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WEST CLARE RAILWAY GREENWAY
SECTION 2: ENNIS TO ENNISTYMON

Constraints Report

February 2023

ROD
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West Clare Railway Greenway
Section 2: Ennis to Ennistymon

Constraints Report

TABLE OF CONTENTS

1. INTRODUCTION

This Constraints Report has been prepared by Roughan & O'Donovan [ROD] on behalf of Clare County Council for the development of a greenway facility between Ennis and Ennistymon as part of the West Clare Railway Greenway. ROD have appointed a multi-disciplinary team of specialists including Cunnane Stratton Reynolds land planning and design, Archaeological Management Services and John Bligh & Associates to provide specialist inputs into the options assessment for the proposed Greenway. This Constraints Report has been prepared in line with the requirements of Code of Best Practice for National and Regional Greenways.

TII manages the Government's rural cycleway and greenway portfolio for development nationally as well as being responsible for the development and maintenance of the national road network. The TII Code of Best Practice for National and Regional Greenways appraisal process aligns with the requirements of the Department of Transport Tourism and Sports Common Appraisal Framework (CAF) 2016 (as amended) and, more recently, the Public Spending Code 2019 (as amended).

A requirement of the appraisal process is the assessment of the desirability of an investment proposal from the perspective of society.

1.1 Project Background

The West Clare Railway initially started as two individual companies – the West Clare Railway which serviced Ennis to Milltown Malbay and the South Clare Railway which serviced Milltown Malbay to Kilrush and Cappa Pier. Additionally, the South Clare Railway ran west from the Moyasta Junction to Kilkee. The West Clare Railway began operating in 1887, while the South Clare Railway began operating later in 1892. In 1948, CIE decided to cease operation of the line due to a decline in passenger numbers, however, in 1952 steam engine trains were replaced with diesel engine trains and the line continued to remain in operation until 1961.

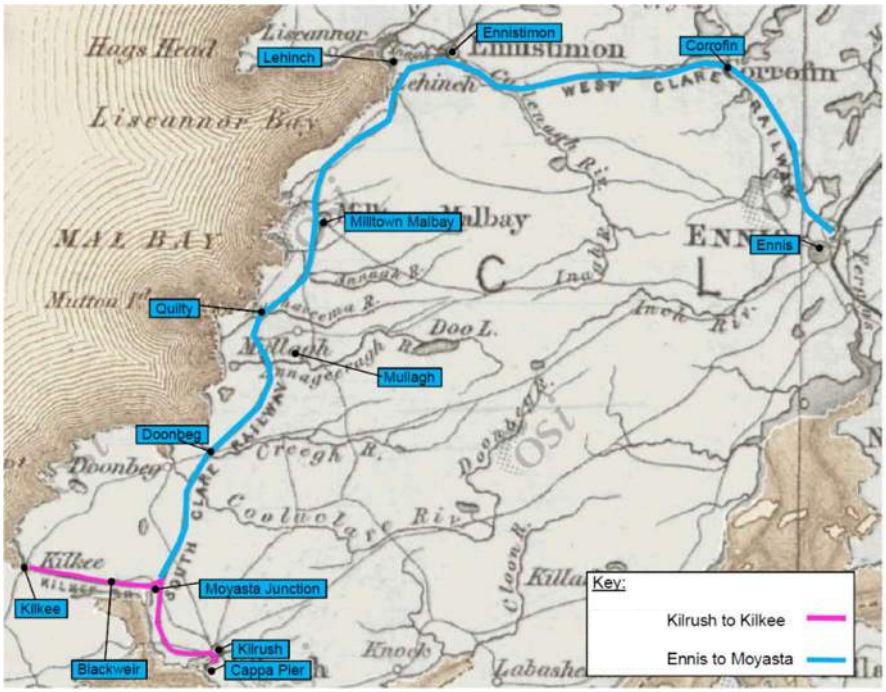


Figure 1-1 Historical Alignment of West Clare Rail Line (Source: Aecom, 2021. Preliminary Strategic Assessment Report Rev A)

This Constraints Report looks at the physical and environmental constraints associated with the Ennis to Ennistymon section of the West Clare Railway Greenway, the study area for which is centred around the route of the West Clare Railway from Ennis to Ennistymon as shown in Figure 1-2.

1.2 Greenway Project Guidance

The preparation of this Constraints Report and the delivery of the West Clare Railway Greenway Section 2 Project is informed by relevant guidelines published by the Department of Transport, Transport Infrastructure Ireland and the National Transport Authority, including:

- The Code of Best Practice National and Regional Greenways (DoT, 2021);
- Greenways and Cycle Routes Ancillary Infrastructure Guidelines (DoT, 2022);
- Project Management Guidelines (PE-PMG-02041) (TII, 2022);
- Project Manager's Manual for Greenway Projects (PE-PMG-02047) (TII, 2022);
- Project Appraisal Guidelines for National Roads Unit 2.2 – Strategic Assessment Reports for Active Modes and Greenways (PE-PAG-02041) (TII, 2022);
- Project Appraisal Guidelines for National Roads Unit 13.0 – Appraisal of Active Modes (PE-PAG-02036) (TII,2021);
- Rural Cycleway Design (Offline and Greenway) (DN-GEO-03047) (TII, 2022);
- National Cycle Manual (NTA, 2011).

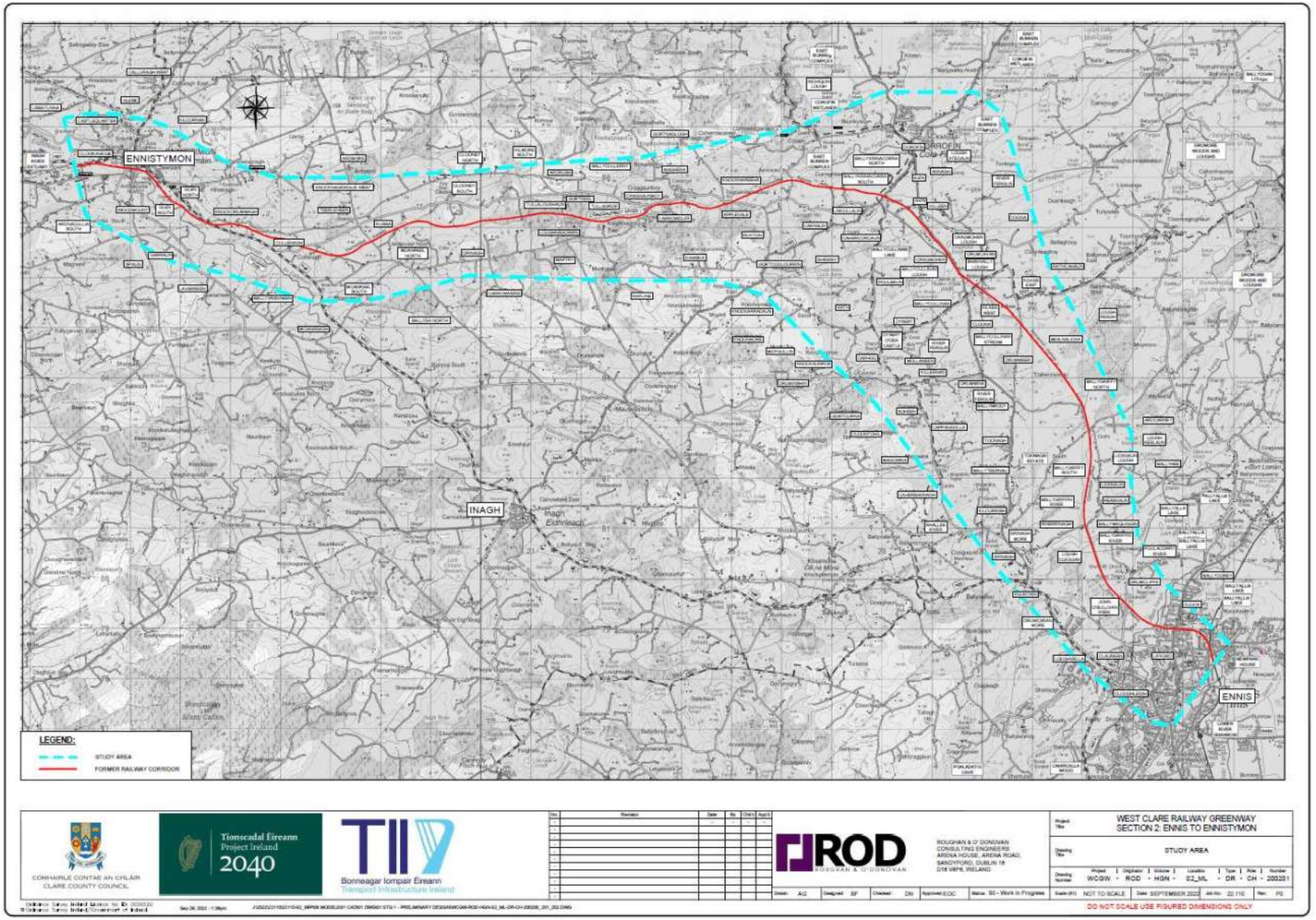


Figure 1-2 West Clare Greenway Section 2: Ennis to Ennistymon Study Area

2. POLICY CONTEXT

The need for pedestrian and cycle facilities throughout Ireland is set out by government policy in relation to the provision of safe cycle routes, improved connectivity, tourism amenities and sustainable transport facilities and their integration with other cycling and walking routes. The most relevant European, National, regional, and local policies and objectives in support of the scheme have been extracted from the principal documents and are discussed in the following sections.

2.1 EU Policy

2.1.1 European Cycling *Strategy 2017*

The EU Cycling Strategy – Recommendations for Delivering Green Growth and an Effective Mobility System in 2030 - consolidates a systematic review of all policies related to cycling, reviewing the current state of cycling in the European Union and provides a cycling implementation plan including proposed policy changes addressed to the European level, complemented by proposed policy changes to the national and regional/local level policy also.

European level proposed policy changes include:

- Issue guidance for the development of national, regional and local networks.
- Support projects related to cycle route networks and individual routes, particularly cross-border connections (e.g. funding through Interreg projects).
- Adopt universal principles for cycle infrastructure across all Member States that can be incorporated into national and local standards.
- Consider cyclists in all EU-funded land-based infrastructure project.
- Support the preparation of more detailed standards/guidance documents, based on bicycle user needs, at a national level (where they do not currently exist).
- Integrate cycling (and bike-sharing) into all relevant multimodal transport policies, project funding, research projects, etc.
- Develop European guidelines for cycling measures that include best practices and can be used by regions and cities to facilitate implementing cycling measures co-funded by the EU.
- Include active modes in one-stop-shop for transport services and therefore include them in the standardisation and harmonisation of multi-modal and real time transport data.
- Streamline cycling into all relevant EU funding streams. This requires a close and regular coordination between all the responsible DGs within the European Commission and the executive agencies. 10% of the EU's transport budget should be invested in cycling measures.

These regional and local proposed policy changes include:

- Develop and maintain national cycle route networks;
- Develop and maintain regional and local cycle route networks;
- Develop safe cycle routes to schools, city centres and business areas;

- Segregate cyclists from other traffic where there is high speed/high volume motorised traffic, or otherwise create safe conditions on roads where cyclists mix with motorised vehicles; and
- Develop the current and future industrial areas, as well as good connections with harbours and other transport modes.

In achieving a shift in mobility culture, the strategy requires EU cities to convince policymakers to support cycling; encourage people to cycle more; and to facilitate the cooperation amongst road users for safer cycling.

The strategy includes four core objectives for the timeframe of the document:

- Grow cycle use by 50% at an average across the EU;
- Halve rates for killed and seriously injured cyclists (per km cycled);
- Invest €3 billion in cycling in the period 2021-2027, and €6 billion from 2028-2034; and
- At a qualitative level, it is strongly advised that cycling is treated as an equal partner in the mobility system.

The provision of the West Clare Railway Greenway will support and contribute towards achieving the above European, regional and local recommendations, while additionally contributing to the four European-wide core objectives, within the designated timeframe.

2.1.2 EU Green Deal

The European Green Deal addresses the task of transforming the European economy from a holistic perspective whereby, essential facets of modern life such as reliable and efficient infrastructure must be made more climate friendly. Transport in the EU contributes roughly 5% to the EU GDP and currently, transport emissions represent around 25% of the EU's total greenhouse gas emissions. While being critical, transport must adapt to become far more efficient in its resource use as per the 2030 climate & energy framework. The EU aims to reduce the transport related emissions by 90% from 1990 levels by the year 2050. The intermediatory target of a 55% reduction by the year 2030 was also set. The Green Deal notes that achieving sustainable transport means putting users first and providing them with more affordable, accessible, healthier and cleaner alternatives to their current mobility habits.

The proposed development supports the aims of the European Green Deal as it will provide pedestrian and cycling infrastructure which connects towns and villages in County Clare, and promotes the use of sustainable modes of transport, and the reduction of transport related greenhouse gas emissions.

2.1.3 European Commission EU Strategy on Adaptation to Climate Change

In 2021, the European Commission adopted the EU Strategy on Adaptation to Climate Change which outlines how the EU can adapt to the effects of climate change and become climate resilient by 2050.

This strategy document highlights the importance of adaptation to the inevitable effects of climate change. This strategy document discusses investing in resilient, climate-proof infrastructure to minimise the risks of disasters from climate change.

Section 2.2.4 of this strategy states:

"*Blue-green (as opposed to grey) infrastructures are multipurpose, "no regret" solutions and simultaneously provide environmental, social and economic benefits to help build climate resilience*"

The proposed development is supported by section 2.2.4 of this strategy as it comprises of a greenway which will provide environmental, social, and economic benefits when operational.

2.2 National Policy

2.2.1 National Planning Framework

Project Ireland 2040 is the Government's overarching policy for spatial planning and development in Ireland to 2040. It was published in 2018 and comprised two major policy documents, the *National Planning Framework to 2040* (NPF) and the *National Development Plan 2018 – 2027* (NDP) (now superseded by the 2021-2030 version as set out in section 1.3.2.2 below). The NPF presents a broad national-level policy to guide strategic planning and development across Ireland, while the NDP sets out the 10-year public capital investment strategy required to support its implementation.

The National Planning Framework also sets out a number of National Policy Objectives (NPOs) in relation to walking and cycling, which are as follows:

NPO 26: *Support the objectives of public health policy including Healthy Ireland and the National Physical Activity Plan, though integrating such policies, where appropriate and at the applicable scale, with planning policy.* (p. 82)

NPO 27: *Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages*. (p.82)

NPO 64: *Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions.* (p.167)

2.2.2 National Development Plan 2021-2030

The National Development Plan (NDP) 2021-2030 was recently published by the Department of Public Expenditure and Reform. The plan details the government's priorities for investment in infrastructure projects over the lifespan of the plan, with particular emphasis being placed on housing, climate, transport, healthcare and job growth. The NDP outlines the governments investment into active travel infrastructure and introduces the new 'National Active Travel Programme' which will receive €360 million annually between 2021-2025.

The National Active Travel Programme aims to provide enhanced regional connection between towns and villages through the provision of active travel infrastructure for walking and cycling. Active travel infrastructure has also been designated as a 'Strategic Investment Priority' under National Strategic Objective 2 – Enhanced Regional Accessibility, National Strategic Objective 3 Strengthened Rural Economies and Communities and National Strategic Objective 4 – Sustainable Mobility.

The proposed development is consistent with the strategic investment priorities of the National Development Plan as it will provide active travel infrastructure, connecting villages and towns in the West Clare area, and providing sustainable transport alternatives to private car use.

2.2.3 People, Place and Policy - *Growing Tourism to 2025*

During the 2002-2007 period, Ireland experienced a surge of tourism which sharply declined in 2008 due to the worldwide economic crisis. Since 2011, in response to the economic crisis, the Government identified that the "*warmth and welcome of our people, complemented by the richness of beauty of our places, landscape and heritage*" are the primary focal aspects which will draw more tourism into Ireland.

The Government aspires to generate a €5 billion overseas tourism revenue in real terms (i.e. in 2014 prices) by 2025 or '10 million overseas visitors per year by 2025 compared to 7.6 million in 2014'. The employment in the sector is desired to reach 250,000 by 2025. To reach this goal, the Plan supports a range of investments to enhance the visitor experience, including '*development of greenways'*.

The West Clare Railway Greenway will enable the exploration of Ireland's cultural heritage and landscapes along the route. The requirement for bike hire, food and accommodation will boost the local economies in Ennis and Ennistymon, along with smaller villages along the route such as Corofin, contributing to the overall goal for the 2025 overseas tourism revenue.

2.2.4 Strategy for Future Development of National and Regional Greenways 2018

This Strategy document by the Department of Transport, Tourism and Sport, defines a Greenway as a "*recreational or pedestrian corridor exclusively for non-motorised journeys, developed in an integrated manner which enhances both the environment and quality of life of the surrounding area."*

For the purposes of this Strategy, the development of 'Greenway' relates to the development of Greenways of scale i.e. for new development or extensions of existing greenway that are more than 20km or shorter where it is proposed to join several existing greenways to form a longer, more strategic route.

The Strategy for the Future Development of National and Regional Greenways identifies the benefits that can arise from further development of greenways in Ireland such as rural development, supporting the local and overseas tourism sector. Greenways are also recognised as serving as attractive amenities, benefiting the users in terms of physical activity and contributing to health and well-being. The strategy contains five main objectives as shown in Figure 2-1 which were developed for the purposes of creating strategic greenways in Ireland. The objectives are as follows:

1. *A Strategic Greenway network of national and regional routes, with a number of high capacity flagship routes that can be extended and/or link with local Greenways and other cycling and walking infrastructure*; (p.6)
2. *Greenways of scale and appropriate standard that have significant potential to deliver an increase in activity tourism to Ireland and are regularly used by overseas visitors, domestic visitors and locals thereby contributing to a healthier society through increased physical activity;* (p.6)
3. *Greenways that provide a substantially segregated off-road experience linking places of interest, recreation, and leisure in areas with beautiful scenery of different types with plenty to see and do; and* (p.6)

4. *Greenways that provide opportunities for the development of local businesses and economies, and* (p.6)
5. *Greenways that are developed with all relevant stakeholders in line with an agreed code of practice.* (p.6)

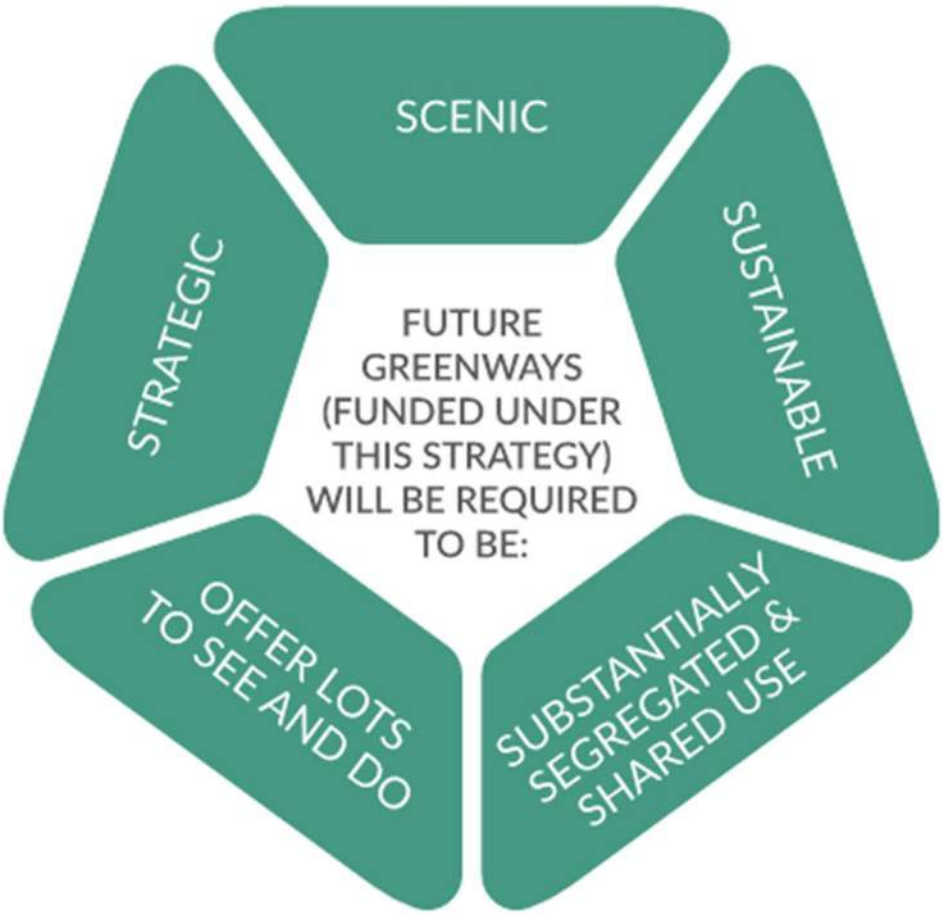


Figure 2-1 Five main objectives of the Greenway Strategy. Source: Strategy for the Future Development of National and Regional Greenways, July 2018

The proposed development aims to achieve the objectives of the above strategy, to create a greenway of scale, to provide a scenic, strategic route for walkers and cyclists between Ennis, Corofin and Ennistymon, essentially providing an active travel connection for locals and tourists alike to these towns and villages and also to attractions located along the way. The project will be substantially segregated insofar as possible and will provide shared use facilities as required.

2.2.5 National Sustainable Mobility Policy

The National Sustainable Mobility Policy outlines a strategic framework to 2030 for active travel and public transport to support Ireland's overall requirement to achieve a 51% reduction in carbon emissions by the end of this decade. This policy aims to deliver at least 500,000 additional daily active travel and public transport journeys. The policy sets out several goals, including:

"*Goal 4 aims to expand the capacity and availability of sustainable mobility in a regional and rural context. This will be done through the delivery of improved active travel infrastructure, the expansion of regional bus and rail services and local bus networks, and improved connectivity between different transport modes.*"

It is acknowledged within this policy document that "*greenways have an important role, both in terms of their economic contribution to communities in attracting tourism and leisure activity, but also their potential to enable active travel within local communities as part of the overall cycle network within settlements*."

The proposed development supports the above policy as it will provide an active travel link between the towns of Ennis, Corofin and Ennistymon.

2.2.6 Draft *National Cycle Network Plan 2022*

The draft National Cycle Network Plan developed by TII, maps existing and proposed cycling infrastructure in Ireland to highlight and identify infrastructural gaps for future intervention and investment. The plan aims to develop a comprehensive, connected and coordinated cycle network that will connect settlements of 5,000 inhabitants with one another. The plan intends to provide a core cycle network for future projects to connect to with, as shown in Figure 2-2. The vision of the plan is:

"*Develop a safe, connected, and inviting cycle network between urban areas and key destinations to achieve accessible, sustainable, and high-quality routes that will help to reduce the carbon impact of transport and promote a healthy and inclusive society*."

At the time of writing, the plan is being revised post public consultation / engagement.

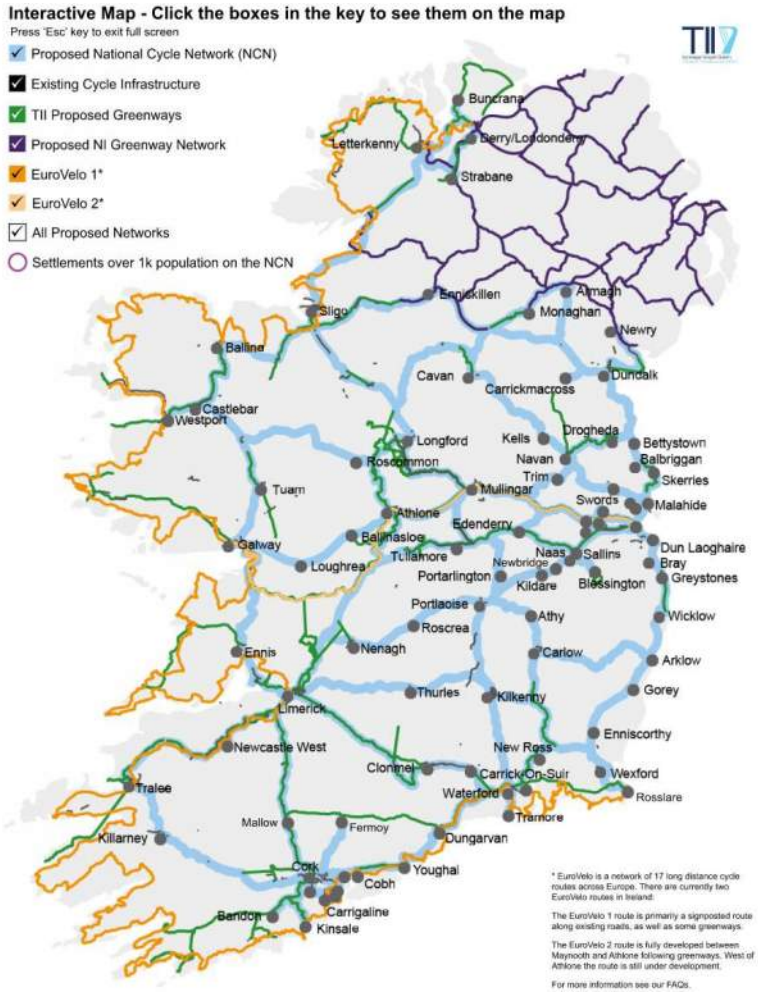


Figure 2-2 National Cycle Network Map Source: Transport Infrastructure Ireland

The proposed development will tie-in with the proposed national cycle network in Ennis. The proposed development supports the vision of the plan by providing pedestrian and cycling infrastructure between Ennis and Ennistymon, which has the potential to encourage a modal shift from the private car to walking and cycling and therefore reducing the carbon impact of transport.

2.2.7 National Inv*estment Framework for Transport in Ireland*

National Investment Framework for Transport in Ireland (NIFTI) published by the Department of Transport will ensure that future investment in the transport network will support the delivery of the ten National Strategic Outcomes (NSOs) of the National Planning Framework. Future transport investment and sectoral strategies e.g. NTA City Strategies and Regional Spatial and Economic Strategies, will be required to align with this framework.

The framework acknowledges that to achieve decarbonisation of the transport sector, investment will be required to promote sustainable modes of transport and states it will support "*investment in public transport, walking and cycling to encourage modal shift away from the private car".* The framework sets out a modal hierarchy for investment in transport in Ireland, which is as follows:

(1) Active Travel

(2) Public Transport

(3) Private Vehicles

NIFTI also sets out a hierarchy of intervention types to ensure that investment is proportionate to the problem identified. The NIFTI Intervention Hierarchy sets out four high-level categories of investment:

(1) Maintain

(2) Optimise

(3) Improve

(4) New

In developing the proposed West Clare Railway Greenway Section 2, the preferred option will need to be considerate of the Intervention Hierarchy outlined in NIFTI.

The investment framework highlights some key issues with transport in Ireland, such as:

> *"The transport sector is a significant contributor to air pollution in Ireland. It is the primary source of nitrogen oxide emissions, with passenger cars and heavy goods vehicles the most significant emitters,"*
>
> *"Transport currently accounts for approximately 18% of Ireland's greenhouse gas (GHG) emissions".*

The proposed development will address the above key issues and supports the modal hierarchy outlined in this framework. By investing in walking and cycling infrastructure in accordance with the modal hierarchy, the proposed development has the potential to encourage a modal shift from the private car to walking and cycling.

2.2.8 Climate Action Plan *2023*

The Climate Action Plan is a policy document published by the Department of Environment, Climate and Communications in 2023 outlining actions to be taken and

setting targets to be achieved across various sectors, including, but not limited to, electricity, transport and the built environment to reduce greenhouse gas emissions.

The plan acknowledges that a modal shift and fleet electrification is one of the most important decarbonisation measures for Ireland over the coming decade, stating:

> "*Policies providing the infrastructure and incentives to use public transport, coupled with changes in behaviour are required to reduce passenger car use. This will require a 20% reduction in vehicle kilometers travelled, and significant increases to the level of additional public transport and active travel journeys per day, as set out in Chapter 15. The uptake of electric vehicles will also require a step change with 30% of the private car fleet to be electrified by 2030, and all new car registrations to be electric for subsequent years*".

The plan also set out the following action in relation to sustainable transport and active travel, including:

> "*CP/23/11. Support and promote a modal shift towards healthy active and sustainable mobility in the design and delivery of our developments. Plan to reduce travel by private car and design to optimise connectivity and access to sustainable and active travel. Promote mobility management planning and e-mobility as well as options for car sharing/clubs"*
>
> *"TR/23/29. Advance roll-out of 1,000 km walking/cycling infrastructure"*
>
> *"TR/23/30. Advance roll-out of National Cycle and Greenway Networks"*

The proposed development supports the Climate Action Plan 2023 by encouraging a modal shift to towards active travel modes through the provision and expansion of walking and cycling infrastructure in Co. Clare.

2.3 Regional Policy

2.3.1 Southern Region *Regional Spatial and Economic Strategy (S-RSES)*

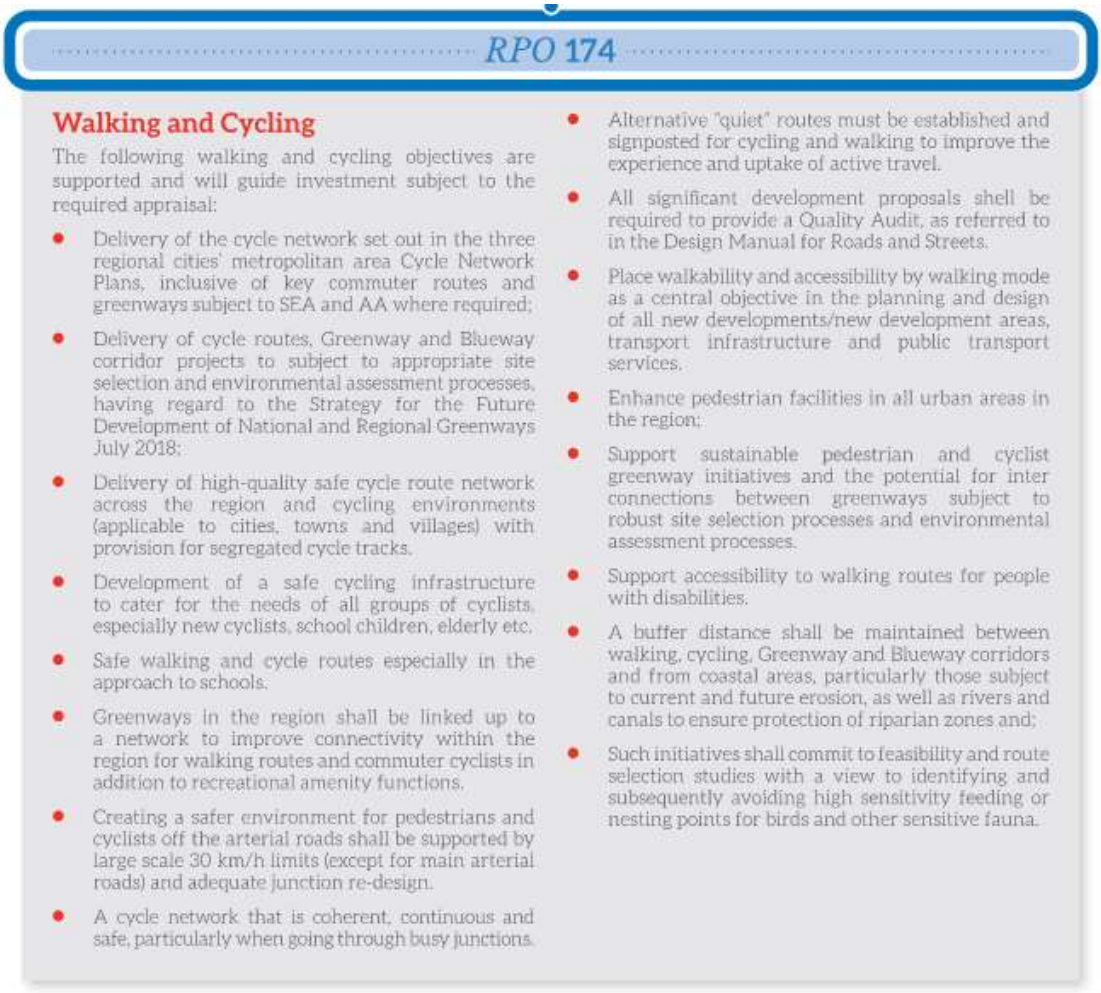
The Regional Spatial and Economic Strategy for the Southern Region of Ireland (S-RSES) outlines how the policies and objectives from the National Planning Framework (NPF) and any other relevant Government policies and objectives will be implemented in the Southern Region. The S-RSES intends to reflect these policies and objectives through economic and spatial strategies targeted specifically at the Southern Region, which comprises counties Clare, Limerick, Kerry, Cork, Tipperary, Waterford, Kilkenny, Carlow and Wexford.

The provision of walking and cycling routes within urban centres and rural areas is targeted as they endorse a healthy lifestyle for the population and create an opportunity for attracting tourism to the area. Regional Policy Objectives (RPOs) within the Southern Region RSES has been identified to promote the development of walking and cycling routes as well as Blueways, Greenways and Peatways in the region. RPOs of the RSES support investment of greenway as follows:

- **RPO 53 Tourism** supports developments in relation to the enhancement of tourism and leisure amenities including investment in walking and cycling infrastructure and includes the following objectives:
  - *"Sustainably develop walking and cycling trails opening greater accessibility to the marine and countryside environment by sustainable modes of transport and promote the sustainable designation of delivery of Greenway and Blueway Corridors."*

- *"Facilitate appropriate tourism development and in particular a National Greenways, Blueways and Peatways Strategy, prioritising sustainable projects that achieve maximum impact and connectivity at national and regional level."*

- **RPO 125 Green infrastructure corridors** *"Transport infrastructure provides potential opportunities to act as green infrastructure corridors. It is an objective to support Local Authorities acting together with relevant national infrastructure providers to co-develop infrastructural management plans to enhance biodiversity".*
- **RPO 201: National Trails, Walking Routes, Greenway and Blueway Corridors** *"It is an objective to support investment in the development of walking and cycling facilities, greenway and blueway corridors within the Region between our Region's settlements and potential for sustainable linkages to create interregional greenways. Proposals for investment in walking and cycling facilities, greenway and blueway corridors should be based on rigorous site/route selection studies and Local authorities should ensure that decision-making in relation to such developments is informed by an appropriate level of environmental assessment, including all necessary reports to assess the potential impact on designated European sites and on biodiversity outside of formal protections such that proposed development does not contribute to loss of biodiversity. Local authorities and other public agencies shall seek to promote and support access to rural areas including upland areas, forestry, coastal areas and the development of existing walking routes, pilgrim paths, mountain trails and nature trails in conjunction with other public bodies, representative agencies and community groups and shall identify and protect existing paths, walkways and rights of way".*
- **RPO 174 Walking and Cycling** as shown in Figure 2-3. This RPO supports investment for developing walking and cycling infrastructure in the region.



RPO 174

Walking and Cycling

The following walking and cycling objectives are supported and will guide investment subject to the required appraisal:

- Delivery of the cycle network set out in the three regional cities' metropolitan area Cycle Network Plans, inclusive of key commuter routes and greenways subject to SEA and AA where required;
- Delivery of cycle routes, Greenway and Blueway corridor projects to subject to appropriate site selection and environmental assessment processes, having regard to the Strategy for the Future Development of National and Regional Greenways July 2018;
- Delivery of high-quality safe cycle route network across the region and cycling environments (applicable to cities, towns and villages) with provision for segregated cycle tracks.
- Development of a safe cycling infrastructure to cater for the needs of all groups of cyclists, especially new cyclists, school children, elderly etc.
- Safe walking and cycle routes especially in the approach to schools.
- Greenways in the region shall be linked up to a network to improve connectivity within the region for walking routes and commuter cyclists in addition to recreational amenity functions.
- Creating a safer environment for pedestrians and cyclists off the arterial roads shall be supported by large scale 30 km/h limits (except for main arterial roads) and adequate junction re-design.
- A cycle network that is coherent, continuous and safe, particularly when going through busy junctions.
- Alternative "quiet" routes must be established and signposted for cycling and walking to improve the experience and uptake of active travel.
- All significant development proposals shall be required to provide a Quality Audit, as referred to in the Design Manual for Roads and Streets.
- Place walkability and accessibility by walking mode as a central objective in the planning and design of all new developments/new development areas, transport infrastructure and public transport services.
- Enhance pedestrian facilities in all urban areas in the region;
- Support sustainable pedestrian and cyclist greenway initiatives and the potential for inter connections between greenways subject to robust site selection processes and environmental assessment processes.
- Support accessibility to walking routes for people with disabilities.
- A buffer distance shall be maintained between walking, cycling, Greenway and Blueway corridors and from coastal areas, particularly those subject to current and future erosion, as well as rivers and canals to ensure protection of riparian zones and;
- Such initiatives shall commit to feasibility and route selection studies with a view to identifying and subsequently avoiding high sensitivity feeding or nesting points for birds and other sensitive fauna.

Figure 2-3 Regional Policy Objective (RPO) 174 Walking and Cycling, Southern Region Draft Southern Region RSES

- **RPO 46** relates to digital and physical infrastructure in rural areas and is supported by the proposed development as it will allow for a more *'enhanced transport connectivity including rural public transport services and* greenway *walking and pedestrian corridors between settlements'* which reduces the reliance of private cars over shorter journeys within the rural landscape.

The construction of the proposed West Clare Railway Greenway will support the listed regional policy objectives by promoting walking and cycling activities in the area. It will also provide connectivity between towns, villages and rural areas while also supporting the tourism sector and potential diversification in the rural economy.

2.4 Local Policy

2.4.1 Clare *County Development Plan 2017-2023*

The Clare County Development Plan 2017-2023 is a policy document which represents an agreed economic, social, cultural, and environmental blueprint for the future planning, growth and development of County Clare. The Clare County Development Plan outlines the importance of cycling and walking. The County Development Plan has identified specific walking and cycling objectives to be implemented between 2017 and 2023, under several headings such as "Off-Road Walking and Cycling", "Smarter Travel", "Walking and Cycling", "Tourism in West Clare" and "Development of a Low Carbon Economy".

The proposed development supports and complies with the following objectives set out in the County Development Plan:

Off-Road Walking and Cycling

CDP 5.12 It is an objective of the Development Plan:

"B. To support and facilitate the development of the West Clare Railway Greenway and necessary supporting infrastructure".

Smarter Travel

CDP8.10 It is an objective of Clare County Council:

"To support sustainable travel in County Clare and to implement the key goals, targets and actions as contained in 'Smarter Travel – A Sustainable Transport Policy for Ireland 2009-2020."

Walking and Cycling

CDP8.13 It is an objective to the Development Plan:

"A. To support the development and enhancement of long-distance cycling routes in County Clare, in accordance with the National Cycle Network Scoping Study 2010."

"B. To safeguard, where feasible, the route of the old West Clare Railway which has not been affected by existing development and to encourage its use for recreational purposes and/or as part of an operational railway tourist attraction. Exceptions to this shall include short sections within the curtilage of residential or commercial property."

"C. To support the development of new walking routes and trails throughout the County."

"D. To ensure the development, enhancement and safeguarding of all walking and cycling routes are in compliance with the requirements of Objectives CDP2.1."

Tourism in West Clare

CDP9.25 It is an objective of Clare County Council:

"A. To work with all relevant stakeholders to further develop and enhance the opportunity for tourism products in particular coastal and cliff walks in Kilkee and Loop Head areas, cycling and niche tourism."

Development of a Low Carbon Economy

CDP18.3 It is an objective of the Development Plan:

"D. To support sustainable modes of transport such as walking and cycling through promotional strategies and the provision of infrastructure where required."

The proposed development aligns with the Clare County Development Plan by providing an amenity that has the potential to attract tourists to West Clare. The proposed development also supports the aforementioned walking and cycling policy outlined in the Development Plan as it provides walking and cycling infrastructure.

2.4.2 Draft Clare County Development Plan 2023-2029

The draft Clare County Development Plan 2023-2029 has recently undergone public consultation ending on the 28th of March 2022. While the Draft County Development Plan has not been officially adopted by Clare County Council, a review of the draft policies has been undertaken to inform this report. The Draft County Development Plan has identified specific walking and cycling objectives to be implemented between 2023 and 2029, under several headings such as "Tourism", "Sustainable Communities" and "Physical Infrastructure, Environment and Energy".

The proposed development supports and complies with the following objectives set out in the Draft County Development Plan:

Tourism

CDP9.8 It is an objective of the Development Plan:

"d. To sustainably develop greenways, blueways and peatways and walking and cycling trails including the West Clare Railway Greenway to achieve greater accessibility to the countryside and the marine environment by sustainable modes and to achieve maximum benefit and connectivity at local, regional and national levels."

"e. To promote activity tourism subject to appropriate site selection and environmental assessment processes; and"

"f) To ensure the siting of Blue and Green Infrastructure is carefully considered in the context of climate change and resilience and flood protection."

CDP9.21 It is an objective of Clare County Council

"D. To support the development of Ennis and its environs as a hub for cycleways, greenways and ecotourism."

CDP 9.26 It is an objective of Clare County Council:

"In addition to the development of its greenway potential to facilitate the reopening of appropriate sections of the West Clare Railway as an operational tourist attraction by permitting where appropriate new sections of railway to be built as alternatives to parts of the line which have been built on or are inaccessible since its closure."

Sustainable Communities

CDP 10.11 It is an objective of Clare County Council:

"a) To support the maintenance of existing off-road walking and cycling trails and support investment in the sustainable development of walking and cycling facilities, greenway and blueway corridors within the County and region extending into and between our County's settlements;

b) To support and facilitate the development of the West Clare Railway Greenway and necessary supporting infrastructure"

Physical Infrastructure, Environment and Energy

CDP 11.5 It is an objective of Clare County Council:

"a) To require walkability and accessibility to be a central consideration in the planning and design of all new developments, transport infrastructure and public transport services;"

"b) To facilitate and support the delivery of a safe, accessible and convenient cycle network and environment across the County and in the Limerick-Shannon Metropolitan Area as set out in the Cycle Network Plans;"

"c) To support the development and enhancement of long-distance cycling routes in County Clare, in accordance with the Strategy for the Future Development of National and Regional Greenways;"

"d) To safeguard, where feasible, the route of the old West Clare Railway which has not been affected by existing development and to encourage its use for recreational purposes and/or as part of a tourist attraction. Exceptions to this include short sections within the curtilage of residential or commercial property;"

"e) To support the development of cycle-lanes in urban areas linking residential areas to town centres, employment centres and school locations;"

"f) To support the development of new accessible walking routes and trails throughout the County;"

West Clare Municipal District Settlement Plans

The draft Clare County Development Plan 2023-2029 also provides settlement plans which outline land zoning details in addition to aims and objectives for all towns and villages in County Clare, excluding Shannon Town. Volume 3(d) of the draft Clare County Development Plan 2023-2029 contains the West Clare Municipal District Settlement Plans. The objectives set out in the Corofin and Ennistymon settlement plans which support the West Clare Railway Greenway, are outlined below.

Corofin

The draft West Clare Municipal District Settlement Plan for Corofin states the following in relation to the West Clare Railway Greenway:

- "*There are also opportunities to develop the tourism and leisure potential of the area, particularly given Corofin's location in proximity to the Wild Atlantic Way, as a 'Gateway to the Burren' and less than a kilometre north of the former West Clare Railway line. The provision of a link between the proposed Greenway and Corofin has the potential to attract visitors to the village and support the development of retail and tourism offering in the village."*
- *"The development of the West Clare Railway Greenway along the former railway line as a proposed recreational route will include a connecting link to Corofin and is supported in this Plan."*

It is an objective of Clare County Council to:

- *"To ensure that future development in Corofin encourages a vibrant village community, which maintains and enhances the economic and service role of Corofin village to residents, tourists, and the surrounding rural area."*
- *"To prioritise the development of the West Clare Railway Greenway."*

Ennistymon

The draft West Clare Municipal District Settlement Plan for Ennistymon states the following in relation to the West Clare Railway Greenway:

"*The development of the West Clare Railway Greenway along the line of the old west Clare Railways as a proposed recreational route*."

In addition, it states that it is an objective of Clare County Council to:

- *"To prioritise the development of the West Clare Railway Greenway."*

2.5 Aims and Objectives

This study provides an assessment of the constraints associated with cycleway and walking route from Ennis to Ennistymon generally following the route of the decommissioned West Clare Railway.

The primary aims of the proposed development are to:

- Increase walking, cycling and sustainable transport modal share and patronage.

- Improve accessibility to/from and within the rural communities along the corridor, and accordingly creating opportunities for enterprise and job creation.
- Create local employment opportunities particularly in the hospitality and leisure industries.
- Provide a world class visitor attraction.

3. STUDY AREA

Clare County Council undertook a Preliminary Strategic Assessment Report (SAR) in 2021 for the West Clare Railway Greenway and a Constraints Study 2020 for the Ennis to Moyasta section of same was carried out in 2020. The SAR identified the historical route of the railway line as the basis for the study are, however due to a number of areas where the greenway alignment may need to deviate from the historical alignment due to development on the line, an arbitrary study area was developed focusing on two Character Areas namely Ennis to Corofin and Corofin to Ennistymon. The Constraints Study also focused on the route of the West Clare Railway and adjoining lands, towns located close to the former railway and potential connections points to the proposed Greenway as the study area. These studies identified various physical and environmental opportunities and constraints along the original line of the West Clare Railway, which have been reviewed and further explored in this Constraints Report.

This Constraints report provides a detailed assessment of the constraints and opportunities associated with the development of the proposed greenway between the towns of Ennis, Corofin and Ennistymon, generally following the route of the decommissioned West Clare Railway. Following on from the SAR, the overall objective of the project is to deliver a greenway that follows the route of the former West Clare Railway, and as such the study area has been developed by examining an area approximately 1km either side of the former railway corridor to accommodate possible alternative routes to the original rail corridor while following the general direction of same.

This area was then reviewed to ensure that any towns, villages, tourist attractions, amenities etc. within the immediate vicinity of the study area which provided opportunities to achieve the 5 S objectives (as outlined in the Strategy for Future Development of National and Regional Greenways 2018) were included where feasible, whilst avoiding any major physical and environmental constraints present.

These 5 S objectives include areas that are:

1) Strategic,
2) Scenic,
3) Sustainable,
4) Substantially segregated & shared use, and
5) Offer lots to see and do.

See section 2.2.4 of this report for more information on this strategy.

The boundary was reviewed and thereby extended to include the area around Corofin and Dysert and connections to these areas from the proposed greenway could provide opportunities for the development of local businesses, tourist attractions and local economies.

The study area for Section 2 of the greenway is bounded by Ennis to the southeast and Ennistymon to the northwest. The study area encompasses the former railway corridor of the West Clare Railway and incorporates nearby attractions and towns such as Corofin and Dysert. The study area, as displayed in the first public consultation, is shown in Figure 3-1.

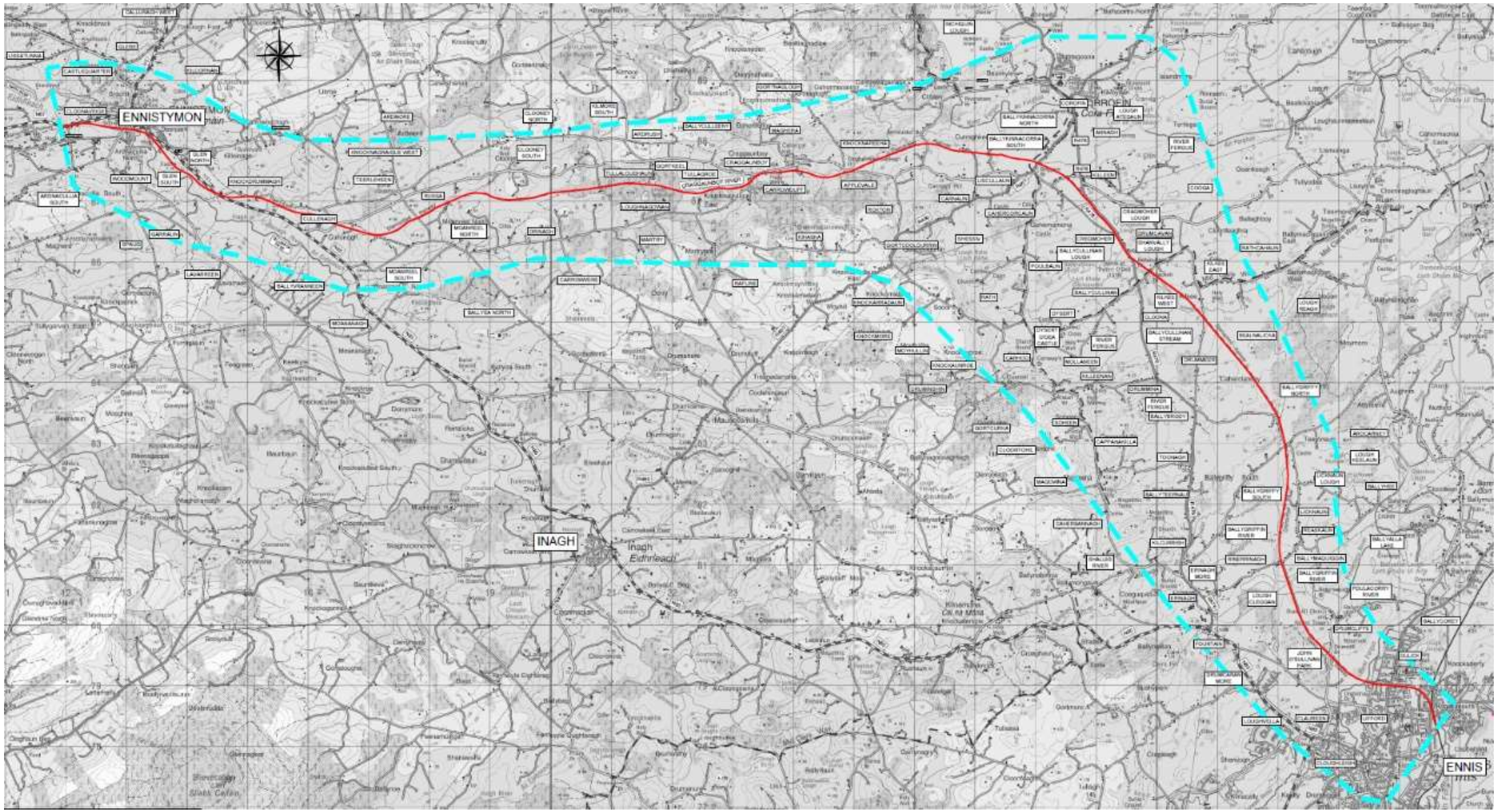


Figure 3-1 West Clare Railway Greenway Section 2 Study Area

4. PHYSICAL CONSTRAINTS

4.1 Condition of the Existing West Clare Railway Corridor

4.1.1 Ennis to Ballygriffy South

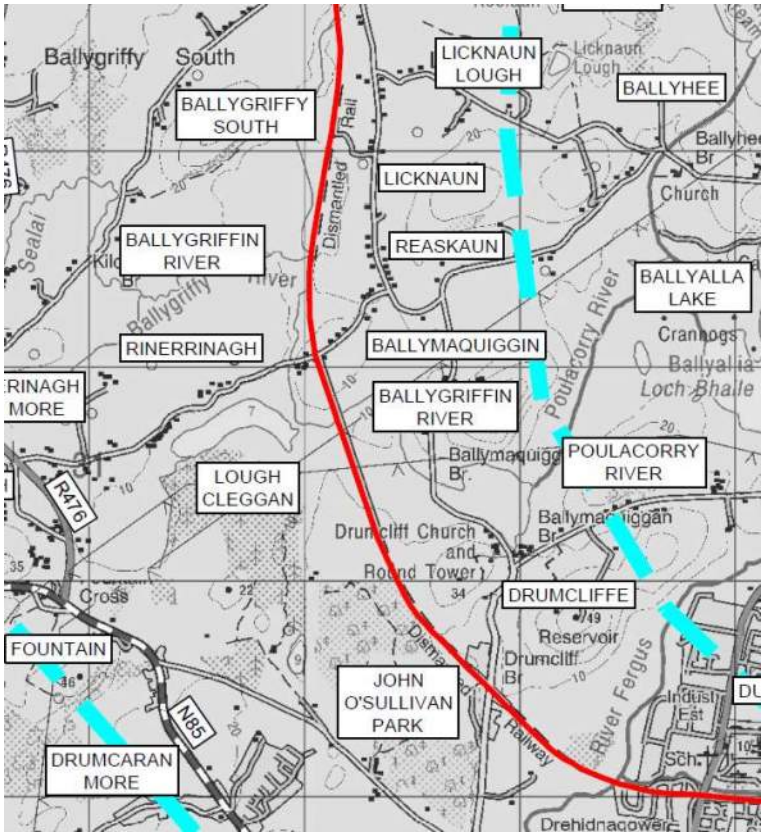


Figure 4-1 Former Railway line from Ennis to Ballygriffy South

Figure 4-1 shows the route of the former West Clare Railway corridor heading north from Ennis to Ballygriffy South. Upon leaving Ennis, the railway passes Drumcliff road, using the Drumcliff bridge. The bridge structure is no longer intact and only the bridge abutments remain in the present day. The former railway corridor is largely intact as it continues north to the Poulacarry River. The former railway crosses over Poulacarry River via an existing small stone bridge, which is still in use for crossings to the adjacent agricultural land. The railway corridor continues north until it joins the local road near Ballymaquiggin, where the corridor has a width of approximately 4-5m.

To the north of the road, the railway has been dismantled due to residential and farming developments. 140m to the west of the former line, the road crosses Poulacarry River with a small limestone bridge, Carranahingan Bridge. The former rail corridor continues north, with the Poulacarry River to the West and a local road between Ballymaquiggin and Ballygriffy via Larch Hill to the east. Some of the original corridor is intermittently preserved along this section, where much has been removed due to farming activities. This section of the former corridor is prone to flooding.

Poulacarry River runs north-south, to the former railway corridor, where its width varies from 190m to 50m. Lough Cleggin adjoins the Poulacarry River, west of the railway corridor at Ballymaquiggin with an area of approx. 40,000 m^2. This area and

lake are prone to flooding. Local roads in the area have typical widths of approx. 5.5-6m run from north to south and east to west crossing at the Reaskaun / Ballymaquiggin area. Ribbon development has taken place with several dwellings and farms along these local roads.

4.1.2 Ballygriffy South to Bealnalicka

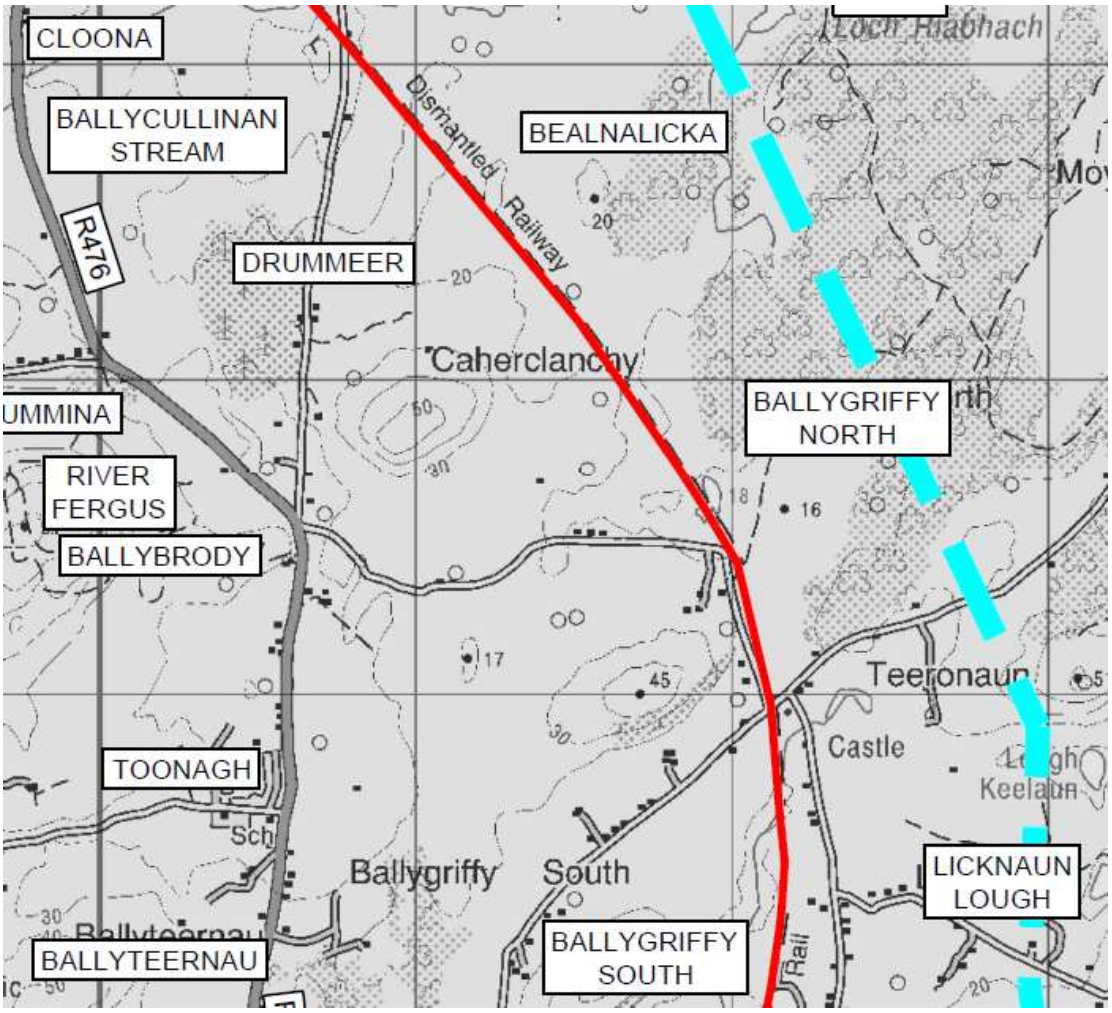


Figure 4-2 Former Railway line from Ballygriffy South to Bealnalicka

The former railway corridor continues northwards from Ballygriffy South through agricultural land where the corridor is largely not intact; the embankment and associated hedgerows, in many fields the corridor cuts through, have been dismantled. The former corridor crosses over the Poulacarry River via what appears to be an overgrown, disused bridge. An assessment of the integrity of this existing structure, if still intact would be required for any route option considered along the former railway corridor in this area.

The former railway continues running north, crossing the east-west road at Ballygriffy. This crossing was the site of a level crossing, and a larger dwelling has been constructed on the site of the former railway cottage, north of the road. Ballygriffy Castle is located due east of the railway on approach to this road, on the opposite bank of the Poulacarry River. The railway corridor then turns northwest, where once again the corridor becomes well defined by vegetation. A section of the former corridor along here is in use as an access road/ trail for adjacent fields / farming operations. The adjacent road diverges, running east – west to join the R476

west of the corridor. The R476 in this area runs adjacent to the Ryan's quarry operated by Roadstone.

4.1.3 Bealnalicka to Ballycullinan

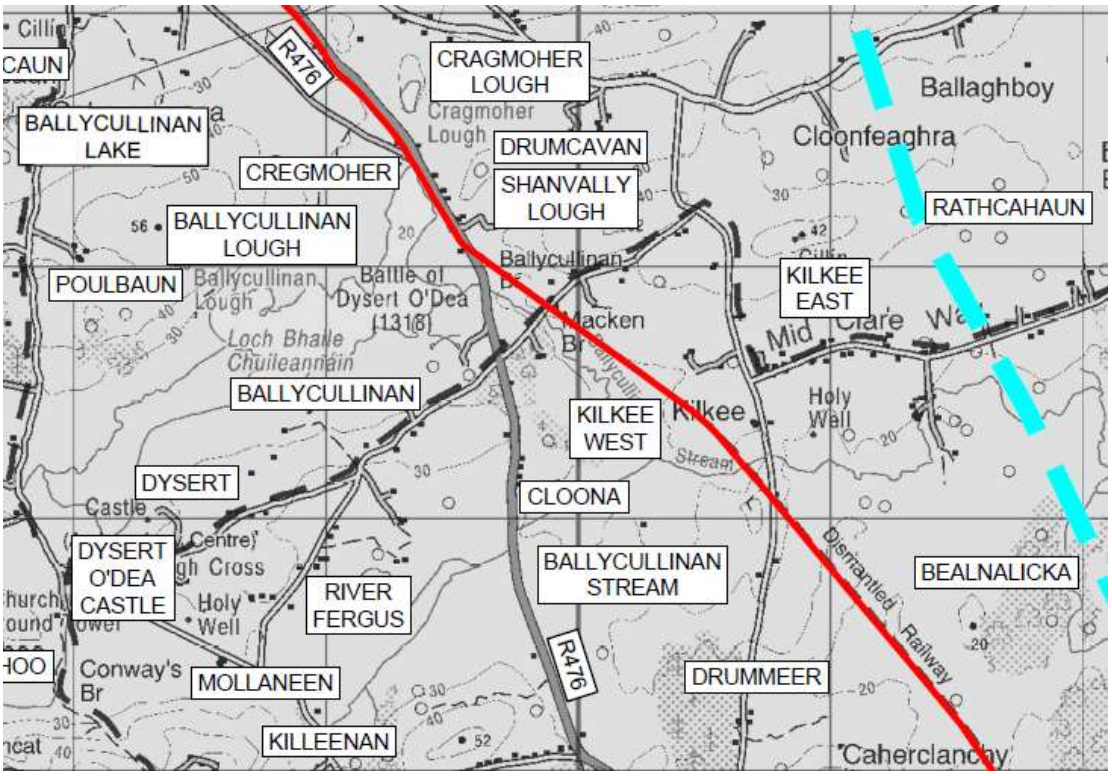


Figure 4-3 Bealnalicka to Ballycullinan

The former railway corridor continues northwest from the former Ruan station, now a private dwelling, towards Corofin, as shown in Figure 4-3. The former corridor crosses a local road of width ~5m at this location and continues in the northwest direction. The railway hedgerows are largely preserved for a subsequent stretch of ~1.6km. The former railway corridor includes a small overgrown bridge over Ballycullinan Stream and then passes through farmland and before crossing another local road of ~4-4.5m width.

Another former railway cottage has been extended and forms part of a private dwelling at this crossing location. The former railway corridor joins onto the main R476 road east of the lough at a former level crossing. Ballycullinan Stream runs to the south and west of the former railway corridor and flows into Ballycullinan Lough. The river is crossed via Macken Bridge to the south of the former local road crossing and railway cottage, and by the R476 via Ballycullinan Bridge.

4.1.4 Ballycullinan to Ballykinnacorra South, Corofin

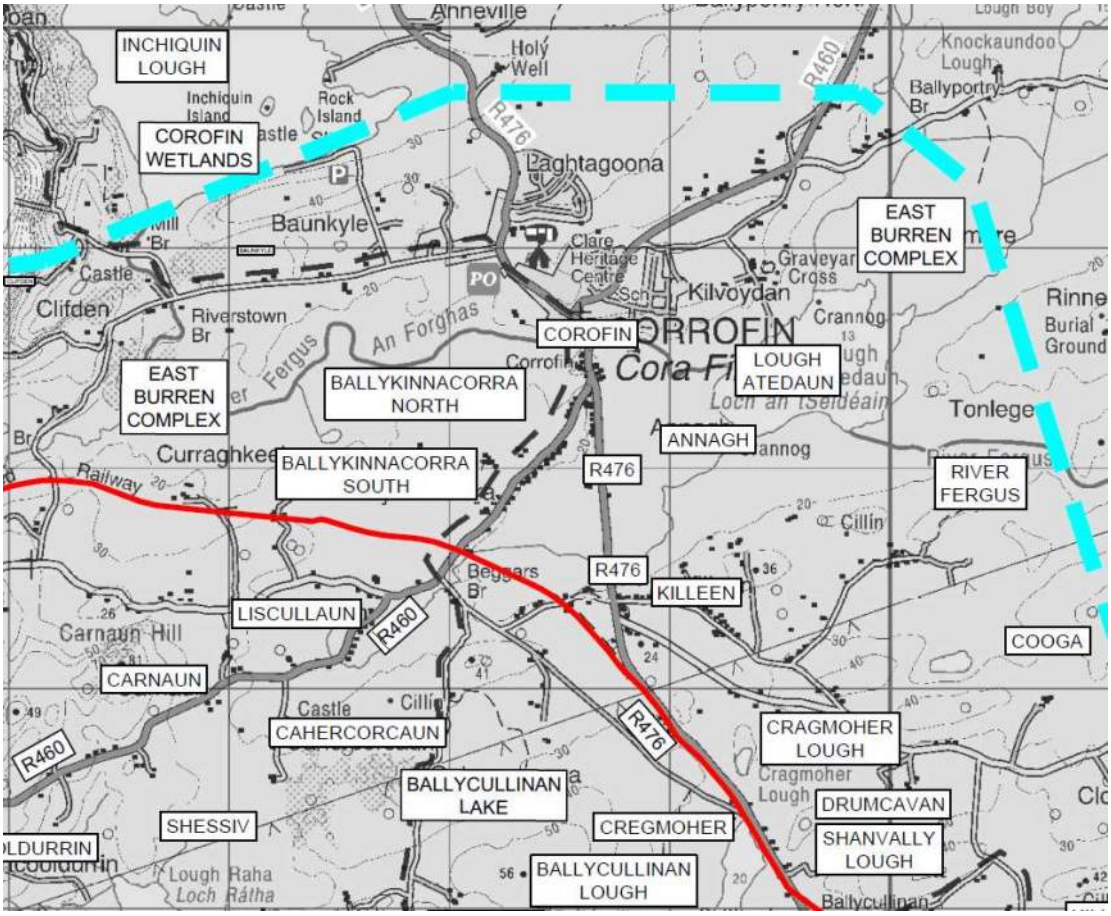


Figure 4-4 R460 and R476 to Corofin

The R476 then continues north to the town of Corofin, as shown in Figure 4-4. The railway curves to the west, continuing over agricultural land along field boundaries. The former railway corridor passes between ribbon development of private dwellings along the road while crossing over the 4.5m wide L1100. The railway corridor continues on to cross the R460 at Ballykinnacorra South. The former Corofin Station is located at this crossing, which is now a private dwelling.

The R460 continues north to Corofin where it joins the R476. Private development has taken place along this section of road into Corofin, in addition to a local national school. Further north, the R476 crosses the River Fergus on the route into the town. The river width ranges from 10m to 16m wide along this section. The Fergus flows into Lough Atedaun to the east, which is located just outside of the study area.

4.1.5 Ballykinnacorra South to Applevale

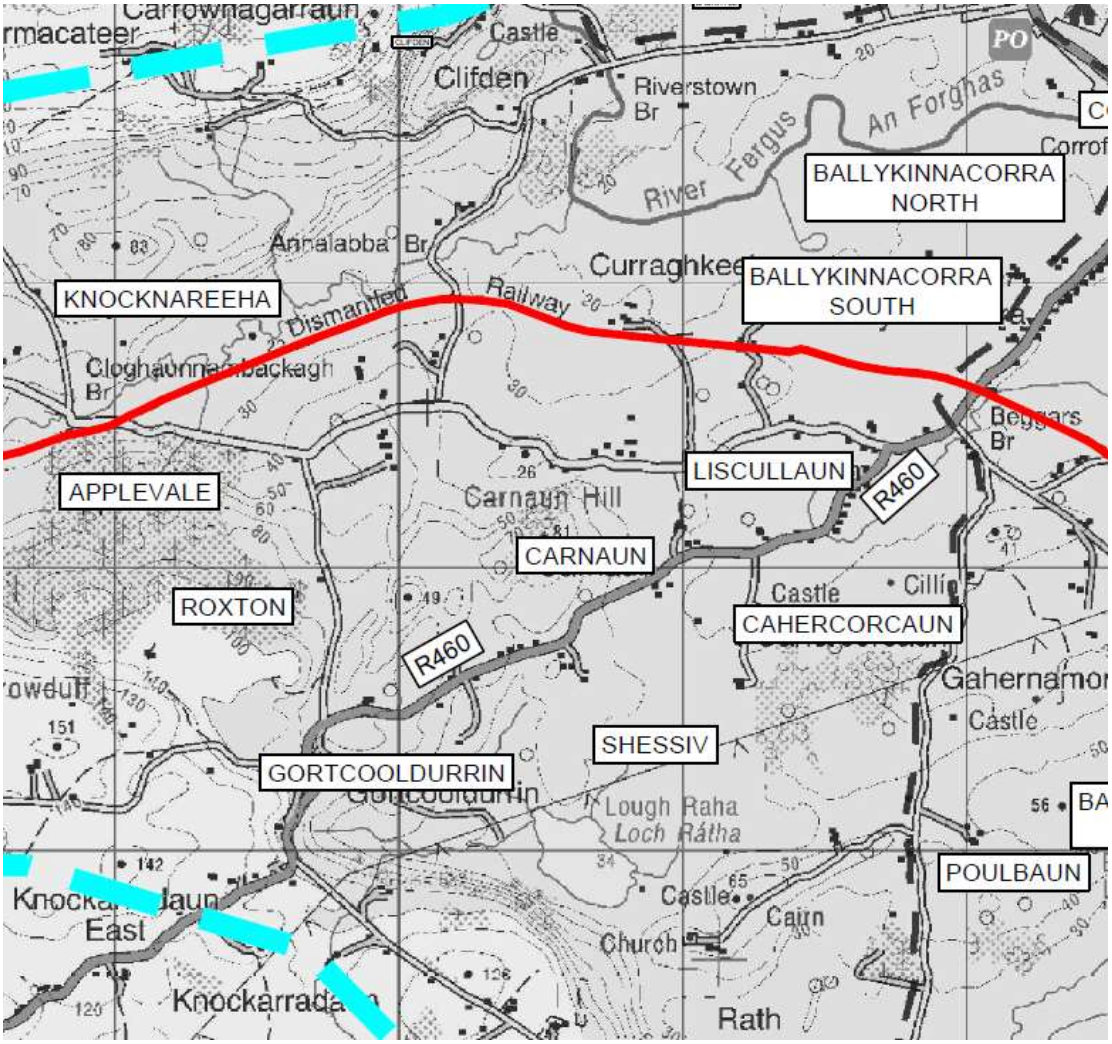


Figure 4-5 Former Railway line between Ballykinnacorra South and Applevale

The former railway corridor continues west from Ballykinnacorra South for approximately 750m through agricultural land, where the corridor is largely still intact. The railway corridor to the west of this has been completely dismantled for the following 700m as it passes through farmland and crosses 2 local access roads connecting several farmhouses, where the former route passes directly through the middle of a farmyard. The former railway corridor continues westwards through the farm, passing through another 230m of fields before crossing another local farm access road.

The railway corridor is again intact and well defined as it continues west towards Applevale. Part of the corridor appears to be in use along this section as an access route for farming. The railway crosses over a former level crossing of the Clifden road, which has a typical width of 4.5m, which runs north -south from Inchiquin Lough and to the St. Mary's Church junction. Here, the Clifden Road joins with the larger Liscullaun to Applevale road, which has a typical width of approx. 5.5m. This road runs from east – west; regular ribbon development can be found along this section.

The River Fergus runs parallel to the north of the railway corridor. The Fergus diverges to the south of Clifden, where it flows north, into Inchiquin Lough. The

southern branch of the river continues to run parallel with the railway corridor, to its north. The Clifden road crosses the river at a small approx. 12m long stone bridge.

4.1.6 Applevale to Tullaloughaun

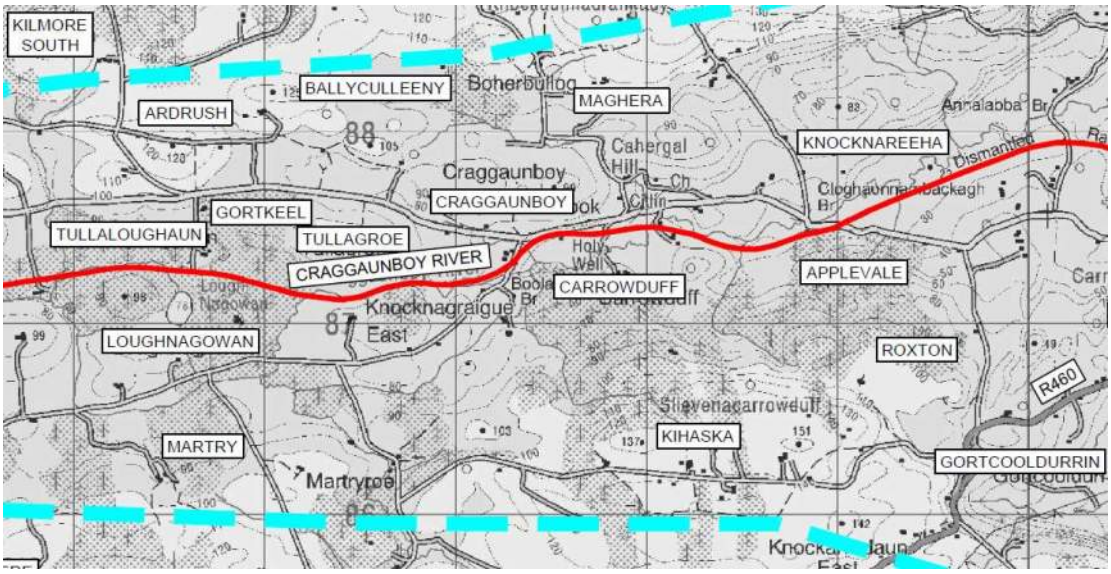


Figure 4-6 Former Railway line between Applevale and Tullaloughaun

The former railway corridor from Applevale to Tullaloughaun is largely intact as it continues west, through mainly agricultural land. It crosses over the Applevale to Craggaunboy road at a historical level crossing. The railway cottage at the crossing is now a private dwelling. The route continues west, bordered by dense forestry followed by farmland before reaching the site of the former Willbrook Station, which is now a private dwelling.

The railway corridor diverges further south from the main road at Craggaunboy. The main road forks in 2 at this point, where the northern road continues west towards Clooney and has a typical width of approx. 4.5m. The southern fork of the road heads toward Moanreel and has a typical width of approx. 3.5m. Very little development has taken place along either road.

To the west of the former Willbrook Station, the Craggaunboy River becomes the Loughnagowan River, which continues, directly adjacent to the former railway corridor. The railway corridor and river continue westwards through the forested area in Tullaloughaun. Lough Nagowan is located to the south of the former corridor, taking up an area of approx. 14,000 m^2.

4.1.7 Tullaloughaun to Cullenagh

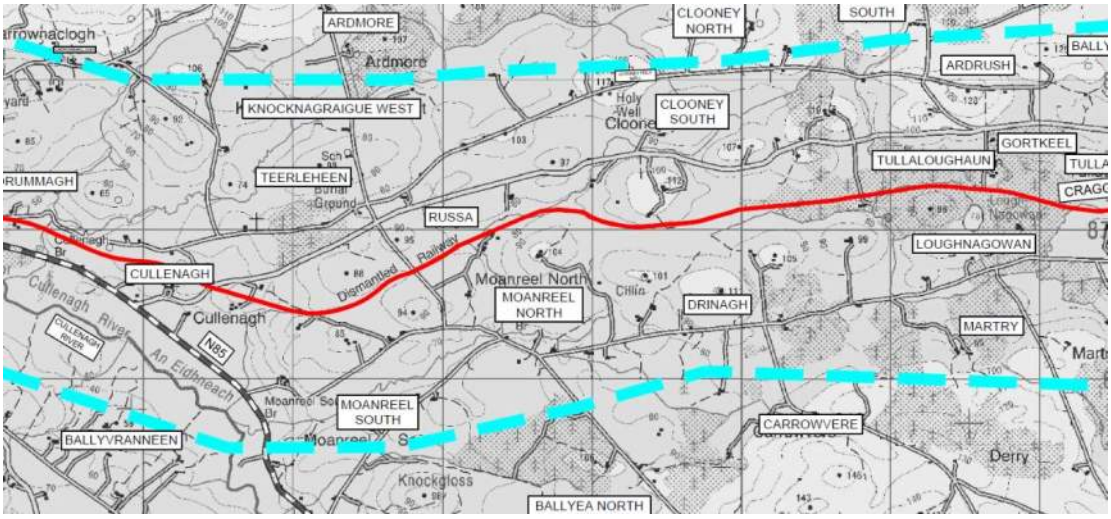


Figure 4-7 Former Railway line from Tulloughaun to Cullenagh

The former railway corridor continues west from the forest at Tulloughaun. The corridor in this general area has largely been completely dismantled by landowners as it passes through agricultural land. This is also the site of a historic, now disused, and backfilled, quarry. The railway corridor continues westwards, crossing the Ardmore to Moanreel road, which is approximately 3m wide. This road has a cluster of dwellings at Russa Cross and also further south, where it meets the wide east-west road at Moanreel.

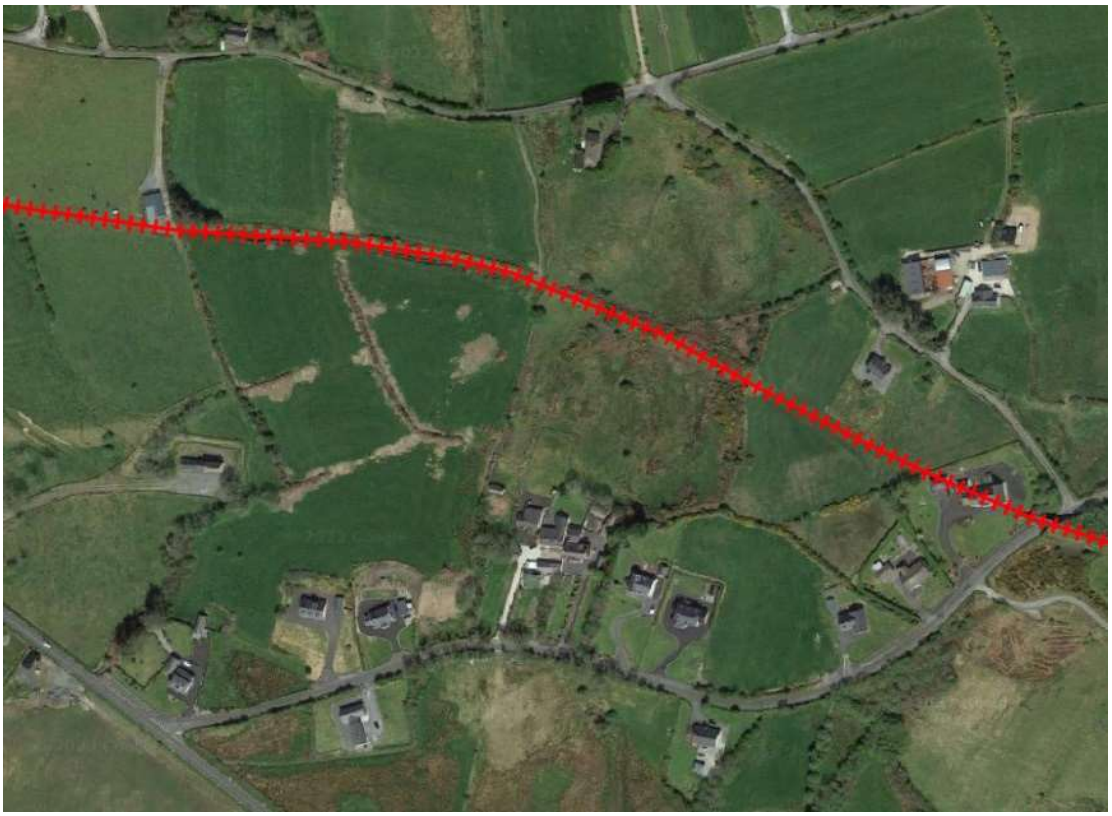


Figure 4-8 Cullenagh, Source: Google Maps

The former railway line crosses over the original 17m long stone railway bridge at Cullenagh leading into what is now a private dwelling and gardens, as shown in

Figure 4-8. The corridor is intact in places further west, where some of the original corridor is in use as an access road for farming. Other sections to the west of Cullenagh have had the corridor completely dismantled.

4.1.8 Cullenagh to Glen North

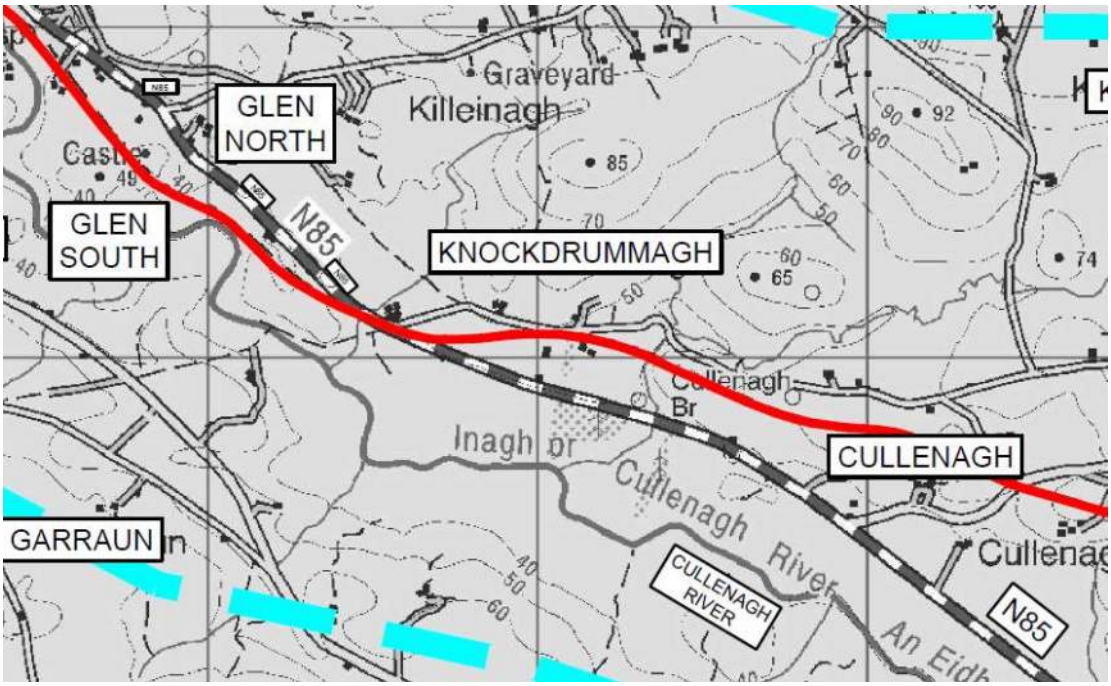


Figure 4-9 Former Railway Line from Cullenagh to Glen North

The Cullenagh River, N85 national secondary road from Inagh and the former railway corridor all follow a similar route, running parallel north and west into Ennistymon, as shown in Figure 4-9. The railway line crosses the N85 at Knockdrummagh South at the site of two former level crossings. This crossing point is also the junction with the Russa Road, where further development has taken place around a previous railway cottage. Some of the former railway corridor is still intact to the west of the crossing, on approach to the town of Ennistymon.

4.1.9 Ennistymon

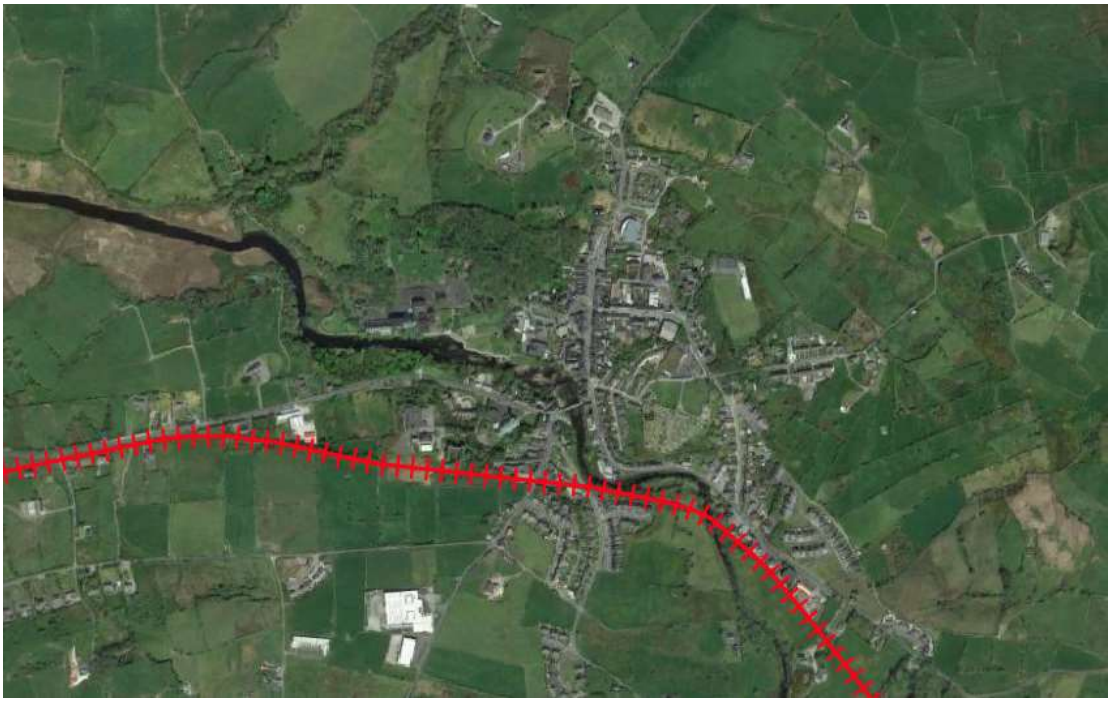


Figure 4-10 Former Railway Line entering Ennistymon, Source: Google Maps

The former rail line enters Ennistymon from the southeast, running to the south and west of the N85, shown in Figure 4-10. The rail line crosses the River Inagh to the south of the town. The bridge, while intact, is not currently in use and is in a state of disrepair. The former railway corridor continues behind the Cuirt Merriman housing development and over New Line Road via another disused bridge.

To the west of the bridge, the railway corridor has been completely redeveloped between the Ardnaculla development and Bogbere Street and Avenue houses. A short section of the corridor and associated hedgerows is intact as it passes behind Scoil Mhainchín, Ennistymon National School and the Mount St. Joseph's Convent before reaching the N67 as it leaves Ennistymon. Typical street widths within Ennistymon are between approximately 7m and 12.5m including footpaths. In the centre of Ennistymon the Cullenagh River is crossed via a bridge of length approx. from Main Street to the corner of Lahinch Road and Bogbere Street.

The railway passes through the site of a proposed retirement village development at the site of Mount St Joseph's Convent which received conditional planning permission (ref. 199333) in December 2019, and the demolition and new construction of a post primary school (ref. 17603). A scheme reconfiguration of Blake's Corner and a new associated crossing are currently in the planning process.

4.2 Watercourses

4.2.1 Watercourses within the Ennis area

The town of Ennis is located on the River Fergus, which flows from Lough Fergus in north Clare into the Shannon Estuary. The Inch River also joins the Fergus in Ennis. There are 5 existing bridges within the study area that cross the Fergus in Ennis – 3 to the south and 2 to the west of the town. The 2 crossings to the west, via Cusack Road and the Drumcliffe Road are approximately 800m apart. A new bridge for

active travel could potentially be constructed between these 2 existing crossing points.

The former railway bridge, which is currently disused, is situated approximately 600m to the north of the Drumcliffe Road bridge. There is potential for this bridge to be remediated and used as part of a greenway. There is only 1 crossing of the Inch River within the study area, located on the Lahinch / Cusack Road, due west of the bridge over the Fergus. There may also be an opportunity to provide a separate active travel crossing of this river to improve accessibility to the west of the town.

4.2.2 Watercourses within the Corofin area

The village of Corofin is also located on the River Fergus, which flows through Ennis to the south. The river is currently crossed by a single existing bridge, located to the south of the town. This bridge has a width of approximately 5.5m and does not have any footpath facilities. The bridge takes traffic from the R460 and the R467 which joins the R460 to the south of the town. To the east of the town is Lough Atedaun. The next closest crossing point of the Fergus is 2.5km to the west of the town, near Clifden.

Any active travel connection from the south to Corofin will likely require the construction of a new bridge, due to the constrained cross section of the existing bridge.

4.2.3 Watercourses within the Ennistymon area

The town of Ennistymon is located on the River Inagh, which flows northwest through the town before flowing west to Liscannor Bay, north of Lahinch. One bridge, "The Bridge" on Bridge Street crosses the Inagh in the middle of the town and has an approximate width of 7.5m. The bridge has a footpath on its southern side and carries traffic from the N67 national secondary road. The former bridge associated with the West Clare Railway is located to the south of the town and is in a substantial state of disrepair.

A scheme reconfiguring Blake's Corner and a new associated crossing are currently in the planning process, which, if successful would see a new bridge constructed to the south of the existing bridge.

4.2.4 Watercourses along the former West Clare Railway Corridor

The River Fergus / Cullenagh River is the main river that runs adjacent to the former railway corridor. Aside from the 2 former bridges highlighted in Ennis and Ennistymon, there are a series of crossings along the former rail corridor. To the north of Ennis, there are 2 crossing points of the Poulacarry River, one near Ballymaquiggan and the second just south of Ballygriffy. To the north of Ballygriffy, the railway passes between 2 bodies of water.

To the northwest of the former Ruan Station, the railway crosses a stream via a former bridge. The railway runs parallel to this stream as it heads north, as far as Ballycullinan Lough, located to the southwest of the corridor. As the railway turns west, it runs parallel to the River Fergus / Craggaunboy River. There are several smaller crossings in the vicinity of Applevale and Moanreel North that would require further investigation if and as required.

4.2.5 Other Watercourses of Note

Other large bodies of water and rivers that will require consideration for crossing and routing include Lough Cleggan, Ballycullinnan Lough, Lough Atedaun, Lough Raha, he River Fergus and its tributaries and the River Inagh.

4.3 Topography

The study area can be described as moderately flat from Ennis to Corofin and more varied to the west of Corofin. 10 metre contour lines were used to conduct a high-level analysis of the study area. Contours ranging from 10m of elevation to 160m of elevation were observed within the study area.

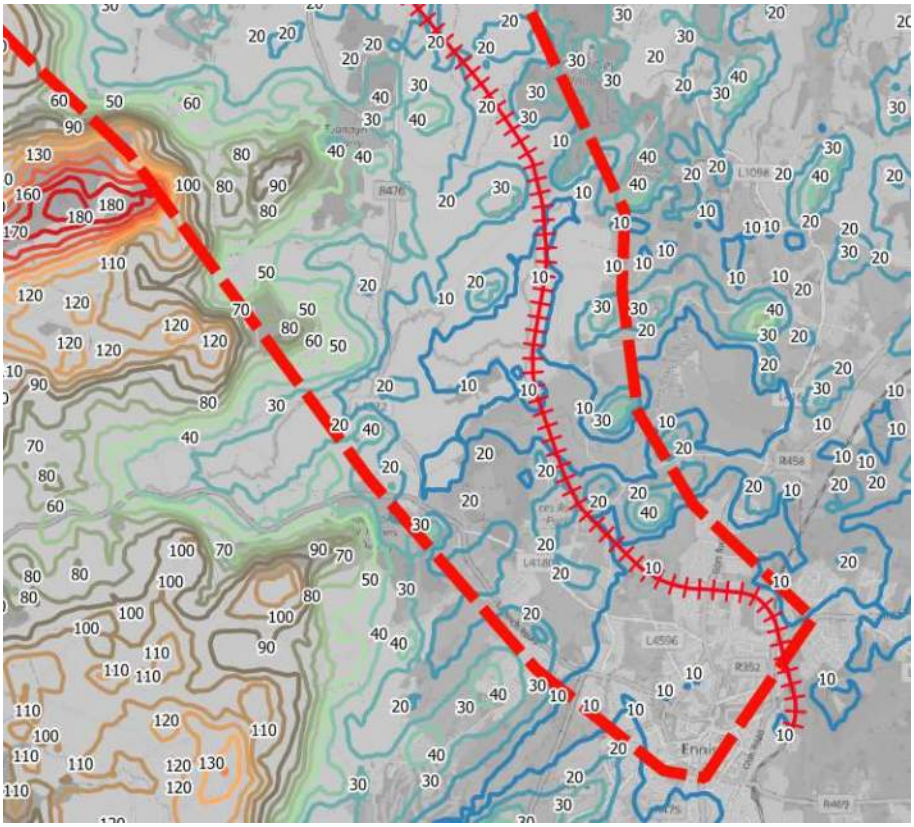


Figure 4-11 Topography Surrounding Ennis

In the vicinity of Ennis, the terrain is flat, with elevations around 10m within the town, rising to 40m in small areas heading northwards. The gradient and overall elevation is lowest around the former railway corridor. To the west of the study area, adjacent to Ryan's Quarry, the terrain starts to rise quite steeply. Careful consideration of any routing in this area is required that takes the gradient into account, as the hilly terrain in this area is largely unsuitable for the gentle gradient required for a greenway.

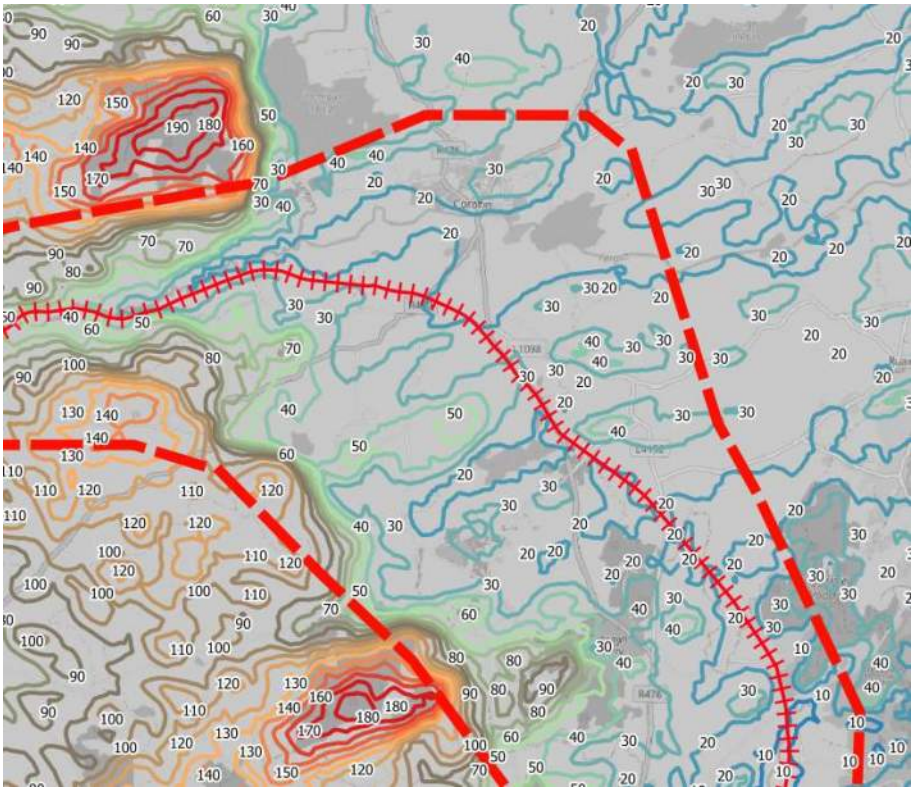


Figure 4-12 Topography Surrounding Corofin, Dysert

To the north of the quarry and to the east, the terrain is again largely flat towards Corofin. The terrain has some local undulations but is still largely suitable for a greenway. Again, to the west of the study area are bigger undulations, particularly bordering the west of the study area, to the southwest of Corofin, near Dysert and Rath. Routes along the southern border of the study area will prove challenging from a gradient perspective. The town of Corofin and its surrounds is also quite flat, with elevations between 20m and 30m largely within the environs of the town.

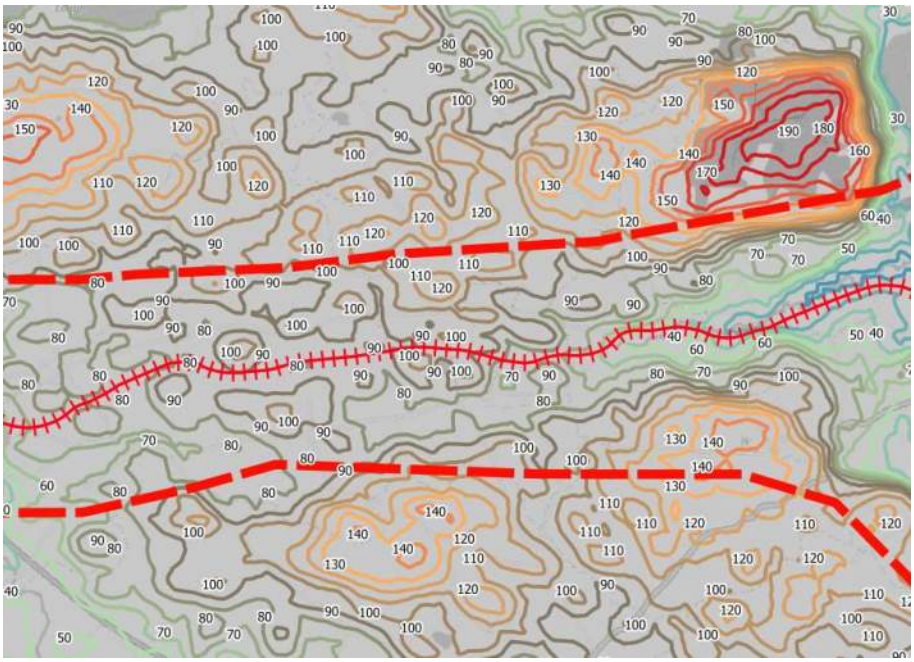


Figure 4-13 Topography Between Corofin and Ennistymon

To the west of Corofin the terrain becomes the most constrained. The River Fergus and railway run at 20-30m of elevation along a valley floor, which rises to the north and south of the river. As the corridor continues west, the terrain climbs to an elevation of 90m, which many hilly undulations throughout this climb. The terrain is steeper to the north and south of the river and rail corridor, so consideration must be given to ensure the gradient is acceptable for a greenway in this area in particular.

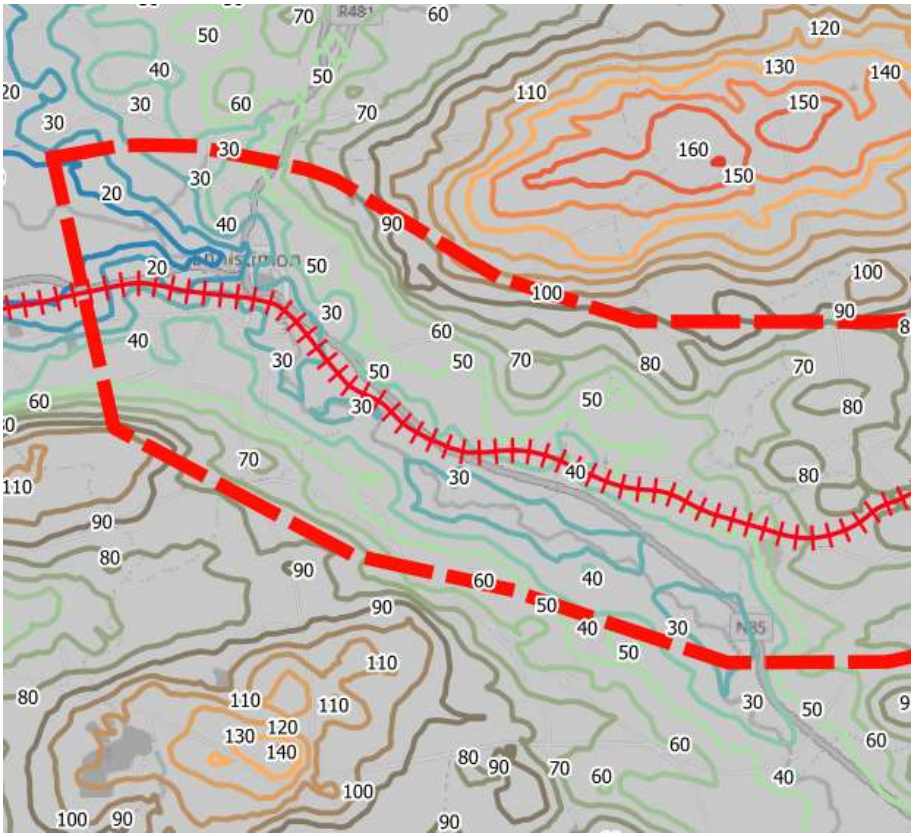


Figure 4-14 Topography Surrounding Ennistymon

From this high point, the terrain gradually falls away toward Ennistymon. Again, the study area is bounded to the north and south here by steeper terrain, particularly to the north. Similarly, in Ennistymon, the gradient increases rapidly to the east of the town, particularly to the northeast and should be taken into account when determining the final route and profile of the greenway.

5. ENVIRONMENTAL CONSTRAINTS

5.1 Population and Human Health

The study area between Ennis and Ennistymon is predominantly rural in nature with low population density between the towns and villages. In general, agricultural lands comprise the majority of the landscape, with dispersed residential dwellings located throughout the study area, frequently situated along regional and local roads.

5.1.1 Settlements and Land Use

Ennis

Ennis is located along the Fergus River, which runs east and then south into the Shannon Estuary. Ennis is recognized as the county's hub since it is the county's administrative, commercial, and industrial centre, and due to the town's proximity to Shannon International Airport, national roads, train lines, and bus links, all of which serve both residents and tourists. According to the Census 2016, Ennis had a total population of 25,276 people, 12,069 of whom were men and 13,207 of them were women.

The town centre is comprised of quaint, medieval lanes and alleyways that are obscured by buildings that date back more than a thousand years. Pubs, cafés, restaurants, supermarkets, stores, national and secondary schools, gas stations, take-out, post offices, banks, train and bus stations, garda stations, leisure sports facilities, pharmacies, and emergency services including hospitals, clinics, and recreational facilities are also available in Ennis. Ennis and the surrounding area have several varied land uses, as shown in Figure 5-1.

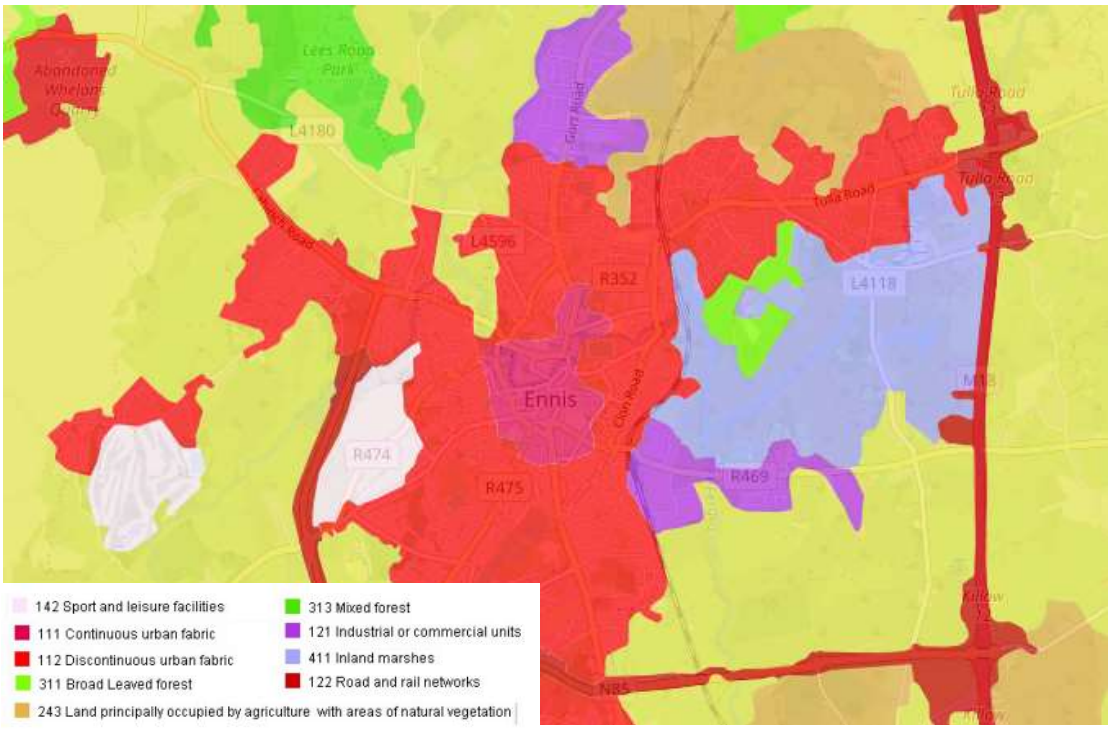


Figure 5-1 Ennis CORINE 2018 Land Use. Source: EPA, 2022

Corofin

Corofin is a historic settlement and large village on the Fergus River, approximately 13 km north of Ennis and 1.2 km north of the disused rail line that runs northwesterly / westerly from Ennis to Ennistymon.

Corofin features various distinctive native floras as well as an exceptionally rich network of prehistoric structures. The topography in the area surrounding Corofin is varied and comprises settled, working, and historic landscapes. Corine 2018 land use maps have classified the land use as discontinuous urban fabric within the village itself, as shown in Figure 5-2. The predominant land use outside of the village is pastures with an area classified as inland marsh located south of the village.

According to the census 2016, the total population in Corofin was 776 persons, 389 males and 387 females. Traditional pubs and restaurants, clinics, hospitals, schools, libraries, pharmacies, take-out restaurants, cafés, gas stations, neighbourhood supermarkets, and recreational playgrounds are a few of the services and amenities available in Corofin.

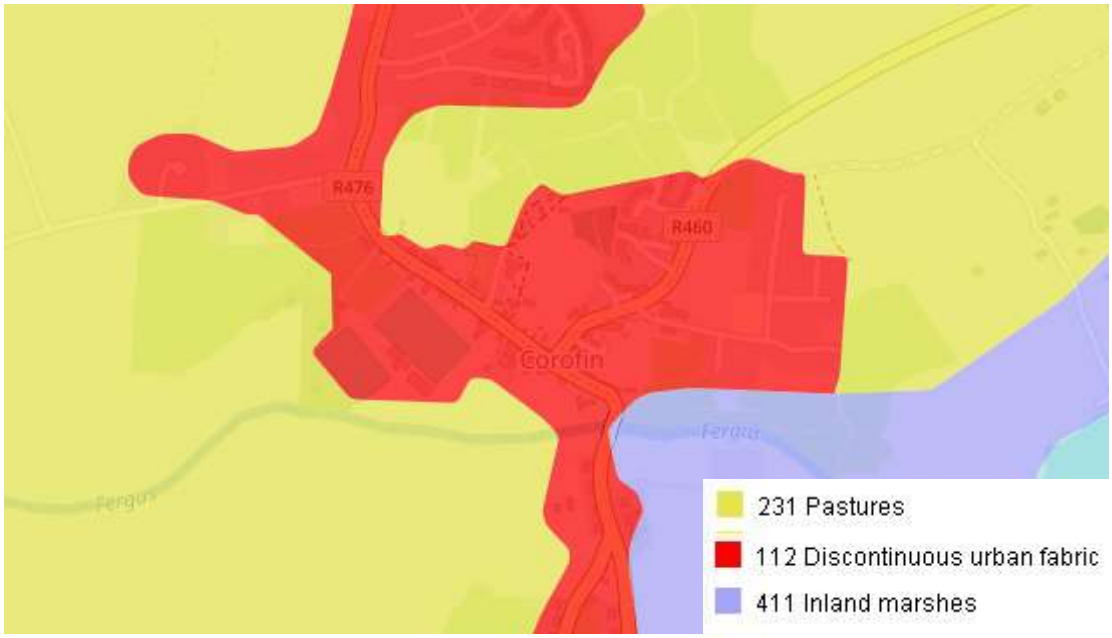


Figure 5-2 Corofin CORINE 2018 Land Use. Source: EPA, 2022.

Ennistymon

Ennistymon is situated in West Clare, on the Cullenagh River, and the junction of the N67 and the N85. The former West Clare Railway line historically crossed the N85 near Knockdrummagh South, approx. 2 km south of Ennistymon where sparse residential dwellings are situated. The former rail line approaches Ennistymon from the south east, crossing the River Cullenagh south of the town, before it passes south and west of Ennistymon, where it previously continued west to Clare's coastal towns and villages. Ennistymon is classified as a market town where most businesses have retained their old traditional shop fronts and doors and are also family-owned and run.

The town lies west of Corofin and east of Lahinch. It offers a wide array of facilities and amenities to the locals and tourists, including pharmacies, hospital, filling service stations, schools, pubs and restaurants, vets, convenience stores and markets, take-away, hair salons and barbers. Corine 2018 land use maps, see Figure 5-3 have

classified the land use as discontinuous urban fabric within the town itself and its immediate surroundings, while the predominant land use outside of the town is pastures. According to the 2016 census's small area population figures showed that Ennistymon had 1,045 people, including 509 men and 536 women.

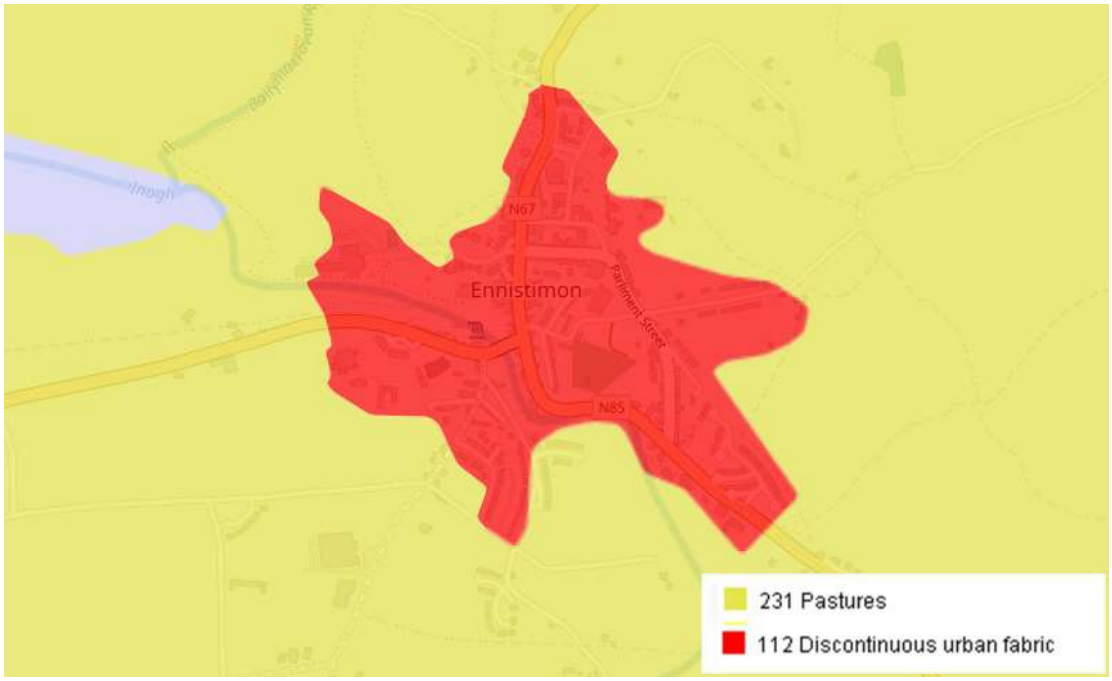


Figure 5-3 Ennistymon CORINE 2018 Land Use. Source: EPA, 2022.

5.1.2 Population Demographics

According to the 2016 Central Statistics Office (CSO) Census, Co. Clare had a total population of 118,817 people, including 58,785 males and 60,032 women. According to preliminary CSO Census demographic data from 2022, the population for Co. Clare has increased by 7.2% between 2016-2022, as seen in Table 5-1. The Southeast Regional Spatial and Economy Strategy (RSES), which has been adopted by the Southern Regional Assembly, states that Co. Clare is predicted to experience a rise in population based on demographic population predictions, which indicate that Clare will see a growth of between 129,500 and 131,500 persons by 2026 and a further increase from 134,000.

The study area is comprised of 16 Electoral Divisions (EDs), all of which encompass the proposed development's study area as shown in Figure 5-4. According to the Census (2016) there is a population of 30,644 within the study area.

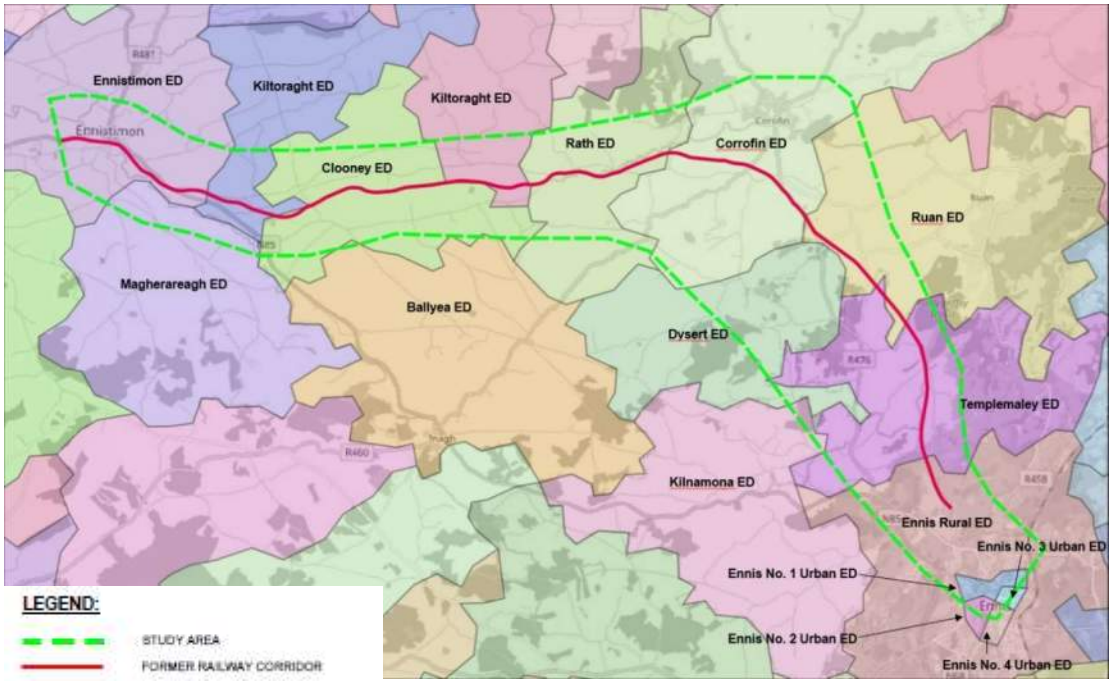


Figure 5-4 Electoral Divisions within Study Area

Table 5-1 Population Change between the 2016 and 2022 period (Preliminary CSO Census Results, 2022)

Region	2016 Population	(Preliminary Results) 2022 Population	Population Change	Population Change
State	4,761,865	5,123,536	361,671	11%
County Clare	118,817	127,419	8,602	7.2%

Age Profile

The proposed greenway would be an amenity and recreational resource for people of all ages. The age profile was determined by analysing Census 2016 data for the 16 EDs that comprise the study area. There is a considerable proportion of the population in the study area in the 0-14, 25-44, and 45-64 age bands, which is comparable to the age profiles of Co. Clare and the State. Hence, the percentage population in various age bands within the 16 EDs are comparable to the county and the State age profile as seen in Table 5-2.

Table 5-2 Age Profile (Census, 2016)

Region	Age Groups by % of the Population				
	0-14	15-24	25-44	45-64	65 +
State	21%	12%	30%	24%	13%
County Clare	22%	11%	26%	26%	15%
Study Area	22%	10%	29%	25%	14%

Principal Economic Status

The economic status of the population residing in the study area was determined and compared using CSO Census 2016 data. The study area is compared with County Clare as well as that of the State as seen in Table 5-3. 53.1% of individuals within the study area are 'at work,' similar to the county average and national averages. A significant percentage of the study area's population is retired (15.9%).

Table 5-3 Economic Status of Persons aged 15 and over (Census, 2016)

Region	Economic Status							
	At work	Looking for first job	Unemployed having lost or given up previous job	Student	Looking after home / family	Retired	Unable to work due to sickness or disability	Other
State	53.3%	0.8%	7.1%	11.4%	8.3%	14.5%	4.2%	0.4%
County Clare	53.1%	0.7%	6.8%	11.2%	8%	16.1%	3.8%	0.3%
Study Area Average	53.1%	0.8%	8.3%	9.8%	7.7%	15.9%	4.1%	0.3%

According to the Census 2016, the highest percentage of people at work are employed in 'Professional Occupations', followed by 'Skilled Trade Occupations' and 'Associate Professional and Technical Occupations' respectively within the study area, as shown in Table 5-4.

Table 5-4 Occupation of Population Within the Study Area (Census, 2016).

Occupation	Study Area Average [5]
Managers, Directors and Senior Officials	7.3 %
Professional Occupations	17.0 %
Associate Professional and Technical Occupations	10.4 %
Administrative and Secretarial Occupations	9.9 %
Skilled Trades Occupations	14.3 %
Caring, Leisure and Other Service Occupations	8.1 %
Sales and Customer Service Occupations	6.8 %
Process, Plant and Machine Operatives	6.1 %
Elementary Occupations	8.7 %
Not stated	11.1 %

Housing

According to Census 2016, there are 14,281 dwelling units within the study area. 81.9% are occupied dwellings, while 2.9% are temporarily absent, 4.4% are unoccupied holiday homes, and 10.8% are other vacant dwellings as shown in Table 5-5.

Table 5-5 Occupancy status of permanent dwellings Within the Study Area (Census, 2016)

Occupancy	Study Area Average [6]
Occupied	81.9%
Temporarily absent	2.9%
Unoccupied holiday homes	4.4%
Other vacant dwellings	10.8%

Travel to Work, School, or College

The travel patterns of the population to work, school, and college within the study area was compared to State and Co. Clare travel patterns, shown in Table 5-6. The percentage of people who commute by foot is slightly higher than the county and state average. The percentage of the population who use a bicycle in the study area is comparable with the county average but lower than the state average, while those who use private vehicles is slightly higher than the state average but comparable to county average.

According to CSO Census 2016 data, 81.2% of Ennis Urban No.4 ED residents commute on foot, representing the highest percentage in this category, whereas Rath ED has just 1.2% of its populations utilizing this mode of transportation, likely due to the ED's predominantly rural setting.

In contrast to other EDs in the study area, Templemaley ED has the highest percentage of residents using private automobiles at 81.4%, while Ennis Urban No.3 ED has the lowest percentage for public transportation use. The Rath ED has the largest percentage of people who use public transportation of all the EDs, at 3%.

Table 5-6 Travel to Work, School or College of Population aged 5 years and over (Census, 2016).

Region	Modes of Commuting					
	On Foot	Bicycle	Public Transport (Bus and Rail)	Private Vehicle	Do not Commute (work mainly at or from home)	Not Stated
State	8.9%	2.9%	8.9%	69.8%	4.8%	4.8%
County Clare	10.3%	1.1%	6.6%	73.3%	4.6%	4.2%
Study Area Average	13.1%	1.2%	4.5%	73.0%	3.1%	5.1%

5.1.2.1 Human Health Profile

The World Health Organization (WHO) defines human health as "*a state of complete physical,* mental *and social well-being and not merely the absence of disease or infirmity".*

According to the 2016 Census, 86% of the population in the study area reported having "good /very good" overall health, while 8.5% reported having 'fair' overall health. 1.7% of persons reported having poor or very bad health and 3.8% did not state, as indicated in Table 5-7. These results are comparable to the state average.

Table 5-7 Economic Status of Persons aged 15 and over (Census, 2016)

Region	General Health			
	Very Good /Good	Fair	Bad or Very Bad	Not Stated
State	87%	8.0%	1.6%	3.4%
County Clare	87.3%	8.3%	1.6%	2.8%
Study area average [7]	86.0%	8.5%	1.7%	3.8%

In 2015, Lenus, the Irish Health Repository carried out a countrywide health profile for the Health Service Executive (HSE) (Lenus, 2015a and b). The keys findings of the study for County Clare as follows:

County Clare

- Co. Clare is the thirteenth most affluent local authority area in Ireland, with 95% of the population ranging from affluent to marginally below average affluence.
- Co. Clare had the highest national incidence of female breast cancer and the lowest national incidence of female lung cancer, while the county's cancer mortality rate was lower than the national norm for all ages.
- Clare's overall birth rate was 14.4, while the birth rate among those under the age of 20 was 9.1, both of which were lower than national averages.
- Co Clare's breastfeeding rate, which was below the national average (46.6%) at 35.9%.
- Co. Clare had a higher-than-average immunisation uptake rate of 97% at 24 months for 3rd 6-in-1 and 94% for MMR1 at 24 months.

Health statistics displayed in Figure 5-5 below illustrate County Clare's highest mortality rate per 100,000 for the four primary causes of death from 2007 to 2012 for all age categories in comparison to Ireland, indicating that the highest incidence of fatalities are due to heart disease and stroke followed by cancer, respiratory disease, and to conclude injury and poisoning.

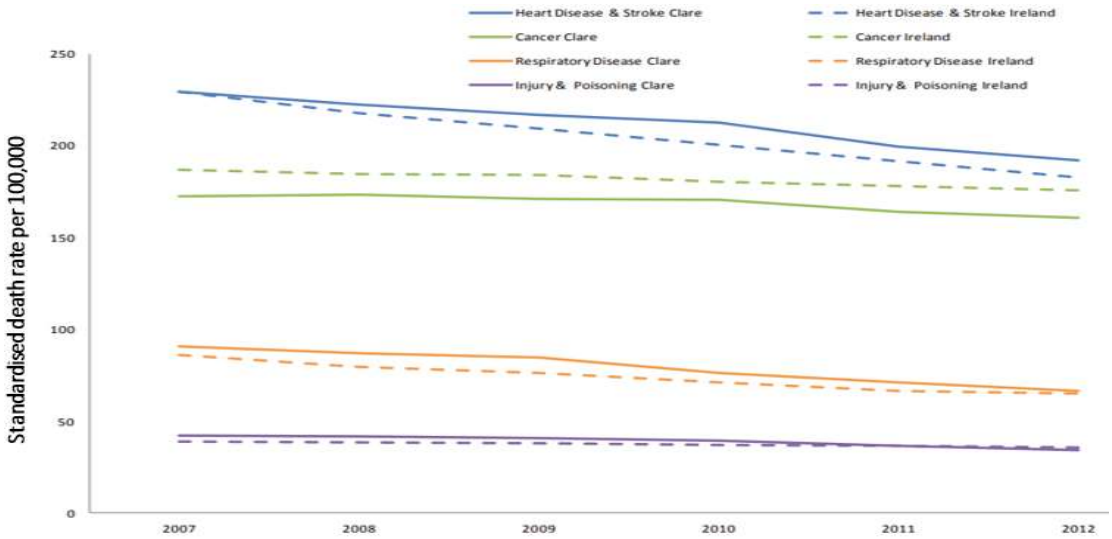


Figure 5-5 Death rate per 100,000 in Co. Clare for the four principal causes of deaths of all ages over the 2007 – 2012 period. Source: Lenus, (2015)

5.1.2.2 Human Health Considerations

Physical Activity

Get Ireland Active! 2018, The Department of Health's 'National Physical Activity Plan for Ireland', established weekly physical activity recommendations based on age groups as follows:

- Children and young children aged 2 to 18 should engage in at least 60 minutes of vigorous to moderate physical exercise every day.
- Adults aged 18 to 64 should engage in at least 30 minutes of moderate physical exercise each day, or 150 minutes per week.
- Older persons whom are 65 and up are advised to participate or engage in at least 30 minutes of moderate physical exercise every day, or 150 minutes per week.
- Children and adults with disabilities are encouraged to be as active as their limitations allow and to do their best to satisfy the requirements of each age group.

The national physical activity requirements for these age categories are not being met by a significant section of the Irish population, according to the 2017 Irish Sports Monitor (ISM) study. Only 32.6% of the population today meet the minimal level of activity. 66.2% of people who pursue an active lifestyle walk for enjoyment, 46.6% walk for transportation, and 11.1% cycle for transportation.

Furthermore, the 2017 ISM report shows that 13% of the Irish population leads a sedentary lifestyle. According to the World Health Organization (WHO), physical inactivity is responsible for approximately 3 million deaths globally. Sedentary lifestyles have been related to a variety of morbidities, including coronary heart disease, cancer, musculoskeletal disorders, and diabetes.

The 'Get Ireland Active! The National Physical Activity Plan for Ireland' (Department of Health, 2018), stated that sedentary lifestyle is believed to be responsible for:

- 8.8% of the burden of disease form coronary heart disease.
- 10.9% of type 2 diabetes.
- 15.2% of breast cancer.
- 15.7% of colon cancer.

A national initiative is in place to minimize sedentary habits among the Irish people and, as a result, any health consequences linked with this lifestyle. Get Ireland Moving! The "National Physical Activity Plan" specified Action Areas where active physical activity promotion can be addressed. For example, Action Area 4 pertains to the Environment, noting that "increasing the use of the natural and built environment, as well as supporting active transportation, are the most feasible and sustainable strategies to boost physical activity as part of daily routine".

Natural Environment and Wellbeing

Access to nature can be difficult for the majority of the Irish population, who live and work in urbanised settings. Many studies have shown that people have an inbuilt urge to connect with nature, known as Biophilia (Wilson, 1984), and that this connection typically has a good influence on wellbeing. Even brief interaction with nature has been connected to the induction of pleasant emotional states and hence has a favourable influence on an individual's happiness (Wilson, 1984). Furthermore, studies have indicated that persons who have access to nature near

their houses might function as a buffer against mental anguish, improving their life happiness (Capaldi et al., 2015).

Furthermore, access to nature has been shown to benefit people suffering from mood disorders such as depression (Berman et a., 2012). Nature has been proved to improve mood, as well as energise and motivate those suffering from various conditions.

Bathing Areas

Lahinch Beach on Clare's west coast is the closest designated bathing area to the proposed greenway (EPA Maps). The water quality of Lahinch Beach is classified as "Excellent water quality" in 2021, according to the EPA online mapping tool.

5.1.3 Local Amenities

The local amenities located within the study area are identified as seen in Table 5-8.

Table 5-8 Local Amenities within the Study Area

Type	Name	Townland
Schools	Ennistymon Vocational School	Ennistymon
	Scoil Mhainchín, Ennistymon National School	Deerpark west
	CBS Secondary School, Ennistymon	Deerpark middle
	Toonagh School	Toonagh
	Freckles Montessori	Ballykinnacora north
	Corofin Preschool	Laghtagoona
	Corofin National School	Kilvoydan
	Clouna National School	Teerleheen
	Scoil Chríost Rí	Ennis
	CBS Primary School	Ennis
	Rice College	Ennis
	St. Annes Special School	Ennis
	Gaelscoil Mhíchíl Cíosóg	Ennis
	Ennis Community College	Ennis
	Holy Family Senior National School	Ennis
	Ennis Educate Together	Ennis
	St. Clare's School	Ennis
	Ennis Montessori	Ennis
Churches	Drumcliff Church	Drumcliff
	St Bridget's Catholic Church	Corofin
	St Mary's Church	Roxton
	St Columba's Church	Teerleheen
	Rath Catholic Church	Roxton
	St. Joseph's Catholic Church	Ennis

Type	Name	Townland
	Franciscan Church of the Immaculate Conception	Ennis
	Christian Congregation in Ireland	Ennis
	St. Columbia's Church	Ennis
	Cathedral of Saints Peter and Paul	Ennis
	North Clare Community Church	Deerpark middle
	St. Andrews Church	Ennistymon
	North Clare Community Church	Ennistymon
	Our Lady and St. Michael's Church	Ennistymon
Post Offices	Corofin Arms Post Office	Baunkyle
	An Post Ennistymon	Ennistymon
	An Post Ennis	Ennis
	An Post Market Street	Ennis
Sports Grounds	Corofin GAA grounds	Baunkyle
	John O'Sullivan (Lees Road Sports and Amenity Park)	Drumcliff
	Ennistymon GAA Pitch	Ennis
	Ennis Tennis & Badminton Club	Ennis
	Cusack Park	Ennis
	All Weather Pitch	Ennis
Pharmacies	Rochford's Pharmacy	Baunkyle
	McGrotty's Pharmacy	Ennistymon
	Currans Pharmacy	Ennistymon
	O'Sullivan's Pharmacy	Ennis
	Haven Pharmacy Hollys	Ennis
	Rochford's Pharmacy	Ennis
	Duffy's Pharmacy	Ennis

5.1.3.1 Tourist Attractions

There is a wide range of existing tourist attractions within County Clare and its surrounding areas. The attractions provide access to a range of cultural heritage sites, natural historical landscapes and other facilities, as well as active domestic and foreign tourism activities including walking and cycling routes.

Dysert O'Dea Castle

The Dysert O'Dea Castle is located 6km south of Corofin. Diarmuid O'Dea, Lord of Cineal Fearmaic, built the Castle in 1480. The uppermost floors and staircase were severely damaged by the Cromwell forces in 1651, however, the castle was restored and reopened in 1986, and it now contains a comprehensive museum, an audio-visual show, and numerous exhibitions for visitors.

Visitors are accommodated by the onsite facilities which include a bookshop, tea rooms, car, and coach parking. As seen in Figure 5-7, the Dysert O'Dea Archaeology Trail, a 300m to 4km walk, allows visitors to explore the castle's

surroundings and see the 25 original field monuments that date back from 1000 BC to 1850 AD. These include medieval stone and earthen forts, fulacht fiadh, holy wells, proselytizing schools, Romanesque churches, 12th-century round towers, and medieval graveyards.

Figure 5-6 Dysert O'Dea Castle. Source: www.dysertcastle.ie

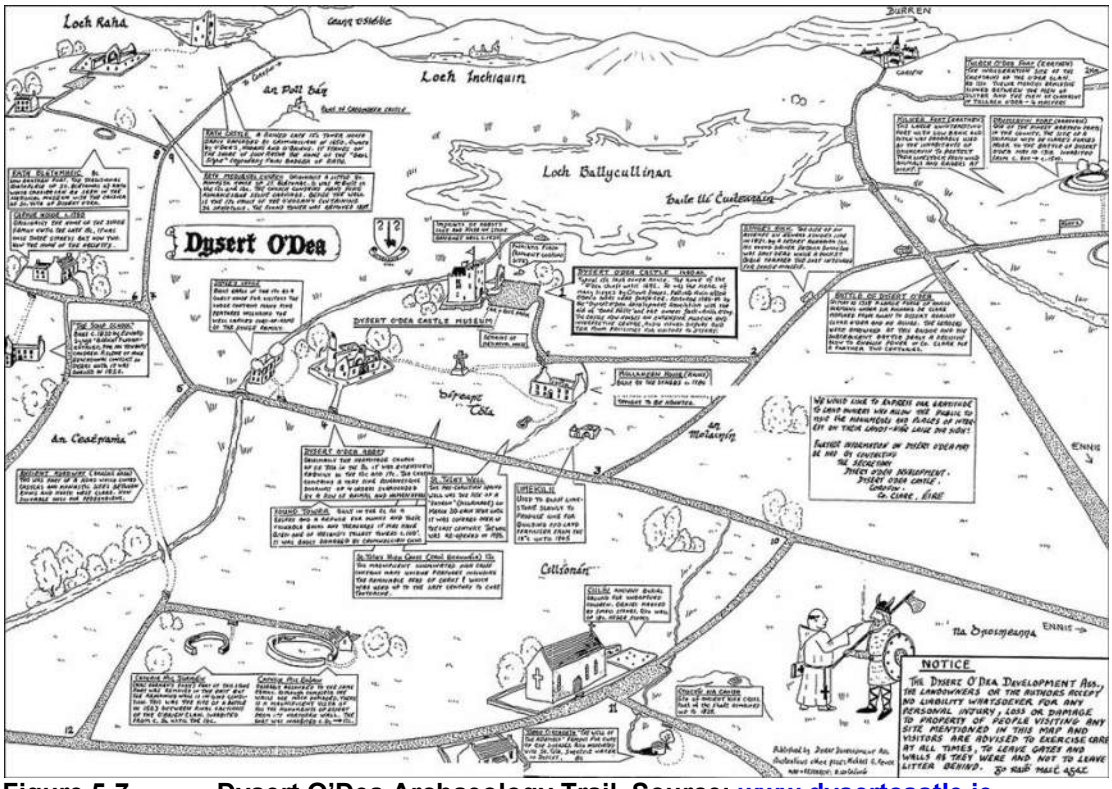


Figure 5-7 Dysert O'Dea Archaeology Trail. Source: www.dysertcastle.ie

Ennistymon Cascades

Ennistymon has incredible natural beauty, antique charm, and a flourishing local economy centred around the ancient bridge, making it a lovely place to visit and conduct business.

The Inagh River flows beneath the historic bridge, where it rushes over an extensive ridge of rocks, creating the famous falls, Ennistymon Cascades, that flow through the town behind the main street as seen in Figure 5-8. Since all restaurants and pubs are close by, the view of these cascades can be seen from the bridge or, more appropriately, from the riverside walkways.

Ennistymon is identified as a Key Service Town in the Clare County Development Plan 2017-2013 (As Varied). Most businesses have maintained their old traditional shop fronts and enterprises are owned and run by families to give both domestic and international visitors a wide choice of services and facilities.

Figure 5-8 Ennistymon Cascades on the Cullenagh River. Source: www.clare.ie

Rath Cemetery

Rath Cemetery is located approximately 1.3km south-west of Corofin in Ballyvauhgan, Co Clare. The cemetery features the remnants of a church erected by Mor Horgan as a burial place for himself and his descendants. The medieval church is comprised of a damaged roofless nave and chancel, with an access into an underground burial chamber beneath the memorial slab at ground level.

A Round Tower, Grave slabs, the remains of a freestanding font with a round basin inside the church's entrance, and stone sculptures from the 12th to the 16th century are also identified in the cemetery as seen in Figure 5-9

On the inner south wall of Rath Church, there are some 12th-century Romanesque stone sculptures. These include a carved head of a bishop, a windowsill decorated with foliage emanating from an animal's mouth in the centre and a Sheela-na-gig carving surrounded by "biting animals" which is an exhibitionist female figure whose purpose was to ward off evil.

Figure 5-9 Rath Cemetery. Source: www.docbrown.info

Clare Heritage and Genealogy Centre

The Clare Heritage and Genealogy centre is located in Corofin in Co. Clare as seen in Figure 5-10. The Heritage and Genealogy Centre was established in 1982 by the late Dr. Naoise Cleary. The museum is recognised both nationally and internationally due to its extensive collection of genealogical materials and record documents pertaining to the traumatic period of Irish history such as The Famine, as well as Census records of household occupants, Land-property, Civil records (Births, Baptisms, Marriages, and Deaths), traditional Irish language and music. This enables domestic and international visitors with ancestors from Co. Clare to trace back and seek information about their ancestral history from a vast collection of records dating back to the early 19th century.

Figure 5-10 Clare Heritage and Genealogy Centre. Source: www.clareroots.com

Walking Trails and Cycleways

There are many walking trails and cycleways around Co. Clare including some which occur within the study area for the proposed Ennis to Ennistymon Greenway. Connectivity between these walking trails and the West Clare Railway Greenway would furnace an opportunity to provide further connectivity across County Clare for local walkers and visitors to the area. The Mid Clare Way, also called the Foxglove way, or Slí na Méaracán in Irish, is a 150km route around Clare, with Ennis at its centre. The route is a mixture of forest tracks and road, boreen and bog, pathway and minor road and is considered of moderate difficulty. Renowned for its natural beauty, the route follows along river valleys and remote hills. The Mid Clare Way crosses through the study area between Corofin and Ennis.

Linking with the Mid Clare Way and the trailhead of Corofin village, in the north of the study area, is the Burren Way. This is a 123km trail located around the Burren landscape of North Clare. The Mid Clare Way and the Burren Way are also discussed in Section 5.6 below which looks at the Landscape and Visual constraints and opportunities within the study area and the route of these walkways are illustrated in Drawing *WCGW-ROD-EAC-S2-ML-DR-GI-200015* in Appendix A.

For a more family friendly and easier walk, as previously mentioned, the Dysert O'Dea Heritage walking route, south of Corofin, is a trail that spans 4.5km, with an additional spur to Rath Church bringing it to 9km. It encompasses many of the areas historical landmarks including the Dysert O'Dea Castle, a round tower and Romanesque church. To the east of the study area, near Ruan, is a 6km walking loop around the Dromore Woods that also links with the Mid Clare Way. This is a flat, forest trail with lake views, passing church ruins and O'Brien Castle.

There are no known existing cycleways within the study area. The Eurovelo 1 – Atlantic Coast Route primarily follows the coast around County Clare and therefore does not fall within the study area. It travels through Clarecastle to the south of Ennis, approximately 3km south of the study area and also through Lahinch, approximately 3.5km west of Ennistymon.

Natural Attractions

There are several natural tourist attractions within and immediately adjacent to the study area, including Ballycullinan Lake, Inchiquin Lough and Lough Atedaun. Within a 12km radius of Corofin are 12 lakes, making the area very popular for fishermen and tourists alike and the town has for decades been a centre for angling. Ballygriffey woods, which is a natural woodland, is also located within the study area. This is a secluded spot, popular for birding, hiking and running. North of the study area is the Burren National Park. Famous for its karst landscape and unique flora it has become an internationally famous attraction for Co Clare. The Wild Atlantic Way is located along the west coast of Ireland and includes locations along the west coast of Clare. The closest point of the Wild Atlantic Way to the proposed greenway is the town of Lahinch. There are active travel facilities in place currently along the Lahinch Road as far as Ennistymon, which users of the greenway will be able to access via local footpaths through Ennistymon town. This will provide connectivity to the Wild Atlantic Way from the end of the proposed greenway in Ennistymon.

5.2 Biodiversity

5.2.1 Introduction

This section provides an overview of the biodiversity constraints within the study area for the proposed road development, in accordance with the guidelines set out in TII's Project Management Guidelines (TII, 2019). The purpose of this study is to identify the areas of ecological significance within the constraints study area (CSA) which may form a constraint to the proposed development.

This section describes:

- The methodology used in identifying the biodiversity constraints.
- The receiving environment in the study area; and
- The biodiversity constraints within the study area.

5.2.2 Methodology

For this assessment of biodiversity constraints, a desktop study was conducted to gather information on available information on ecologically important sites and habitats located within the study area, which includes a combination of document review and analysis, as well as mapping to identify designated sites, protected habitats, and species that are prevalent.

The desktop study and evaluation of the ecological constraints within the study area was carried out using the following sources of information:

- Review of Ordnance Survey maps and of orthophotography.
- Environmental Protection Agency (EPA) online interactive mapping tools (https://gis.epa.ie/EPAMaps) and (https://www.catchments.ie/maps/) for water quality data including surface and ground water bodies quality status, and river catchment boundaries.
- The National Parks and Wildlife Service (NPWS) database, consulted for the designated areas of ecological interest and sites of nature conservation importance within and adjacent to the study area accessed online July 2022. (www.npws.ie).
- The National Biodiversity Data Centre (NBDC) database, consulted for records of rare, protected and invasive species for Irish National Grid 10km square R18, R28, R38 and R37 accessed online July 2022 (www.biodiversityireland.ie).
- GeoHive online mapping (http://map.geohive.ie/mapviewer.html).
- Bird conservation status in Ireland (Gilbert *et al.*, 2021).
- Geological Survey of Ireland – geology, soils, and hydrogeology (www.gsi.ie).
- Draft Clare County Development Plan 2023-2029.
- Clare County Development Plan 2017-2023.

5.2.3 Designated Sites

The Zone of Influence for designated sites encompasses the CSA and a buffer of 15km around it, as shown in drawing no. WCGW-ROD-EAC-S2-ML-DR-GI-200007 in Appendix A and considered the "source-pathway-receptor" model which considered the potential impact pathways connecting the proposed development to designated sites.

Designated sites fall into one of following categories:

- Special Area of Conservation (SACs) are strictly protected sites designated under the European Commission (EC) Habitats Directive.
- Special Protection Area (SPA) are strictly protected sites classified in accordance with Article 4 of the EC Birds Directive.
- Natural Heritage Areas (NHA) are considered important for the habitats that are present or which hold species of plants and animals whose habitat needs protection. These areas are afforded statutory protection under the Wildlife Amendment Act (2000).
- Proposed Natural Heritage Areas (pNHAs) are areas of wildlife and habitat importance which have not yet been statutorily proposed or proclaimed as NHAs. These locations were designated for preservation on a non-statutory list that was first published in 1995 and has since been updated.
- Nature Reserves are areas of importance to wildlife which are protected under the Wildlife Act 1976 (as amended). Most are in public ownership; however, some are in the ownership of non-governmental organisations or in private ownership.

5.2.3.1 European Sites

The Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive") and the European Parliament and Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds ("the Birds Directive") specify habitats and species that are important for conservation and require protection in a European context. This protection is provided in part through the designation of sites that provide notable examples of habitats or populations of species in a European context. Sites designated for wild birds are termed "Special Protection Areas" (SPAs) and sites designated for natural habitat types or other species are termed "Special Areas of Conservation" (SACs) and the complete network of European sites is referred to as "Natura 2000". These sites are presented in Table 5-9. These sites are generally referred to as "European sites". There are 26 European sites in the Zone of Influence, of which six are within the Constraints Study Area.

Table 5-9 European Sites within the Zone of Influence

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from CSA (km)
000036	Inagh River Estuary SAC	• Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Within the CSA
001926	East Burren Complex SAC	• Marsh Fritillary (*Euphydryas aurinia)* [1065] • Lesser Horseshoe Bat (*Rhinolophus hipposideros)* [1303] • Otter (*Lutra lutra)* [1355] • Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp.* [3140]	Within the CSA

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from CSA (km)
		• Turloughs [3180] • Water courses of plain to montane levels with the (*Ranunculion fluitantis)* and (*Callitricho Batrachion)* vegetation [3260] • Alpine and Boreal heaths [4060] • *Juniperus communis* formations on heaths or calcareous grasslands [5130] • Calaminarian grasslands of the *Violetalia calaminariae* [6130] • Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia* (important orchid sites) • Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] • Calcareous fens with (*Cladium mariscus)* and species of the (*Caricion davallianae)* [7210] • Petrifying springs with tufa formation (*Cratoneurion)* [7220] • Alkaline fens [7230] • Limestone pavements [8240] • Caves not open to the public [8310] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) [91E0]	
000016	Ballycullinan Lake SAC	• Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	Within the CSA
002246	Ballycullinan Old Domestic Building SAC	• Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]	Within the CSA
000014	Ballyallia Lake SAC	• Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150]	Within the CSA
002165	Lower River Shannon SAC	• Sandbanks which are slightly covered by sea water all the time [1110] • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Coastal lagoons [1150] • Large shallow inlets and bays [1160] • Reefs [1170] • Perennial vegetation of stony banks [1220] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (*Juncetalia maritimi)* [1410]	0.90km east of the CSA

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from CSA (km)
		• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] • Alluvial forests with Alnus glutinosa and Fraxinus excelsior *(Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] • Sea Lamprey (*Petromyzon marinus*) [1095] • Brook Lamprey *(Lampetra planeri)* [1096] • River Lamprey *(Lampetra fluviatilis)* [1099] • Salmon (*Salmo salar)* [1106] • Common Bottlenose Dolphin (Tursiops *truncatus*) [1349] • Otter *(Lutra lutra*) [1355]	
002247	Toonagh Estate SAC	• Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]	0.60km west of the CSA
000032	Dromore Woods and Loughs SAC	• Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150] • Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] • Limestone pavements [8240] • Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303] • Otter (*Lutra lutra*) [1355]	1.2km northeast of the CSA
000037	Pouladatig Cave SAC	• Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303] • Caves not open to the public [8310]	2.6km south of the CSA
002314	Old Domestic Buildings, Rylane SAC	• Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]	10km northeast of the CSA
002157	Newgrove House SAC	• Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]	10km east of the CSA
002318	Knockanira House SAC	• Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]	7.5km southwest of the CSA
000051	Lough Gash Turlough SAC	• Turloughs [3180] • Rivers with muddy banks with *Chenopodion rubri* p.p. and *Bidention* p.p. vegetation [3270]	10km south of the CSA
000064	Poulnagordon Cave (Quin) SAC	• Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303] • Caves not open to the public [8310]	10km southeast of the CSA

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from CSA (km)
002010	Old Domestic Building (Keevagh) SAC	• Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]	7km southeast of the CSA
000994	Ballyteige (Clare) SAC	• Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]	8.5km north of the CSA
000020	Black Head-Poulsallagh Complex SAC	• Reefs [1170] • Perennial vegetation of stony banks [1220] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] • Alpine and Boreal heaths [4060] • Juniperus communis formations on heaths or calcareous grasslands [5130] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] • Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] • Petrifying springs with tufa formation (*Cratoneurion*) [7220] • Limestone pavements [8240] • Submerged or partially submerged sea caves [8330] • Petalwort (*Petalophyllum ralfsii*) [1395]	10km northwest of the CSA
000054	Moneen Mountain SAC	• Turloughs [3180] • Alpine and Boreal heaths [4060] • *Juniperus communis* formations on heaths or calcareous grasslands [5130] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] • Petrifying springs with tufa formation (*Cratoneurion*) [7220] • Limestone pavements [8240] • Marsh Fritillary (*Euphydryas aurinia*) [1065] • Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]	8.5km north of the CSA
000057	Moyree River System SAC	• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] • Alkaline fens [7230] • Limestone pavements [8240] • Caves not open to the public [8310] • Lesser Horseshoe Bat (*Rhinolophus*	8.5km north of the CSA

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from CSA (km)
		hipposideros) [1303] • Otter (*Lutra lutra*) [1355]	
000019	Ballyogan Lough SAC	• Calcareous fens with *Cladium mariscus* and species of the C*aricion davallianae* [7210] • Limestone pavements [8240]	9km north of the CSA
004220	Corofin Wetlands SPA	• Little Grebe (*Tachybaptus ruficollis*) [A004] • Whooper Swan (*Cygnus cygnus*) [A038] • Wigeon (*Anas penelope*) [A050] • Teal (*Anas crecca*) [A052] • Black-tailed Godwit (*Limosa limosa*) [A156] • Wetland and Waterbirds [A999]	Within the CSA
004041	Ballyallia Lough SPA	• Wigeon (*Anas penelope*) [A050] • Gadwall (Anas strepera) [A051] • Teal *(Anas crecca*) [A052] • Mallard (*Anas platyrhynchos*) [A053] • Shoveler *(Anas clypeata*) [A056] • Coot (*Fulica atra*) [A125] • Black-tailed Godwit (*Limosa limosa*) [A156] • Wetland and Waterbirds [A999]	1km east of the CSA
004005	Cliffs of Moher SPA	• Fulmar (*Fulmarus glacialis*) [A009] • Kittiwake (*Rissa tridactyla*) [A188] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda)* [A200] • Puffin (*Fratercula arctica*) [A204] • Chough (*Pyrrhocorax pyrrhocorax*) [A346]	7.5km west of the CSA
004182	Mid-Clare Coast SPA	• Cormorant (*Phalacrocorax carbo*) [A017] • Barnacle Goose (*Branta leucopsis*) [A045] • Ringed Plover (*Charadrius hiaticula*) [A137] • Sanderling (*Calidris alba*) [A144] • Purple Sandpiper (*Calidris maritima*) [A148] • Dunlin (*Calidris alpina*) [A149] • Turnstone (*Arenaria interpres*) [A169] • Wetland and Waterbirds [A999]	12.5km south of the CSA
004077	River Shannon and River Fergus Estuaries SPA	• Cormorant (*Phalacrocorax carbo*) [A017] • Whooper Swan (*Cygnus cygnus*) [A038] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Wigeon (*Anas penelope*) [A050] • Teal (*Anas crecca*) [A052] • Pintail (*Anas acuta*) [A054] • Shoveler (*Anas clypeata*) [A056]	3km south of the CSA

Site Code	Site Name	Qualifying Interest Habitats and Species (*=Priority Habitat)	Distance from CSA (km)
		• Scaup (*Aythya marila*) [A062] • Ringed Plover (*Charadrius hiaticula*) [A137] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Lapwing (*Vanellus vanellus*) [A142] • Knot (*Calidris canutus*) [A143] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Curlew (*Numenius arquata*) [A160] • Redshank (*Tringa totanus*) [A162] • Greenshank (*Tringa nebularia*) [A164] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Wetland and Waterbirds [A999]	
004168	Slieve Aughty Mountains SPA	• Hen Harrier (*Circus cyaneus*) [A082] • Merlin (*Falco columbarius*) [A098]	8km northeast of the CSA

Nationally Designated Sites

Nationally designated sites comprise Natural Heritage Areas (NHAs), proposed Natural Heritage Areas (pNHAs) and Nature Reserves. There are six NHA, 21 pNHAs and one Nature Reserve within the Zone of Influence (Table 5-10).

Table 5-10 National Designated Sites within the Zone of Influence

Site Code	Site Name	Description	Distance from CSA (Km)
002397	Slievecallen Mountain Bog NHA	• Upland Blanket bog and associated supporting habitats	7.9 km south of the CSA
002439	Oysterman's Marsh NHA	• Lowland blanket bog and associated habitats, including a large freshwater reed swamp	7.5 km east of the CSA
002367	Lough Naminna Bog NHA	• Upland blanket bog and associated supporting habitats	15.0 km southwest of the CSA
002421	Lough Acrow Bogs NHA	• Upland blanket bog and associated supporting habitats	12.5 km southwest of the CSA
002400	Cragnashingaun Bogs NHA	• Lowland blanket bog and associated habitats	15.4 km southwest of the CSA
002442	Maghera Mountain Bogs NHA	• Upland blanket bog and associated supporting habitats	13.5 km east of the CSA
001331	Lough Cleggan	• East of the larger Ballyallia Lake lies Lough	Within the CSA

Site Code	Site Name	Description	Distance from CSA (Km)
	pNHA	Cleggan, a little freshwater lake. The lake is important for wintering wildfowl including Tufted Duck (*Aythya fuligula*) and Coot (*Fulica atra*), and it has a substantial reed fringe and a substantial stand of woodland (with *Corylus avellana, Salix spp*. and *Fvaxinus excelsior*).	
000014	Ballyallia Lake pNHA	• Refer to Ballyallia Lake SAC	Within the CSA
000036	Inagh River Estuary pNHA	• Refer to Inagh River Estuary SAC	Within the CSA
001926	East Burren Complex pNHA	• Refer to East Burren Complex SAC	Within the CSA
000016	Ballycullinan Lake pNHA	• Refer to Ballycullinan Lake SAC	Within the CSA
002048	Fergus Estuary and Inner Shannon, North Shore pNHA	• Refer to River Shannon and River Fergus Estuaries SPA	3.1 km southeast of the CSA
000037	Pouladatig Cave pNHA	• Refer to Pouladatig Cave SAC	2.6 km south of the CSA
001001	Cahircalla Wood pNHA	• Large area of woodland 1 km southwest of Ennis on a rocky hill. • The canopy is dominated by ash (*Fraxinus excelsior*) and hazel (*Corylus avellana*)	2.0 km south of the CSA
002091	Newhall And Edenvale Complex pNHA	• Refer to Newhall and Edenvale Complex SAC	2.6 km south of the CSA
000032	Dromore Woods and Loughs pNHA	• Refer to Dromore Woods and Loughs SAC	1. km east of the CSA
000038	Inchicronan Lough pNHA	• Medium sized lake • Fringing reed beds include Common Reed (*Phragmites australis*), Common Club-rush (*Schoenoplectus lacustris*) and Reed Canary-grass (*Phalaris arundinacea*).	5.8km east of the CSA
001021	Carrowmore Point To Spanish Point And Islands pNHA	• Refer to Carrowmore Point to Spanish Point and Islands SAC	12.0 km southwest of the CSA
000026	Cliffs of Moher pNHA	• Refer to Cliffs of Moher SPA	8.5km northeast of the CSA
000048	Lough Goller pNHA	• Lake surrounded by a fringe of Common Reed (*Phragmites australis*), Great Fen-sedge (*Cladium mariscus*) and several other sedge species (*Carex* spp.).	6.6km northeast of the CSA
001024	Caherkinallia	• Small area of WN1 oak-birch-holly woodland,	5.6 km northeast

Site Code	Site Name	Description	Distance from CSA (Km)
	Wood pNHA	which grows on the steep north-facing slope of an escarpment.	of the CSA
001008	Dromoland Lough pNHA	• Lake surrounded by a fringe of Common Reed (*Phragmites australis*) and Common Clubrush (*Schoenoplectus lacustris*)	7.7km southeast of the CSA
000051	Lough Gash Turlough pNHA	• Refer to Lough Gash Turlough SAC	10.3 km southeast of the CSA
000015	Ballycar Lough pNHA	• Small calcareous late situated approx. 1.5km north of Newmarket-on-Fergus,Co. Clare. • Fringing vegetation is rich and diverse with a range of reed, fen and marsh communities.	10.3 km southeast of the CSA
001010	Fin Lough (Clare) pNHA	• Small to medium sized calcareous lake • Fringing vegetation is diverse with good examples of fen, raised bog, heath and scrub habitats.	11.3 km southeast of the CSA
002054	Rosroe Lough pNHA	• small lake (a little over 3km long) in Co. Clare, in a shallow basin • bounded by Finn Lough to the west and a complex of limestone outcrops, scrub and • cultivated fields to the east.	12.5 km southeast of the CSA
001017	Lough Cullaunyheeda pNHA	• Medium sized lake in a low-lying area, surrounded by extensive cutover bog to the north and east.	13.0 km southeast of the CSA
n/a	Dromore Nature Reserve	• Approximately 1000 acres of (Mixed) Broadleaved Woodland	3.2 km east of the CSA

5.2.4 Fossitt Habitats

The habitats within the CSA were classified using aerial photography according to Julie A. Fossitt (2000) *A Guide to Habitats in Ireland* (Table 5-11). The most prevalent habitat types were improved agricultural grassland (GA1) and wet grassland (GS4). The CSA also has some dispersed forestry plantations as well as various natural or semi-natural habitats such as hedgerows, scrub, and mixed broadleaved woodlands.

Table 5-11 Fossitt (2000) habitat types within the CSA.

Habitat Name	Fossitt Code
Mixed broadleaved/conifer woodland	WD2
(Mixed) broadleaved woodland	WD1
Scrub	WS1
Immature woodland	WS2
Wet grassland	GS4
Dry calcareous and neutral grassland	GS1
Reed and large sedge swamps	FS1

Habitat Name	Fossitt Code
Rich fen and flush	PF1
Mesotrophic lakes	FL4
Dense bracken	HD1
Recolonising bare ground	ED3
Exposed calcareous rock	ER2

5.2.4.1 Ancient and Long-established Woodland

The Poulivaun wood is the only site within the Zone of Influence that is listed in the Ancient and Long-Established Woodlands Inventory (NPWS, 2010). The Poulivaun wood extends along the western and south-western shores of Lough Inchiquin and is situated 2 km west of Corofin. According to Fossitt, it is classified as WD2 Mixed Broadleaved/Conifer Woodland, where Ash (*Fraxinus excelsior)* occupies the majority of the woodland with Beech (*Fagus sylvatica*) abundantly dispersed throughout the woodland.

5.2.5 Watercourses and Waterbodies

Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (the Water Framework Directive or 'WFD') requires that each Member State protect and improve water quality in all waters so that good ecological status is achieved. Additionally, proposed actions (within discrete River Basin Management Plans) are also required, to secure national natural water resources for the future. The EPA is the competent authority responsible for monitoring, protecting, and improving the water environment in the Republic of Ireland.

In accordance with WFD guidelines, water quality 'Status' is assigned using a variety of available data on aquatic flora and fauna (including fish), the availability of nutrients, and aspects like salinity, temperature, and pollution by chemical pollutants. Morphological features, such as quantity, water flow, water depths and structures of the riverbeds, are also taken into account.

The original EPA water quality classification system (the 'Quality Rating System' or 'Q-values') is also used to assess water quality in Irish rivers, taking into account aquatic macrophytes, phytobenthos and hydromorphology. The Quality Rating System has been shown to be a robust and sensitive measure of riverine water quality and has been linked with both chemical status and land-use pressures in catchments. Individual macroinvertebrate species are ranked for their sensitivity to organic pollution and the Q-value is assessed based, primarily, on their relative abundance within a biological sample. A review of both the internal EPA Q-value status and WFD surface water status for the relevant watercourses was undertaken.

The EPA's online map viewer provides access to information at individual waterbody level in Ireland. Waterbodies can relate to surface waters (these include rivers, lakes, estuaries [transitional waters], and coastal waters), or to groundwater.

The constraints study area comprises the Shannon Estuary North catchment (Code: 27), Mal Bay catchment (Code: 28), and the sub-catchments of Inagh (Ennistymon) _SC020, Shallee SC 10, Fergus SC 020, Fergus SC 030, Fergus SC 040, and Fergus SC 050. The Environmental Protection Agency's (EPA) online map viewer indicates the River Ballymacravan (Ballymacravan 10) and 6 no. smaller

tributaries of the River Ballymacravan flow into the River Inagh within the CSA's western boundary. In the northeast of the constraints study area, the River Craggaunboy and 15 no. smaller tributaries, meets the River Fergus which flows through Corofin and into Lough Atedaun. The River Ballygriffey and 9 no. smaller tributaries join the River Poulacarry and flow into Ballyallia Lough, 700 meters east of the constraints study area's eastern boundary. As a result, the proposed development may have an impact on water quality inside the constraints study area.

The River Poulacarry, River Inagh (Ennistymon), and River Fergus (Fergus SC 030 and Fergus SC 050) were classified as 'Good' river quality based on The River Waterbody WFD 2010-2015. Whereas River Ballygriffey and River Fergus (Fergus SC 020 and Fergus SC 040) are classified as 'Moderate,' and River Ballymacravan and River Craggaunboy are classified as having 'Poor' river Quality.

Additionally, the EPA surface water monitoring programme developed a 'Q' values rating system which assess the status of a waterbody based on its ecological and chemical status: Q-rating of 5 classifies the water quality as being in a 'pristine, and unpolluted' condition, while a Q-rating of 1 is indicative of 'Gross pollution'. The EPA Q-rating classifies the water quality of the River Inagh as 'Good' (Q4), and was measured at a station on the western boundary of the CSA (Station Code: RS28I010450). The water quality of the River Fergus is classified as 'Moderate' (Q3-4) and was measured at a station on the northern boundary of the CSA (Station Code: RS27F010200). The water quality of River Ballygriffey is classified as 'Poor') and was measured at a station on the Eastern boundary of the CSA (Station Code: RS27S010500). The Inagh Estuary is classified as having a 'Moderate' status under the Transitional Waterbody WFD Status 2013-2018. The Liscannor Bay in west of the CSA is classified as having a 'High' status under the Coastal Waterbody WFD Status 2013-2018.

The Ennis groundwater body (IE SH G 080), Miltown Malbay groundwater (IE SH G 167), and Craggaunaboy groundwater (IE SH G 069) are all classified as 'Good' under the Ground Waterbody WFD Status 2013-2018. The aquifer within the CSA is classified as Regionally Important Aquifer - Karstified' and Locally Important Aquifer by the Geological Survey Ireland (GSI).

5.2.6 Protected and Invasive Species

The CSA lies within the Ordnance Survey 10km x 10km grid squares (hectads) R18, R28, R38 and R37. Records of rare, protected, and invasive species of flora and fauna from these grid squares were obtained from the National Biodiversity Data Centre (NBDC) in December 2022.

5.2.6.1 Birds

167 species of bird have been recorded in the hectads R18, R28, R38 and R37 including species listed on Annex I to the Habitats Directive, Red listed, and Amber listed species. There are a number of designated sites within the CSA which are designated for birds, including the Corofin Wetlands SPA, Ballyaillia Lough SPA and Ballycullinan Lake SPA, which highlights the importance of the CSA for birds, particular wetland birds. Bird surveys are required to establish the importance of the areas affected by the proposed development for both wintering and breeding birds.

5.2.6.2 Otter

Otter has been recorded on all of the major watercourses within the CSA. The Lower River Shannon SAC and the East Burren Complex SAC are designated for Otter. The project has the potential to impact Otter directly through habitat loss and

indirectly through habitat degradation, the pollution of watercourses and disturbance. An Otter survey is required along all watercourses affected by the proposed development to determine the presence of Otter within the CSA. This should be undertaken in accordance with the National Roads Authority (NRA) (2008) *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes.*

5.2.6.3 Bats

Lesser Horseshoe Bat (*Rhinolophus hipposideros*), Daubneton's Bat (*Myotis daubentonii*), Natterer's Bat (*Myotis nattereri*), Whiskered Bat (*Myotis mystacinus*), Brown Long-eared Bat (*Plecotus auritus*) Leisler's Bat (*Nyctalus leisleri*), Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*) were recorded in the relevant hectads. Lesser Horseshoe Bat is afforded additional protection and is listed on Annex II of the Habitats Directive. This species has a number of SACs designated for it within 15km of the CSA. Further, all bat species are listed on Annex IV of the Habitats Directive and the Fifth Schedule of the Wildlife (Amendment) Act 2000. Treelines, hedgerows, scrub, and woodlands have the potential to provide commuting, foraging, and roosting habitat for bats. A survey should be undertaken to determine the potential for roosting habitat for bats in the CSA prior to selection of a preferred route.

5.2.6.4 Badger

Badger is protected under the Wildlife Act 1976 (as amended) and are common and widespread in Ireland and it is assumed that Badger setts are present in the hedgerows and pockets of woodland in the CSA. The proposed development has the potential to impact badger during the construction stage of this project. A Badger survey should be undertaken prior to selection of a preferred route to determine the presence of Badger in the CSA. This should be undertaken in accordance with the National Road Authority (NRA) *Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes 2005*.

5.2.6.5 Red Squirrel

Red Squirrel is protected under the Wildlife (Amendment) Act 2000 and has been recorded in the woodlands along the route of the proposed development, at Drumcliff, Moymore, Ballycullinan and Clonee. The proposed development has the potential to impact this species though habitat loss, habitat degradation, habitat fragmentation, and disturbance. However, this species is very discreet and can be difficult to survey, thus findings from any future surveying may be unreliable as they are easily missed. As a result, vegetation clearance should be minimised where possible to retain useful habitat for Red Squirrel.

5.2.6.6 Other Mammals

Pygmy Shrew (*Sorus minutus*), Hedgehog (*Erinaceus europaeus*), Pine Marten (*M. martes*), Irish Hare (*Lepus timidus hibernicus*) and Stoat (*Mustela erminea*) have been recorded within the relevant hectads.

5.2.6.7 Amphibians and Reptiles

Common Frog (*Rana temporaria*) and Smooth Newt (*Lissotriton vulgaris*) were recorded within the relevant hectads. These species are ubiquitous throughout Ireland. These species rely on standing water including ponds and drainage ditches to breed and are vulnerable to the loss of these habitats particularly during spawning season.

The Common Lizard *(Zootoca vivipara*) was also recorded in the relevant hectads. This species is Ireland's only native terrestrial reptile and is widespread across the country in grasslands, heathlands, and woodland fringes.

5.2.6.8 Invasive Species

An invasive species survey of the preferred route should be undertaken to identify and map invasive species and provide recommendations to prevent the spread of these species during construction of the proposed development. Of particular concern are plant species listed on the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations, S.I. 477 of 2011 (as amended) ("the Habitats Regulations"). The following is a list of the species recorded in the relevant hectads and that could be encountered along the route:

- Brazilian Giant-rhubarb *(Gunnera manicata)*
- Himalayan Knotweed *(Persicaria wallichii)*
- Canadian Waterweed *(Elodea canadensis)*
- Japanese Knotweed *(Reynoutria japonica)*
- Giant Knotweed *(Fallopia sachalinensis)*
- Rhododendron *(Rhododendron ponticum)*
- Canadian Waterweed *(Elodea canadensis)*
- Zebra Mussel *(Dreissena (Dreissena) polymorpha)*
- Curly Waterweed *(Lagarosiphon major)*
- Nuttall's Waterweed *(Elodea nuttallii)*

As the management of some of these plant species is particularly onerous, consideration should be given to avoiding any stands where possible. Where stands cannot be avoided, best practice guidance should be followed to present the spread of these species. Best practice guidance includes Transport Infrastructure Ireland (TII) (2020) *The Management of Invasive Alien Plant Species on National Roads – Standard*, and *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance*.

5.2.7 Summary of Key Biodiversity Constraints

(1) The presence of watercourses which drain into European and nationally designated sites.

(2) The presence of bats and bat habitat in the CSA.

(3) The potential for invasive species in the CSA.

(4) The presence wintering and breeding birds in the CSA.

(5) Watercourses within the CSA.

(6) The presence of protected mammals such as Badger, Pine Marten, Red Squirrel and Otter in the CSA.

(7) Semi-natural habitats in the CSA including woodlands and limestone pavement.

5.2.8 References

Gilbert G, Stanbury A, and Lewis L (2021) Birds of Conservation Concern in Ireland 2020 –2026.

NPWS (2010) Ancient and Long-Established Woodland Inventory 2010. ArcGIS map viewer [Accessed 19th December 2022] National Parks & Wildlife Service, Department of Housing, Local Government and Heritage, Dublin.

5.3 Soils and Geology

A desktop assessment of the study area was conducted to assess and establish the baseline conditions. The desktop assessment consists of gathering all relevant geological data for the study area using the following sources of information from the consulted websites:

- Geological maps, Geological Survey of Ireland (GSI) (www.gsi.ie);
- Teagasc Subsoils map (www.gsi.ie);
- Protected areas, Biodiversity Ireland (maps.biodiversityireland.ie).
- Historic Maps from the Ordnance Survey of Ireland (www.osi.ie); and
- Aerial Photography from the Ordnance Survey of Ireland (www.geohive.ie).

5.3.1 Topography

The topography varies along this section of the former railway line moving in a general north-westerly direction from Ennis (in the south-east), via Corofin and towards Ennistymon in the north-west of the Study Area. The proposed development area is significant for its diverse topography, rivers, and loughs that are mostly oriented from the northeast to the southwest. The physical landscape in north-western regions of Clare is composed of medium and high elevation areas that are typically flat and suitable for agriculture.

The GSI map indicates that the highest point in the study area is Ardrush, west of Corofin, at 128m above sea level, whereas the areas surrounding Ennis, toward Corofin, and the area of Ennistymon have altitudes ranging between 3 & 58m.

The ground levels in Ennis are approximately 10 mOD [Malin] and increases to around 40 mOD [Malin] in Corofin. The ground along old railway line travelling from Ennis to Corofin is fairly level. After Corofin, the elevations rise continuously as the land becomes hillier. The levels reach approximately 75 mOD at Willbrook and continuously rise through forested areas to approximately 90 mOD until Clouna South, where the gradient eventually levels out.

The railway line then travels through boggy moorland with a gradual fall, where according to a cutting identified on the 1940s OS Map, there used to be a bridge. Continuing west towards Ennistymon, the ground gradually drops to 40 mOD Malin.

On the whole, surface slope angles appear to follow the underlying bedrock dip angles and are generally below 10 degrees.

5.3.2 Bedrock Geology

The existing bedrock geology of the proposed development site and the surrounding area has been identified from the Geological Survey of Ireland's (GSI's) geological online mapping, See drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200009 in Appendix A.

Bedrock dip angles are generally recorded as being low, with angles between zero degrees up to a maximum of around ten degrees across the study area. There are, therefore, fewer negative impacts on the stability of slopes as a consequence.

The geology to the east of the study area comprises predominantly marine shelf facies, limestone and calcareous shale of Palaeozoic era, dating from the Carboniferous period. The western end of the study area is underlain by fluvio-deltaic and basinal marine, shale, sandstone, siltstone and coal measures of Palaeozoic era, dating from the Carboniferous period.

The majority of the study area is underlain by the Gull Island Formation in the centre and the Central Clare Group in the west at Ennistymon. Whereas the Slievenaglasha Formation, Aillwee and Maumcaha Members, Burren Formation, Clare Shale Formation, and Magowna Formation compose the eastern section of the study area between Corofin and Ennis.

The area from north of Ennistymon towards the east to Corofin and down to south next to Ennis is underlain by the Gull Island Formation, which consists of grey siltstones with up to 20% sandstones at the base of the succession, decreasing towards the top.

East of this formation, running from Northwest of Corofin down towards the southern end of Ennis within the study area is the Clare Shale Formation, which is described as a condensed sequence of black shales with closely spaced layers rich in goniatites, underlain by shales with many phosphatic horizons, carbonate nodules, and chert. Northwest of Corofin towards the west of Ennis, the Clare Shale Formation is underlain by the Magowna Formation, which comprises dark limestones and shale. The Magowna Formation is one of the youngest beds of the Carboniferous Limestone, of late Brigantian age. The base of the formation is formed by a 0.1m think, black, shale overlying a coarse, calcarenitic limestone that is assigned to the Slievenaglasha Formation.

The areas from the north of Corofin down towards the south of Ennis are underlain by the Slievenaglasha Formation, which underlies the phosphates of the Magowna Formation and comprises cyclic crinoidal packstones to grainstones and dark grey wackestones.

The surrounding area of Corofin towards the south of Ennis is underlain by the Aillwee and Maumcaha Members, which are described as members of the Burren Formation and consist of a massive or thick bedded clean limestone. The Maumcaha Member comprises massive medium to pale-grey packstones, and the overlying Ailwee Member consists of cyclical 'terraced' units with thickly-bedded to massive steely-blue limestones (GSI, 1999).

The Burren Formation underlies areas from east of Corofin to the east of Ennis and is described as pale grey packstones and wackestones but also contains intervals of dark cherty limestone associated with oolitic grain stone. An area to the revised study area to the east and north of Corofin appears to comprise skeletal pale grey clean skeletal limestone of the Burren Formation.

The Central Clare group underlies the area of Ennistymon and towards the southwest of Ennis and comprises sandstones, siltstone and mudstone. The group is divided into five cyclothems, each consisting of a laminated shale unit with a thin (7-18m) marine band at the base, which coarsens upwards into a thick (35-80m) unit of massive grey siltstones overlain by thick-bedded, laminated and cross-bedded sandstones.

5.3.3 Karst Landforms

Karst is a type of geological feature characterised by caves, springs and other types of underground drainage resulting from the dissolution of the underlying bedrock formation. This typically occurs in areas of high rainfall with rock types vulnerable to dissolution, such as limestone. Occasionally, in areas underlain by limestone, the characteristics of the rock can affect how groundwater flows into or out of karstified areas, where soluble parts of the rock are gradually removed, mostly by chemical weathering leaving natural piping in the rock. At a local level, these can form depressions or develop into sinkholes where material is washed down through the resulting voids. In karst areas, a very complicated hydrogeologic system is most likely to occur, which can lead to turloughs, a seasonal drainage system that can flood following wet weather.

The GSI bedrock groundwater mapping has indicated that there are 47 no. karst landscapes and features which lie within the boundary of the study area. The most common type of karst landforms encountered by the route corridor are springs, with 25 no. discovered in the study area. Other karst landscape and feature types in the area include swallow holes and enclosed depressions.

The route locally crosses a dense complex of springs towards Ballygriffy North and Bealnalicka locations. The cluster of these karst landforms extends east outside the route corridor however, 25 no. springs are located within the study area, according to the GSI mapping. Similarly, 11 no. karst landforms interpreted as swallow holes, or sinkholes, are noted within the route corridor. The route corridor predominantly follows the old railway line that locally crosses a spring at Ballygriffy North and a swallow hole at Kilkee East, the location accuracy of these features based on GSI mapping is to within 50m.

The GSI mapping identifies 10 no. enclosed depressions within the study area. The flooding in that area is noted by the OPW Flood Map viewer and can be seen in drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200012 in Appendix A.

Table 5-12 Karst Landforms within Study Area

Type	Identifier Code	Name	Townland
Swallow Hole	1117NEK030	Poulacorey	Drumcliff
Swallow Hole	1117SEK037		Loughvella
Swallow Hole	1117NEK041		Soheen
Swallow Hole	1117NEK044		Bealnalicka
Swallow Hole	1117NEK046		Ballygriffy north
Swallow Hole	1117NEK042		Kilkee east
Swallow Hole			Drumcliff
Swallow Hole			Kilkurrish
Swallow Hole			Shessiv
Swallow Hole			Shessiv
Swallow Hole			Ballyteernau
Spring	1117NEK009	Toberavilla	Kilkee East
Spring	1117NEK012	Toberineenboy	Caherbannagh

Type	Identifier Code	Name	Townland
Spring	1117NEK013	Tobernamanaulin	Magowna
Spring	1117SEK022	Drumcliff Springs	Claureen
Spring	1117NEK022	Tobernacooha	Licknaun
Spring	1117NEK031		Fountain
Spring	1117NEK015	Toberanierin	Killeenan
Spring	1117NEK053	Rises	Ballygriffy North
Spring	1117NEK056	Rises	Carhoo
Spring	1117NEK057	Rises	Carhoo
Spring	1117NEK058	Rises	Knockaunroe
Spring	1117SEK038	Drumcliff North Spring	Drumcliff
Spring	1117NEK035		Rath
Spring	1117NEK037		Rath
Spring	1117NEK038		Carhoo
Spring	1117NEK039		Carhoo
Spring	1117NEK040		Mollaneen
Spring	1117NEK043		Bealnalicka
Spring	1117NEK045		Ballygriffy North
Spring	1117NEK048		Teeronaun
Spring	1117SEK021	Ballycorey Springs	Dulick
Spring	1117NEK073		Ballygriffy north
Spring	1117SEK03		Drumcliff
Spring	1117NEK036		Rath
Spring	1117NEK049		Ballyteernan
Enclosed depression	1117NEK007	Poulbaun	Poulbaun
Enclosed depression	1117NEK018	Poulnagrmpaun	Ballyteernan
Enclosed depression	1117NEK019	Poulnagat	Ballyteernan
Enclosed depression	1117NEK020	Poulmore	Ballyteernan
Enclosed depression	1117NEK016	Pulaphumpa	Kilcurrish
Enclosed depression	1117SEK019	Poulnambraher	Lifford
Enclosed depression	1117NEK010	Poulbealnalicka	Bealnalicka
Enclosed depression	1117NEK028	Poulaphucaun	Licknaun
Enclosed depression	1117NEK017	Poulavilleen	Ballyteernan
Enclosed depression	1117NEK009		
Cave			Kilcurrish

5.3.4 Mineral Localities

The GSI website identifies a small number of non-metallic Mineral localities which have been shown on drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200009 in Appendix A. Generally, the locations are broadly spaced throughout the study area:

- Drumcavan Townland Dimension Stone Limestone Outcrops as small scarp, and unlikely to be capable of yielding blocks suitable for commercial cutting.
- Ballybrody Townland Limestone Active limestone Quarry producing material for road and building construction and concrete products. Site damaged by blasting and therefore unlikely to be used for other aggregate sources.
- Ballyneilan Townland - Fountain Cross limestone quarry - probably Kinahan's Bushypark quarry - precise location unknown. A large aggregate quarry, blasting has occurred and therefore no potential for dimension stone production.
- Bushypark Townland – Non-metallic. Small veins of fluorspar on the limestone, noted on GSI 6" mapping.

5.3.5 Soils and Subsoils

The study area as shown in drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200011 in Appendix A, comprises Ennis, Corofin, Ennistymon, and the surrounding area between these three districts in the southwest of Co. Clare. The study area comprises poorly drained soils and deep well-drained minerals, according to the Teagasc Soil Maps[1].

According to the Teagasc Soil Maps in drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200011 in Appendix A, the surrounding areas located north and east of Ennistymon are underlain by the Kilrush soil association (700b), which is predominantly comprised of fine, loamy drift with siliceous stones as well as areas of fine loam over shale bedrock. Borrisoleigh (960c) is present in the south of Ennistymon which is predominantly composed of fine loamy over mudstone, shale, or slate bedrock.

Peat (1xx) is located along the west of the study area, particularly in northeast of Ennistymon and south of Corofin. Elton soil association (1000a) which is comprised of fine, loamy drift with limestone is present in areas southeast & southwest of Corofin and north of Ennis.

The Burren soil association (360a) is identified in a small area southwest of Corofin and is described as loamy over limestone bedrock. Crush soil association (360c) is identified north of Ennis and in a smaller area located southwest of Corofin. The River Fergus and Corofin are underlain by the Faoldroim soil association (1150c) which is described as fine loamy with limestone. This soil association has also been identified in disperse areas to the north of Ennis.

The receiving environment in Ennistymon and Ennis comprises Made Ground and is classified as Urban.

In terms of Quaternary sediments, the study area predominantly comprises till derived from Namurian sandstone and shale, till derived from limestones and Karstified bedrock outcrop or subcrop. According to GSI Maps[2], presence of

[1] Geological Survey Ireland Spatial Resources (arcgis.com)
[2] Geological Survey Ireland Spatial Resources (arcgis.com)

Alluvium is identified west of Corofin along the Craggaunboy River, and small areas of Alluvium are scattered within the surrounding areas of Ennistymon, particularly along the Cullenagh River. The presence of alluvial soils in the areas of Corofin and Ennistymon suggest recurring flooding activities from River Fergus and River Cullenagh in those areas. Estuarine silts and clays are prevalent in the area west of Ennistymon and in small areas in the environs of Corofin.

There are areas of blanket peat, cut over raised peat and fen peat are interspersed throughout the study area, within the areas surrounding Ennistymon and Corofin. These soils have high organic content, high compressibility and low shear strength which may be problematic for the construction of the greenway and therefore should be avoided where possible. Areas of bedrock outcrops or subcrops are scattered within the study area, predominately located east of Ennistymon. Karstified bedrock outcrops or subcrops are also present in significant numbers within the areas between Ennis and Corofin.

5.3.6 Vulnerability of Existing Soils

According to the GSI Landslide mapping, the majority of the study area is classified as having Moderately Low landslide susceptibility. Small areas to the north and southeast of Ennistymon have been identified as having Moderately High landslide classification. In contrast, small areas northwest of Ennis has been identified as having Moderately Low landslide susceptibility.

The GSI bedrock groundwater mapping has also revealed that there are many domestic and agricultural boreholes in the study area that are vulnerable to wall collapse, corrosion, and deterioration of water quality.

5.3.7 Geological Heritage Sites

The GSI audited geological heritage mapping has identified two County Geological Sites (*Audited* Status) within the study area approximately equidistant between the towns of Corofin and Ennis.

These include mushroom rocks and stones in Ballykinnacorra North (CE004) and Toonagh Quarry (CE042), which is an active limestone quarry. The Ballykinnacorra North site (CE004) comprises mushroom rocks, isolated wave worn stones in grazing fields. These are thought to have developed when lakes persist for long enough for water to dissolve the limestone beneath the lake's surface. This site has been designated a County Geological Site status and given an IGH (1) Karst theme of the GSI's IGH Programme (GSI, 2014).

According to the GSI County Geological Site Report, the Toonagh Quarry (CE042) is the best representative section in the country for the typical Clare Burren Formation, aside from the karstic exposures in the Burren. The site is of high importance as it has been assigned a County Geological Site status and is recommended for an NHA designation under the IGH (8) Lower Carboniferous theme of the GSI's IGH Programme (GSI, 2014).

5.4 Hydrology

The hydrological baseline conditions of the study area of the proposed development site were established during a desk study, which included consultation with the following:

- Geological maps, Geological Survey of Ireland (GSI) (www.gsi.ie);
- Groundwater quality status maps (watermaps.wfdireland.ie);

- Teagasc Subsoil map (gis.teagasc.ie);
- Environmental Protection Agency Map Viewer (www.epa.ie);
- Geological Survey of Ireland – Groundwater Body characterisation Reports;
- Aerial Photography from the Ordnance Survey of Ireland (www.geohive.ie);
- Met Éireann historical weather data (www.met.ie); and
- OPW CFRAM and NCFHM (www.floodinfo.ie).

The study area crosses two main catchments and many sub catchments as defined by the Water Framework Directive (WFD). The route of the West Clare Railway from Ennis to Ennistymon passes through the Shannon Estuary North and Mal Bay catchments and crosses surface water bodies at approximately 15 points.

The eastern section of the study area including Corofin and Ennis is located within the Shannon Estuary North catchment and is drained by the River Fergus and all streams entering tidal water between Thomond Bridge and George's Head, Co. Clare, draining a total area of 1,658 km². The largest urban centre in the catchment is Ennis. The Shannon Estuary North comprises 14 sub-catchments with 69 river water bodies, 26 lake water bodies, five transitional and five coastal water bodies, and 15 groundwater bodies. There is one heavily modified water body and no artificial water bodies in the Shannon North Estuary Catchment.

The western section of the study area from Ennistymon to Clooney South is located in the Mal Bay WFD Catchment. The Mal Bay catchment includes the area drained by all streams entering tidal water in Mal Bay and between George's Head and Black Head, Co. Clare, draining a total area of 848 km². The largest urban centre in the catchment is Lahinch. The other main urban centres are Milltown Malbay, Inagh, Ennistymon and Lisdoonvarna. The Mal Bay catchment comprises 7 sub-catchments with 37 river water bodies, four lakes, four transitional and four coastal water bodies, and four groundwater bodies. There is one heavily modified water body and no artificial water bodies in the catchment.

5.4.1 Watercourses

Rivers and streams were identified within the study area using EPA GIS information shown in drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200012 in Appendix A.

The following surface water bodies are identified as those crossed by the study area:

- Fergus_020
- Fergus_030
- Fergus_040
- Fergus_050
- Fergus_060
- Fergus_070
- Shallee_010
- Craggaunboy_010
- Inagh (Ennistymon)_050
- Ballymacravan_010

Within the Shannon Estuary North, the Shallee_010 flows primarily in easterly direction and joins the Fergus in the north before discharging into Ballyalia Lough.

Doonah 27 flows eastward into the Dromore Lough. From the centre of the study area, the Craggaunboy River and the smaller rivers joining it at various points (i.e., Tullagroe, Tullaloughaun, Tonlegee 27, Applevale, and Ballykinnacora) flows in the north easterly direction, before joining into the River Fergus _020 discharging into Lough Atedaun.

Further to the west of the study area within the Mal Bay catchment is the River Inagh_50 (a transitional waterbody) which flows predominantly westward, making its way through Ennistymon, is joined by the Ballymacraven River which outflows from Lickeen Lough. The Inagh River then becomes tidal and makes its way to sea via Liscannor Bay between the towns of Lahinch and Liscannor.

Other water bodies which lie within the study area but are not crossed by the route of the West Clare Railway are:

- Deerpack_Lower_28
- Ballyculinan Lough (lies in very close proximity to the route at Cregmoher).
- Lough Cleggan
- Lough Raha
- Lough Atedaun
- Lough Nagowan
- Inchiquin Lough
- Dromore Lough

5.4.2 Surface Water Quality

The Water Framework Directive requires that good water quality status is achieved for all waterbodies by 2027.

The water quality of lakes and rivers varies throughout the study area. Table 5-13 shows the WFD status of each water body over the five-year period covering 2016 to 2021, and the risk of each water body failing to achieve/ maintain good water quality status by 2027.

Table 5-13 Water quality of each water body within the study area.

Water Body	Status (2016 – 2021)	Risk (3rd Cycle)
Inagh (Ennistymon)_050	Good	At Risk
Craggaunboy_010	Poor	At Risk
Ballymacravan_010	Poor	At Risk
Shallee_010	Poor	At Risk
Fergus_020	Moderate	At Risk
Fergus_030	Good	Not at Risk
Fergus_040	Poor	At Risk
Fergus_050	Good	Not at Risk
Fergus_060	Poor	At Risk
Fergus_070	Moderate	At Risk

Only three water bodies (Inagh (Ennistymon)_050, Fergus_030 and Fergus_050) had a good water quality status between 2016 and 2021. The latter two are not currently at risk of losing this status, but Inagh (Ennistymon)_050 is at risk of losing this status. The other eight water bodies are yet to achieve good water quality status and are therefore at risk of not achieving this by 2027.

5.4.3 Drinking Water - Rivers

There are two surface waterbodies in the catchment identified as Protected Areas (Drinking Water- Rivers). These are the Fergus_040 and Fergus_070 water bodies.

5.4.4 Licensed Discharges

A number of licensed surface water discharges exist within the study area. These are summarised below:

- A licensed Industrial Emissions Licensing facility (Reg CD: P0771) is located approximately halfway between Corofin and Ennis.
- A licensed Industrial Emissions Licensing facility (Reg CD: P0061) is located in the north of Ennis.
- The Ennistymon Urban Waste Water Treatment plant agglomeration boundary (Reg CD: D0081) lies within the study area. A sewage treatment plant (treating sewage waste produced by >500 people) is located in the west of Ennistymon (Reg CD: D0081-01).
- The Corofin Urban Waste Water Treatment plant agglomeration boundary (Reg CD: D0434) lies within the study area. A sewage treatment plant (treating sewage waste produced by >500 people) is located in Corofin (Reg CD: D0434-01).
- The Ennis North Urban Waste Water Treatment plant agglomeration boundary (Reg CD: D0048) partially lies within the southern portion of the study area. A sewage treatment plant (treating sewage waste produced by >500 people) is located in the centre of Ennis (Reg CD: D0048-01).
- A Primary Effluent Emission Point (ID: TPEFF0300D0081SW001) is located in Ennistymon (E: 112447, N: 188682).
- A Primary Effluent Emission Point (ID: TPEFF0300D0434SW001) is located in Corofin (E: 128874, N: 188574).
- A Storm Water Overflow (ID: TPEFF0300D0434SW002) is located in Corofin (E: 128610, N: 188594).

5.4.5 Flooding

The majority of the study area is not within the areas associated with flooding according to Catchment Flood Risk Assessment and Management (CFRAM) River Flood Extents- Present Day and CFRAM Coastal Flood Extents-Present Day maps.[3] However, areas of Ennis adjacent to the River Fergus are at risk of both coastal and river flooding. There is a high probability of coastal flooding alongside the River Fergus. The high probability river flood extents are similar, but also extends to the area around the N85 national road. The low probability river flood extents cover residential areas within central Ennis.

The Office of Public Works (OPW) report on past flood events and flood risk areas. There are no known or reported flood events with the study area or in the adjacent

area[3]. The past flood event local area summary report[3] indicates that flooding occurred at Inagh River, Moananagh in January 2005 and this point is at least 2km upstream of the nearest point of the route corridor.

The National Indicative Fluvial Mapping -Present Day shows in drawing no WCGW-ROD-EAC-S2_ML-DR-GI-200012 in Appendix A that the following areas are at 'River- Low Probability' to 'River- Medium Probability' of flooding:

- Rinerrinagh to southeast of Ballygriffy south:
- Drummer to east of Cregmoher;
- West of Killeen to Ballykinnacorra south;
- Curraghkeel to Knocknagraigue east; and
- Southeast of Knockdrummagh south to Ennistymon.

5.4.6 Hydromorphological Pressure

Pressures have been identified for several waterbodies within the study area which are at risk of not meeting their WFD water quality objectives. Within the study area, agriculture and hydromorphology are the significant pressures which affects three water bodies, followed by forestry (2), urban waste water (2) and urban run-off (1):

- Ballymacravan_010: River Hydromorphology Pressures.
- Craggaunboy_010: River Agriculture Pressures and River Forestry Pressures.
- Fergus_020: River Agriculture Pressures and River Urban Run Off Pressures.
- Fergus_040: River Agriculture Pressures and River Forestry Pressures.
- Fergus_060: River Hydromorphology Pressures and River Urban Waste Water Pressures.
- Fergus_070: River Hydromorphology Pressures and River Urban Waste Water Pressures.

5.5 Hydrogeology

The baseline hydrogeological environment was established using the following sources:

- Environmental Protection Agency Map Viewer (www.epa.ie)
- Water Framework Directive (WFD)
- Catchments.ie
- Geological Survey of Ireland (GSI)

Information on the status of groundwater bodies underlying the area has been obtained from the GSI online mapping. The available information includes the aquifer classification data, well data, groundwater vulnerability classification, groundwater body description, groundwater body status, and source protection data. The aquifer classification along the route is illustrated on drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200013 in Appendix A. The study area is mainly underlain by the following bedrock as discussed in the above Soils and Geology section:

- Central Clare Group comprising Sandstone, siltstone & mudstone;
- Gull Island Formation comprising Grey siltstone & sandstone;

[3] https://www.floodinfo.ie/map/floodmaps/

- Clare Shale Formation comprising Mudstone, cherty at base;
- Slievenaglasha Formation comprising Cherty limestone, crinoidal intervals;
- Aillwee & Maumcaha Members comprising Massive to thick bedded clean limestone;
- Maumcaha Member comprising massive limestone sparsely fossiliferous; and
- Burren Formation comprising Pale grey clean skeletal limestone.

According to the Geological Survey of Ireland[4] (GSI), the majority of the study area, west of Knocknareeha is underlain by Locally Important Aquifer – Bedrock (i.e., Central Clare Group, Gull and Island Formation) which is Generally Moderately Productive only in Local Zones. The Clare Shale is classified as Poor Aquifer - Bedrock which is Generally Unproductive. The rest of the study area including Corofin and Ennis, is underlain by Regionally Important Aquifer - Karstified (conduit) comprising Slievenaglasha Formation, Aillwee & Maumcaha Members, Maumcaha and Burren Formation.

Drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200014 in Appendix A illustrates the groundwater vulnerability along the study area. The vulnerability varies significantly along the route corridor. The groundwater vulnerability is classified as 'low', 'moderate', 'high', 'moderate', 'extreme' and 'Rock at or near Surface or Karst' within the study area and is further described as follows:

- From Ennistymon to Craggaunboy, the majority of the study area lies within areas designated as low to moderate groundwater vulnerability. There are also minor areas designated as high, extreme and Rock at or near surface or Karst.
- From Craggaunboy to Ennis, the majority of the study area lies within areas designated as high, extreme and Rock at or near surface or Karst.

The WFD groundwater bodies underlying the study area are Milltown Malbay (Poorly productive bedrock), Craggaunboy (Poorly productive bedrock), and Ennis (Karstic). Each groundwater body is classified as "Good" (2016-2021 WFD Status). The risk of each groundwater body failing to achieve good water quality status by 2027 is currently under review.

5.5.1 Groundwater resources

A Public Supply Source Protection Area named Drumcliff_Springs PWS is overlain by the route corridor in the east as shown in drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200013 in Appendix A.

Drumcliff_Springs Public Water Supply (PWS) supplies water for the town of Ennis, Co. Clare. There are two main springs which rise within approximately 20 m of each other, here referred to as Drumcliff West and Drumcliff North, although a much higher flow discharges from Drumcliff North. The springs are located just outside the northern boundary of the Urban District Council (UDC) jurisdiction, on the western bank of the River Fergus between the Drehidnagower and Railway bridges[5].

5.5.2 Groundwater Recharge

In the western parts of the study area, between Ennistymon and Corofin, the recharge rate is generally less than 200mm/yr. Recharge rates are generally higher

[4] Geological Survey Ireland Spatial Resources (arcgis.com)
[5] PUBLIC SUPPLY (dccae.gov.ie)

than this in the eastern parts of the study area, with maximum values up to 800mm/yr. Isolated pockets of basin peat exist throughout the study area with recharge rates less than 50mm/yr.

5.5.3 Water Dependent Habitats

Several Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are located within the study area. These are listed below:

- The Inagh River Estuary SAC (Site Code: 000036) is located to the west of Ennistymon.
- The East Burren Complex SAC (Site Code: 001926) is located around Corofin.
- The Ballycullian Lake SAC (Site Code: 000016) is located south of Corofin.
- The Toonagh Estate SAC (Site Code: 002247) is located approximately halfway between Corofin and Ennis,
- The Ballyallia Lake SAC (Site Code: 000014) is located to the north of Ennis.
- The Lower River Shannon SAC (Site Code: 002165) is located in central Ennis and extends south to the River Shannon estuary.
- The Corofin Wetlands SPA (Site Code: 004220) is located around Corofin.
- The Ballyallia Lough SPA (Site Code: 004041) is located to the north of Ennis.

5.5.4 Karst Hydrogeological Features

Several karst landfroms are located in the south-eastern parts of the study area. These include approximately eight enclosed depressions, around 20-25 springs and approximately 11 swallow holes, as shown in drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200012 in Appendix A.

5.6 Landscape and Visual

5.6.1 Guidance

The identification of landscape and visual constraints includes guidance from the following sources:

- Landscape Institute and the Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (hereafter referred to as the GLVIA).
- TII (2020). Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of Specified Infrastructure Projects - Overarching Technical Document.
- Department of Tourism, Transport and Sport (2018). Strategy for the Future Development of National and Regional Greenways.
- TII (2022) Rural Cycleway Design (Offline & Greenway).
- Clare County Development Plan 2017-2023 and Draft 2023-2029.

5.6.2 Greenway Characteristics and Objectives

The proposed Greenway will generally be designed in accordance with the TII Rural Cycleway Design Standards with a 3m wide bound or unbound surface, with a bound surface more appropriate to the urban areas. Access will be provided at certain points, and 'hubs' will be provided in the towns and villages close to existing amenities which will include cycle parking and route information. Ancillary facilities such as additional parking and toilets, etc. will also be provided. Road crossings will

be provided, and bridges may be necessary along the route. Signage and route fencing/railings will also be provided where necessary.

This description of the proposed development describes a proposed walkway and cycleway that is benign and overall is likely to be low in terms of its potential landscape and visual impact, with some potentially more noticeable features as well as interfaces with private properties that require more careful consideration.

The identification of opportunities and constraints also includes the consideration of the nature of this development, which is by its nature, less intrusive than many other forms of development. In this regard, this feasibility study which identifies constraints, in landscape and visual terms, is as much about highlighting opportunities to maximise positive impacts and enhance the receiving environment, as it is about sensitivities and constraints to that development. The design of the Greenway, the opportunities to enhance access to and enjoyment of elements of natural heritage and of built heritage are important considerations which are not relevant to many other types of development. The development of the Greenway is also an opportunity to increase access (for both tourists and locals) to remote and previously inaccessible parts of the study area, while providing new viewing points in the landscape. It also has the potential to revitalise certain parts of the study area.

The Greenway would be unlikely to change the character of an area but would result in increased pedestrians and cyclists along the route, and any effects on the landcover along the route are likely to be localised. Visual effects are not envisaged to be an issue, as the Greenway itself will not be visually intrusive, and with good design, hub developments will be well located and integrated in the towns and villages along the preferred route. Where the route is close to residences, sensitive design of the route can take advantage of natural screening where possible or include landscape mitigation measures. Elements along the route which are of natural or built heritage interest (e.g. bridges) can be enhanced by the presence of the Greenway.

The following sections set out the relevant policies and the character, constraints, and opportunities within the study area relevant to Landscape and Visual receptors. This study draws on a review of available data and site visits to the study area on October 10th and 18th 2022 by the author.

5.6.3 Receiving Environment – Policy Context

The Clare County Development Plan 2017-2023 (hereafter referred to as the Development Plan) contains a number of policies and objectives relating to landscape and visual amenity, including designations and scenic routes. It also includes reference to the Clare Landscape Character Assessment which was undertaken in 2003.

Section 5.4.2.1 of the Development Plan refers to specific policies relating to off-road walking and cycling. Objective 5.12 includes several objectives, as follows:

a. To support the maintenance of existing offroad walking and cycling trails and support the development of new trails in County Clare;

b. To support and facilitate the development of the West Clare Railway Greenway and necessary supporting infrastructure;

d. To ensure any proposed development for off-road walking and cycling takes into consideration the safe and adequate provision of access, set-down and parking areas;

e. To complete heritage audits and improve heritage interpretation along walking and cycling areas in the County.

Additionally, **Objective 8.13** is as follows:

b. To safeguard, where feasible, the route of the old West Clare Railway which has not been affected by existing development and to encourage its use for recreational purposes and/or as part of an operational railway tourist attraction. Exceptions to this shall include short sections within the curtilage of residential or commercial property;

In addition, Section 9.4.5 of the Plan refers to tourism in West Clare, and though the study area is closer to North Clare, contains the following relevant objective:

It is an objective of the Development Plan:

To facilitate the reopening of the West Clare Railway as an operational tourist attraction by permitting new sections of railway as alternatives to parts of the line which have been built on or are inaccessible since its closure, in compliance with all relevant legislation as outlined in Objective CDP2.1.

Landscape Designations – Living Landscapes

In Section 13.3.2 of the Development Plan, Co. Clare's landscapes are categorised into areas which have similar characteristics for which similar planning policies are applicable. The Plan notes that the approach builds on the Landscape Character Assessment of County Clare. The 'Living Landscapes' approach sets out three main categories, recognising that the different parts of the County have different potential. The Plan also notes that the landscapes are not constant but seen as alive and continually changing. The three categories are listed below:

- **Settled Landscape** – areas where people live and work.
- **Working Landscapes** – intensively settled and developed areas within Settled Landscapes or areas with a unique natural resource.
- **Heritage Landscapes** – areas where natural and cultural heritage are given priority and where development is not precluded but happened more slowly and carefully.

The landscape categories listed above are illustrated in Figure 5-11 below. (It should be noted that the study area boundary is indicative at this map scale).

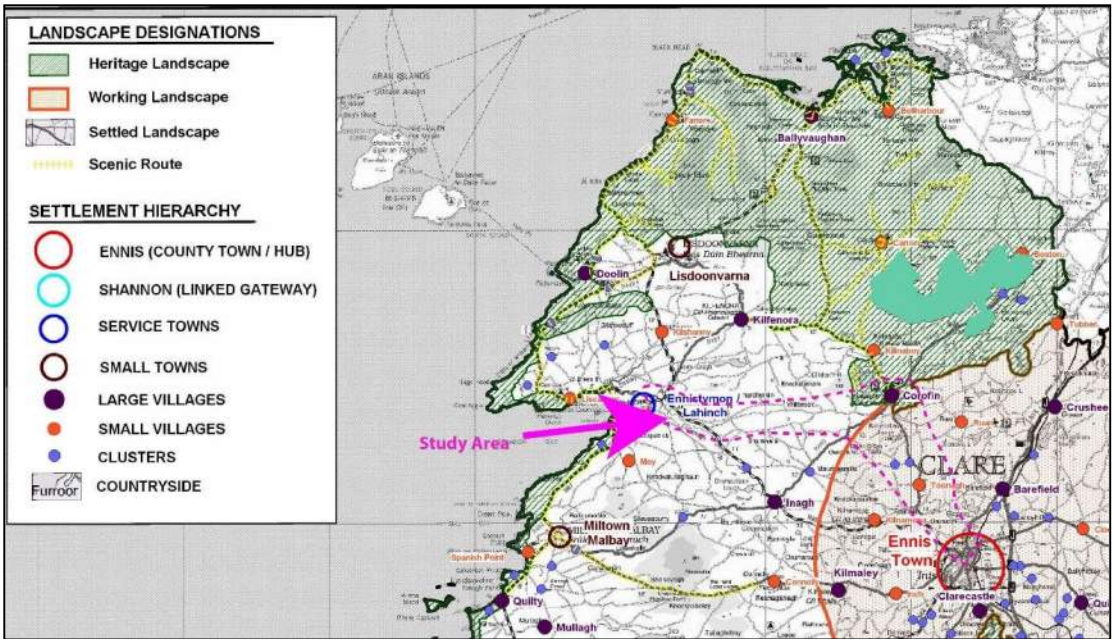


Figure 5-11 Clare County Council Landscape Designations Map (extract) with Study Area

Figure 5-11 above shows that the study area for the proposed Greenway, which takes in the area between Ennis, Corofin, and Ennistymon includes areas of Settled Landscape between Ennistymon and Corofin, and a Working Landscape from south of Corofin to the east around Ennis. South of Corofin to Ennistymon, the area is categorised as Settled Landscape on Figure 5-11 above. The town of Corofin and the immediate environs and lands to the north are designated as a Heritage Landscape but this is a very small proportion of the overall study area.

These landscape categories inform the planning policies in rural areas and are described in the Plan as follows:

Settled landscapes – areas where people live and work; The study area between Corofin and Ennistymon is included in this category. The Plan describes these areas as comprising '*the network of farmland, villages and towns that make up the majority of the County. These landscapes are where the majority of the population live and work*.

Areas of concentrated development within settled landscapes are known as Working Landscapes.

Working Landscapes – *intensively settled and developed areas within Settled Landscapes or areas with a unique natural resource*;

Part of the study area south of Corofin east to Ennis falls within the Western Corridor Working Landscape from Ennis to Limerick. This area is described in the Plan as

This part of the County contains the highest concentrations of population and employment and the strongest transport links and connectivity. It includes the Linked Gateway of Shannon and the County Town/Hub Town of Ennis. It is the economic driver of County Clare and an important area of the Mid-West Region.

Heritage Landscapes – *areas where natural and cultural heritage are given priority and where development is not precluded but happens more slowly and carefully*.

Policies associated with Settled Landscapes are as follows:

Policy CDP 13.2: It is an objective of the Development Plan:

To permit development in areas designated as 'settled landscapes' that sustain and enhance quality of life and residential amenity and promote economic activity subject to:

- Conformity with all other relevant provisions of the Plan and the availability and protection of resources;
- Selection of appropriate sites in the first instance within this landscape, together with consideration of the details of siting and design which are directed towards minimising visual impacts;
- Regard being given to avoiding intrusions on scenic routes and on ridges or shorelines.
- Developments in these areas will be required to demonstrate:
    - That the site has been selected to avoid visually prominent locations;
    - That the site layouts avail of existing topography and vegetation to reduce visibility from scenic routes, walking trails, water bodies, public amenities and roads;
    - That design for buildings and structures reduce visual impact through careful choice of forms, finishes and colours, and that any site works seek to reduce visual impact.

Policy CDP 13.3 Development Plan Objective – Western Corridor Working Landscape:

a) To permit development in these areas that will sustain economic activity, and enhance social well-being and quality of life - subject to conformity with all other relevant provisions of the Plan and the availability and protection of resources;

b) That selection of appropriate sites in the first instance within this landscape, together with consideration of the details of siting and design, are directed towards minimising visual impact;

c) That particular regard should be given to avoiding intrusions on scenic routes and on ridges or shorelines. Developments in these areas will be required to demonstrate:

    (i) That the site has been selected to avoid visually prominent locations;

    (ii) That site layouts avail of existing topography and vegetation to reduce visibility from scenic routes, walking trails, public amenities and roads;

    (iii) That design for buildings and structures reduce visual impact through careful choice of form, finishes and colours and that any site works seek to reduce visual impact of the development.

Heritage Landscapes

Heritage Landscapes occur in four main areas of the County, with part of the study area in the vicinity of Corofin categorised as Heritage Landscape 2: the Burren, which includes parts of the Landscape Character Areas Unit 1 Burren Uplands, Unit 2 Low Burren and Unit 4 Fergus Loughlands.

The Plan notes that these landscapes are envisioned as the most valued parts of the County, and they are important in sustaining natural and cultural heritage. However, the plan does note that these landscapes need to evolve to accommodate certain

interventions – the renewal of existing houses, farms, roads, power lines and new facilities. The Plan also notes that uses within these landscapes are expected to include small scale employment, tourism, cultural and social services.

Policy 13.5 states that it is an objective of the Development Plan:

"To require that all proposed developments in Heritage Landscapes demonstrate that every effort has been made to reduce visual impact. This must be demonstrated for all aspects of the proposal – from site selection through to details of siting and design. All other relevant provisions of the Development Plan must be complied with.

All proposed developments in these areas will be required to demonstrate:

- That sites have been selected to avoid visually prominent locations;
- That layouts avail of existing topography and vegetation to minimise visibility from scenic routes, walking trails public amenities and roads;
- That design for buildings and structures minimise height and visual contrast through careful choice of forms, finishes and colour and that any site works seek to reduce the visual impact of the development".

Views and Prospects

Section 13.5 of the Development Plan contains a number of objectives in relation to scenic routes. A list of scenic routes in included in Appendix 5 and they are mapped on the Landscape Designations map, Figure 5-11 above. A very short section (approximately 0.4 kilometres) of scenic route 4 (from Laghtagoona north of Corofin to Killinaboy and Leamaneagh Castle), falls within the northern boundary of the study area.

Landscape Character Assessment of County Clare

Section 13.2.1.2 refers to the Landscape Character Assessment of Co. Clare, which informed the Landscape Character Areas Map which is illustrated in this Section of the Plan.

Policy CDP 13.1 states:

It is an objective of Clare County Council:

To encourage the utilisation of the Landscape Character Assessment of County Clare and other relevant landscape policy and guidelines and to have regard to them in the management, enhancement and promotion of the landscapes of County Clare.

The landscape designations in the Development Plan have evolved over the years. Section 13.2.1 of the Development Plan refers to the Landscape Character Assessment of Co. Clare (2004), hereafter referred to as the Assessment, identified 26 Landscape Character Types (LCTs) which categorise the landscape into areas of uplands, lowlands and coastal areas. The Assessment also identified 21 Landscape Character Areas (LCAs) and contains a description of each area and identifies characteristics, pressures and opportunities.

The County is divided into 21 LCAs, which are illustrated on Figure 5-12 below.

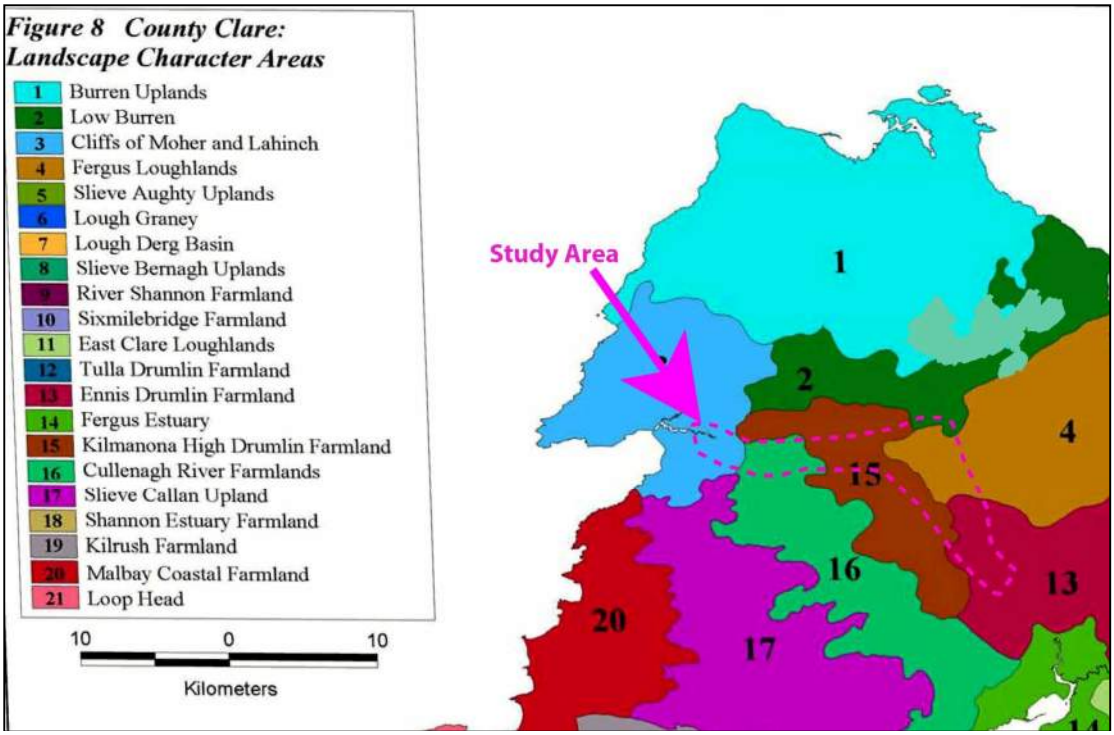


Figure 5-12 Landscape Character Areas 2,3,4,13 and 15 within Study Area

The study area as illustrated on Figure 5-12 above, lies primarily within LCAs 13, 4, 15, 16, and 3, when viewed from east to west. A very small section lies within LCA 2 which is the LCA just north of Corofin, but the area concerned is very small, concerning the area north of Corofin village. The main LCAs in the study area are as follows, from east to west through the study area:

LCA 13 Ennis Drumlin Farmland

This LCA includes Ennis town and the surrounding drumlin landscape to the east and west of the town, (and north of the town within the study area).

Characteristics of the area around Ennis are predominately grassland, with some broadleaf forests, especially to the west and south-west of Ennis. Transitional woodland and scrub are also evident in small areas, though this is likely to be recent planting of commercial forestry. The Landscape Character Assessment notes that Consultees identified a number of features within this area, including the limestone outcrops, hidden pockets of shale, the caves near Quin (which allegedly connect to Quin Abbey) and fairy trees.

Some relevant Forces for change are as follows:

- *Pressure from increased road construction and loss of hedgerows and land within the Ennis area.*
- *Removal of coppiced woodland.*
- *Pressure from intensification of quarry activities.*
- *Under-utilisation of Ennis to Limerick rail.*
- *Agricultural decline or intensification.*

Recommendations relevant to the study area include:

- *Expansion of existing settlements, most notably Ennis, should take due care of local landscape features and integrate these into design briefs for developers.*
- *The integrity of the rural landscape should be maintained through sensitive planning and design.*
- *Infrastructural developments, including road widening, should consider local landscape character and reflect local boundary treatments.*
- *Advice for new developments should include design, siting and boundary treatments.*
- *Core agricultural features including hedgerows and stone walls should be maintained.*
- *Quarries should be reinstated and screened appropriately.*
- *Encourage uptake of REPS*

In summary, the Landscape Character Assessment, though no longer a supporting document to the Development Plan, gave rise to the current LCAs which are mapped in the Development Plan. The Landscape Character Assessment identifies several areas of distinct landscape character within the study area. Section 6.6.2.1 below describes the landscape characteristics of the study area and notes that the Landscape Character Areas are distinctive parts of the study area and in general gives a good overview of the landscape condition, pressures and trends in the landscape of the study area.

LCA 4 Fergus Loughlands

A proportion of the study area, southeast of Corofin which includes Lough Atedaun and Ballycullinan and including the historical buildings at Dysert O'Dea are within this LCA.

The key characteristics relevant to this area are as follows:

- *Undulating lowland mosaic of loughs, farmland and wooded limestone pavements.*
- *Loughs and rivers are oriented predominantly northeast to southwest reflecting historical glacial movements.*
- *Characteristic lowland limestone pavement in parts are vegetated with hazel scrub and is of high ecological value, e.g. Dromore Lough nature reserve.*
- *Important historical features include Dysert O'Dea.*
- *Area is largely rural in character dissected by quiet minor roads.*
- *Scattered settlement aside from the villages of Crusheen and Ruan.*

Within the study area, relevant features are the loughs, rivers and gentle drumlins – described as:

> *… are oriented predominately northeast to southwest reflecting historical glacial movements. The Fergus catchment strongly influences this area, with a number of tributaries such as the Moyree and Castlelodge rivers draining from the loughs and into the Fergus itself*.

The Landscape Character Assessment notes that the Fergus catchment strongly influences the area. In the study area south of Corofin, the Fergus river and plain is indeed a key feature of the area.

Forces for change include:

- *Changes in farming practices, both the decline and resultant loss of traditional landscape components including stone walls, hedgerows and scrub encroachment, or intensification and run off to loughs.*
- *Inappropriate modern development and dereliction of older properties.*
- *Drainage of wetlands.*
- *Inappropriate development in terms of siting, design and treatment.*
- *Potential recreational pressure on loughs.*

LCA 15 Kilnamona High Drumlin Farmland

A small proportion of the study area (the area east of the Cullenagh/Inagh River and west of Corofin) is included in this LCA.

The key characteristics are described as:

- *High drumlins with mosaic of land uses, including improved and rushy farmland, wetland, lough and forest.*
- *Coniferous shelter belts are present across the area, reflecting the area's windy exposed characteristics.*
- *Dissected with narrow windy roads, lined with hedgebanks and hedges.*
- *This landscape can be disorientating as views are only available from higher drumlin tops and roads are typically twisting.*

Forces for change are considered as:

- *Afforestation masking landform and historical remains.*
- *Agricultural decline and degradation of agricultural landscape.*

Recommendations include:

- *New development within lower slopes of drumlin and screened by planting of native species.*
- *Advice and guidance should be made available on design, siting and boundary treatments that reflect local landscape character.*
- *Careful consideration needs to be given to siting and planting regime of new forestry plantations, in small-scale irregular plantations with a good proportion of deciduous trees. Irregular edges, following the landform and varied age structure, will help prevent the creation of large uniform blocks Infrastructure should take least invasive route option.*

LCA 16 Cullenagh River Uplands

A relatively small stretch of the study area, from the drumlin landscape at Knockdrummagh east of Ennistymon, to Clooney South, is included in this LCA which is focused on the Cullenagh or Inagh River.

The key characteristics are described as;

- *Drumlin farmlands drained by Cullenagh River catchment by a series of small loughs.*

- *Buckthorn, more deciduous trees and more woody vegetation present with thick hedgerows in parts.*
- *Drumlins orientated east-west.*
- *Attractive intimate area with rural intact feel.*
- *Main settlement at Inagh at crossroads, otherwise scattered.*

The LCA description notes that grassland is the most common land cover with some natural grassland interspersed with quite extensive bog and wetland areas, likely to be raised bog in inter drumlin hollows and close to loughs. The introduction of small blocks of coniferous plantation has taken place, once again close to loughs and adjacent to wetter peaty areas.

Forces for change identified by the Landscape Character Assessment which are relevant to the study area include:

- *Afforestation;*
- *Agricultural decline and loss of landscape elements;*
- *Abandonment of old stone houses and construction of new bungalows.*

Recommendations include:

- *Development will be more appropriately sited in lower drumlin areas and screened with native planting, reflecting mix of hedgerows;*
- *Advice and guidance on design, siting and boundary treatments that reflect local landscape character should be made available;*
- *Careful consideration needs to be given to siting and planting regime of new forestry plantations, in small-scale irregular plantations with a good proportion of deciduous trees. Irregular edges following the landform and varied age structure will help prevent creation of large uniform blocks;*
- *Encourage uptake of REPS;*
- *Encourage local area plan for North Clare.*

LCA 3 Cliffs of Moher and Lahinch

This LCA stretches from Lahinch and includes Ennistymon and environs, stretching north to Doolin and the Cliffs of Moher and east to Kilfenora.

The Cliffs of Moher and the coastline are an important part of the LCA and the study area occupies just the area immediately around Ennistymon (at the western extent of the study area).

The relevant characteristics to this area include:

- An area of coastal plateau and farmland gently sloping inwards towards the coast and rivers.
- Liscannor stone walls with slatey appearance are highly distinctive and widely used throughout the area.
- Popular tourist centres at Cliffs of Moher, Lahinch and Liscannor.
- Extensive coastal views are afforded from bays and plateau.
- Away from the coastal road, it is increasingly remote, and an isolated sense is retained.

- Character of sea strongly affects the area.

The LCA notes that in terms of landcover, grassland predominates, though there is a considerable amount of wetter, peaty soils on the higher areas, with some coniferous forestry plantations on the fringes of these sites. There are also occasional pockets of natural grassland (GS1) along the cliffs and within pockets of well-drained peat areas. The valleys of the Inagh (Cullenagh) and Dealagh rivers also support wet grassland vegetation, with pockets of woodland including wet woodland and dry deciduous woodland. The Inagh River estuary is also designated as an SAC. The description of the LCA includes a reference to the West Clare Railway and the presence of the Moher Slate stone which consultees identified as being of value to the area.

Forces for change identified focus on the pressures on areas such as the Cliffs of Moher and Lahinch. Regarding the rural parts of the LCA, references are made to:

- *Agricultural decline and degradation of key features such as stone walls.*
- *Potential for afforestation in areas where elevation is below the 750ft contour.*

Recommendations include:

- *Generally, any development should be directed to existing settlements and encourage reuse of old buildings.*
- *New development should be sensitive to landscape and reflect traditional design forms in siting, layout and boundary treatment.*
- *Agricultural and environmental schemes to avoid dereliction of landscape should be promoted.*

In summary, the Landscape Character Assessment, though no longer a supporting document to the Development Plan, gave rise to the current LCAs which are mapped in the Development Plan. The Landscape Character Assessment identifies several areas of distinct landscape character within the study area. Section 5.6.3.1 below describes the landscape characteristics of the study area and notes that the Landscape Character Areas are distinctive parts of the study area and in general gives a good overview of the landscape condition, pressures and trends in the landscape of the study area.

Implications of Landscape Policy

- The Development Plan has policies which are supportive of new off-road walking and cycling trails, and in particular of the development of the West Clare Railway Greenway.
- There is just one short (0.4km) section of Scenic Route 4 within the northern boundary of the study area.

The study area is predominantly located within Settled Landscape. Small areas of Heritage Landscape are found of the west around Ennistymon and to the north in the vicinity of Corofin.

- The Landscape Character Assessment referred to in Chapter 13 identifies that there are 5 distinct Landscape Character Areas within the study area. The West Clare Railway is noted as a distinctive element in some of these LCAs. The landscape is characterised as a series of drumlin areas with the former railway line following the lower ground near the rivers and their tributaries.

- Other elements noted include the River Inagh (Cullenagh), the River Fergus and various tributaries, important lakes including Lough Atedaun and Inchiquin, and cultural heritage attractions including Dysert O' Dea.
- Agricultural pasture is noted as well as areas of considerable coniferous afforestation in the centre of the study area.

5.6.3.1 Description of Site and Environs

The study area is described under several headings, in order to give a more detailed picture of the landscape characteristics and visual qualities. Under each heading, reference to the route of the former West Clare Railway is included, as well as a description of the wider study area.

Access and Location

The study area (as shown in drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200015 in Appendix A) consists of an area between Ennistymon near the west coast of Co. Clare, as far as Ennis town to the east of the County. The study area also includes the village of Corofin.

The former West Clare Railway route is partly intact, with sections which can be seen from the road, and aerial views, while other sections are not evident or are in private lands and at some distance from the nearest public road.

The route of the disused railway line runs east from Ennistymon, to the south of Corofin and enters Ennis from the north. It generally follows lower ground along the valley floors for much of the route, with some areas where it traverses higher ground, notably at Ennistymon, at Cullenagh, and north of Ennis, where the railway corridor travels above the present-day road network.

The N85 National Road links Ennistymon to Ennis, however this is located further south, and is only partly within the study area to the south-west of Ennistymon. A series of local roads connect Ennistymon with Corofin, the main local road leaving the N85 at Cullenagh, southeast of Ennistymon, and joining the R460 just south of Corofin, following relatively close to the line of the disused railway corridor. The R476 between Corofin and Ennis travels for a short section along the route of the former railway, and joins the N85 to Ennis, just within the study area at Fountain. To the northeast of this R476 regional route, a network of narrow local roads east of Ballycullinan Lough, provide local connectivity from Corofin to the Drumcliff area north of Ennis and into the town itself. The route of the former railway line traverses these roads at a number of locations.

Apart from the National (N85) and Regional (R476 and R460) roads, the study area is traversed by a network of minor roads, some of which are narrow, especially east of the study area between Corofin and Ennis.

Landform – Topography and Drainage

The landform of the study area varies considerably.

Higher ground skirts the south-western boundary of the study area, enclosing the archaeological settlement at Dysert O'Dea, south as far as Fountains Cross, while east of the R476 the lands are flatter with occasional drumlins enclosing the views and creating an intimate character. The former railway line travels through generally flat topography between 10 and 20 metres to join a tributary and eventually crosses the River Fergus where it enters the settlement of Ennis. Ennis itself is a low-lying

settlement in between the rivers Claureen and Fergus and mainly less than 20 metres in elevations with no significant areas of higher ground.

Between Corofin and Ennis, the landscape is still characterised by drumlins and lakes, some larger lakes (Lough Atedaun, and Ballycullinan) are in the vicinity of Corofin. Lough Inchiquin, just north of the study area boundary, is a well-known local attraction, and there is a looped walk form Corofin village to Lough Atedaun.

The disused railway line then follows close to the river valley further east, through the Craggaunboy river valley, with gently undulating drumlins to the north and south. South of Corofin, the route disused railway line traverses the flat area and floodplain of the Fergus river. The floodplain of the River Fergus is a noticeable feature just south of the village of Corofin, which showed areas of flooding at the time of a site visit on 18 October 2022.

Plate 5-1 River Fergus plain south of Corofin village

East of Ennistymon, the Inagh flows in a valley bordered by higher ground (some areas over 100m in elevation) and characteristic drumlins to the north and south, and the N85 road travels parallel to the river for a time. The former railway line is evident close to the lower ground but then runs through higher ground near Cullenagh to follow one of the Inagh's tributaries.

The former railway line, of which remnants can be seen south of the town, attains a higher elevation due to the higher ground south of the town, where the railway crosses the River Inagh. The route of the railway line runs at a lower elevation as one travels east, where it is similar in level to the N85 and the River Inagh.

To the west of the study area, near Ennistymon, the topography ranges from 10-20 metres along the River Inagh, but with several areas of higher ground surrounding the town, creating a dramatic townscape, in combination with the river. In the town centre, the River Inagh forms a set of spectacular waterfalls, and the town is known as the 'Town of the Cascades'.

Plate 5-2 River Inagh Cascades in Ennistymon is a key feature of the town

Landcover – Vegetation

The landcover of the former railway line itself, where it is intact, appears to be either running through agricultural lands, or through areas which are overgrown with hedgerow vegetation. Some parts of the former railway line are now occupied by private properties, and in the towns of Ennistymon and Ennis, development has taken place along sections of the track. A section of the former railway line between Corofin and Ennis has been replaced by the R476 road, adjacent to Ballycullinan Lough.

Outside of the main settlements of Ennistymon, Corofin and Ennis, the landcover is a mosaic of agricultural pastureland, particularly in the environs of Ennistymon, south of Corofin, and north of Ennis (shaded yellow in Figure 5-13). Other landcover consists of considerable areas covered with coniferous forestry, shaded dark green, in the centre of the study area, in the river valleys of the River Cullenagh and along with agricultural lands with a significant area of natural vegetation in this part of the study area shaded brown.

These main landcover areas are shown in the Figure 5-13, illustrating the EPA Corine Landcover Map 2018.

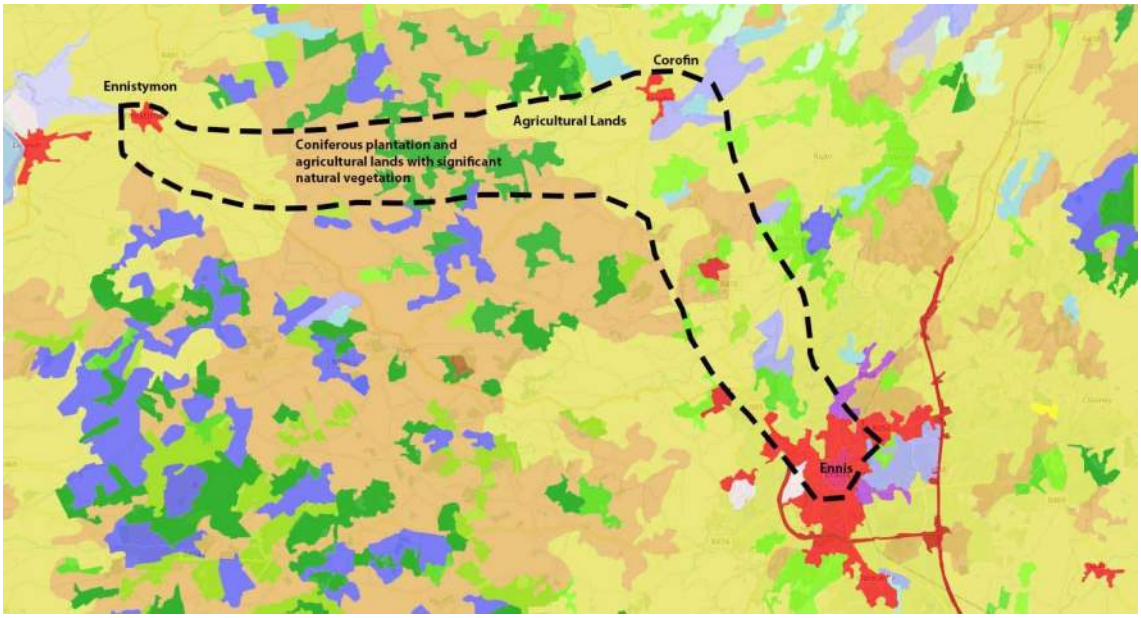


Figure 5-13 EPA CORINE landcover Map (2018) with study area (Source://gis.epa.ie/EPAMaps/)

Ennis-Corofin

Between Ennis and Corofin, aerial images and the EPA CORINE landcover map (Figure 5-13 above) show several large areas of semi-natural vegetation, broadleaf woodland as well as mixed woodland. These are evident north of Ballycullinan Lough and at Ballygriffy Wood, while east of Ballycullinan Lough the railway line passes through a large expanse of semi-natural vegetation with some limestone outcrops apparent on the aerial view. The railway line passes through smaller areas of agricultural lands and marsh/wetland both south of Corofin and north of Ennis. The landcover is described in some more detail below. In the vicinity of Ennis town, south of Drumcliffe, the River Fergus and associated flatter lands are a characteristic of the landcover, which becomes sub-urban and urban south-east of the river.

Plate 5-3 River Fergus north of Ennis with open fields and mixed woodland

North of Ennis, the landscape becomes more built up, interspersed with areas of pastureland and some areas of wetland (around Lough Cleggan), broadleaf and mixed woodland near Drumcliff. The John O' Sullivan public park and Drumcliff Cemetery to the west of the route of the original railway line.

East of the R476, along the Drumcliff Road, near the outskirts of the town, some evidence of the railway is found where the piers of the railway bridge are visible along a well populated road.

Plate 5-4 Stone Piers of the former railway line at Drumcliff, north of Ennis

The route of the disused railway runs north, close to the Drumcliff cemetery, continuing north through land that is mainly pasture, towards Ballygriffy castle where the railway line runs along a stream and an area of wetland. Though the former railway line is not evident in Plate 5-5 below, the railway line ran through this area of pasture and close to the edge of Ballygriffy Wood, a significant area of Broadleaf woodland.

Plate 5-5 Route of the disused railway line (no longer visible, on the far side of the stream) in pasture with Ballygriffy Wood in the background

Between the townlands of Ballygriffy North and Kilkee East and the railway line traverses a large area of semi-natural vegetation, crossing into an area of agricultural lands adjacent to Ballygriffy Wood. Plate 5-5 above represents a view from the local road in which the railway line is not visible:

The route of the railway line in this area, east of the R476, is occasionally visible from the road, and appears frequently overgrown or lined with trees and shrubs, as in Plate 5-6 and Plate 5-7, or runs through a private property.

Plate 5-6 & 5-7 Route of the disused railway line with trees and groundcover vegetation visible from the local roads at Drumcavan, and at Kilkee East southeast of Corofin

West of the R476, the railway route traverses a number of minor local roads. Plate 5-8 below shows the Ballycullinan stream and surrounding land in flood, south of the railway line, in an area of predominantly semi-natural vegetation. Areas of broadleaf woodland are seen on either side of the view.

Plate 5-8 Ballycullinan stream with flooded areas and woodland visible

Below, Plate 5-9 illustrates a section of the former railway corridor which is now the Ennis-Corofin Road (R476) where it traverses a wooded area south of Corofin village.

Plate 5-9 **Route of the disused railway line which is now the regional road R467 south of Corofin, passing through an area of broadleaf trees**

South of Corofin, on the Corofin-Inagh road (R460), the former railway line crosses the road. The landcover here is composed of agricultural lands with some scrubby vegetation, with scattered dwellings lining the road, with the railway corridor visible on one side at Ballykinnacora as in Plate 5-10 below. Further east the railway line passes through a small section of marsh/wetland, which is the River Fergus floodplain.

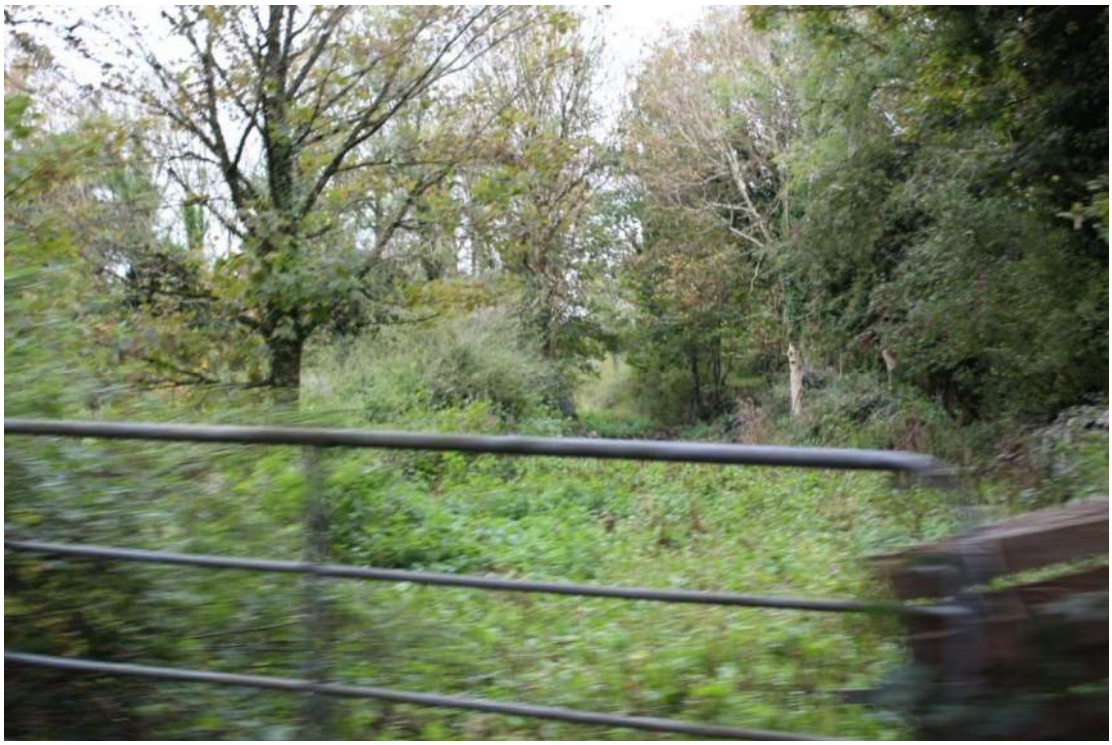


Plate 5-10 **Former railway line opposite residence at Ballykinnacora South south of Corofin**

Corofin-Ennistymon

Plate 5-11 to Plate 5-10 below illustrate the varied landcover areas through which the original railway line passes. This ranges from areas of semi-natural vegetation and pasture near Corofin, and then the route passes through to areas of coniferous woodland, close to a stream, in the centre of the study area. From Cloona/Clooney South, as far as the N67 east of Ennistymon the railway line traverses pasture lands.

Also observed during the site visit were several smaller areas of marginal or wetland, found at some scale through most of the study area. In some areas the railway line route is now part of a private property.

Plate 5-11 **Route of the disused railway line passes through pasture and areas of natural vegetation and near a private residence near Annalabba bridge west of Corofin**

Plate 5-12 **Coniferous plantation on the valley sides between Corofin and Ennistymon, with semi-natural vegetation**

Plate 5-13 **Route of former railway corridor in front of dwelling (adjacent to the N67 east of Ennistymon**

Landcover – Built Form and Cultural Heritage

Built form and elements of cultural heritage within the study area can be described together as there are many features of built heritage in the study area. These are described in some more detail in terms of the settlements of Ennis, Corofin and Ennistymon, all of which lie within the study area.

Some of the features of built form include features of cultural heritage which are referred to above in the descriptions of the built form of the towns of Ennis, Corofin and Ennistymon. Of particular interest in the context of the disused railway line are the built structures which remain, which include the remnants of railway bridges in

the towns of Ennis and Ennistymon, and along the route at Cullenagh and also at Drumcliff, north of Ennis which are referred to above.

Southeast of the study area between Ennis and Corofin lies the archaeological site of Dysert O' Dea. This includes a 15th-century castle, now restored and an Archaeology centre, as well as two Romanesque Churches, a 12th Century Illuminated Doorway and High Cross, two 15th Century Tower Houses and a number of other monuments accessed by a 4km trail. This is an important tourist destination and a well-known feature of cultural heritage importance. A high proportion of monuments listed on the RMP (Records of Monuments and Places) lie in this area.

Other features closer to the route of the disused railway line include Ballygriffy Castle in the east of the study area, while closer to Ennis, other elements of cultural heritage include the Drumcliff Round Tower and ruined church adjacent to the graveyard, north of Ennis.

Between Ennistymon and Corofin, other locations of particular cultural heritage interest in the study area include the castle at Glen, east of Ennistymon, which is adjacent to the former railway line. There are some, but relatively few, well scattered monuments in the river valleys between Ennistymon and Corofin. A number of Crannog sites are marked along the shores of Lough Atedaun east of Corofin village.

Settlements – Ennis, Corofin, Ennistymon.

Ennis is a largest town in the study area and is the County town of Clare. The Development Plan notes that an ACA includes the medieval town centre, part of which is within the study area.

The route of the former railway line is not a highly noticeable feature in the town at present, entering from the northwest from the Drumcliff area. The former railway bridge piers are visible on Drumcliff Road as illustrated in Plate 5-4 where the railway line crossed the local road, while the main element of built form relating to the railway on the approach to Ennis is the bridge over the River Fergus as shown in Plate 5-14 below:

Plate 5-14 Railway bridge over the River Fergus with marginal lands and shrubby vegetation seen from Aughateeroe residential estate

Built form is more concentrated south/east of the River Fergus, closer to the town. As seen in Plate 5-14, this bridge is surrounded by marginal and wetlands to the northwest, with some shrubby vegetation as shown in the Plate 5-14 above.

To the southeast, the route of the railway is now the location of a housing estate as shown in Plate 5-15, with shrubby vegetation along the River Fergus corridor. The remaining route of the railway does not appear to be evident in the rest of the town, with residential developments and St. Clare's school close to the route of the railway line, which followed a tributary of the River Fergus to join the existing railway line.

Plate 5-15 Residential estates are among the main elements of built form close to the former railway line in Ennis

In the centre of the study area, Corofin is a smaller village, but the main street is designated an ACA and has a number of traditional shopfronts, and these contribute to a traditional street façade. The bridge over the River Fergus on the southern entrance to the town is also a notable feature, as shown below in Plate 5-16, as are a number of fine buildings in this part of the town. The route of the former railway does not pass through the town, but to the countryside to the south.

Plate 5-16 Impressive stone bridge over the River Fergus at Corofin

Several buildings of note occur in Ennistymon, which include examples of vernacular architecture and buildings of 18th and 19th century origin, as well as the remarkable bridge over the Inagh River and the Falls Hotel being characteristics of the town. An Architectural Conservation Area (ACA) is located in the centre of the town, which is famous for its wooden shopfronts as well as local features such as roofs slated from locally quarried stone.

Plate 5-17 Distinctive buildings on Church Street in Ennistymon looking south, while the railway line originally traversed higher ground in background

Some remnants of the railway are also evident in Ennistymon. The route of the railway line is evident in the eastern approach to the town where it crosses the River Inagh, and it then traverses the higher ground south of the town towards Lahinch as illustrated below. Two railway bridges are evident today, one adjacent to the N85 entering the town from the east, and another further east in the Ardnaculla area. The bridge at Ardnaculla, above to the River Inagh's west bank to the southwest of the town is bordered by a green amenity area which slopes to the river and some stone

sheds nearby add character to the riverside area. This area of the town is now a primarily residential area with residences on the location of the former railway line.


Plate 5-18 & 5-19 Remnants of railway bridges in Ennistymon, background of Plate 5-17.

Walking trails and recreational facilities

A short section of the Mid Clare Way runs through part of the study area south of Corofin and following local roads to the castle and churches and other monuments at Dysert O' Dea. This is a long distance (130km) walking route traversing local roads and begins and ends at Newmarket on Fergus. Other recreational facilities in the study area include the lakes (Lough Inchiquin, Lough Atedaun) near Corofin as well as Ballygriffy Woods to the east of the study area between Corofin and Ennis. Corofin is known as a location for angling. A short section of the long-distance Burren Way runs through the north of the study area near Corofin.

Corofin is the location of the Clare Heritage & Genealogy Centre and is close to the Burren National Park, however the park boundary is outside the study area.

Land Uses

Between Ennis and Corofin there is a lower proportion of agricultural land and more land under broadleaf woodland and semi-natural vegetation as well as some areas of marginal or marshy land. West of the R476 road between Ennis and Corofin, the land use includes a large quarry at Toonagh.

The centre of the study area between Ennis and Corofin is a mixture of farmland, coniferous plantations and areas of semi-natural lands some of which are marginal. Other land uses include transportation – some of the routes lie along existing roads, both national and local roads, as well as road in urban areas. A higher concentration of dwellings are found along the N85 and the approach roads to Ennis and Ennistymon, while settlement in the centre of the study area, south-west of Corofin, is more scattered as the area is more remote.

Ennistymon and Corofin are associated with tourism in the summer months in particular, however Ennistymon is a larger market town which is close to the seaside town of Lahinch and has a range of land uses. Corofin is a smaller town but is also a popular location for tourists to the Burren area.

Land uses along the route of the original railway line between Ennistymon and Corofin are primarily agricultural, with much of the route close to Ennistymon and

Ennis occupied by farmland with some scattered dwellings, where some of the line is visible within private gardens or properties.

5.6.4 Landscape Values and Character, Opportunities and Constraints

Valued elements of the landscape can be inferred from designations, such as the Heritage Landscape designations, or designations relating to cultural historical interest. However, in addition to formal designations at international, national and local level, the *Guidelines for Landscape and Visual Impact Assessment* (2013), recommend the use of a number of criteria which can help to assess landscape values. These are listed below and include, but are not limited to:

- Landscape Quality/Condition
- Heritage/Conservation interests
- Scenic Quality
- Rarity
- Perceptual aspects:
- Recreation Value

Landscape Values are determined by reference to the landscape designations, as well as the above criteria.

The important and valued elements and characteristics of the landscape and visual amenity identified above have in some cases, the potential to be seen as opportunities rather than constraints. In these cases, the potential for a landscape element to be an opportunity rather than a constraint depends on the route design and treatment in particular areas where potentially sensitive receptors are located. However, the very purpose of a Greenway project is to introduce and allow users enjoy and interact with the landscape resource in a way that is appropriate and sensitive. Therefore, some landscape characteristics are listed both as an opportunity and a constraint. In fact, more robust elements or areas in the landscape may not be suitable resource or location for the Greenway due to lack of interest.

Following the description of landscape value and landscape and visual character, the opportunities and constraints relating to each area are hereafter listed for the following key character areas within the study area:

- Ennis-Corofin section (with Ennis as a distinct area)
- Corofin-Ennistymon section (with Ennistymon and Corofin as distinct areas)

Landscape Value – Ennis to Corofin

- Certain areas in this part of the study area have landscape values considered High.
- There are several relatively large mixed and broadleaved woodlands as well as several areas of semi-natural vegetation which are considered important in Development Plan policy, and Ballygriffy Wood is also a publicly accessible recreation area. The lakes are also important elements in the landscape.
- Other areas include the cultural heritage site at Dysert O' Dea. The Mid Clare Way trail (and Burren Way) is also a well-known recreational trail.
- Areas adjacent to the R476, a busy regional road, would have a lower landscape value.

- Areas where the track of the former railway is evident, or elements of built heritage such as bridges and piers, and related buildings are also of landscape value due to their historic connections to the railway.
- The landscape character in parts of this section of the study area is attractive and the Drumlin landscape creates an intimate character but without the restriction on views resulting from the conifer plantation. Woods here tend to be mixed or broadleaved.
- Landscape character on the northern suburbs of Ennis would not be considered particularly strong or distinctive.

Opportunities and Constraints - Ennis to Corofin

- There are several areas of broadleaved and mixed woodland and areas of semi-natural vegetation close to the former railway line which appear to be pleasant environments for a Greenway - however the Greenway should avoid removal of trees so these may be a constraint to development.
- The Mid-Clare Way runs through the study area and there are also trails in the vicinity of Dysert O'Dea, so the interaction of the proposed Greenway with these existing routes would be an opportunity.
- The character of the study area close to the R476 Regional Road is that of a busy road with no verge.
- Several tranquil minor roads traverse the study area both to the east and west of the R476 and these areas have a sense of tranquillity which is more suited to the provision of a Greenway.

In both areas, common opportunities include the retention of the railway infrastructure where possible and the remains of some bridges and piers as an opportunity for integration of cultural heritage elements into the Greenway.

Some of the former route is now private lands and this is likely to be a constraint.

Landscape Value - Corofin to Ennistymon

- The study area between Corofin and Ennistymon has several character areas – the town of Ennistymon, the village of Corofin and the river valleys between the two settlements which the former railway line traverses. However, there are several features which distinguish this area from the Ennis-Corofin section of the study area.
- Areas where the landscape value is high include the settlements of Ennistymon and Corofin, which include valued elements of built and cultural heritage as evidenced by the ACA in both towns. Ennistymon is particularly valued for the Falls of the River Inagh (Cullenagh) and the stone bridge, as well as the topography which give a unique setting and character to the town. Vernacular buildings and several noticeable remnants of the former railway are also important features of the character.
- The town of Corofin also has valued buildings along the main street including the bridge over the River Fergus. The nearby Lough Inchiquin, just on the boundary of the study area is a scenic location with recreational potential good views across the lake. Lough Atedaun is found to the east of Corofin and is also a local recreational area and these would be of High Landscape Value.
- The former railway line itself is not a prominent feature of the study area between the settlements, with the railway bridge and track just visible in the vicinity of Cullenagh, but few obvious traces remain.

- The river valleys between Corofin and Ennistymon are a mosaic of agricultural pasture lands, some marginal or wetlands near the rivers, with large areas of coniferous forestry. The former railway route passes through some of these coniferous plantations. This area is not of obvious scenic value though there are some pleasant views over streams and of bridges. Overall, outside the towns of Corofin and Ennistymon there are few elements of interest and no landscape designations in this area and the overall landscape value is considered Low.

Opportunities and Constraints – Corofin to Ennistymon

- Overall, outside the towns of Corofin and Ennistymon there are few elements of interest. The remnants of the railway line, where existent, the streams, river and bridges are elements of interest which add local character. A Greenway route here would likely have a low level of landscape effect, and while, the route would be unlikely to fulfil the requirement for an attractive and interesting Greenway it is considered that the areas of coniferous plantation with existing tracks represent an opportunity for a Greenway to open up access as well as views to the surrounding landscape.
- The town of Ennistymon, considered of High Landscape/Townscape Value, presents both opportunities and constraints. The scenic nature of the town itself, with the river, bridge and remains of the railway route would be opportunities for an attractive Greenway, and while the overall value of the townscape is considered High, west of the River Fergus the route of the railway traverses a residential area of Moderate Value and with some potential for improvement. Areas of green space adjacent to the River Inagh may also be opportunity sites.

5.7 Noise and Vibration

5.7.1 Introduction

This section of the report describes the existing noise conditions and constraints identified within the study area. The objective of this constraints study is to identify potential receptors within the study area that may be sensitive to noise or vibrations.

5.7.2 Methodology

The noise and vibration study has been prepared in accordance with the following guidelines:

- TII Guidelines *for Treatment of Noise and Vibration in National Road Schemes* (2004).

The establishment of potential noise and vibration constraints within the study area consisted of a desktop review, using the following sources of information:

- OS Mapping
- Satellite Mapping (Google Earth)
- Clare Country Council Noise Action Plan 2018
- EPA Maps

5.7.3 Existing Environment

The existing environment in the study area is predominantly rural. The land use within the study area is mostly a combination of dispersed residential dwellings, agricultural lands, marginal commercial and industrial premises, natural boundaries

such as trees and hedgerows, and hard standing areas such as regional roadways and lanes.

There are 2 no. towns, Ennis and Ennistymon, located at the eastern and western extents of the study area, respectively, and the village of Corofin, located approx.13 km north of Ennis.

Due to the rural settlement, there is a reduced population density in the study area. The majority of the residential dwellings are situated along existing local roads.

The N85 National primary road from Ennis to Ennistymon, which runs to the south of the former railway line, is the principal contributor to the prevailing noise environment within the study area. The predominant contributors to the prevailing noise environment within the study area are local and regional roads and sections of the N85 National primary road from the town of Ennis to Ennistymon, which runs to the south of the former railway line.

5.7.3.1 Noise-Sensitive Receptors within the Area

Noise sensitive receptors have been identified as "schools, hospitals, places of worship, heritage buildings, special habitats, common use amenity areas and designated quiet areas" (TII, 2004). The County Clare Noise Action Plan (2018) also lists funeral homes as a noise-sensitive receptor.

The noise sensitive receptors identified in the study area include private residential dwellings, commercial facilities, schools and educational facilities, places of worship and cemeteries, funeral homes, heritage buildings, special habitats, common use amenity areas and designated quiet areas.

The majority of noise-sensitive receptors in the research region are private detached single dwellings.

There are 14 no. churches within the study area. There are 2 no. hospitals within the study area – Ennis Day Hospital and St. Joseph's Hospital.

There are 17 no. schools (including Montessori) present within the study area. There are 4 no. post-secondary schools located in the study area - CBS Secondary School, Ennistymon Vocational School, Ennis Community College and St.Clare's School

There are 10 no. primary schools located within this study area, - Scoil Mhainchín, Toonagh National School, Corofin National School, Clouna National School, Scoil Chríost Rí, Holy Family Senior National School, Ennis Educate Together, St. Annes Special School and Gaelscoil Mhíchíl Cíosóg.

There are 2 no. Montessoris in the study area -, Corofin Preschool, and Ennis Montessori.

There are 6 no. graveyards located within the study area, Drumcliffe Cemetery, Clouna Graveyard, Templemaley Graveyard, Rath Cemetery, Kilvoydane Cemetery and Killeinagh Cemetery. There are 5 no. funeral homes located within the study area, 2 no. in Ennistymon, 2 no. in Ennis and 1 no. in Corofin.

Other sensitive receptors include special habitats and designated areas. There are 6no. special habitats / designated areas within the study area. East Burren Complex SAC, Inagh River Estuary SAC, Ballycullinan Old Domestic Building SAC,

Ballycullinan Lake SAC, Ballyallia Lake SAC and Corofin Wetlands SPA which are located within the study area.

There are 214 Protected Structures, 5 Archaeological Conservation Areas. 120 NIAH sites, 12 Historic Demesnes and Gardens and 29 undesignated cultural heritage sites.

5.8 Air Quality and Climate

5.8.1 Introduction

This section of the report provides a description of the existing air and climate conditions and constraints identified within the study area.

5.8.2 Methodology

This desktop review of baseline Air Quality has been prepared in accordance with the following guidelines:

- TII *Air Quality Assessment of Proposed National Roads - Standard* (2023).
- TII *Climate Assessment of Proposed National Roads – Standard* (2023).

The constraints assessment was carried out by means of a desktop review of available information on the proposed study area and a review of existing air quality and climate data from the EPA and other sources. The following information was reviewed as part of this study:

- OS Mapping
- Satellite Mapping (Google Earth)
- EPA Maps
- Air Quality in Ireland (EPA, 2020)
- Air Quality in Ireland (EPA, 2019)
- Air quality

5.8.3 Air Quality Limit Values

The applicable standards in Ireland include the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), which incorporate the requirements of the EU Clean Air for Europe Directive 2008/50/EC and sets out the limit values for a number of air pollutants. Table 5-14 shows the limit type and value for Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}).

Table 5-14 Nitrogen dioxide (NO_2) and Particulate Matter (PM_{10}) limit types

Pollutant	Regulation	Limit Type	Value
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health – not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health – not to be exceeded more than 35 times/year	50 µg/m^3

		Annual limit for protection of human health	40 g/m^3

5.8.4 Existing Air Quality - Nitrogen Dioxide (NO2)

The EPA has divided Ireland into four air quality zones for air quality monitoring, management, and assessment purposes. The proposed development is located partially within the Air Zone D – Rural Ireland and partially within Air Zone C – Other Cities and Large Towns. The annual mean NO^2 concentration from 2005-2019 for Zone D and Zone C was below the EU Limit Value of 40 µg/m^3, shown in Figure 5-14.

The Air Quality Standards Regulations 2011 sets out the acceptable air quality standards in Ireland. The annual average limit value of 40 µg/m^3 has been prescribed in the regulations for NO_2 for the protection of human health, whereas the annual average limit of 30 µg/m^3 has been prescribed in the regulations for the protection of vegetation. Zone D and Zone C NO_2 emissions from 2005-2019 have been well below the limit values set out in the Air Quality Standards Regulations 2011.

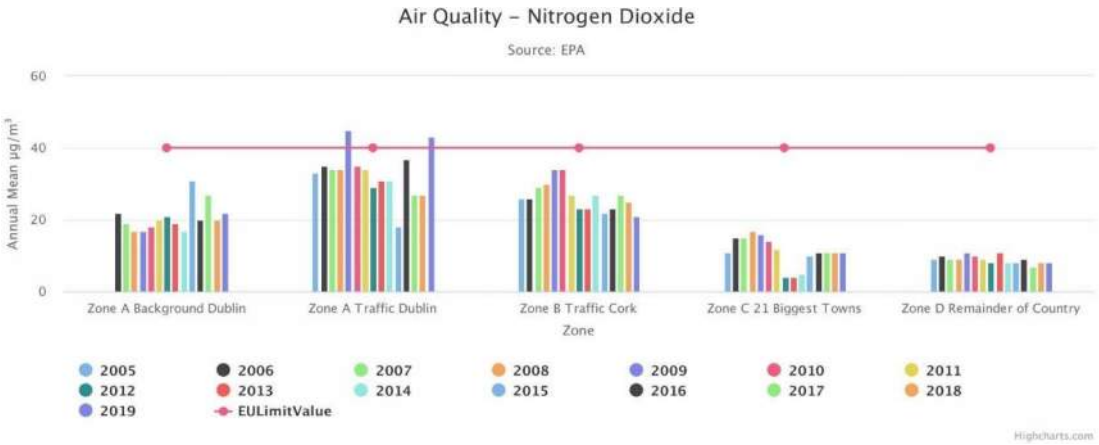


Figure 5-14 Nitrogen Dioxide Annual Mean Levels for Zones A – D for 2005 – 2019

5.8.5 Particulate Matter (PM_{10})

The annual mean PM_{10} concentration from 2005-2019 for Zone D and Zone C was below the EU Limit Value of 20 µg/m^3 and below the World Health Organisation Guidelines limit value of 40 µg/m^3.

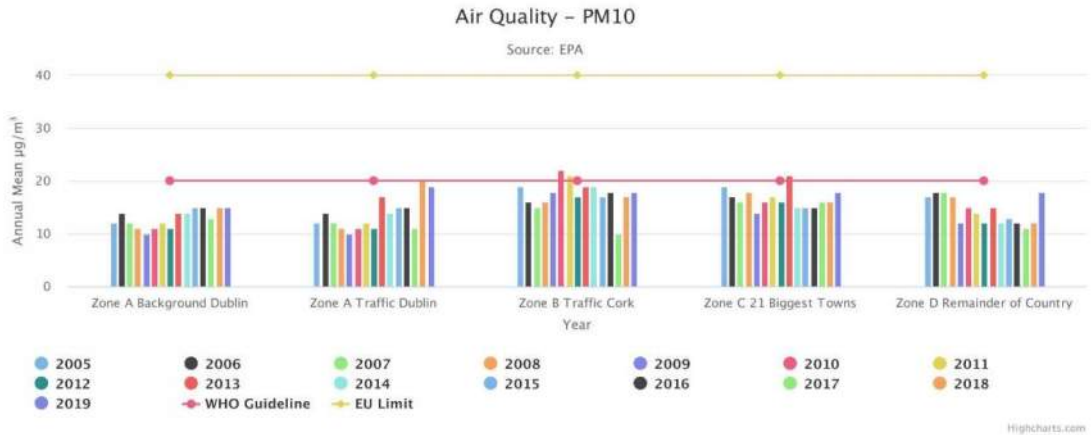


Figure 5-15 PM10 Annual Mean Levels for Zones A – D for 2005 - 2019

5.8.6 Sources of Pollution

Industrial

The NRA *Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes*, 2011, requires that non-road sources of pollution that are capable of negatively impacting air quality within the study area are identified, such as industry, ports, power stations etc.

There are 3 main sources of industrial, non-road sources of pollution within the study area, shown in Table 5-15.

Table 5-15 Non-Road Sources of Pollution within Study Area

Company Name	Townland	Licence Reg Number	Location (approx. distance from study area)	Activity	Parameter	Emission Limit Value (mg/m^3)
Paclene Limited	Ennis	P0144-01	Within	The use of coating materials in processed with a capacity to use at least 10 tonnes per year of organic solvents	Total Organics (as C)	3kg/hour
Essidev S.A	Ennis	P0061-03	Within	The manufacture of olefins and their derivatives or of monomers and polymers, including styrene and vinyl chloride	H2S	1 mg/m3
					Mercaptans	0.5 mg/m3
					Isocyanates	0.5 mg/m3
Clogrennane Lime Limited Toonagh Quarry	Ennis	P0771-02	Within	Cement, Lime and Magnesium Oxide Production of lime in kilns with a production capacity exceeding 50 tonnes per day.	Carbon Monoxide	500 BAT 48
					TOC	30 BAT 50
					Oxides of sulphur (as SO_2)	200 mg/m3 BAT 47
					Nitrogen oxides (as NO_2)	350 BAT45
					Dioxins and furans (PCDD/F) Note[1]	0.1 ng/Nm3 BAT 52
					Dust	10 BAT43

Seveso Sites

There are no Seveso sites within a 3km radius of the study area.

5.8.7 Sensitive Receptors

Air sensitive receptors have been identified as "residential housing, schools, hospitals, places of worship, sports centres and shopping areas" (TII, 2011). Additionally, designated sites are also designated as potential receptors.

The majority of air-sensitive receptors in the research region are private detached single dwellings.

There are 14 no. churches within the study area. There are 2 no. hospitals within the study area – Ennis Day Hospital and St. Joseph's Hospital.
There are 17 no. schools (including Montessori) present within the study area. There are 5 no. post-secondary schools located in the study area - CBS Secondary School, Ennistymon Vocational School, Ennis Community College, St.Clare's School and Rice College.

There are 10 no. primary schools located within this study area, - Scoil Mhainchín, Toonagh National School, Corofin National School, Clouna National School, Scoil Chríost Rí, Holy Family Senior National School, Ennis Educate Together, St. Annes Special School, CBS Primary School and Gaelscoil Mhíchíl Cíosóg.

There are 2 no. Montessoris in the study area -, Corofin Preschool, and Ennis Montessori.

There are 6 no. graveyards located within the study area, Drumcliffe Cemetery, Clouna Graveyard, Templemaley Graveyard, Rath Cemetery, Kilvoydane Cemetery and Killeinagh Cemetery. There are 5 no. funeral homes located within the study area, 2 no. in Ennistymon, 2 no. in Ennis and 1 no. in Corofin.

Other sensitive receptors include special habitats and designated areas. There are 6no. special habitats / designated areas within the study area. East Burren Complex SAC, Inagh River Estuary SAC, Ballycullinan Old Domestic Building SAC, Ballycullinan Lake SAC, Ballyallia Lake SAC and Corofin Wetlands SPA which are located within the study area.

There are 214 Protected Structures, 5 Archaeological Conservation Areas. 120 NIAH sites, 12 Historic Demesnes and Gardens and 29 undesignated cultural heritage sites.

5.8.8 Climate – Review of Greenhouse Gas Emissions

The EPA 2022 GHG Emissions Predictions Reports describe the important trends and projections for anthropogenic emissions from 2021 to 2040. Agriculture was the greatest contributor to GHG emissions in 2020, accounting for 38% of total emissions in Ireland, while the energy sector accounted for 14.9% of total emissions in Ireland. Transport emissions amounted for 17.8% of total emissions in Ireland, with road traffic accounting for about 94% of transport related emissions.

In July 2021, the Climate Action and Low Carbon Development (Amendment) Act 2021 was enacted. This Act aims to achieve a climate-neutral economy by 2050 and to reduce emissions in Ireland by 51% by 2030.

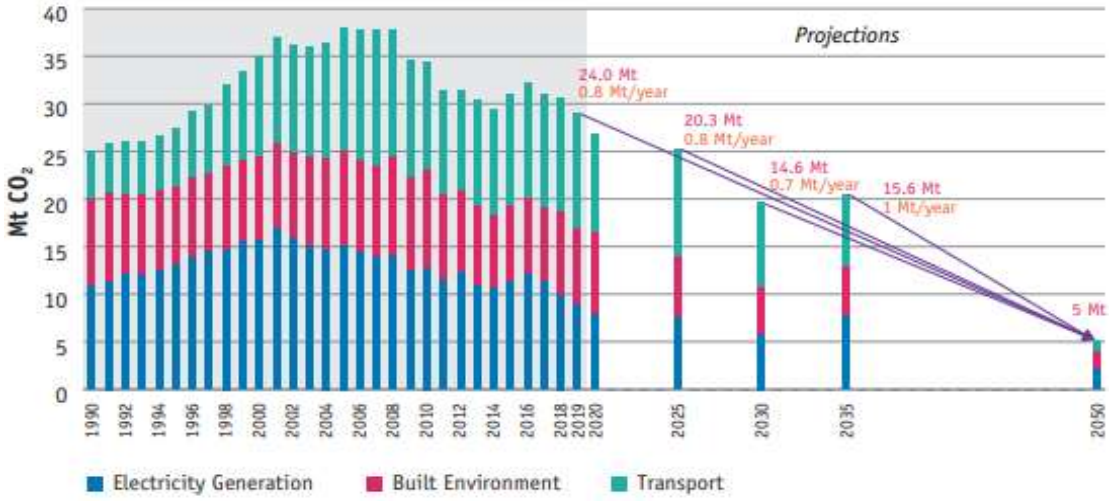


Figure 5-16 EU Climate Targets & Projects up to 2050

5.8.9 Meteorological Data

Shannon Airport in Co. Clare is the nearest representative meteorological monitoring station maintaining detailed weather data. This manned weather station is located 19km southeast of the study area. The predominant wind direction at Shannon Airport has been determined using meteorological data collected over a 64-year period. Wind direction was primarily westerly to south-westerly, according to data collected from 1946 to 2010. The average wind speed at Shannon Airport, based on data collected between 1981 and 2010, is 4.7m/s (Met Eireann, 2022). An examination of Shannon Airport's historical 30-year data reveals that rain of more than 0.2mm falls on 211 days each year on average (Met Eireann, 2022).

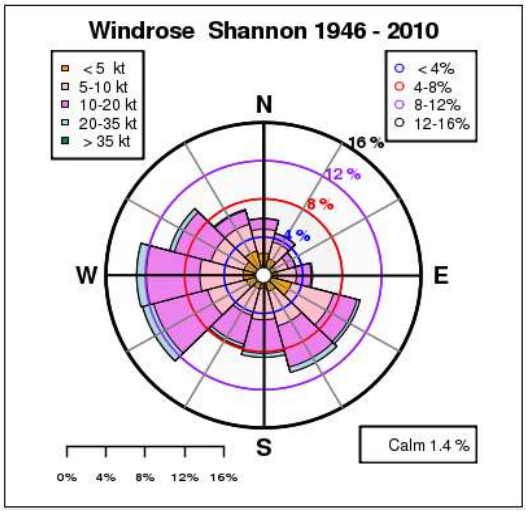


Figure 5-17 Windrose Shannon 1946-2010

5.8.10 Climate Vulnerabilities

In line with the TII *Climate Assessment of Proposed National Roads – Standard* (2023) a review of historic climate events has been undertaken to identify possible climate vulnerabilities within the study area that may impact the project.

Met Eireann's 30-year average dataset for Shannon Airport[6] has been used to collect information on the observed climate data over the set baseline period of 1981 to 2010. The Global Facility for Disaster Reduction and Recovery's (2020) 'Think Hazard' tool has also been reviewed[7] to identify any hazards that may be identified within the study area. The results of these searches are provided in Table 5-16 below.

Table 5-16 Presentation of Climate Vulnerabilities

Observed climate data (based on Met Eireann's 30-year dataset for Shannon Airport)	
Climate Variable	**Observed climate at project location**
Average Temperature	**10.7 °C**
Average Precipitation (monthly)	**81.46 mm**
Maximum Temperature	**30.6 °C**
Minimum Temperature	**-11.4 °C**
Hazard Levels for County Clare (based on the GFDRR's 'Think Hazard!' tool)	
Hazard Type	**Hazard Level**
Coastal Flood	**High**
Pluvial Flood	**Low**
Fluvial Flood	**Low**
Extreme Flood	**Low**
Extreme Heat	**Low**
Wildfire	**Medium**
Landslide	**No data available**

The temperatures identified are typical of Ireland's Climate and it is not anticipated that any severe climate events are likely in the study area in particular. The design of the proposed development will need to be cognisant of these temperature ranges at later stages in the process.

Coastal Flooding has been identified as having a 'High' hazard level, however it is noted that this hazard level applies to Clare as a County and not specifically to the study area for the proposed development (more specific information is not currently available). As the proposed development is located at least 3.5km from a coastal area, the closest coastal area being Lahinch, it is not considered a significant constraint for the proposed development. Wildfires have been identified as a 'Medium' hazard level in County Clare. There are a number of wooded areas and forests within the study area which may be susceptible to wildfires in times of drought or dry, hot weather. This hazard should be considered during the option selection process and in the design stages of the project if the final route is located in or near any areas that would be particularly susceptible to wildfires.

[6] https://www.met.ie/climate-ireland/1981-2010/shannon.html [Accessed 03/02/2023]
[7] https://thinkhazard.org/en/report/1584-ireland-clare [Accessed 03/02/2023]

5.9 Archaeology, Architecture and Cultural Heritage

5.9.1 Introduction

Archaeological Management Solutions (AMS) has been engaged by Roughan & O'Donovan (ROD) on behalf of Clare County Council (CCC) to prepare a Cultural Heritage Constraints Study for Section 2 of the West Clare Railway Greenway, as provided herein this section.

5.9.1.1 Project Background

The scheme project is part of a larger greenway project plan comprising four sections (see below), which is being progressed by CCC in partnership with Transport Infrastructure Ireland (TII) to provide a sustainable, high quality and fully accessible walking and cycling corridor that connects communities and other destinations across West Clare.

Where feasible, the greenway will be located along the former route of the West Clare Railway (which incorporated the South Clare Railway) and comprising an 85km long narrow gauge line between the county town of Ennis and two termini at Kilrush and Kilkee. This former railway corridor has been broken into four separate sections:

Section 1: Kilrush to Kilkee, via Moyasta.

Section 2: Ennis to Ennistymon.

Section 3: Ennistymon to Milltown Malbay.

Section 4: Milltown Malbay to Moyasta.

Section 2, the subject of this study (running between Ennis and Ennistymon), is approximately 29.5km long, originally had six stations/halts sited along its length and was in operation from 1887 to 1961.

At locations where environmental constraints or other obstructions exist (such as at locations where the former railway corridor has been developed/built upon) deviations from the rail corridor will be explored. The project will also include associated infrastructure such as car parks and connections to adjacent towns and villages, in addition to the provision of the greenway.

5.9.1.2 Aim, Scope and Structure of this Section

In line with TII's Project Management Guidelines (TII 2019 and TII 2022), the purpose of this current study is to identify the nature and extent of Cultural Heritage constraints, at an appropriate level of detail, within the defined study area for Section 2 of the West Clare Railway Greenway and to map these constraints, such that options under consideration during the next stage can be designed taking cognisance of such constraints.

Cultural Heritage comprises three broad groups which are used to categorise constraints in this study. These are:

(1) Recorded Archaeological Heritage.

(2) Recorded Architectural/Built Heritage.

(3) Undesignated Cultural Heritage.

Further details with respect to these categories are provided in Section 5.9.3 and catalogues listing known Cultural Heritage constraints within/intersected by the study area are provided in the relevant appendices. Appendix A contains supporting figures showing the location of these constraints. The study has been undertaken based on

the study area provided by ROD as shown in drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200016 in Appendix A.

5.9.2 Methodology

5.9.2.1 Codes of Practice and Guidance Documents

The Cultural Heritage Constraints Study was carried out in line with the recently published Code of Best Practice for National and Regional Greenways (published in December 2021)[8] and the 2017 Code of Practice for Archaeology, as agreed between TII and the Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs (TII & DAHRRGA 2017), as well as in accordance with TII's aforementioned 2019 and 2022 Project Management Guidelines. The methodology is primarily based on two guidance documents produced by the National Roads Authority (now TII):

- Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes (NRA 2005a).
- Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes (NRA 2005b).

The aim of these documents is to provide guidance on the assessment of archaeological and architectural heritage impacts during the planning and design of national road schemes in the Republic of Ireland, but they are also applicable for evaluating other linear schemes, such as greenways. They specifically outline the approach to be adopted in the assessment of archaeological and architectural heritage at the Constraints Study, Route Corridor Selection and Preliminary Design/Environmental Impact Assessment phases. It should be noted that TII will shortly publish new Cultural Heritage Impact Assessment Standards and Guidelines which will replace the existing 2005 archaeological and architectural heritage impact assessment guidelines.

The methodology is also consistent with other guidance including the Environmental Protection Agency's Advice Notes on Current Practice (EPA 2003) and their recently published Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022).

5.9.3 Defining the Baseline Environment

This study comprises a high-level quantitative summation and visual presentation of known Cultural Heritage constraints within the study area. The survey does not presently include a fieldwork element; however, it may be necessary prior to the next stage to verify the nature and extent of certain constraints by means of windshield or walkover surveys.

The baseline environment for the Cultural Heritage subcategories, namely (1) Recorded Archaeological Heritage, (2) Recorded Architectural/Built Heritage, and (3) Undesignated Cultural Heritage, was defined using the sources listed in Table 5-17, Table 5-18, and Table 5-19 respectively. Cultural Heritage datasets from the sources listed in the aforementioned tables were incorporated into a Geographical Information System (GIS),[9] and spatially mapped in relation to the former West Clare Railway corridor and the scheme's study area, which comprises approximately 8,571 ha (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200017-26 in Appendix A).

[8] Available at: https://www.gov.ie/en/publication/6b6a0-code-of-best-practice-for-national-and-regional-greenways/ [Accessed September 2022].
[9] QGIS (https://www.qgis.org/en/site/).

The sources listed in Table 5-17 and Table 5-18 were used to identify all previously recorded archaeological and architectural/built heritage sites within the study area. A preliminary survey to identify other Cultural Heritage sites was also undertaken. These constraints are categorised as Undesignated Cultural Heritage and consist of sites that have not previously been recorded or entered on any statutory or national registers, inventories, or lists, but are considered to be of historical, cultural and/or built heritage significance. For the purposes of this study a preliminary list of Undesignated Cultural Heritage sites within 50m either side of the former West Clare Railway line was identified through a high-level desktop survey using the sources listed in Table 5-19.

It should be noted that it was not feasible or practical to identify all previously unrecorded Cultural Heritage sites at this stage and detailed assessment, including field surveys, to be undertaken in subsequent stages will inevitably identify further Cultural Heritage sites. It should also be noted that it was not feasible or practical to identify specific areas of archaeological potential at this stage. However, with respect to this, it should be anticipated that lands such as undeveloped greenfield and riverine environments close to recorded sites or find spots, or within a wider rich archaeological landscape with a high density of recorded sites, will in very broad terms/generally be considered to have potential for the survival of previously unknown subsurface archaeological remains.

All recorded Cultural Heritage constraints and the preliminary list of Undesignated Cultural Heritage constraints have been tabulated in catalogues (Appendices C2–C4) and mapped visually (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200017-26 in Appendix A). Supporting information is provided in Appendix C1. This includes a summary of the legal and regulatory protections for Cultural Heritage in Ireland (Appendix C1.1); an overview summary of notification, licence, and consent requirements for Cultural Heritage sites (Appendix C1.2); and a list of townlands within the study area (Appendix C1.3). The list of townlands was used as the basis for interrogating certain sources for the present study, such as the National Museum of Ireland's (NMI) online Finds Database; and will be used going forward as a means to inform archaeological potential through toponymy (placenames analysis), as well as for identifying historical townland boundaries that could be affected by the proposed development.

Table 5-17 Sources consulted for Recorded Archaeological Heritage [Accessed September 2022].

Source/Dataset	Available at
UNESCO World Heritage Properties and Tentative List for World Heritage Properties in Ireland	https://whc.unesco.org/en/list/ https://www.worldheritageireland.ie/tentative-list/
Record of Monuments and Places (RMP) – statutory list of protected places and monuments with accompanying constraints maps established under the terms of the *National Monuments Act*; issued for Co. Clare in 1996 and published in 1998.	https://www.archaeology.ie/publications-forms-legislation/record-of-monuments-and-places

Source/Dataset	Available at
Sites and Monuments Record (SMR) – list of all known archaeological sites and monuments maintained by the Archaeological Survey of Ireland, a unit of the National Monuments Service (NMS), Department of Housing, Local Government and Heritage (DHLGH), which is accessible via the online Historic Environment Viewer (HEV).	https://maps.archaeology.ie/HistoricEnvironment/
List of National Monuments (NM) in State Care (Ownership and Guardianship) for Co. Clare, published in 2009. A national monument, as defined in Section 2 of the *National Monuments Act 1930*, means a monument 'the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto…'.	https://www.archaeology.ie/sites/default/files/media/pdf/monuments-in-state-care-clare.pdf
List of Preservation Orders (PO), published by NMS in 2019. Section 8 (1) of the *National Monuments Act 1930* provides for the Minister placing a PO on a monument which they consider to be a national monument under threat (DAHGI 1999, 39).	https://www.archaeology.ie/sites/default/files/media/publications/po19v1-all-counties.pdf
National Museum of Ireland's (NMI) online Finds Database (current to 2010) – dataset hosted via the Heritage Council's website, which is compiled from the NMI Irish Antiquities Division's Collections Database (in particular the Topographical Files).	https://heritagemaps.ie/WebApps/HeritageMaps/
Wreck Inventory of Ireland Database (WIID) – list of all recorded wrecks from inland waterways and Irish maritime waters. Of the approximate 18,000 records, only 4,000 (22%) have precise locations. Only those with a precise location are visible in the online Wreck Viewer; however, a complete list is available via the data downland link in the viewer.	https://www.archaeology.ie/underwater-archaeology/wreck-viewer
Database of Irish Excavation Reports (DIER) – summary accounts of archaeological excavations carried out in Ireland – North and South – from 1969 to 2020, compiled from the published *Excavations Bulletins* (1970–2010) and including additional online-only material from 2011 onwards. The geospatial dataset for excavations on TII projects was also consulted.	https://www.excavations.ie TII dataset available at: https://data.gov.ie/dataset/archaeological-excavations-on-road-constructions-schemes

In addition to the sources listed in Table 5-17 for Recorded Archaeological Heritage, the NMS also maintains a statutory list of sites included on the Register of Historic Monuments (RHM) – see Appendix C1.1 for further information relating to the RHM.

For the present study the NMS were consulted with respect to confirming sites listed on the RHM within the study area.[10]

The NMI online Finds Database (included in Table 5-17) does not represent the complete inventory of finds recorded in the NMI Collections Database and is also current only to 2010. It is therefore inevitable that additional archaeological objects are recorded in the museum's archive at Kildare Street in Dublin. Many of the objects, including those in the online dataset (where a point location is provided), have no precise locational information and some are located to a townland only.[11] Nevertheless, even when located to a townland only, they do serve as blunt indicators of archaeological activity in the area. The Topographical Files housed in the NMI at Kildare Street will be consulted during the next phase of works. In addition to this resource, the NMS also maintains a list of log boat finds, which will be consulted during the next phase of works.

With respect to the WIID dataset (included in Table 5-17Table 5-17), only those entries that have a precise location were evaluated for this present study. A more in-depth evaluation of the dataset will be carried out at the next stage to ascertain whether any of the entries without precise locational information could potentially come from watercourses close to/crossed by the scheme. For previous investigations in the area, a geospatial dataset was used and cross-checked with information available in the online DIER. Only the location of previous investigations where archaeological and/or post-medieval remains were uncovered have been mapped on drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200017-21 in Appendix 2. For the next stage, the full online DIER will be interrogated using a list of placenames generated in GIS.

Table 5-18 Sources consulted for Recorded Architectural/Built Heritage [Accessed September 2022].

Source/Dataset	Available at
Record of Protected Structures (RPS) for Co. Clare – statutory list of Protected Structures included in Volume 4 of the *Clare County Development Plan* [CDP] *2017–2023.* Their locations are shown on maps included in Volume 2.	https://www.clarecoco.ie/services/planning/ccdp2017-2023/
Architectural Conservation Areas (ACA) – this statutory provision is supplementary to the RPS, allowing a clear mechanism for the protection of areas, groups of structures or townscapes which are either of intrinsic special interest or contribute to the appreciation of Protected Structures.	Vol.1, Appendix 4 of Clare CDP*:* https://www.clarecoco.ie/services/planning/ccdp2017-2023/vol1/clare-county-development-plan-2017-2023-volume-1-written-statement-24125.pdf

[10] Email confirmation received from the NMS 19.10.22.
[11] The online dataset's metadata states 'locations shown […] are not an accurate representation of the actual find spot [and] in some cases, the location symbol may only represent the townland in which the find was located.'

Source/Dataset	Available at
National Inventory of Architectural Heritage (NIAH) – Building and Garden Surveys – nationwide surveys carried out under the terms of the *Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999*	https://www.buildingsofireland.ie/buildings-search/ NIAH Buildings Survey is also available via the HEV: https://maps.archaeology.ie/HistoricEnvironment/ NIAH Gardens Survey downloadable dataset: https://www.buildingsofireland.ie/resources/

With respect to the NIAH Gardens Survey (Table 5-18), the historic demesnes included in this survey are currently mapped on drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200022-26 in Appendix A as point locations only (as per the available online dataset). The full extent of each area is recorded/shown on historical mapping accessible via the 'Image Gallery' for each record at the individual weblinks provided in Appendix C3.4. For the next stage, the extent of these sites will be digitised from the historical mapping.

Table 5-19 Sources consulted for Undesignated Cultural Heritage [Accessed September 2022].

Source/Dataset	Available at/via
Industrial Heritage Review of Co. Clare (2008) –interim survey of structures and surviving features of engineering, scientific, technical, industrial, and architectural interest, constructed over the past three centuries in Co. Clare, implemented under the Clare Heritage Plan, 2003–2007.	https://www.clarelibrary.ie/eolas/coclare/heritage/pdfs/industrial_heritage_review_of_County_Clare_2008.pdf
Irish Historic Railway dataset – from Ronan Hennessy's *National Animated Timeline Map of Irish Railways* project (funded by the Heritage Grant Scheme 2012).	http://geoscene.blogspot.com/2013/03/animated-timeline-map-of-irish-railway.html
North Clare Bridge Survey – *The Bridges of North County Clare, An Inventory of Civil Engineering Heritage* (Lotts Architecture and Urbanism 2015).	https://www.clarecoco.ie/services/planning/publications/heritageconservation/north-clare-road-bridge-survey-2015-22291.pdf
Historical nineteenth-century Ordnance Survey (OS) maps: • First-edition 6-inch sheets CE015–017, CE023–025, CE033 (surveyed 1839; published 1842). • First-edition 25-inch sheets CE015–017, CE023–025, CE033 (surveyed 1894/5; published 1897).	https://osi.maps.arcgis.com/apps/webappviewer/index.html?id=bc56a1cf08844a2aa2609aa92e89497e
Ireland's Workhouses – dataset mapping and providing information on workhouses built during the nineteenth century in Ireland.	https://www.workhouses.org.uk/Ireland/ and mapped via https://www.heritagemaps.ie
Satellite images and orthophotographs.	https://webapps.geohive.ie/mapviewer/index.html ; Bing satellite imagery via QGIS Web Mapping Service
Google Street View (GSV) and historical aerial imagery.	Google Earth Pro [on desktop] downloadable at: https://www.google.com/earth/versions/

In addition to the sources listed in Table 5-19, Eddie Lenihan's book In the Tracks of the West Clare Railway (Lenihan 2008), which provides an account of a walking journey along the former railway corridor, was consulted for supporting information. Additionally, the Irish Railway Record Society's (IRRS) online Photographic Archive was also consulted for supporting information.[12] Further analysis of these resources will be undertaken for the next stage. Clare County Council also provided drawings showing the location of historical bridges along and in close proximity to the former West Clare Railway; those located within 50m of the former West Clare Railway line have been included in this present study.

5.9.4 Summary of Findings

5.9.4.1 Recorded Archaeological Heritage

(1) There are no World Heritage Properties, or sites nominated for inclusion on the new Tentative List for World Heritage Properties in Ireland, within the study area.

(2) There are three national monuments (NM) in state ownership within the study area. These include **NM No. 16 [Dysert O'Dea Monument]** which comprises three sites — a church (CL025-091001-), a round tower (CL025-091003-) and a cross (CL025-091004-) — in the townland of Mollaneen (Appendix C2.1; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200020 in Appendix A); **NM No. 170 [Ennis Friary],** the impressive remains of a Franciscan friary (CL033-082001-) situated in the centre of Ennis Historic Town (CL033-082----) on what was formerly an island formed by the River Fergus in the townland of Clonroad Beg (Appendix C2.1; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200021 in Appendix A); and **NM No. 204 [Drumcliff**] consisting of two sites — a church (CL033-033001-) and a round tower (CL033-033003-) — in the townland of Drumcliff (Appendix C2.1; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200021 in Appendix A).

(3) Within the study area three sites are subject to Preservation Orders (POs). These are a tower house (CL025-095002-) known as O'Dea's Castle in Dysert townland subject to **PO No. 11/1971** (Appendix C2.1; WCGW-ROD-EAC-S2_ML-DR-GI-200020 in Appendix A); Ballygriffy Castle, a second tower house (CL025-203002-) in the townland of Ballygriffy South subject **to PO No. 182/1947** (Appendix C2.1; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200020 in Appendix A) – this castle is located 15m to the east of the former West Clare Railway; and Ennis Friary cloistral buildings (CL033-082034-) in Clonroad Beg townland subject to **PO No. 2/1975** (Appendix C2.1; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200021 in Appendix A).

(4) Three sites within the study area, are listed on the Register of Historic Monuments (RHM). These include O'Dea's Castle (CL025-095002-), which is also the subject of a PO (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200020 in Appendix A); a ringfort - cashel (CL025-138----) in Bealnalicka townland (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200020 in Appendix A); and a megalithic tomb (CL025-189----) in the townland of Caherbannagh (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200020 in Appendix A).

(5) Within the study area there are 375 records listed in the Sites and Monuments Record (SMR), 255 of which are Recorded Monuments listed in the Record of Monuments and Places (RMP) (Appendix C2.1). A further seven record numbers are unique to the RMP; however, in the case of six of these it appears

[12] The weblink is provided here for information purposes as it is accessible only through IRRS membership: https://www.flickr.com/people/irishrailwayarchive/ [Accessed October 2022].

that they equate to sites listed in the SMR where a sub-element has been added to their record number (e.g., CL025-032--- in the RMP and CL025-032001- in the SMR) – i.e., these sites should be counted within the 375 records and are not in addition to these; all six cases have been indicated in Appendix C2.1. The seventh record (CL033-146---) relates to a site where archaeological investigations subsequent to the publication of the RMP have revealed that the precise location is not known and there is no record for it included in the SMR/HEV.

(6) Of the 375 records included in the SMR, twenty-four are classed as 'Redundant Records' and are not scheduled to be included in the next revision of the RMP. A further nine SMR records with various classifications are also not scheduled to be included in the next revision of the RMP: CL016-105005- (architectural fragment); CL017-205---- (burnt mound); CL025-114---- (battlefield); CL025-121---- (earthwork); CL025-253---- (church); CL033-082054- (burial ground); CL033-125---- (windmill); CL033-128---- (fulacht fia); and CL033-169---- (ring-ditch).

(7) The other 342 records relate to a wide variety of archaeological site and monument types of secular and religious origin spanning almost the complete timeframe of the Irish archaeological record and indicate that the study area has a long, rich and varied history of human settlement. The most numerous site type is the ringfort - cashel, of which there are 64 known sites located within the study area. Ennis Historic Town (CL033-082----) is the most extensive Recorded Monument, including 52 individual sites and monuments and encompassing an area of approximately 21 ha (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200021 in Appendix A). The range of recorded archaeological site types and their quantities are detailed in **Table 5-21** below.

(8) There are a further 52 sites listed in the SMR that are located in townlands within/intersected by the study area which have no ITM recorded in the HEV; thirteen of which are included on the RMP. As noted in Appendix C2.2 (cataloguing these sites) the HEV records a number of reasons why there is no ITM. This includes the use of an obsolete classification term where the entry is now classed as a 'Redundant Record'; a duplicate record created in error; a site with documentary evidence but no precise location, as is the case with a large proportion (19) of the records in this list that are within Ennis Historic Town (CL033-082----). In some cases, there is no further information available via the HEV. None of these sites are scheduled to be included in the next revision of the RMP.

(9) In addition to Ballygriffy Castle (CL025-203002-, PO 182/1947) noted above (in No. 3), there are eleven further recorded archaeological sites located within 50m of the former Railway Corridor (see

(10) Table ***5-20*** for details) one of which is now classed as a 'Redundant Record' and a second where archaeological investigations subsequent to the publication of the RMP have revealed that the precise location is not known.

(11) There are twelve records of archaeological objects in the NMI's online Finds Database from townlands within the study area, as well as one record referring to a possible megalithic tomb. The objects include a number of stone axes, as well as metal artefacts (Appendix C2.4).

(12) No wrecks with a precise location are recorded within the study area in the Wreck Inventory of Ireland Database (WIID); and while the Clare Traditional

Boat and Currach Project undertaken by Darina Tully in 2008[13] notes the location of a currach (Record No. 133; West Clare type) housed in Clare County Museum in Ennis, it did not originally hail from a location within the study area.

(13) Of the 90 previous archaeological investigations recorded within the study area (see Appendix C2.4), 56 were found to have no archaeological significance. Only the locations of previous investigations (34) where archaeological and/or post-medieval remains were uncovered are mapped on drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200017-21 in Appendix A. These are largely concentrated within and in close proximity to Ennis Historic Town (CL033-082----), with 30 of the 34 investigations taking place within this area.

5.9.4.2 Recorded Architectural / Built Heritage

(14) There are 214 Protected Structures within the study area (Appendix C3.1; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200022-26 in Appendix A). These are largely concentrated in the three urban areas situated in the study area – Ennis (134), Corofin (8) and Ennistymon (40), totalling 182 – with a further 32 Protected Structures located in the surrounding countryside and within smaller settlements.

(15) There are five Architectural Conservation Areas (ACAs) located within the study area (Appendix C3.2); one within Ennistymon town (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200022 in Appendix A); a second within Corofin village (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200024 in Appendix A); and three located in the Ennis area (drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200026 in Appendix A). As noted in Section 5.9.3 (Table 5-18) these are supplementary to the Record of Protected Structures (RPS), allowing a clear mechanism for the protection of areas, groups of structures or townscapes which are either of intrinsic special interest or contribute to the appreciation of Protected Structures.

(16) There are 120 sites listed in the NIAH Building Survey within the study area (Appendix C3.3; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200022-26 in Appendix A). With the exception of two, all of these sites are Protected Structures.

(17) There are twelve historic demesnes/gardens listed in the NIAH Garden Survey within the study area (Appendix C3.4; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200022-26 in Appendix A). As noted in Section 5.9.3, for the present study these areas are mapped using an ITM point location on drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200022-26 in Appendix A; their full extent can be viewed at the individual weblinks provided in Appendix C3.4. Nine of these areas fall entirely within the study area, with the remaining three situated partially within the study area. It should be noted that although there are no unrecorded historic demesnes within 50m of the former West Clare Railway, it is likely that there are further potential historic demesnes not previously recorded situated outside this 50m zone within the study area; for instance, Willbrook House, Cooga House and Lifford House (to the north of the former Ennis Union Workhouse, RPS 804).

5.9.4.3 Undesignated Cultural Heritage

(18) In addition to the former West Clare Railway corridor (CH01), a preliminary non-exhaustive list of twenty-nine other Undesignated Cultural Heritage sites

[13] Available at: https://www.clarelibrary.ie/eolas/coclare/heritage/pdfs/clare_traditional_boat_and_currach__project_2008.pdf [Accessed October 2022].

located within 50m of this former corridor has been identified (Appendix C3.4; drawing no. WCGW-ROD-EAC-S2_ML-DR-GI-200022-26 in Appendix A). These comprise structures associated with the former railway, such as station buildings / structures, bridges, crossing keeper's cottages and a gate keeper's house, as well as other sites recorded on historical mapping, such as dwellings, lime kilns and non-railway associated bridges.

(19) It should be noted that CH01 includes any sections of surviving track, embankment and cutting, any surviving boundary/retaining walls and cattle passes; as well as level crossing sites (of which there are 23 labelled on the first-edition 25-inch OS map) and any surviving signal posts/boxes (of which there are seven labelled on the first-edition 25-inch OS map).

5.9.4.4 Cultural Heritage Potential

(20) As noted in Section 5.9.3, previously unrecorded and undesignated Cultural Heritage sites (including subsurface archaeological remains) are inevitably present within the study area and could be revealed through further desktop research (e.g., LiDAR, cartographic, aerial and satellite imagery analyses) and through field surveys/inspections, as well as through geophysical surveys, archaeological test excavations and monitoring.

5.9.4.5 Potential Notification, Licence and Consent Requirements

(21) Potential notification, licence and consent requirements for archaeological investigations/ works are summarised in Appendix C1.2 and will need to be agreed/approved by the relevant statutory authority.

Table 5-20 Recorded archaeological sites within 50m of the former West Clare Railway corridor.

Reference Number	SMR Class Description	Townland	Figure (Vol. 2)	RMP	Inclusion in next RMP Rev.
CL023-011001-	Earthwork	Glen South	Figure 3	Y	Y
CL023-011002- [Glen Castle]	Castle - tower house	Glen South	Figure 3	Y	Y
CL023-016----	Barrow - unclassified	Cullenagh	Figure 3	Y	Y
CL024-010----	Ritual site - holy well	Craggaunboy	Figure 5	Y	Y
CL024-041----	Ringfort - cashel	Applevale	Figure 5	N	Y
CL025-023----	Earthwork	Killeen (Rath Par.)	Figure 6	Y	Y
CL025-026----	Ringfort - cashel	Killeen (Rath Par.)	Figure 6	Y	Y
CL025-136----	Ringfort - cashel	Bealnalicka	Figure 8	Y	Y
CL025-203001-	Redundant record	Ballygriffy South	Figure 8	Y [earthwork]	N
CL025-203002- PO No. 182/1947 [Ballygriffy Castle]	Castle - tower house	Ballygriffy South	Figure 8	Y	Y
CL025-242----	Fulacht fia	Drummeer	Figure 8	Y	Y

Reference Number	SMR Class Description	Townland	Figure (Vol. 2)	RMP	Inclusion in next RMP Rev.
CL033-146---	Not included in SMR	Drumcliff	Figure 9[14]	Y [fulachta fiadh]	To be confirmed – no HEV record

Table 5-21 Recorded archaeological site types within the study area.

Class Description	NM/PO/RHM	RMP	SMR	Next RMP Rev.[15]
Architectural fragment	-	2	14	13
Barrow - ring-barrow	-	-	1	1
Barrow - unclassified	-	1	1	1
Battlefield	-	3	1	-
Bawn	-	1	4	4
Bridge	-	1	2	2
Bullaun stone	-	-	1	1
Burial ground	-	4	4	3
Burnt mound[16]	-	10	13	11
Cairn - unclassified	-	1	2	2
Castle - tower house	2 [PO]; 1 [RHM]	9	11	11
Castle - unclassified	-	3	3	3
Children's burial ground	-	7	9	9
Church	2 [NM]	10	11	10
Concentric enclosure	-	-	1	1
Crannog	-	3	3	3
Cross	1 [NM]	2	5	5
Cross - high cross	-	1	1	1
Cross - Tau Cross	-	-	1	1
Cross - wayside cross	-	1	1	1
Cross-inscribed stone	-	-	2	2
Cross-slab (present location)	-	-	4	4
Earthwork	-	34	30	29
Ecclesiastical enclosure	-	2	2	2
Enclosure	-	31	31	31
Field System	-	-	1	1

[14] Precise location of this Recorded Monument is unknown [see Appendix 2.1]; the area shown on Fig. 9 is as per the RMP map.
[15] Number of sites to be retained/scheduled to be included in the next revision of the RMP.
[16] Also included in this count are sites classed as fulacht fia or fulachta fiadh.

Class Description	NM/PO/RHM	RMP	SMR	Next RMP Rev.[15]
Font	-	-	3	3
Gatehouse	-	-	2	2
Gateway	-	-	1	1
Graveslab	-	-	6	6
Graveyard	-	8	8	8
Hilltop enclosure	-	1	1	1
Historic town	-	1	1	1
House - 16th/17th century	-	1	6	6
House - 17th century	1 [PO]	-	6	6
House - 18th/19th century	-	1	1	1
House - indeterminate date	-	-	1	1
House - medieval	-	2	2	2
Hut site	-	-	4	4
Inn	-	-	1	1
Inscribed stone	-	-	4	4
Market-house	-	-	1	1
Megalithic structure	-	1	1	1
Megalithic tomb - unclassified	1 [RHM]	2	2	2
Megalithic tomb - wedge tomb	-	1	1	1
Memorial stone	-	-	1	1
Mound	-	2	2	2
Possible enclosure	-	7	-	-
Possible fulachta fiadh	-	1	-	-
Potential site - aerial photo	-	1	-	-
Redundant record	-	-	24	-
Religious house - Franciscan friars	1 [NM]	-	1	1
Ring-ditch	-	-	1	-
Ringfort - cashel	1 [RHM]	60	64	64
Ringfort - rath	-	25	26	26
Ringfort - unclassified	-	3	3	3
Ritual site - holy well	-	9	9	9
Round tower	2 [NM]	3	3	3
Sheela-na-gig	-	1	2	2
Souterrain	-	-	2	2
Standing stone	-	-	1	1
Stone head (present location)	-	-	1	1
Stone sculpture	-	-	4	4

Class Description	NM/PO/RHM	RMP	SMR	Next RMP Rev.[15]
Structure	-	-	1	1
Tomb - effigial	-	-	1	1
Wall monument	-	-	11	11
Water mill - unclassified	-	2	2	2
Water mill - vertical-wheeled	-	2	2	2
Well	-	1	2	2
Windmill	-	1	1	-

5.9.5 Concluding Statements

Adverse impacts to all known Cultural Heritage sites should be avoided in the development proposals wherever possible.

There will also be opportunities to positively affect and enhance the environment of identified Cultural Heritage sites. For example, through creating improved access to sites, such as the two upstanding castles located within 50m of the former railway corridor (Ballygriffey Castle, pictured on the front cover [CL025-203002-; PO No. 182/1947] and Glen Castle [CL023-011002-]);[17] increasing awareness and enjoyment of our shared Cultural Heritage through the installation of heritage informational boards at these and other sites (such as for the former West Clare Railway) and/or the use of other forms of interpretation; improving visual amenities; as well as stabilising and conditioning elements of the Cultural Heritage environment, such as surviving boundary, cutting or retaining walls of the former West Clare Railway line.

In addition to informing subsequent option and design decisions and choices, the information set out in this Constraints Study should be used by the project heritage experts in consultation with the design team to determine where field inspections may be beneficial prior to the next stage; for instance, to establish the extent of surviving elements associated with the West Clare Railway and recorded archaeological sites in close proximity to the former railway corridor (see Table 5-20.

5.9.6 References

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[17] See Table 5-20 for site details.

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5.10 Material Assets and Land – Agriculture

5.10.1 Introduction

John Bligh and Associates were appointed as Agricultural Property specialists for the West Clare Railway Greenway – Ennis to Ennistymon Greenway Project. This section of the report is presents the constraints input for Material Assets – Agriculture as required under Phase 2 Options selection. The key agricultural constraints are identified on an associated drawing (Dwg. Ref. West Clare Greenway – Ennis to Ennistymon Greenway Project – Agricultural Constraints). The key agricultural constraints identified in this report will inform the development of the route corridor options.

5.10.2 Methodology

The methodology for the preparation of this section is based on a desktop review of the study area using available information, consultation with agricultural advisors representative of the study area and a roadside survey.

The preparation of this report has considered the following guidance:

- Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- Directive 2014/52/EU amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- Code of Best Practice, National and Regional Greenways, TII (December 2021).

Under EU and TII guidance, there is a requirement to identify likely significant effects on the environment and the measures taken to avoid adverse impacts on the environment. The avoidance of significant adverse effects on agricultural property is achieved through the identification of Key Agricultural Constraints. This is required to avoid unnecessarily impacting farms considered as sensitive or of importance in terms of type or scale. Key enterprises of a sensitive nature would include equine enterprises where the holding is involved in the breeding or training of high value bloodstock. Key enterprises of an important nature would include dairy farms where land take and or land severance due to a road alignment may have a significant or profound effect. Other key enterprises of an important nature might include intensive enterprises such as pig farms, poultry farms, tillage lands, horticultural units, agribusinesses, or agricultural research / educational institutions.

The desktop review involved a survey of available mapping for the study area and online aerial photography. Data sources used during the desktop review are outlined in Table 5-22:

Table 5-22 Information sources

Information	Source
Digital mapping – Discovery, Ordinance Survey and Satellite imagery	Roughan & O'Donovan Consulting Engineers
Agricultural constraints	Online Aerial imagery (Google Earth). Consultation with Teagasc advisors (Clare region). IPC Licensing mapping, EPA https://gis.epa.ie/EPAMaps/

Information	Source
Planning Applications	Clare County Council - https://www.clarecoco.ie/services/planning/
Soils Information	Irish National Soils Map, 1:250,000k, V1b (2014). Teagasc, Cranfield University - http://gis.teagasc.ie/soils/ National Soils mapping, EPA Maps - http://gis.epa.ie/EPAmaps/
Agricultural statistics	National census of agriculture statistics derived from the June 2020 Census of Agriculture, Central Statistics Office, 2022. Farm Structure Survey 2016, Central Statistics Office, 2018. The contribution of the Sport Horse Industry to the Irish Economy, Corbally, A. F. & Fahey, Prof. A. G., 2017

Consultation also took place with agricultural advisors as representatives of the agricultural sector in the study area. A roadside survey of the study area was conducted on the 10th October 2022 to confirm locations of key agricultural constraints.

5.10.3 Receiving Environment

The study area is comprised predominantly of agricultural lands and includes the urban areas of Corofin, Ennistymon and the environs of Ennis town. Land cover within the study area is quite mixed and comprises of a significant area with natural vegetation and commercial forestry in addition to improved grasslands.

From Ennis to Corofin, the agricultural lands are predominantly comprised of well drained mineral soils with areas of peat at Ballycullinan Lough and Lough Atedaun and alluvium soils at the Ballygriffey River and Fergus River. The western half of the study area extending from Lough Raha to the east of Ennistymon is predominantly comprised of poorly drained mineral soils with more significant areas of peat and alluvium soils at the Craggaunboy River. In the Ennistymon area, the agricultural lands are predominantly comprised of well drained mineral soils with low levels of peat. South of the N85 road, there are alluvium soils along the Inagh River and poorly drained mineral soils (EPA, 2022).
In general, agricultural land use follows a similar division within the study area. From Ennis to Corofin, there are higher levels of improved grassland with a wide range of moderate to intensive land uses which are primarily grassland-based livestock production. The area extending from Lough Raha to east of Ennistymon is limited with more extensively used grassland and commercial forestry. In the Ennistymon area, the well-drained soils allow for intensive land use while to the south land use is more limited (EPA, 2022).

Farm size in County Clare is 32.1ha on average, which is lower than the average for the Mid-West region of 37.1ha and the national average of 33.4ha (CSO, 2022).

The farming type in the study area is comprised mainly of beef, sheep and mixed livestock farming. There are low levels of dairy and equine present. In County Clare, specialist beef at 81.1% and dairy farming at 7.7% are the predominant farming types. Mixed field crops, mixed grazing livestock and sheep are at lower levels of 6.7%, 2.4% and 1.5% respectively. All other farms categories are at very low levels (CSO, 2022).

There are equine holdings present the study area with such farms mainly involved in the Sport Horse sector. In County Clare, the Sport Horse sector has a combined 876 breeders and 340 competitors (Corbally & Fahey, 2017).

5.10.3.1 Identified Constraints

The agricultural constraints within the study area include all farmhouses and farmyards where the essential farm buildings and facilities are located for the operation of on-farm activities. The on-farm facilities include buildings for animal housing, fodder storage, milking parlour/dairy, machinery storage, general purpose buildings, etc. and other farm facilities for slurry storage, fodder storage, animal handling (pens, yards, sand areas, etc.), etc. Where these facilities exist on farms, they are considered agricultural constraints within the study area.

The methodology for the identification of key agricultural constraints input has focused on those agricultural farming enterprises considered to be of a sensitive nature or of importance in terms of type or scale. These typically include farms within the dairy sector, equine farms involved in breeding and training activities, pig farms, poultry farms and horticulture enterprises.

Dairy

The primary constraint on dairy farms is the farmyard and adjoining milking platform as a unit given the daily movement of dairy cows to and from grazing paddocks. The impact of land take on the milking platform and land severance, can have a significant effect on the operation of a dairy farm depending on the scale of operation and the availability of land. There is a difficulty at constraints stage in identifying owned lands associated with a dairy farm without landownership information.

The focus of this assessment has been to map the location of the farmyard and the associated land area or milking platform area relative to the farmyard.

In the study area, there is a relatively low level of dairy farming due in part to mixed land cover and prevalence of limited agricultural soils. There are six dairy farms with herd sizes ranging from approximately 30 cows to 100+ cows. The average herd size in the study area is lower than that in County Clare and significantly lower than the average herd size of 94 cows at national level.

There are six dairy farms identified as dairy constraints at the following locations:

- Drumcliff, Ennis.
- Erinagh, Ennis.
- Kilcurrish, Ennis
- Boherbullog, Corofin.
- Killeinagh, Ennistymon.
- Carrownaclogh, Ennistymon

Equine

The equine constraints include equestrian centres and farm holdings with equine activities concentrated around the stable yard and equine facilities present. Most equine farm holdings comprise of stables and a working yard area and may include sand areas, gallops, arenas, etc. The primary constraint on equine holdings is the stable yard and the associated facilities where the intensive activities involving human interaction with horses are carried out. The direct impact of land take at or in the proximity of where the intensive activities are preformed can have a significant

effect on the equine operation. The severance of adjoining lands may have a significant effect and result in a high level of operational disturbance. There is a difficulty at constraints stage in accurately identifying owned lands associated with an equine farm.

There are seven equine holdings identified as equine constraints at the following locations:

- Drumcliff Equestrian Centre, Drumcliff, Ennis.
- Fountain, Ennis.
- Banner Equestrian Centre, Toonagh, Ennis.
- Rockview Sporthorses, Nooan, Ruan.
- Cahercorcaun, Corofin.
- Applevale, Corofin.
- Craggaunboy, Corofin

Tillage / Horticulture

Tillage farms may comprise of arable lands with or without a farmyard comprised of farm buildings used for machinery and / or crop storage. Tillage plots are not representative of individual tillage farms as several tillage plots may be owned or farmed as a single farm holding. The primary constraint is land take to generally high-quality lands resulting in a reduction in tillage area.

Horticultural constraints can include garden centres, nurseries, glasshouses / polytunnels and associated lands used for intensive production of soft fruit and vegetable crops. The primary constraint is land take involving a direct impact on buildings, yard or adjoining lands.

There were three horticultural constraints identified within the study area:

- Ballycullinan, Ennis.
- Moanreel South, Ennistymon.
- Knockdrummagh, Ennistymon.

Agribusiness

Agribusiness constraints involve commercial businesses within the agricultural sector. These businesses are typically located in a rural setting and provide important local employment in these areas. The primary constraint is land take involving a direct impact to the business premises or associated lands.

There are two agribusinesses identified as a key agricultural constraint:

- Clare Foods Ltd. – Cappankilla, Ennis.
- Kerry Farm and Homestore – Corofin.
- Kerry Farm and Homestore – Ennistymon

Pigs / Poultry

Pig and poultry farms are similar, typically being highly intensive indoor operations that are based within a farmyard setting. The primary constraint to such farms is a direct impact to the farmyard buildings or yard which may result in a significant effect.

There were no pig or poultry constraints identified within the study area.

5.10.3.2 References

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