MAKING COMPLEX EASY
A TETRA TECH COMPANY

CLONASLEE FLOOD RELIEF SCHEME

Report to inform screening for Appropriate Assessment

MDW0867-RPS-EI-XX-R-EN-0101
Clonaslee Flood Relief Scheme
Appropriate Assessment Screening
S5.P01
27th February 2025

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
S5 P01	Final Issue	JG/RW/SA	MN	PC	27.02.2025

Approval for issue

PC	27 February 2025

Prepared by:

RPS

Prepared for:

Laois County Council

Dublin | Cork | Galway | Sligo | Kilkenny
rpsgroup.com

RPS Group Limited, registered in Ireland No. 91911
RPS Consulting Engineers Limited, registered in Ireland No. 161581
RPS Engineering Services Limited, registered in Ireland No. 99795
The Registered office of each of the above companies is West Pier Business Campus, Dun Laoghaire, Co. Dublin, A96 N6T7

Contents

Tables

Figures

Appendices

EXECUTIVE SUMMARY

RPS was commissioned by Laois County Council to prepare a report to inform screening for Appropriate Assessment (AA) (Stage 1) with respect to the Clonaslee Flood Relief Scheme (FRS) (the “Proposed Scheme”). The Proposed Scheme is not directly connected with or necessary for the management of any European Site.

Based on the information available at the time of this assessment, in view of best scientific knowledge and in view of the Conservation Objectives of the relevant European Sites, it is considered that the Proposed Scheme is likely to have a significant effect on Charleville Wood SAC. Furthermore, given the assumed presence of crayfish plague (*Aphanomyces astaci*) in the River Clodiagh, the potential for significant effects on European Sites for which white-clawed crayfish (*Austropotamobius pallipes*) is listed as a qualifying interest can also not be ruled out. Connectivity between the Proposed Scheme and the following SACs has been identified as white-clawed crayfish is listed as a qualifying interest in these SACs. These sites are not linked to the Proposed Scheme in any other way. The SACs include: the River Barrow and River Nore SAC; Blackwater River (Cork/Waterford) SAC, Bricklieve Mountains and Keishcorran SAC, Glenade Lough SAC, Kilroosky Lough Cluster SAC, Lough Bane and Lough Glass SAC, Lough Corrib SAC, Lough Gill SAC, Lough Lene SAC, Lough Owel SAC, Lower River Suir SAC, River Moy SAC, White Lough Ben Loughs and Lough Doo SAC, Lough Hoe Bog SAC, Lough Nageage SAC.

Given that likely significant effects have been identified, it is the recommendation of RPS that the Proposed Scheme be brought forward to Stage 2 Appropriate Assessment for consideration of adverse effects on integrity of European Sites and for the application of suitable mitigation of these effects.

1 INTRODUCTION

1.1 Purpose and Scope of Report

RPS was commissioned by Laois County Council (LCC) to prepare a report to inform screening for Appropriate Assessment (AA). This report will inform the decision of the Competent Authority in their screening for AA for the proposed Clonaslee Flood Relief Scheme (hereafter referred to as the 'Proposed Scheme') in Clonaslee, Co. Laois.

Consent approval under the Planning and Development Act, 2000 (as amended) in respect of the Proposed Scheme can only be given after the Competent Authority has conducted an assessment pursuant to Section 177U of the Planning and Development Act, which concludes that there is no likelihood of significant effects on European Sites, either individually or in combination with other plans or projects, in view of their conservation objectives. The assessment conducted under Article 6(3) of the Habitats Directive must therefore be completed before a consent approval decision can be made.

This screening for AA report has been prepared to provide a sufficient level of information to the Competent Authority for it to complete a screening of the potential of the Proposed Scheme to impart likely significant effects on European Sites, in view of their conservation objectives, either individually or in combination with other plans or projects.

Where the Competent Authority determines that the project is not directly connected with or necessary for the management of the site as a European Site and if it can be excluded on the basis of objective scientific information that the Proposed Scheme, individually or in combination with other plans or projects, will not have a significant effect on a European Site(s), the Competent Authority shall determine that an AA of the project is not required.

This report is an examination of whether, in view of best scientific knowledge and applying the precautionary principle, the Proposed Scheme, either individually or in combination with other plans or projects, is likely to have a significant effect on any European Site(s). The assessment has been carried out in accordance with the legal context outlined in **Section 1.3**.

1.2 Author Qualifications

This report has been authored and reviewed by experienced and qualified RPS ecologists.

1.3 Legislative Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "The Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of a European Union (EU)-wide network of sites known as Natura 2000 (hereafter referred to as 'European Sites').

The Natura 2000 network is defined under the Habitats Directive (Article 3) and the Birds Directive 2009/147/EC (Article 4) as a coherent European ecological network of Special Areas of Conservation (SAC) and Special Protection Areas (SPA). SACs are composed of sites hosting the Qualifying Interest (QI) habitat types listed in Annex I and/or species listed in Annex II. SPAs are composed of sites supporting Special Conservation Interests (SCI) comprising Annex I bird species, regularly occurring migratory species and in some sites the supporting wetland habitats. The purpose of the network is to enable the natural habitat types and the species' concerned to be maintained or, where appropriate, restored to a favourable conservation status in their natural range.

In this report, candidate and proposed SACs and SPAs are referred to as "SACs" and "SPAs" throughout the appraisal, and there is no distinction made between candidate/proposed sites and European Sites as they have the same level of protection as a matter of domestic law and, therefore, the AA procedure does not treat them differently. For the purposes of AA, they are one and the same.

Each European Site has assigned Conservation Objectives (CO) and a list of QIs or SCIs. The National Parks and Wildlife Service (NPWS) publish COs for European Sites on their website.

1.4 Appropriate Assessment

1.4.1 European Context

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to have a significant effect on or adversely affect the integrity of European Sites. Article 6(3) establishes the requirement for AA:

"*Any plan or project not directly connected with or necessary to the management of the [European] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In 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.*"

Article 6(4) states:

"*If, in spite of a negative assessment of the implications for the [European] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*"

1.4.2 National Context

The Habitats Directive has been transposed into Irish law by Part XAB of the Planning and Development Act, 2000, as amended and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) as amended. In Ireland, these SAC and SPA sites are included within the meaning of 'European Site' as per section 177U of the Planning and Development Act, 2000 as amended and Part 1(2) of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended.

1.4.3 Role of the Competent Authority

In accordance with subsection 177U(I) of the Planning and Development Act, 2000 as amended, the screening for AA of an application for consent for the Proposed Scheme shall be carried out by the Competent Authority to assess in view of best scientific knowledge, whether the Proposed Scheme, individually or in combination with other plans and projects, is likely to have a significant effect on a European Site. This report provides the sufficient level of information to the Competent Authority in making their determination on the screening for AA.

2 METHODOLOGY

2.1 Stages of Appropriate Assessment

The Department of the Environment, Heritage, and Local Government Guidelines (DEHLG 2010a) reflects the European Commission's methodological guidance (EC 2021) promoting a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

The AA process follows a sequential staging, the conclusion of each stage determining whether subsequent stages are required. The stages are outlined below.

Stage 1: Screening / Test of Significance: This process identifies whether the proposed plan / project is directly connected with or necessary for the management of a European Site(s) and identifies whether the plan / project is likely to have significant effects upon a European Site(s) either alone or in combination with other plans / projects. The output from this stage is a determination by the Competent Authority of not significant, significant, potentially significant, or uncertain effects. The latter three determinations will cause the plan / project to be brought forward to Stage 2.

Stage 2: Appropriate Assessment: This stage considers the impact of the proposed plan or project on the integrity of a European Site(s), either alone or in combination with other plans / projects, with respect to: (i) the site's conservation objectives; and (ii) the site's structure, function, and its overall integrity. The output from this stage is a Natura Impact Statement (NIS). This document is used, alongside any other information considered relevant by the Competent Authority to carry out the AA and reach their determination. If their determination is negative, i.e., adverse effects on the integrity of a site cannot be excluded despite incorporation of measures to avoid or reduce the adverse effects, then the process must consider alternatives (Stage 3).

Stage 3: Assessment of Alternatives: This process examines alternative ways of achieving the objectives of the plan / project that avoid adverse effects on the integrity of a European Site. This assessment may be carried out concurrently with Stage 2 in order to find the most appropriate solution. If no alternatives exist or all alternatives would result in negative effects on the integrity of the European Sites, then the process either moves to Stage 4 or the plan / project is abandoned.

Stage 4: Assessment where Adverse Impacts Remain: This stage is undertaken when it has been determined that a plan / project will have adverse effects on the integrity of a European Site, but no alternatives exist. It includes the identification of compensatory measures where, in the context of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

2.2 Appropriate Assessment Guidance

The principal national and European guidelines have been followed in the preparation of this document. The following list identifies these and other pertinent guidance documents:

- European Commission (EC) (2021) Assessment of Plans and Projects in relation to Natura 2000 Sites – Methodological Guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- Office of the Planning Regulator Practice Note (PN01) 'Appropriate Assessment Screening for Development Management' (OPR 2021).
- EC Notice C (2018) 7621 'Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC 2018).
- EC (2013) EC Interpretation Manual of European Union Habitats. Version EUR 28. European Commission.
- Department of the Environment, Heritage and Local Government (DEHLG) (2010a) Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin.

- DEHLG (2010b) DEHLG Circular - National Parks and Wildlife Service (NPWS) 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin.
- EC (2000) Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg.

There have been important changes to AA practice since both the EC (2021) and the DEHLG (2010a) guidance, arising from practice and rulings in UK, European, and Irish courts. These changes have been addressed in the preparation of this report.

2.3 Identifying Relevant European Sites

The identification of relevant European Sites to be assessed in this report to inform screening for AA is based on the criteria provided in OPR (2021) guidelines, namely:

- Any European Site within or immediately adjacent to the Proposed Scheme area;
- Identification of European Sites within the Zone of Influence (ZoI) of the Proposed Scheme using a Source-Pathway-Receptor (S-P-R) model, as outlined below in **Section 2.3.1.**

2.3.1 Zone of Influence

Determination of the ZoI of the Proposed Scheme is achieved by assessing the requirements and deliverables of the Proposed Scheme against the ecological receptors within the Proposed Scheme footprint, in addition to all ecological receptors that could be connected to and subsequently impacted by it through abiotic and biotic vectors.

The proximity of the Proposed Scheme to European Sites, and more importantly QIs/SCIs of the European Sites, is of importance when identifying potential likely significant effects. In accordance with the OPR AA Screening Guidelines (OPR 2021), the S-P-R model has been used to identify the ZoI to ensure that relevant European Sites are identified. The S-P-R model minimises the risk of overlooking distant or obscure effect pathways, while also avoiding an over reliance on buffer zones (e.g., 15 km), within which all European Sites should be considered.

The ZoI of the Proposed Scheme for mobile species (e.g., birds, mammals, and fish), and static species and habitats (e.g., saltmarshes, woodlands, and flora) is considered differently. Mobile species may have 'range' outside of the European Site in which they are QI/SCI. The range of mobile QI/SCI species varies considerably, from several metres (e.g., in the case of whorl snails *Vertigo* spp.), to hundreds of kilometres (in the case of migratory wetland birds). Whilst static species and habitats are generally considered to have ZoIs within close proximity of a proposed project, they can be significantly affected at considerable distances from an effect source; for example, where an aquatic QI habitat or plant is located many kilometres downstream from a pollution source.

The identification of relevant European Sites to be included in this report was based on the identification of the ZoI of the Proposed Scheme using a S-P-R model, where:

- A 'source' is defined as the individual element of the Proposed Scheme that has the potential to impact on a European Site, its qualifying features and its conservation objectives;
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor; and
- A 'receptor' is defined as the SCI of SPAs or the QI of SACs, in addition to any relevant supporting habitat within or outside of the European Site.

An S-P-R model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. It is also important to note that the identification of an impact source or pathway for effects does not necessarily mean that there will be or that there is likely to be a significant effect on a European Site. The nature and magnitude of the impact, the characteristics and resilience of the receptor, and the significance of the effect at the receptor must also be considered.

2.4 Desk & Field Studies

A desk study was carried out to identify all relevant European Sites and their associated QIs/SCIs within the ZoI of the Proposed Scheme. A number of datasets were consulted in order to identify any relevant SPAs/SACs in the area surrounding the Proposed Scheme. The desktop study had regard to the following sources:

- Information on the location and nature of the Proposed Scheme;
- Environmental Protection Agency (EPA) online interactive mapping tools;
- Mapping of European Site boundaries and COs for relevant sites, available online from the National Parks and Wildlife Service (NPWS);
- Distribution records for QI and SCI species of European Sites (where available) held online by the National Biodiversity Data Centre (NBDC);
- Geological Survey Ireland (GSI) online interactive mapping tools;
- Boundaries for catchments with confirmed or potential freshwater pearl mussel *Margaritifera* populations in GIS format available online from the NPWS.

Full details of the desk study sources are available in **Appendix A**.

Ecological surveys were conducted by RPS ecologists on various dates between April 2021 and August 2024. The data collected during these surveys provided detailed information on the existing environment of relevance to this screening to inform AA report (e.g., habitats, protected flora, invasive flora, otter, breeding birds, kingfisher, aquatic ecology). Full details of the methodology and dates of these surveys are available in **Appendix A**.

3 PROJECT DESCRIPTION

The full Project Description of the Proposed Scheme, which provides details on design, construction methods and operational maintenance is included in **Appendix B**. The Project Description provides detail on the objectives of the Proposed Scheme and the specific construction methodologies. The following section provides a short summary of the Proposed Scheme.

3.1 Location of the Proposed Scheme

The Proposed Scheme is located in Clonaslee in County Laois. Clonaslee is a small village, located in the foothills of the Slieve Bloom Mountains. Clonaslee village has a history of river flooding due to its location on the Clodiagh River, which flows through the town. The main source of flooding in Clonaslee is the high-water levels in the Clodiagh River which originate from the Slieve Bloom Mountains. High water levels in the Clodiagh River are quick to occur and quick to dissipate. A flood event of note occurred in November 2017, when Chapel Street and the adjacent properties were subject to flooding. This coincided with a breach in the existing wall along the river. Anecdotal evidence indicates water seeps through this wall and bubbles up through the road along Chapel Street in times of high-water levels.

3.2 Proposed Scheme

3.2.1 Flood Relief Scheme Design Approach

The Proposed Scheme was developed following a detailed hydrological and hydraulic study of the catchment. Potential options were developed and compared using the OPW's Multi-Criteria Analysis (MCA) guidelines. All potential options were required to deliver a Target Standard of Protection (SoP) for the 1% Annual Exceedance Probability (AEP) rainfall event. The MCA identified the preferred scheme based on technical, social, environmental, and economic criteria.

All proposed flood relief works are planned for the Clodiagh River; no flood relief works are considered necessary on the Gorragh River.

Each of the flood relief measures has been developed to solve a specific source of flood risk in the Scheme Area as described in **Table 3-1**.

Table 3-1: Scheme Design Approach.

Source of Flood Risk	Specific Flood Relief Measure
A tributary from Brittas Lake joining the Clodiagh River upstream of the village, was identified as a flood source during Public Information Events. The root cause of flooding here is an existing culvert in Brittas Wood that is almost totally blocked.	Remediation to the culvert (600mm pipe road crossing) including a headwall on the upstream side to reduce blockage risk and ease of maintenance.
Potential for water coming out of bank from the Clodiagh River at Brittas Wood, leading to adjacent land flooding and flowing into the village.	Construction of an embankment above predicted flood levels.
Blockage in the river caused by woody debris accumulation at the bridge in Clonaslee village.	Installation of a debris trap upstream of the bridge at a location that can be easily accessed for debris removal.
The existing stone wall on Chapel St currently acts as a flood defence. It is structurally vulnerable, and information gleaned at Public Information Events indicates water visibly seeps through the wall and from under the road.	Bolstering the existing stone wall with a specifically designed flood relief wall, and below ground flow cut-off.
An existing informal embankment to the north of the village acts as a flood defence. It is structurally vulnerable and has gaps possibly caused by livestock.	A new embankment constructed parallel to the existing.
Potential for water coming out of bank from the Clodiagh River and increasing flooding of the Integrated Constructed Wetlands Treatment Plant owned and operated by Uisce Éireann (UÉ).	A new retaining wall adjacent to the Integrated Constructed Wetlands (ICW) to mitigate flood increases over the wetlands.

A summary of the Proposed Scheme is set out in **Table 3-2**. The Proposed Scheme has been separated into three areas (**Area 1, Area 2, Area 3**) and associated temporary construction compounds. **Figure 3-1** shows the location of the Proposed Scheme with each area labelled.

Table 3-2: Summary of the Proposed Scheme.

Location	Defence Elements
Area 1: Brittas Wood	• Embankment • Debris trap with access slipway • Culvert remediation
Area 2: Chapel Street	• Flood wall
Area 3: Tullamore Rd and Integrated Constructed Wetland (ICW)	• Flood wall • Embankment

3.2.2 Operational and Maintenance Phase

It is expected that the operation and maintenance activities required will be undertaken by existing Laois County Council maintenance personnel. An Operation and Maintenance Programme will be prepared for the Proposed Scheme. **Table 3-3** provides a description of the expected maintenance activities required for the Proposed Scheme.

Table 3-3: Operational and Maintenance Activities.

Element	Activity	Frequency
Flood walls	Inspections	Annually
	Repairs	As required
	Vegetation control	Annually
Debris Trap	Inspections	Monthly
	Repairs	As required
	Removal of debris	As required
Culverts	Inspections	Annually
	Repairs	As required
	Removal of trash and vegetation	Quarterly
Embankments	Inspections and maintenance	Annually
	Vegetation control	Annually
	Vermin control	Bi-annually
	Back drainage improvements	Bi-annually

Figure 3-1: Location of the Proposed Scheme.

4 RECEIVING ENVIRONMENT

4.1 Site Location and Context

The Proposed Scheme is located within Clonaslee Village, which is situated in the upstream Brosna catchment. Two rivers pass through the village; the Clodiagh River to the west and Gorragh River to the east. The Clodiagh River flows northwards through the village, from its source on Knockachorra Mountain in the Slieve Bloom Mountain range. The River Clodiagh flows in a predominantly northerly direction before merging with the Tullamore River. From this point, it flows northwest and joins the River Brosna southwest of Clara. The Brosna then flows southwest and merges with the River Shannon near Shannon Harbour at the border of counties Offaly and Galway.

The Proposed Scheme will be constructed on a Coillte amenity trail in Brittas Wood; on Chapel Street within the village itself; in a private garden adjoining Chapel Street; in an agricultural field to the north of the village; and adjacent to an Uisce Éireann Integrated Constructed Wetlands wastewater treatment facility.

The Proposed Scheme is partially located within the Slieve Bloom Mountains SPA, which is designated for hen harrier (*Circus cyaneus*). The Slieve Blooms SAC is located just over one kilometre to the south of the Proposed Scheme. Charleville Wood SAC is hydrologically connected with the Proposed Scheme. **Figure 3-1** and **Figure 5-1** shows the location of the Proposed Scheme relative to European Sites.

4.2 Ecological Baseline – Summary

A detailed account of the ecological baseline is provided as supporting information in **Appendix A**. A summary of the ecological baseline is provided below.

4.2.1 Water & Hydrogeology

The Proposed Scheme is located within the Lower Shannon WFD catchment. As noted above, there are two rivers within Clonaslee village, the River Clodiagh and the River Gorragh. Both the River Clodiagh and River Gorragh are 2nd order rivers. The River Clodiagh downstream of the Proposed Scheme is part of the OPW Arterial Drainage Schemes (ADS). A small stream (hereafter referred to as “Brittas Stream”) which rises near Brittas Lake (located approximately 1.5 km west of Clonaslee village) flows into the River Clodiagh immediately downstream of the proposed debris trap. This stream has not been mapped by the EPA but appears on historic 25” and 6” maps. It is culverted under the gravel path adjacent to the River Clodiagh.

The most recent EPA monitoring of the River Clodiagh and River Gorragh (2023) indicates that these rivers have Q-values of 4-5 and 5 respectively, which is indicative of ‘high’ ecological status. The Water Framework Directive (WFD) status of the Clodiagh (Tullamore)_010 river waterbody in the period 2016-2021 is ‘good’. The WFD status assigned to the Gorragh_010 river waterbody in the period 2016-2021 is ‘good’. The River Gorragh has a high-status objective under the WFD.

The Proposed Scheme is located within two groundwater bodies (GWB), Geashill and Clonaslee West. The WFD status of both of these GWB is ‘good’. The Geashill GWB occupies the area between Offaly, Laois, and Westmeath. Nearly all aquifers within the GWB are locally important, which are moderately productive only in local zones. The streams and rivers crossing the aquifer are likely to be gaining, and groundwater comes to surface as springs. Due to the shallow groundwater flow in these aquifers, the groundwater and surface waters may be closely linked where subsoils are thinner. In the bedrock aquifers, groundwater flow paths are generally short, on the order of 30-300 m, with groundwater discharging to the streams and rivers that traverse the aquifer and to small springs.

The Clonaslee West GWB is located at the base of the northwestern slopes of the Slieve Bloom mountains. The general groundwater flow direction is naturally downhill (north and northwest) radiating from the peak of the Slieve Bloom Mountains. Groundwater flow follows topography, radiating north and north-westwards outwards from Slieve Bloom. Groundwater discharges to the small springs, streams emerging mid-way down the slopes, and near the contact area with the overlying impure limestones. The rivers crossing the aquifer in areas where the subsoil is not too thick are gaining.

Flood modelling has been undertaken by RPS for the Proposed Scheme. The extent of the predicted flooding in the present-day ‘do-nothing’ scenario and post-scheme scenario during the 1% Annual Exceedance Probability (AEP) is shown in Figure 4-1**.** The present-day ‘do-nothing’ scenario assumes that

the two informal flood defences, namely the existing wall on Chapel Street and an embankment upstream of the ICW access bridge, remain intact and act as flood defences. To get an understanding of the flood risk to properties in the scenario where the informal defences fail, a model was created with those defences removed. The results of this model are shown in **Figure 4-2.** The 1% AEP represents medium-probability flood events that have approximately a 1-in-a-100 chance of occurring or being exceeded in any given year.

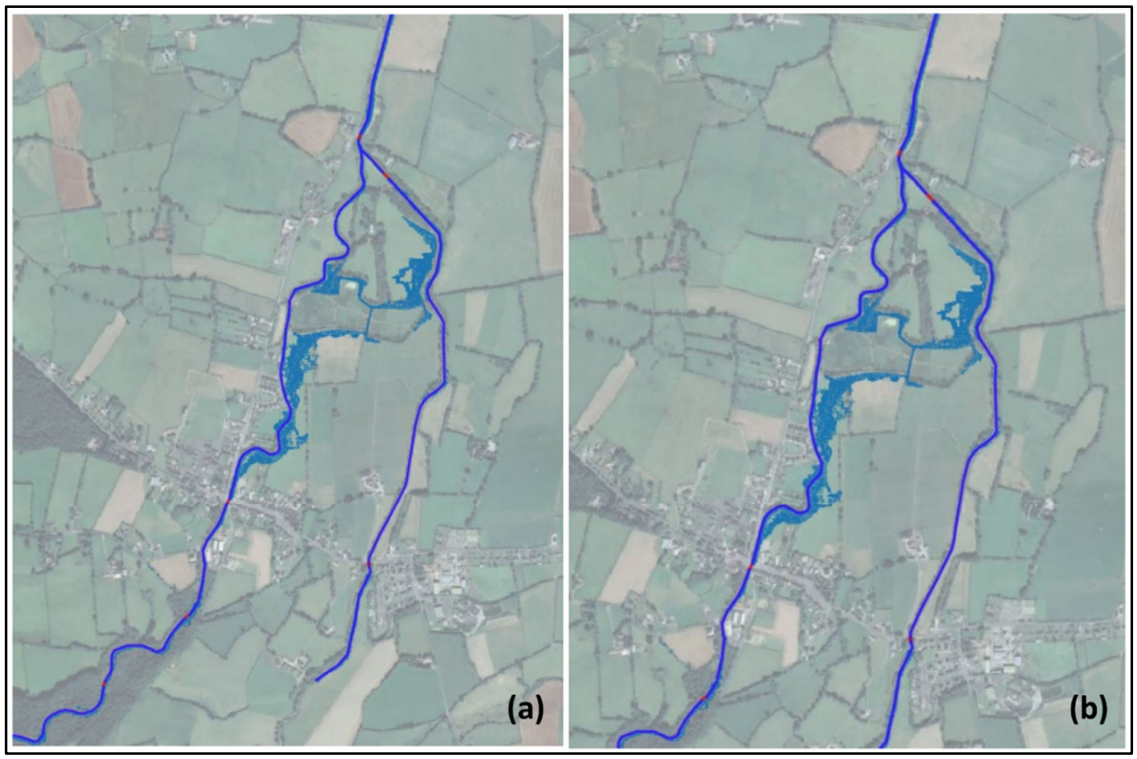


Figure 4-1: 1% AEP Model Predicted flooding in (a) present-day 'do-nothing' scenario and (b) post-scheme 1% AEP model predicted flooding. The present-day 'do-nothing' scenario assumes that the two informal flood defences, namely the existing wall on Chapel Street and an embankment upstream of the ICW access bridge, remain intact and act as flood defences. This is why both (a) and (b) look similar. The 1% AEP event in the undefended scenario is shown in Figure 4-2 below.

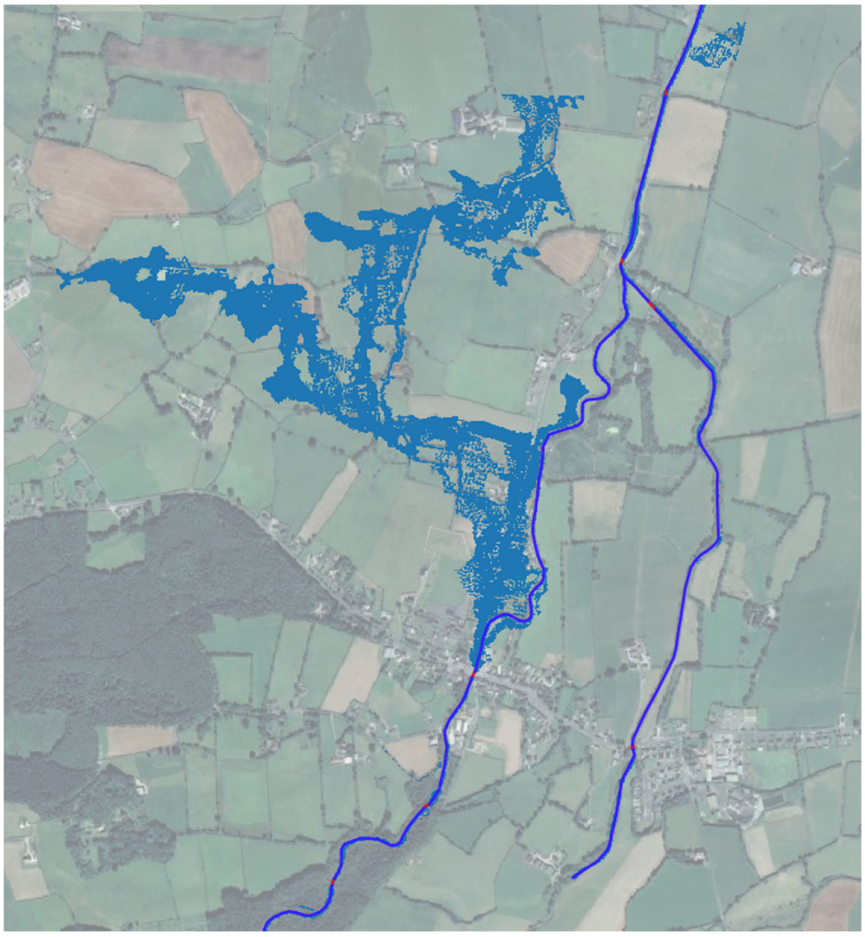


Figure 4-2: 1% AEP event in the undefended scenario.

4.2.2 Habitats

The main habitats identified within and immediately adjacent to the Proposed Scheme area include agricultural land, amenity grassland (gardens), broadleaved woodland, linear woodland habitats comprising hedgerows and treelines, buildings and artificial surfaces, eroding/upland rivers and reed and large sedge swamp. None of the terrestrial habitats correspond with any Annex I habitat type. There is a possibility that the Clodiagh river has affinities to the upland aspect of Annex I floating river vegetation habitat (3260), namely the bryophyte-dominated aquatic communities FW2A *Fontinalis antipyretica – Myriophyllum alterniflorum* aquatic community[1] or FW2B *Rhynchostegium riparioides – Chiloscyphus polyanthos* aquatic community[2]. No vascular plants were recorded within the River Clodiagh during surveys, but mosses were noted growing on boulders and cobbles within the river, with coverage of 2-5% noted.

According to the desk study, the Annex I habitat closest to the Proposed Scheme area (dry heath habitat) is located c. 1km to the southeast. An active raised bog (7110) is located c. 4 km west of the village and alluvial forests are located c. 14 km downstream (by river).

4.2.3 Invasive Alien Plant Species

Invasive Alien Plant Species (IAPS) listed under the Third Schedule of the European Communities (Birds and Natural Habitats Regulations) 2011, as amended, were identified during the field surveys. Japanese

[1] Description available online at: https://biodiversityireland.ie/ivc-classification-explorer/fw2/fw2a/ [Accessed: 13/11/2024].

[2] Description available online at: https://biodiversityireland.ie/ivc-classification-explorer/fw2/fw2b/ [Accessed 13/11/2024].

knotweed (*Reynoutria japonica*), and hybrid knotweed (*R. x bohemica*) were recorded. A Japanese knotweed stand is located within the footprint of the Proposed Scheme. A map showing the location of IAPS within and adjacent to the Proposed Scheme area is shown in **Apx Figure 7**.

4.2.4 Otter

Dedicated otter surveys were undertaken in 2021, 2023 and 2024 along the River Clodiagh. The river does have potential to support otter. A number of otter signs were noted within the River Clodiagh during the surveys undertaken in 2021 (see **Appendix A**). However, the most recent surveys undertaken (2023 and 2024) did not identify significant evidence of otter activity along the Clodiagh River. No evidence was found in 2023, and only a single spraint was observed on a boulder within the Clodiagh River in Brittas Wood in 2024.

4.2.5 Ornithology

Seven species listed under Annex I of the EU Bird's Directive (2009/147/EC) were identified as part of the desk study. These species were kingfisher (*Alcedo atthis*), golden plover (*Pluvialis apricaria*), hen harrier, little egret (*Egretta garzetta*), merlin (*Falco columbarius*), peregrine falcon (*Falco peregrinus*) and whooper swan (*Cygnus cygnus*). Hen harrier is an SCI species of Slieve Bloom Mountains SPA, a portion of which falls within the red line boundary of the Proposed Scheme area.

The Clodiagh river provides kingfisher feeding habitat with abundant overhanging tree branches providing perches for fishing. In August 2021, a kingfisher was observed flying up and downstream a section of the River Clodiagh adjacent to the Proposed Works area. An exposed sediment bank was identified nearby on the right bank, however no nesting holes were identified. The kingfisher habitat appraisal undertaken in August 2023 did not identify suitable kingfisher breeding habitat along the River Clodiagh within the study area. The banks comprised mainly treelines, vegetated banks, or banks reinforced with stone. The entire length of the River Clodiagh from Area 1 to Area 3 was walked on the 6th June 2024. Four discrete locations with suitable kingfisher nesting habitat were identified during this survey, as described in **Appendix A**. Whereas suitable kingfisher nesting habitat was identified, no kingfisher or kingfisher nest holes were noted during the course of the survey.

4.2.6 White-clawed Crayfish

Overall, crayfish habitat is excellent within the Clodiagh River, with boulder/cobbles, instream woody debris, leaf litter and over hanging banks creating refugia. Brittas Stream does not provide optimal habitat for crayfish. The crayfish surveys undertaken in 2021 identified white-clawed crayfish within the River Clodiagh. Many of these were dead, and a crayfish plague outbreak was suspected. An outbreak of crayfish plague in the River Clodiagh near Clonaslee was officially announced on the 30th August 2021. No crayfish were observed during kick sampling or dedicated crayfish surveys undertaken in 2023. This is likely due to the crayfish plague outbreak in the Clodiagh.

5 IDENTIFICATION AND DESCRIPTION OF RELEVANT EUROPEAN SITES

5.1 Identification of ZoI using Source-Pathway-Receptor Model

As outlined in **Section 2.3**, the S-P-R model was used to identify European Sites potentially within the ZoI of the Proposed Scheme. Where it is evident that there are no S-P-R links between the Proposed Scheme and receptors (i.e. European Sites and/or features for which the sites are designated), the receptors are excluded from the AA Screening assessment process. The potential effects and the potential for them to occur as a result of the Proposed Scheme during both construction and operation are explored in detail in **Table 5-1** and **Table 5-2** below. Where there is no or extremely low likelihood of an effect occurring as a result of the Proposed Scheme, such effects are scoped out of further assessment with a rationale provided.

Table 5-1: Source-Pathway-Receptor Model for the Construction Phase of the Proposed Scheme.

Source of Potential Effects	Description of Effect Pathway	Potential Effect
Habitat loss/deterioration/fragmentation	Land take for the construction of the Proposed Scheme, trimming or removal of trees/hedgerows could remove a valuable habitat or cause fragmentation. Potential indirect habitat loss or deterioration via hydrological or hydrogeological pathways.	Habitat loss is possible from removal of habitat through vegetation clearance. The closest European Site to the Proposed Scheme is Slieve Bloom Mountains SPA (004160), works associated with the Proposed Scheme will be carried out within the boundary of this Site. Habitat deterioration and/or fragmentation is possible due to access (tracking of vehicles and machinery), and removal of vegetation. Indirect habitat deterioration, fragmentation or loss in designated sites downstream of or hydrogeologically linked with the Proposed Scheme is possible as a result of surface water or groundwater quality deterioration as well as spread of IAPS. This potential effect is considered further as part of the assessment.
Surface water run-off carrying suspended silt or contaminants, arising from Proposed Scheme works, into watercourses	Silt, hydrocarbons, cement, suspended soils, and/or other contaminants accidentally released during the Proposed Scheme works, may enter nearby watercourses through surface-water runoff, with the potential to impact Annex I habitats and Annex II species.	Construction work has the potential to negatively impact water quality. During construction, the disturbance of soil and removal of vegetation exposes the soil to erosion. Following rainfall events, the eroded soil can wash into nearby waterways, streams, rivers, and lakes which leads to increased turbidity. Construction can also lead to harmful chemicals running off into the waterways. These pollutants can have detrimental effects on aquatic ecosystems. Hydrological connections between the proposed works and European Sites may occur over significant distances. Due to the nature and proximity of the works to the River Clodiagh, there is potential for direct hydrological connectivity to downstream European Sites. This potential effect is considered further as part of the assessment.
Changes to groundwater quality, yield, and/or flow paths associated with the works	The Proposed Scheme works could interfere with groundwater quality, yields, and/or flow paths, potentially affecting the water quality or hydrogeological regime of habitats dependent on groundwater supply.	Construction activities can affect groundwater quality and volume. Accidental spills of hazardous materials and chemicals (e.g., petroleum) can lead to contamination of soil and groundwater reserves. Dewatering has the potential to reduce groundwater reserves within a GWB. Hydrogeological linkages between the Proposed Scheme and European Sites (and their QIs/SCIs) are highly variable based on the characteristics of the GWB, the characteristics of the Proposed Scheme, and the presence of groundwater-dependant terrestrial habitats and species. This potential effect is considered further as part of the assessment.
Noise, vibration, and human presence-related disturbance	Noise or other construction-related disturbance could reduce the ability of populations of QI/SCI species to forage, roost, or breed.	Construction activities such as the operation of heavy machinery and vehicles can interfere with the foraging, breeding, and navigation of various species. Vibrations from construction activities can also alter the physical environment, potentially damaging burrows/nests and disrupting the foraging patterns and habitat use of both terrestrial and aquatic animals.

Source of Potential Effects	Description of Effect Pathway	Potential Effect
		The presence of humans and construction equipment can lead to displacement of fauna. Species that are not adaptable may face increased risks of stress and mortality. This potential effect is considered further as part of the assessment.
Air pollution from release of dust and vehicle emissions	Air pollution from construction activities may affect sensitive habitats in the vicinity of the works. Dust or particles transported through the air and subsequently falling onto plants can physically smother the leaves affecting photosynthesis, respiration, and transpiration.	Air pollution from vehicle emissions significantly impacts ecosystems, contributing to a range of detrimental effects on plants, animals, and the wider environment. This potential effect is considered further as part of the assessment.
Disturbance and potential spread of invasive species and pathogens during the Proposed Scheme works	Construction activities could lead to the spread of scheduled invasive species or pathogens either via machinery, materials or clothing. Propagules may also be transported downstream to European Sites.	The spread of IAPS and pathogens can have significant impacts on the ecological functioning of terrestrial and aquatic habitats. The effect of spread of Japanese Knotweed into European Sites located downstream of the Proposed Scheme may have permanent effects if unmanaged. However, it is considered reversible if mitigation is implemented. The effect of spread of Crayfish Plague can result in 100% mortality of the native, white-clawed crayfish, which, without mitigation, could have permanent irreversible effects. This potential effect is considered further as part of the assessment.

Table 5-2: Source-Pathway-Receptor Model for the Operational Phase of the Proposed Scheme.

Source of Potential Effects	Description of Effect Pathway	Potential Effect
Surface-water runoff carrying suspended silt or contaminants, arising from flood waters post-scheme works, into watercourses	During a flood event there is potential for flood waters to flush suspended silt and nutrients from agricultural lands and lands adjacent to the Integrated Constructed Wetland (ICW) into the River Clodiagh or River Gorragh, with the potential to impact European Sites downstream.	Flood modelling shows that during the operational phase, there is no increased risk or change in the nature of flooding over agricultural lands or in lands around the ICW (see **Figure 4-1**). This potential effect is not considered further as part of the assessment.
	Irregular removal of debris from the proposed debris trap has the potential to release built-up sediment, potentially resulting in water-quality	There is hydrological connectivity with European Sites downstream of the Proposed Scheme.

Clonaslee FRS

Source of Potential Effects	Description of Effect Pathway	Potential Effect
	and habitat degradation, which could have negative effects on aquatic habitats, water quality, and fauna.	This potential effect is considered further as part of the assessment.
Changes in the hydrological regime of the River Clodiagh during the Operational Phase	The construction of embankments and floodwalls could lead to changes in channel velocities and potential changes to patterns of bed material transport (deposition / scouring) during a flood event.	There is hydrological connectivity with European Sites downstream of the Proposed Scheme. This potential effect is considered further as part of the assessment.
Noise, vibration, and human presence - related disturbance	Maintenance-related disturbance could reduce the ability of populations of QI/SCI species to forage, roost, or breed.	There will be minimal maintenance required during the operational phase. As the Proposed Scheme is located in an urban setting, the proposed maintenance works are not envisaged to cause significant disturbance effects on QI species/habitats and SCI birds. This potential effect is not considered further as part of the assessment.
Disturbance and potential spread of invasive pathogens during maintenance works	Equipment and PPE used during the maintenance of the debris trap has potential to spread crayfish plague.	There is a potential risk of equipment, maintenance personnel, and PPE transferring crayfish plague to other waterbodies. This potential effect is considered further as part of the assessment.
Air pollution from releasing dust and vehicle emissions	Air pollution from vehicles used to maintain the proposed scheme.	There will be minimal maintenance required with a low number of vehicles needed. Therefore, the proposed maintenance works are not envisaged to cause significant effects. This potential effect is not considered further as part of the assessment.

5.2 The Zone of Influence

5.2.1 Description

Based on the S-P-R model presented in **Section 5.1** above, the potential ZoI has been identified as follows:

The lands within the Proposed Scheme area and within 500 m of same. This ZoI is included to account for European Sites within the environs of the Proposed Scheme that could be affected directly or indirectly (e.g., due to noise, dust, human disturbance, etc.).

The hydrogeological baseline is described in **Section 4.2.1** and **Appendix A**. In terms of hydrogeological pathways via groundwater flow paths, it is anticipated that groundwater flows within the Geashill groundwater body will be relatively short (30 – 300 m). Flow paths within the Clonaslee West groundwater body may be longer as the Site occurs within the confined section of this groundwater body. Groundwater flows are expected to follow local topography. Discharge is to rivers and springs which cross these groundwater bodies and near the contact areas with the impure limestones at the north of the study area. It is expected that groundwater flow will generally follow a subdued version of topography. Regional topography slopes from the high ground at the south towards the north, therefore local groundwater flow direction is expected to be from south to north towards the Clodiagh River and Gorragh River. As a precaution, European Sites dependent on groundwater are considered to be within the potential ZoI of the Proposed Scheme if they are located within close proximity (defined here as 1 km) to the Proposed Scheme.

In terms of hydrological pathways, European Sites are considered to be within the potential ZoI of the Proposed Scheme if they occur downstream and within the floodplain of the River Clodiagh to a distance (by river) of 50 km, or if they occur upstream of the Proposed Scheme but support mobile fauna or species dependent on same. The flood plain is determined based on a review of CFRAM River Flood Extents maps[3]. Some of the flood extents in downstream reaches are under review by the OPW due to error identified in the flood map source data (map review code: MR075). Where the flood extents are under review, then consideration has been given to historic maps, topography and distance between European Sites and the River Clodiagh. In the case of uncertainty, the precautionary principle was applied.

Given the assumed presence of crayfish plague in the River Clodiagh (it was confirmed in 2021, see **Section 4.2.6** and **Appendix A**), the potential for significant effects on European Sites, for which white-clawed crayfish is listed as a qualifying interest, is also considered here. Although there is a possibility that the pathogen is no longer present within the River Clodiagh (the pathogen is likely to die out once all host crayfish perish (Brady, et al. 2024)), surveys in Ireland have found crayfish plague to persist in catchments both upstream and downstream of an infected site. This was observed in the River Bruskey in the Erne catchment where surveys undertaken after a mass mortality event due to crayfish plage indicated that by a year later (2016), the pathogen was still present and had spread downstream (Mirimin, et al. 2022). Furthermore, the Marine Institute, as part of the National Crayfish Plague Surveillance Programme (2020/2021) detected crayfish plague via eDNA analysis in sites within the Shannon Estuary South in both 2020 and 2021 (Swords and Griffin 2022). Therefore, without tests confirming the absence of crayfish plague from the Clodiagh River, the possibility that it still persists must be assumed. All European sites in Ireland which have been designated for the protection of white-clawed crayfish are included in the ZoI due to uncertainty regarding whether machinery, equipment or PPE used during the construction and operational phase of the Proposed Scheme could also be used in other waterbodies across Ireland subsequently, and therefore potentially spread crayfish plague. Although the likelihood of crayfish plague spread may be relatively low, particularly for crayfish catchments very remote from the Proposed Scheme area, the potential magnitude of the effect (risk of 100% mortality in affected populations), and the uncertainty as to whether it could occur, justifies including these European Sites within the ZoI. Human-mediated transport of crayfish plague via contaminated water equipment is highly likely to be the primary cause of spread within Ireland (Brady, et al. 2024).

European Sites within 20 km of the Proposed Scheme are considered with regard to whether they support SCI bird species. This distance was chosen as *ex-situ* foraging ranges of populations of SCI bird species from SPAs can extend up to 20 km (NatureScot 2016).

[3] Available at: https://www.floodinfo.ie/map/floodmaps/# [Accessed September 2024].

As a precautionary measure, any European Site which supports QI or SCI species which have been shown through survey to be present in *ex-situ* habitats within or adjacent to the Proposed Scheme will be considered with regard to potential for likely significant effects.

5.2.2 European Sites Within the potential Zone of Influence

The following European Sites have been identified within the potential ZoI:

- River Barrow and River Nore SAC (002162)
- Charleville Wood SAC (000571)
- River Shannon Callows SAC (000216)
- Slieve Bloom Mountains SPA (004160)
- Middle Shannon Callows SPA (004096)
- River Nore SPA (004233)
- Blackwater River (Cork/Waterford) SAC (002170)
- Bricklieve Mountains and Keishcorran SAC (001656)
- Glenade Lough SAC (001919)
- Kilroosky Lough Cluster SAC (001786)
- Lough Bane and Lough Glass SAC (002120)
- Lough Corrib SAC (000297)
- Lough Gill SAC (001976)
- Lough Lene SAC (002121)
- Lough Owel SAC (000688)
- Lower River Suir SAC (002137)
- River Moy SAC (002298)
- White Lough Ben Loughs and Lough Doo SAC (001810)
- Lough Hoe Bog SAC (000633)
- Lough Nageage SAC (002135)

European Sites identified within the potential ZoI of the Proposed Scheme are detailed in **Table 5-3** and **Table 5-4**. **Table 5-3** includes a column outlining the rationale for the inclusion of the European Site within the potential ZoI, and a scoping column to identify relevant QIs and European Sites to be brought forward for assessment. The European Sites listed in **Table 5-4** are not linked to the Proposed Scheme in any way other than that white-clawed crayfish is listed as a QI within them, and therefore, no other QIs associated with these European Sites are considered to be at risk of significant effects as a result of the Proposed Scheme. **Figure 5-1** shows the European Sites in relation to the Proposed Scheme.

Clonaslee FRS

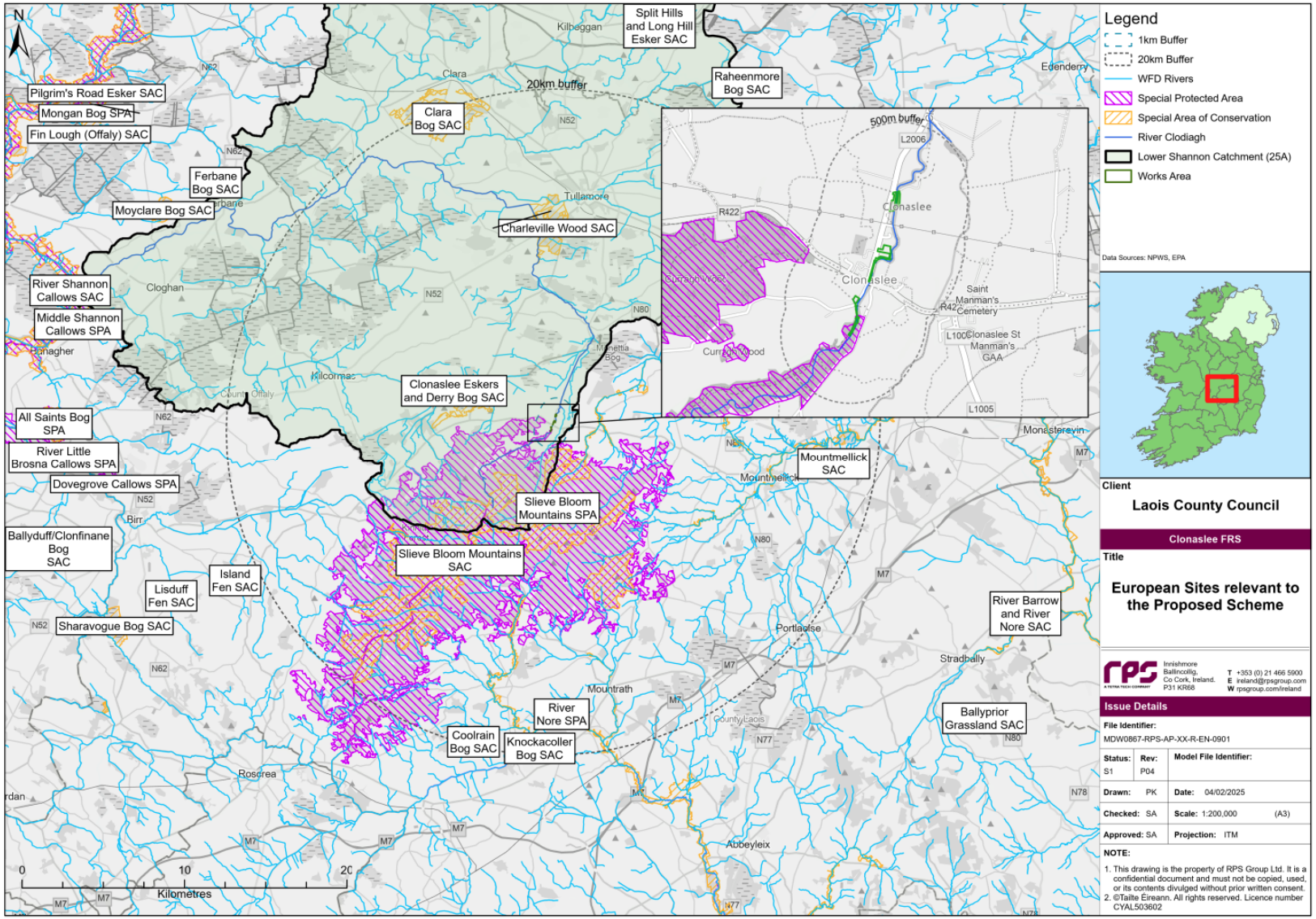


Figure 5-1: European Sites relevant to the Proposed Scheme (excluding those listed for white-clawed crayfish outside the range of this map).

Table 5-3: Conservation Objectives of European Sites Within the ZoI.

European Site (Code)	Straight line distance to Proposed Scheme	Qualifying Interest Habitats & Species (*=Priority Habitat)	Conservation objective	Rationale for inclusion within potential ZoI	Scoped in for further assessment?
River Barrow and River Nore SAC (002162) (NPWS 2011)	2 km (East)	Estuaries [1130]	Maintain	This SAC is included within the potential ZoI of the Proposed Scheme given its proximity to the Scheme, and that white-clawed crayfish are listed as a qualifying interest. There is no direct hydrological or hydrogeological connectivity between the Proposed Scheme and this European Site. The only QI that may be within the ZoI of the Proposed Scheme is **white-clawed crayfish**. The remaining QIs are sufficiently remote from the Proposed Scheme (at least 2 km) and have no connectivity to the Proposed Scheme. Otters are known to forage up to 32 km from their home range[4] and have been confirmed in the Clodiagh River, within the footprint of the Proposed Scheme. However, given the distance between this SAC and the Proposed Scheme, and the extensive areas of suitable habitat for otter within the River Barrow and River Nore SAC itself, it is considered that there is no likelihood for significant effects on otter associated with this SAC as a result of the Proposed Scheme. Despite the absence of a direct hydrological link between the Proposed Scheme and the River Barrow and River Nore SAC, white-clawed crayfish are considered to be within the ZoI. There is the potential, although slight, that machinery, equipment or PPE used during the construction and operational phase of the Proposed Scheme could also be used in this catchment. Given the potential magnitude of the effect of the spread of crayfish plague into watercourses (risk of 100% mortality in affected populations), and the uncertainty as to whether it could occur during the construction or operational	**Yes**
		Mudflats and sandflats not covered by seawater at low tide [1140]	Maintain		
		Reefs [1170]	Maintain or restore[5]		
		Salicornia and other annuals colonising mud and sand [1310]	Maintain		
		Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Restore		
		Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Restore		
		Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]	Maintain		
		European dry heaths [4030]	Maintain		
		Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	Maintain		
		* Petrifying springs with tufa formation (*Cratoneurion*) [7220]	Maintain		
		Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	Restore		

[4] NatureScot (2024) https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/otter

[5] This habitat is listed as a qualifying interest of this SAC on the site synopsis but not the conservation objectives document (NPWS 2011).

Clonaslee FRS

European Site (Code)	Straight line distance to Proposed Scheme	Qualifying Interest Habitats & Species (*=Priority Habitat)	Conservation objective	Rationale for inclusion within potential ZoI	Scoped in for further assessment?
		* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]	Restore	phase, this species is considered to be within the potential ZoI.	
		Freshwater pearl mussel (*Margaritifera margaritifera*) [1029]	The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review.		
		Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016]	Maintain		
		Nore pearl mussel (*Margaritifera durrovensis*) [1990]	Restore		
		Killarney fern (*Trichomanes speciosum*) [1421]	Maintain		
		Sea lamprey (*Petromyzon marinus*) [1095]	Restore		
		Brook lamprey (*Lampetra planeri*) [1096]	Restore		
		River lamprey (*Lampetra fluviatilis*) [1099]	Restore		
		Atlantic salmon (*Salmo salar*) (only in fresh water) [1106]	Restore		
		Twaite shad (*Alosa fallax*) [1103]	Restore		
		White-clawed crayfish (*Austropotamobius pallipes*) [1092]	Maintain		
		Otter (*Lutra lutra*) [1355]	Restore		
Charleville Wood SAC (000571)	9.4 km (North)	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]	Restore	This European Site is located downstream of the Proposed Scheme, with direct hydrological connectivity	**Yes**

Clonaslee FRS

European Site (Code)	Straight line distance to Proposed Scheme	Qualifying Interest Habitats & Species (*=Priority Habitat)	Conservation objective	Rationale for inclusion within potential ZoI	Scoped in for further assessment?
(NPWS 2021a)		Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016]	Maintain	via the Clodiagh River. The SAC is approximately 13 km downstream by river.	
River Shannon Callows SAC (000216) (NPWS 2022a)	29.1 km (NW)	Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]	Restore	This European Site is located downstream of the Proposed Scheme, with direct hydrological connectivity via the Clodiagh River. The only QIs which may be within the ZoI are the water dependent habitats and species listed for the site, namely alkaline fens, molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae), alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) and otter. However, considering the distance to this Site is approximately 40 km by river, it is unlikely that significant effects on receptors within this SAC are likely to arise. Therefore, this SAC is not screened in for further assessment.	**No**
		Limestone pavements* [8240]	Maintain		
		Alkaline fens [7230]	Maintain		
		Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]	Restore		
		Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]	Maintain		
		Otter (*Lutra lutra*) [1355]	Maintain		
Slieve Bloom Mountains SPA (00416) (NPWS 2022b)	Intersects Proposed Scheme	Hen Harrier (*Circus cyaneus*) [A082]	Restore	This SPA intersects with the Proposed Scheme. Noise or other construction related disturbance could reduce foraging and breeding ability of the hen harrier populations, a QI species. Potential for habitat loss as works are proposed within this SPA.	**Yes**
River Nore SPA (004233) (NPWS 2022c)	17.4 km (South)	Kingfisher (*Alcedo atthis*) [A229]	Maintain or restore	This SPA is located within 20 km of the Proposed Scheme. There is no hydrological or hydrogeological connectivity with this site. The only species listed for this SPA is kingfisher. According to Bird Watch Ireland, kingfisher are a very sedentary species, rarely moving from their territories[6]. Therefore, this SPA is not considered further in this assessment.	**No**
	29.1 km	Whooper Swan (*Cygnus cygnus*) [A038]	Maintain		**No**

[6] https://birdwatchireland.ie/birds/kingfisher/

Clonaslee FRS

European Site (Code)	Straight line distance to Proposed Scheme	Qualifying Interest Habitats & Species (*=Priority Habitat)	Conservation objective	Rationale for inclusion within potential ZoI	Scoped in for further assessment?
Middle Shannon Callows SPA (004096) (NPWS 2022d)		Wigeon (*Anas penelope*) [A050]	Restore	This European Site is located downstream of the Proposed Scheme, with direct hydrological connectivity via the Clodiagh River. However, considering the distance to this Site is approximately 50 km by river, it is unlikely that significant effects on receptors within this SPA are likely to arise. Therefore, this SPA is not scoped in for further assessment.	
		Lapwing (*Vanellus vanellus*) [A142]	Restore		
		Black-tailed Godwit (*Limosa limosa*) [A156]	Restore		
		Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	Restore		
		Wetland and Waterbirds [A999]	Maintain		
		Corncrake (*Crex crex*) [A122]	The status of corncrake as a Species of Conservation Interest for the Middle Shannon Callows SPA is currently under review.		
		Golden Plover (*Pluvialis apricaria*) [A140]	Maintain		

Table 5-4: Conservation objectives for white-clawed crayfish in the SACs for which this species is listed as a QI.

European Site (Code)	Conservation Objective for white-clawed crayfish	Rationale for inclusion within potential ZoI	Scoped in for further assessment?
River Barrow and River Nore SAC (002162) (NPWS 2011)	To maintain the favourable conservation condition of white-clawed crayfish in the River Barrow and River Nore SAC.	There is the potential, although slight, that machinery, equipment or PPE used during the construction and operational phase of the Proposed Scheme could also be used in catchments supporting these SACs. Given the potential magnitude of the effect of the spread of crayfish plague into watercourses (risk of 100% mortality in affected populations), and the uncertainty as to whether it could occur during the construction or operational phase, this species is considered to be within the potential ZoI.	Yes
Blackwater River (Cork/Waterford) SAC (002170) (NPWS 2012)	To maintain the favourable conservation condition of White-clawed Crayfish in the Blackwater River (Cork/Waterford) SAC.		
Bricklieve Mountains and Keishcorran SAC (001656) (NPWS 2021b)	To maintain the favourable conservation condition of white-clawed Crayfish in Bricklieve Mountains and Keishcorran SAC.		
Glenade Lough SAC (001919) (NPWS 2021c)	To maintain the favourable conservation condition of White-clawed Crayfish in Glenade Lough SAC.		
Kilroosky Lough Cluster SAC (001786) (NPWS 2021d)	To maintain the favourable conservation condition of White-clawed Crayfish in Kilroosky Lough Cluster SAC.		
Lough Bane and Lough Glass SAC (002120) (NPWS 2021e)	To restore the favourable conservation condition of White-clawed Crayfish in Lough Bane and Lough Glass SAC.		
Lough Corrib SAC (000297) (NPWS 2017a)	To maintain the favourable conservation condition of White-clawed Crayfish in Lough Corrib SAC.		
Lough Gill SAC (001976) (NPWS 2021f)	To maintain the favourable conservation condition of White-clawed Crayfish in Lough Gill SAC.		
Lough Lene SAC (002121) (NPWS 2021g)	To restore the favourable conservation condition of White-clawed Crayfish in Lough Lene SAC.		
Lough Owel SAC (000688) (NPWS 2018)	To maintain the favourable conservation condition of White-clawed Crayfish in Lough Owel SAC.		
Lower River Suir SAC (002137) (NPWS 2017b)	To maintain the favourable conservation condition of White-clawed Crayfish in Lower River Suir SAC.		
River Moy SAC (002298) (NPWS 2016)	To maintain the favourable conservation condition of White-clawed Crayfish in River Moy SAC.		
White Lough, Ben Loughs and Lough Doo SAC (001810) (NPWS 2021h)	To maintain the favourable conservation condition of White-clawed Crayfish in White Lough, Ben Loughs and Lough Doo SAC.		
Lough Hoe Bog SAC (000633) (NPWS 2017c)	To maintain the favourable conservation condition of White-clawed Crayfish in Lough Hoe Bog SAC.		
Lough Nageage SAC (002135) (NPWS 2021i)	To maintain the favourable conservation condition of White-clawed Crayfish in Lough Nageage SAC.		

5.3 Assessment of Connectivity Conclusion

Of the European Sites within the ZoI of the Proposed Scheme, the only Sites considered for further assessment (as significant effects on these sites are considered likely) are **Charleville Wood SAC** and **Slieve Bloom Mountains SPA**, as well as the **15 Sites for which white-clawed crayfish are a QI** (**Table 5-4**).

6 APPROPRIATE ASSESSMENT SCREENING

6.1 Management of European Sites

Screening for AA is not required where a plan or project is connected with, or necessary for the management of any European Site. In this case, the Proposed Scheme is not directly connected with or necessary for the management of any European Site(s).

6.2 Assessment of Likely Significant Effects

The integrity of a European Site (referred to in Article 6(3) of the EU Habitats Directive) is determined based on the conservation status of the qualifying features of the European Site(s).

European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status areas designated as SAC and SPA. The government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

Site-specific conservation objectives for SACs and SPAs aim to define the favourable conservation condition for a particular designated interest (either a QI or SCI) of each designation.

Favourable conservation condition of a habitat is achieved when:

i. Its natural range, and area it covers within that range, are stable or increasing;

ii. The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the for the foreseeable future; and

iii. The conservation status of its typical species is favourable.

Favourable conservation condition of a species is achieved when:

i. 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;

ii. The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and

iii. There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

6.2.1 Habitat loss/deterioration/fragmentation

Charleville Wood SAC

There is a risk of pollutants, namely silt and hydrocarbons to enter the River Clodiagh through the instream works proposed for construction of the debris trap in Area 1 of the Proposed Scheme, as well as the proposed bankside works, in the absence of mitigation. Furthermore, there is a risk of IAPS spread (Japanese knotweed) downstream as a result of the Proposed Scheme. As such, there is potential for indirect habitat deterioration effects within Charleville Wood SAC as a result of the Construction Phase of the Proposed Scheme. Two QIs are listed for this SAC, namely alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* [91E0] and Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016].

Habitat deterioration effects from construction phase contaminants and IAPS are likely to be restricted to habitats within the River Clodiagh itself and its floodplain. According to the (CO) document for Charleville Wood SAC, alluvial forest habitat, for which this SAC is designated, is present around Charleville Lake and occurs in mosaic with other native woodland types (NPWS 2021a). The document also states that it is important to note that further unsurveyed areas may be present within the SAC. Mapping in the CO document (Map 2) indicates that the habitat occurs on the banks of the River Clodiagh within the SAC, as well as the area around Charleville Lake. There is one known site in Charleville Wood SAC for Desmoulin's whorl snail which is found on the margins of Charleville Lake within the 1 km grid square N3122 (NPWS 2021a). The swamp habitat fringing Charleville Lake is the main area of habitat that supports Desmoulin's whorl snail. Another sub-site is in an area of wet woodland with sedges (*Carex* spp.) to the east of the lake

(NPWS 2021a). EPA river flow mapping does not indicate that the River Clodiagh flows into Charleville Lake, however it is possible that this could occur during a flood event. Catchment-based Flood Risk Assessment and Management (CFRAM) river flood extents for the lands within Charleville Wood SAC are currently under review (however see **Figure 6-1** for indicative flood mapping within this area, and its interaction with the QIs of Charleville Wood SAC). Therefore, it must be assumed that during a flood event, there may be direct hydrological connectivity between the River Clodiagh and Charleville Lake. Siltation of Desmoulin's whorl snail habitat and hydrocarbon pollution of Desmoulin's whorl snail habitat as well as alluvial forest has the potential to result in significant effects on Charleville Wood SAC. Furthermore, Japanese knotweed can be harmful to QI habitats and species due to its aggressive growth, resilience and the ecological impacts it imposes. Japanese knotweed can quickly dominate an area, outcompeting with native flora for resources and altering habitats. Alluvial forests are characterised by their rich biodiversity and unique ecosystem functions, and are especially vulnerable to such invasions. Japanese knotweed invasion could result in the loss of flora on which Desmoulin's whorl snail relies (e.g., large sedges, reeds) and could also result in too much shade and/or drying out of the snail's habitat. Given that in-stream works are highly unlikely to be permitted during flood events as standard health and safety protocol, it is acknowledged that the likelihood of some of the above sources of significant effects (silt, hydrocarbons) migrating into the alluvial forest and supporting habitat for Desmoulin's whorl snail of Charleville SAC is reduced. Nevertheless, flood waters could mobilise hydrocarbon spills on the bank top which have not been properly treated, for example, or mobilise silt from exposed ground within the works area. Furthermore, hydrocarbon spills within the works area could migrate to the River Clodiagh via storm water drains or sloping ground, and eventually reach the SAC. As a precaution, mitigation is required to address these possible sources of significant effects.

As such, in relation to the potential for effects on alluvial woodland and Desmoulin's whorl snail as a result of indirect habitat deterioration during the construction phase, **the potential for significant effects cannot be ruled out**.

Siltation of downstream reaches of the River Clodaigh arising as a result of operational phase maintenance activities (debris removal and maintenance of the Brittas Stream culvert) is anticipated to be a localised effect that could affect water quality within the River Clodiagh. Silt from upstream sources in the River Clodiagh catchment could accumulate behind debris within the proposed debris trap or Brittas Stream culvert, and then create a plume downstream when disturbed. It is assumed for the purposes of this assessment that maintenance activities that could result in siltation occurring downstream will not be undertaken during flood events (i.e., debris removal will be undertaken after a flood has occurred). It is anticipated that this effect would be localised and restricted to the channel of the River Clodiagh (and not adjacent habitats within the flood plain) and is therefore not likely to significantly affect alluvial woodland habitat, Desmoulin's whorl snail, or habitat supporting Desmoulin's whorl snail within Charleville Wood SAC. Given the distance between the Proposed Scheme and Charleville Wood SAC, silt plumes potentially arising from maintenance activities are anticipated to settle out within the River Clodiagh channel prior to reaching Charleville Wood SAC. Furthermore, it is assumed that vehicles used to clear debris will be appropriately maintained and thus there is a low likelihood of a fuel or chemical leak from same occurring during maintenance activities.

There is a risk of run-off from the slipway to the River Clodiagh, as well as the embankment in Area 1 during the operational phase. These sloping features of the Proposed Scheme design could create preferential surface water flow pathways to the River Clodiagh. The run-off could be silt laden, or introduce unnatural material into the river such as hardcore or grit, which could have negative effects on instream habitat and fauna. It is anticipated that this effect, should it occur, would be localised and restricted to the channel of the River Clodiagh and is not likely to significantly affect alluvial woodland or Desmoulin's whorl snail within Charleville Wood SAC.

Taking into consideration the relatively minor and infrequent nature of maintenance works required, the distance between the Proposed Scheme and the QIs of Charleville Wood SAC during these activities, significant effects as a result of the operational phase are not anticipated and these effects are not considered further.

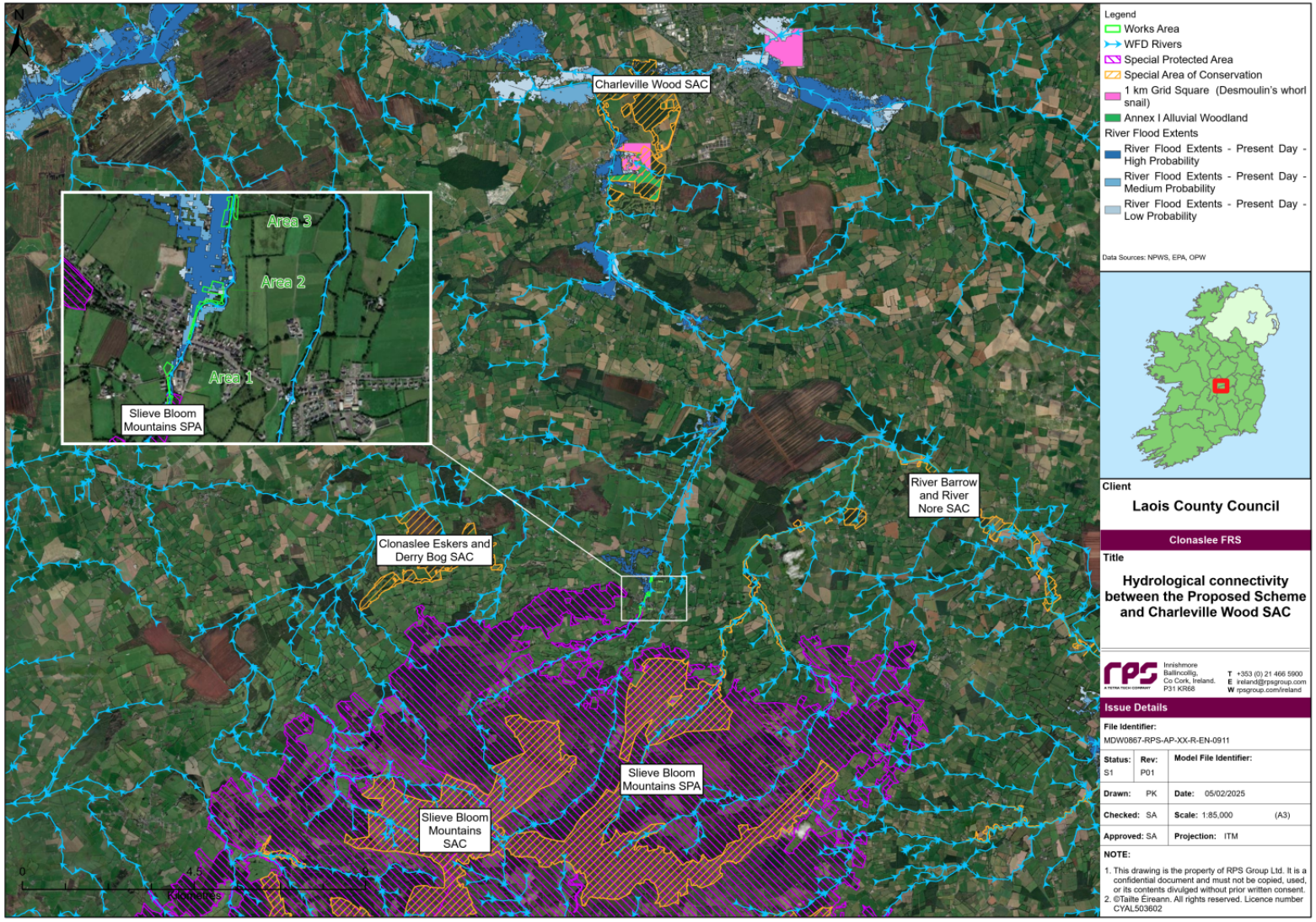


Figure 6-1: Hydrological connectivity between the Proposed Scheme and Charleville Wood SAC. River flood extents shown are OPW modelled data.

Slieve Bloom Mountains SPA

The Proposed Scheme is located within the northern margins of the Slieve Bloom Mountains SPA, which is designated for hen harrier. The Proposed Scheme area within the SPA comprises mixed broadleaved woodland, with the surrounding environment characterised by agricultural and built land, and mature broadleaved woodland. Regarding hen harrier habitat, the COs for the Slieve Bloom Mountains SPA relate to maintaining the extent and condition of heath and bog and associated habitats, maintaining the extent and condition of low intensity managed grasslands and associated habitats, maintaining the extent and condition of hedgerows, and achieving an even and consistent distribution of age-classes across the forest estate (NPWS 2022b). According to the Site Synopsis for this SPA, much of the slopes of the SPA are afforested, and overall coniferous plantations account for c. 60% of the site (NPWS 2015). The Proposed Scheme will result in the removal of 10 no. trees from within the SPA. All of these trees are broadleaved species within Brittas Wood and are not associated with important hen harrier habitat within the SPA. Furthermore, all of the trees to be removed are located along public walkway within Brittas wood in close proximity to the village. It is therefore considered that the removal of these broadleaved trees and associated understorey as part of the Proposed Scheme **will not result in significant effects** on the conservation objectives of hen harrier within this SPA.

6.2.2 Water Quality Deterioration

Charleville Wood SAC

Water quality deterioration has been identified as a potential source of significant effects on European Sites downstream of the Proposed Scheme, namely Charleville Wood SAC. The nature of the hydrological pathway between this SAC and the Proposed Scheme is outlined in **Section 6.2.1** above. Water quality deterioration potentially arising as a result of the Proposed Scheme could result in indirect effects on the habitat and species listed for this SAC. The indirect effect of water quality deterioration on alluvial woodland habitat as well as habitat supporting Desmoulin's whorl snail has been addressed in **Section 6.2.1**, and the potential for significant effects has been identified during the Construction Phase. There is also potential for direct effects on Desmoulin's whorl snail as a result of hydrocarbon pollution affecting this species during the Construction Phase. According to the CO document for this SAC, there is one known site in Charleville Wood SAC for Desmoulin's whorl snail which is found on the margins of Charleville Lake within the 1km grid square N3122. As noted in **Section 6.2.1**, EPA river flow mapping does not indicate that the River Clodiagh flows into Charleville Lake, although there could be connectivity between these two waterbodies during a flood event. As such, potential direct effects on Desmoulin's whorl snail would only be expected during a flood event. Therefore, in the absence of mitigation measures to control surface water pollution during the construction phase of the Proposed Scheme, **the potential for likely significant effects on alluvial woodland or Desmoulin's whorl snail within Charleville Wood SAC cannot be ruled out**.

6.2.3 Changes in Groundwater Quality and/or Yield

Charleville Wood SAC

Charleville Wood SAC and the Proposed Scheme are within the Geashill groundwater body. This SAC has groundwater dependent QI habitat and species, alluvial forests and Desmoulin's whorl snail. The CO for alluvial forest states that a hydrological regime of appropriate flooding depth and height of the water table is essential to maintain the habitat, while the CO for Desmoulin's whorl snail states that the hydrological regime is to maintain the current water levels in the lake subject to natural processes (NPWS 2021a).

Groundwater flows to the surface water bodies and springs within the flow direction, controlled by topography in the Geashill groundwater body. The flow path lengths within this groundwater body are described by the GSI are short (< 30 – 300 m) (GSI 2003). Given that the flow paths are relatively short, and that the SAC is located more than 9 km north of the Proposed Scheme, groundwater flow will likely be into the Clodiagh River within the footprint of the Proposed Scheme. Dewatering of groundwater infiltrating excavations may be required during the Construction Phase. However, given the distance between the Proposed Scheme and this SAC, and the small scale of any dewatering that will be required for the Proposed Scheme relative to the extent of the aquifer underlying both the Proposed Scheme and Charleville Wood SAC (Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones), significant effects on yield or groundwater quality are not anticipated.

Therefore, it is considered **unlikely for significant effects** on the QI alluvial forests and Desmoulin's whorl snail of this SAC to occur due to changes in groundwater quality or yield. This effect has been scoped out from further assessment.

6.2.4 Air pollution from releasing dust and vehicle emissions

Slieve Bloom Mountains SPA

Air pollution can pose threats to the health, reproductive success and survival rates of SCI bird species. There is potential for direct and indirect effects from air pollution on bird species, which include respiratory problems, behavioural changes and indirect effects such as habitat degradation.

The Slieve Bloom Mountains SPA is designated for the SCI species hen harrier. As noted in **Section 6.2.1**, the lands within the Proposed Scheme do not provide important hen harrier habitat. Furthermore, as well as the Proposed Scheme itself, the lands within 750 m of it do not contain suitable breeding habitat for this SCI species. These lands comprise agricultural land, broadleaved woodland, hedgerows and urban areas associated with Clonaslee village. Hen harrier breed mainly in upland areas, in localised, but fragmented areas of suitable heath and blanket bog and afforested habitats (conifer plantations). All the Slieve Bloom hen harrier breeding pairs identified during the 2022 national survey of breeding hen harrier were located within heather habitats and not in afforested habitats (Ruddock, et al. 2024). Therefore, it is unlikely, given the abundance of suitable habitat within the SPA, that hen harrier will utilise the mixed broadleaved woodland habitat within the Proposed Scheme area, or the agricultural land or mixed broadleaved woodland in the surrounding area for breeding. It is possible that hen harrier forage along the hedgerows within the vicinity of the Proposed Scheme.

Given the preferred breeding habitats of hen harrier (Ruddock, et al. 2024), and abundant foraging habitat within the SPA, it is **unlikely that significant disturbance effects** on hen harrier will occur due to air pollution. Significant effects on hen harrier as a result of air pollution are therefore ruled out.

6.2.5 Noise, vibration, lighting and human presence-related disturbance

Slieve Bloom Mountains SPA

The potential for indirect effects from noise, vibration, lighting, and human presence as a result of the Proposed Scheme has been identified as requiring further assessment.

As noted previously, the location of the works in Area 1 (within the Slieve Bloom Mountains SPA) does not contain suitable breeding habitat for hen harrier. All of the Slieve Bloom breeding pairs identified during the 2022 national survey of breeding hen harrier were located within upland, heather habitats and none in afforested habitats (Ruddock, et al. 2024). The Proposed Scheme work area is limited to mixed broadleaved woodland (Brittas forest) on the outskirts of the SPA. It also comprises a public amenity area utilised by pedestrians, cyclists and dog walkers. As well as the Proposed Scheme itself, the lands within 750 m of it do not contain suitable breeding habitat for this SCI species. These lands comprise agricultural land, broadleaved woodland, hedgerows and urban areas associated with Clonaslee village. However, it is possible that hen harrier forage along the hedgerows within the vicinity of the Proposed Scheme.

Given the construction work will be isolated to Brittas wood, Clonaslee village, the ICW boundary and an agricultural field north of the village, and hen harriers prefer upland habitats for nesting and foraging, it is considered that the construction phase of the Proposed Scheme is **unlikely to result in significant effects** on hen harrier in terms of disturbance from and therefore has been scoped out from further assessment.

6.2.6 Disturbance and potential spread of invasive species

Charleville Wood SAC

There is potential for effects due to disturbance and dispersal of Third Schedule invasive species during the proposed works. Japanese knotweed has been recorded within the Proposed Scheme footprint (Area 2). Charleville Wood SAC is located approximately 13 km by river downstream of the Proposed Scheme, with direct hydrological connectivity via the Clodiagh River. The nature of the hydrological pathway between this SAC and the Proposed Scheme is outlined in **Section 6.2.1** above. Japanese knotweed spread, potentially arising as a result of the Proposed Scheme, could result in effects on the habitat and species listed for this SAC. This effect on alluvial woodland habitat as well as habitat supporting Desmoulin's whorl snail has been addressed in **Section 6.2.1**, and the potential for significant effects has been identified. In the absence of

mitigation measures to control disturbance and spread of invasive species during the construction of the Proposed Scheme, **the potential for likely significant effects on Charleville Wood SAC cannot be ruled out**.

No operational effects regarding the spread of Japanese knotweed are foreseen.

Crayfish Plague

As crayfish plague was confirmed in the River Clodiagh in 2021, there is a risk of crayfish plague transfer to other waterbodies from the Clodiagh River as a result of the Proposed Scheme (refer to **Section 5.2.1** for rationale). Without tests confirming the absence of crayfish plague from the Clodiagh River, the possibility that it still persists must be assumed.

Fifteen SACs were taken into consideration as part of the assessment due to the presence of crayfish plague in the Clodiagh River. These include the River Barrow and River Nore SAC, Blackwater River (Cork/Waterford) SAC, Bricklieve Mountains and Keishcorran SAC, Glenade Lough SAC, Kilroosky Lough Cluster SAC, Lough Bane and Lough Glass SAC, Lough Corrib SAC, Lough Gill SAC, Lough Lene SAC, Lough Owel SAC, Lower River Suir SAC, River Moy SAC, White Lough Ben Loughs and Lough Doo SAC, Lough Hoe Bog SAC, Lough Nageage SAC.

The proposed construction activities within the Clodiagh River could inadvertently facilitate the transfer of the pathogen responsible for crayfish plague, via machinery, equipment, and PPE. This is also true for the operational phase, where machinery and personnel will be required to maintain the proposed culvert inlet on the Brittas Stream as well as the proposed debris trap on the Clodiagh River.

In the absence of mitigation measures to control the spread of this pathogen, the potential for likely significant effects on the QI white-clawed crayfish associated with the fifteen SACs as listed above cannot be ruled out during the construction and operational phases. Although spread from the Proposed Scheme area to SACs a significant distance from the Proposed Scheme is unlikely (e.g., Lough Nageage SAC in Co. Donegal), given the potential magnitude of the effect of the spread of this pathogen into watercourses (risk of 100% mortality in affected populations), and the uncertainty as to whether it could occur, all SACs for which white-clawed crayfish is listed as a QI are considered in this assessment as a precaution. Accordingly, the potential for **likely significant effects** cannot be ruled out.

6.2.7 Changes in hydrological regime of the River Clodiagh

Charleville Wood SAC

The construction of embankments and floodwalls could lead to changes in channel velocities and potential changes to patterns of bed material transport (deposition / scouring) during a flood event during the operational phase. The Annex I habitat alluvial forests is listed for Charleville Wood SAC and occurs downstream of the Proposed Scheme area. According to the CO document for this SAC, the habitat is present around Charleville Lake and occurs in mosaic with other native woodland types and further unsurveyed areas may be present within the SAC (NPWS 2021a). Mapping in the CO document (Map 2) indicates that the habitat occurs on the banks of the River Clodiagh within the SAC. Appropriate hydrological regimes are necessary for the maintenance of alluvial vegetation. Therefore, any changes to the hydrological regime as a result of the Proposed Scheme could theoretically affect the alluvial woodland listed for Charleville Wood SAC. Similarly, hydrological regimes are important for sustaining Desmoulin's Whorl Snail *Vertigo moulinsiana* populations. According to the CO document for this SAC, there is one known site in Charleville Wood SAC for Desmoulin's whorl snail which is found on the margins of Charleville Lake within the 1km grid square N3122.

Significant effects on alluvial forest and Desmoulin’s whorl snail in Charleville Wood SAC, as a result of the Proposed Scheme, are not anticipated, however. Firstly, regarding alluvial forest, it is noted in the CO document for this SAC that “the water level of Charleville Lake, and hence the degree of inundation of the alluvial forests habitat, is controlled by a sluice”. Similarly, regarding Desmoulin’s whorl snail, the CO document states “in this SAC, the lake is controlled by a sluice/weir and this should be maintained to ensure that water levels are kept as close as possible to current levels”. EPA river flow network data and historic maps indicate that the River Clodiagh does not flow into Charleville Lake. The lake appears to be fed by a 2nd order stream flowing into the lake from the east called “Haras Hill”. Therefore, it is assumed that any changes to the hydrological regime of the River Clodiagh as a result of the Proposed Scheme are highly unlikely to affect the hydrological regime of Charleville Lake, and therefore are highly unlikely to affect alluvial forest dependent on inundation by the lake or Desmoulin’s whorl snail. Secondly, this SAC is located approximately 13 km downstream of the Proposed Scheme Area (by river). Taking into consideration this

distance, the presence of numerous streams that provide flows into the River Clodaigh between the Proposed Scheme area and Charleville Wood SAC and the relatively minor nature of the proposed works, changes to the hydrological regime of the River Clodiagh are anticipated to be minor and localised, and any effects arising from the Scheme will not extend downstream as far as Charleville Wood SAC. Furthermore, an evaluation of the compliance of the Proposed Scheme with the WFD has been undertaken separately by Lauren Williams (2024), and the report is included as part of this planning application under separate cover. This report also concludes that changes to hydraulic regime are anticipated to be highly localised to the area within the vicinity of the debris trap.

Therefore, it is considered **unlikely for significant effects** to occur as a result of hydrological change, and this effect has been scoped out for further assessment.

6.2.8 Likely Significant Effects Alone Conclusion

The key findings from the assessment of likely significant effects conclude that, in the absence of mitigation measures during the construction phase to control surface water pollution and the spread of invasive alien plant species and waterborne pathogens, the potential for likely significant effects on European Sites cannot be ruled out. In the absence of mitigation measures during the operational phase to control the spread of waterborne pathogens the potential for likely significant effects on European Sites cannot be ruled out.

6.3 In-Combination Effects

Legislation, guidance, and case law require that in-combination effects with other plans or projects are considered. On this basis, a range of other plans and projects were considered in terms of their potential to have in-combination effects with the Proposed Scheme.

6.3.1 Projects

Given the relatively small scale, extent, and duration of the Proposed Scheme works, only planning applications within 5 km of the Proposed Scheme were considered. In order to identify projects with the potential to interact with the Proposed Scheme, a comprehensive search of the following data sources was undertaken:

- Department of Housing, Local Government and Heritage (DHLGH) EIA portal map viewer[7];
- An Bord Pleanála[8] website to identify any relevant applications, including Strategic Infrastructure Development (SID) and Strategic Housing Development (SHD) in the past five years in close proximity to the proposed Works;
- National planning application map viewer[9].

The above searches were limited to the five-year period preceding the date of issue of this report and excluded developments that have been constructed (where this information is available), retention applications (i.e., typically local-scale residential or commercial developments where an impact has already occurred), withdrawn, and refused applications**. Table 6-1** below outlines projects in close proximity to the Proposed Scheme.

In addition, forestry licences within the River Clodiagh catchment were reviewed on the online Forestry Licence Viewer[10], as well as any drainage activities proposed or recently undertaken by the OPW in the downstream Brosna ADS channel.

No afforestation is proposed within the River Clodiagh catchment upstream of the Proposed Scheme. In the last number of years, however, a considerable number of clear felling and thinning activities, as well as a small number of forestry roads, have been approved or are pending approval in the catchment. It is assumed that the approved and pending forestry licence applications in the Slieve Bloom mountains to the south of the Proposed Scheme have been subject to Appropriate Assessment screening at the least, and would only be

[7]Available online at: https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1 [accessed November 2024].
[8]Available online at: www.pleanala.ie [accessed November 2024].
[9] Available online at: https://myplan.ie/national-planning-application-map-viewer/ [accessed November 2024].
[10] https://flv.apps.services.agriculture.gov.ie/ [accessed January 2025].

consented if, following assessment, significant effects or adverse effects on integrity could be ruled out. In terms of potential water quality impacts on downstream European Sites (i.e., Charleville Wood SAC), given the extent of approved and pending forestry licence applications in the River Clodiagh catchment, and the potential for significant effects on water quality arising from the Proposed Scheme alone in the absence of mitigation, it is considered that significant in-combination effects on Charleville Wood SAC cannot be ruled out.

In terms of potential in-combination effects on hen harrier in the Slieve Bloom Mountains SPA as a result of forestry activity, significant in-combination effects are not anticipated. This is because the Proposed Scheme alone will not result in the loss of any important nesting or foraging hen harrier habitat and is also highly unlikely to result in any significant disturbance of hen harrier, given the lack of suitable breeding habitat in the lands surrounding the Proposed Scheme. It is possible that hen harrier forage along the hedgerows within the vicinity of the Proposed Scheme. However, as noted previously, the lands within the Slieve Bloom mountains provide superior foraging habitat, and hedgerow habitat is relatively common in the wider landscape around Clonaslee. Significant in-combination effects on hen harrier as a result of the Proposed Scheme and forestry activities are therefore not anticipated.

An NIS for statutory arterial drainage maintenance activities that were proposed take place over the five-year period 2018-2022 in the Brosna ADS channel was prepared by JBA (2018). The Arterial Drainage Scheme is located between Co. Offaly and Co. Westmeath. It includes 613.2 km of watercourse and 46 km of embankment. Provided works for the 2018-2022 period are complete, significant in-combination effects are not anticipated for this cycle. However, it is assumed future maintenance work within the ADS channel will be required at least once in the next cycle. If there is overlap between the maintenance activities and the construction phase of the Proposed Scheme, significant in-combination effects on downstream European Sites, namely Charleville Wood SAC, could arise.

Numerous local planning applications at different stages of the planning process were found within 5 km of the Proposed Scheme. Adherence to the overarching policies and objectives of Laois County Development Plan 2021-2027 and any future development plans ensure that local planning applications and subsequent grant of planning comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives, national legislation, and environmental considerations. The majority of the developments listed in **Table 6-1** below do not have the potential to result in significant in-combination effects with the Proposed Scheme due to their small scale and nature (e.g., reg. ref. 2429). However, should some of the larger scale developments (e.g., reg. ref. 22361) be hydrologically linked with the River Gorragh or River Clodiagh, and if the construction phase of these developments and the Proposed Scheme overlap, there is potential for in-combination effects if appropriate mitigation measures are not in place. Operational phase in-combination effects are not anticipated.

Table 6-1: Planning Search Results from the County Planning and EIA Portal Maps

Planning Application Reference Number	Project/Applicant Name and Proposed Location	Development Description	Application Status/Outcome	Approximate Distance and Direction from Proposed Works	Date Planning Application Granted
2348	Declan Callaghan Chairman of Clonaslee St. Manman's GAA Club Clonaslee	Erect 6 no. 20m high lighting columns with 48 no 1.5KW LED Floodlights to main playing pitch; 25m long x 4.9m high concrete hurling wall with 1.2m high sports fencing to the top of the wall, 3m long x 4.9m high wing walls to include 25m x 25m AstroTurf playing surface, 2.4m high surround sports fencing and 2 no 12m high lighting columns with 2 no 1.5KW LED	Grant permission	149.1 m NW	08/05/2023

Clonaslee FRS

Planning Application Reference Number	Project/Applicant Name and Proposed Location	Development Description	Application Status/Outcome	Approximate Distance and Direction from Proposed Works	Date Planning Application Granted
		Floodlights; 6 no 15m high lighting columns to training pitch with 18 no 1.5KW LED floodlights; 24 no 6m high octagonal public lighting columns to existing walking track with 24 no Axia LED Lanterns; Construction of extension to existing car park, onto our own lands, to allow for increased parking spaces and all associated site works			
23284	Mountmellick Credit Union Limited, Chapel Street Clonaslee	Retain the demolition of the existing office building and full planning permission for the construction of a new replacement office building and all associated site works.	Grant permission (conditional)	19.5 m W	04/03/2024
20554	Residential development (Edel O'Brien, Chapel Street Clonaslee)	Retain 2 rear facing pitched roof extensions (24.1 sq. m), a steel-clad shed (29.7 sq. m), a change of use of a domestic garage into residential accommodation (41.9 sq. m), the removal of a steel-clad car port (19.9 sq. m) and permit to construct a single storey extension (17.3 sq. m) to the side of the existing dwelling to connect the former garage to the existing dwelling and all associated site works	Grant permission (conditional)	49.4 m W	20/01/2021
22361	Retail (John Maher, Bellair, Clonaslee)	Retention/permission for rear extension to existing shop/hardware store, also to retain change of use of adjoining dwelling structure to use as part of above mentioned shop/hardware store. Application also for full permission to construct new building comprising sit down delicatessen, as well as changing rooms, shower rooms and sauna for bicycle tourists and all associated works.	Grant permission (conditional)	735 m E	05/10/2022

Planning Application Reference Number	Project/Applicant Name and Proposed Location	Development Description	Application Status/Outcome	Approximate Distance and Direction from Proposed Works	Date Planning Application Granted
2429	Clonaslee Tidy Towns, Main Street, Clonaslee	Develop a bus shelter with permission to comprise of retention permission to retain a conc. base and planning permission to erect a bus shelter and to include all associated site works	Grant permission	88 m E	12/07/2024
20593	Agriculture buildings (Dan Maher, Graigueafulla, Clonaslee)	Construct a new slatted tank with associated holding yard, a new silage slab, a new cattle crush, and all ancillary site works	Grant permission (conditional)	1.9 km E	09/02/2021

6.3.2 Plans

A search was conducted of national, regional, and local plans which were deemed relevant to the Proposed Scheme. Search results are outlined in **Table 6-2**.This list is not exhaustive of all plans and programmes, but instead focuses on plans which may result in in-combination effects within relevant European Sites.

Table 6-2: Planning Search Results - Plans and Programmes

Plan	Conflicting Policies	Protective Policies/Actions
National Biodiversity Plan 2023-2030	n/a	**Objective 1:** Adopt a Whole of Government, Whole of Society Approach to Biodiversity. **Objective 2:** Meet Urgent Conservation and Restoration Needs. **Objective 3:** Secure Nature's Contribution to People. **Objective 4**: Enhance the Evidence Base for Action on Biodiversity. **Objective 5:** Strengthen Ireland's Contribution to International Biodiversity Initiatives.
Water Action Plan 2024 – A River Basin Management Plan for Ireland	n/a	The following evidence-based priorities have been adopted for this river basin planning cycle: Ensure full compliance with relevant EU legislation. Prevent deterioration. Meet the water standards and objectives for designated protected areas. Protect high-status waters. Implement targeted actions and pilot schemes in focus sub-catchments aimed at (i) targeting water bodies close to meeting their objective and (ii) addressing more complex issues that will build knowledge for future cycles.
Laois County Development Plan 2021-2027	**NRPO 6 -**Preserve the major natural amenities of the County (i.e., Slieve Bloom Mountains and River Valleys) and to provide parks and open spaces in association with them along with facilitating walking and cycling routes linking the mountains, river valleys and major parks.	**CS 02 -** Implement all land use planning policy and objectives in a manner which takes account of and is consistent with the Core Strategy in order to accelerate a transition to a greener, low carbon and climate resilient county with a focus on reduced travel demand through the promotion of sustainable settlement patterns. **CS 03 -** In the assessment of development proposals, to take account of transport corridors, environmental carrying capacity, availability and/or capacity to provide waste water and water supply services, potential to conflict with Water Framework Directive objectives, potential to impact on the integrity of European Sites

Plan	Conflicting Policies	Protective Policies/Actions
	TM 6 - Support in principle the development or expansion of tourism around the Slieve Bloom Mountains, Laois' Inland Waterways, Laois' historic towns and villages, heritage-based tourism, activity-based tourism, geo tourism, eco-tourism, food-based tourism, diaspora-based tourism and spiritual tourism. Proposals for sustainable tourism development will be required to demonstrate a need to locate in a particular area and demonstrate compliance with the Development Management Standards. **TRANS 46 -** Investigate the feasibility of designating and promoting the Slieve Blooms as a Walking and Cycling Activity Hub	and Annexed Habitats and species, features of biodiversity value including ecological networks, impact on landscape and visual characteristics, education and other socioeconomic objectives. **SCPO 12 -** Require the use of SuDS within Local Authority Developments and other social infrastructure projects in accordance with the Greater Dublin Regional Code of Practice for Drainage Works. **NRPO 9 -** Encourage and facilitate the development of green infrastructure that recognises the synergies that can be achieved with regard to the following: • Provision of open space amenities. • Sustainable management of water. • Protection and management of biodiversity. • Protection of cultural heritage. • Protection of protected landscape sensitivities. **SWD 2 -** Implement policies contained in the Greater Dublin Strategic Drainage Study (GDSDS) in relation to SUDS and climate change. **SWD 3 -** Ensure new development is adequately serviced with surface water drainage infrastructure which meets the requirements of the Water Framework Directive, associated River Basin Management Plans and CFRAM Management Plans. **SWD 4 -** Require that planning applications are accompanied by a comprehensive SUDs assessment that addresses run-off quantity, run-off quality and its impact on the existing habitat and water quality. **FRM 7 -** Protect and enhance the County's floodplains and wetlands as 'green infrastructure' which provides space for storage and conveyance of floodwater, enabling flood risk to be more effectively managed and reducing the need to provide flood defences in the future, subject to normal planning and environmental criteria. **FRM 9 -** Ensure that where flood risk management works take place that the natural and cultural heritage, rivers, streams and watercourses are protected and enhanced. **FRM 11 -** Consult, where necessary, with Inland Fisheries Ireland, the National Parks and Wildlife Service and other relevant agencies in the provision of flood alleviation measures in the County. **ES 18 -** Maintain and improve the water quality in rivers and other water courses in the county, including ground waters. The Council will have cognizance of, where relevant, the EU's Common Implementation Strategy Guidance Document No. 2 and 36 which provide guidance on exemptions to the environmental objectives of the Water Framework Directive **ES 23** - Ensure, through the implementation of the relevant River Basin Management Plan and their associated Programmes of Measures and any other associated legislation, the protection and improvement of all drinking water, surface water and ground waters throughout the county. **ES 24 -** Protect and develop, in a sustainable manner, the existing groundwater sources and aquifers in the County and control development in a manner consistent with the proper management of these resources, in accordance with the County Water Source Protection Zones. **ES 31 -** New developments which include on-site wastewater treatment in an Extreme Vulnerability Inner Source Protection Area shall be restricted: **ES 34 -** Consult as necessary with other competent authorities with responsibility for environmental management.

Plan	Conflicting Policies	Protective Policies/Actions
		ES36 - Ensure that developments that may adversely affect water quality will not proceed unless mitigation measures are employed, such as settlements ponds, interceptors etc. **ES38 -** Ensure that all air emissions associated with new developments are within Environmental Quality Standards as out in the Air Quality Standards Regulations 2011 (SI No. 180 of 2011) (or any updated/superseding documents). **ES 40 -** Encourage the use of appropriate mitigation measures, such as dust dampeners, chimney stack scrubbers, etc. to minimise the potential impacts of developments on air quality. **ES 45 -** Ensure that relevant planning applications comply with the provisions of any Noise Action Plan or noise maps relating to the area. **ES 46 -** Restrict development proposals causing noise pollution in excess of best practice standards. **ES 48 -** Ensure new development does not cause an unacceptable increase in noise levels affecting noise sensitive properties. Proposals for new development with the potential to create excessive noise will be required to submit a construction and/or operation management plan to control such emissions. **ES 49 -** Require activities likely to give rise to excessive noise to install noise mitigation measures and monitors. The provision of a noise audit may be required where appropriate. **ES 50 -** Ensure that external lighting and lighting schemes are designed so that light spillage is minimised, thereby limiting light pollution into the surrounding environment and protecting the amenities of nearby properties and wildlife, including protected species. **ES 51 -** Encourage the maintenance of dark skies in rural areas and limit light pollution in urban and rural areas. **BNH 1 -** Protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity. **BNH 2 -** Conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92/43/EEC) (as amended) and the Birds Directive (2009/147/EC), the Wildlife Acts 1976 and 2010 (as amended) and the Flora Protection Orders. **BNH 3 -** Support and co-operate with statutory authorities and others in support of measures taken to manage proposed or designated sites in order to achieve their conservation objectives and maintain the favourable conservation status and conservation value of Sites under National and European legislation and International Agreements and maintain and /develop linkages between them where feasible. **BNH 5 -** Projects giving rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall not be permitted on the basis of this Plan (either individually or in combination with other plans or projects). Screening for AAs and AAs undertaken shall take into account invasive species as relevant. **BNH13 -** It is a policy objective of the Council to require new developments to identify, protect and enhance ecological features by making provision for local biodiversity (for example, through provision of swift boxes or bricks, bat roost boxes, green roofs, etc.) and improve the ecological coherence of wider green infrastructure. **BNH28 -** Ensure that hedgerow removal to facilitate development is kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting will be required comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where

Plan	Conflicting Policies	Protective Policies/Actions
		possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting.

6.3.3 In-Combination Conclusion

Numerous local planning applications at different stages of the planning process were found less than 5 km from the Proposed Scheme. Adherence to the overarching policies and objectives of Laois County Development Plan 2021-2027 and any future development plans ensure that local planning applications and subsequent grant of planning comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives, national legislation, and environmental considerations. The only potential in-combination effects identified were those occurring during the construction phase of the Proposed Scheme.

Given the extent of approved and pending forestry licence applications in the River Clodiagh catchment, and the potential for significant effects on water quality arising from the Proposed Scheme alone in the absence of mitigation, it is considered that significant in-combination effects on Charleville Wood SAC cannot be ruled out. Furthermore, future maintenance works within the ADS channel, if undertaken concurrently with the construction phase of the Proposed Scheme, could result in significant in-combination effects on downstream European Sites, namely Charleville Wood SAC.

No other plans or projects were identified as having the potential to contribute to in-combination effects on the identified European Sites, which is overall a relatively small scale and short-term scheme to construct.

7 SCREENING CONCLUSIONS AND STATEMENT

RPS has prepared this report to inform screening for AA to assess whether the Proposed Scheme, individually or in-combination with other plans or projects, and in view of best scientific knowledge, is likely to have a significant effect on any European Site(s).

The screening exercise was completed with cognisance of the relevant European Commission guidance, national guidance, and current case law. The potential effects of the Proposed Scheme have been considered in the context of the European Sites potentially affected, their qualifying interests and/or special conservation interests, and their conservation objectives.

Through an assessment of the source-pathway-receptor model, which considered the ZoI of effects from the Proposed Scheme and the potential in-combination effects with other plans or projects it is concluded that the Proposed Scheme has the potential to result in likely significant effects alone on the following European Sites:

- Charleville Wood SAC;
- River Barrow and River Nore SAC;
- Blackwater River (Cork/Waterford) SAC;
- Bricklieve Mountains and Keishcorran SAC;
- Glenade Lough SAC;
- Kilroosky Lough Cluster SAC;
- Lough Bane and Lough Glass SAC;
- Lough Corrib SAC;
- Lough Gill SAC;
- Lough Lene SAC;
- Lough Owel SAC;
- Lower River Suir SAC;
- River Moy SAC;
- White Lough Ben Loughs and Lough Doo SAC;
- Lough Hoe Bog SAC; and
- Lough Nageage SAC.

There is also potential for in-combination effects with projects within Clonaslee village and licenced forestry activities on Charleville Wood SAC through water quality deterioration, and potential future maintenance activities on the River Clodiagh ADS channel. The Proposed Scheme must therefore be brought forward to Stage 2 Appropriate Assessment for consideration of adverse effects on integrity of European Sites and the need for mitigation of these effects.

8 REFERENCES

Brady, D.J, R Meade, J.d Reynolds, A Vilcomskas, and K Theissinger. 2024. “The Crayfish Plague Pathogen Aphanomyces astaci in Ireland.” *Microorganisms* .

DEHLG. 2010a. *Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities.* . Dublin: Department of the Environment, Heritage and Local Government.

DEHLG. 2010b. *DEHLG Circular - National Parks and Wildlife Service (NPWS) 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities.* Dublin: Department of the Environment, Heritage and Local Government.

EC. 2021. *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.* Luxembourg: Office for Official Publications of the European Communities.

EC. 2000. *Communication from the Commission on the Precautionary Principle.* . Luxembourg: Office for Official Publications of the European Communities.

EC. 2013. *EC Interpretation Manual of European Union Habitats. Version EUR 28.* . European Commission.

EC. 2018. *Managing Natura 2000 Sites: the provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC.* Luxembourg: Office for Official Publications of the European Communities.

Fossitt, Julie A. 2000. *A Guide to Habitats in Ireland’.* Kilkenny: The Heritage Council.

GSI. n.d. “Clonaslee West GWB: Summary of Initial Characterisation. .”

GSI. 2003. “Geashill GWB: Summary of Initial Characterisation. .”

JBA Consulting. 2018. “Office of Public Works Arterial Drainage Maintenance Works - Brosna Arterial Drainage Scheme. Stage 2 Natura Impact Statement. 2019-2023.”

Mirimin, L, D Brady, M Gammell, H Lally, C Minto, CT Graham, O Slattery, et al. 2022. “nvestigation of the first recent crayfish plague outbreak in Ireland and its subsequent spread in the Bruskey River and surrounding areas.” *Knowl. Manag. Aquat. Ecosyst.*

NatureScot. 2016. “Assessing Connectivity with Special Protection Areas (SPAs).”

NPWS. 2022c. *Conservation objectives for River Nore SPA [004233]. First Order Site-specific Conservation Objectives Version 1.0.* Department of Housing, Local Government and Heritage.

NPWS. 2012. *Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS. 2021b. *Conservation Objectives: Bricklieve Mountains and Keishcorran SAC 001656. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2021a. *Conservation Objectives: Charleville Wood SAC 000571. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2021c. *Conservation Objectives: Glenade Lough SAC 001919. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2021d. *Conservation Objectives: Kilroosky Lough Cluster SAC 001786. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2021e. *Conservation Objectives: Lough Bane and Lough Glass SAC 002120. Version 1.* . National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2017a. *Conservation Objectives: Lough Corrib SAC 000297. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS. 2021f. *Conservation Objectives: Lough Gill SAC 001976. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

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

NPWS. 2021g. *Conservation Objectives: Lough Lene SAC 002121. Version 1. .* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2021i. *Conservation Objectives: Lough Nageage SAC 002135. Version 1. .* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2018. *Conservation Objectives: Lough Owel SAC 000688. Version 1. .* National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

NPWS. 2017b. *Conservation Objectives: Lower River Suir SAC 002137. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS. 2022d. *Conservation Objectives: Middle Shannon Callows SPA 004096. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2011. *Conservation Objectives: River Barrow and River Nore SAC 002162. Version 1.0.* Department of Arts Heritage and the Gaeltacht. .

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

NPWS. 2022a. *Conservation Objectives: River Shannon Callows SAC 000216. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2022b. *Conservation Objectives: Slieve Bloom Mountains SPA 004160. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2021h. *Conservation Objectives: White Lough, Ben Loughs and Lough Doo SAC 001810. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. 2015. *Site Synopsis: Slieve Bloom Mountains SPA. Site Code: 004160.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

OPR. 2021. “Practice Note PN01: Appropriate Assessment Screening for Development Management. Office of the Planning Regulator.” Dublin.

Ruddock, M, R Wilson-Parr, J Lusby, F Connolly, J Bailely, and L O'Toole. 2024. *The 2022 National Survey of Breeding Hen Harrier in Ireland.* Dublin: Irish Wildlife Manuals 147.

Swords, Fiona, and Bogna Griffin. 2022. “The National Crayfish Plague Surveillance Programme, Ireland – 2020-2021 .” *National Parks and Wildlife* 1-29.

Williams, L. 2024. “Evaluation of Compliance with EU Water Framework Directive (WFD) (2000/60/EC).”

Appendix A
Ecological Supporting Information

A.1 Introduction

This Appendix provides details on the desk and field studies used to inform the screening for AA for the Proposed Scheme. It provides information on the methodologies employed to determine the baseline environment and description of the results obtained.

A.1.1 Desk Study

Information on habitats and species within the ecology study area was collected through a detailed desk review of existing, publicly available studies and datasets. These are summarised in **Apx Table 1**.

The National Biodiversity Data Centre's (NBDC) online database was searched for records of protected flora (Flora (Protection) Order, 2022), protected fauna under the EU Habitats Directive (92/43/EEC), Birds Directive (2009/147/EC) and Wildlife Acts (1976, as amended) and invasive species within a 5 km radius of the Proposed Scheme. Records greater than 20 years old were excluded from the assessment.

Apx Table 1: Summary of Key Desktop Sources.

Title	Year[11]	Author/Source
Surface and ground water quality status, and river catchment boundaries	2024	Environmental Protection Agency (EPA) https://gis.epa.ie/EPAMaps/default Accessed February 2024.
Groundwater body characterisation summaries	Geashill GWB (2003); Clonaslee West GWB (no date).	Geological Survey Ireland (GSI) https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx Accessed November 2024
NPWS designated areas spatial data	2024	National Parks and Wildlife Services (NPWS) https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data Accessed October 2024
Margaritifera Sensitive Areas Map	2020	NPWS: https://www.npws.ie/maps-and-data/habitat-and-species-data Accessed March 2024
Distribution records for protected species and habitats held online by the National Biodiversity Data Centre (NBDC), NPWS, and Heritage Council.	2004- 2024	NBDC: https://maps.biodiversityireland.ie/ (Map Assessed October 2024.) NPWS: https://www.npws.ie/maps-and-data/flora-protection-order-map-viewer-bryophytes Accessed October 2024 NPWS: https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=a41ef4e10227499d8de17a8abe42bd1e (Accessed October 2024) Heritage Council: https://heritagemaps.ie/WebApps/HeritageMaps/index.html Accessed October 2024.
Birds of Conservation Concern	2021	Gilbert G, Stanbury A and Lewis L (2021), Birds of Conservation Concern in Ireland 2020 –2026. Irish Birds 9: 523—544
Status of EU Protected Habitats and Species in Ireland, Volume 1, 2, and 3	2019	NPWS: https://www.npws.ie/publications/article-17-reports/article-17-reports-2019 Accessed November 2024.

A.1.2 Field Survey Methodologies

Survey Schedule

Field surveys were undertaken using professional interpretation and reference to the guidance referred to in the text describing each survey. These multidisciplinary and taxon-specific terrestrial ecology surveys were undertaken between 2021 and 2024 during the optimum seasons for the relevant habitats and species. These ecology field surveys informed the characterisation of the baseline environment against which impacts and effects on ecological receptors were assessed. **Apx Table 2** and **Apx Table 3** summarise the surveys carried out.

The survey extents changed as the Proposed Scheme was developed. Surveys undertaken in 2021 and 2023 focused on the assumed or confirmed project footprint at that time. Surveys undertaken in 2024 related to design modifications and additions to the Proposed Scheme and comprised additional walkovers of the

[11] Note that the year provided for website sources refers to the last time it was checked. For published sources, dates are variable.

River Clodiagh, the proposed site compound areas and trees directly affected by works. Ecology surveys and results relevant to the final Proposed Scheme design are presented.

Apx Table 2: Summary of relevant site-specific terrestrial surveys.

Field Survey	Extent of survey	Overview of survey	Date(s)
Walkover Survey	Survey in April 2021 focused on the River Clodiagh 1.1km downstream of Clonaslee bridge and 500m upstream plus 50 m either side of river. Survey in June 2021 focused on a proposed flood retention Area 2.5 km south-west of Clonaslee near Scarroon. Survey in June 2024 focused on the proposed site compound in Area 2, but also included a general walkover survey of the entire scheme area to validate the habitat and IAPS survey data collected during the previous year.	Multidisciplinary walkover survey to identify mammal signs, habitats, invasive flora, rare or protected flora, high level bat roost potential, incidental bird observation.	April & June 2021 June 2024
Habitats	Surveys in 2023 focused on the footprint of the Proposed Scheme and immediate adjoining lands (where accessible).	Phase 1 Habitat classification to Fossitt (2000).	August 2023
Protected and Notable Flora	Footprint of the Proposed Scheme and immediate adjoining lands (where accessible).	Search for species listed in Flora Protection Order and Red Lists (Wyse *et al*., 2016; Lockhart *et al*., 2012) as part of habitat survey.	August 2023
Invasive alien plants (IAPS)	Surveys in 2021 and 2023 focused on footprint of the Proposed Scheme and immediate adjoining lands (where accessible).	Identification of Third Schedule species of European Communities (Birds and Natural Habitats) Regulations 2011 (as amended).	September 2021 August 2023
Otter	Bankside and instream assessment of the Clodiagh River. See below for detail.	Assessment for evidence of holts and field signs (e.g., spraint, slides, trails, prints, and couch) along the River Clodiagh	August, October 2021 August 2023 June 2024
Breeding birds	Incidental data	Identification of calls and sightings.	October 2021, July 2023
Kingfisher	Along the banks of the Clodiagh River	Walkover survey - Kingfisher habitat appraisal	August 2023 June 2024

Apx Table 3: Summary of relevant site-specific aquatic ecology surveys.

Survey	Date	Survey extent
Walkover survey, crayfish habitat appraisal	21st April 2021	1.1 km downstream of Clonaslee bridge and 500 m upstream.
Crayfish survey and habitat appraisal	11th August 2021	500 m downstream of Clonaslee bridge plus a 100m reach at the ICW, 500 m upstream of Clonaslee bridge.
Crayfish survey and habitat appraisal	17th August 2021	Resurvey of areas not visible on 11th August 2021 upstream of Clonaslee bridge.
Crayfish survey and habitat appraisal	24th August 2023	800 m downstream of Clonaslee bridge and 500 m upstream.

Walkover Surveys

Initial site surveys were carried out on the 21st April and 1st June 2021, respectively, for the original Proposed Scheme design. The survey extents in April 2021 comprised the River Clodiagh within the scheme area, namely a section between 1.1 km downstream of Clonaslee bridge and 500 m upstream. In June 2021, an area proposed for flood retention approximately 2.5 km southwest of Clonaslee was walked along a 1 km stretch from a local bridge northwest of Scarroon in an eastward direction toward Brittas Wood. An extra 100 m was also walked either end of these start and end locations. The lands within 50 m either side of river were also walked during both the April and June 2021 surveys. Note that the area surveyed in June 2021 is no longer part of the Proposed Scheme. The surveys undertaken comprised multidisciplinary walkover surveys (i.e., identification of invasive flora, habitat classification, identification of mammal signs, high-level assessment of bat roosting potential). On the 6th June 2024, a walkover survey of the proposed site compound within Area 2 was undertaken, comprising a search for invasive flora, habitat classification and a search for mammal signs. This survey also comprised an additional walkover survey of the River Clodiagh, and the Proposed Scheme area to validate the habitat and IAPS survey data collected during the previous year.

Habitats and Flora

The initial site surveys were carried out in April and June 2021 for the original Proposed Scheme design. However, the Proposed Scheme design has since been refined. To account for this, the Proposed Scheme area was revisited in August 2023, and detailed baseline habitat surveys were undertaken.

The aim of the survey was to classify habitats using the Heritage Council's habitat classification system[12] for both aquatic and terrestrial habitats occurring within the footprint and adjoining habitats of the Proposed Scheme. The mapping of habitats had cognisance of the Heritage Council's mapping methodology[13]. The information gathered from the surveys were used to describe habitat features, and to direct further habitat and species-specific survey work to inform this assessment. 'Target Notes' were recorded as necessary on maps in the field to identify the location of additional ecological features noted during the field surveys.

Habitat surveys recorded species using an ordinal abundance scale, the DAFOR scale, as detailed in the Heritage Council's mapping methodology. The DAFOR scale records each species' abundance as Dominant, Abundant, Frequent, Occasional, or Rare based on a semi-quantitative description of each category. Indicator species for different habitat types or conditions and rare or declining species identified on relevant Red Lists[14,15] if present, were also noted.

Habitats were also assessed for their affinity to Annex I habitat in line with relevant guidance [13,16].

Invasive Alien Plants and Animal Species

The presence and location of any invasive alien plant species (IAPS) and invasive alien animal species (IAAS) was recorded during initial walkover surveys undertaken in April and June 2021 and supplemented through the completion of a dedicated survey for invasive flora undertaken on the 29th September 2021. Subsequently, additional data was required to update baseline data collected in 2021, and this survey was carried out on the 1st August 2023. During survey in 2023, information on IAPS was recorded including the species present, the location of the species and the approximate extent of the infestation.

For the purpose of this assessment, IAPS and IAAS are those contained within the third schedule of the Habitats Regulations (S.I. No. 477/2011).

Otter

Otter surveys were undertaken on the 11th and 17th August 2021, 18th October 2021, 1st August 2023 and 6th June 2024. The survey on the 11th August 2021 focused on an area 500 m upstream of Clonaslee bridge and 1.1 km downstream of Clonaslee bridge. An area proposed for flood retention approximately 2.5 km southwest of Clonaslee was surveyed on 17th August 2021 and 18th October 2021. Note that this flood retention area is no longer within the Proposed Scheme area. The surveys undertaken in August 2023 and June 2024 focused on the footprint of the Proposed Scheme, the River Clodiagh within the Proposed Scheme area, and included an Area 150 m upstream and downstream of same where accessible. The focus of the survey effort was on areas where otter may spraint (e.g., on or adjacent to trails or on conspicuous features like boulders or bridge footings), where signs of commuting otter might be obvious (e.g., prints or trails left in muddy riverbanks) and where holts or couches might be likely (e.g., vegetated areas adjacent to the stream, among roots etc.). If trails leading from the river were identified, these were followed as far as possible and searched for signs of holts. In addition, otter signs, if observed during the course of other ecological surveys (e.g., general walkover surveys), were recorded. Otter surveys were undertaken to confirm the presence or likely absence of otter through the identification of field signs such as spraints, prints, slides, holts and couches.

---

[12] Fossitt, J. (2000). *A Guide to Habitats in Ireland*. Kilkenny: The Heritage Council.

[13] Smith, G., O'Donoghue, P., O'Hora, K., & Delaney, E. (2011). *Best Practice Guidance for Habitat Survey and Mapping*. Kilkenny: The Heritage Council.

[14] Jackson, W. M., Skeffington, S. M., & Mark, W. (2016). *Ireland Red List No.10 - Vascular plants*. Dublin: National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[15] Lockhart, N. H. (2012). *Ireland Red List No.8: Bryophytes*. Dublin, Ireland: National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[16] EC. (2013). *Interpretation Manual of European Union Habitats. Version EUR 28*. Luxembourg: European Commission.

Otter surveys were carried out with cognisance of the NRA publication 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' and 'Guidelines for the Treatment of Otters Prior to the Construction of National Road Scheme'[17, 18].

Birds

Kingfisher Survey

The methodology employed involved walking the Clodiagh River from Area 1 of the Proposed Scheme, located south of Clonaslee Village to Area 3, north of Clonaslee Village (areas shown in **Apx Figure 3**). The survey was carried out in August 2023 and all activity of target species (i.e. kingfisher) was noted as well as any observations of potential nesting sites and suitable habitat along the riverbanks. Kingfishers breed in tunnels dug in vertical banks along streams and rivers. Kingfisher nesting banks are typically tall vertical banks with soft material into which they can dig their burrows[19]. This survey was repeated on the 6th June 2024.

Incidental Bird Activity

Incidental bird activity was recorded during all of the site visits. Observations of birds, such as number of birds, flight direction and behaviour (e.g., commuting or foraging) were recorded, where possible.

White-Clawed Crayfish Habitat Appraisal

Strict biosecurity protocols were employed to ensure there was no potential for spread of disease for all surveys undertaken. *Check, Clean, Disinfect, Dry* was the core of the protocol. Inland Fisheries Ireland (IFI) Biosecurity Protocol for Field Survey Work was implemented for disinfection procedures.

Assessment of the quality of the Clodiagh River for white-clawed crayfish (*Austropotambius pallipes*) habitat was undertaken on the 21st April 2021, 11th August 2021, 17th August 2021 and 24th August 2023. The assessment was based on published information on the habitat criteria for crayfish[20],[21]. The survey on the 21st April 2021 comprised a general walkover survey of the river Clodiagh upstream (500 m) and downstream (1.1 km) of the bridge in Clonaslee. The surveys on the 11th and 17th August 2021 and 24th August 2023 were undertaken as part of dedicated crayfish surveys (described below). An appraisal of crayfish habitat on the Brittas Stream (this stream has not been mapped by the EPA but appears on historic 25" and 6" maps - it is culverted under the gravel path adjacent to the River Clodiagh) at and immediately upstream of the culvert was undertaken on the 12th March and 6th June 2024.

The rating of habitat for crayfish was on a scale of None/None-Poor/Fair/Good/Very Good/Excellent. This rating assesses the physical suitability of the habitat; the presence/absence/density of the species in question will also depend on present and historical water quality, current or historic presence of disease and accessibility of the section to these species. This was taken into consideration where information was available.

The rating of habitat for crayfish is classified as:

- 'None' indicates that the ecologist carrying out the assessment regards it as impossible that the watercourse could support the species in question in the relevant life stage.
- 'None-Poor' indicates that it is regarded as possible but extremely unlikely that the stream could support the species in the relevant life stage.

---

[17] NRA. (2008a). *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*. National Roads Authority.

[18] NRA. (2008b). *Guidelines for the Treatment of Otters Prior to the Construction of National Road Scheme*. National Roads Authority.

[19] Cummins, S., Fisher, J., McKeever, R., McNaughten, L., & Crowe, O. (2010). *Assessment of the distribution and abundance of Kingfisher Alcedo atthis and other riparian birds on six SAC river systems in Ireland*. Department of Environment, Heritage and Local Government.

[20] Holdich, D. (2003). *Ecology of the White-clawed Crayfish. Conserving Natura 2000 Rivers Ecology Series No. 1.* Peterborough: English Nature

[21] Peay, S. (2003). *Monitoring the White-clawed Crayfish* Austropotamobius pallipes. *Conserving Natura 2000 Rivers Monitoring Series No. 1.* Peterborough: English Nature.

- ‘Fair’ indicates that it is possible that the stream section could support the species in question.
- ‘Good’ indicates that the ecologist considers it possible and likely that the stream could support the species in question.
- ‘Very Good’ indicates that the stream certainly could support the species.
- ‘Excellent’ indicates that the ecologist regards the stream as the ideal habitat for the species in question.

Crayfish Hand Search

Dedicated white-clawed crayfish surveys of the River Clodiagh were undertaken on the 11th and 17th August 2021 and the 24th August 2023. The surveys were undertaken with reference to Peay (2003)[22], under the following licences: C146/2021 and C36/2023.

In 2021, a section measuring approximately 500 m was surveyed from the bridge at Clonaslee upstream into Brittas Wood, and a section measuring approximately 500 m downstream of Clonaslee bridge plus a 100 m reach at the ICW was surveyed. In 2023, a 500 m section was surveyed from the bridge at Clonaslee upstream into Brittas Wood, and an 800 m section was surveyed from the bridge at Clonaslee downstream as far as the bridge over the River Clodiagh to the ICW. The surveys were undertaken by separating the river Clodiagh into discrete reaches (approximately 100 m in length). Within each reach, five habitat patches were identified. Ten suitable crayfish refuges within each habitat patch were then hand searched for crayfish with the help of a bathyscope where necessary. To supplement the bathyscope survey, kick sampling was conducted in survey areas. Refuges were also searched by sweeping or kicking with a pond net where appropriate (e.g., in muddy patches or under tree roosts). Identification of suitable habitat patches and refuges was made with reference to Table 5 “Crayfish habitat preferences – a guide to identifying habitat patches and refuges” and Section 4.4.2 in Peay[22]. An overall habitat appraisal for crayfish was undertaken at each reach. If crayfish were found, they were measured and notes on their condition taken.

A.1.3 Limitations

Desk study

Sources of desk study information are neither exhaustive nor necessarily easily available, and a reasonable effort was made to obtain ecological data in the public domain to inform the description of the baseline environment and its assessment. Additional information, not in the public domain, is likely to exist, but could not be obtained or assessed here. This limitation is acknowledged and incorporated into the assessment and is deemed to not affect the certainty or predictability of the assessment.

Species records data held by record centres and statutory bodies (such as the NBDC and NPWS) are often provided on an ad-hoc basis by recorders. These records can only provide an indication of what species might be found in an area; they do not constitute full and complete species lists. Absence of certain species from these sources does not confirm absence of these species from the area.

Field study

The receiving environment (i.e., baseline condition) may naturally vary through seasons and between years[18]. All reasonable effort has been made to address this (e.g., combined use of desk and field survey data), and the limitation is acknowledged. Once incorporated into the assessment the limitation is deemed to not affect the certainty or predictability of the assessment. Surveys have been completed and updated over multiple years which also increases the robustness of the baseline against which the assessment has been completed.

Habitat Survey

Not all lands within and adjacent to the Proposed Scheme area were subject to walkover survey. Binoculars were used, where possible, to survey such areas. The only lands within the proposed works area not subject to walkover survey was the location of the Proposed Site compound in Area 1. This agricultural field was surveyed from the roadside. This roadside survey was deemed suitable for the purposes of assessing the area. Once incorporated into the assessment this limitation is deemed to not affect the outcome or certainty of the assessment.

A.2 Results

A.2.1 Catchment Data

Overview

There are two rivers within Clonaslee village, the River Clodiagh and the River Gorragh. Both rivers are located within the Lower Shannon WFD catchment. The River Clodiagh rises in the Slieve Bloom Mountains near the border of counties Laois and Offaly. At the location of the Proposed Scheme, the Clodiagh is a 2nd order river. It flows in a predominantly northerly direction before merging with the Tullamore River. From this point, it flows northwest and joins the River Brosna southwest of Clara. The Brosna then flows southwest and merges with the River Shannon near Shannon Harbour at the border of counties Offaly and Galway. The River Clodiagh at and upstream of the Proposed Scheme is underlain by a locally important aquifer, a regionally important aquifer and a poor aquifer. The catchment at and upstream of the Proposed Scheme comprises a mixture of poorly draining mineral soil, well-draining mineral soil, peat, alluvium as well as made ground in the town of Clonaslee. The River Clodiagh downstream of the Proposed Scheme is part of the OPW Arterial Drainage Schemes (ADS). The OPW is therefore required to maintain this section of the river under sections 37 and 38 of the Arterial Drainage Act, 1945 (as amended).

The Gorragh River is a 2nd order river, located approximately 520 m to the east of the River Clodiagh within Clonaslee village. The Gorragh River flows in a northerly direction before its confluence with the Clodiagh River, approximately 1.5 km north of Clonaslee village.

A small stream (hereafter referred to as “Brittas Stream”) which rises near Brittas Lake (located approximately 1.5 km west of Clonaslee village) flows into the River Clodiagh immediately downstream of the proposed debris trap. This stream has not been mapped by the EPA, but appears on historic 25” and 6” maps. It is culverted under the gravel path adjacent to the River Clodiagh.

EPA Biological Water Quality Review

The WFD is enforced in Ireland under the European Union Environmental Objectives (Surface Waters) Regulations S.I. No. 272 of 2009, as amended. Q-value status, as reported by the EPA, is determined by the biological quality element, macroinvertebrate fauna. The Q-value is assigned on a scale of 1 to 5 with a Q5 representing high quality pristine conditions and a Q1 representing bad seriously polluted conditions. The intermediate values (Q1-2, 2-3, 3-4, etc.) denote transitional conditions. A target for Q4 and above is required for rivers sites to comply with good (Q4) or better (i.e., high status - Q4-5, Q5). The most recent EPA monitoring of the River Clodiagh and River Gorragh (2023) is summarised in **Apx Table 4**. The station on the River Clodiagh is located immediately upstream of Clonaslee bridge. There are two stations on the River Gorragh. One station is located at the Gorragh bridge within Clonaslee village, and the second is located 250 m upstream of the confluence of the River Clodiagh and River Gorragh.

Apx Table 4: EPA River Q-value Monitoring - 2023.

Station Code	Station Name	River Waterbody Name	Q-Value	Q-Value Status
RS25C060100	CLODIAGH (TULLAMORE) - Just u/s Clonaslee Br	CLODIAGH (TULLAMORE)_010	4-5	High
RS25G090300	Killart House	GORRAGH_010	5	High
RS25G090200	GORRAGH - Gorragh Br E of Clonaslee	GORRAGH_010	5	High

WFD Status

The WFD status assigned to the Clodiagh (Tullamore)_010 river waterbody in the period 2016-2021 is ‘good’. According to the 3rd cycle WFD risk assessment, this waterbody is *not at risk* of failing to meet its WFD status objectives by 2027. The Clodiagh does not have a high-status objective under the WFD.

The WFD status assigned to the Gorragh_010 river waterbody in the period 2016-2021 is ‘good’. According to the 3rd cycle WFD risk assessment, this waterbody is *at risk* of failing to meet its WFD status objectives by 2027. The River Gorragh has a high-status objective under the WFD.

A.2.2 Groundwater

The Proposed Scheme is located within two groundwater bodies (GWB), Geashill and Clonaslee West. The WFD status of both of these GWB is 'good'. Groundwater vulnerability is predominantly 'moderate' within the Proposed Scheme area, with a small area of 'high' vulnerability to the south in Brittas Wood.

The following summaries of these GWBs are taken from the GSI characterisation reports[22]:

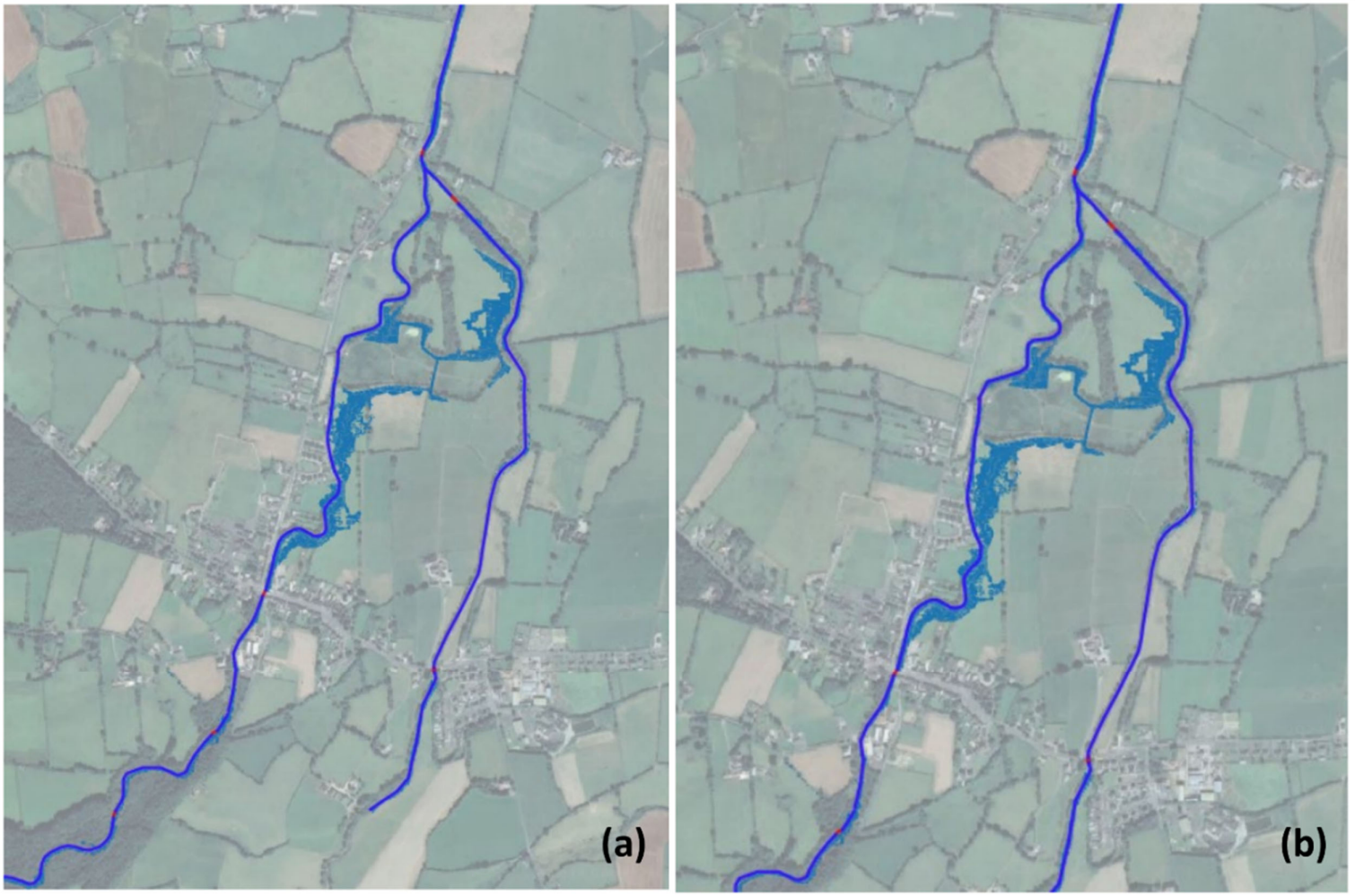
Geashill – The GWB occupies the area between Offaly, Laois, and Westmeath. It is bounded on the north-west by the contact between the low transmissivity rock units of this GWB and the karstified pure bedded limestones of the adjacent Tullamore GWB. Surface water catchment divides define south-east and north-east edges of the GWB, the latter two of which are coincident with the river basin district boundary. Nearly all aquifers within the GWB are locally important, which are moderately productive only in local zones. The very small area in the north-east of dolomitised limestone is classified as a regionally important karstified aquifer dominated by diffuse flow. The dinantian pure unbedded limestones, and the dinantian lower and upper impure limestone aquifers are more than several hundreds of metres thick. However, permeability tends to decrease rapidly with depth. Most flow occurs in the upper ≤ 15 m. The dolomitised limestones will have an epikarstic layer, below which there is a diffusely-karstified network of fissures and collapse conduits down to around 30 m below rock head. The streams and rivers crossing the aquifer are likely to be gaining, and groundwater comes to surface as springs. Due to the shallow groundwater flow in these aquifers, the groundwater and surface waters may be closely linked where subsoils are thinner. In the bedrock aquifers, groundwater flow paths are generally short, on the order of 30-300 m, with groundwater discharging to the streams and rivers that traverse the aquifer and to small springs. Local groundwater flows are determined by the local topography. There are several fens and wetlands in the area that are dependent on groundwater.

Clonaslee West - This groundwater body is located at the base of the northwestern slopes of the Slieve Bloom mountains. The eastern and southern boundary are defined by surface water catchments. The northwestern and southeastern boundaries are formed by the contact with lower transmissivity bedrock. The general groundwater flow direction is naturally downhill (north and northwest) radiating from the peak of the Slieve Bloom Mountains. Depending upon topography, the water table can vary between a few metres up to 20 m below ground surface. Groundwater flow follows topography, radiating north and north-westwards outwards from Slieve Bloom. Groundwater discharges to the small springs, streams emerging mid-way down the slopes, and near the contact area with the overlying impure limestones. The rivers crossing the aquifer in areas where the subsoil is not too thick are gaining. The aquifer becomes confined where it passes under the Lower Limestone Shales rock unit, or under thick low permeability tills, and wells are artesian. Flow path lengths in the upland areas are short (≤ 300 m). Confined flow path lengths are considerably longer, and flow will be slow. The Proposed Scheme within the confined section of this GWB. Derry Bog fens, located at the foot of the gravel ridges (eskers), are fed by springs fed from groundwater in the esker.

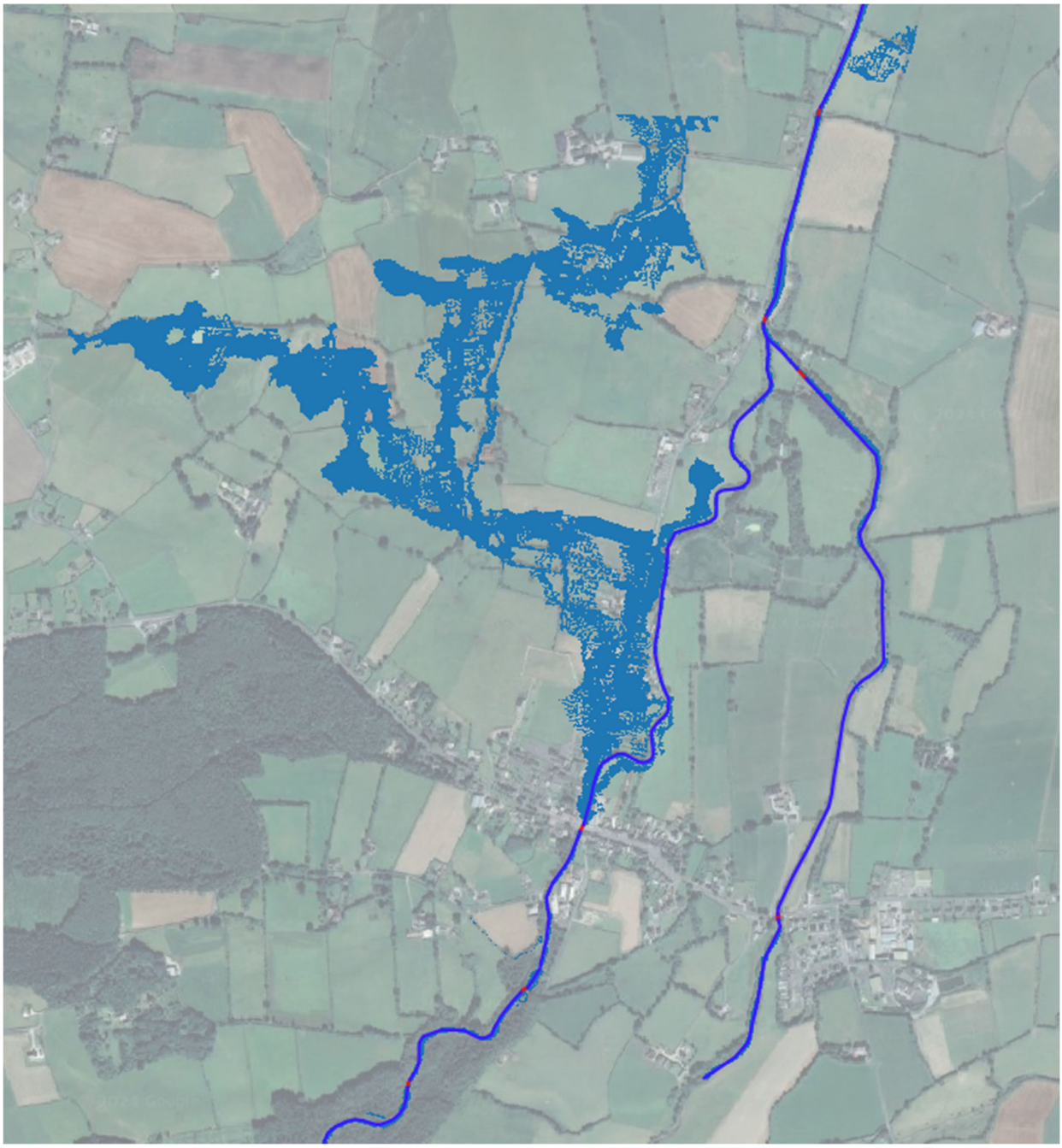
A.2.3 Flooding

Flood modelling has been undertaken by RPS for the Proposed Scheme. The extent of the predicted flooding in the present-day 'do-nothing' scenario and post-scheme scenario during the 1% Annual Exceedance Probability (AEP) is shown in **Apx Figure 1**. The present-day 'do-nothing' scenario assumes that the two informal flood defences, namely the existing wall on Chapel Street and an embankment upstream of the ICW access bridge, remain intact and act as flood defences. It should be noted that in 2017, Chapel Street wall was damaged by a vehicle and this event coincided with a flood event causing damage to adjacent properties. To get an understanding of the flood risk to properties in the scenario where the informal defences fail, a model was created with those defences removed. The results of this model are shown in **Apx Figure 2.** The 1% AEP represents medium-probability flood events that have approximately a 1-in-a-100 chance of occurring or being exceeded in any given year.

[22] Available at: https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx (Accessed 14/11/2024).



Apx Figure 1: 1% AEP Model Predicted flooding in (a) present-day 'do-nothing' scenario and (b) post-scheme 1% AEP model predicted flooding. The present-day 'do-nothing' scenario assumes that the two informal flood defences, namely the existing wall on Chapel Street and an embankment upstream of the ICW access bridge, remain intact and act as flood defences.



Apx Figure 2: 1% AEP event in the undefended scenario.

A.2.4 Habitats

Habitat mapping of the Proposed Scheme was carried out by RPS ecologists during the field surveys. Habitats were identified and classified according to the Guidelines set out in *'A Guide to Habitats in Ireland'*[13], which classifies habitats based on the vegetation present and management history. The potential correspondence with or affinities of identified habitats with those listed on Annex I of the Habitats Directive was also identified. Habitats identified within and immediately adjacent to the Proposed Scheme area included improved agricultural grassland, amenity grassland (improved), (mixed) broadleaved woodland, scattered trees and parkland, hedgerows, treelines, scrub, stone walls and other stonework, buildings and artificial surfaces, eroding/upland rivers and reed and large sedge swamp (see **Apx Figure 3** to **Apx Figure 6**). None of the terrestrial habitats corresponded with any Annex I habitat type. The River Clodiagh may

however have affinities to the upland aspect of the Annex I habitat floating river vegetation (3260), namely the bryophyte-dominated aquatic communities FW2A *Fontinalis antipyretica – Myriophyllum alterniflorum* aquatic community[23] or FW2B *Rhynchostegium riparioides – Chiloscyphus polyanthos* aquatic community[24]. No vascular plants were recorded within the River Clodiagh during surveys, but mosses were noted growing on boulders and cobbles within the river, with coverage of 2-5% noted.

The Clodiagh River is a relatively small river (c. 5-6 m width). It flows through woodland (Brittas Wood), urban areas (Clonaslee village) and agricultural land (downstream of Clonaslee village) within the Proposed Scheme area. The following summarises the results of habitat surveys undertaken between the years 2021 and 2024.

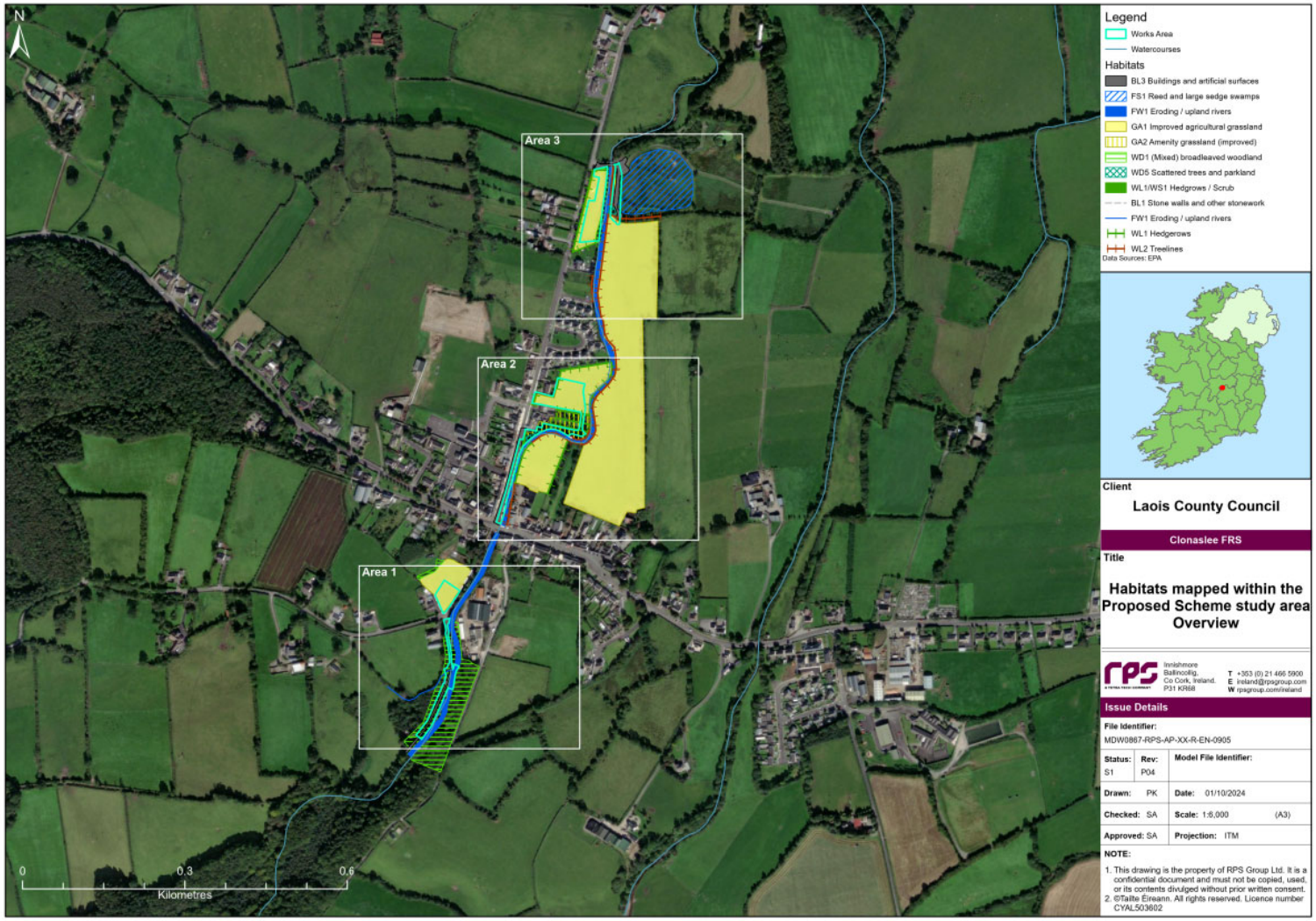
The Clodiagh River has been historically modified with straightening evident and stone or concrete reinforcement recorded on the banks. Upstream of Clonaslee bridge, well-developed riffle/glide/pool sequences are common. Boulders have been placed instream at regular intervals, and it is assumed these are measures to increase habitat heterogeneity and improve habitat available for fish. The boulders have been placed on the left and right margins of the river channel and deflect flow towards the centre of the channel. A pool was typically present at the downstream end of these in-stream features. Riffle areas were typically shallow but deeper pools were present with large boulders (60 cm+ depth), and this was common in the reach. Bank protection (stone boulders) was noted on the right bank near the water treatment plant (WTP). Historic modifications to the river channel were also noted in the form of a small concrete weirs and a degraded masonry bridge footing. Undercutting of both the right and left banks was noted.

Directly downstream of Clonaslee bridge, instream habitat is more open with bank reinforcement, shallow flow and more cobble/gravel substrate. A few sparse boulders were noted. A retaining wall spans large sections of the left bank. Further downstream, riffle/glide/pool sequences are present with good boulder/cobble substrate. As with the river upstream of Clonaslee bridge, undercut banks were noted in sections.

The desk study identified a number of Annex I habitats in the wider landscape surrounding the Proposed Scheme. These are mainly located south of Clonaslee village and include habitat such as dry heath (4030) and wet heath (4010). Blanket bog habitat (7130) is also found in this area and to the east of the Gorragh River. The Annex I habitat closest to the Proposed Scheme area (dry heath habitat) is located c. 1km to the southeast. An active raised bog (7110) is located c. 4 km west of the village and alluvial forests are located c.10 km downstream of the Proposed Scheme. An Annex I habitat old oak woodlands (91A0) is present c. 1.5 km west of the Proposed Scheme.

[23] Description available online at: https://biodiversityireland.ie/ivc-classification-explorer/fw2/fw2a/ [Accessed: 13/11/2024].

[24] Description available online at: https://biodiversityireland.ie/ivc-classification-explorer/fw2/fw2b/ [Accessed 13/11/2024].



Apx Figure 3: Habitat mapping overview.

Apx Figure 4: Habitat map: Area 1.

Apx Figure 5: Habitat map: Area 2.

Apx Figure 6: Habitat Map: Area 3.

A.2.5 Invasive Alien Plant Species

A search of the NBDC database was conducted for records of invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats Regulations) 2011, as amended. A 5 km buffer around the Proposed Scheme was used for this search.

Himalayan balsam (*Impatiens glandulifera*), was the only IAPS species listed under the Third Schedule of the European Communities (Birds and Natural Habitats Regulations) 2011, as amended, identified as part of this search.

Apx Table 5: Invasive alien plant species returned in NBDC desk study (within 5 km of the Proposed Scheme).

Species name	Record count	Date of last record	Designation
Indian balsam (*Impatiens glandulifera*)	1	18/07/2019	High Impact Invasive Species **Regulation S.I. 477 (Ireland)**
Sycamore (*Acer pseudoplatanus*)	12	31/12/2010	Medium Impact Invasive Species

During the field surveys Japanese knotweed (*Reynoutria japonica*), and hybrid knotweed (*R. x bohemica*) were recorded within Area 2 of the Proposed Scheme (**Apx Table 6**).

Japanese knotweed was recorded along the Clodiagh River during the field surveys carried out between April 2021 and September 2023. Three stands in close proximity to each other were recorded in 2021 and 2023, and one additional stand was identified during the 2023 survey. The first stand is located downstream of Clonaslee bridge on the left bank of the Clodiagh River (53.15029, -7.52392). A small stand is located directly opposite this. Two more stands of knotweed are located on the left bank and right bank further downstream from this area (53.150173, -7.522841). These stands were approximately 5 m in length and 1 m in width with old canes as well as new growth visible.

During a resurvey of the Japanese knotweed stands in September 2021, hybrid knotweed, as well as Japanese knotweed, was identified in the larger stand on the right bank of the Clodiagh River (53.150388, -7.522849). The leaves on the hybrid plant were primarily that of Japanese knotweed, however, a number of leaves had a more cordate base than would be expected from Japanese knotweed. This plant was therefore recorded as hybrid knotweed. Knotweed species (i.e., Japanese knotweed, giant knotweed and hybrid knotweed) are classified as being at risk of causing high impact and are listed under the Third Schedule of the Habitats Regulations and subject to strict controls under Regulation 49.

An individual Japanese knotweed plant was observed outside of the Proposed Scheme boundary, but between Areas 2 and 3 during an otter survey undertaken in June 2024. During the same survey, an individual Japanese knotweed plant was observed growing within a debris dam downstream of Area 3. These new plants are assumed to be spreading from the large stands located upstream, within the Scheme Area. The location of the IAPS recorded during field surveys is shown in **Apx Figure 7.**

Apx Table 6: Third Schedule Invasive Alien Plant Species (IAPS) recorded during field surveys (2021 – 2024) in Area 2 of the Proposed Scheme.

Stand Code	Description	Location (GPS)	Survey Year
Japanese knotweed – JK01	Japanese knotweed was recorded on the left-hand side of the Clodiagh River. The first stand is downstream of Clonaslee bridge on the left bank of the river. It is 10 m in length and 1 m in width with old canes as well as new growth present. This stand was located directly on the riverbank near a wall within the back garden of a residential property. Surveyors could not get full access to this stand however, all leaves looked like Japanese knotweed from a distance, and so this stand was identified as Japanese knotweed.	53.15029, -7.52392	2021
JK02	The second and third stands are located on the left and right bank respectively, located approx. 300 m downstream of Clonaslee bridge. These stands were approximately 5 m long, and 1 m wide, and were situated on the riverbank. As with JK01, the surveyors could not get full access to the stands, but all leaves looked like Japanese knotweed from a distance, therefore these stands were identified as Japanese knotweed.	53.150173, -7.522841	2021
Hybrid knotweed - HK01	This stand was located on the right-hand bank of the Clodiagh river, within the same location as the knotweed identified on the right bank at JK02. The majority of leaves within this stand were typical Japanese knotweed shaped	53.150388, -7.522849	2021

Clonaslee FRS

Stand Code	Description	Location (GPS)	Survey Year
	leaves however, a number were more typical of hybrid knotweed, having a more cordate base than Japanese knotweed. This stand was therefore identified as hybrid knotweed. This stand was 16 m long and 5 m wide with 2-3 cm thick stems. This stand stretched the entire way from the top of the riverbank down to the wetted width of the watercourse. This stand has been managed by the landowner during the course of hedgerow management. Additionally, a number of individual, small shoots were also visible encroaching into the neighbouring agricultural parcel.		
JK03	The first stand recorded in 2023 surveys were located downstream of Clonaslee bridge on the left bank of the river. Standing at 12 m long, 1 m wide with old canes as well as new growth present. Same location as JK01 above. It is evident that the JK has started growing under the wall in places. Boulders and tarpaulin have been used to stunt growth. Homeowner advised they treated the infestation with roundup. There were some stands on the wall that looked like they had been cut in the past.	53.150353, -7.523898 to 53.150365, -7.523734 (Start to end)	2023
JK04	The second stand recorded during the survey in 2023 was located on the right bank of the river across from JK03. This stand appears to be covered with tarpaulin however, fresh shoots were observed (c. 50 cm high) growing around edges.	53.150342, -7.523794 to 53.150365, -7.523834 (Start to end)	2023
JK05	JK was observed from a distance on the left and right banks of the River Clodiagh along the bankside of the neighbour's garden (same location as JK02). Due to accessibility, surveyors could only note JK growing here and were unable to collect enough data to provide an extent of the stands.	53.150388, -7.522849	2023
Individual	Individual plant noted on left bank.	53.151743, -7.522195	2024
Individual	Individual plant noted growing within debris dam in channel.	53.1552769, -7.520739	2024

Apx Figure 7: Invasive Alien Plant Species recorded during field surveys 2021-2024.

A.2.6 Otter

Desk Study

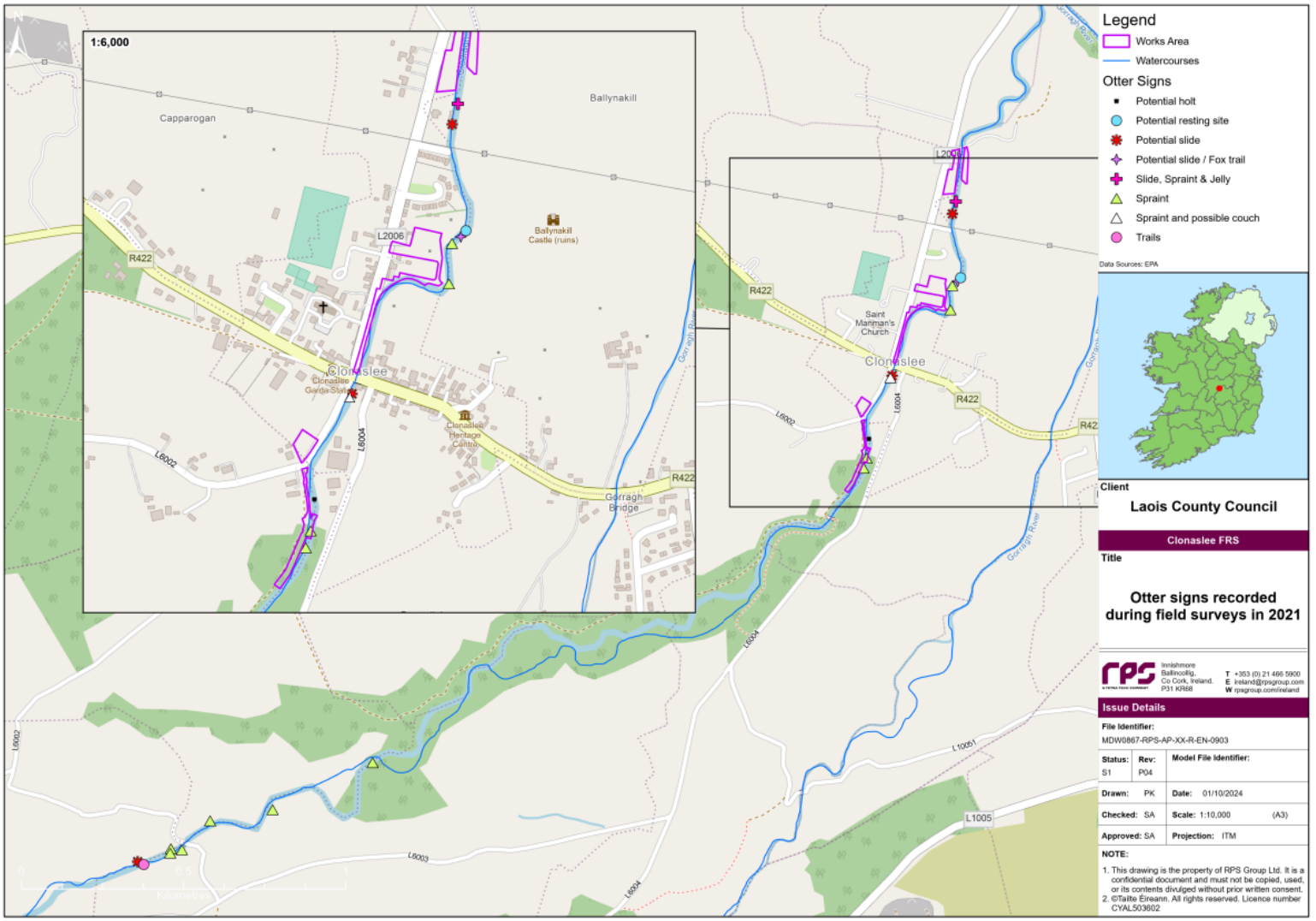
The NBDC search did not identify otter records within the last 20 years.

Field Survey

During general walkover surveys undertaken in April 2021, otter prints were observed along several sandy exposed banks downstream of Clonaslee bridge in the River Clodiagh. The exact location of these prints was not recorded. A spraint was recorded on a boulder approximately 200 m downstream of Clonaslee bridge. During the dedicated otter surveys undertaken in August and October 2021, otter spraints, potential resting places (couches and a holt) and potential slides were recorded. The recorded locations of these signs are shown in **Apx Figure 8**. Fish bones and scales, as well as crayfish remains were noted within the spraints observed. A potential holt was found within a stone bank-reinforcement structure on the right bank of the River Clodiagh, just downstream of Area 1. The “potential resting site” identified comprised a hollow in a tree, however it was noted as being inactive at the time and likely to be inundated during high flows. The potential couch identified just upstream of Clonaslee bridge comprised an undercut tree.

The Proposed Scheme area was resurveyed in August 2023, following refinement of the Scheme design. No evidence of otter was observed during this survey.

The Proposed Scheme area was surveyed again in June 2024. A single spraint was recorded on a boulder just upstream of the proposed debris trap within Area 1 (53.146156, -7.52647). Fish bones were noted in the spraint. No other signs were identified. The stone bank-reinforcement structure on the right bank of the River Clodiagh, just downstream of Area 1 was checked for signs of otter. This structure did contain various crevices that could be used by otter, as noted in surveys undertaken in 2021, but no clear signs of use (e.g., claw marks, footprints, worn paths) were noted. Furthermore, some of the crevices are likely to be inundated during high flows. Otter were not considered to be using this feature for holting or resting at the time of survey.



Apx Figure 8: Otter signs recorded during field surveys in 2021.

A.2.7 Ornithology

Desk Study

The search for bird species' records from NBDC within the Proposed Scheme desk study area returned a total of 96 bird species. Of these records 20 were classified as red-listed within the Birds of Conservation Concern in Ireland (BoCCI) 2020-2026[25]. Twenty-seven were classified as amber-listed species within the BoCCI 2020-2026. Seven species are listed under Annex I of the EU Bird's Directive (2009/147/EC). Records of hen harrier were returned for the desk study area. Hen harrier is an SCI species of Slieve Bloom Mountains SPA, a portion of which falls within the red line boundary of the Proposed Scheme Area. Species identified as part of the desk study are listed in **Apx Table 7**.

Apx Table 7: Threatened and protected bird species returned in NBDC desk study (within 5 km of the Proposed Scheme). Birds listed include those on the Birds of Conservation Concern in Ireland (BOCCI) red and amber lists, SCI (Special Conservation Interest) bird species and those listed on Annex I of the Birds Directive.

Species name	Record count	Date of last record	BOCCI Status	Birds Directive Annex I	SCI Bird Species
Barn Owl (*Tyto alba*)	5	08/02/2016	Red	-	-
Barn Swallow (*Hirundo rustica*)	29	14/04/2018	Amber	-	-
Common Coot (*Fulica atra)*	13	31/12/2011	Amber	-	✓
Common Goldeneye (*Bucephala clangula*)	1	31/12/2011	Red	-	✓
Common Kestrel (*Falco tinnunculus*)	25	30/10/2019	Red	-	-
Common Kingfisher (*Alcedo atthis*)	8	31/12/2011	Amber	✓	✓
Common Linnet (*Carduelis cannabina*)	27	31/12/2011	Amber	-	-
Common Pochard (*Aythya ferina*)	4	31/12/2011	Red	-	✓
Common Quail (*Coturnix coturnix*)	1	31/12/2011	Red	-	-
Common Redshank (*Tringa totanus*)	4	31/12/2011	Red	-	✓
Common Sandpiper (*Actitis hypoleucos*)	1	31/12/2011	Amber	-	-
Common Snipe (*Gallinago gallinago*)	22	31/12/2011	Red	-	-
Common Starling (*Sturnus vulgaris*)	42	31/12/2011	Amber	-	-
Common Swift (*Apus apus*)	14	31/12/2011	Red	-	-
Eurasian Curlew (*Numenius arquata*)	18	31/12/2011	Red	-	✓
Eurasian Teal (*Anas crecca*)	9	31/12/2011	Amber	-	✓
Eurasian Wigeon (*Anas penelope*)	6	31/12/2011	Amber	-	✓
Eurasian Woodcock (*Scolopax rusticola*)	14	31/12/2011	Red	-	-
European Golden Plover (*Pluvialis apricaria*)	9	03/03/2022	Red	✓	✓
European Greenfinch (*Carduelis chloris*)	36	31/12/2011	Amber	-	-
Gadwall (*Anas strepera*)	1	31/12/2011	Amber	-	✓
Goldcrest (*Regulus regulus*)	37	31/12/2011	Amber	-	-
Great Cormorant (*Phalacrocorax carbo*)	3	31/12/2011	Amber	-	✓
Great Crested Grebe (*Podiceps cristatus*)	3	31/12/2011	Amber	-	✓
Grey Heron (*Ardea cinerea*)	20	31/12/2011	Green	-	✓
Grey Partridge (*Perdix perdix*)	7	31/12/2011	Red	-	-
Grey Wagtail (*Motacilla cinerea*)	21	31/12/2011	Red	-	-
Hen Harrier (*Circus cyaneus*)	25	26/01/2022	Amber	✓	✓

[25] Gilbert G, Stanbury A and Lewis L (2021). *Birds of Conservation Concern in Ireland 2020 –2026*. Irish Birds 9: 523—544

Species name	Record count	Date of last record	BOCCI Status	Birds Directive Annex I	SCI Bird Species
House Martin (*Delichon urbicum*)	20	31/12/2011	Amber	-	-
House Sparrow (*Passer domesticus*)	40	31/12/2011	Amber	-	-
Little Egret (*Egretta garzetta*)	1	31/12/2011	Green	✓	-
Little Grebe (*Tachybaptus ruficollis*)	5	31/12/2011	Green	-	✓
Mallard (*Anas platyrhynchos*)	23	31/12/2011	Amber	-	✓
Meadow Pipit (*Anthus pratensis*)	40	31/12/2011	Red	-	-
Merlin (*Falco columbarius*)	8	31/12/2011	Amber	✓	✓
Mute Swan (*Cygnus olor*)	15	31/12/2011	Amber	-	-
Northern Lapwing (*Vanellus vanellus*)	18	31/12/2011	Red	-	✓
Northern Shoveler (*Anas clypeata*)	1	31/12/2011	Red	-	✓
Northern Wheatear (*Oenanthe oenanthe*)	6	31/12/2011	Amber	-	-
Peregrine Falcon (*Falco peregrinus*)	7	30/10/2019	Green	✓	✓
Red Grouse (*Lagopus lagopus*)	17	26/09/2017	Red	-	-
Redwing (*Turdus iliacus*)	15	31/12/2011	Red	-	-
Ringed Plover (*Charadrius hiaticula*)	2	31/12/2011	Amber	-	✓
Sand Martin (*Riparia riparia*)	13	31/12/2011	Amber	-	-
Sky Lark (*Alauda arvensis*)	25	31/12/2011	Amber	-	-
Spotted Flycatcher (*Muscicapa striata*)	17	31/12/2011	Amber	-	-
Stock Pigeon (*Columba oenas*)	8	31/12/2011	Red	-	-
Tufted Duck (*Aythya fuligula*)	7	31/12/2011	Amber	-	✓
Whooper Swan (*Cygnus cygnus*)	9	29/12/2019	Amber	✓	✓
Willow Warbler (*Phylloscopus trochilus*)	31	14/04/2018	Amber	-	-
Yellowhammer (*Emberiza citrinella*)	27	15/07/2020	Red	-	-

Field Survey

The semi-natural habitats surrounding the Proposed Scheme (e.g., the River Clodiagh, treelines, hedgerows, and broadleaved woodland habitat, riparian habitats) provide feeding and nesting habitat for breeding birds. **Apx Table 9** provides an overview of bird species encountered during field surveys undertaken between 2021 – 2024. Three birds associated with river habitat were identified during field surveys, namely grey wagtail (*Motacilla cinerea*), dipper (*Cinclus cinclus*) and kingfisher (*Alcedo atthis*).

Grey wagtail breed mainly along streams and rivers, frequently building nests under bridges. A grey wagtail was noted upstream of the Proposed Scheme area near Scarroon during surveys undertaken in August 2021. Grey wagtail have red-list status on the most recent BOCCI list.

Dipper is a bird associated with rivers and they feed on aquatic macroinvertebrates. They are associated with good water quality and healthy river ecosystems. The Clodiagh River, which has high ecological status (Q 4-5) provides ideal feeding habitat. Dipper nests are traditionally located in a natural crevice in a stream-side cave or waterfall, although the birds readily take to cracks in man-made alternatives such as bridges, walls, weirs, and culverts. The underside of the Clodiagh bridge was inspected for dipper nests but none were observed. Two dipper were observed foraging along the river during the otter survey carried out in October 2021 and one dipper was observed foraging and resting on an instream boulder during the aquatic survey carried out in August 2023.

Kingfisher is another bird associated with rivers, feeding on small fish. It is also an Annex I bird species. The nearest SPA for which Kingfisher is designated is the River Nore SPA, located 18 km south of the Clonaslee village. The Clodiagh river provides kingfisher feeding habitat with abundant overhanging tree branches providing perches for fishing. Kingfishers breed in tunnels dug in vertical banks along streams and rivers. The birds typically choose a vertical bank clear of vegetation, since this provides a reasonable degree of protection from predators. In August 2021, a kingfisher was observed flying up and downstream a section of

the River Clodiagh (53.15139, -7.52197) adjacent to the Proposed Scheme area. An exposed sediment bank was identified nearby on the right bank, however no nesting holes were identified. The kingfisher habitat appraisal undertaken in August 2023 did not identify suitable kingfisher breeding habitat along the River Clodiagh within the Proposed Scheme area. The banks comprised mainly treelines, vegetated banks, or banks reinforced with stone. The entire length of the River Clodiagh from Area 1 to Area 3 was walked on the 6th June 2024. Four discrete locations with suitable kingfisher nesting habitat were identified during this survey, as described in **Apx Table 8**. Whereas suitable kingfisher nesting habitat was identified, no kingfisher or kingfisher nest holes were noted during the course of the survey.

Apx Table 8: Kingfisher nesting habitat identified during walkover survey in 2024.

Number	Nesting Habitat Description	Location relative to Scheme	Lat	Long
1	Located on right bank - 1.2 m high and 6 m wide, exposed earth and roots. Possible kingfisher habitat. Two holes noted but assumed to be from a rat, due to absence of bird droppings and location among tree roots. No obvious kingfisher nest holes observed. Bank is eroding.	Adjacent to Area 2, on bank opposite works area.	53.15018	-7.52306
2	Located on right bank – 1 m high, 2 m wide. No nest holes. Some overhanging vegetation.	Adjacent to Area 2, on bank opposite works area.	53.15021	-7.52263
3	Suitable kingfisher habitat. Located on left bank - approximately 2.2 m high and 17 m wide. Sandy material, bank is vertical with overhanging brambles, but exposed areas with no/sparse overhanging vegetation present. No nest holes observed, but brambles obscured view in places. Located between 53.153355, -7.522387 and 53.153450, -7.522333	Immediately upstream (c. 5 m) of Area 3, on same side of river channel as works.	53.15336	-7.52239
4	Located on right bank adjacent to ICW. Approximately 1.5 m high, 1.5 m wide. Clayey material with some overhanging vegetation. No nest holes	Adjacent to Area 3, on same side of river channel as works.	53.15472	-7.52202

Apx Table 9: Incidental observations of bird species recorded during site visits 2021-2023.

Species	Scientific Name	BOCCI Status	Note
Rooks	*Corvus frugilegus*	Green	Rookery present along the left bank of the Clodiagh just upstream of Clonaslee bridge
Buzzard	*Buteo buteo*	Green	Calling overhead near Clodiagh River
Blackcap	*Sylvia atricapilla*	Green	Singing in vegetation along Clodiagh River
Dipper	*Cinclus cinclus*	Green	Feeding along the Clodiagh River
Goldcrest	*Regulus regulus*	Amber	Singing in vegetation along Clodiagh River
Chiffchaff	*Phylloscopus collybita*	Green	Singing in vegetation along Clodiagh and Gorragh River
Swallow	*Hirundo rustica*	Amber	In flight over field at entrance to Britta's wood
Wren	*Troglodytes troglodytes*	Green	Singing in vegetation along Clodiagh and Gorragh River
Blackbird	*Turdus merula*	Green	Singing in vegetation along Gorragh River
Great tit	*Parus major*	Green	Singing in vegetation along Gorragh River
Coal tit	*Periparus ater*	Green	Singing in vegetation along Gorragh River
Woodpigeon	*Columba palumbus*	Green	In flight
Kingfisher	*Alcedo atthis*	Amber	Flying up and down section of river, downstream of Clonaslee bridge
Grey wagtail	*Motacilla cinerea*	Red	Upstream of Proposed Scheme area, at bridge near Scarroon

Species	Scientific Name	BOCCI Status	Note
Pied Wagtail	*Motacilla alba yarrellii*	Green	In flight along Clodiagh River and perching briefly on instream boulder
Sparrow hawk	*Accipiter nisus*	Green	Observed in Brittas Wood during bat emergence surveys in 2024.

A.2.8 White-clawed Crayfish Survey and Habitat Appraisal

Overall, crayfish habitat was excellent within the Clodiagh River, with boulder/cobbles, instream woody debris, leaf litter and over hanging banks creating refugia. Upstream of Clonaslee bridge ideal habitat was present, with coarse substrate (boulders and cobble) providing habitat for crayfish to shelter. Well-developed riffle-glide-pool sequences were noted, which are helped by boulders which have been placed in the river channel. Under-cut banks are present with a good amount of detritus and woody debris providing habitat and a food source for juveniles. Directly downstream of the bridge, habitat is open with bank reinforcement, shallow flow and a more cobble/gravel dominated substrate. A few sparse boulders provided some habitat. Riffle/glide/pool sequences are present downstream with good boulder/cobble substrate, undercut banks in sections, woody debris and detritus. Near the ICW there are soft banks for burrowing present. Downstream of the ICW habitat is less ideal with bank reinforcements and less boulder habitat. Crayfish habitat at the proposed debris trap, and upstream and downstream of same, is considered to be excellent.

Brittas Stream at the Proposed Scheme area does not provide optimal habitat for crayfish. During surveys undertaken in March 2024, Brittas Stream at the Proposed Scheme area was noted as possibly providing some habitat for juvenile crayfish. The stream at this location is small, relatively shallow and lacked coarse substrate. The overhanging vegetation and detritus at the culvert inlet may provide some refugia and food sources. The habitat here was rated as ‘fair’. The stream upstream of the works is likely to be more suitable for crayfish. The stream was completely dry and had been excavated during surveys undertaken in June 2024, thus providing no habitat for the species. Taking this into consideration, the stream is considered unlikely to support crayfish, with the exception of perhaps providing refuge or foraging habitat in winter when water is flowing in the channel.

No crayfish were observed during kick sampling in April 2021. No crayfish were observed within the survey reaches during the dedicated crayfish surveys undertaken on the 11th August 2021. However, on the 11th August 2021 otter spraint with crayfish carapace remains was noted on a boulder upstream of Clonaslee bridge at 53.14619, -7.52655. During the resurvey of a few sections in the River Clodiagh on the 17th August 2021, 21 dead crayfish were found, with a range of sizes (3 – 11 cm total length), and crayfish plague was suspected. In addition, one live, white-clawed crayfish (4 cm total length) and one dead (9 cm total length) were identified in an area surveyed 2.5 km southwest of Clonaslee on the Clodiagh River on the 17th August 2021 (no longer part of the ecology survey area and therefore not described above). Three otter spraints with crayfish carapace were identified on a boulder at this location also. Dead crayfish specimens were sent to the Marine Institute and the NBDC and NPWS were informed. An outbreak of crayfish plague in the River Clodiagh near Clonaslee was announced on the 30th August 2021. No crayfish were observed during kick sampling or dedicated crayfish surveys undertaken on the 24th August 2023. This is likely due to the crayfish plague outbreak in the Clodiagh.