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NATURA IMPACT STATEMENT

WESTERN BRAND GROUP ULC, KNOCK ROAD, BALLYHAUNIS CO. MAYO

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DATE:	7th December 2020	**REVIEWED:**	Mike Fraher, BSc.

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EXECUTIVE SUMMARY

This report has been prepared by Panther Environmental Solutions Ltd to provide for the assessment of the proposed development, comprising of the construction of a proposed treated effluent rising main discharge from Western Brand Group ULC, Knock Road, Ballyhaunis, Co. Mayo.

This report identified the presence of European sites within the potential zone of influence of the proposed development due to hydrological connectivity / potential hydrological connectivity and distances from the proposed development site. The potential for impacts to European sites as a result of the proposed development such as potential surface water quality impacts, introduction of invasive species, habitat destruction and impacts from noise and dust were considered and the level of risk posed assessed.

During Stage 1 Screening for Appropriate Assessment, it was considered that there may be potential for impacts upon the qualifying interests of the River Moy Special Area of Conservation (SAC) (Site Code: 002298) Errit Lough (SAC) (Site Code: 000607), Urlaur Lakes (SAC) (Site Code: 001571) and Lough Corrib SAC (Site Code: 000297) due to a potential deterioration in water quality during the construction and operational phases. Therefore, a Natura Impact Statement was prepared.

Due to the recommended control measures and standard practice during the construction and operational phases, it is considered that there would be no significant risks to the conservation objectives of the habitats and species for which the aforementioned designated sites have been designated.

It is considered that there would be no significant risk of negative impact, either alone or in combination with other plans or projects, to the integrity of the Natura 2000 network.

1.0 INTRODUCTION

This Natura Impact Statement (NIS) has been prepared by Panther Environmental Solutions Ltd., to accompany an application for planning permission to Mayo County Council by the Western Brand Group ULC, to construct a new treated effluent rising main pipeline from their existing WWTP discharge pump sump to a proposed outfall at the River Glore [Mayo] (also named Gweestion or Mannin River). The proposed discharge to the River Glore would take place at Annagh townland, Co. Mayo.

The principal aim of this study is to assess whether significant effects to European sites (the Natura 2000 network) are likely to occur as a result of this project in accordance with Article 6(3) of the Habitats Directive and the Planning and Development (Amendment) Act, 2001, as amended.

A study was undertaken by Dr Ross Donnelly-Swift of Panther Environmental Solutions Limited (PhD Biosystems Engineering, MSc Environmental Science and BSc (Hons) Biology). This comprised a review of the proposed development, a site visit on the 30th of June 2020 to examine the ecological context of the proposed development, a desk study of the information on European sites within the potential zone of influence of the site and an analysis of the information in the context of the guidance to determine if a Natura Impact Statement is required.

This report has been prepared with regard to;

- DoEHLG (2009) "*Appropriate Assessment of Plans & Projects in Ireland*"
- Environment DG, European Commission (2002) "*Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*" Oxford Brookes University, 2001
- Department of the Environment Heritage and Local Government (DoEHLG) Circular Letter SEA 1/08 and NPWS 1/08.
- Department of the Environment Heritage and Local Government (DoEHLG) Circular letter NPWS 1/10 and PSSP 2/10

2.0 LEGISLATIVE CONTEXT

The EU Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora, as amended by council directive 97/62/EC, 2006/105/EC, and Regulation EC1882/2003 of September 2003, as transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/11), provides the framework for legal protection for habitats and species of European importance. The Natura 2000 network provides an ecological infrastructure for the protection of sites that are of particular importance for rare, endangered or vulnerable habitats and species within the EU. The Natura 2000 network in Ireland is made up of European Sites which include:

- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)

Article 6(3) of the Habitats Directive establishes the requirement for appropriate assessment when planning new developments that might affect a Natura 2000 site. Article 6(3) of the Habitats Directive states;

"*Any plan or project not directly connected with, or necessary to the management of the site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site, and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*"

Stage 1: Screening for Appropriate Assessment
This stage involves an initial screening assessment of the potential impacts of the project, either alone or in combination with other projects, upon a Natura 2000 site. If it can be concluded that there would be no significant impacts upon Natura 2000 sites, the assessment stops at this stage. If not, or if further assessment is required, the assessment proceeds to Stage 2.

Stage 2: Appropriate Assessment / Natura Impact Statement (NIS)
This stage assesses the impact of the project, alone or in combination with other projects or plans, on the integrity of the Natura 2000 site, with respect to the site's conservation objectives, the site's ecological structure and function and its overall integrity. The output of this stage is an NIS, which also includes any mitigation measures required to avoid, reduce or offset negative impacts of the project. If this stage determines that adverse effects on the Natura 2000 site cannot be excluded, then the plan or project should proceed to Stage 3 or be abandoned.

3.0 METHODOLOGY

Stage 1 - Screening
Screening is the first stage in the Appropriate Assessment process, and is carried out to determine whether a Stage 2 Appropriate Assessment and a Natura Impact Statement (NIS) is required. Screening addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3);

1. Whether a plan or project is directly connected to or necessary for the management of the European (Natura 2000) site; and

2. Whether a plan or project, alone or in combination with other plans or projects, is likely to have significant effects on a European (Natura 2000) site, in view of its conservation objectives.

Screening should be undertaken without the inclusion of mitigation measures. If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 AA and an NIS.

The findings and conclusions of the screening process should be documented, with the necessary supporting evidence and objective criteria. This is of particular importance in the

cases where the Appropriate Assessment process ends at the screening stage because the conclusion is that no significant effects are likely.

Following Stage 1 Screening, it was considered that there may be potential for an indirect impact upon the qualifying interests of a European site, therefore, the assessment progressed to Stage 2.

Stage 2 – Natura Impact Assessment

The scope of this assessment follows the appropriate assessment statement methodology as defined within the European Commission guidance document "*Assessment of plans and projects significantly affecting Natura 2000 sites"* (2002), Section 3, Part 2. Guidance from the Department of the Environment, Heritage and Local Government "*Appropriate Assessment of Plans and Projects in Ireland*" (2009) and "*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive*" (2018) have also been used in the preparation of this report. In accordance with this guidance, the following methodology has been used to produce this Natura Impact Statement:

Step 1**:** Information Required

Identifying the conservation objectives of the Natura 2000 site and the aspects of the project, alone or in combination with other projects or plans, which have the potential to affect those conservation objectives.

This process involves gathering information for the Natura 2000 site, including the conservation objectives of the site, factors contributing to conservation value, aspects sensitive to change and the existing baseline condition of the site. The principal source of information used for Natura 2000 sites, their qualifying interests and conservation objectives is the National Parks and Wildlife Service (NPWS). Information is also required for the project including the size and scale of the project, the relationship (distance, connectivity etc.) of the project to the Natura 2000 site and the characteristics of existing, proposed or other projects which have the potential to affect the Natura 2000 site.

Step 2: Impact Prediction

This process predicts and identifies the likely impacts of the project on the Natura 2000 site. Potential impacts are identified as; direct and indirect; short or long-term duration; construction, operational or decommissioning; and isolated, interactive and cumulative effects.

Step 3: Conservation Objectives

Once the potential impacts of the project have been predicted and identified, it will be necessary to assess whether these impacts will adversely impact upon the integrity of the Natura 2000 site, as defined by the site's conservation objectives and status of the site. Where it cannot be demonstrated that there will be no adverse impacts upon the Natura 2000 site, mitigation measures must be proposed for the project.

Step 4: Mitigation Measures

Upon the identification of potential impacts, the project will have on the Natura 2000 site (alone or in combination with other projects or plans), mitigation measures will be proposed to eliminate, reduce or offset these negative impacts. Mitigation measures should be considered with preference to the hierarchy of preferred options outlined in the guidance document "*Assessment of plans and projects significantly affecting Natura 2000 sites"*.

3.1 METHODOLOGY BACKGROUND

This Appropriate Assessment has been carried with reference to the following guidelines:

- *Appropriate Assessment of Plans and Projects in Ireland. Guidelines for Planning Authorities*. DoEHLG, 2009.
- Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities
- *Managing Natura 2000 sites – The Provisions of Article 6 of The Habitats Directive 92/43/EEC.* European Commission, 2000.
- Circular L8/08 Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments 2 September 2008
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites. Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.* European Commission, 2002.
- Commission Notice "Managing Natura 200 sites The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission, 21.11.2018
- CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*, 2nd edition, Chartered Institute of Ecology and Environmental Management, Winchester.

3.2 DESKTOP RESEARCH

- Desktop research was carried out to gather information on the ecology of the site and surrounding areas. The locations of the Natura 2000 sites within 15km of the proposed rising main were identified from National Parks and Wildlife Service (NPWS) online map viewer. Other Natura sites beyond 15km were also reviewed and considered for the potential for the project to have a negative effect.

- Water quality data from the EPA was reviewed for the assessment of biological and environmental data collected on waterbodies in Ireland (Water Quality in Ireland 2013-2018 (2019))

- Information on the characteristics of the Natura 2000 sites within the potential zone of influence was reviewed from the conservation objectives documents, site synopses and Standard Natura 2000 data forms available on the NPWS website.

3.3 ROUTE SURVEY

A site characterisation assessment was undertaken on the 30th of June 2020 to examine the ecological context of the development site, by systematically walking the proposed route, adjacent land and boundaries and determining the habitats present. The habitat survey was undertaken in accordance with the standard methodology outlined in Fossitt's "*A Guide to Habitats in Ireland*", a hierarchical classification scheme based upon the characteristics of vegetation present. The Fossitt system also indicates when there are potential links with Annex I habitats of the E.U. Habitats Directive (92/43/EEC). Cognisance was also taken of the Heritage Council guidelines, "*Best Practice Guidance for Habitat Survey and Mapping*", (Smith *et al.*, 2011).

Bird species and signs of fauna activity and dwellings were also noted. Particular attention was given to the possible presence of habitats and/or species, which are legally protected under Irish and European legislation and to assessing any potential ecological connectivity with Natura 2000 sites or supplementary or stepping stone habitats of relevance to Natura 2000 sites.

4.0 DESCRIPTION OF PROPOSED DEVELOPMENT AND EXISTING SITE

4.1 PROPOSED DEVELOPMENT

Western Brand are proposing to construct new treated effluent rising main pipeline from their existing WWTP discharge pump sump to a proposed outfall at the Glore River (also named Gweestion or Mannin River). The proposed discharge to the Gweestion Stream would take place at Annagh townland, Co. Mayo.

The proposed rising main would begin at the Western Brand facility effluent plant and pass underground through lands owned by the applicant and third parties until reaching the proposed discharge point at Irish Grid Reference (147918 E, 281599 N) or Irish Transverse Mercator (547880 E, 781616 N). The majority of the proposed pipeline will be open cut trenching, with the final section at the River Moy (SAC) to be Horizontal Directional Drilling (HDD). To minimise disturbance to the River Moy SAC and circumvent an area of land that is inaccessible, the proposed rising main will use HDD to go through the underlying impermeable Marl layer. This will prevent disturbance to vegetation, avoid open trench works in a high-water table area and prevent changes in waterflow which can impact on fens.

There are no proposed amendments to the existing wastewater treatment process at Western Brand. Trade effluent from the production process at the Western Brand facility is sent to the onsite effluent treatment plant, where it undergoes primary and biological treatment processes to produce a high quality treated final effluent. The quality of discharges from the Western Brand facility are controlled under the sites EPA Industrial Emissions licence (P0831-02). The location of the proposed treated effluent rising main would start at the Western Brand facility at Knock Road approximately 3.5km west of Ballyhaunis, Co. Mayo. The rising main will traverse the townlands of Knockaunacat, Erriff, Derrymore, Island and Annagh. A location map of the proposed development is included in Figure 4.1 below. The proposed development would be located mainly within a rural, farming area predominantly comprised of pastureland, stonewalls and hedgerows. Small rural settlements and farmyard complexes exist in the area.

Figure 4.1: Location of Proposed Rising Main (with HDD section in yellow)

The proposed treated effluent emissions have been based upon the assimilative capacity of the River Glore and the current water quality of the River Glore. An assimilative capacity assessment report was completed to predict the river's ability to accommodate a treated effluent discharge of BOD_5, COD, Total Phosphorous, Orthophosphate, Total Nitrogen, Nitrate, Ammonia, Suspended Solids, Chloride and Oils, Fats and Greases from the Western Brand facility. The assessment concluded that the River Glore would have sufficient assimilative capacity to accommodate the proposed discharge from the Western Brand facility.

This assessment has been based upon a proposed discharge rate of 800 m^3/day of treated effluent to the River Glore]. Table 4.1 below provides the proposed discharge concentrations for effluent discharges to the River Glore. The average actual discharge concentrations of final effluent from the Western Brand facility between May 2019 and April 2020 are also presented in table 4.1 below. This assessment has been based on these figures.

The assimilative capacity assessment has concluded that Western Brand monitoring conducted in 2020 has determined that the ambient quality would be classified under the "*good quality*" threshold, as defined by the EC Environmental Objectives (Surface Waters) Regulations 2009 [S.I. 272 of 2009]. It has been predicted that the proposed maximum discharge concentrations from the facility at 800 m^3/day would not, in and of itself, result in the exceedance of ambient water quality standards in the River Glore [Mayo]. It has been predicted that actual average discharge concentrations from the facility would not, in and of itself, result in the exceedance of ambient water quality standards in the River Glore [Mayo]. As a result of this assimilative capacity assessment, it has been predicted the River Glore [Mayo] would have sufficient assimilative capacity to accommodate the proposed discharge of 800 m^3 per day at the discharge limits. The expected construction timeframe for the proposed development would be approximately three months, with the treated effluent rising main works expected to take approximately six weeks. Rising main construction hours would be from 7am to 7pm, Monday to Friday.

Table 4.1: Effluent Discharge Limits at Western Brand

Parameter	Units	Current Discharge Limits	Proposed Discharge Limits	2019-2020 Average Discharge
BOD_5	mg/l O_2	10	**10**	2.39
COD	mg/l O_2	125	**125**	17.61
Total Phosphorous	mg/l P	2	**2**	0.05
Orthophosphate	mg/l PO_4-P	0.5	**0.5**	0.11
Nitrogen	mg/l N	15	**15**	10.11
Nitrate	mg/l NO_3-N	11.3	**11.3**	8.21
Ammonia (Total)	mg/l N	0.5	**0.5**	0.11
*Ammonia (Unionised)**	*mg/l NH_3-N*	*0.006*	***0.006***	*0.0013*
Suspended Solids	mg/l SS	10	**10**	3.24
Chloride	mg/l Cl	250	**1000**	478.28
OFG	mg/l	10	**10**	9.00
Discharge Rate	m^3/day	570	**800**	476

**Calculated from total ammonia based upon field temperature and pH results.*

The majority of the rising main route would traverse agricultural pastures and also cross roadways, hedgerows and some areas of stone walls. Limited sections of hedgerow removal would be required as the rising main traverses field boundaries. Stone walls would be reinstated upon completion of construction works. Hedgerows would be replanted following the completion of construction works.

The rising main will go through potential marsh areas adjacent the Glore River [Mayo]. See accompanying hydrological assessment by IE Consulting of the suitability of the proposed HDD pipeline at the River Moy SAC (Document Ref - Hydrogeological-Hydrological Risk Assessment, Nov 2020).

When working beside watercourses measures must be taken to prevent sedimentation from entering the watercourse. A buffer zone around surface water drains near the route (with the exception of watercourse crossings) would be marked out prior to the laying of the rising main and the installation of silt control features undertaken where appropriate. If the drainage ditch needs to be crossed, then damming the water flow from the rising main footprint using sandbags to create the seal / dam across the drainage ditch. Pumps would be set up to take the flow from upstream to downstream of the crossing point. A filter would be provided at the pump inlet to prevent the entry of aquatic fauna into the pump, and to limit the potential disturbance to the drainage ditch/marsh due to sediments. Pumping operations would be supervised at all times. Excavation of the drainage ditch bed/marsh would then proceed, with the excavated material stockpiled for later reinstatement. Following the completion of reinstatement works, including any required bank reinstatement works, the sandbags would be removed.

The outfall for the discharge of the treated effluent rising main into the River Glore [Mayo] that would be placed in a position to minimize erosion around the new discharge point. Where concrete is required, this would comprise of pre-cast concrete where possible. The new treated effluent rising main would be located at a level below the low flood level within the river.

4.2 EXISTING ENVIRONMENT

A site characterisation assessment was undertaken on the 30th of June 2020 to examine the ecological context of the development site, by systematically walking the site and boundaries and determining the habitats present. The habitat survey was undertaken in accordance with the standard methodology outlined in Fossitt's "*A Guide to Habitats in Ireland*", a hierarchical classification scheme based upon the characteristics of vegetation present. The Fossitt system also indicates when there are potential links with Annex I habitats of the E.U. Habitats Directive (92/43/EEC). Cognisance was also taken of the Heritage Council guidelines, "*Best Practice Guidance for Habitat Survey and Mapping*", (Smith *et al.*, 2011). While the site assessment was undertaken inside the optimal habitat survey period (April to September.

Fauna sightings and signs of fauna activity and dwellings were also noted. Particular attention was given to the possible presence of habitats and/or species which are legally protected under Irish and European legislation.

During the site walkover, sixteen habitats were identified. The rising main is proposed to discharge into the River Glore [Mayo] within close proximity to the River Moy SAC. Habitats found here include:

The River Glore [Mayo] flows into Island Lake which would be classified as Limestone/marl lakes (FL3) habitat. The River Glore [Mayo] is classified as Depositing / lowland rivers (FW2) habitat, the flora found here includes Bulrush (*schoenoplectus lacustri*), Sweet grass (*Glyceria* sp.) and Water lilies (*Nymphaeaceae*).

Reed and large sedge swamps (FS1) habitat can be found which include the species Common reed (*Phragmites australis*), Water Mint (*Mentha aquatica*), Sedges (*Carex* spp.), in particular Long-stalked Yellow-sedge (*Carex lepidocarpa*), Reed Canary-grass (*Phalaris Arundinacea*) and Lesser Reedmace (*Typha latifolia*), with Vetch (*Vicia* spp.), Wild Angelica (*Angelica Sylvestris*) Hebridean Spotted-orchid (*Dactylorhiza fuchsii* ssp. *hebridensisand*) and Meadow Thistle (*Cirsium dissectum*)

Riparian woodland (WN5) with tree species Willow, as the dominate flora with and understory flora similar to FS1 with Meadowsweet (*Filipendula ulmaria*).

The rising main through several agricultural fields where the following habitats can be found:

The most common habitat found within the fields is improved agricultural grassland (GA1). This habitat is dominated by ryegrasses (*Lolium* spp.), with occasionally recorded Buttercup (*Ranunculus* spp.), Dandelion (*Taraxacum* spp.), Ribwort Plantain (*Plantago lanceolata*), Dock (*Rumex* spp.), Thistle (*Cirsium* spp.), Nettle (*Urtica dioica*), Greater Plantain (*Plantago major*) and White Clover (*Trifolium repens*).

A few fields are made up of Dry calcareous and neutral grassland (GS1) habitat. Grasses such as Yorkshire Fog (*Holcus lanatus*), Meadow-grasses (*Poa* spp.) and Bent grasses (*Agrostis* spp.). With Creeping Buttercup (*Ranunculus repens*), Dock (*Rumex* spp.), Yarrow (*Achillea millefolium*), Bluebells (*Hyacinthoides*) and Primrose (*Primula vulgaris*).

Areas of Wet grassland (WS4) habitat are found in fields as the rising main route gets closer to the River Moy SAC. Species found here include which includes Grass spp, Rushes (*Juncus*

spp.), Water Forget-me-not (*Myosotis scorpoides*), Marsh Marigold (*Caltha palustris*), Ragged robin (*Lychnis Flos-cuculi*), Marsh Thistle (*Cirsium palustre*) Hebridean Spotted-orchid (*Dactylorhiza fuchsii* ssp. *hebridensisand*) and Silverweed (*Potentilla anserina*).

Amenity grassland (GA2) habitat can be found in places near residential dwellings. Flora species found here include Grass species such as Annual Meadow-grass (*Poa annua*), Dandelion (*Taraxacum* spp.), White Clover (*Trifolium repens*) and Daisy (*Bellis perennis*).

Hedgerow (WL1) habitat can be found along boundary of agriculture fields and roadways with tree species such as Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Blackthorn (*Prunus spinosa*), Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), Holly (*Ilex aquifolium*), Elm (*Ulmus* sp.), and Oak (*Quercus* spp.). Other species commonly found in this habitat are Bracken (*Pteridium aquilinum*), Bramble (*Rubus fruticosus*), Cow Parsley (*Anthriscus sylvestris*), Dog-rose (*Rosa canina agg.*), Gorse (*Ulex europaeus*), Guelder-rose (*Viburnum opulus*), Hogweed (*Heracleum sphondylium*), Herb-Robert (*Geranium robertianum*), Ivy (*Hedera helix*), Snowberry (*Symphoricarpos albus*), Cleavers (*Galium aparine*), Violet (*Viola* spp.) and Nettle (*Urtica dioica*).

Treelines (WL2) habitat this will contain the tree species found in WL1 and also Beech (*Fagus sylvatica*), Horse-chestnut (*Aesculus hippocastanum*), Willow (*Salix* spp.), Sitka Spruce (*Picea sitchensis*) and Silver Birch (*Betula pendula*).

Scrub (WS1) habitat is found along the route at various points. Flora species include are Grass spp, Gorse (*Ulex europaeus*), Bramble (*Rubus fruticosus*), Willow (*Salix* spp.), Dock (*Rumex spp*.), Ivy (*Hedera helix*), Sitka Spruce (*Picea sitchensis*) and Rosebay Willowherb (*Chamerion angustifolium*) and Bracken ((*Pteridium aquilinum*).

Also, along the proposed route are stone walls and other stonework (BL1) habitat. Species found here include ferns such as Hart's-tongue (*Phyllitis scolopendrium*), Common Polypody (*Polypodium vulgare*), Spleenwort (*Asplenium*) and Moss (*Bryophyta spp*).

An area of Dry calcareous heath (HH2) habitat with small patches of Wet heath (HH3) habitat can be found in close proximity to the boundary of Western Brand buildings. Species found here include Ling Heather (*Calluna vulgaris*), Moss species (*Sphagnum spp*.), Sedge (*Carex spp*), Willow (*Salix* spp.) Bog Asphodel (*Narthecium ossifragumand*) Gorse (*Ulex gallii*), Marsh Cinquefoil (*Potentilla palustris*) and Reindeer Lichen (*Cladonia spp*).

Ornamental/non-native shrub (WS3) habitat that includes species such as Privet (*Ligustrum* sp.), Japanese laurel (*Aucuba japonica*) Fuchsia (*Fuchsia magellanica*), *Cotoneaster spp*, Hydrangea (*Hydrangea macrophylla*), Oregon grape (*Mahonia aquifolium*), Red robin (*Photinia x fraseri*), New Zealand holly (*Olearia macrodonta*) and Rose (*Rosa spp*).

Areas of buildings and artificial surfaces (BL3) habitat can be found along the proposed route around Western Brand and along the road network. There is little to no vegetation in this habitat.

Earth banks (BL2) habitat is found at varying places along the route in particular around the Western Brand facility, with similar flora to GS2 but also found here is Bramble (*Rubus fruticosus*), Butterbur (*Petasites hybridus*), Creeping Cinquefoil (*Potentilla reptans*), Lesser Burdock (*Arctium minus*), Dandelion (*Taraxacum* spp.), Willowherb (*Epilobium* spp.),

Ragwort (*Senecio jacobaea*), Speedwell (*Veronica* spp.), Winter Heliotrope (*Petasites fragrans*), Hedge Mustard (*Sisymbrium officinale*), Creeping Thistle *(Cirsium arvense*), Dock (*Rumex* spp), Sow-thistle (*Sonchus* spp.) and Spear Thistle (*Cirsium vulgare*).

The majority of the site, comprising of, improved agricultural grassland with buildings and artificial surfaces can be considered to be modified and of low ecological value. Stonewalls, hedgerow and treelines habitat at the site can be considered to be of moderate ecological value. Habitats within close proximity and at the HDD pipeline route such as reed and large sedge swamps habitat (which is located within the River Moy SAC) would be considered ecologically important. No plant species of conservation significance or Third Schedule invasive plant species were noted during the site assessment.

The identified habitats at the proposed development site, as per the Fossitt habitat classification scheme, are summarised in Table 4.1 below.

Table 4.1: Summary of Habitats Identified at the Proposed Development Site

HABITAT CLASSIFICATION HIERARCHY		
LEVEL 1	**LEVEL 2**	**LEVEL 3**
F – Freshwater	**FL** – Lakes and ponds	**FL1** – Limestone/marl lakes
	FW – Watercourses	**FW2** – Depositing / lowland rivers
	FS - Swamps	**FS1** – Reed and large sedge swamps
G – Grassland and marsh	**GA** – Improved grassland	**GA1** – Improved agricultural grassland
		GA2 – Amenity grassland (improved)
	GS – Semi-natural grassland	**GS1** – Dry calcareous and neutral grassland
		GS2 – Dry meadows and grassy verges
		GS4 – Wet grassland
H - Heath and dense bracken	**HH** - Heath	**HH2** – Dry calcareous heath
		HH3 – Wet heath
W – Woodland and scrub	**WN** - Semi-natural woodland	**WN5** – Riparian woodland
	WS – Scrub / transitional woodland	**WS1** – Scrub
		WS3 – Ornamental/ non-native shrub
	WL – Linear woodland / scrub	**WL1** – Hedgerows
		WL2 – Treelines
B – Cultivated and built land	**BL** – Built land	**BL1** – Stone walls and other stonework
		BL2 – Earth Banks
		BL3 – Buildings and artificial surfaces

Given the agricultural land use of the surrounding area, it would be expected that common grassland and hedgerow bird species would be present in the area. Also given the proposed pipeline will discharge into the River Glore [Mayo], it would be expected that waterbird species would also be present within the general area of the proposed pipeline. Bird species noted during the site walkover included Blackbird (*Turdus merula*), Blue Tit (*Parus caeruleus*), Coal Tit (*Parus ater*), Chaffinch (*Fringilla coelebs*), Dunnock (*Prunella modularis*), Grey Heron (*Ardea cinerea*), Goldfinch (*Carduelis carduelis*), Great Tit (*Parus major*), Hooded Crow (*Corvus cornix*), Jackdaw (*Corvus monedula*), Magpie (*Pica pica*), Pied Wagtail (*Motacilla alba*), Pheasant (*Phasianus colchicus*), Robin (*Erithacus rubecula*), Rook (*Corvus frugilegus*), Song Thrush (*Turdus philomelos*), Sedge Warbler (*Acrocephalus schoenobaenus*), Swallow (*Hirundo rustica*), Tree Sparrow (*Passer montanus*), Willow Warbler (*Phylloscopus trochilus*), Woodpigeon (*Columba palumbus*) and Wren (*Troglodytes troglodytes*). No species are red-listed under the BoCCI classification, while three species were amber listed: Robin, Tree Sparrow and Swallow. None of the bird species recorded are listed under Annex I of the E.U. Birds Directive.

Mammals, typical of that found throughout the rest of Ireland, which would be expected to be found in the general area include Badger (*Meles meles*), Fox (*Vulpes vulpes*), Otter (*Lutra lutra*), Pine Marten (*Martes martes*), Stoat (*Mustela erminea hibernica*), American Mink (*Mustela vison*), Irish Hare (*Lepus timidus hibernicus*), Rabbit (*Oryctolagus cuniculus*), Hedgehog (*Erinus europaeus*), Red Squirrel (*Sciurus vulgaris*), Wood Mouse (*Apodemus sylvaticus*), Pygmy Shrew (*Sorex minutus*), Brown Rat (*Rattus norvegicus*) and Bank Vole (*Myodes glareolus*).

During the site walkover Fox (*Vulpes vulpes*), Common Frog (*Rana temporaria*) and evidence of Rabbit (*Oryctolagus cuniculus*), was observed.

In addition to the site walkover, flora and fauna records were reviewed on the National Biodiversity Data Centre (NBDC) website for the proposed development and vicinity. The proposed development site is located within the 10km squares (M48 and M47), therefore cognisance was taken of the records for both 10km squares. Two protected flora species under the Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) were recorded for the M48 and M47 10km squares; Green Blackwort (*Southbya tophacea*) and Large White-moss (*Leucobryum glaucum*). Three invasive flora species listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) were recorded for the M48 and M47 10km squares; Canadian Waterweed (*Elodea canadensis*), Bohemian Knotweed (*Fallopia bohemica*) and Japanese Knotweed (*Fallopia japonica*).

Fauna records for the previous thirty years were reviewed on the NBDC website for the two 2km squares (M48K and M47P) in which the proposed development is located. Fauna of note include the Otter (*Lutra lutra*), Smooth Newt (*Lissotriton vulgaris*), Freshwater White-clawed Crayfish (*Austropotamobius pallipes*), Pipistrelle (*Pipistrellus pipistrellus sensu lato*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Red Squirrel (*Sciurus vulgaris*), Pygmy Shrew (*Sorex minutus*), Badger (*Meles meles*), Common Frog (*Rana temporaria*), American Mink (*Mustela vison*) and the threatened Wall (*Lasiommata megera*). Birds of note include Barn Owl (*Tyto alba*), Barn Swallow (*Hirundo rustica*), Black-headed Gull (*Larus ridibundus*), Common Coot (*Fulica atra*), Common Grasshopper Warbler (*Locustella naevia*), Corn Crake (*Crex crex*), Curlew (*Numenius arquata*), Great Cormorant (*Phalacrocorax carbo*), Goldeneye (*Bucephala clangula*), Golden Plover (*Pluvialis apricaria*), Great Crested Grebe (*Podiceps cristatus*), Kestrel (*Falco tinnunculus*), Kingfisher (*Alcedo atthis*), Linnet (*Carduelis cannabina*), Hen

Harrier (*Circus cyaneus*), House Martin (*Delichon urbicum*), House Sparrow (*Passer domesticus*), Pochard (*Aythya ferina*), Snipe (*Gallinago gallinago*), Starling (*Sturnus vulgaris*), Teal (*Anas crecca*), Wigeon (*Anas penelope*), Little Grebe (*Tachybaptus ruficollis*), Merlin (*Falco columbarius*), Mew Gull (*Larus canus*), Northern Lapwing (*Vanellus vanellus*), Northern Wheatear (*Oenanthe oenanthe*), Sand Martin (*Riparia riparia*), Sky Lark (*Alauda arvensis*), Spotted Flycatcher (*Muscicapa striata*), Tufted Duck (*Aythya fuligula*), Whooper Swan (*Cygnus cygnus*), Sandpiper (*Actitis hypoleucos*), Swift (*Apus apus*), Pink-footed Goose (*Anser brachyrhynchus*), Red Grouse (*Lagopus lagopus*), Ringed Plover (*Charadrius hiaticula*), Stock Pigeon *(Columba oenas*), Water Rail (*Rallus aquaticus*) and Yellowhammer (*Emberiza citrinella*).

4.2.1 Information on Water Quality

The proposed development is located within Moy & Killala Bay Catchment, Pollagh Sub-Catchment (SC_010). There are several loughs noted in the general area, the closest of which include Bekan Lough and Greenwood Turlough, located approximately 750m west of the development site respectively. According to the EPA Envision website and available monitoring data, Bekan Lough was assigned a Lake Water Quality ecological status of "moderate" during the 2007-2009 monitoring period. Bekan Lough has been unassigned during both the 2010-2012 and 2010-2015 monitoring periods. See figure 4.2.1 for rivers and lakes within the area of proposed development.

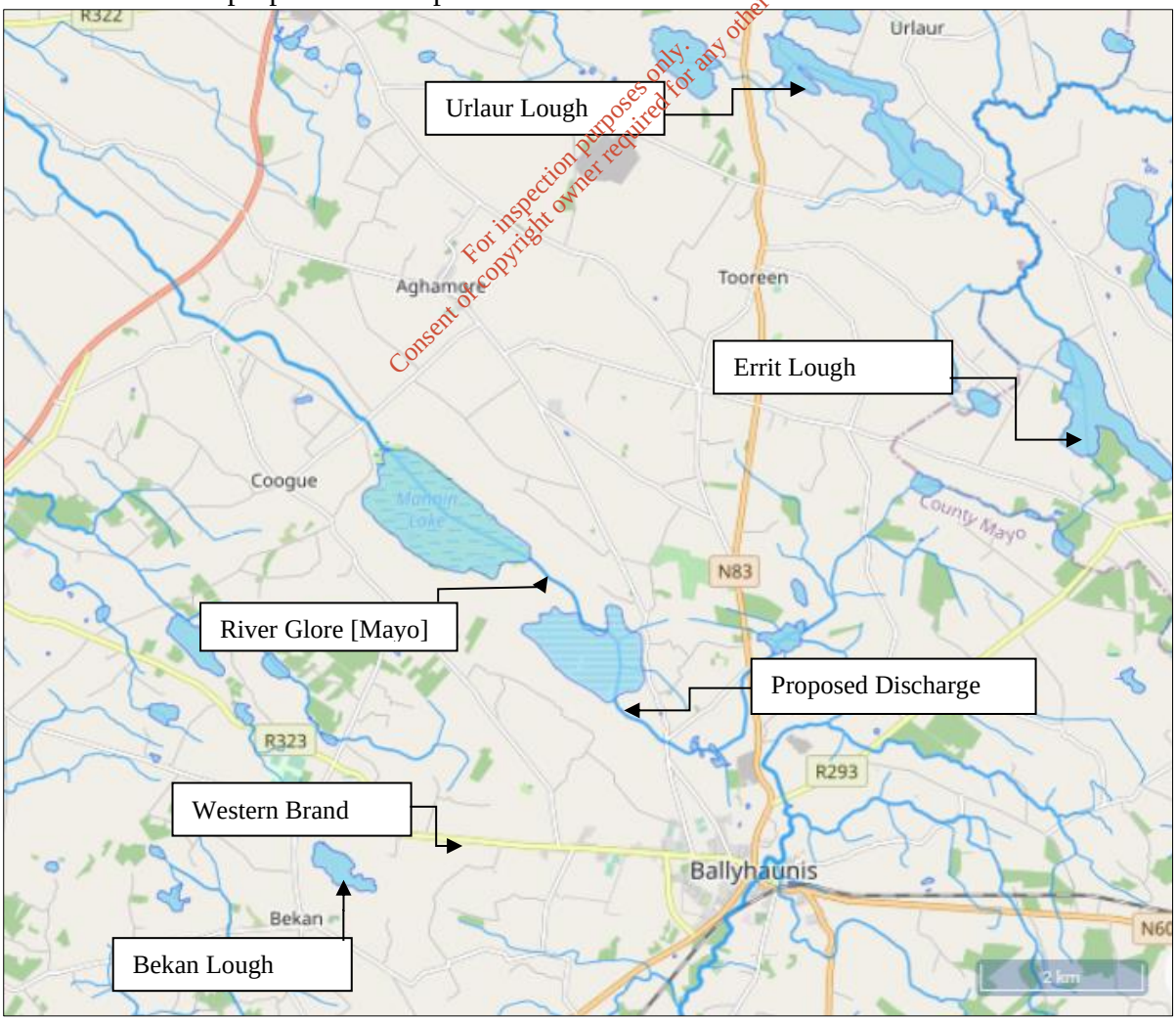

Figure 4.2.1: Rivers and lakes

The proposed rising main development would discharge treated effluent into the River Glore [Mayo]. It is noted that part of the River Glore [Mayo] is designated as part of the River Moy SAC (Site Code: 002298). There is also possible hydrological connectivity with Errit Lough SAC (Site Code: 000607), Urlaur Lakes SAC (Site Code: 001571) and Lough Corrib SAC (Site Code: 000297). The Conservation Objectives documents for both the River Moy SAC and Lough Corrib SAC show that water quality objectives have been set for certain qualifying interests, such as a Q3-4 (moderate status) for White-clawed Crayfish (*Austropotamobius pallipes*) and Q4 (good status) for Atlantic Salmon (*Salmo salar*). Further details are provided in Section 7 below. Objectives have been set for nutrients within both Errit Lough SAC and Urlaur Lakes SAC.

Table 4.2.1: Operational Monitoring Stations of the River Glore [Mayo]

ACTIVE STATION NO.	STATION LOCATION	EASTING	NORTHING	APPROX. LOCATION RELATIVE TO PROPOSED PIPELINE
RS34G020010	Bridge u/s Island Lough	148526	281153	730m upstream
RS34G020100	Bridge near Cloonfallagh	138997	289493	13.6km downstream
RS34G020200	Glore Bridge	135016	291784	19.40km downstream

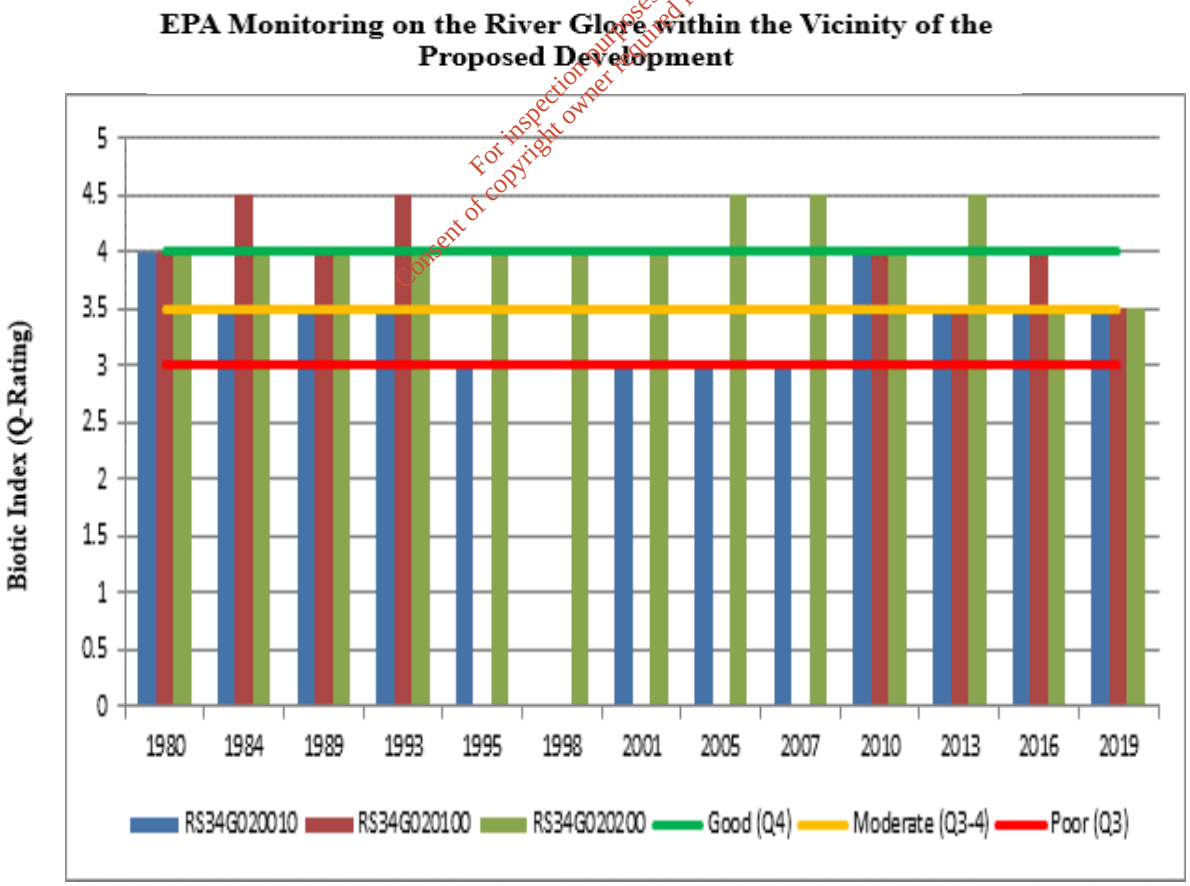

Figure 4.2.2: EPA Ecological Monitoring of the River Glore [Mayo] from 1980 – 2019

As can be seen in Figure 4.2.2 above, the River Glore [Mayo] was mainly achieving a water quality status of between Q3 (poor) and Q4-5 (high) at the monitoring locations (Table 4.2.1), with the status of all stations now at Q3-4 (moderate) in 2019. EPA comments on the most recent monitoring results for the River Glore [Mayo] are as follows; *"The Glore (Mayo) is a calcifying river with extensive carbonate deposits in its lower reaches in particular. Many Irish rivers draining karstic geology become saturated with calcium which precipitates again owing to the biogenic activity of filamentous cyanobacteria, in part. However, periphyton assemblages in the Glore contrast with those of midland rivers where 'Phormidium incrustatum' calcification can be more extensive. Its macroalgal and diatom flora is intermediate between this latter type and those described from the Caher River in Co. Clare. Based on its invertebrate community the Glore was unsatisfactory at all three stations in 2019 because sensitive taxa were formerly encountered at higher densities in some less compacted reaches.*"

5.0 NATURA 2000 SITES

In assessing the zone of influence of this project upon European sites, the following factors must be considered:

- Potential impacts arising from the project
- The location and nature of European sites
- Pathways between the development and European sites

There is no standard radius that can be used to select which European sites are to be analysed. This can only be determined by looking at the zone of influence of the project at hand. A rule of thumb often used is to include all European sites within a distance of 15km. There are no Special Protection Area (SPA) sites within 15km of the proposed development. Nine Special Area of Conservation (SAC) sites occur within 15km of the proposed development and are shown in the following table:

SITE NAME	SITE CODE	DISTANCE TO PROPOSED DEVELOPMENT
River Moy SAC	002298	Adjacent the SAC
Errit Lough SAC	000607	6.4km N-E
Urlaur Lakes SAC	001571	7.5km N-E
Carrowbehy / Caher Bog SAC	000597	8km N-E
Lough Corrib SAC	000297	8.1km S
Derrinea Bog SAC	000604	9km N-E
Drumalough Bog SAC	002338	10.7km N-E
Coolcam Turlough SAC	000218	13.5km S-E
Cloonchambers Bog SAC	000600	13km E

Maps detailing Natura 2000 sites within 2km and 15km of the proposed site are included as Appendix A below.

For this assessment, the SAC site considered to be within the potential zone of influence of the proposed development is the River Moy SAC (Site Code: 002298), due to hydrological

connectivity and distance. While there are no watercourses within the immediate vicinity of the proposed development site which drain to the Corrib catchment, in which Lough Corrib SAC (Site Code:000297) is located, given that the proposed development site is located in a karst area, the nature of groundwater flow can be unpredictable. Therefore, there may be a potential hydrological connection to Lough Corrib SAC and also possibly to Urlaur Lakes SAC (Site Code: 001571) and Errit Lough SAC (Site Code: 000607).

The proposed development is not located within the same river catchment as the following SAC sites: Carrowbehy / Caher Bog SAC (Site Code: 000597), Derrinea Bog SAC (Site Code: 000604), Drumalough Bog SAC (Site Code: 002338), Coolcam Turlough SAC (Site Code: 000218) or Cloonchambers Bog SAC (Site Code: 000600). Therefore, in the absence of a source-pathway-receptor relationship, and given the distances from the development, these sites have been screened out.

Therefore, for this assessment, taking into consideration the scale of the proposed development, distances to designated sites and hydrological connectivity, the sites considered to be within the zone of influence of the proposed development are the River Moy SAC (Site Code: 002298), Errit Lough SAC (Site Code: 000607), Urlaur Lakes SAC (Site Code: 001571) and Lough Corrib SAC (Site Code: 000297).

5.1 RIVER MOY SAC (002298)

This SAC comprises almost the entire freshwater element of the River Moy and its tributaries including both Loughs Conn and Cullin. Apart from the Moy itself, other rivers included within the site are the Deel, Bar Deela, Castlehill, Addergoole, Clydagh and Manulla on the west side, and the Glenree, Yellow, Strade, Gweestion, Trimogue, Sonnagh, Mullaghanoe, Owengarve, Eighnagh and Owenaher on the east side. The site is a Special Area of Conservation (SAC) selected for the following habitats and species listed on Annex I and Annex II of the E.U. Habitats Directive:

ANNEX I HABITATS	
CODE	**DESCRIPTION**
7110	Raised Bog (Active)*
7120	Degraded Raised Bog
7150	Rhynchosporion Vegetation
7230	Alkaline Fens
91A0	Old Oak Woodlands
91E0	Alluvial Forests*

** denotes a priority habitat*

ANNEX II SPECIES		
CODE	**COMMON NAME**	**SCIENTIFIC NAME**
1092	White-clawed Crayfish	*Austropotamobius pallipes*
1095	Sea Lamprey	*Petromyzon marinus*
1096	Brook Lamprey	*Lampetra planeri*
1106	Atlantic Salmon	*Salmo salar*
1355	Otter	*Lutra lutra*

An excerpt from the Natura 2000 Data Form for the River Moy SAC is included below, while further details are available within the site's site synopsis (NPWS, 2014).

"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 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, 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… Water quality of the river channels is generally good, and the majority is classified as unpolluted. The open waters of Loughs Conn and Cullin are moderately hard with relatively low colour and good transparency. Lough Conn is classified as a mesotrophic system, while Lough Cullin is classified as an oligotrophic system. The rivers and lakes support important populations of Otter, White-clawed Crayfish, Brook Lamprey and Sea Lamprey. The Moy system is one of the most important in Ireland for Atlantic Salmon and is an internationally renowned fishery. It also has important stocks of Brown Trout (*Salmo trutta*). Lough Conn supports a nationally important population of Greenland White-fronted Goose (*Anser albifrons flavirostris*) and has regionally important numbers of Whooper Swan (*Cygnus cynus*) and Golden Plover (*Pluvialis apricaria*) (all Annex I Bird Directive species). The lakes support a range of other wintering waterfowl, notably nationally important populations of Tufted Duck (*Aythya fuligula*) and Goldeneye (*Bucephala clangula*). Lough Conn / Cullin represents one of only 4 breeding sites in Ireland for Common Scoter (*Melanitta nigra*), range of mammals listed in the Red Data Book occur within the site, including Pine Marten (*Martes martes*) and Daubenton's Bat (*Myotis daubentonii*). At least five Red Data Book plant species occur, including Narrow-leaved Helleborine (*Cephalanthera longifolia*) and Irish Lady's-tresses (*Spiranthes romanzoffiana*)."

The main site vulnerabilities, including any key pressures or trends within and around the SAC that have been identified as impacting upon the site, may be summarised as agricultural intensification, forest planting on open ground, use of fertilisers (forestry), diffuse pollution to surface waters due to agricultural and forestry activities and invasive non-native species.

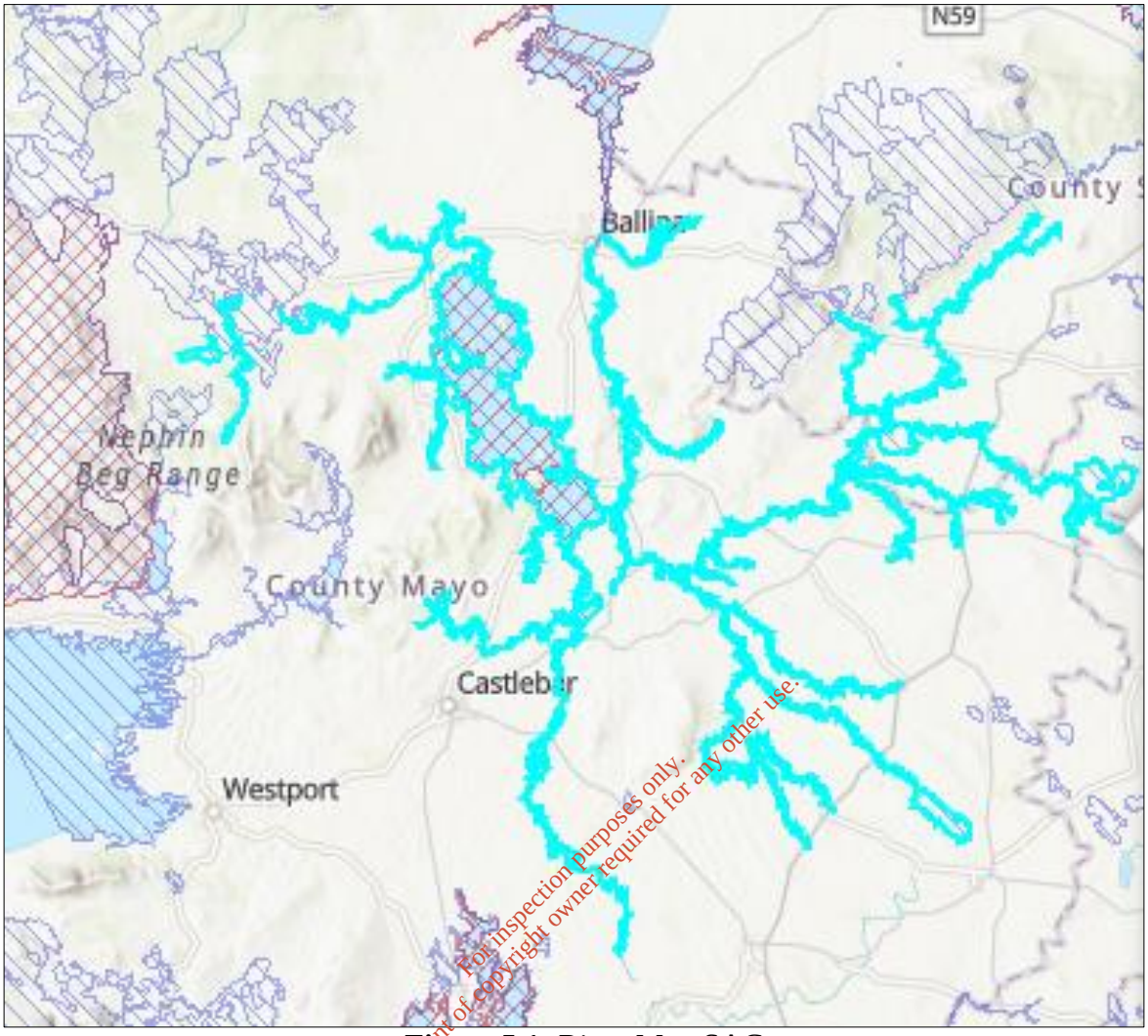

Figure 5.1: River Moy SAC

River Moy SAC Conservation Objectives

The Habitats Directive requires the Appropriate Assessment process to assess the potential impacts of the development "in *view of the site's conservation objectives*". Site specific conservation objectives (SSCOs) for the qualifying interests of the River Moy SAC are provided in the table below, where available from the NPWS document "*Conservation Objectives: River Moy SAC 002298*" (NPWS, 2016).

ATTRIBUTE	MEASURE	TARGET
[7110] Raised Bog (Active)		
Habitat area	Hectares	Restore area of active raised bog to 132.4ha, subject to natural processes
Habitat distribution	Occurrence	Restore the distribution and variability of active raised bog across the SAC.
High bog area	Hectares	No decline in extent of high bog necessary to support the development and maintenance of active raised bog.
Hydrological regime: water levels	Centimetres	Restore appropriate water levels throughout the site
Hydrological regime: flow patterns	Flow direction; slope	Restore, where possible, appropriate high bog topography, flow directions and slopes.
Transitional areas between high bog and adjacent mineral soils (including cutover areas)	Hectares; distribution	Restore adequate transitional areas to support/protect active raised bog and the services it provides
Vegetation quality: central ecotope, active flush, soaks, bog woodland	Hectares	Restore 66.2ha of central ecotope/active flush/soaks/bog woodland as appropriate
Vegetation quality: microtopographical features	Hectares	Restore adequate cover of high quality microtopographical features
Vegetation quality: bog moss (*Sphagnum*) species	Percentage cover	Restore adequate cover of bog moss (*Sphagnum*) species to ensure peatforming capacity
Typical ARB species: flora	Occurrence	Restore, where appropriate, typical active raised bog flora
Typical ARB species: fauna	Occurrence	Restore, where appropriate, typical active raised bog fauna
Elements of local distinctiveness	Occurrence	Maintain features of local distinctiveness, subject to natural processes
Negative physical indicators	Percentage cover	Negative physical features absent or insignificant
Vegetation composition: native negative indicator species	Percentage cover	Native negative indicator species at insignificant levels
Vegetation composition: non-native invasive species	Percentage cover	Non-native invasive species at insignificant levels and not more than 1% cover
Air quality: nitrogen deposition	kg N/ha/year	Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr
Water quality	Hydrochemical measures	Water quality on the high bog and in transitional areas close to natural reference conditions
[7120] Degraded Raised Bog		
The long-term aim for Degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) and a separate conservation objective has not been set in River Moy SAC		
[7150] Rhynchosporion Vegetation		
Depressions on peat substrates of the Rhynchosporion is an integral part of good quality Active raised bogs (7110) and thus a separate conservation objective has not been set for the habitat in River Moy SAC		
[7230] Alkaline Fens		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes

ATTRIBUTE	MEASURE	TARGET
Hydrological regime	Metres	Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat
Peat formation	Flood duration	Active peat formation, where appropriate
Water quality: nutrients	Water chemistry measures	Appropriate water quality to support the natural structure and functioning of the habitat
Vegetation structure: typical species	Percentage	Maintain vegetation cover of typical species including brown mosses and vascular plants
Vegetation composition: trees and shrubs	Percentage	Cover of scattered native trees and shrubs less than 10%
Physical structure: disturbed bare ground	Percentage	Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%
Physical structure: drainage	Percentage	Areas showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%
[91A0] Old Oak Woodlands		
Habitat area	Hectares	Area stable or increasing, subject to natural processes.
Habitat distribution	Occurrence	No decline.
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter
Woodland structure: veteran trees	Number per hectare	No decline
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens*)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control
[91E0] Alluvial Forests		
Habitat area	Hectares	Area stable or increasing, subject to natural processes.
Habitat distribution	Occurrence	No decline.

ATTRIBUTE	MEASURE	TARGET
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy
Hydrological regime: Flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least $30m^3$/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)
Woodland structure: veteran trees	Number per hectare	No decline
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including alder (*Alnus glutinosa*), willows (*Salix* spp), oak (*Quercus robur*) and ash (*Fraxinus excelsior*)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control
[1092] White-clawed Crayfish		
Distribution	Occurrence	No reduction from baseline.
Population structure: recruitment	Occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in all occupied tributaries
Negative indicator species	Occurrence	No alien crayfish species
Disease	Occurrence	No instances of disease
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality
[1095] Sea Lamprey		
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary
Population structure of juveniles	Number of age/size groups	At least three age/size groups present
Juvenile density in fine sediment	Juveniles/m^2	Juvenile density at least 1/m^2
Extent and distribution of spawning habitat	m^2 and occurrence	No decline in extent and distribution of spawning beds

ATTRIBUTE	MEASURE	TARGET
Availability of juvenile habitat	No. of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive
[1096] Brook Lamprey		
Distribution: extent of anadromy	% of river accessible	Access to all water courses down to first order streams
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	No. of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive
[1106] Atlantic Salmon		
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling
Out-migrating smolt abundance	Number	No significant decline
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA
[1355] Otter		
Distribution	% positive survey sites	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 1068.8ha
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 479.4km
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 1248.2ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
Barriers to connectivity	Number	No significant increase

River Moy SAC Conservation Status

According to the Habitat's Directive, favourable conservation status of a habitat is achieved when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined below.

According to the Habitat's Directive, favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation statuses for the qualifying interests for the River Moy SAC are outlined below.

CODE	QUALIFYING INTEREST	CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
7110	Raised Bogs (Active)	Bad	Reduced
7120	Degraded Raised Bog	Bad	Reduced
7150	Rhynchosporion Vegetation	Bad	Reduced
7230	Alkaline Fens	Bad	Good
91A0	Old Oak Woodlands	Bad	Good
91E0	Alluvial Forests	Bad	Good
1092	White-clawed Crayfish	Bad	Excellent
1095	Sea Lamprey	Bad	Excellent
1096	Brook Lamprey	Favourable	Reduced
1106	Atlantic Salmon	Inadequate	Excellent
1355	Otter	Favourable	Excellent

**Sourced from the Status of EU Protected Habitats and Species in Ireland (NPWS, 2019b and 2019c)*
***Sourced from NPWS (2017)*

5.2 LOUGH CORRIB SAC (000297)

Lough Corrib is the second largest lake in Ireland. The lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north. The surrounding lands to the south and east are mostly pastoral farmland, while bog and heath predominate to the west and north. A number of rivers are included within the SAC including the Clare, Grange, Abbert, Sinking, Dalgan and Black to the east, and the Cong, Bealanabrack, Failmore, Cornamona, Drimneen and Owenriff to the west. In addition to the rivers and lake basin, adjoining areas of conservation interest, including raised bog, woodland, grassland and limestone pavement, have been incorporated into the site. The site is a Special Area of Conservation (SAC) selected for the following habitats and species listed on Annex I and Annex II of the E.U. Habitats Directive:

ANNEX I HABITATS	
CODE	**DESCRIPTION**
3110	Oligotrophic Waters containing very few minerals
3130	Oligotrophic to Mesotrophic Standing Waters
3140	Hard Water Lakes
3260	Floating River Vegetation
6210	Orchid-rich Calcareous Grassland*
6410	Molinia Meadows
7110	Raised Bog (Active)*
7120	Degraded Raised Bog
7150	Rhynchosporion Vegetation
7210	Cladium Fens*
7220	Petrifying Springs*
7230	Alkaline Fens
8240	Limestone Pavement*
91A0	Old Oak Woodlands
91D0	Bog Woodland*

* *denotes a priority habitat*

ANNEX II SPECIES		
CODE	**COMMON NAME**	**SCIENTIFIC NAME**
1029	Freshwater Pearl Mussel	*Margaritifera margaritifera*
1092	White-clawed Crayfish	*Austropotamobius pallipes*
1095	Sea Lamprey	*Petromyzon marinus*
1096	Brook Lamprey	*Lampetra planeri*
1106	Atlantic Salmon	*Salmo salar*
1303	Lesser Horseshoe Bat	*Rhinolophus hipposideros*
1355	Otter	*Lutra lutra*
1393	Slender Green Feather-moss	*Drepanocladus vernicosus*
1833	Slender Naiad	*Najas flexilis*

An excerpt from the Natura 2000 Data Form for the Lough Corrib SAC is included below, while further details are available within the site's site synopsis (NPWS, 2015).

"Lough Corrib is situated directly north of Galway city and is the second largest lake in Ireland. The lake supports extensive Chara beds, many wooded islands and large areas of swamp and fen in the shallow south-east section which lies on limestone. The north-west part is deeper, wider and more oligotrophic. Shore is mainly karst, bog and small areas of callow. The surroundings are farmland and holiday-home areas. Most of the main rivers and their tributaries which flow into the lake are included within the site, including the Abbert, Clare, Cong, Cornamona, Dalgan, Drimeen, Grange, Owenwee, Owenriff and Sinking rivers. The River Corrib flows from the southern point of the lough into the sea at Galway city.

The site is of immense importance for the occurrence of scarce and specialised habitats, as well as animal and plant species. Lough Corrib is the second largest oligotrophic lake in the country and is a superb example of a hardwater system. The site holds 14 Annex I habitats, 6 of these are priority Annex I habitats of the EU Habitats Directive, 5 Red Data Book plant species, also Slender Green Feather-moss and Otter, and a rare chironomid *Corynorera ambigua*, good populations of Freshwater Pearl Mussel, White-clawed Crayfish, Sea Lamprey and Brook Lamprey. The site also supports an important population of Atlantic Salmon. Important for wintering and breeding birds with Greenland White-fronted Goose (*Anser albifrons flavirostris*), Common Tern (*Sterna hirundo*) and Arctic Tern (*Sterna paradise*)."

The main site vulnerabilities, including any key pressures or trends within and around the SAC that have been identified as impacting upon the site, may be summarised as agricultural intensification, mechanical removal of peat, human intrusions and disturbances, diffuse pollution to surface waters due to household sewage and waste and invasive species.

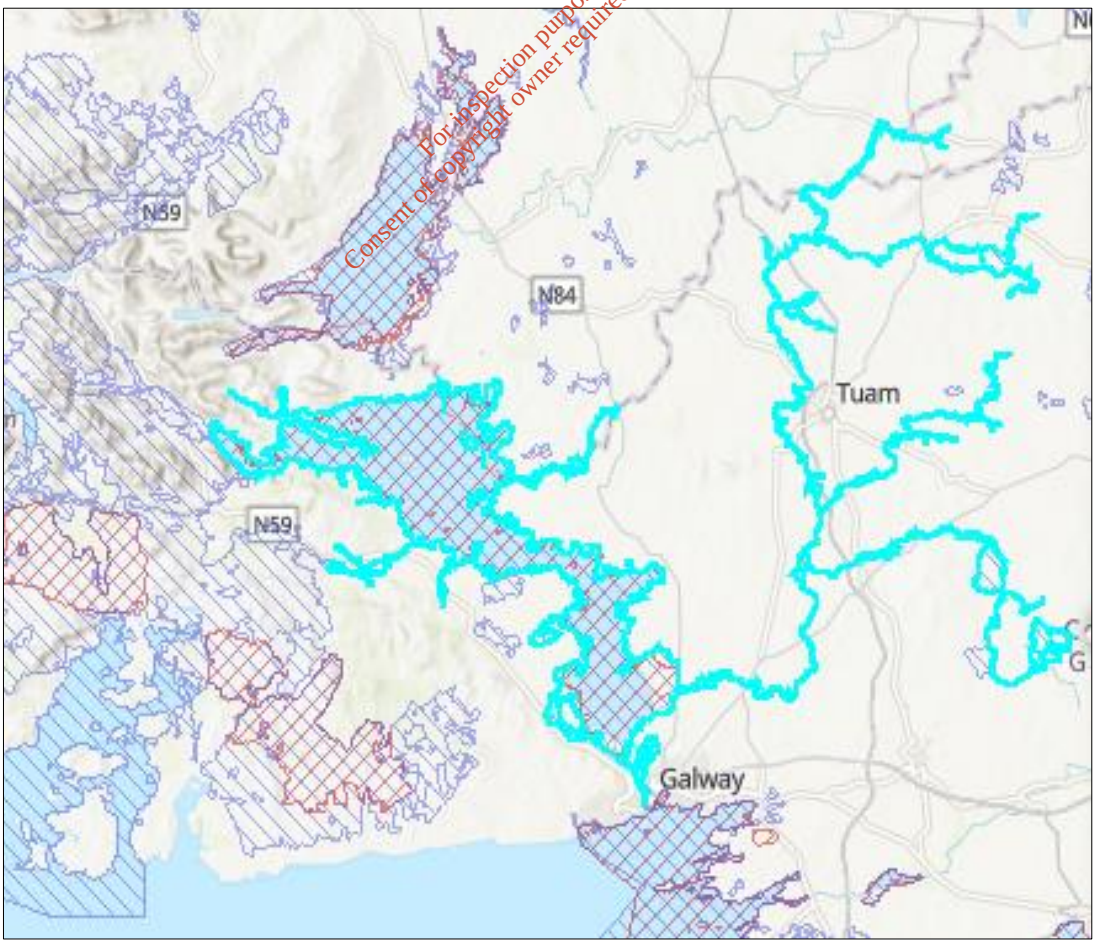

Figure 5.2: Lough Corrib SAC

Lough Corrib SAC Conservation Objectives

The Habitats Directive requires the Appropriate Assessment process to assess the potential impacts of the development "in *view of the site's conservation objectives*". Site specific conservation objectives (SSCOs) for the qualifying interests of the Lough Corrib SAC are provided in the table below, where available from the NPWS document "*Conservation Objectives: Lough Corrib SAC 000297*" (NPWS, 2017).

ATTRIBUTE	MEASURE	TARGET
[3110] Oligotrophic Waters containing very few minerals		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition
Vegetation distribution: max. depth	Metres	Restore maximum depth of vegetation, subject to natural processes
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat
Lake substratum quality	Various	Restore appropriate substratum type, extent and chemistry to support the vegetation
Water quality: transparency	Metres	Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency
Water quality: nutrients	µg/l P; mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species
Water quality: phytoplankton biomass	µg/l Chlorophyll a	Restore appropriate water quality to support the habitat, including high chlorophyll a status
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric	Maintain high macrophyte status
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes
Water colour	mg/l PtCo	Restore/maintain appropriate water colour to support the habitat
Dissolved organic carbon (DOC)	mg/l	Restore/maintain appropriate organic carbon levels to support the habitat
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Restore/maintain appropriate turbidity to support the habitat
Fringing habitat : area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110
[3130] Oligotrophic to Mesotrophic Standing Waters		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition
Vegetation distribution: max depth	Metres	Restore maximum depth of vegetation, subject to natural processes

ATTRIBUTE	MEASURE	TARGET
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat
Lake substratum quality	Various	Restore appropriate substratum type, extent and chemistry to support the vegetation
Water quality: transparency	Metres	Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency
Water quality: nutrients	µg/l P; mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species
Water quality: phytoplankton biomass	µg/l Chlorophyll a	Restore appropriate water quality to support the habitat, including high chlorophyll a status
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric	Maintain high macrophyte status
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes
Water colour	mg/l PtCo	Restore/maintain appropriate water colour to support the habitat
Dissolved organic carbon (DOC)	mg/l	Restore/maintain appropriate organic carbon levels to support the habitat
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Restore/maintain appropriate turbidity to support the habitat
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3130
[3140] Hard Water Lakes		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition
Vegetation distribution: max. depth	Metres	Restore maximum depth of vegetation, subject to natural processes
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat
Lake substratum quality	Various	Restore appropriate substratum type, extent and chemistry to support the vegetation
Water quality: transparency	Metres	Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency
Water quality: nutrients	µg/l P; mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species
Water quality: phytoplankton biomass	µg/l Chlorophyll a	Maintain appropriate water quality to support the habitat, including high chlorophyll a status

ATTRIBUTE	MEASURE	TARGET
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric	Restore high macrophyte status
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes
Water colour	mg/l PtCo	Restore/maintain appropriate water colour to support the habitat
Dissolved organic carbon (DOC)	mg/l	Restore/maintain appropriate organic carbon levels to support the habitat
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate unit	Restore/maintain appropriate turbidity to support the habitat
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3140
[3260] Floating River Vegetation		
Habitat area	Kilometres	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes
Hydrological regime: groundwater discharge	Metres per second	Maintain appropriate hydrological regimes
Substratum composition: particle size range	Millimetres	Maintain appropriate substratum particle size range, quantity and quality, subject to natural process
Water quality	Various	Maintain appropriate water quality to support the natural structure and functioning of the habitat
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition
Floodplain connectivity: area	Hectares	The area of active floodplain at and upstream of the habitat should be maintained
Riparian habitat: area	Hectares	Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types
[6210] Orchid-rich Calcareous Grassland		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Vegetation composition: typical species	Number at a representative number of monitoring stops	At least seven positive indicator species present, including two "high quality" species
Vegetation composition: negative indicator species	Percentage at a representative number of monitoring stops	Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%
Vegetation composition: non-native species	Percentage at a representative number of monitoring stops	Cover of non-native species not more than 1%

ATTRIBUTE	MEASURE	TARGET
Vegetation composition: woody species and bracken	Percentage at a representative number of monitoring stops	Cover of woody species (except certain listed species) and bracken (Pteridium aquilinum) not more than 5% cover
Vegetation structure: broadleaf herb: grass ratio	Percentage at a representative number of monitoring stops	Broadleaf herb component of vegetation between 40% and 90%
Vegetation structure: sward height	Percentage at a representative number of monitoring stops	At least 30% of sward between 5cm and 40cm tall
Vegetation structure: litter	Percentage at a representative number of monitoring stops	Litter cover not more than 25%
Physical structure: bare soil	Percentage at a representative number of monitoring stops	Not more than 10% bare soil
Physical structure: disturbance	Square metres	Area showing signs of serious grazing or other disturbance less than 20m²
[6410] Molinia Meadows		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Vegetation composition: typical species	Number at a representative number of monitoring stops	At least seven positive indicator species present, including one "high quality" species
Vegetation composition: negative indicator species	Percentage at a representative number of monitoring stops	Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%
Vegetation composition: non-native species	Percentage at a representative number of monitoring stops	Cover of non-native species not more than 1%
Vegetation composition: moss species	Percentage at a representative number of monitoring stops	Hair mosses (*Polytrichum spp*.) not more than 25% cover
Vegetation structure: woody species and bracken	Percentage at a representative number of monitoring stops	Cover of woody species and bracken (*Pteridium aquilinum*) not more than 5%
Vegetation structure: broadleaf herb: grass ratio	Percentage at a representative number of monitoring stops	Broadleaf herb component of vegetation between 40% and 90%
Vegetation structure: sward height	Percentage at a representative number of monitoring stops	At least 30% of sward between 10cm and 80cm tall
Vegetation structure: litter	Percentage at a representative number of monitoring stops	Litter cover not more than 25%
Physical structure: bare soil	Percentage at a representative number of monitoring stops	Not more than 10% bare soil
Physical structure: disturbance	Square metres	Area showing signs of serious grazing or other disturbance less than 20m²
[7110] Raised Bog (Active)		
Habitat area	Hectares	Restore area of active raised bog to 78.8ha, subject to natural processes
Habitat distribution	Occurrence	Restore the distribution and variability of active raised bog across the SAC.
High bog area	Hectares	No decline in extent of high bog subject to the conservation requirements of the SAC

ATTRIBUTE	MEASURE	TARGET
Hydrological regime: water levels	Centimetres	Restore appropriate water levels throughout each site
Hydrological regime: flow patterns	Flow direction; slope	Restore, where possible, appropriate high bog topography, flow directions and slopes.
Transitional areas between high bog and adjacent mineral soils (including cutover areas)	Hectares; distribution	Restore adequate transitional areas to support/protect active raised bog and the services it provides
Vegetation quality: central ecotope, active flush, soaks, bog woodland	Hectares	Restore 39.4ha of central ecotope/active flush/soaks/bog woodland as appropriate
Vegetation quality: microtopographical features	Hectares	Restore adequate cover of high quality microtopographical features
Vegetation quality: bog moss (*Sphagnum)* species	Percentage cover	Restore adequate cover of bog moss (*Sphagnum*) species to ensure peatforming capacity
Typical ARB species: flora	Occurrence	Restore, where appropriate, typical active raised bog flora
Typical ARB species: fauna	Occurrence	Restore, where appropriate, typical active raised bog fauna
Elements of local distinctiveness	Occurrence	Maintain features of local distinctiveness, subject to natural processes
Negative physical indicators	Percentage cover	Negative physical features absent or insignificant
Vegetation composition: native negative indicator species	Percentage cover	Native negative indicator species at insignificant levels
Vegetation composition: non-native invasive species	Percentage cover	Non-native invasive species at insignificant levels and not more than 1% cover
Air quality: nitrogen deposition	kg N/ha/year	Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr
Water quality	Hydrochemical measures	Water quality on the high bog and in transitional areas close to natural reference conditions
[7120] Degraded Raised Bog		
The long-term aim for Degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) and a separate conservation objective has not been set in Lough Corrib SAC		
[7150] Rhynchosporion Vegetation		
Depressions on peat substrates of the Rhynchosporion is an integral part of good quality Active raised bogs (7110) and thus a separate conservation objective has not been set for the habitat in Lough Corrib SAC		
[7210] Cladium Fens		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Ecosystem function: hydrology	Metres	Maintain appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat
Ecosystem function: peat formation	Flood duration	Maintain active peat formation, where appropriate
Ecosystem function: water quality	Water chemistry measures	Maintain appropriate water quality, particularly nutrient levels, to support the natural structure and functioning of the habitat

ATTRIBUTE	MEASURE	TARGET
Vegetation structure: typical species	Presence	Maintain vegetation cover of typical species including brown mosses and vascular plants
Vegetation composition: non-native species	% cover at, and in local vicinity of, a representative no. of 2m x 2m monitoring stops	Cover of non-native species less than 1%
Vegetation composition: trees and shrubs	% cover in local vicinity of a representative no. of monitoring stops	Cover of scattered native trees and shrubs less than 10%
Physical structure: disturbed bare ground	% cover at, and in local vicinity of, a representative no. of 2m x 2m monitoring stops	Cover of disturbed bare ground not more than 10%. Where tufa is present, disturbed bare ground not more than 1%
Physical structure: drainage	% area in local vicinity of a representative no. of monitoring stops	Areas showing signs of drainage as a result of drainage ditches or heavy trampling not more than 10%
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat
[7220] Petrifying Springs		
Habitat area	Square metres	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes
Water quality - nitrate level	mg/l	No increase from baseline nitrate level and less than 10mg/l
Water quality - phosphate level	µg/l	No increase from baseline phosphate level and less than 15µg/l
Vegetation composition: positive indicator species	Number per spring	At least three positive/high quality indicator species as listed in Lyons and Kelly (2016) and no loss from baseline number
Vegetation composition: negative indicator species	Cover (DAFOR scale)	Potentially negative indicator species should not be Dominant or Abundant; invasive species should be absent
Vegetation structure: sward height	Centimetres	Field layer height between 10cm and 50cm (except for bryophyte-dominated ground
Physical structure: trampling/dung	Cover (DAFOR scale)	Cover should not be Dominant or Abundant
[7230] Alkaline Fens		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Ecosystem function: soil nutrients	Soil pH & appropriate nutrient levels at a representative no. of monitoring stops	Maintain soil nutrient status within natural range
Ecosystem function: peat formation	Flood duration	Maintain active peat formation, where appropriate
Ecosystem function: hydrology	Metres	Maintain appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat

ATTRIBUTE	MEASURE	TARGET
Ecosystem function: water quality	Water chemistry measures	Maintain appropriate water quality, particularly nutrient levels, to support the natural structure and functioning of the habitat
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes
Vegetation composition: number of positive indicator species (brown mosses)	Number of species at a representative number of 2m x 2m monitoring stops	Number of brown moss species present at each monitoring stop is at least one
Vegetation composition: number of positive indicator species (vascular plants)	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive vascular plant indicator species present at each monitoring stop is at least two for small-sedge flushes and at least three for black bog-rush (*Schoenus nigricans*) flush and bottle sedge (*Carex rostrata*) fen
Vegetation composition: cover of positive indicator species	% cover at a representative number of 2m x 2m monitoring stops	Total cover of brown moss species and positive vascular plant indicator species at least 20% for small-sedge flushes and at least 75% cover for black bog-rush (*Schoenus nigricans*) flush and bottle sedge (*Carex rostrata*) fen
Vegetation composition: negative indicator species	% cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%
Vegetation composition: non-native species	% cover at, and in local vicinity of, a representative no. of 2m x 2m monitoring stops	Cover of non-native species less than 1%
Vegetation composition: native trees and shrubs	% cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%
Vegetation composition: soft rush and common reed cover	% cover in local vicinity of a representative number of monitoring stops	Total cover of soft rush (*Juncus effusus*) and common reed (*Phragmites australis*) less than 10%
Vegetation structure: height	% of leaves/shoots at a representative number of 2m x 2m monitoring stops	Proportion of live leaves and/or flowering shoots of vascular plants that are more than 5cm above the ground surface should be at least 50%
Physical structure: disturbed bare ground	% cover at, and in local vicinity of, a representative no. of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%
Physical structure: drainage	% area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%
Physical structure: tufa formations	% cover in local vicinity of a representative number of 2m x 2m monitoring stops	Disturbed proportion of vegetation cover where tufa is present is less than 1%

ATTRIBUTE	MEASURE	TARGET
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat
[8240] Limestone Pavement		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Distribution	Occurrence	No decline, subject to natural processes
Vegetation composition: typical species	Number at a representative number of monitoring stops	At least seven positive indicator species present
Vegetation composition: bryophyte layer	Percentage at a representative number of monitoring stops	Bryophyte cover at least 50% on wooded pavement
Vegetation composition: negative indicator species	Percentage at a representative number of monitoring stops	Collective cover of negative indicator species on exposed pavement not more than 1%
Vegetation composition: non-native species	Percentage at a representative number of monitoring stops	Cover of non-native species not more than 1% on exposed pavement; on wooded pavement not more than 10% with no regeneration
Vegetation composition: scrub	Percentage at a representative number of monitoring stops	Scrub cover no more than 25% of exposed pavement
Vegetation composition: bracken cover	Percentage at a representative number of monitoring stops	Bracken (*Pteridium aquilinum*) cover no more than 10% on exposed pavement
Vegetation structure: woodland canopy	Percentage at a representative number of monitoring stops	Canopy cover on wooded pavement at least 30%
Vegetation structure: dead wood	Occurrence in a representative number of monitoring stops	Sufficient quantity of dead wood on wooded pavement to provide habitat for saproxylic organisms
Physical structure: disturbance	Occurrence in a representative number of monitoring stops	No evidence of grazing pressure on wooded pavement
Indicators of local distinctiveness	Occurrence	Indicators of local distinctiveness are maintained
[91A0] Old Oak Woodlands		
Habitat area	Hectares	Area stable or increasing, subject to natural processes.
Habitat distribution	Occurrence	No decline.
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter

ATTRIBUTE	MEASURE	TARGET
Woodland structure: veteran trees	Number per hectare	No decline
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens*)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control
[91D0] Bog Woodland		
Habitat area	Hectares	Area stable or increasing, subject to natural processes. At least 1.22ha.
Habitat distribution	Occurrence	No decline, subject to natural processes.
Vegetation composition: positive indicator species	Number in a representative number of monitoring stops	of monitoring stops Birch (*Betula pubescens*), bog moss (*Sphagnum*) species and at least five other indicator species present
Vegetation composition: negative indicator species	% cover at a representative number of monitoring stops	Both native and non-native invasive species absent or under control. Total cover should be less than 10%
Woodland structure: cover and height of birch	% cover and metres at a representative number of monitoring stops	A minimum 30% cover of birch (*Betula pubescens*) with a median canopy height of 4m
Woodland structure: dwarf shrub cover	% cover at a representative number of monitoring stops	Dwarf shrub cover not more than 50%
Woodland structure: ling cover	% cover at a representative number of monitoring stops	Ling (*Calluna vulgaris*) cover not more than 40%
Woodland structure: bryophyte cover	% cover at a representative number of monitoring stops	Bryophyte cover at least 50%, with bog moss (*Sphagnum spp*.) cover at least 25%
Woodland structure: tree size classes	Occurrence	Each size class present
Woodland structure: senescent and dead wood	Occurrence	Senescent or dead wood present
[1029] Freshwater Pearl Mussel		
Distribution	Kilometres	Maintain at 9.1km
Population size	Number of adult mussels	Restore Owenriff population to at least one million adult mussels
Population structure: recruitment	Percentage per size class	Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length
Population structure: adult mortality	Percentage	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution
Suitable habitat: extent	Kilometres	Restore suitable habitat in more than 8.3km in the Owenriff and Glenawbeg rivers and any additional stretches necessary for salmonid spawning

ATTRIBUTE	MEASURE	TARGET
Suitable habitat: condition	Kilometres	Restore condition of suitable habitat
Water quality: macroinvertebrate and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality - macroinvertebrates: EQR greater than 0.90 (Q4-5 or Q5); phytobenthos: EQR greater than 0.93
Substratum quality: filamentous algae (macroalgae); macrophytes (rooted higher plants)	Percentage	Restore substratum quality - filamentous algae: absent or trace (less than 5%); macrophytes: absent or trace (less than 5%)
Substratum quality: sediment	Occurrence	Restore substratum quality - stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regimes
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the population
[1092] White-clawed Crayfish		
Distribution: rivers	Occurrence	No reduction from baseline.
Distribution: Lough Corrib	Occurrence	No reduction from baseline.
Population structure: recruitment	Occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in all occupied tributaries and occupied parts of Lough Corrib
Negative indicator species	Occurrence	No alien crayfish species
Disease	Occurrence	No instances of disease
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality
[1095] Sea Lamprey		
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary
Population structure of juveniles	Number of age/size groups	At least three age/size groups present
Juvenile density in fine sediment	Juveniles/m²	Juvenile density at least 1/m²
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	No. of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive, with a minimum of four positive sites in a catchment, which are at least 5km apart
[1096] Brook Lamprey		
Distribution: extent of anadromy	% of river accessible	Access to all water courses down to first order streams
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present
Juvenile density in fine sediment	Ammocoetes/m²	Mean catchment juvenile density of brook/river lamprey at least 5/m²

ATTRIBUTE	MEASURE	TARGET
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	No. of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive
[1106] Atlantic Salmon		
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling
Out-migrating smolt abundance	Number	No significant decline
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA
[1303] Lesser Horseshoe Bat		
Population per roost	Number	Minimum number of 100 bats for summer roost (roost id. 217 in NPWS database)
Summer roosts	Condition	No decline
Number of auxiliary roosts	Number and condition	No decline
Extent of potential foraging habitat	Hectares	No significant decline
Linear features	Kilometres	No significant loss, within 2.5km of qualifying roosts.
Light pollution	Lux	No significant increase in artificial light intensity adjacent to named roost or along commuting routes within 2.5km of the roost.
[1355] Otter		
Distribution	% positive survey sites	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 1,054ha along river banks/ lake shoreline/around ponds
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 314.2km
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 4,178ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
Barriers to connectivity	Number	No significant increase
[1393] Slender Green Feather-moss		
Distribution of populations	Number and geographical spread of populations	No decline, subject to natural processes
Population size	Number of individuals	No decline, subject to natural processes
Population cover	% cover in a representative no. of 2m x 2m monitoring plots	Mean percentage cover of slender green feather-moss (*Hamatocaulis vernicosus*) should be at least 45%

ATTRIBUTE	MEASURE	TARGET
Area of suitable habitat	Hectares	No decline, subject to natural processes
Hydrological conditions: water table level	Metres	Maintain suitable hydrological conditions
Vegetation composition: tree cover	% cover in a representative no. of 2m x 2m monitoring plots	Mean percentage tree cover should be less than 15%
Vegetation composition: shrub cover	% cover in a representative no. of 2m x 2m monitoring plots	Mean percentage shrub cover should be less than 20%
Vegetation composition: grass cover	% cover in a representative no. of 2m x 2m monitoring plots	Mean percentage grass species cover should be less than 25%
Vegetation composition: bryophyte cover	% cover in a representative no. of 2m x 2m monitoring plots	Mean percentage bryophyte cover should be more than 50%
Vegetation composition: cover of *Calliergonella cuspidata*	% cover in a representative no. of 2m x 2m monitoring plots	Mean percentage cover of *Calliergonella cuspidata* should be less than 15%
Vegetation structure: vegetation height	Centimetres in a representative no. 2m x 2m monitoring plots	Mean vegetation height should not exceed 40cm
[1833] Slender Naiad		
Population extent	Hectares; distribution	Restore the spatial extent of *Najas flexilis* within the lake, subject to natural processes
Population depth	Metres	Restore the depth range of *Najas flexilis* within the lake, subject to natural processes
Population viability	Plant traits	Restore plant fitness, subject to natural processes
Population abundance	Square metres	Restore the cover abundance of *Najas flexilis*, subject to natural processes
Species distribution	Occurrence	Restore to at least the north-western bay, subject to natural processes
Habitat extent	Hectares	Restore, subject to natural processes
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat for the species
Lake substratum quality	Various	Restore appropriate substratum type, extent and chemistry to support the population of the species
Water quality	Various	Restore appropriate water quality to support the population of the species
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the population of *Najas flexilis*, subject to natural processes
Water colour	mg/l PtCo	Restore/maintain appropriate water colour to support the population of *Najas flexilis*
Associated species	Species composition and abundance	Restore appropriate associated species and vegetation communities to support the population of *Najas flexilis*
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the population of *Najas flexilis*

Lough Corrib SAC Conservation Status

According to the Habitat's Directive, favourable conservation status of a habitat is achieved when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined below.

According to the Habitat's Directive, favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation statuses for the qualifying interests for Lough Corrib SAC are outlined below.

CODE	QUALIFYING INTEREST	CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
3110	Oligotrophic Waters containing very few minerals	Bad	Reduced
3130	Oligotrophic to Mesotrophic Standing Waters	Inadequate	Reduced
3140	Hard Water Lakes	Bad	Excellent
3260	Floating River Vegetation	Inadequate	Good
6210	Orchid-rich Calcareous Grassland*	Bad	Good
6410	Molinia Meadows	Bad	Good
7110	Raised Bog (Active)	Bad	Good
7120	Degraded Raised Bog	Bad	Reduced
7150	Rhynchosporion Vegetation	Bad	Reduced
7210	Cladium Fens*	Inadequate	Good
7220	Petrifying Springs*	Inadequate	Good
7230	Alkaline Fens	Bad	Good
8240	Limestone Pavement*	Inadequate	Good
91A0	Old Oak Woodlands	Bad	Good
91D0	Bog Woodland*	Favourable	Excellent
1029	Freshwater Pearl Mussel	Bad	Excellent
1092	White-clawed Crayfish	Bad	Excellent
1095	Sea Lamprey	Bad	Good

CODE	QUALIFYING INTEREST	CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
1096	Brook Lamprey	Favourable	Excellent
1106	Atlantic Salmon	Inadequate	Excellent
1303	Lesser Horseshoe Bat	Inadequate	Good
1355	Otter	Favourable	Excellent
1393	Slender Green Feather-moss	Favourable	Excellent
1833	Slender Naiad	Inadequate	Excellent

**Sourced from the Status of EU Protected Habitats and Species in Ireland (NPWS, 2019b and 2019c)*
***Sourced from NPWS (2017)*

5.3 URLAUR LAKES SAC (001571)

Urlaur Lakes SAC comprises three small hard water lakes - Lough Nanoge, Lough Roe and Urlaur Lough. They lie in the upper catchment of the Lung River, a major tributary of the Boyle River. The site is located approximately 10 km north of Ballyhaunis in Co. Mayo. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

ANNEX I HABITATS	
CODE	DESCRIPTION
3140	Hard Water Lakes

The conservation objectives for the SAC site are to maintain or restore the favourable conservation condition of the qualifying interests. An excerpt from the SAC's site synopsis is included below.

All three lakes at this site lie on marl. The aquatic flora is dominated by stoneworts (*Chara spp*.), but other aquatic species also occur, e.g. Canadian Waterweed (*Elodea canadensis*), Yellow and White Water-lilies (*Nuphar lutea* and *Nymphaea alba*), pondweeds (*Potamogeton spp*.) and Common Duckweed (*Lemna minor*). Land use practices within the site boundary are of low intensity. The shoreline may be accessible to grazers from the adjacent pasture. Some mechanical turf-cutting is ongoing in the areas of cut-away to the south-east of Urlaur Lough. The lakes provide an important local amenity for fishing and are well regarded by the local community. Input of organic wastes (slurry, fertiliser, etc.) would cause eutrophication and a reduction of the water quality of these lakes. Intensive drainage could also threaten this site. These three calcareous lakes are excellent examples of hard water lakes, a habitat listed on Annex I of the E.U. Habitats Directive. They contain a range of habitats and a good diversity of plant species, as well as providing breeding and feeding grounds for a range of wildfowl species. They are, in addition, an important and very scenic local amenity.

The main site vulnerabilities, including any key pressures or trends within and around the SAC that have been identified as impacting upon the site, may be summarised as agricultural intensification, mechanical removal of peat, human intrusions and disturbances, diffuse pollution to surface waters due to household sewage and waste and invasive species.

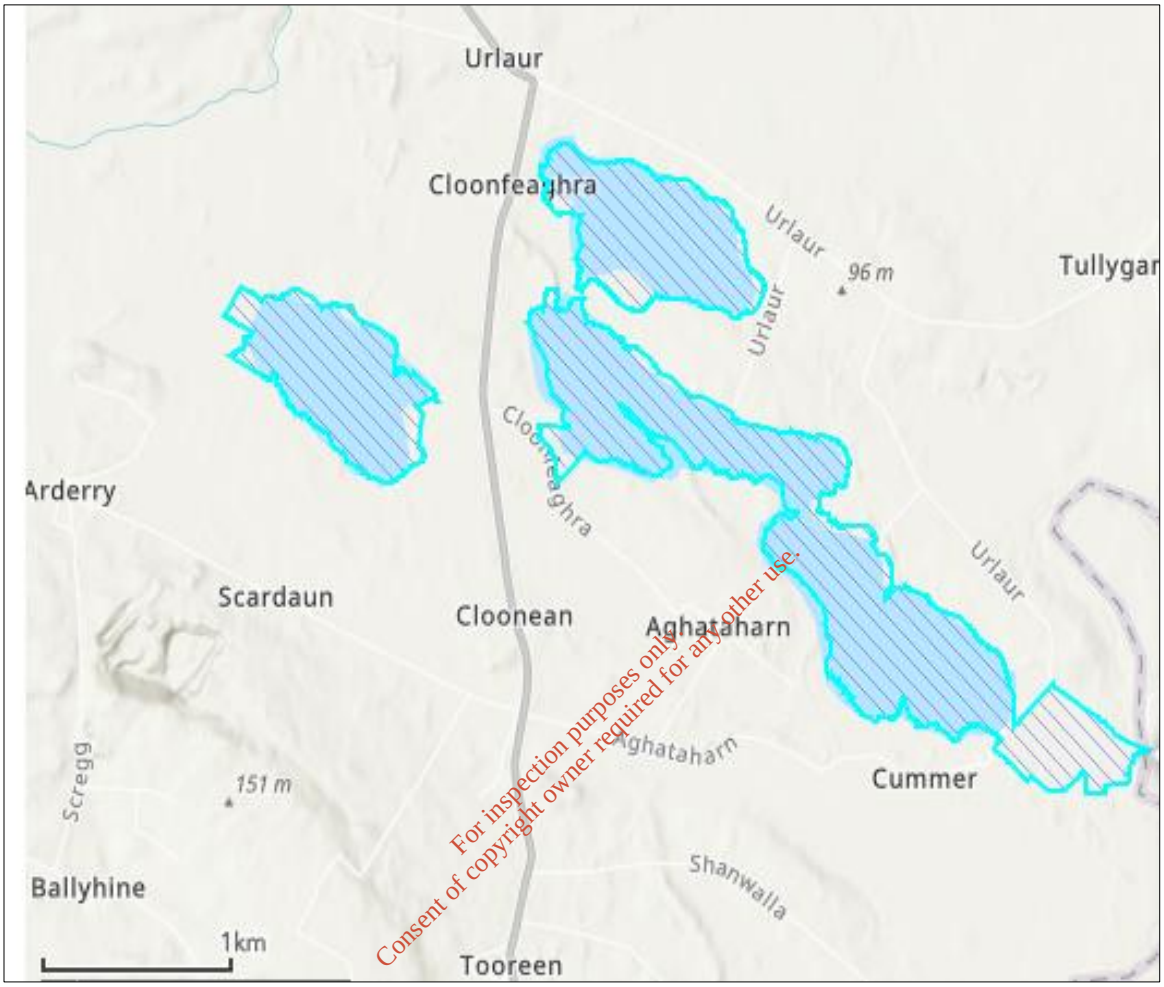

Figure 5.3: Urlaur Lakes SAC

Urlaur Lakes SAC Conservation Objectives

The Habitats Directive requires the Appropriate Assessment process to assess the potential impacts of the development "in *view of the site's conservation objectives*". Site specific conservation objectives (SSCOs) for the qualifying interests of the Urlaur Lakes SAC are provided in the table below, where available from the NPWS document "*Conservation Objectives: Urlaur Lakes SAC 001571*" (NPWS, 2018a).

ATTRIBUTE	MEASURE	TARGET
[3140] Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition
Vegetation distribution: max. depth	Metres	Restore maximum depth of vegetation, subject to natural processes
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat
Lake substratum quality	Various	Restore appropriate substratum type, extent and chemistry to support the vegetation
Water quality: transparency	Metres	Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency
Water quality: nutrients	µg/l P; mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species
Water quality: phytoplankton biomass	µg/l Chlorophyll a	Restore appropriate water quality to support the habitat, including high chlorophyll a status
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Restore appropriate water quality to support the habitat, including high phytoplankton composition status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain/restore trace/absent attached algal biomass (<5% cover) and high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric	Restore high macrophyte status
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes
Water colour	mg/l PtCo	Maintain/restore appropriate water colour to support the habitat
Dissolved organic carbon (DOC)	mg/l	Maintain/restore appropriate organic carbon levels to support the habitat
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3140

Urlaur Lakes SAC Conservation Status

According to the Habitat's Directive, favourable conservation status of a habitat is achieved when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined below.

According to the Habitat's Directive, favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation statuses for the qualifying interests for Urlaur Lakes SAC are outlined below.

CODE	QUALIFYING INTEREST	CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
3140	Hard Water Lakes	Bad	Good

**Sourced from the Status of EU Protected Habitats and Species in Ireland (NPWS, 2019b and 2019c)*
***Sourced from NPWS (2018a)*

5.4 ERRIT LOUGH SAC (000607)

Errit Lough is a hard water lake situated in the upper part of the Boyle River catchment, 10 km south-west of Ballaghderreen, Co. Roscommon. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

ANNEX I HABITATS	
CODE	DESCRIPTION
3140	Hard Water Lakes

The conservation objectives for the SAC site are to maintain or restore the favourable conservation condition of the qualifying interests. An excerpt from the SAC's site synopsis is included below.

The lake has exposed stony shores on the east side, and some sheltered bays on the west side with emergent species such as Common Club-rush (*Scirpus lacustris*) and Common Reed (*Phragmites australis*), and marginal vegetation of Bottle Sedge (*Carex rostrata*) and Common Spike-rush (*Eleocharis palustris*). The submerged vegetation of the lake has a typical zonation and is dominated by well-developed beds of stoneworts (*Chara spp*.). Stonewort species recorded from the site include *C. pedunculata, C. rudis, C. desmacantha* and *C. fragilis*. A sparse floating leaf zone dominated by Yellow Water-lily (*Nuphar lutea*) occurs in places. Errit Lough is situated in an area of intensive agriculture and is vulnerable to deterioration in water quality through farm pollution and neighbouring forestry activities. The site is of considerable conservation significance as an example of a hard water lake, a habitat that is listed on Annex I of the E.U. Habitats Directive.

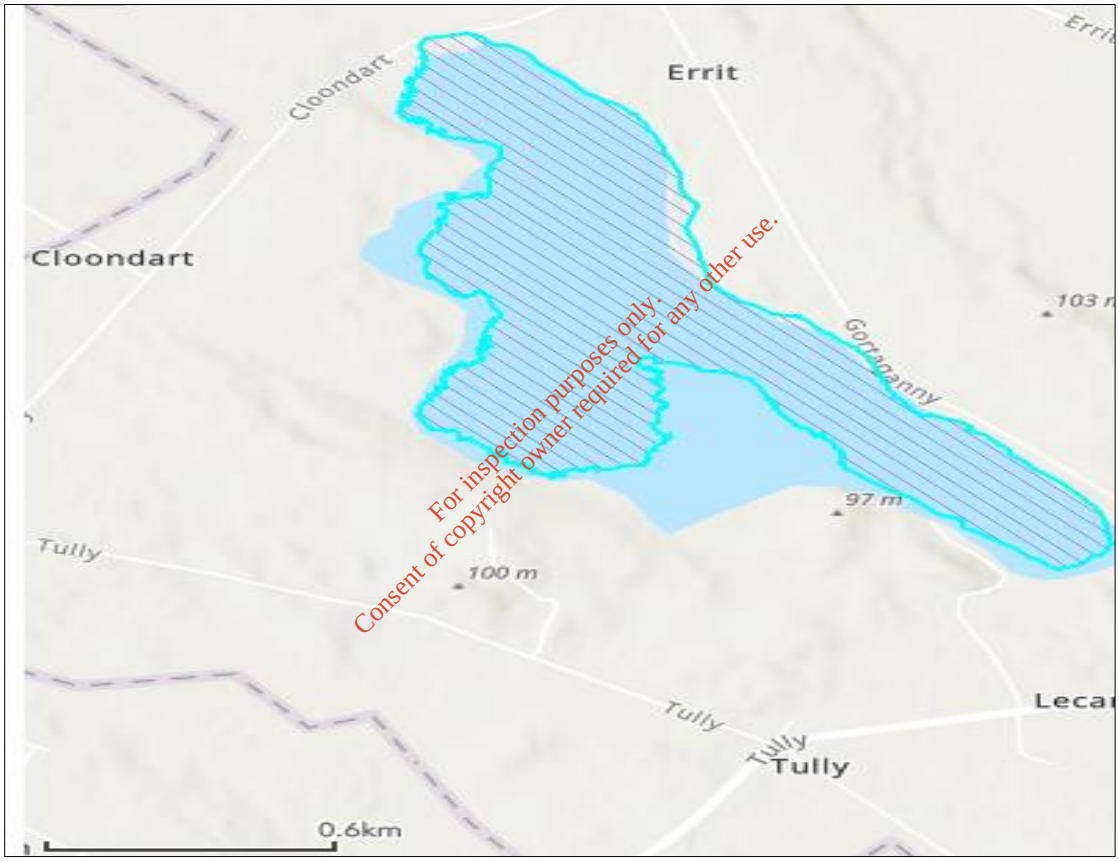

Figure 5.4: Errit Lough SAC

Errit Lough SAC Conservation Objectives

The Habitats Directive requires the Appropriate Assessment process to assess the potential impacts of the development "in *view of the site's conservation objectives*". Site specific conservation objectives (SSCOs) for the qualifying interests of the Errit Lough SAC are provided in the table below, where available from the NPWS document "*Conservation Objectives: Errit Lough SAC 000607*" (NPWS, 2018b).

ATTRIBUTE	MEASURE	TARGET
[3140] Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition
Vegetation distribution: max. depth	Metres	Maintain/restore maximum depth of vegetation, subject to natural processes
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation
Water quality: transparency	Metres	Maintain/restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency
Water quality: nutrients	µg/l P; mg/l N	Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species
Water quality: phytoplankton biomass	µg/l Chlorophyll a	Maintain appropriate water quality to support the habitat, including high chlorophyll a status
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric	Maintain high macrophyte status
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes
Water colour	mg/l PtCo	Maintain/restore appropriate water colour to support the habitat
Dissolved organic carbon (DOC)	mg/l	Maintain/restore appropriate organic carbon levels to support the habitat
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3140

Errit Lough SAC Conservation Status

According to the Habitat's Directive, favourable conservation status of a habitat is achieved when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined below.

According to the Habitat's Directive, favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation statuses for the qualifying interests for Errit Lough SAC are outlined below.

CODE	QUALIFYING INTEREST	CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
3140	Hard Water Lakes	Bad	Good

**Sourced from the Status of EU Protected Habitats and Species in Ireland (NPWS, 2019b and 2019c)*
***Sourced from NPWS (2018b)*

6.0 ASSESSMENT OF LIKELY EFFECTS: STAGE 1 SCREENING

6.1 DISTURBANCE TO PROTECTED HABITATS AND SPECIES

Errit Lough SAC is approximately 6.4km, Urlaur Lakes SAC is approximately 7.5km and Lough Corrib SAC is located approximately 8.1km from the proposed development. Given the proposed site's proximity to these sites, potential ex-situ impacts must also be considered.

The proposed rising main route would pass within a short section of the boundary of the River Moy SAC European site. Within this area of the rising main route, horizontal directional drilling (HDD) would be used for approximately 300m underneath the River Moy SAC.

The majority of the rising main go through agricultural fields and discharge into the River Glore [Mayo] in an area of Hawthorn and Bramble at the edge of the River Moy SAC. This proposed route would not have a significant impact on the species associated with these habitats.

It is considered that the proposed development route is close to areas of possible fen. Alkaline Fens [7230] and Cladium Fens [7210] would be located within the proximity of the pipeline route. The proposed rising main would go under the River Moy SAC through the underlying calcareous Marl from a pit located south of the SAC boundary to a reception pit located outside at eastern boundary of the River Moy SAC. There would be no loss or destruction of habitat, fragmentation of habitat, disturbance of habitat or direct reduction in species density or species diversity.

The proposed rising main does not go through areas of active bog or extensive woodlands and predominately goes through active agricultural land with no open areas of karst. Therefore, species associated with Raised Bog (Active) [7110], Petrifying Springs [7220], Limestone Pavement [8240], Rhynchosporion Vegetation [7150], Alluvial Forests [91E0], Old Oak Woodlands [91A0] and Bog Woodland [91D0] would not be present.

The proposed rising main route is proposed to go through areas of possible fen that are actively grazed for agriculture therefore, these fields are degraded and less suitable for species such as Slender Green Feather-moss and Slender Naiad for which Lough Corrib SAC has been designated.

Habitats outside of the River Moy SAC and Lough Corrib SAC that have the potential to contain similar species associated with the qualifying habitats of these SACs are Degraded Raised Bog [7120], Orchid-rich Calcareous Grassland [6210] and Molinia Meadows [6410]. Alongside the proposed rising main is an area of Wet Heath (which has areas of sphagnum moss growth and heathers associated with Degraded Raised Bog [7120]. However, this habitat is considerably degraded and is actively been encroached by colonizing conifers (*Pinus* spp.) and plants associated with drier soils.

Along the proposed rising main are fields containing grasses and other vascular plants associated with Dry meadows and grassy verges (GS1) habitat. These are agricultural fields that are approximately 9km from the Lough Corrib SAC. The potential for Orchid-rich Calcareous Grassland [6210] and Molinia Meadows [6410] is low and the impact on the species associated with these habitats would not be significant.

While no sightings of otter, or evidence of otter (including holts, slides, spraints and tracks) were recorded during the site walkover, given that the proposed development site is located beneath and adjacent to the River Moy SAC it is possible that otter are present within the general vicinity of the development. Disturbance to otter may occur during construction, however works would be during daylight hours, thus limiting possible disturbance to otter movements in the area of proposed pipeline. Therefore, the proposed development would not have a significant potential impact upon otter due to habitat loss or fragmentation.

It is possible that Bats such as the Lesser Horseshoe Bat would be in the area and could use the area for foraging. Hedgerows would be removed as part of the development, but these would be limited sections and would not require the removal of mature trees therefore the impact on possible roosting sites would not be significant.

The potential disturbance on protected habitats due to dust during the construction phase would not be considered significant, given the transient nature of construction works and the construction timeframe (approximately 3 months). It is not considered that the operational phase of the proposed development would have the potential to significantly impact upon air quality within the area, with the potential to adversely impact upon the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC.

It is therefore considered that the proposed development would not result in any significant risk to the protected habitats and species of the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC due to habitat fragmentation or loss, disturbance or reduction in species density or diversity.

6.2 INVASIVE SPECIES

Under Regulation 49(2) of the European Communities (Birds and Natural Habitats) Regulations 2011, save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to any plant which is included in Part 1 of the Third Schedule shall be guilty of an offence.

Materials containing invasive species such as Japanese Knotweed are considered "controlled waste" and, as such, there are legal restrictions on their handling and disposal. Under Regulation 49(7) of the European Communities (Birds and Natural Habitats) Regulations 2011, it is a legal requirement to obtain a license to move "vector materials" listed in the Third Schedule, Part 3.

As noted in Section 4.3, three invasive flora species listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 have been recorded by the NBDC within the two 10km squares (M48 and M47) in which the proposed development site is located within / located immediately adjacent to; Canadian Waterweed, Bohemian Knotweed and Japanese Knotweed. However, no Third Schedule invasive species of concern were noted as present during the site walkover.

The risk of invasive species being introduced onto the site during the construction phase of the project is considered to be low, with no import of materials with the potential to contain invasive flora species. Soils excavated during construction works would be stockpiled and re-

used for site levelling where required, therefore no importation of topsoil or subsoil would be required as part of the development works.

Given the nature of the proposed development, there would be no significant risk of introducing invasive species during the operational phase.

Therefore, it is considered that there would be no significant risk to protected habitats and species as a result of invasive species from the proposed development.

6.3 POTENTIAL IMPACTS ON HYDROLOGY AND WATER QUALITY

During the construction phase of projects, a deterioration in water quality can arise through the release of uncured concrete, the release of suspended solids during soil disturbance works and the release of hydrocarbons (fuels and oils), including during directional drilling.

The potential for construction works to impact upon the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC cannot be ruled out, given that works will take place beneath and adjacent to the River Moy SAC, within the River Glore [Mayo] and within a region with karst formations. It is therefore considered that control measures would need to be implemented during the construction phase to ensure there is no adverse impact upon the SAC sites.

During the construction phase of projects, a deterioration in water quality can arise through the release of suspended solids during soil disturbance works, the release of uncured concrete and the release of hydrocarbons (fuels and oils). Construction works would last approximately three months in duration and would be confined to the proposed rising main route.

An increase in sediments has the potential to adversely impact upon fish, which consequently would impact upon fish consumers such as Otter. An increase in sediments can also increase the level of nutrients (which are bound to the suspended solids) in the water, which can result in excessive eutrophication, leading to deoxygenation of waters.

As discussed within the IE Consulting Hydrological Risk Assessment, the proposed HDD pipeline route would occur within the low permeability marl subsoil which underlies the worked out peat soil substrate. As the pipe is laid down, the marl will effectively swell against the pipe wall, and form an impermeable seal, preventing the development of any linear drainage pathways. Therefore, it is considered that the laying of the pipeline within the SAC boundary would not cause a change in hydrology that would impact upon high groundwater table dependent habitats.

As discussed in Section 4.1, the proposed treated effluent emission values have been calculated based upon current water quality in the River Glore [Mayo] and the river's assimilative capacity. The proposed final discharge rate of 800 m^3/day to the Glore [Mayo] at the proposed maximum permitted effluent discharge limits during 95%ile flow conditions would result in an increase from existing ambient concentrations by 0.4 mg/l BOD_5 (27% headroom), 5.4 mg/l COD (18.5% headroom), 0.09 mg/l P Total Phosphorous (headroom not applicable), 0.0235 mg/l PO_4-P Orthophosphate (33% headroom), 0.66 mg/l N Total Nitrogen (34% headroom), 0.49 mg/l NO_3-N Nitrate (5 % headroom), 0.02 mg/l $NH_{(3+4)}$-N Ammonia (Total) (20% headroom). 0.0003 mg/l NH_3-N Unionised Ammonia (2 % headroom), 0.4 mg/l Suspended

Solids (2 % headroom), 46.6 mg/l Chloride (20% headroom) and 0.5 mg/l Oils, Fats and Greases (headroom not applicable).

The assimilative capacity assessment determined that the proposed discharge would not result in the River Glore [Mayo] failing to achieve good status. The assessment concluded that the River Glore [Mayo] would have sufficient assimilative capacity to accommodate discharges from the Western Brand.

While it is considered that the proposed discharge of treated effluent to the River Glore [Mayo] would not have any significant impacts upon the River Moy SAC, measures would need to be implemented to ensure that the proposed treated effluent meets the proposed emission limit values.

The rising main is located within a karst area (meaning the nature of groundwater flow can be unpredictable), however, the distances to the Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC is significant. It is therefore considered that, with mitigation measures put in place during both the construction and operational phases, there may be a potential for impacts to the Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC sites.

6.4 SCREENING CONCLUSION

In order for an effect to occur, there must be a pathway between the source and the receptor (the SAC sites). Where a pathway does not exist, an impact cannot occur. A potential pathway exists between the proposed development and the designated sites, the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC, given that the works within the River Moy SAC and proposed development is located in a karst area, and therefore may be potentially linked to Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC due to groundwater.

As detailed above, it is considered that the proposed development would not result in any significant risks to the protected habitats and species of the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC due to the potential introduction of invasive species or the long-term disturbance of species and habitats.

However, the assessment has determined that during construction works, the proposed development has the potential to impact upon the qualifying interests / special conservation interests of the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib due to a potential deterioration in water quality and construction works to be carried out within the River Moy SAC. Therefore, a Natura Impact Statement is required.

7.0 ASSESSMENT OF LIKELY EFFECTS: STAGE 2 APPROPRIATE ASSESSMENT

Describe the significant effects, if any, on the relevant European site which have occurred, which are occurring or which can reasonably be expected to occur as a result of the project or plan (alone or in combination).

The proposed development has the potential to impact upon the qualifying interests of the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC due to a potential deterioration in water quality and temporary disturbance to species.

During construction works, there is potential for water quality deterioration through the release of suspended solids during soil disturbance works. Suspended solids could become entrained in surface water run-off and could affect aquatic qualifying interests through deposition. Nutrients can be bound in suspended solids, therefore, a significant increase in suspended solids can result in excessive eutrophication, leading to the deoxygenation of waters and subsequent asphyxia of aquatic species. An increase in sediments has the potential to impact upon fish species by damaging gravel beds required for spawning, smothering fish eggs and in extreme cases, by interfering with the gills of fish. An increase in suspended solids also has the potential to reduce water clarity, which can impact the light penetration of water and may also affect certain behaviours of aquatic fauna such as foraging success.

A potential source of chemical contamination would be from the release of hydrocarbons (oils, fuels) from construction plant and equipment which may contaminate waters, soils or groundwater. Hydrocarbons can affect water quality, potentially resulting in toxic conditions for aquatic flora and fauna. Oil films on the water surface can disrupt oxygen diffusion from the atmosphere, resulting in de-oxygen of waters.

Another potential source of contamination would be the release of uncured concrete. In the event of uncured concrete entering a waterbody, the pH would be altered locally, potentially leading to the death of aquatic flora and fauna and an alteration to the waterbody substrate.

During the operational phase, there is potential for contamination to water quality due to the use of potentially polluting substances used in the cleaning process and the storage of hydrocarbons which may be used for certain equipment onsite.

The BREF document for Slaughterhouses and Animals By-Products Industries note that generated wastewaters at slaughterhouses typically have a high organic strength, owing to the high BOD (biochemical oxygen demand) and COD (chemical oxygen demand) properties of blood and animal by-products. Additionally, wastewaters from slaughtering facilities and meat processing facilities generally have a high suspended solids and nutrient content (phosphorous and nitrogen).

Organic pollution to rivers can occur when high organic wastewaters are insufficiently treated and discharged to waterbodies. When a high organic load enters a waterbody, the growth of bacteria and other micro-organisms increase significantly in response to the available food supply. The rapid break down of organic compounds by bacteria and micro-organisms results in the deoxygenation of the water. Where significant organic pollution takes place, the river can become uninhabitable for aquatic flora and fauna due to the lack of required oxygen.

Bacteria also break down the protein content of the wastewater into various nitrogen compounds including nitrate, nitrite, ammonia and ammonium. Depending on the concentration, these compounds can have further impacts upon water quality and aquatic flora and fauna. For example, the compound ammonia (NH_3) is considered toxic to freshwater fish at low concentrations.

The potential impacts of an increase in suspended solids and oils and fats, which may also be generated in wastewater, are discussed above.

Aquatic flora and fauna could also be impacted upon by an increase in the nutrients, nitrogen and phosphorous. A significant increase in nutrients (particularly phosphorous for freshwater bodies), could result in excessive eutrophication, whereby an increase in nutrients results in the significant growth of aquatic plants, particularly algae (EPA, 2015). As plant growth increases, oxygen depletion occurs due to increased photosynthesis and through the decomposition of plant organic material. The increase in plant growth can also limit the availability of sunlight.

The tables below outline which of the qualifying interests may be impacted upon by a potential deterioration in water quality from the proposed development. The following tables also briefly outline the occurrence of the qualifying interests of the designated sites, taking cognisance of the NPWS site synopsis and conservation objectives reports, and of Volumes 1, 2 and 3 of the 2019 NPWS Reports, "The *Status of EU Protected Habitats and Species in Ireland*".

RIVER MOY SAC (SITE CODE: 002298)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[7110] Raised Bog (Active) [7120] Degraded Raised Bog [7150] Rhynchosporion Vegetation	The proposed development is located within the current known distribution, current range and favourable reference range of these qualifying interests (NPWS, 2019b). According to the SAC Conservation Objectives report, the nearest examples of these qualifying interests are located at Kilgarriff, Gowlaun, Derrynabrock, Tawnaghbeg and Cloongoonagh, which are located at a considerable distance from the proposed development site (approximately 21km) and would likely be located upstream of the development. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon these qualifying interests.	No
[7230] Alkaline Fens	The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, the full extent of this habitat within the SAC is unknown, but an extensive area has been recorded at the Mannin & Island Lakes and around the Glore River [Mayo]. It is therefore possible that this qualifying interest is located within the vicinity of the development site. The Conservation Objectives for this qualifying interest include water quality attributes. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[91A0] Old Oak Woodlands	The proposed development is located within the current range and favourable reference range of this qualifying interest, but outside the current known distribution (NPWS, 2019b). According to the SAC Conservation Objectives report, old oak woodlands are located more than 40km from the proposed discharge point. However, the report notes that the total extent of this qualifying interest within the SAC is unknown. Old oak woodlands is a terrestrial habitat, therefore a potential deterioration in water quality would not be anticipated to have a significant adverse impact upon this qualifying interest should it be present within the vicinity of the development or downstream of the proposed development.	No
[91E0] Alluvial Forests	The proposed development is located outside of the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, alluvial forests are located more than 40km from the proposed discharge point. However, the report notes that the total extent of this qualifying interest within the SAC is unknown. Water quality is not listed as a conservation objective for this qualifying interest.	No

RIVER MOY SAC (SITE CODE: 002298)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	
[1092] White-clawed Crayfish (*Austropotamobius pallipes*)	The White-clawed Crayfish is the only crayfish species found in Ireland and is a relatively long-lived species with a maximum life of 10 years. It occurs in both streams and lakes in Ireland and requires relatively hard water with a pH of 7 or above and calcium concentrations of at least 5mg/l. White-clawed crayfish are omnivorous, with young crayfish more reliant than adults on animal foods. The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). The SAC Conservation Objectives report notes that crayfish are widespread in the upper tributaries of the River Moy and the rivers which feed Loughs Conn and Cullin. The tributaries where it has been recorded include the River Yellow and the River Glore [Mayo], which is the location of the discharge point of the rising main. According to the Conservation Objectives report, the nearest records for white-clawed crayfish are located within the Cloonlavis River, located approximately 18km to the north-west of the development site. It is therefore possible that white-clawed crayfish are present within the watercourses within the general vicinity of the proposed development site. The conservation status of crayfish in the SAC is dependent on good water quality status, as this species requires clean water (Q3-4). Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[1095] Sea Lamprey (*Petromyzon marinus*)	Sea lamprey are an anadromous species, with adults living at sea and migrating to freshwater for spawning in late May or June. The fertilised eggs hatch within days, with the larvae burrowing into fine sediment where they filter feed for a number of years. Transformation to young adults occurs in summer and young adults can be found migrating downriver to estuarine waters in autumn – winter. The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). The report by O'Connor (2004) on the surveying of juvenile lamprey in the Moy catchment noted that no sea lamprey were recorded within the watercourses within the vicinity of the proposed site. Lampreys were absent from the Glore [Mayo] sub-catchment due apparently to the general absence of suitable nursery habitats There are no NBDC	No

RIVER MOY SAC (SITE CODE: 002298)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	records for sea lamprey within the vicinity of the development site, or within the immediate vicinity downstream of the site. It is therefore considered unlikely that sea lamprey are located within the vicinity of the proposed development site. Therefore, it is not anticipated that the proposed development would have any adverse impacts upon this qualifying interest.	
[1096] Brook Lamprey (*Lampetra planeri*)	The brook lamprey is the smallest of the three lampreys native to Ireland and is the only species that is non-parasitic and spends all its life in freshwater. Adults spawn in spring, excavating shallow nests in gravel areas of reduced flow. Adult fish die after spawning. After hatching, larvae drift/swim downstream to areas with a fine silt composition. They burrow into this bed material and live as filter feeders for years before transforming into young adult fish. The young adults overwinter before migrating short distances upstream to gravelled areas where they spawn. The proposed development is located within the current known distribution, current range and favourable reference range of brook lamprey (NPWS, 2019c). The proposed development is located within the current known distribution, current range and favourable reference range of brook lamprey (NPWS, 2019c). The report by O'Connor (2004) on the surveying of juvenile lamprey in the Moy catchment noted that brook lamprey were recorded further downstream in the River Pollagh and River Glore [Mayo]. It is therefore possible that brook lamprey are present within the general vicinity of the proposed site. Lamprey may be adversely impacted upon by sedimentation and water pollution. Therefore, there is potential for the proposed development to have an impact upon these qualifying interests due to a potential deterioration in water quality.	Yes
[1106] Atlantic Salmon (*Salmo salar*)	Atlantic Salmon use rivers to reproduce and as nursery areas. Eggs are deposited during winter in river gravels. The eggs hatch into alevins in spring, which in turn develop into fry. The fry feed for the summer and autumn, gradually becoming parr. Fry and parr feed primarily upon invertebrates. The Irish population generally comprises fish that spend two winters in freshwater before going to sea in spring as smolts. Adults spend 1-3 years at sea, feeding upon crustaceans and fish as they migrate to feeding grounds in the North Atlantic. The majority of Irish fish spend one winter at sea before returning to their natal rivers, mainly during the summer, as grilse. The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). The Glore is designated as a Salmonid Water under EC (Quality of Salmonid Waters) Regulations (S.I. No. 293 of 1988).While no	Yes

RIVER MOY SAC (SITE CODE: 002298)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	specific abundance data is available within the SAC Conservation Objectives report, the report notes that there are no artificial barriers within the Moy catchment limiting access to Salmon. The Site Synopsis report notes that the Moy system is one of Ireland's premier Salmon waters and is a most productive catchment in salmon terms. It is probable that Atlantic Salmon are present within the vicinity of the proposed development. Atlantic Salmon, particularly juveniles and spawning beds, are sensitive to sedimentation and water pollution. The conservation status of salmon is dependent on good water quality status, as this species requires clean water (Q4) for spawning and early life stages. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	
[1355] Otter (*Lutra lutra*)	Otters have two basic requirements: aquatic prey and safe refuges where they can rest. Otters are opportunistic predators with a broad and varied diet. In freshwater areas, a variety of fish will be taken, while crayfish and frogs can be important locally or seasonally. The development site is located within the current distribution, current range and favourable reference range of Otter (NPWS, 2019c), while the NBDC has records for otter approximately 2km from the development site. The National Otter Survey of Ireland 2010/12 (Reid *et al.*, 2013) report noted that the occurrence of otter within survey sites for the western river basin district was 65.4%. While no evidence of otter (including spraints and tracks) were recorded during the site assessment, it is noted in the SAC conservation objectives that Otter is present in Mannin and Island lakes. A significant impact on water quality could indirectly impact upon this qualifying interest by causing a reduction in prey populations and availability. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes

LOUGH CORRIB SAC (SITE CODE: 000297)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[3110] Oligotrophic Waters containing very few minerals	The development site is located outside the current distribution, current range and favourable reference range of these qualifying interests (NPWS, 2019b). According to the SAC Conservation Objectives report, the nearest examples of these qualifying interests are located a considerable distance (greater than 30km distance between locations, but considerably further when taking into account hydrological distance) from the proposed development. It is therefore not anticipated that the development would have the potential to adversely impact upon these qualifying interests.	No
[3130] Oligotrophic to Mesotrophic Standing Waters		
[3140] Hard Water Lakes	The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, the nearest example of this qualifying interest is located a considerable distance (greater than 30km distance between locations, but considerably further when taking into account hydrological distance) from the proposed development. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No
[3260] Floating River Vegetation	The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). While no specific location information is available for this qualifying interest within the SAC Conservation Objectives report, it is possible that this habitat is present within the watercourses within the vicinity of the proposed development. The Conservation Objectives for this qualifying interest include water quality attributes. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[6210] Orchid-rich Calcareous Grassland*	The development site is located within the current range and favourable reference range of this qualifying interest, but outside of the current known distribution (NPWS, 2019b). The SAC Conservation Objectives report notes that the areas of this habitat within the SAC have not been identified. Orchid-rich Calcareous Grassland is a terrestrial habitat, and does not have water quality listed as a conservation objective. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest, should it be present within the vicinity of the development.	No

LOUGH CORRIB SAC (SITE CODE: 000297)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[6410] *Molinia* Meadows	The proposed development is located within the current range and favourable reference range, but outside the current known distribution of this qualifying interest (NPWS, 2019b). The SAC Conservation Objectives report notes that the full extent of this habitat within the SAC is currently unknown. Water quality is not listed as a conservation objective for this qualifying interest. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No
[7110] Raised Bog (Active) [7120] Degraded Raised Bog [7150] Rhynchosporion Vegetation	The proposed development is located within the current known distribution, current range and favourable reference range of these qualifying interests (NPWS, 2019b). According to the SAC Conservation Objectives report, the nearest examples of these qualifying interests are located at Aldergoole and Lough Tee, which are located at a considerable distance from the proposed development site (greater than 40km distance between locations, but considerably further when taking into account hydrological distance) and would likely be located upstream of the development. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon these qualifying interests.	No
[7210] Cladium Fens	The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, the full extent of this habitat within the SAC is unknown, but its area is considered to be extensive. It is therefore possible that this qualifying interest is located within the vicinity of the development site. The Conservation Objectives for this qualifying interest include water quality attributes. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[7220] Petrifying Springs*	The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, the full extent of this habitat within the SAC is unknown. The Conservation Objectives for this qualifying interest include water quality attributes. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes

LOUGH CORRIB SAC (SITE CODE: 000297)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[7230] Alkaline Fens	The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, the full extent of this habitat within the SAC is unknown, but its area is considered to be extensive. It is therefore possible that this qualifying interest is located within the vicinity of the development site. The Conservation Objectives for this qualifying interest include water quality attributes. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[8240] Limestone Pavement*	The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). The SAC Conservation Objectives report notes that the full extent of this habitat within the SAC is currently unknown. Water quality is not listed as a conservation objective for this qualifying interest. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No
[91A0] Old Oak Woodlands	The proposed development is located within the current range and favourable reference range of this qualifying interest, but outside the current known distribution (NPWS, 2019b). According to the SAC Conservation Objectives report, old oak woodlands are located a considerable distance (greater than 35km distance between locations, but considerably further when taking into account hydrological distance) from the proposed site. However, the report notes that the total extent of this qualifying interest within the SAC is unknown. Old oak woodlands is a terrestrial habitat, therefore a potential deterioration in water quality would not be anticipated to have a significant adverse impact upon this qualifying interest should it be present within the vicinity of the development or downstream of the proposed development.	No
[91D0] Bog Woodland*	The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, this qualifying interest is located at Aldergoole Bog, which is located at a considerable distance from the proposed development site (greater than 40km distance between locations, but considerably further when taking into account hydrological distance) and would likely be located upstream of the development. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No

LOUGH CORRIB SAC (SITE CODE: 000297)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)	Freshwater pearl mussel are long-lived, bivalve molluscs found in clean, fast-flowing rivers. *M. margaritifera* is widespread in Ireland, however, the population has been in decline for a long time, with the current decline attributed to a combination of hydrological and morphological changes, sedimentation and enrichment of its habitat (NPWS, 2019a). The species has an unusual life cycle. Eggs develop into the larval stage (glochidia), which are brooded in the female gills before being released into open water. A small number are inhaled by passing salmonid fish, which act as the mussels' temporary hosts. Once mature enough to exist independently, they fall off their hosts and bury into gravel where they filter feed (Moorkens, 2000). The proposed development is located outside the current known distribution, current range and favourable reference range of the freshwater pearl mussel (NPWS, 2019c). The proposed development is located outside the current known distribution, current range and favourable reference range of the freshwater pearl mussel (NPWS, 2019c). According to the SAC Conservation Objectives report, Freshwater Pearl Mussel is confined to the Owenriff Catchment, with the nearest examples of this qualifying interest located a considerable distance (greater than 45km between locations, but considerably further when taking into account hydrological distance) from the proposed development. There are no NBDC records of Freshwater Pearl Mussel within the general vicinity of the proposed site. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No
[1092] White-clawed Crayfish (*Austropotamobius pallipes*)	The White-clawed Crayfish is the only crayfish species found in Ireland, and is a relatively long-lived species with a maximum life of 10 years. It occurs in both streams and lakes in Ireland and requires relatively hard water with a pH of 7 or above and calcium concentrations of at least 5mg/l. White-clawed crayfish are omnivorous, with young crayfish more reliant than adults on animal foods. The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). The SAC Conservation Objectives report notes that crayfish are present within the Rivers Abbert, Grange, Dalgan and Sinking, with the nearest record located approximately 18km (River Sinking) from the proposed site. However, it is possible that crayfish are located in the tributaries upstream of the River Sinking. It is therefore possible that white-clawed crayfish are present within the watercourses within the general vicinity	Yes

LOUGH CORRIB SAC (SITE CODE: 000297)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	of the proposed development site. The conservation status of crayfish in the SAC is dependent on good water quality status, as this species requires clean water (Q3-4). Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	
[1095] Sea Lamprey (*Petromyzon marinus*)	Sea lamprey are an anadromous species, with adults living at sea and migrating to freshwater for spawning in late May or June. The fertilised eggs hatch within days, with the larvae burrowing into fine sediment where they filter feed for a number of years. Transformation to young adults occurs in summer and young adults can be found migrating downriver to estuarine waters in autumn – winter. The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). The report by O'Connor (2007) on the surveying of juvenile lamprey in the Corrib catchment noted that no sea lamprey were recorded upstream of Galway Regulating Weir. There are no NBDC records for sea lamprey within the vicinity of the development site, or within the immediate vicinity downstream of the site. It is therefore considered unlikely that sea lamprey are located within the vicinity of the proposed development site. Therefore, it is not anticipated that the proposed development would have any adverse impacts upon this qualifying interest.	No
[1096] Brook Lamprey (*Lampetra planeri*)	The brook lamprey is the smallest of the three lampreys native to Ireland and is the only species that is non-parasitic and spends all its life in freshwater. Adults spawn in spring, excavating shallow nests in gravel areas of reduced flow. Adult fish die after spawning. After hatching, larvae drift/swim downstream to areas with a fine silt composition. They burrow into this bed material and live as filter feeders for years before transforming into young adult fish. The young adults overwinter before migrating short distances upstream to gravelled areas where they spawn. The proposed development is located within the current known distribution, current range and favourable reference range of brook lamprey (NPWS, 2019c). The report by O'Connor (2007) on the surveying of juvenile lamprey in the Corrib catchment noted that brook lamprey were recorded at the River Dalgan, which at its closet, is located approximately 5km to the east of the proposed site. Two out of the five survey sites yielded brook lamprey. It is therefore possible that brook lamprey are present	Yes

LOUGH CORRIB SAC (SITE CODE: 000297)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	within the general vicinity of the proposed site. Lamprey may be adversely impacted upon by sedimentation and water pollution. Therefore, there is potential for the proposed development to have an impact upon these qualifying interests due to a potential deterioration in water quality.	
[1106] Atlantic Salmon (*Salmo salar*)	Atlantic Salmon use rivers to reproduce and as nursery areas. Eggs are deposited during winter in river gravels. The eggs hatch into alevins in spring, which in turn develop into fry. The fry feed for the summer and autumn, gradually becoming parr. Fry and parr feed primarily upon invertebrates. The Irish population generally comprises fish that spend two winters in freshwater before going to sea in spring as smolts. Adults spend 1-3 years at sea, feeding upon crustaceans and fish as they migrate to feeding grounds in the North Atlantic. The majority of Irish fish spend one winter at sea before returning to their natal rivers, mainly during the summer, as grilse. The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). While no specific abundance data is available within the SAC Conservation Objectives report, the report notes that there are no artificial barriers within the Corrib catchment limiting access to Salmon. The Site Synopsis notes that Salmon use the lakes and rivers as spawning grounds. It is therefore possible that Atlantic Salmon are present within the vicinity of the proposed development. Atlantic Salmon, particularly juveniles and spawning beds, are sensitive to sedimentation and water pollution. The conservation status of salmon is dependent on good water quality status, as this species requires clean water (Q4) for spawning and early life stages. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	The development site is located within the current distribution, current range and favourable reference range of Lesser Horseshoe Bat. According to the SAC Conservation Objectives report, the nearest known example of this qualifying interest is located a considerable distance (approximately 47km) from the proposed site. Water quality is not listed as a conservation objective for this qualifying interest. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No

LOUGH CORRIB SAC (SITE CODE: 000297)		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[1355] Otter (*Lutra lutra*)	Otters have two basic requirements: aquatic prey and safe refuges where they can rest. Otters are opportunistic predators with a broad and varied diet. In freshwater areas, a variety of fish will be taken, while crayfish and frogs can be important locally or seasonally. The development site is located within the current distribution, current range and favourable reference range of Otter (NPWS, 2019c), while the NBDC has records for otter approximately 3.2km from the development site. The National Otter Survey of Ireland 2010/12 (Reid *et al.*, 2013) report noted that the occurrence of otter within survey sites for the western river basin district was 65.4%. While no evidence of otter (including spraints and tracks) were recorded during the site assessment, given the presence of loughs and watercourses in the area, and given the NBDC records for otter in the vicinity, it is likely that otter are present within the general area of the proposed development. A significant impact on water quality could indirectly impact upon this qualifying interest by causing a reduction in prey populations and availability. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[1393] Slender Green Feather-moss (*Drepanocladus vernicosus*)	The proposed development is not located within the current known distribution, current range or favourable reference range of Slender Green Feather-moss (NPWS, 2019c). According to the SAC Conservation Objectives report, Slender Green Feather-moss is located at Gortachalla Lough, which is located a considerable distance (approximately 49km) from the proposed site. Given the distance and given that water quality is not listed as a as a conservation objective for this qualifying interest, it is not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No
[1833] Slender Naiad (*Najas flexilis*)	The proposed development is not located within the current known distribution, current range or favourable reference range of Slender Naiad (NPWS, 2019c). According to the SAC Conservation Objectives report, the nearest example of this qualifying interest is located a considerable distance (greater than 40km distance between locations, but considerably further when taking into account hydrological distance) from the proposed development. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No

ERRIT LOUGH SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[3140] Hard Water Lakes	The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, the nearest example of this qualifying interest is located 6.4km but is but considerably further when taking into account hydrological distance from the proposed development. A significant impact on water quality could indirectly impact upon this qualifying interest.	Yes

URLAUR LAKES SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[3140] Hard Water Lakes	The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, the nearest example of this qualifying interest is located 7.5km but is but considerably further when taking into account hydrological distance from the proposed development. A significant impact on water quality could indirectly impact upon this qualifying interest.	Yes

8.0 MITIGATION MEASURES

This assessment has determined that the proposed development has the potential to impact upon the River Moy SAC and the Lough Corrib SAC due to a potential deterioration in water quality. As discussed in Section 7, it is considered that the proposed development has the potential to impact upon the following qualifying interests:

River Moy SAC:

- [7230] Alkaline Fens
- [1092] White-clawed Crayfish
- [1096] Brook Lamprey
- [1106] Atlantic Salmon
- [1355] Otter

Lough Corrib SAC:

- [3260] Floating River Vegetation
- [7210] Cladium Fens
- [7220] Petrifying Springs
- [7230] Alkaline Fens
- [1092] White-clawed Crayfish
- [1096] Brook Lamprey
- [1106] Atlantic Salmon
- [1355] Otter

Errit Lough SAC and Urlaur Lakes SAC

- [3140] Hard Water Lakes

8.1 CONSTRUCTION PHASE

The following mitigation measures would be employed during the construction phase to ensure that there would be no significant impacts to the listed habitats or species, as listed above, of the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC due to a potential deterioration in water quality:

- Daily visual inspections would be undertaken of watercourses during construction works;
- A 6m buffer zone would be maintained around all watercourses (with the exception of works beside the River Glore [Mayo]), where feasible;
- Provision of silt control features where appropriate, such as silt fencing;
- Silt fencing (comprising of a porous filter fabric which detains sediment) would be provided along the boundary of the 6m buffer where the rising main comes within close proximity to any other watercourses. Silt fencing would remain in place until the completion of construction works;
- Additional silt fencing would be placed adjacent to storage areas of stockpiled soil, until such time as the excavated soil has been used in landscaping / re-instatement works or removed offsite by a licenced waste contractor;
- Silt control features would be inspected on a daily basis and maintained as appropriate;

- Where spoil is generated, this would only be stored temporarily and away from surface waters. Where possible, spoil would be covered or alternatively, graded to avoid ponding or water saturation;
- Excavations and earth-moving activities would be planned outside periods of heavy rainfall, to limit the potential for suspended solids to become entrained within surface water run-off;
- Should water be encountered during excavation works, water would be pumped to a constructed silt control feature, such as a settlement pond or detention pond. A filter would be provided at the pump inlet and, where required, dewatering bags or silt fences would be used at the outlet to retain any potential silt entrained in the water. Pumping operations would be supervised at all times;
- All construction plant machinery and equipment would be maintained in good working order and regularly inspected;
- Machinery used for the HDD pipeline would be thoroughly checked before use and only operated by suitably experienced personnel;
- Continuous monitoring of the environment during works for the HDD pipeline and implementing immediate containment measures should a release occur;
- If inadvertent returns occur during the HDD pipeline works, then standard operational procedures will be in place to contain this fluid such a containment excavation with a pump to remove the fluid for processing elsewhere;
- Post construction validation monitoring should include flow monitoring at start and end of the pipe to ensure no losses;
- The temporary site compound would be used for the storage of all machinery and plant when not in use, the re-fuelling of plant and the storage of all associated oils and fuels for plant;
- Any fuels, oils or chemicals would be stored in accordance with the EPA guidance on the storage of materials, in designated bunded areas at the temporary site compound, with adequate bund provision to contain 110% of the largest drum volume or 25% of the total volume of containers;
- The designated area for the storage of hydrocarbons would be inspected on a regular basis;
- Deliveries of fuels and oils to the site would be supervised;
- All loading and unloading of hydrocarbons would take place within the bunded area where possible;
- Fuels / oils would be handled and stored with care to avoid spillage or leakage;
- Where appropriate, small construction plant equipment would be placed on drip trays;
- The diesel generator would be suitably bunded;
- Any waste fuel / oils would be collected in bunded containers at designated areas (i.e. temporary construction compound for rising main works) and properly disposed of to an authorised waste contractor;
- Spill kits, adequately stocked with spill clean-up materials such as booms and absorbent pads, would be readily available onsite;

- In the unlikely event of a hydrocarbon spillage, contaminated spill clean-up material would be properly disposed of to an authorised waste contractor;
- Where re-fuelling of construction plant is required to take place onsite, re-fuelling would take place within a bunded area. Under no circumstances would re-fuelling take place within the immediate vicinity of watercourses, including drainage ditches;
- Re-fuelling onsite would only be undertaken by experienced and trained personnel;
- Where construction plant shows signs of hydrocarbon leakage, site personnel would cease the operation of the item in plant in question. Any defective plant would be kept out of service until the necessary repairs are undertaken;
- The use of pre-cast concrete where possible;
- The delivery and pouring of concrete would be supervised at all times;
- Concrete would be poured directly into the shuttered formwork from the Ready-Mix Truck, reducing the risk of spillage;
- The wash-out of Ready-Mix Truck drums would not be permitted onsite, in the environs of the site, or at a location which could result in a discharge to surface water;
- The disposal of excess uncured concrete would be removed from site by an authorised waste contractor;
- The pouring of concrete would be avoided during periods of expected heavy rainfall;
- It is not envisaged that vehicle wheel wash facilities would be required. However, in particularly dry weather, additional dust control measures may be required, including the provision of a wheel wash facility. Should a wheel wash facility be required, it would be located at an area isolated from any watercourses. The associated run-off would be collected via a settling pond;
- Particular care would be taken during the construction of the discharge point outfall. Plant operation within the River Moy SAC would be kept to a minimum. Mitigation measures specified above for suspended solids, concrete and hydrocarbons would be followed;
- To minimise any potential impacts on salmonid fish, outfall works would be undertaken in the July to September period where possible, which would avoid the salmonid spawning season. Should outfall works be required outside the July – September timeframe, works would only commence upon prior agreement with IFI;
- For dry open cut crossings, the pump used to take the flow from upstream to downstream of the crossing point would be fitted with a filter, to prevent entry of aquatic fauna into the pump and to limit the potential disturbance to the watercourse bed due to sediments. Pumping operations would be supervised at all times;
- Cognisance would be taken of the IFI's "*Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters*". The design and choice of route through the River Moy SAC to the River Glore [Mayo] would provide for the passage of aquatic fauna, would prevent erosion and sedimentation and would be laid in such a manner as to maintain the existing watercourse profile. The structure would be covered with clean, inert material and would be fenced with silt fencing or similar to prevent sediment entering the watercourse;
- Monitoring of receiving water for suspended solids would be undertaken daily;

- In the unlikely event of a suspected deterioration in water quality within any of the watercourses due to construction works at the development site, works would immediately cease, an investigation into the cause undertaken and the relevant NPWS and Inland Fisheries Ireland personnel informed;

- The construction work contractor would prepare a detailed Construction Environmental Management Plan (CEMP) for all construction activities. The CEMP would describe how construction work would be undertaken in an environmentally sensitive manner and would include measures for the protection of water quality such as the implementation of silt control features.

In addition to the above measures, the construction works contractor would take cognisance of the following guidelines:

- CIRIA, 2001: *Control of Water Pollution from Construction Sites; guidance for consultants and contractors*;
- CIRIA, 2002: *Control of Water Pollution from Construction Sites – Guide to Good Practice*;
- IFI, 2016: *Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters*.

8.2 OPERATIONAL PHASE

To ensure the operational phase of the development does not result in any potential significant impacts upon the designated habitats or species of River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC, the following measures are proposed:

Should planning consent be granted for a discharge to the River Glore [Mayo], a review of the Western Brand facility's current IE Licence would be required to be submitted to the Environmental Protection Agency (EPA) for approval. Proposed emission limit values would be assessed by the EPA, and once agreed, would be specified within the amended licence.

Western Brand would be required to undertake scheduled monitoring of the effluent treatment process and discharge for parameters specified by the EPA in their licence. This monitoring would ensure that treated effluent quality would remain high, and that any slight increases in parameter results would be identified and addressed prior to the potential for impact upon the River Moy SAC.

The proposed rising main route would be included in the pipeline integrity testing carried out every three years in accordance with Western Brand's EPA licence. The pipeline should also be included in the sites preventative maintenance schedule to avoid blockages.

As part of the site's IE Licence review, it would be required that the integrity of the proposed rising main would be tested every three years. This would reduce the potential for any leakages due to any potential damage or weaknesses within the pipeline in its lifetime.

9.0 IN-COMBINATION EFFECTS

The following plans and projects were reviewed and considered for in-combination effects with the proposed development:

- Mayo County Development Plan 2014-2020;
- County Mayo Biodiversity Action Plan 2010-2015;
- Mayo Local Economic and Community Plan 2015-2021;
- Proposed and permitted developments in the area available on Mayo County Council planning system.

The location of the proposed treated effluent rising main would start at the Western Brand facility at Knock Road approximately 3.5km west of Ballyhaunis, Co. Mayo. The rising main will traverse the townlands of Knockaunacat, Erriff, Derrymore, Island and Annagh. The land use of the area is mainly agricultural, dominated by pasture with some areas of peat bogs, aquatic habitats and coniferous forest. There are few commercial enterprises within the general area, with the exception of agricultural enterprises.

According to the Mayo County Council online planning system, current planning applications within the vicinity of the proposed development site are mainly residential projects consisting of dwelling houses and associated works.

Table 9.1: EPA Licenced Facilities within 15km of the Development

LICENCE NO.	LICENCE NAME	LICENCE TYPE (FIRST SCHEDULE OF EPA ACT, 1992, AS AMENDED)	APPROX. DISTANCE FROM DEVELOPMENT SITE
P0911-01	Mr. Eugene Lannon (Bernie's Farm)	6.1 (a) Intensive Agriculture	1.7km West
P0912-01	Mr. Eugene Lannon (Hunts Farm)	6.1 (a) Intensive Agriculture	2km South-West
P0048-03	Dawn Meats Ireland t/a Western Proteins	7.4.1 Food and Drink	3km South-East
P0923-01	Mr. Paraig Kiely	6.1 (a) Intensive Agriculture	5km South-East
P0971-01	Martin and Mhairi Dempsey	6.1 (a) Intensive Agriculture	10km North-West

Potential in-combination effects are discussed under the following headings.

9.1 HABITAT LOSS / FRAGMENTATION

As discussed in Section 6.1, the proposed development does not impinge on the surface area of a European site. The uninterrupted HDD pipeline will go through an area of impermeable calcareous Marl. The Marl will effectively swell against the pipe wall, and form an impermeable seal, preventing the development of any linear drainage pathways. This method of pipe installation under the River Moy SAC will prevent any disturbance to protected habitat on the surface and prevent any disturbance to groundwater flows in the area. Therefore, the proposed rising main would not be expected to have any in-situ effects upon a protected site

through loss or destruction of habitat or fragmentation of habitat or disturbance of species for which the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC have been designated once mitigation measures are fully implemented.

As discussed above, the land use of the area is mainly agricultural, dominated by pastureland, therefore the area can generally be considered to be modified and of low to moderate biodiversity value. There are few planning applications within the immediate vicinity of the development site, with those nearby mainly proposed on agricultural grassland. Given the land use of the area, should future planning applications be submitted for the area, it is likely that these would also be located upon agricultural grassland. Therefore, it is unlikely that current or future proposed developments would result in the loss or fragmentation of designated habitats of the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC, within the vicinity of the proposed site. Therefore, no in-combination effects on habitat loss / fragmentation are anticipated.

9.2 DISTURBANCE TO SPECIES

Disturbance to species may arise through noise emissions and human activity. The main in-combination noise and human activity effects would be from any commercial activities and traffic within the area. However, as noted above, there are few commercial enterprises located within the immediate vicinity of the development site, with the general area around the development site mainly used for agricultural purposes and for some dispersed one-off housing. Therefore, owing to the distances of commercial activities and the EPA licenced facilities detailed in the table above, given the nature of activities at the proposed development, and given the distance of the development site to designated sites (with the nearest designated site located approximately 1.7km from the development), it is considered that there would be no cumulative noise impacts, or other disturbance effects due to human activity, which would pose a significant risk to designated sites or species.

9.3 AIR QUALITY

Given the nature of the development and the treatment process of the effluent there is no cumulative air impacts that would have a significant impact on the habitats or species associated with the SACs therefore this development would not result in the lowering of air quality nor significantly impact on nearby sensitive receptors.

9.4 DETERIORATION IN WATER QUALITY

Continued implementation of the Water Framework Directive would result in achieving, or maintaining, improvements to water quality in the Moy & Killala Bay Catchment and Corrib Catchment. Developments such as this proposed development could act in combination with existing environmental pressures on the Moy & Killala Bay Catchment and Corrib Catchment, including: agriculture, anthrogenic, domestic and urban waste water, urban run-off and industry.

Discharges from the existing Western Brand treatment works are routinely treated to a very high standard. Therefore, under normal circumstances, a much lower headroom utilisation

would typically occur. The concentration of BOD_5, Ammonia and Ortho-phosphate in the discharge would remain in compliance with water quality objectives for good status during a 95%ile low flow condition.

Two of the facilities listed in Table 9.1 above, Bernie's Farm (P0911-01) and Hunts Farm (P0912-01), operated by Mr. Eugene Lannon, generate wash-waters which are likely spread within the general area. It is likely that the facilities operated by Mr. Paraig Kiely (P0923-01) and Martin and Mhairi Dempsey (P0971-01) also generate wash-waters which may also be directed to landspreading in the general area. However, the landspreading of wash-waters would be required to be undertaken in compliance with the Nitrates Regulations. Therefore, no cumulative impacts upon water quality due to landspreading would be anticipated, provided that operators complied with legal landspreading requirements.

It is therefore considered that there would be no significant cumulative impacts upon water quality which could pose a risk to the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC.

10.0 CONCLUSION

It is not anticipated that the proposed development, subject to recommended mitigation measures, by itself or in combination with other developments, would impact negatively upon European sites (the Natura 2000 network) during the construction or operational phases of the project.

The proposed development site is located beneath and adjacent to the River Moy SAC and approximately 6.4km from Errit Lough SAC, 7.5km from Urlaur Lakes SAC and 8.1km from Lough Corrib SAC. It is considered that the proposed development would not result in any significant risk to the protected habitats and species of the aforementioned sites due to habitat fragmentation or loss, disturbance or reduction in species density or introduction of invasive species.

The proposed development is potentially hydrologically connected with all SAC sites. However, it is considered that there would be no potential risk of significant impacts upon the qualifying interests of the River Moy SAC, Errit Lough SAC, Urlaur Lakes SAC and Lough Corrib SAC due to the proposed mitigation measures to be employed.

It is the conclusion of this Natura Impact Statement that, subject to recommended mitigation measures, there would be no potential for significant impacts on European sites as a result of the proposed development and mitigation measures to be employed. This conclusion refers to the development by itself or in combination with other developments.

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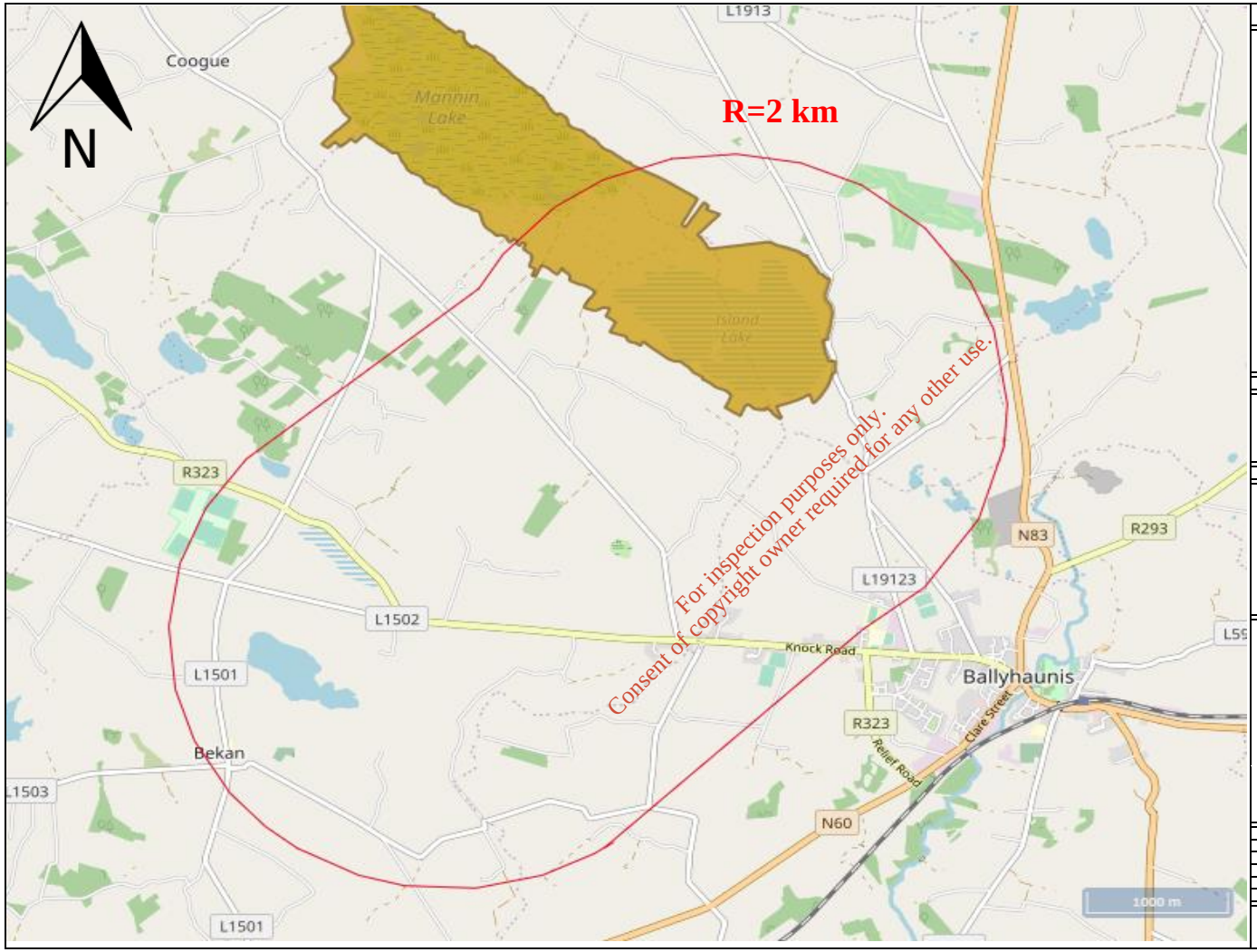
APPENDIX A

PROTECTED SITES



Notes

Site Location –

S.P.A. –

S.A.C. –

Project Title:

PROTECTED SITES MAP

Client Name:

WESTERN BRAND

PANTHER ENVIRONMENTAL SOLUTIONS LTD

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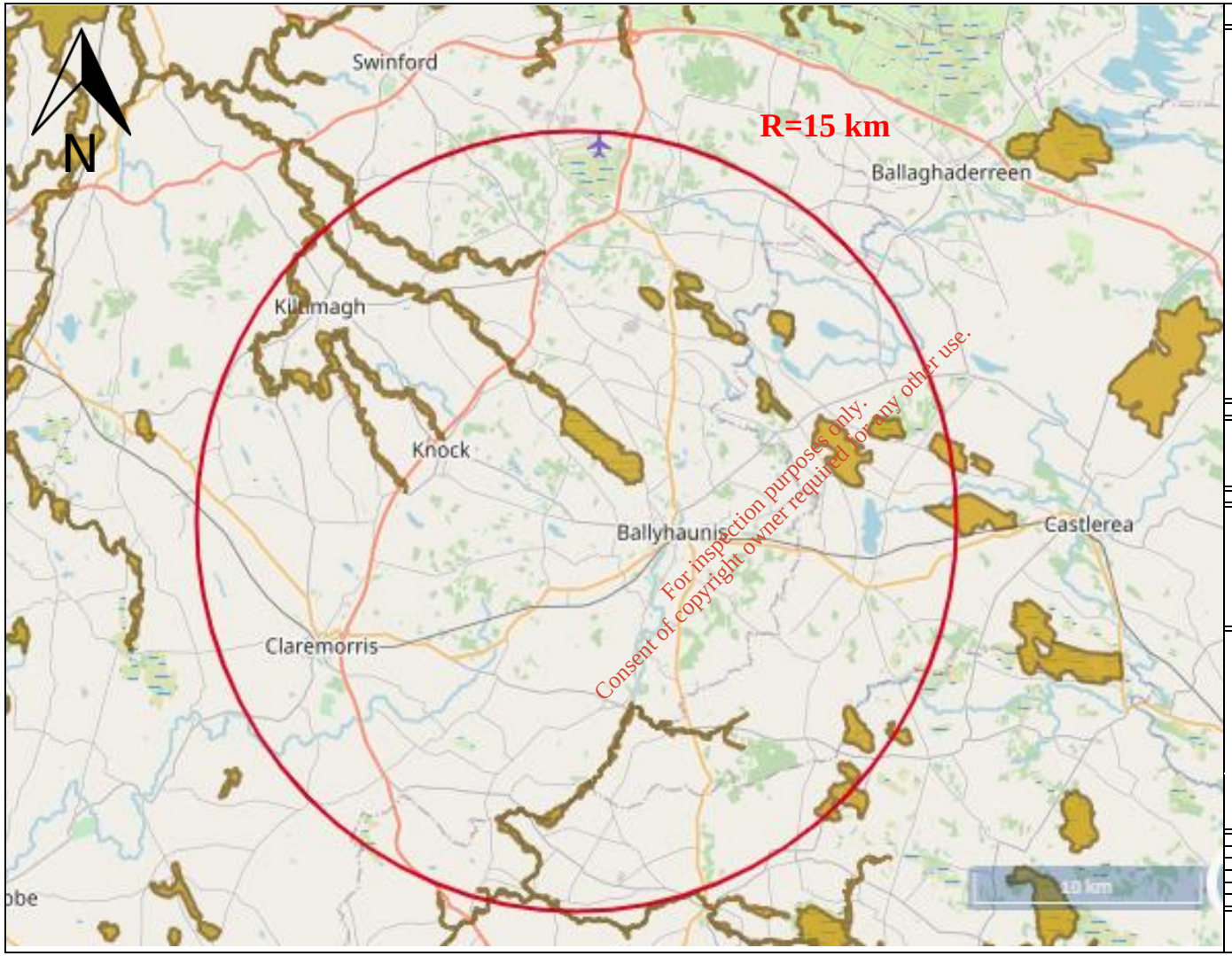
Drawing Status:	**Scale:**	NTS	A4
Report	**Datum:**		EPA Maps
Drawing Number:	**Drawn:**		PES
	Checked:		MF
Revision:	**Approved:**		-
R1	**Date:**		30/06/2020



Notes

Site Location –

S.P.A. –

S.A.C. –

Project Title:

PROTECTED SITES MAP

Client Name:

WESTERN BRAND

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Drawing Status:	**Scale:**	NTS	A4
Report	**Datum:**	EPA Maps	
Drawing Number:	**Drawn:**	PES	
	Checked:	MF	
Revision:	**Approved:**	-	
	Date:	30/06/2020	

APPENDIX B

PHOTO LOG

Plate 1: Example of FW2 habitat.

Plate 2: Example of WN6 habitat within the River Moy SAC.

Plate 3: GS4 habitat within the River Moy SAC

Plate 4: FS1 habitat within the River Moy SAC.

Notes:

APPENDIX B
PHOTO LOG

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file location:		scale: N/A	A4
drawing status:	REPORT	datum:	N/A
		drawn:	PES
drawing no.	rev	checked:	MF
PES_20_9766	A	approved:	-
		date:	30/06/2020

Plate 5: Area of GS1 habitat, with WL1 habitat in the background

Plate 6: GA2 habitat withWL2 in the background.

Plate 7: Example of BL1 habitat.

Plate 8: Area of HH3 habitat.

Notes:

APPENDIX B
PHOTO LOG

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file location:		scale: N/A	A4
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