AtkinsRéalis

Environmental Impact Assessment Report (EIAR) Volume 2 – Chapter 7 – Biodiversity

Uisce Éireann

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BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE

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Contents

Abbreviations 7-i

Glossary 7-ii

7. Biodiversity 7-1

7.1 Statement of Authority 7-1

7.2 Methods 7-2
7.2.1 Legislative and policy context 7-2
7.2.2 Ecological study area and Zone of Influence 7-3
7.2.3 Desk study 7-4
7.2.4 Site survey 7-7
7.2.5 Valuing ecological importance 7-8
7.2.6 Determining ecologically significant effects 7-8
7.2.7 Mitigation and overall residual ecological impact 7-9
7.2.8 Appropriate Assessment (AA) 7-9
7.2.9 Difficulties encountered in completion of this chapter 7-9

7.3 Description of receiving environment 7-9
7.3.1 General overview 7-9
7.3.2 European sites 7-10
7.3.3 National sites 7-29
7.3.4 National Nature Reserves 7-35
7.3.5 Non-Qualifying Interest Annex I habitat 7-35
7.3.6 Wetland Sites (Wetland Survey Ireland) 7-37
7.3.7 Surface water features 7-42
7.3.8 Woodlands 7-56
7.3.9 Bird sites 7-62
7.3.10 Site Surveys - Predominant habitats identified 7-63
7.3.11 Faunal Species - documented and site survey evidence 7-87
7.3.12 Key ecological features 7-94

7.4 Potential Impacts 7-102
7.4.1 Types of Impacts 7-102
7.4.2 Do-Nothing Scenario 7-102
7.4.3 Designated Sites 7-103
7.4.4 Annex I habitats 7-113
7.4.5 Wetland habitats 7-114
7.4.6 Surface Water Features and Aquatic Species 7-115
7.4.7 Habitats 7-115
7.4.8 Fauna 7-119
7.4.9 Flora 7-120
7.4.10 Invasive species 7-120

7.5 Mitigation and monitoring 7-121
7.5.1 Design Stage Mitigation Measures 7-121
7.5.2 Preconstruction Mitigation Measures 7-122
7.5.3 Construction Stage Mitigation Measures 7-123

7.5.4 Additional construction phase mitigation measures....7-133
7.5.5 Locations for Construction Phase Mitigation Measures....7-133
7.6 Cumulative Effects....7-136
7.6.1 Plans....7-137
7.6.2 Other Projects....7-137
7.6.3 Cumulative Impacts to Habitats....7-138
7.6.4 Cumulative Impacts to Species....7-139
7.6.5 Overall Cumulative Impact Conclusion....7-140
7.7 Interactions....7-140
7.8 Residual Effects....7-141
7.9 References....7-143

Tables

Table 7-1 — Approach to Mitigation....7-9

Table 7-2 — European Sites within potential connectivity to the Proposed Development. 7-11

Table 7-3 — NHAs and pNHAs within the ZoI of the Proposed Development....7-30

Table 7-4 — Wetland crossing points of the Proposed Development.....7-37

Table 7-5 — Surface water features crossed by the Proposed Development....7-42

Table 7-6 — Macroinvertebrate Kick sampling results Abbeytown Stream....7-46

Table 7-7 — Macroinvertebrate Kick sampling results Brusna River....7-48

Table 7-8 — Macroinvertebrate Kick sampling results of Fiddaun Stream and Srafaungal Stream....7-50

Table 7-9 — Macroinvertebrate Kick sampling results Srafaungal Stream crossing....7-51

Table 7-10 — Macroinvertebrate Kick sampling results Glenree Stream....7-52

Table 7-11 — Bird Species recorded within 1km along the Proposed Development route within the past 10 years ..7-87

Table 7-12 — Other Notable Species recorded within 1km along the Proposed Development route....7-91

Table 7-13 — Evaluation of Key Ecological Receptors....7-95

Table 7-14 — Proposed biodiversity enhancement measures....7-118

Table 7-15 — Locations for Mitigation Measures....7-133

Table 7-16 — Interactions between Environmental Aspects of the Proposed Development....7-140

Figures

Figure 7-1 — SACs within the Potential Zone of Influence of the Proposed Development 7-19

Figure 7-2 — SPAs within the Potential Zone of Influence of the Proposed Development 7-20

Figure 7-3 — Proposed Development at Lough Conn within River Moy SAC (and Lough Conn and Lough Cullin SPA).....7-22

Figure 7-4 — Proposed Development at the Brusna River crossing within River Moy SAC 7-24

Figure 7-5 — Proposed Development on the west and east side Moy Estuary within Killala Bay / Moy Estuary SAC / SPA.....7-26

Figure 7-6 — Proposed Development alongside Lough Hoe Bog SAC.....7-28

Figure 7-7 — NHAs, and pNHAs located within the Potential ZoI of the Proposed Development.....7-34

Figure 7-8 — Non-Qualifying Interest Annex I Habitats within the Ox Mountains.....7-36

Figure 7-9 - Eastern section of pipeline along roadway adjacent to WSI Wetland Site Boundaries.....7-39

Figure 7-10 - Mid section of pipeline route along Behy Road alongside WSI Wetland Site Boundaries 7-40

Figure 7-11 - Western section of pipeline route along R294 roadway alongside WSI Wetland Site Boundaries 7-41

Figure 7-12 - Watercourses crossed by the Proposed Development.....7-45

Figure 7-13 — Abbeytown Stream at proposed crossing point.....7-47

Figure 7-14 — Brusna River at proposed crossing point (via HDD) in River Moy SAC.....7-49

Figure 7-15 — Fiddaun Stream at crossing point.....7-50

Figure 7-16 — Srafaungal Stream at crossing point 7-50

Figure 7-17 — Srafaungal Stream at crossing point 7-51

Figure 7-18 — Glenree Stream at crossing point.....7-52

Figure 7-19 - Alignment of the Proposed Pipeline through Belleek Woods and Castle Grounds 7-60

Figure 7-20 — Pipeline alignment along overgrown gravel track west side of Belleek Woods 7-61

Figure 7-21 — Pipeline alignment along gravel track centre of Belleek Woods 7-61

Figure 7-22 — Pipeline alignment along tarmac road (Cyril's Way) east side of Belleek Woods.....7-61

Figure 7-23 - Pre-Development Habitat Map of Wherrew Raw Water Intake and Pumping Station.....7-64

Figure 7-24 - Pre-Development Habitat Map of Lisglennon WTP site 7-66

Figure 7-25 - Pre-Development Habitat Map of Lisglennon Reservoir site.....7-68

Figure 7-26 — Pre-Development Habitat Map of off road pipeline route east of Lisglennon Reservoir site 7-70

Figure 7-27 — Pre-Development Habitat Map of pipeline route through River Moy SAC / Brusna River crossing.7-72

Figure 7-28 - Agricultural grassland crossed by the proposed pipeline and within Bonniconlon BPS site 7-74

Figure 7-29 — Off Road Stream crossing and Bonniconlon Reservoir Site (existing).....7-76

Figure 7-30 — Pre-Development Habitat Map at Srafaungal Stream crossing 7-78

Figure 7-31 — Cutover Blanket Bog at the Windy Gap Break Pressure Tank Site 7-80

Figure 7-32 — Crossing location of unnamed stream at Lough Talt and location of optimal *V. geyeri* habitat 7-82

Figure 7-33 — Predevelopment Habitat Map of Lough Talt WTP.....7-84

Figure 7-34 — Japanese and Himalayan Knotweed stand at Belleek Woods.....7-93

Abbreviations

Abbreviation	Term
AA	Appropriate Assessment
BPS	Booster Pumping Station
BPT	Break Pressure Tank
BSc	Bachelor of Science
CIEEM	Chartered Institute of Ecology and Environmental Management
EC	European Commission
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
EU	European Union
GSI	Geological Survey Ireland
HDD	Horizontal Directional Drilling
IFI	Inland Fisheries Ireland
I-WeBS	Irish Wetland Bird Survey
MCIEEM	Member of CIEEM
MSc	Master of Science
NBDC	National Biodiversity Data Centre
NHA	Natural Heritage Area
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority
pNHA	proposed Natural Heritage Area
PS	Pumping Station
QI	Qualifying Interest
RLB	Red Line Boundary
RWI	Raw Water Intake
RWI&PS	Raw Water Intake and Pumping Station
RWSS	Regional Water Supply Scheme
SAC	Special Area of Conservation
SCI	Special Conservation Interest
SPA	Special Protection Area
TE	Tailte Éireann
UE	Uisce Éireann

Abbreviation	Term
WFD	Water Framework Directive
WSI	Wetland Survey Ireland
WSZ	Water Supply Zone
WTP	Water Treatment Plant
ZoI	Zone of Influence

Glossary

Term	Definition
Alluvial Woodland	Woodland associated with river floodplains.
Appropriate Assessment (AA)	Assessment of potential effects on European Sites.
Biodiversity Net Gain	Enhancement approach resulting in measurable biodiversity improvement after development.
Blanket Bog	Peat-forming habitat occurring in upland areas with high rainfall.
Cutover Bog	Bog previously modified by peat extraction.
European Site	Site designated as a SAC or SPA under European legislation.
Fen	Groundwater-fed wetland habitat supporting specialised plants and animals.
Geyer's Whorl Snail (Vertigo geyeri)	Protected Annex II snail dependent on stable fen habitats.
Hedgerow	Linear woody habitat providing ecological connectivity.
Horizontal Directional Drilling (HDD)	Trenchless method used to install pipelines beneath sensitive features.
Invasive Species	Non-native species capable of harming biodiversity.
Japanese Knotweed	Invasive plant species regulated in Ireland.
Key Ecological Receptor (KER)	Ecological feature considered important for impact assessment.
Natura 2000 Network	Network of SACs and SPAs established across the EU.
Natura Impact Statement (NIS)	Report supporting Appropriate Assessment.
Natural Heritage Area (NHA)	National conservation designation in Ireland.
Otter	Protected Annex II species associated with aquatic habitats.
Proposed Natural Heritage Area (pNHA)	Site proposed for future NHA designation.
Qualifying Interest (QI)	Habitat or species for which a SAC is designated.
Ramsar Site	Wetland of international importance designated under the Ramsar Convention.
Riparian Habitat	Habitat along the banks of rivers and streams.
Special Area of Conservation (SAC)	Protected site designated under the Habitats Directive.
Special Conservation Interest (SCI)	Bird species or features for which a SPA is designated.

Special Protection Area (SPA)	Protected site designated under the Birds Directive.
Trenchless Crossing	Pipeline installation without excavation through a watercourse.
Water Framework Directive (WFD)	EU legislation for protection and improvement of water bodies.
Wetland	Land saturated with water permanently or seasonally.
White-clawed Crayfish	Protected freshwater crayfish species listed under the Habitats Directive.
Zebra Mussel	Invasive freshwater mollusc capable of colonising infrastructure.
Zone of Influence (ZoI)	Area within which ecological features may experience effects from the development.

7. Biodiversity

This chapter details the baseline conditions for biodiversity within and around the Proposed Development site. It then assesses potential impacts associated with the Proposed Development from an ecological perspective. The identification of ecological constraints associated with the proposed Ballina and Lough Talt Water Supply Upgrade development involved a combination of desktop studies and site surveys to identify any ecologically significant areas and/or features within the development site and within the zone of influence (ZoI) of the Proposed Development. Specific consideration is given to statutorily designated sites and habitats and species of conservation value.

A list of the key ecological features found within the development site was compiled, and an indication as to the likely value of each feature was determined in a geographical context. Collated ecological information was used to undertake an assessment of potential ecological impacts that have then been used to inform key aspects of the Proposed Development; the latter includes ecological mitigation measures proposed with the intention of avoiding significant effects on European sites, sites of conservation value and protected habitats and species.

This Biodiversity Chapter should be read in conjunction with other relevant chapter of the EIAR. Key interrelationships include:

- **Chapter 9 Land, Soils and Geology:** regarding ground disturbance, trenching activities and reinstatements which influence habitat loss, recovery and species usage.
- **Chapter 10 Water (Hydrology and Hydrogeology):** in relation to watercourse crossings, potential impacts on aquatic habitats and species and the role of water quality and drainage design in protecting ecological receptors.
- **Chapter 18 Landscape and Visual:** with respect to habitat connectivity, disturbance of semi-natural habitats and restoration of vegetation along the route corridor.

Mitigation measures outlined in these chapters also contribute to the protection of biodiversity.

7.1 Statement of Authority

The EIAR Biodiversity Chapter was prepared by Niamh Kelly, Kevin Coogan and Colin Wilson. Kevin McCaffrey provided peer review and support.

Niamh Kelly (AtkinsRéalis) has a BSc (Hons) in Environmental Science with Ecology from Atlantic Technological University Sligo. Niamh conducts research and site surveys including habitat classification (Fossitt classification) and terrestrial mammal activity. She also assists in bat emergence/activity surveys. She is responsible for aiding the preparation of Appropriate Assessment Screening Reports, Natura Impact Statements, Environmental Impact Assessment – Biodiversity Chapters and Constraints Assessment, Feasibility Reports and Multi-Criteria Analysis. Niamh collated background information for this assessment.

Kevin Coogan (AtkinsRéalis) has a BSc (Hons) in Zoology from University College Dublin. He has developed ecological surveying skills through country-wide small river sampling experience, as well as habitat evaluation experience in Spain and Ireland. He has volunteer experience in bird surveying on North Bull Island SPA and Ireland's Eye SPA. Kevin collated background information for this assessment.

Colin Wilson (Atkins Dublin) has a BSc (Hons) in Environmental Science and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He has over 19 years working in the fields of ecology and environmental management. He is an Associate Ecologist with experience in ecological surveying, environmental assessment, on-site ecological supervision and mitigation. He has experience on multiple infrastructure projects regarding all elements of surface and groundwater management, monitoring, sampling

and associated reporting. Colin also has a broad range of experience in invasive species management, biosecurity and control. Colin has prepared AA screening reports, Natura Impact Statements and has also been involved in the development of Environmental Operating Plans and Construction Environmental Management Plans for a number of national infrastructure projects. Colin is the author of this report.

Kevin Mc Caffrey (Atkins Galway) has a BSc (Hons) in Applied Freshwater and Marine Biology and a MSc in Environmental Sustainability. He is a Senior Ecologist with over 10 years' experience in freshwater and marine ecology, environmental surveying, impact assessment and as an Ecological clerk of Works. He has prepared and reviewed a wide range of technical reports including Environmental Impact Assessment, AA screening, Natura Impact Assessment and sanitary surveys. Kevin provided peer review and support for this assessment.

7.2 Methods

7.2.1 Legislative and policy context

The assessment of the potential impacts of the Proposed Development on ecological features of interest has been undertaken in accordance with the following legislation, policy documents, plans and guidelines:

- A Guide to Habitats in Ireland. The Heritage Council. The Heritage Council (Fossitt, 2000);
- All-Ireland Pollinator Plan 2021 to 2025. National Biodiversity Data Centre;
- Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council, Church Lane, Kilkenny, Ireland (Smith et al., 2011);
- EC Habitats Directive 92/43/EEC;
- EC Birds Directive 2009/147/EEC;
- EC (Birds and Natural Habitats) Regulations, 2011 (as amended);
- EIA Directive 2011/92/EU (as amended);
- EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018);
- Fisheries (Consolidation) Act, 1959;
- Flora (Protection) Order, 2022;
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Local Government and Heritage 2018);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);
- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2024, Version 1.3);
- Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017);
- Local Government (Water Pollution) Act, 1977 (as amended);

- National Biodiversity Action Plan, 2023 to 2027;
- Planning and Development Act, 2000 (as amended);
- Planning and Development (Amendment) Act, 2010;
- Planning for Watercourses in the Urban Environment. Inland Fisheries Ireland 2020;
- The Wildlife Act, 1976 (as amended);
- Water Framework Directive;
- Sligo County Development Plan 2024 to 2030;
- Mayo County Development Plan 2022 to 2028;
- Sligo County Biodiversity Action Plan 2024 to 2030; and,
- Mayo County Biodiversity Action Plan 2020 to 2025.

7.2.2 Ecological study area and Zone of Influence

The ecological study area incorporated all sites, habitats and species that could potentially fall within the Zone of Influence (ZoI) of the Proposed Development route. The ZoI represents the area within which ecological features may experience significant effects arising from the proposed works or associated activities. In many cases, this area extends beyond the immediate development footprint, particularly where ecological or hydrological connections link the site to surrounding environments. The extent of the ZoI varies depending on the sensitivity of individual ecological receptors and the type and scale of changes that could affect them. Guidance recognises that an appropriate ZoI must be defined on a project-specific basis, taking account of factors such as the nature of the works, the characteristics of the receiving environment, the vulnerabilities of ecological receptors, and the potential for cumulative or in-combination effects (CIEEM 2024, Version 1.3). National guidance emphasises that determining the ZoI requires case-by-case evaluation, rather than reliance on a fixed or standard distance, ensuring that all relevant ecological pathways are fully considered.

Ecological resources or features of conservation value within the ZoI of the Proposed Development may be subject to impacts as a result of their direct or indirect connectivity to the Proposed Development. Direct connectivity refers to ecological features found within or partly within the study area. These features may be directly impacted by the proposed work activities, e.g. through habitat loss. Indirect connectivity refers to sites outside of the study area but connected through features such as linear habitats (i.e. wildlife corridors) or surface water pathways (e.g. rivers, streams, and field drains), groundwater (e.g., groundwater dependent ecosystems), through the air etc. Indirect impacts may include deterioration of water quality, air quality, noise and severing of linear corridors used by wildlife to move between sites and disturbance to species.

The Ecological Study Area was defined as:

- Natura 2000 sites within the Proposed Development site
- For the consideration of indirect impacts, such as impacts to water quality or disturbance of species, the ZoI was extended to incorporate the presence of European and Nationally designated sites that have potential hydrological or ecological connectivity with the Proposed Development site. Refer to Natura Impact Statement (AA Screening and NIS; AtkinsRéalis 2026 Document Ref; 0089328DG0011)
- The Proposed Development site red line boundary and all watercourses flowing through the Proposed Development site
- An approx1 km radius around the development site was used to identify records of protected species
- Woodlands within approx. 500 m of the development site and wetlands within approx. 500 m of the development site

- Wintering waterbird sites within approx. 5 km of the development site
- Non-qualifying Annex I habitats within approx. 1 km of the development site (where records are available)
- Direct impacts, such as loss of habitat and direct mortalities of species, were confined to ecological resources contained within the Study Area boundary

Ecological features, habitats and species outside of the aforementioned Study Area are scoped out of the assessment because they are not within the ZoI of the Proposed Development and there is no potential for them to be significantly affected (as per CIEEM guidelines[1]).

7.2.3 Desk study

A desktop study was carried out to collate information available on Natura 2000 sites in the vicinity of the Proposed Development. These areas were viewed using Google Earth, Google maps[2] and Bing maps[3] (last accessed on16/04/2026).

The NPWS online databases[4] (last accessed on 16/04/2026) were reviewed for information on European Sites and their features of interest in the ZoI of the Proposed Development. The Environmental Protection Agency (EPA) mapping[5] system was used to identify any hydrological connection between the Proposed Development and European Sites (last accessed on 16/04/2026).

Boundary shapefiles were also downloaded from the NPWS website (last accessed on 16/04/2026) to facilitate the preparation of development graphics.

Information reviewed included site synopses for each SAC/SPA, conservation objectives, site boundaries, standard European Data Form for each SAC/SPA, which details conditions and threats of the sites, and published information and unpublished reports. In addition, a review of NPWS Article 17 datasets was undertaken to assess if any non-Qualifying Interest Annex I Habitats have been recorded within the ZoI of the Proposed Development.

The desk-based study also reviewed available information on any known or potentially important sites for rare or protected flora or fauna known to occur along or within the ZoI of the Proposed Development. Species records from the National Biodiversity Data Centre (NBDC) and NPWS datasets were reviewed for the ten-year period (2016-2026). Species records were also reviewed from bird count data from the Irish Wetland Bird Survey[6] (I-WeBS). Information on identified wetland habitats within the ZoI of the Proposed Development was reviewed from Wetland Survey Ireland[7]. Inland Fisheries Ireland river sampling reports were also reviewed[8] (last accessed 16/04/2026).

Relevant planning information for the surrounding area was reviewed using the planning enquiry systems Mayo County Council and Sligo County Council. Search criteria were implemented to determine whether such projects or plans would be relevant to this study and this information was used to determine potential in-combination impacts from other plans / projects with the Proposed Development.

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[1] https://cieem.net/wp-content/uploads/2018/08/EcIA-Guidelines-v1.3-Sept-2024.pdf
[2] https://www.google.ie/maps
[3] http://www.bing.com/maps/
[4] http://webgis.npws.ie/npwsviewer/
[5] https://gis.epa.ie/EPAMaps/
[6] https://c0amf055.caspio.com/dp/f4db30005dbe20614b404564be88
[7] https://www.wetlandsurveysireland.com/wetlands/map-of-irish-wetlands--/map-of-irish-wetlands---map/index.html
[8] http://wfdfish.ie/index.php/category/river-surveys-2022/

7.2.3.1 Designated sites

Sites designated for nature conservation reviewed in context with the Proposed Development included both internationally, e.g. European sites (Natura 2000 sites) and Ramsar sites, and nationally designated conservation areas, e.g. Natural Heritage Areas, proposed Natural Heritage Areas and statutory Nature Reserves.

The Natura 2000 network is comprised of both Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) for birds; these sites are designated for the protection of biodiversity across the European Union. SACs are designated under the EU Habitats Directive (92/43/EEC), as transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations (as amended), 2011, while SPAs are designated under the EU Birds Directive (2009/147/EC). SACs are sites of international importance due to the presence of Annex I habitats and/or Annex II species listed under the EU Habitats Directive (92/43/EEC). SPAs are designated for the protection of bird species listed on Annex I of the Bird Directive (2009/147/EC), regularly occurring populations of migratory species and areas of international importance for migratory birds. Ramsar sites are wetland sites designated to be of international importance under the Ramsar Convention.

A Natural Heritage Area (NHA) is the basic designation of sites for wildlife under the Wildlife Act. NHAs are selected on the basis of having special scientific significance for one or more species, communities, habitats, landforms or geological features, or for a variety of natural attributes. A proposed NHA (pNHA) is a site of significance for wildlife and habitats which has not been statutorily proposed or designated. A Nature Reserve is an area of importance to wildlife, which is protected by Ministerial Order under Section 15 of the Wildlife Act (as amended).

Details of European sites, Natural Heritage Areas, proposed Natural Heritage Areas and statutory Nature Reserves were reviewed from NPWS datasets. Information on Ramsar sites were reviewed from the Ramsar sites information service portal.

7.2.3.2 Features of ecological importance

Annex I habitats were reviewed in the context of the Proposed Development. These are habitats listed on Annex I to the Habitats Directive and for which Member States must designate SACs. The overall objective of the Habitats Directive is to achieve and maintain favourable conservation status for all habitats and species of community interest; and to contribute towards maintaining biodiversity of natural habitats and of wild flora and fauna in member states. To this end, EU member states are obliged to monitor the conservation status of habitats and species. As all habitats (as listed in Annex I) and species of Community interest are included, the monitoring requirements obliged to be undertaken by member states is not restricted to European sites (SACs and SPAs) but encompasses the total national resource of each habitat. Consequently, data on Annex I habitat must be collected both within and outside the Natura 2000 network. In addition, member states are obliged, as detailed in Article 17 of the Habitats Directive, to report to the EU commission every six years on the implementation of measures taken towards meeting the objectives of the directive. Annex I habitats are categorised into the following general habitat categories; - Bogs, mires and fens, Costal habitats, Dune habitats, Forests, Freshwater habitats, Grasslands, Heath and scrub and Rocky habitats. Details of Annex I habitats within 5 km of the Proposed Development site were reviewed from NPWS 2019 Article 17 datasets.

The inland surface water features (e.g. lakes, rivers, streams, field drains) which are within, or which are connected to the Proposed Development were reviewed and, where information was available, were assessed in relation to their fisheries value, biological status, water quality and designation status. Relevant waterbodies within the study area were identified through a review of datasets acquired from the Environmental Protection Agency (EPA) and Tailte Éireann (TE). Available records of protected aquatic species, designation status and water quality for these water features were reviewed. For larger watercourses, Inland Fisheries Ireland river sampling reports were also reviewed.

National Biodiversity Data Centre (NBDC) and NPWS protected species and invasive records were reviewed within a 1 km radius of the Proposed Development for a ten year period (2016 to 2026).

Wetland sites, as detailed within Wetland Survey Ireland datasets, within 500 m of the Proposed Development route were also reviewed. Woodland sites with potential hydrological connectivity to the Proposed Development site, as identified within the National Survey of Native Woodlands[9] and the Inventory of Ancient and Long-Established Woodland[10] are also included in the desk study. NBDC forestry datasets were also reviewed to identify woodlands within 1km of the Proposed Development site. Irish Wetland Bird Survey (I-WeBS) count sites within 5 km of the Proposed Development site were included in the desktop review. For larger watercourses within the ZoI, Inland Fisheries Ireland river sampling reports were also reviewed. Data for the desktop research was last accessed April 2026.

The desk-based study also reviewed available information on any known or potentially important sites for rare or protected flora or fauna known to occur along or within the ZoI of the Proposed Development. Available information on any other non-designated sites of ecological value found along or in close proximity to the alignment of the Proposed Development was also reviewed.

7.2.3.3 Data Sources

The locations of conservation sites protected species occurrences and areas of ecological interest were reviewed using Google maps/Google StreetView[11] and Bing maps[12]. Sources of data used to collate and compile information of ecological features of interest and importance for the study include: -

- National Parks and Wildlife Services (NPWS) webpage/data:
  - Information on sites designated for nature conservation, including spatial data (NPWS);
  - Habitats and species data;
  - Wildfowl Sanctuaries; and,
  - Red List of Terrestrial Mammals (Marnell *et al.,* 2019).
- National Biodiversity Data Centre (NBDC):
  - Protected species records;
  - Invasive species records; and,
  - Woodlands.
- Environmental Protection Agency (EPA):
  - Watercourses and lakes spatial files;
  - Water quality data; and,
  - Corine land cover data.
- Geological Survey of Ireland:
  - Underlying geology, soils and hydrogeology.
- Tailte Éireann mapping, aerial photographs, and field drains.
- Birdwatch Ireland;
  - Bird count data from the Irish Wetland Bird Survey (I-WeBS),
  - Birds of Conservation Concern in Ireland (Gilbert *et al.,* 2021).
- Wetland Survey Ireland:
  - Information on identified wetland habitats within the study area.
- Inland Fisheries Ireland (IFI):
  - River sampling reports.
- Heritage Trees of Ireland:

[9] Perrin, P.; Martin, J.; Barron, S.; O'Neill, F.; McNutt, K.; Delaney, A. (2008). National Survey of Native Woodlands 2003-2008.

[10] Perrin, P.M. & Daly, O.H. (2010). A provisional inventory of ancient and long-established woodland in Ireland. *Irish Wildlife Manuals*, No.

[11] https://www.google.ie/maps

[12] http://www.bing.com/maps/

    - Tree preservation orders.
- Ramsar sites information service;
- National Biodiversity Action Plan 2023 to 2027;
- Sligo County Development Plan 2024 to 2030;
- Mayo County Development Plan 2022 to 2028;
- Sligo County Biodiversity Action Plan 2024 to 2030; and,
- Mayo Biodiversity Action Plan 2020 to 2025 (Draft 2026 to 2031).

7.2.4 Site survey

Ecological Surveys included the lands within the red line boundary of the Proposed Development and lands within a 50 m buffer of the Proposed Development. Surveys were undertaken by AtkinsRéalis Ecologists Kevin McCaffrey, Colin Wilson, Daniel Blake and Kevin Coogan between July 2024 and October 2025.

While on site, semi-natural habitats present were recorded using the Fossitt (2000) classification system, in conjunction with the Irish Vegetation Classification and the EU interpretation manual, and their constituent species noted. Potential sensitive ecological receptors present within the survey area were recorded, including the presence of protected species and habitats or habitats that would support protected species, in addition to noting connectivity to European sites. Any presence of non-native invasive species was also recorded.

The objectives of the ecological site visits were to: -

- Check for evidence of rare or protected habitats and species and to assess the potential for protected species to be present within the Proposed Development site including bird species listed on Annex I of the EU Birds Directive and habitats suitable to support said species;
- Assess the potential for habitats listed on Annex I of the EU Habitats Directive, as well as species listed on Annex II and IV of the EU Habitats Directive to occur within the Proposed Development site;
- Identify the predominant habitats within the Proposed Development site, with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000); and
- Check for evidence of invasive plant species as listed on the 3rd Schedule of the EC Birds and Natural Habitats Regulations (S.I. 477 of 2011, as amended).

Site surveys included for any evidence of mammal activity (e.g. badgers, otters) within the Proposed Development site or within 50 m of the Proposed Development site.

Trees and structures within the Proposed Development site were also visually assessed for signs of bat activity and potential bat roost features. Site specific bat activity surveys were carried out within Belleek Woods, the only woodland habitat within the Proposed Development site.

During the site visits, invasive species noted while on site were also recorded. Incidental sightings of any birds, mammals, invertebrates, and amphibians were noted during site visits to further evaluate the importance of the Proposed Development site to flora and fauna (in line with the approach set out in the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017).

Ecological survey methods were in accordance with those outlined in the following documents: -

- A Guide to Habitats in Ireland (Fossitt, 2000);
- Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.,* 2011);
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA,2009);
- *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* CIEEM (2024, Version 1.3);

- Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017);
- NRA (2006) Guidelines for the treatment of Badgers prior to the construction of national road schemes;
- NRA (2009) Guidelines for the treatment of Otters prior to the construction of national road schemes; and,
- Bat Survey for Professional Ecologists; Good Practice Guidelines 4th Edition.

7.2.5 Valuing ecological importance

Ecological features can be important for a variety of reasons. Importance may relate, for example, to the quality or extent of the site or habitats found within, or the rarity of the habitat and/or species, the extent to which such habitats and/or species are threatened throughout their range, or to their rate of decline[13].

The importance of an ecological feature was considered within a defined geographical context. The frame of reference used to determine ecological value relied on known and published accounts of the feature's ecological importance, rarity and distribution, combined with professional judgement.

The following geographic frame of reference was used for evaluating the importance of ecological features within the study area:

- International importance;
- National importance;
- County importance;
- Local importance (higher value); and,
- Local importance (lower value).

The geographical context for determining the value of ecological receptors followed recommendations as outlined in the *Guidelines for Assessment of Ecological Impacts of National Roads Scheme, National Roads Authority* (2009). This methodology is consistent with the *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM 2024, Version 1.3).

7.2.6 Determining ecologically significant effects

CIEEM (2024, Version 1.3) defines an ecologically significant effect as an effect (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographic area.

The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified CIEEM (2024, Version 1.3). The significance of predicted effects has been assessed in line with *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) and best scientific knowledge in the field. The evaluation of significant effects should always be based on the best available scientific evidence. If sufficient information is not available, further survey or additional research may be required. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect should be assumed. Where uncertainty exists, it must be acknowledged in the assessment.

[13] NRA's Guidelines for Ecological Impact Assessment of National Road Schemes (NRA, 2009), *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland* (CIEEM 2018).

7.2.7 Mitigation and overall residual ecological impact

Where significant impacts have been identified, the mitigation hierarchy has been considered, as suggested in the 2024 CIEEM EcIA Guidelines (2024, Version 1.3) and the 2022 EPA Guidelines, which sets out a sequential approach of avoidance of impacts where possible, application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied, along with any necessary compensation measures, and opportunities for enhancement incorporated, residual impacts have then been identified.

Overall residual, or mitigated, ecological effects are assessed by taking account of any expected beneficial ecological effects and those measures which have been integrated within the development proposals in order to avoid, eliminate or reduce the significance of ecological impacts (and any further recommended measures which attach a high probability of successful implementation). The following widely accepted strategy for mitigation (Chapter 6 of the CIEEM Guidelines) has been employed as shown in Table 7-1 below.

Table 7-1 — Approach to Mitigation

Avoidance	Where viable, the project has been redesigned to avoid adverse ecological effects.
Elimination	Where possible and feasible, measures which eliminate adverse ecological effects are employed.
Reduction	Measures intended to reduce the significance of adverse ecological effects are employed where options for avoidance or elimination have been exhausted or are deemed to be impractical.
Compensation	Where adverse ecological effects cannot be avoided or eliminated or reduced in significance to an acceptable level, consideration is given to compensating for residual adverse effects.
Remediation	Where adverse ecological effects are unavoidable, consideration is given to undertaking limiting remedial works.
Enhancement	Consideration is given to providing opportunities for ecological improvement, enhancement, and the realisation of beneficial ecological effects.

7.2.8 Appropriate Assessment (AA)

The Proposed Development has been subject to the Appropriate Assessment process. Details of the assessment are provided for in the accompanying Appropriate Assessment Screening Report and Natura Impact Statement (AA Screening and NIS; AtkinsRéalis 2026 Document Ref; 0089328DG0011).

7.2.9 Difficulties encountered in completion of this chapter

No difficulties were encountered in completing survey work or desktop research to inform this assessment. Surveys were undertaken within the seasonally appropriate window for assessing habitats and floral species. There were no access issues to the Proposed Development site.

7.3 Description of receiving environment

7.3.1 General overview

The Proposed Development is located within a rural setting. Water is transferred from Wherrew Raw Water Intake and Pumping Station (Wherrew RWI&PS) to Lisglennon Water Treatment Plant (Lisglennon WTP) for

treatment. From Lisglennon WTP the route of the proposed new truck main / pipeline follows the existing road network for the majority of its length. In the western section, the pipeline passes close to several rural residential properties before connecting to an existing pipeline under the River Moy Estuary north of Ballina. The crossing of the estuary via this existing pipeline is noted to be outside of the Proposed Development boundary. On the east side of the estuary,the proposed new truck main is aligned in a generally southeast direction along the road network, progressing into the Ox Mountains toward the Lough Talt Water Treatment Plant (Lough Talt WTP).

Approximately 85% of the pipeline; 25.7 km of the total 30.2 km, will be installed within the existing road corridor. The remaining sections will require offroad construction through greenfield areas, including agricultural lands and Belleek Woods.

Treated water will gravitate from the Lisglennon WTP toward Ballina and subsequently onward to Bonniconlon. Beyond this area, changes in local topography necessitate pumping. A new booster pumping station is proposed near Bonniconlon (Bonniconlon Booster Pumping Station [Bonniconlon BPS]), from which treated water will be pumped via a rising main to a break pressure tank at Windy Gap (Windy Gap Break Pressure Tank [Windy Gap BPT]), Knocknasliggaun, in the Ox Mountains. From Windy Gap, water will flow to the existing Lough Talt WTP site, which will be repurposed to house the new treated water storage tank and treatment facilities, before entering the existing Lough Talt RWSS network under gravity.

7.3.2 European sites

The following European sites are potentially within the ZoI of the Proposed Development; River Moy SAC, Lough Conn and Lough Cullin SPA, Killala Bay/Moy Estuary SAC, Killala Bay/Moy Estuary SPA, Lough Hoe Bog SAC, Lough Nabrickkeagh Bog SAC, Ox Mountains Bog SAC, Lacken Saltmarsh and Kilcummin Head SAC, Bellacorick Bog Complex SAC, Glenamoy Bog Complex SAC, Turloughmore (Sligo) SAC and Newport River SAC.

The ZoI of the Proposed Development includes European sites within the Proposed Development site and those with potential indirect connectivity through the following pathways:

- Hydrological – effects via surface water quality; or,
- Hydrogeological – effects via groundwater.

Consideration has also been given to species which may occur at a distance from the SAC or SPA for which they are a Qualifying Interest (QI). Many SAC Qualifying Interest species (e.g. otters, aquatic species) and Special Conservation Interest (SCI) SPA waterbirds and wildfowl have a wide geographical range, therefore, the mobility of QI or SCI species and their potential to range outside of the delineated boundaries of their respective European sites has also been considered.

There are twelve European sites within the potential ZoI of the Proposed Development, ten SACs and two. SPAs, as outlined in Table 7-2, and Figure 7-1 and Figure 7-2 below. The table lists their associated Qualifying Interests (QIs) and Special Conservation Interests (SCIs) and specifies whether there is connectivity to the European site from the Proposed Development or not.

Table 7-2 — European Sites within potential connectivity to the Proposed Development.

Site Name and Code	Approximate Distance from Proposed Development location	Features of Interest	Connectivity with the Proposed Development
River Moy SAC (002298)[14]	Within the Proposed Development site	▪ Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510] ▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the *Rhynchosporio*n [7150] ▪ Alkaline fens [7230] ▪ Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] ▪ Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0] ▪ *Austropotamobius pallipes* (White-clawed Crayfish) [1092] ▪ *Petromyzon marinus* (Sea Lamprey) [1095] ▪ *Lampetra planeri* (Brook Lamprey) [1096] ▪ *Salmo salar* (Salmon) [1106] ▪ *Lutra lutra* (Otter) [1355]	Yes. There is direct connectivity between the Proposed Development site and the River Moy SAC. The development includes the abstraction of water from Lough Conn at the Wherrew RWI&PS, as well as construction activities along the shoreline and within the lough itself. Because Lough Conn forms part of the River Moy SAC, these works create a direct pathway between the development and the designated site. In addition, the proposed pipeline will cross the SAC at the Glenree River (also known as the River Brusna). The route will also intersect ten other watercourses, all of which ultimately drain into the River Moy SAC. Accordingly, the Proposed Development site has both direct and indirect hydrological connectivity to the River Moy SAC. A more detailed discussion of this designated site is provided below.

[14] NPWS (2016) *Conservation Objectives: River Moy SAC 002298. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Site Name and Code	Approximate Distance from Proposed Development location	Features of Interest	Connectivity with the Proposed Development
Killala Bay/Moy Estuary SAC (000458)[15]	Within the Proposed Development site	▪ Estuaries [1130] ▪ Mudflats and sandflats not covered by seawater at low tide [1140] ▪ Annual vegetation of drift lines [1210] ▪ Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] ▪ *Salicornia* and other annuals colonising mud and sand [1310] ▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] ▪ Embryonic shifting dunes [2110] ▪ Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] ▪ Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] ▪ Humid dune slacks [2190] ▪ *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] ▪ *Petromyzon marinus* (Sea Lamprey) [1095] ▪ *Phoca vitulina* (Harbour Seal) [1365]	Yes. The proposed pipeline works are in close proximity Killala Bay/Moy Estuary SAC to the east of Belleek Woods north of Ballina town, creating a potential connection between the Proposed Development site and this estuarine designated area. The route also intersects nine additional watercourses, all of which discharge into the Killala Bay/Moy Estuary SAC (via watercourses within or connected to River Moy SAC). Consequently, the Proposed Development site establishes both direct and hydrological connectivity with this SAC. This site is discussed further below.

[15] NPWS (2012) *Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name and Code	Approximate Distance from Proposed Development location	Features of Interest	Connectivity with the Proposed Development
Lough Conn and Lough Cullin SPA (004228)[16])	Within the Proposed Development site	▪ Tufted Duck (*Aythya fuligula*) [A061] ▪ Common Scoter (*Melanitta nigra*) [A065] ▪ Common Gull (*Larus canus*) [A182] ▪ Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] ▪ Wetland and Waterbirds [A999]	Yes. There is direct connectivity between the Proposed Development site and Lough Conn and Lough Cullin SPA. The Proposed Development will result in water abstraction from Lough Conn at Wherrew RWI&PS. Also, construction activities are proposed at Wherrew RWI&PS, which is within the SPA. The Proposed Development also includes for the installation of water abstraction pipes within Lough Conn waterbody. This site is discussed further below.
Killala Bay/Moy Estuary SPA (004036)[17]	Within the Proposed Development site	▪ Ringed Plover (*Charadrius hiaticula*) [A137] ▪ Golden Plover (*Pluvialis apricaria*) [A140] ▪ Grey Plover (*Pluvialis squatarola*) [A141] ▪ Sanderling (*Calidris alba*) [A144] ▪ Dunlin (*Calidris alpina*) [A149] ▪ Bar-tailed Godwit (*Limosa lapponica*) [A157] ▪ Curlew (*Numenius arquata*) [A160] ▪ Redshank (*Tringa totanus*) [A162] ▪ Wetland and Waterbirds [A999]	Yes. The proposed pipeline works are in close proximity to Killala Bay/Moy Estuary SPA to the east of Belleek Woods in north Ballina, thereby providing potential connectivity between the Proposed Development site and this European Site. The proposed pipeline route also crosses nine watercourses which flow into Killala Bay/Moy Estuary SPA. This site is discussed further below.
Lough Hoe Bog SAC (000633)[18]	Adjacent to the Proposed	▪ Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] ▪ Blanket bogs (* if active bog) [7130]	Yes. A section of the proposed pipeline route is aligned directly alongside the boundary of Lough Hoe Bog SAC at Lough Talt

[16] NPWS (2022) *Conservation objectives for Lough Conn and Lough Cullin SPA [004228]. First Order Site-specific Conservation Objectives Version 1.0*. Department of Housing, Local Government and Heritage.

[17] NPWS (2013) *Conservation Objectives: Killala Bay/Moy Estuary SPA 004036. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[18] NPWS (2017) *Conservation Objectives: Lough Hoe Bog SAC 000633. Version 1*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

Site Name and Code	Approximate Distance from Proposed Development location	Features of Interest	Connectivity with the Proposed Development
	Development site	▪ *Vertigo geyeri* (Geyer's Whorl Snail) [1013] ▪ *Austropotamobius pallipes* (White-clawed Crayfish) [1092]	for approx. 4km and crosses one unnamed small stream which flows into Lough Talt thereby providing potential connectivity between the Proposed Development site and this SAC. This site is discussed further below.
Lough Nabrickkeagh Bog SAC (000634)[19]	160 m	▪ Blanket bogs (* if active bog) [7130]	No. There is no direct overlap between the Proposed Development site and Lough Nabrickkeagh Bog SAC. This SAC is uphill of the pipeline route in the region of the R294 at Lough Talt. There is no indirect connectivity between the Proposed Development site and this SAC via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development. This site is not considered further.
Ox Mountains Bog SAC (002006)[20]	700 m	▪ Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] ▪ Natural dystrophic lakes and ponds [3160] ▪ Northern Atlantic wet heaths with *Erica tetralix* [4010] ▪ European dry heaths [4030] ▪ Blanket bogs (* if active bog) [7130] ▪ Transition mires and quaking bogs [7140]	No. There is no direct overlap between the Proposed Development site and Ox Mountains Bog SAC. This SAC is uphill of the pipeline route in the region of the R294. There is no indirect connectivity between the Proposed Development site and this SAC via groundwater, watercourses, drains, ditches or any other vectors.

[19] NPWS (2019) *Conservation Objectives: Lough Nabrickkeagh Bog SAC 000634.Version 1*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

[20] NPWS (2016) *Conservation Objectives: Ox Mountains Bogs SAC 002006. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Site Name and Code	Approximate Distance from Proposed Development location	Features of Interest	Connectivity with the Proposed Development
		▪ Depressions on peat substrates of the *Rhynchosporion* [7150] ▪ *Vertigo geyeri* (Geyer's Whorl Snail) [1013] ▪ *Saxifraga hirculus* (Marsh Saxifrage) [1528]	Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development. This site is not considered further.
Lackan Saltmarsh and Kilcummin Head SAC (000516)[21]	7.54 km	▪ *Salicornia* and other annuals colonising mud and sand [1310] ▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] ▪ Mediterranean salt meadows (*Juncetalia maritimi*) [1410] ▪ Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] ▪ Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	No. There is no direct overlap between the Proposed Development site and Lackan Saltmarsh and Kilcummin Head SAC. Surface waters from the Proposed Development site flow to the River Moy Estuary and not to Lackan Saltmarsh and Kilcummin Head SAC. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors. Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development. This site is not considered further.
Bellacorick Bog Complex SAC (001922)[22]	9.25 km	▪ Natural dystrophic lakes and ponds [3160] ▪ Northern Atlantic wet heaths with *Erica tetralix* [4010] ▪ Blanket bogs (* if active bog) [7130]	No. There is no direct overlap between the Proposed Development site and Bellacorick Bog Complex SAC.

[21] NPWS (2016) *Conservation Objectives: Lackan Saltmarsh and Kilcummin Head SAC 000516. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

[22] NPWS (2017) *Conservation Objectives: Bellacorick Bog Complex SAC 001922.Version 1*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

Site Name and Code	Approximate Distance from Proposed Development location	Features of Interest	Connectivity with the Proposed Development
		▪ Depressions on peat substrates of the *Rhynchosporion* [7150] ▪ Alkaline fens [7230] ▪ *Vertigo geyeri* (Geyer's Whorl Snail) [1013] ▪ *Saxifraga hirculus* (Marsh Saxifrage) [1528]	Surface waters from the Proposed Development site flow to the River Moy Estuary and not to Bellacorick Bog Complex SAC. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors. Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development. This site is not considered further.
Glenamoy Bog Complex SAC (000500)[23]	12.3 km	▪ Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] ▪ Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] ▪ Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] ▪ Humid dune slacks [2190] ▪ Machairs (* in Ireland) [21A0] ▪ Natural dystrophic lakes and ponds [3160] ▪ Northern Atlantic wet heaths with *Erica tetralix* [4010] ▪ *Juniperus communis* formations on heaths or calcareous grasslands [5130] ▪ Blanket bogs (* if active bog) [7130] ▪ Transition mires and quaking bogs [7140] ▪ Depressions on peat substrates of the *Rhynchosporion* [7150]	No. There is no direct overlap between the Proposed Development site and Glenamoy Bog Complex SAC. Surface waters from the Proposed Development site flow to the Moy Estuary and not to Glenamoy Bog Complex SAC. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors. Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development. This site is not considered further.

[23] NPWS (2017) *Conservation Objectives: Glenamoy Bog Complex SAC 000500. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Site Name and Code	Approximate Distance from Proposed Development location	Features of Interest	Connectivity with the Proposed Development
		▪ *Salmo salar* (Salmon) [1106] ▪ *Petalophyllum ralfsii* (Petalwort) [1395] ▪ *Saxifraga hirculus* (Marsh Saxifrage) [1528] ▪ *Hamatocaulis vernicosus* (Slender Green Feather-moss) [6216]	
Turloughmore (Sligo) SAC (000637)[24]	13.4 km	▪ Turloughs [3180]	No. There is no direct overlap between the Proposed Development site and Turloughmore (Sligo) SAC. Surface waters from the Proposed Development site flow to the Moy Estuary and not to Turloughmore (Sligo) SAC. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors. Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development. This site is not considered further.
Newport River SAC (002144)[25]	14.27 km	▪ *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] ▪ *Salmo salar* (Salmon) [1106]	No. There is no direct overlap between the Proposed Development site and Newport River SAC. Surface waters from the Proposed Development site flow to the Moy Estuary and not to Newport River SAC, the Newport

[24] NPWS (2021) *Conservation Objectives: Turloughmore (Sligo) SAC 000637.Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

[25] NPWS (2019) *Conservation Objectives: Newport River SAC 002144. Version 1*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

Site Name and Code	Approximate Distance from Proposed Development location	Features of Interest	Connectivity with the Proposed Development
			River is not in the same catchment area as the Proposed Development site. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors. Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development. This site is not considered further.

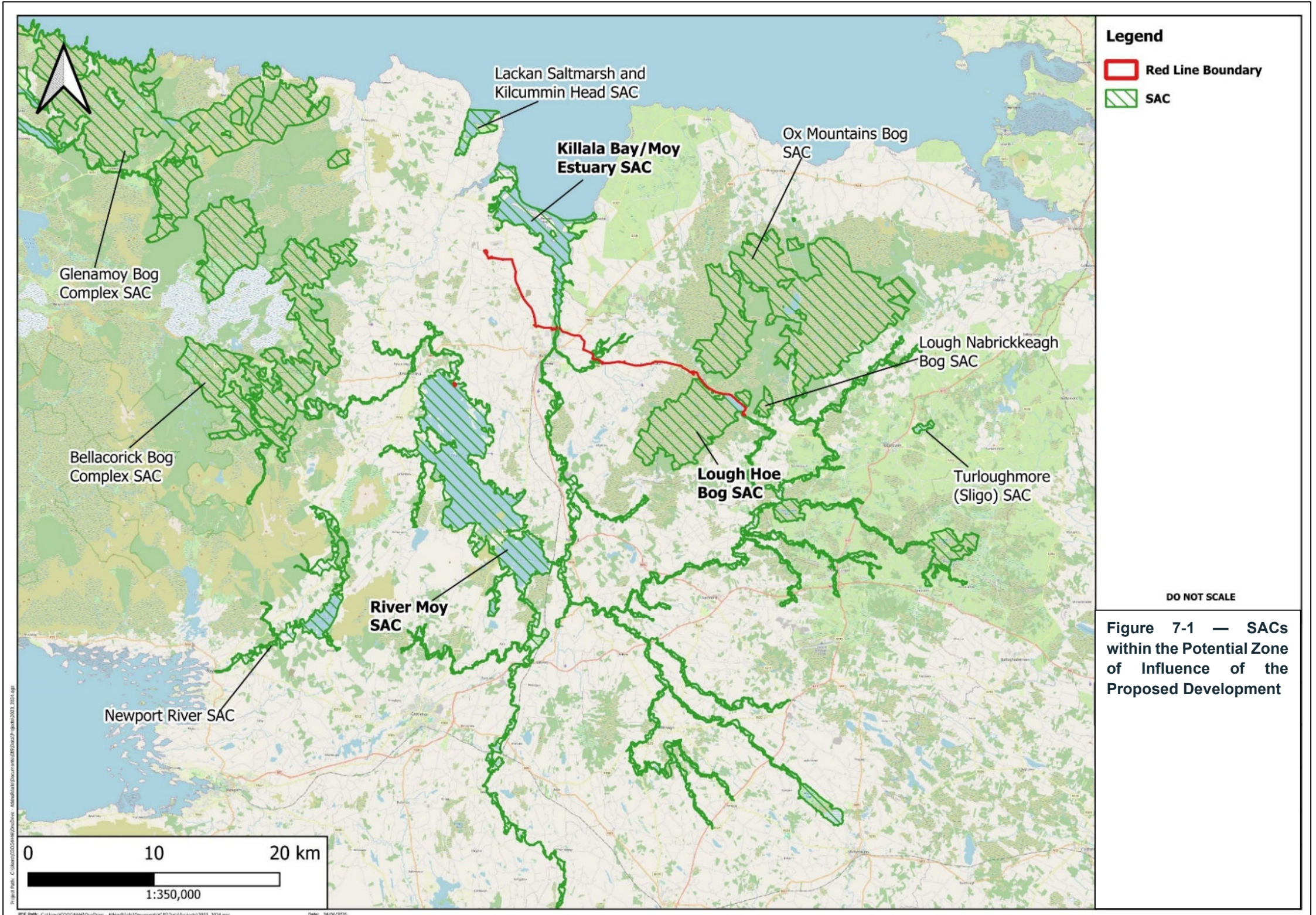


Figure 7-1 — SACs within the Potential Zone of Influence of the Proposed Development



Figure 7-2 — SPAs within the Potential Zone of Influence of the Proposed Development

7.3.2.1 River Moy SAC

A site synopsis of the SAC, as detailed by the Natura 2000 Standard Data Form, is as follows[26] : -

"This site comprises almost the entire freshwater element of the Moy and its tributaries, including both Lough Conn and Lough Cullin. The system drains a catchment area of 805 km^2. Most of the site is in Co. Mayo though parts are in west Sligo and north Roscommon. The underlying geology is Carboniferous Limestone for the most part though Carboniferous Sandstone is present at the extreme west of the site with Dalradian Quartzites and schists at the south west. The river and its various tributaries rise in a number of locations some of which are upland areas dominated by blanket bog and heath. Throughout most of its course however the river flows through low-lying countryside where most of the adjoining land consists of agricultural grassland. The river eventually reaches the sea at Ballina where it flows into Killala Bay. To the west of Lough Cullin the river passes through areas where the bedrock is dominated by silicious rocks such as granite and here the character of the adjoining land changes to one where blanket bog and heath are important components of the landscape. In addition to river and lake habitats, the site contains adjoining habitats of ecological interest such as raised bogs, heath, wet grassland and deciduous woodland. Small pockets of conifer plantations, close to the lakes and along parts of the rivers, are included. Improved grassland is also included where it occurs along the river channels.

This extensive site contains good examples of the Annex 1 habitats active raised bog, degraded raised bog, Rhynchosporion vegetation, alkaline fen, lowland hay meadows, alluvial woodland and old oak woodlands. The raised bog areas present constitute the most north-westerly examples of raised bog in Ireland, with the most important examples occurring at Derrynabrock and Tawnaghbeg. Alkaline fen is particularly well developed at Mannin and Island Lakes, an excellent example of old oak woodland is to be found just east of Pontoon along the shores of Loughs Conn and Cullin. This represents one of the largest stands of oak woodland in western Ireland. Water quality of the river channels is generally good and the majority is classified as unpolluted. Species-rich lowland hay meadows are found in the river floodplain adjacent to the River Moy in the stretches approximately 5 km both north and south from Foxford town, including westward to the eastern shores of Lough Cullin. The open waters of Loughs Conn and Cullin are moderately hard with relatively low colour and good transparency. Lough Conn, with a surface of 50km2, is classified as a mesotrophic system, while Lough Cullin (surface of 11 km2) is classified as an oligotrophic system. The rivers and lakes support important populations of Lutra lutra, Austropotamobius pallipes, Lampetra planeri and Petromyzon marinus. The Moy system is one of the most important in Ireland for Salmo salar and is an internationally renowned fishery. It also has important stocks of Salmo trutta. Lough Conn supports a nationally important population of Anser albifrons flavirostris and has regionally important numbers of Cygnus cynus and Pluvialis apricaria (all Annex I Bird Directive species). The lakes support a range of other wintering waterfowl, notably nationally important populations of Aythya fuligula and Bucephala clangula. Lough Conn / Cullin represents one of only 4 breeding sites in Ireland for Melanitta nigra, which in Ireland is at the south-west end of its European range. The population, however, has seriously declined in recent years. A range of mammals listed in the Red Data Book occur within the site, including Martes martes and Myotis daubentoni. At least five Red Data Book plant species occur, including Cephalanthera longifolia and Spiranthes romanzoffiana."

As outlined in Table 7-3, the Proposed Development is located within the River Moy SAC at the existing Wherrew RWI&PS site at Lough Conn. The works will involve installing new raw water abstraction infrastructure, including a new intake pipe and a fish return system. The revised intake design also includes infilling the existing intake channel to restore the natural shoreline of the lough. Figure 7-3 below illustrates the Proposed Development's direct interaction with Lough Conn, which lies within and forms part of the River Moy SAC.

[26] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0002298&release=62&nav=4

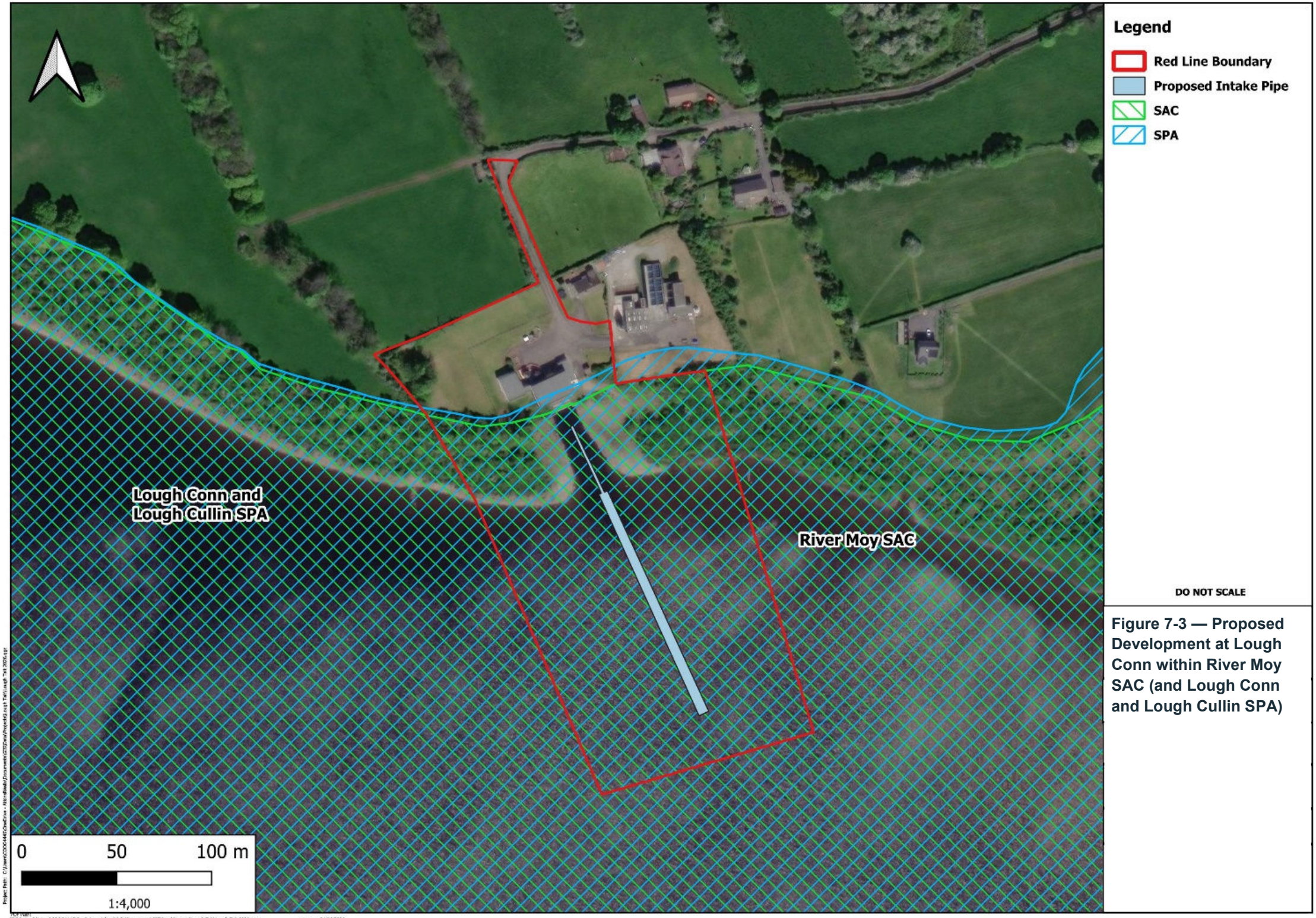


Figure 7-3 — Proposed Development at Lough Conn within River Moy SAC (and Lough Conn and Lough Cullin SPA)

The Proposed Development further interacts directly with the River Moy SAC where the pipeline route crosses the Glenree / Brusna River (hereafter referred to as the Brusna River). The pipeline is aligned through agricultural grassland fields either side of the river crossing and will utilise Horizontal Directional Drilling (HDD) under the Brusna River. HDD launch / reception pits will be set back a minimum of 20 m from the Brusna Riverbanks within the SAC. Figure 7-4 below illustrates the Proposed Development's crossing of the Brusna River, which lies within and forms part of the River Moy SAC.

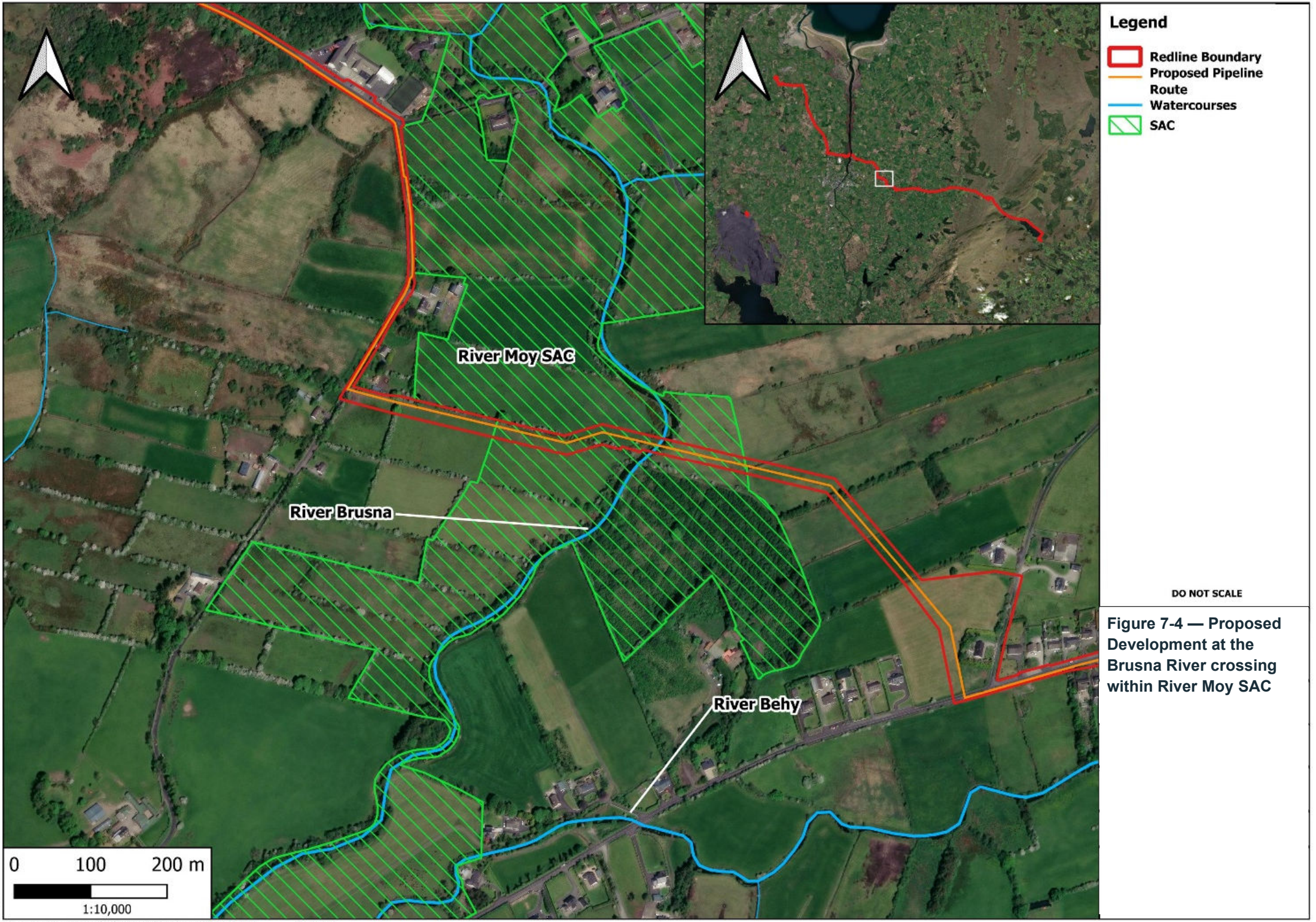


Figure 7-4 — Proposed Development at the Brusna River crossing within River Moy SAC

7.2.2.2 Killala Bay/Moy Estuary SAC

A site synopsis of the SAC, as detailed by the Natura 2000 Standard Data Form, is as follows[27] -

"Situated on the north Mayo/Sligo coast, this large site comprises the inner part of Killala Bay, including the estuary of the River Moy from downstream of Ballina. The towns of Enniscrone and Killala occur on the eastern and western shores respectively. Sand dunes systems, estuaries and intertidal areas are the main habitats of the site. Bartragh Island, a sand bar on which a dune system has developed, stretches across most of the outer part of the site. A further dune system protrudes westwards from Enniscrone, while more dunes occur at the Ross peninsula in the north-west of the site. Other habitats present include salt marshes, dry grassland, reedbeds and scrub.

This large site displays an excellent diversity of dune types and is one of the most important dune systems in the north-west region. There remains a substantial area of intact fixed dune despite modifications to parts of the site for recreational and agricultural purposes. Some humid dune slacks also occur, and there are good and fairly extensive examples of shifting dunes with marram, embryonic shifting dunes and annual vegetation of driftlines. Salt marshes are well represented, with both Atlantic salt meadows and Salicornia types present. The Moy estuary is an important example of an estuary and has extensive intertidal sand and mud flats. Water quality is very good. The site is important for the occurrence of the Annex II mollusc Vertigo angustior, which occurs in marsh habitat. An excellent diversity of waterfowl winter at site, including two Annex I Bird Directive species (Pluvialis apricaria, Limosa lapponica). Seven other species winter in nationally important numbers, and in some winters internationally important concentrations of Branta bernicla hrota occur. Two Red Data plant species are known from site. The site supports an important population of Phoca vitulina and both adult and juvenile Petromyzon marinus."

The proposed pipeline route is in close proximity to River Moy Estuary east of Belleek Woods at the northern end of Ballina town. This section of the estuary lies within Killala Bay / Moy Estuary SAC. The Proposed Development will make use of an existing trunk main located under the estuary to facilitate the transfer of water to a proposed new trunk main located to the east of the estuary, the existing sub estuarine trunk main is noted to be outside of the boundary of the Proposed Development. Figure 7-5 below illustrates the location of the pipeline on the west and east sides of Killala Bay / Moy Estuary SAC.

[27] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0000458&release=62

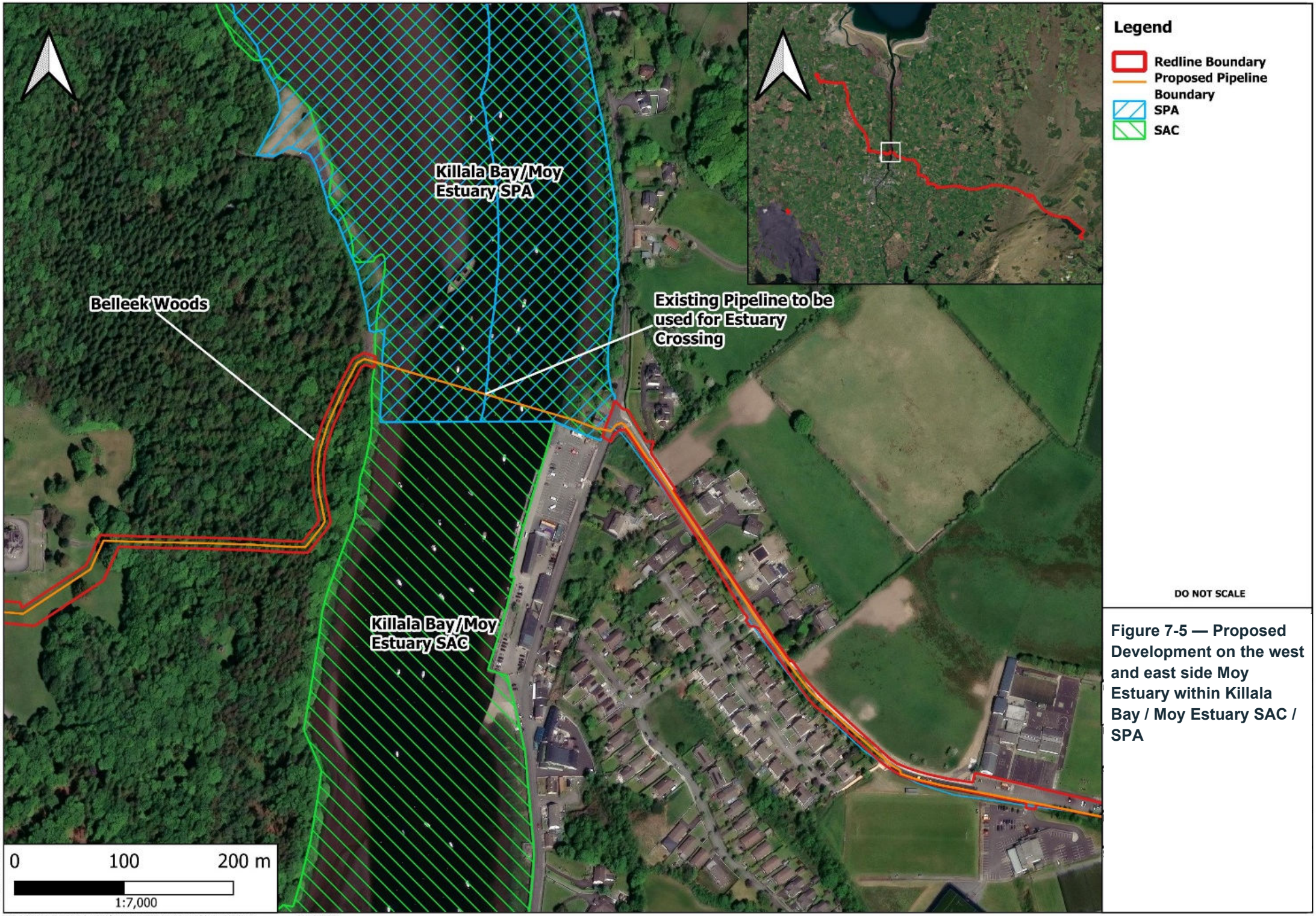


Figure 7-5 — Proposed Development on the west and east side Moy Estuary within Killala Bay / Moy Estuary SAC / SPA

7.2.2.3 Lough Hoe Bog SAC

A site synopsis of the SAC, as detailed by the Natura 2000 Standard Data Form, is as follows[28] :-

"*An area of undulating blanket bog and heath-covered rocky ridges on a lake-studded plateau in the Ox Mountains. Lough Talt, the largest lake on the site, is situated on lower ground at the North-eastern end of the site. Many streams and rivers drain the site. Some 50% of the site supports wet and dry heath, while blanket bog covers most of the rest of the site. The underlying geology is of granite, gneiss and schist, the latter giving rise to a small area of fen vegetation near Lough Talt. The blanket bog on the site comprises a relatively intact example of the montane type. The diversity of vegetation communities and plant species is comparatively low and microtopographical features of the blanket bog are generally quite poorly developed. Lough Talt and other areas of standing water on the site are good examples of unpolluted, acidic oligotrophic lakes. Lough Talt holds a population of the rare Arctic Charr (Salvelinus alpinus) and a population of Austropotamobius pallipes. The rare Red Data Book species Oak Fern (Gymnocarpium dryopteris) has been recorded from the site and the rare snail vertigo geyeri occurs on its northern side.*"

The proposed pipeline route runs alongside Lough Hoe Bog SAC for approximately 4 km as it crosses the Ox Mountains. This section largely follows the existing roadway, apart from a short off-road section. It represents the final stretch of the pipeline before connection to the Lough Talt WTP, which will be repurposed to accommodate the new treated water storage tank and treatment facilities. The pipeline encroaches into the Lough Hoe Bog SAC for only approx. 20 m at Lough Talt to enable a minor stream crossing, with the remainder of the route aligned along the existing R294 roadway.

[28] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0000633&release=62

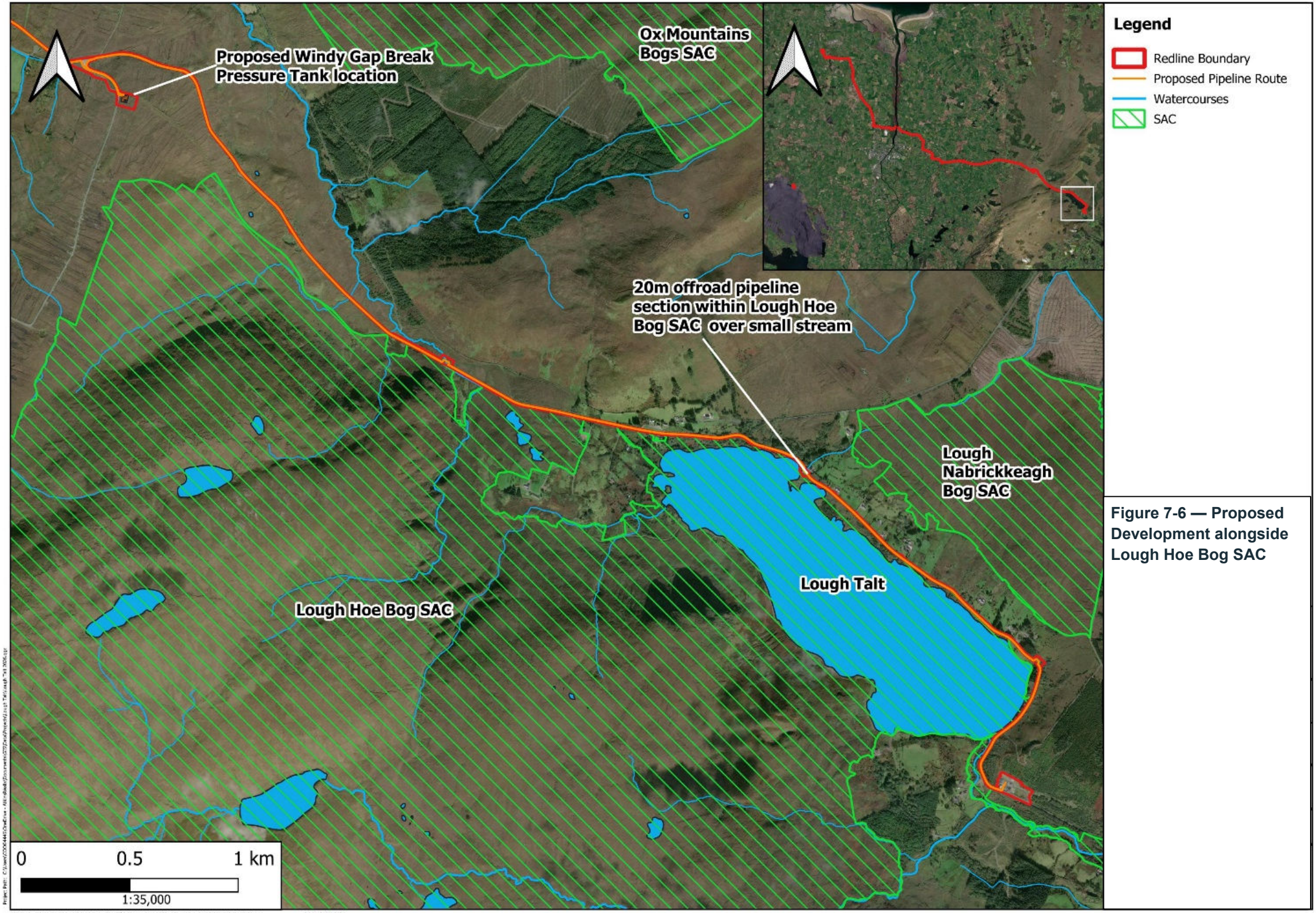


Figure 7-6 — Proposed Development alongside Lough Hoe Bog SAC

7.2.2.4 Lough Conn and Lough Cullin SPA

A site synopsis of the SPA, as detailed by the Natura 2000 Standard Data Form, is as follows[29] : -

"Lough Conn and Lough Cullin are situated in north Co. Mayo and are connected by a narrow inlet near Pontoon. The main inflowing rivers to Lough Conn are the Deel, the Addergoole and the Castlehill while the main outflowing river from Lough Cullin is the River Moy. The lakes have a number of small islands. Fringing swamp vegetation occurs in some sheltered areas. Both Lough Conn and Lough Cullin are part of an important salmonid fishery.

Lough Conn and Lough Cullin is one of only four breeding sites in the country for Melanitta nigra (supporting 40% of the all-Ireland total), a species that in Ireland is at the south-west end of its European range. Recent surveys have recorded a considerable reduction in breeding pairs. Lough Conn and Lough Cullin is also of importance for wintering waterfowl, with a nationally important population of Aythya fuligula (1% of all-Ireland total). The lakes attract other species in lesser numbers, including Cygnus olor, Cygnus cygnus, Anas crecca, Pluvialis squatarola, Bucephala clangula, Vanellus vanellus and Podiceps cristatus. Lough Conn is also one of the sites utilised by a population of Anser albifrons flavirostris. The geese feed mainly on Annagh Island and at a shoreline site near Cloonaghmore Point."

Refer to Figure 7-3 for the interaction of the Proposed Development with Lough Conn and Lough Cullin SPA.

7.2.2.5 Killala Bay/Moy Estuary SPA

A site synopsis of the SPA, as detailed by the Natura 2000 Standard Data Form, is as follows[30] : -

"This large site comprises the inner, estuarine part of Killala Bay, at the mouth of the River Moy. It is a funnel-shaped estuary that is approximately 7 km wide at its outer limit. The site is well-sheltered by a sandy island, Bartragh Island, that extends across much of the outer part, and by a sandy peninsula which extends from Enniscrone on the eastern side. Extensive intertidal sand and mud flats are exposed at low tide. Salt marshes skirt part of the intertidal flats.

This site is a fine example of an estuarine system in a natural state. It supports an excellent diversity of wintering waterfowl and is one of the most important sites in the region. Six of the species have populations of national importance: Limosa lapponica, Charadrius hiaticula, Pluvialis squatarola, Calidris alba, Calidris canutus and Calidris alpina. Pluvialis apricaria also occurs in numbers close to national importance. There is a regular population of Branta bernicla hrota which in some winters exceeds the threshold for international importance. Gavia stellata is regular within the site. The Red Data Book species Groenlandia densa occurs in the site."

Refer to Figure 7-5 for the interaction of the Proposed Development with Killa Bay/Moy Estuary SPA.

7.3.3 National sites

The Proposed Development does not lie within or have connectivity to any Natural Heritage Area (NHA). The Proposed Development lies directly within Lough Conn and Lough Cullin proposed Natural Heritage Area (pNHA), crosses Killala Bay/Moy Estuary pNHA, and is aligned adjacent to Lough Hoe Bog pNHA. These sites are also designated for the same Conservation Interests as their corresponding European sites as discussed in Section 7.2.2.

[29] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0004228&release=62

[30] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0004036&release=62

All NHAs and pNHAs within the potential Zone of Influence (ZoI) of the proposed development are listed in Table 7-3. The table outlines the distance of each national site from the Proposed Development and indicates whether potential connectivity exists.

A map of NHAs and pNHAs located within the potential ZoI of the Proposed Development is illustrated in Figure 7-7.

Table 7-3 — NHAs and pNHAs within the ZoI of the Proposed Development

National Sites (Site Code)	Approx. Distance from Proposed Development	Connectivity to Proposed Development
Lough Conn and Lough Cullin pNHA (000519)	Within Proposed Development.	Yes. There is direct connectivity between the Proposed Development site and Lough Conn and Lough Cullin pNHA. The Proposed Development will result in water abstraction from Lough Conn at Wherrew RWI&PS. Also, construction activities are proposed within Wherrew RWI&PS, which is within the pNHA. The Proposed Development also includes for the installation of water abstraction pipe within Lough Conn waterbody.
Killala Bay/Moy Estuary pNHA (000458)	Within Proposed Development.	Yes. The proposed pipeline route is in close proximity Killala Bay/Moy Estuary pNHA to the east of Belleek Woods in north Ballina, thereby providing connectivity between the Proposed Development site and this pNHA. The proposed pipeline route also crosses nine watercourses which flow into Killala Bay/Moy Estuary pNHA. Therefore, the Proposed Development site is providing both direct and hydrological connectivity between the Proposed Development site and this pNHA.
Lough Hoe Bog pNHA (000633)	20 m	Yes. A section of the proposed pipeline route is aligned directly alongside the boundary of Lough Hoe Bog pNHA at Lough Talt thereby providing potential connectivity between the Proposed Development site and this pNHA.
Lough Nabrickkeagh Bog pNHA (0006340	0.2 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Ox Mountains Bogs pNHA (002006)	0.7 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways

National Sites (Site Code)	Approx. Distance from Proposed Development	Connectivity to Proposed Development
		there will be no impacts on this site as a result of the Proposed Development.
Killala Esker pNHA (001517)	1.3 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Cloonagh Lough (Mayo) pNHA (001485)	3.0 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Lough Alick pNHA (001527)	7.6 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Cloongoonagh Bog pNHA (001657)	7.6 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Lackan Saltmarsh and Kilcummin Head pNHA (000516)	8.1 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Moy Valley pNHA (002078)	9.2 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.

National Sites (Site Code)	Approx. Distance from Proposed Development	Connectivity to Proposed Development
Bellacorick Bog Complex pNHA (001922)	10.4 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Creevagh Head pNHA (000482)	12.5 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Turloughmore (Sligo) pNHA (000637)	13.3 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Moylough Turlough pNHA (001677)	13.8 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Bellacorick Iron Flush pNHA (000466)	17.7 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Drumleen Lough pNHA (001499)	21.5 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Forrew Bog NHA (002432)	10.9 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA

National Sites (Site Code)	Approx. Distance from Proposed Development	Connectivity to Proposed Development
		via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Ummerantarry Bog NHA (001570)	14.9 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.
Cunnagher More Bog NHA (002420)	18.4 km	No. There is no potential direct or indirect connectivity between the Proposed Development site and this pNHA via groundwater, watercourses, drains, ditches or any other vectors. Given the lack of any connecting pathways there will be no impacts on this site as a result of the Proposed Development.

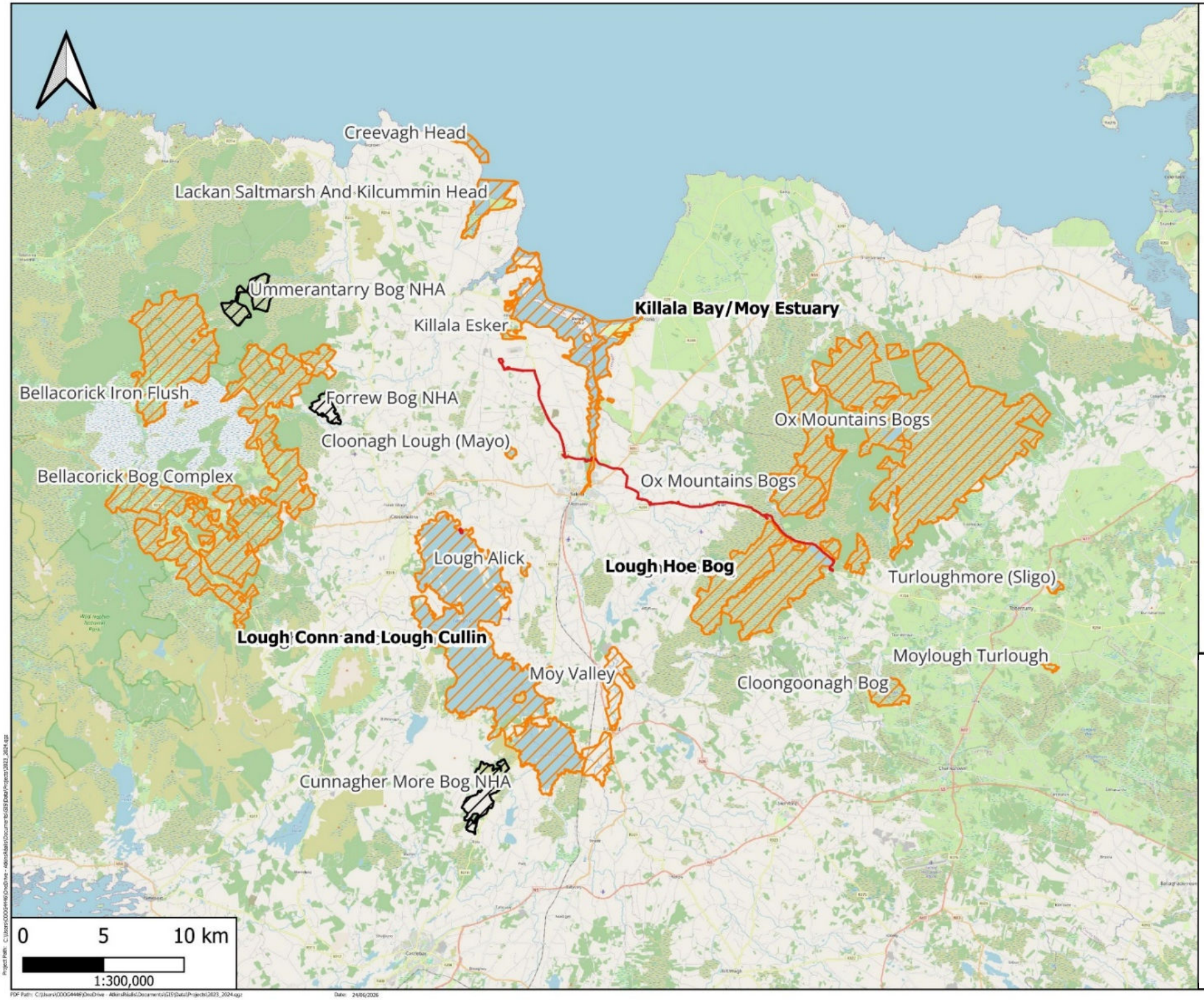


Figure 7-7 — NHAs, and pNHAs located within the Potential ZoI of the Proposed Development

7.3.4 National Nature Reserves

A review of NPWS datasets[31] was undertaken to determine if there are any Nature Reserves within the potential ZoI of the Proposed Development. Easkey Bog Nature Reserve (14 km northeast) and Owenboy Nature Reserve (18 km south west) are the nearest Nature Reserves, however, there is no connectivity between these sites, or any other Nature Reserves, and the Proposed Development.

7.3.5 Non-Qualifying Interest Annex I habitat

A review of NPWS Article 17 datasets[32] (last accessed 16 April 2026) identifies the proposed pipeline route is aligned under and alongside Non-Qualifying Interest Annex I habitats where it crosses the Ox Mountains.

The pipeline route follows existing roadways through the Ox Mountains, adjacent to the Lough Hoe Bog SAC. NPWS datasets identify Annex I Wet Heath [4010] and Dry Heath [4030] habitats in this part of the mountains; which occur outside the boundary of the Lough Hoe Bog SAC. The same datasets also map these areas outside the SAC as Annex I Blanket Bog habitat [7130].

The proposed Windy Gap BPT site is located within an area mapped by NPWS as non-qualifying Annex I Wet Heath, Dry Heath, and Blanket Bog habitats, all situated outside of any SAC boundary. It should be noted that NPWS datasets are not fully comprehensive, site survey evidence confirms that the Windy Gap Site for the proposed Break Pressure Tank has conformity to uniform Cutover blanket bog (Refer to Section 7.2.10).

Throughout this section in the Ox Mountains, the pipeline itself is routed entirely along existing road infrastructure (R294 and wind farm roadways), thereby the pipeline avoids any direct interaction with heath or blanket bog habitats.

In addition, NPWS datasets identify a small area of non-qualifying Annex I Alkaline Fen habitat [7230] along the eastern shore of Lough Talt within the Lough Hoe Bog SAC. In this location, the pipeline follows the R294, ensuring no direct or indirect interaction with the fen habitat. The locations of non-qualifying interest Annex I heath, bog and fen habitats are illustrated in Figure 7-8 below.

[31] https://www.npws.ie/nature-reserves

[32] https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17 - It is acknowledged that this is not a definitive list as the NPWS datasets are incomplete.

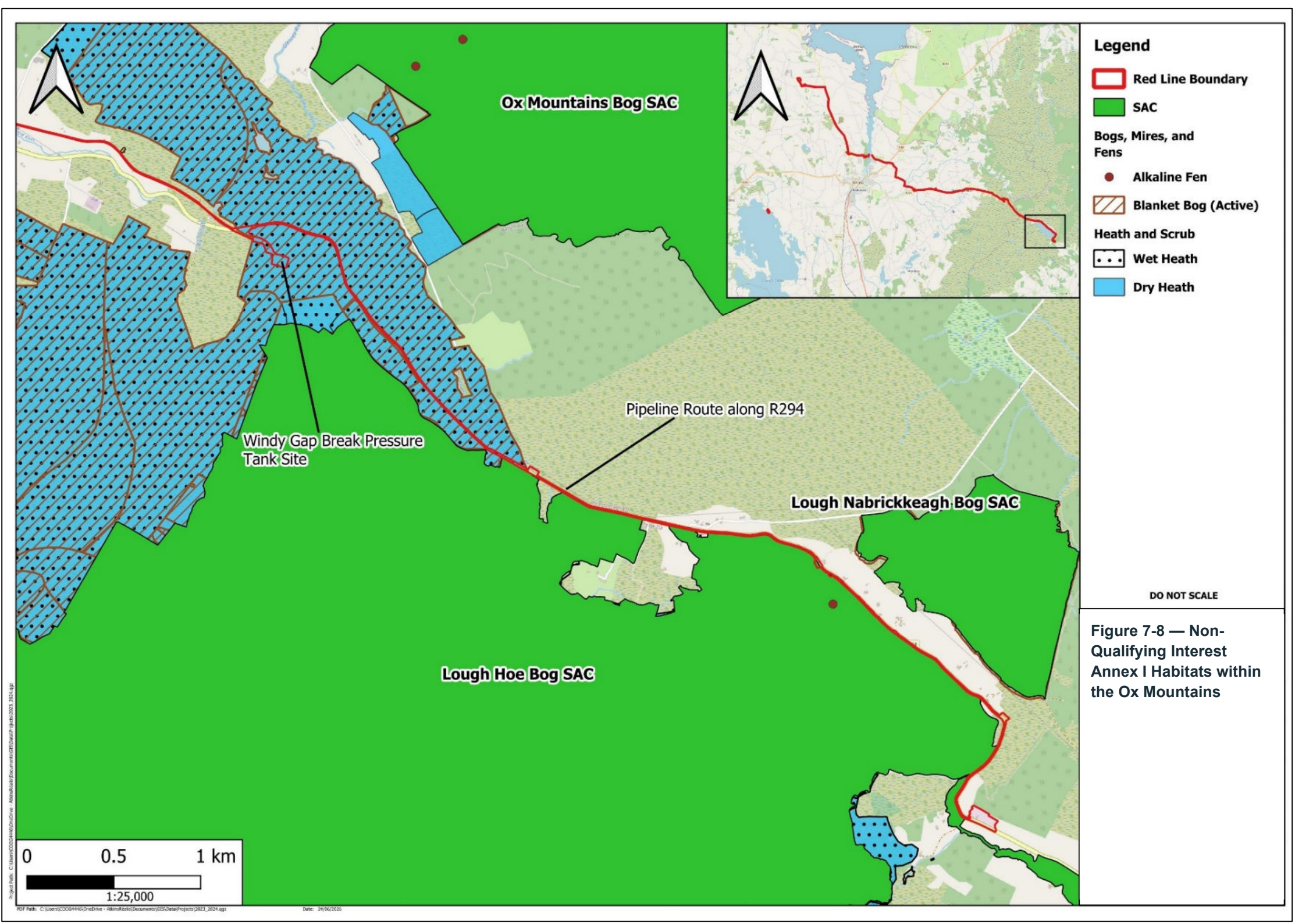


Figure 7-8 — Non-Qualifying Interest Annex I Habitats within the Ox Mountains

7.3.6 Wetland Sites (Wetland Survey Ireland)

A review of Wetland Survey Ireland (WSI) datasets identifies seven wetland sites adjacent to the online/on road sections of the proposed pipeline route as detailed in Table 7-4 below. WSI also provide the wetland habitat type and an evaluation of the wetland site which is included in the table. The Proposed Development pipeline alignment has been specifically developed to avoid direct interaction with any wetland habitat.

Figure 7-9 to Figure 7-11 below show the proposed pipeline route aligned along roadways beside the WSI wetland sites.

Table 7-4 — Wetland crossing points of the Proposed Development[33].

WSI Wetland Site Name (Code)	WSI Site Evaluation	Wetland Type	Connectivity
Coonealcuraun Farm Pond (WMI_MA726)	F-Rating	Lake, Scrub, Wet Grassland	No. The proposed pipeline route follows the R314 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline route does not cross any watercourses with connectivity to this wetland site. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to and from the wetland remain unimpeded.
Farrannsculloge Coonealcuraun Cutover (WMI_MA725)	F-Rating	Cutover bog	No. The proposed pipeline route follows the R314 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline route does not cross any watercourses with connectivity to this wetland site. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to and from the wetland remain unimpeded.
Quignashee Cutover (WMI_MA735)	F-Rating	Cutover bog, bog woodland, scrub	No. The proposed pipeline route follows the Behy roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline route does not cross any watercourses with connectivity to this wetland site. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded.
Bunnyconnellan East Cutover	F-Rating	Cutover bog, dystrophic lake, scrub	Yes. The proposed pipeline route follows the R294 roadway, which runs alongside this wetland site. Because the

[33] https://www.wetlandsurveysireland.com/wetlands/map-of-irish-wetlands--/map-of-irish-wetlands---2/

Complex (WMI_MA596)			pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded. The pipeline route diverges for approx. 250 m off the R294 onto an existing windfarm gravel track to connect to the proposed new site for the Windy Gap BPT. The new tank site, and also the gravel tracks leading to the new site, are located within bogland habitats within this WSI wetland site.
Drumsheen Cutover Complex (WMI_MA595)	C+ Rating	Cutover bog, scrub, wet grassland, dystrophic lake, acid lake, river, wet heath, transition mire, poor fen	Yes. The proposed pipeline route follows the R294 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded. The pipeline route crosses three small streams which flow into bogland habitat within this wetland site.
Tullaghglass Largan Mountain Bog (WMI_SO303)	F-Rating	Lake, River, Wet Heath, Upland Bog	Yes. The proposed pipeline route follows the R294 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded. The pipeline route crosses one. small streams which flow into bogland habitat within this wetland site.
Tullaghglass Largan South Bog (WMI_SO302)	F-Rating	River, Wet Grassland, Cutover Bog, Fen	No. The proposed pipeline route follows the R294 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline route does not cross any watercourses with connectivity to this wetland site. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded.

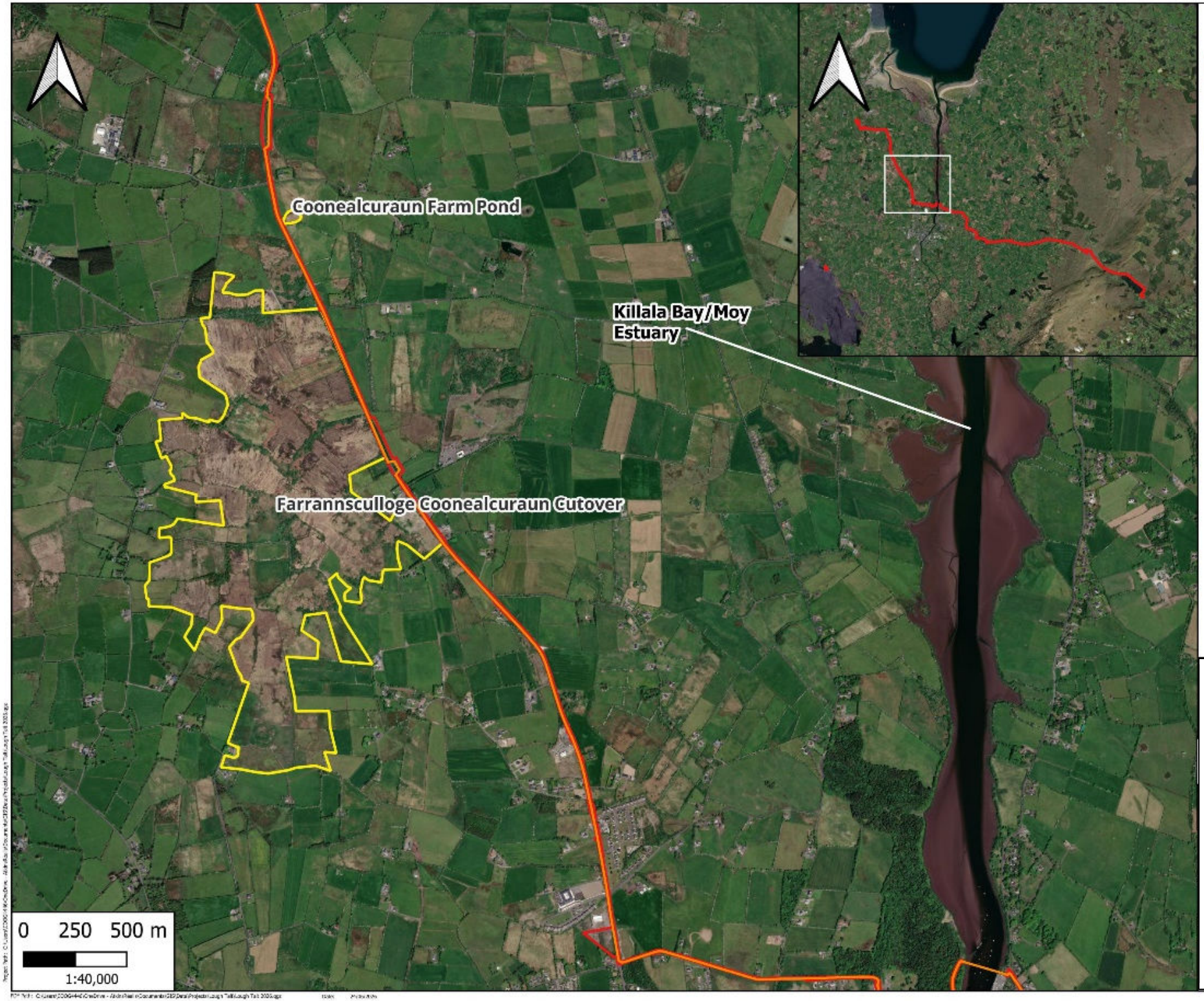


Figure 7-9 - Eastern section of pipeline along roadway adjacent to WSI Wetland Site Boundaries

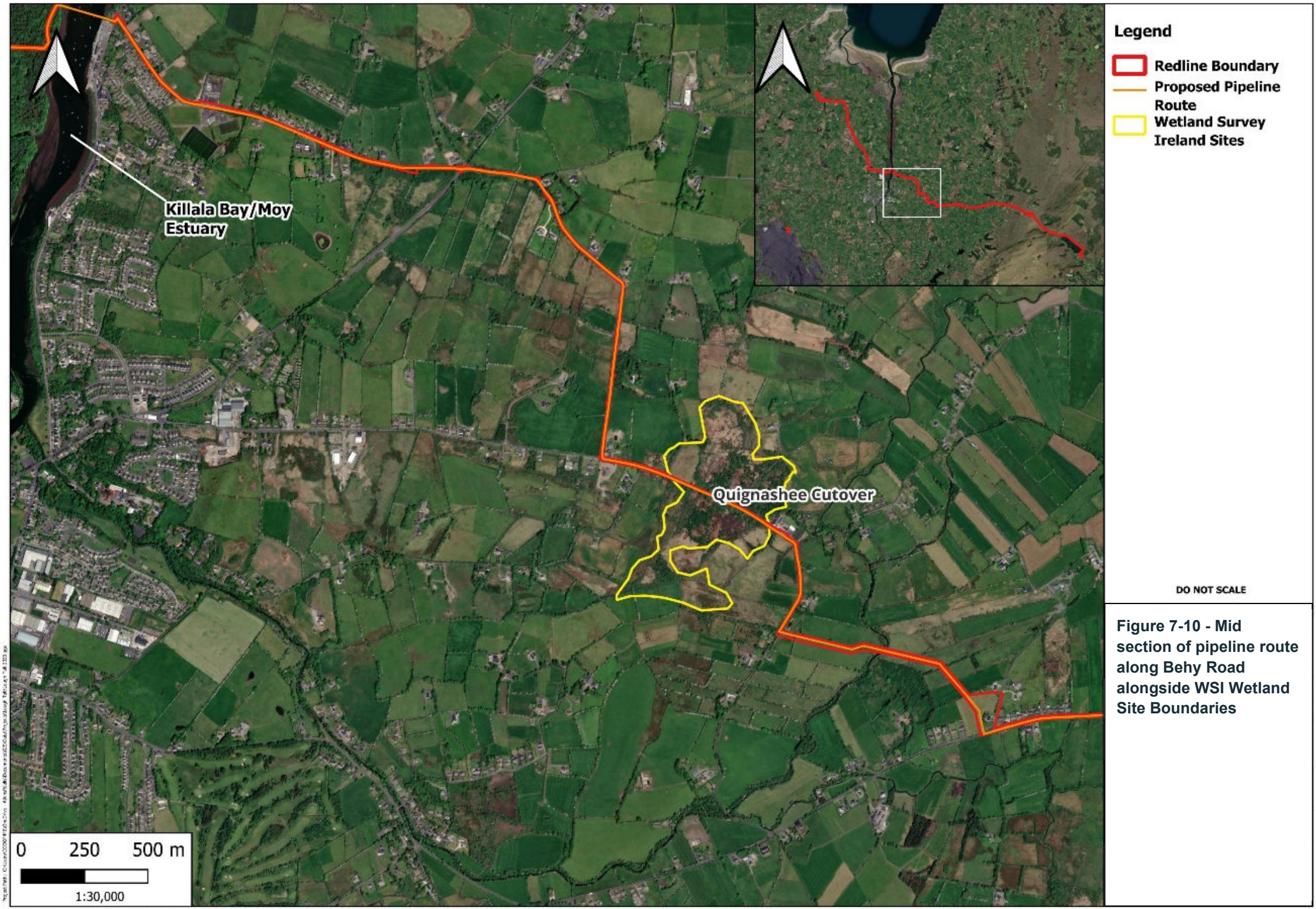


Figure 7-10 - Mid section of pipeline route along Behy Road alongside WSI Wetland Site Boundaries

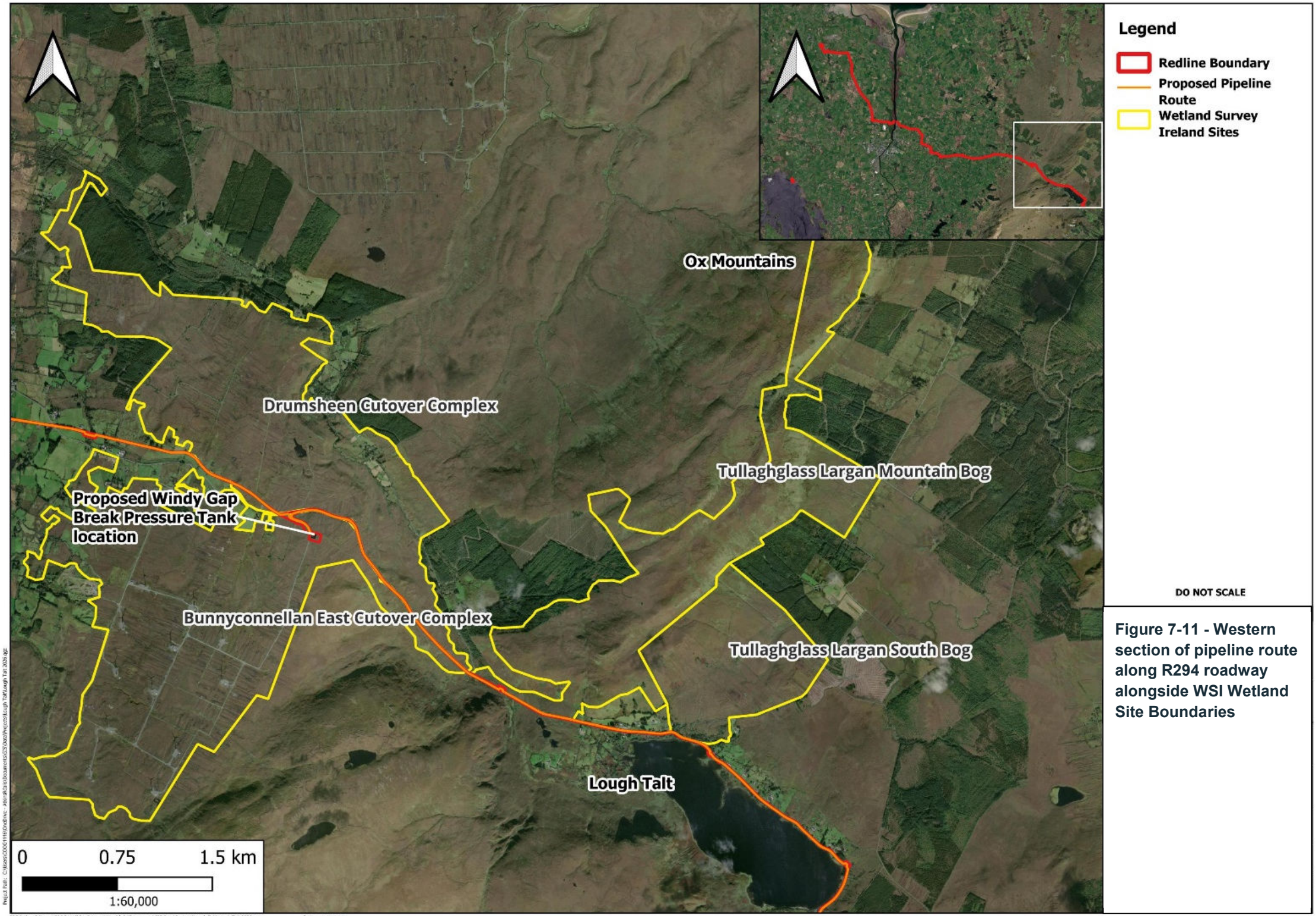


Figure 7-11 - Western section of pipeline route along R294 roadway alongside WSI Wetland Site Boundaries

7.3.7 Surface water features

7.3.7.1 Watercourse crossings

As it traverses through Counties Mayo and Sligo, the Proposed Development's new approx. 30.2 km pipeline will cross thirty surface water features; eighteen EPA identified watercourses and twelve. field drains as identified from field surveys, EPA and Tailte Eireann datasets (it is noted that some of the smaller streams and many of the field drains were dry at the time of surveying).

The majority of the watercourses and field drains crossed by the alignment of the proposed pipeline are within the River Moy subcatchment, and they all flow via various tributaries into the Moy Estuary.

The watercourse crossing points of the Proposed Development are outlined below in Table 7-5 and Figure 7-12 - Watercourses crossed by the Proposed Development. Table 7-5 also details the Water Framework Directive (WFD) water quality status and risk status as detailed in EPA datasets.

The larger watercourses that are intersected by the Proposed Development, as well as the two lough waterbodies connected to the Proposed Development are discussed in greater detail below.

Table 7-5 — Surface water features crossed by the Proposed Development

EPA Watercourse Name	WFD Status 2019 to 2024	WFD Risk	On Road / Off Road	Chainage	Crossing Methodology	Watercourse Connectivity to Designated Sites
Moyne	Moderate	Review	On	880	Open Cut	Killala Bay/Moy Estuary SPA, SAC, pNHA
Newtownwhite	Good	Review	On	2600	Trenchless	Killala Bay/Moy Estuary SPA, SAC, pNHA.
Broadlands of Knockafarson	Good	Review	On	2900	Open Cut	Killala Bay/Moy Estuary SPA, SAC, pNHA.
No Name	Good	Review	On	3520	Trenchless	Killala Bay/Moy Estuary SPA, SAC, pNHA.
Abbeytown	Good	Review	Off	3720	Trenchless	Killala Bay/Moy Estuary SPA, SAC, pNHA.

EPA Watercourse Name	WFD Status 2019 to 2024	WFD Risk	On Road / Off Road	Chainage	Crossing Methodology	Watercourse Connectivity to Designated Sites
No Name	Good	Review	Off	3880	Trenchless	Killala Bay/Moy Estuary SPA, SAC, pNHA.
Field Drain	n/a	n/a	Off	5630	Open Cut	
Illanamuck	Moderate	At risk	On	8020	Open Cut	River Moy SAC, Killala Bay/Moy Estuary pNHA
Moy Estuary	Moderate	At risk	On	10200	Existing duct	Direct Crossing of Killala Bay/Moy Estuary SPA, SAC, pNHA
Field Drain of Quignamanger	n/a	n/a	On	11830	Trenchless	
Field Drain	n/a	n/a	On	12610	Open Cut	
Glenree / Brusna	Good	Not at risk	Off	15280	Trenchless	Direct Crossing of River Moy SAC Connectivity to Killala Bay/Moy Estuary SPA, SAC, pNHA
No Name	Moderate	Review	On	16860	OC or Trenchless	River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA
Fiddaun	Moderate	Review	Off	17220	Trenchless	River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA
Srafaungal	Moderate	Review	Off	17850	Trenchless	River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA
Bunnyconnellan West	Moderate	Review	OFF	20470	Trenchless	River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA
Field Drain	n/a	n/a	On	21050	Open Cut	None

EPA Watercourse Name	WFD Status 2019 to 2024	WFD Risk	On Road / Off Road	Chainage	Crossing Methodology	Watercourse Connectivity to Designated Sites
Srafaungal	Moderate	Review	Off	21700	Trenchless	River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA
No Name	High	Not at risk	On	25730	Open Cut	River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA
Field Drain	n/a	n/a	On	25810	Open Cut	None
No Name	High	Not at risk	On	25970	Trenchless	River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA
Glenree	High	Not at risk	Off	26280	Trenchless	River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA
Field Drain	n/a	n/a	On	27175	Open Cut	Lough Hoe Bog SAC
Field Drain	n/a	n/a	On	28830	Open Cut	Lough Hoe Bog SAC
No Name	High	Not at risk	Off	28070	Trenchless	Lough Hoe Bog SAC
Field Drain	n/a	n/a	On	28350	Open Cut	Lough Hoe Bog SAC
Field Drain	n/a	n/a	On	28730	Open Cut	Lough Hoe Bog SAC
Field Drain	n/a	n/a	On	28950	Open Cut	Lough Hoe Bog SAC
Field Drain	n/a	n/a	On	29295	Open Cut	Lough Hoe Bog SAC
Field Drain	n/a	n/a	Off	29470	Open Cut	Lough Hoe Bog SAC

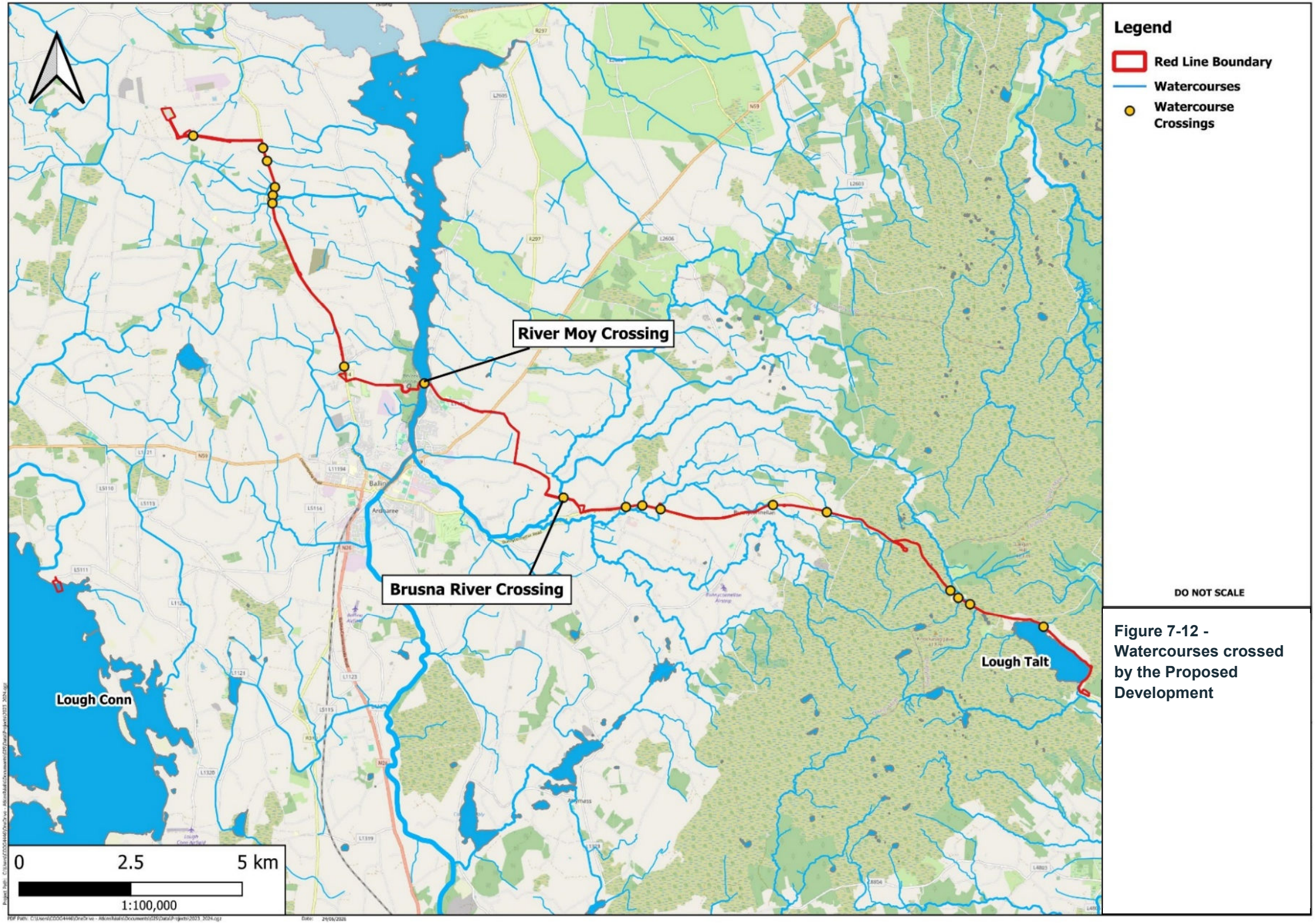


Figure 7-12 - Watercourses crossed by the Proposed Development

7.3.7.2 Watercourse Ecology

This section describes the aquatic ecology of the streams and rivers intersected by the proposed pipeline. Information on the ecological condition of these watercourses is based on Inland Fisheries Ireland (IFI) fish survey data where available, supplemented by EPA biological monitoring results for larger rivers. The EPA's Biological Q Rating System is an established method for assessing river quality using macroinvertebrate communities and provides an indication of ecological health by examining the balance between pollution sensitive and pollution tolerant species.

Project-specific freshwater surveys carried out in 2024 also inform this assessment. Q-value assessments were completed for all watercourses suitable for macroinvertebrate sampling. Several watercourses could not be assessed due to their very small size, lack of flow, or because they were dry at the time of survey.. The results of the Q-value assessments for all eligible watercourses are presented below. Details of the in-stream and riparian plant species recorded during the site surveys are also included in this section.

Abbeytown Stream (Chainage 3720)

Neither IFI or the EPA undertake monitoring or surveying of this watercourse.

Project specific surveys were carried out at the Abbeytown Steam at the proposed crossing point. The Abbeytown Stream was characterised as having 'Poor' status at the time of surveying receiving a Q-value score of 3, as such the stream is considered to be 'Moderately' polluted. The stream is deep relative to the size of the stream with a slow flow. The riverbed is soft mud (approx. 15 cm at its deepest), as such there is no suitable spawning habitat for Salmonids. There is potential habitat for Lamprey ammocoetes within the silt. Lampreys are a QI of Killala Bay/Moy Estuary SAC, no records are available for the area and no lamprey were recorded during the survey. This stream will be crossed by trenchless techniques (pipe jacking) and as such there will be no instream works or direct interaction with the stream. Macroinvertebrate sampling results are provided in Table 7-6. Figure 7-13 is a site photograph of the Abbeytown Stream at the proposed crossing point.

Table 7-6 — Macroinvertebrate Kick sampling results Abbeytown Stream

Taxa	Sensitivity Group*	Abundance
Gammarus	C	104
Corixidea	C	1*
Gyrinidae	C	1*
Chironomidae	C	10
Sialidae	C	7
Assellus aquaticus	D	80
	Q-value	**3**

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)



Figure 7-13 — Abbeytown Stream at proposed crossing point

River Moy Estuary (Chainage 10200)

The Moy Estuary lies to the north of Ballina in County Mayo. It is funnel-shaped, measuring approx. 3 km wide at the outermost part of the estuary, and covers an area of about 742 ha. Bartragh Island, situated at the seaward limits of the estuary, extends across much of its mouth and provides significant shelter to the water body. Extensive intertidal sand and mudflats are exposed at low tide, offering rich feeding habitats that support a wide variety of waterfowl species

The Moy Estuary was last sampled by the Central and Regional Fisheries Boards (now Inland Fisheries Ireland) in 2008. The results of the survey found that the estuary was important habitat for flounder (*Platichthys flesus*), two-spotted goby (*Gobiusculus flavescens*), sand goby (*Pomatoschistus minutes*), common goby (*Pomatoschistus microps*), plaice (*Pleuronectes platessa*), eel (*Anguilla anguilla*), long-spined sea scorpion (*Taurulus bubalis*), five-bearded rockling (*Ciliata Mustela*), brown trout (*Salmo trutta*), sea trout (*Salmo trutta*), whiting (*Merlangus merlangus*), pollack (*Pollachius pollachius*), gunnel (*Pholis gunnellus*), saithe (*Pollachius virens*), greater pipefish (*Syngathus acus*), three-spined stickleback (*Gasterosteus aculeatus*) and deep-snouted pipefish (*Syngathus typhle*)[34].

The EPA do not undertake biological monitoring of the estuary itself, however they undertake monitoring of the Moy River approx.1 km upstream of Ardnaree Bridge in Ballina town. EPA biological monitoring undertaken in 2022 (latest available data) detail a Q Value score of 3-4 indicating a ‘Moderate’ biological status (slightly polluted) and ‘Good’ status for Phytoplankton for this waterbody. The Moy Estuary, being a very large waterbody, was not subject to project specific aquatic surveying. It is noted that the pipeline, where it crosses the Moy Estuary will utilise an existing trunk main, as such there will be no works within or interaction with the estuarine waterbody.

Brusna River (Chainage 15280)

[34] http://www.wfdfish.ie/wp-content/uploads/2009/09/Moy

The Brusna River is located within the River Moy SAC. The Brusna River rises in the Ox Mountains near Knockasliggaun in Co. Sligo, it flows west through Ballina to join with the River Moy Estuary. The Proposed Development crosses the watercourse north of the confluence of the Brusna and Behy Rivers. Downstream of the confluence the river is classified as a large 6th order watercourse by the EPA.

The Brusna River is not subject to fish surveys by IFI. The EPA undertake biological monitoring of this river approx. 400 m upstream of the proposed pipeline crossing point. EPA biological monitoring undertaken in 2022 (latest available data) detail a Q Value score of 5 indicating a 'High' biological status (unpolluted) and 'Good' status for Invertebrates for this waterbody.

Project specific freshwater surveys (2024) found the river at the crossing point is in good condition with silt free cobble, gravel and sand substrate suitable for salmon spawning. Macroinvertebrate kick sample at this site recorded a Q-4, which is in line with 'Good' status waterbodies. The riparian habitat upstream of the crossing is mostly grassy banks with a willow treeline on the southern bank and a small alder tree and one large ash tree on the north bank. Set bank from the northern bank there is also old spoil piles presumably from historic dredging activities. Downstream the riparian habitat is much denser with scrub immediately next to the river backed by a treeline on both banks. The treeline becomes more continuous and established the further downstream from the crossing. A project specific crayfish survey was carried out from approx. 100 m downstream of the Brosna crossing to approx. 100 m upstream. Although there was an abundance of suitable crayfish habitat none were recorded.

This Brusna River will be crossed by trenchless techniques (horizontal directional drilling (HDD)) and as such there will be no instream works or direct interaction with the river, the HDD launch/reception pits are set back a minimum of 20 m from the riverbanks. Macroinvertebrate sampling results are provided in Table 7-7. Figure 7-14 is a site photograph of the Brosna River at the proposed crossing point.

Table 7-7 — Macroinvertebrate Kick sampling results Brusna River

Taxa	Sensitivity Group*	Abundance
Ecdyonurus sp.	A	6
Dinocras cephalotes	A	3
Nemouridae	A	3
Sericostomatide	B	3
Odontoceriidae	B	10
Glossosomatidae	B	2
Goeridae	B	2
Gammarus	C	19
Hydrobidae	C	5
Baetis sp.	C	2
	Q-value	**4**

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)



Figure 7-14 — Brusna River at proposed crossing point (via HDD) in River Moy SAC

Fiddaun Stream (Chainage 17220) and **Srafaungal Stream** (Chainage 17850)

Neither IFI or the EPA undertake monitoring or surveying of these watercourses. Project specific aquatic surveys were carried out (2024) on the Fiddaun and Srafaungal streams to be crossed by the proposed pipeline. Both streams received a Q-value score of 3 giving a status of 'Poor'.

The eastern bank of the Fiddaun Stream is backed by a garden (amenity grassland) with riverbank itself having little vegetation with areas of bare soil with signs of herbicide being used. The western bank has a mature hedgerow containing mostly hawthorn (*Crataegus monogyna*), with dense vegetation at the base of the bank and into the stream which is predominately fool's watercress (*Helosciadium nodiflorum*). The substrate contains cobbles, however, there are high levels of silt between the cobbles the stream bed is very soft in places.

The Srafaungal Stream also contains dense instream macrophytes in this section, within instream vegetation also mostly fool's watercress. However, the river substrate is much cleaner than the Fiddaun with little silt and a mix of gravel and cobbles. There were no signs of salmonids or redds during the survey, however there are some areas of suitable gravel for spawning. The high abundance of macrophytes could cause issues with fluctuating oxygen levels. The stream is bordered by wet grassland on both banks containing meadowsweet (*Filipendula ulmaria*), willowherb (*Chamaenerion angustifolium*), softrush (*Juncus effusus*) and a range of grass species.

Both streams will be crossed by trenchless techniques (pipe jacking) and as such there will be no instream works or direct interaction with the streams or banks. Macroinvertebrate sampling results are provided in Table 7-8. Figure 7-15 and 7-16 are site photographs of the Fiddaun Stream and Srafaungal Stream at the proposed crossing points.

Table 7-8 — Macroinvertebrate Kick sampling results of Fiddaun Stream and Srafaungal Stream

Taxa	Sensitivity Group	Fiddaun Stream Abundance	Srafaungal Stream Abundance
Nemouridae	A	1	
Sericostomatide	B	2	6
Odontoceriidae	B		2
Leuctridae	B		2
Limnephilidae	B	1	
Cased caddisfly (Too small to ID in the field)	B	2	
Piscicolidae	C		4
Gammarus sp.	C	50	45
Simuliidae	C	2	15
Empherellidae	C		4
Dugesiidae	C		7
Hydrobidae	C		10
Baetis sp.	C	2	3
Dicranota	C		2
Coleoptera Larvae	C		4
Polycentropodidae	C	1	
	Q-value	**3**	**3**

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa_



Figure 7-15 — Fiddaun Stream at crossing point



Figure 7-16 — Srafaungal Stream at crossing point

Srafaungal Stream (Chainage 21700)

Neither IFI or the EPA undertake monitoring or surveying of this watercourse. A project specific aquatic survey was carried out on the Srafaungal Stream at this second crossing point. The riparian habitat at this crossing of the Srafaungal Stream is a combination of wet grassland and sparse deciduous treelines on both banks. Willow is the dominant tree type with some ash present also. There are some conifers present further back from the river on the western side. Other species present include nettles (*Urtica dioica*), Foxglove (*Digitalis purpurea*), Meadowsweet, ferns (*Dryoptera* spp,), hogweed (*Heracleum sphondylium*) and creeping butter cup (*Ranunculus repens*). The rivers substrate is predominantly cobbles with areas of final clean gravel, which offer potential spawning habitat for Salmonids. The macroinvertebrate sample returned a Q-value score of 4 which is representative of a WFD 'Good' status waterbody.

This stream will be crossed by trenchless techniques (pipe jacking) and as such there will be no instream works or direct interaction with the stream or bankside vegetation. Macroinvertebrate sampling results are provided in Table 7-9. Figure 7-17 is a site photograph of the Srafaungal Stream at the proposed crossing point.

Table 7-9 — Macroinvertebrate Kick sampling results Srafaungal Stream crossing

Taxa	Sensitivity Group*	Abundance Crossing
Rhitrogenia sp.	A	3
Leuctra	B	2
Goeridae	B	9
Dugesiidae	C	3
Baetis sp.	C	4
Dicranota	C	2
Coleoptera Larvae	C	2
Polycentropodidae	C	2
Chironomidae	C	1
Sialidae	C	1
Elimidae	C	2
	Q-value	**4**

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)

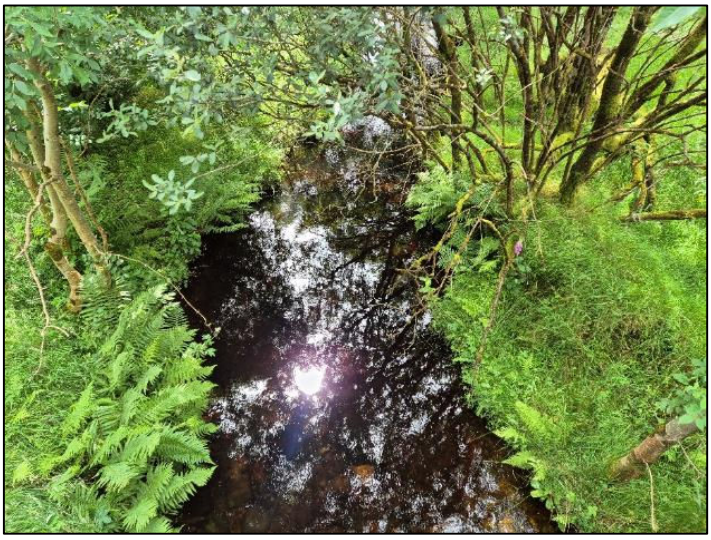


Figure 7-17 — Srafaungal Stream at crossing point

Glenree Stream (Chainage 25970)

Neither IFI or the EPA undertake monitoring or surveying of this watercourse. A project specific aquatic survey was carried out on the Glenree Stream. The Glenree Stream originates in the Ox Mountains and flows down for >15 km to conjoin with the Brusna River. The habitat present at this crossing of the Glenree Stream is predominantly blanket bog, however it is being grazed by sheep and so is species poor. The river banks are steep on both sides. Downstream of the road culvert at the crossing point there is a good mix of riffle and glide areas. The substrate is cobbles and boulders with some small areas of gravel. There is limited spawning value due to the sediment being mostly large cobbles and high abundance of filamentous algae being present. Upstream of the road culvert the flow is very slow and the stream is very straight and canalised. Horsetail (*Equisetum arvense*) is growing throughout the stream. The substrate is very soft and highly silted. There is no suitable spawning habitat for Salmonids. The macroinvertebrate survey returned a Q-value of 4 which is representative of a 'Good' status water body. However, due to the low abundance of species and high levels of filamentous algae this result should be considered with caution.

This stream will be crossed by trenchless techniques (pipe jacking) and as such there will be no instream works or direct interaction with the stream or banks. Macroinvertebrate sampling results are provided in Table 7-10. Figure 7-18 is a site photograph of the Glenree Stream at the proposed crossing point.

Table 7-10 — Macroinvertebrate Kick sampling results Glenree Stream

Taxa	Sensitivity Group*	Glenree Stream
Rhitrogenia sp.	A	2
Nemouridae	A	1
Gammarus sp.	C	3
Simuliidae	C	1
Empherellidae	C	2
Baetis sp.	C	1
Polycentropodidae	C	1
Chironomidae	C	2
Elimidae	C	1
	Q-value	**4**

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)



Figure 7-18 — Glenree Stream at crossing point

7.3.7.3 Lough waterbodies

This section provides ecological details of the (only) two lough waterbodies within the Proposed Development footprint; Lough Conn and Lough Talt.

Lough Conn

Lough Conn is the (existing) abstraction point for raw water for the Proposed Development. Lough Conn is located in the Moy catchment in north County Mayo. The lake is connected to its immediate neighbour to the south, Lough Cullin, by a narrow channel that passes under a regional road at Pontoon Bridge. The River Deel flows into Lough Conn and exits Lough Cullin at its southern end near Foxford, just before joining the River Moy which discharges into the Atlantic Ocean at Killala Bay. The lake has a surface area of 4,704ha and a maximum depth of 37.9 m. The lake is categorised as typology class 12 (as designated by the EPA for the Water Framework Directive), i.e. deep (mean depth >4 m), greater than 50 ha and high alkalinity (>100 mg/l CaCO3)[35].

Lough Conn in County Mayo is best classified as a Limestone/Marl Lake (FL3). The lake lies within a catchment dominated by Carboniferous limestone, resulting in base-rich, alkaline conditions that are characteristic of FL3 lake types.

The latest IFI fish survey report[36] (2022) for Lough Conn details the following: -

> 'Lough Conn's reputation as a fine brown trout and salmon fishery goes back to the very beginning of angling in the west of Ireland (O' Reilly, 1998). The main run of spring salmon enters Lough Conn from the end of March and continues right through April. The grilse run begins and May and continues into July (IFI, 2016).
>
> The lake was surveyed by IFI on eight occasions between 1978 and 2013 (1978, 1984, 1990, 1994, 1998, 2001, 2005 and 2013) as part of a brown trout fish stock assessment programme (O' Grady and Delanty, 2001; Delanty and O'Grady, 2014). The lake was also surveyed in 2016 as part of the WFD surveillance programme (Kelly et al., 2017). Brown trout (*Salmo trutta*), rudd (*Scardinius erythrophthalmus*), roach (*Rutilus rutilus*), perch (*Perca fluviatilis*), European eel and pike (*Esox lucius*) were captured in the surveys.
>
> Historically the lake held a population of Arctic char (*Salvelinus alpinus*), however, they have been extinct for some time. Following the apparent collapse of the Arctic char population, IFI surveyed the spawning areas where Arctic char, if present, would be congregating to spawn during the Arctic char spawning seasons of 1991 to 1994. Three Arctic char were captured in the 1991 sampling, one fish in 1992 and none thereafter in 1993 or 1994. An examination of pike stomachs from fish captured in various parts of Lough Conn, throughout the 1990s, found no Arctic char (Igoe, et al., 2000). It is therefore reasonable to assume that Arctic char had become extinct in Lough Conn by the mid-1990s.'

IFI latest fish stock survey[36] identified a total of seven fish species recorded on Lough Conn in 2022. Roach and perch were the two most abundant species captured on Lough Conn in 2022 and they accounted for 88% of all fish captured in the survey. Abundance of roach and perch was relatively similar between 2016 and 2022. The roach population was characterised by a large proportion of larger and older fish while the perch population was dominated by younger year classes in 2022. The report outlines that Lough Conn is an important brown trout fishery. Both the abundance and biomass of brown trout was relatively similar between the 2016 and 2022 surveys. Brown trout ranged in length from 15.9 cm to 56.7 cm and ranged in age from 1+ to 6+ years, indicating consistent recruitment with persistence of some larger and older individuals. An increase in the proportion of smaller fish (approx. 20 cm) was observed since 2016, indicating that recruitment may have increased in later years. The 2022 survey found that Lough Conn supports a stable and balanced fish community, dominated by roach and perch, with healthy brown trout recruitment and a

[35] *Inland Fisheries Ireland National Research Survey Programme Fish Stock Survey of Lough Conn, September 2022*

[36] http://wfdfish.ie/index.php/fish-stock-survey-of-lough-conn-september-2022/

consistent presence of other species including Atlantic salmon, eel, tench (*Tinca tinca*), and pike. The 2022 report details Lough Conn has been assigned an ecological status of 'Good' for 2022 based on the fish populations present. Lough Conn was also assigned a fish ecological status of 'Good' in 2016.

IFI have a programme[37] to manage the fish stock in Lough Conn. The principal aim of the 2023 management plan is to remove the predator species pike by electrofishing and gill netting, from the lakes and some of the tributary rivers. The control and removal of non-indigenous, predatory fish such as pike from valuable salmonid fisheries has been practiced for over 100 years in some parts of Ireland. It has been perceived as an important tool in the management of these inland waterways as quality brown trout and salmon fisheries (salmon are noted to be a species associated with River Moy SAC). In Lough Conn, pike are known to have been introduced in relatively recent times. Pike are known to prey on salmon smolts during the spring period. Salmon smolts passing through large lakes on their downward migration are frequently recorded in pike stomachs in Lough Conn (and Cullin) on the Moy system. Pike have been recorded accumulating in significant numbers where in flowing streams enter lakes in spring. There have also been rare incidences of large pike preying on adult salmon in Lough Conn.

Sea lamprey and Brook lamprey, which are both species associated with the River Moy SAC, utilise Loughs Conn (and Cullin) primarily as transitional or resident lake habitats, depending on species and life-history strategy. Sea lamprey (*Petromyzon marinus*), an Annex II species, are anadromous and spend most of their adult life in the marine environment; however, individuals migrating to known spawning sites in the River Moy and its tributaries, including the River Deel, may pass through Lough Conn during their upstream migration in April–June. Lough Conn is not used for spawning or larval development by sea lamprey, with juvenile ammocoetes confined to fine sediments in flowing riverine habitats, rather than lake waterbodies[38]. Brook lamprey (*Lampetra planeri*), a non-parasitic, largely fluvial species, have not been recorded within Lough Conn, though their occurrence in the River Deel suggests possible seasonal passage through lake waters; however, their life cycle is almost entirely river-based[39]. In contrast, a landlocked form of lamprey is known to occur in Lough Conn and other large Irish lakes, including Cullin, Corrib and Derg, and was recorded in Lough Conn during targeted investigations in 2016. These populations complete their full life cycle within lake catchments and tributaries, though little is known about their spawning ecology; spawning is presumed to occur in accessible inflowing streams where adults excavate redds in suitable substrates. Overall, available evidence indicates that Loughs Conn and Cullin function as migration corridors for sea lamprey, have limited importance for brook lamprey, and support a resident landlocked lamprey population, with no records indicating that lake-based activities overlap with sensitive spawning or larval habitats[39].

The white-clawed crayfish (*Austropotamobius pallipes*), another aquatic species associated with River Moy SAC, is widespread in the upper tributaries of the River Moy and the rivers which flow to Loughs Conn and Cullin. This species is absent from the main River Moy and the main bodies of Lough Conn and Lough Cullin. It is noted that crayfish plaque is present within the Moy catchment.

EPA datasets identify the Lake Waterbody WFD Status (2019-2024) is 'Good' for Lough Conn whilst the latest WFD Lake Waterbodies Risk (2019-2024) is 'Under Review'. EPA datasets[39] classifies the Ecological status/potential of Lough Conn as 'Good', with 'High' status for phytoplankton, aquatic flora and has 'High' supporting chemistry conditions (dissolved oxygen, pH, nitrogen, and phosphorous).

As outlined, raw water will be sourced from Lough Conn and treated at Lisglennon WTP. An inlet channel feeds into two separate sumps under the Wherrew RWI&PS. It has been noted that that silt can accumulate in the inlet channel over time which necessitates intermittent maintenance in the form of in-lake dredging. There is also no fine screen present and no mitigation for potential colonisation of the intake and sump by invasive species zebra mussels

[37] https://www.fisheriesireland.ie/sites/default/files/2023-02/l.conn_cullin_stock_management_aa_screening2023_0.pdf

[38] https://www.fisheriesireland.ie/sites/default/files/2023-02/l.conn_cullin_stock_management_aa_screening2023_0.pdf

[39] https://www.catchments.ie/data/#/waterbody/IE_WE_34_406b?_k=jkuh3w

(*Dreissena polymorpha*). Zebra mussels have been identified as a significant pressure in Lough Cullin, and therefore a threat to Lough Conn exists.

Lough Talt

Lough Talt is situated in Co. Mayo in the Ox Mountains, between Tobercurry and Ballina in the Moy catchment. The lake has a surface area of 97 ha and a maximum depth of approx. 40 m. The lake is categorised as typology class 8 (as designated by the EPA for the Water Framework Directive), i.e. deep (mean depth >4 m), greater than 50 ha and moderate alkalinity (20 to100 mg/l CaCO3)[40].

Lough Talt in County Sligo is best classified as an Acid Oligotrophic Lake (FL2), reflecting its naturally nutrient-poor waters and upland bog-dominated catchment. The lake forms part of the Lough Hoe Bog SAC, an area specifically characterised by oligotrophic lakes within montane bog landscapes.

The lake is also an important habitat for a population of white-clawed crayfish, which is listed on Annex II of the EU Habitats Directive. Lough Talt is recognised as a historically good brown trout (*Salmo trutta*) fishery and holds a population of Arctic char (*Salvelinus alpinus*), a rare and threatened species listed in the Irish Red Data Book for fish as vulnerable[41]. Lough Talt is home to the sole remaining Arctic char population in the River Moy catchment, perch, eels, and three-spined stickleback are also among the aquatic species found in Lough Talt[42].

Lake Waterbody Status outlined by WFD (2019–2024) lists Lough Talt as having 'Good' status. The latest WFD Lake Waterbodies Risk monitoring data (2019–2024) classifies the Ecological status/potential of Lough Talt as 'Good', with 'High' status for phytoplankton, phytobenthos, fish, and supporting chemistry conditions (dissolved oxygen, pH, nitrogen, and phosphorous).

As Lough Talt is designated as part of the Lough Hoe Bog SAC, detailed hydrogeological investigations were completed as part of the historic Water Abstraction Order (WAO) application process for Lough Talt. The hydrogeological investigations concluded that during periods of extended dry weather or drought, the lake abstraction operation contributes to the lake level dropping, which has an impact on the supporting conditions for the fen habitat of the Geyer's Whorl snail (*Vertigo geyeri*). This snail is an Annex II species of the EU Habitats Directive and is a qualifying interest of Lough Hoe Bog SAC. The minute Geyer's Whorl snail is a species dependent on specific habitat conditions for its survival and spread and is stringent in its habitat requirements, requiring stable hydrological conditions. *V. geyeri* was first found in the fen habitat at Lough Talt in 1992 and in subsequent surveys until 2007. *V. geyeri* has now been lost in the fen habitats surrounding the lough. The most likely cause for extirpation of *V. geyeri* is the reduction of groundwater levels due to abstraction pressures applied to the lake during drought periods (e.g. during summer months). As the lake acts as a hydraulic boundary for groundwater flow in the fen, artesian conditions are lost when the lake level drops, thus preventing groundwater from penetrating the fen's surface.

The overall aim of the Proposed Development is to provide an alternative water supply for the region and to facilitate cessation of abstraction of water from Lough Talt. In addition to the cessation of water abstraction, in order to meet the aims and objectives of Uisce Éireann's Biodiversity Action Plan, which are to help conserve, enhance and work with the natural environment, a plan was developed to mitigate impacts to the fen habitats around Lough Talt and compensate for the loss of *V. geyeri*. Mitigation (irrigation) and compensatory (*V. geyeri* reintroduction) measures have been prescribed. Two mitigation approaches were developed to maintain suitable moisture conditions during prolonged dry periods: the first involves surface irrigation and deep artificial groundwater recharge over approximately 30–40% of optimal habitat, with ongoing monitoring and adaptive adjustments to maintain favourable conditions; the second consists of continued monitoring of groundwater level and quality, lake level, fen moisture and rainfall to evaluate habitat performance under abstraction. A four-year management programme accompanies these measures,

[40] Inland Fisheries Ireland (2020), National Research Survey Programme Fish Stock Survey of Lough Talt.

[41] https://www.fisheriesireland.ie/sites/default/files/2021-08/Talt_2020.pdf

[42] https://www.fisheriesireland.ie/sites/default/files/2021-08/Talt_2020.pdf

beginning with testing and deploying the irrigation system and monitoring hydrological and microhabitat conditions; followed in Year 2 by translocation of less sensitive mollusc species and further monitoring alongside consultation with NPWS; then the translocation of *V. geyeri* in Year 3 with continued ecological and hydrological assessment; and finally, from Year 4 onward, a monitoring regime to ensure proper irrigation management and to confirm establishment, reproduction and dispersal of the translocated snail populations through hand searches of monitoring quadrats and suitable microhabitats.

7.3.8 Woodlands

A review of the National Survey of Native Woodlands (NSNW), Ancient and Long-Established Woodland Inventory (ALEW), NPWS and NBDC datasets identifies that there are no NSNW or ALEWs within 1 km of the Proposed Development route.

The Proposed Development has interaction with one area of woodland habitat, the pipeline route traverses Belleek Woods within Belleek Castle grounds for approx. 900 m. Throughout this section, the route follows existing formal woodland trails, including gravel paths and tarmac access roads, and also crosses an area of maintained amenity grassland (lawn) around the castle building. Because these trails and roadways are typically 8–10 m wide, the pipeline can be installed entirely along these existing corridors and will not require any direct encroachment into woodland habitat.

Project specific surveys were undertaken in Belleek Woods in 2024, 2025 and 2026, and the results of these surveys are summarised in this section. Belleek Woods was also previously surveyed for the Belleek Woods Biodiversity Action Plan, and relevant findings from that work are also presented here.

The pipeline alignment was deliberately designed to remain on wide, established trails to avoid the loss of trees. A specialist arboricultural survey, undertaken in 2026 for the Proposed Development (Appendix 7-1), confirmed that although the pipeline does not pass through any treed areas, several dead trees and ash trees showing advanced ash dieback occur adjacent to the trails/pipeline route. These trees are recommended for removal during the works period for safety and woodland management reasons. The findings and recommendations of the arboricultural survey are outlined below.

Figure 7-19 illustrates the proposed pipeline alignment along the existing tracks and roadways within Belleek Woods and Belleek Castle grounds. Figure 7-20 to Figure 7-22 provide site photographs of the route.

Belleek Woods was subject to surveying as part of the Belleek Woods Biodiversity Action Plan 2022-2026[43]. The findings of the survey are summarised as follows;

> Belleek Woods occupies 61.5 hectares along the western bank of the River Moy, extending northwards from Ballina town. The woodland forms a diverse ecological mosaic shaped by variations in elevation, hydrology, tree composition and habitat structure. Bordered by the Moy Estuary to the east and farmland to the north and west, the woodland interfaces with both freshwater and coastal ecological influences, while a network of trails, including Cyril's Way, provides access through an environment of high recreational and biodiversity value.
>
> The woodland itself is predominantly a mix of Mixed Broadleaved/Conifer Woodland (WD2) and Mixed Broadleaved Woodland (WD1). The terrain is undulating, with slopes, depressions, terraces and low hills that create a variety of microhab itats. A tall canopy, dominated largely by mature beech (*Fagus sylvatica*), and interspersed with Scot's pine (*Pinus sylvestris*), conifers such as Monterey pine (*Pinus radiata*) and occasional stands of Lawson cypress (*Chamaecyparis lawsoniana*), creates extensive shade, beneath which a typical woodland assemblage of ferns, ivy (*Hedera helix*) and bramble (*Rubus fruticosus* agg.) thrives. Regeneration is

[43] O'Connell, C. A. (2022) Belleek Woods, Ballina, Co. Mayo Biodiversity Action Plan 2022-2026. Prepared for River Moy Search and Rescue, Ballina, Co. Mayo.

evident throughout, with abundant ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and beech seedlings wherever canopy gaps allow sufficient light to reach the forest floor.

The northern part of Belleek Woods supports the greatest biodiversity, due largely to a network of tufa-forming streams that create wetter soils and a more structurally complex woodland. Here, the vegetation layers become richer and more stratified, with canopy, understorey, dwarf shrub, herb and moss layers all well represented. Species such as alder (*Alnus glutinosa*), willow (*Salix* spp.), birch (*Betula* spp.) and hawthorn intermingle with ash, beech and sycamore. The moist ground supports a diverse herb flora including bugle (*Ajuga reptans*), meadowsweet, water figwort (*Scrophularia auriculata*), speedwell (*Veronica* spp.) and numerous ferns and mosses. Freshwater invertebrates, including shrimp (*Gammarus duebeni*), flatworm (*Planaria* spp.) and mayfly larvae (*Ephemeroptera*), were abundant in stream samples, indicating clean, oxygenated water.

Elsewhere in the woods, distinct zones occur. Near the main southern car park, the beech–Scot's pine canopy shades an herb layer that includes opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*), lesser celandine (*Ficaria verna*) and wood avens (*Geum urbanum*). Between the duck pond and the Knox-Gore monument, spring displays of Spanish bluebell (*Hyacinthoides hispanica*) and lesser celandine flourish beneath tall conifers and beech. The elm trail, along the northern boundary of Belleek Castle, features decaying old spruce trunks (*Picea* spp.) that contribute valuable deadwood habitat, while younger beech plantings support abundant woodland herbs. Along the elevated western trails, primrose (*Primula vulgaris*), bracken (*Pteridium aquilinum*), strawberry (*Fragaria vesca*), herb-robert (*Geranium robertianum*), honeysuckle (*Lonicera periclymenum*) and several moss species create a richer ground flora; butterflies such as speckled wood (*Pararge aegeria*) and birds like goldcrest (*Regulus regulus*) are commonly recorded.

Closer to the river along Cyril's Way (tarmac road along which the pipeline is aligned, Figure 7-22), the woodland becomes low-lying and damp, with a canopy of tall spruce and diverse broadleaves. To the north moss-covered trunks, wetland herbs and constant trickling streams create a cool, humid woodland microclimate favoured by mosses, ferns and moisture-dependent invertebrates. Chiffchaff (*Phylloscopus collybita*) and other woodland birds frequent this area.

Despite its ecological richness, several invasive plant species occur. Cherry laurel (*Prunus laurocerasus*), an invasive shrub, is widespread and undergoing control, though regrowth persists in places. The invasive species Rhododendron (*Rhododendron ponticum*) appears in several patches. Other invasive plant species include winter heliotrope (*Petasites fragrans*), snowberry (*Symphoricarpos albus*), Japanese knotweed (*Reynoutria japonica*), pheasant bush or Himalayan honeysuckle (*Leycesteria formosa*), montbretia (*Crocosmia crocosmiiflora*) and bamboo (*Bambusoideae* spp.), each reducing native habitat quality if not managed effectively. Ash dieback, caused by the fungal pathogen *Hymenoscyphus fraxineus*, is present in the woodland.

Throughout the woods, a well-developed network of tarmacked and gravel paths supports high visitor use but also shapes habitat distribution. The rich interplay of mature woodland, regenerating stands, tufa streams, wet hollows, upland edges and river-associated habitats makes Belleek Woods an ecologically varied landscape supporting diverse flora, fauna and ecological processes.

The tufa streams are approx. 750 m north of the proposed pipeline at nearest point (Figure 7-19 - Alignment of the Proposed Pipeline through Belleek Woods and Castle Grounds) and the Proposed Development will have no interaction with tufa formations or petrifying springs.

Red squirrels are present within the woods, and National Biodiversity Data Centre records show that the species has been observed regularly in the area, with sightings documented in 2012, 2014, 2016, 2017, 2022 and 2023.

Belleek Woods was subject to project specific site surveys (2024 and 2025) the findings of the survey as summarised as follows;

The proposed pipeline route enters the Belleek Woods to the west of Belleek Castle on an existing gravel track (Figure 7-19 - Alignment of the Proposed Pipeline through Belleek Woods and Castle Grounds). This track has been

recolonised by vegetation with sporadic Common spotted orchid (*Dactylorhiza fuchsia*) occurring along the path. From there the route travels along a crushed stone road within Belleek Castle grounds before being aligned across amenity grassland to the south of the castle and exiting the castle lawns on the eastern side. The area surrounding Belleek Castle is predominately amenity grassland (lawn) and artificial surfaces. In the amenity grassland to the northeast of the castle there is a stand of mature trees (beech and ash). Within the grassland to the north of the castle and along the boundary of the woodland in this area there is a high abundance of Japanese and Himalayan Knotweed (invasive species). Along the woodland boundary the Knotweed is in the form continuous mature stands and within the grassland mostly young shoots. The proposed route has been specifically aligned to avoid this area of invasive species to the north of the castle (Figure 7-19 - Alignment of the Proposed Pipeline through Belleek Woods and Castle Grounds).

Belleek Woods along the alignment of the pipeline route is noted to be a mixed woodland with broadleaved and conifer species. Tree species present in the wood include hazel (*Corylus avellana*), elm (*Ulmus* spp.), Sycamore, Norway spruce, Beech, Scot's Pine, Lawson Pine, Monteray pine, Oak (*Quercus robur*) and Ash. After leaving the Belleek castle grounds the pipeline route travels east along a wide woodland stone path (Figure 7-21) before turning north along a tarmac road (Cyril's Way, Figure 7-22) which runs parallel to the Moy estuary. The proposed route continues north along this road until it comes to an opening where the existing water main passing under the Moy estuary will be tied into. The habitats in this location are artificial surfaces and wet/amenity grassland. The eastern bank also supports wet grassland, where species present include marsh ragwort (*Jacobaea aquatica*), reed canary grass (*Phalaris arundinacea*), meadowsweet, bindweed (*Calystegia sepium*), bramble, woundwort (*Stachys sylvatica*), willowherb (*Epilobium* spp.) and hogweed. A few small willows are also present on the bank.

Other than the two knotweed species present within the woods there are also a number of other invasive plant species which are considered to have moderate or high potential negative impacts. These include, Himalayan honeysuckle (*Leycesteria formosa*), montbretia, winter heliotrope and cherry laurel. Although not recorded during the surveys other invasive plant species known to occur in the woods include Rhododendron, snowberry and bamboo. Belleek Woods was also subject to a project specific bat activity survey, details of which are present in Section 7.3.11 below.

The woodland trees adjacent to the alignment of the proposed pipeline were subject to an arboricultural survey, the report for which is included in Appendix 7-1. The arboricultural survey was carried out during January 2026 within the grounds of Belleek Castle, Ballina, to inform the proposed installation of the pipeline along existing avenues and woodland tracks. The assessment, undertaken by an independent arboricultural consultant, followed the visual inspection methodology set out in BS 5837:2012[44], including ground-based examination of tree condition, sounding for basal decay and evaluation of structural integrity and tree management requirements.

A total of twenty trees were surveyed adjacent to the pipeline route, encompassing individual trees, groups and small woodland clusters. The tree population comprises a diverse mix of native and non-native species, including beech, sycamore, ash, oak, wych elm, yew, Lawson cypress, Douglas fir, Norway spruce, deodar cedar (*Cedrus deodara*), monkey puzzle (*Araucaria araucana*) and larch (*Larix decidua*). The age structure ranges from young-mature to over-mature individuals, with several large parkland specimens likely predating the current castle and contributing significantly to the historic landscape character.

Of the trees assessed, eleven were found to be in fair overall condition, requiring either no intervention or routine arboricultural maintenance. The remaining nine were categorised as being in poor condition, frequently due to structural defects, excessive deadwood, crown failures or declining vitality. A notable concern is the presence of ash dieback, confirmed in four ash trees that exhibit pronounced dieback symptoms and diminished structural stability.

Two ash trees in advanced decline and decay were identified as requiring complete removal on safety grounds. An additional four trees require selective removal of dead or unstable stems within falling distance of the woodland trails. All recommended removals are limited, targeted and confined to trees that are already compromised by disease or

[44] BS 5837:2012 — Trees in Relation to Design, Demolition and Construction – Recommendations

structural instability. The remainder of the tree population is suitable for retention, subject to standard management such as crown cleaning, end-weight reduction, crown lifting and removal of excessive ivy where necessary.

Protection measures for the retained trees have been specified in the tree survey report, including the establishment of construction exclusion zones, installation of temporary ground protection and strict controls on excavation within root protection areas. These measures are intended to safeguard tree health throughout the construction phase.

The survey concludes that the wooded parkland within the Belleek Castle grounds makes a significant contribution to local biodiversity and landscape quality. While the loss of two diseased ash trees is unavoidable, the overall impact of the proposed works on the arboricultural resource is very limited and focused on safety. All healthy and high value trees will be retained and protected under the recommended arboricultural method statements, ensuring that the character and ecological function of the woodland are preserved.

Faunal species documented in Belleek Woods is presented in Section 7.3.11 below.

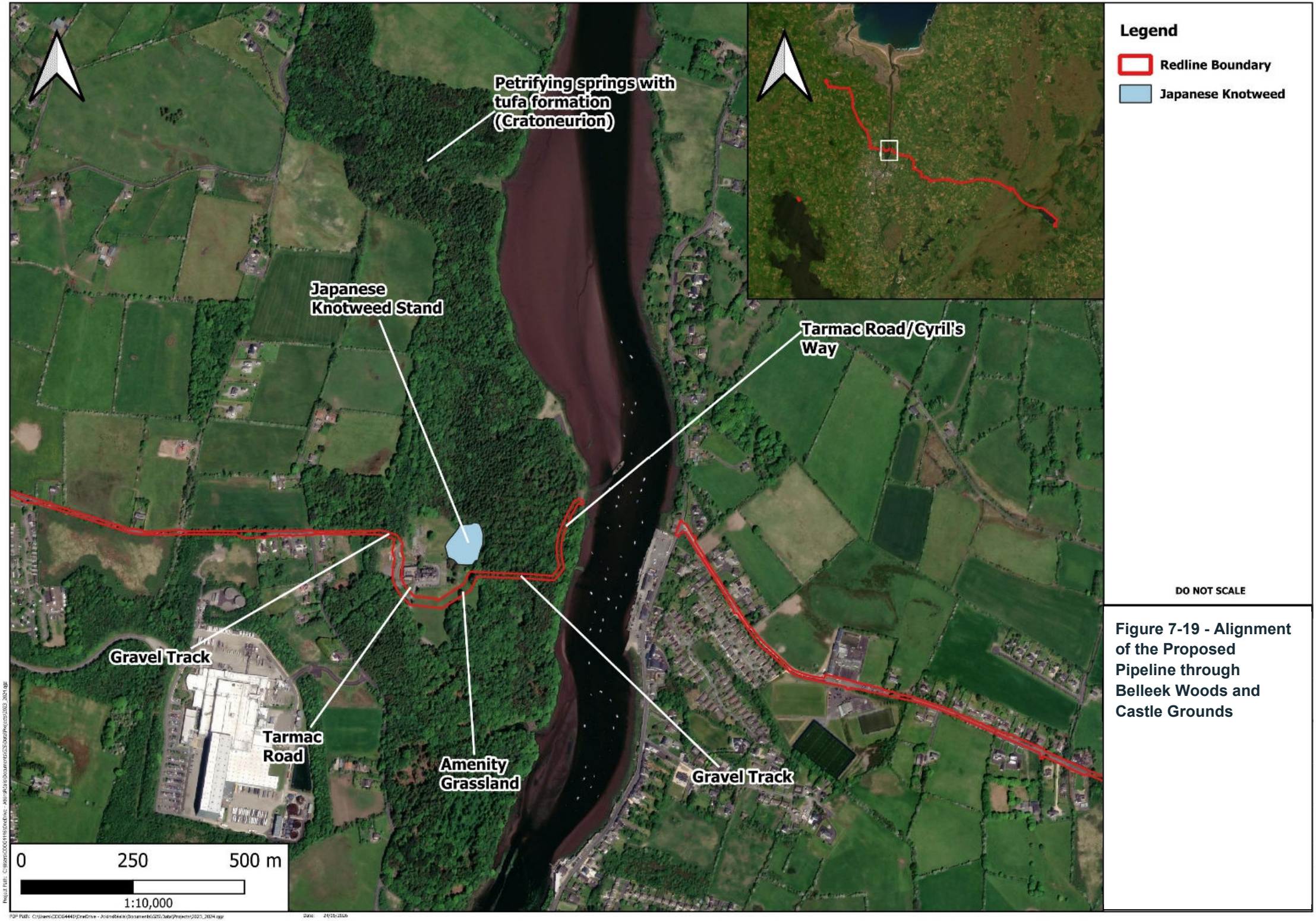


Figure 7-19 - Alignment of the Proposed Pipeline through Belleek Woods and Castle Grounds



Figure 7-20 — Pipeline alignment along overgrown gravel track west side of Belleek Woods



Figure 7-21 — Pipeline alignment along gravel track centre of Belleek Woods



Figure 7-22 — Pipeline alignment along tarmac road (Cyril's Way) east side of Belleek Woods

7.3.9 Bird sites

7.3.9.1 Killala Bay / Moy Estuary

There is one wetland site designated under the Convention on Wetlands, i.e., Ramsar Site, within the red line boundary of the Proposed Development; Killala Bay / Moy Estuary Ramsar Site (Code 843), which covers the same geographical area as Killala Bay / Moy Estuary SPA. The Ramasar Sites Information Service details this bird site as; '*An estuary and intertidal bay separated from the sea by a long sandy island. The site includes a well-developed dune system, saltmarsh, sand and shingle beaches backed by sea-cliffs, and extensive sand and mudflats exposed at low tide. The dunes support a rich and diverse flora that includes several rare or threatened plants. The intertidal flats provide important feeding sites for birds. Brent geese overwinter in the bay in internationally important numbers, and regionally or locally important numbers of several species of waterbirds use the site*.'

The Irish Wetland Bird Survey (I-WeBS) conducts systematic counts and monitoring of waterbirds across a wide range of wetlands throughout Ireland, and Killala Bay is one of the designated I-WeBS count sites. Within the Killala Bay count area (OD407), records of bird species from the two most recent survey periods (2019/2020 and 2020/2021, the latest available data) are summarised below.

Bird species listed on Annex I of the Birds Directive recorded at this site include red-throated diver (*Gavia stellata*), great northern diver (*Gavia immer*), Slavonian grebe (*Podiceps auritus*), cormorant (*Phalacrocorax carbo*), little egret (*Egretta garzetta*), golden plover (*Pluvialis apricaria*), dunlin (*Calidris alpina*), bar-tailed godwit (*Limosa lapponica*), and kingfisher (*Alcedo atthis*).

Red-listed species under Birds of Conservation Concern in Ireland 4 (BoCCI4), excluding Annex I species, include long-tailed duck (*Clangula hyemalis*), common scoter (*Melanitta nigra*), oystercatcher (*Haematopus ostralegus*), grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), knot (*Calidris canutus*), snipe (*Gallinago gallinago*), black-tailed godwit (*Limosa limosa*), curlew (*Numenius arquata*), and redshank (*Tringa totanus*).

Amber-listed BoCCI4 species, again excluding Annex I species, include mute swan (*Cygnus olor*), whooper swan (*Cygnus cygnus*), shelduck (*Tadorna tadorna*), wigeon (*Mareca penelope*), teal (*Anas crecca*), mallard (*Anas platyrhynchos*), red-breasted merganser (*Mergus serrator*), great crested grebe (*Podiceps cristatus*), shag (*Phalacrocorax aristotelis*), ringed plover (*Charadrius hiaticula*), common sandpiper (*Actitis hypoleucos*), turnstone (*Arenaria interpres*), black-headed gull (*Larus ridibundus*), common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*), sandwich tern (*Sterna sandvicensis*), and little ringed plover (*Charadrius dubius*).

The Moy Estuary opens into Killala Bay approx. 5.6 km north of the proposed pipeline crossing point. The species listed above occur predominantly within the extensive intertidal habitats of Killala Bay, rather than the much narrower intertidal areas near the proposed crossing location. The Proposed Development will not require any encroachment into intertidal or wetland habitats of the Moy Estuary, as it will utilise an existing trunk main already in place beneath the estuary. In addition, the pipeline route through Belleek Woods is entirely screened from the estuary by dense woodland.

7.3.9.2 Lough Conn

An I-WeBS counts site also covers parts of Lough Conn: the Lough Conn I-WeBS count site (Site Code: OD002). Lough Conn is also designated as a Wildfowl Sanctuary (WFS 40), removing it from the Open Season Order and prohibiting the shooting of game birds within the sanctuary.

Within this I-WeBs count site, the following Annex I species were recorded during the 2019/2020 and 2020/2021 winter periods: Greenland white-fronted goose (*Anser albifrons flavirostris*), great northern diver, cormorant, and little egret.

BoCCI4 Red-listed species recorded during the same period, excluding Annex I species, include goldeneye (*Bucephala clangula*), oystercatcher, lapwing, snipe, and curlew.

BoCCI4 Amber-listed species recorded at the site, again excluding Annex I species, include mute swan, whooper swan, greylag goose (*Anser anser*), wigeon, gadwall (*Mareca strepera*), teal, mallard, tufted duck (*Aythya fuligula*), red-breasted merganser, great, crested grebe, spotted redshank (*Tringa erythropus*), black-headed gull, common gull, lesser black-backed gull, and herring gull.

The Proposed Development involves the installation of a new raw water intake pipe within a very localised area of northeast Lough Conn and as such there will be construction activities only within a small area of the I-WeBS site.

7.3.10 Site Surveys - Predominant habitats identified

This section describes the habitats present within the greenfield areas of the Proposed Development site, including the Plant Sites at Wherrew RWI&PS, Lisglennon WTP, Lisglennon Reservoir, Bonniconlon BPS, Bonniconlon Reservoir, Windy Gap BPT, and Lough Talt WTP. It also outlines the habitats occurring along the 'off-road' sections of the pipeline route, including those traversing agricultural land as well as the Brusna River (River Moy SAC) and stream crossings.

7.3.10.1 Wherrew Raw Water Intake and Pumping Station

The ground surrounding the Raw Water Intake building to the north is amenity grassland (GA2), with one large ash to the west of the building showing potential signs of ash dieback. The western side of this grassland area is bordered by native hedgerow (WL1) containing hawthorn, elder (*Sambucus nigra*) and brambles. No boundary hedgerows or trees will be interacted with or lost as a result of proposed works.

The grounds surrounding the raw water intake building are best characterised as amenity grassland/wet grassland (GA2/GS4), as the area does not appear to be cut as frequently as other sections. Species present within the grassland include vetch (*Vicia* spp.), soft rush, ribwort plantain (*Plantago lanceolata*), silverweed (*Potentilla anserina*), creeping buttercup, stitchwort (*Stellaria* spp.) and dock (*Rumex* spp.). The boundary fence has been overgrown by a number of species including hazel, sycamore, willow, hogweed, brambles, vetch, ivy and great willowherb and is best characterised as hedgerow (WL1).

A deep channel has been dredged from the lake shore to the current intake. Either side of the channel, and continuing along the shoreline, there is a band of loose calcareous rock that becomes mostly covered when the lake rises in winter. Plant species present within the loose rock include bird's-foot trefoil (*Lotus corniculatus*), selfheal (*Prunella vulgaris*), black sedge (*Carex nigra*), creeping buttercup and woundwort (*Stachys* spp.). Dead zebra mussel shells were present along the shoreline, with live mussels visible below the water level, zebra mussels are noted to be an invasive species. The rocky lake shoreline is backed by stunted immature / transitional woodland (WS2) comprised of alder and willow. No areas of bankside woodland will be interacted with as a result of upgrading the raw water intake.

Figure 7-23 - Pre-Development Habitat Map of Wherrew Raw Water Intake and Pumping Station provides a pre-development habitat map of the Wherrew RWI&PS.

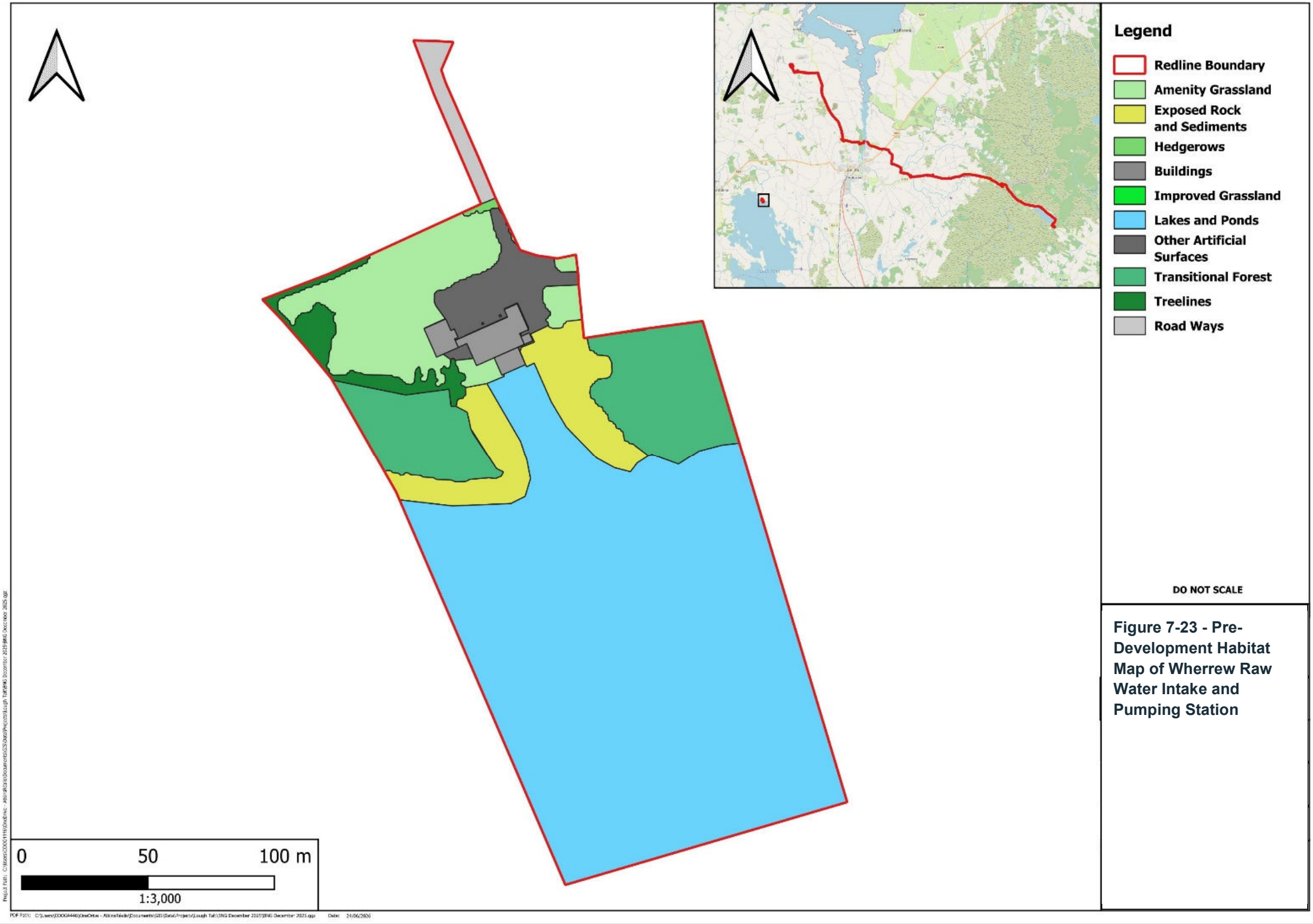


Figure 7-23 - Pre-Development Habitat Map of Wherrew Raw Water Intake and Pumping Station

7.3.10.2 Lisglennon Water Treatment Plant

To the west of the Lisglennon WTP lies an extensive area of wet grassland (GS4) that is not subject to regular mowing. Vegetation here includes sedges (*Carex* spp.), marsh thistle (*Cirsium palustre*), silverweed (*Potentilla anserina*), soft rush (*Juncus effusus*), bush vetch (*Vicia sepium*), creeping buttercup, horsetail (*Equisetum* spp.), hogweed (*Heracleum sphondylium*), dock (*Rumex* spp.) and bramble (*Rubus fruticosus* agg.) in more overgrown patches.

There are amenity grasslands (GA2) along the WTP site entrance and improved agricultural grassland fields (GA1) immediately south and east of the plant are more intensively managed, supporting species such as spear thistle (*Cirsium vulgare*), winter heliotrope (*Petasites fragrans*), common dandelion (*Taraxacum officinale*), prickly sow-thistle (*Sonchus asper*), ragwort (*Jacobaea vulgaris*), ribwort plantain (*Plantago lanceolata*), yellow flag iris (*Iris pseudacorus*), field horsetail (*Equisetum arvense*), and black medic (*Medicago lupulina*).

In the southeastern corner of the eastern field, there is a small marsh (GM1) dominated at the time of survey by yellow flag iris, with surrounding areas of cracked, muddy ground. A semi-circular treeline borders this marsh, composed of ash (*Fraxinus excelsior*) and hawthorn (*Crataegus monogyna*). Figure 7-24 - Pre-Development Habitat Map of Lisglennon WTP site provides a pre-development habitat map of the Lisglennon WTP site.

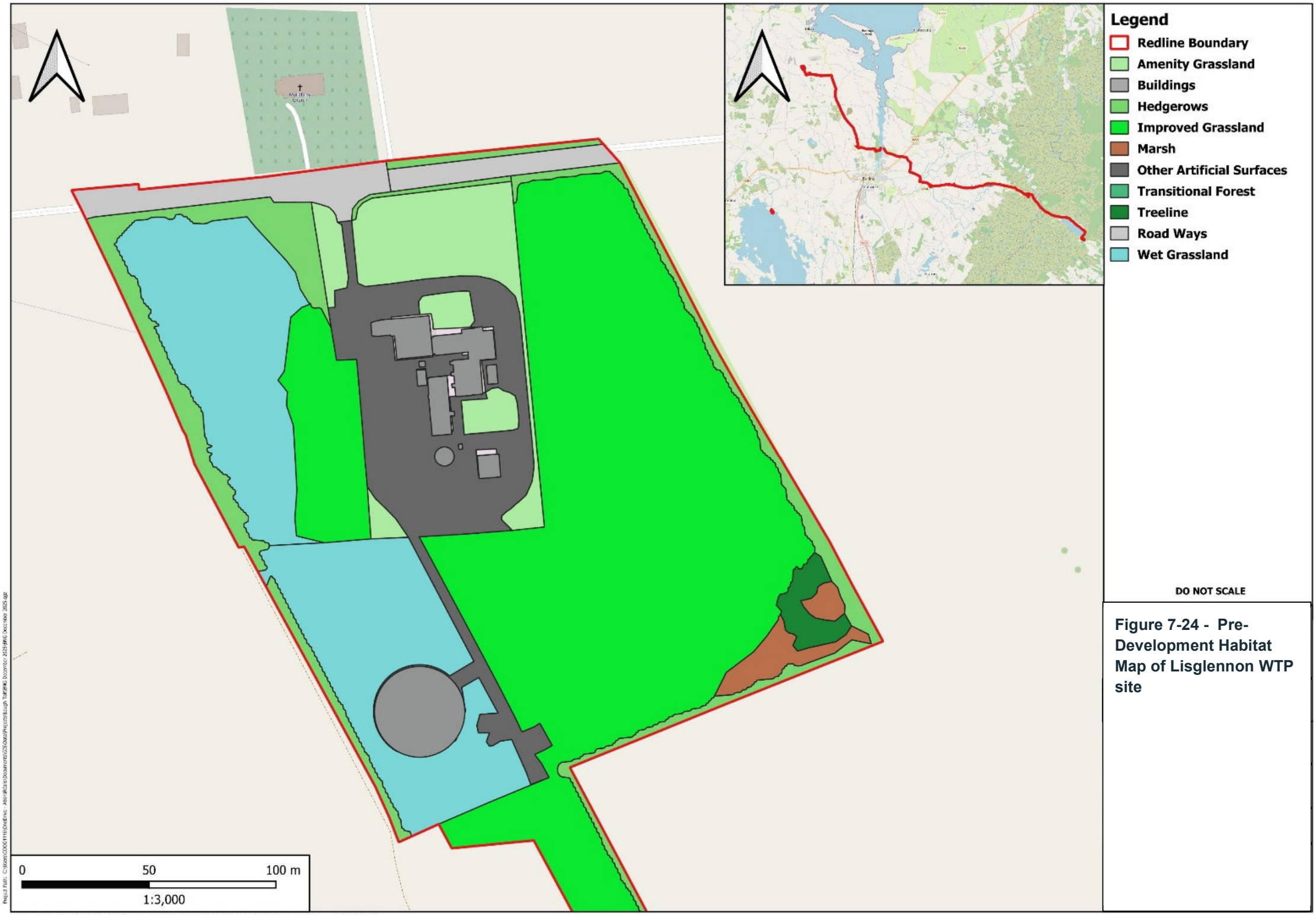


Figure 7-24 - Pre-Development Habitat Map of Lisglennon WTP site

7.3.10.3 Offroad section of Pipeline between Lisglennon WTP and Lisglennon Reservoir (Pipeline A, approx. 800 m)

The habitats present along this off-road section are species poor improved agricultural grassland (GA1) and native hedgerow (WL1). The grassland is dominated by *Lolium sp*. grasses with dock (*Rumex* sp.) and creeping thistle (*Cirsium arvense*) present sporadically throughout the fields. Hedgerows present along the route are predominately hawthorn and brambles with ash and alder present also. The pipeline route is through gateways and/or gaps in the hedgerow where available along this approx. 800 m off road section of the pipeline (Figure 7-25 - Pre-Development Habitat Map of Lisglennon Reservoir site), however, the pipeline is aligned through four hawthorn and ash hedgerows near Lisglennon Reservoir site. Approximately 5 m sections of these four hedgerows will be removed to facilitate pipeline installation.

7.3.10.4 Lisglennon Reservoir Site

Within the Proposed Development site boundary, the ground within the currently active area of Lisglennon Reservoir site is a combination of buildings and artificial surfaces (BL3) and amenity grassland (GA2). The site is bounded to the north by a treeline (WL2) comprised of mature ash and beech trees. The Proposed Development involves upgrades to mechanical equipment (pumps) within existing buildings with no site habitats being interacted with.

Immediately to the east, outside of the Proposed Development site boundary, there is a gravel based excavated area intended for a second storage tank, however, this tank was never installed and the area is now a mixture of recolonised bare ground (ED3), artificial surface (BL3), wet grassland (GS4) and hedgerows (WL1). Species within the wet grassland include hard rush (*Juncus inflexus*), buttercup (*Ranunculus* spp.), willow herb (*Epilobium* spp.), red clover (*Trifolium pratense*), silverweed and *Carex* spp. young ash trees are present sporadically through the area, however, many of them appear to be dead (likely due to Ash Die back). Hedgerow species include Ash, Willow (*Salix* spp.), Sycamore (*Acer pseudoplatanus*) and brambles. Many of the ash trees have Ash Die Back. Figure 7-25 - Pre-Development Habitat Map of Lisglennon Reservoir site provides a pre-development habitat map of the Lisglennon Reservoir site.

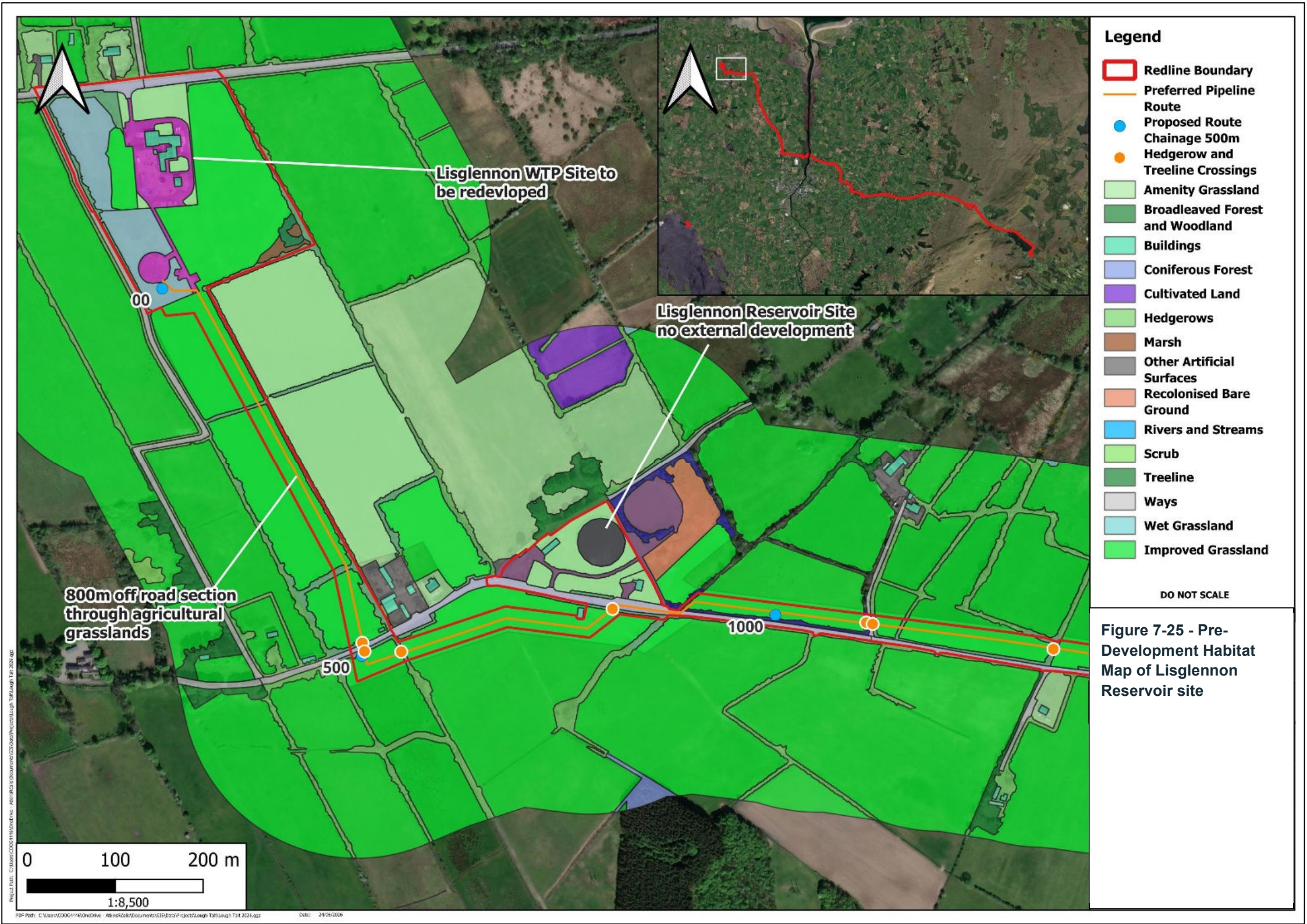


Figure 7-25 - Pre-Development Habitat Map of Lisglennon Reservoir site

7.3.10.5 Offroad section of Pipeline between Lisglennon Reservoir and R314 (Pipeline B, approx. 1,460 m)

The pipeline route east of Lisglennon Reservoir goes off road through fields parallel to the small rural road for approx. 660 m. The land along this section is Improved agricultural grassland (GA1). It intersects four intact native hawthorn hedgerows and approx. 5 m sections of these hedgerows will be required to be removed to facilitate pipeline installation. The route then crosses a rural road and continues east through agricultural land for approx. 800 m before diverging onto the R314 roadway. The fields at the west/start of the this second offroad section are mostly wet grassland (GS4) with some areas of improved agricultural grassland (GA1). Species recorded in the wet grassland included purple loosestrife (*Lythrum salicaria*), meadowsweet, lesser stitchwort (*Stellaria graminea*), yellow flag Iris, water forget-me-not (*Myosotis scorpioides*) and some areas of devil's bit scabious (*Succisa pratensis*). Devil's bit scabious is noted to be the host plant for butterfly - marsh fritillary (*Euphydryas aurinia*). The survey was carried out during late August which is with the optimum survey window for marsh fritillary larval webs but none were recorded. The remaining fields are improved agricultural grassland (GA1). The majority of the field boundaries are earthen banks with little or no vegetation, however, an approx. 5 m section of one hawthorn dominated hedgerow will be intersected / lost as a result of pipeline works.

Figure 7-26 provides a pre-development habitat map of off-road section of pipeline between Lisglennon Reservoir site and R314 tie in.



Figure 7-26 — Pre-Development Habitat Map of off road pipeline route east of Lisglennon Reservoir site

7.3.10.6 Belleek Wood and Castle

Refer to Section 7.2.8 for habitats and species present in Belleek Woods.

7.3.10.7 Brusna River Crossing

The pipeline runs off-road for approx. 980 m between Behy Road and the R294. Along this section, the route passes through improved agricultural grassland (GA1), bordered by mature hedgerows (WL1) and treelines (WL2) composed of hawthorn, ash and sycamore. On the eastern side of the River Brusna, a conifer plantation (WD4) is present but is intentionally avoided by the pipeline alignment.

East of the River Brusna crossing, the pipeline continues through approx. 400 m of agricultural grassland, with one section of hawthorn hedgerow approx. 5 m wide requiring removal to facilitate construction. The proposed pipeline will not interact with any hedgerows, trees, or riparian habitats along the banks of the River Brusna.

On the western side of the River Brusna crossing, before the pipeline reconnects with the R294, the alignment extends through approx. 580 m of agricultural grassland. In this area, the pipeline intersects one hawthorn-dominated hedgerow and one treeline composed of hawthorn and ash. Approx. 5 m of each feature is proposed to be removed to accommodate the works.

The riparian habitat at the pipeline crossing location is mostly grassy banks with a willow treeline on the southern bank and a small alder and one large ash on the north bank. Montbretia was noted growing along the upstream northern bank. Set back from the northern bank there are old spoil piles presumably from historic dredging activities. Scrub habitat near the riverbank contains brambles, gorse, willow along with a variety of grass species. Downstream the riparian habitat is much denser with scrub immediately next to the river backed by a treeline on both banks. The treeline becomes more continuous and established the further downstream from the pipeline crossing point. The treeline contains ash, alder, willow, sycamore and hawthorn. No qualifying interest habitats of River Moy SAC (e.g. alluvial woodlands, oak woodland, hay meadows) are present at the pipeline crossing point nor within the field systems either side of the River Brusna that are within the River Moy SAC.

It is noted that the crossing of the Brusna River will be via HDD with launch/reception pits set back a minimum of 20 m from the riverbank and associated riparian habitat. Figure 7-27 provides a pre-development habitat map of off-road section of pipeline through River Moy SAC at the Brusna crossing point.

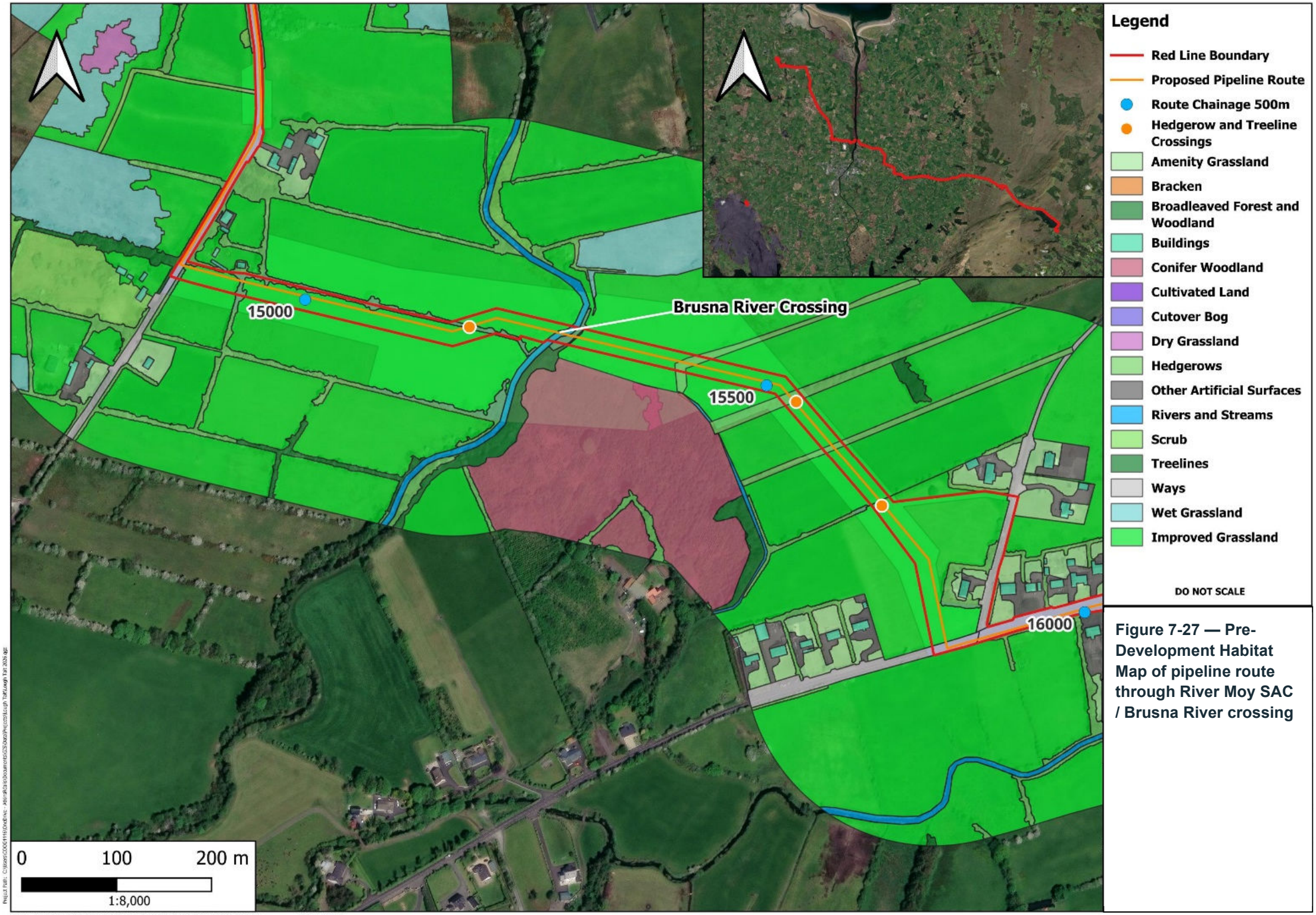


Figure 7-27 — Pre-Development Habitat Map of pipeline route through River Moy SAC / Brusna River crossing

7.3.10.8 Offroad section of Pipeline to cross Fiddaun and Srafaungal Streams (approx. 190 m)

Following the crossing of the Brusna River the proposed pipeline is aligned along the R294 to connect to the proposed new Bonniconlon Booster Pumping Station. Along this section, the pipeline is aligned off road for approx. 140 m to cross the Fiddaun Stream prior to connecting to the pumping station and is aligned for a further approx. 50 m off road to cross the Srafaungal Stream directly after the pumping station tie in. Both stream crossings will be trenchless by means of pipe jacking under the streams.

The dominant habitat along this section is improved agricultural grassland (GA1). The route will pass through one hawthorn dominated hedgerows before returning to the road, with approx. 5 m of this low-cut hedgerow to be removed to facilitate works. Species present with the hedgerow include hawthorn, ivy (*Hedera helix*), brambles, bracken (*Pteridium aquilinum*), ash, bindweed (*Convolvulus arvensis*). As the route leave the main road near the Fiddaun Stream there is a small area of wet grassland (GS4) which is relatively species poor containing a variety of grasses along with docks, meadowsweet, buttercup, lesser burdock (*Arctium minus*) and garden escapee Geraniums. The crossing of the Srafaungal Stream is within an agricultural grassland setting (GA1).

Both streams will be crossed by trenchless techniques (pipe jacking) as such there will be no direct interaction with either watercourse or interaction with or loss of any riparian habitat at each stream.

Figure 7-28 **- Agricultural grassland crossed by the proposed pipeline and within Bonniconlon BPS site** illustrates the two short off road sections near the Bonniconlon Booster Pumping Station site.



Figure 7-28 - Agricultural grassland crossed by the proposed pipeline and within Bonniconlon BPS site

7.3.10.9 Bonniconlon Booster Pumping Station Site

The site for the proposed Bonniconlon BPS is comprised entirely of improved agricultural grassland with a patchy hawthorn hedgerow along the northeastern boundary of the proposed site, the hedgerow is to be retained with additional hedgerow planting proposed. Areas of agricultural grassland will be lost to proposed infrastructure. The site was specifically chosen during the design process as it contains only low ecological value habitat. Refer to Figure **7-28** - Agricultural grassland crossed by the proposed pipeline and within Bonniconlon BPS site above for the improved agricultural grassland setting. No hedgerow loss is necessitated for the PS site.

7.3.10.10 Offroad section of Pipeline to cross Bunnyconnellan West Stream (approx. 70 m)

Within the immediate area of Bonniconlon village the pipeline route is aligned for approx. 70 m off road to cross the Bunnyconnellan West Stream (Figure 7-29). One hawthorn and ash treeline (WL2) will be intersected as the pipeline diverges off the roadway alignment, with a approx. 5 m section required to be removed to facilitate works. The proposed crossing is to the southern side of the R294 road is predominantly improved agricultural grassland (GA1). However, areas of the grassland are quite wet with some wet grassland species present including yellow flag Iris, Marsh thistle, soft rush and creeping buttercup. The stream is very small (< 50 cm) and overshadowed by dense vegetation including brambles, alder and hawthorn. Due to the small size of the stream and level of dense vegetation it was not possible to carry out kick sampling for freshwater surveying purposes. At one location where the stream could be accessed a sweep net approach was used. The only species recorded was caddis fly larvae (two *Polycentropodidae*), this species is not sensitive to pollution. As a full and adequate kick sample could not be collected a Q-value could be assigned. It is noted that the stream will be crossed by trenchless techniques (pipe jacking) as such there will be no direct interaction with this watercourse or banks.

7.3.10.11 Bonniconlon Reservoir Site

Approx. 200 m after the off-road crossing of the Bunnyconnellan West Stream the new proposed reservoir tank site is located in an approx. 600 m^2 site, it comprises of small areas of artificial surfaces (Reservoir), unmanaged agricultural grassland (GA1) and hawthorn dominated hedgerows (Figure 7-29). No hedgerows will be intersected in this area.

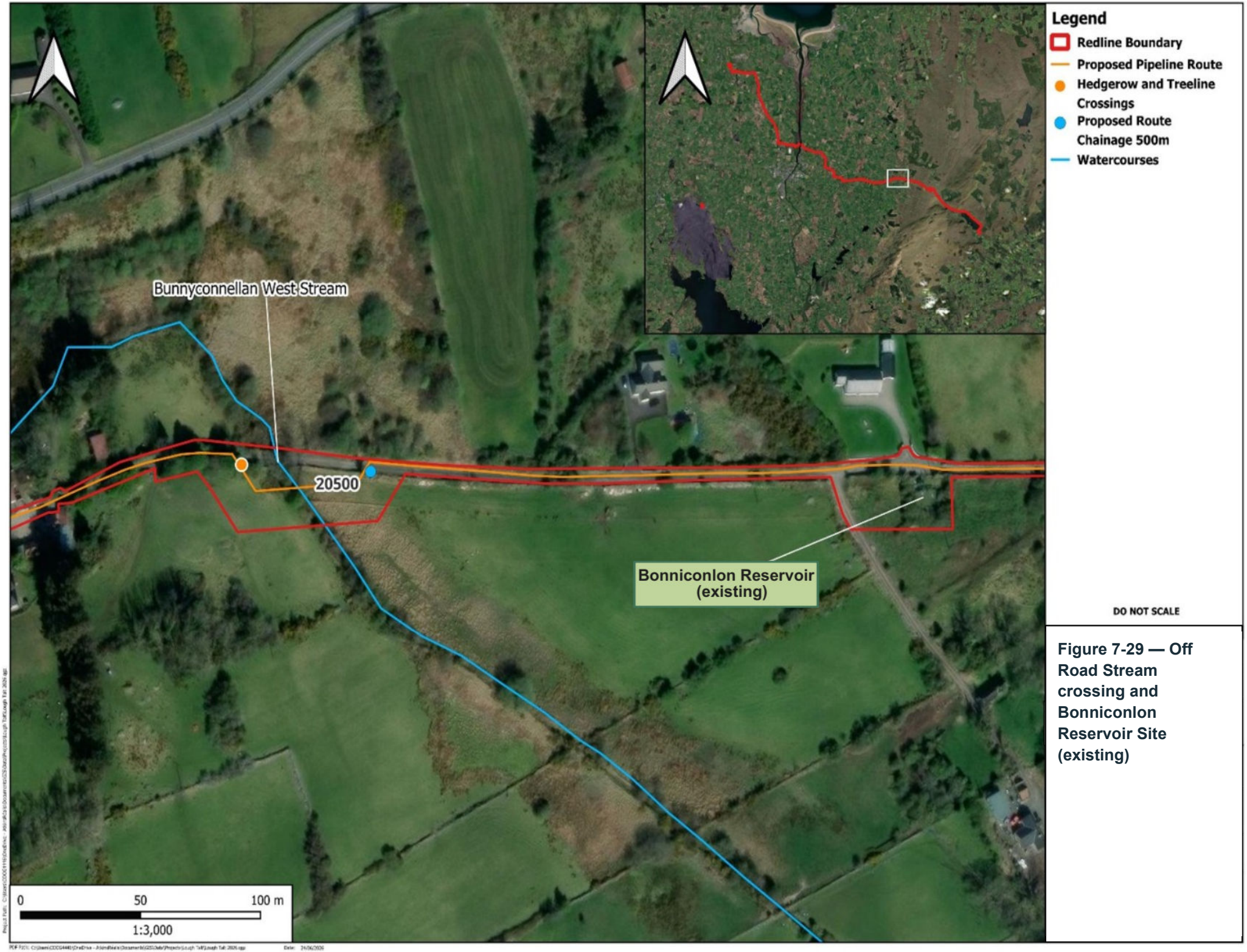


Figure 7-29 — Off Road Stream crossing and Bonniconlon Reservoir Site (existing)

7.3.10.12 Off road section of pipeline to cross Srafaungal Stream (approx. 100 m)

The proposed pipeline is aligned off road for approx. 100 m in order to cross the Srafaungal Stream. One hawthorn and ash hedgerow (WL1), of approx. 5 m in width, will be intersected/removed as the pipeline diverges off the roadway into an agricultural grassland field (GA1). On the opposing side of the stream the pipeline is aligned through agricultural grassland and through a farmer gateway as it turns back onto the roadway.

The riparian habitats at this crossing of the Srafaungal Stream dominate an approx. 20 m – 25 m strip either side of the stream and are a combination of wet grassland and sparse deciduous treelines on both banks. Willow is the dominant tree type with some ash also present. There are some Sitka spruce conifers present further back from the river on the western side (Figure 7-30). Other species present in the wetland habitat beside the watercourse include nettles, foxglove, meadowsweet, ferns, hogweed and creeping butter cup.

The stream will be crossed by trenchless techniques (pipe jacking) as such there will be no direct interaction with the watercourse. The launch pit / reception pit for the pipe jacking will be set back a 10 m minimum distance from the trees and bankside wetland habitat, as such there will be no loss of trees or excavations within any high value wetland habitat.

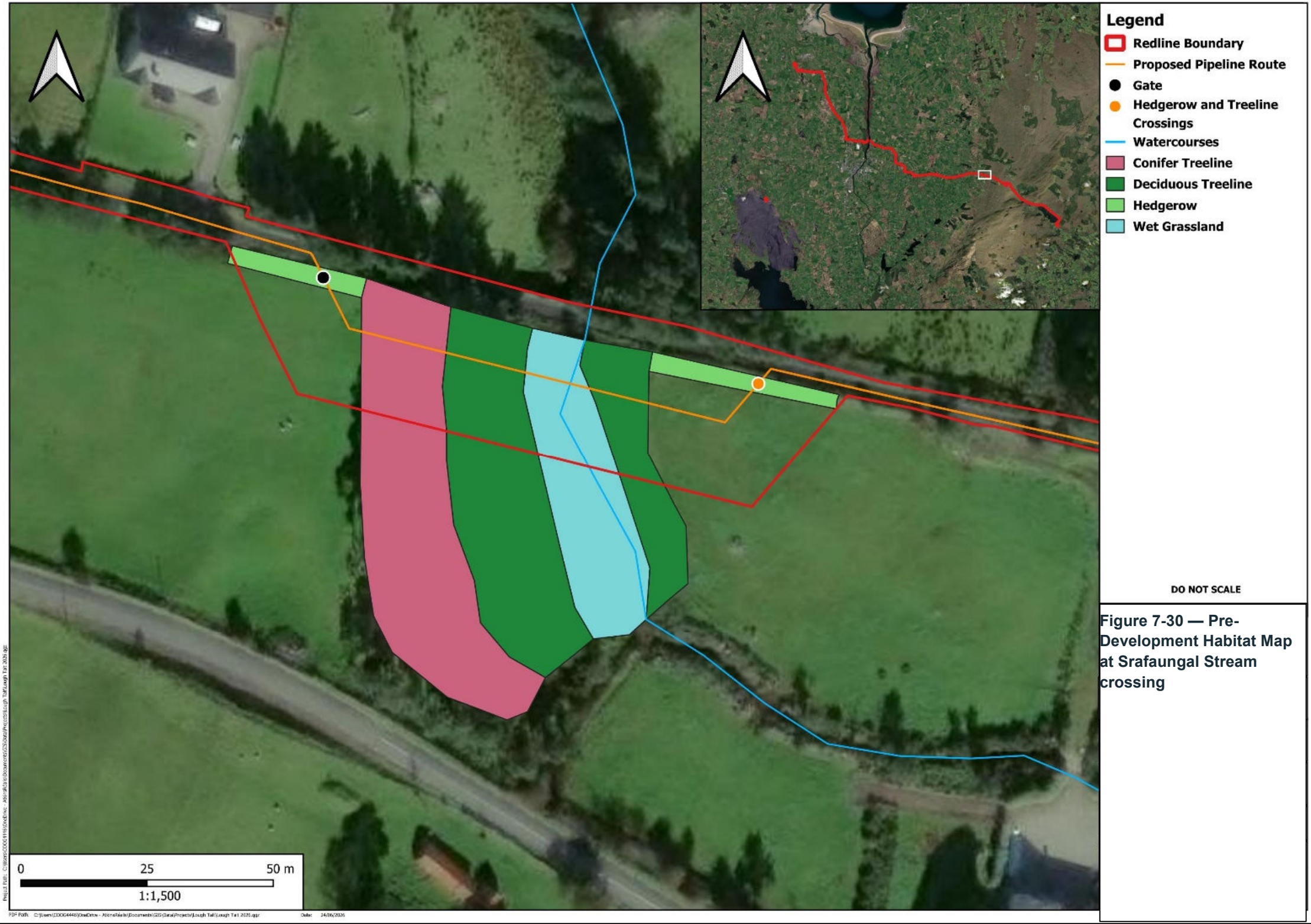


Figure 7-30 — Pre-Development Habitat Map at Srafaungal Stream crossing

7.3.10.13 Windy Gap Break Pressure Tank Site

The proposed upland tank site lies within the Ox Mountains, in an area characterised by uniform bogland habitat. The site is located outside any designated SAC. The site and surrounding habitat consist of cutover blanket bog (PB4) that has naturally revegetated following historic peat extraction. Vegetation is dominated by heather (*Calluna vulgaris*), purple moor-grass (*Molinia caerulea*), and various bog mosses (*Sphagnum* spp.), typical of recovering blanket bog communities. No trees occur within this upland landscape. It is noted that NPWS datasets identify this area as non-qualifying interest Annex I Blanket Bog habitat.

The new tank and associated infrastructure will be buried beneath reinstated salvaged peat soils, with any surplus peat used to create bunds as screening features. Figure 7-31 shows the location of the Windy gap site in the Ox Mountains.

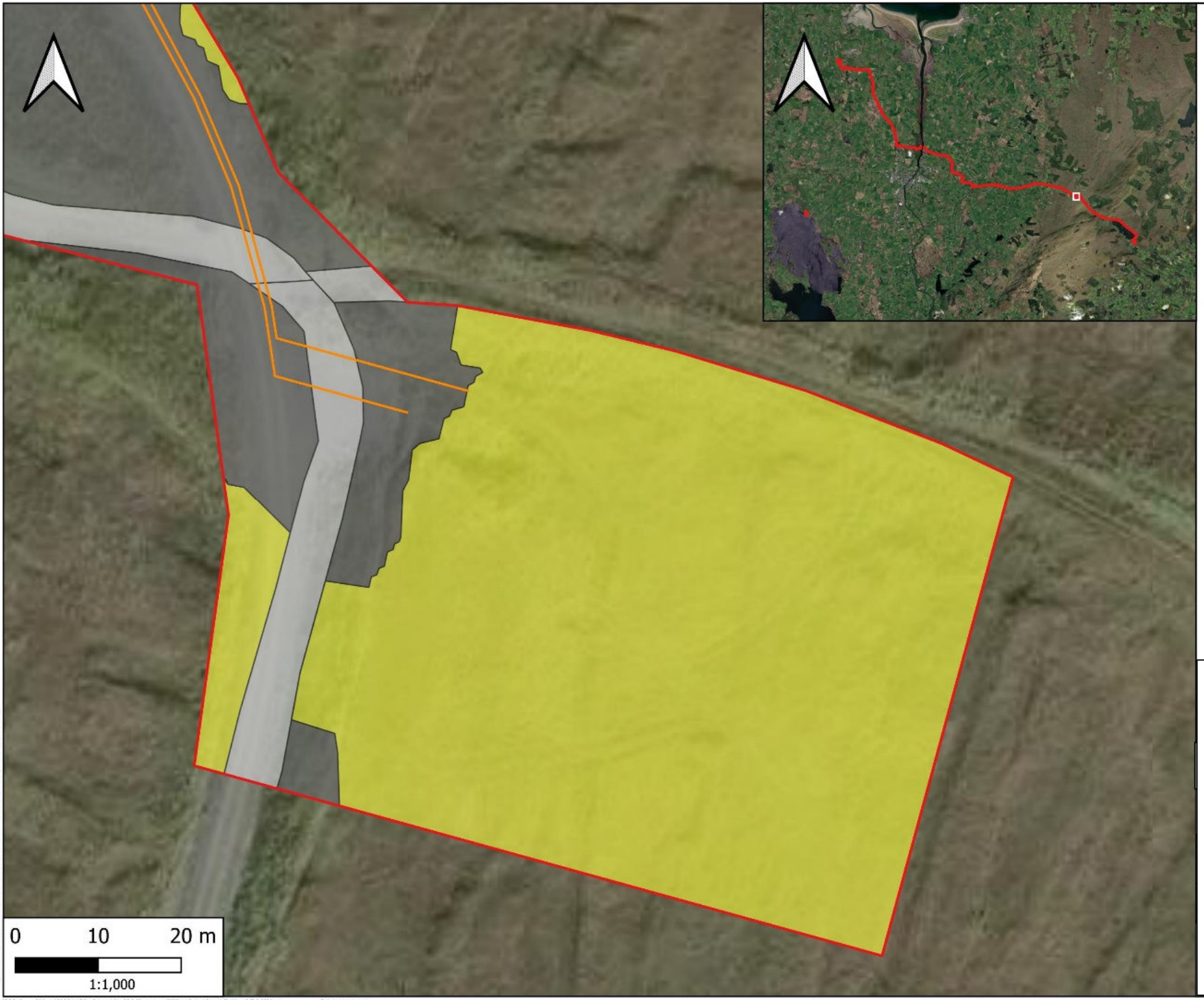


Figure 7-31 — Cutover Blanket Bog at the Windy Gap Break Pressure Tank Site

7.3.10.14 Off road section of pipeline to cross Glenree Stream

Refer to Section 7.2.7.2 for details of the approx. 25 m Glenree Stream crossing.

7.3.10.15 Off road section of pipeline to cross Unnamed Stream at Lough Talt

At this location, the route diverts off-road for approximately 20 m to cross a small unnamed stream akin to a field drain. On the north side of the channel, the habitat comprises amenity grassland (GA2) that appears to be regularly mown to facilitate access to the lake for launching fishing boats. Several trees, including ash and conifer species, occur along the channel margin, and Fuchsia is also present. There is the potential for one semi-mature ash to be lost at this location.

The southern side of the channel supports scrub vegetation (WS1) dominated by bramble and nettles, with common willowherb growing throughout. The stream itself had little to no observable flow and was heavily overgrown with vegetation, making it unsuitable for carrying out a macroinvertebrate survey. The area was also noted to contain scattered litter.

This watercourse crossing is within the boundary of Lough Hoe Bog SAC. This unnamed stream will be crossed using trenchless techniques (pipe jacking). Figure 7-32 shows the location of the unnamed stream at Lough Talt. No wetland habitats suitable for supporting Geyer's Whorl (*Vertigo geyeri*) snail species are located at this crossing point. The location of the nearest optimal *V. geyeri* habitat is on a headland approx. 130 m south of the proposed stream crossing point (Figure 7-32).



Figure 7-32 — Crossing location of unnamed stream at Lough Talt and location of optimal *V. geyeri* habitat

7.3.10.16 Off road section of pipeline to cross Field Drain at Lough Talt (approx. 20 m)

The final off road section of the proposed pipeline is approx. 500 m before the trunk main terminates in Lough Talt WTP (WTP is to be redeveloped). The proposed route at this location goes off road for short section (approx. 20 m) to cross a field drain on the northern side of the R294 outside of Lough Hoe Bog SAC. The habitat present at the crossing point is wet grassland (GS4) which is dominated by soft rush with patches of bracken. Foxgloves (*Digitalis purpurea*) were also recorded within the field. The small drain has no fisheries value and was not possible to sample for macroinvertebrates due to it's small size and a willow tree growing in the middle of the drain and adjoining road culvert arch.

7.3.10.17 Lough Talt WTP

The existing Lough Talt Water Treatment Plant (WTP) site consists primarily of artificial surfaces (BL3) and surrounding amenity grassland (GA2), with no semi-natural habitats present within the main operational area. Beyond the WTP boundary, a developing woodland habitat dominated by young willow species occurs to the east. In addition, an area of conifer plantation is located on the upper slopes to the north and west of the site. Figure 7-33 illustrates the habitats within the existing Lough Talt WTP site.

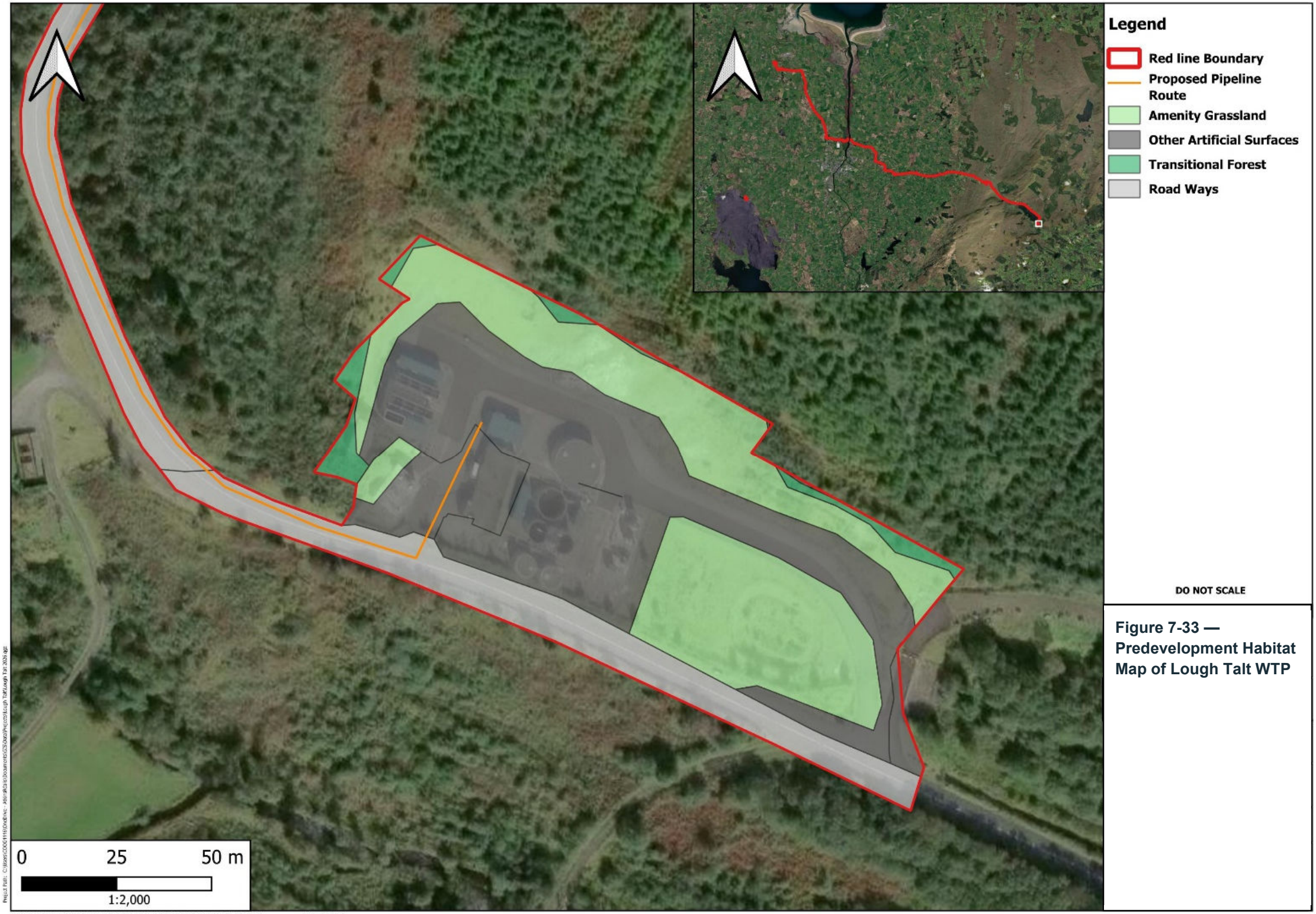


Figure 7-33 — Predevelopment Habitat Map of Lough Talt WTP

7.3.10.18 Site Compound

A site compound is proposed on a brown field site near Culleens village in County Mayo.

The primary habitat within the proposed compound site consists of spoil and bare ground (ED2), with large spoil heaps occurring along the eastern boundary of the brownfield site. Hardstanding gravel surfaces (BL3) are located at the northern end of the compound site which will be the main area utilised for the Proposed Development. Extensive areas of recolonising bare ground (ED3) are also present. Scattered patches of scrub (WS1), dominated by gorse and willow, occur throughout the mid and southern areas of the compound site.

Two unfinished steel-framed warehouse structures are situated in the central and north-western sections of the compound site. To the east, a low cut landscape feature beech hedgerow (WL1) is present along the roadside behind a diffuse landscaped treeline (WL2) composed of young broadleaved trees. A mature treeline forms the southern boundary of the compound. An operational warehouse and associated hardstanding car park lie immediately to the north. No boundary trees or hedgerows will be removed.

The Illanamuck Stream (FW2) is located approx. 150 m north of the proposed compound and is culverted beneath the Oaklawn roadway. There is no potential connectivity between the proposed compound site and this watercourse.

7.3.10.19 Evaluation of Primary Habitats

The habitats within the Proposed Development site have been classified in accordance with the Fossitt (2000) habitat classification system, based on findings from site surveys and supporting desktop research. This section outlines the ecological importance of each habitat type. The methodology used to determine the ecological importance of habitats within the development site is described in Section 7.1.6 of this report and follows guidance provided in CIEEM (2024, Version 1.3).

Artificial Surfaces (BL3)

The majority, approx. 85%, of the proposed pipeline route is along existing hardstanding surfaces in the form of roadways or gravel tracks. Artificial surfaces, in the form of existing infrastructure, also dominate some of the existing Plant Sites (Wherrew RWI&PS, Lisglennon WTP, Lisglennon Reservoir and Lough Talt WTP). These artificial surfaces are of no ecological value.

Improved Agricultural Grassland (GA1)

The off road sections of the proposed pipeline is aligned through areas of agricultural grasslands as detailed in Section 7.2.10. All agricultural grasslands lands along the pipeline route will be reinstated post works. Areas of agricultural grasslands are also present in existing and proposed Plant Sites and some of these areas of agricultural grassland will be lost to new infrastructure at Lisglennon WTP, Bonniconlon BPS and Bonniconlon Reservoir Site. These areas of agricultural grassland are considered to be of local importance (lower value).

Amenity Grassland (GA2)

Areas of amenity grassland are present within the Proposed Development boundary; within existing Plant Sites (e.g. Wherrew RWI&PS, Lisglennon WTP, Lisglennon Reservoir Site) and within Belleek Castle grounds. Some areas of amenity grassland within the aforementioned Plant Sites will be lost to new infrastructure. The amenity grassland (lawns) around Belleek Castle will be reinstated post works. These areas of amenity grassland are considered to be of local importance (lower value).

Wet Grassland (GS4)

Wet grassland is found within existing Plant Sites; Wherrew RWI&PS and Lisglennon WTP. There will be areas of wet grassland lost within Lisglennon WTP as a result of proposed new infrastructure, no other areas of wet grassland

within Plant Sites will be affected. There are also areas of wet grassland along off road sections of the pipeline alignment (refer to Section 7.2.10), in these areas, where excavations occur with wet grassland, soils will be salvaged for reinstatement following pipeline installation. These areas of wet grassland to be lost within the Plant Sites are of local importance (lower value).

Hedgerow (WL1)

Field boundary hedgerows will be intersected by off road sections of the proposed pipeline. There will be a total of thirteen hedgerows (predominantly hawthorn and ash) intersected by the pipeline with an estimated total length of 65 m of hedgerows to be lost. Hedgerows will be reinstated like for like post works as per Uisce Éireann policy. Additional planting is also proposed which is discussed in subsequent sections of this chapter. These sections of hedgerows are considered to be of local importance (higher value).

Treelines (WL2)

There are two areas where there will be a loss of hawthorn and ash treelines, located approx. 250 m after the Brusna River crossing and again as the pipeline diverges off road to cross Bunnyconnellan West Stream. A combined total of approx. 10 m of treelines is proposed to be removed to facilitate pipeline installation. As with hedgerows, lost trees will be replaced with like for like species. These sections of treelines are considered to be of local importance (higher value).

Mixed Broadleaf and Conifer Woodland (WD2)

The pipeline is aligned through Belleek Woodlands for approx. 900 m and, as detailed in Section 7.2.8, the route is along existing roads and tracks through the woodland habitat. Two ash trees, which are decayed with ash die back disease, and proposed to be removed for health and safety and woodland management reasons. A small number of track side trees are also recommended to be trimmed to remove dead overhanging branches. Given the ecological diversity within this woodland, and given that it is one of the largest mixed broadleaf and conifer woodlands within a wide geographical area, this woodland is considered to be of county importance.

Immature Woodland (WS2)

Within the Proposed Development boundary, the banks of Lough Conn at the Wherrew RWI&PS are lined with immature willow and alder woodland. The Proposed Development will have no interaction with this woodland which is considered to be of local ecological value (higher level).

Watercourses (FW2)

The Proposed Development includes eighteen watercourse crossings. The Proposed Development crosses the Brusna River west of Bonniconlon via HDD techniques. The Brusna River is a watercourse of international importance as it is designated as part of the River Moy SAC. Other watercourses crossed by the Proposed Development are of local importance (higher level).

Tidal Rivers (CW2)

The Proposed Development crosses the River Moy Estuary at Ballina via an existing trunk main. The Moy Estuary is considered to be of international importance as it is designated as part of the Killala Bay/Moy Estuary SAC/SPA.

Lakes (FL2 / FL3)

The Proposed Development abstracts from Lough Conn, and is aligned adjacent to Lough Talt. These lakes are both of international importance as they are designated as part of the River Moy SAC, Lough Conn and Lough Cullin SPA, and Lough Hoe Bog SAC respectively.

Drainage Ditch (FW4)

Twelve field drainage ditches are located along the proposed pipeline route. These field drainage ditches are of small size, and many have no flow or are dry. These drainage ditches are of local importance (lower value).

Scrub (WS1)

Areas of scrub habitat are found along the banks of the Brusna River, the Proposed Development does not necessitate any interaction or loss of riparian habitats along the Brusna River. Given the location within an SAC, this scrub habitat is of local importance (higher value). Developing scrub habitat is also found within the proposed site compound brown field area.

Cutover Bog (PB4)

The proposed pipeline route is flanked on both sides by cutover bog for easterly portion of the route through the Ox Mountains. This bogland habitat is within the red line boundary at the proposed Windy Gap BPT site. This habitat is considered to be of county importance.

7.3.11 Faunal Species - documented and site survey evidence

This section outlines the faunal species recorded within the Proposed Development site during project-specific surveys and also summarises historical species records available from NBDC datasets.

7.3.11.1 Birds

NBDC datasets record twenty five notable bird species within an approx. 1 km radius of the Proposed Development route within the past ten years (2016 to 2026). Three species are listed under Annex I in the EU Birds Directive; common tern, whooper swan, and common kingfisher. Species noted to be on the red list of the Birds of Conservation Concern Ireland, other than those listed as Annex I species above include; grey wagtail, kestrel, lapwing, meadow pipit, oystercatcher, snipe, redshank, and swift. Species noted to be on the amber list of the BOCCI, other than those listed as Annex I species above include; common sandpiper, cormorant, goldcrest, herring gull, house martin, house sparrow, mallard, mute swan, sand martin, skylark, starling, swallow, wheatear, and willow warbler.

None of these bird species are listed as Qualifying Interests (QI) for the European Sites with connectivity to the Proposed Development route.

Table 7-11 — Bird Species recorded within 1km along the Proposed Development route within the past 10 years

Species	Scientific Name	Status
Common Sandpiper	*Actitis hypoleucos*	Amber List
Common Tern	*Sterno hirundo*	Annex I/Amber List
Cormorant	*Phalacrocorax carbo*	Amber List
Goldcrest	*Regulus regulus*	Amber List
Grey Wagtail	*Motacilla cinerea*	Red List
Herring Gull	*Larus argentatus*	Amber List
House Martin	*Delichon urbicum*	Amber List
Kestrel	*Falco tinnunculus*	Red List
House Sparrow	*Passer domesticus*	Amber List

Species	Scientific Name	Status
Kingfisher	*Alcedo atthis*	Annex I/Amber List
Lapwing	*Vanellus vanellus*	Annex II/Red List
Mallard	*Anas platyrhynchos*	Annex II/Amber List
Meadow Pipit	*Anthus pratensis*	Red List
Mute Swan	*Cygnus olor*	Amber List
Oystercatcher	*Haematopus ostralegus*	Red List
Redshank	*Tringa totanus*	Red List
Sand Martin	*Riparia riparia*	Amber List
Skylark	*Alauda arvensis*	Amber List
Snipe	*Gallinago gallinago*	Annex II/Red List
Starling	*Sturnus vulgaris*	Amber List
Swallow	*Hirundo rustica*	Amber List
Swift	*Apus apus*	Red List
Wheatear	*Oenanthe oenanthe*	Amber List
Whooper Swan	*Cygnus cygnus*	Annex I/Amber List
Willow Warbler	*Phylloscopus trochilus*	Amber List

Incidental sightings of birds recorded during walkover surveys from Lisglennon WTP to Lough Talt WTP were common species and included Great Tit (*Parus major*), Swallow (*Hirundo rustica*), Wood Pigeon (*Columba palumbus*), Goldfinch (*Carduelis carduelis*) and Kestrel (*Falco tinnunculus*)

Breeding Bird Survey

Delichon Ecology Ltd. was commissioned by AtkinsRéalis to undertake a breeding bird survey at Lough Conn[45] at Wherrew RWI&PS site in June 2024 (Refer to Appendix 7-2). This study comprised walkover surveys incorporating line transect and vantage point methods during the late breeding season (mid to late June 2024). The surveys aimed to assess the presence and distribution of breeding bird species within and surrounding the Wherrew RWI&PS area. They also informed an evaluation of the ecological importance of the site and its capacity to support breeding avifauna.

Survey methodology for the Wherrew RWI&PS area and its environs included two line transects and three vantage point (VP) surveys. The VPs were positioned to cover the existing intake area as well as the northern shoreline and bay of Lough Conn. All target species; namely Annex I listed species and red and amber-listed Birds of Conservation Concern, were recorded alongside common species potentially sensitive to development. Observations included flightlines, flight duration, direction, and height.

The surveys recorded very low breeding bird abundance and activity across the main northern body of Lough Conn. Although the lake has historically supported breeding Common Scoter (*Melanitta nigra*), Common Gull (*Larus canus*), Lesser Black-backed Gull (*Larus fuscus*) and Common Tern (*Sterna hirundo*), no evidence of breeding habitat or active colonies for these species was identified within the survey area around Wherrew Intake. Small numbers of gull species and Common Terns were recorded overflying the transect and VP areas, indicating that these species likely use the wider lake for foraging and refuge during the breeding season.

The lake margins provided suitable breeding habitat for Grey Wagtail (*Motacilla cinerea*) and Common Sandpiper (*Actitis hypoleucos*), with confirmed breeding activity for both species along exposed rocky shorelines. Summer

[45] Delichon Ecology Ltd. (2025). Wherrew Water Treatment Plant Intake Breeding Bird Survey 2024.

migrants observed feeding over the survey area included Sand Martin (*Riparia riparia*), House Martin (*Delichon urbicum*), Swallow (*Hirundo rustica*), and Swift (*Apus apus*). While no suitable nesting habitat for these species occurs within the footprint of the surveyed area, the lake and shoreline provide important foraging opportunities.

Typical migrant warblers recorded in fringing scrub and woodland included Willow Warbler (*Phylloscopus trochilus*), Blackcap (*Sylvia atricapilla*), and Whitethroat (*Curruca communis*). Resident breeding species recorded included Reed Bunting (*Emberiza schoeniclus*), Chaffinch (*Fringilla coelebs*), Wren (*Troglodytes troglodytes*), and Linnet (*Linaria cannabina*).

No raptor species were observed during the surveys, and the study area does not provide optimal nesting habitat for such species. Nevertheless, species such as Sparrowhawk (*Accipiter nisus*), Kestrel (*Falco tinnunculus*), Peregrine (*Falco peregrinus*), and Buzzard (*Buteo buteo*) are likely to use the area opportunistically for hunting.

Red-listed species recorded during the breeding surveys included Grey Wagtail, Meadow Pipit (*Anthus pratensis*), and Swift. All were observed along the lakeshore fringes north and south of the existing RWI&PS area. Both Grey Wagtail and Meadow Pipit occurred within suitable breeding habitat and showed probable breeding behaviour.

7.3.11.2 Terrestrial Mammals

NBDC datasets record four notable mammal species within an approx. 1 km radius of the Proposed Development route in the past ten years.

Otter, a species listed on Annex II and IV of the EU Habitats Directive, are widespread through the Proposed Development site and have been recorded regularly in Lough Conn, Lough Talt, Brusna River and the Glenree Stream.

The other mammal species recorded within NBDC datasets include red squirrel (*Sciurus vulgaris*), hare (*Lepus timidus hibernicus*) and badger (*Meles meles*) which area protected under the Wildlife Act(s). Red squirrel have been recorded in Belleek Woods with sightings documented in 2012, 2014, 2016, 2017, 2022 and 2023. Irish Hare have been recorded around Lough Conn and north of Ballina and Bonniconlon. Badger recordings are widespread throughout the agricultural lands of counties Mayo and Sligo. Evidence gathered during site specific mammal surveys is presented below.

Otter

All watercourses within the Proposed Development site were surveyed for evidence of otter activity, it is noted that otter is a Qualifying Interest (QI) of the River Moy SAC. At the Wherrew RWI&PS site on Lough Conn, no definitive signs, such as tracks, spraint, or slides, were recorded; however, the rocky shoreline made otter evidence detection difficult, and otter presence along the lake edge remains likely based on habitat suitability, no otter holts were recorded within 50 m of the Proposed Development red line boundary at Lough Conn. At the Abbeytown Stream crossing, mammal tracks and two slides leading down to the stream were observed, along with indistinct prints on the muddy riverbank, suggesting probable otter use of the watercourse. No holts were identified within 50 m of this crossing. At the Brusna River crossing, no holts or clear otter signs were recorded, though mammal tracks potentially attributable to otter were noted approx. 70 m downstream of the pipeline crossing point. In the Ox Mountains, an otter spraint was found on a boulder in the Glenree Stream immediately downstream of the R294 road bridge, and an otter roadkill was recorded approx. 500 m east of this location. Across all watercourses and surveyed sections, no otter holts were identified.

Badgers

No direct evidence of badger activity, including the presence of setts, was recorded anywhere along the Proposed Development route. This includes the Wherrew RWI&PS, Lisglennon WTP, the lands between Lisglennon WTP and

Lisglennon Reservoir, Belleek Woods, the Brusna River crossing, Lough Talt WTP, and all off-road watercourse crossing locations.

At Lisglennon Reservoir, mammal tracks were identified to the north of the second storage tank base; however, these tracks could not be attributed to any particular species. The proximity of a farmyard suggests that some of the tracks may have been made by domestic dogs. No burrows or setts were recorded in this area.

Further mammal tracks were observed along the off-road section between Lisglennon Reservoir and the R314, mainly on the southern side of hedgerows and outside the proposed pipeline route corridor. A single small burrow was also recorded; although soil disturbance indicated recent activity, vegetation growth around the entrance made it difficult to determine whether it was actively used. The burrow was too small to be suitable for badger and was located outside the proposed route corridor. Overall, no evidence of badger setts was recorded within, or within 50 m of, the Proposed Development boundary.

7.3.11.3 Bats

NBDC records of bat species identifies the following bat species within the Proposed Development site;

- Common pipistrelle (*Pipistrellus pipistrellus sensu stricto*),
- Soprano pipistrelle (*Pipistrellus pygmaeus*),
- Pipistrelle (*Pipistrellus pipistrellus sensu lato*), and
- Leisler's bat (*Nyctalus leisleri*).

These records date from 2009 to 2021 and are distributed along the full extent of the pipeline route. The absence of records in certain areas does not indicate the absence of bats, but rather reflects recording effort and highlights the potential for bat species to be present within the wider landscape.

Hedgerows and treelines intersected by the Proposed Development were inspected for potential bat roost features such as holes, cracks, and crevices. The pipeline alignment was specifically designed to avoid any mature trees that could contain suitable roosting features. The Proposed Development will intersect thirteen hedgerows and two treelines (refer to Section 7.2.11); however, no trees or hedgerows containing potential bat roost features will be removed. An assessment of bat activity within Belleek Woods is provided separately below.

The proposed pipeline will also cross several watercourses that are culverted beneath existing roadways, including a number of older stone arch culverts. All of these culverts and arches are small, low lying structures, and none were found to provide suitable habitat for roosting bats.

Bat Activity Survey at Belleek Woods

A bat activity survey was undertaken by AtkinsRéalis ecologists in September 2024 at Belleek Woods, located west of the River Moy Estuary. The survey was conducted in accordance with *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edition).

Bat activity surveys are designed to determine the presence or absence of bats on a site and, where present, to identify how the site is being used (e.g. for commuting, foraging, or roosting). Environmental conditions during the survey were considered suitable, with a temperature of approx. 20°C, calm conditions (no wind or breeze), and no rainfall. No constraints were identified that would have affected the quality or completeness of the survey.

The first bat call was recorded at 19:49, with the final call recorded at 21:43. A total of six bats were directly observed, comprising three common pipistrelles and three soprano pipistrelles. In addition, further echolocation calls were recorded, indicating the presence of other bats within the immediate area.

Two instances of bats actively foraging were observed along the boundary between the woodland and Belleek Castle. Additional bat calls were recorded along this boundary during the survey. Echolocation calls were also recorded along the riverside pathway (Cyril's Way); however, no bats were directly observed at this location, suggesting that individuals were commuting along the river corridor or within the woodland.

Overall bat activity within the survey area was assessed as low, with soprano pipistrelle being the predominant species recorded. Individuals were observed in low numbers and for short durations, primarily engaging in foraging and commuting behaviour. Bats detected acoustically but not visually were likely commuting through or over the woodland to other areas within the wider landscape.

Although the surrounding landscape is considered suitable for bat foraging, roosting, and commuting, the results of the survey indicate that bat activity within this specific area is limited. No roosts were identified alongside the proposed pipeline route.

The pipeline route was specifically chosen so as to avoid any mature trees or trees with potential bat roost features. No trees or structures within bats roosts or potential bat roost features are to be lost as a result of the Proposed Development.

7.3.11.4 Other notable species

NBDC datasets record of other notable species, along with their locations, within an approx. 1 km radius of the Proposed Development in the past ten years are included in Table 7-12 below. The large red tailed bumble bee (*Bombus (Melanobombus) lapidarius*) was recorded near Belleek Woods and is noted to be a near threatened species, Freshwater white-clawed crayfish is listed under Annex II and V of the EU Habitats Directive and is a QI of Lough Hoe Bog SAC and was recorded in the area surrounding Lough Talt. Common lizard (*Zootoca vivipara)* another species protected under Wildlife Act(s), is also recorded near Belleek Woods and during site surveys common lizard was recorded in 2024 basking on a boulder approx. 100 m south east of the proposed pipeline route along the shoreline of Lough Talt.

Table 7-12 — Other Notable Species recorded within 1km along the Proposed Development route

Species	Scientific Name	Status	Location
Common Lizard	*Zootoca vivipara*	Wildlife Acts	River Moy/Belleek Woods
Large red tailed bumble bee	*Bombus (Melanobombus) lapidarius*	Near Threatened	Creggs Cross to Behy More and River Moy/Belleek Woods
Freshwater white-clawed crayfish	*Austropotamobius pallipes*	Annex II/Annex V/Wildlife Acts	Lough Talt

7.3.11.5 Invasive Species

A review of NBDC datasets (2016–2026) was undertaken to identify records of legally restricted Third Schedule invasive species, listed under the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011), within 100 m of the Proposed Development.

Himalayan knotweed (*Persicaria wallichii*) was recorded in the southern section of Belleek Woods in 2015. Japanese knotweed (*Reynoutria japonica*) was reported at four locations along the Proposed Development corridor in 2015; however, the precise locations are unknown due to a spatial accuracy of 1 km. Rhododendron was recorded within

Belleek Woods in 2015 and 2021, and also approximately 100 m south of the pipeline route at the base of the Ox Mountains.

Canadian waterweed (*Elodea canadensis*) was recorded in Lough Conn and Lough Talt in 2008 and is considered likely to remain present. No records occur within 100 m of the proposed intake location at Lough Conn or the Lough Talt WTP. Killer shrimp (*Dikerogammarus villosus*) was recorded approx. 350 m north of the proposed Brusna River crossing along the Glenree watercourse.

Project specific site surveys identified zebra mussel at the existing Wherrew RWI&PS on Lough Conn. The design of the proposed new raw water intake incorporates a specialised coating to prevent zebra mussels from attaching to, and subsequently clogging, the intake infrastructure, an issue commonly associated with this species where it is present.

As detailed in Section 7.2.8, a substantial stand of Japanese knotweed and Himalayan knotweed, both Third Schedule invasive plant species, is present within Belleek Woods (see Figure 7-34 for mapped location and approximate extent). This extensive infestation occupies the lawns north of Belleek Castle and extends along the adjoining woodland boundary, where both species occur in high abundance. On the castle lawns, knotweed has been repeatedly mown and to the north of the lawns forms continuous mature stands along the woodland edge. The proposed pipeline route has been deliberately aligned to avoid all areas affected by knotweed within this part of the woodland.

Cherry laurel is also present within the woodland near the proposed pipeline corridor and is widespread throughout Belleek Woods (Section 7.2.8). However, the proposed works will not require any encroachment into areas where cherry laurel occurs. Other invasive species historically recorded within the woodland include rhododendron, winter heliotrope (*Petasites fragrans*), snowberry (*Symphoricarpos albus*), Himalayan honeysuckle (*Leycesteria formosa*), montbretia (*Crocosmia* × *crocosmiiflora*), and bamboo (*Bambusoideae* spp.).

During site surveys, a small stand of Japanese knotweed was also identified near Culleens National School, located within scrub adjacent to the R314 and outside the Proposed Development red line boundary. This stand is already marked with a “Do Not Cut” notice, and, as with the infestation in Belleek Woods, the proposed works will not require any encroachment into this area.

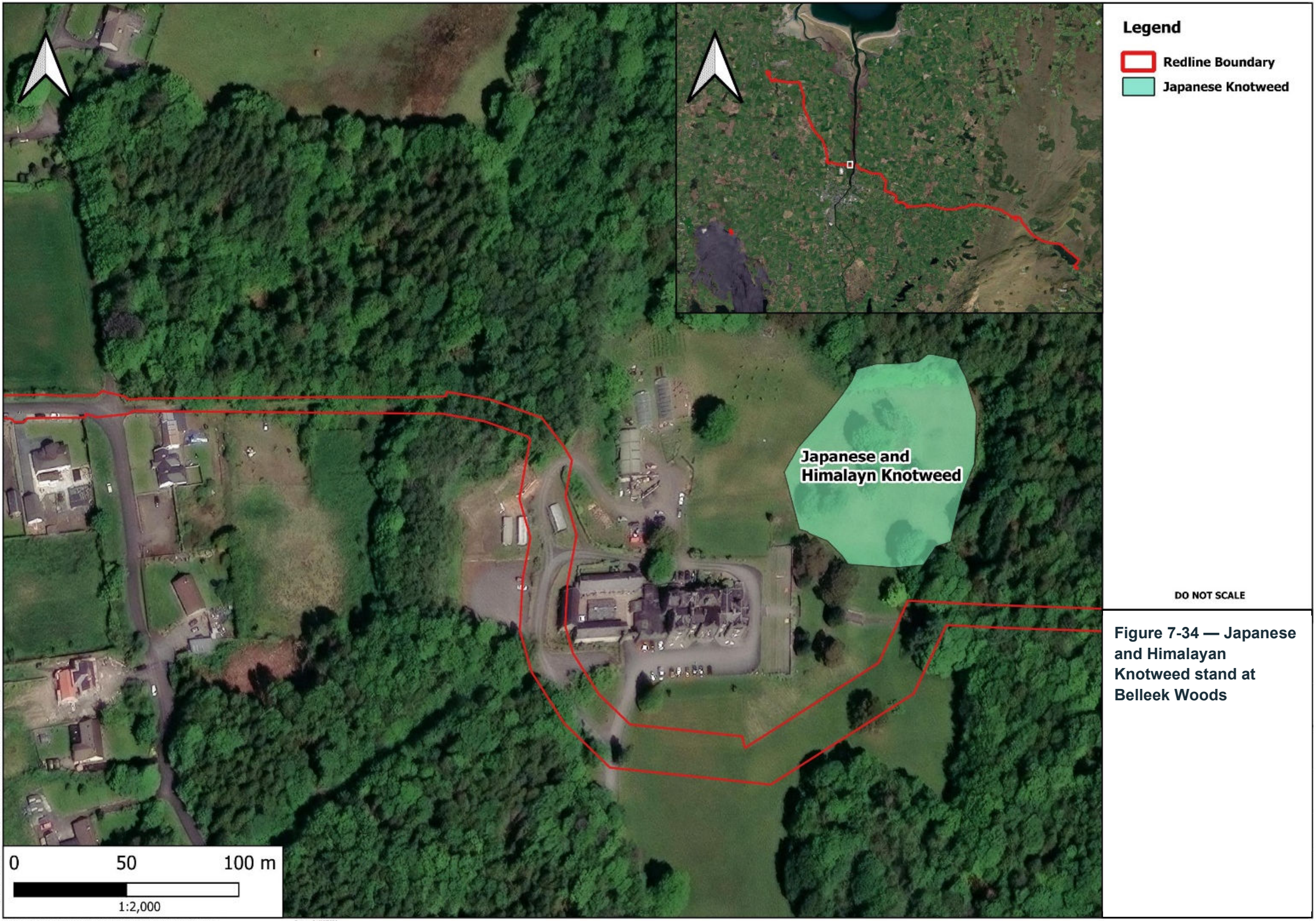


Figure 7-34 — Japanese and Himalayan Knotweed stand at Belleek Woods

7.3.12 Key ecological features

Key ecological receptors (KERs) occurring within, or within the ZoI of, the Proposed Development and with potential to be directly or indirectly affected during the construction or operational phases are outlined in this section.

European Sites located within the ZoI have been assessed in detail in the accompanying NIS (AtkinsRéalis, 2026; Document Reference: 0089328DG0011). The NIS identifies those sites with direct, hydrological or hydrogeological connectivity to the Proposed Development as having potential to be indirectly affected by the scheme. Potential effects on ex-situ qualifying interests, including aquatic species, otter and bird species associated with SACs and SPAs, were also evaluated. All European Sites determined to fall within the ZoI in the NIS are included as KERs in this assessment.

Nationally designated sites (pNHAs) with direct, hydrological or hydrogeological connectivity to the Proposed Development are also considered to be KERs.

Sites, habitats and species within the ZoI that are assessed as being of Local Importance (Higher Value) or above, and that have potential to be impacted by the Proposed Development, are identified as KERs. Features with potential indirect connectivity, for example via hydrological pathways, are also included.

The habitats and species identified as KERs have been evaluated to determine their ecological value or conservation importance. Values have been assigned using a geographical scale, as outlined in Section 7.2.5.

Where a species is identified as a KER, its value is determined with reference to its protection status, conservation condition and the availability of suitable habitat within the ZoI. The presence, or likely presence, of each KER has been established using online datasets, published sources, results of field surveys, and expert ecological judgement. All legally protected habitats and species within, or potentially within, the ZoI and with potential to be affected by the Proposed Development are included as KERs.

KERs within the ZoI of the proposed scheme are listed in Table 7-13.

Table 7-13 — Evaluation of Key Ecological Receptors

KER	Description of KER	Potential for impact	Value of KER	Determination
Designated Sites				
River Moy SAC (002298) Killala Bay/Moy Estuary SAC (000458) Lough Hoe Bog SAC (000633) Lough Conn and Lough Cullin SPA (004228) Killala Bay/Moy Estuary SPA (004036)	Natura 2000 sites, see Section 7.3.2 for location details.	There is potential for direct impacts as works are proposed within two SACs, two SPAs, and directly adjacent to one SAC. There is potential for impact through watercourse connectivity, e.g. contamination and/or pollution of surface water features during the construction phase could negatively impact surface water quality. There is potential for impacts on downstream protected habitats and species should the water quality of water features be affected.	Internationally important	Key ecological receptor. Assessed as a key receptor as the Proposed Development route connects to existing duct that crosses River Moy SAC, Killala Bay/Moy Estuary SAC/SPA, is within Lough Conn and Lough Cullin SPA, as well as any other potential indirect connectivity to these SACs/SPAs from the Proposed Development route through surface water or groundwater pathways.
Lough Conn and Lough Cullin pNHA (000519) Killala Bay/Moy Estuary pNHA (000458) Lough Hoe Bog pNHA (000633)	Proposed Natural Heritage Areas, see Section 7.3.3 for location details.	The Proposed Development is within Lough Conn and Lough Cullin pNHA, connects to the existing duct that crosses the Killala Bay/Moy Estuary pNHA and is directly adjacent to Lough Hoe Bog pNHA. There is potential for impact through watercourse connectivity to these pNHAs e.g. contamination and/or pollution of surface water features near and crossed by the Proposed Development route during the construction phase could	Nationally important	Key ecological receptor. Assessed as a key receptor due to the designation status of the sites and as there is direct and indirect connectivity to the three pNHA sites.

KER	Description of KER	Potential for impact	Value of KER	Determination
		negatively impact the habitats and species within the designated sites.		
Non-Qualifying Interest Annex I Habitats				
Blanket Bog [7130] Wet Heaths [4010] Dry Heaths [4030]	Annex I habitats, see Section 7.3.5 for location details.	NPWS datasets identify the Proposed Windy Gap BPT site is located within an area of non-qualifying interest Annex I habitats; blanket bog, wet heath and dry heath, site surveys note this area as Cutover Blanket bog habitat.	Internationally important	Key ecological receptor. Assessed as a key ecological receptor as the Proposed Development is directly within an area of blanket bog habitat.
Wetland Habitats				
Bunnyconnellan East Cutover Complex Drumsheen Cutover Complex Tullaghaglass Largan Mountain Bog	Wetland sites with potential connectivity, refer to Section 7.3.6 for locations.	The Proposed Development pipeline alignment has been specifically chosen to avoid direct interaction with any wetland habitat, however, there is potential hydrological connectivity to three wetland sites	Bunnyconnellan East Cutover Complex and Tullaghaglass Largan Mountain Bog wetland sites have been given a F rating within WSI datasets. Drumsheen Cutover Complex, which has been assigned a C rating denoting County Conservation value.	Key ecological receptor. Assessed as a key ecological receptor as the Proposed Development has potential hydrological connectivity to three WSI identified wetland sites.
Surface Water Features				

KER	Description of KER	Potential for impact	Value of KER	Determination
Lough, Rivers, Streams, and Drains	The Proposed Development is within Lough Conn and is aligned alongside Lough Talt. The proposed pipeline will cross thirty surface water features; eighteen EPA identified watercourses and twelve field drains. Refer to Section 7.3.7	The Proposed Development will involve an increase in water abstraction from Lough Conn and is aligned directly alongside Lough Talt. The pipeline will cross thirty surface water features. There will be direct connectivity during the construction phase of the Proposed Development which has potential to cause impacts on the water quality of these waterbodies which could in turn affect ecologically important aquatic species and downstream habitats. Several of these water features form a part of SACs/SPAs.	The ecological value of watercourses ranges from being of Internationally Important (Lough Conn, Moy Estuary, Brusna River, Lough Talt) to being Locally Important (small tributary streams).	Key ecological receptor. Assessed as a key receptor due the likelihood of the watercourses accommodating species of high ecological importance and for the potential for the Proposed Development to result in adverse impacts on the water quality of surface water features.
Woodlands				
Belleek Woods	Broadleaf/conifer and mixed woodland See Section 7.3.8 for details.	The Proposed Development route travels directly through Belleek Woods resulting in direct connectivity. There is potential to cause impacts to the habitats within the woods during the construction phase which in turn could affect woodland species.	Given the ecological diversity within this woodland, and given that it is one of the largest mixed broadleaf and conifer woodlands within a wide geographical area, this woodland is considered to be of county importance	Key ecological receptor. Assessed as a key receptor due to the direct connectivity to Belleek Woods
Other Habitats				

KER	Description of KER	Potential for impact	Value of KER	Determination
Hedgerows (WL1) and Treelines (WL2)	Refer to Section 7.3.10 and 7.3.11	There will be a total of thirteen hedgerows (predominantly hawthorn and ash) intersected by the pipeline, with a estimated total length of 65 metres of hedgerows to be lost. There are two areas where there will be a loss of hawthorn and ash treelines. A combined total of approx. 10 m of treelines is proposed to be removed	Local Importance (higher value)	Key ecological receptor Assessed as such as there will be a direct loss of hedgerows and treelines.
Mixed Broadleaf and Conifer Woodland (WD2)	See Woodland KER above	See Woodland KER above	See Woodland KER above	Key ecological receptor
Watercourses (FW2), Tidal Rivers (CW2), Lakes (FL2/FL3) and Drainage ditches (FW4)	See Surface Water Features KER above	See Surface Water Features KER above	See Surface Water Features KER above	Key ecological receptor
Immature Woodland (WS2)	Refer to Section 7.3.10 and 7.3.11	The banks of Lough Conn at the Wherrew RWI&PS are lined with immature willow and alder woodland. The Proposed Development will have no interaction with this woodland	Local Importance (higher value)	Not a key ecological receptor Assessed as such as there will be no interaction with this developing woodland habitat.
Scrub (WS1)	Refer to Section 7.3.10 and 7.3.11	Scrub habitat is found along the banks of the Brusna River, there river will be crossed by trenchless techniques and there will be no	Local Importance (higher value)	Not a key ecological receptor Assessed as such as there will be no interaction with this scrub habitat.

KER	Description of KER	Potential for impact	Value of KER	Determination
		interaction with any scrub in this area.		
Cutover bog (PB4)	See Annex I KER above	See Annex I KER above	See Annex I KER above	Key ecological receptor.
Improved agricultural grassland (GA1), Amenity grassland (GA2), Wet grassland (GS4)	Refer to Section 7.3.10 and 5.3.11	The pipeline is aligned through these grassland habitats which will be reinstated post works.	Local Importance (lower value)	Not a key ecological receptor Assesses as such due to these habitats being of lower ecological value.
Species				
Aquatic species	The Proposed Development will result in increased water abstraction from Lough conn which accommodates a wide range of protected aquatic species. The Proposed Development route crossed over thirty surface water features many of which will contain protected aquatic species. See Section 7.3.7 for more details.	There is the potential for construction related activities to result in impacts to the water quality of surface water features within and crossed by the Proposed Development which could in turn affect protected aquatic species.	Internationally important. Categorised as such as some of the aquatic species present are protected under the Habitats Directive.	Key ecological receptor. Assessed as a key receptor due to the potential impacts on water quality which in turn could impacted aquatic species.

KER	Description of KER	Potential for impact	Value of KER	Determination
Birds	Bird species are widespread throughout the Proposed Development route. Bird species may utilise the lands within close proximity to the Proposed Development route site for nesting, foraging, hunting and roosting.	There is potential for disturbance, displacement, loss of nests and loss of nesting habitat.	Internationally nationally, county, and locally important. Categorised as such as some species listed in the EU Birds Directive, Wildlife Acts, and Birds of Conservation Ireland.	Key ecological receptor. Assessed as a key receptor due to protection status and there is the potential for loss of bird nesting habitat (e.g. hedgerows).
Otter	Otter is a qualifying interest of River Moy SAC.	The Proposed Development will not affect any otter refugia. There is the potential for construction related activities to result in impacts to the water quality of surface water features which could in turn affect fish which are prey for otters.	Internationally important. Categorised as such as this species is strictly protected under the Habitats Directive.	Key ecological receptor. Assessed as a key receptor due to protection status and potential for indirect adverse effects.
Bats	Refer to Section 7.3.11	There will be no loss of any bat roots or trees with potential bat roost features as a result of the Proposed Development. The underground pipeline installation and the construction / alteration of Plant Sites will have no affect on local bat populations.	Internationally and nationally important. Categorised as such as these species are listed on Annex IV to the Habitats Directive, as well as Wildlife Acts.	Not a key ecological receptor Assessed as such as there will be no interaction with any bat roosts or loss of foraging or commuting habitat.
Badger	Refer to Section 7.3.11	Site surveys did not identify any evidence of badger activity within	Nationally important.	Not a key ecological receptor

KER	Description of KER	Potential for impact	Value of KER	Determination
		the Proposed Development site and there are no badger setts within the Proposed Development site.	Categorised as such as this species is listed as protected under Irish Wildlife Acts.	Assessed as such as there will be no interaction with any badger refugia as a result of the Proposed Development.
Common Spotted Orchid	Refer to Section 7.3.8 for details.	Site surveys identified Common Spotted Orchid sporadically along the western laneway of Belleek Woods	Local Value (higher level)	Key ecological receptor Assessed as such as there is the potential for loss of a small number of orchid plants.
Invasive species	Zebra mussels are found within Lough Conn at the Wherrew Intake site. Refer to Section 7.3.12	Japanese knotweed, Himalayan knotweed and Cherry laurel have been recorded within Belleek Woods, however, the pipeline route entirely avoids any interaction with any invasive plant species. Zebra mussels were identified at the existing Wherrew RWI&PS and there is the potential for these to clog new intake infrastructure.	No ecological value for invasive species.	Key ecological receptor. Assessed as such due to the presence of zebra mussels within the Proposed Development site.

7.4 Potential Impacts

7.4.1 Types of Impacts

In the absence of mitigation measures, during the construction and operational phases, the Proposed Development could have a range of potential impacts on the key ecological receptors within the ZoI of the Proposed Development. The types of potential impacts are described below.

7.4.1.1 Physical Damage/ Habitat Loss

Physical damage includes the degradation to, modification, fragmentation or loss of habitats. Direct physical damage of habitats could occur within where construction works are undertaken. Physical damage of habitats can also be an indirect impact and could occur, for example, through the introduction of fine sediments into an aquatic system, causing changes to the particle composition of the benthic habitats. Physical damage may be temporary or permanent.

7.4.1.2 Disturbance

Disturbance can cause sensitive species (e.g. otters, waterbirds) to deviate from their normal and preferred behaviour, resulting in stress and increased energy expenditure. Disturbance can result in species being displaced from suitable habitat areas that provide areas for feeding and foraging, passage routes, and resting and breeding sites. Physical disturbance of species can also result in direct mortalities of species and thus, disturbance impacts can be both direct and indirect and may be temporary or permanent in nature. Examples of direct disturbance includes activities such as damage to a breeding or resting site of a protected species. Disturbance may result from the presence of works crews and personnel on site during construction, light and noise emanating from a construction site, causing species to avoid the area.

7.4.1.3 Changes in Water Quality

The release of pollutants to water can impact upon the relevant waterbodies and the species they support. This can result in impacts such as increased turbidity of the water column, a reduction in photosynthesis, contribution to eutrophication and changes to the species composition of the system as a result. The degree of impact depends on the type of pollutant released and the nature of the receiving receptor. For example, the release of fine sediments to a stream or river is likely to cause siltation of the river bed and interrupt the functioning of species, from aquatic plants to macroinvertebrates to fish, and larger predators that depend on these biotic groups as a food supply, e.g. otters. Impacts to water quality could be temporary in the form of surface water runoff during construction, or permanent in the form of a continued discharge impacting negatively on the receiving environment. Dispersal of Invasive Species

7.4.2 Do-Nothing Scenario

In the absence of the Proposed Development, in the short term it is assumed that the Proposed Development site will remain as roadways, amenity, wet and agricultural grassland, woodland, hedgerows and trees and the ‘Do-Nothing’ impact is likely to result in continued artificial and semi-natural habitats on the Proposed Development site. The potential value of the site and adjoining habitats to species would continue. Should no development be undertaken, it would be expected that any species using or adjacent to the site would remain.

7.4.3 Designated Sites

An Appropriate Assessment screening and Natura Impact Statement was prepared for the Proposed Development route (AtkinsRéalis 2026). The report outlines that the five following European Sites have direct or indirect connectivity to the Proposed Development; River Moy SAC, Killala Bay/Moy Estuary SAC, Lough Hoe Bog SAC, Lough Conn and Lough Cullin SPA, Killala Bay/Moy Estuary SPA. There is also direct or indirect connectivity to Lough Conn and Lough Cullin pNHA , Killala Bay/Moy Estuary pNHA and Lough Hoe Bog pNHA. Killala Bay/Moy Estuary is also a Ramsar wetland site.

The following section provides details of potential effects on these European sites from both the construction and operation of the Proposed Development. As the pNHAs and the Ramsar site share the same conservation interests and geographical area as the SACs and SPAs, the assessment of potential impacts also includes these designations.

7.4.3.1 Lough Conn

Lough Conn forms a substantial part of the River Moy SAC and Lough Conn and Lough Cullin SPA/pNHA and is an ecologically important waterbody supporting several Qualifying Interests (QIs), including salmon, lamprey and otter. Although white-clawed crayfish is also a QI of the SAC, historic records detail it does not occur within Lough Conn and therefore cannot be affected by the Proposed Development works at Lough Conn. Areas of qualifying interest oak woodland and alluvial woodland occur along sections of the lough shoreline; however, these terrestrial habitats are not located near, nor have any ecological or hydrological connectivity to, the Wherrew RWI&PS site. As a result, they cannot be impacted by either construction or operational activities. Similarly, other QI bogland habitats within the wider SAC do not have any direct or indirect pathway of effect from the Proposed Development. Lough Conn and Lough Cullin SPA is designated for four SCI waterbird species and the wetland habitats that support these birds.

The Proposed Development includes construction works at the existing Wherrew RWI&PS and an increase in water abstraction from Lough Conn when operational. Given the direct physical and hydrological connection between the intake site and the River Moy SAC, a comprehensive assessment of potential effects on the ecological integrity of Lough Conn is necessary.

Construction Phase

During construction, the primary potential impacts relate to proposed works required to upgrade the raw water intake. These works include installation of a new screened intake structure, installation of a fish return system, installation of a new intake pipe in the near shore zone of the lough and finally infilling of the historically dredged intake channel. The aforementioned works will be undertaken whilst raw water abstraction is ongoing at current rates so that local water supply remains unaffected.

Works will begin with the installation of temporary raw intake pipes (polyethylene or similar) connected to the existing pumps in the intake building. From there they will be laid across ground, weighted, secured, and otherwise appropriately protected from accidental damage. The abstracting end will be connected to pontoons in the lake. The pontoons float on the surface, ensuring that the end of the temporary abstraction pipes will be fully submerged at all times and away from the lakebed. This temporary intake mechanism will maintain continuous abstraction throughout the new intake construction period. Following completion of the permanent upgrade works, these temporary pipelines will be removed.

Once the temporary abstraction arrangement is operational, a channel/trench will be excavated alongside the current intake channel to accommodate the fish return bypass pipe, once installed the trench will be backfilled. Following which, the intake area surrounding the existing screens will be isolated using a cofferdam and dewatered to allow safe and dry access for installation of the new intake structure, fish screens, and associated fish return system components. It is currently anticipated that the temporary cofferdam structure may comprise sheet piling over an

approximate length of 30 m, or an equivalent solution such as a waterdam or inflatable dam (Portadam[46] or Aquadam[47] or similar), subject to detailed design by the Appointed Contractor. If sheet piling is utilised, installation will be of very short duration (typically 1–2 days) and will employ resonance free vibratory piling techniques to minimise noise and vibration. Additional mitigation measures will include the use of acoustic shrouds, temporary acoustic barriers, restricted working hours and vibration monitoring. All cofferdam installation works will be undertaken during the period July to September, which represents the optimal ecological window for instream works. This timing avoids sensitive periods for aquatic species (e.g. salmonid spawning, egg incubation and early juvenile development) and also avoids the overwintering period for waterbirds associated with Lough Conn and Lough Cullin SPA, thereby minimising the potential for disturbance to Special Conservation Interest species.

The installation of sheet piles within the nearshore zone has the potential to generate short term increases in underwater noise and localised vibration within Lough Conn. These effects could temporarily disturb fish species present within the vicinity of the works, including Qualifying Interest species such as salmon and lamprey. However, given the short duration of piling activities, the use of low impact vibratory methods, and the implementation of noise and vibration attenuation measures, any disturbance will be highly localised, temporary and short term. Fish are expected to move away from the works area during piling activity and return shortly after once works have ceased. No injury, mortality or disruption to key ecological functions (e.g. spawning or migration) is predicted. On this basis, the impact of sheet piling activities on aquatic receptors will be short-term, not significant, and will not affect the ecological integrity of Lough Conn or associated designated sites.

Following the installation of the cofferdam, all water removed during dewatering will undergo settlement within designated settlement tanks, after which the clarified water will be returned to Lough Conn in a controlled manner. No adverse impacts on the waterbody are anticipated as the over pumped waters will be fully settled prior to discharge. All intake upgrade works will be undertaken in the dry behind the dam and as such there is no potential for any contaminating materials (e.g., cementitious materials, hydrocarbons) to enter the lake waterbody. Once the intake works are completed, the cofferdam will be removed and construction will proceed to installation of the new intake pipeline within the lake.

The new polyethylene intake pipe will be approx. 165 m in length and 1,200 mm internal diameter. This length is required as water depths near this area of shoreline are shallow during summer months, typically only 2 m – 3 m deep at a distance of approx. 165 m from the shore. To ensure that the pipeline sits level on the lakebed, minor grading and levelling of a narrow strip of lakebed, approx. 1.2 m in width, will be required. This work will be carried out mechanically using an excavator positioned on a barge or pontoon.

The intake pipe will be floated into position using boats or pontoons and flotation devices before being lowered onto the lakebed. Once in place, it will be secured using a fascine mattress (woven mat), which will be ballasted with clean, washed stone to minimise the generation of suspended sediments. Along the near shore section, stone will be placed directly onto the mattress covering the submerged pipe using a long reach excavator working from the shoreline, ensuring that no machinery tracks within the waterbody. For the remaining pipeline length, clean stone will be transported on a modular pontoon or barge, from which a small excavator will place the stone material along the mattress alignment. The pontoon will be repositioned incrementally until stone installation is completed along the full length of the pipeline. Additional localised grading/excavation will also be necessary at the pipe termination point to prepare a flat base area, at the required level, for the primary intake unit at the end of the pipe. As with stone install, the preparation of a flat base area for the intake unit will be done by an excavator on a pontoon/barge. The prefabricated intake unit consists of a section ductile iron pipe and a coarse screen which are mounted inside a precast concrete block approx. 1.75 m x 1.75 m in size. This unit will be lowered into the prepared flat base area and connected to the end of the intake pipe manually by divers. All intake pipe works within the lough waterbody will be undertaken during spring/summer months when lake levels are at their lowest.

[46] https://portadam.com/wp-content/uploads/2024/09/MES-0824-097-Portadam-Cofferdam-Brochure.pdf

[47] https://murlac.com/wp-content/uploads/2022/07/MURLAC-Temporary-Dams-Brochure-2022.pdf

Following installation of the new infrastructure, the existing intake channel, currently a deep, approx. 20 m wide incision in the shoreline, will be backfilled with clean stone, capped with soil, to restore natural shoreline morphology. The reinstated shoreline will mimic adjoining undisturbed areas and will remove a long standing artificial bank incision from the loughs edge.

The new intake system incorporates primary and secondary fish screens, low velocity intake heads and a dedicated fish return system to protect aquatic fauna. The fish screening and fish return system shall be designed in accordance with applicable European and national legislative requirements for the protection of aquatic species, including Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive), Directive 2000/60/EC establishing a framework for Community action in the field of water policy (the Water Framework Directive), and Council Regulation (EC) No. 1100/2007 establishing measures for the recovery of the stock of European eel (the Eel Regulation). In addition, the intake screening and fish protection measures have been developed with reference to Environment Agency (England) guidance on the protection of eels and other fish species at water abstraction intakes, including *Screening at Intakes and Outfalls: Measures to Protect Eel* (Environment Agency, 2011). The primary intake screen, with an approximate mesh aperture of 20 mm, prevents the entry of larger fish and other aquatic species into the abstraction system. Any smaller individuals that pass through this initial screen are intercepted by a dedicated fish return system and safely returned to the lake. Downstream of the fish return system, and upstream of the intake chamber, a secondary fine screen with a mesh aperture of 2 mm - 3 mm prevents the passage of even smaller fish and aquatic organisms into the raw water intake infrastructure. The low intake velocity (≤ 0.10 m/s) further reduces the potential for entrainment, ensuring that juvenile and adult fish, including eels, elvers and lamprey, are either excluded from the abstraction structure or safely returned to the lake without entering the intake chambers. The screening and fish return arrangements are therefore consistent with best practice guidance for the protection of aquatic species at water abstraction intakes. As a result, the proposed abstraction will effectively eliminate the risk of fish entrainment associated with the intake and remove a potential pressure on qualifying interest fish species. This will, in turn, maintain the availability of prey resources for otters and piscivorous waterbirds that utilise the lough. Consequently, the proposed abstraction represents an ecological improvement over the existing situation. To address biofouling risks, the intake screens are coated with a specialised surface treatment that prevents colonisation by zebra mussels, an invasive species known to cause operational issues in raw water intakes.

Potential pollution risks during intake construction works adjacent to the lake, such as accidental hydrocarbon spills, concrete runoff, or silt-laden surface water, are recognised considerations for a designated site of this sensitivity. However, all intake works will be carried out within an isolated, fully enclosed cofferdam, allowing the works area to be kept dry and preventing any interaction with the lake. As a result, there will be no pathway for release of pollutants to the lake and no potential effects on water quality, aquatic species, waterbirds or otter within the lough.

Only minor excavations of soils are required for the works (fish return pipe), and therefore there will be no potential for significant generation of silt laden runoff from exposed soils or spoil stockpiles. Stone materials used for pipeline bedding and for infilling the existing intake channel will consist solely of clean, washed stone, free of fine sediments. These materials will be stockpiled at an appropriate distance from the shoreline to further eliminate any risk of contaminated runoff reaching the lake. Consequently, these construction activities will not give rise to any pollutants capable of affecting lake water quality, sensitive aquatic receptors, waterbirds, otters or wetland habitats.

The grading of the pipeline alignment and the installation of the pipe and stone directly within the lough have the potential to generate localised increases in turbidity, temporary mobilisation of sediments, and short term disturbance to fish and waterbird species if present in the immediate area. Intake pipe works are estimated to take three weeks so any disturbance to fish or birds would be very localised and of short duration. The lake itself is large and capable of assimilating any minor plume of suspended sediment that may be generated from small scale bed grading, laying a polyethylene pipe and placing stone ballast on top. The revised intake design eliminates the need for maintenance dredging within the lake which historically has been necessary. Any sediment release from pipe installation works would be spatially restricted to and diluted within the localised area and would be temporary in nature, with no likely potential to propagate into the wider lake basin or downstream into the River Moy system. Notwithstanding this, mitigation measures to limit the spread suspended solids and sediments within the lough are included in Section 7.5.

Given that the construction works are located within an already developed section of shoreline, any disturbance to otter, waterbirds or breeding birds is expected to be minimal and temporary. No otter holts or couches are present at or near the Wherrew RWI&PS, and otters in the area are likely habituated to the existing facility and routine human activity. The works will be of relatively short duration and undertaken during daylight hours; as otters are predominantly nocturnal, no significant disturbance to their foraging or movement patterns is anticipated. In-lake works for the laying of the intake pipe will be undertaken during spring summer months (April – September) to negate any potential disturbance to overwintering Special Conservation Interest species; Tufted duck and Greenland White-fronted geese associated with Lough Conn and Lough Cullin SPA.

Operational Phase

The potential operational phase effects on the qualifying interest habitats and species of the River Moy SAC and the Lough Conn and Lough Cullin SPA/pNHA primarily relate to changes in lake levels and flows, water-quality processes, the risk of entrainment of aquatic fauna at the intake, and any associated effects on aquatic ecology or fish passage. Each of these pathways is assessed below in the context of the proposed abstraction increase and the design features of the upgraded intake.

Changes in Water Levels and Flows; The accompanying hydrological assessment (Lough Conn Abstraction Assessment Report, Document Ref. 10025936-ATK-XX-XX-RP-ZZ-911500) identifies that the proposed abstraction will result in less than a 5% change in both lake levels and flows within Lough Conn, Lough Cullin and the River Moy. Seasonal lake level fluctuations in these systems naturally span approx. 3300 mm, driven by rainfall, catchment inflows and evaporation. In comparison, the effect of increased abstraction is predicted to reduce lake levels by only 11 mm – 31 mm, representing a very small proportion of the natural regime.

The hydrological assessment also highlights that peak summer evaporation can exceed 200 ML/d, more than five times the proposed abstraction rate, demonstrating that abstraction related effects are negligible relative to natural hydrological variability. As a result, the predicted minor fluctuations in lake level will not alter shoreline extent, waterbody depth, wetted width, marginal or fringe habitats, nor the ecological conditions required by any QI habitats or QI/SCI species. In the River Moy, the proportionate change in downstream flows is similarly insignificant and will not produce any discernible hydrological change.

Changes in Water Quality and Associated Processes; Changes to water levels or flows can potentially influence water quality parameters such as temperature, dissolved oxygen concentration, and dilution capacity. The hydrological assessment concludes that, under the proposed abstraction regime, both lake and river waterbodies will remain in compliance with WFD “Good” or “High” status for all relevant parameters. Consequently, no changes in water quality processes of ecological relevance are expected, and no deterioration in conditions required to support QI species, including salmon, lamprey, and otter, will occur.

Entrainment of Aquatic Species at the Intake; The existing abstraction at Wherrew uses only a coarse screen at the intake which allows the potential ingress of fish and other aquatic organisms into the pump station. Under current conditions, this presents a potential pressure on salmonids, lamprey, and other prey species relied upon by otter and certain SPA bird species. The upgraded intake design substantially improves the current situation. The new intake system incorporates primary and secondary fish screens, low velocity intake heads, and a dedicated fish return system to protect aquatic fauna. The primary screen (approximately 20 mm mesh aperture) prevents the entry of larger fish and other aquatic species into the abstraction system, while any smaller individuals that pass this screen are intercepted by a dedicated fish return system and safely returned to the lake. A secondary fine screen (2 mm - 3 mm mesh aperture), located downstream of the fish return system and upstream of the intake chamber, prevents the passage of even smaller fish and aquatic organisms into the raw water intake. As a result, juvenile and adult fish, including elvers and lamprey, are either excluded from the abstraction structure or safely returned to the lake without entering the intake chambers. These measures will eliminate entrainment risk and therefore remove the existing pressure on QI fish species and otters and waterbirds that rely on them. As such, the proposed abstraction represents an ecological improvement compared with current conditions.

Effects on Waterbody Habitat and Fringe/Marginal Zones; Because the predicted abstraction related change in lake levels is extremely small (11 mm - 31 mm) when set against the natural 3,300 mm seasonal fluctuation, the project will not alter the extent, composition, or functioning of lake fringe habitats around Lough Conn or Lough Cullin. Wetland margins, shallow bays, littoral vegetation zones, and shoreline features will remain unaffected. Accordingly, no QI or SCI species reliant on these habitats, such as otter or waterbirds, will experience habitat loss or degradation.

Effects on Aquatic Community Structure; A reduction in river flows can, in theory, lead to a loss of taxa dependent on higher velocity habitats. However, given that hydrological modelling shows no perceptible change in lake levels, no meaningful change in river flows downstream of Foxford, and no reduction in WFD status, changes to habitat characteristics are not anticipated. The aquatic communities of Lough Conn, Lough Cullin and the River Moy are therefore expected to continue functioning within their natural ecological regimes.

Potential Restrictions on Fish Passage or Migration; Changes in river flow or water levels could affect the porosity or effectiveness of in-stream barriers and fish passes. Available information indicates the presence of one major barrier, the Ballina Salmon Weir, and two minor structures between Lough Cullin and the River Moy (including an old eel weir). As the hydrological assessment shows no discernible reduction in flows within the River Moy, the operation of these structures will not be altered. Fish passage conditions, migration cues and barrier passability will remain unchanged, and no fragmentation of habitats or impediment to migratory salmon or lamprey is anticipated.

Additional Operational Considerations; Under the upgraded abstraction regime, daily abstraction will increase from approx. 13,400 m³/day to 26,900 m³/day (a net increase of 12,950 m³/day), with potential future demand up to 38,120 m³/day. Even at maximum demand, abstraction represents a minor component of total lake turnover in a large (4,704 ha), deep (37.9 m), hydrologically robust system with significant inflows. Consequently, the predicted abstraction is not expected to influence nearshore hydrodynamics or have any ecological consequences.

Fish migration, spawning, and recruitment processes will also remain unaffected. Lough Conn supports stable populations of salmon, brown trout, eel, perch, roach and landlocked lamprey, all of which will experience enhanced protection as a result of the new screening system. Migratory sea lamprey will continue to pass through the lake en route to upstream spawning grounds, and no changes to these ecological pathways are expected.

The invasive zebra mussel, already present at the intake site, poses operational challenges through biofouling. The proposed intake includes anti-fouling coatings that prevent zebra mussel settlement, eliminating infrastructure blockages and reducing the need for intrusive maintenance. Since the species is already established within the lake, the new intake will not alter its distribution or create any new ecological risk.

In summary, the proposed abstraction will result in only minimal changes to lake levels and no measurable changes to flows in the River Moy. Water quality will remain within WFD “Good” to “High” status, fringe and marginal habitats will not be altered, and no hydrological or ecological pathways will give rise to adverse effects on QI or SCI species or habitats. The new intake design provides a substantial improvement for aquatic fauna by eliminating entrainment risk, delivering an ecological benefit compared with the existing intake.

No impacts on fish passage, migration, aquatic community structure, wetland habitats, SCI birds or ecological processes are predicted. Given the absence of any adverse effects and the overall improvement in protection of aquatic species, it can be concluded that when operational, the Proposed Development will not result in likely significant effects on the qualifying interest habitats or species of the River Moy SAC or the Lough Conn and Lough Cullin SPA/pNHA in view of their conservation objectives. The inclusion of the fish screens and fish return system can result in a significant positive effect over the long term within Lough Conn.

7.4.3.2 Brusna River Crossing

The Proposed Development involves the installation of a trunk main through River Moy SAC for approx. 250 m in agricultural lands west of Bonniconlon village (Refer to Figure 7-27). This will involve the Brusna River crossing, which forms part of the SAC, this crossing is proposed to be completed via Horizontal Directional Drilling (HDD). The use of

HDD ensures that no instream works occur and that the riverbed and adjacent riparian zone remain physically undisturbed. The HDD launch and reception pits are positioned a minimum of 20 m from the riverbanks, thereby avoiding the riparian corridor.

Site surveys found that the Brusna River at the proposed crossing location is a high quality watercourse supporting a diverse and sensitive macroinvertebrate community. Kick-sample surveys conducted in 2024 recorded a Q-value of 4, representing 'Good' ecological status in accordance with the EPA biological assessment system. This result corresponds closely with EPA monitoring data from 2022, which recorded Q5 ('High') status approx. 400 m upstream. The riverbed consists of clean cobble, gravel, and sand substrate, providing optimal habitat for salmonid spawning, and is also suitable for lamprey species associated with the SAC. The surrounding riparian zone comprises grassy banks with scattered willow and alder, transitioning downstream into a more continuous treeline and scrub habitat. Although suitable habitat for white-clawed crayfish was present, no individuals were recorded during species specific surveys undertaken for the project. Otter activity was not identified at the crossing location.

Construction Phase

No QI habitats of the River Moy SAC, such as alluvial woodland, old oak woodland, alkaline fen, or lowland hay meadows, are present at or near the proposed crossing location. Accordingly, the works in this area will not affect any QI habitats. The surrounding land is dominated by improved agricultural grassland with small sections of hedgerow and treeline. One short section (approx. 5 m) of hawthorn hedgerow within the SAC boundary will be removed to facilitate construction; this will be reinstated on a like-for-like basis following completion of the works (other hedgerows intersected in this area are outside of the SAC). All disturbed agricultural land will also be fully reinstated.

The use of HDD allows the pipeline to pass beneath the river at a depth of approx. 1.5 m – 2 m, meaning the river channel, banks, and riparian zone will remain entirely undisturbed. As no instream works are required at any stage, there will be no loss, alteration, or fragmentation of aquatic or riparian habitats within the SAC.

In the absence of mitigation, construction activities in proximity to the river could pose risks such as sediment mobilisation, hydrocarbon or chemical spills, and the inadvertent release of drilling fluid (frac-out) into the aquatic environment. These events have the potential to impact sensitive SAC species, including salmonid eggs and fry, lamprey ammocoetes, and macroinvertebrate communities that rely on clean, well-oxygenated substrates. HDD has been specifically selected to be 1.5 m – 2 m below the river bed to minimise such risks by avoiding riverbed disturbance and ensuring that drilling operations remain isolated from surface waters.

Standard bentonite drilling muds commonly used in HDD are known to be harmful to aquatic organisms due to their potential to clog fish gills if released into watercourses. To eliminate this risk, only non-toxic drilling fluids will be used for the Brusna River crossing. Although HDD launch and reception pits will be positioned at least 20 m from the riverbanks, there remains a residual potential for silt-laden runoff or accidental hydrocarbon releases, particularly during periods of heavy rainfall, to reach the river and temporarily affect water quality. Without appropriate mitigation, such effects would represent a significant, temporary, adverse impact at a local scale. Measures to prevent deterioration of water quality in the Brusna River are set out in Section 7.5.

As no instream activity will occur, there will be no vibration impacts, alteration of flow patterns, or removal of substrate. Consequently, any salmonid spawning habitat and lamprey nursery areas will remain unaffected, and fish passage, feeding behaviour, and life-cycle processes will not be impacted. The HDD technique also avoids interaction with riparian habitat, thereby preventing disturbance to any otter commuting routes or resting sites. Given the absence of crayfish records at this location and the lack of direct instream works, no effects on this Annex II species are anticipated.

The HDD method also prevents the need for vegetation clearance along the riverbanks, avoiding disturbance to nesting birds and preserving riparian cover. All works will occur at a substantial distance from the watercourse, and no night-time construction will take place, further reducing the potential for disturbance to nocturnal species such as otter (or bats).

Operational Phase

Once installed, the pipeline will be buried, with no emissions or operational discharges. There will be no requirement for maintenance works within the riparian area, and no pathways for ongoing impacts to the hydrology, water quality, or ecological function of the Brusna River. As such, no operational impacts on SAC habitats or species will occur.

7.4.3.3 Moy Estuary Crossing

The Proposed Development requires a crossing of the River Moy Estuary to facilitate the transfer of treated water from Lisglennon toward Bonniconlon. Importantly, no new instream or sub-tidal works are proposed within the estuary, as the Proposed Development will make use of an existing trunk main already installed beneath the estuary. This design decision substantially reduces the potential for ecological impacts within this sensitive receiving environment. The River Moy Estuary forms the innermost section of Killala Bay and is designated as part of both the Killala Bay/Moy Estuary SAC and SPA, as well as a pNHA and a Ramsar wetland of international importance. The estuary supports a diverse fish community and is also internationally significant for wintering birds, including species listed under Annex I of the Birds Directive such as golden plover, dunlin, and bar-tailed godwit. However, these bird species predominantly utilise the extensive intertidal areas of Killala Bay rather than the narrower estuarine channel closer to Ballina where the pipeline tie-in works occur. The route through Belleek Woods is entirely screened from the estuary by dense woodland, further reducing potential disturbance.

Construction Phase

Because the Proposed Development will utilise an existing sub-estuarine trunk main, no excavation, trenching, pipe installation or bed disturbance will occur within the estuary, meaning there will be no loss of intertidal or sub-tidal habitat, no alteration of estuarine geomorphology, and no changes to hydrology or sedimentation patterns; as a result, the project completely avoids potential ecological impacts typically associated with new estuarine pipeline installations.

The reuse of the existing trunk main eliminates the need for any works in the estuarine environment itself. Construction activities will instead be confined to an open glade on woodland edge within Belleek Woods on the west side and a roadway (Quat Road) on the east side of the estuary, where the trunk main tie-ins will occur. The pipeline works leading up to the western tie in are directly within the woods are well buffered from the estuary by dense woodland. The only potential pathway for water quality impacts would arise from accidental runoff or spills during construction works on the landward sides. Given the separation distance and the interception provided by bankside vegetation, the likelihood of pollutants reaching the estuary is extremely low. In the absence of mitigation measures, the limited amount of pollutants that could reach the estuary would represent a slight adverse, temporary impact at a local setting. Standard construction phase controls, including spill prevention, designated refuelling zones, and silt management measures, are considered sufficient to prevent any deterioration in water quality and are detailed in Section 7.5 below.

Because the existing trunk main will be used, there will be no noise, vibration, or physical disturbance within estuarine waters. Migration corridors for salmonids and eels will remain unobstructed, and no alteration of estuarine flows will occur. The diverse fish community of the estuary, including species of conservation concern, will therefore remain unaffected.

The proposed works at the River Moy Estuary will take place over a short duration, the use of the existing sub-estuarine trunk main ensures that all construction activity is of small scale and remains confined to the terrestrial tie in locations rather than within the estuary itself. While the two tie in locations either side of the estuary are not entirely screened by trees, they are located along a relatively narrow section of the river where waterbirds are far less likely to congregate. The majority of qualifying and special interest estuarine species prefer the extensive intertidal flats and wider open habitats to the north within Killala Bay, where feeding and roosting opportunities are far more abundant. As a result, even with visibility between the works area and the estuary, the small scale and brief duration of construction, combined with the absence of instream activity, means that disturbance to estuarine birds is expected to be negligible.

Operational Phase

Once installed, the pipeline will be buried, with no emissions or operational discharges. There will be no requirement for maintenance works within the estuarine area, and no pathways for ongoing impacts to the hydrology, water quality, or ecological function of the estuary. As such, no operational impacts on SAC/SPA habitats or species will occur.

7.4.3.4 Other Watercourse Crossings

The Proposed Development includes a total of thirty surface water feature crossings, comprising eighteen EPA identified streams/rivers and twelve field drains along the pipeline route (Refer to Section 7.3.7). The Brusna River and the Moy Estuary crossings area already discussed separately above. Of the remaining sixteen streams, thirteen will be crossed by trenchless techniques via pipe jacking and three will be via open cut techniques. Field drains, many of which are noted to be dry during surveying, will be predominantly crossed within the roadways via open cut techniques (all bar one).

The surface water features vary substantially in size, ecological condition, and sensitivity, ranging from small agricultural drains with little or no flow, to moderate-status tributaries, to high-quality salmonid watercourses connected to the River Moy SAC and Killala Bay/Moy Estuary SAC/SPA. While only the Brusna River crossing occurs within the River Moy SAC, all other watercourse interactions require careful assessment due to downstream hydrological connectivity to designated sites and the presence of sensitive aquatic species.

Most streams and drains encountered along the route lie within the wider River Moy catchment, ultimately discharging to either the River Moy SAC or Killala Bay/Moy Estuary SAC/SPA. One unnamed stream and seven drains (most dry) crossed by the pipeline connect to Lough Talt which is within Lough Hoe Bog SAC, the pipeline route along the R294 through the OX Mountains road is also aligned alongside Lough Talt / Lough Hoe Bog SAC for approx. 2 km. Potential impacts from works on this particular SAC is discussed separately below.

EPA water quality classifications across the watercourses range from High to Moderate, with several small tributaries assessed during site surveys returning Q-values of 3 (Poor) due to siltation and/or agricultural pressures. Conversely, a number of streams, such as the Glenree Stream and one of the Srafaungal Stream crossings, achieved Q4 (Good), indicating healthy aquatic communities and clean substrate. Macroinvertebrate assemblages recorded during project-specific surveys included a range of sensitive mayflies, stoneflies, and caddisflies, as well as pollution-tolerant taxa typical of small rural streams. Habitat suitability for salmonid spawning varied considerably: the Glenree Stream and Srafaungal Stream (Ch. 21700) contained clean gravels and riffles suitable for spawning, whereas tributaries such as the Fiddaun Stream and Srafaungal Stream (Ch. 17850) crossing locations were heavily silted, reducing their spawning potential. Small field drains, many of which were dry and/or stagnant at the time of survey, offer limited ecological value, although some may contribute hydrologically to downstream designated sites. None of the smaller streams exhibited habitat suitable for Annex II species white-clawed crayfish.

Construction Phase

Three EPA watercourses; Moyne Stream, Broadlands of Knockafarson Stream and the Illanamuck Stream, all of which are located east of Lisglennon Reservoir site, are culverted under roadways and will be crossed via open cut excavation as opposed to pipe jacking or HDD. Open cut techniques were chosen as site surveys did not identify any watercourses with water at the two crossing locations of the Moyne Stream and the Broadlands of Knockafarson Stream. Whilst all roadside channels (which are akin to field drains) in these areas were found to be dry, there are existing culverts in the roadway. The Illanamuck Stream was noted to have water and is also culverted within in the roadway. At all three locations the new pipeline is proposed to be laid within the roadway under existing road culverts (drainage pipes) and as such there will be no interaction with any open channel watercourse or any riparian habitats at these four locations.

Trenchless techniques (pipe-jacking) is proposed to be used for the remaining thirteen streams being crossed, such as at the Newtownwhite Stream, Abbeytown Stream, Fiddaun Stream, Bunnyconnellan West Stream, Srafaungal

Stream (two crossing locations), Glenree Stream and several unnamed streams, and as such no instream works will occur at these thirteen. crossings. Pipe jacking launch and reception pits will be set back a minimum of 10m from the these streams so there will be no direct interaction with any stream banks, in the case of the second crossing of the Srafaungal Stream pits will be set back at a greater distance to avoid loss of, or impacts to, sensitive habitats such as trees and wet grasslands (Refer to Section 7.3.10.12). As a result, there will be no disturbance to the stream beds, banks, or riparian vegetation at these locations. These methods avoid physical alteration to instream habitats and prevent any mortality of aquatic fauna.

As detailed for the Brusna River crossing, construction machinery operating in proximity to watercourses, even with a setback distance for launch/reception pits, introduces the potential for accidental release of sediments, hydrocarbons or other contaminants. Small streams with limited dilution capacity, such as several narrow streams crossed by the pipeline, would be particularly vulnerable to short term pollution events. Downstream hydrological connectivity means that any spill, even in a minor tributary, has the potential to reach high value designated waters such as the Brusna River within River Moy SAC or the Moy Estuary within Killala Bay/Moy Estuary SAC/SPA/pNHA. Measures to prevent deterioration of water quality in the streams and field drains crossed by the pipeline are set out in Section 7.5.

Across the full suite of watercourse crossings, the combination of sensitive design (notably the widespread use of trenchless techniques), robust construction phase mitigation measures (Section 7.5), and full reinstatement ensures that the Proposed Development will not give rise to significant ecological impacts and, importantly, no impacts are predicted for protected species, salmonid spawning habitat, or any downstream European site.

Operational Phase

As noted previously, the proposed pipeline will be buried with no emissions during the operational phase. The usage of the trunk main will have no effect on any watercourse.

7.4.3.5 Lough Talt

In the Ox Mountains, the proposed pipeline will follow the R294, which runs directly alongside Lough Talt, part of the Lough Hoe Bog SAC, for approx. 2 km. Along this section, the pipeline will cross one unnamed stream and seven drainage ditches that connect to Lough Talt. The unnamed stream and one drainage ditch will be crossed adjacent to the road, while the remaining crossings will take place within the roadway corridor, where the pipeline will be installed beneath existing road culverts. As a result, there will be no interaction with open channel watercourses or associated riparian habitats at these on-road drainage ditch crossings.

Site surveys recorded no discernible flow within the unnamed stream, and most drainage ditches were dry at the time of site visits. Neither the stream nor the wet ditches were identified as having any fisheries value. The approx. 20 m off-road crossing of the unnamed stream will be carried out using pipe jacking techniques and represents the only location across the entire development where works are proposed directly within the Lough Hoe Bog SAC. No qualifying interest habitats are present at this crossing. Site surveys confirmed the area is dominated by mown amenity grassland, a small stream channel with no visible flow, scattered trees, and tall ruderal vegetation, primarily rosebay willowherb. No wetland habitats suitable for supporting the qualifying interest species Geyer's Whorl Snail (*Vertigo geyeri*) occur at the crossing location or within 100 m of it, the fen habitats that historically supported *V. geyeri* are located on a separate headland set back from the R294 approx. 130 m from the unnamed stream crossing point. Lough Talt lies approx. 15 m from the unnamed stream crossing and is known to support the qualifying interest species White-clawed Crayfish, as well as non-qualifying species such as Arctic Char.

Construction Phase

Given the close proximity of the stream crossing to Lough Talt, there is potential, if unmitigated, for construction related silt, sediment or other contaminants to enter the lake and temporarily affect water quality and associated aquatic species. However, owing to the small scale and short duration of the works (approx. 1–2 days), any such effects

would be localised, temporary and not significant. On this basis, significant impacts on White-clawed Crayfish or Arctic Char are considered unlikely. Mitigation measures to prevent adverse effects on the water quality of Lough Talt are provided in Section 7.5.

As noted above, the pipeline will be installed along the lakeshore section of the R294 for approx. 2 km. Trenching works in this area will be confined to a single lane and undertaken in short sections of approx. 100 m to allow the continued flow of traffic. In some locations, particularly where there are no natural barriers such as berms, bunded verges or dense vegetation, there is potential for sediment laden runoff from excavations to enter Lough Talt. It is also noted that this section of road lacks surface water gullies that could otherwise convey runoff away from the lake. In the absence of appropriate mitigation, sediment runoff could result in a temporary, localised deterioration in lake water quality, with potential impacts on aquatic species such as White-clawed Crayfish and Arctic Char. Mitigation measures to address these risks during roadway trenching works are also detailed in Section 7.5.

The pipeline will be installed at a depth of approx. 1.5 m below road level and, given this shallow depth, will not result in significant interaction with the local groundwater body. Ground investigation data from trial pits indicate that groundwater seepage was encountered at approx. 2.5 m below road level at the unnamed stream crossing, and at an average depth of 1.92 m across six trial pits along the 2km stretch of the R294. As the pipeline installation will not intersect the groundwater table, no impacts on groundwater quality or the local hydrogeological regime are anticipated. Consequently, there will be no effects on groundwater dependent ecosystems, including fen habitats along the lake shore. Details of ongoing measures to enhance groundwater flows to shoreline fen habitats, aimed at improving wetland conditions suitable for *Vertigo geyeri*, are provided below.

Operational Phase - Cessation of Abstraction From Lough Talt

The Proposed Development includes the permanent cessation of raw water abstraction from Lough Talt. This represents a key element of the project and will result in a significant long term positive impact on the ecological integrity of Lough Talt within Lough Hoe Bog SAC and the sensitive wetland habitats associated with the lake.

Baseline ecological assessments have demonstrated that historical abstraction from Lough Talt led to lowered water levels that adversely affected groundwater dependent fen habitats surrounding the lake and is considered likely to have contributed to the local loss of suitable habitat for the Annex II qualifying interest species *V. geyeri*. These pressures reduced the stability of surface saturation and soil moisture regimes required to sustain fen vegetation structure and wetland fauna.

The cessation of abstraction will allow Lough Talt water levels to recover to a natural hydrological regime driven by rainfall, catchment inputs and natural seasonal variability. This recovery is expected to restore long term hydrological stability at the lake margins and across associated fen and wetland habitats. The reestablishment of stable water levels will reduce hydrological stress on these habitats and is anticipated to promote the gradual regeneration of degraded fen vegetation communities, improving habitat condition for specialist wetland flora and invertebrates over time.

Hydrological recovery will also increase the resilience of the wetland mosaic to climatic variability, including drought events, by reinstating more robust groundwater surface water interactions. In the longer term, the restoration of stable saturation and vegetation structure is expected to improve the suitability of fen habitats for species dependent on consistent wet conditions, including the potential reestablishment of ecological niches formerly suitable for *Vertigo geyeri*.

A programme of ecological protection and monitoring measures has already been implemented by Uisce Éireann at Lough Talt to help improve wetland habitats during the period of abstraction and to support habitat recovery. These measures include the installation of fen irrigation systems to maintain moisture levels in sensitive areas, continuous monitoring of lake levels, groundwater levels and fen hydrological conditions, and targeted ecological surveys to assess habitat quality and detect evidence of natural recovery.

With abstraction pressure removed, these interim measures will progressively give way to a self sustaining, naturally functioning hydrological system. The Proposed Development therefore facilitates a transition from managed hydrological support to long term natural recovery of the lake and its associated wetlands. This represents a permanent improvement in environmental conditions within Lough Talt / Lough Hoe Bog SAC and contributes to the enhancement of habitat quality, structural diversity and overall biodiversity value at a site and catchment scale.

In summary, the cessation of abstraction from Lough Talt during the operational phase of the Proposed Development can help deliver a significant, permanent positive effect on groundwater dependent habitats around Lough Talt. By restoring natural hydrological processes, the Proposed Development helps support long term habitat recovery, enhances ecosystem resilience, and provides improved ecological conditions that are essential for the conservation and potential future recovery of wetland species associated with the site.

7.4.3.6 Scour Management

As detailed in the project description Scour Management is required. Scour management forms an integral part of the safe operation, commissioning and maintenance of the proposed water supply infrastructure. A range of fittings, including scour valves, hydrants, air valves, flow meters and pressure control devices, will be installed in accordance with Uisce Éireann standards to facilitate controlled drainage and maintenance of the network. During construction, commissioning and operational maintenance, sections of pipeline and associated infrastructure will require controlled dewatering and flushing. This will be undertaken via designated scour valves located at low points along the network, as well as through site specific arrangements at key infrastructure locations such as Lisglennon WTP, Bonniconlon Reservoir, Windy Gap BPT and Lough Talt WTP. Scoured water will either be collected and tankered off site to an appropriate authorised facility, or waters will be dechlorinated and the raw clean water will be discharged in a controlled manner to nearby watercourses where appropriate permissions and controls are in place.

The primary potential environmental impact associated with scour activities relates to the discharge of water to the receiving environment, with particular consideration given to water quality and downstream ecological receptors. However, a key design principle of the Proposed Development is that only raw water will be discharged during scour and flushing operations, no dechlorinated treated water will be subject to discharge. This ensures that no chlorinated or chemically treated waters enters surface water systems, thereby protecting aquatic ecology and water quality. Where discharge to the environment is required, flows will be carefully controlled and gradual, with discharge locations selected based on their capacity to assimilate flows without causing erosion, sediment mobilisation or ecological disturbance. In cases where discharge is not considered appropriate, water will be fully contained and tankered off site.

Given that discharged water will be free from harmful residual chemicals and released at controlled rates, the potential for adverse effects on aquatic habitats, species and hydromorphological processes is very low. The receiving watercourses identified are generally of low ecological sensitivity or have sufficient dilution capacity, and site specific assessments have confirmed that no significant environmental or ecological impacts are anticipated at any of the proposed discharge locations. On this basis, scour and dewatering activities are considered to give rise to temporary, localised and not significant impacts, and will not adversely affect the integrity of any waterbody or associated ecological receptors within the study area.

7.4.4 Annex I habitats

The proposed Windy Gap BPT is located in the Ox Mountains within an area of cutover blanket bog, a habitat that has been previously modified by peat extraction but which has naturally revegetated with typical bog species such as heather, purple moorgrass, and Sphagnum mosses. Although this habitat is considered to be of county ecological importance, it lies outside any designated conservation site (approx. 330 m from Lough Hoe Bog SAC), and NPWS datasets classify it as non-qualifying Annex I blanket bog [7130]. No trees, surface water features, or notable terrestrial faunal habitat occur at the site, and no invasive plant species were recorded during surveys.

Construction of the break pressure tank will result in direct but highly localised loss of cutover bog (approx. 93 m^2) within the immediate footprint of the tank and small areas of associated infrastructure (e.g. control boxes). However, the design incorporates measures to minimise habitat alteration by burying the tank beneath reinstated peat soils, thereby maintaining the surface profile and ecological character of the site as far as practicable. All peat excavated during the works will be carefully salvaged for reinstatement or used to form low bunds around the site, ensuring that all peat resources are retained on site. No indirect impacts on nearby designated sites are anticipated.

Given the limited scale and duration of the works, and the implementation of appropriate peat handling and restoration practices under ecological supervision, impacts on cutover blanket bog at this location are expected to be small scale, localised, and not significant. The involvement of an Ecological Clerk of Works to oversee habitat reinstatement and general ecological protection will ensure that the ecological integrity of the cutover bog is maintained and that no long term adverse effects to the surrounding bogland habitats arise.

The Windy Gap BPT site is relatively small and works will have no effect any bogland habitat outside of the Proposed Development red line boundary. Ground investigations for the Proposed Development (boreholes) identified groundwater levels at the Windy gap site to be greater than 6m below ground level which is significantly below proposed excavation depths (maximum 3 m). The small scale excavations and infrastructure installation will not lead to any significant effects to local groundwater quality at this high point in the mountains. The proposed works do not have the potential to impede ground water flows or groundwater recharge rates. No indirect impacts on Lough Hoe Bog SAC are anticipated either during the works or the operation of the break pressure tank.

7.4.5 Wetland habitats

The proposed pipeline alignment runs adjacent to seven WSI identified wetland sites, however, in all cases except at the Windy Gap BPT location, the pipeline is installed entirely within existing roadway subbase materials, thereby avoiding direct contact with wetland habitat. Because the pipeline remains confined to hardstanding surfaces along the R314, Behy Road, and the R294, there is no requirement for excavation, vegetation removal, or ground disturbance within the mapped wetland areas. As a result, the hydrological functioning of these wetlands, including local groundwater movement and surface-water drainage patterns, will remain unaltered. The wetland habitats at Coonealcuraun Farm Pond, Farrannsculloge Coonealcuraun Cutover, Quignashee Cutover, Drumsheen Cutover Complex, Tullaghglass Largan Mountain Bog, and Tullaghglass Largan South Bog are therefore not subject to any direct ecological effects.

Because the pipeline will be installed within shallow excavations, no deeper than approx. 1.5 m, and entirely within existing road subbase materials, the works will not have any significant effect or interaction with the local groundwater body. As a result, any groundwater flow patterns that support WSI wetland sites will remain uninterrupted, and there will be no changes to groundwater levels, flow directions, or groundwater connectivity within these wetlands.

Although no direct works occur within these roadside wetland systems, there remains a limited potential for indirect temporary effects during construction. These include the risk of silt-laden runoff entering adjacent wetland margins where the road corridor lies immediately a wetland site, particularly during rainfall. Any such effect would be localised and short lived, given the small scale of the work areas, the linear and intermittent nature of excavation, and the capacity for roadside vegetation to intercept sediment. With standard construction mitigation, such as silt control, surface water management, and careful material storage, these indirect risks can be effectively avoided. Mitigation measures are provided in Section 7.5.

The only location where direct interaction with a WSI wetland will occur is at the Windy Gap BPT site, which lies within a mapped wetland comprising cutover blanket bog. As noted above, the reinstatement strategy, requiring salvaging and reusing peat on site and reinstating the final surface profile, greatly reduces the long term ecological implications, and no hydrological link exists between this site and other sensitive wetlands in the Ox Mountains.

Considering the above, potential effects on WSI wetlands along the route are minor, largely limited to temporary indirect risks associated with construction near roadside habitats. The only substantive effect occurs at the Windy Gap site, where a small area of cutover bog will be disturbed; however, due to the modified nature of the habitat, the lack of hydrological connectivity to designated sites, and the reinstatement measures proposed, this impact is assessed as low in magnitude and localised in extent.

7.4.6 Surface Water Features and Aquatic Species

The potential impacts on aquatic species arising from the Proposed Development have largely been addressed through the detailed assessment of watercourse crossings and water quality pathways in Section 7.3.3, and the conclusions of that assessment apply directly to all aquatic fauna associated with the receiving environment. As all medium and high value watercourses will be crossed using trenchless methods, and as no instream works will occur within any major tributary or designated site, there will be no direct disturbance to aquatic habitats, spawning substrates, or nursery areas for fish, lamprey, white-clawed crayfish, or macroinvertebrate communities. In locations where open cut crossings of minor drains are required, these features were confirmed to be mostly dry, have no or negligible fisheries value and limited ecological sensitivity, reducing the potential for adverse effects.

The primary remaining risk to aquatic species relates to temporary water quality impacts during construction, particularly sediment mobilisation or accidental spills. These risks have been fully accounted for in Section 7.3.3 and will be effectively managed through established pollution prevention measures, silt control systems, appropriate material handling, and ecological supervision (Section 7.5). With these measures in place, any deterioration in water quality will be avoided, ensuring that downstream sensitive species, including salmonids and lamprey within the River Moy system, will remain unaffected. Consequently, the Proposed Development is not expected to give rise to significant adverse effects on aquatic species, and any potential impacts are assessed as minor, temporary, and fully mitigable.

7.4.7 Habitats

Woodlands

The Proposed Development will interact with woodland habitat only within Belleek Woods, where the pipeline route is confined entirely to existing trails, gravel tracks, and a tarmac road. As a result, no woodland floor, understory, or canopy habitat will be directly removed along the route. Project specific surveys confirm that the pipeline does not pass through treed areas and that habitat loss is avoided by adhering to established pathways. The only required tree removals comprise two ash trees in advanced decline due to ash dieback, along with the trimming or removal of a small number of hazardous overhanging dead branches for safety. These interventions relate to existing poor tree condition rather than impacts arising from the pipeline works. All mature, structurally important, and ecologically valuable trees adjacent to the route will be retained and protected through exclusion zones and ground protection measures during construction, as specified in the arboricultural assessment. Mitigation measures are detailed in Section 7.5.

Because the works are restricted to existing paths and surfaced areas, and because woodland soil, root protection zones, and hydrological conditions will remain undisturbed, the development will not fragment woodland habitat, impede ecological connectivity, or alter woodland structure or function. Woodland fauna, including birds, bats, and red squirrel, will not be adversely affected beyond minor, short term disturbance associated with human activity along paths that already experience regular public use. With the implementation of tree protection measures and adherence to arboricultural method statements, the works will not give rise to significant effects on the ecological integrity of Belleek Woods, and any residual impacts will be negligible and temporary.

Hedgerows and Trees

Hedgerows and individual trees occur intermittently along off-road sections of the proposed pipeline route, primarily within agricultural land between Lisglennon to Ballina and Ballina to Bonniconlon. These features are generally hawthorn and ash dominated field boundaries. Thirteen hedgerows will be intersected, typically requiring the removal of short sections of approx. 5 m to permit pipeline installation, with two treeline sections also affected. These hedgerows and treelines are considered to be of local ecological importance, functioning as linear habitats and providing commuting routes and foraging resources for common bird and mammal species. There may potentially be temporary, minor fragmentation of bat commuting corridors where 5 m sections of hedgerow loss will occur. However, all hedgerow sections removed will be reinstated on a like-for-like basis following construction, in line with Uisce Éireann's standard reinstatement practices, limiting the duration and magnitude of habitat loss. All hedgerow losses are small in scale, spatially isolated, and confined to already modified agricultural landscapes and as detailed will be replaced post pipeline installation.

Faunal use of these features, including nesting birds or occasional bat foraging, may experience minor and temporary disturbance during construction, but this is readily mitigated through timing restrictions and ecological supervision. Overall, potential impacts on hedgerows and trees outside Belleek Woods are limited to very small scale temporary losses and low magnitude disturbance, all of which are mitigatable through reinstatement and good construction practice. Mitigation measures are outlined in Section 7.5.

Habitats within Plant Sites

There will be a loss of lower value habitats within the existing and proposed Plant Sites including a loss of improved agricultural and wet grassland at Wherrew RWI&PS and Lisglennon WTP site. In addition there will be a loss of improved agricultural grasslands at the proposed Bonniconlon BPS site and the new Bonniconlon Reservoir site and a loss of amenity grassland Lough Talt WTP site. This habitat loss is not considered to be significant in terms of local biodiversity impacts.

The redevelopment of existing Plant Sites and the development of new Plant Sites, provides opportunities within the Proposed Development design to include for ecological enhancement measures in line with Uisce Éireann's Biodiversity Net Gain policies. All seven Plant Sites; Wherrew RWI&PS, Lisglennon RWS&PS site, Lisglennon WTP site, Bonniconlon BPS site, Bonniconlon Reservoir site, Windy Gap BPT site and Lough Talt WTP site were all subject to assessment with the aim of including additional landscaping features and biodiversity enhancement measures where possible. Following completion of the design the entire Proposed Development site, including the seven Plant Sites and also the linear pipeline corridor, where subject to an assessment to determine if the Proposed Development results in a Biodiversity Net Gain or Net Loss. The conclusions of the assessment detail that the Proposed Development, with the inclusion of additional measures, results in a Biodiversity Net Gain which results in a long term positive effect at a local level.

The Biodiversity Net Gain (BNG) Report (AtkinsRealis 2026, Document Ref; 0089328DG0012) is included in Appendix 7-3 and is summarised as follows.

The BNG Report assesses how the Ballina and Lough Talt Water Supply Upgrade development can deliver measurable biodiversity benefits across both the linear pipeline route and the seven associated infrastructure sites. The assessment follows Uisce Éireann's Biodiversity Action Plan commitments, which require that biodiversity is protected and, where possible, enhanced as part of project delivery. The report identifies that the Proposed Development will result in localised habitat loss across several terrestrial habitat types, including hedgerows, grasslands and wet grasslands, however, implementation of targeted habitat creation and enhancement measures allows for a positive net outcome overall.

The BNG evaluation is based on pre- and post-development habitat mapping for each site, combined with Uisce Éireann's biodiversity calculator to quantify habitat changes and habitat value. A suite of landscape enhancement measures has been incorporated into the design, including the creation of extensive wildflower areas via a reduced mowing regime, planting of new native hedgerows, woodland mix planting, and installation of bat boxes, bird boxes, insect boxes and hibernacula at appropriate sites. These measures are applied across all non-linear sites: Wherrew

RWI&PS, Lisglennon WTP, Lisglennon RWS&PS, Bonniconlon BPS, Bonniconlon Reservoir, Windy Gap BPT and Lough Talt WTP. The landscaping strategy assumes that all temporarily disturbed greenfield habitats will be reinstated to an equal or higher ecological value following construction, consistent with BNG principles.

The results of the biodiversity calculator demonstrate that six of the seven Plant Sites achieve a positive net gain, with the largest increases occurring at Wherrew WIR&PS, Lisglennon WTP and Lisglennon RWS&PS, where sizeable areas of new woodland and wildflower grassland are proposed. Only the Windy Gap BPT site results in a net loss, reflecting the removal of a small area (approx. 93 m^2) of cutover upland blanket bog where habitat creation is not appropriate. All hedgerow losses along the linear pipeline route will be reinstated like for like, and because the pipeline is largely confined to existing roadways, the linear component of the project results in no net loss in biodiversity value.

Overall, when considered at project scale, the combined BNG measures produce a substantial net increase across the seven sites and the pipeline route. The report concludes that the landscaping and habitat creation proposals not only compensate for habitat losses but deliver tangible ecological enhancements across multiple locations. These measures support Uisce Éireann's biodiversity policy commitments and ensure that the project contributes positively to local ecological networks and long term habitat diversity.

Table 7-14 below provides a summary of the habitat loss, habitat gain, landscaping measures and additional biodiversity enhancement measures included in the design for the entire Proposed Development site.

Table 7-14 — Proposed biodiversity enhancement measures

Site	Habitat Loss	Habitat Gain	Landscaping Measure	Biodiversity Measures
Wherrew Raw Water Intake and Pumping Station	2,484 m^2 amenity grassland 248 m^2 siliceous scree and loose rock 2,370 m^2 limestone/marl lake	1525 m^2 wet willow, alder, ash woodland 2,723 m^2 wildflower planting area via reduced mowing regime	1,525 m^2 woodland mix planting 2,723 m^2 wildflower planting area or reduced mowing regime	Bat boxes, Bird boxes, Insect Boxes, Hibernaculum
Lisglennon WTP	2661 m^2 amenity grassland 16,398 m^2 improved agricultural grassland 6,897 m^2 wet grassland	4,888 m^2 woodland mix 13,180 m^2 wildflower planting area via reduced mowing regime	4,888 m^2 woodland mix planting or reduced mowing regime 13,180 m^2 wildflower planting area or reduced mowing regime	Bat boxes, Bird boxes, Insect Boxes, Hibernaculum
Lisglennon Raw Water Storage and Pumping Station	2,027 m^2 amenity grassland	2,027 m^2 wildflower planting area via reduced mowing regime 87 m hedgerow	2,027 m^2 wildflower planting area or reduced mowing regime 87 m hedgerow	
Bonniconlon Booster Pumping Station	2,143 m^2 improved agricultural grassland	118 m hedgerow 1013 m^2 woodland mix 151 m^2 artificial pond	118 m hedgerow 1,013 m^2 woodland mix 151 m^2 artificial pond	Bat boxes, Bird boxes, Insect Boxes, Hibernaculum
Bonniconlon Reservoir	156 m^2 improved agricultural grassland	87m^2 Hedgerow	87 m^2 Hedgerow	
Windy Gap Break Pressure Tank Site	93 m^2 upland blanket bog	N/A	Salvage of peat for reinstatement	
Lough Talt WTP Site		126 m of hedgerow 856 m^2 wildflower planting area via reduced mowing regime 1070 m^2 woodland mix	126 m of hedgerow 856 m^2 wildflower planting area or reduced mowing regime 1070 m^2 woodland mix	Bat boxes, Bird boxes, Insect Boxes, Hibernaculum
Linear pipeline (corridor)	Approx. 65 m of hedgerow and approx. 10 m of treeline	No biodiversity net loss along the linear route after reinstatement	Approx. 65 m of hedgerow and approx. 10 m of treeline	N/A

7.4.8 Fauna

7.4.8.1 Birds

Breeding birds occur throughout the landscapes traversed by the Proposed Development, primarily within agricultural grasslands, hedgerows, treelines, and the wooded environment of Belleek Woods. Surveys and desk study information indicate the presence of a range of common and widespread species, including several on the Red and Amber lists of Birds of Conservation Concern Ireland, as well as occasional records of Annex I species such as kingfisher, whooper swan, and common tern, although these species are associated primarily with aquatic or open wetland habitats rather than the terrestrial areas directly affected by the works. None of the species recorded are qualifying interests of any of the European sites hydrologically linked to the project, and no sensitive or rare breeding bird habitats (such as reedbeds, wet grassland mosaics, or open bog pools) will be disturbed. Hedgerow and treeline habitats along agricultural sections of the pipeline route provide the main potential nesting habitat for passerines, while Belleek Woods supports typical woodland assemblages.

Although these hedgerow and treeline features offer nesting opportunities for common species such as robin, wren, tit species, and finch species, the scale of habitat loss is extremely small relative to the availability of similar habitats in the wider area. Disturbance from construction activities, including noise, movement of machinery, and temporary human presence, may also cause local displacement or discourage birds from nesting in immediately adjacent vegetation. However, works are confined to linear corridors, are short in duration at any given point, and often occur within already disturbed environments such as road verges and existing woodland trails.

Because the woodland works occur only along existing tracks within Belleek Woods, and do not require entry into undisturbed interior habitats, disturbance to nesting woodland birds is expected to be minimal and highly localised. Similarly, agricultural grassland crossed by the pipeline supports relatively low nesting opportunities. No ground nesting species of conservation concern were recorded within the immediate footprint of the proposed works, and the construction areas will be reinstated post works, allowing rapid recolonisation of disturbed ground. With the application of standard breeding bird protection measures, most importantly avoiding vegetation clearance during the main nesting season unless preconstruction checks confirm no active nests, the risk of direct mortality or loss of nests is eliminated. Mitigation measures are outlined in Section 7.5.

The works at Lough Conn involve not only activity along the shoreline at the Wherrew RWI&PS but also the installation of new raw water abstraction infrastructure within the lough itself, including a new intake pipe and upgrades to the existing intake channel. This in-lake activity will take place in a small, localised area along the northern shore where habitat surveys and the dedicated breeding bird survey confirmed the presence of only common generalist species and an absence of significant shoreline or open water breeding bird activity. The broader SPA breeding populations, including tufted duck, common scoter and gull species, occur primarily in shoreline wetlands and island habitats elsewhere on the lake and were not recorded breeding in or near the Proposed Development site. The works footprint is spatially confined to the modified shoreline rather than undisturbed nesting habitat. Although construction within the lake may generate short term noise and human presence, any resulting disturbance to nearby birds, breeding birds or overwintering species, is expected to be highly localised and brief in duration as in-lake works will take approx. three weeks. Given the absence of nesting habitats for SPA species at the works area, the scale of in-lake installation, and the availability of extensive undisturbed shoreline and open water habitat around Lough Conn, no significant impacts on breeding birds are anticipated.

Overall, the potential effects on breeding birds are limited to small scale, temporary habitat disturbance and short term displacement, all of which are readily mitigated through timing of works, ecological supervision, and reinstatement of hedgerows and treelines. Given the absence of high value breeding bird habitat, the lack of any qualifying interest bird species recorded in the affected areas, and the very small magnitude of shoreline alteration (20 m), no significant adverse impacts on breeding birds are predicted.

7.4.8.2 Otter

Otter is a qualifying interest of the River Moy SAC and is known to occur widely throughout the Moy catchment; however, project-specific surveys found no holts, couches or resting places within 50 m of any part of the Proposed Development, including the major watercourse crossings at the Brusna River and the smaller tributaries along the pipeline route. The aquatic and riparian habitats at the Brusna River, Glenree Stream and other stream crossings support suitable foraging and commuting conditions for otter, but the use of trenchless crossing techniques such as HDD and pipe jacking ensures the watercourse channels, banks and riparian vegetation will remain entirely undisturbed, thereby avoiding any direct impact on potential otter habitat.

Potential impacts on otter relate primarily to temporary disturbance from construction activity, including noise and the presence of machinery near watercourses. These disturbances may temporarily displace animals from commuting routes or foraging areas; however, any such disturbance will be minimal due to the brief duration of works at each watercourse crossing, the limited footprint of construction activity, and the absence of instream works. Because the pipeline is installed beneath existing road corridors for the majority of its length, and because the off-road sections are short and confined to agricultural grassland, there is no risk of barrier effects, obstruction of movement, or habitat fragmentation for otter. In addition, no nighttime works are proposed, eliminating the potential for disruption during peak periods of otter activity.

The main residual risk to otter is associated with potential water quality impacts from silt or accidental spills reaching connected river systems; however, this risk has already been assessed in the water quality and aquatic species sections and is mitigated through robust pollution prevention measures, including silt control, strict material handling procedures, and ecological supervision. With these measures in place, the risk of adverse effects on otter foraging habitat or prey availability is negligible. As such, the project is not expected to result in any significant impacts on otter, and any temporary disturbance effects will be minor and localised.

7.4.9 Flora

During site surveys, Common spotted orchid (*Dactylorhiza fuchsii*) was recorded sporadically along the gravel laneway on the western side of Belleek Woods. This species is the most common orchid in Ireland, is widespread nationally, and is classified as Least Concern on the Irish Red List[48] of vascular plants.

Given the confined nature of the laneway, there is potential for pipeline installation works to result in the loss of small numbers of individual plants. While the species is widespread, listed as Least Concern, and not subject to specific legal protection, following best practice, mitigation measures to offset potential impacts on orchid populations along the laneway are outlined in Section 7.5.

7.4.10 Invasive species

Zebra mussel is an invasive non-native species recorded within Lough Conn and therefore represents a potential ecological pressure for the lough through natural spread or through the operation of existing intake infrastructure. As the proposed works at the Wherrew RWI&PS involve upgrading and improving existing abstraction systems rather than creating new pathways, the development does not introduce additional vectors for zebra mussel introduction beyond those already present. Nevertheless, the intake infrastructure requires appropriate management due to the species' capacity to colonise hard surfaces and pipework, potentially leading to operational blockages..

Construction activities at the intake site will occur along the existing shoreline and in the intake channel. While zebra mussels are already present in this part of the lough, there remains a risk of inadvertently facilitating further spread of veligers or attached juveniles if construction plant or equipment were to be moved between waterbodies without

[48] Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016). *Ireland Red List No. 10: Vascular Plants*.

proper biosecurity measures. With adherence to standard invasive species protocols, such as cleaning, draining, and drying equipment before and after entering the water environment, this risk can be effectively controlled. Given that the proposed works do not involve material transfer between different waterbodies, or the movement of contaminated substrate, the likelihood of exacerbating zebra mussel spread during construction is low. Mitigation measures are outlined in Section 7.5.

Operation of the upgraded intake will incorporate improved screening and mitigation measures, reducing the potential for zebra mussels to colonise internal pipework and reducing the entrainment of mussels. These design improvements will not influence the population dynamics of zebra mussels within the lake but will help avoid impacts on the hydraulic operation of the infrastructure. As the species is already present in Lough Conn and Lough Cullin, and given the absence of any new hydrological connections created by the Proposed Development, there is no feasible pathway for the development to expand the species' regional range. Consequently, residual impacts relating to zebra mussel are negligible and relate solely to the need for ongoing operational management rather than any direct ecological effect linked to the construction or functioning of the Proposed Development.

7.5 Mitigation and monitoring

The measures below combine design stage avoidance, construction stage controls, species specific protection, habitat reinstatement and long term enhancement. They implement the Biodiversity Net Gain strategy and address the impacts described in Section 7.4.

7.5.1 Design Stage Mitigation Measures

A range of avoidance led design measures has been incorporated into the Proposed Development to minimise ecological impacts from the outset, which include:-

- Using trenchless techniques (e.g. HDD and pipe jacking) at major watercourses, including the Brusna River and all ecologically sensitive streams, to avoid instream works and direct disturbance to aquatic habitats and species.
- Reusing the existing sub-estuarine trunk main for the River Moy Crossing, avoiding intertidal disturbance and associated bird disturbance.
- Routing approximately 24.65 km of the approx. 30 km pipeline within existing road corridors to avoid terrestrial habitat loss and fragmentation.
- On off-road sections, utilising existing field entrances to minimise hedgerow removal.
- In Belleek Woods, confining the pipeline to established tracks/roadways to avoid woodland habitat loss, tree felling and invasive species.
- The intake screening, and any required associated intake components, will have anti-fouling surfaces that significantly reduce the ability of zebra mussels to attach and colonise.

7.5.1.1 Fish Return System Design

The following fish return system design measures will avoid fish entrainment, maintain fish populations within Lough Conn, and protect other lough species dependent on fish populations, including otter and waterbirds.

- The intake screening and fish protection measures will be designed in accordance with recognised best practice for the protection of eels, elvers and other fish species at water abstraction intakes, including the principles set out in *Screening at Intakes and Outfalls: Measures to Protect Eel* (Environment Agency, 2011).
- The intake screening and fish return system will be designed to comply with the requirements of the Habitats Directive (92/43/EEC), Water Framework Directive (2000/60/EC) and Council Regulation (EC) No. 1100/2007 on the recovery of European eel stocks.
- The intake will incorporate a low velocity abstraction system with a maximum approach velocity of ≤ 0.10 m/s to minimise the risk of fish impingement and entrainment.

- A primary intake screen of mesh aperture approximately 20 mm will be installed at the intake head to prevent the entry of larger fish and aquatic fauna into the abstraction system.
- The intake will incorporate a dedicated fish return system comprising a continuous, unobstructed and hydraulically suitable return route to Lough Conn, ensuring that any fish entering the screening system are safely returned to the lake.
- Downstream of the fish return system, a fine screen with a maximum mesh aperture of ≤ 3 mm will be provided to prevent the entrainment of juvenile fish, eels, elvers, lamprey and other small aquatic organisms.
- Screen cleaning will be undertaken using a low pressure self cleaning spray bar system (≤ 1 bar) to minimise the potential for injury or mortality of intercepted fish.
- Fish passage and screening performance will be monitored using underwater fish counters, cameras and/or other approved monitoring technologies, as agreed with Inland Fisheries Ireland.
- Where required, screen mesh apertures will be refined to dimensions smaller than 3 mm, subject to the requirements of Inland Fisheries Ireland.
- Operational noise generated by the intake and screening infrastructure will not exceed:
    - 45 dB LAr,T during daytime hours (07:00-19:00);
    - 40 dB LAr,T during evening hours (19:00-23:00); and
    - 35 dB LAeq,T during night-time hours (23:00-07:00).

7.5.2 Preconstruction Mitigation Measures

7.5.2.1 Confirmatory surveys

In advance of works, the Contractor's Ecological Clerk of Works (ECoW) or the Contractor's appointed ecologist will complete preconstruction surveys of the following ecological features to ascertain if they are found around the Proposed Development site since the previous surveys carried out with the aim to avoid interaction with and impact to species:

- Otter breeding/resting sites at the Brusna River crossing, and all other stream crossings for 50m upstream and downstream of the crossing points. Otter surveys will be carried out having regard to guidance of NRA (2009)[49];
- Invasive species surveys in Belleek Woods will be carried out having regard to guidance of Transport Infrastructure Ireland[50];
- Breeding bird surveys as detailed in Section 7.5.3.7 below, any bird surveys will be carried out having regard to guidance of NRA[51].
- Common spotted orchid survey along the western gravel laneway in Belleek Woods (Refer to Section 7.5.3.5.3 below)

7.5.2.2 Reporting

The results of preconstruction surveys will inform the refinement of mitigation measures (if required) in the updated CEMP which the Contractor will be required to adhere to, and all results will be incorporated into the Contractor's constraint mapping. Survey reporting and mapping will also be provided to the Uisce Éireann and as additionally required by any planning conditions.

[49] NRA (2009) Guidelines for the treatment of otters prior to the construction of national road schemes.

[50] https://www.tiipublications.ie/library/GE-ENV-01105-01.pdf

[51] NRA (n.d.) *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*

7.5.3 Construction Stage Mitigation Measures

7.5.3.1 Construction stage monitoring

All works carried out within or near ecologically sensitive areas, i.e. within an SAC/SPA, at loughs, at watercourse crossings, within Belleek Woods and hedgerow/treeline intersections will be supervised by a suitably qualified Ecological Clerk of Works (ECoW). The ECoW will be fully informed of all mitigation measures and the reasons for which they are required. Such measures include, for example, the installation and removal of silt control measures (silt curtains, silt fences, silt traps). The ECoW and Site Manager will be responsible for the monitoring of mitigation measures implemented for the duration of the construction works in order to ensure they are effective and are working as required. The locations of where ECoW monitoring and supervision will occur is listed in Table 7-15.

7.5.3.2 Ecological Clerk of Works

An ECoW will be appointed by the Contractor in advance of construction.

All works carried out within ecologically sensitive areas; at surface water features (lough and watercourses), within woodlands and greenfield sites, will be supervised by a suitably qualified ECoW.

The ECoW will: -

- Be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), the Institute of Environmental Management or equivalent; and,
- Have demonstrable experience with overseeing construction in designated conservation sites.

In the detailed CEMP, which the Contractor will be required to prepare and adhere to, the Contractor will provide all necessary method statements to the ECoW to demonstrate how these mitigation measures will be implemented. Such method statements will include the installation and removal of silt control measures (silt curtains, silt fences, silt traps).

The ECoW will be responsible for monitoring the Contractor and identifying to the Contractor any additional or refined mitigation measures (i.e. adaptive management measures required). The ECoW will concisely report the findings of monitoring, including any adaptive management measures recommended to the Contractor, and the effectiveness of same.

The ECoW will have the authority to ensure all mitigation measures are being implemented effectively and will have the authority to stop works activities if required.

The ECoW and Site Manager will deliver site induction and training to all construction personnel prior to commencement of construction activities. The Contractor will maintain a record of training completed, which will be made available to the Developer upon request if required.

The ECoW will monitor Met Éireann's weather forecast and will instruct the Contractor that works within 50m of watercourses and loughs will not be permitted within 24hrs of Met Éireann issuing a yellow, orange or red weather warning.

The ECoW will monitor all construction works within 50m (as per criteria above) of the surface water features with potential connectivity to European sites.

The Contractor (following ECoW advice and recommendations) will be responsible for the implementation of mitigation measures. In the unlikely event that the implemented measures are not performing effectively, emergency measures will be put in place e.g. bunding or spill kits and all works will cease immediately. This will ensure that mitigation measures are responsive to unexpected issues that may arise on site during the construction works.

7.5.3.3 Surface Water and Aquatic Species Mitigation Measures

The following Development specific surface water mitigation measures will be implemented during the construction phase.

7.5.3.3.1 Off Road Surface Water Feature Crossings

The following surface water quality mitigation measures will be implemented at all open channel watercourses crossed by the pipeline off roadways, this includes the Brusna River, EPA identified open channel streams and one field drain near Lough Talt. In addition, these mitigation measures will be implemented in the vicinity of the Moy Estuary, where the proposed pipeline connects to existing infrastructure and does not cross the estuary.

The locations of these Off Road areas is provided in Table 7-15 below.

The following surface water mitigation measures will be implemented to avoid potential adverse impacts from contaminated runoff from the Proposed Development site.

- No tracking of plant and equipment is permitted across any open channel river or stream or drain containing water flow;
- The Contractor shall identify all surface water features near works locations (including watercourses and ditches, which may be affected by the works) and no discharge of silted or contaminated waters to these surface water features is permitted;
- Materials which may cause pollution, including but not limited to; fuels, oils, hydrocarbons, cementitious materials, shall not be stored within 50m of open channel surface water features;
- Any generators or pumps will be installed on drip trays, with any captured contaminants (hydrocarbons or oils) disposed to a licenced waste facility;
- Any excavated materials will not be stockpiled within 20m of open channel surface water features;
- Any waste materials, refuse or debris arising from the works site in the vicinity of surface water features shall be collected and removed as required so that none may be transported into the surface water features; and,
- Excavations will not be permitted within 50m of an open channel watercourse within 24hrs of Met Éireann issuing a yellow, orange or red weather warning; ECoW to monitor Met Éireann warnings.

Silt Fences:

Silt fences are required between HDD / Pipe Jacking launch and reception pits and open channel water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water feature. Refer to Table 7-15 for locations.

- Silt fences will be installed around the launch and reception pits between, and if possible downgradient of, the potential source of the silt/sediment and any open channel surface water feature;
- The silt fence will contain the area where silted waters are being generated and shall terminate on high ground;
- They shall be constructed using permeable filter fabric (Hy-Tex Terrastop silt fence or similar) rather than a mesh material;
- Its base shall be embedded at least 15 cm into the ground and staked at 2 m intervals;

- The vegetated turves shall be peeled back and not detached from the ground, the materials inserted, and the turves replaced to hold the base in place;
- The silt fence will be inspected regularly by the ECoW and contractor during the working day and weekly during construction, and in particular following heavy rainfall;
- Silt fences shall remain in-situ for the duration of the watercourse crossing works;
- Should water build up behind the fences, the sediment will settle to the bottom. Water can be released, but sediments will remain;
- Silt fences will be inspected daily and after periods of heavy rainfall;
- Following completion of works the silt fence and stakes will be removed manually and only during dry conditions; and,
- A record of its installation, inspection and removal will be maintained by the ECoW.

Dewatering:

Excavation works are required at HDD / Pipe Jacking launch and reception pits and groundwater may be encountered during such works. Should groundwater be encountered during excavations, the following measures will be implemented:

- Excavations will not be carried out during or following times of prolonged rainfall;
- The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of proposed treatment system, and discharge location;
- All groundwater / perched water removed from the excavation will be pumped to onsite temporary settlement tanks or filtration systems; where a proprietary settlement tank system is used, they are typically located on the stone or ground protection mat platform and water from the excavation will be allowed to settle in these prior to discharge;
- Following discharge of settled waters, any soil sediments remaining in the tanks / filtration systems will be reused where possible for landscaping purposes and / or infill where appropriate, ensuring that any residual soil waste is kept to a minimum. Any soil sediment not deemed suitable for landscaping or infill will be characterised and removed offsite in accordance with all relevant waste management legislation;
- No untreated water discharge will be permitted to any watercourses, field drains or ditches; and,
- The time period that excavations are left uncovered will be reduced in so far as reasonably practical with impermeable coverings being used to cover excavations over night or in times of heavy rainfall during working hours. These coverings will be secured at night to prevent mammals becoming trapped.

Hydrocarbon/chemical pollution mitigation measures:

In order to prevent any potential surface water impacts via. release of hydrocarbon/chemical contaminants the following standard measures will be implemented at all works areas as required:

- Fuels, lubricants and hydraulic fluids for equipment used at the works area, as well as any solvents, oils, and paints will be handled so as to avoid spillage, properly secured against unauthorised access or vandalism, and will be provided with spill containment equipment/systems.

- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the works area for disposal or re-cycling.

- A response procedure prepared by the Site Manager/ECoW will be put in place to deal with any accidental spill events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained by the contractor and the contaminated soil removed from the works area and properly disposed of in accordance with all relevant waste management legislation.

The following mitigation measures will also be implemented in full for mitigation of construction related contaminants:

- All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.

- The Contractor will ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.

- No oils will be stored in works areas, oils will be stored within site compounds only.

- Generators, pumps and similar plant will be placed on drip-trays to prevent contamination.

- All temporary construction fuel tanks will also be located in a suitably bunded area within the construction compound.

7.5.3.3.2 Works at Wherrew Raw Water Intake and Pumping Station at Lough Conn

The following mitigation measures are prescribed for the works at the Wherrew RWI&PS and within Lough Conn waterbody;

General Water Protection

- Establish a clearly defined construction exclusion zone at the lake edge, preventing unnecessary access by personnel, plant or vehicles.
- Carry out all shoreline works in dry, contained conditions using cofferdams or equivalent isolation systems where required.
- Do not allow any construction runoff, concrete washout, fuels, oils, chemicals or fine materials to enter the lake at any stage.
- Maintain all machinery in leak-free condition and refuel only at designated, bunded locations remote from the lake.
- Store all materials, including stone, at a safe distance from the lake margin with appropriate containment measures.

Sediment and Turbidity Control

- Use only clean, washed stone free of fines for all rock armour, bedding or reinstatement works associated with pipeline installation.
- Install floating booms and silt curtains around in-lake works to ensure any turbid plumes are contained and allowed to settle.
- Avoid working during periods of high winds or heavy rainfall when sediment dispersal risk is elevated.
- Reinstate disturbed ground immediately so as to avoid silt laden run-off.

Intake Pipeline Installation Measures

- Installation / laying of the new intake pipe within Lough Conn waterbody is not be permitted during the months when birds are overwintering within Lough Conn and Lough Cullin SPA, namely October to March inclusive.
- Works directly within Lough Conn waterbody is only to be undertaken during the months of April–September inclusive.
- Lay the pipeline using floating pontoons and controlled lowering to minimise bed disturbance.
- Restrict the footprint of works to the minimum area needed and avoid any dredging or unnecessary disturbance to the lake substrate.
- Install rock armour over the pipeline using controlled placement from pontoon or from shore using long-reach equipment, ensuring no plant enters the water.
- Avoid any accidental release of material into the lake by using controlled loading and transfer procedures at the pontoons.

Cofferdam – Sheet Piling (if required)

Sheet piling may be required as part of temporary cofferdam installation to enable dry working conditions for intake upgrade works.

- Works limited to a short duration (typically 1–2 days) to minimise disturbance.
- Use of resonance-free vibratory piling techniques to reduce underwater noise and vibration.
- Installation of acoustic shrouds and temporary acoustic barriers where required.
- Implementation of restricted working hours to limit disturbance.
- Timing of works between July and September to avoid sensitive periods for fish (spawning, incubation, juvenile development).
- Works scheduled outside the overwintering period for SPA waterbirds to avoid disturbance.

Dewatering and Water Handling

- Electro-fish the coffer-dammed waters, by a suitably qualified and licenced expert, and return any caught fish to the lough prior to any pumping works.
- Pump any water removed from isolated cofferdam working areas back into the lake only after it has been fully settled and is free of visible suspended solids.
- Do not discharge any untreated water to the lake.

Protection of Aquatic Ecology

- Use low velocity intake heads and fine mesh screens on any temporary abstraction or pumping equipment to prevent the entrainment of fish.
- Maintain quiet working methods to reduce disturbance to birds and aquatic fauna using the nearshore zone.
- Avoid works during nighttime, and also early morning and dusk periods where possible to reduce indirect disturbance to foraging species.

Invasive Species Prevention

- Implement full biosecurity measures for all plant, equipment, pontoons and materials used at the waterbody, including inspection, cleaning and disinfection before mobilising to site.
- Ensure no movement of water, sediment or equipment from Lough Conn to any other waterbody without full decontamination.
- Use only lake-specific pumps, hoses and temporary works equipment to avoid transfer of zebra mussels or other aquatic invasive species.

Emergency Preparedness

- Maintain spill kits at all shoreline working locations and ensure all staff are trained in their use.
- Stop works immediately if any pollutant or sediment release occurs, contain the incident, and implement corrective actions before recommencing.
- Keep a site-specific emergency response plan available and briefed to all site personnel.

Site Reinstatement

- Restore all disturbed shoreline areas to their original profile using clean stone material and natural contours.
- Stone material for shoreline infill should be sourced locally and match the surrounding geology of the lake.
- Reinstate any temporary access routes or working platforms, ensuring all imported materials are removed and ground conditions stabilised.

7.5.3.3.3 Works at River Moy Crossing

The following mitigation measures will be employed at the west bank and east bank tie in locations to the existing culvert under the River Moy Estuary:

- No tracking of plant and equipment is permitted within the estuarine waterbody nor intertidal areas.
- Silt fences will be installed between the tie in locations and the estuary channel.
- Silt fence mitigation measures will be employed as per off road surface water crossings.
- Materials storage mitigation measures will be employed as per off road surface water crossings.
- Dewatering mitigation measures will be employed as per off road surface water crossings.

7.5.3.3.4 Crossing Culverted Surface Water Features

The Contractor will employ the following mitigation measures at on road culverted surface water feature crossings;

- Maintain dry working conditions at culvert entry/exit points using appropriate barriers, pumps or containment as required.
- Install silt fencing/sediment traps at all culvert interfaces to prevent sediment-laden water entering drainage systems.
- Implement strict no discharge protocols for untreated waters to any drain.
- Store all fuels and hazardous materials in double-bunded facilities away from culvert inlets/outfalls.

- Ensure all excavated material is stored at a safe distance from culvert openings to run-off during rainfall.
- Minimise ground disturbance at culvert approaches and reinstate surfaces immediately following pipeline installation.
- Use clean stone only for backfilling around culverts, avoiding loose fines that could wash into watercourses.
- Ensure plant is well maintained, leak-free, and refuelled only at designated controlled locations.
- Maintain emergency spill kits at all culvert locations, with staff trained in their use.
- Undertake regular inspection of culvert protection measures, particularly after heavy rainfall.

7.5.3.3.5 Pipeline Works adjacent to Lough Talt

The Contractor will employ the following mitigation measures along the approx. 2 km section of works alongside Lough Talt;

- Do not allow plant, machinery or personnel to enter the lake waterbody at any time.
- Prevent tracking of machinery on soft ground adjacent to the lake.
- Use only clean, washed stone free of fine material for any trenching works.
- Do not stockpile excavated material or stone within close proximity of the lake edge; store materials on level ground with containment away from surface water pathways.
- Maintain all fuel, oils and chemicals in secure bunded areas away from the lake margin.
- The ECoW will assess the works zones for areas where there is no physical or vegetative barrier to prevent run-off and silt fences will be installed where required.
- Install silt fencing or cut-off drainage on any sloped ground draining toward Lough Talt to intercept suspended material.
- Cover and stabilise any exposed soils immediately following trench backfilling to prevent run-off.
- Avoid works during periods of high rainfall.
- Ensure no discharge of untreated or contaminated waters to Lough Talt.
- The ECoW will implement continuous visual lake water quality monitoring, for sediment or turbidity, during shoreline works to ensure there is no contaminated run-off the lake waterbody.

7.5.3.4 Wetland Site Mitigation Measures

The Contractor will employ the following mitigation measures along the wetland sites adjacent to the pipeline route, locations are detailed in Table 7.15.

- The ECoW will assess the works zones for areas where there is no physical or vegetative barrier to prevent run-off and silt fences will be installed where required.
- Install continuous silt curtains, silt fencing, straw bales or similar interceptors on road edges adjacent to wetland sites where no natural barrier exists.
- Position all silt/sediment barriers at the lowest feasible point to capture sediment-laden runoff before it reaches wetland soils or channels.
- Avoid any excavation, stockpiling or vehicle turning on land draining directly toward wetland areas.

- Restrict working areas to the minimum footprint required, with machinery movement confined to existing hard surfaces.
- Store excavated material on the opposite side of the road from wetland habitats and ensure it is adequately covered.
- Reinstate roadsides immediately after works, replacing verge vegetation and stabilising soils as soon as possible.
- Avoid works during periods of saturated ground conditions or heavy rainfall when runoff risk is highest.
- Ensure that any trench dewatering effluent is discharged through settlement tanks or vegetated areas, never directly toward wetlands.
- Maintain strict pollution prevention controls (fuel storage, refuelling protocols, spill kits) at all roadside wetland sections.

7.5.3.5 Habitat mitigation measures

7.5.3.5.1 Mitigation for Hedgerow and Treeline Loss

The Contractor will implement the following measures where there is hedgerow or tree loss along off road sections of the pipeline.

- Replant all lost hedgerow and treeline sections on a like-for-like basis in accordance with Uisce Éireann replanting policy.
- Use native species sourced locally such as hawthorn, blackthorn, hazel, and holly species where necessary.
- Reinstate linear connectivity by planting reinstated hedgerow sections to match the original alignment and width.
- Protect newly planted hedgerows with temporary stockproof fencing until established.
- Undertake planting at the earliest suitable season following works.

7.5.3.5.2 Mitigation Measures for Belleek Woods

The following tree protection measures will be implemented for the pipeline installation within Belleek Woods. The mitigation and protection measures are also included in the Arboricultural Report included in Appendix 7-1.

- Works will be monitored by a suitably qualified arboriculturalist who will delineate exclusion zones and root protection zones.
- Install 2.3 m high protective barriers around all retained trees following BS5837:2012, marked as construction exclusion zones.
- Keep all construction traffic, storage, spoil and machinery outside exclusion zones.
- Avoid excavation within identified root protection zones unless supervised and carried out using vacuum excavator / air-spade or hand tools only.
- Retain all significant roots and avoid severing roots larger than 25 mm diameter.
- Root barrier membrane will then be put in place between the roots and the pipeline, where required, to ensure that the preserved roots are deflected away from infrastructure.
- Carry out any necessary access facilitation pruning only by qualified arborists,
- Use only low-ground-pressure machinery under 2 tonnes within protection zones.
- Fell or trim dangerous, unstable or diseased trees (including those affected by ash dieback) within falling distance of the works area.

- Maintain appropriate separation distances from all retained trees during excavation and construction activities.
- Avoid root severance and soil disturbance wherever possible.
- Ensure all tree works are carried out by qualified personnel with appropriate certification.
- Apply pruning or cleaning to specific trees along the route where required, such as crown cleaning or reducing end-weight.
- Monitor trees and maintain safe offsets during construction.
- Protect healthy trees requiring no action through exclusion fencing and avoidance of root protection areas.

7.5.3.5.3 Mitigation Measures for Orchids along Belleek Woods Laneway

The following mitigation measures will be implemented for the pipeline installation along the western gravel laneway of Belleek Woods;

- The gravel laneway on the west side of Belleek Woods will be subject to a pre-construction botanical survey in spring/early summer by the Contractor's ECoW.
- Should orchids be found during pre-construction surveys, the Contractor will avoid pipeline installation works in the area of orchids during the peak growing and flowering season; May-August.
- In any area where orchids are identified, any ground vegetation clearance should be undertaken outside of the orchid growing season, i.e. during late autumn – winter.

7.5.3.5.4 Plant Sites Landscaping and Biodiversity Enhancement Measures

The following landscaping and biodiversity enhancement measures are included in the Proposed Development design Drawings Ref; 10025936-ATK-W1-ZZ-DR-CE-211723 - 10025936-ATK-T2-ZZ-DR-CE-211723).

Landscaping Measures:

Woodland mix planting across multiple sites, including:

- 1,525 m² at Wherrew RWI&PS
- 4,888 m² at Lisglennon WTP
- 1,013 m² at Bonniconlon BPS

Creation of extensive wildflower areas by implementation of reduced-mowing regimes, including:

- 2,723 m² at Wherrew RWI&PS
- 13,180 m² at Lisglennon WTP
- 2,027 m² at Lisglennon RWS&PS
- 856 m² at Lough Talt WTP

Hedgerow planting and reinstatement, including:

- 87 m at Lisglennon RWS&PS
- 118 m at Bonniconlon BPS
- 87 m at Bonniconlon Reservoir
- 126 m at Lough Talt WTP
- 65 m hedgerow and 10 m treeline reinstated along the pipeline corridor

Biodiversity Enhancement Measures:

- Installation of bat boxes at suitable Plant Sites (Wherrew RWI&PS, Lisglennon WTP, Bonniconlon BPS, Lough Talt WTP).
- Installation of bird boxes at the same locations to enhance nesting opportunities for local bird species.
- Installation of insect boxes to support bees, wasps, beetles and other invertebrates.
- Construction of hibernacula (e.g., stone/log refuges) at designated sites to support amphibians, reptiles and invertebrates.

7.5.3.5.5 Windy Gap Break Pressure Tank Site – Bogland Mitigation Measures

Peat will be salvaged and reinstated at Windy Gap BPT site to restore upland bog surface conditions. All peat excavated during the works will be carefully salvaged for reinstatement. All salvaged peat materials will be kept wet by the Contractor for the duration of construction activities. The underground infrastructure and the tank will be buried / surrounded by reinstated peat soils, thereby maintaining the surface profile and ecological character of the site as far as practicable. Excess peat will be used to form low bunds around the site, ensuring that all peat resources are retained on site.

The following mitigation measures will be employed at the Windy Gap BPT Site;

- The Contractor will strip and store peat separately from mineral soils, keeping intact turves oriented correctly for reinstatement.
- The stripping and salvaging of peat materials will be undertaken under the supervision of the ECoW.
- Salvaged peat shall be temporarily stored in the northeast section of the Windy Gap BPT Site where there is no planned infrastructure.
- The Contractor will ensure that the salvaged peat material remains wetted for the duration of construction activities so as to prevent desiccation of peat materials.
- The ECoW will undertake inspections (minimum of two per month) of the salvaged / stored peat materials to ensure that materials are wetted, are not subject to desiccation and remain in good condition for reinstatement.
- Where possible, the Contractor will re-lay salvaged peat over underground infrastructure and around the tank immediately after construction.
- Should the new underground infrastructure or the tank be required to be left exposed for any prolonged period of time, for example for tank testing purposes (typically 1 month), the Contractor shall ensure that stored / salvaged peat material remains wetted throughout this period so as to prevent desiccation of peat materials.
- Following the covering of underground infrastructure and tank sides with salvaged peat material, any surplus peat materials will be used to form low bunds that blend with the natural bog surface. The alignment of the bunds will be in line with the Windy Gap BPT Proposed Site Landscaping Plan (Drawing Ref; 10025936-ATK-T1-ZZ-DR-CE-211723).
- The Contractor will avoid deep excavation wherever possible to maintain natural hydrological conditions.
- The Contractor will minimise vehicle tracking on peat and will use light weight plant and bog mats within the site to prevent compaction outside of infrastructure areas.

- The Contractor will encourage natural revegetation by reinstating sphagnum-rich peat layers and minimising surface compaction.

7.5.3.6 Invasive Species Mitigation (Zebra mussel)

The following measures will be employed at the Wherrew RWI&PS works area;

- Implement full biosecurity protocols for all equipment used at Lough Conn or Lough Talt, including cleaning, drying and disinfection before moving to another waterbody.
- Prohibit movement of water, sediment, equipment or boats from Lough Conn/Talt to other freshwater sites without full decontamination.
- Avoid transferring any aquatic material during abstraction works by ensuring intake structures, pumps and hoses remain lake specific.
- Use intake infrastructure designed to prevent zebra mussel attachment (e.g., specialist coatings and fine mesh screening).
- Ensure all temporary water management (pumping, bypassing) uses dedicated equipment that does not move between infested and non-infested waters.
- Train all contractors in invasive species identification and response procedures before commencing works.
- Monitor intake structures periodically after installation to ensure no establishment or accumulation occurs.

7.5.3.7 Birds – mitigation and monitoring measures

Removal of nesting habitat (hedgerows and treeline habitats utilised by bird species) will be carried outside the breeding bird season, which runs from 1 March to 31 August, inclusive. Where nesting habitat clearance cannot be avoided during this period the ECoW will oversee clearance of nesting habitat and ensure the area is free of nesting birds. Should nests be found clearance will not be undertaken until chicks have fledged or the nest is no longer in use.

7.5.4 Additional construction phase mitigation measures

The Contractor shall employ good practice environmental and pollution control measures with regard to current best practice guidance such as Environmental Good Practice Onsite Guide (CIRIA, 2023);

The construction management of the site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guides ‘Control of Water Pollution from Construction Sites’ and ‘Groundwater control – design and practice’ to minimise as far as possible the risk of pollution.

7.5.5 Locations for Construction Phase Mitigation Measures

Table 7-15 below outlines the locations where the aforementioned mitigation measures will be employed.

Table 7-15 — Locations for Mitigation Measures

Location	On Road / Off Road	Chainage	Watercourse Crossing Methodology	Mitigation Measures	ECoW Supervision & Monitoring
Wherrew RWI&PS / Lough Conn	N/A	N/A	N/A	Refer to Section 7.5.3.3.2 & 7.5.3.5.3 & 7.5.3.6	Y
Moyne Stream Crossing	On	880	Open Cut	Refer to Section 7.5.3.3.4	Y
Newtownwhite Stream Crossing	On	2600	Trenchless	Refer to Section 7.5.3.3.4	Y
Broadlands of Knockafarson Stream Crossing	On	2900	Open Cut	Refer to Section 7.5.3.3.4	Y
No Name Stream Crossing	On	3520	Trenchless	Refer to Section 7.5.3.3.4	Y
Abbeytown Stream Crossing	Off	3720	Trenchless	Refer to Section 7.5.3.3.1	Y
No Name Stream Crossing	Off	3880	Trenchless	Refer to Section 7.5.3.3.1	Y
Roadway trenching next to Wetland Site	On	4700-5540	N/A	Refer to Section 7.5.3.4	Y
Field Drain Crossing	Off	5630	Open Cut	Refer to Section 7.5.3.3.1	Y
Illanamuck Stream Crossing	On	8020	Open Cut	Refer to Section 7.5.3.3.4	Y
Belleek Woods	N/A	9920 - 10320	N/A	Refer to Section 7.5.3.5.2	Y & Arboricultural Supervision
River Moy Crossing	On	10200	Existing duct	Refer to Section 7.5.3.3.1 & 7.5.3.3.3	Y
Field Drain of Crossing	On	11830	Trenchless	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	On	12610	Open Cut	Refer to Section 7.5.3.3.4	Y
Roadway trenching next to Wetland Site	On	13880-14350	N/A	Refer to Section 7.5.3.4	Y

Location	On Road / Off Road	Chainage	Watercourse Crossing Methodology	Mitigation Measures	ECoW Supervision & Monitoring
Brusna River Crossing	Off	15280	Trenchless	Refer to Section 7.5.3.3.1	Y
No Name Stream Crossing	On	16860	OC or Trenchless	Refer to Section 7.5.3.3.4	Y
Fiddaun Stream Crossing	Off	17220	Trenchless	Refer to Section 7.5.3.3.1	Y
Bonniconlon BPS	N/A	17760	N/A	Refer to Section 7.5.3.5.3	Y
Srafaungal Stream Crossing	Off	17850	Trenchless	Refer to Section 7.5.3.3.1	Y
Bunnyconnellan West Stream Crossing	Off	20470	Trenchless	Refer to Section 7.5.3.3.1	Y
Bonniconlon Reservoir	N/A	20700	N/A	Refer to Section 7.5.3.5.3	Y
Field Drain Crossing	On	21050	Open Cut	Refer to Section 7.5.3.3.4	Y
Srafaungal Stream Crossing	Off	21700	Trenchless	Refer to Section 7.5.3.3.1	Y
Roadway trenching next to Wetland Site	On	22420-27900	N/A	Refer to Section 7.5.3.4	Y
Windy Gap BPT	N/A	23700	N/A	Refer to Section 7.5.3.5.4	Y
No Name Stream Crossing	On	25730	Open Cut	Refer to Section 7.5.3.3.4	Y
Field Drain Stream Crossing	On	25810	Open Cut	Refer to Section 7.5.3.3.4	Y
No Name Stream Crossing	On	25970	Trenchless	Refer to Section 7.5.3.3.4	Y
Glenree Stream Crossing	Off	26280	Trenchless	Refer to Section 7.5.3.3.1	Y

Location	On Road / Off Road	Chainage	Watercourse Crossing Methodology	Mitigation Measures	ECoW Supervision & Monitoring
Field Drain Crossing	On	27175	Open Cut	Refer to Section 7.5.3.3.4	Y
Lough Talt Roadway	N/A	27900-29900	N/A	Refer to Section 7.5.3.3.5	Y
Field Drain Crossing	On	28830	Open Cut	Refer to Section 7.5.3.3.4	Y
No Name Stream Crossing	Off	28070	Trenchless	Refer to Section 7.5.3.3.1	Y
Field Drain Crossing	On	28350	Open Cut	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	On	28730	Open Cut	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	On	28950	Open Cut	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	On	29295	Open Cut	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	Off	29470	Open Cut	Refer to Section 7.5.3.3.1	Y
Lough Talt WTP	N/A	30220	N/A	Refer to Section 7.5.3.5.3	N

7.6 Cumulative Effects

Cumulative impacts with the following plans and projects were considered during the preparation of this Biodiversity Chapter and the accompanying Natura Impact Statement (AtkinsRéalis, 2026). The assessment has been undertaken in accordance with EPA (2022) Guidelines and CIEEM (2024), and considers whether the Proposed Development could act in combination with other plans or projects to give rise to significant effects on biodiversity receptors.

The Zone of Influence (ZoI) for the cumulative effects assessment is defined based on ecological connectivity pathways identified in the Biodiversity Chapter, including hydrological connections to the River Moy SAC, Killala Bay/Moy Estuary SAC/SPA and Lough Conn and Lough Cullin SPA, as well as habitat linkages and species mobility.

The assessment focuses on other projects that have potential connectivity via:

- Surface water pathways
- Hydrological systems
- Habitat networks

- Ecological corridors

7.6.1 Plans

Mayo County Development Plan (CDP) 2022-2028 and Sligo CDP 2024-2030 sets out policies and objectives for the development of the counties. The CDPs aim to promote the sustainable development and improvement of the economic, environmental, cultural and social aspects of the counties. The CDPs also require that any developments must be subject to AA process and that permitted developments comply with the requirements of the WFD, the relevant River Basin Management Plans and the Habitats Directive. A Strategic Environmental Assessment (SEA) was prepared for the CDPs and they went through the AA process. The findings of which were integrated into the objectives of the CDPs resulting in Plans that afford high levels of protection to the environment and European sites.

7.6.2 Other Projects

A review of Mayo County Council, Sligo County Council and An Coimisiún Pleanála planning records, combined with information from the Natura Impact Statement (AtkinsRéalis 2026), identified the following developments within the wider ZoI of the Proposed Development.

The following developments were identified as part of the cumulative impact assessment:

- **Office of Public Works (OPW) – DPE63-14-2018** – River Deel Flood Relief Scheme
- **BP Mitchell Haulage and Plant Hire Ltd. – 319173 / 2360182** – Inert Waste Recovery Facility
- **Mayo Data Hub Limited – 322575** – Data Centre Development
- **Lisglennon AD Limited – 313975** – Anaerobic Digestion Biogas Facility and Pipeline
- **Mercury Renewables (Carrowleagh) Limited – 317560** – Windfarm and Hydrogen Plant
- **Ardagh GAA Club – 211063** – Club Facility Development
- **Killala Community Windfarm DAC – 19260** – Wind Turbine Development
- **Killala Community Windfarm DAC – 17619** – Wind Farm Development
- **Mullafarry Quarry Ltd – 21342** – Quarry Restoration
- **Mullafarry Quarry Ltd – 211284** – Quarry Extension
- **BP Mitchell Haulage & Plant Hire Ltd. – 21708** – Quarry Operation Continuation
- **Killala Community Windfarm DAC – 2012** – Energy Storage Facility
- **SSE Renewables (Ireland) Ltd. – 18358** – Battery Storage Facility
- **SSE Renewables (Ireland) Ltd. – 2560108** – BESS Facility
- **Mayo Renewable Limited – 2360134** – Biomass Energy Plant
- **Constant Energy – 2360266** – Hydrogen Plant and Energy Centre
- **Schutz Ireland Ltd. – 2460699** – Industrial Facility Expansion
- **Schutz (Ireland) Ltd. – 2460295** – Industrial Development Works
- **Aqua Comms (Ireland) Ltd. – 22562** – Cable Landing Station Extension
- **Stephen Hannick – 2460701** – Agricultural Development
- **Lorcan Brennan – 22757** – Land Reclamation Works
- **Conor Ruane – 2560595** – Land Reclamation Works
- **Martin Carey – 22652** – Access Road Development
- **Noreen Hackett – 2560027** – Commercial Unit Development
- **Siobhan Henry & Declan Kiely – 2560391** – Residential Development
- **Holgrove Ltd. – 19393** – Building Extension
- **Ballina Rugby Football Club – 2253** – Car Park Upgrade
- **IDA Ireland – 211376** – Access Road Infrastructure

- **Joseph Corcoran – 20646** – Land Reclamation
- **Paul Hanley – 2460315** – Land Reclamation
- **EirGrid PLC – 2360261** – Overhead Line Upgrade
- **St Joseph's National School – 2460330** – School Extension
- **Bonniconlon Youth Hub – 2460631** – Community Sports Development
- **H-Gen Renewables Ltd. – 21881** – Wind Turbine Development
- **ESB Networks – 21581** – Communication Structure

These projects include a mixture of infrastructure, renewable energy, agricultural, commercial, and residential developments.

7.6.3 Cumulative Impacts to Habitats

The Proposed Development will result in localised and temporary disturbance to habitats, primarily affecting habitats of low ecological value such as improved agricultural grassland, roadside verges and hedgerows. Higher value habitats (e.g. woodland, wetlands, and Annex I habitats) are largely avoided through design, with trenchless techniques used at sensitive crossings. Construction phase mitigation measures, including surface water protection, silt control and pollution prevention, are prescribed for all works in proximity to watercourses and designated sites. These measures ensure that no significant adverse impacts to habitats of high ecological value will occur.

Of the projects reviewed, the majority are located in separate catchments or have no direct or indirect connectivity to habitats associated with the Proposed Development. These developments therefore cannot act in-combination to give rise to cumulative effects.

A small number of projects identified within the wider study area share potential hydrological connectivity with the Proposed Development, including those associated with flood relief infrastructure, pipeline works and windfarm developments where watercourse crossings are required. These developments represent the only realistic scenario in which cumulative effects on habitats could theoretically arise, due to their potential interaction with shared surface water pathways and associated ecological receptors.

However, all such projects have been subject to Appropriate Assessment and/or detailed ecological assessment as part of their respective planning processes. These assessments have concluded that, with the implementation of prescribed mitigation measures, there will be no adverse effects on water quality, hydrological processes or associated habitats. In particular, these projects incorporate standard and robust measures such as controlled watercourse crossings (e.g. trenchless techniques), sediment and pollution control systems, and construction management protocols designed to protect receiving environments. As a result, no significant residual impacts on habitats or ecological receptors are predicted for any of these other projects on an individual basis.

Similarly, the Proposed Development has been designed to avoid impacts on higher value habitats and incorporates comprehensive mitigation measures to protect water quality and maintain hydrological connectivity. The Biodiversity Chapter concludes that, following the implementation of mitigation, the Proposed Development will not result in significant residual impacts on habitats, including those of higher ecological value.

Given that all identified projects, including the Proposed Development, avoid or fully mitigate potential impacts on key pathways such as water quality and hydrology, there are no remaining mechanisms by which effects could combine or accumulate. In the absence of overlapping unmitigated impact pathways, the potential for cumulative impacts on habitats of ecological value is effectively eliminated.

On this basis, it is concluded that the Proposed Development will not act in combination with other plans or projects to give rise to significant cumulative impacts on habitats.

7.6.4 Cumulative Impacts to Species

Aquatic Species

Key aquatic receptors within the Zone of Influence include salmon, lamprey and other species associated with the River Moy SAC and its connected watercourses. The principal pathway through which cumulative effects could arise is through deterioration in water quality, which has the potential to affect aquatic habitats, spawning grounds and overall ecological function.

The Proposed Development has been specifically designed to avoid such impacts through the implementation of robust mitigation measures, including trenchless crossings at sensitive watercourses, the establishment of buffer zones and the application of strict pollution prevention controls during construction activities. Similarly, other projects identified within the wider study area that involve interactions with watercourses have been subject to Appropriate Assessment and/or ecological assessment and incorporate equivalent mitigation measures to protect aquatic environments.

These assessments have consistently concluded that no significant effects on water quality or aquatic habitats will arise. As a result, no individual project is predicted to give rise to water quality impacts, and there is no potential for additive or cumulative effects on receiving waters. Furthermore, there are no anticipated changes to hydrological processes that could influence habitat availability or ecological function.

In the absence of any residual water quality impacts or altered hydrological regimes, there is no viable pathway through which cumulative effects on aquatic species could occur. Accordingly, cumulative impacts on aquatic species are not expected.

Otter

Otter habitat is present along several watercourses within the ZoI, and potential cumulative impacts could theoretically arise through disturbance, habitat fragmentation or indirect effects on prey availability. However, site specific surveys did not identify the presence of holts within the Proposed Development footprint, indicating limited direct sensitivity in the immediate works area.

The Proposed Development has been designed to avoid instream works and to maintain water quality, thereby preserving the ecological conditions required by otter populations. In addition, mitigation measures such as buffer zones, pollution control and best practice construction management will further reduce the potential for disturbance. Other developments within the ZoI that have potential hydrological connectivity have likewise incorporated appropriate mitigation measures and have been assessed as not giving rise to significant impacts on otter or associated habitats.

Given that all relevant projects avoid disturbance pathways and maintain habitat integrity, there is no overlap of impact pathways that could result in cumulative disturbance, habitat loss or fragmentation. Therefore, cumulative impacts on otter populations are not predicted.

Waterbirds

Waterbirds associated with Lough Conn and the Killala Bay/Moy Estuary SPAs represent key ecological receptors that are sensitive to disturbance and changes in habitat quality. Potential cumulative impacts could arise through increased disturbance, degradation of supporting habitats or deterioration in water quality.

The Proposed Development avoids direct habitat loss within SPAs and incorporates mitigation measures to maintain water quality and minimise disturbance during both construction and operation. The design of the scheme ensures that sensitive habitats are not encroached upon and that ecological function is preserved.

Other projects considered within the cumulative assessment are either located outside the ZoI of SPA habitats, lack ecological connectivity to these sites, or have been assessed through Appropriate Assessment and determined not to result in significant effects. As such, there are no additional disturbance pressures or habitat impacts that could combine with those of the Proposed Development.

Given the absence of disturbance pathways and the maintenance of habitat condition across all projects, there is no mechanism for cumulative effects on waterbirds. Therefore, cumulative impacts on waterbird populations and their supporting habitats are not expected.

Terrestrial Fauna (Birds, Bats and Mammals)

Potential impacts on terrestrial fauna associated with the Proposed Development are limited to localised and temporary disturbance during construction, primarily affecting habitats such as hedgerows, grassland and woodland edges. These impacts are mitigated through measures including seasonal restrictions on vegetation clearance, habitat reinstatement and management of works areas.

Other projects within the ZoI are generally small scale in nature, spatially separated from the Proposed Development, and located outside key ecological networks or areas of higher biodiversity value. As a result, they do not contribute to wider habitat fragmentation or sustained disturbance pressures.

Given the temporary and localised nature of impacts associated with the Proposed Development, and the limited scale and separation of other projects, there is no potential for cumulative fragmentation or disturbance effects on terrestrial fauna.

7.6.5 Overall Cumulative Impact Conclusion

The review of other plans and projects demonstrates that only a limited number of developments share potential ecological connectivity with the Proposed Development, primarily through hydrological pathways. All such developments have been subject to environmental assessment and incorporate mitigation measures designed to avoid significant ecological effects.

The Proposed Development similarly incorporates a comprehensive suite of mitigation measures and has been assessed as not giving rise to significant residual impacts on biodiversity. Crucially, there are no overlapping unmitigated pathways between projects that could give rise to combined or additive effects.

In light of these factors, it is concluded that the Proposed Development will not act in combination with other plans or projects to give rise to significant cumulative effects on biodiversity, including habitats, species or ecological processes within the study area.

7.7 Interactions

The interaction of biodiversity with other environmental attributes are summarised below in 7-16.

Table 7-16 — Interactions between Environmental Aspects of the Proposed Development

Interaction	Description
Soils and Geology	Potential impacts on biodiversity may arise from excavation works, soil stripping, trenching activities, habitat disturbance and reinstatement works associated with the Proposed Development. Temporary and permanent habitat loss, impacts on hedgerows and treelines, and potential disturbance to species are intrinsically linked to land and soil conditions. However, the mitigation measures described in Chapter 9 – Land, Soils and Geology and

	those outlined in Sections 7.5 of this chapter are anticipated to manage potential risks so as to be unlikely to affect ecological receptors.
Water (Hydrology and Hydrogeology)	Biodiversity is closely linked to surface water and groundwater resources. The Proposed Development includes works within and adjacent to watercourses, lakes and designated sites, including Lough Conn, the River Moy SAC and Lough Hoe Bog SAC. Potential impacts to aquatic habitats, protected species, wetlands and downstream ecological receptors could occur through changes in water quality, hydrology or sediment release during construction. However, the mitigation measures described in Chapter 10 – Water (Hydrology and Hydrogeology) together with the biodiversity mitigation measures outlined in Section 7.5 are anticipated to manage the potential risks so as to be unlikely to affect ecological receptors.
Landscape and Visual	Biodiversity and landscape resources are closely related through the presence of woodland, hedgerows, treelines, wetland habitats and other semi-natural features that contribute to ecological connectivity and landscape character. Construction activities have the potential to affect vegetation, habitat structure and wildlife movement corridors. However, habitat reinstatement, landscaping proposals, woodland and hedgerow planting, and biodiversity enhancement measures described in Chapter 18 – Landscape and Visual and Section 7.5 of this chapter are anticipated to manage potential risks and contribute to improved ecological connectivity and biodiversity value in the long term.

7.8 Residual Effects

Following the application of the full suite of avoidance, reduction, and compensation measures detailed in this Biodiversity Chapter, the residual ecological effects of the proposed Ballina and Lough Talt Water Supply Upgrade development are predicted to be minor, localised, and not significant. The Proposed Development has undergone iterative design to avoid high value habitats where possible, to route infrastructure along existing road corridors and established paths, and to incorporate robust ecological safeguards. These measures substantially reduce the scale, duration, and likelihood of adverse impacts on sensitive ecological receptors.

The most ecologically important areas associated with the scheme include designated European sites such as the River Moy SAC, Killala Bay/Moy Estuary SAC and SPA, Lough Hoe Bog SAC, and the Lough Conn and Lough Cullin SPA. The majority of potential effects relate to construction phase risks, particularly the potential for short term deterioration in surface water quality, disturbance to aquatic species, and localised habitat alteration at watercourse and lakeshore interfaces. However, with the implementation of strict surface water management protocols, isolation of works at the Wherrew RWI&PS, trenchless river crossings, and comprehensive pollution prevention measures, no significant changes to waterbody status or hydrological functioning are expected. As a result, residual effects on designated aquatic species such as salmon, lamprey, otter, and Arctic char are predicted to be negligible.

Similarly, the cessation of abstraction at Lough Talt, paired with established mitigation and compensation measures for fen habitats and *Vertigo geyeri*, will result in a long term net ecological gain at that location. The reinstatement of more natural hydrological conditions is expected to support the gradual recovery of groundwater dependent fen habitats. No residual adverse effects are anticipated for this receptor.

Within terrestrial habitats, the Proposed Development results in the loss of short sections of hedgerows, as well as the removal of a small sections of treelines. These features are limited in extent and are primarily of local ecological value. Through the application of like for like replanting, delivery of additional hedgerow enhancement, and implementation of biodiversity focused landscaping at plant sites, the long term effect on hedgerow and treeline networks will be neutral to slightly positive. Short term effects on nesting birds may occur during construction; however, adherence to seasonal clearance restrictions and pre-works surveys ensures that no significant residual effects are expected.

Within Belleek Woods, the pipeline alignment along existing tracks avoids direct impacts on woodland trees, roots, and canopy structure. Only trees already compromised by ash dieback or structural instability are to be removed. With construction exclusion zones and root protection measures in place, the integrity of woodland habitats and associated fauna, including bats, red squirrel and breeding birds, will be maintained. The limited nature of tree removals means residual effects are negligible and localised.

Across wetland sites adjacent to the pipeline alignment, the installation of roadside silt controls, careful material storage, and the use of clean stone ensure that no lasting hydrological or ecological effects occur. As these wetland areas are not directly impacted and hydrological connectivity will be preserved, residual effects are restricted to a temporary, minor risk of sedimentation during construction that is fully mitigated through the prescribed measures.

In relation to invasive species, particularly Japanese knotweed, Himalayan knotweed, cherry laurel, and zebra mussel, the project avoids all known terrestrial infestations and incorporates stringent biosecurity procedures. The upgraded intake at Lough Conn incorporates anti-fouling measures that will prevent zebra mussel colonisation of new infrastructure. Consequently, the residual risk of spread or establishment of invasive species is negligible.

Completion of the proposed works will result in only minor, short term ecological disturbance limited to the immediate construction footprint, primarily in the form of temporary noise, activity, and vegetation disturbance. Once operational, the scheme is not expected to give rise to any ongoing ecological pressures. Indeed, several aspects of the development, including enhanced screening and fish friendly intake design at Lough Conn, habitat reinstatement, the delivery of biodiversity enhancement measures at Plant Sites, and significantly the cessation of water abstraction for Lough Talt will contribute positively to local ecological value over time.

Cumulative effects have been assessed and are not considered significant, as overlapping plans and projects either lack ecological connectivity or are subject to equivalent mitigation standards. With mitigation in place, the Proposed Development will not adversely affect the integrity of designated sites, nor will it result in any long term adverse ecological effects.

Overall, the residual effects of the scheme on biodiversity are not significant. The combination of avoidance led design, comprehensive mitigation, and targeted habitat restoration and enhancement measures ensures that ecological receptors will remain protected. In several locations, including Lough Talt, the Proposed Development will facilitate long term ecological improvements, demonstrating compliance with the mitigation hierarchy and alignment with national biodiversity objectives.

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