UWF GRID CONNECTION

REFERENCE DOCUMENTS

UWF REPLACEMENT FORESTRY

VOLUME F5: EIAR NON-TECHNICAL SUMMARY & EIAR FIGURES

Volume A	Planning Application Documents – Application Form; Site/Newspaper Notice; Letters of Consent; Schedule of Submitted Documents etc.	
Volume B	Planning Drawings	
Volume C	UWF Grid Connection EIA Report (EIAR)	Volume C1: EIAR Non-Technical Summary Volume C2: EIAR Main Report Volume C3: EIAR Figures Volume C4: EIAR Appendices
Volume D	Environmental Management Plan for UWF Grid Connection	
Volume E	Appropriate Assessment Reporting	
VOLUME F	**REFERENCE DOCUMENTS FOR OTHER ELEMENTS OF THE WHOLE UWF PROJECT**	Volume F1 to F3: UWF Related Works EIA Report Volume F4: Environmental Management Plan For The UWF Related Works Volume F5 TO F7: 2018 UWF Replacement Forestry EIA Report **VOLUME F5: EIAR NON-TECHNICAL SUMMARY & EIAR FIGURES** Volume F8 to F9: Upperchurch Windfarm **DETAILS OVERLEAF**

Planning Application to An Bord Pleanála
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Project Website: www.upperchurchwindfarmgridconnection.ie

REFERENCE DOCUMENTS DETAILS

Volumes F1 to F3: 2018 UWF Related Works EIA Report

Volume F1: EIAR Non-Technical Summary & EIAR Figures

Volume F2: EIAR Main Report (2 Parts)

Volume F3: EIAR Appendices (3 Parts)

Volume F4: Environmental Management Plan for the UWF Related Works

Volumes F5 to F7: 2018 UWF Replacement Forestry EIA Report

Volume F5: EIAR Non-Technical Summary & EIAR Figures

Volume F6: EIAR Main Report (2 Parts)

Volume F7: EIAR Appendices (3 Parts)

Volumes F8 to F9: Upperchurch Windfarm

Volume F8: 2013 EIS for Upperchurch Windfarm

Volume F9: 2013 RFI for Upperchurch Windfarm & 2014 ABP Inspector's Report for Upperchurch Windfarm & 2014 Grant of Permission & Conditions for Upperchurch Windfarm

UWF Replacement Forestry EIA Report

Volume C1: EIAR Non-Technical Summary

Non-Technical Summary
of
Chapters 1 to 20
of the EIAR Main Report

EIAR Coordinator:

ECOPOWER

May 2018

Topic	**Non-Technical Summary**

Contents

List of Figures

Figures can be found at the end of this Non-Technical Summary

NTS of Chapter 1: Introduction

1.1 The Non-Technical Summary

This is the **Non-Technical Summary** of the **Environmental Impact Assessment Report** (EIA Report) which has been submitted with the **Afforestation Licence Application to the Minister of Agriculture, Food and the Marine** for **UWF Replacement Forestry** (Upperchurch Windfarm Replacement Forestry). It is written in non-technical language, avoiding technical terms, detailed data and scientific discussion. The aim is that the Non-Technical Summary is understandable to a lay member of the public, who does not have a background in the environment or in-depth knowledge of the development itself.

The Non-Technical Summary provides a summary description of the development, the environment in which it will be located, the effects that it will have on that environment, proposals to lessen any negative effects and the end result after the development is built. It also sets out how the studies in the EIA Report were conducted.

This Non-Technical Summary is set out as follows

1) Section 1: An **introduction to this afforestation licence** and a description of the new wood,
2) Section 2: A description of the EIA Report and the **process governing EIA** in the licensing process,
3) Section 3: The **people consulted about the development** and the area before the EIA Reports were prepared,
4) Section 4: The **different locations and designs** that were considered for the new wood,
5) Section 5: A **description of the new wood**,
6) Section 6 – 17: A **summary, chapter by chapter** of the EIA Report's **12 scientific topic chapters,**.

Note: The numbering in these sections will facilitate the reader who wants more in-depth or scientific information, to find the relevant chapter or appendix in the EIA Report, because they will have the same section/chapter numbering. For example 'Material Assets – Roads' is covered in **Section 15 of this Non-Technical Summary** document and in **Chapter 15 and Appendix 15 of the EIA Report**.

7) Section 18: A **summary of cross-factor effects** between the environmental topics or factors.
8) Section 19: A summary of the **monitoring arrangements** for the development.
9) Section 20: A **Summary Conclusion.**

1.2 The Afforestation Licence Application

This afforestation licence application is being made to the Minister of Agriculture, Food and the Marine. The full planning application includes

- Afforestation Licence Application and Drawings;
- EIAR Main Report,
- this Non-Technical Summary;
- Figures and Appendices for each chapter of the EIAR Main Report;
- Appropriate Assessment Reporting on the effect on protected European Sites and
- Reference Documents (including those for assessment of in-combination effects with other projects).

1.3 UWF Replacement Forestry - The Proposed Development

The UWF Replacement Forestry is a proposal to plant forestry on six hectares of agricultural lands. The forestry will comprise native tree and shrub species.

1.4 The Purpose of UWF Replacement Forestry

The UWF Replacement Forestry at Foilnaman will fulfil the replanting obligation which will arise from the felling of forestry for the development of some of the Other Elements of the Whole Upperchurch Windfarm Project (in particular UWF Grid Connection (Element 1), UWF Related Works (Element 2) and Upperchurch Windfarm (Element 4)).

Note: Upperchurch Windfarm received planning consent in 2014, but is not yet constructed.

1.5 The Location and Brief Description of UWF Replacement Forestry

The UWF Replacement Forestry lands are located in two adjoining parcels of agricultural lands in Foilnaman townland, near the village of Upperchurch in County Tipperary.

Figure NTS 1: Location of UWF Replacement Forestry

It is proposed to plant six hectares (6ha) of agricultural grassland with 20,000 saplings of native woodland species, set in clusters of well-matched native species, to be managed as permanent forest. Wide ride-lines between deeper areas of core woodland will be provided which will create an open space with tree-lined boundaries, which is much favoured by birds of prey during the day (e.g. hen harrier) and bats at night, as hunting ground.

Tree guards will be used to protect the saplings and young trees from rabbit damage and the new native woodland will be protected by stock-proof fencing all around.

A small headwater stream within the Clodiagh River catchment, flows through the western part of the lands. No planting works will take place within 10 metres of the banks of the stream.

An existing agricultural entrance leading off the L-2264-34, will be used to access the new wood. There are adequate existing sightlines at the entrance already.

Figure NTS 2: Layout of UWF Replacement Forestry

1.6 The proposed development as part of the Whole Upperchurch Windfarm Project

UWF Replacement Forestry is Element 3 of a whole project which has the following other elements – Element 1: UWF Grid Connection; Element 2: UWF Related Works; Element 4: Upperchurch Windfarm (UWF) and; Element 5: UWF Other Activities. These are collectively referred to as the Whole Upperchurch Windfarm Project (Whole UWF Project).

An Environmental Impact Assessment Report has also been prepared to accompany planning applications to the Planning Authorities for **Element 1 - UWF Grid Connection (An Bord Pleanála)** and **Element 2: UWF Related Works (Tipperary County Council)**. Element 4 – Upperchurch Windfarm has already being granted planning permission in August 2014 (Planning Ref. 13/51/0003) and Element 5 - UWF Other Activities are the

types of activities that do not require planning permission, but are included in the EIA Report as part of the cumulative or in-combination assessment.

The vast majority of the **Whole Upperchurch Windfarm Project is located in County Tipperary** with some minor activities along the Upperchurch Windfarm turbine component haul route and on the existing Killonan to Nenagh overhead line, in County Limerick (these activities are part of UWF Other Activities). **The vast majority of the interaction of all five elements occur in and around the already consented but not yet constructed, Upperchurch Windfarm.**

The location of the Elements of the Whole Upperchurch Windfarm Project in the vicinity of Upperchurch Windfarm (consented but not constructed) is illustrated on:

Figure NTS 3: UWF Replacement Forestry and the Other Elements of the Whole UWF Project

1.7 The Applicant

Ecopower Developments Limited is part of the Ecopower Group of specialist on-shore wind energy development and windfarm operation companies, and has been involved in wind energy developments in Ireland since 1996.

NTS of Chapter 2: The EIA Report Process

2.1 Why is this EIA Report Required?

UWF Replacement Forestry is part of the Whole Upperchurch Windfarm Project, one element of which, the Upperchurch Windfarm, did require that Tipperary County Council carry out an **Environmental Impact Assessment (EIA)**. Therefore the Department of Agriculture, Food and the Marine, as the Afforestation Licencing Authority, must now carry out a cumulative (in-combination) assessment of UWF Replacement Forestry (the development being applied for here). Ecopower Developments has prepared an EIA Report so that the Department of Agriculture, Food and the Marine has enough information to carry out an EIA.

2.2 What topics does the EIA Report cover and who are the authors?

The developer prepares an EIA Report by appointing an EIA Report Coordinator, who arranges all the works and reports for the planning application; appoints engineering and scientific experts for The Project Design Team and the EIA Report Team and; co-ordinates the assembly and presentation of the EIA Report. Julie Brett and Phil Kenealy of Ecopower Developments are EIA Report Coordinators for the UWF Replacement Forestry project.

In the EIA Report, the following environmental factors or topics are examined by experts in the field - **Population & Human Health** (including socio-economic**s); Biodiversity** (plants and animals); **Land, Soils; Water; Air (**including air quality, noise & vibration and electromagnetic fields); **Climate; Material Assets including Built Services** (electricity network, communication network, water supply infrastructure) **and Roads; Cultural Heritage** (archaeology) **and Landscape**. Each topic has a dedicated chapter and was prepared by specialists who are competent in their field of expertise. The topic experts are identified at the start of each Section 6 to 17 of this Non-Technical Summary. The full list and the expert's experience is supplied in Chapter 2 of the EIAR Main Report. The EIA Report **presents the likely effects** on the topics listed.

2.3 Key Activities in the preparation of the EIA Report

The **key activities** involved in the preparation of the EIA Report included:

- An introductory description of the proposed development was prepared by Ecopower Developments and examined by the Project Team, which included the developer and the scientific experts.
- The span of the topics that should be covered was investigated by the Project Team (called scoping) through 'on the ground investigations' (fieldwork); desktop studies of guidelines and scientific publications and consultation with the local authority in whose area the forestry in being proposed.
- The area that should be studied was identified; potential aspects or receivers in that study area, that might be affected, were identified; and the means by which these could be affected was considered.
- Potentially significant effects were identified. Alternative locations, layouts and processes were considered for the development. Project Design Environmental Protection Measures were developed by the experts to endeavour to lessen any potentials for significant effects.
- The final project design was decided and a description prepared. For the cumulative assessment, a description of consequential development i.e the environmental information for the Other Elements of the Whole Upperchurch Windfarm Project was also provided. Other projects and activities in the area were also identified.
- This final project was evaluated in twelve topic specific chapters, by the topic specific experts, covering the factors listed above. Any additional measures that were required to possibly further lessen negative effects from the development, were then suggested.

- A cumulative evaluation of the UWF Replacement Forestry in-combination with all the other Elements of the Whole Upperchurch Windfarm Project and, a cumulative evaluation with other projects and activities, relevant to the development, was carried out also.

2.4 Terminology used to described the level of an impact

All aspects of the environment within the area, likely to be affected by the development, were identified using a combination of field surveys; desktop surveys; industry guidance (if any) on protection standards for the environmental topics and the expert's knowledge and expertise.

Taking into account the Project Design Environmental Protection Measures, the likely ways that effects could happen to the various aspects of the environment, from the development, were identified and the size of the effect was calculated.

If it was **likely that an aspect of the environment could be affected and if that aspect could be measurably or noticeably affected, then it was evaluated in depth**.

The definitions used to describe the significance (or importance) of effects are explained in the following table;

Table 1: Significance of Effects (EPA, August 2017)

Significance of Effect	Description
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

Note: *All effects are assumed negative unless stated otherwise.*

2.4.1 Matters evaluated as having No Effect

Some effects to the environment were considered, but due to the lack of potential or no likelihood for the effect to occur, or the due to the very small or negligible size of the effect, the effect was excluded from further in-depth evaluation. The term 'Neutral' is used to identify these effects.

Neutral is defined as: 'No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error'.

2.5 Presentation of the EIA Report

Accessibility, legibility and clarity were the key considerations when organizing the lay-out of the EIA Report Chapters.

- This Non-Technical Summary is presented in a handy, short separate volume with figures included. This is Volume C1: EIAR Non-Technical Summary.
- In Volume C2: EIAR Main Report, the information in the topic Chapters 6 to 17 is prepared by different **experts** but presented in the chapters using a **standardised structure** with a **pre-defined layout, terms and definitions; standard evaluation processes (including scoping) and standard descriptive methods and impact descriptions** in order to ensure that all likely and significant effects are clearly communicated, placed in context and easily cross-referenced.
- So that the information for the **cumulative evaluation** is clearly distinguishable from the information on the actual development being applied for, **all cumulative information sections are highlighted in light grey**.
- **Mapping and Illustrations, including maps, plans, sections and diagrams** are presented in a **separate volume** so that they can be prepared at a scale that is legible and so that they do not distract from the flow of the text. These are contained in – Volume C3: EIAR Figures.
- **Appendices** have been used for including detailed or supplementary information and photographs that are not core to the EIA Report but which nonetheless provide additional information on the matters evaluated in the chapter. These are contained in a **separate volume** - Volume C4: EIAR Appendices.

2.6 EIA Report Review

Two checklist reviews of the EIA Report, were carried out by the EIA Report Co-ordinator;

- A **CHECKLIST** review of compliance with EU legislation.
- A **CHECKLIST** review of the completeness of the information in the EIA Report.

As well as the EIA Report team, this checklist can be used by the Planning Authority and members of the public involved in the consultation process, as a quick guide to the location and sufficiency of all of the information provided in the EIA Report.

Both completed CHECKLISTS can be found in in Appendices to Chapter 2 Volume C4: EIAR Appendices

Appendix 2.1: Review of Compliance with Legislation.

Appendix 2.4 Completed EIA Report Checklist.

NTS of Chapter 3: The Consultations

Scoping consultation in the form of written consultation with Public Authorities and presentations to The Public in the general area of development, was carried out as part of the overall consultation on the Whole Upperchurch Windfarm Project.

3.1 Public Bodies Consulted

At first, UWF Replacement Forestry was proposed for a site in Firoda, County Kilkenny. Feedback specific to UWF Replacement Forestry was received from Kilkenny County Council , who requested that an alternative location be considered on Biodiversity, Road Safety and Cultural Heritage grounds. This feedback was given due consideration and UWF Replacement Forestry was relocated to an alternative site at Foilnaman, County Tipperary.

During discussions on the Whole Upperchurch Windfarm Project, the National Parks and Wildlife Service (NPWS) expressed a preference for forestry replanting to be carried out in the same general area as were the felling occurs, the project ecologists preferred a location in proximity to the Upperchurch Hen Harrier Scheme, which is part of the Whole Upperchurch Windfarm Project.

3.2 Public Consultation

As well as personal contact with the landowner of the UWF Replacement Forestry site and with landowners generally involved in Upperchurch Windfarm, part of the public consultation included a **Public Consultation and Information Day**, which Ecopower Developments organised in the following three venues (at the same time and date for all three venues); Kilcommon Community Centre; Rear Cross Community Centre and Lee's Bar, Newport on Tuesday 10th October, 2017 from 2pm to 8pm. The events were advertised in the two newspapers widely read locally – the Tipperary Star and the Nenagh Guardian - and the Rear Cross Kilcommon Newsletter; by word of mouth through the landowners; postering in and around the three venue locations and by email to the Local Authority members representing the relevant municipal districts i.e Templemore Thurles Municipal District and Nenagh Municipal District.

Members of the Project Team and Coillte (as one of the landowners for the UWF Grid Connection and UWF Related Works) were present to provide information, answer any questions and engage in consultation on the details and timing of the proposal.

Most attendees were landowners involved in the Whole Upperchurch Windfarm Project and some residents not connected with the project, but living in the area.

Neither local residents nor landowners, expressed any concerns about the location or design of UWF Replacement Forestry at these events.

All of the planning documents submitted with the afforestation licence application are also available for public examination on the internet at **www.upperchurchwindfarm.ie**. This dedicated website will also include contact details of the applicant.

NTS of Chapter 4: Alternatives Considered

The consideration of alternative ways of designing, building or operating a development is the single most effective means of avoiding significant environmental effects.

4.1 Alternative Locations for UWF Replacement Forestry

Different locations were examined for the replacement forestry.

Three alternative locations were investigated for planting;

- Technically approved lands at Ballaghaderreen, Co. Roscommon.
- Technically approved lands at Firoda Upper, Co. Kilkenny.
- Lands at Foilnaman, Co. Tipperary, near Upperchurch Windfarm, technically suitable for afforestation but without approval.

The Roscommon site became unavailable to the developer during the EIA Report process and therefore the Kilkenny site and the Tipperary site were compared for environmental effects. The site in Tipperary was favoured in comparison of environmental effects on Biodiversity, Water, Roads and Cultural Heritage. Also Kilkenny County Council were not supportive of a forestry entrance without adequate sightlines at the Firoda site. On the other hand, NPWS were supportive of a new native woodland outside of the Slievefelim to Silvermines Mountains SPA but in the surrounding upland area. Therefore the Foilnaman site in Tipperary was chosen.

4.2 Alternative Design

Many environmental issues can be resolved by design solutions that vary key aspects of the proposal. Two alternatives were considered for the design of the UWF Replacement Forestry;

- **Commercial Conifer Plantation**: monoculture non-native conifer plantation to replace the Whole Upperchurch Windfarm Project felling of similar type conifers. Commercial harvest when mature.
- **Permanent Native Woodland**: The lands to be planted with a mixture of native trees both deciduous and conifer. Permanent woodland – no harvest.

Permanent Native Woodland was chosen as the design of the UWF Replacement Forestry in Foilnaman, which will enhance biodiversity (plants and animals) by encouraging the abundance and diversity of native woodland species. It will support the value of the Upperchruch Hen Harrier Scheme also. The loss of commercial sale of forest will be neutral in terms of the overall value of the Whole Upperchurch Windfarm Project.

4.3 Alternative Processes and Mitigation Measures

Two alternative processes were considered

- **Planting in geometric plan using machinery**; installing drainage channels; and growth management with fertilisers and weed and pest control chemicals.
- **Planting by hand incorporating 'Ride Lines'** being left unplanted to encourage hen harrier prey species to nest and facilitate hunting by hen harrier and bats along the woodland boundaries; and management of growth by thinning and without fertilisers, herbicides and pesticides.

The **environmentally sympathetic process – planting by hand, including 'ride lines' and management without chemicals was chosen** as the best choice environmentally in the context of management of this woodland with conservation as the primary objective, rather than a commercial tree crop.

4.4 'Do-Nothing' Alternative

There is a legal replanting obligation for the felling of all forestry, except for certain exceptions. The felling required for the of some of the Other Elements of the Whole Upperchurch Windfarm Project (in particular UWF Grid Connection (Element 1), UWF Related Works (Element 2) and Upperchurch Windfarm (Element 4)) does not qualify as an exception and therefore, there is no 'do-nothing' alternative.

NTS of Chapter 5: Description of the Development

5.1 Location and Features of UWF Replacement Forestry

UWF Replacement Forestry relates to the planting with forestry, of six hectares of agricultural lands in Foilnaman, County Tipperary, the purpose of which is to fulfil the replanting obligation which will arise from the felling of forestry, for the development of some of the Other Elements of the Whole Upperchurch Windfarm Project (in particular UWF Grid Connection (Element 1), UWF Related Works (Element 2) and Upperchurch Windfarm (Element 4)). Whole Upperchurch Windfarm Project.

The lands will be planted with well-matched native woodland species, set in clusters including a mixture of tall trees and understory shrubs. There will be varied spacing created between the clusters and the design includes wide ride-lines and deeper areas of core woodland. The ride-lines will create open spaces with tree-lined boundaries, which is much favoured by birds of prey during the day (e.g. hen harrier) and bats at night as hunting ground. A mixture of land cover – tall grasses, short grasses and scrub will be maintained under the planting and in the ride lines to encourage hen harrier prey species.

Tree guards will be used to protect the saplings and young trees from rabbit damage. A livestock-proof fence will be erected around the perimeter of the planting.

The lands to be afforested are currently in two agricultural landholdings. A small watercourse, with an existing culvert crossing, runs through the site. A 10m set back will be implemented, and the strip of land along this watercourse (and outside this set back area) will be enhanced through planting with hazel, alder and willow species.

There is an existing agricultural entrance and farm access road from the public road, to the lands.

5.1.1 Project Design Features and Measures which will protect the environment

At the start, when UWF Replacement Forestry was being designed, the Project Design Team focused on the potential or likely significant effects of the basic Project, on the environment where it is to be located. These potential or likely effects were then **avoided or reduced**, by developing and integrating measures (called **Project Design Environmental Protection Measures**) into the fundamental design of the Project. There are **fifteen** of these measures. The Project Design Environmental Protection Measures are as much part of the project as the layout and choice of tree species. The Project that is examined and evaluated in the EIA Report includes these measures, not as a desirable addition, but as an **integral part of the Project.**

5.2 UWF Replacement Forestry: Planting and Growth Stage

Planting Stage: Tree planting will be carried out by hand by four forestry workers. Tree saplings, wooden fence posts and fencing wire and gates will be imported to the site by four wheel drive vehicle.

Growth Stage: Once planted, the trees will go through numerous stages of growth from sapling, through to maturity, old age and eventual decay with natural regeneration occurring through the lifecycle of the native wood. Other than thinning activities and grass/scrub management, natural maturation, old age and regeneration, no other changes to the native woodland are expected. Felling is not envisaged.

Use of Natural Resources: Six hectares of agricultural land will be planted with mixed species to create a native woodland, comprising tall trees and understory shrubs, along with wide ride-lines, and a mix of tall grasses, short grasses and scrub land cover maintained during the growth stage. This will enhance biodiversity (plants and animals) in the area. New trees and shrubs will be set back from the watercourse which runs through the site. The existing waterside habitat will be enhanced through the planting with hazel, alder and willow species and the lands will be protected from livestock by the perimeter fence.

Emissions – Planting and Growth Stage: Negligible.

Waste - Planting and Growth Stage - such as packaging, and excess planting materials will be generated in very small quantities and this waste will be removed and stored in a designated area at the Upperchurch Windfarm construction compound or site offices and disposed of in an appropriate licensed facility.

5.3 Vulnerability of UWF Replacement Forestry to Major Accidents and/or Disasters

UWF Replacement Forestry **is not vulnerable to Major Accidents or Disasters**, due to the minimal volumes of the Dangerous Substances which will be used, limited to small volumes of diesel fuel used by vehicles during the planting and growth stages.

UWF Replacement Forestry is **not vulnerable to land slippage**, as the afforestation site is located on agricultural grassland which is inherently stable and no excavations will occur – planting will be carried out by hand**.**

UWF Replacement Forestry is **not vulnerable to flooding**, due to there being no new permanent infrastructure proposed and the planting will be carried out by hand with minimal disturbance to soil.

NTS of Chapter 6: Population

The population chapter, examines the effect of the proposed UWF Replacement Forestry on the **economic activity of the Electoral Division of Foilnaman**.

6.1 How the Population study was carried out

The study was carried out by John Lawler and Ciara Morley of EY-DKM Economic Consultants.

Examination of the **latest Census figures**; Tipperary and Limerick **County Development Plans** and; the **GeoDirectory database of business and residential premises** reveals the make-up of the local population and economic and social activity in the area.

6.2 The make-up of the population and economic activity of the area

UWF Replacement Forestry is proposed for **Foilnaman townland** between **Upperchurch and Kilcommon villages**. The area surrounding the site is rural, comprising agricultural grassland, commercial forestry plantations, private roads and public roads. Isolated residences and farmsteads are also scattered throughout the area.

6.3 How could Population be affected

The local economy could be positively affected by **local spending and an increased employment locally**, and negatively affected by **business disruption** due to the **presence of roadworks**, or a **reduction in tourism** revenue due to changes in the landscape and visual amenity. If the economic effects were large enough there could also be an effect to the National Economy and Settlement Patterns locally (due to increased new long-term employment in the area).

6.3.1 The effects of UWF Replacement Forestry

6.3.1.1 Local Economy

Gross Value Added to Business (local spend) & Employment Opportunities: *Neutral effect*

UWF Replacement Forestry was evaluated as having **neutral effects to the Local Economy during construction,** for the following reasons:

- Trees are likely to be sourced from a nursery outside of the Foilnaman Electorial District.
- At a local scale, the financial transactions (positive impact) associated with the Replacement Forestry will be very low. Capital expenditure will be greatest during the planting stage and will represent substantially less than 1% of the Local Economy.

6.3.2 Matters evaluated as having No Effect

There will also be **neutral effects** in terms of reduction **in tourism revenue and business disruption** during the planting and growth phase.

Due to its size, there will be noeffects on the **National Economy or on Settlement Patterns** in the area as the development will **not require** or result in any **temporary or permanent relocation, of business or population**.

6.3.3 The cumulative effects

As the UWF Replacement Forestry will not affect Population on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (UWF Grid Connection, UWF Related Works, Upperchurch Windfarm are relevant); the cumulative effects with the Bunkimalta Windfarm **will not be significant.**

6.4 Conclusion

The experts who examined this topic concluded that **no likely significant effects to Population** will occur as a result of the UWF Replacement Forestry on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.

NTS of Chapter 7: Human Health

Health is determined not only by access to quality healthcare services and lifestyle choices but also by the social and economic conditions in which people live.

7.1 How the Human Health study was carried out

This chapter evaluates the effects on **Local Residents and Community** – i.e. the people who live and work in the development area; teachers and children attending **Kilcommon National School**; and **Transient People (i.e. people passing through**, whether road users, agricultural and farm workers and tourists and recreational users such as walkers and cyclists).

The Human Health chapter investigates and assesses the likelihood of significant effects directly attributable to the development and draws from and builds upon, the conclusions of the other chapters most notably Chapter 6: Population, Chapter 11: Water, Chapter 12: Air, Chapter 14: Material Assets Built Services and Chapter 15: Material Assets Roads. A positive or negative impact to these topics, could in turn impact on human health.

The chapter is also informed by Human Health related guidelines and publications on electromagnetic fields from power lines and, on air pollution from construction activities.

7.2 The current status of Human Health in the area

People living in the area are assumed to be marginally more sensitive to health effects than the average population in Ireland in the context of the Census of Population 2016, which has indicated that the **proportion of elderly and young people resident in the area is slightly higher than the national average**, thereby making them more sensitive to health effects.

7.3 How could Human Health be affected

The health of local residents and members of the community **could be positively impacted** by increased employment, and **could be negatively impacted** by contamination of water sources or a disruption in water supply, an increase in airborne dust and other pollutants, increase in noise and disturbance to sleep, if there were substantial increases in electromagnetic fields, a reduction in road safety and resultant feelings of stress and annoyance**.**

7.3.1 Measures to avoid, prevent or reduce significant negative effects on Human Health

Protective measures for air quality, noise, road safety and local water quality and supply will also indirectly protect human health. The following protective measures are pertinent:

- The lands will be planted by hand, using spades and hand tools.
- No pesticide or fertilizer will be used at the UWF Replacement Forestry site.
- There will be no refueling of vehicles or plant, no storage of fuels and no overnight parking permitted within the site.

7.3.2 The effects of UWF Replacement Forestry

7.3.2.1 Local Residents & Community, Transient People, Kilcommon National School

It was evaluated by the topic authors that UWF Replacement Forestry has **no potential to cause any adverse health impacts**.

7.3.3 Matters evaluated as having No Effect

There will be **no negative impacts to the health of local residents or members of the community; or to children and teachers at Kilcommon National School; or to transient people working and passing through the area** as a result of cross factor effects from water, air or material assets, due to:

- **Population (local economy):** At a local scale, the financial transactions associated with the UWF Replacement Forestry will be very low.
- No impact to **water quality in local wells or springs or piped water supply** because there are no springs or wells or piped water within 50m of the UWF Replacement Forestry site**.**
- There will be no material negative impact on **air quality, noise or vibration**. Planting of the new woodland will be carried out by hand, with use of vehicles limited to personnel vehicles and therefore minimal emissions, noise or vibration will occur. During the growth stage thinning activities will be infrequent, brief in nature and at a distance from local residents.
- There will be **no electromagnetic fields (EMF) emissions**: There are no electrical or radio-communication parts associated with the UWF Replacement Forestry.
- There will be no increased risk of traffic accidents as **traffic volumes** associated with the planting and growth stage will generate extremely low traffic volumes. There will **be no harvesting traffic effects**, as UWF Replacement Forestry will be **permanent woodland**.
- There is no potential for impacts to Kilcommon National School, which is nearly 5km away from the lands.

7.3.4 The Cumulative Effects

As the UWF Replacement Forestry will not affect Human Health on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (UWF Grid Connection, UWF Related Works, Upperchurch Windfarm are relevant); the cumulative effects with the Bunkimalta Windfarm **will not be significant.**

7.4 Conclusion

The experts who examined this topic concluded that **no likely significant effects to Human Health** will occur as a result of the UWF Replacement Forestry on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.

NTS of Chapter 8: Biodiversity (plants & animals)

The study in Chapter 8: Biodiversity relates to natural areas, rivers and their fish and animal life, all birds including hen harriers, bats, all animals on the ground in the area, and the marsh fritillary butterfly.

The UWF Replacement Forestry is located within the Slievefelim to Silvermines mountains area. The area is representative of typical upland habitats, and includes lands under active management for agriculture and forestry. Features of the local environment on or around the works include a headwater stream which is a tributary of the Clodiagh River which forms part of the River Suir catchment and flows into the Lower River Suir SAC which is located downstream of the site. Also relevant are the European Sites - Slievefelim to Silvermines Mountains Special Protection Area (SPA) for the Hen Harrier bird; and the Lower River Shannon Special Area of Conservation (SAC) and the Lower River Suir SAC.

8.1 How was the Biodiversity Study Carried Out

The study was carried out by Howard Williams and Chris Cullen and their team of ecologists in Inis Environmental Consultants.

The effects on **National Sites**, **Aquatic** (water) **Habitats and Species**, **Terrestrial** (land) **Habitats**, the **Hen Harrier** bird, **General Bird Species**, **Bats**, **Non-Volant** (not flying – i.e. land based) **Mammals**, **Amphibians & Reptiles** and the **Marsh Fritillary** butterfly were studied.

The effects on **European Sites** is summarised in Chapter 8, and evaluated in detail in the Natura Impact Statement which accompanies the Afforestation Licence application as Volume D.

Sources of information on the biodiversity in the area came from **Consultations** locally and nationally with specialist bodies including **National Parks and Wildlife Service (NPWS)** and **Inland Fisheries Ireland (IFI)** and with the other experts on the EIA Report team in particular **Soil, Water** and **Air** experts. **Guidelines** and **Publications from the Forest Service** on Native Woodland Establishment; Environmental Requirements for Afforestation and Management Guidelines for Ireland Native Woodlands were considered. The **Whole Windfarm Project area** was travelled by environmental experts to gain an **on-site overview** of the whole development area.

8.1.1 Summary of Fieldwork Surveys Carried Out

The following is a list of the surveys conducted, which informed the Biodiversity study;

- **Habitat Survey** of UWF Replacement Forestry site in September 2017 including mammal survey (badger, otter, field mammals, bats), amphibians and reptiles survey and search for Marsh Fritillary butterfly habitat.
- **Hen Harrier Species Survey** of the afforestation lands plus 50m in all directions.
- **General Bird Surveys:** Breeding season bird surveys were carried out in May/June 2016 and in April/June 2017. Winter Bird surveys were carried out over the same stretches in November and December 2016 and in January and February 2017 for the Whole Upperchurch Windfarm Project area.

All of these surveys formed the basis of identification of the biodiversity, or plants and animal life, in the area. Full details of all surveys can be found in Appendix 8.1 in Volume C4: EIAR Appendices.

8.2 The make-up of Biodiversity in the Area

European Sites: A tributary of the **Clodiagh River**, which drains downstream to the **Lower River Suir cSAC,** flows through the UWF Replacement Forestry site. The site is located entirely in the Clodiagh River sub-catchment. The site is **outside of the Slieve Felim to Silvermine Mountains SPA** and all other European and National designated sites.

Aquatic Habitats & Species: The headwater stream (tributary of the Clodiagh River) is the only **watercourse on site (Class 1 - with fisheries value). No new watercourse crossing is required.**

Terrestrial Habitats: The habitats within the site covers two fields of mostly **agricultural grassland** with some **wet grassland and scrub and with earth banks and hedgerows** around the perimeter.

Hen Harrier: The site includes **habitat which is sub-optimal for foraging hen harrier but may be used occasionally**. **No suitable breeding or winter roost habitat** is present.

The **General Birds** present, both breeding and wintering, are **typically representative of the current land use**. There is suitable foraging habitat at the lands for Golden Plover and Meadow Pipit.

Bats: During surveys, **no bat roosts were recorded** at the afforestation site, **one low suitability roost was recorded within 150m of the entrance** to the lands.

Land mammals: No badger setts or **no evidence of Otter** were recorded within the afforestation site. **Fallow Deer, Red Fox and Irish Hare** are present throughout the local environment.

Amphibians & Reptiles: No amphibians or reptiles were recorded from site visits but the habitat present is suitable for the common frog and the common lizard.

No Marsh Fritillary habitat was recorded during site surveys.

8.3 How could Biodiversity be affected

The **land, trees and hedgerows** on which animals, birds and bats depend can be affected by **land use change; vegetation removal.**

All animals, birds, bats and fish may be sensitive to **disturbance by human activity works**; **displacement** and **habitat loss** by permanent features of the works; the **changing of a natural habitat; the breaking up an animals natural range** for foraging and mating; and **accidental death**.

A deterioration in Water quality could indirectly affect the river catchments and **all fisheries and animals relying on these natural areas.**

8.3.1 Measures to avoid, prevent or reduce negative effects on Biodiversity

The following is a summary list of the **Project Design Environmental Protection Measures**, which are built into the **design** of the proposed UWF Replacement Forestry project, in order to prevent negative impacts on biodiversity;

- The **lands will be planted with native woodland**, by **hand**, using spades and hand tools.
- **No pesticide or fertiliser** will be used at the site.
- There will be **no refuelling of vehicles or plant, no storage of fuels and no overnight parking** permitted within the site.
- A water setback from the watercourse which flows through the site, will be established during planting works. The **setback will be 10m from the edge of the watercourse**. No planting or other works will be carried out in this 10m wide buffer area.
- The new wood will be **protected from livestock by the perimeter fence**.
- All planting and maintenance activities will be carried out during **daylight hours.**
- **Confirmatory surveys** will be carried out ahead of construction works for **hen harrier birds, otters** and **badgers**, and construction works will be controlled where works occur close to the breeding or resting places of these animals – for example no works within 500m of an active hen harrier nest, scheduling of works during a shorter daytime period within 150m of an otter holt, no works within 50m of an active badger sett during the breeding season.

8.3.2 The effects of UWF Replacement Forestry

8.3.2.1 European Sites

The potential for effects on European Sites of the UWF Replacement Forestry and the Other Elements of the Whole Upperchurch Windfarm Project **is evaluated in the Natura Impact Statement** (included as Volume D of the Planning Application).

In summary, there are 23 European protected sites within 15km of the afforestation lands, construction works boundaries and activity locations associated with all of the Elements of the Whole Upperchurch Windfarm Project, and it was evaluated that there is potential for significant effects to three sites; Lower River Shannon SAC, Lower River Suir SAC and the Slievefelim to Silvermines Mountains SPA. In summary, potentially significant effects have been evaluated and it is concluded that, with the implementation of the environmental protection measures, the development **will not result in any effects that will adversely affect the integrity of the European Sites** under consideration.

8.3.2.2 National Sites

National protected sites within 15km of the construction works boundaries (two Natural Heritage Areas NHAs): The UWF Replacement Forestry will not overlap any NHA boundary, and therefore there is no potential for impacts due both to distance and also to the absence of any connectivity (i.e water).

8.3.2.3 Aquatic Habitats & Species

No potential to cause impacts because there are no instream works; no sediment creation as planting will be carried out by hand; the grassland beside the existing stream will be retained; no nitrogen deposition, as the new forestry will be a permanent native woodland, therefore no tree-felling or harvesting will be carried out; no herbicide or fertilisers will be used during the planting and growth stage and use of machinery on site will be minimal.

8.3.2.4 Terrestrial Habitats

Land habitats: Neutral Effect/No Potential impact because **no high value natural lands** will be lost to the planting and there will be no hedgerows or mature trees removed during the development of UWF Replacement Forestry.

8.3.2.5 Hen Harrier

Reduction in or Loss of Suitable Foraging Habitat: ***Very Significant (Positive)*** effect because the existing suitable foraging habitat for Hen Harrier on the site is sub-optimal, being mainly agricultural grassland with some wet grassland and scrub. However the entire site will be transformed to 6 hectares of native forestry to be managed specifically for the beneficial use of the Hen Harrier birds.

8.3.2.6 General Birds

Golden Plover and Meadow Pipit: Habitat Loss is *Slight* because of the loss of suitable roosting and foraging grassland habitat; however the 'ride lines' between the woodland will retain some grassland; no disturbance will be caused during construction because planting will be done by hand.

General Birds: Habitat Improvement*: Slight* (Positive) because of the benefits to birds in general of the creation of a new native wood which high quality habitat for birds in general.

8.3.2.7 Bats

Destruction or disturbance of bat roosts in trees, Severance of Commuting Routes or Feeding Areas, Disturbance or Displacement due to Lighting; *No potential to cause impacts* because there are no hedgerows or trees being removed or pruned. No lighting will be used during the planting and growth stage. In fact woodland edge habitat will be created around the new wood and at the 'ride lines' for foraging bats, as the new wood grows.

8.3.2.8 Non Volant Mammals (land mammals)

Non-Volant Mammals include Badger, Otter, Irish Hare, Pine Martin, Red Squirrel, and Fallow Deer.

Badger: Habitat Loss: ***Slight (Positive)*** because of the benefits to badger in general of the creation of a new native wood which high quality habitat.

Badger: Disturbance/Displacement: *No potential for Impact* because there were no badger setts recorded in the study area surveys; Project Design Measures will protect badger and badger setts if new setts are confirmed before planting activity commences.

Otter: Disturbance/Displacement: *Neutral* because there were no otter holts recorded in the study area surveys; Project Design Measures will protect otter and otter holts if new holts are confirmed before planting activity commences.

Irish Hare, Pine Marten, Red Squirrel and Fallow Deer: Habitat Loss is *Not Significant* because loss of suitable foraging or breeding grassland habitat is offset by the creation of a new native woodland. No disturbance effect as planting will be done by hand during daylight hours.

8.3.2.9 Amphibians & Reptiles

Neutral/no likely impacts are concluded because the extent of land use change is evaluated as negligible in the context of available surrounding land.

8.3.2.10 Marsh Fritillary butterfly

Habitat Loss: *No potential* to cause impacts because here is no suitable habitat for Marsh Fritillary in or adjacent (within 50m) to the afforestation lands.

8.3.3 Matters evaluated as having No Effect

The following effects were not evaluated in detail as it **they were considered to be Neutral** – effects on National Sites; habitat degradation effects to Aquatic Habitats & Species; foraging, nesting and roosting habitat and mortality for Hen Harrier; loss of hedgerow or High Nature Value trees; loss of Flora Protection Order species; disturbance/ displacement, mortality of birds, bats and land mammals; reduction or degradation of habitats; introduction of invasive species; effects to rivers and their fish during the growth stage.

8.3.4 The Cumulative Effect

When the effects of UWF Replacement Forestry on Biodiversity are considered with the effects of UWF Grid Connection, UWF Related Works, Upperchurch Windfarm and UWF Other Activities and Bunkimalta Windfarm, Castlewaller Windfarm, Newport Distributor Road, Forestry, Agriculture and Turf Cutting - the summary result **is that the cumulative effects will not be significant.**

8.4 Conclusion

The experts who examined this topic concluded that **no likely negative significant effects to Biodiversity** will occur as a result of the UWF Replacement Forestry on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.

The experts who examined this topic concluded that while the UWF Replacement Forestry **will not cause any significant negative effects** to Biodiversity on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities**, it will have very significant positive effects to Hen Harrier on it's own,** this effect will be **significant positive when all Elements of the Whole Upperchurch Windfarm Project are considered,** and **Neutral when other projects and activities** (particularly forestry) **are taken into account**.

8: Biodiversity

Topic **Non-Technical Summary of the UWF Replacement Forestry EIA Report**

NTS of Chapter 9: Land

The study in Chapter 9: Land relates to the land and landuse in the area.

9.1 How the Land study was carried out

The study, was carried out by Andy Dunne of Environmental Agricultural Engineering Consultancy.

The effects on **Agricultural Land** and **Forestry Land** were studied. The landholdings in the area make up the study area for Land.

The Department of Agriculture, Food and Forestry's Rural Development Programme 2014-2020 along with the State of the Environment Report 2016 were examined. Other sources of information on Land in the area included the websites of NPWS, Bing and Google. A site visit and field walking was carried out on lands along the development site.

9.2 Lands and Land-use in the area

The lands for the development are located in rural countryside. The land-use in the area is generally **two-thirds permanent grassland and one-third set to commercial forestry** (which is a higher forestry component than the national average of 12%).

9.3 How could Land be affected?

Agricultural and forestry land could be negatively affected by a loss of use and/or restricted access, a change of use or harvesting impacts. Land could be positively affected by an improvement in farm or forestry infrastructure such as roads.

9.3.1 The effects of the UWF Replacement Forestry

9.3.1.1 Agricultural Land and Forestry Land

There are *No Impacts* expected to Agricultural Land and Forestry Land, because **the lands will change from one productive use to another**. Both of these landuses are the predominant landuses in this upland area.

There will be **no new or upgraded roads** associated with the UWF Replacement Forestry and therefore no land use change to permanent road.

There is **no impact of temporary or permanent loss of connectivity** due to planting activities. Existing farm access road will continue to be used by the landowner, to gain access to other lands.

The new forestry will not be harvested and therefore there will be **no harvesting changes to land**.

9.3.2 The Cumulative Effects

As the UWF Replacement Forestry will not affect Air on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (UWF Grid Connection, UWF Related Works, Upperchurch Windfarm are relevant); the cumulative effects **will not be significant.**

9.4 Conclusion

The experts who examined this topic concluded that **no likely significant effects to Land** will occur as a result of the UWF Replacement Forestry on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.

NTS of Chapter 10: Soils

The study in Chapter 10: Soil relates to the **top soil or peat, subsoil and the underlying bedrock** (geology) in the area. Soil supports a range of critical functions such as land based ecosystems and biodiversity, agricultural food production, flood alleviation, water filtration and storage, and carbon capture.

10.1 How was the Soils study carried out?

The study was carried out by David Broderick and Michael Gill of Hydro Environmental Services.

The effects on **Local Soils, Subsoils & Bedrock**, soils in the **Lower River Shannon SAC**, and soils in the **Bleanbeg Bog NHA** were studied.

National Roads Authority and Institute of Geologists Ireland Guidelines on the Assessment of Soils and Geology in EIA Reports, have been considered during the preparation of the evaluation.

Sources of information came from **Consultation** locally; **Desktop investigations** using the Environmental Protection Agency, Geological Survey of Ireland, National Parks & Wildlife Services Public Map Viewer **databases** and review of the EIA Report Chapter 9: Land; and fieldwork including **walkover surveys and geological mapping** of the Whole Upperchurch Windfarm Project area.

10.2 The Soils in the area

The UWF Replacement Forestry will be located entirely on **agricultural grassland**. The soil comprises mainly **mineral and peaty topsoil**. Overall, the soil, subsoil and bedrock on site is considered to have a **low to medium geological importance** and are abundant in the area and not unique in any way.

The **nearest point of the Lower River Shannon SAC is 4km and of Bleanbeg Bog NHA is 14km.**

10.3 How could Soils be affected

Soils and geology can be sensitive to **excavation and relocation of soil, subsoil and bedrock**; to **processes such as erosion, compaction and drainage** and to **contamination from vehicle fuels**.

10.3.1 Measures to avoid, prevent or reduce significant negative effects to Soils

The following is a list of the **Project Design Environmental Protection Measures**, which are a build into the **design** of the proposed UWF Replacement Forestry project, in order to prevent negative impacts on Soils;

- The lands will be planted by hand, using spades and handtools.
- No pesticide or fertilizer will be used at the afforestation site.
- There will be no refuelling of vehicles or plant, no storage of fuels and no overnight parking permitted within the site

10.3.2 The effects of UWF Replacement Forestry

10.3.2.1 Local Soils, Subsoils & Bedrock

No Impacts are likely to occur to **Local Soils, Subsoils & Bedrock**, for the following reasons:

- The forestry will be planted by hand and therefore impacts on the local soils and geology during the planting phase will be less than imperceptible as there is no requirement for machinery, with any digging with shovels very localised and very shallow.
- No effects on soils and geology are expected during the growing phase as there is no requirement for any machinery or excavations.

10.3.2.2 Lower River Shannon SAC and Bleanbeg Bog NHA

UWF Replacement Forestry has no potential to cause impacts to either **Lower River Shannon SAC or Bleanbeg Bog NHA** because the entirety of the afforestation lands **occur outside the boundaries of both of these designated sites**.

10.3.3 Matters evaluated as having No Effect

The following effects were not evaluated in detail as it **they were considered to be Neutral** – effects to Mauherslieve Bog NHA, Rear Cross Moraines CGS, or Owenbeg Moraines CGS due to separation distances; effects to soils during the growth stage.

10.3.4 The Cumulative Effects

As the UWF Replacement Forestry will not affect Soils on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (UWF Grid Connection, UWF Related Works, Upperchurch Windfarm are relevant); the cumulative effects with Castlewaller Windfarm and Turf Cutting **will not be significant.**

10.4 Conclusion

The experts who examined this topic concluded that **no likely significant effects to Soils** will occur as a result of the UWF Replacement Forestry on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.

NTS of Chapter 11: Water

The study in Chapter 11: Water relates to the **surface water** which includes rivers, streams and drains and **groundwater** like aquifers, wells and springs; **water dependant designated sites** like Special Areas of Conservation (SACs) and Natural Heritage Areas (NHAs) and **special natural areas** dependant on good water quality.

11.1 How was the Water study carried out?

The study was carried out by David Broderick and Michael Gill of Hydro Environmental Services.

The effects on **Local Surface Water Bodies**, **Local Groundwater Bodies**, **Local Wells & Springs**, and effects to water in the **Lower River Shannon SAC**, **Lower River Suir SAC, Bleanbeg Bog NHA,** and **Local Water Dependent Habitats** were studied.

Sources of information on the Water in the area came from **Consultations** locally and nationally with **specialist bodies; Desktop Studies** of website-based databases of the **Environmental Protection Agency, Geological Survey of Ireland, Met Eireann, National Parks & Wildlife Services, Water Framework Directive, OPW Flood Maps** and **Catchment Flood Risk Assessment and Management.**

Field Surveys included walkover survey, mapping of **watercourses** and **water sampling**.

11.2 The Water in the Area

All of the UWF Replacement Forestry is located within the **Clodiagh River catchment**, which is part of the **River Suir Catchment**. The afforestation site is at least **12km upstream of the River Suir SAC.** A headwater stream of the Clodiagh River **(a watercourse with fisheries value (Class 1)** flows in an easterly direction through the western part of the afforestation lands.

In respect of **Groundwater,** the site is located entirely within the **Templemore A: Ground Water Body**.

11.3 How could Water be impacted

Changes to **surface water quality** can affect local surface water bodies and local wells and springs. Surface Water quality could be **negatively impacted** during **planting activities** by **sediment** (i.e. soil) **laden run-off into rivers** from excavations and storage of soils; by **watercourse crossing works**; and by **contamination by vehicle fuels**, **fertilisers and pesticides**. **Groundwater Bodies** could be contaminated by **spillage of vehicle fuels**.

11.3.1 Measures to avoid, prevent or reduce negative effects to Water

The following is a list of the **Project Design Environmental Protection Measures**, which are a build into the **design** of the proposed UWF Replacement Forestry project, to protect Water;

- The lands will be planted with native woodland, by hand, using spades and hand tools.
- No pesticide or fertiliser will be used at the site.

- There will be no refuelling of vehicles or plant, no storage of fuels and no overnight parking permitted within the site.
- A water setback from the watercourse which flows through the site, will be established during planting works. The setback will be 10m from the edge of the watercourse. No planting or other works will be carried out in this 10m wide buffer area.

11.3.2 The Effects of UWF Replacement Forestry

11.3.2.1 Surface Water and the Lower River Suir SAC

Due to the Project Design Measures there will be *imperceptible impacts* to either the Clodiagh River or to the Lower River Suir SAC from sediment laden run-off or contamination from fuels or chemicals. In addition, the following features of the afforestation result in their being *no potential for impact* to Water - existing culvert crossings will be used to access the lands and no instream works or directional drilling will be required; no felling will be carried out; there is no requirement for dewatering of excavations; no cement based compounds are required; no new access roads or permanent hardstanding areas are required; and no increased flood risk is expected.

11.3.3 Matters Evaluated as having No Effect

The following effects were not evaluated in detail as it **they were considered to either Neutral, not likely to occur or having no potential to occur due to separation distances.** The afforestation lands are;

- There is *no potential for impacts* because the afforestation is **outside the boundary** of both the Lower **River Shannon** SAC and the River Shannon regional catchment area.
- There is *no potential for impacts* because the afforestation is **14.4km to the east of the Bleanbeg Bog NHA.**
- *No likely impact/No potential for impact* to g**roundwater due to contamination** by fuels, oils, chemicals and cement or dewatering of excavations**.**
- **There is** *no potential for impact to* **local springs or wells because there are none within 50m** of the afforestation lands.
- There is *no potential for impacts* because there are **no local water dependent habitat on or adjacent** to the afforestation lands.

11.3.4 The Cumulative Effects

When the effects of UWF Replacement Forestry on Water are considered with the effects of UWF Grid Connection, UWF Related Works, Upperchurch Windfarm, Bunkimalta Windfarm and Newport Distributor Road - the summary result **is that the cumulative effects will not be significant.**

11.4 Conclusion

The experts who examined this topic concluded that **no likely significant effects to Water** will occur as a result of the UWF Replacement Forestry on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.

NTS of Chapter 12: **Air** (air quality, noise and vibration, EMF)

The study in Chapter 12: Air relates to the effects locally of the development on **air quality, noise and vibration levels and electromagnetic field (EMF)** levels.

12.1 How was the Air study carried Out?

The study was carried out by Dr.Ciara Nolan of AWN Consultants, Peter Barry of Malachy Walsh & Partners, and John McAuley, Lewis Brien and Nigel Duignan of Compliance Engineering Ireland.

Effects on **Local Residents & Community** and **Transient People** were studied. Local Residents & Community includes people living locally in houses and farmsteads near the new wood. **Transient People** includes **walkers and cyclists** on waymarked trails– the Ormond Way cycle route and also people working in and travelling close to the new wood.

EPA Annual Air Quality Monitoring Reports (1997 – 2014) and EPA "Air Quality Monitoring Report 2015" (EPA, 2016); and Comreg, ESB and Radiological Protection Institute of Ireland online Information were examined. Other sources of information included a **review of aerial photography**, and **OSI and other online mapping** to identify local residential properties, local community facilities and walking/cycling routes and to identify other activities in close proximity to these properties and routes.

12.2 Air in the area

The setting is **rural and away from major sources of air pollution, noise and vibration and electromagnetic fields**. The existing levels of air pollutants from vehicles and dust from earthworks in the area are low. The existing noise sources are natural sources, mainly wind borne and there is also man-made noise sources including farm machinery when in operation, and traffic on the local road network. The absence of intensive power and communications infrastructure results in miniscule levels of both electric and magnetic fields in the area – substantially less than national and international guideline levels. All of these **low levels of pollutants, noise and electromagnetic fields are typical of rural Ireland**.

12.3 How could Air be affected

Air can be sensitive to **increases in the local levels of dust, vehicle emissions and noise.**

12.3.1 Measures to avoid, prevent or reduce negative effects to Air

The following **Project Design Environmental Protection Measures**, is built into the **design** of the proposed UWF Replacement Forestry project;

- The lands will be planted by hand, using spades and hand tools.
- The new wood will remain permanently in place.

12.3.2 The Effects of UWF Replacement Forestry

12.3.2.1 Local Residents & Community and Transient People

The UWF Replacement Forestry is **will have neutral effects/no potential for effects to air quality or ambient noise levels** because planting will be carried out by hand, which avoids both the use of large machinery (noise, vibrations and emissions) and the presence of large volumes of excavated soils (**dust**). Management activities during the growth stage are also expected to have neutral effects on local residents or to any transient people present in the local area because this type of activity will be infrequent, brief in nature and at a distance from local residents.

As the UWF Replacement Forestry does not include any electrical or communications equipment, the new woodland will not contribute to **EMF levels** in the vicinity.

12.3.3 The Cumulative Effects

As the UWF Replacement Forestry will not affect Air on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (UWF Grid Connection, UWF Related Works, Upperchurch Windfarm are relevant); the cumulative effects with the Shannonbridge – Killonan 220kV OHL, Killonan – Nenagh 110kV OHL and Castlewaller Windfarm **will not be significant.**

12.4 Conclusion

The experts who examined this topic concluded that **no likely significant effects to Air** will occur as a result of the UWF Replacement Forestry on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.

NTS of Chapter 13: Climate

Climate is defined as the average weather over a period of time. Climate change is a natural process, but in more recent years the climate is changing as a result of human activities, through the much increases in the release of greenhouse gases. These gasses are altering the earth's atmosphere resulting in a 'Greenhouse Effect'. The release of carbon dioxide from the burning of gas, oil and coal to generate electricity, is a major cause of this release of gasses which is accelerating climate change.

13.1 How was the Climate study carried out?

The study was carried out by Ciara Nolan of AWN Consulting Ltd.

EPA data on greenhouse gas levels in Ireland, UK Environmental Agency carbon calculators were considered along with a review of Ireland's energy targets and climate agreements.

13.2 Climate Change action in Ireland

Ireland has signed up to a number of Climate Agreements under the United Nations and the European Union. These agreements set limits for the amount of greenhouse gases which can be produced by a country on an annual basis. The EU agreement - 2030 Climate and Energy Policy Framework - aims to reduce greenhouse gas emissions, by 40% compared with 1990 levels, by 2030. Developing on-shore wind energy is an integral part of Ireland's limiting of greenhouse gasses because there are no emissions of greenhouse gasses from wind energy electricity production, compared with gas, coal or oil.

13.3 How could Climate be affected

Climate can be affected positively by increased production of electricity from renewable sources and from increased carbon uptake due to tree planting. Climate can be negatively affected by vehicle emissions and tree felling and the release of carbon from excavated soils and materials.

13.3.1 The Effect of UWF Replacement Forestry

UWF Replacement Forestry itself will not cause positive or negative effects to Climate – any impacts will be *Neutral/No Impact*.

13.3.2 Matters evaluated as having No Effect

The following effects were not evaluated in detail as it they were considered to be **Neutral/No Impact** – increase in national levels of greenhouse gas emissions due to the very small scale of vehicle emissions and the very small scale of embodied emissions which could be released during planting; carbon sequestration effects from planting of new trees due to the small scale of afforestation in relation to National targets and has no potential to directly positively impact Climate through increasing renewable energy production - as the UWF Replacement Forestry itself will not generate renewable electricity.

13.3.3 The Cumulative Effects

As the UWF Replacement Forestry will not affect Climate on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (Upperchurch Windfarm is relevant); the cumulative effects with the other operational windfarms in Ireland **will be Significant and positive.**

13.4 Conclusion

The expert who examined this topic concluded that while the UWF Replacement Forestry **will be neutral/no impact** to Climate on its own, **when considered cumulatively** as part of the Whole Upperchurch Windfarm Project and cumulatively with other projects and activities i.e other windfarms in Ireland, **the effect to Climate will be a significant positive effect**.

NTS of Chapter 14: Chapter 14: Material Assets - Built Services

The Built Services in the area are the **pipes, electricity system, lines and cables, telecoms cables and wireless signals** which supply the **drinking water, electricity and telephone services** to local residents, businesses and community facilities.

14.1 How was the Built Services study carried out?

The study of the effects of the UWF Replacement Forestry on Built Services, was carried out by a number of experts: David Broderick and Michael Gill of Hydro Environmental Services; Ruairí Geary of TLI Group (electrical engineers/utility infrastructure consultancy), Kevin Hayes of Ai Bridges (telecommunication engineers).

The effects on **Local Residents & Community** and the **Electricity Transmission System** were studied.

The built services in the area of the UWF Replacement Forestry were identified by consultation with infrastructure owners; **ESB Networks, Eir and Irish Water**. A review of **built services mapping** was also undertaken and finally a **site walkover** of the construction works areas was carried out.

14.2 Built Services in the Area

The services in the area are made up of **overhead telephone lines** which are located along roadside boundaries, and **overhead electricity lines** which are generally located in fields close to the local roads, which are connected to local residences and well as a small number of community facilities and local businesses. Other above-ground built services include a **telecommunications mast, known as the Foilnaman Mast, at Knockmaroe**, along with other small masts in the wider area.

As the study area is sparsely populated, **the number of houses and other properties connected to services is very low**. There are no high voltage **Electricity Transmission System** assets in the development area.

14.3 How could Built Services be affected

The water, electricity system and telecommunications network serving the locality, can potentially be **damaged by moving machinery and during excavation works**, any damage to pipes, cables or lines would cause an interruption in supply to customers.

14.3.1 The Effects of UWF Replacement Forestry

14.3.1.1 Local Residents & Community

UWF Replacement Forestry has **no potential to cause impacts to these services** and therefore no loss of service to Local Residents & Community because there are **no excavation works or large machinery required** - all planting and maintenance activities will be carried out by hand and vehicles required will be standard vans or four-wheel drive vehicles and trailers.

14.3.1.2 Electricity Transmission System

UWF Replacement Forestry has no potential to cause impacts to **Electricity Transmission System** due to the **absence of any Electricity Transmission System Assets in the area**.

14.3.2 The Cumulative Effects

As the UWF Replacement Forestry will not affect Built Services on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (UWF Grid Connection, UWF Related Works, Upperchurch Windfarm are relevant); the cumulative effects with the Bunkimalta Windfarm and Castlewaller Windfarm **will not be significant.**

14.4 Conclusion

The experts who examined this topic concluded that **no likely significant effects to Material Assets – Built Services** will occur as a result of the UWF Replacement Forestry on its own, or cumulatively as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.

NTS of Chapter 15: Material Assets - Roads

The study in Chapter 15: Material Assets Roads relates to local roads in the vicinity of the afforestation site and along the route of the forestry related traffic.

15.1 How was the Roads Study carried out?

The study was carried out by Eoin Reynolds of NRB Consulting Engineers.

The effects on **Public Roads** and the **Road Users** were studied.

The evaluation, was prepared in accordance with **Transport Infrastructure Ireland's Traffic & Transportation Assessment Guidelines**. The following investigations were carried out on the affected road;

- **Traffic count survey** for a 24 hour period as part of the Whole Upperchurch Windfarm Project investigations;
- **Examination of databases** - POWSCAR 2016 CSO Database (on vehicle use) and RSA Collision Statistics Database.

15.2 The Roads in the Area

The Public Road adjoining the afforestation site is **Local Road L2264-34 at Foilnaman**, from which access will be gained through an existing farm entrance to the lands to be planted. This is very lightly trafficked road.

15.3 How could Public Roads and Road Users be affected

Road pavements and culverts can be effected by road works involving the **excavation** of the pavement or the adjacent verge and by **increases in traffic**, particularly truck traffic. **Road boundaries** can be affected by **new or widened accesses** from the public road network, onto the lands beyond.

Road Users could be sensitive to changes in road use conditions such as **increases in traffic volumes**, particularly trucks; presence of **roadworks and traffic management measures;** and a **reduction in road pavement quality** which could either increase journey times or reduce road safety. Cyclists or walkers could also be **intimidated by the presence of trucks**, particularly on narrow roads.

15.3.1 The Effect of UWF Replacement Forestry

15.3.1.1 Effects on Public Roads and Road Users

It was evaluated by the topic authors that the **effects will be No Impact on Public Roads and Neutral to Public Road Users** due to the development because:

- There will be no noticeable increase in traffic volumes on the public road network - the planting stage will generate **1 to 2 vehicles movements per day** over a one-month period and the growth stage will generate

of **2 to 4 vehicle movements per year**. There is **no harvesting traffic** as the woodland is native and permanent.

- There is **no requirement** for **roadworks** or works to **roadside boundaries or buried structures**. The e**xisting farm entrance** will be used without change because it has adequate sightlines and set back distances.

15.3.2 The Cumulative Effects

As the UWF Replacement Forestry will not affect Built Services on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (UWF Grid Connection, UWF Related Works, Upperchurch Windfarm are relevant); the cumulative effects **will not be significant.**

15.4 Conclusion

The expert who examined this topic concluded that **no likely significant negative effects** to Material Assets - Roads will occur as a result of the **UWF Replacement Forestry on its own, or cumulative as part of the Whole Upperchurch Windfarm Project.**

NTS of Chapter 16: Cultural Heritage (Archaeology)

Cultural Heritage relates to sites of **archaeological, historical or architectural** significance in the form of **sites, monuments, historic structures, artefacts and environmental evidence**.

16.1 How was the Cultural Heritage study carried out?

The study was carried out by Barry Fitzgibbon and Cóilín O'Drisceoil of Kilkenny Archaeology.

The effects on **Recorded Legally Protected Sites**, **Other Recorded Sites**, **Previously Unrecorded Sites** and **Unrecorded Subsurface Sites** were studied.

In an archaeology context **Recorded Legally Protected Sites** are those that are listed on the Record of Monuments and Places and are protected under the National Monuments Acts (1934-2014). **Other Recorded Sites** are sites listed on the National Inventory of Architectural Heritage (NIAH), although not legally protected, they are an important part of Irish architectural heritage. **Previously Unrecorded Sites** are sites that are listed in this study, but are unrecorded in the Records of Monuments and do not have legal protection. The majority of these sites are features or ruins of features such as Lime Kilns, Wells, Quarries and Townland Boundaries. Previously **Unrecorded Subsurface Sites** are features or artefacts that have not been discovered yet.

The study area for effects **from groundworks** was set at **a) for Recorded Legally Protected Sites and Other Recorded Sites** - within the footprint of the afforestation area, plus 500m radius surrounding the footprint; **b) for Previously Unrecorded Sites** - within the footprint of afforestation area and extended out to 500m at certain locations which have features of potentially significant interest or importance and; **c) for Unrecorded Subsurface Archaeology** - within the footprint of afforestation area where groundworks will take place.

National and European guidelines on the assessment, protection and conservation of archaeological and architectural heritage have been considered during the preparation of the evaluation of cultural heritage in the area. These guidelines are listed in full in Chapter 16 of the EIA Report.

Sources of information on the area under study, came from **consultation locally**; **desktop study** of the Record of Monuments and Places; Record of Protected Structures; National Inventory of Architectural Heritage; National Museum of Ireland Topographic Files; All editions of the historic Ordnance Survey Maps (including the first edition 1841 and the second edition 1898 1:10560 maps); Other historic mapping, such as the Down Survey (1655) and the Griffith Valuation (1850); and aerial photography mapping of the area. **Field studies** including **walking of the afforestation site areas**. A detailed description of the archaeological context of the study area is described in detail in Chapter 16: Cultural Heritage of the EIAR Main Report (Volume C2).

16.2 Cultural Heritage in the Area

UWF Replacement Forestry is located on the eastern slopes of the Slievefelim – Silvermine Mountain uplands area, which is a region with a **rich and diverse history of human settlement going back to prehistoric times**. This extended period of occupation is reflected in the archaeological record. The broader upland landscape (over 100m above sea level) has numerous known monuments, recorded on the Record of Monuments and Places. While the spread of these monuments date from **the Neolithic through to post medieval and modern times**, the upland region appears to have been most intensively settled in the late Neolithic, with populations dispersing to the lower slopes during later periods.

There are **no Recorded Legally Protected Sites and no Other Recorded Sites** either on the UWF Replacement Forestry lands, or within 500m of the lands.

Previously Unrecorded Sites: UWF Replacement Forestry is located in the townland of **Foilnaman**. **Cartographic analysis, aerial photography and a thorough field survey** identified the **townland boundary of Foilnaman with Knockcurraghbola Commons townland** as part of the boundary of the UWF Replacement Forestry lands. There are **three Previously Unrecorded Sites** (two wells and a quarry) which will have theoretical visibility of the new woodland.

Unrecorded Subsurface Sites: Because much of these uplands have been subject to intensive agriculture and later forestry planting**, it is considered that** Unrecorded Subsurface Sites **exposed during the course of planting are most likely to be** levelled earthworks, back filled ditches or slot trenches **cut directly into the natural subsoil, or areas of large scale burning such as you might find at a** Fulacht Fiadh **site. There is also the possibility for other site types being exposed, including (but not limited to)** artefact scatters**, objects such as** pottery, stone and bronze axes**,** foundations of buried structures, burials, and trackways**.**

16.3 How could this Cultural Heritage be affected

Archaeological sites can be **affected by any groundworks** which would partially or wholly damage the site itself or features/objects associated with the site or which may damage any associated subsurface features or structures which are no longer visible.

Townland boundaries can be **affected by groundworks**. Often modern townland boundaries have **origins going back to the medieval period or earlier**, where they might have acted as extents for manors or ancient landholdings. As such, any associated structures or ditches may contain archaeologically significant material which may be damaged or removed during groundworks.

Also, some **archaeological sites or monuments** were **purposefully constructed** in specific locations, on specific alignments, **to take advantage of views of the surrounding landscape, celestial events and other monument**s. As such the **views of and from these sites** are an integral part of the monument's character and could be **affected by the presence of new development** in the local area.

16.3.1 The Effects of UWF Replacement Forestry

16.3.1.1 Recorded Legally Protected Sites, Other Recorded Sites, Previously Unrecorded Sites, Unrecorded Subsurface Sites

The topic authors conclude that UWF Replacement Forestry has **no potential to cause impacts** to Cultural Heritage sites.

16.3.2 Matters evaluated as having No Effect

No potential for effects to **Recorded Legally Protected Sites** or to **Other Recorded Sites**, due to the absence of these Sites within the lands or within 500m of the lands.

There is **no potential for impacts** to the Foilnaman/Knockcurraghbola Commons townland boundary, as **no works are required to this boundary**. **No other Previously Unrecorded Sites were mapped** on the lands during field surveys or desktop review, therefore there is **no potential for effects** to these sites. In relation to **visual effects** from the maturing woodland; three Previously Unrecorded Sites which will have theoretical

visibility of the new woodland, however as these sites lack archaeological, cultural or historical significance it is considered that the maturing wood will **not cause any measurable visual effects**.

There is no potential for impacts to Unrecorded Subsurface Sites because ground works during planting will involve **minor, manual turning of the sod which are unlikely to expose any subsurface structures, features or objects of archaeological significance**, therefore there is no likelihood of damage occurring to any Unrecorded Subsurface Sites.

In relation to **visual effects from the maturing woodland**; it is unlikely that a monument will be uncovered during planting works, rather that Unrecorded Subsurface Sites (if any) will are likely to be small artefacts, levelled earthworks or backfilled cuts. These types of archaeology are considered **unlikely to be sensitive to visual effects.**

16.3.3 The Cumulative Effects

As the UWF Replacement Forestry will not affect Cultural Heritage on it's own, it will not contribute to cumulative effects with the other elements of the Whole Upperchurch Windfarm Project. In relation to the cumulative effects of the other elements (UWF Grid Connection, UWF Related Works, Upperchurch Windfarm are relevant); the cumulative effects with Milestone Windfarm, Foilnaman Mast and Cummermore Communications Pole **will not be significant.**

16.4 Conclusion

The experts who examined this topic concluded that **no likely significant effects** to Cultural Heritage will occur as a result of the **UWF Replacement Forestry on its own, or cumulative as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities.**

16: Cultural Heritage

Topic **Non-Technical Summary of the UWF Replacement Forestry EIA Report**

NTS of Chapter 17: Landscape

Landscape is an Area perceived by People, whose character is the result of the action and interaction of natural and/or human factors. Landscape is about the relationship between people and place and provides the setting for our day-to-day lives.

17.1 How was the Landscape study carried out?

The study was carried out by Richard Barker of Macroworks (Landscape architect).

The effects on **Landscape Character** and **Visual Amenity** were studied.

Industry guidelines on the assessment of landscape and visual impacts have been considered during the preparation of the evaluation of Landscape in the area.

17.2 The Landscape Setting for UWF Replacement Forestry

The landscape setting of the UWF Replacement Forestry is that of **an extensively managed upland rural landscape of farmland and forestry**. It is **wholly rural** in terms of land use (grassland and forestry) and character. The lands to be planted are **typical and abundant** in the area (grassland).

17.3 How could Landscape be affected

The a**lteration of land cover** from grassland to forestry **will be visible**. **Intensification of activity** during planting **could cause a reduction in rural tranquillity**.

17.3.1 Measures to avoid, prevent or reduce negative effects to Landscape

The following **Project Design Environmental Protection Measures**, is built into the **design** of the proposed UWF Replacement Forestry project thus **reducing intensification of activity during planting;**

- The lands will be planted by hand, using spades and hand tools.

17.3.2 The Effects of UWF Replacement Forestry

17.3.2.1 Landscape Character and Visual Amenity

The effects on **landscape Character** and **visual amenity** will be **Imperceptible/Neutral** because;

- There will be **minimal land disturbance** during planting
- The **forest planting activity is temporary** – lasting about one month – and an activity **typical of the area**.
- The **new woodland is small in scale and beside existing forest** in a wider landscape that is composed of forestry and farmland.

17.3.3 The Cumulative Effects

When the effects of UWF Replacement Forestry on Landscape are considered with the effects of UWF Grid Connection, UWF Related Works, Upperchurch Windfarm, Milestone Windfarm, Foilnaman Mast, Cummermore Communications Pole, Forestry and Agricultural activities - summary result **is that the cumulative effects will not be significant.**

17.4 Conclusion

The experts who examined this topic concluded that **no likely significant negative effects** to Landscape will occur as a result of the **UWF Replacement Forestry on its own, or cumulative as part of the Whole Upperchurch Windfarm Project, or cumulatively with other projects or activities**.

NTS of Chapter 18: Interaction of the Foregoing

In the application reports, all the required Environmental Factors are examined. These are **Population & Human Health**; **Biodiversity** (plants and animals); **Land; Soils**; **Water**; **Air** (air quality, noise, vibration and electromagnetic fields); **Climate**; **Material Assets** including **Built Services** (electricity network, communication network, water supply infrastructure**)** and **Roads**; **Cultural Heritage** (archaeology) and **Landscape**. Each Factor has a dedicated chapter.

Any interaction between these Environmental Factors is called a **cross factor effect**. A cross factor effect happens when the effect on one Environmental Factor causes an indirect effect on another environmental factor – e.g. excavation to **Soils** causing run-off of soils into a drain or watercourse which then causes an indirect effect to **Water** quality.

In the previous sections of this Non-Technical Summary, likely direct and indirect effects are presented.

In summary there are no effects on one Environmental Factor likely to cause significant indirect effects on another Environmental Factor.

18: Interaction of th

Topic **Non-Technical Summary of the UWF Replacement Forestry EIA Report**

NTS of Chapter 19: Monitoring Arrangements

The Project Promoter is **committed to developing the UWF Replacement Forestry without causing significant effects on the environment and human health**.

To achieve this commitment, **Environmental Commitments** have been developed during the design of the project and the preparation of this EIA Report.

The Project Promoter will **contractually oblige the forestry contractors to carry out the works in accordance with all of the Environmental Commitments**. This commitment will be monitored on the ground by an **Environmental Clerk of Works, independent of the contractors**.

19: Monitoring Arrangements

Topic **Non-Technical Summary of the UWF Replacement Forestry EIA Report**

NTS of Chapter 20: Summary Conclusion

Ecopower Developments are applying for **an afforestation licence** to the Minister of the Department of Agriculture, Food and the Marine.

It is proposed to **plant forestry on six hectares of agricultural lands**, in order to **fulfil the replanting obligation arising from the felling of forestry for the development of some of the Other Elements** of the Whole Upperchurch Windfarm Project (in particular UWF Grid Connection (Element 1), UWF Related Works (Element 2) and Upperchurch Windfarm (Element 4)).

The afforestation lands are located in **two adjoining parcels of agricultural lands in Foilnaman townland**, west of the village of Upperchurch in County Tipperary. It is proposed to plant **six hectares of grassland with 20,000 saplings of native woodland species, set in clusters, to be managed as permanent forest.** Wide ride-lines and deeper areas of core woodland will be provided which will **create an open space with tree-lined boundaries, which is much favoured by birds** of prey during the day (e.g. hen harrier) and bats at night, as hunting ground. **Tree guards** will be used to protect the saplings and young trees from rabbit damage and the new woodland will be protected by **stock-proof fencing all around**.

A small stream within the **Clodiagh River** catchment, flows through the western part of the lands. **No planting will take place within 10 metres of the riverbank**. **An existing agricultural entrance** leading off the L-2264-34, will be used to access the new woodland. There are **adequate existing sightlines** at this entrance.

The UWF Replacement Forestry is part of a whole project (**Whole Upperchurch Windfarm Project**), which also includes **UWF Grid Connection, UWF Related Works, the Upperchurch Windfarm (already consented), and UWF Other Activities.** This EIA Report and evaluation takes the whole project into account.

The scientific experts who evaluated the proposal for effects on the environment and human health, in this EIA Report, have concluded that **no likely and significant negative effects will occur** to the environment or human health, **as a result of the UWF Replacement Forestry either alone or in combination** with the Other Elements of the **Whole Upperchurch Windfarm Project** or with other existing or consented projects or activities.

Very Significant positive effects are expected to Biodiversity (in particular Hen Harrier) as a result of the UWF Replacement Forestry on its own, and while the **UWF Replacement Forestry will not generate renewable electricity itself**, **it is part of the whole Upperchurch Windfarm Project**, which **includes the Upperchurch Windfarm**, and together with the other operational windfarms in Ireland, will have a **significant positive effect on Ireland's commitment to tackling Climate change.**

This UWF Replacement Forestry EIA Report is available on-line at

www.upperchurchwindfarm.ie

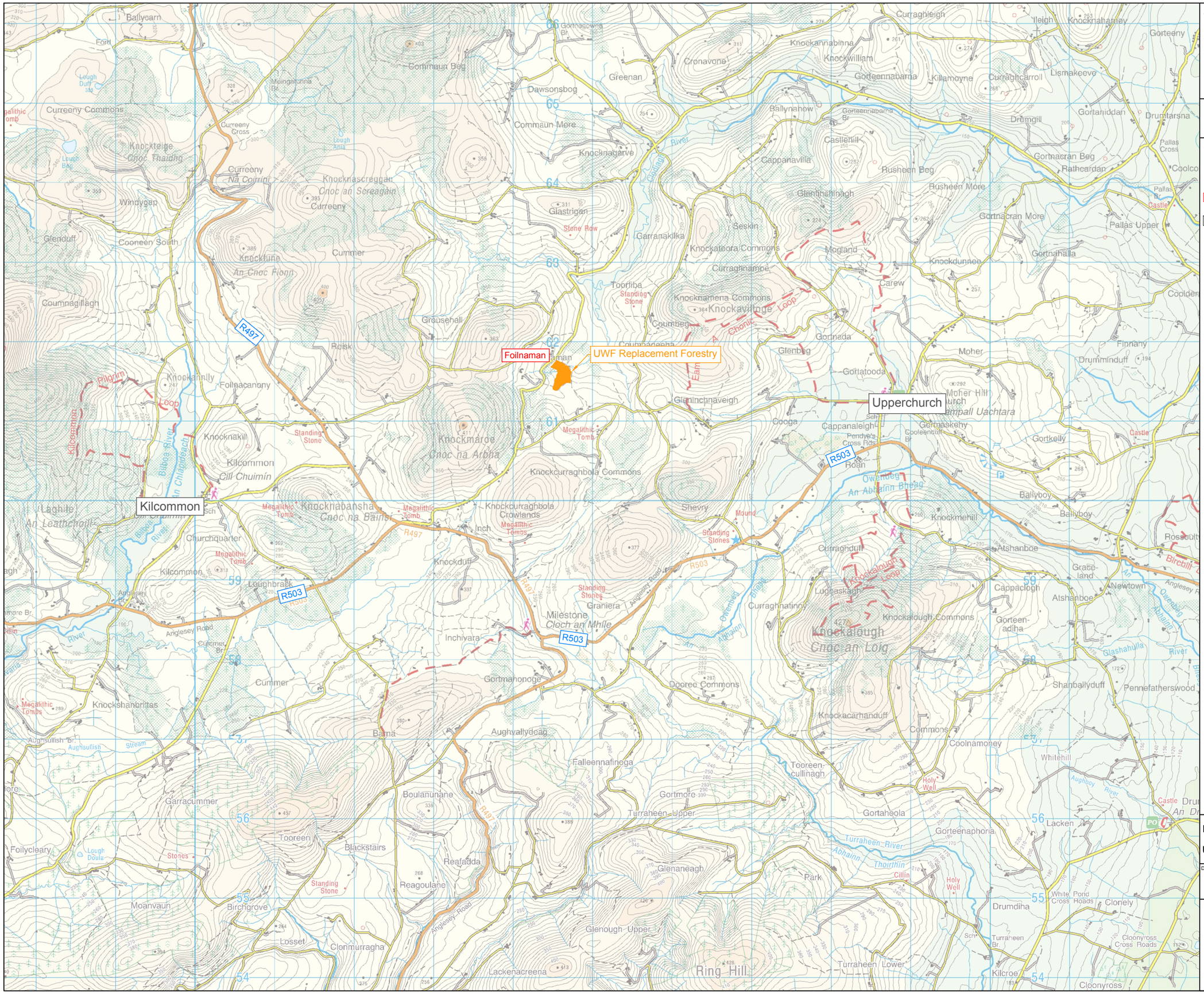

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Figure **NTS 1**

Location of UWF Replacement Forestry

Map Number:
1 of 1

Legend:

- UWF Replacement Forestry
- Foilnaman — Townland
- Kilcommon — Village
- R503 — Regional Road Number

N

Project:

UWF Replacement Forestry (RF)

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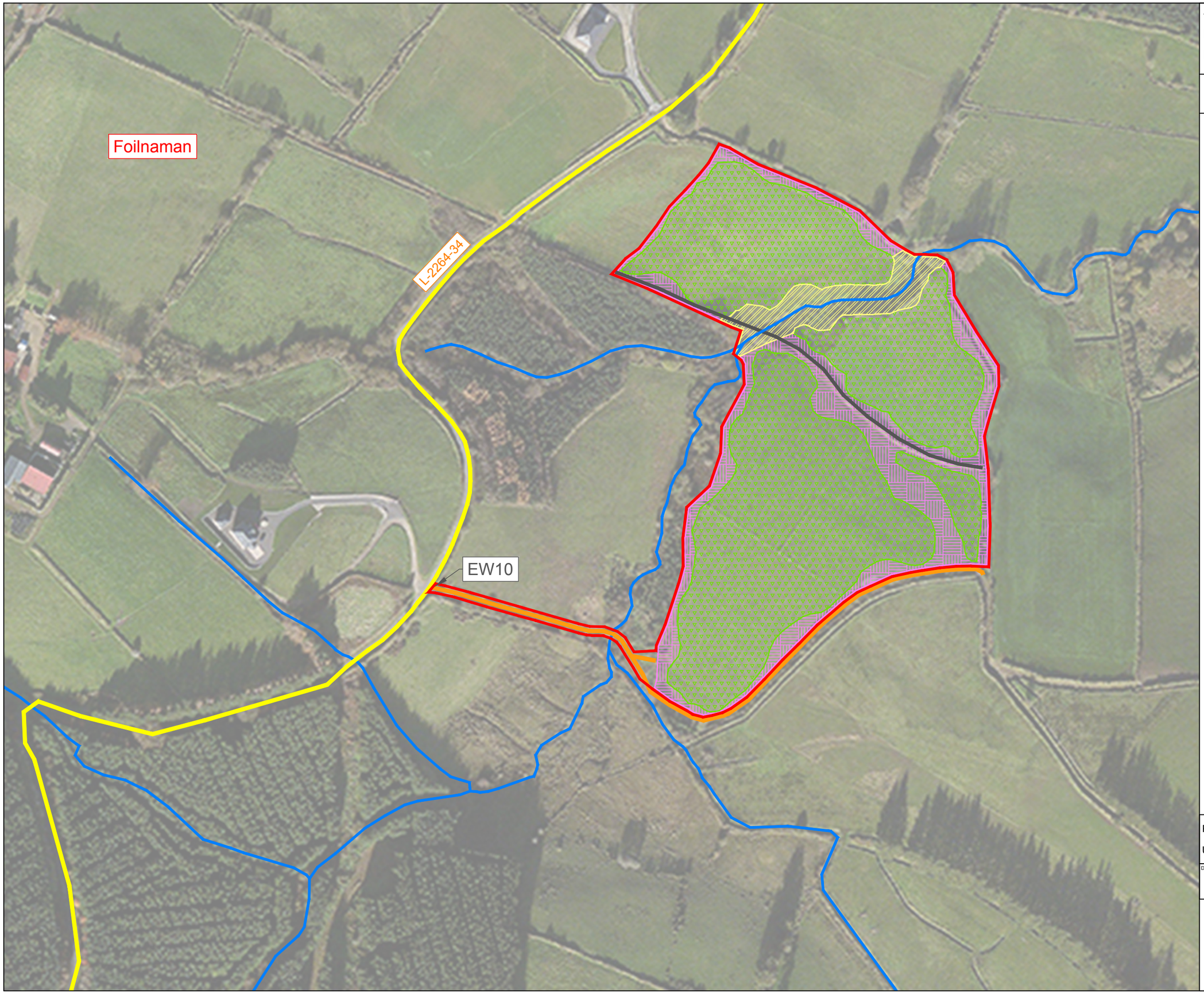

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Figure **NTS 2**

Layout of UWF Replacement Forestry

Map Number:
1 of 1

Legend:

- Ride Lines
- Planting Area
- Riparian Zone
- Site Boundary
- Existing Access Road
- Existing Hedgerows
- Watercourse
- Public Road
- EW10 — Site Entrance
- Foilnaman — Townland
- L-2264-34 — Regional Road Number

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Project:

UWF Replacement Forestry (RF)

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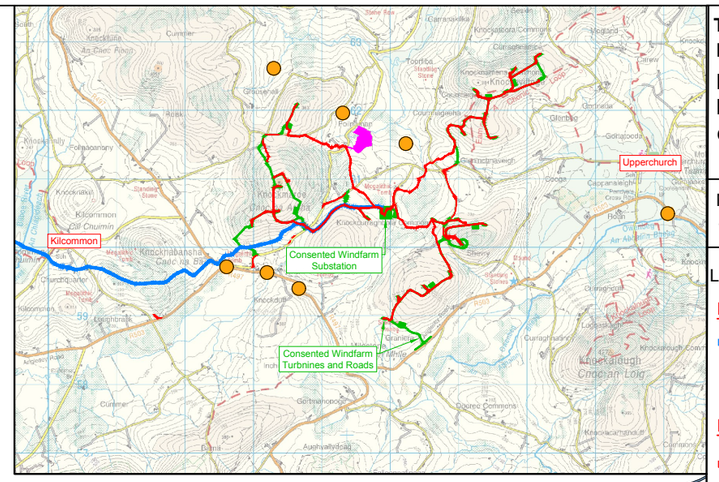

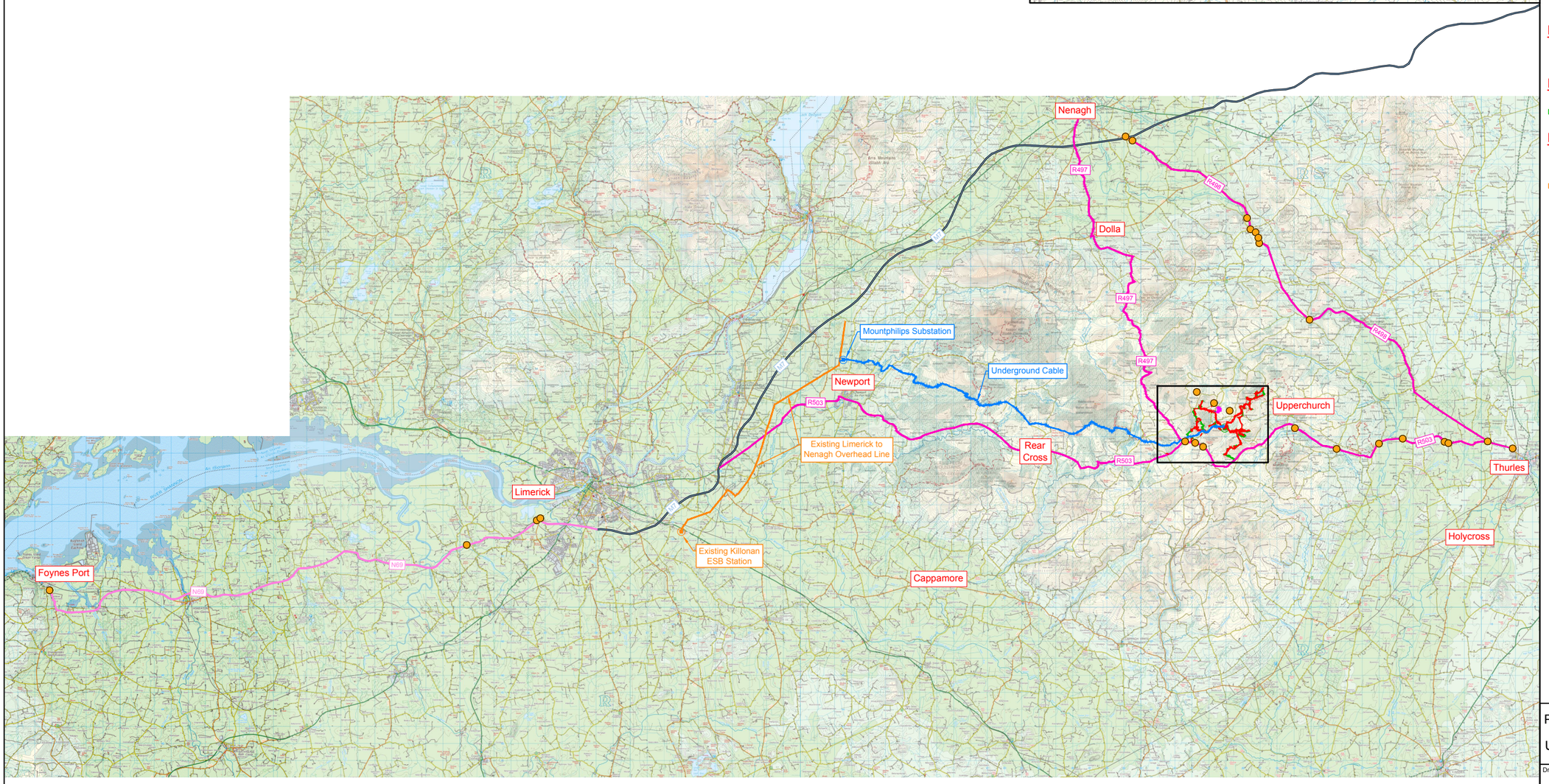

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Figure NTS 3

Location of the UWF Replacement Forestry and the Other Elements of the Whole UWF Project

Map Number:

1 of 1

Legend:

Element 1:

- Underground Cable
- Mountphilips Substation

Element 2:

- UWF Related Works

Element 3:

- UWF Replacement Forestry

Element 4:

- Upperchurch Windfarm (UWF)

Element 5:

- UWF Other Activites

N

Project:

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Upperchurch Windfarm
Replacement Forestry
(UWF Replacement Forestry)

UWF Replacement Forestry EIA Report (EIAR)

VOLUME C3: EIAR FIGURES

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May 2018

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ECOPOWER

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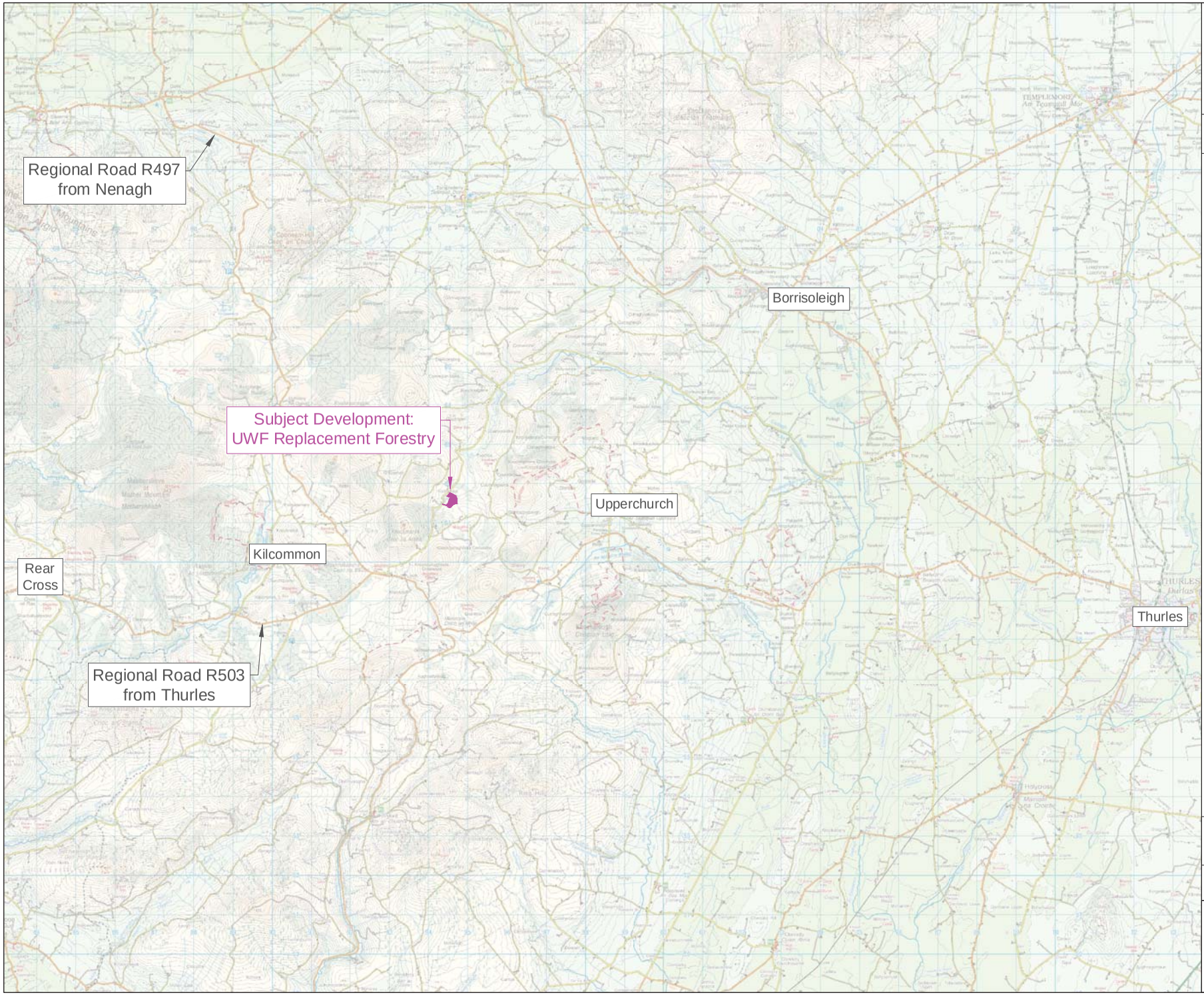
Figures for Chapter 20 Executive Summary		**Tab 18 (printed version)**
No mapping or figures for Chapter 20		



Title:
Figure RF 1.1

Location of the UWF Replacement Forestry on OSI Discovery Mapping (The Subject Development)

Map Number:
1 of 1

Legend:

Subject Development:

UWF Replacement Forestry

N

Project:
UWF Replacement Forestry (RF)

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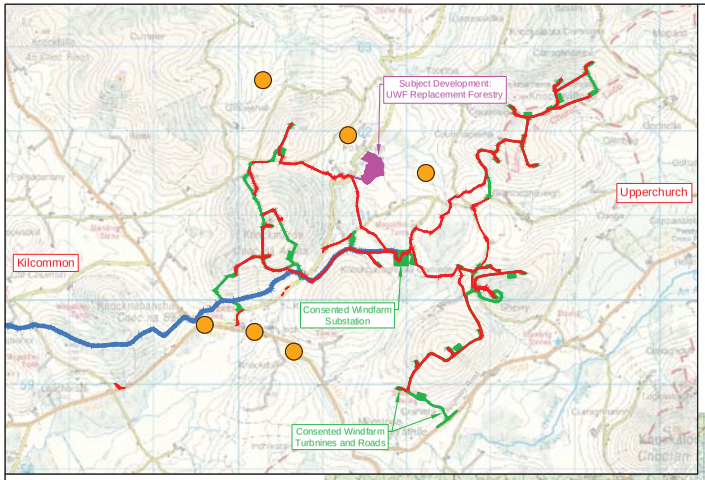

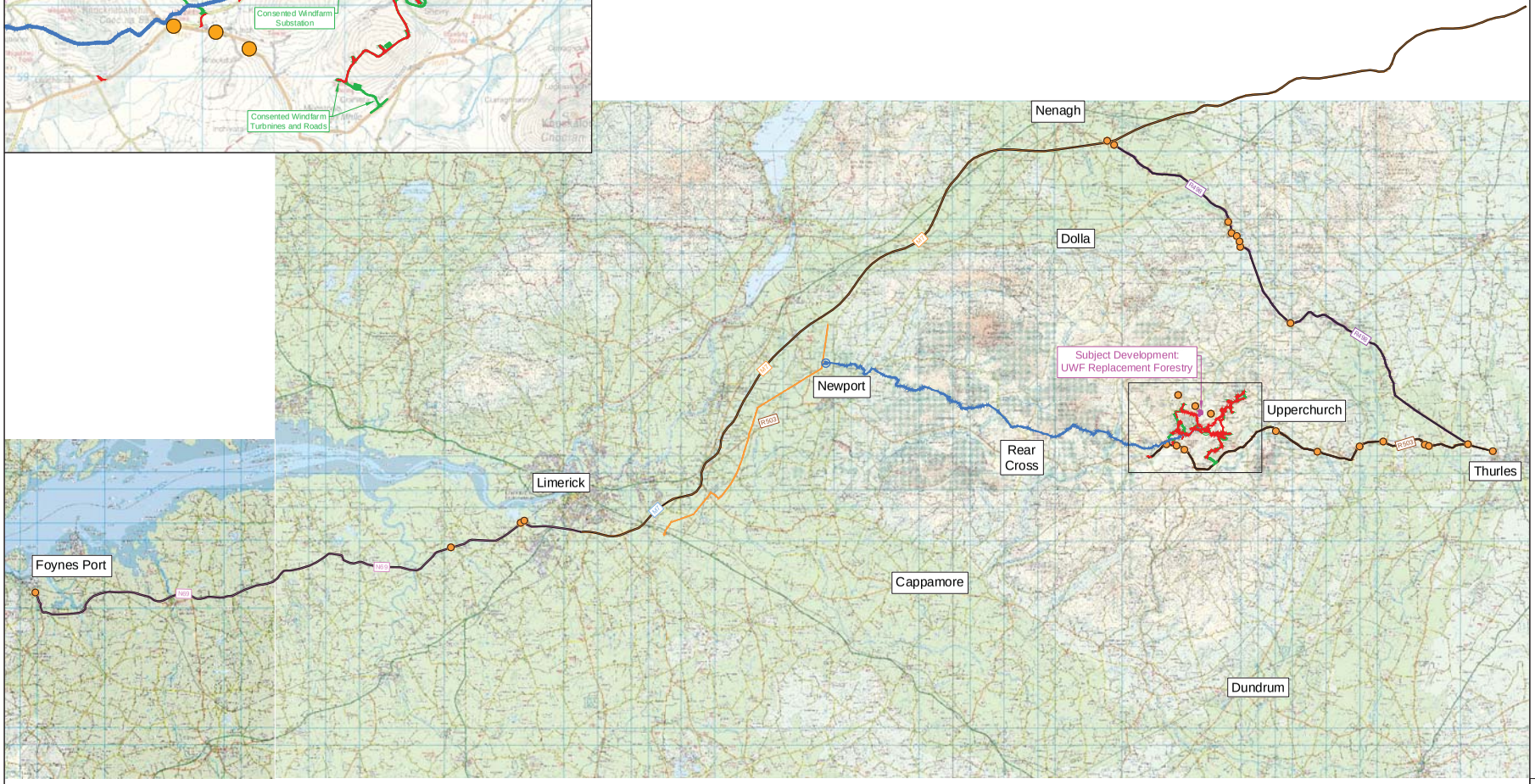

Title:
Figure CE 1.1

Location of UWF Replacement Forestry and the Other Elements of the Whole UWF Project on OSI Discovery Mapping

Map Number:
Map 1 of 1

Legend:

Subject Development:

- UWF Replacement Forestry

Other Elements of the Whole UWF Project:

- UWF Grid Connection
- Mountphilips Substation
- UWF Related Works
- Upperchurch Windfarm
- UWF Other Activites

N

Project:

UWF Replacement Forestry (RF)

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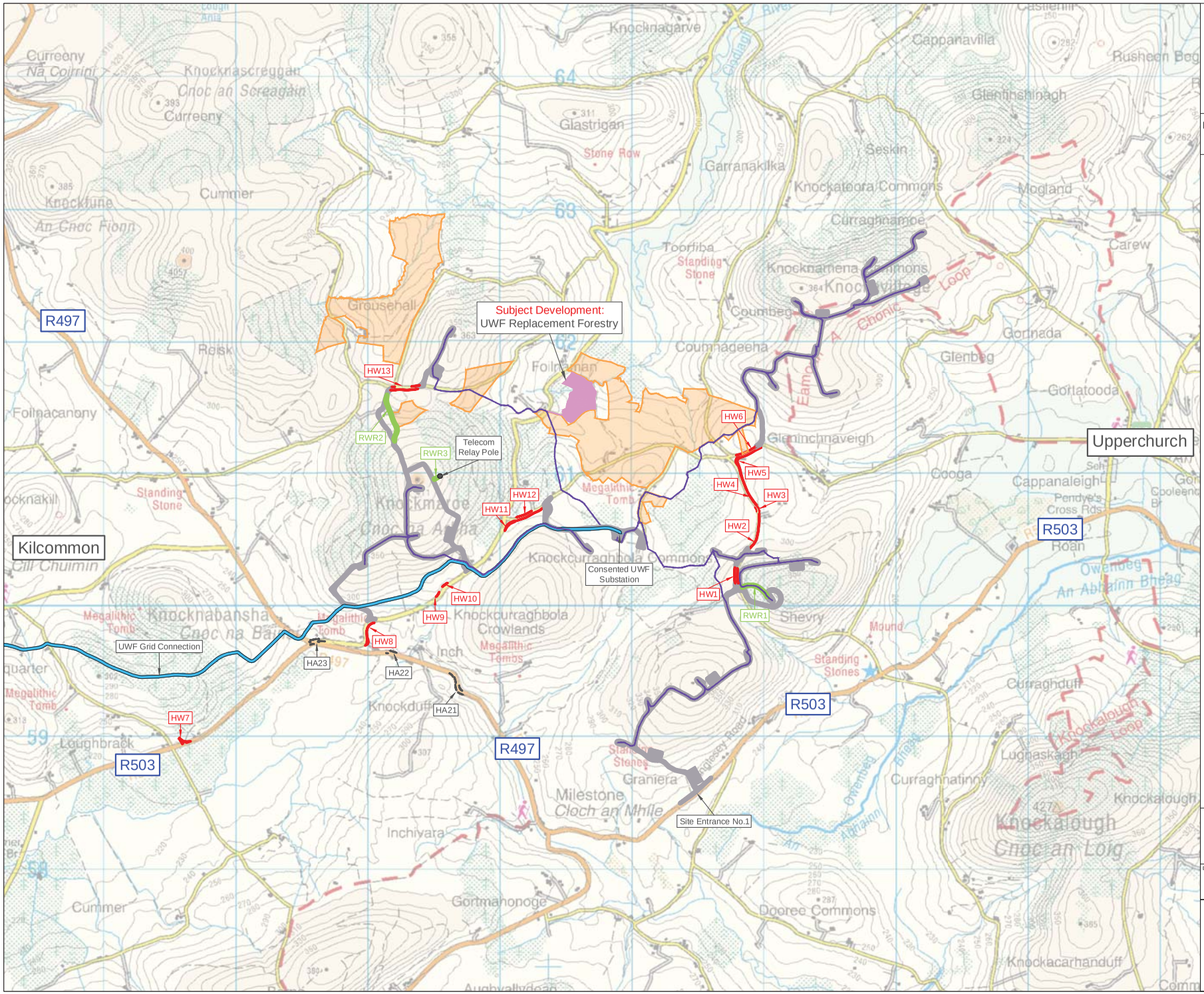

Title:
Figure CE 1.2

UWF Replacement Forestry and the Other Elements of the Whole UWF Project in the vicinity of Upperchurch Windfarm

Map Number:
Map 1 of 1

Legend:

UWF Replacement Forestry:
(Subject Development)
- UWF Replacement Forestry

UWF Grid Connection:
- UWF Grid Connection

UWF Related Works:
- Haul Route Works
- Haul Route Works Numbers (HW1 - HW13)
- Realigned Windfarm Road
- Realigned Windfarm Road Numbers (RWR1 - RWR3)
- Internal Windfarm Cabling
- Telecom Relay Pole

Upperchurch Windfarm:
- Upperchurch Windfarm
  -Consented UWF Turbines
  -Consented UWF Substation
  -Consented UWF Roads

UWF Other Activities:
- Haul Route Activities
- Haul Route Activities Number
- Upperchurch Hen Harrier Scheme

- Regional Road Number

N

Project:
UWF Replacement Forestry (RF)

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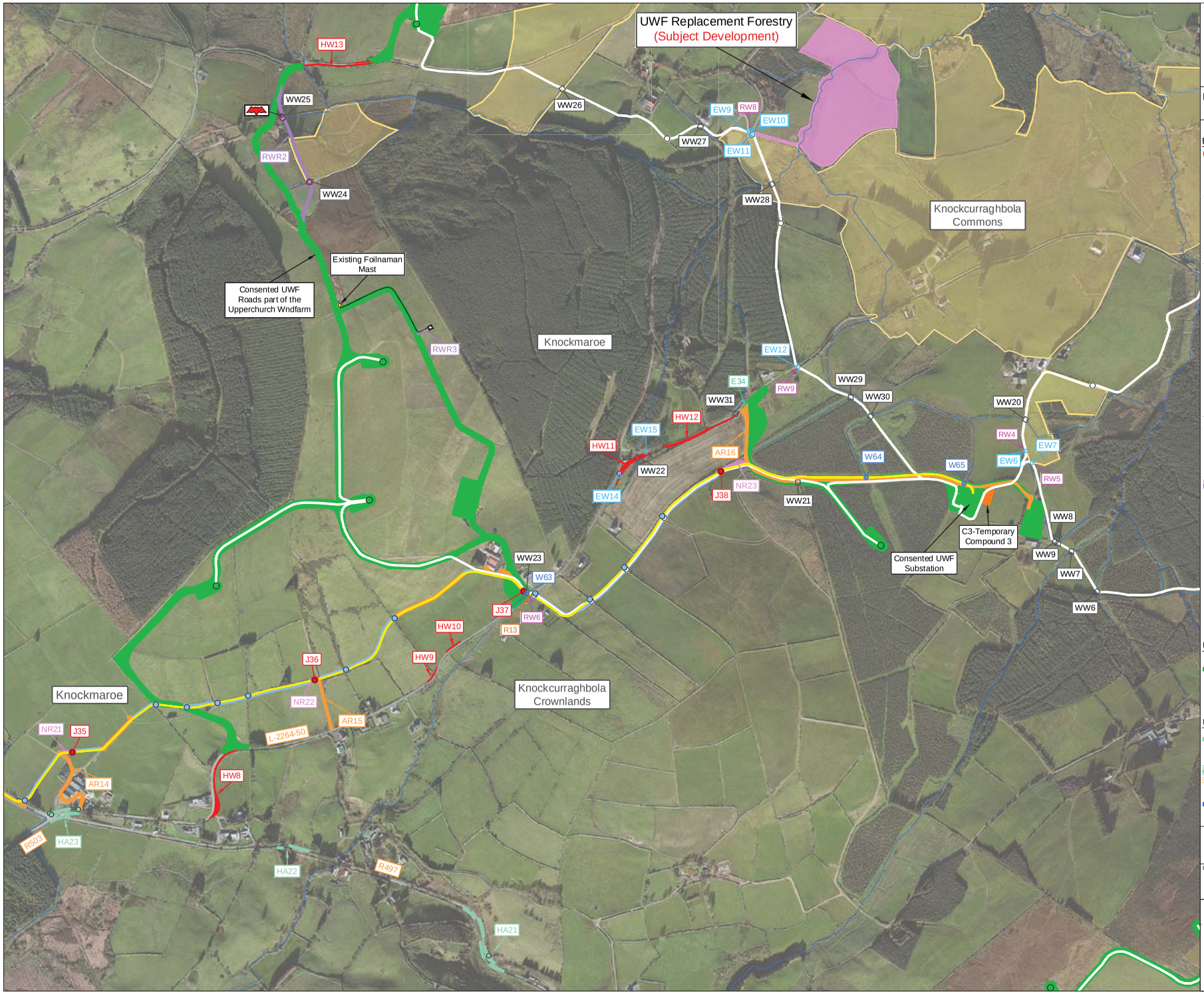

Title:

Figure CE 1.3

UWF Replacement Forestry and the Other Elements of the Whole UWF Project in Knockmaroe, Knockcurraghbola Commons and Knockcurraghbola Crownlands

Map Number:
Map 1 of 1

Legend:

UWF Replacement Forestry:
(Subject Development)
- UWF Replacement Forestry

UWF Grid Connection:
- UWF Grid Connection
- New Permanent Access Roads
- New Permanent Road ID
- Existing Access Roads
- Existing Access Road ID
- Temporary Access Roads
- Temporary hedge/tree removal & pruning
- Joint Bay Locations
- Grid Connection Road Crossings
- Grid Connection Water Crossings
- Grid Connection Site Entrance

UWF Related Works:
- Haul Route Works
- Haul Route Works Numbers (HW8 - HW12)
- Realigned Windfarm Road
- Realigned Windfarm Road Numbers (RWR2 - RWR3)
- Internal Windfarm Cabling
- Telecom Relay Pole
- Temporary hedge/tree removal & pruning
- Permanent hedge/tree removal & pruning
- Related Works Water Crossings
- Bat Crossing Location
- Related Works Road Crossings
- Related Works Site Entrance

Upperchurch Windfarm:
- Upperchurch Windfarm
  -Consented UWF Turbines
  -Consented UWF Substation
  -Consented UWF Roads

UWF Other Activities:
- Haul Route Activity - Vegetation Trimming
- Haul Route Activity - Street Furniture Removal
- Haul Route Activities Number
- Upperchurch Hen Harrier Scheme
- Watercourse
- Regional Road Number

N

Project:
UWF Replacement Forestry (RF)

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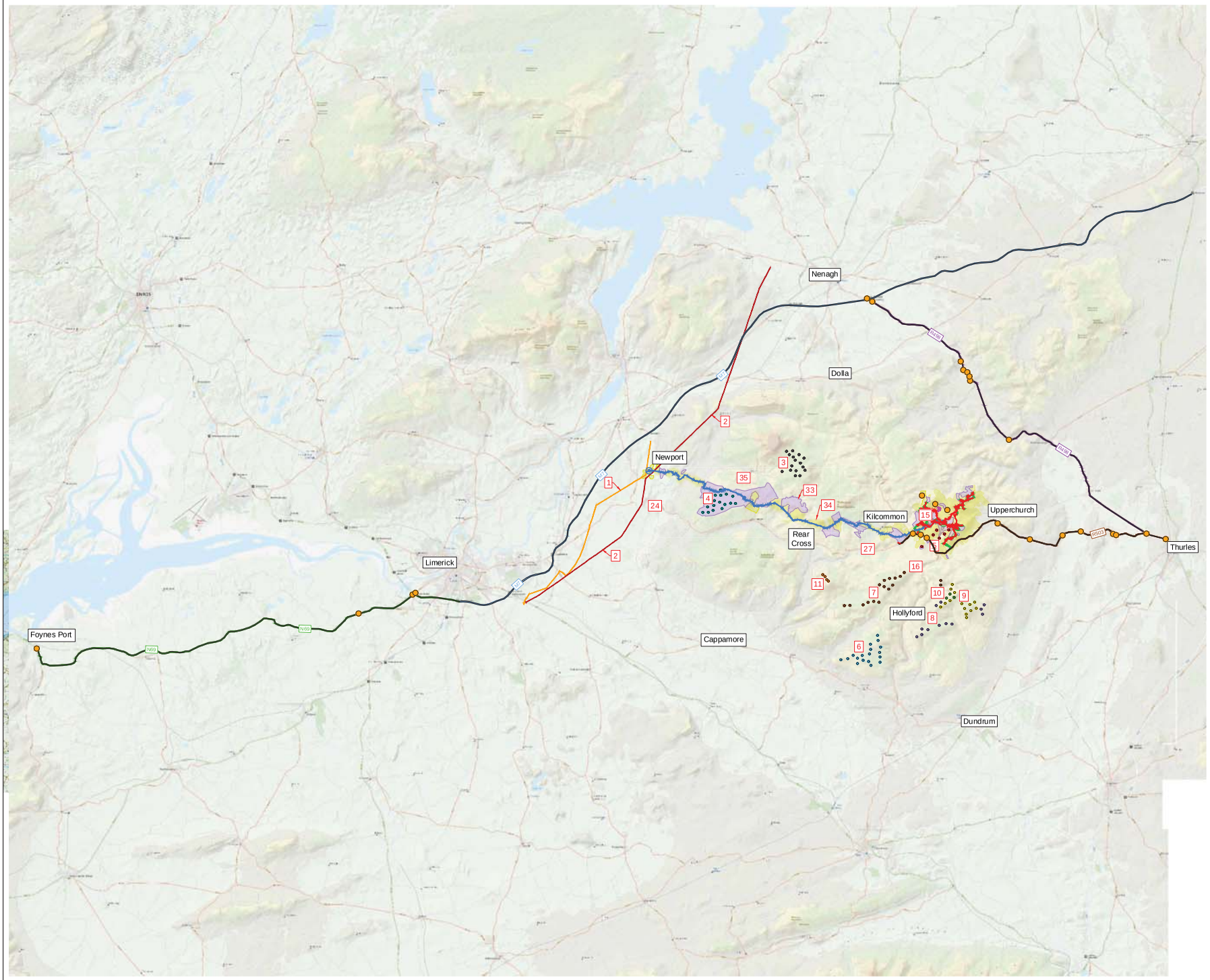

Title:

Figure CE 2.1

Other Projects or Activities Scoped in for Cumulative Evaluation in the Environmental Factor topic chapters

Map Number:
Map 1 of 1

Subject Development:

- UWF Replacement Forestry

Other Elements of the Whole UWF Project:

- UWF Related Works
- Upperchurch Windfarm
- UWF Grid Connection
- Mountphilips Substation
- UWF Other Activites

Other Projects or Activties Scoped in:

1. Killonan to Nenagh 110kV OHL
2. Shannonbridge to Killonan 220kV OHL
3. Bunkimalta Windfarm
4. Castlewaller Windfarm
5. Milestone Windfarm
6. Cappawhite Windfarm
7. Garracummer Windfarm
8. Glencarbry Windfarm
9. Glenough Windfarm
10. Hollyford Windfarm
11. Knockastanna Windfarm
15. Foilnaman Mast
16. Cummermore Communications Pole
24. Newport Distributor Road
33. Forestry
34. Agriculture
35. Turf - Cutting

N

Project:

UWF Replacement Forestry (RF)

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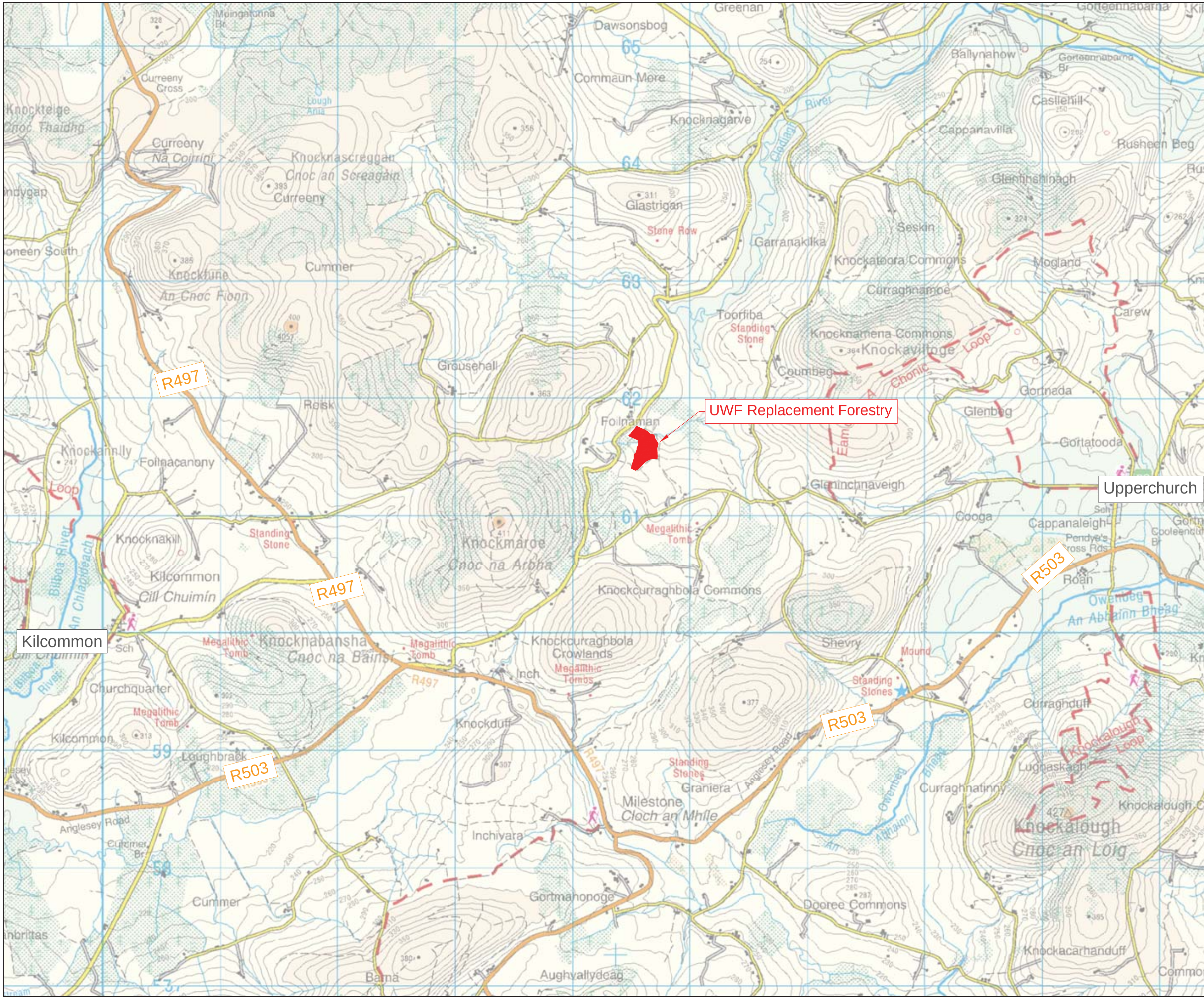
Figures for Chapter 3: EIA Report Process	Tab 3 (printed version)
No mapping or figures for Chapter 3	

Figures for Chapter 4: EIA Report Process	Tab 4 (printed version)
No mapping or figures for Chapter 4	


UWF Replacement Forestry
Upperchurch
Kilcommon
R497
R503
Foilnaman
Knockmaroe
Cnoc na Arbha
Knocknabansha
Cnoc na Bainsi
Knockalough
Cnoc an Loig
Glenbeg
Gortnada
Gortatooda
Cooga
Cappanaleigh
Glastrigan
Garranakilka
Toorliba
Grousehall
Roisk
Cummer
Dawsonsbog
Commaun More
Greenan
Ballynahow
Castlehill
Cappanavilla
Mogland
Seskin
Carew
Shevry
Graniera
Milestone
Cloch an Mhile
Inchivara
Gortmahonoge
Doonee Commons
Aughvallydeag
Knockakilly
Foilnacanony
Kilcommon
Cill Chuimín
Churchquarter
Loughbrack
Inch
Knockduff
Curraghduff
Lugnaskagh
Curraghnatinny
Knockacarhanduff
N

Title:

Figure RF 5.1

Location of UWF Replacement Forestry on OSI Discovery Mapping

Map Number:
Map 1 of 1

Legend:

UWF Replacement Forestry

Project:
UWF Replacement Forestry (RF)

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Title:

Figure RF 5.2

Planting Layout on Aerial Photography Mapping

Map Number:
Map 1 of 1

Legend:

- Ride Lines
- Planting Area
- Riparian Zone
- Site Boundary
- Existing Access Road
- Existing Hedgerows
- Watercourse
- Public Road
- EW10 Site Entrance

N

Project:

UWF Replacement Forestry (RF)

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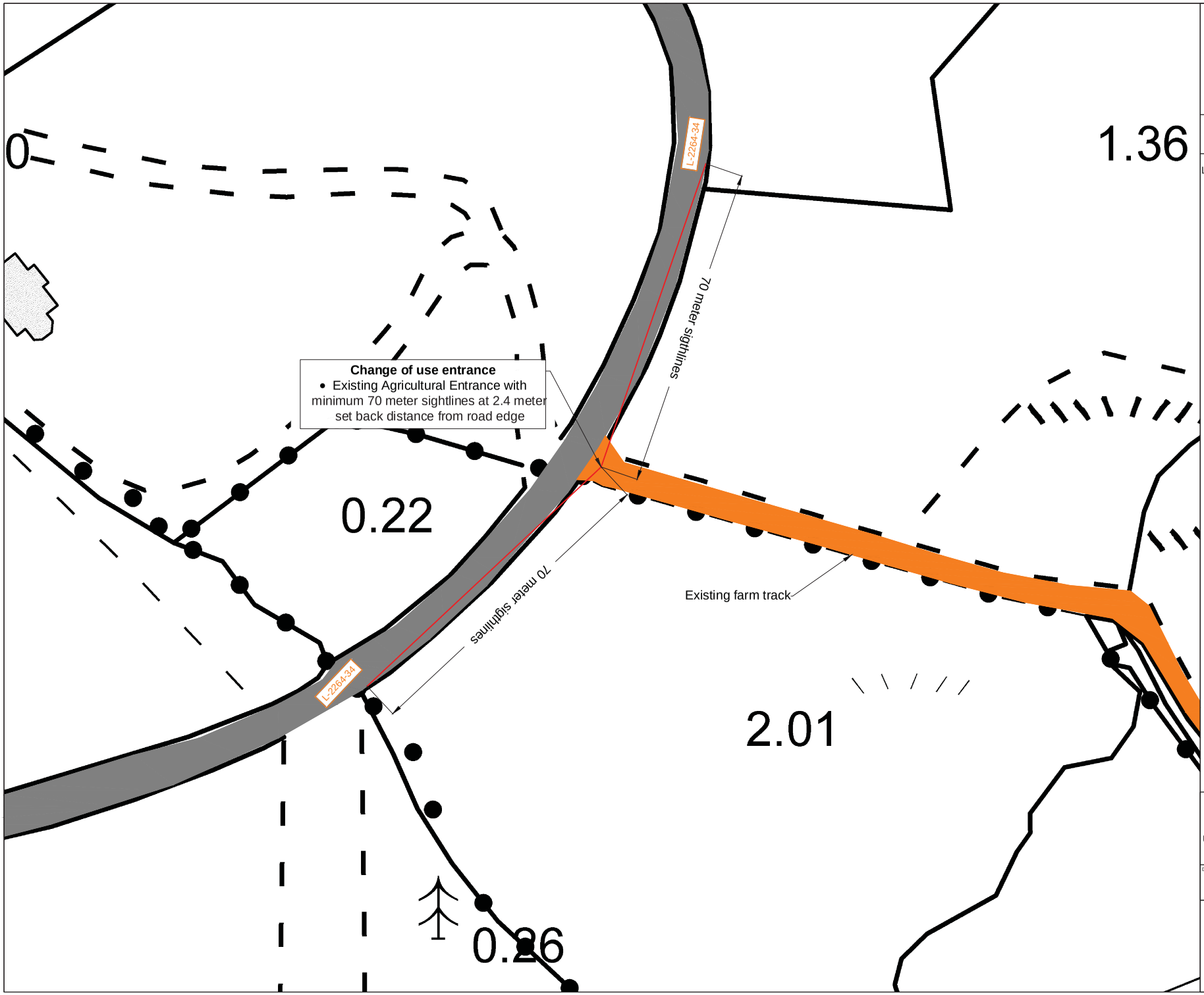

Title:

Figure RF 5.3

Entrance for Replacement Forestry Lands

Map Number:
Map 1 of 1

Legend:

- Public Road
- Existing farm track
- L-2264-34 Public Road Number
- Existing sightlines

N

Project:

UWF Replacement Forestry (RF)

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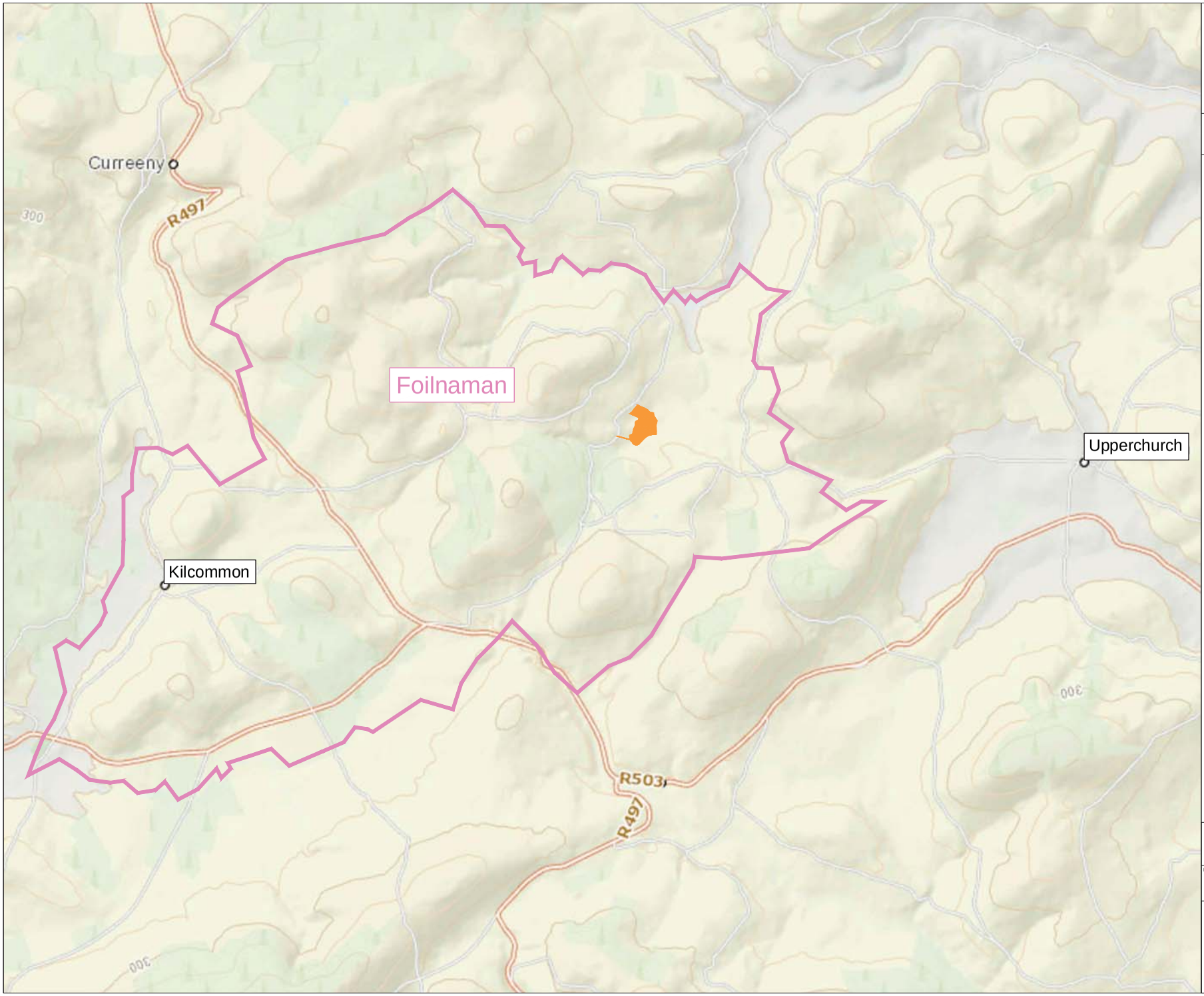

Title:

Figure RF 6.1

Location of the UWF Replacement Forestry

Map Number:
1 of 1

Legend:

- UWF Replacement Forestry Area
- Electoral Division
- Foilnaman — Electoral Division Name
- Kilcommon — Villages

N

Project:

UWF Replacement Forestry (RF)

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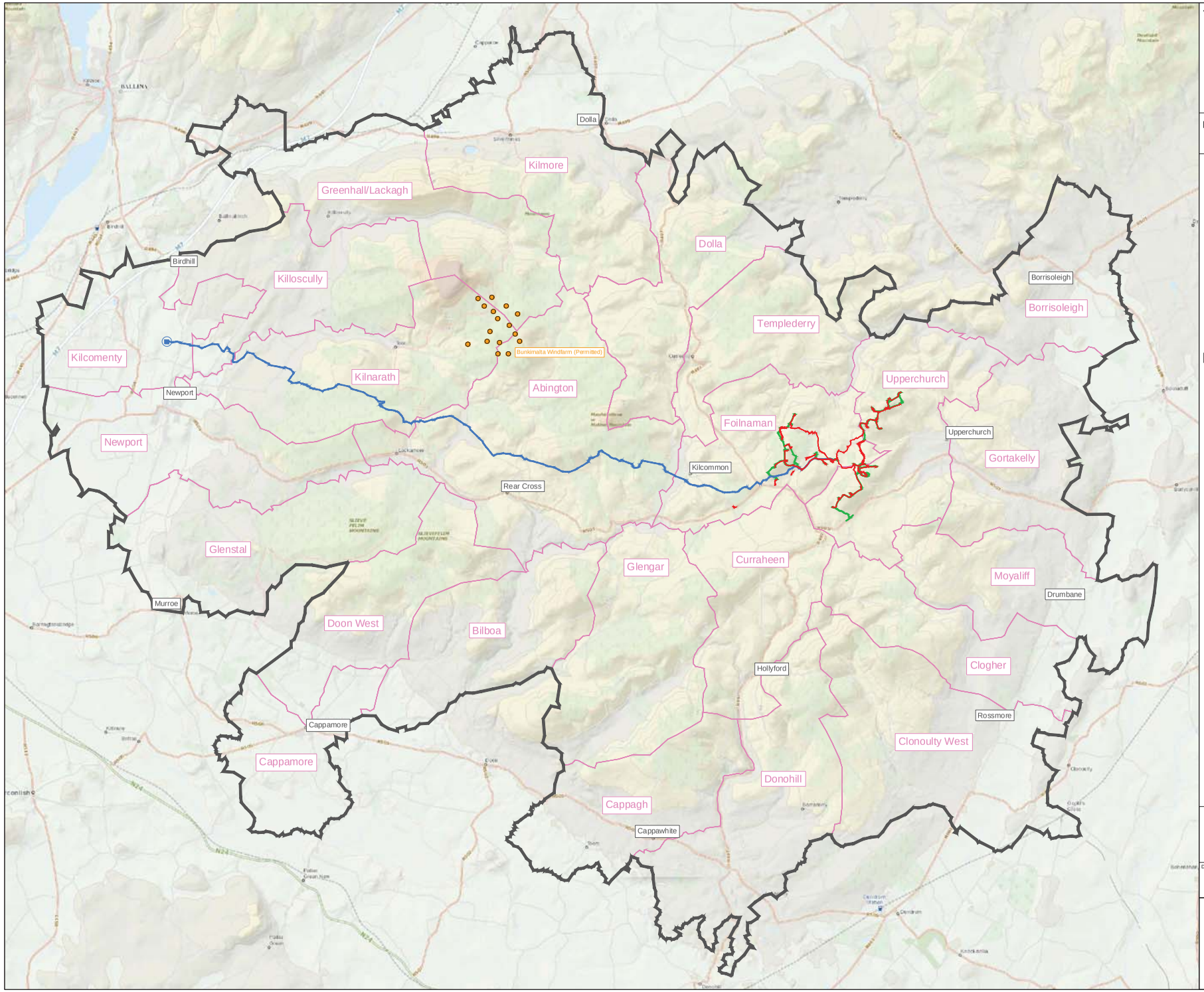

Title:

Figure CE 6.2

Local Economy within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

Study Area Extents :

- UWF Grid Connection
- Mountphilips Substation
- Study Area for the Local Economy
- Electoral Divisions
- Dolla — Electoral Division Names
- UWF Related Works
- Upperchurch Windfarm
- Newport — Villages

Survey Results :

- Bunkimalta Wind Turbines

Project:

UWF Replacement Forestry (RF)

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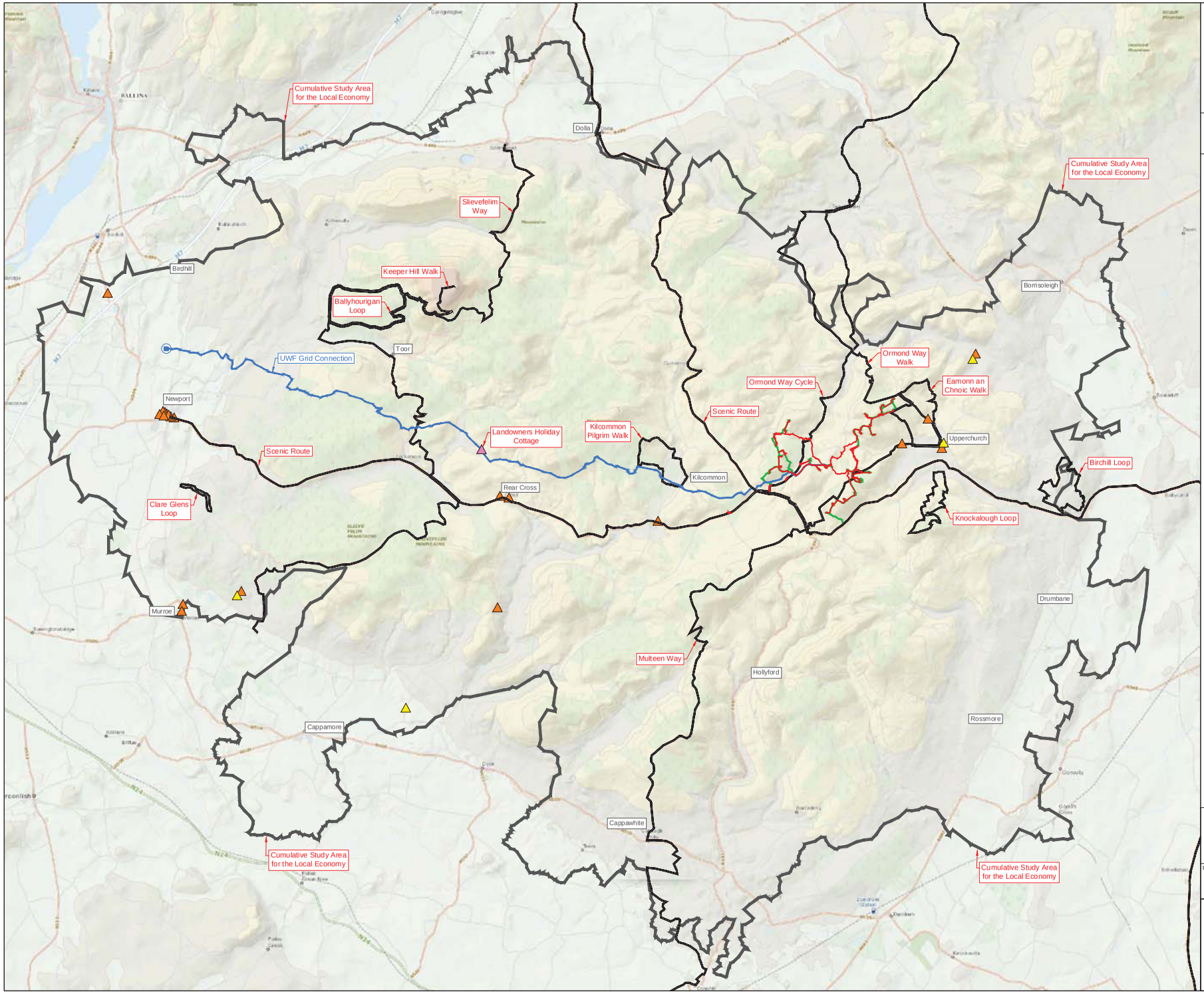

Title:

Figure CE 6.2.1

Tourism Products within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

Study Area Extents :

- UWF Grid Connection
- Mountphilips Substation
- UWF Related Works
- Upperchurch Windfarm
- Cumulative Study Area for the Local Economy
- Newport — Villages

Survey Results :

- Accomodation or Food Services
- Landowner Holiday Cottage
- Activites
- Walking/Cycling Trails and Driving Route

Project:
UWF Replacement Forestry (RF)

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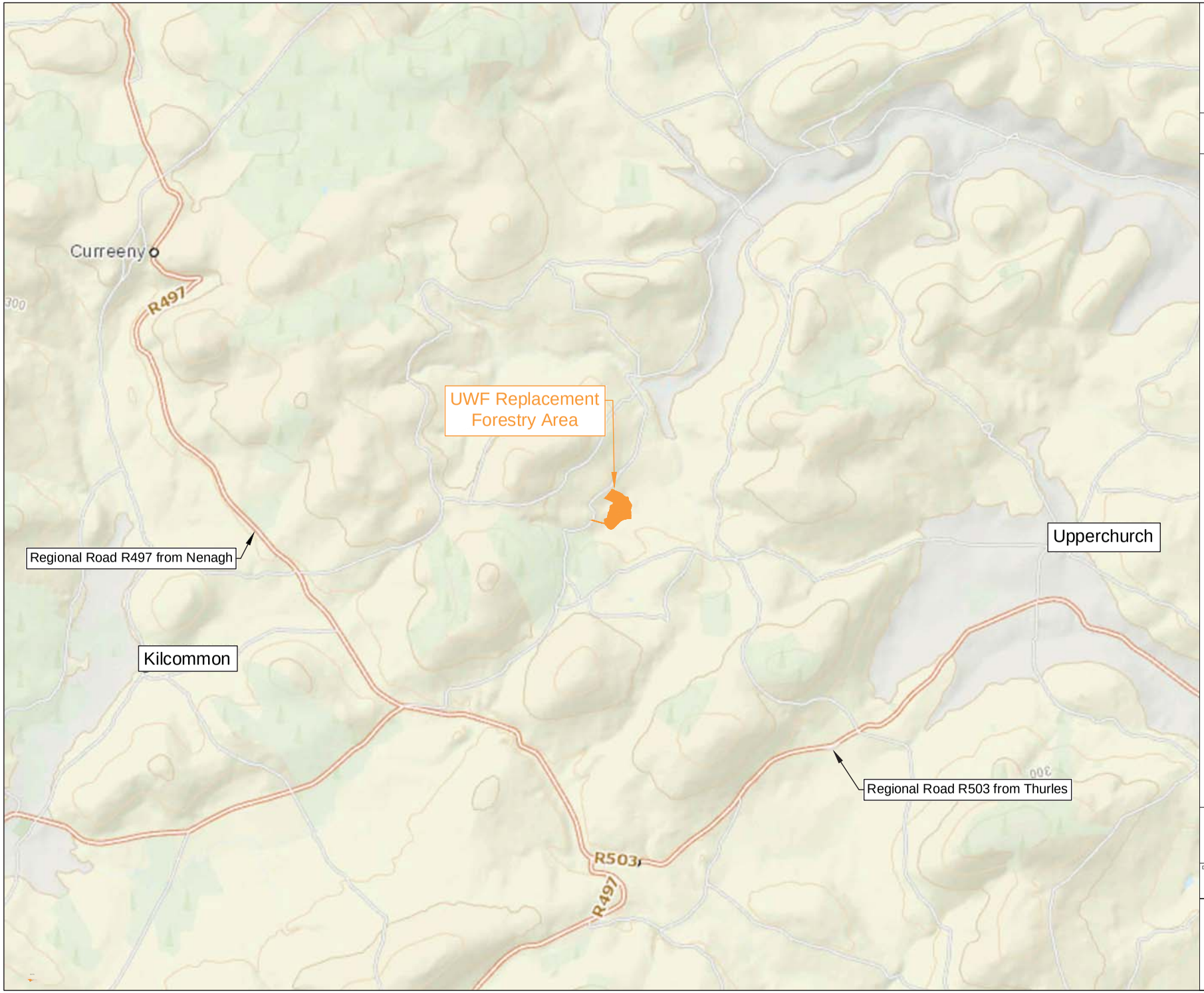

Title:

Figure RF 7.1

Location of the UWF Replacement Forestry Study Area

Map Number:
Map 1 of 1

Legend:

UWF Replacement Forestry

Kilcommon — Villages

N

Project:

UWF Replacement Forestry (RF)

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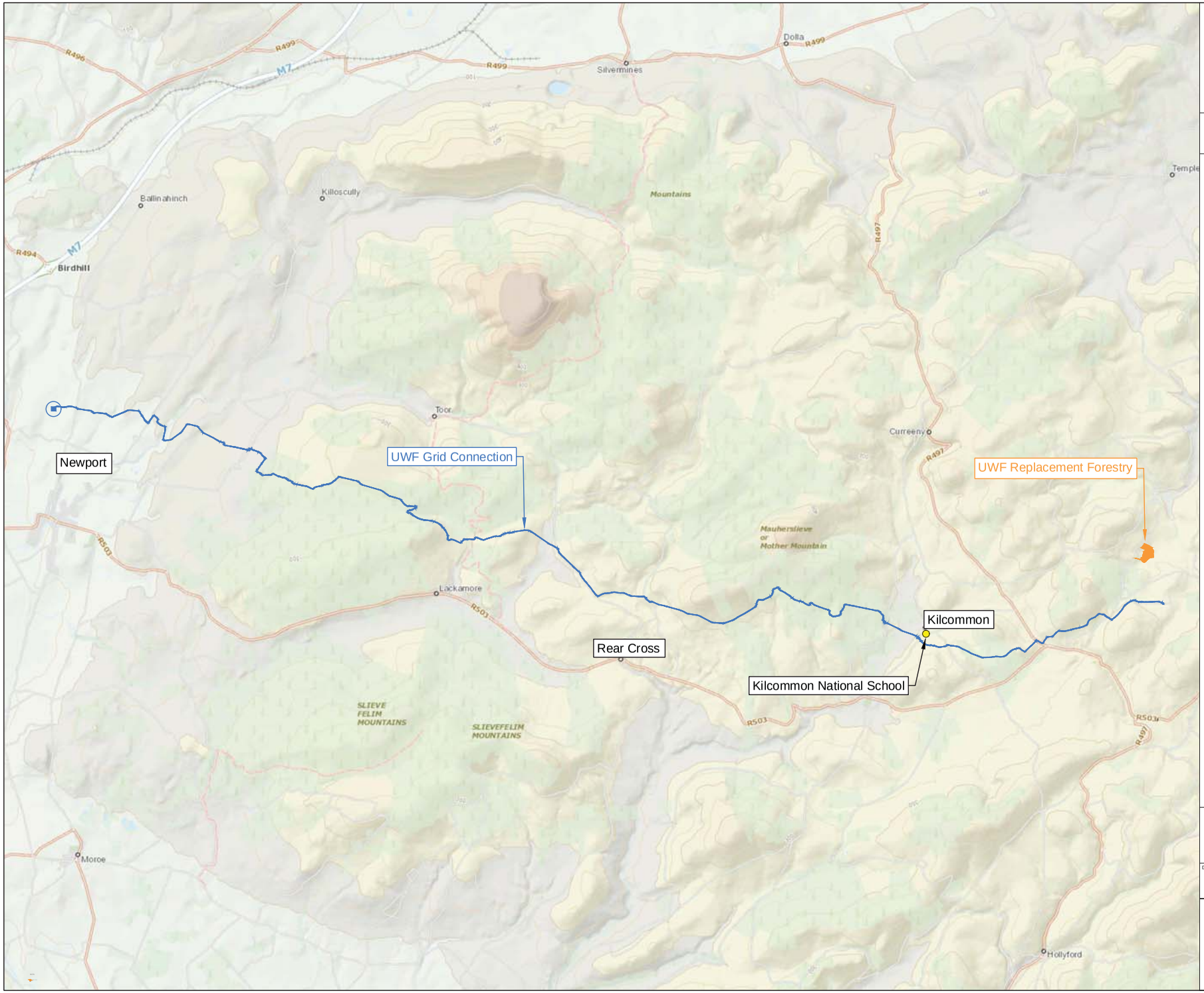

Title:

Figure CE 7.3

Kilcommon National School within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

- UWF Replacement Forestry
- UWF Grid Connection
- Kilcommon — Villages
- Location of Kilcommon National School

N

Project:

UWF Replacement Forestry (RF)

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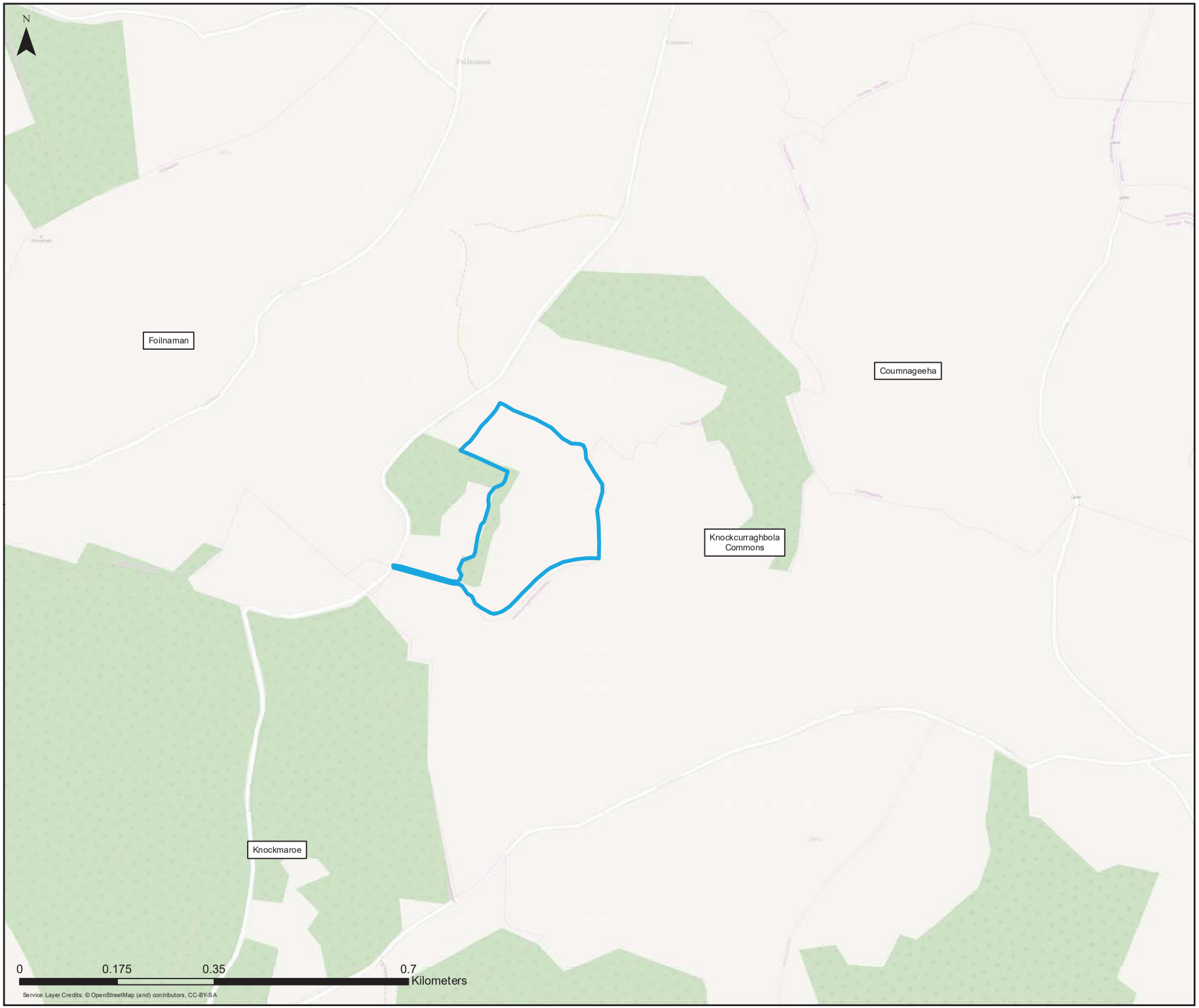

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.1:
UWF Replacement Forestry Location Map

Legend:

UWF Replacement Forestry Area

For illustrative purposes only. Map not to scale

Disclaimer: Although presented in mapping, please note that the construction works boundary for the Consented Windfarm is included for illustrative purposes only as it is already subject to planning consent. For study area boundaries please see Figure 8.1, and the accompanying EIAR Biodiversity Chapter/Biodiversity Appendix.

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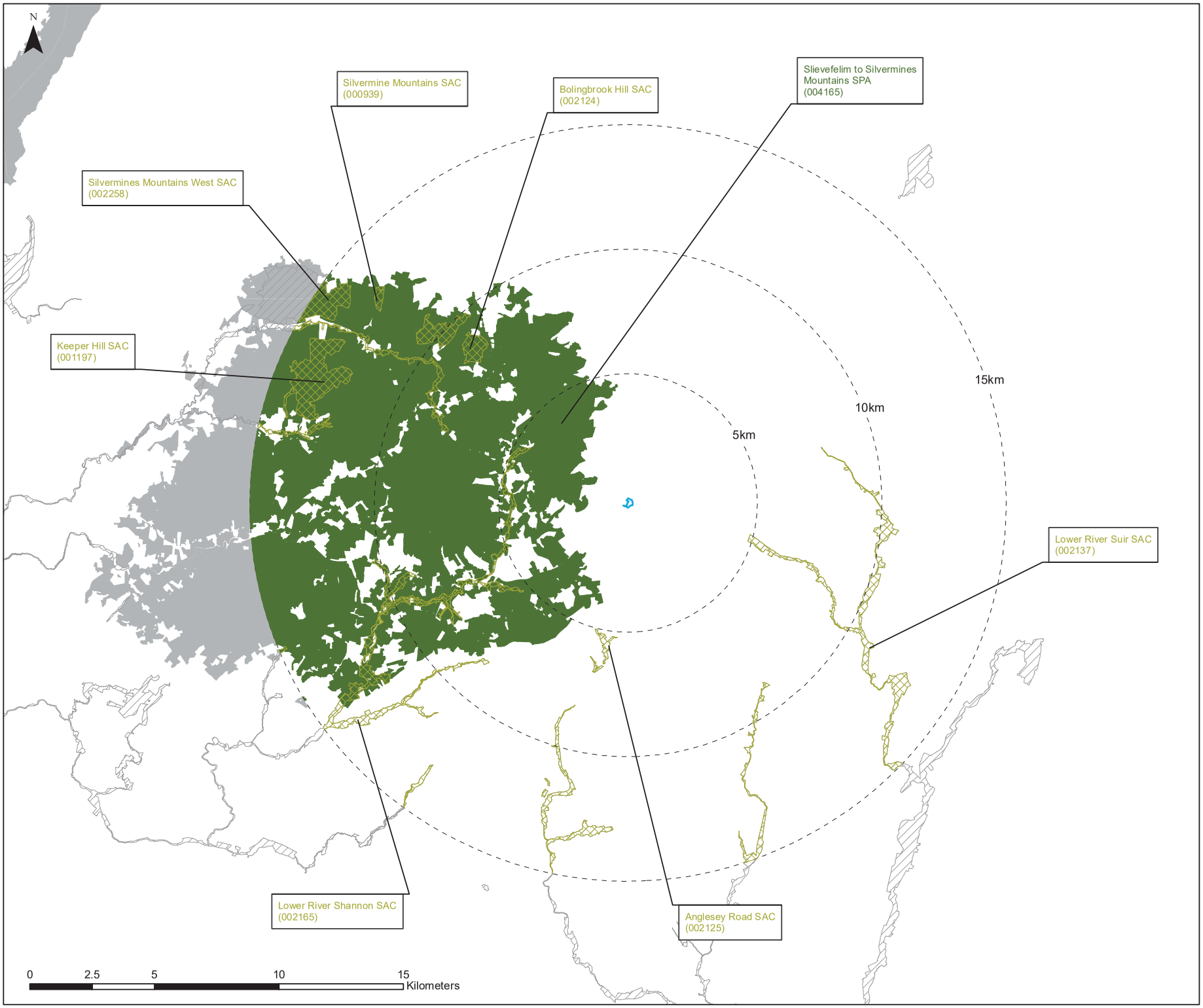

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.2:
European Sites within the
UWF Replacement Forestry Study Area

Legend:

- UWF Replacement Forestry Area
- Special Areas of Conservation within 15km
- Special Protection Areas within 15km
- Replacement Forestry 5km, 10km, 15km Buffer

For illustrative purposes only. Map not to scale

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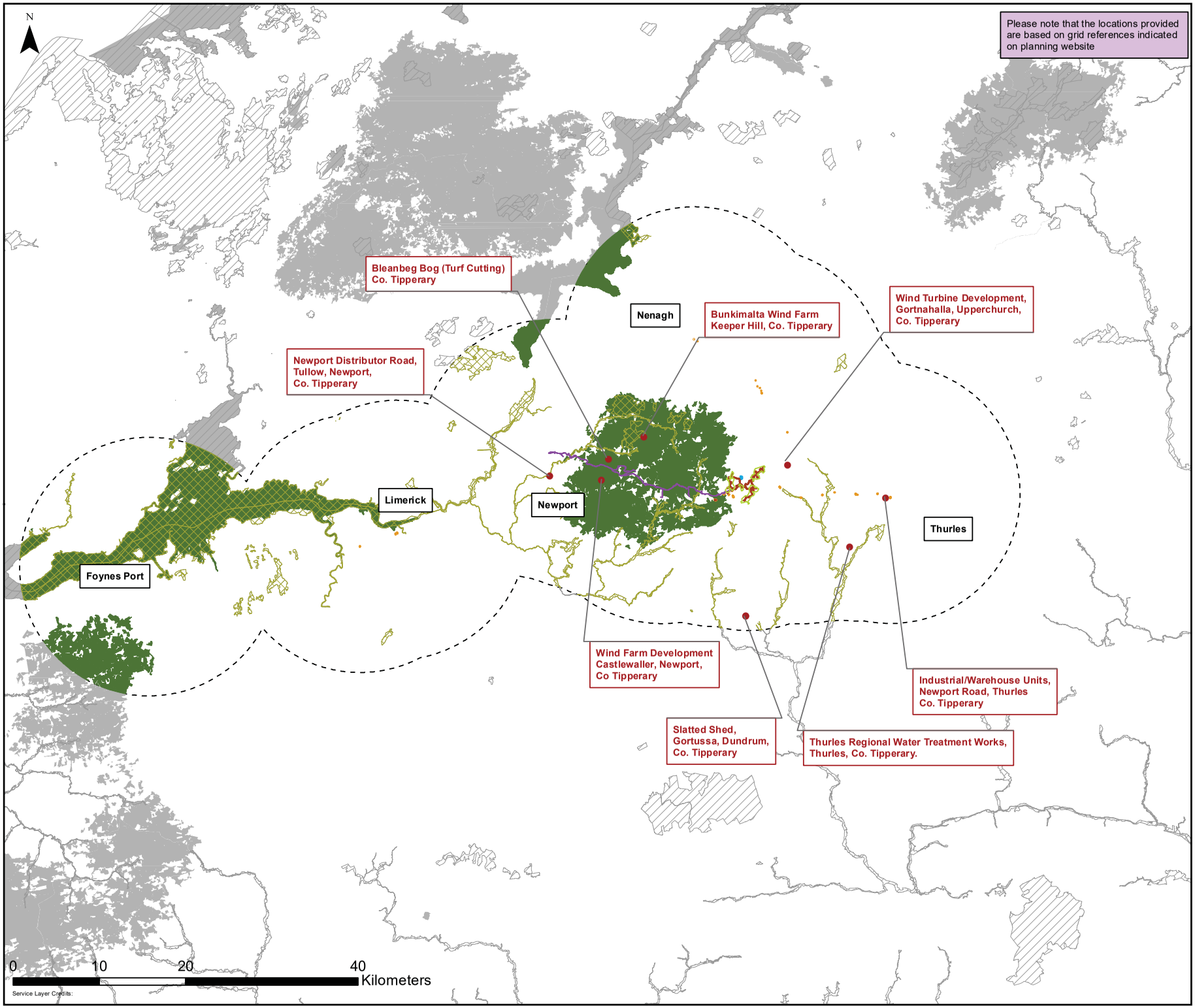

Client: Ecopower Developments Ltd.

Project: Whole Windfarm Project

Title:
Figure CE 8.2: European Sites within the Cumulative Evaluation Study Area

Legend:

- Projects/Activities
- Upperchurch Windfarm 2013 Study Area
- UWF Related Works Construction Works Area
- UWF Grid Connection Construction Works Area
- UWF Replacement Forestry Construction Works Area
- UWF Other Activities Construction Works Boundary
- Special Areas of Conservation within 15km
- Special Protection Areas within
- 15km Buffer (Designated European Sites)

* Forestry & Agriculture: Please see those map book figures which illustrate terrestrial habitats on aerial photography, for reference purposes with respect to the extent of Forestry and Agricultural lands.

** Please Refer to Natura Impact Statement in Volume E

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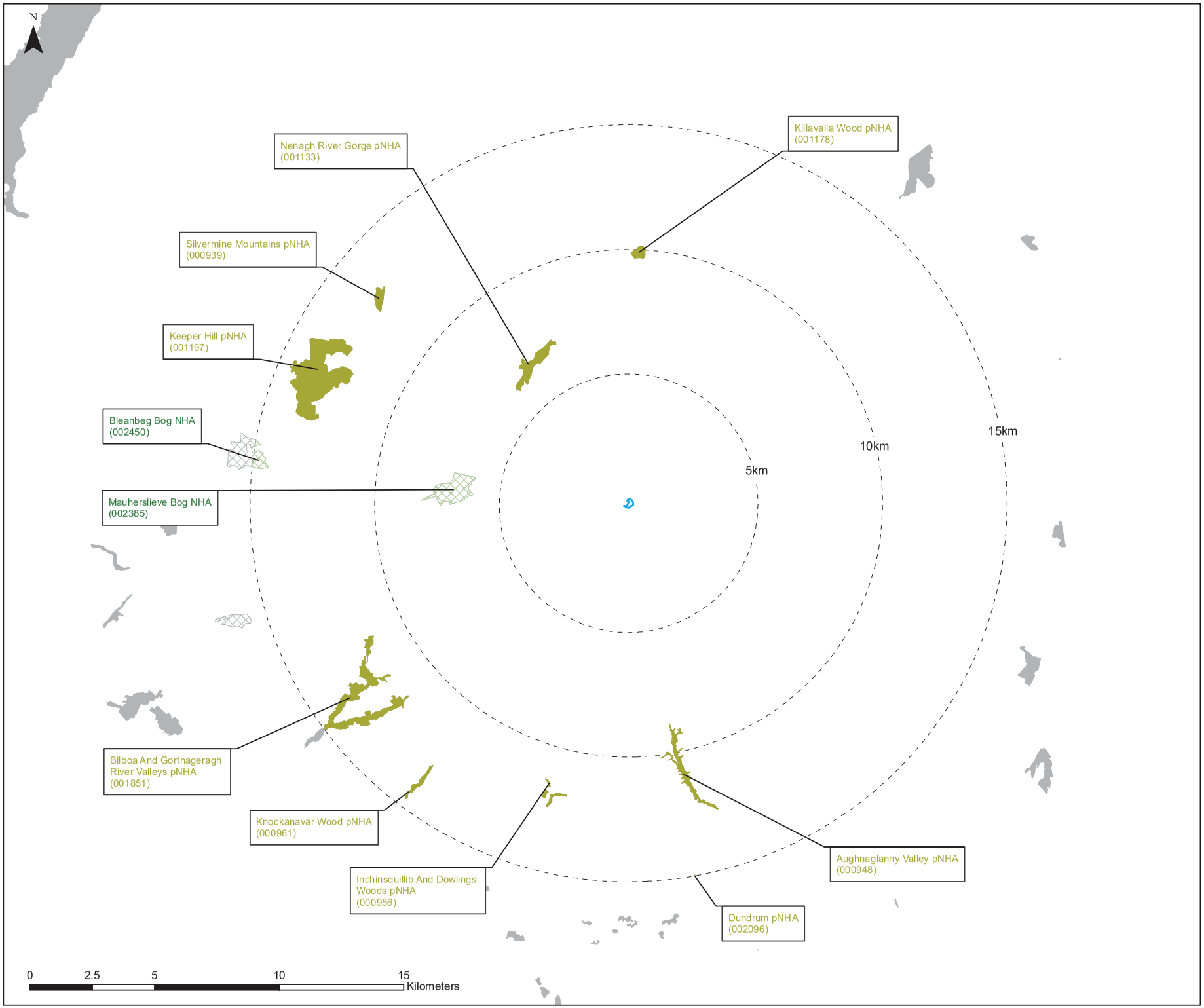

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.3:
National Sites within the UWF Replacement Forestry Study Area

Legend:

- UWF Replacement Forestry Area
- National Heritage Areas within 15km
- Proposed Natural Heritage Areas within 15km
- Replacement Forestry 5km, 10km, 15km Buffer

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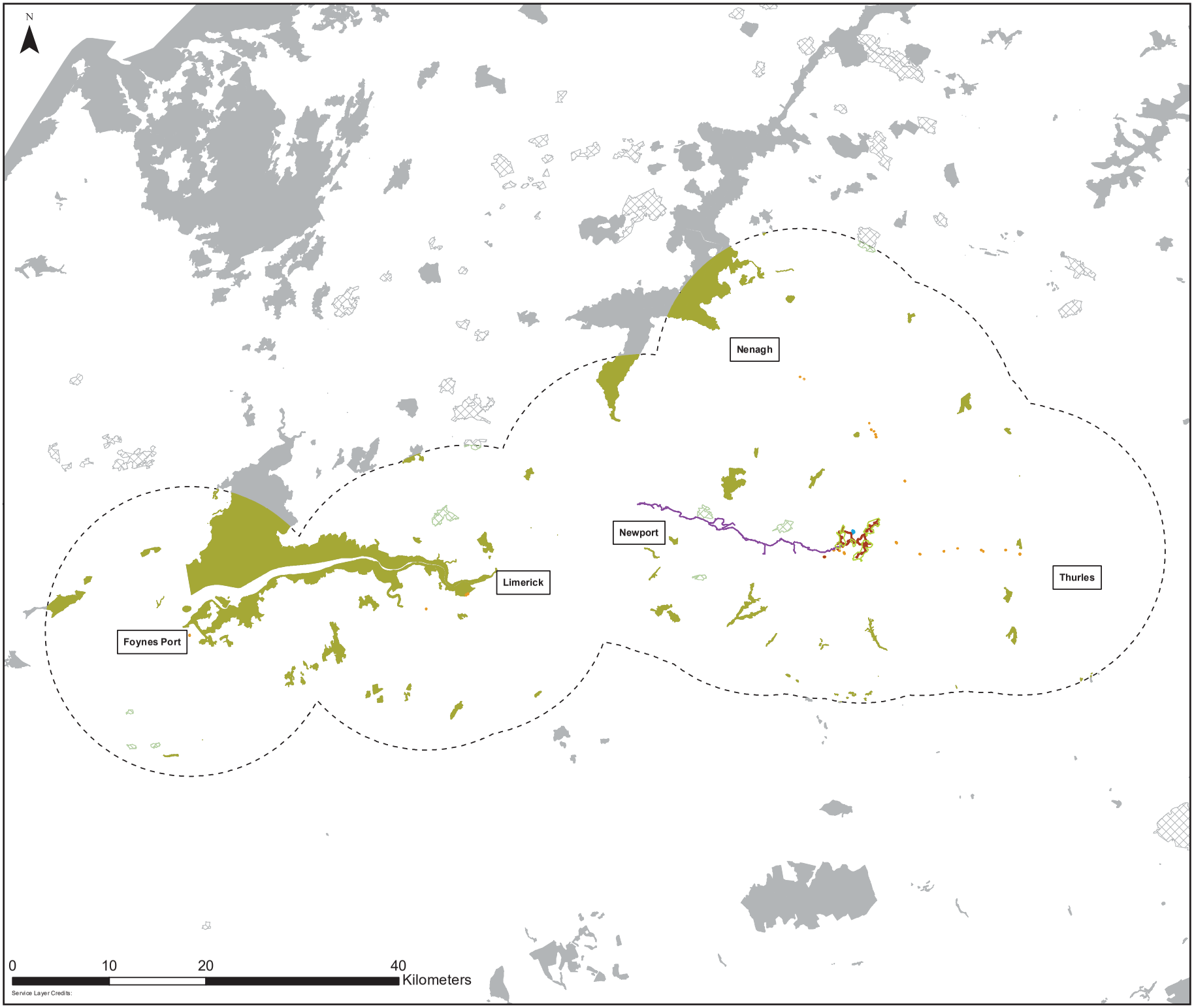

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure CE 8.3: National Sites within the Cumulative Evaluation Study Area

Legend:

- Upperchurch Windfarm 2013 Study Area
- UWF Related Works Construction Works Area
- UWF Grid Connection Construction Works Area
- UWF Replacement Forestry Area
- UWF Other Activities Construction Works Boundary
- Proposed Natural Heritage Areas within 15km
- Natural Heritage Areas within 15km
- 15km Buffer (NHA and pNHA sites)

No Other Projects or Activities scoped in for evaluation

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Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:

Figure RF 8.4: Aquatic Habitats & Species within the UWF Replacement Forestry Study Area

Legend:

- UWF Replacement Forestry Area
- Watercourses

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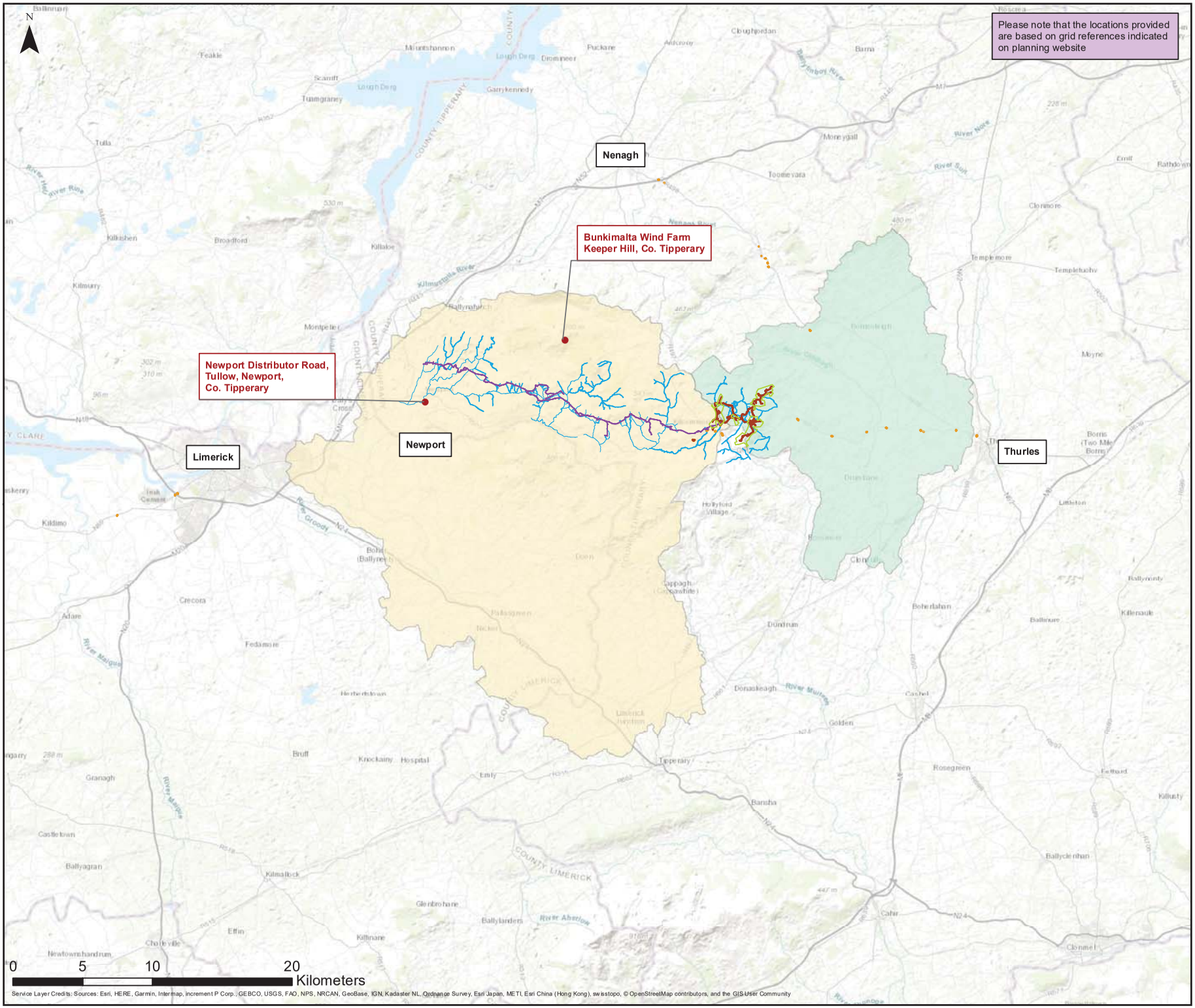

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure CE 8.4: Aquatic Habitats & Species within the Cumulative Evaluation Study Area

Legend:

- Project/Activities
- Upperchurch Windfarm 2013 Study Area
- UWF Related Works Construction Works Area
- UWF Grid Connection Construction Works Area
- UWF Replacement Forestry Area
- UWF Other Activities Construction Works Boundary
- Watercourses
- Clodiagh River Catchment
- Mulkear River Catchment

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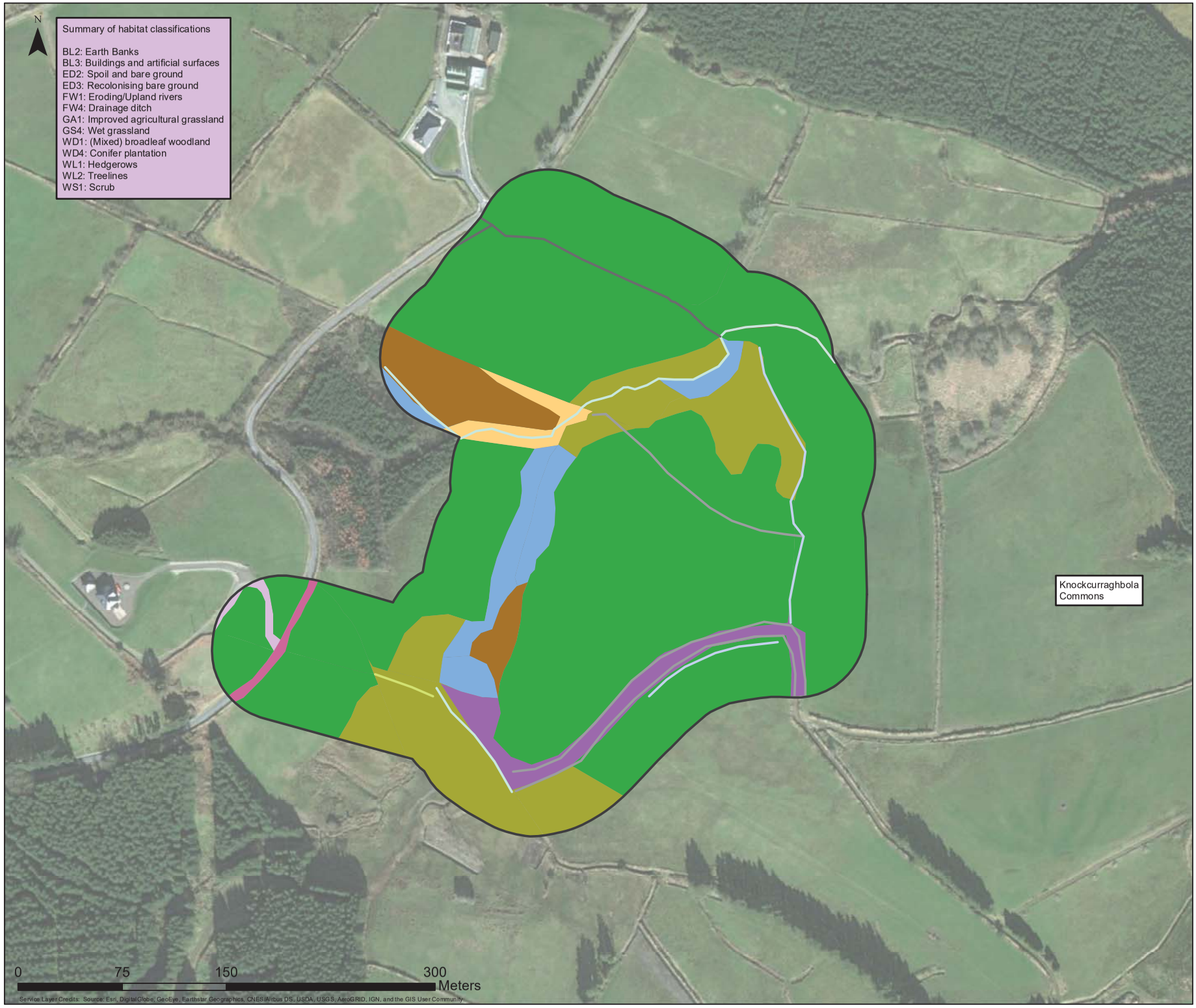

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.5: Terrestrial Habitats within the UWF Replacement Forestry Study Area.

Legend:

- BL3
- ED2
- ED3
- GA1
- GS4
- WD1
- WD4
- WS1
- BL2
- BL3
- FW1
- FW4
- WL1
- WL2
- Study Area Boundary (50m)

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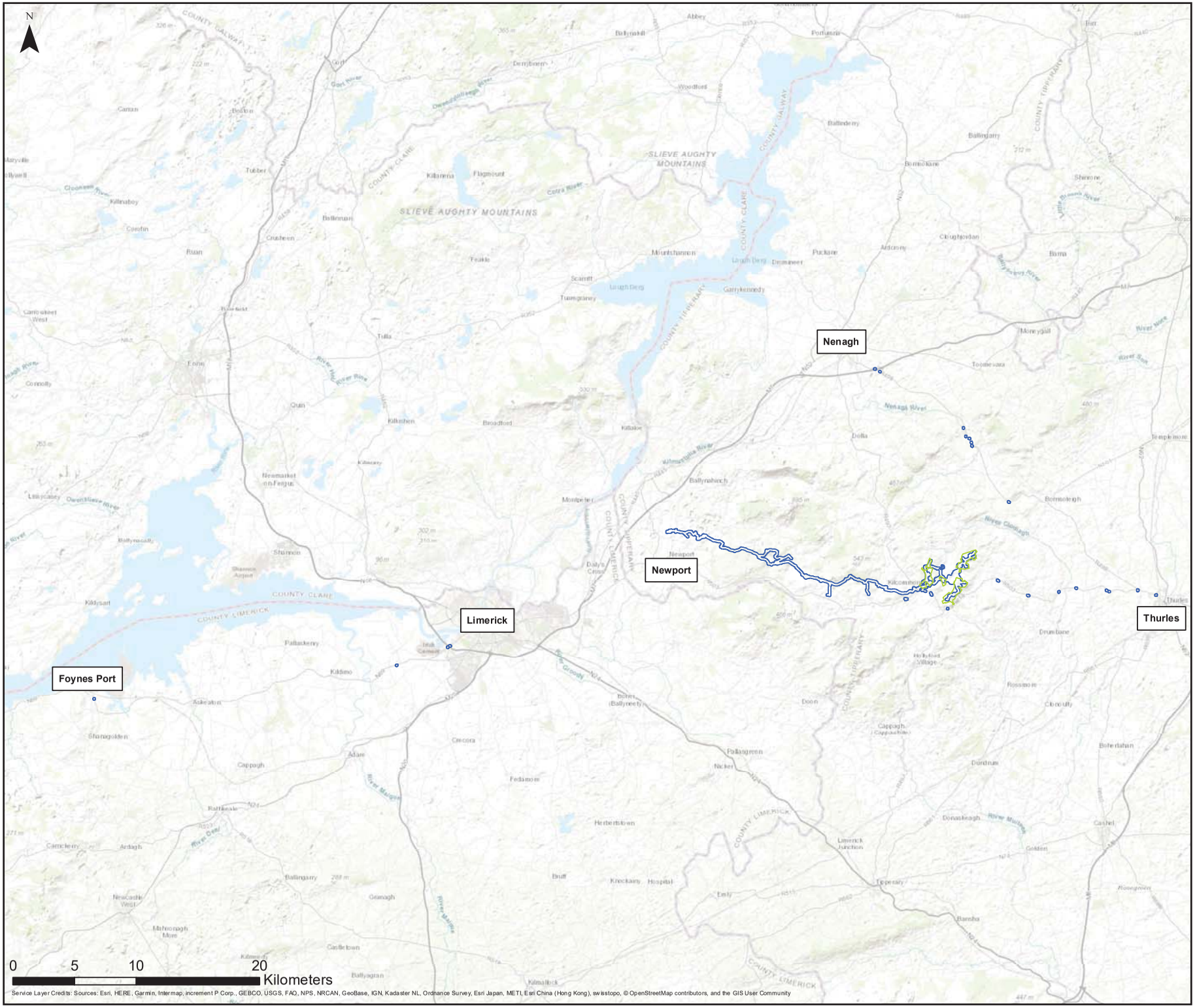

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure CE 8.5: Terrestrial Habitats within the Cumulative Evaluation Study Area

Legend:

- Upperchurch Windfarm 2013 Study Area
- Habitats 100m Buffer

No Other Projects or Activities scoped in for evaluation

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Drawn:	Checked:	Authorised:
POC	CC	HW

Date:	Map Reference:
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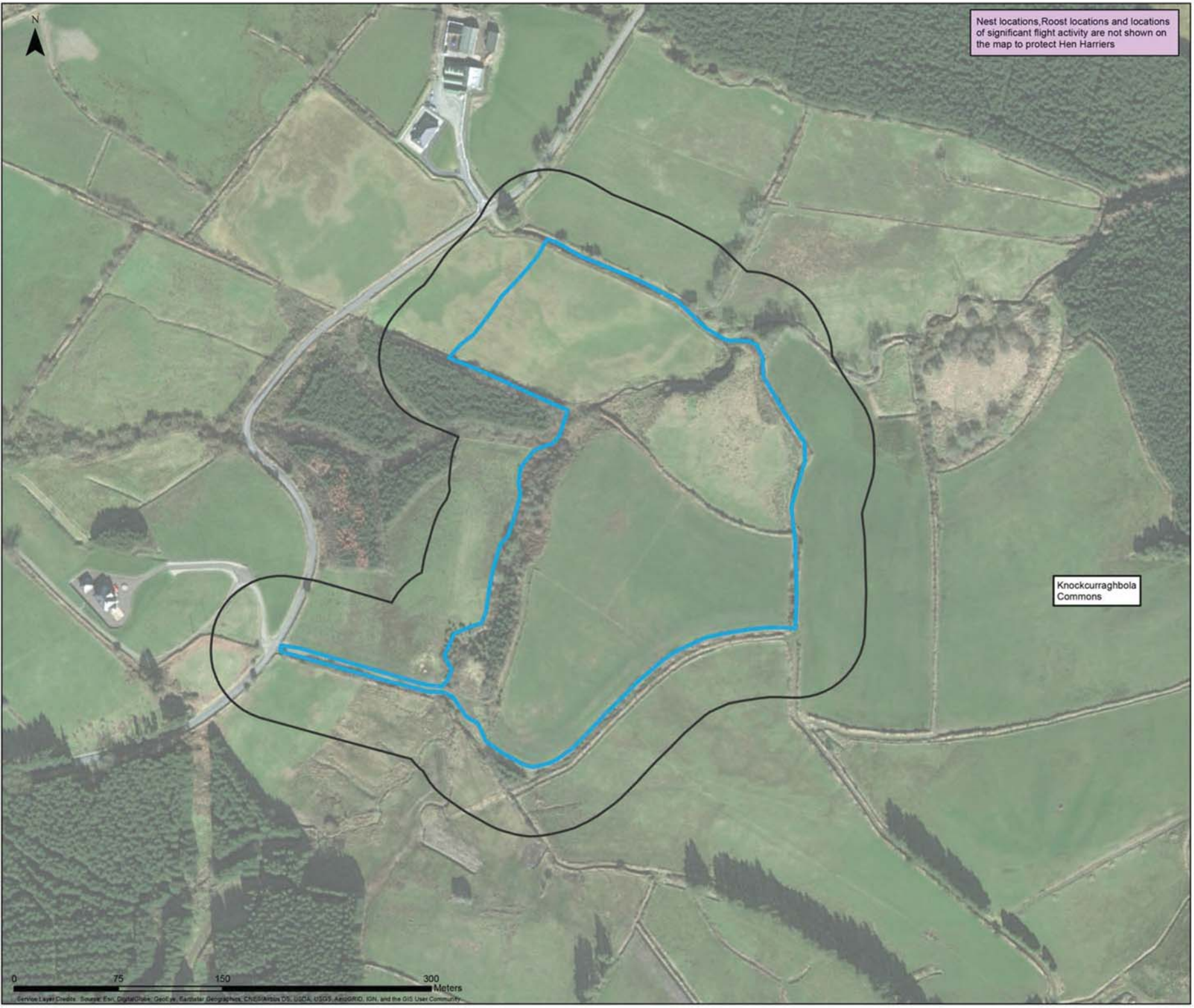

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.6: Hen Harrier within the UWF Replacement Forestry Study Area.

Legend:

- UWF Replacement Forestry Area
- Study Area Boundary (50m)

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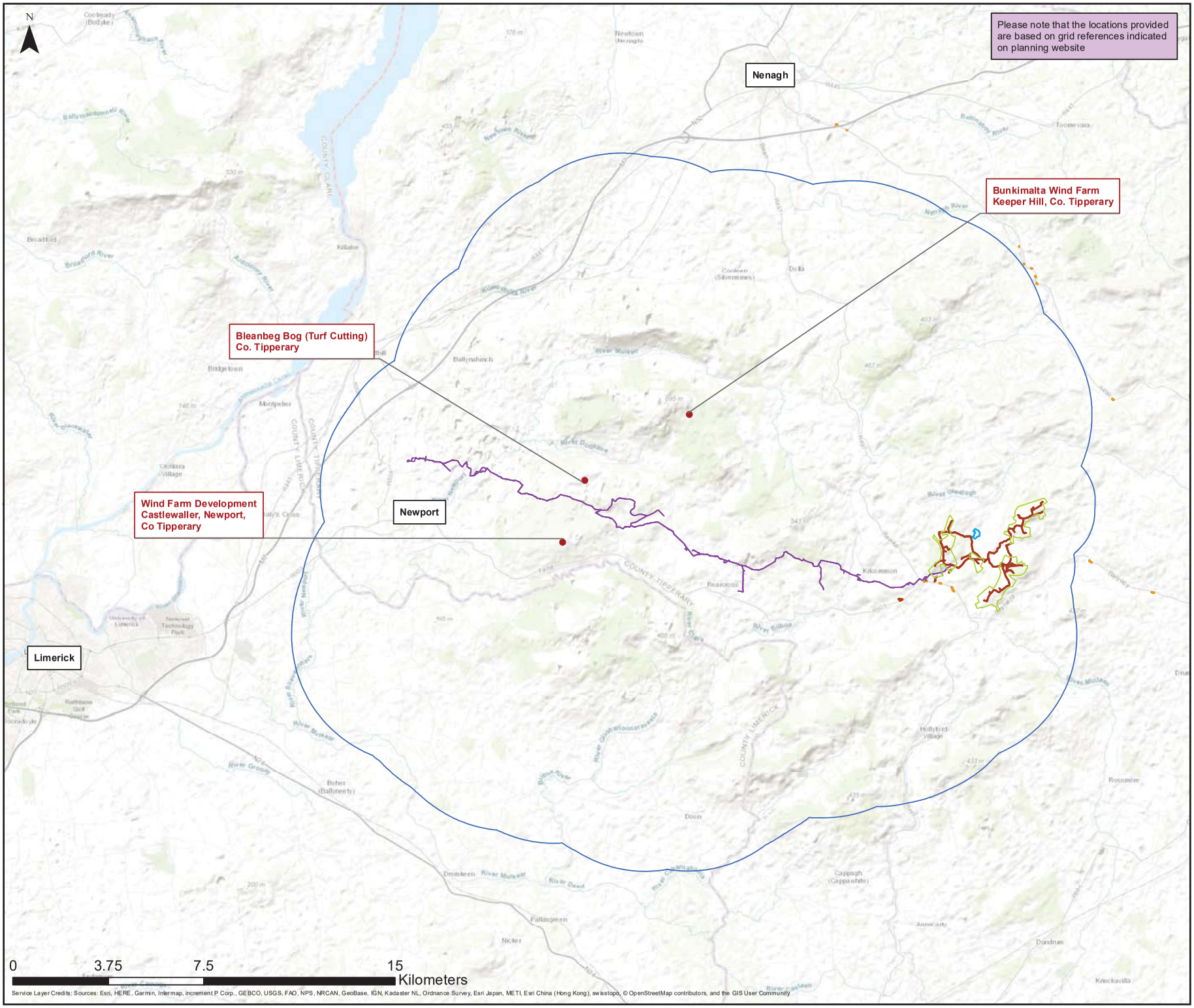

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure CE 8.6: Hen Harrier within the Cumulative Evaluation Study Area

Legend:

- Projects/Activities
- Slievefelim to Silvermines Mountains SPA plus Consented Wind Farm plus 5 km Buffer (Hen Harrier)
- Upperchurch Windfarm 2013 Study Area
- UWF Related Works Construction Works Area
- UWF Grid Connection Construction Works Area
- UWF Replacement Forestry Area
- UWF Other Activities Construction Works Boundary

* Forestry & Agriculture: Please see those map book figures which illustrate terrestrial habitats on aerial photography, for reference purposes with respect to the extent of Forestry and Agricultural lands.

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Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.7: General Bird Species within the UWF Replacement Forestry Study Area.

Legend:

UWF Replacement Forestry Area

Study Area Boundary (50m)

Nil Observations of Note

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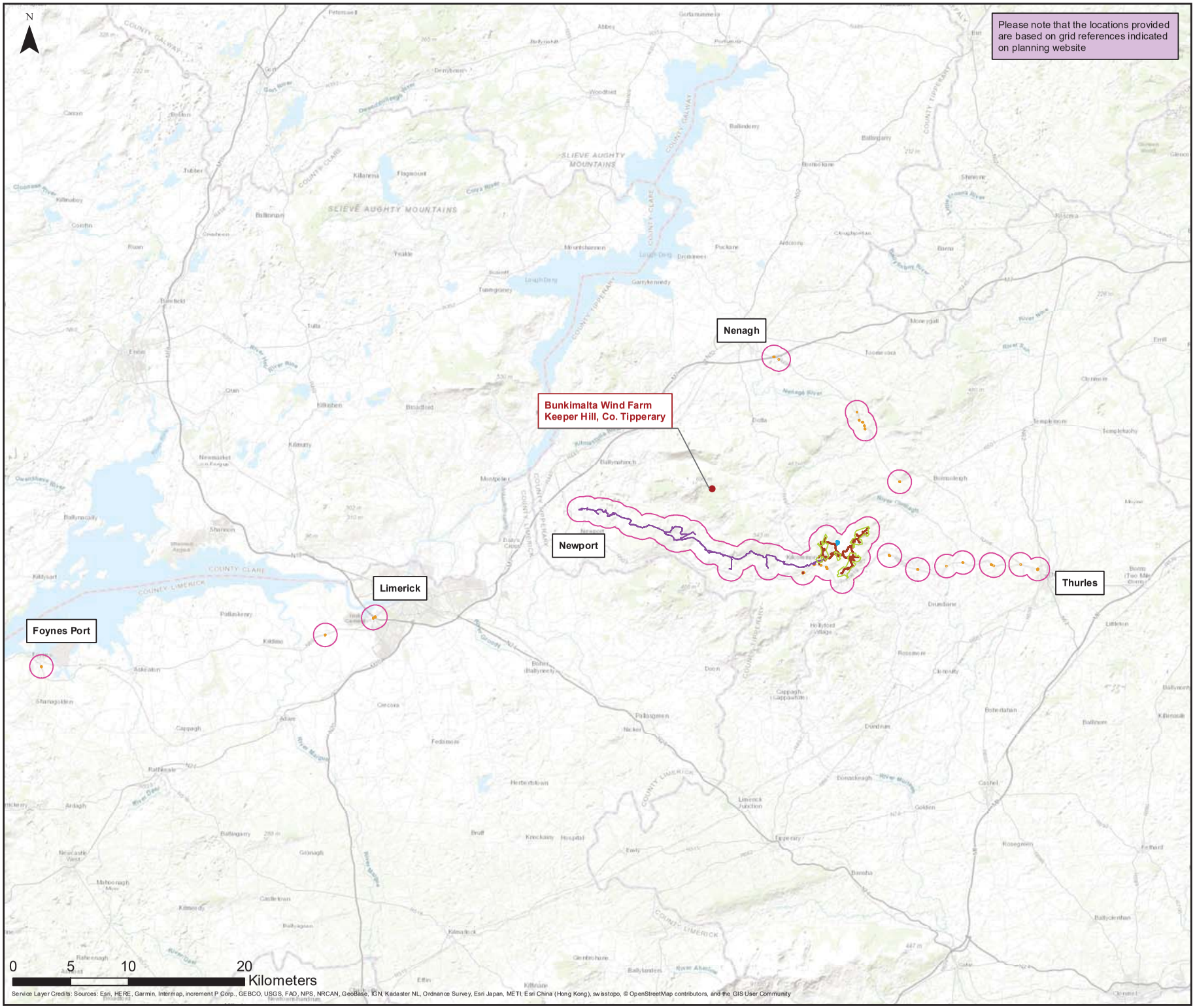

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure CE 8.7: General Bird Species within the Cumulative Evaluation Study Area

Legend:

- Project/Activities
- Upperchurch Windfarm 2013 Study Area
- UWF Related Works Construction Works Area
- UWF Grid Connection Construction Works Area
- UWF Replacement Forestry Area
- UWF Other Activities Construction Works Boundary
- 1km Buffer (General Bird Species)

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Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.8: Bats within the UWF Replacement Forestry Study Area.

Legend:

Bat Roost Suitability: *

Buildings
- Low

Study Area Boundary (150m)

UWF Replacement Forestry Area

Study Area Boundary (50m)

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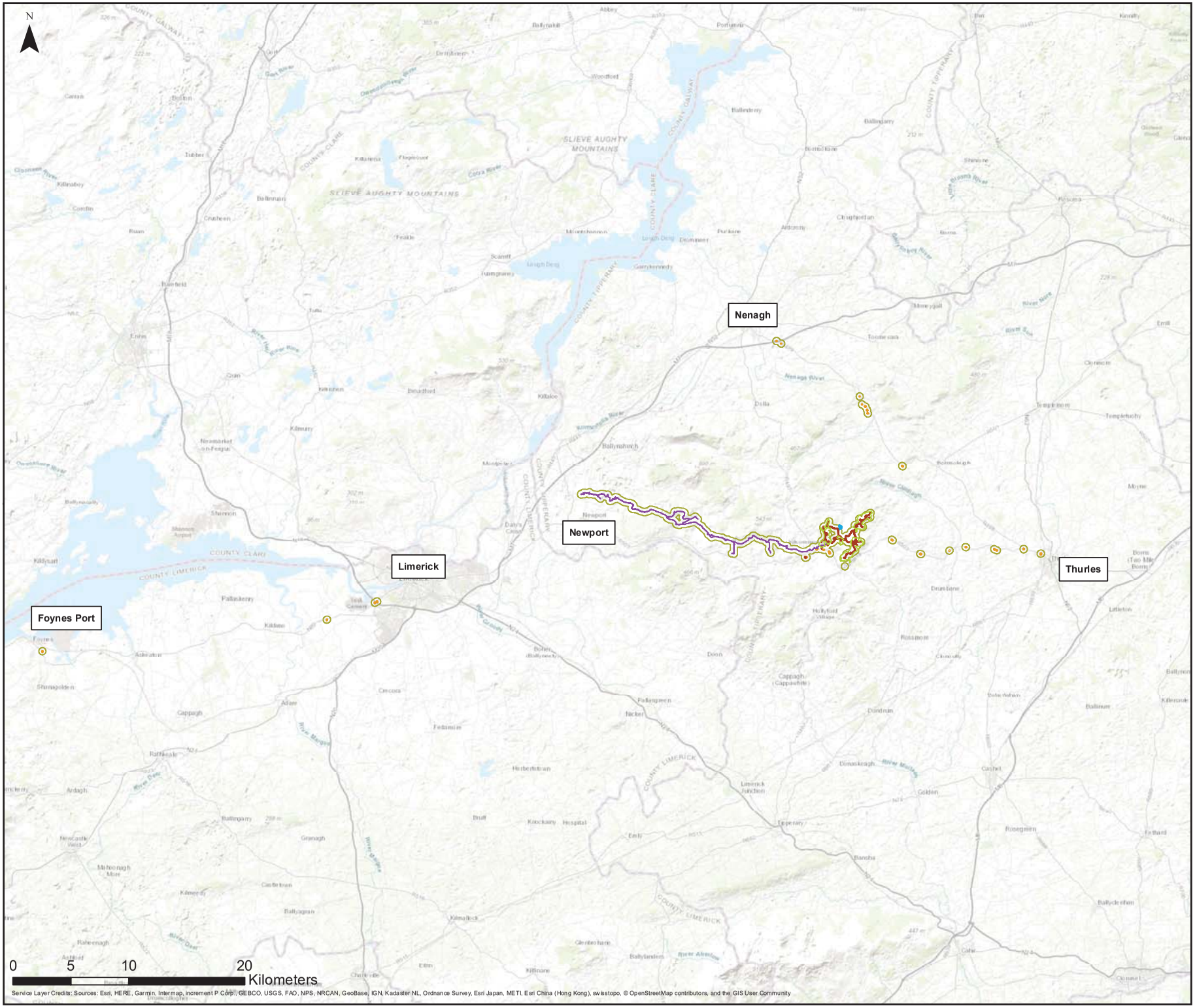

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure CE 8.8: Bats within the Cumulative Evaluation Study Area

Legend:

- Upperchurch Windfarm 2013 Study Area
- UWF Related Works Construction Works Area
- UWF Grid Connection Construction Works Area
- UWF Replacement Forestry Area
- UWF Other Activities Construction Works Boundary
- Bats 300m Buffer

No Other Projects or Activities scoped in for evaluation

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Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.9: Non-Volant Mammals within the UWF Replacement ForestryStudy Area

Legend:

UWF Replacement Forestry Area

Study Area Boundary (50m)

Survey Results:*

Badger

Fox

Note: Fallow Deer, Pine Martin, Red Squirrel and Irish Hare and Other Mammals were recorded throughout the study. Please refer to appendixfor locations

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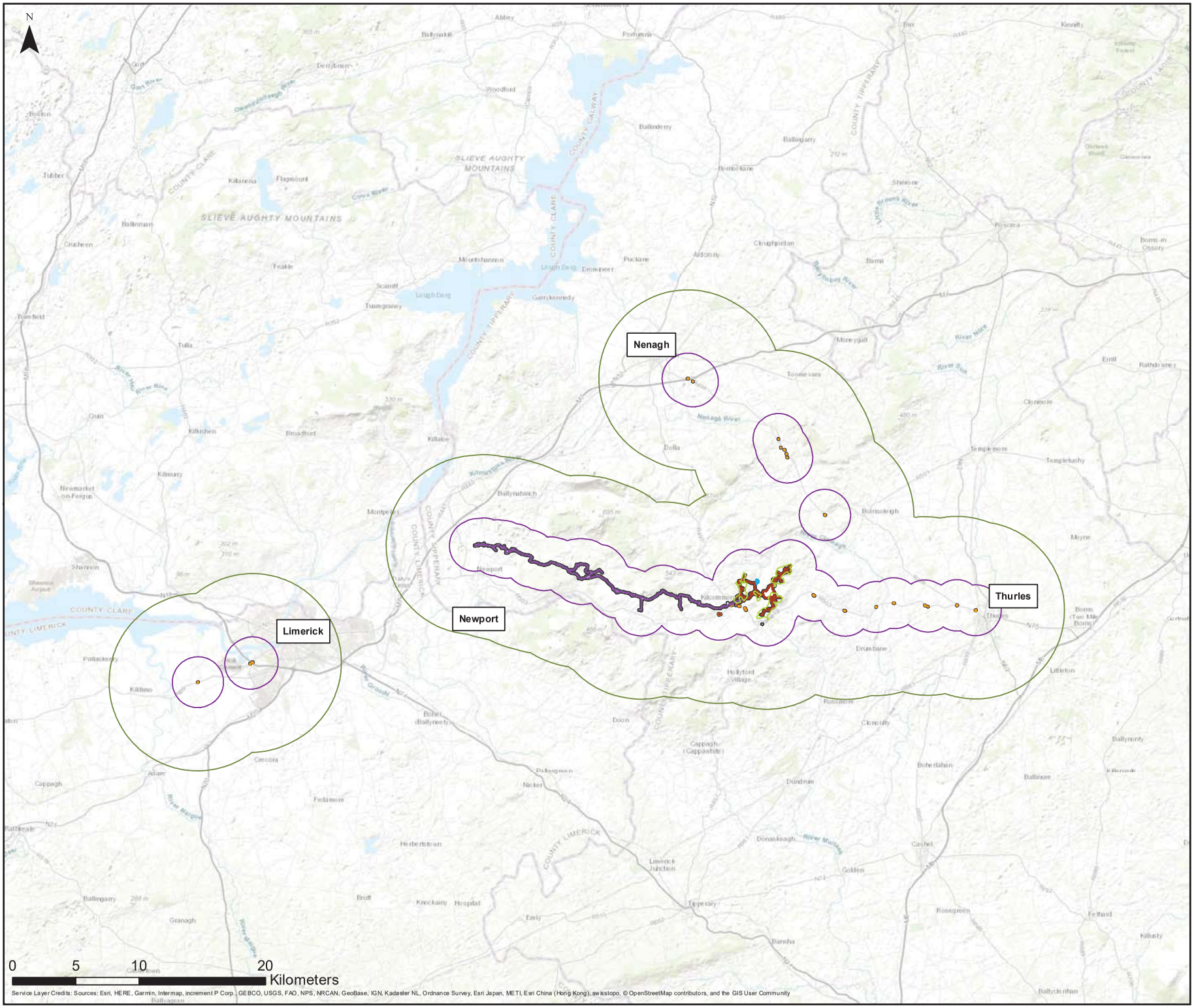

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:

Figure CE 8.9: Non-Volant Mammals within the Cumulative Evaluation Study Area

Legend:

- Upperchurch Windfarm 2013 Study Area
- UWF Related Works Construction Works Area
- UWF Grid Connection Construction Works Area
- UWF Replacement Forestry Area
- UWF Other Activities Construction Works Boundary
- General Non-Volant Mammals 100m Buffer
- Badger 2km Buffer
- Otter 7km Buffer

* Forestry: Please see those map book figures which illustrate terrestrial habitats on aerial photography, for reference purposes with respect to the extent of Forestry lands.

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Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure RF 8.10: Amphibians & Reptiles within the UWF Replacement Forestry Study Area

Legend:

UWF Replacement Forestry Area

Study Area Boundary (50m)

Nil Observations

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Drawn:	Checked:	Authorised:
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Date:	Map Reference:
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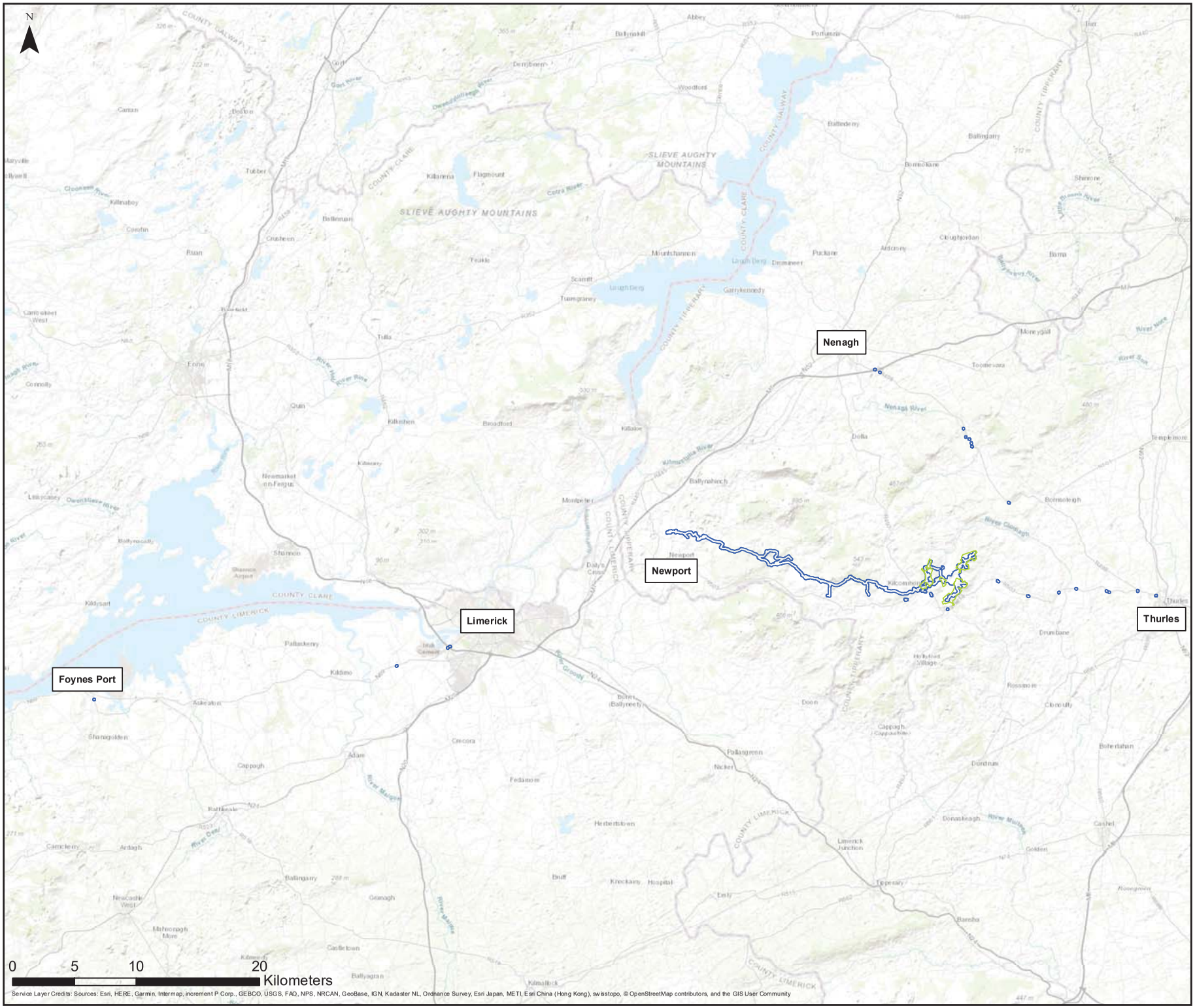

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Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure CE 8.10: Amphibians & Reptiles within the Cumulative Evaluation Study Area

Legend:

- Upperchurch Windfarm 2013 Study Area
- Amphibians & Reptiles 100m Buffer

No Other Projects or Activities scoped in for evaluation

For illustrative purposes only. Map not to scale

Drawn:	Checked:	Authorised:
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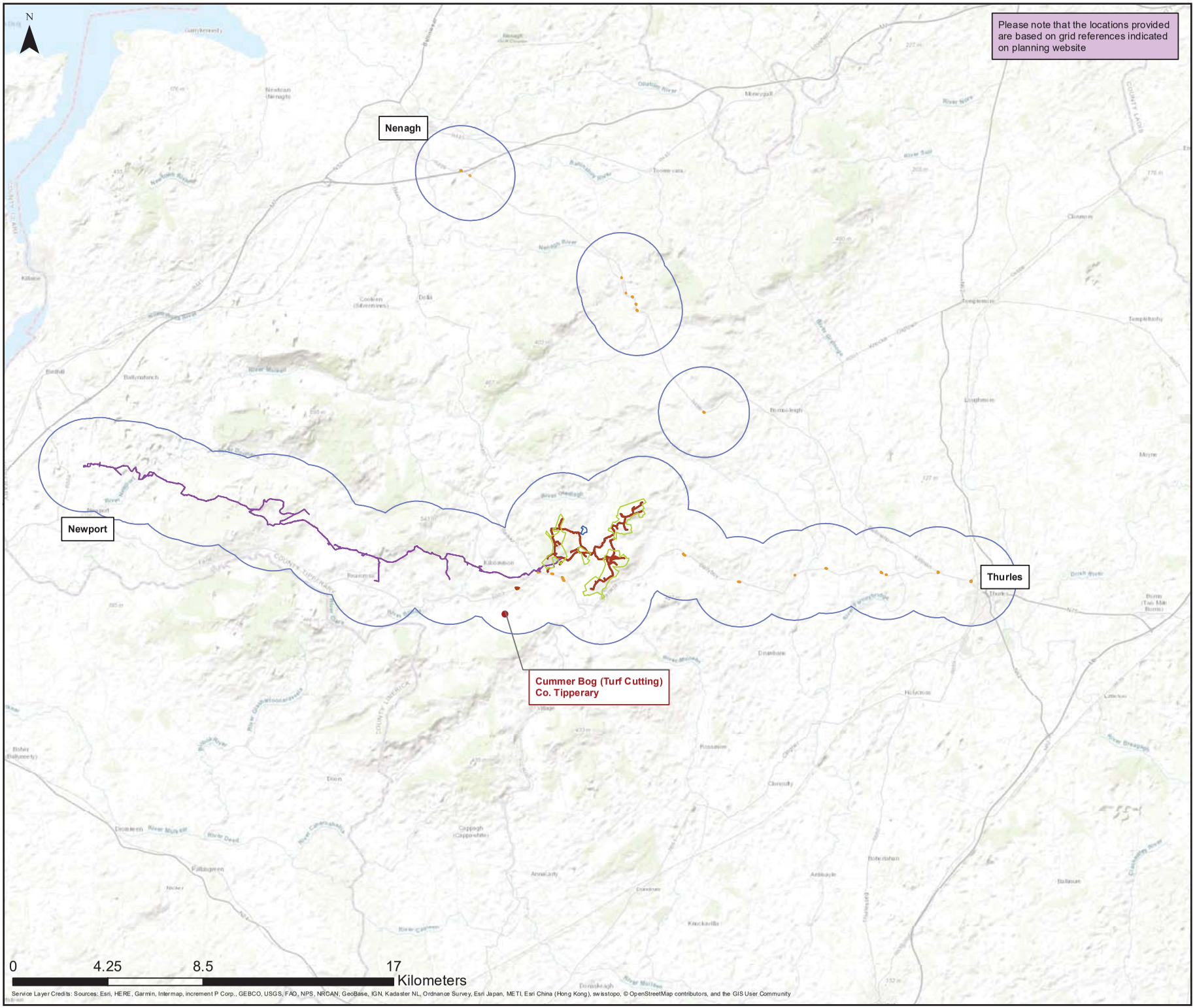

Client: Ecopower Developments Ltd.

Project: Whole UWF Project

Title:
Figure CE 8.11: Marsh Fritillary within the Cumulative Evaluation Study Area

Legend:

- Projects/Activities
- Upperchurch Windfarm 2013 Study Area
- UWF Related Works Construction Works Area
- UWF Grid Connection Construction Works Area
- UWF Replacement Forestry Area
- UWF Other Activities Construction Works Boundary
- 2km Buffer (Badger, Invertebrates - Marsh Fritillary)

* Forestry & Agriculture: Please see those map book figures which illustrate terrestrial habitats on aerial photography, for reference purposes with respect to the extent of Forestry and Agricultural lands.

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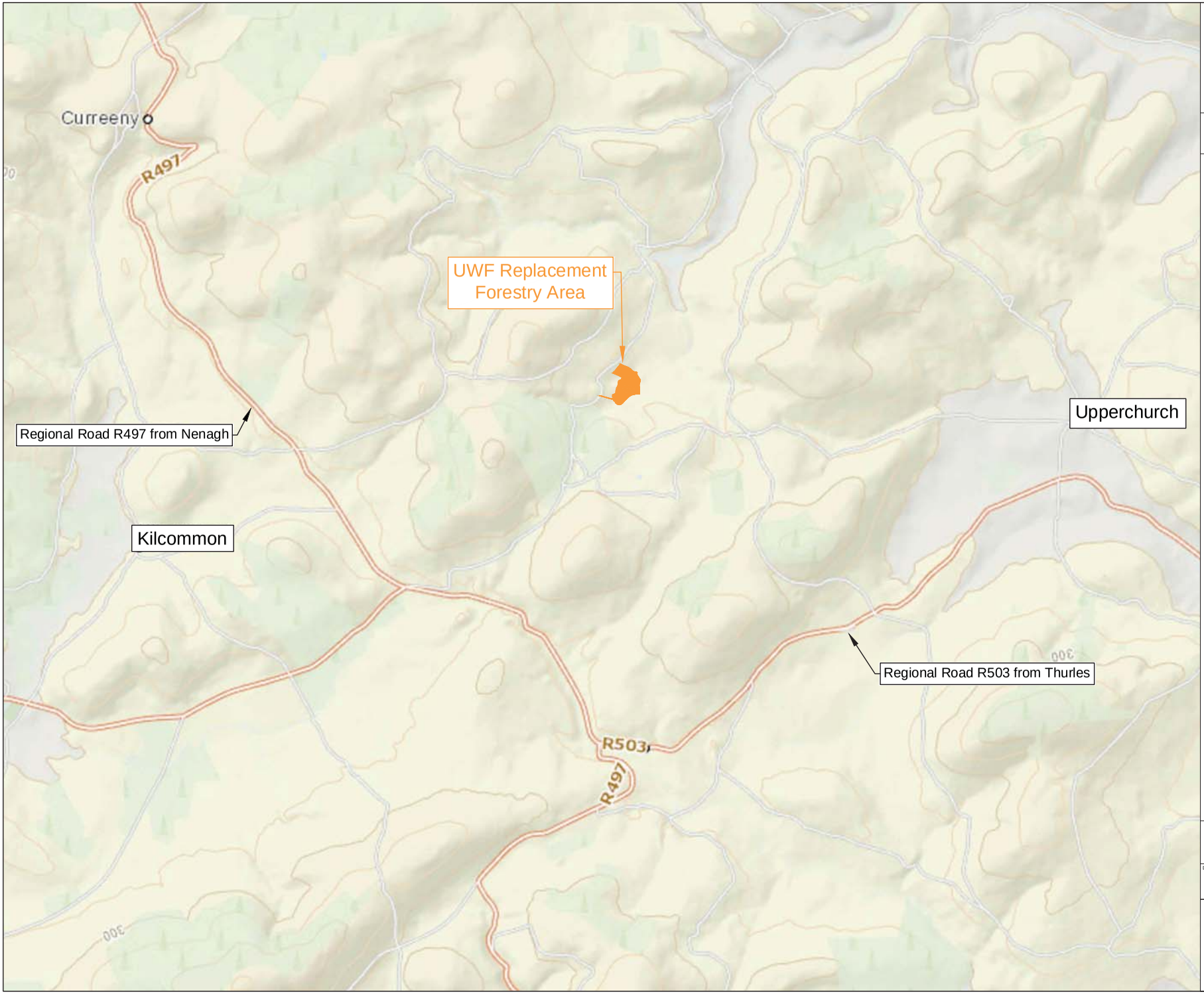

Title:
Figure RF 9.1

Location of the UWF Replacement Forestry Study Area

Map Number:
1 of 1

Legend:

UWF Replacement Forestry Area

Kilcommon Villages

N

Project:
UWF Replacement Forestry (RF)

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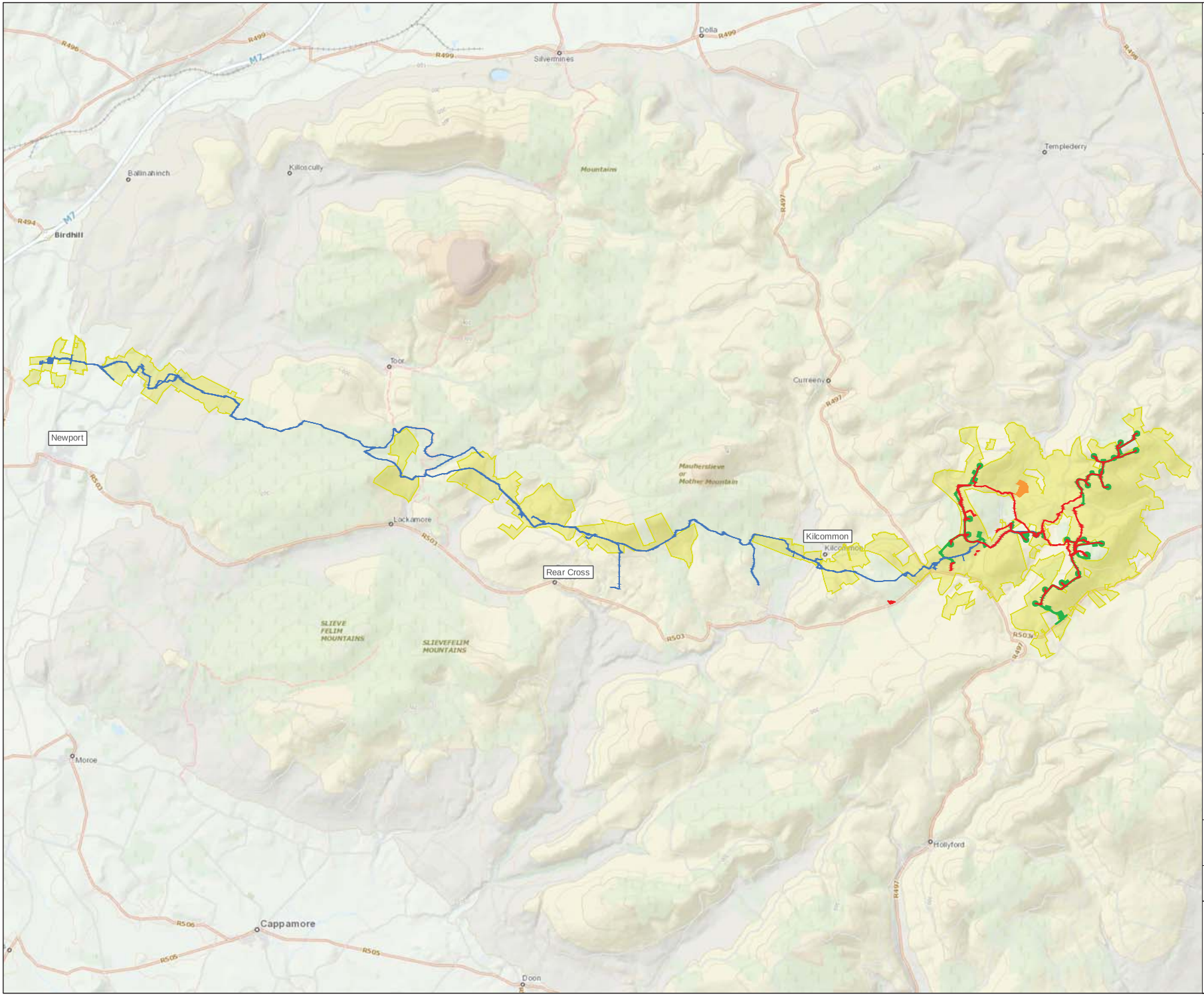

Title:
Figure CE 9.2

Agricultural Land within the Cumulative Evaluation Study Area

Map Number:
1 of 1

Legend:

- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Windfarm Construction Works Area
- UWF Replacement Forestry Area
- Landholding: Agricultural Land

N

Project:
UWF Replacement Forestry (RF)

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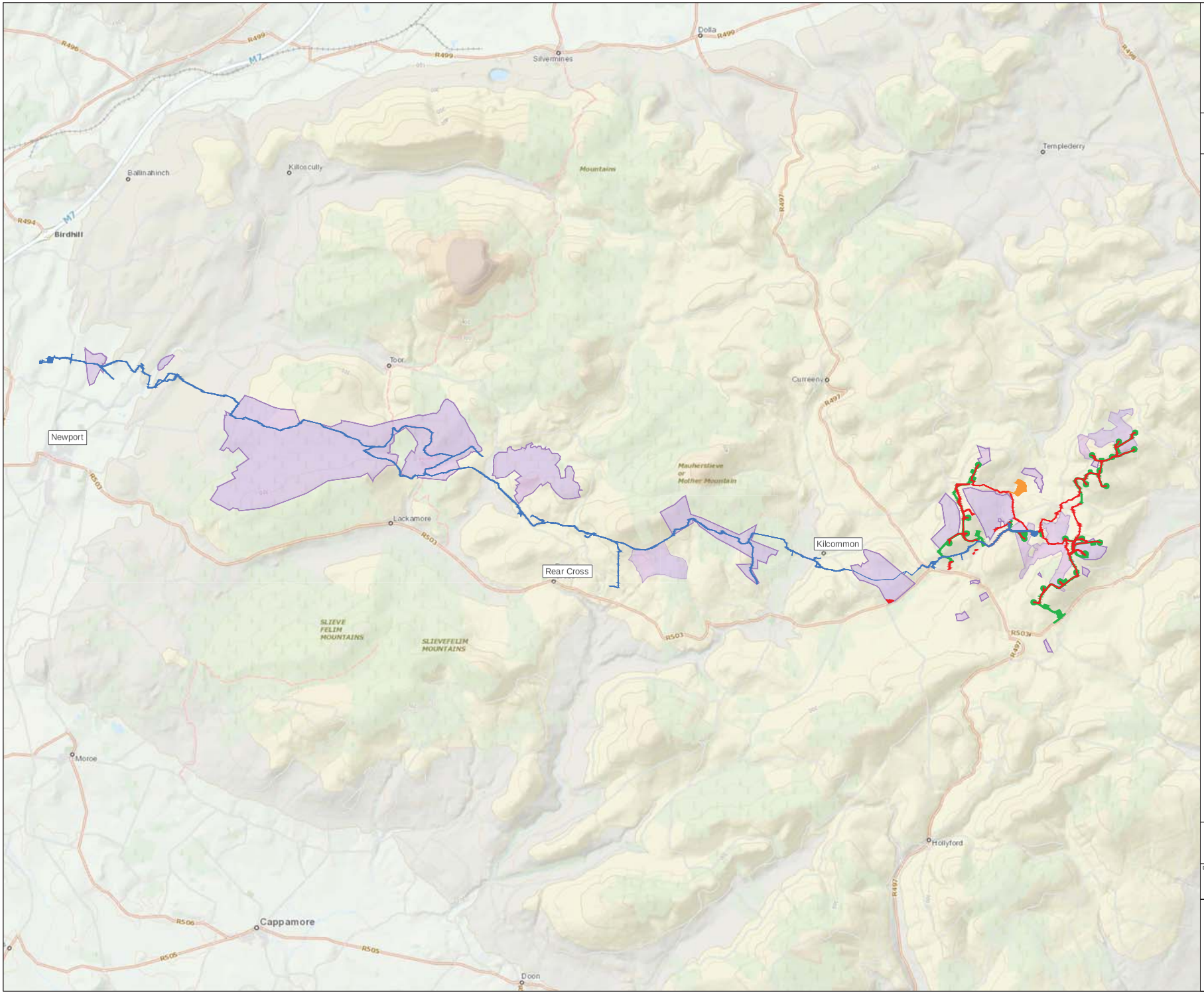

Title:
Figure CE 9.3

Forestry Lands within the Cumulative Evaluation Study Area

Map Number:
1 of 1

Legend:

- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Windfarm Construction Works Area
- UWF Replacement Forestry Area
- Landholding: Forestry

N

Project:
UWF Replacement Forestry (RF)

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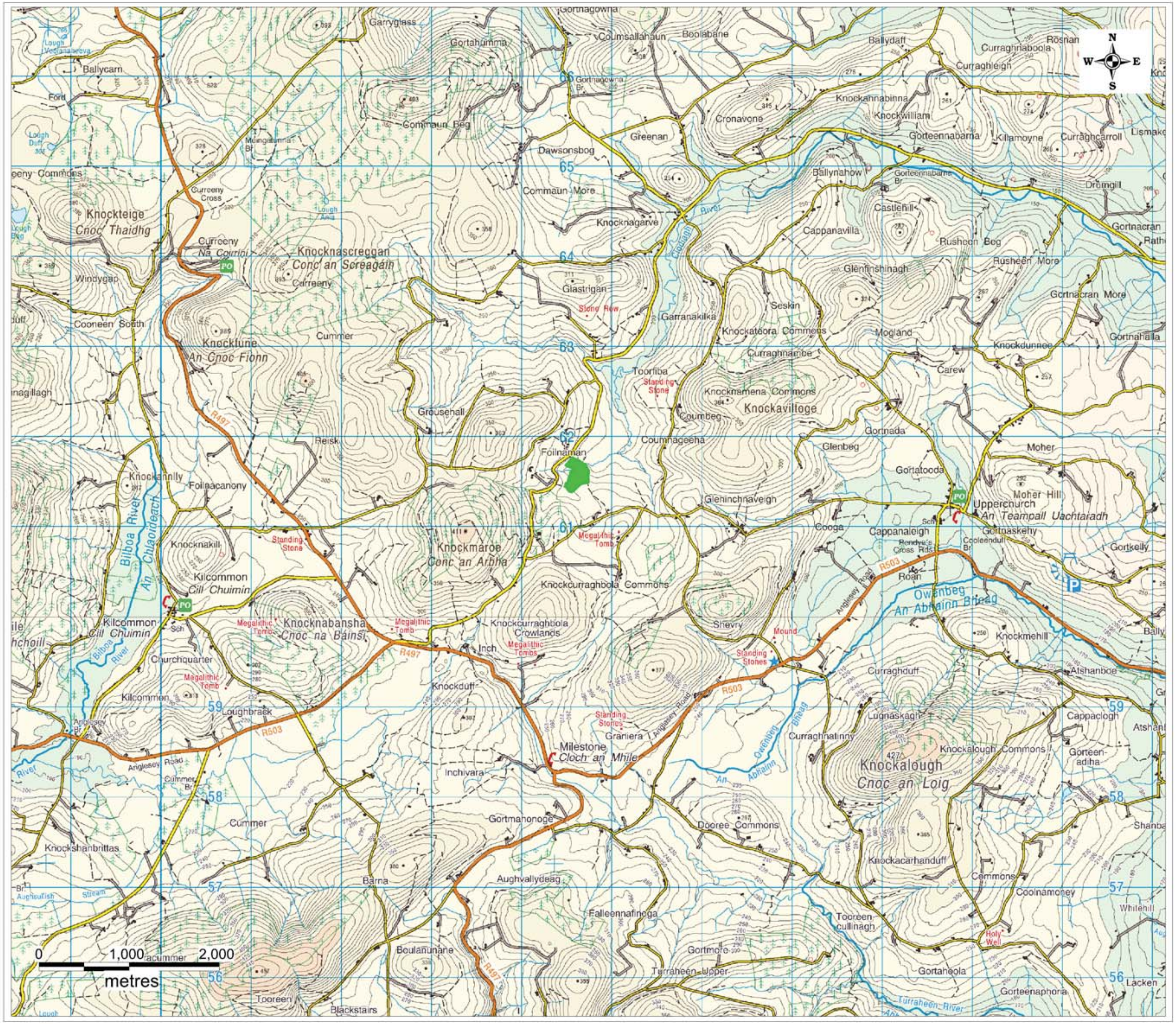

Legend

UWF Replacement Forestry

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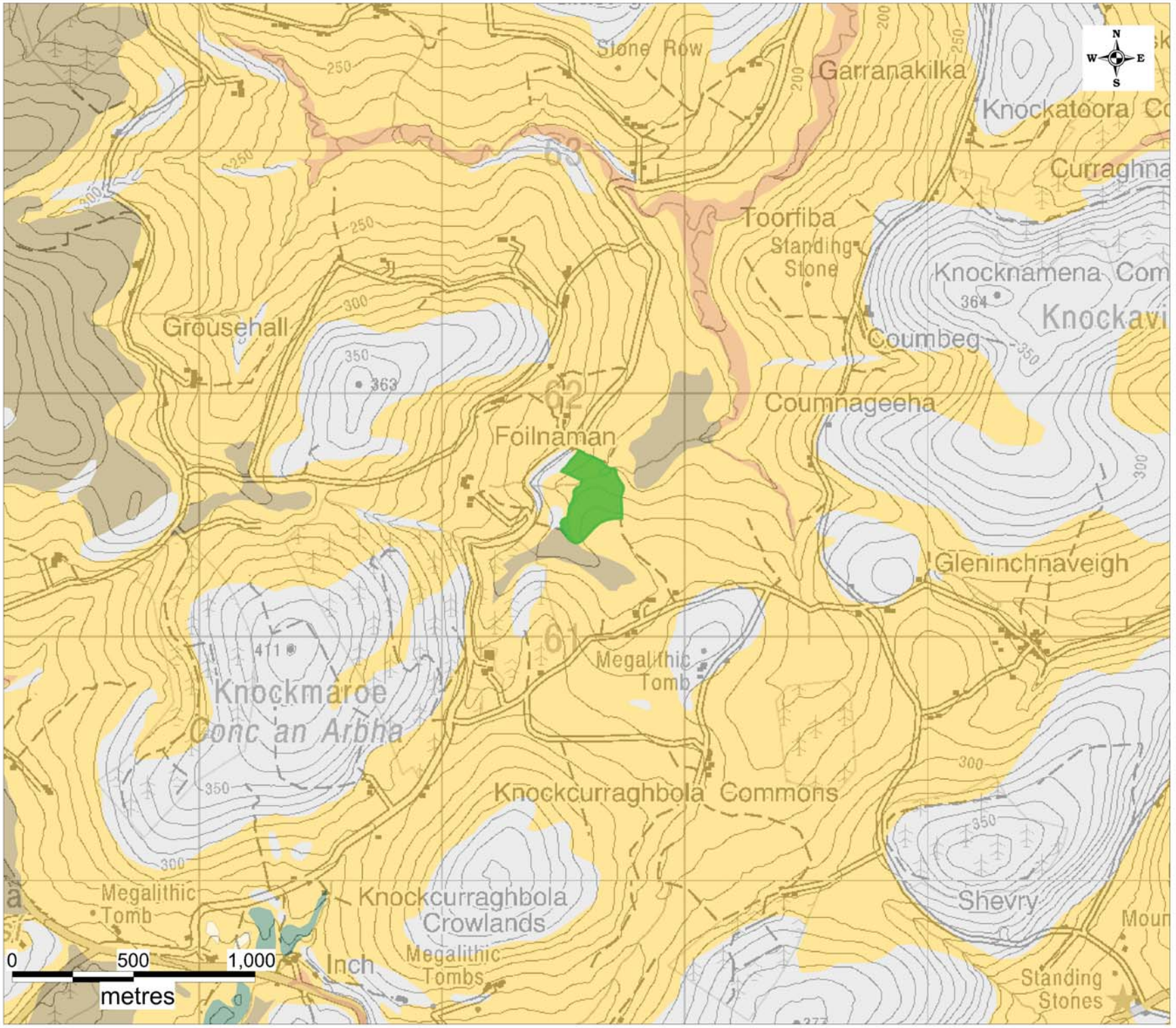
Client: Ecopower Developments Ltd.	
Job: UWF Replacement Forestry	
Title: Location of the UWF Replacement Forestry	
Figure No: Figure RF 10.1	
Drawing No: P1299-2-0318-FRF-10-1-A3-0A	
Sheet Size: A3	Project No: P1299-2
Scale: 1:40,000	Drawn By: GD
Date: 13/03/2018	Checked By: MG



Legend

- UWF Replacement Forestry
- Alluvium
- Blanket Peat
- Cutover Peat
- Sandstone Sands and Gravels
- Made Ground
- Bedrock at Surface
- Sandstone Till Devonian
- Sandstone Till Lower
- Sandstone and Shales Till
- Water

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Client: Ecopower Developments Ltd.	
Job: UWF Replacement Forestry	
Title: Local Soils & Subsoils within the UWF Replacement Forestry Study Area	
Figure No: Figure RF 10.2	
Drawing No: P1299-2-0318-FRF-10-2-A3-0A	
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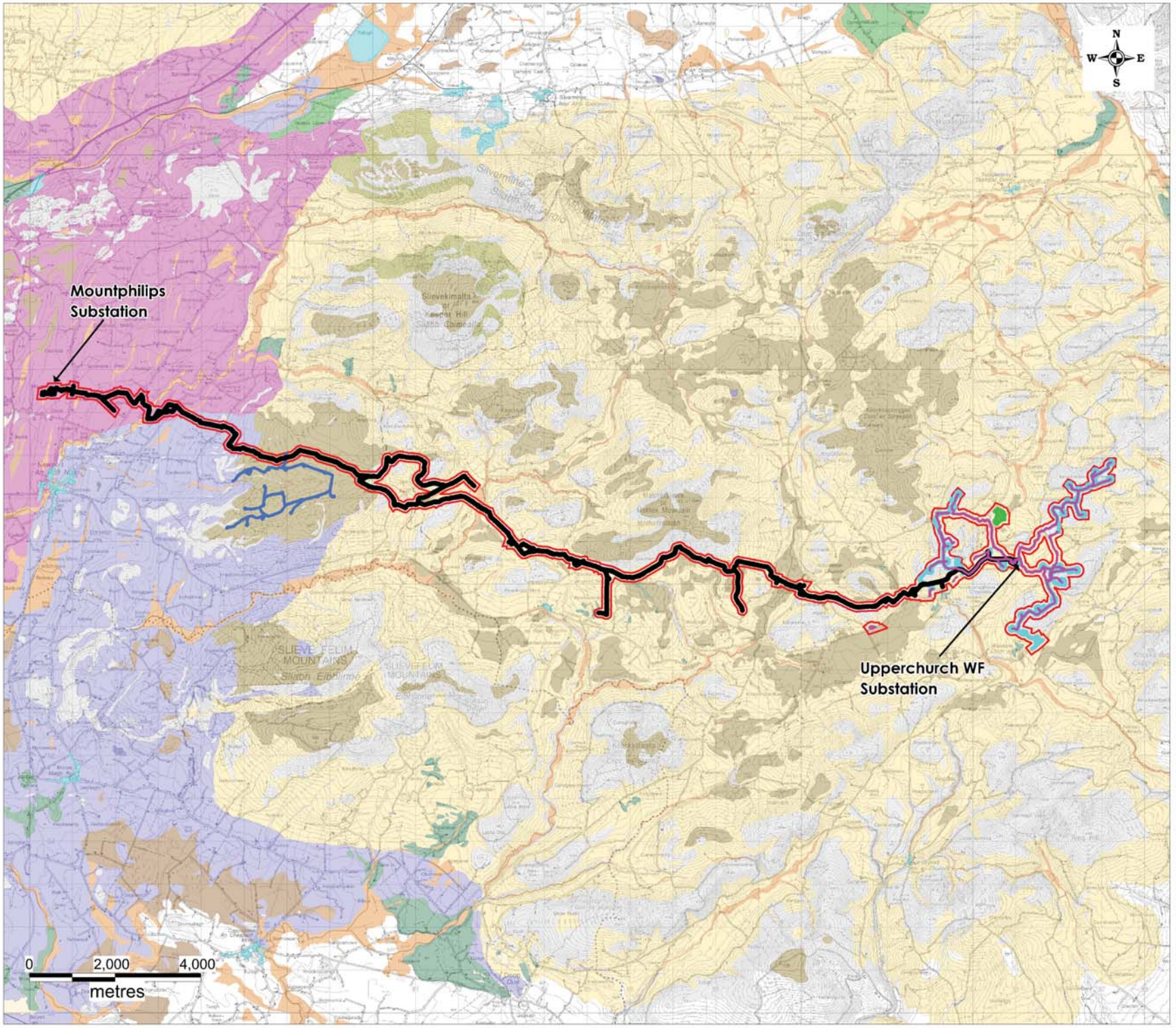

Legend

- UWF Grid Connection Construction Works Area Boundary
- UWF Related Works Construction Works Boundary
- Upperchurch Windfarm Construction Works Boundary
- Castlewaller Windfarm Construction Footprint
- UWF Replacement Forestry
- 100m Buffer for the Whole UWF Project
- Alluvium
- Blanket Peat
- Cutover Peat
- Sandstone Sands and Gravels
- Made Ground
- Bedrock at Surface
- Sandstone Till Devonian
- Sandstone Till Lower
- Sandstone and Shales Till
- Water

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Client: Ecopower Developments Ltd.

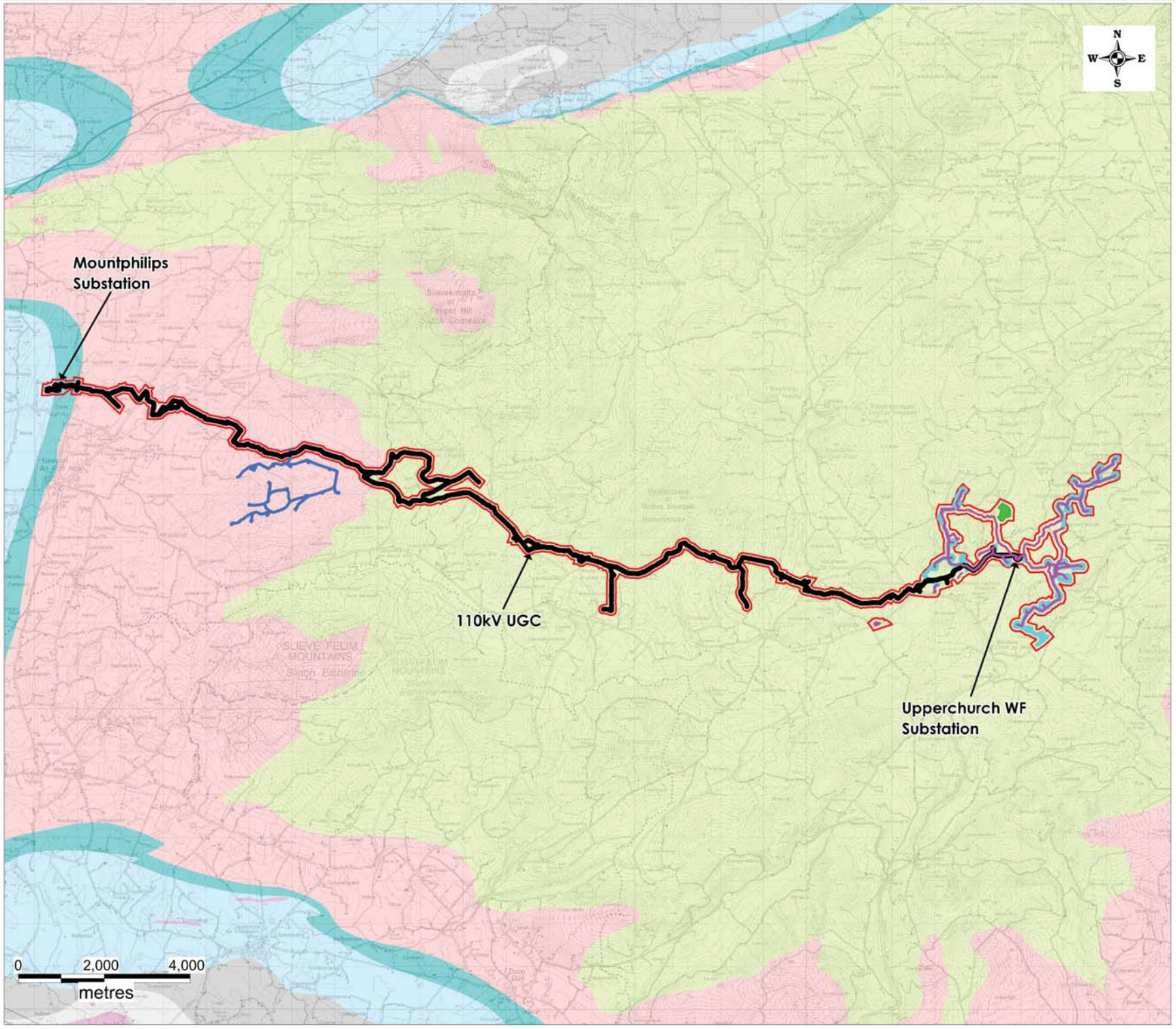
Job: UWF Related Works

Title: Local Soils & Subsoils within the Cumulative Evaluation Study Area

Figure No: Figure CE 10.2

Drawing No: P1299-2-0318-FCE-10-2-A3-0A

Sheet Size: A3	Project No: P1299-2
Scale: 1:85,000	Drawn By: GD
Date: 12/03/2018	Checked By: MG



Legend

- UWF Grid Connection Construction Works Area Boundary
- UWF Related Works Construction Works Boundary
- Upperchurch Windfarm Construction Works Boundary
- Castlewaller Windfarm Construction Footprint
- UWF Replacement Forestry
- 100m Buffer for the Whole UWF Project
- Dinantian (early) Sandstones, Shales and Limestones
- Dinantian Lower Impure Limestones
- Devonian Old Red Sandstones
- Dinantian Pure Unbedded Limestones
- Dinantian Pure Unbedded Limestones
- Silurian Metasediments and Volcanics

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Client: Ecopower Developments Ltd.

Job: UWF Related Works

Title: Local Bedrock within the Cumulative Evaluation Study Area

Figure No: Figure CE 10.3

Drawing No: P1299-2-0318-FCE-10-3-A3-0A

Sheet Size: A3	Project No: P1299-2
Scale: 1:85,000	Drawn By: GD
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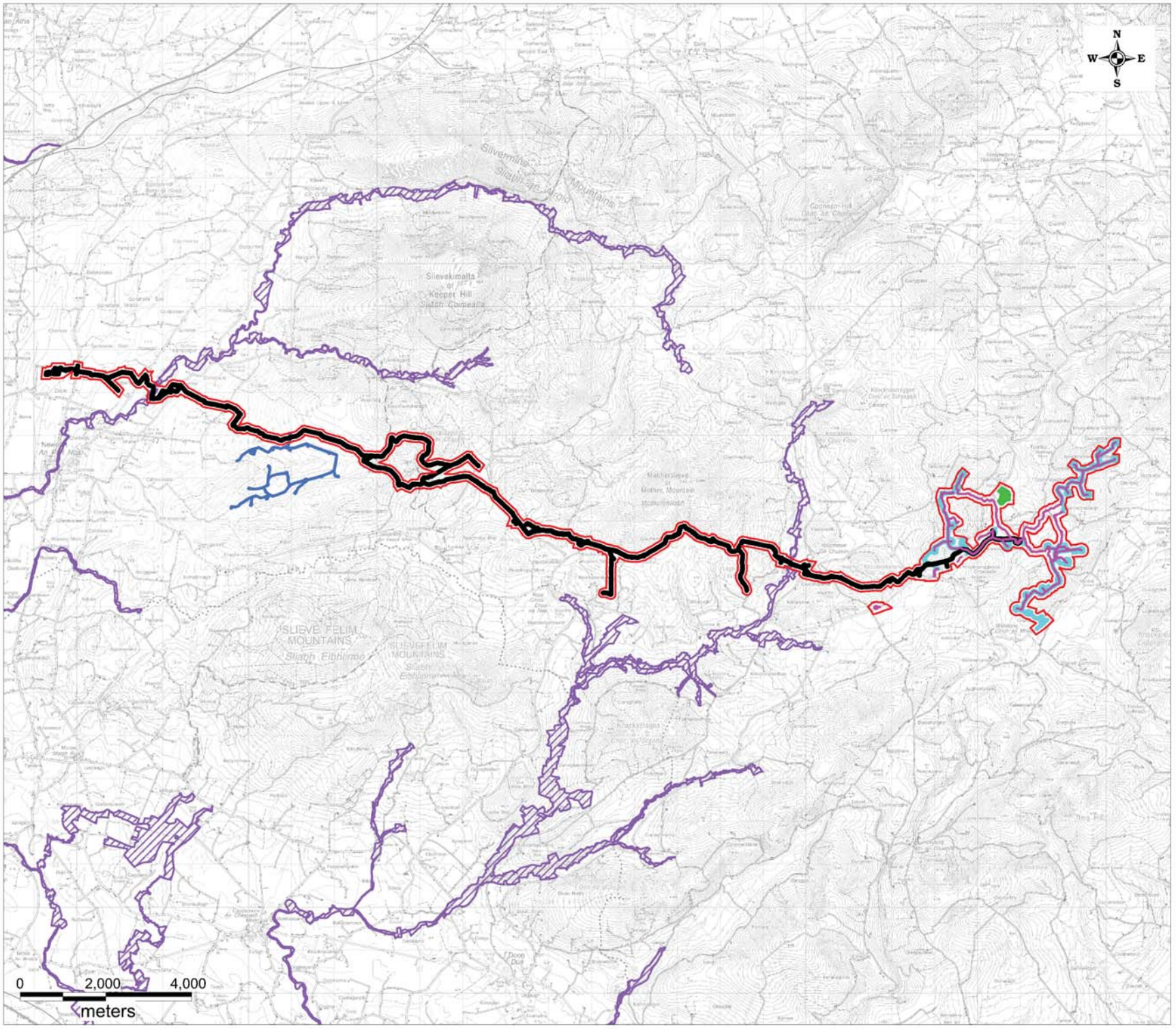

Legend

- UWF Grid Connection Construction Works Area Boundary
- UWF Related Works Construction Works Boundary
- Upperchurch Windfarm Construction Works Boundary
- Lower River Shannon SAC
- UWF Replacement Forestry
- Castlewaller Windfarm Construction Footprint
- 100m Buffer for the Whole UWF Project

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Client: Ecopower Developments Ltd.	
Job: UWF Related Works	
Title: Lower River Shannon SAC within the Cumulative Evaluation Study Area	
Figure No: Figure CE 10.4	
Drawing No: P1299-2-0318-FCE-10-4-A3-0A	
Sheet Size: A3	Project No: P1299-2
Scale: 1:85,000	Drawn By: GD
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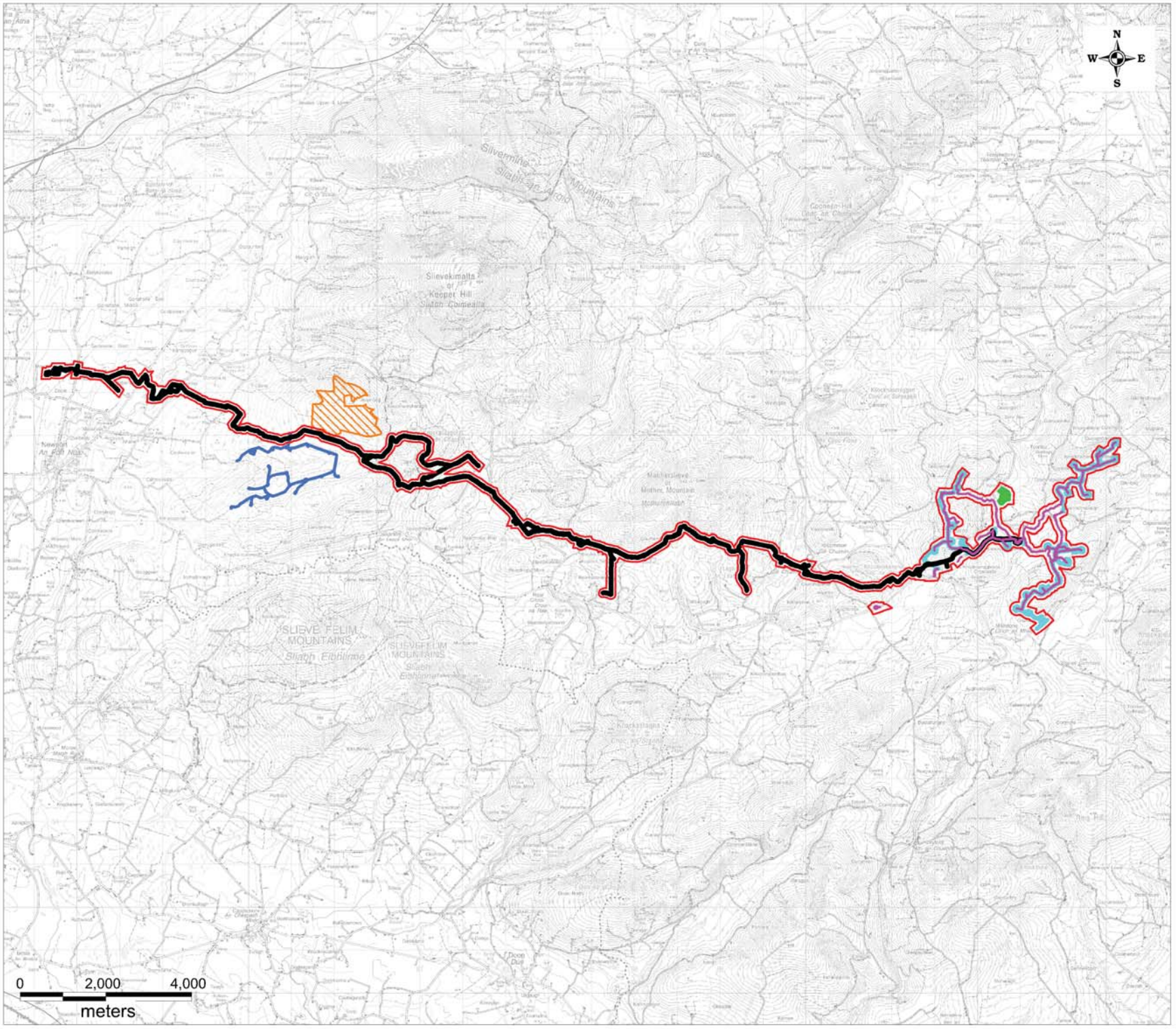

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Client: Ecopower Developments Ltd.	
Job: UWF Related Works	
Title: Bleanbeg Bog NHA within the Cumulative Evaluation Study Area	
Figure No: Figure CE 10.5	
Drawing No: P1299-2-0318-FCE-10-5-A3-0A	
Sheet Size: A3	Project No: P1299-2
Scale: 1:85,000	Drawn By: GD
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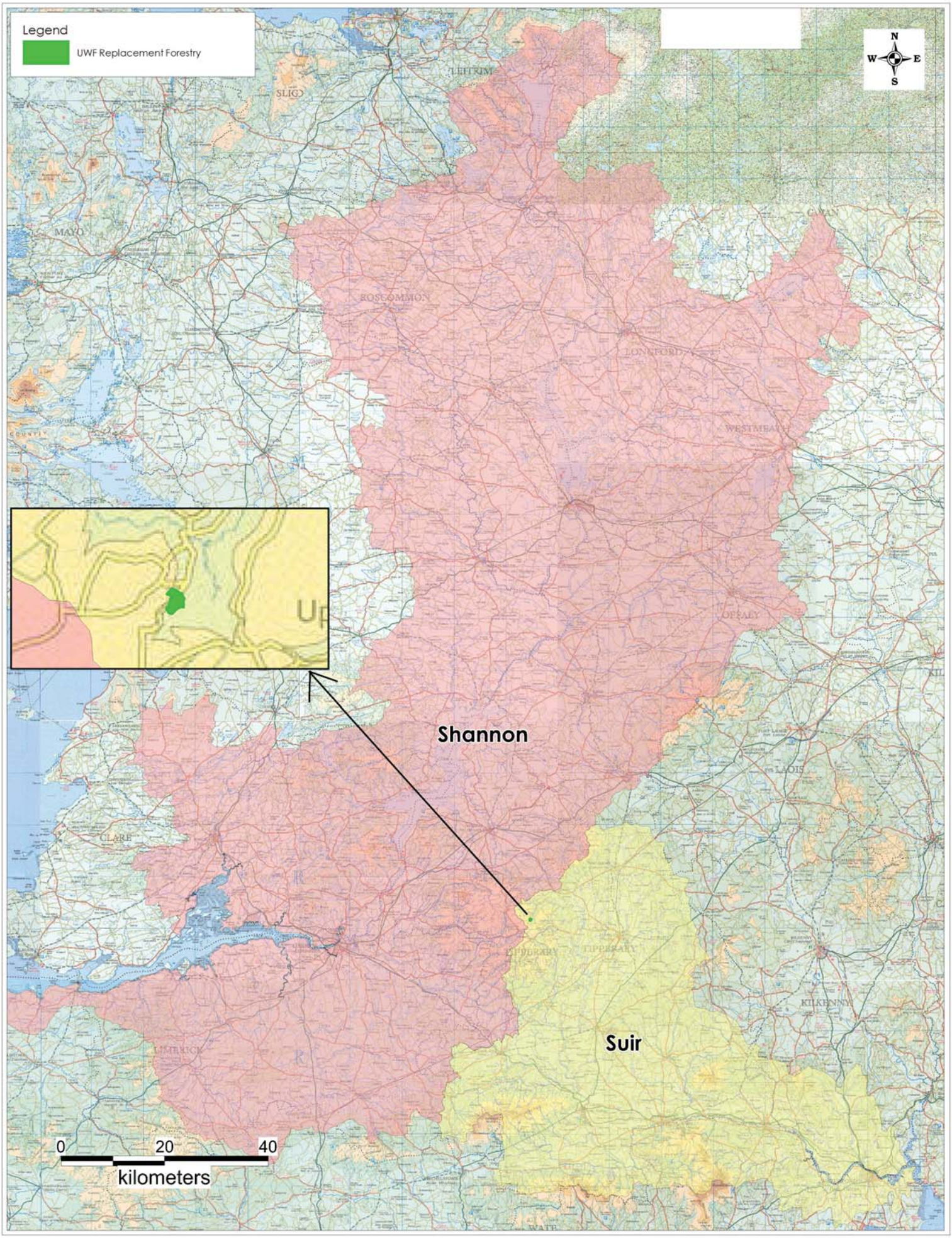

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Job: UWF Replacement Forestry	Sheet Size: A3	Project No: P1299-2
Title: Location of the UWF Replacement Forestry - River-Basin	Scale: 1:650,000	Drawn By: GD
Figure No: Figure RF 11.1.1	Date: 12/03/2018	Checked By: MG

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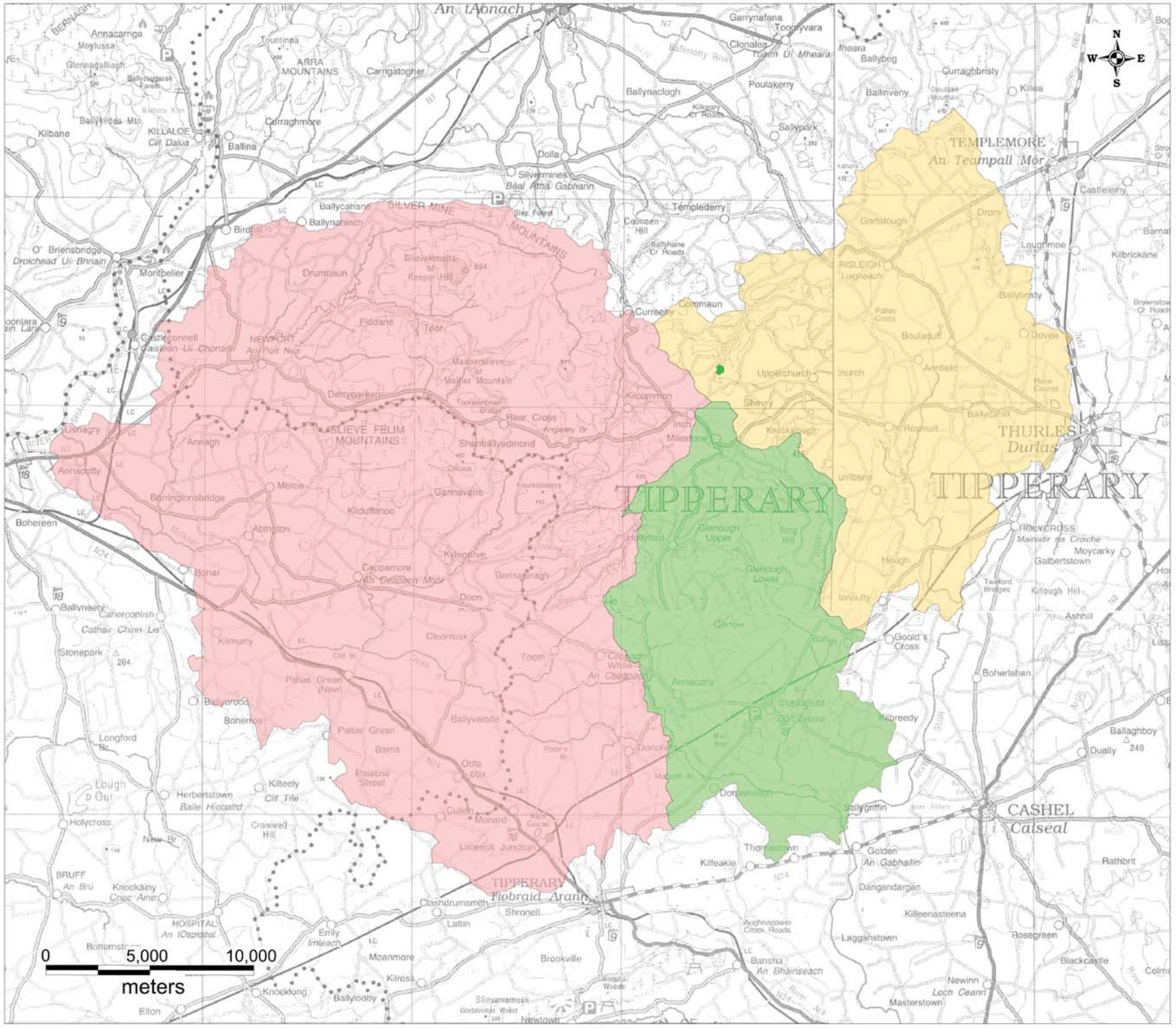

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Job: UWF Replacement Forestry	
Title: Location of the UWF Replacement Forestry - Regional Hydrology	
Figure No: Figure RF 11.1.2	
Drawing No: P1299-2-0318-FRF-11-1-2-A3-0A	
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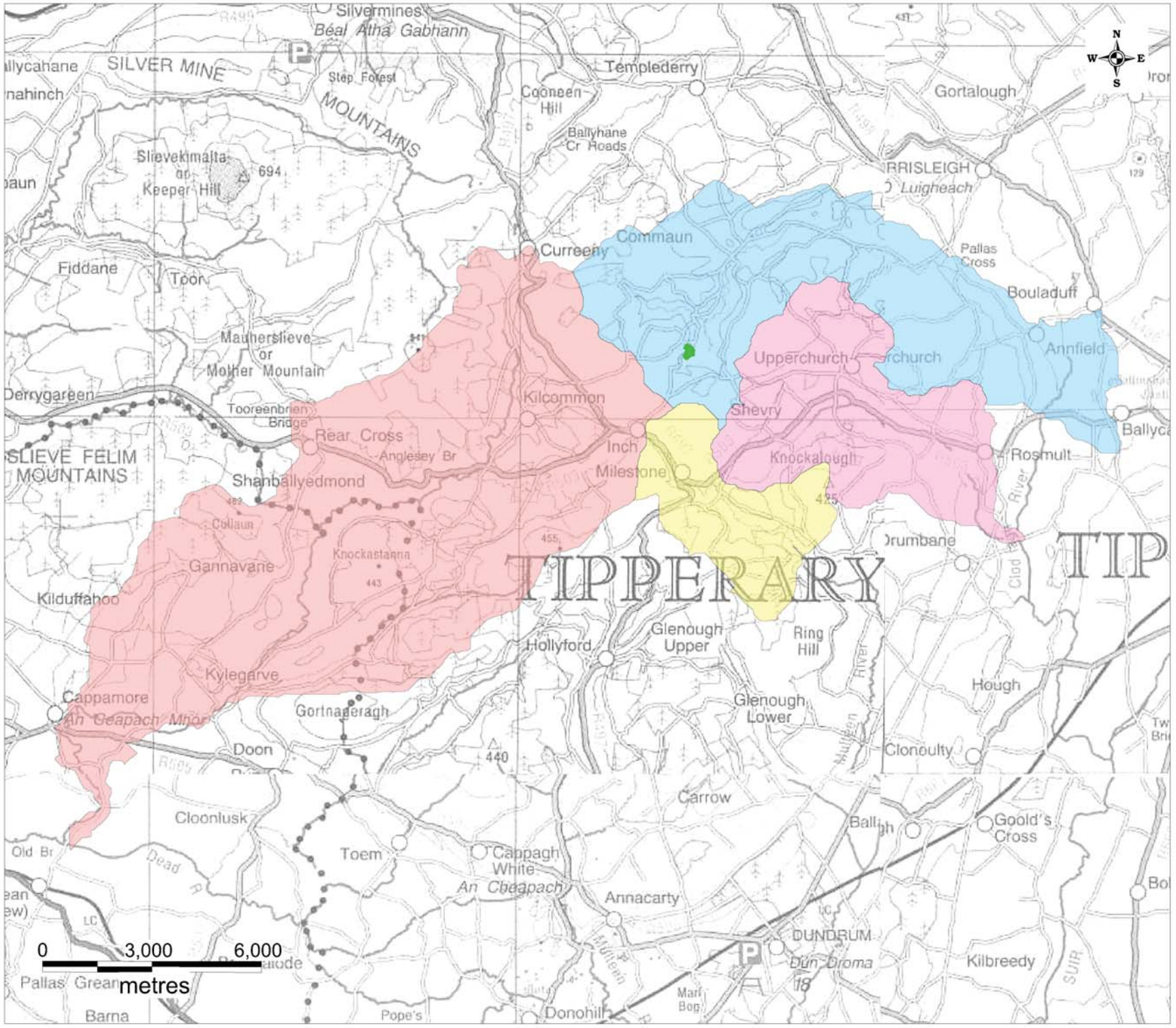
Date: 12/03/2018	Checked By: MG



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Client: Ecopower Development Ltd.

Job: UWF Replacement Forestry

Title: Local Surface Waterbodies within the UWF Replacement Forestry Study Area

Figure No: Figure RF 11.2.1

Drawing No: P1299-2-0318-FRF-11-2-1-A3-0A

Sheet Size: A3	Project No: P1299-2
Scale: 1:100,000	Drawn By: GD
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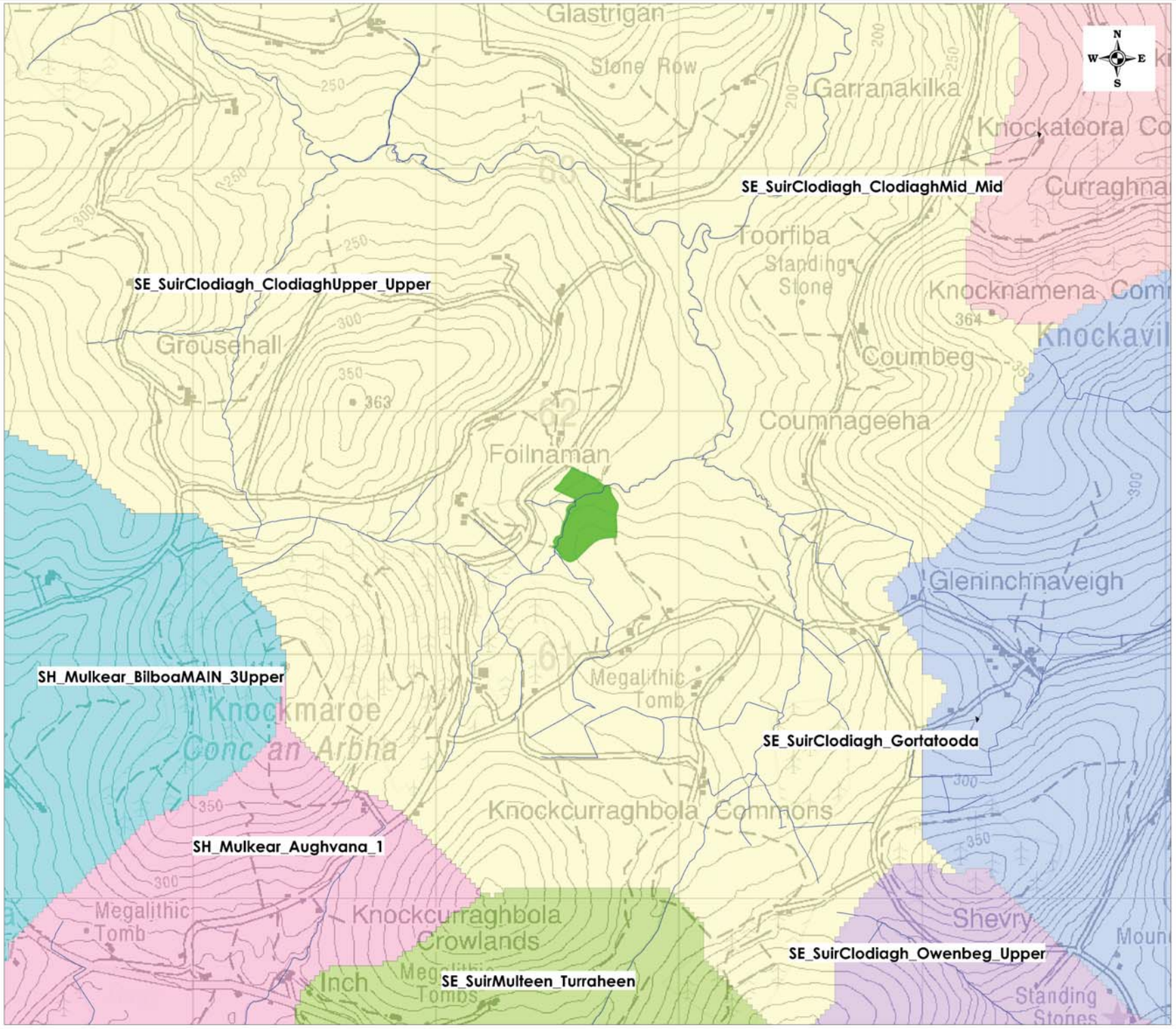

Legend

- Replacement Forestry Border
- Watercourse

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Client: Ecopower Developments Ltd.	
Job: UWF Replacement Forestry	
Title: Local Surface Waterbodies (WFD) within the UWF Replacement Forestry Study Area	
Figure No: Figure RF 11.2.2.	
Drawing No: P1299-2-0318-FRF-11-2-2-A3-0A	
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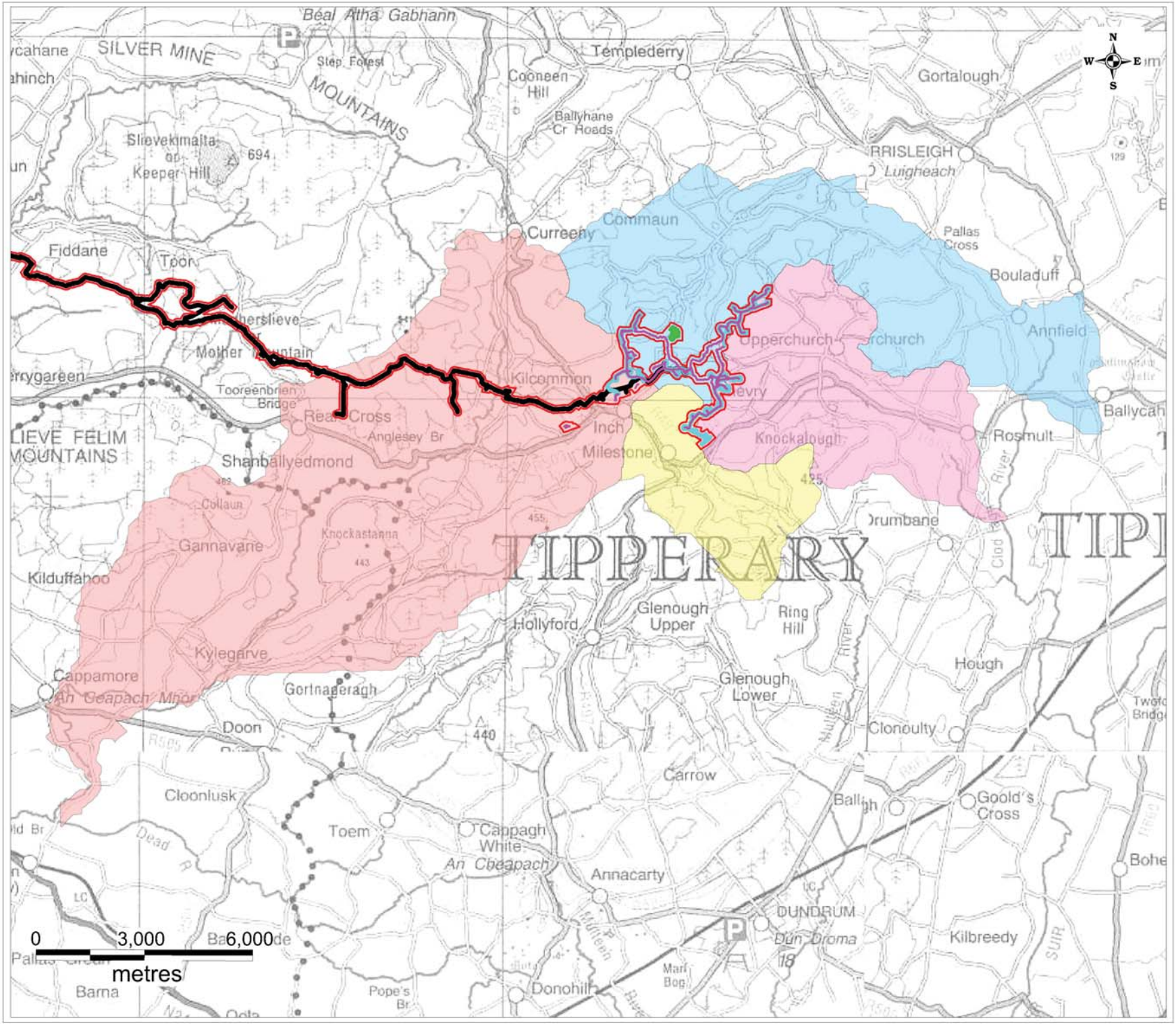
Date: 14/03/2018	Checked By: MG



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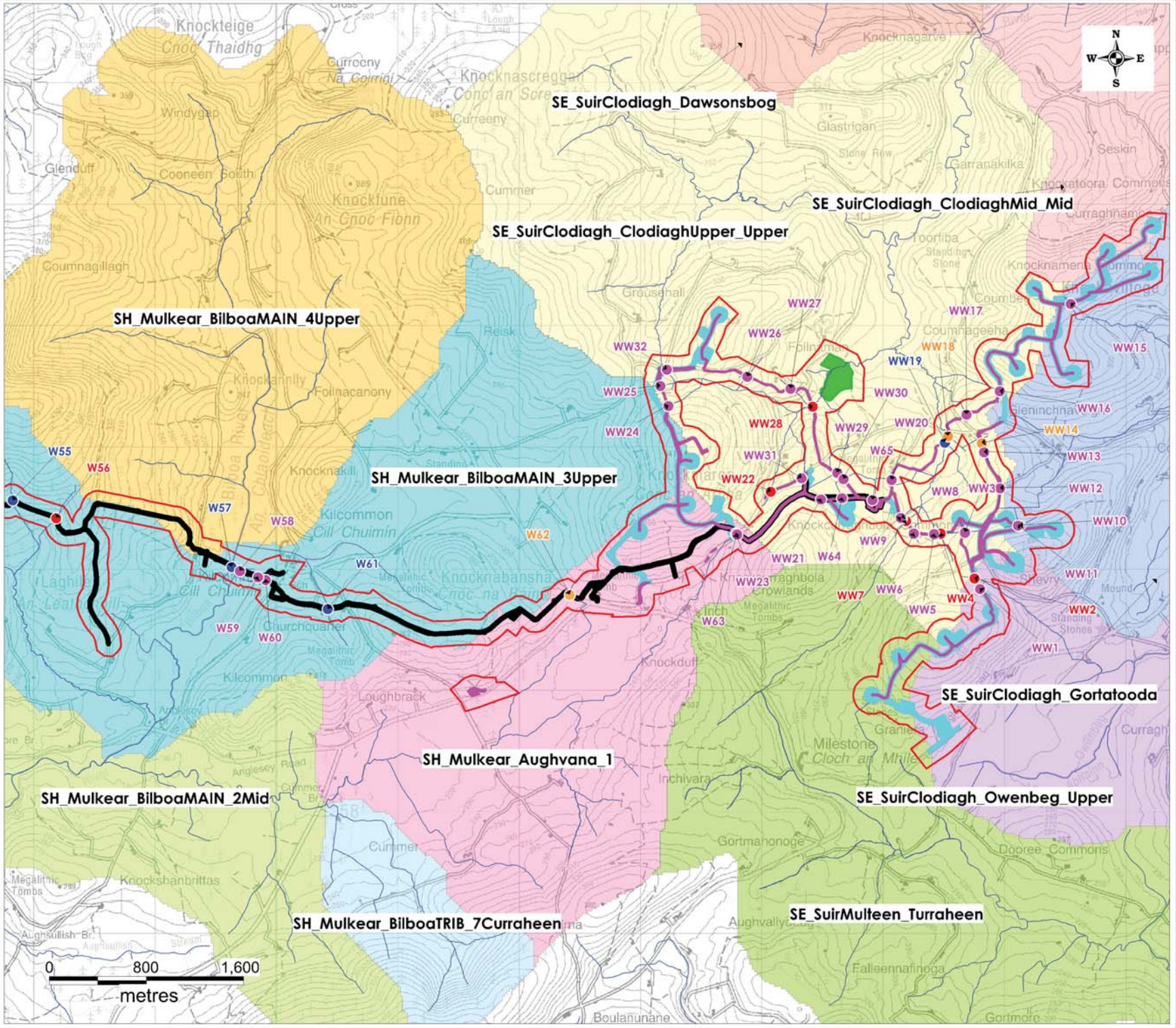
Client: Ecopower Development Ltd.	
Job: UWF Replacement Forestry	
Title: Local Surface Waterbodies within the Cumulative Evaluation Study Area	
Figure No: Figure CE 11.2.1	
Drawing No: P1299-2-0318-FCE-11-2-1-A3-0A	
Sheet Size: A3	Project No: P1299-2
Scale: 1:100,000	Drawn By: GD
Date: 14/03/2018	Checked By: MG



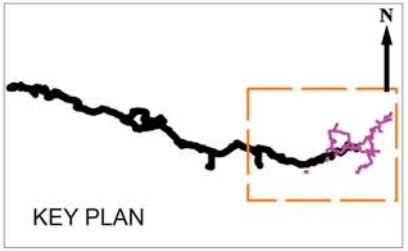
Legend

- UWF Grid Connection Construction Works Area Boundary
- UWF Related Works Construction Works boundary
- Upperchurch Windfarm Construction Works Boundary
- UWF Replacement Forestry Border
- 100m Buffer for the Whole UWF Project
- Watercourse

Watercourse Crossing Class Type

- Class 1_EPA Blueline
- Class 2_EPA Blueline Equivalent
- Class 3_Sub Optimal
- Class 4_Drainage Ditch

*Note: W - Grid Connection Watercourse Crossing
WW - Related Works Watercourse Crossing



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Client: Ecopower Developments Ltd.

Job: UWF Replacement Forestry

Title: Local Surface Waterbodies (WFD) within the Cumulative Evaluation Study Area

Figure No: Figure CE 11.2.2.

Drawing No: P1299-2-0318-FCE-11-2-2-A3-0A

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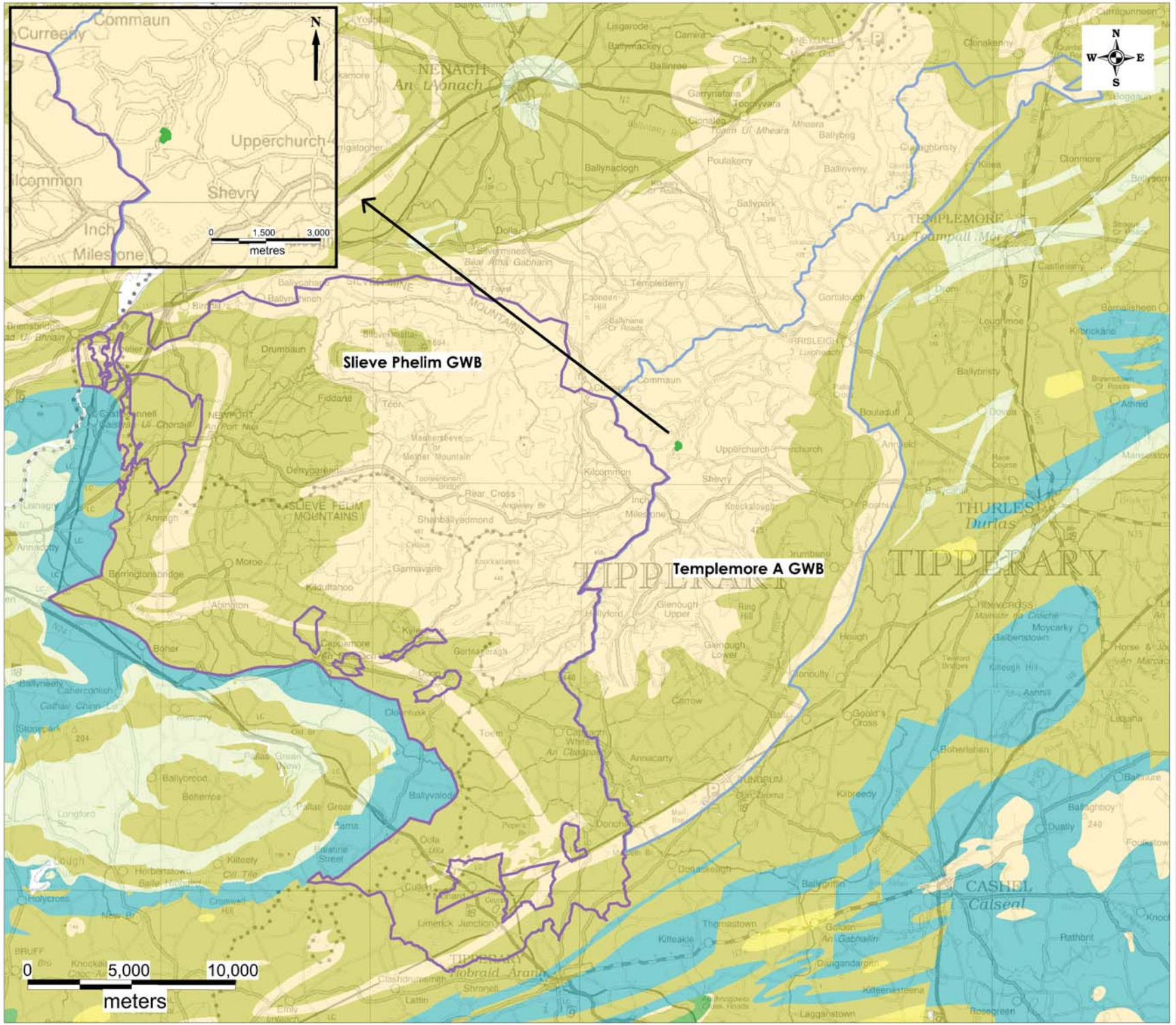

Legend

UWF Related Works Construction Works Boundary

Groundwater Bodies

- Slieve Phelim GWB Boundary
- Templemore A GWB Boundary

Aquifer Type

- Locally Important Aquifer - Karstified
- Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Regionally Important Aquifer - Karstified (diffuse)

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Client: Ecopower Developments Ltd.

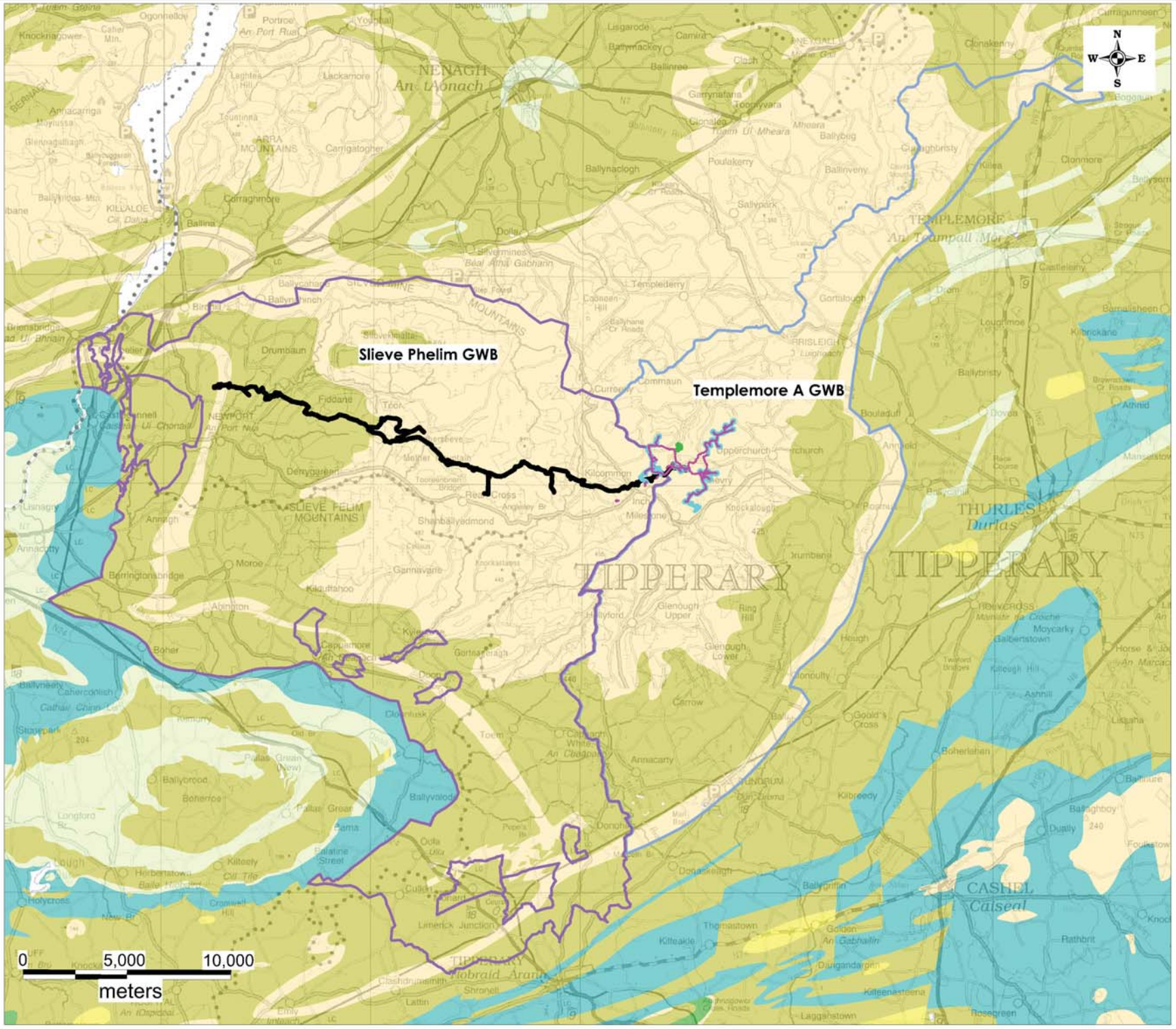
Job: UWF Replacement Forestry

Title: Local Groundwater Bodies within the UWF Replacement Forestry Study Area

Figure No: Figure RF 11.3

Drawing No: P1299-2-0318-FRF-11-3-A3-0A

Sheet Size: A3	Project No: P1299-2
Scale: 1:175,000	Drawn By: GD
Date: 14/03/2018	Checked By: MG



Legend

- UWF Grid Connection Construction Works Area Boundary
- UWF Related Works Construction Works boundary
- Upperchurch Windfarm Construction Works Boundary
- UWF Replacement Forestry Border

Groundwater Bodies

- Slieve Phelim GWB Boundary
- Templemore A GWB Boundary

Aquifer Type

- Locally Important Aquifer - Karstified
- Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Regionally Important Aquifer - Karstified (diffuse)

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Client: Ecopower Developments Ltd.

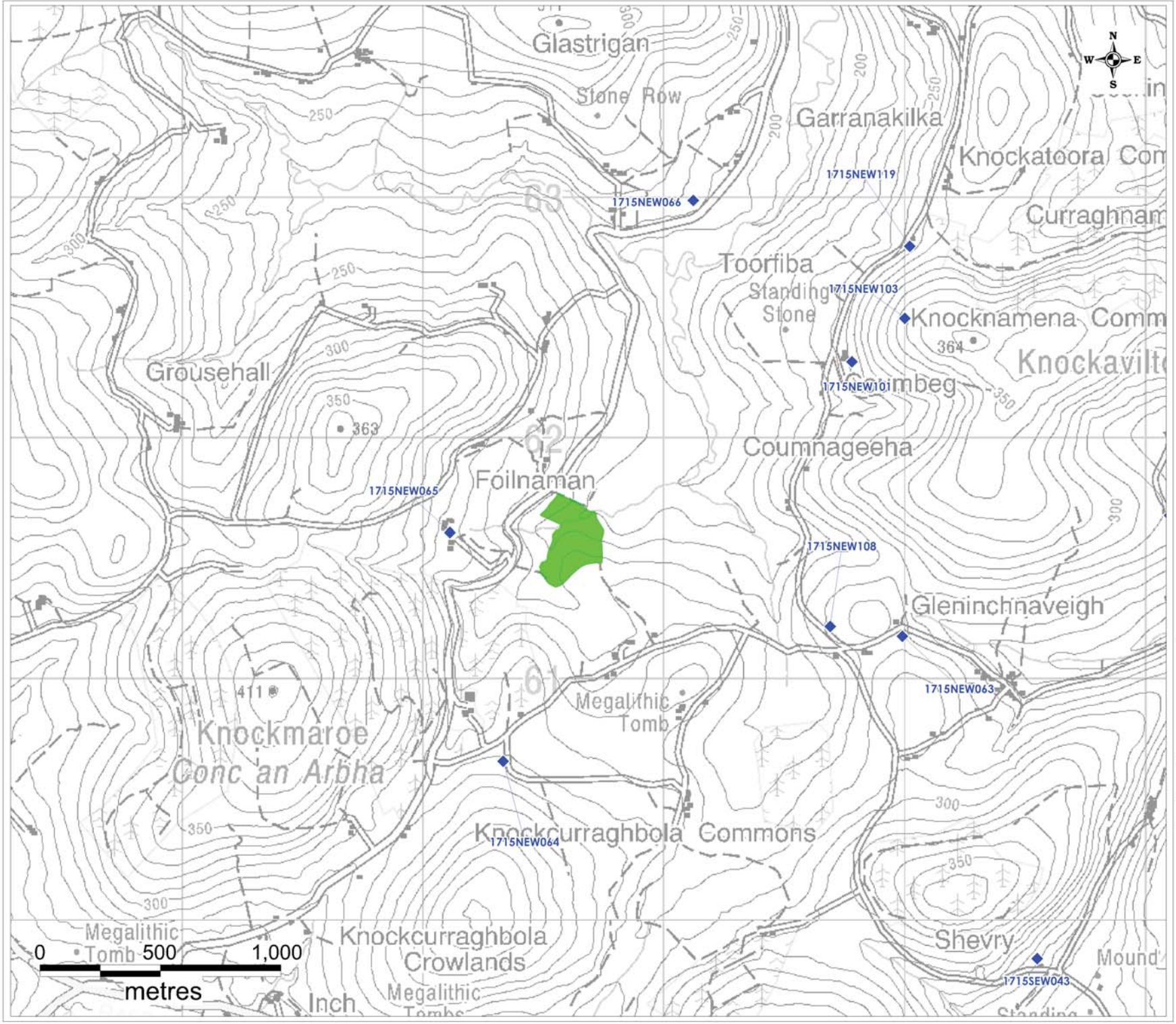
Job: UWF Replacement Forestry

Title: Local Groundwater Bodies within the Cumulative Evaluation Study Area

Figure No: Figure CE 11.3

Drawing No: P1299-2-0318-FCE-11-3-A3-0A

Sheet Size: A3	Project No: P1299-2
Scale: 1:175,000	Drawn By: GD
Date: 14/03/2018	Checked By: MG



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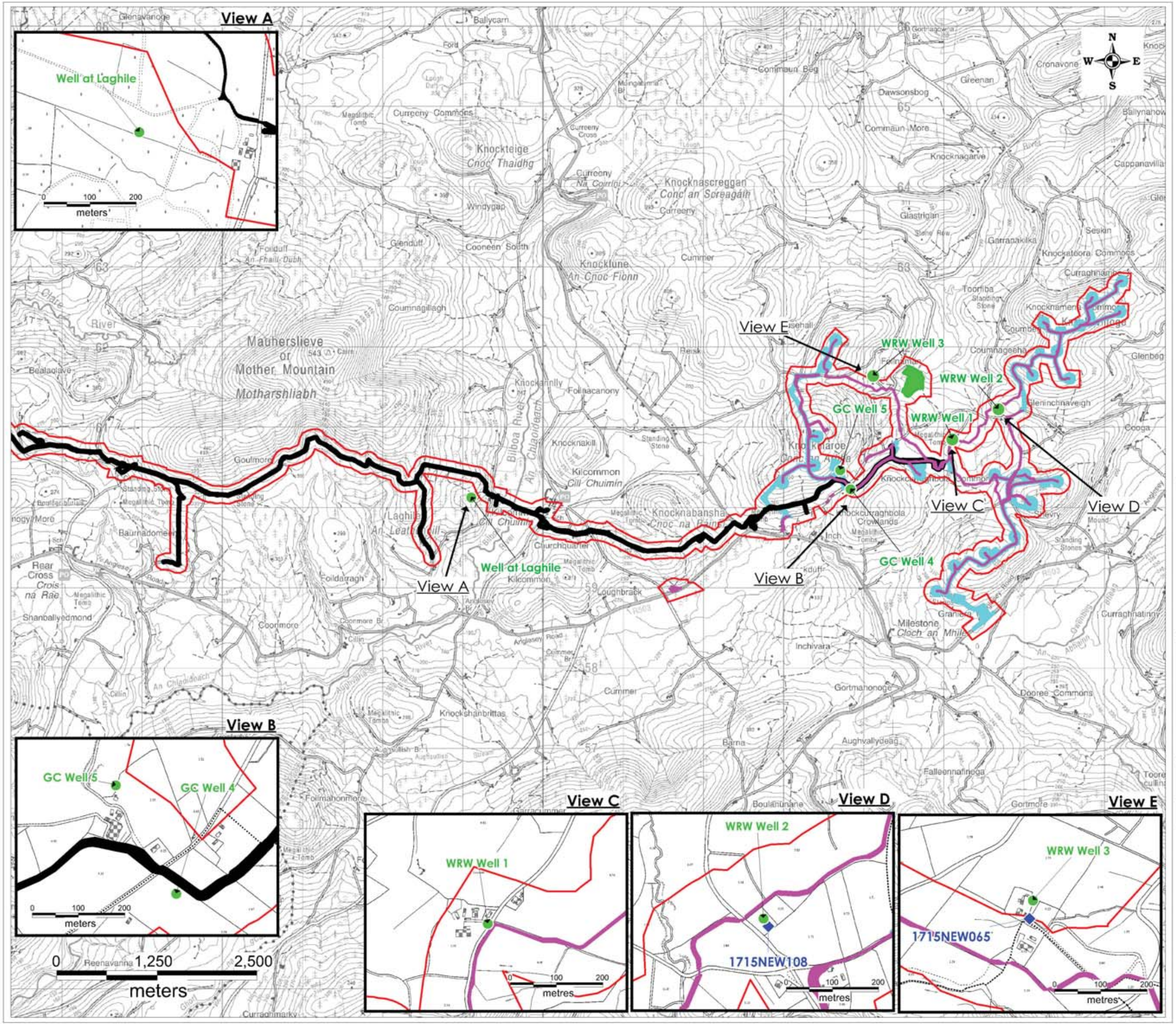
Client: Ecopower Development Ltd.	
Job: UWF Replacement Forestry	
Title: Local Wells & Springs within the UWF Replacement Forestry Study Area	
Figure No: Figure RF 11.4.	
Drawing No: P1299-2-0318-FRF-11-4-A3-0A	
Sheet Size: A3	Project No: P1299-2
Scale: 1:15,000	Drawn By: GD
Date: 14/03/2018	Checked By: MG



Legend

- UWF Grid Connection Construction Works Area Boundary
- Related Works Construction Works boundary
- Upperchurch Windfarm Construction Works Boundary
- Mapped GSI Wells (accuracy <50m)
- Mapped Third Party Wells (accuracy <5m)
- Replacement Forestry Border
- 100m Buffer for the Whole UWF Project

*Note: Mapped Third Party Wells (GC) within 50m of the Grid Connection

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Client: Ecopower Development Ltd.	
Job: UWF Replacement Forestry	
Title: Local Wells & Springs within the Cumulative Evaluation Study Area	
Figure No: Figure CE 11.4	
Drawing No: P1299-2-0218-FCE-11-4-2-A3-0A	
Sheet Size: A3	Project No: P1299-2
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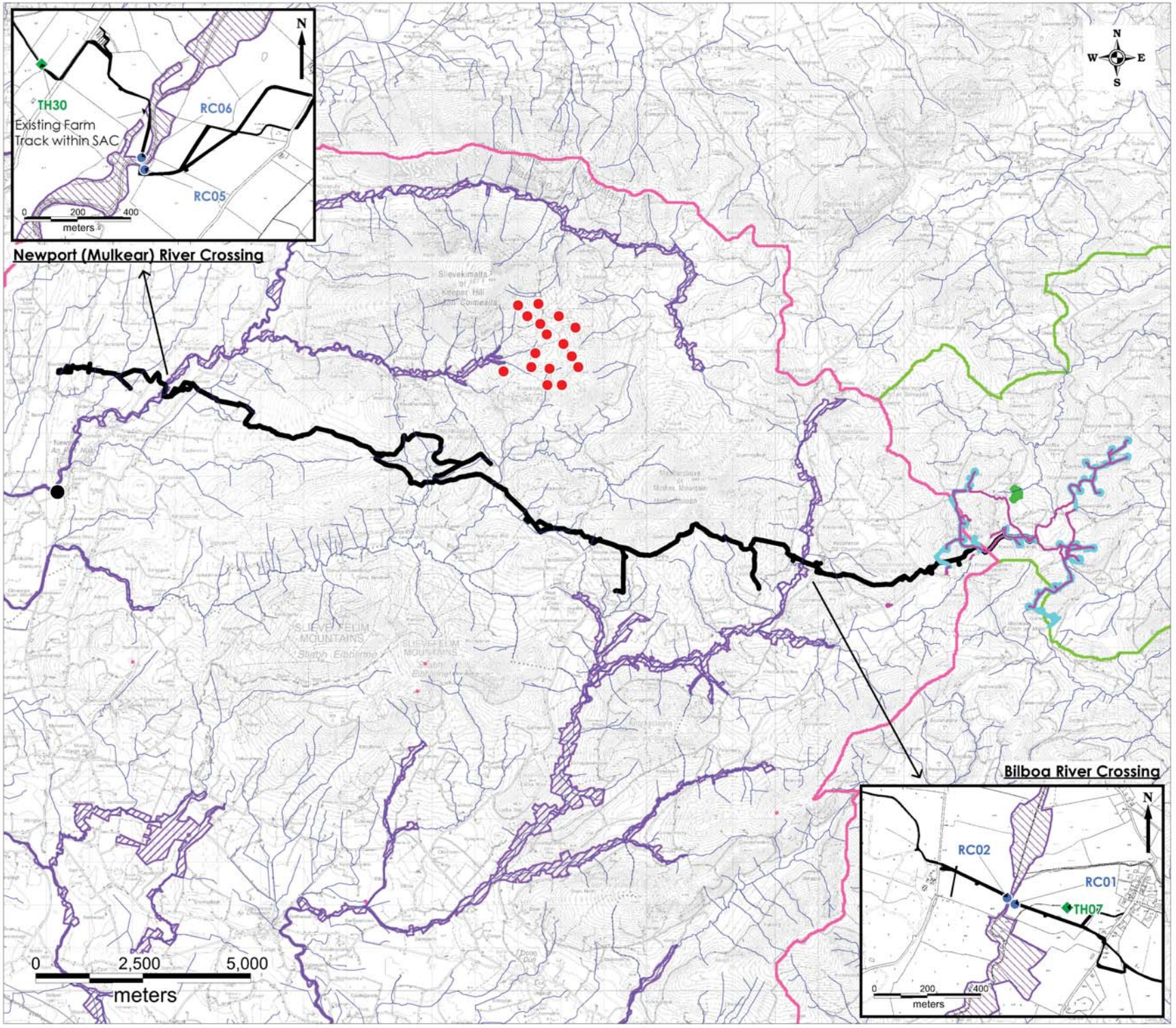

Legend

- UWF Grid Connection Construction Works Area Boundary
- UWF Related Works Construction Works boundary
- Upperchurch Windfarm Construction Works Boundary
- Lower River Shannon SAC
- Bunkimalta WF Turbines
- Proposed Newport Town Distribution Road
- Mulkear River Catchment
- Clodiagh River Catchment
- UWF Replacement Forestry Border
- Watercourse
- Borehole Sampling Locations
- Grid Connection Trial Pits

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Client: Ecopower Developments Ltd.	
Job: UWF Related Works	
Title: Lower River Shannon SAC within the Cumulative Evaluation Study Area	
Figure No: Figure CE 11.5	
Drawing No: P1299-2-0318-FCE-11-5-A3-0A	
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Scale: 1:85,000	Drawn By: GD
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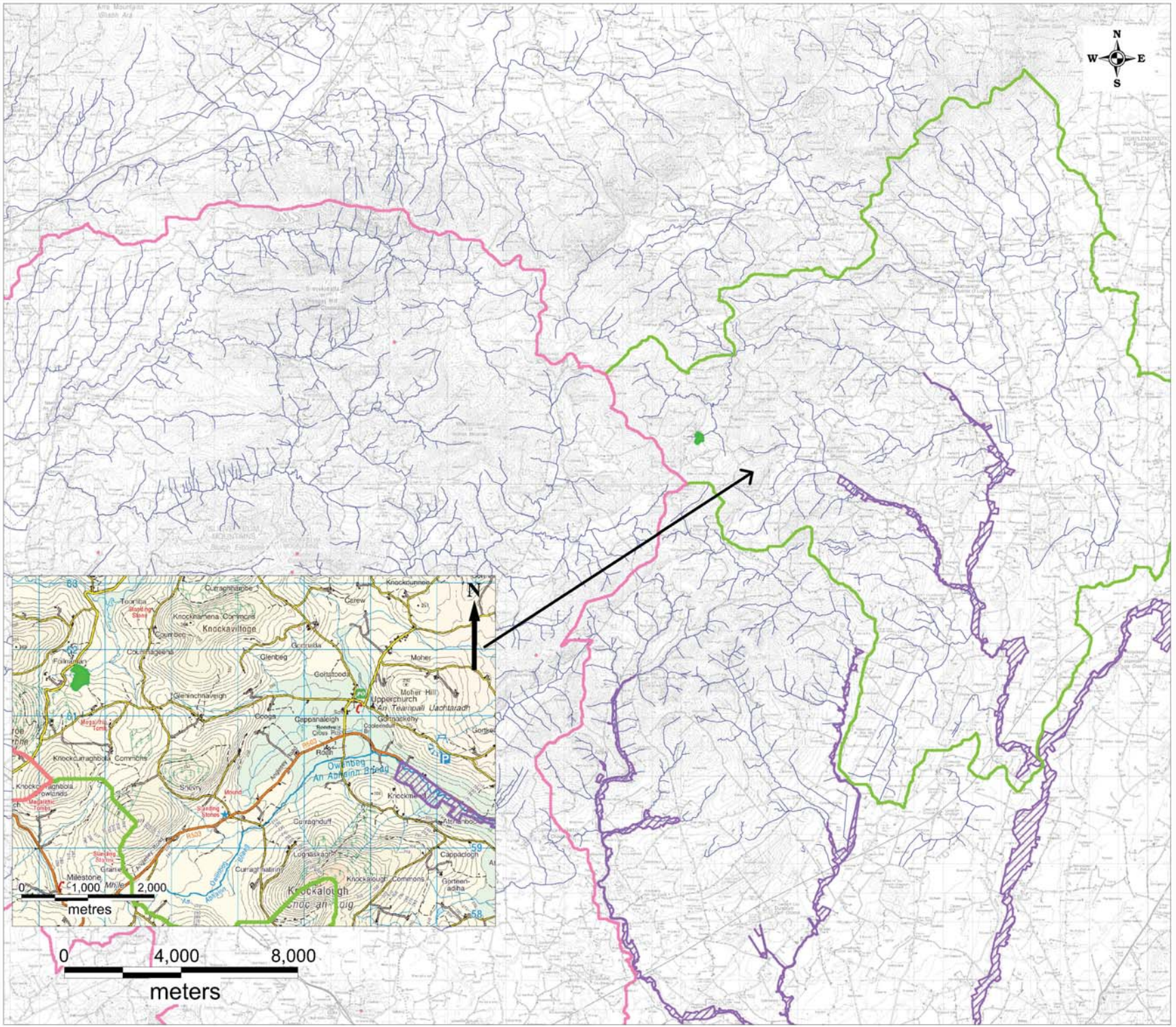

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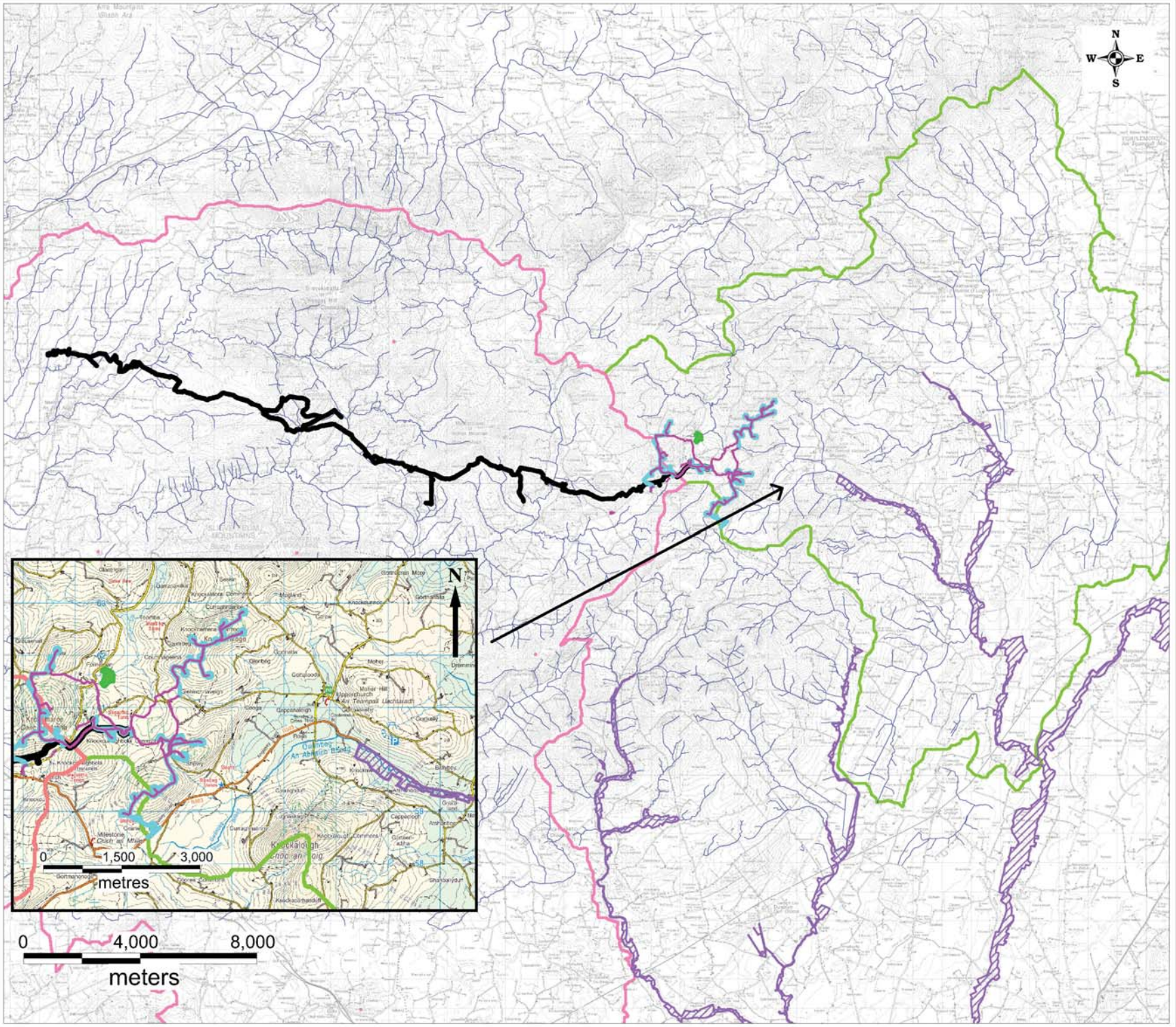
Client: Ecopower Developments Ltd.	
Job: UWF Replacement Forestry	
Title: Lower River Suir SAC within the UWF Replacement Forestry Study Area	
Figure No: Figure RF 11.6	
Drawing No: P1299-2-0318-FRF-11-5-A3-0A	
Sheet Size: A3	Project No: P1299-2
Scale: 1:125,000	Drawn By: GD
Date: 14/03/2018	Checked By: MG



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Client: Ecopower Developments Ltd.	
Job: UWF Replacement Forestry	
Title: Lower River Suir SAC within the Cumulative Evaluation Study Area	
Figure No: Figure CE 11.6	
Drawing No: P1299-2-0318-FCE-11-5-A3-0A	
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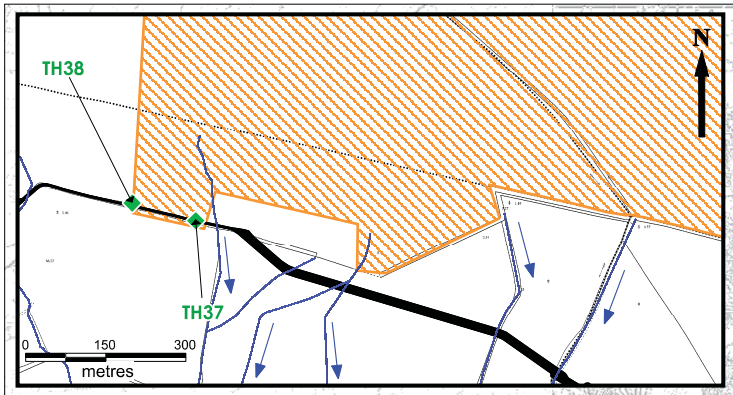
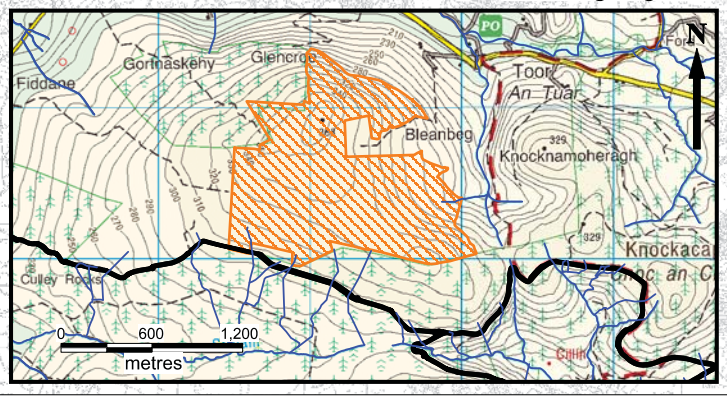
Scale: 1:125,000	Drawn By: GD
Date: 14/03/2018	Checked By: MG



Bleanbeg Bog NHA



0 2,000 4,000
meters

Legend

- UWF Grid Connection Construction Works Area Boundary
- Related Works Construction Works boundary
- Upperchurch Windfarm Construction Works Boundary
- Bleanbeg Bog NHA
- Replacement Forestry Border
- Watercourse
- Surface Water Flow Direction
- Grid Connection Trial Pits

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Client: Ecopower Developments Ltd.	
Job: Upperchurch WF Grid Connection	
Title: Bleanbeg Bog NHA within the Cumulative Evaluation Study Area	
Figure No: Figure CE 11.7	
Drawing No: P1299-2-0218-FCE-11-7-A3-0A	
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Scale: 1:85,000	Drawn By: GD
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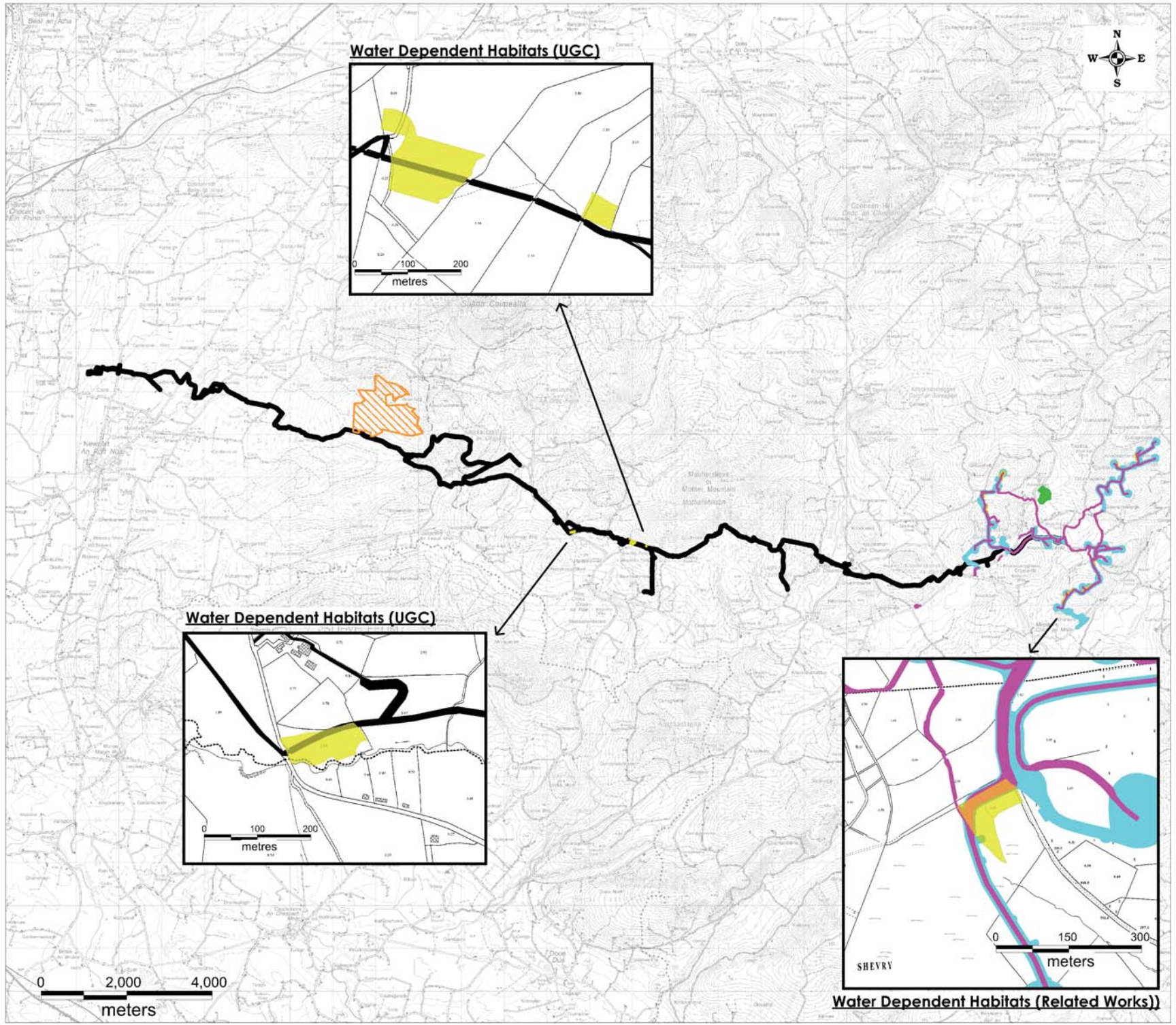

Legend

- UWF Grid Connection Construction Works Area Boundary
- Related Works Construction Works boundary
- Upperchurch Windfarm Construction Works Boundary
- Bleanbeg Bog NHA
- Water Dependent Habitats
- Replacement Forestry Border

*Note: Smaller maps show Local Water Dependent Habitats that are intersected or adjacent to Cable Route
Other Water Dependent Habitats are shown on the main map but these are remote from the Cable Route

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Client: Ecopower Developments Ltd.

Job: UWF Replacement Forestry

Title: Local Water Dependent Habitats within the Cumulative Evaluation Study Area

Figure No: Figure CE 11.8

Drawing No: P1299-2-0218-FCE-11-8-A3-0A

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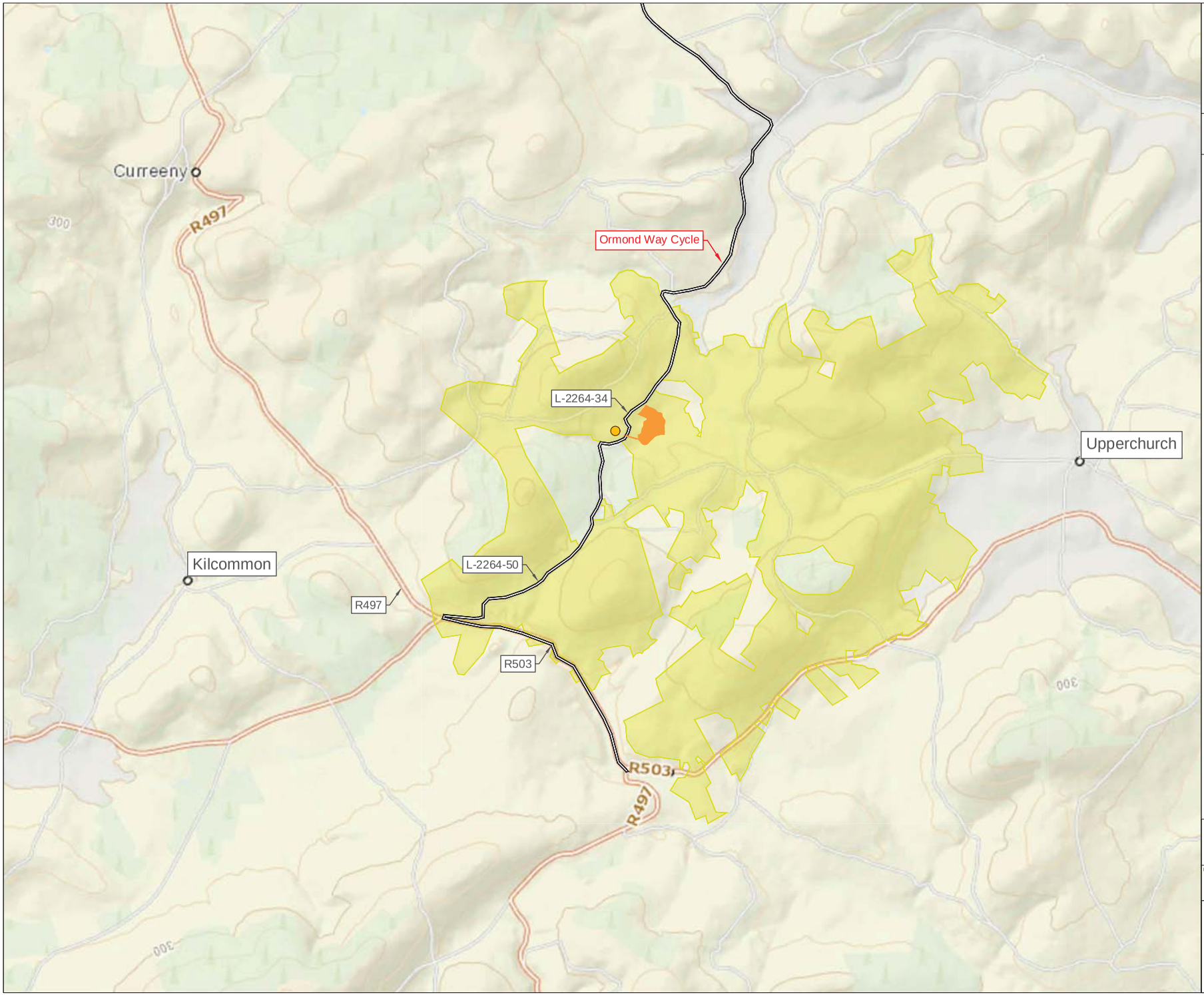

Title:

Figure RF 12.1

Location of the UWF Replacement Forestry

Map Number:
1 of 1

Legend:

- UWF Replacement Forestry Area
- Landholding: Agricultural Land
- Cycling Route
- L-2264-34 — Local Road Number
- House between 51m and 100m of UWF Replacement Forestry Area
- Kilcommon — Village

N

Project:
UWF Replacement Forestry (RF)

Drawn by:	Checked by:	Date:	Sheet Size:
AB	JB	5-Apr-18	A4

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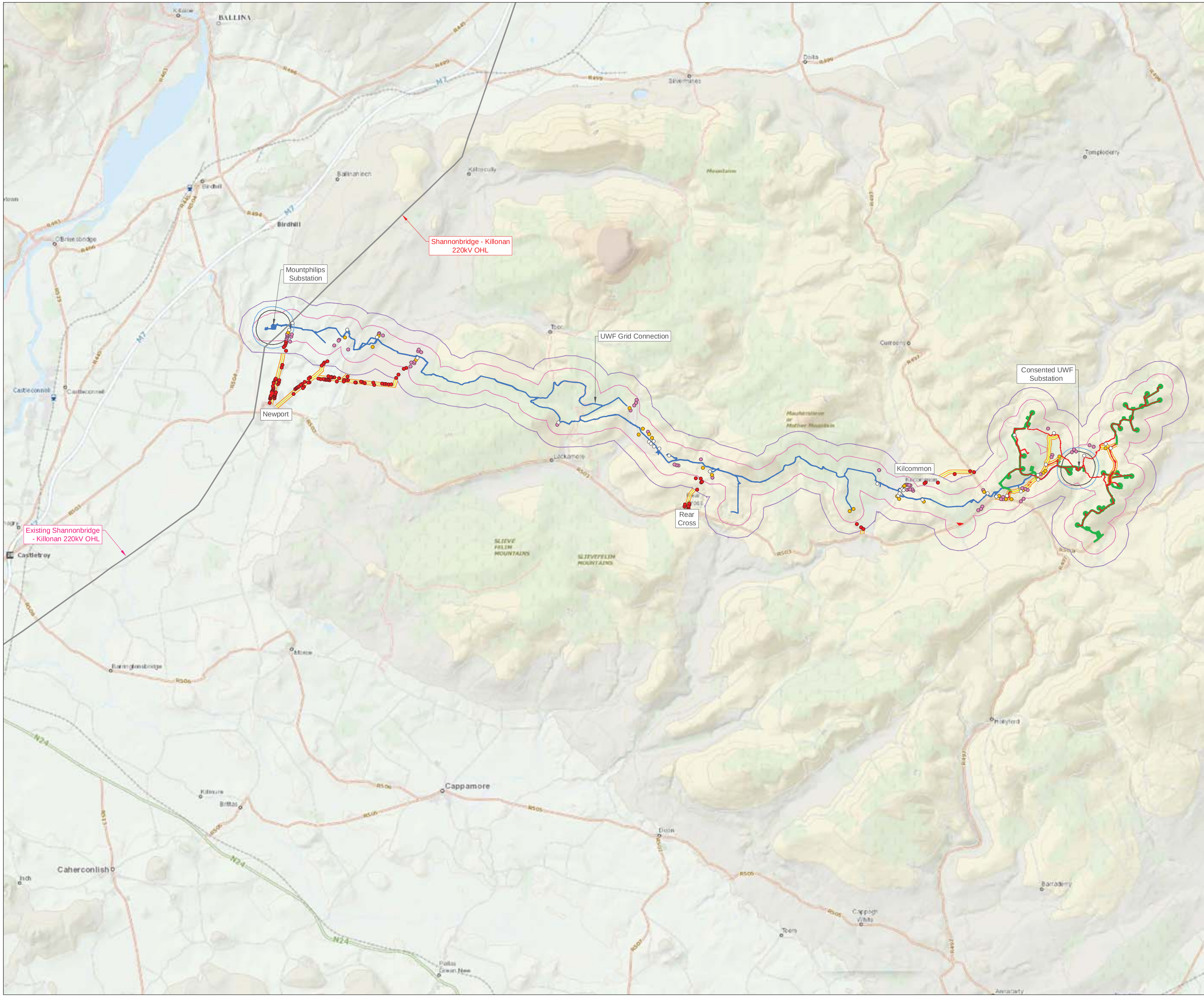

Title:

Figure CE 12.2.1

Local Reisdents & Community (Dust, Noise) within the Cumulative Evaluation Study Area

Map Number:
1 of 1

Legend:

Study Area:

- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Windfarm Construction Works Area
- **Air Quality,Noise & Vibration:** 350m Study Area from all of the Construction Works Areas
- **Air Quality,Noise & Vibration:** 700m Study Area from all of the Construction Works Areas
- **Air Quality,Noise & Vibration:** 400m Study Area from Substations
- **Air Quality,Noise & Vibration:** 500m Study Area from Substations
- **Air Quality,Noise & Vibration:** 50m from the Haul Route Roads
- Haul Route Roads

Survey Results:

- Shannonbridge - Killonan 220kV OHL
- **Air Quality:** Houses 50m from Local Haul Roads
- **Air Quality:** Houses within 50m of Construction Works Area
- **Air Quality:** Houses between 51m and 100m of Construction Works Area
- **Air Quality:** Houses between 101m and 350m of Construction Works Area

N

Project:
UWF Replacement Forestry (RF)

Drawn by:	Checked by:	Date:	Sheet Size:
AB	JB	23-Feb-18	A4

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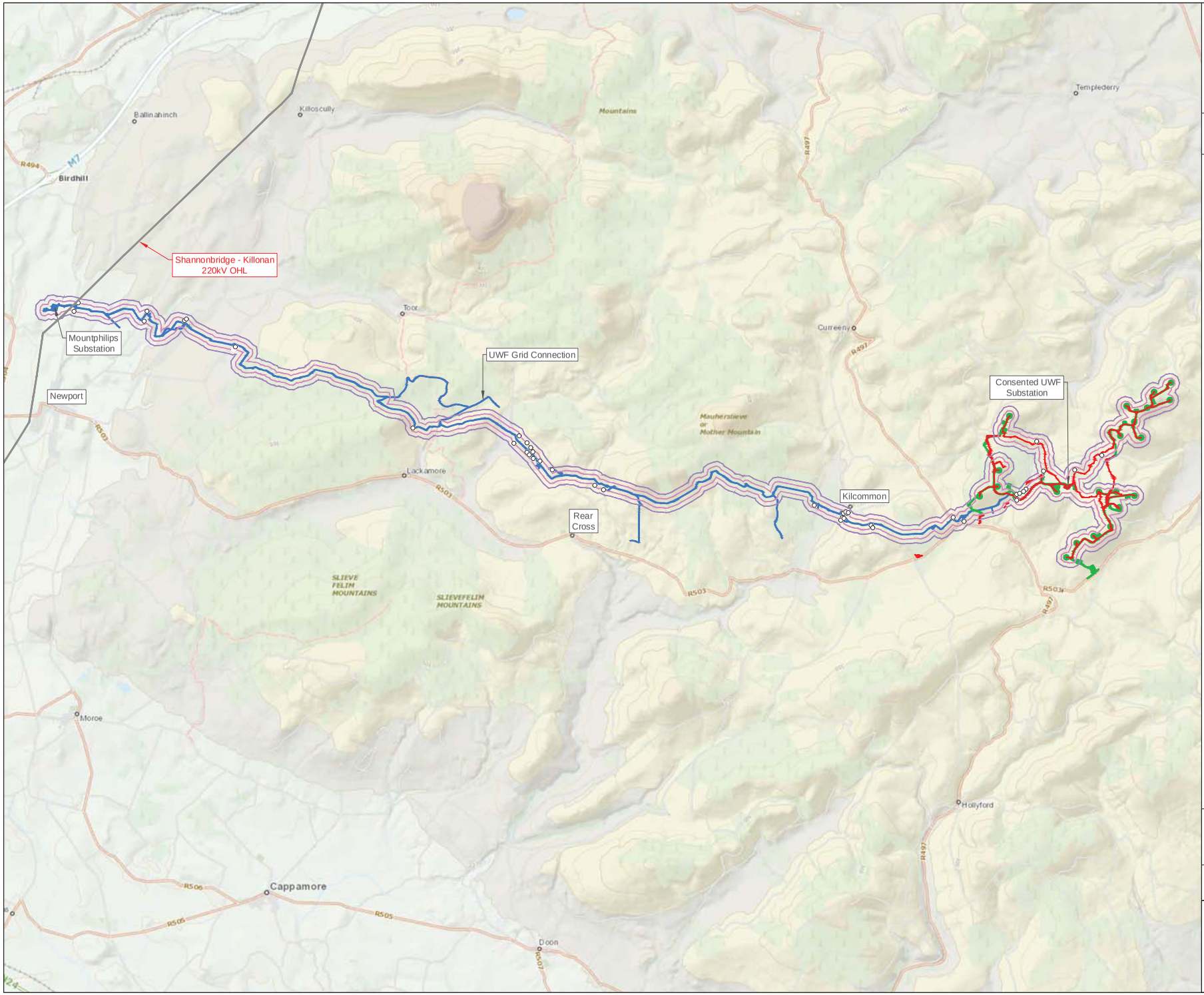

Title:

Figure CE 12.2.2

Local Reisdents & Community (EMF) within the Cumulative Evaluation Study Area

Map Number:
1 of 1

Legend:

Study Area:

- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Windfarm Construction Works Area
- **EMF:** 100m Study Area
  - Mountphilips Substation
  - UWF Grid Connection
  - Internal Windfarm Cabling
  - Consented UWF Turbines
  - Consented UWF Substation
- **EMF:** 200m Study Area
  - Mountphilips Substation
  - UWF Grid Connecion
  - Internal Windfarm Cabling
  - Consented Upperchurch Turbines
  - Consented Upperchurch Substation

Survey Results:

- Shannonbridge - Killonan 220kV OHL
- **EMF:** Houses within the 100m Study Area

Project:
UWF Rplacement Forestry (RF)

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AB	JB	23-Feb-18	A4

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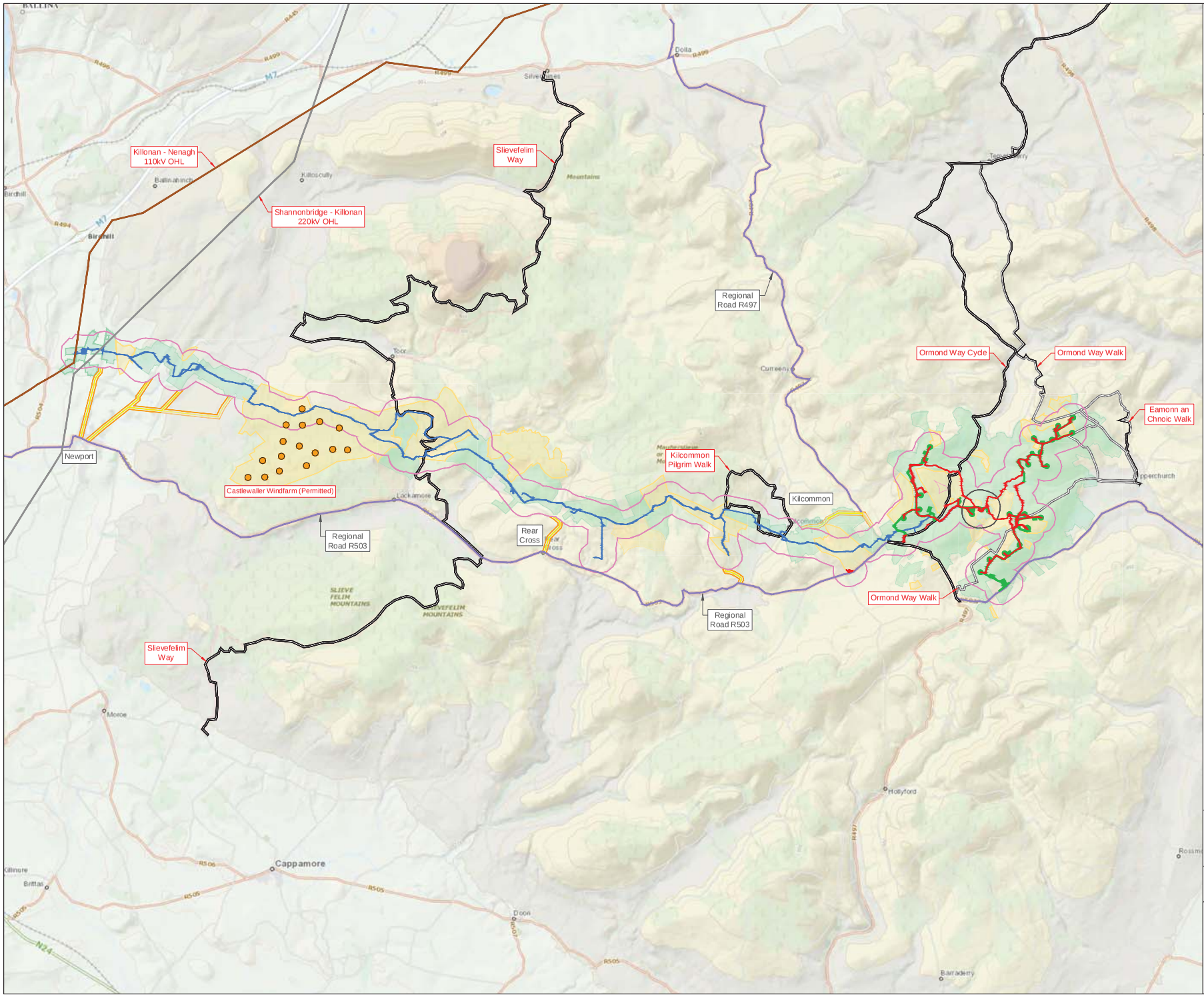

Title:

Figure CE 12.3

Transient People within the Cumulative Evaluation Study Area

Map Number:
1 of 1

Legend:

Study Area:

- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Wndfarm Construction Works Area
- **Air Quality, Noise & Vibration:** 350m Study Area from all of the Construction Works Areas
- **Air Quality, Noise & Vibration:** 50m from the Haul Route Roads
- Haul Route Roads
- **Air Quality, Noise & Vibration:** Regionl Roads
- **Operational Stage Noise:** 400m Study Area
  - Consented Upperchurch Substation

Survey Results:

- **Air Quality, Noise & Vibration:** Landholding - Agricultural Land
- **Air Quality, Noise & Vibration:** Landholding - Forestry
- **Air Quality, Noise & Vibration:** Walking/Cycling Trails
- Shannonbridge - Killonan 220kV OHL
- Killonan - Nenagh 110kV OHL
- Castlewaller Wind Turbines

Project:
UWF Rplacement Forestry (RF)

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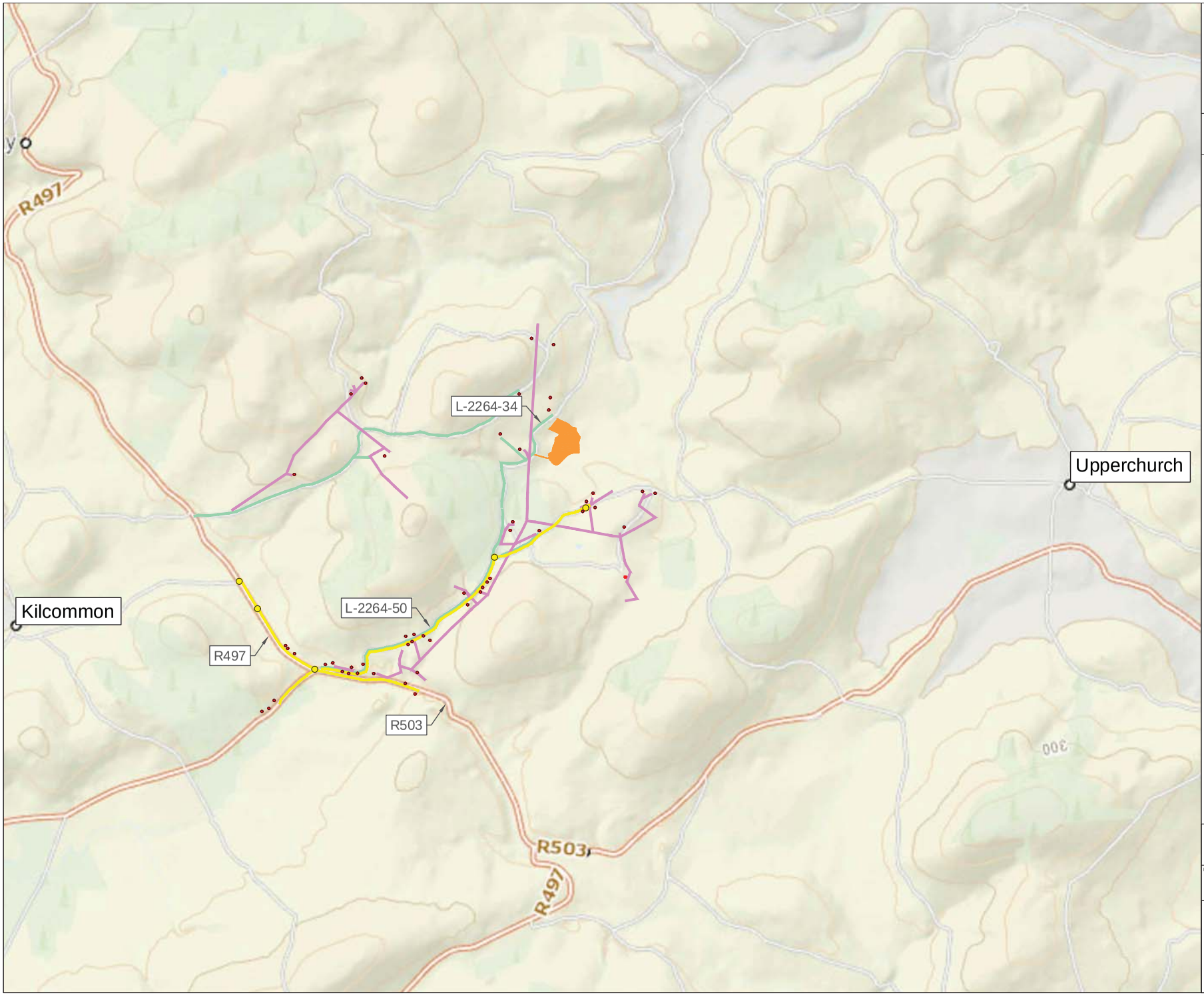
ECOPOWER

Figures for Chapter 13: Climate	Tab 13 (printed version)
No mapping or figures for Chapter 13	



Title:

Figure RF 14.1

Location of the UWF Replacement Forestry

Map Number:
1 of 1

Legend:

- UWF Replacement Forestry Area
- Eir Network
- ESB Networks
- Irish Water Line
- Irish Water Valve
- Built Service Users
- Kilcommon — Village
- L-2264-34 — Local Road Number

N

Project:

UWF Replacement Forestry (RF)

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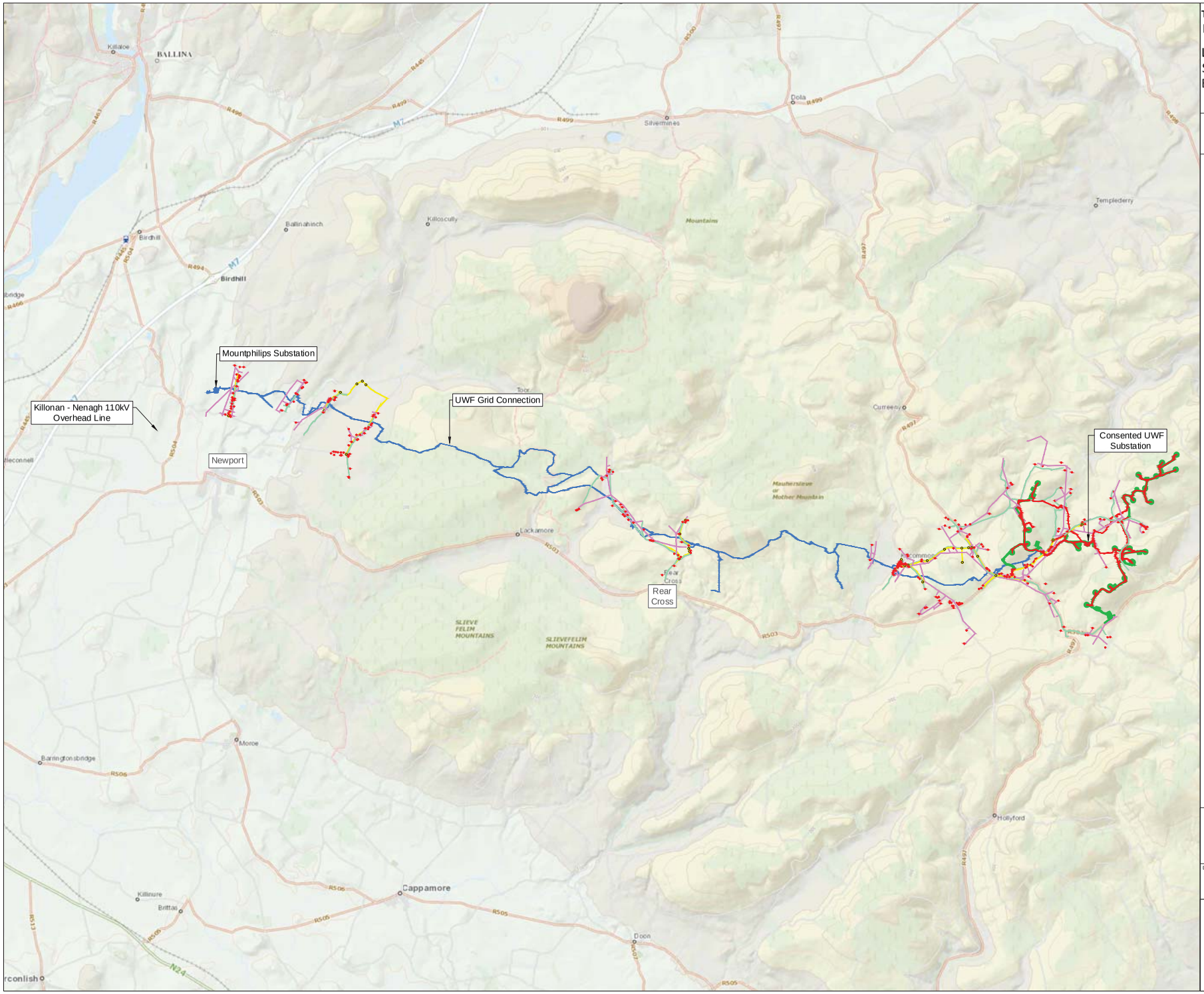

Title:

Figure CE 14.2

Local Residents & Community (Built Services) within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

Study Area Extents:

- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Windfarm Construction Works Area
- Irish Water Line
- Irish Water Valves
- Eir Network
- ESB Networks

Survey Results:

- Built Service Users

Project:
UWF Replacement Forestry (RF)

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AB	JB	14-Feb-18	A4

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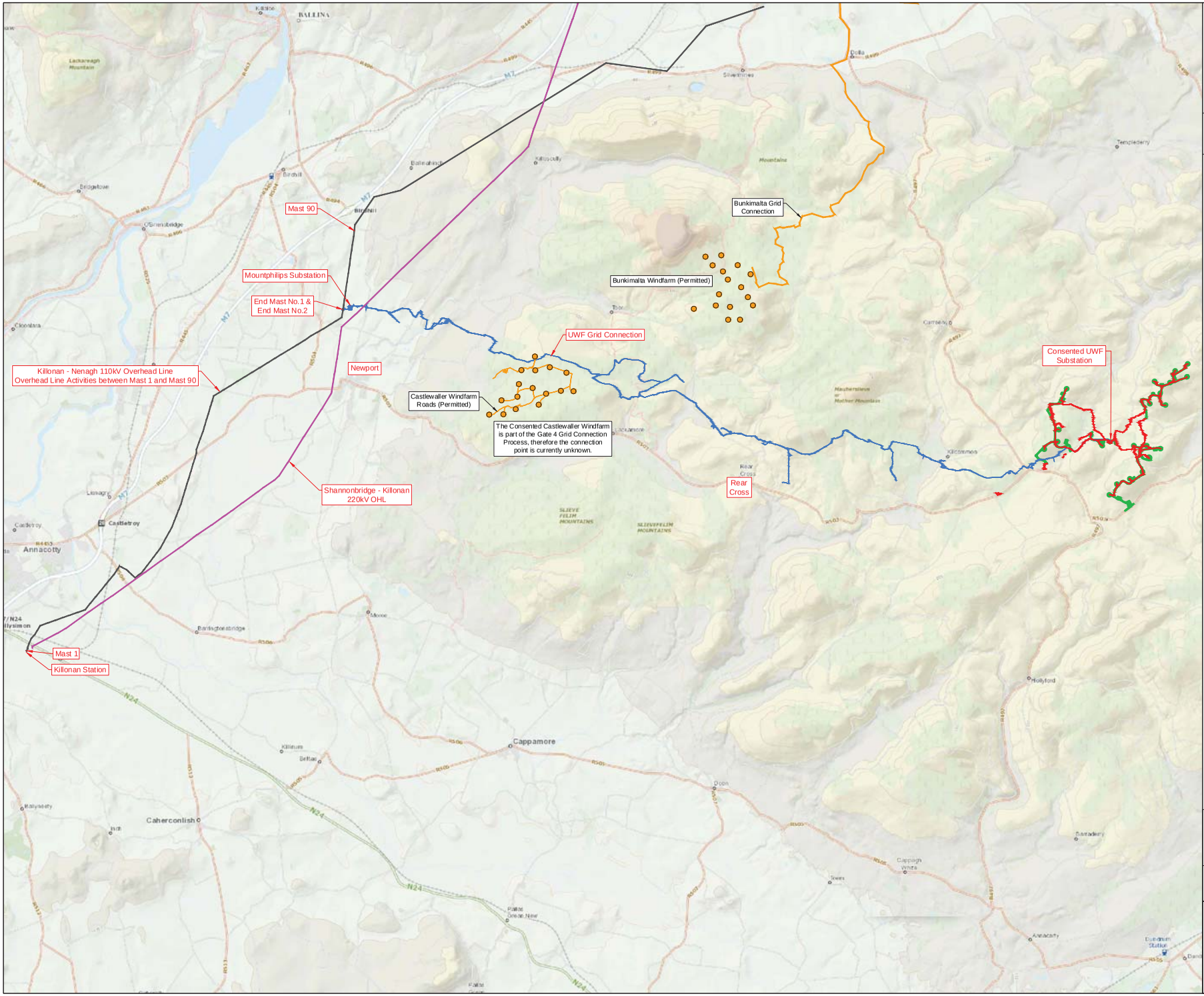

Title:

Figure CE 14.3

Electricity Transmission System within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

Study Area Extents:

- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Windfarm Construction Works Area
- Killonan to Nenagh 110kV Overhead Line
- Shannonbridge to Nenagh 220kV Overhead Line

Survey Results:

- Other existing and permitted windfarm turbines
- Bunkimalta Windfarm Grid Connection

N

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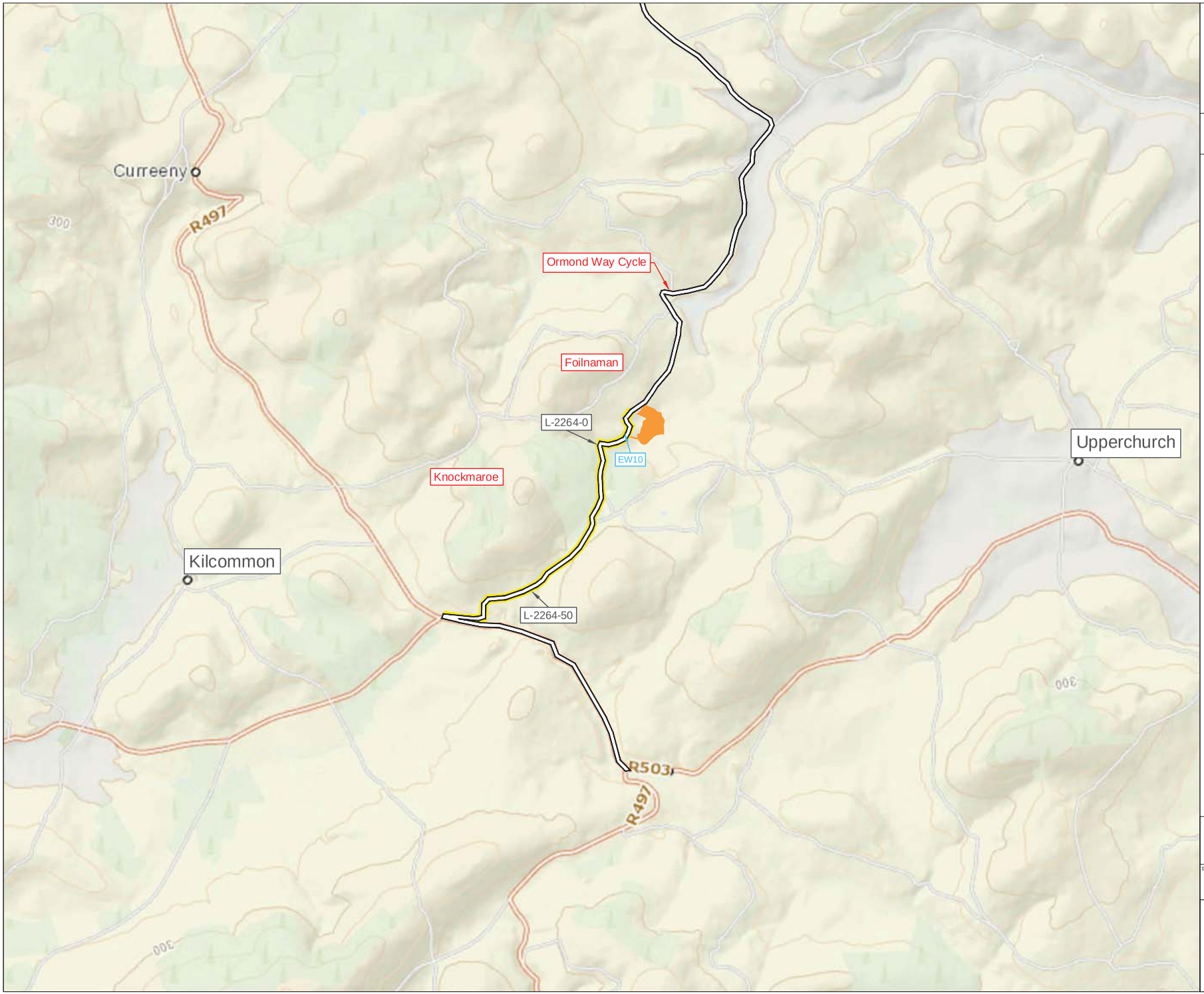

Title:

Figure RF 15.1

Location of the UWF Replacement Forestry

Map Number:
1 of 1

Legend:

- UWF Replacement Forestry Area
- Cycling Route
- EW10 — Site Entrance
- Local Road
- L-2264-0 — Local Road Number
- Foilnaman — Townlands
- Kilcommon — Village

N

Project:

UWF Replacement Forestry (RF)

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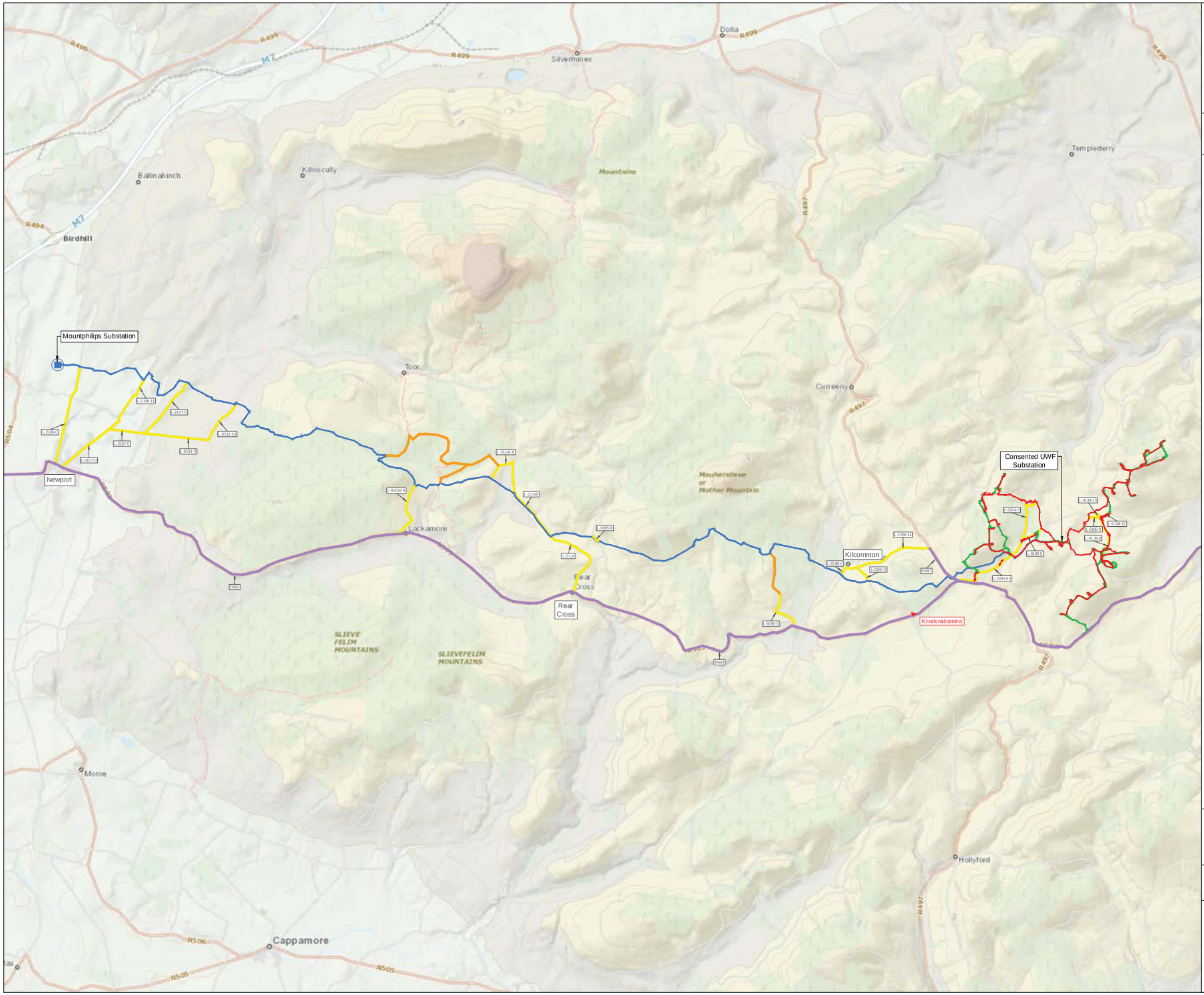

Title:

Figure CE 15.2

Public Roads within the Cumulative Evaluation Study

Map Number:
1 of 1

Legend:

Study Area Extents:

- UWF Grid Connection
- UWF Related Works
- Upperchurch Windfarm
- Public Roads
- Regional Roads
- Existing Access Tracks
- L-2264-50 Road Number

N

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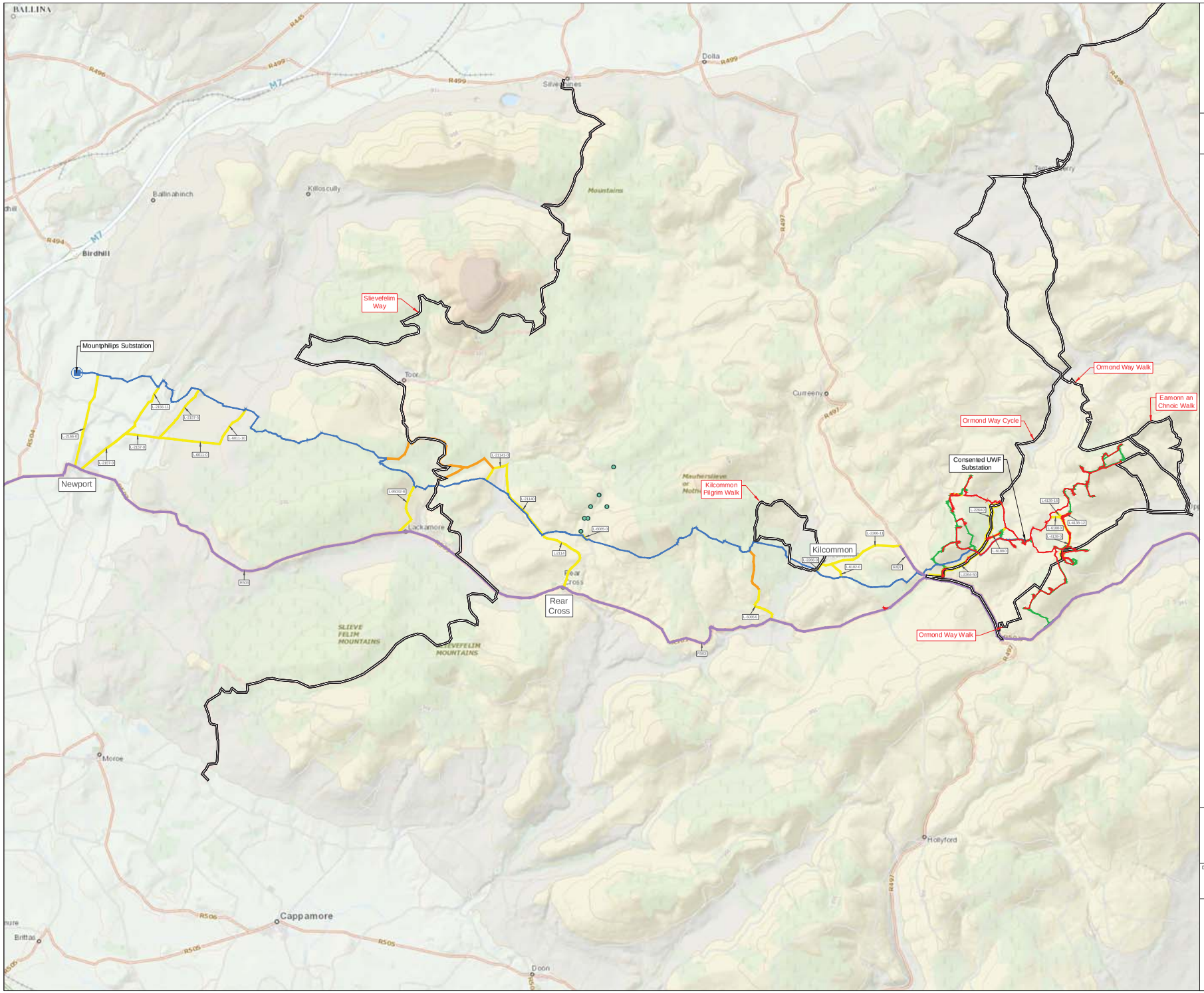

Title:

Figure CE 15.3

Road Users within the Cumulative Evaluation Study

Map Number:
1 of 1

Legend:

Study Area Extents:

- UWF Grid Connection
- UWF Related Works
- Upperchurch Windfarm
- Public Roads
- Regional Roads
- Existing Access Tracks
- Road Number

Survey Results:

- Walking and Cycling Trails
- Residents along the L-6085-0 at Baurnadomeeny

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UWF Replacement Forestry (RF)

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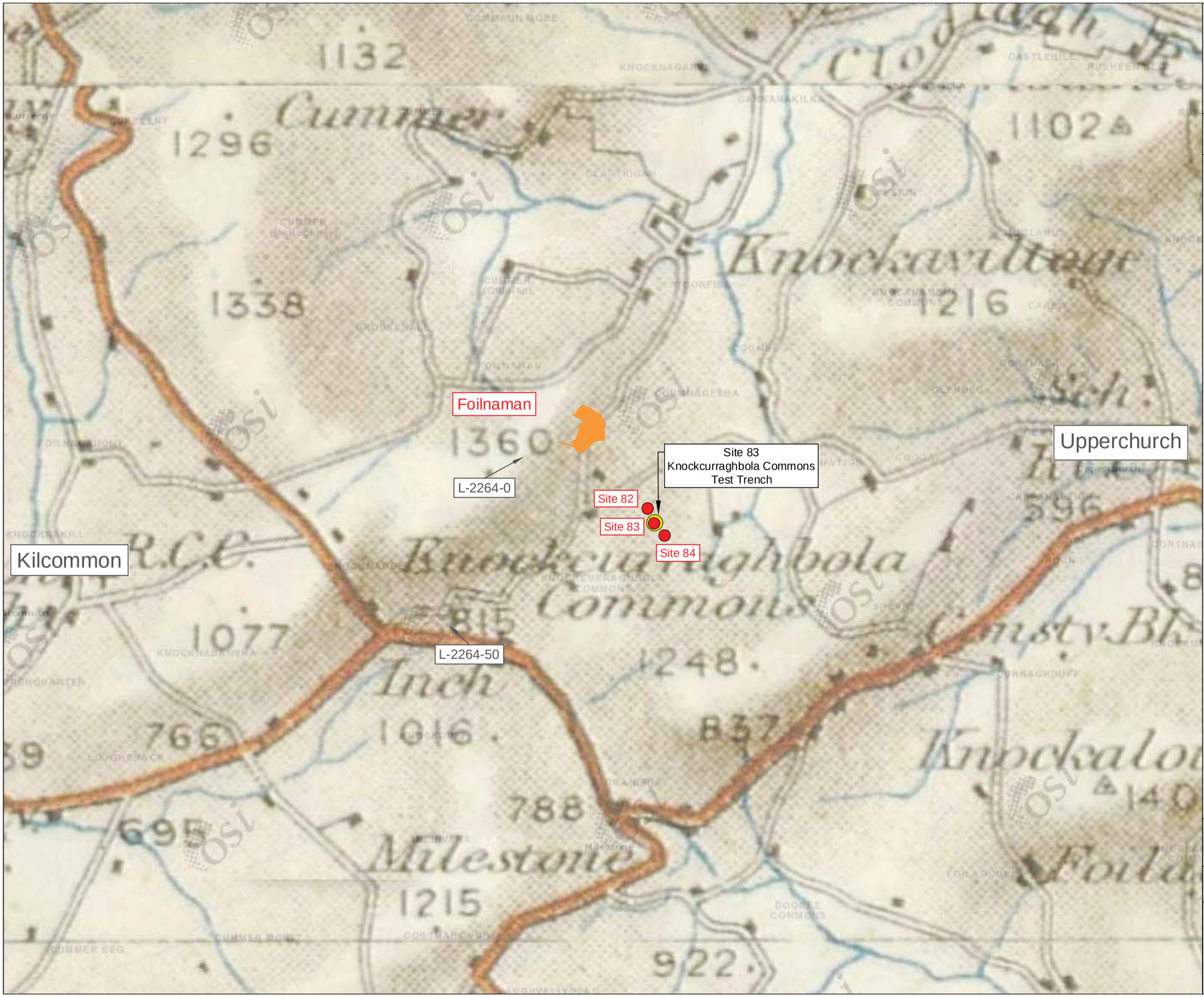

Title:

Figure RF 16.1

Location of the UWF Replacement Forestry on Historical Mappng

Map Number:
1 of 1

Legend:

- UWF Replacement Forestry Area
- L-2264-0 — Local Road Number
- Foilnaman — Townland
- Kilcommon — Village
- Location of Test Trench
- Recorded Legally Protected Sites
- Site 84 — Recorded Legally Protected Sites Identification

N

Project:

UWF Replacement Forestry (RF)

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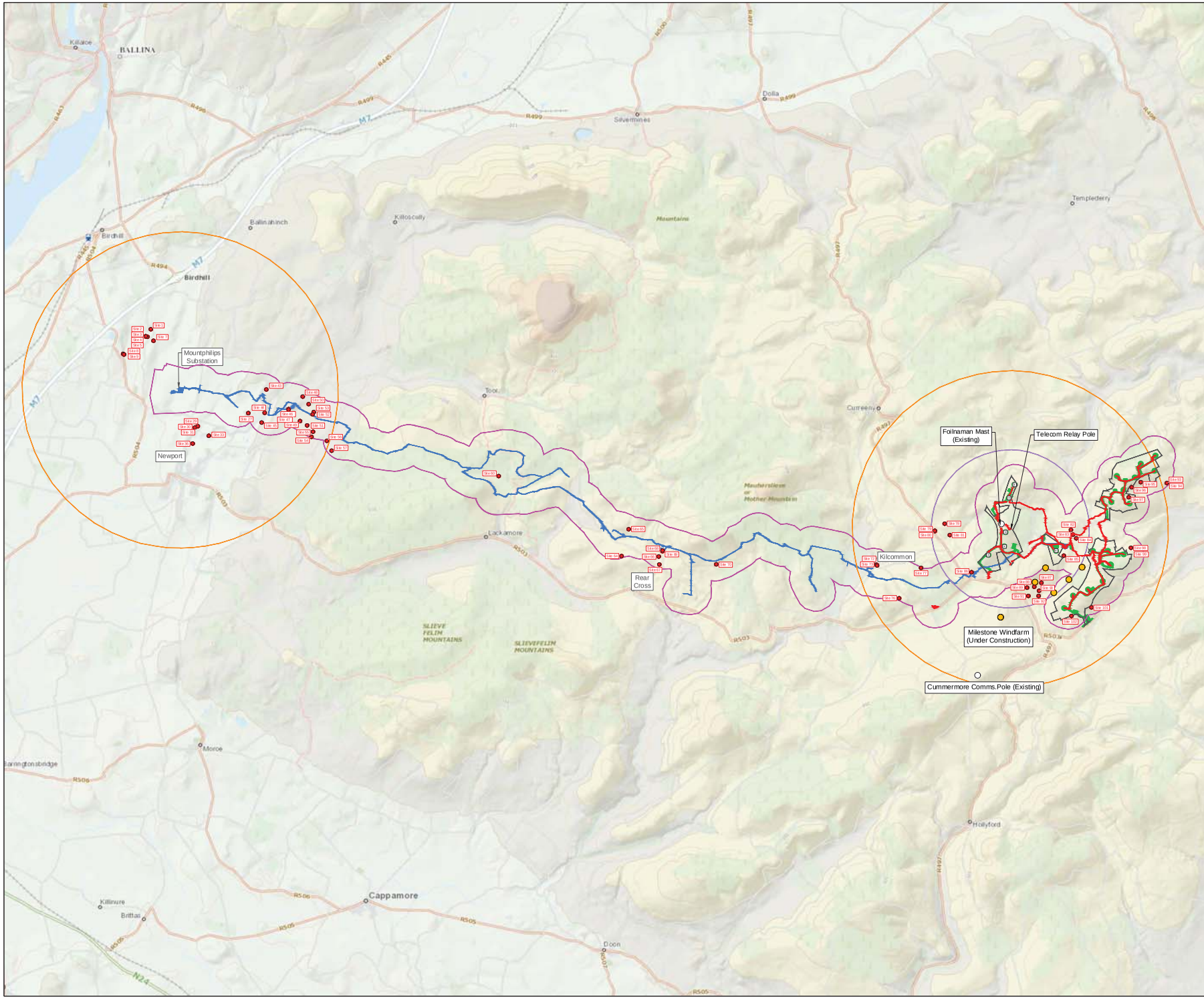

Title:

Figure CE 16.2

Recorded Legally Protected Sites within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

Study Area Extents :

- UWF Related Works
- UWF Grid Connection
- Upperchurch Windfarm
- 500m Study Area
  - UWF Related Works
  - UWF Grid Connection
- Upperchurch Windfarm 2013 Study Area
- 4km Study Area
  - Mountphilips Substation
  - Telecoms Relay Pole

Survey Results :

- Other existing and permitted projects/activity
- Other existing and permitted windfarm turbines
- Recorded Legally Protected Sites
- Site 84 — Recorded Legally Protected Sites Identification
- X — Consented UWF Turbines within 2km of Telecoms Relay Pole

N

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UWF Replacement Forestry(RF)

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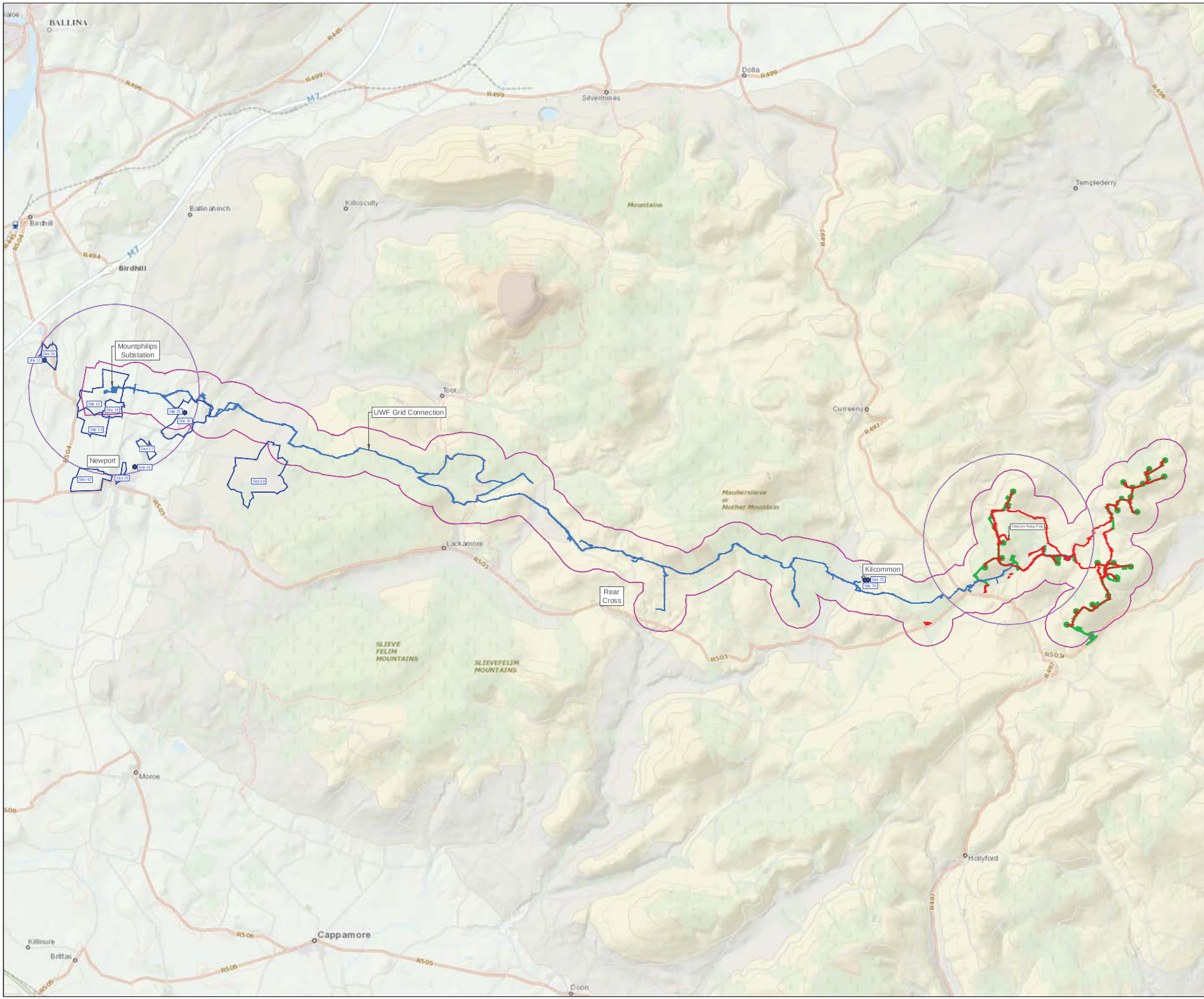

Title:

Figure CE 16.3

Other Recorded Sites within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

Study Area Extents :

- UWF Grid Connection
- UWF Related Works
- Upperchurch Windfarm
- 500m Study Area
  - UWF Grid Connection
  - UWF Related Works
- 2km Study Area
  - Telecoms Relay Pole
  - Mountphilips Substation

Survey Results :

- Other Protected Sites
- Site 58 Other Recorded Sites Identification
- Other Recorded Site - Demesne

N

Project:
UWF Replacement Works (RF)

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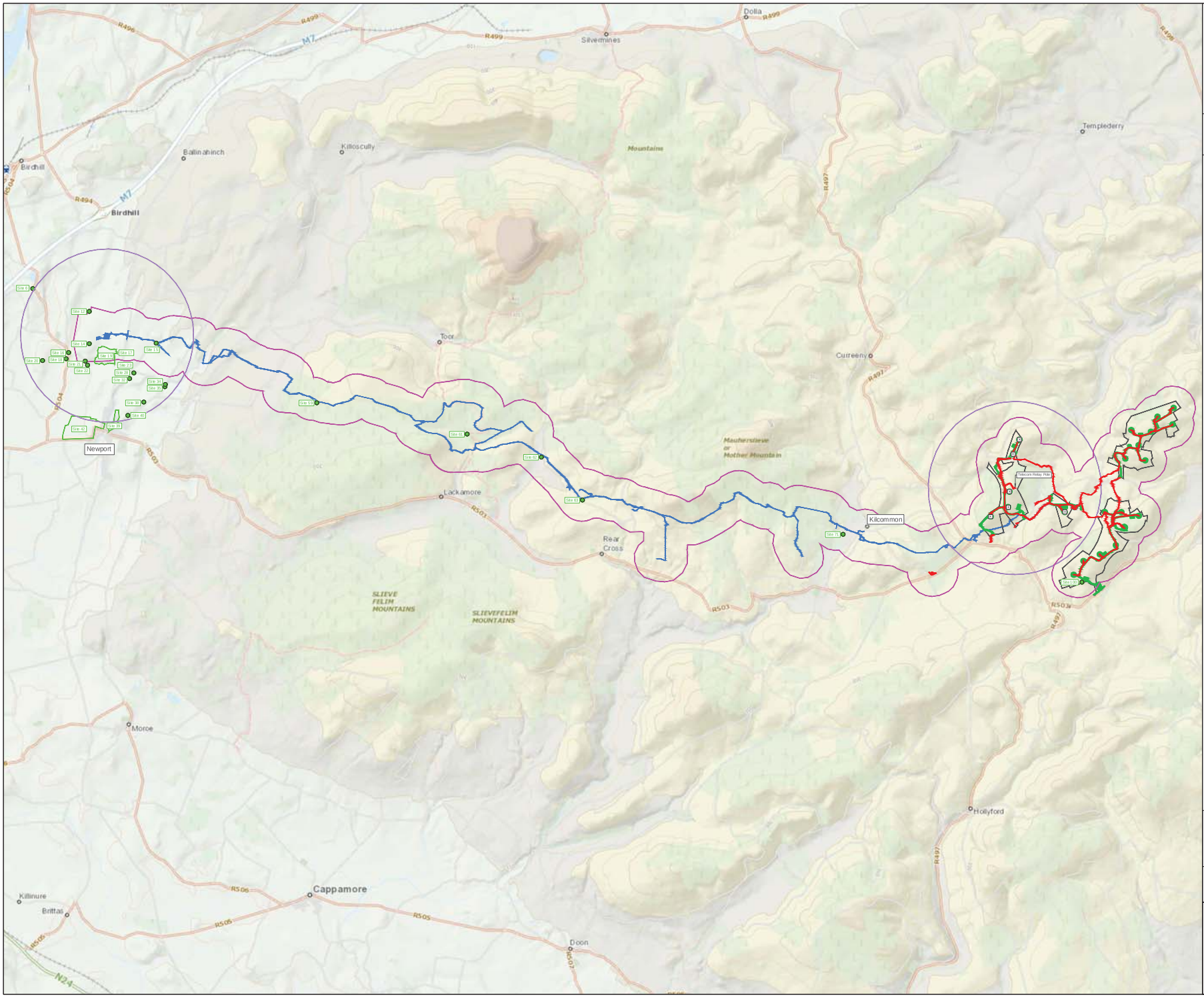

Title:

Figure CE 16.4

Previously Unrecorded Sites within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

Study Area Extents :

- UWF Grid Connection
- UWF Related Works
- Upperchurch Windfarm
- 500m Study Area
  - UWF Grid Connection
  - UWF Related Works
- Upperchurch Windfarm 2013 Study Area
- 2km Study Area
  - Telecoms Relay Pole
  - Mountphilips Substation

Survey Results :

- Previously Unrecorded Sites
- Site 58 Previously Unrecorded Sites Identification
- Previously Unrecorded Sites - Demesne
- X Consented UWF Turbines within 2km of Telecoms Relay Pole

N

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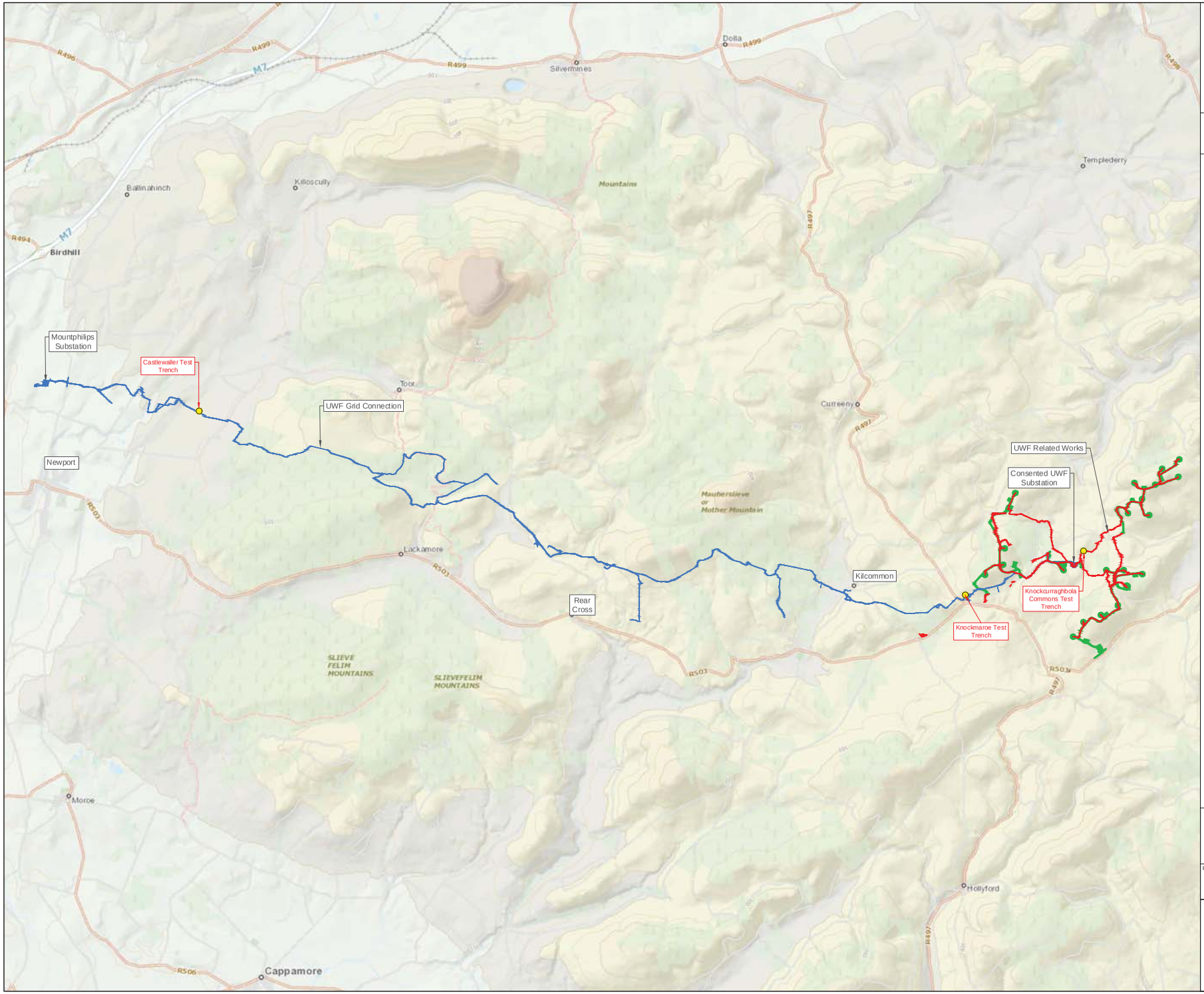

Title:

Figure CE 16.5

Unrecorded Subsurface Sites within the Cumulative Evaluation Study Area

Map Number:
Map 1 of 1

Legend:

Study Area Extents :

- UWF Related Works
- UWF Grid Connection
- Upperchurch Windfarm

Survey Results :

- Location of Test Trench

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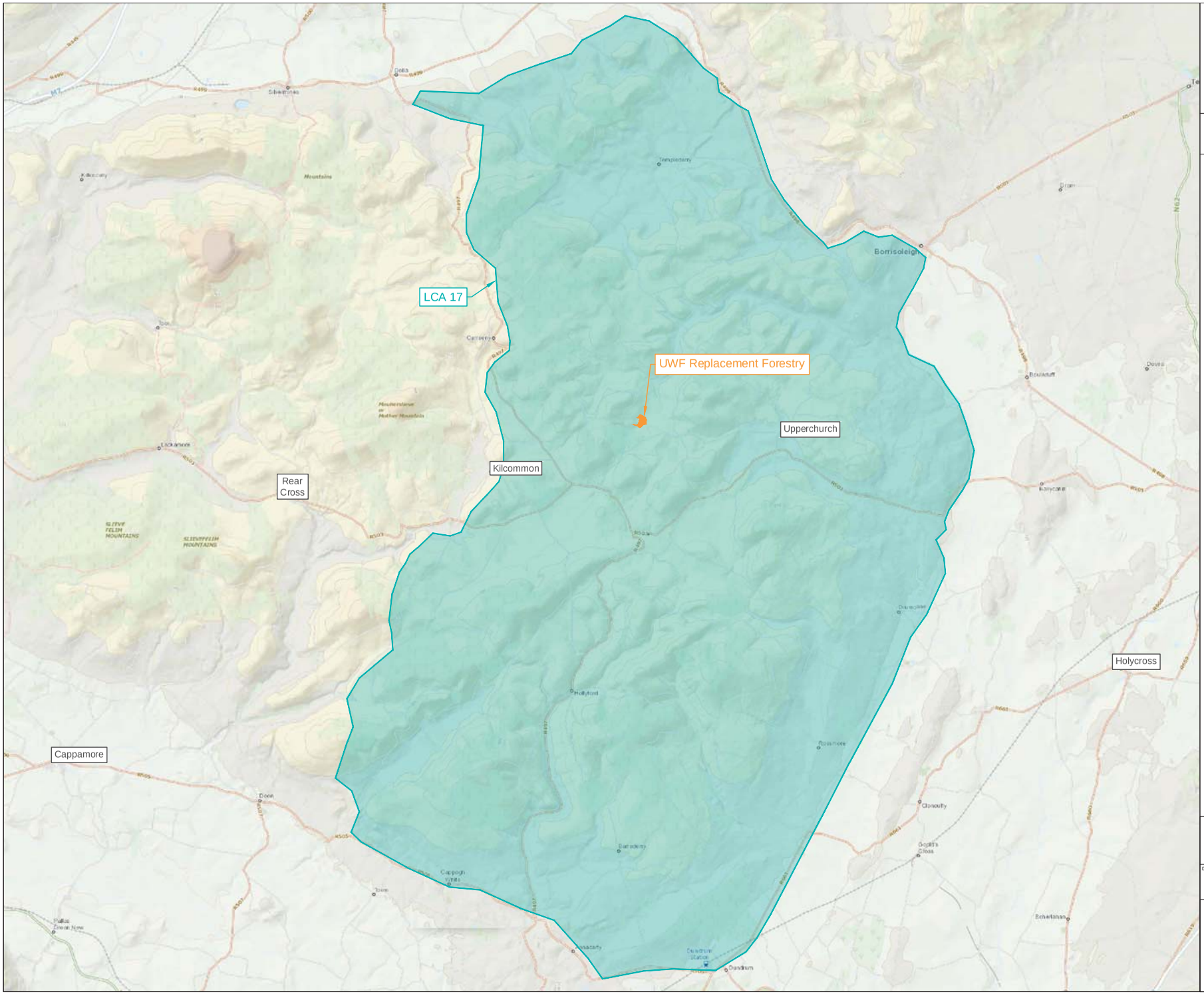

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Figure RF 17.1

Location of the UWF Replacement Forestry

Map Number:
1 of 1

Legend:

- UWF Replacement Forestry Area
- LCA 17 Upperchurch, Kilcommon & Hollyford Mountain Mosaic
- Kilcommon — Village

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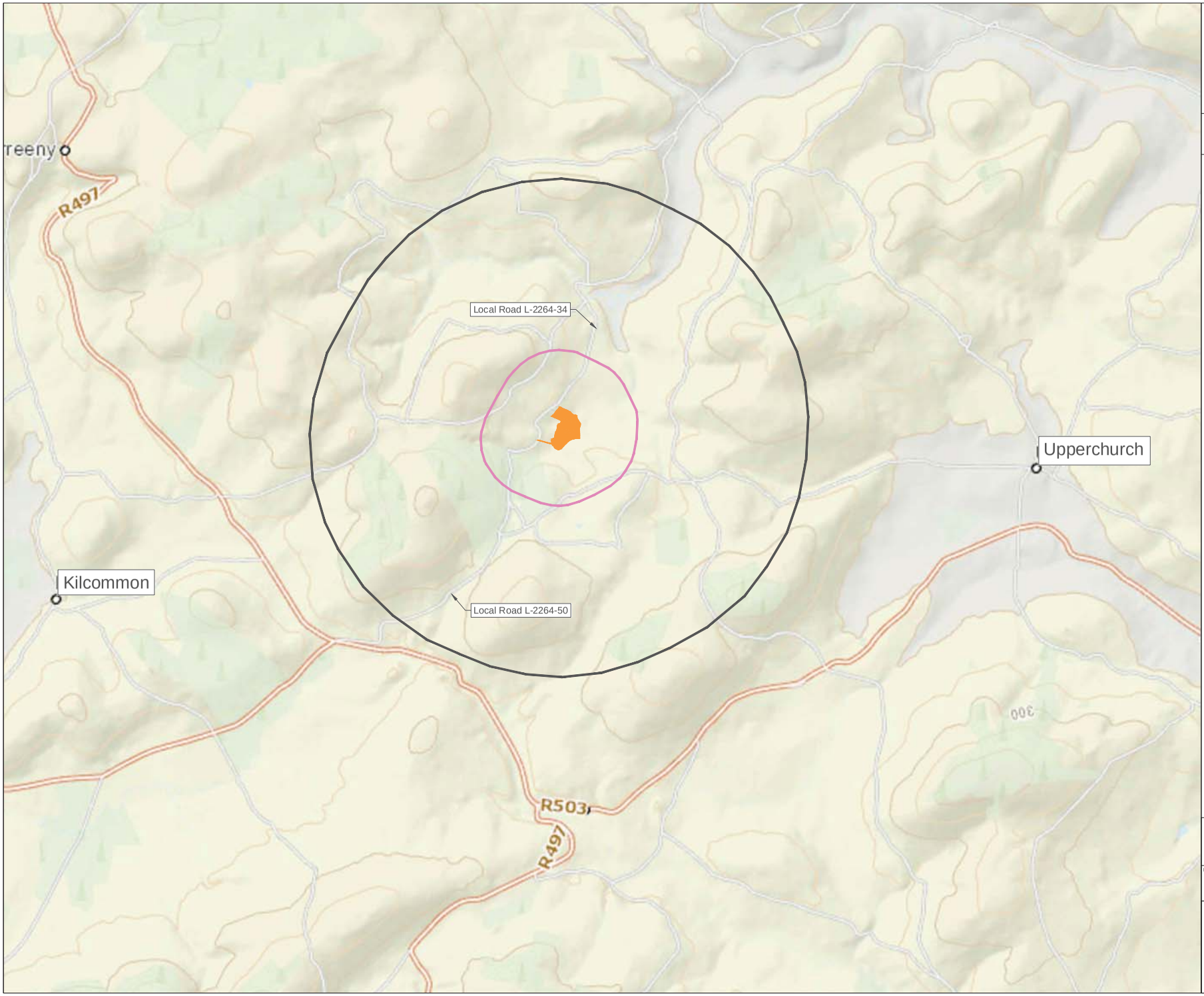

Title:

Figure RF 17.2

Landscape Character within the UWF Replacement Forestry Study Area

Map Number:
1 of 1

Legend:

- UWF Replacement Forestry Area
- L-2264-0 — Local Road Number
- Kilcommon — Village
- 500m Study Area from the UWF Replacement Forestry
- 2km Study Area from the UWF Replacement Forestry

N

Project:

UWF Replacement Forestry (RF)

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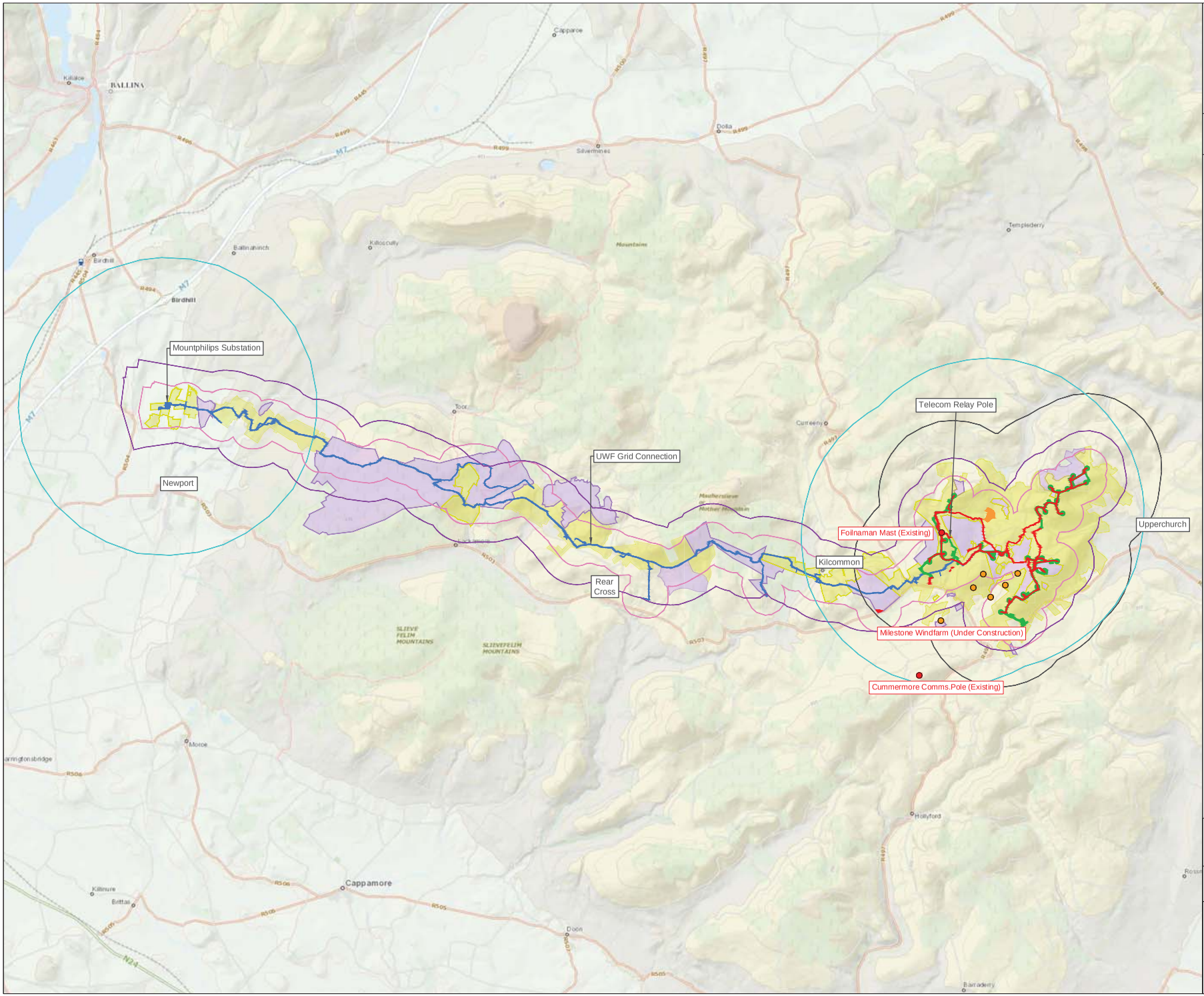

Title:

Figure CE 17.2

Landscape Character within the Cumulative Evaluation Study Area

Map Number:
1 of 1

Legend:

Study Area:

- UWF Replacement Forestry Area
- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Windfarm
- 1km Study Area
  - UWF Grid Connection
  - Internal Windfarm Cabling
  - Realigned Windfarm Roads
- 2km Study Area
  - Telecom Relay Pole
  - UWF Replacement Forestry
  - Consented UWF Substation and UWF Wind Turbines
- 4km Study Area
  - Mountphilips Substation
  - Telecom Relay Pole
  - UWF Replacement Forestry
- 500m Study Area from Construction Works Areas

Survey Results:

- Existing Milestone Windfarm
- Other existing and permitted projects/activity
- Landholding - Agricultural Land
- Landholding - Forestry Land

N

Project:

UWF Replacement Forestry (RF)

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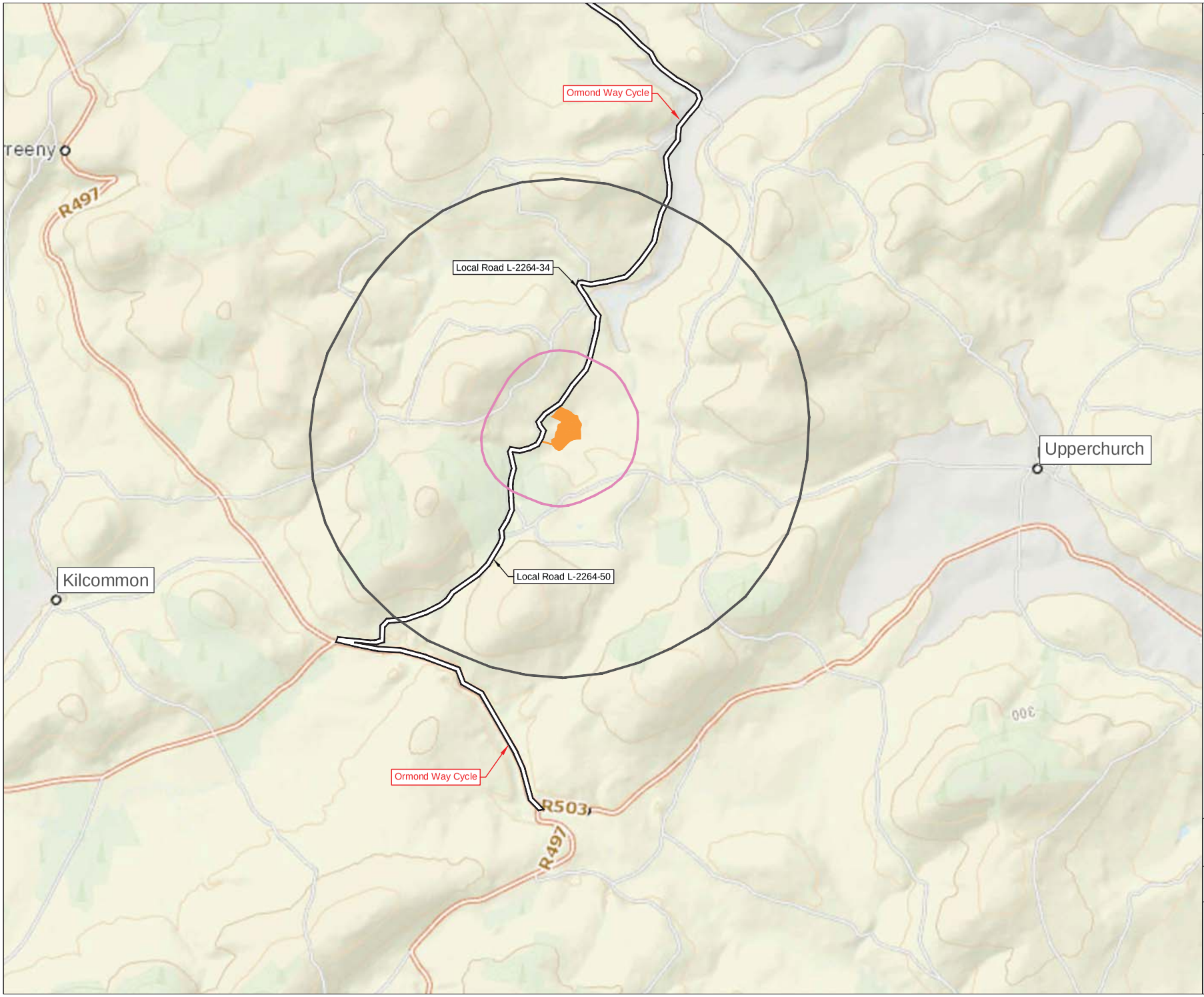

Title:

Figure RF 17.3

Visual Amenity within the UWF Replacement Forestry Study Area

Map Number:
1 of 1

Legend:

Study Area:

- UWF Replacement Forestry Area
- 500m Study Area from the UWF Replacement Forestry
- 2km Study Area from the UWF Replacement Forestry

Survey Results:

- Cycling Route

N

Project:

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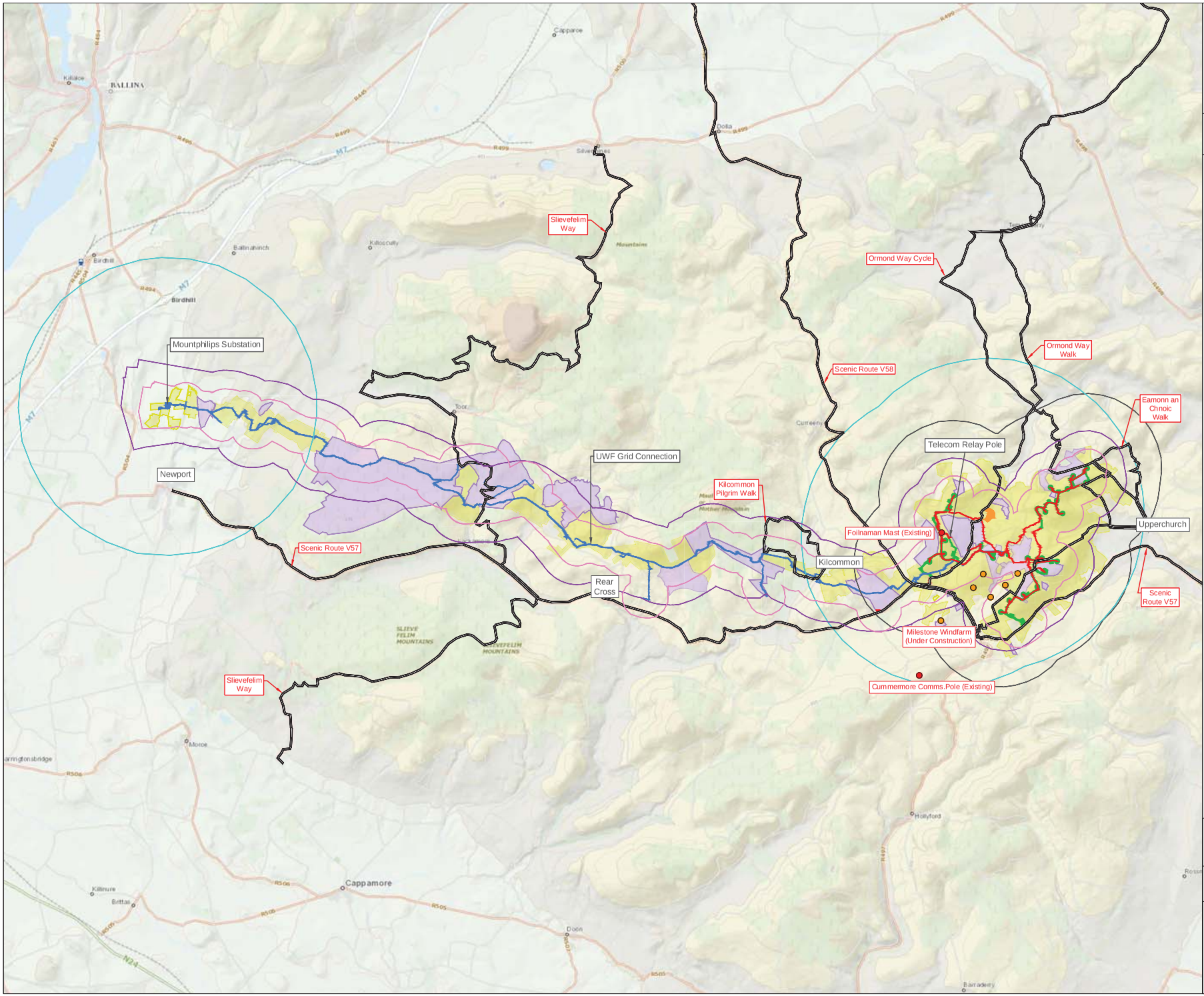

Title:

Figure CE 17.3

Visual Amenity within the Cumulative Evaluation Study Area

Map Number:
1 of 1

Legend:

Study Area:

- UWF Replacement Forestry Area
- UWF Grid Connection Construction Works Area
- UWF Related Works Construction Works Area
- Upperchurch Windfarm
- 1km Study Area
  - UWF Grid Connection
  - Internal Windfarm Cabling
  - Realigned Windfarm Roads
- 2km Study Area
  - Telecom Relay Pole
  - UWF Replacement Forestry
  - Consented UWF Substation and UWF Wind Turbines
- 4km Study Area
  - Mountphilips Substation
  - Telecom Relay Pole
  - UWF Replacement Forestry
- 500m Study Area from Construction Works Areas

Survey Results:

- Existing Milestone Windfarm
- Other existing and permitted projects/activity
- Landholding - Agricultural Land
- Landholding - Forestry Land
- Walking/Cycling and Scenic Routes

N

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Figures for Chapter 18: Interaction of the Foregoing	Tab 18 (printed version)
No mapping or figures for Chapter 18	

Figures for Chapter 19: Monitoring Arrangements	Tab 19 (printed version)
No mapping or figures for Chapter 19	

Figures for Chapter 20: Executive Summary	Tab 20 (printed version)
No mapping or figures for Chapter 20	