage Sites in Kildare on the UNESCO Tentative List – Ireland.*

Policy - AH P5 - *Secure the identification, protection and conservation of historic items and features of interest throughout the county including street furniture, surface finishes, roadside installations, items of industrial heritage, riverine heritage, and other stand-alone features of interest (items not listed on the RMP or RPS).*

Policy - AH P6 - *Protect, conserve and manage the archaeological and architectural heritage of the county and to encourage sensitive sustainable development in order to ensure its survival, protection and maintenance for future generations.*

Policy - AH P7 - *Promote appreciation of the landscape and historical importance of traditional and historic gardens, demesnes and parks within County Kildare and particularly where they constitute an important and intrinsic value to the setting of a protected structure.*

Policy - AH P8 - *Preserve and protect the historic gardens and designed landscapes identified in the National Inventory of Architectural Heritage Survey of Historic Gardens and Designed Landscapes.*

Policy - AH P9 - *Promote the protection, retention, appreciation and appropriate revitalisation of the built vernacular heritage of the county.*

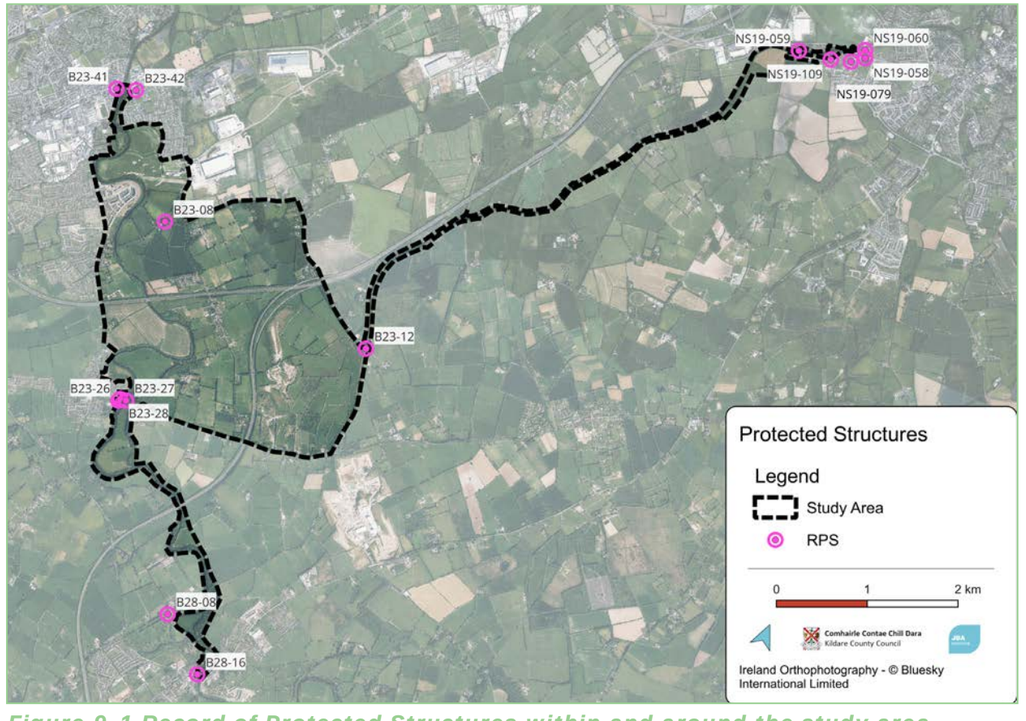
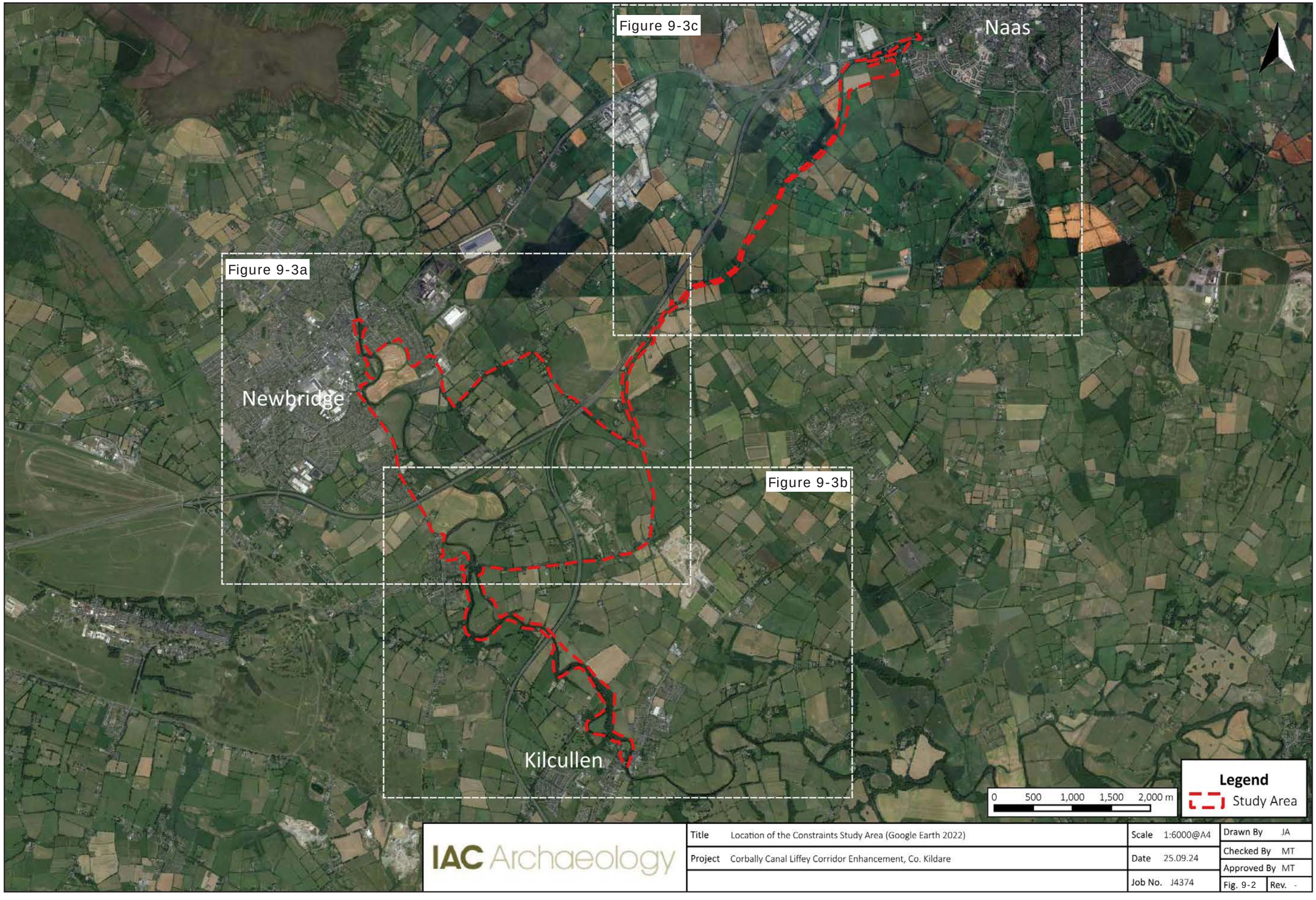


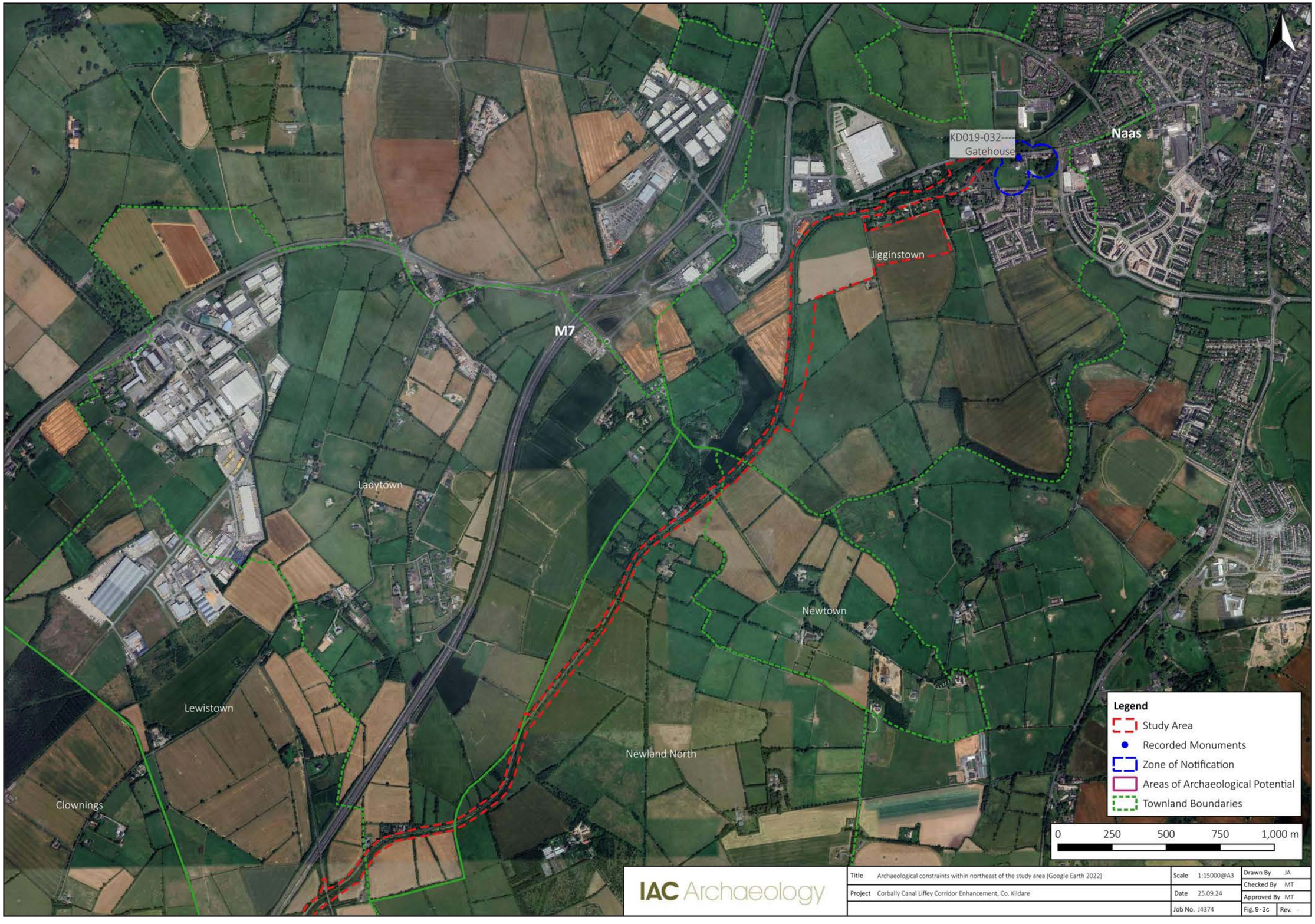
Figure 9-1 Record of Protected Structures within and around the study area



IAC Archaeology	Title: Location of the Constraints Study Area (Google Earth 2022)	Scale: 1:6000@A4	Drawn By: JA
	Project: Corbally Canal Liffey Corridor Enhancement, Co. Kildare	Date: 25.09.24	Checked By: MT
		Job No. J4374	Approved By: MT
			Fig. 9-2 Rev. -


Piercetown
Oldconnell
Newbridge
Kilbelin
Greatconnell
KD023-017----
Ritual site- holy well
KD023-016002-
Sheela-na-gig
KD023-016006-
Water mill- unclassified
KD023-016003-
Dovecote
KD023-016005-
Town defences
KD023-126----
Enclosure
KD023-016007-
Ford
KD023-127----
Enclosure
AAP1
KD023-021----
Burial
M7
AAP2
M9
Millsborough
KD023-025----
Well
KD023-024----
Mound
KD023-026----
Burial
KD023-023----
Castle- unclassified
Walshestown
Oldtown
Corbally
Rosetown
KD023-030----
Ringfort- rath
Athgarvan
KD023-029----
Church
KD023-029001-
Graveyard
Brackrath and Athgarvan
Greenhills
Clownings
Lewistown
Ladytown
Newland North
Herbertstown
M7
Legend
Study Area
Recorded Monuments
Zone of Notification
Areas of Archaeological Potential
Townland Boundaries
0
250
500
750
1,000 m
IAC Archaeology
Title Archaeological constraints within west of the study area (Google Earth 2022)
Project Corbally Canal Liffey Corridor Enhancement, Co. Kildare
Scale 1:15000@A3
Date 25.09.24
Job No. J4374
Drawn By JA
Checked By MT
Approved By MT
Fig. 9-3a
Rev. -


Kilbelin
KD023-021----
Burial
Greatconnell
AAP2
Millsborough
KD023-024----
Mound
Herbertstown
KD023-026----
Burial
M7
KD023-023----
Castle- unclassified
Walshestown
Oldtown
Corbally
Rosetown
KD023-030----
Ringfort- rath
Athgarvan
KD023-029----
Church
KD023-029001-
Graveyard
M9
Greenhills
Brackrath and Athgarvan
Kineagh
KD028-022002-
Graveyard
KD028-022001-
Tomb- effigial
Kilcullenbridge
Castlemartin
Kilcullenbridge
Kilcullen
Legend
Study Area
Recorded Monuments
Zone of Notification
Areas of Archaeological Potential
Townland Boundaries
0
250
500
750
1,000 m
IAC Archaeology
Title Archaeological constraints within southwest of the study area (Google Earth 2022)
Project Corbally Canal Liffey Corridor Enhancement, Co. Kildare
Scale 1:15000@A3
Date 25.09.24
Job No. J4374
Drawn By JA
Checked By MT
Approved By MT
Fig. 9-3b
Rev. -


KD019-032----
Gatehouse
Naas
Jigginstown
M7
Ladytown
Newtown
Lewistown
Newland North
Clownings
Legend
Study Area
Recorded Monuments
Zone of Notification
Areas of Archaeological Potential
Townland Boundaries
0
250
500
750
1,000 m
IAC Archaeology
Title Archaeological constraints within northeast of the study area (Google Earth 2022)
Project Corbally Canal Liffey Corridor Enhancement, Co. Kildare
Scale 1:15000@A3
Date 25.09.24
Job No. J4374
Drawn By JA
Checked By MT
Approved By MT
Fig. 9-3c
Rev. -

9.6 Summary

The purpose of this constraints study is to provide a preliminary analysis of the archaeological heritage resource in order to inform the design of the Corbally Canal Liffey Corridor Enhancement, County Kildare. The study area contains all or part of 21 townlands, extending across nine parishes and four baronies, all situated within County Kildare.

There are a total of 23 recorded monuments and 17 protected structures within the study area, or for which the zone of notification extends within the study area. This includes a hub of archaeological relevance within Greatconnell. Of these recorded monuments, 21 currently have RMP status and two are SMR sites. One recorded monument within the study area is subject to a Preservation Order and possesses national significance- a gatehouse (KD019-032/ Pres. Order 3/2000). In addition, town defences (KD023-016005) associated with an abandoned medieval settlement (KD023-016004) may under the National Policy for Town Defences (2008), be attributed national significance.

Any works that may affect recorded monuments will require detailed archaeological impact assessments with a suite of mitigation measures designed to reduce or remove any potential impacts upon the archaeological resource.

The gatehouse and the route of the town defences are also key archaeological sites within the study area and require careful assessment if works at these locations are required. Works in these areas may require Ministerial Consent.

There is currently little evidence for prehistoric activity within the study area; however, the River Liffey would have been a valuable resource at this time and has been identified as an Area of Archaeological Potential. Numerous archaeological artefacts have been recovered from the elsewhere at the river and any works within the channel or banks would require an underwater archaeological assessment as part of the planning process.

A review of the Excavations Bulletin (1970–2024) has revealed that three archaeological investigations have been carried out to date within the study area. Only one investigation has identified archaeological features, a geophysical survey which identified remains associated with the Augustinian Abbey, medieval settlement and town defences at Greatconnell. It remains possible that previously unrecorded archaeological features are present beneath the current ground level, particularly within areas of undisturbed greenfield that survive intact within the study area.

All AAPs should also be considered as archaeological constraints and avoided where possible. Where avoidance is not possible, potential impacts should be minimised through design. This includes the use of clear span structures across water ways, for example.

One of the main purposes of the Corbally Canal and Liffey Enhancement Feasibility Study is to understand how Corbally Harbour may function as a heritage asset within the landscape. The harbour (and its attendant structures) is a protected structure and therefore subject to statutory protection under the Planning and Development Act. Any proposed works that may arise to conserve the built heritage at the harbour will require agreement from Kildare County Council, Waterways Ireland and appropriate design and assessment by competent built heritage experts. Works may vary from the consolidation of the ruins to full renovation (subject to the appropriate approvals) and access to the site would require appropriate Health and Safety assessment, given the presence of open water.

The harbour represents an important part of the post medieval industrial heritage in the county and indeed Ireland as a whole, due to its direct connection to the Grand Canal. Interpretation of the site as part of a local and/or regional heritage narrative would be a positive benefit to the site, and as noted above, could take the minimal form of a discrete information panel, to a maximum full restoration of the site. The key constraint is the legal protection afforded to the site. This protection does not preclude restoration or redevelopment but ensures that the correct procedures and processes are followed in order to achieve it.

10.0 RECREATION & TOURISM

10.1 Tourism and recreation policies

The Kildare CDP policies that are relevant to tourism and recreation are included in Table 10-1 below.

Table 10-1 Kildare CDP policies

Policy	Description
RE P15	Support, promote, protect, improve, encourage, and facilitate tourism development throughout the county as an essential contributor to job creation through the area's proper planning and sustainable development.
RE P16	Support and promote environmental sustainability, which will be central to the development and protection of a viable tourism sector within the County.
RE P17	Continue to collaborate with other key stakeholders to implement the programmes and plans of Ireland's Ancient East initiative over the plan's lifetime to maximise the county's tourism potential. 126 RE P18 Continue to support and encourage increased coordination, cohesion and linkages between Fáilte Ireland, INTO Kildare and Kildare County Council.
RE P21	Work with the National Transport Authority (in conjunction with relevant objectives in Chapter 5), INTO Kildare, Fáilte Ireland, Waterways Ireland and all stakeholders to develop a coordinated approach to the selection, delivery and servicing of future greenways, Blueway's, trails and routes throughout the county and region, subject to all relevant and cumulative environmental assessments and planning conditions. New paths and routes should first be subject to feasibility assessment. Where feasibility is established, a Corridor and Route Selection Process will be undertaken, where appropriate, for relevant new infrastructure in two stages: Stage 1 – Route Corridor Identification, Evaluation and Selection and Stage 2 – Route Identification, Evaluation and Selection.
RE P22	Work with stakeholders, including the OPW, the Heritage Council, the Arts Council, local communities and businesses to support and promote the development of heritage and cultural tourism in County Kildare.
RE P24	Support Agri-tourism initiatives including but not limited to visitor accommodation and supplementary activities such as organic farmers' markets, health farms, heritage and nature trails, pony trekking, boating, walking, eco-tourism, open farms and pet farms, ensuring that all built elements are appropriately designed and satisfactorily assimilated into the landscape.
RE P26	Support the development of tourism activities on and adjacent to waterways, subject to the usual planning and environmental criteria and by the requirements of the Birds and Habitats Directive, Water Framework Directive and all other relevant European Directives.
RE P27	Maximise opportunities for using canals and other waterways, including the River Liffey and River Barrow, as tourism and recreational amenities.

10.2 Specific Parts of the Feasibility Scope Relating to Tourism, Recreation & Heritage

The following parts of the feasibility scope apply to this study area. This baseline analysis has aligned with these objectives as far as possible.

- Summarise the heritage significances displayed by the Study scope (e.g. the Canal) at the Baseline Stage and identify gaps that require Assessment as part of the Study.
- Assessment of existing land use, access and recreational use, including informal walking trails, pocket parks, and water sports.
- Corbally Basin—Review the significance of the Corbally Harbour and the protected Historic Harbour and structures (harbour, building, courtyard, lime kiln, associated structures within the curtilage) and consider its repair, repurpose, and how the existing structures can be complemented appropriately by additional facilities. Develop components and options for use as a recreational hub and focal point.
- Corbally Basin—River Liffey Greenway Connection—Assessment of typology options, route options, and emerging preferred routes, including evaluation of technical, safety, financial, heritage, landscape, and environmental constraints.
- Corbally Harbour—Assessment and evaluation of options for repairing and repurposing existing protected structures and their curtilage (record of protected structure).

10.3 Policy Context

The main policy reports and strategies directly relevant to this element of the study are as follows:

- National & Regional Policy – Relevant to Tourism, Culture and Heritage.
- Ireland 2040.
- National Development Plan 2021 – 2030.
- Regional Economic & Spatial Strategy for the Eastern & Midland Regional Assembly (RSES).
- Rural Development Policy 2021 – 2025 (Our Rural Future).
- National Cycle Network.
- National Biodiversity Action Plan Sub-regional Policy.
- Kildare County Development Plan 2023 – 2029.
- Kildare County Council Heritage Plan.
- Naas Local Area Plan 2021 – 2027.
- Recreation & Tourism Strategies.
- Open Space Strategy & Outdoor Recreation Strategy 2023 – 2029.
- People's Place & Policy, Growing Tourism to 2025.
- Strategy for the Future Development of National and Regional Greenways 2018.
- Outdoor Recreation Plan for Public Lands and Waters in Ireland 2017-2021 Waterways Ireland.
- Reimagining Our Waterways: 10-Year Plan (Waterways Ireland, 2023) including remit for management and maintenance, biodiversity.

10.4 Global & European Tourism

International tourism has recovered well since the significant downturn caused by the COVID-19 pandemic. Global tourism movements are expected to recover fully by the end of 2024.

The United Nations World Tourism Organization (UNWTO) anticipates a continuing rate of increase of 3% annually to 2030, subject to no significant global downturns. The UNWTO sees long-term prospects for international tourism to Europe as slightly below the global average as other regions gain market share.

10.4.1 National Tourism

Overseas tourist arrivals to the Republic of Ireland grew at an average annual rate of 6.1% between 2010 and 2019 but substantially fell between 2020 and 2021. Recovery is now robust, and the Irish Tourism Confederation predicts a return to the highest point in 2019 by the end of 2025. Longer-term visitor flows are expected to grow in line with global predictions. The National and international tourism predictions provide a positive backdrop for the Study which includes the Corbally Canal and Trailways and potentially linking it to the river Liffey at Corbally Harbour.

10.4.2 National Tourism Strategy

- The Fáilte Ireland National Tourism strategy includes significant pillars relevant to the Corbally Canal and Harbour. These are:
- Accelerate Domestic Tourism Demand;
- Opening up of the Outdoors;
- Preparing the Pipeline (and new product development as a core component of this pillar); and
- Reducing the Carbon Footprint.

10.4.3 Ireland's Ancient East

Ireland's Ancient East is Fáilte Ireland's proposition for the eastern and southern areas, including Co Kildare. The brand is rooted in its rich history and diverse cultural heritage experiences, particularly prevalent in these regions.

10.4.4 Vision - Ireland's Ancient East

The vision for Ireland's Ancient East is:

"*Ireland's Ancient East will be an immersive experience of living culture, breath-taking and hidden history made remarkable by vibrant communities, local lore and authentic character of real Ireland*" (Source: Fáilte Ireland)

Fáilte Ireland has identified Counties Kildare and Wicklow as having significant tourism development potential due to their proximity to Dublin and powerful rural and environmental features.

The critical actions set out in the strategy aim to:

- Maintain and improve existing infrastructure;
- Provide a high-quality workforce with solid communication skills and;
- Develop a defined tourism product.

The Study of the Corbally Canal and basin fits well into the actions to improve infrastructure and develop tourism products.

10.5 Kildare Tourism

County Kildare is located in Ireland's Ancient East Region. According to Fáilte Ireland, pre-COVID-19, the county attracted an estimated 192,000 visitors who spent €104 million. Together with County Carlow, Kildare attracted 309,000 visitors in 2018, who spent €36 million.

Kildare's competitive advantage as a destination is its location. The county is within 30 minutes of Dublin, which has a catchment of 1.9 million. Apart from access to the capital, the national primary routes (N7 and M4) serve as gateways to other major cities in the state (Galway: 2 hours; Kilkenny: 1 hour; Limerick: 1 hour 45 minutes).

Tourism is an essential sector of Kildare's economy and has grown substantially over the last few years. Because of its proximity to the Dublin tourism hub, the tourism sector requires a particular strategic approach for success. This includes emphasising boutique and exceptional character hotels and other accommodation bases. Kildare has a varied tourism portfolio with a position of excellence in heritage, golf, equine and horse racing. Whether operating individually, within clusters, or along touring routes, these facilities and activities must be developed and marketed as attractive day visits or touring options that appeal to domestic and international visitors. The trail development at Corbally Canal appeals to recreational interests and a wide range of potential users, both domestic and international.

Significant natural attractions include the Curragh plains, the bogs to the west, the rolling hills of the eastern uplands, the waterways of the River Liffey, the River Barrow and the Grand and Royal Canals. The county's rich architectural and archaeological heritage is acknowledged with many renowned structures and houses, including Castletown House, Carton House, the Wonderful Barn, Moone High Cross and Castledermot Round Tower. There is a newly opened Grand Canal greenway Sallins to Dublin which goes to Naas Harbour and would potentially link into Corbally Harbour as the end destination.

Kildare is a significant visitor destination within the eastern region. Visitors' numbers and expenditure in the Mid East Region in 2022 reveal that there were 1.9m tourism trips to the region and 4.6m bed nights sold, and an estimated spend of € COVID-19 has substantially impacted all regions. Still, most areas are on a solid rebound curve, which applies to Kildare. Kildare is positioned to develop further, promote, and expand tourism.

According to Fáilte Ireland (Kildare Accommodation Investment Toolkit), in terms of market mix, 52% of visitors to Kildare's top attractions were domestic leisure visitors. The greater bulk of visitors to Kildare Village likely fall into this category.

In addition to the above attractions, festivals and events are essential in attracting visitors to the county. Significant in this regard are the Curragh Irish Derby, Punchestown Festival, Taste of Kildare Food Festival, major golf events at the K-Club and Carton House and music festivals.

Recent investments that are significant for tourism in the County include:

- The re-investment at the Irish National Stud
- The Barrow Greenway

10.5.1 Visitor Attractions & Heritage Sites in Co. Kildare

The development of trails, whilst important and attractive in their own right, will likely combine and cluster well with existing tourism attractions. Domestic and International visitors are attracted to areas that provide various activities and range for differing interest groups, ages, and demographics.

The following are the main visitor attractions in County Kildare, for which Fáilte Ireland collects visitor numbers, as shown in Table 10-2.

Table 10-2 Study of the number of visitors per attraction or heritage site in 2019

Attraction or Heritage Site
Kildare Village
Castletown House and Park
Irish National Stud and Japanese Gardens
Newbridge Silverware
Maynooth Castle
Burtown House
Athy Heritage Centre – Shackleton Experience
Lullymore Heritage Park
Kildare Town Heritage Centre
Larchill Arcadian Gardens

The waterways of County Kildare include:

- The River Liffey,
- The Barrow River System,
- The Grand Canal and
- The Royal Canal

10.5.2 Recreation Strategy

Furthermore, Fáilte Ireland has identified Ireland's opportunity to become a world-class outdoor activity destination by combining our outstanding natural heritage with new opportunities to get active.

These are:

10.6 Corbally Canal & Basin

This section focuses on baseline information on the Corbally Canal and the basin's tourism, cultural, and heritage potential.

Figure 10-1 below is a map indicating the Canal route.

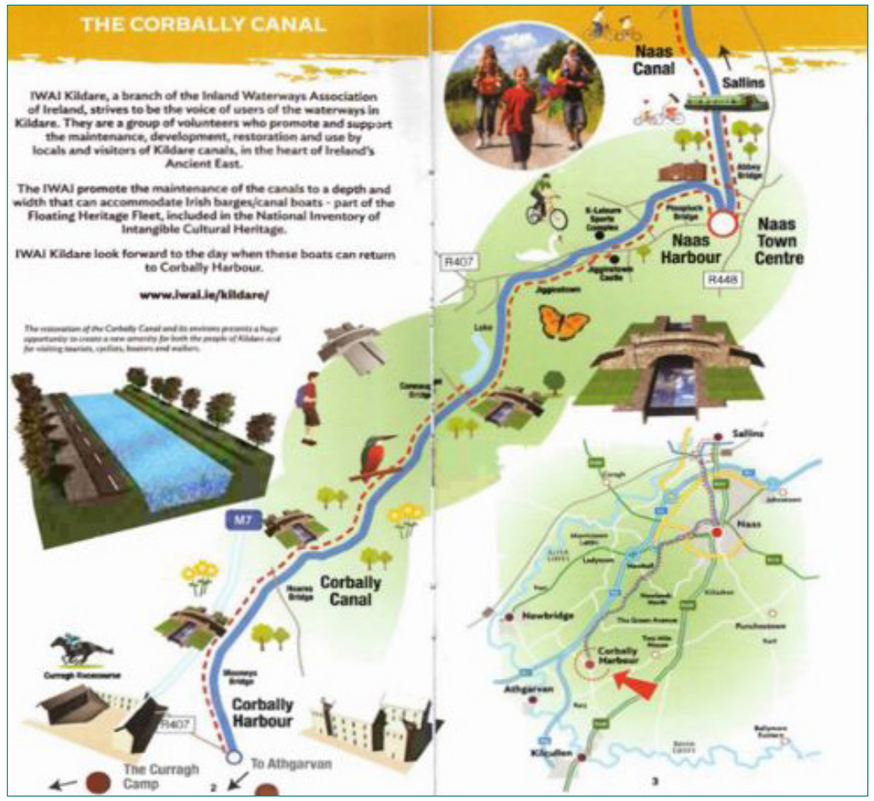


Figure 10-1 Corbally Canal Route - Illustrative only (Source: IAWI Kildare local walkers guide)

10.6.1 Site Visit

The vision for Ireland's Ancient East is:

"*Ireland's Ancient East will be an immersive experience of living culture, breath-taking and hidden history made remarkable by vibrant communities, local lore and authentic character of real Ireland*" (Source: Fáilte Ireland)

Fáilte Ireland has identified Co Kildare and Wicklow as having significant tourism development potential due to their proximity to Dublin and powerful rural and environmental features.

- The critical actions set out in the strategy aim to:
- Maintain and improve existing infrastructure;
- Provide a high-quality workforce with solid communication skills and;
- Develop a defined tourism product.

A site visit was carried out on 22nd August. On that day, the consultants met at Naas and walked as much as possible of the trails public and accessible areas, focusing on bridges, access points, the condition of the trail, and issues likely to arise.

The primary considerations at the site visit from a tourism, culture and heritage point of view were:

- Accessibility and potential to create a more obvious trail route that is uninterrupted
- Natural features and exciting aspects of the Corbally canal and basin
- Potential for activities based on and around the canal
- Potential for trailhead and stop-off or destination points
- Linkages to other activities and tourism facilities in the area

An early list of activities that would fit well with the Kildare County Development Plan and Feasibility Study aims along the Corbally Canal are shown below in Figure 10-2.

Walking trail alongside the Canal - Potentially developing into a Greenway	**Cycling trail along the Canal and connecting to broader cycling trails.**	**Natura walks (guided or self-guided)**
Water-based activity - kayak, canoe and paddle boarding	**Angling along the Canal**	**Bird watching hides and learning options**
School tours and outdoor classroom	**Heritage and storytelling tours**	**Art and photography classes**
Outdoor viewing points, interpretive panels and information	**Outdoor gym and running trail**	**Eco camping / glamping and bubble pods**
Adventure challenges, orienteering and team building	**Seasonal events located at critical locations on the trail**	**Geological heritage sites interpretative panels**

Figure 10-2 List of appropriate activities for the Corbally Canal

10.6.2 Carrying Capacity

The issue of carrying capacity for sensitive areas is currently very relevant for balancing access to environmental sustainability. Many National parks and environmentally sensitive regions use this measure to understand the maximum capacity and how daily activity measures against this.

The carrying capacity can reflect or measure the social, economic, and environmental capacity, which is very different and has its impacts.

10.6.2.1 Positive and Negative Impacts of Further Developing the Trail at Corbally Canal and Basin

Considering the study of the Trail at Corbally Canal and Basin, a list of Positive and Negative Impacts were prepared, as shown below in Table 10-3.

Table 10-3 Positive and Negative Impacts of Further Developing the Trail at Corbally Canal and Basin

Positive Impacts of Additional Tourism Along the Corbally Canal	Negative Impacts of Additional Tourism
• Due to the extra facilities, additional visitors will visit the County and the Corbally Canal facility, stay overnight, and remain longer. • Potential micro business development in the immediate area – small accommodation bases – Airbnb, guesthouses, activity providers, food and drink business • Positive economic impact benefit for existing business locally and on the broader county • Educational benefits of opening up access to an area of high-quality biodiversity – potential benefits to future generations of school children and much broader.	• Negative ecological impacts of additional people in the immediate canal area • Noise pollution caused by additional visitors • Litter spreading • Impact of additional infrastructure to manage visitors – car parks, road enhancements and heavier infrastructure

10.6.3 Features of the Corbally Canal to Appeal to Visitors

The following is a collection of images taken on the site visit. There were many very positive features observed including:

- Beautiful waterway left to develop naturally and has high biodiversity quality.
- Good Quality and attractive bridges that are all landscaped well to create a positive impact.
- Existing trails are very natural, and there is grass in many areas.
- Mature trees surrounding many parts of the Canal.
- Corbally Harbour is a very naturally attractive mini destination with natural stone buildings facing the water feature.
- The only negative issue was the original blockage of the canal's flow due to the development of the Newbridge Road in Naas.

Any proposal needs to be sensitive to the natural and cultural heritage of this corridor:

- Tourism and amenity offering can be slow, recognising the carrying capacity of a nationally important pNHA, valuing the existing amenity.

Figure 10-3 Photos captured of Corbally Canal during the site visit

10.6.4 Visitor Management

Best practices in Visitor Management indicate that the following key factors need to be considered as part of the Study.

1. Ensure that environmental conservation is well represented throughout the study and is integral to the development of any trail or greenway.
2. Involve the community and other interested parties in the management aspect, notably access.
3. Develop statements of the significance of the Canal and immediate landscape area and its primary interpretive themes and use these to overlay value into the trails and activities.
4. Analyse and match resources to potential visitor use and expectations.
5. Agree and define the range of visitor experiences and activities that could take place at the site—a very early list of these is included in this baseline report, and they will be developed throughout the feasibility study.
6. Allocate activities to potential Zones within the Canal area and determine a carrying capacity management approach for each—specify standards for each Zone.
7. Monitor resources, environmental and social indicators for impacts over time.
8. Feedback all learnings into management approach to the site over time.

10.6.5 Opportunities for Investment and Economic Benefits from Corbally Canal Development

- Accommodation and food aimed at users of the Corbally Canal.
- Equipment Hire – bike, kayak, canoe, walking gear, angling equipment.
- Transport – to and from the location.
- Guiding services and information.
- Events and festivals.
- Attractions/places to visit—the potential to cluster the Canal trail with similar activities and the broader attraction and tourism activities.
- Attractive towns and visits.

10.6.6 Connecting with the Local Stories and Heritage

Local stories, people, and places of interest create a unique personality for any place, and Corbally Canal has many attractions. The following, Table: 10.3 are heritage sites and places of interest that could be connected to the trail to create a broader interest for visitors.

Table 10-4 Heritage Sites

Heritage Site	Information
Corbally Harbour	A historic harbour along the Grand Canal is significant for the area's transport and trade history. Corbally Harbour is a protected structure – RPS no. B23-12.
Naas Town Centre	The historic core of Naas features medieval buildings, cobbled streets, and heritage sites.
St. David's Church, Naas	An ancient Church of Ireland building dating back to the 12th century, located in the heart of Naas.
Naas Courthouse	A striking neoclassical courthouse from the 1800s is now a focal point of the town's civic life.
Jigginstown Castle	An incomplete 17th-century mansion commissioned by Thomas Wentworth, Earl of Strafford, just outside Naas.
Old Naas Gaol (County Gaol)	Remnants of an 18th-century jail, with a small portion of the building still standing.
Moat Theatre	The remains of an ancient defensive mound are now housing the local theatre and arts venue.
Naas Harbour and Canal Quarter	A historic 19th-century market building. A Masterplan is being prepared for this area.
Oldtown Demesne	A historic estate and landscape featuring old ruins and a walled garden area.
Monread Park	This park was part of the historic Monread Estate, which has been transformed into a public space while retaining its heritage links.
Killashee House	A grand Victorian mansion turned hotel with lush grounds and historical architecture.
Tougher's Castle	The remains of a medieval tower house near Naas, a hidden historical gem.
Piper's Hill	Historically, this hill was a strategic location in medieval times, offering panoramic views of Naas.
The Leinster Aqueduct	A significant engineering feat is that the Grand Canal crosses over the River Liffey. It's a historic landmark of Ireland's inland waterways.
Sallins	A historic canal village known for its connections to the Grand Canal and its use as a commercial and transport hub in the 18th and 19th centuries.
Craddockstown House	A historic country house near Naas, with links to the local gentry.
Punchestown Racecourse	It is a historic racecourse with roots in Ireland's rich equestrian traditions dating back to the 19th century.
Tipperkevin Church	An old, ruined church near Punchestown, dating from the medieval period.
Ballycane House	A Georgian house on the outskirts of Naas, with historical significance as a former estate house.
Maudlins Cemetery	A cemetery located just outside Naas, where many notable figures from the area's history are buried.

10.7 The Liffey Corridor

This Feasibility Study will also include an assessment of a proposed recreational trail/ greenway connecting the Corbally Harbour to the River Liffey, facilitating connections from the Harbour to the settlements of Newbridge, Kilcullen, and Athgarvan along the River. This baseline report provides some baseline commentary on this particular aspect of the overall study area.

This option to link the Corbally Canal and the Liffey Corridor could potentially open the Corbally Canal to a much broader potential for recreational amenities, tourism, and economic development. These objectives are central to the County Development Plan. The main Liffey corridor could potentially get further Blueway and greenway connections over time, which could have impacts on the existing Corbally Canal trail.

10.7.1 Athgarvan

Athgarvan developed near the mill between Athgarvan crossroads, Athgarvan House and the river Liffey. This village is a historic settlement, and the first references to it appeared in 1752. The existing Malthouse dates to 1840.

The Town and its hinterland have significant Natural Heritage, including mainly Woodland, river, and grassland habitats. The Curragh and the River Liffey are significant features in close proximity. There is also an abundance of Archaeological heritage and places.

Consistency with County and regional policy:

The local area plan includes providing high-quality amenities and recreational facilities in Athgarvan as a critical objective of the existing amenity value of the River Liffey and the Curragh.

OAR 2 will promote the development of the riverside and walking routes and the designated amenity areas in conjunction with the relevant statutory and voluntary bodies.

10.7.2 Kilcullen

The historic settlement of Kilcullen originated with the construction of the river crossing over the River Liffey in 1319. Any development proposals at this location should be subject to detailed archaeological

The Canoe Club is very active in Kilcullen. A new clubhouse was opened adjacent to the River Liffey in 2008. The Valley Riverside Walk and Mass path east of the bridge provide a short walking route from Main Street and runs adjacent to the river, past St Brigid Well, until it reaches a grass surface riverside path and ends at New Abbey Road. Camphill Community Farm is located to the west of the bridge. This provides a Nature Trail and walkway along the river's edge. This area is farmed by those living in the community.

Consistency with County and regional policy:

T 2 To capitalise on potential tourist income by seeking to Improve the promotion and marketing of Kilcullen as a tourism destination (in particular attractions such as River Liffey).

RA 1 To encourage the provision, improvement and expansion of more varied social, cultural, recreational and sporting facilities to serve the town's needs.

RA 4 To co-operate with sports clubs, schools, community organisations and individuals in the provision of sports and recreational facilities to serve the residents of Kilcullen.

RA 5 To retain, enhance and develop walking routes for recreation and tourism use and to increase permeability for pedestrians within and around the

Designated Natural Heritage Sites There are no designated natural heritage sites within the town boundary of Kilcullen. However, the Liffey Bank at Athgarvan is a proposed Natural Heritage Area 2.3 km northwest of the town.

10.7.3 Newbridge

Newbridge has developed in several stages, evident in the town's structure. The town was primarily shaped as a garrison town with the establishment of the Cavalry Barracks in c. 1815. The town evolved to the Curragh to the south and southwest, the River Liffey to the east, the M7 to the south and the railway to the north. Beyond these immediate areas lie Pollardstown Fen and Mouds Bog to the north and Kildare Town to the west.

Consistency with County and regional policy:

TM 2 To improve the town's visitor experience and cooperate with all stakeholders and appropriate agencies in promoting tourism and securing tourist-based enterprises and facilities.

TM 5 To promote and support the sustainable development of new walking, cycling and biodiversity routes and bridges along the River Liffey by the Newbridge Liffey Valley Park study.

TM 6 To enhance and facilitate proposals for alternative forms of tourism, such as Encouraging active recreational tourism through improvements to walks and cycle links along the Liffey River bank, which link to broader pathway networks as well as allowing greater river access for fishing and small non-motorised boats

GMO 11 To investigate the feasibility and seek the construction of a pedestrian/cyclist bridge over the River Liffey at Walshestown Cross to reinstate the old Sligh Dala route to connect with the public road (L2028) at Great Connell in consultation with Inland Fisheries Ireland

10.8 Fáilte Ireland – Tourism Along Greenways, Blueways & Trails

Fáilte Ireland has extensive experience and analysis of developing tourism along greenways and Blueway's, which applies equally to tracks and trails that may not be as large.

The Fáilte Ireland toolkit on visitor amenities and best practices for greenways and Blueways is an excellent guide to developing visitor facilities and attractions.

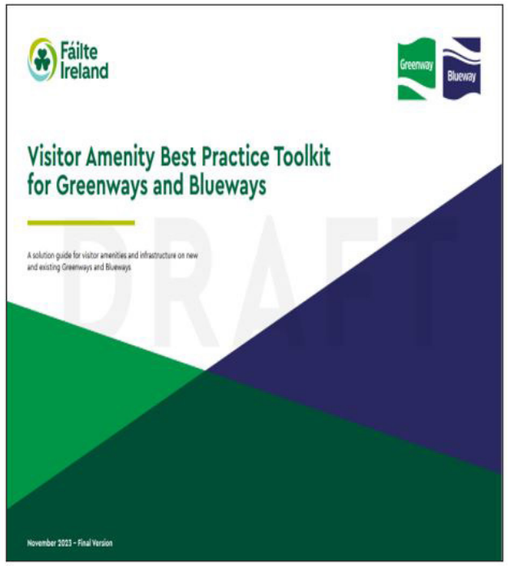


Figure 10-4 Fáilte Ireland Toolkit

The primary source documents for the Fáilte Ireland toolkit are the source reports for the Fáilte Ireland toolkit, indicating its excellent foundations and reference points.

The Fáilte Ireland toolkit covers all of the following areas – this will be developed in the course of this Feasibility Study.

- Location & Landscape Context
- Who will the users of the trail be?
- Access for All
- Branding
- Signage & Signposting
- Local Stories
- Arrival & Access
- Facilities

Fáilte Ireland – consideration of main features for visitors for greenways and Blueways:

- **Scenic** – are they of sufficient scenic value to attract visitors?
- **Safe** – are they safe and create no apparent risk factors?
- **Segregation** – are they separated from significant traffic routes?
- **Sites** – are there other attractions, facilities and exciting sites in the area?

10.9 Early Findings on the National & Local Trends

- National tourism is on a solid growth trend, fully recovering by late 2025 or 2026. Kildare is likely to follow the National trend closely.
- Growth is expected in Domestic and International Tourism. Recent Fáilte Ireland surveys on the Domestic audience indicate a growth pattern in trips taken in Ireland.
- Consumer travel performance in post-pandemic has shown a more significant concern for personal well-being, air quality, environmental impacts, desire for open spaces, and preference for active holidays.
- Fáilte Ireland's latest corporate strategy reflects the commitment to accelerate domestic tourism demand, transformation of Ireland's outdoor tourism experience, and reduction of the carbon footprint of the Irish tourism sector.
- Ireland's Ancient East Region is positioning itself as a cultural tourism destination focusing on cultural experiences, landscape, authenticity, and community engagement.
- National Strategic Planning is now supporting outdoor activity and related recreational initiatives.
- Walking, cycling, and other 'softer' outdoor activities are becoming increasingly popular and will continue to do so.
- The significant ageing and active demographics should form a major target group for future outdoor amenity developments.
- The Barrow Blueway is a significant regional tourism and recreational development.
- Significant infrastructure will be needed to meet the increased demand for outdoor activities.

10.10 Summary

1. The baseline work has provided the basis for a range of early observations and conclusions that will shape further work in the feasibility study.

2. As the feasibility study outlines, developing a recreation amenity along the Corbally Canal appears consistent with local, National, and Regional Policy.

3. A potential trail development aligns with the stated objectives of County plans, including the County Development Plan.

4. From a tourism and recreation point of view, there is a potential to fit with policy and the sector's most recent trends—Ireland's Ancient East strategies and specific direction on developing Greenways, Blueways, and Trails will be essential.

5. Early observation of the entire site would suggest that any development of the canal trail or greenway should be incremental and phased. This is due to the geography, landscape, land ownership, and current extent of the canal's access. The scale of potential tourism development needs to be appropriate to the trail's sensitive natural features and environment.

6. Any development of a recreation and tourism facility should be partnered and clustered with other tracks and trails and a wide range of quality tourism facilities and locations in the Naas area and co-Kildare, in general. The Corbally Canal must be seen more generally when visiting Kildare.

7. Developing a trail for tourism could consider and include the following:
    - Creating trailheads and destination points or facility points
    - Developing viewing points and resting areas that could form picnic stops and scenic rest areas – the Bridges already provide beautiful landscapes and amenities
    - The local stories could be overlaid by interpreting the trail
    - Creating facilities around the trail that promote recreation and enjoyment—bike hire, kayak and canoe hire and instruction, walking tours and trail information, a local café, and Airbnb.

8. Corbally Harbour is unique and exciting, and could have tourism and recreation potential. The old buildings could have tourism potential for regeneration and provide a natural trailhead for the Canal.

11.0 CLIMATE ACTION

11.1 Climate Action Plan 2024

Annually, the Climate Action Plan is published by the Government of Ireland which sets out carbon budgets and sectoral emissions ceilings and sets a roadmap for taking decisive action to halve our emissions by 2030. The Climate Action Plan 2024 (CAP2024) identifies the role active and sustainable travel can play in how Ireland adapts as a result of climate change and in mitigating the implications of such, the plan outlines the urgent need to accelerate these efforts.

CAP2024 requires transport planning and appraisal to prioritise interventions in line with the Sustainable Mobility Policy, and requires Ireland to:

- Avoid stimulating or facilitating increased greenhouse gas (GHG) emissions from transport, especially over the next 20 years;
- Support a shift to active travel and public transport, including by the reallocation of road space;
- Maintain our existing transport infrastructure; and
- Support the adaptation and resilience of existing, redesigned and new transport infrastructure to the impacts of climate change.

CAP2024 notes that priority will be given to “Safe Routes to School, Cycle Connects routes, the National Cycle Network and scenic greenways”.

11.2 Kildare Climate Action Plan 2024-2029

Kildare County Council have published their own Climate Action Plan for 2024-2029. The Plan establishes actions that are to be taken by the Council, businesses and citizens in Co. Kildare to respond to the challenges of climate change. The Kildare CAP, like the CAP2024, has the Sustainable Mobility Policy as a central tool in achieving a more sustainable transport section through the Avoid-Shift-Improve principle:

- Avoid: Reduce the frequency and distance of trips;
- Shift: Move towards more environmentally friendly modes of transport, such as walking, cycling or using public transport; and
- Improve: Promoting efficient fuel and vehicle technologies

Several strategic goals in the Kildare CAP are relevant to the Corbally Canal Study. These include reallocation of road space for active travel and public transport, and supporting the Sustainable Mobility Policy. It also includes goals for developing and publishing a cycle network plan for the county, and expanding the greenway network across Kildare.

11.3 Potential Constraints

Proposed developments within the study area are likely to be in accordance with the relevant climate action policies, both nationally and within Co. Kildare. The feasibility study will present an opportunity for Kildare County Council to contribute to its own policies under the Kildare CAP.

The Study will provide sustainable transport corridors and active travel routes between recreational areas, reducing the need for car travel and avoiding the emissions of GHG. This will benefit the Study area by decreasing traffic congestion, improving air quality and enhancing public health.

It is possible that, as several different areas of sustainable transport are to be prioritised under the Kildare CAP, the Feasibility Study may need to compete with others to gain funding and approval. Ensuring future developments within the study area are compliant with climate policies will be important.

Travel and transport infrastructure is generally resilient against potential climate impacts. Nonetheless, proposed designs must be cognisant of potential impacts with regard to flooding, increased rainfall, impacts to the green infrastructure and other climate changes.

12.0 BASELINE ASSESSMENT

12.1 Summary

The study area includes three general areas, comprising the Liffey Corridor, Corbally Canal (Corbally Branch of the Grand Canal) and the Transient Lands, area between both corridors.

Below is a summary according to key characteristics identified in this document.

12.1.1. Environment, Landscape & Biodiversity

The study area is situated along two waterbodies, the River Liffey and the Corbally Canal, a branch of the Grand Canal. Tributaries of the River Liffey include the River Dodder, the River Poddle, the River Camac, the King's River and Rye Water. It primarily flows through agricultural land and also some urban areas. The Grand Canal begins in Dublin and was originally constructed to connect Dublin to the River Shannon. At present, the Grand Canal is navigable from Dublin to Naas. Similar to the River Liffey, the Grand Canal flows through agricultural land and some built up areas. Corbally Canal is a non-navigable branch of the Grand Canal and is owned and maintained by Waterways Ireland. The Corbally Canal has been non-navigable since 1954, when a culvert was installed to facilitate the Limerick Road bypass.

The Corbally Canal & Liffey Corridor area is part of the Water Framework Directive (WFD) Liffey and Dublin Bay catchment (09). There are three WFD river waterbodies within the study area: LIFFEY_060, LIFFEY_070 an LIFFEY_080. The LIFFEY_060 is a *Moderate* status and the LIFFEY_070 waterbody is a *High* ecological status waterbody under the WFD for 2016-2021. It is of the utmost importance that the Liffey waterbody is protected. The Grand Canal Naas Branch (Liffey and Dublin Bay) is an artificial waterbody located within the study area. It has also been noted that the canal has Good ecological potential. Pressures acting on the study area waterbodies include Agriculture, Domestic Waste Water, Urban run-off, Urban waste water, Extractive Industry, Hydromorphology, Waste, Industry and Anthropogenic Pressures.

Constraints on the Corbally Canal and Liffey Corridor related to waterbodies are the potential construction impacts on surface water and groundwater from runoff of contaminated water and accidental spillage, and possible release and/or mobilization of nutrients and suspended solids. The high ecological status of the Liffey Catchment needs to be considered when developing potential proposals within the Corbally Canal and Liffey Corridor. Any adverse impact on water quality could result in the waterbody failing to achieve its WFD objectives and negatively impact its WFD status.

There are four different aquifers within the underlying bedrock beneath the site. Around Newbridge, the underlying aquifer is a regionally important karstified bedrock aquifer, dominated by diffuse flow. The landscape is characterised by largely underground drainage, with most flow occurring through the more permeable, solutionally-enlarged, interconnected fissure/conduit zones, which may be several kilometres long. The underlying aquifer for the area around Athgarvan, between Newbridge and the M9 extending along the M7 up to Naas, is locally important and moderately productive, but only in local zones. The aquifer has a limited and relatively poorly connected network of fractures, fissures and joints, giving a low fissure permeability which tends to decrease further with depth.

Some manholes and outfalls were identified during the site visit however further investigation may be required to identify any existing drainage elements which may impact future design proposals. Given the nature of greenways/cycleways and the TII preference for over the edge drainage, existing drainage will only be utilised in areas where infiltration and attenuation is not feasible. SuDS measure shall be considered and prioritised in developable areas within the study area. This includes where a proposed walkway/cycleway interferes with natural overland flow paths and infiltration at the Corbally Canal. Given the rural setting, existing field drains may traverse the proposed route. Where this is the case, the open field drain may need to be culverted to allow the proposed walkway/cycleway to travel over it. The size and shape of the culvert shall not interrupt the existing flow in the drain.

There are several subsoils present within the 2km study area. Most of the Liffey corridor is underlain by alluvium, which would be expected of a typical river corridor. The canal is mostly underlain by limestone till, with sections of other subsoils including alluvium. Groundwater vulnerability is primarily 'High' across the site. The east section of the Liffey Corridor crosses areas of 'Extreme' and 'Moderate' vulnerability, with a small section consisting of 'Rock at or near Surface or Karst'. This indicates that there is a high possibility of groundwater contamination by human activities in the area. Constraints relating to soils and geology on the Corbally Canal and Liffey Corridor study area relate to changes in groundwater quality or levels, which could lead to adverse impacts on the locally important bedrock aquifer.

The existing landscape character is generally of low sensitivity with exception of the River Liffey corridor which is of special sensitivity. The existing green infrastructure is rich due to the existing field boundary hedgerow and tree line network as well as the two riparian corridors within the Liffey Corridor and Corbally Canal. There are also two designated woodlands at Liffey Corridor and Greatconnell. The GI can be enhanced by the provision of a sustainable travel network which will subsequently provide a connection between east and west (Liffey Corridor and Corbally Canal) which is currently served only by a local road network. Additionally, areas zoned for open space will also benefit the GI, in accordance with KCC policies. It is the policy of the Council to "*identify the key elements of the green infrastructure network in Kildare; and seek to protect, enhance, and expand the County's green infrastructure network, through informed, evidence-based methods, which do not threaten the integrity of existing native biodiversity*" and to "*recognise the importance of Green Infrastructure in Kildare and protect this valued biological resource, the ecosystem services it provides and the contribution to climate resilience*".

The Liffey River is generally not accessible to the public, with only some locations comprising proximity to the river such as Liffey Valley Park in Newbridge and Kilcullen Valley Park. The landscape context along the Liffey River is mostly agricultural.

Multiple sports clubs and community amenities are close to the study area. These include the Ryston Sports and Social Club in Newbridge, the Kilcullen Canoe Club in Kilcullen and the K Leisure Centre in Naas, and others which are in the area but not immediately adjacent to the site. Developing a sustainable transport corridor between Naas and Newbridge will enable sustainable travel to occur between the two towns, which both offer a growing range of services and employment opportunities.

Multiple internationally (2) and nationally (7) designated sites were found to be within the study or within the locality. Additionally, at total of 16 habitats ranging from high local to nationally important ecological value, with the exception of the tilled land and buildings and artificial surfaces. All habitats associated with the Grand Canal pNHA and the River Liffey are considered sensitive and will result in a number of constraints for potential future development within the study area.

Several protected species were identified on site during past surveys (as carried out by ROD Ecologists for Waterways Ireland in 2015) and current surveys (as carried out by JBA Consulting for this report). Some species are protected by EU Birds / Habitats Directive Annex Listing such as the Common Wood Pigeon *Columba palumbus*, Kingfisher *Alcedo atthis,* Mallard *Anus platyrhynchos*, Mute Swan *Cygnus olor,* Otter *Lutra lutra.* The nesting areas / nests of these protected species will give rise to constraints to future developments within the Study area.

Multiple invasive non-native species were also recorded during the same site surveys, with the potential for high impact (and listed under Regulation S.E. 477/2011) such as the Canadian Waterweed *Elodea canadensis*, Grey Squirrel *Sciurus carolinensis*, Himalayan Balsam *Impatiens glandulifera*, Nutall's Waterweed *Elodea nutalli*, Sika Deer *Cervus nippon* and *Gunnera* spp..

The Feasibility Study will need to take into consideration KCC policies and objectives on riparian zones, scenic views, open space, drainage (SuDS), aquifer protection, and green infrastructure. Furthermore, the protection of protected species identified on site and the proper management of invasive species will need to be considered when proposing any works along the study area.

12.1.2. Structures & Heritage

There are several heritage sites and structures located within the study area. This includes multiple stone bridge structures that transverse the Corbally Canal. Mortar loss and vegetation growth was noted across most of the existing bridges. Vegetation should be removed, missing masonry replaced and masonry repointed to maintain the integrity of the structures. Graffiti was present on part of the structures, although it may not affect the structural integrity of the bridge, it is not aesthetically pleasing.

Some ravelling, scaring and rutting is present on the carriageway surface. Should the carriageway become a shared space remedial works may be necessary to remove grass verges and resurface.

Further recommendations may be required when the preferred route is finalised. A conservation engineer and structural engineer will be engaged, as applicable, to undertake condition assessments and provide specialist advice on any mitigation measures that may be required.

There are a total of 23 recorded monuments and 17 protected structures within the study area, or for which the zone of notification extends within the study area. Of these, 21 currently have RMP status and two are SMR sites. One recorded monument within the study area is subject to a Preservation Order and possesses national significance- a gatehouse (KD019-032/ Pres. Order 3/2000). In addition, town defences (KD023-016005) associated with an abandoned medieval settlement (KD023-016004) may under the National Policy for Town Defences (2008), be attributed national significance.

During the 18th and 19th centuries the study area was subject to advances in transport and infrastructure, associated with the growing industrialisation of food and textile production. The Grand Canal (Corbally Branch) is located within the study area. While work on the Grand Canal began in the late 18th century, the Corbally Branch (Nass Harbour to Corbally Harbour) was completed in 1810. There were initially plans to extend the canal to Kilcullen, but these plans were never implemented. By 1852, all of the passenger boats had been decommissioned, due to competition from the railway industry and this section of the canal has been closed to navigation since 1954.

Any works that may affect recorded monuments will require detailed archaeological impact assessments with a suite of mitigation measures designed to reduce or remove any potential impacts upon the archaeological resource. All AAPs should also be considered as archaeological constraints and avoided where possible. Where avoidance is not possible, potential impacts should be minimised through design. This includes the use of clear span structures across water ways, for example.

One of the main purposes of the Corbally Canal and Liffey Enhancement Feasibility Study is to understand how Corbally Harbour may function as a heritage asset within the landscape. The harbour (and its attendant structures) is a protected structure and therefore subject to statutory protection under the Planning and Development Act. Any proposed works that may arise to conserve the built heritage at the harbour will require agreement from Kildare County Council, Waterways Ireland and appropriate design and assessment by competent built heritage experts. Works may vary from the consolidation of the ruins to full renovation (subject to the appropriate approvals) and access to the site would require appropriate Health and Safety assessment, given the presence of open water.

12.1.3. Human Interaction, Wellbeing and Recreation

The main source of noise pollution in the study area is from the existing M9 and M7 motorways.

Land ownership constraints will arise during the scheme. There are a variety of public and private landowners in the area.

There is a potential for the improvement to cyclist and pedestrian amenity, and increased connectivity between urban areas with the construction of this development.

From a tourism and recreation point of view, it entirely fits with policy and the sector's most recent trends—Ireland's Ancient East strategies and specific direction on developing Greenways, Blueways, and Trails will be essential.

Early observation of the entire site would suggest that developing the canal trail or greenway should be incremental and phased. This is due to the geography, landscape, land ownership, and current extent of the canal's access. The scale of tourism development will naturally be appropriate to the trail's sensitive natural features.

Developing the recreation and tourism facility should be partnered and clustered with other tracks and trails and a wide range of quality tourism facilities and locations in the Naas area and co-Kildare, in general. The Corbally Canal must be seen more generally when visiting Kildare.

Developing the trail for tourism could consider and include the following:

- Creating trailheads and destination points or facility points
- Developing viewing points and resting areas that could form picnic stops and scenic rest areas – the Bridges already provide beautiful landscapes and amenities
- The local stories could be overlaid by interpreting the trail
- Creating facilities around the trail that promote recreation and enjoyment—bike hire, kayak and canoe hire and instruction, walking tours and trail information, a local café, and Airbnb.

Corbally Harbour is unique and exciting, with tourism and recreation potential. The old buildings have tourism potential for regeneration and provide a natural trailhead for the Canal.

12.1.4. Climate Action

Proposed developments within the study area are likely to be in accordance with the relevant climate action policies, both nationally and within Co. Kildare. The feasibility study will present an opportunity for Kildare County Council to contribute to its own policies under the Kildare CAP.

It is possible that, as several different areas of sustainable transport are to be prioritised under the Kildare CAP, the proposed may need to compete with others to gain funding and approval. Ensuring the is compliant with climate policies will be important.

Travel and transport infrastructure is generally resilient against potential climate impacts. Nonetheless, proposed designs must be cognisant of potential impacts with regard to flooding, increased rainfall, impacts to the green infrastructure and other climate changes.

12.2 Combined Baseline Findings

A Baseline Assessment Plan was prepared using the information described in each chapter of this report (Figure 12-1 overleaf). The plan highlights several structures, upcoming developments, travel routes and green infrastructure elements. The land use of the study area informs the quantity of amenities and developments in the study area. For example, urban areas include multiple amenities such as parks and private open spaces that are easily accessible by the existing road network. The agricultural use of the transient lands provides a rich green infrastructure network in the form of mature native hedgerows along field boundaries but lacks travel routes, including sustainable ones, across the Liffey Corridor and Corbally Canal.

The Corbally section of Grand Canal pNHA is of national ecological importance and the protected habitats and species it supports (e.g. high-value meadow, reedbeds, Otter) will need to be protected and future assessments and developments will need to ensure that ecological features of value will not suffer significant adverse impacts. While the section of the River Liffey within the study area is not a designated protected site, it still supports a range of riparian habitats and numerous protected species therewithin; and as a result, will need appropriate safeguards to ensure valued ecological features are not impacted by future developments within the study area. In some cases, protected resting areas like Otter active holts and couches, have the ability to constrain development within specific areas of the study area. Additionally, appropriate measures will need to be taken for the removal and management of the identified invasive non-native species; this of particular importance along the sections of the River Liffey within the study area.

The existing road network comes in proximity of the Corbally Canal and transverses the transient lands and Liffey Corridor. There is noise pollution associated with the motorway alignments especially. Enhancing the green infrastructure along the existing watercourses will benefit the user experience and wellbeing. The Corbally Canal is currently accessible as a walking route.

There are several recorded monuments and protected structures identified within the study area. This includes a hub of archaeological relevance within Greatconnell. Identifying a potential connection route between Corbally and Liffey during Stage 4 will consider the location and zone of notification for each monument and structure. It is important that these heritage sites are not impacted by new developments and any recovery or repurposing works comply with KCC and Waterways Ireland policies. The key constraint for the Corbally Harbour is the legal protection afforded to the site. This protection does not preclude restoration or redevelopment but ensures that the correct procedures and processes are followed in order to achieve it.

The existing structures have also been identified as scenic viewpoints in some locations. Some bridges within the Liffey Corridor and Corbally Canal provide views of scenic quality due to the proximity to water. Ensuring the protection and enhancement of these views will continue to provide pleasant connections between the community and nature. The location of these elements in each town also coincides with the identification of ecological features of value or invasive behaviour.

Future developments will need to be appropriately scaled and sited in order to minimise impacts to the existing landscape, ecology and heritage sites. The improvement works of existing routes and structures may be required. The potential for structures such as the Corbally Harbour to be repurposed and thus 'brought back to life' would provide new hubs and community attractions / amenities within the area.

In general, the feasibility study area is capable of receiving sustainable travel proposals accompanied by green infrastructure enhancement and tourism growth. Nature based solutions, community involvement and biodiversity & heritage protection should be a priority for potential upcoming developments.

12.3 Upcoming Stages

The upcoming stages will be **Stage 3 -** Engagement Process and Report; followed by **Stage 4 -** Principles, Parameters and Options Report.

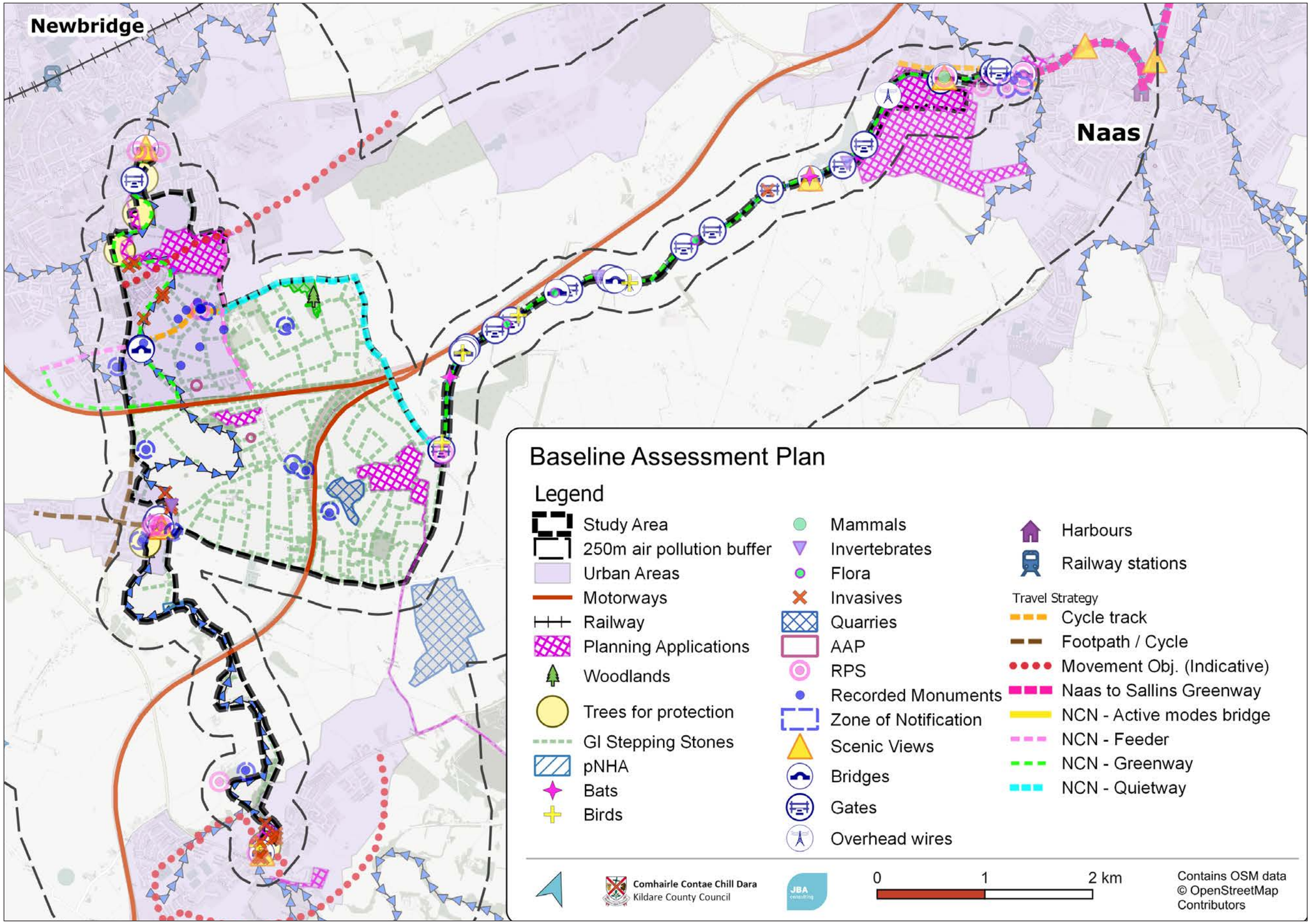


Figure 12-1 Baseline Assessment Plan

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