

**AGHOO BRIDGE TO LOCK 4 BLUEWAY, BALLINAMORE, CO. LEITRIM
ECOLOGICAL IMPACT ASSESSMENT (EciA)**



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1. INTRODUCTION

This Ecological Impact Assessment (EclA) report has been prepared to evaluate the proposed amended design for the Aghoo Bridge to Lock 4 Blueway Project. Leitrim County Council in partnership with Waterways Ireland are proposing the continuation of the Shannon-Erne Blueway Trail from Aghoo Bridge to Lock 4 – Aghoo. Waterways Ireland is the navigation authority for the Shannon-Erne Navigation. Along the banks of the canalised river and canal sections of the Shannon-Erne Navigation, Waterways Ireland owns and maintains the towpath. The proposed Blueway will comprise of the construction of approximately 390m of new cycle/pedestrian trail including a new bridge underpass at Aghoo Bridge. The Shannon-Erne Blueway layout plans and proposed alignment are detailed in the Project Description accompanying this planning application.

At various locations along the Shannon Navigation and Shannon-Erne Waterway, walkways and cycle routes have been developed in both the rural and urban environments which have proven to be very popular attractions to the region. The Blueway Trail from Aghoo Bridge to Lock 4 is a continuation of the existing trail which starts at Lock 7 and passes through Ballinamore town. The current proposal is to develop a further 390m section of Blueway Trail from Lock 4 – Aghoo Bridge (as shown in Figure 1), where it will connect to the existing Ballyduff to Aghoo Bridge Walking Trail along the Ballinamore Canal.

The typical construction of the Blueway trail will involve constructing a 3m wide compacted stone unbound dust surface along most of the route. The proposed works shall include a section rock armour bank stabilisation, signage, road markings, fencing and drainage. A new pedestrian underpass shall be provided under Aghoo Bridge which shall be constructed from gabion baskets with a handrail and timber fender.

The impact assessment and evaluation of significance presented in this report have been completed by a qualified and competent ecologist utilising current guidance and scientific information, as well as ecological survey data on the ground.

1.1 Description of the Project

The proposed Blueway trail will join with the existing Blueway trail on the southern side of the navigation, at the western side of Aghoo Bridge, near Ballinamore, Co. Leitrim (Figure 1 above). An underpass will be constructed below the road bridge to allow trail users to cross safely under the road to the eastern side of the road bridge. The trail will then be in the field running adjacent to the public road, ascending the hill towards Lock 4. The trail will cross through the field from the roadside, dropping to meet the existing maintenance strip along the canal alignment. The trail follows the existing maintenance strip, adjacent to the navigation to meet the parking area at Lock 4, and traverses Lock 4 and weir at the existing walkway bridges to the northern side of the navigation. Most of the works are to be completed by Waterways Ireland direct labour force; however, some elements of the work shall be contracted out such as installation of crash barriers along the public road margin and the hire of some plant.

The location of the project is as shown in Figure 1 above, a detailed project works location is presented in Figure 2a and 2b below.

Aghoo Bridge to Lock 4 Blueway – Ecological Impact Assessment

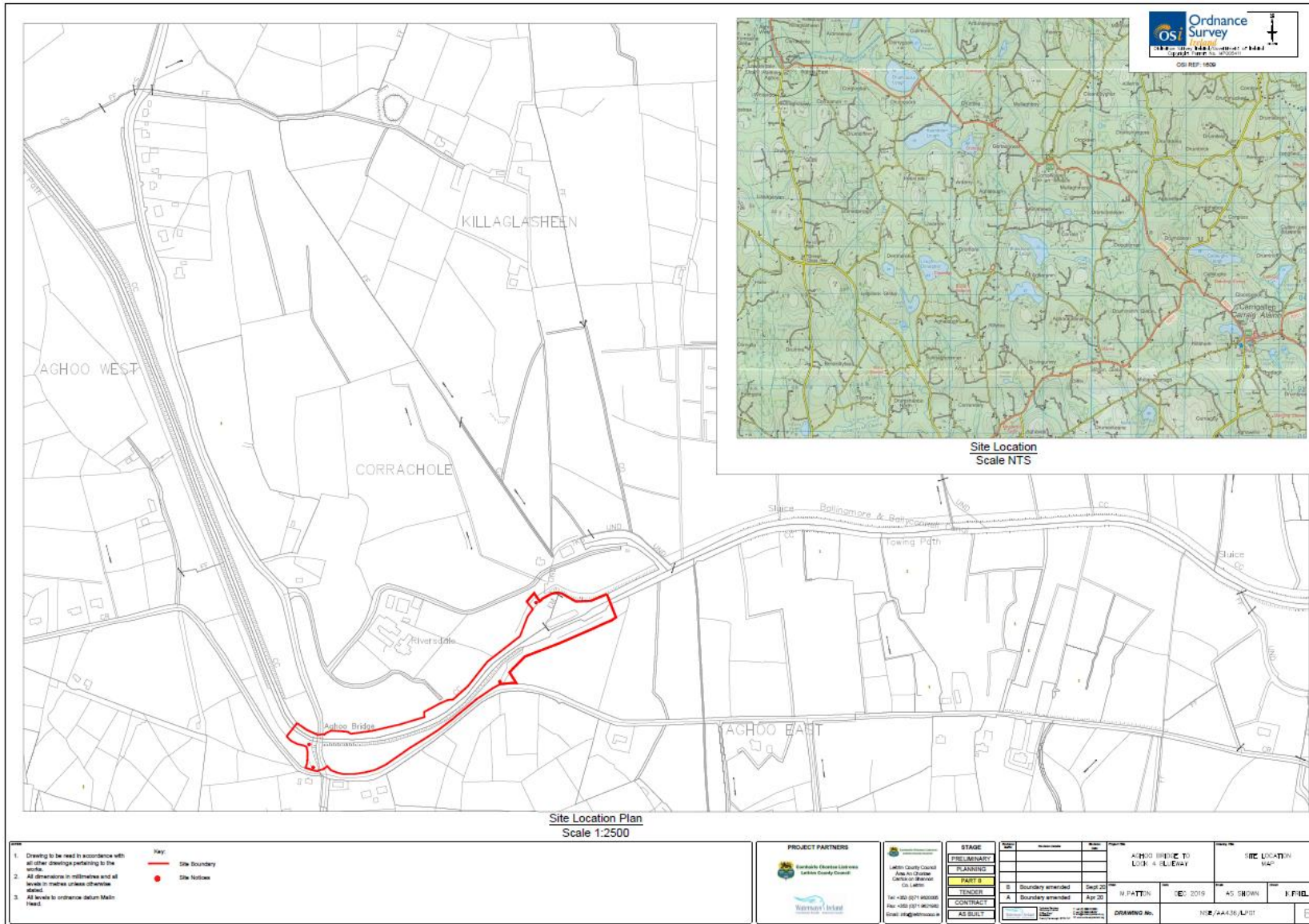


Figure 1. Location of the proposed Lock 4 to Aghoo Bridge Blueway project

1.1.1 Construction Methodology

Site Access

1. Prior to works commencing, including site access or ground clearance, the appointed Contractor must provide a detailed Construction Environmental Management Plan (CEMP) to be approved by Waterways Ireland. This must incorporate the protective actions and mitigation measures outlined in this document for implementation in full, as well as any other environmental management requirements in accordance with relevant planning conditions and legislation.
2. Entry to the site will be made only at the existing gates at the hardstanding to the western side of Aghoo Bridge; off the public road at the eastern side of the bridge; and at Lock 4 to access the eastern end of the route. Site offices, storage, etc. shall be at these same locations. Gates, fences, lights and guards will be provided as necessary.
3. Ongoing Consultation on the final Works Method Statement and schedule with IFI and National Parks and Wildlife.
4. Issue marine notice to inform navigation users of the planned works.
5. IFI to be given 2 week notice for electrofishing and will be kept updated and given notice as to which actual days this will be required.

Stepwise construction methodology

1. A ramp shall be constructed to join the existing trail to the underpass at the start of the new trail.
2. Where existing levels are above design levels, excavation for the trail shall be carried out to the depths shown on the drawings with excavated materials set aside for re-use. This material shall be reused to form a bund where required. Openings shall be provided at 5m centres in bunds to promote dispersal of surface water.
3. Run off from the road discharges into the aforementioned field drain. Further along the trail towards Lock 4 the run off discharges down the bank into the navigation. A large culvert crosses from the high ground on the far side of the road and discharges on the bank above the proposed walkway. A culvert will be required at this location.
4. Substantial bank reconstruction is required over an approximately 50m length of the walkway prior to construction of the proposed trail. This work shall consist of a rock armour revetment with a side slope of 1 vertical to 1.5 horizontal. The existing bank profile shall be shaped to this gradient prior to construction. The trail shall meet the black top area at Lock 4 through the existing stone piers.
5. On completion of construction, a timber post and wire fence shall be constructed as per the drawing. Design and construction of the traffic collision barrier will be completed by appointed qualified persons. Barriers or field gates shall be constructed as per the design drawings. Signage shall be erected as per the design drawings.

The works comprise of the following elements and shall be sequenced as detailed below:

1. Installation of safety barriers, railings and signage at appropriate locations
2. Set up a fuel storage area including setting out a minimum 10m refuelling set-back distance from the watercourse.
3. Placement of all non-bunded pumps on site on drip trays which will be subject to regular inspection and any fuel disposed of accordingly. All plant, machinery and fuel lines will be inspected daily to check for leaks and damage, with faulty (leaking) equipment being removed off site for repair without delay. Spill kits on sites.

4. Arrange with IFI to complete a site inspection to ensure they are happy with the pre-construction site set up. Fisheries may inspect settlement measures before any dewatering pumping commences at the bridge underpass works.
5. Silt curtain/silt fencing will be installed adjacent to all instream works locations. Silt curtains will be deployed across the navigation at the bridge works sites to reduce mobilisation of silt into the channel downstream. Silt fencing will be installed along the bank to prevent bank slippage and washout of sediment to the watercourse from works adjacent to the water.
6. Installation of dams at the bridge underpass. Excavators to work from both sides of Aghoo bridge (upstream and downstream) to create a sand bag and puddle clay dam with access to works area. The same method is to be utilised at the revetment area to dam off the works area there, inspected at required frequency.
7. Dewatering will be undertaken with water to be pumped through grass in field downstream of dam.
8. As water levels reduce IFI will be engaged to complete a fish salvage exercise within the dammed section.
9. The intake for pumps during the pumping will be screened to prevent the intake of fish .
10. Pumps will dewater onto grass area and not directly into navigation.
11. Monitoring of water quality at the outflow of pumps will take place on an ongoing basis. There shall be no direct discharge of waters from pumping to the watercourse.
12. Regular visual inspections of the watercourse downstream of the Lock chamber will be carried out at agreed intervals.
13. IFI will be contacted immediately in the case of any incident relating to pollution of aquatic habitat damage. Working hours and emergency contact numbers are as follows:
 - a. IFI Environmental Officer: 087 261 1352
 - b. IFI 24 hour emergency pollution number: 1890 34 74 24
 - c. Leitrim County Council Environmental Hotline: 1890 205205
14. IFI will be notified 48 hours in advance of lock chamber and area between lock and clay dam requiring re-watering post works, to facilitate IFI in carrying out an inspection prior to the re-watering.
15. IFI will be contacted immediately in the case of any incident relating to pollution of aquatic damage.
16. Installation of gabions and fill with clean rock
17. Demobilisation: Remove dams from instream, removal of temporary safety barriers along the road verge, install signage as required. Withdraw marine notice and carry out post construction appraisals with IFI to determine if there are any measures that can be improved upon for future works at this and other sites.

1.1.2 Operational Requirements

As the proposed walkway is to be constructed within Waterways Ireland property along the existing towpath and adjacent to the canal at the bridge underpass, the operational maintenance will be accessed from Waterways Ireland access points at either end of the trail section. Such maintenance works and operational requirements are limited to occasional resurfacing of the unbound crushed stone finish.

Aghoo Bridge to Lock 4 Blueway – Ecological Impact Assessment

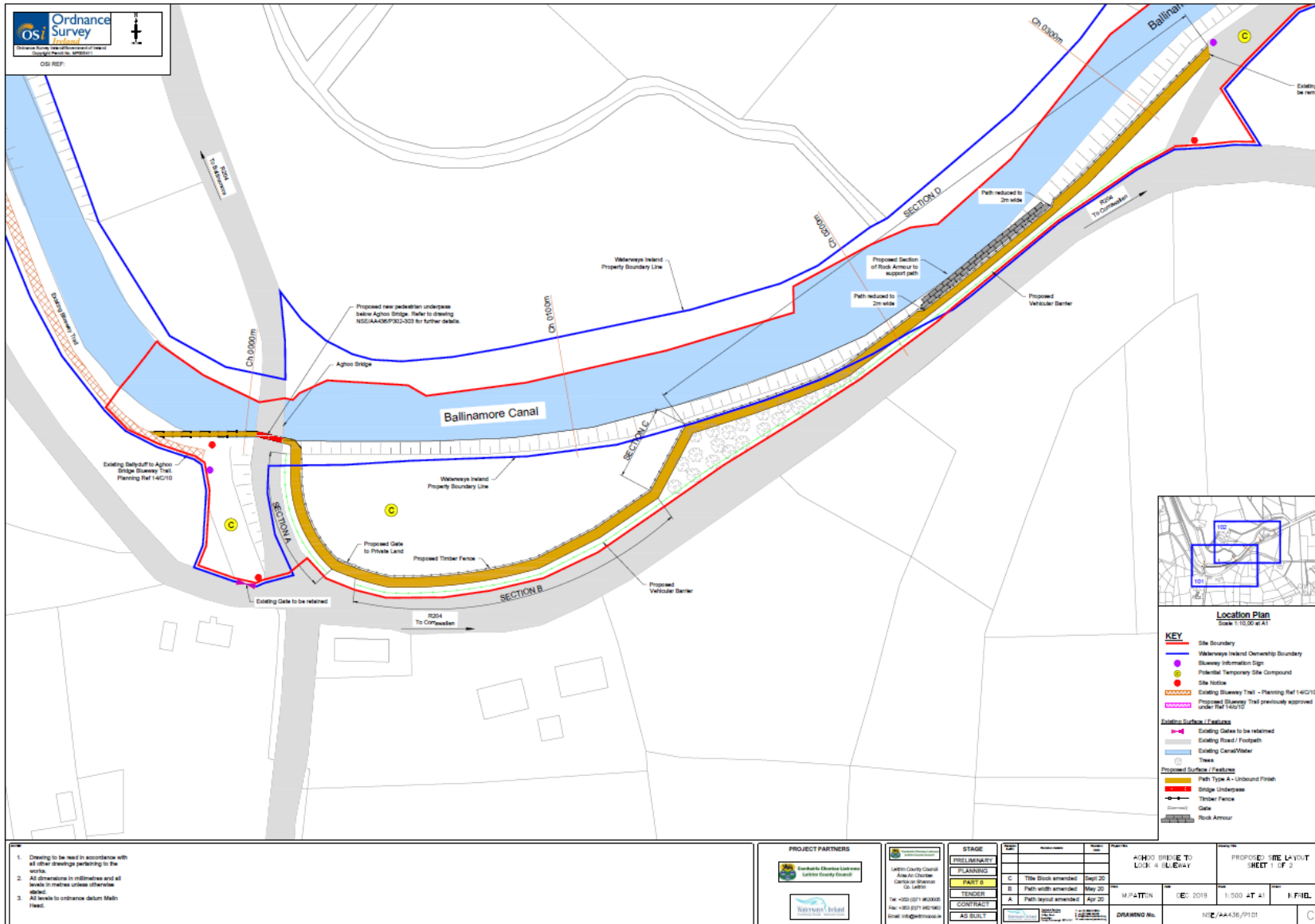


Figure 2a. Location and layout of the proposed project from west to east.

Agghoo Bridge to Lock 4 Blueway – Ecological Impact Assessment

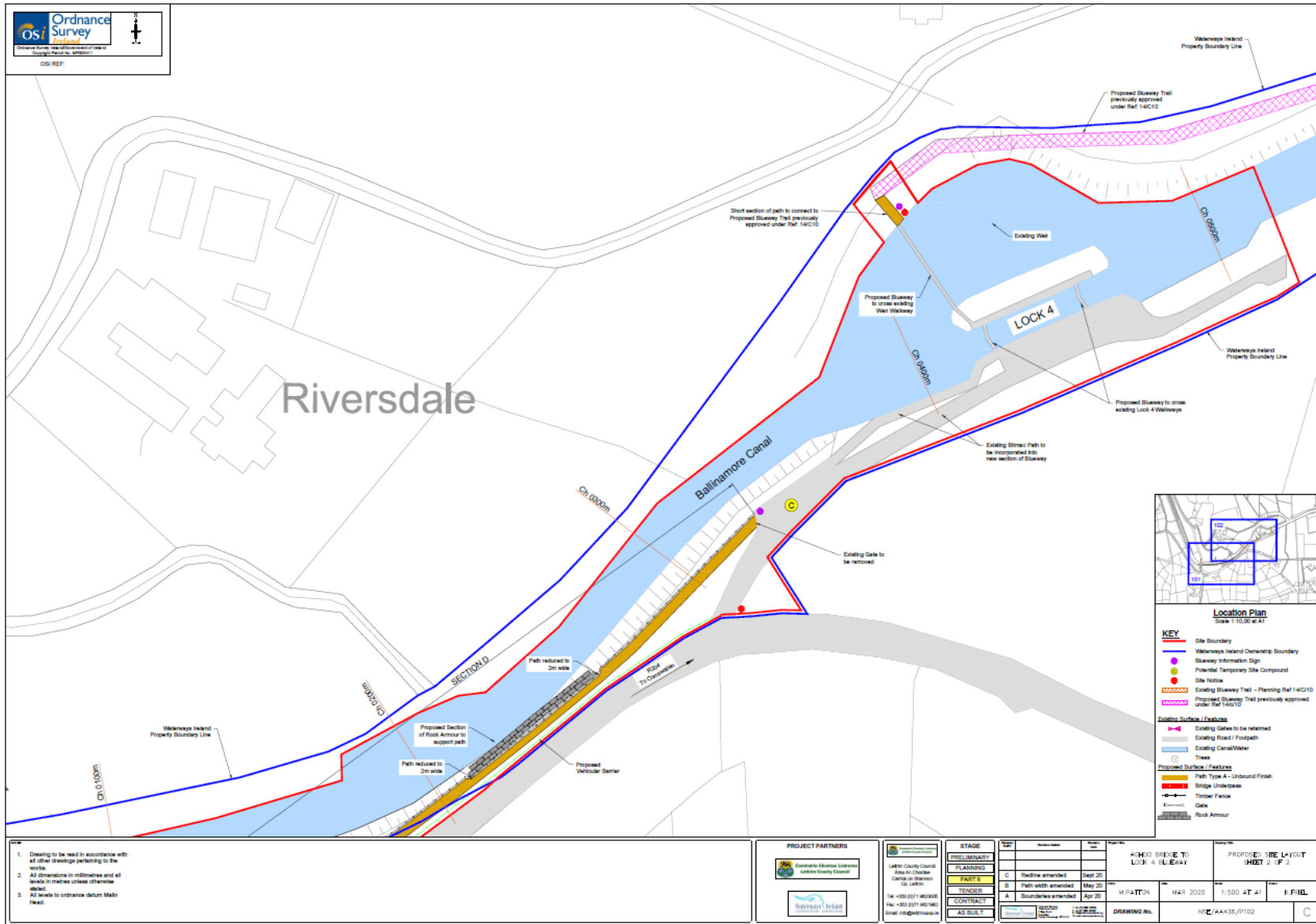


Figure 2b. Location and layout of the proposed project from west to east.

2. METHODOLOGY

This report has been prepared with regard to the following guidelines and legislation: -

National and International Legislation

- Planning and Development (Amendment) Act 2010, as amended; hereafter collectively referred to as the Planning Acts;
- Wildlife Act, 1976 and Wildlife (Amendment) Act (2000) (as amended); hereafter collectively referred to as the Wildlife Acts;
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011 (as amended); hereafter referred to as the Birds and Habitats Regulations;
- EU Birds Directive 2009/147/EEC;
- EU Habitats Directive 92/43/EEC (as amended); and,
- Flora (Protection) Order, 2015.

Relevant Guidelines

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM 2018);
- Guidelines for Ecological Report Writing, 2nd Edition. (CIEEM 2017);
- Guidelines for Preliminary Ecological Appraisal, 2nd Edition (CIEEM, 2017)
- Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.*, 2011);
- A Guide to Habitats in Ireland (Fossitt, 2000).

2.1 Desk Study and Field Survey

A desk study was undertaken in order to attempt to ascertain what information was available concerning the flora and fauna of the area that includes the site of the proposed development. Published material was checked and consultation was sought with relevant organisations. These included such sources as NPWS site synopses for designated conservation sites, the National Biodiversity Data Centre records for flora and fauna including birds and mammals, as well as specialist research publications.

The reports and data sources that were consulted in July 2020 as part of the desk-based review include, but were not limited to, the following: -

- National Parks and Wildlife Service (NPWS) MapViewer: (<http://webgis.npws.ie/npwsviewer/>)
- National Biodiversity Data Centre Biodiversity Maps: (<https://maps.biodiversityireland.ie/Map>)
- Environmental Protection Agency MapViewer: (<https://gis.epa.ie/EPAMaps>)

The proposed Blueway development does not lie within any designated conservation site. There were no NPWS site synopses relevant to the proposed development.

The flora and habitats of the site were assessed by means of a desk study of literature pertinent to the site and surrounding area and by a walkover field survey of the site. It was considered that bird survey techniques such as those recommended by Bibby *et al.* (2000) were not necessary due to the habitats present within the study area. An ecological walkover of the proposed route alignment was completed on the 29th of October, 2019. All bird species observed or heard within the site were recorded and the presence, or signs of, mammals, amphibians, reptiles and more obvious invertebrates was noted during the visit. Aquatic vegetation was observed predominantly from the riverbank, although in many

places this was not possible due to the height of the bank above the canal navigation and also due to trees and scrub between the route and the water.

2.2 Limitations

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the survey and the potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or cryptic nature) was assessed. The ecological walkover survey was conducted predominantly from the riverbank; instream habitat suitability was visually assessed. The presence of aquatic species (e.g. crayfish potentially present along under-cut and eroding banks) may not have been recorded and are therefore evaluated as likely to occur, based on desk study information.

A fisheries assessment was outside the scope of this project, with sufficient data gathered in previous studies of the Shannon Erne Waterway (Woodford River). Therefore, the potential of presence of fisheries is based on the desktop review and the suitability of habitat types present within the channel that were recorded during the walkover survey.

Lamprey ammocoetes are patchily distributed in freshwater streams and rivers and can move limited distances both upstream and downstream (Moser *et al.*, 2007). They can be found in substrates a few centimetres deep to 30cm or more in depth (Maitland, 2003). The current assessment comprises a desktop review of previous surveys commissioned by Waterways Ireland in the Shannon Erne navigation, in addition to habitat suitability evaluations.

Plants that do not flower during late October, or that are not easily identified by their foliage, can be difficult to detect. The seasonal limitations of the field survey did not restrict the accurate and comprehensive evaluation of habitats present within the works area, in accordance with standard classification guidelines.

3. DESCRIPTION OF THE RECEIVING ENVIRONMENT

The proposed Aghoo Bridge to Lock 4 Blueway Project comprises a section of Blueway amenity recreation trackway extending along the southern bank of the Ballinamore Canal, Co. Leitrim. The project is located in a predominantly agricultural context of grazing pasture, with coniferous forestry plantation located to the south (Figure 3).

The Ballinamore Canal is an artificial waterbody connecting the Shannon navigation to the Lough Erne navigation to the north east and is fed by the Woodford River to the west of Ballinamore town. As an artificial waterbody it is unassigned for Water Framework Directive (WFD) water quality monitoring, including Environmental Quality Indicators (EQIs) such as biological water quality, macrophytes and fish.

The field survey characterised the ecological constraints present within the works area, including the potential for pathways for impacts connected to sensitive ecological receptors within the Zone of Influence (Zoi) of the Project. Sensitive ecological receptors are defined as those ecological features within the study area evaluated as being of local importance (higher value) or greater, including habitats of biodiversity value in the local context, or corresponding to Annex I habitat types and also protected species listed under the Wildlife (Amendment) Acts (2000) and/or the Birds and Habitats Regulations (2011).

A photographic survey of the proposed Blueway route alignment is presented below, with annotation provided as context with regard to ecological sensitivities within the wider study area.



Figure 3. Satellite aerial imagery of the study area, from Aghoo Bridge to Lock 4 (Bing imagery).

Aghoo Bridge to Lock 4 Blueway – Ecological walkover and photographic survey



Plate 1 Existing crushed stone walkway at the western end of the project, to which the new Blueway will connect.



Plate 2 Aghoo Bridge, the pedestrian underpass will be connected to the right side of the bridge arch, as viewed from this image.



Plate 3 Otter spraint recorded from rock armour at Aghoo Bridge, evidence of White-clawed crayfish remains were noted.



Plate 4 Existing hardstanding at the western end of the proposed project, adjacent to Aghoo Bridge. This will be used as a site compound for the works.



Plate 5 After crossing below Aghoo Bridge, the route follows the outer boundary of this field adjacent to the public road.



Plate 6 The route exits the field into the woodland corridor adjacent to the Ballinamore Canal, in the background of this image.



Plate 7 Existing trail within beech dominated woodland adjacent to the public road and Ballinamore Canal.

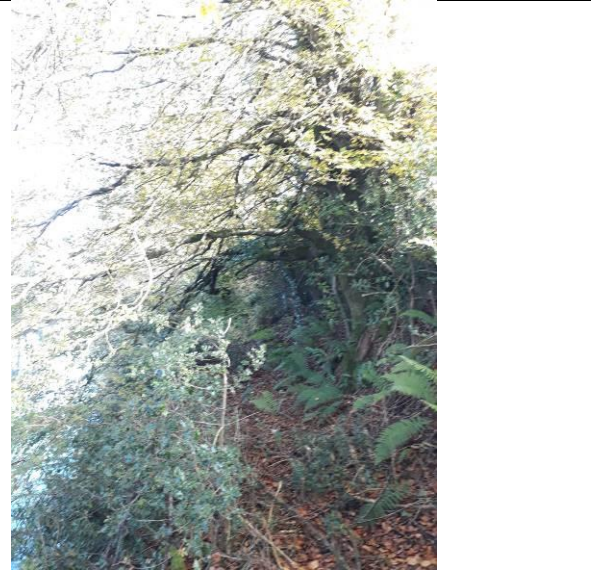



Plate 8 View east towards Lock 4 along the narrow section of the route.

	
<p>Plate 9 Approaching Lock 4 the route passes through immature Alder woodland.</p>	<p>Plate 10 Open waste ground and fencing at the approach to Lock 4.</p>
	
<p>Plate 11 View of the existing facilities at Lock 4, the eastern terminal end of the proposed development.</p>	

3.1 Designated Sites

A standard source-receptor-pathway conceptual model was used to identify a preliminary list of ‘relevant’ European sites (i.e. those which could be potentially affected due to connectivity via impact pathways). The potential for hydrological pathways to connect potential impacts arising from the project with European Sites downstream of the proposed works have been examined, with regard to the potential for significant effects in the absence of protective measures or measures intended as mitigation for the avoidance of impacts on the sensitivities of a European Site.

The Cuilcagh-Anierin SAC and the Lough Oughter and Associated Loughs SAC European sites are identified as the only sites within a 15km radius of the proposed development. The Lough Oughter and Associated Loughs SAC is the only European site with potential connectivity to the proposed project by reason of hydrological pathways at a distance of approximately 14km over land or over 33km downstream from the proposed development via the Shannon Erne Waterway. The qualifying interests of this SAC are:

- Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150]

- Bog woodland [91D0]
- *Lutra lutra* (Otter) [1355]

From an evaluation of the project description and the consideration of potential impact pathways with connectivity to the wider environment, there are no other SAC or SPA sites within proximity of the proposed development, and no pathways for impacts are identified whereby indirect effects may occur affecting other European Sites at a distance from the proposed works.

There are no pathways for impacts which could give rise to significant effects on any nationally designated conservation site (NHA/pNHA), where the closest designation is Garadice Lough Woodland pNHA located 6.5 km over land and 7.5km via hydrological connection downstream. Furthermore, this designated site comprises a terrestrial woodland habitat and thus is not connected to the potential impacts arising from the development, regardless of their small scale and extent.

On the basis of the project description, including best scientific evidence in the field, it has been evaluated that the potential for likely significant effects on the qualifying interests and the conservation objectives of the Lough Oughter and Associated Lakes SAC can be excluded in the absence of protective measures or mitigation measures to avoid significant effects, and in view of best scientific evidence in the field.

A Screening for Appropriate Assessment (Waterways Ireland, 2020) is included with the planning application for the proposed development. This report determined that the potential for significant direct, indirect or cumulative impacts which could affect the qualifying interests/special conservation interests of the European sites within the study area could be excluded. It is therefore concluded, beyond reasonable scientific doubt, that the proposed project will not give rise to significant effects, either individually or in combination with other plans and projects, within the identified European Site(s).

3.2 Habitats and Flora

Due to the modified nature of the Shannon Erne navigation channel, the canal bank habitats and instream aquatic habitat is evaluated as quite homogenous along its length. The wetted instream channel margins were approximately 1-2m wide, before the channel shelves off significantly. The substrate of the wetted channel margins consisted of silts, and fine and coarse sands and gravels. Cobble substrata was infrequent within the channel margins and boulders were present at intervals. Flow type within the channel was a slow glide. No heterogeneity in flow types was recorded, e.g. pool, riffle or run sections.

A riparian margin of approximately 4-5m in width was fenced off from the neighbouring farmland. This riparian margin varied in its management and within the route of the proposed development was generally unmanaged and had been colonised by a semi-continuous treeline varying in width. Riparian vegetation along the bank was predominantly Scrub (WS1) and Treelines (WL2) which extended in width to comprise Mixed broadleaved woodland (WD4). Some open grassland was recorded classified as Dry Meadows and Grassy Verges (GS2) and Wet Grassland (GS4). The amenity facility at the eastern end of the route at Lock 4 is characterised by hard artificial surfaces and Amenity grassland (GA2).

The habitats found on the site and in its immediate vicinity were classified according to the guidelines set out in '*A Guide to Habitats in Ireland*' (Fossitt, 2000), which classifies habitats based on the vegetation present and management history. These habitats are listed and described below.

Amenity grassland (GA2)

The proposed Blueway terminates at its eastern end at Lock 4, an area managed by Waterways Ireland. The vegetation in this area is mown grass with a species mix that includes Creeping Bent (*Agrostis stolonifera*), Yorkshire Fog (*Holcus lanatus*), Smooth Meadow-grass (*Poa pratensis*), Cocksfoot (*Dactylis glomerata*), Meadow Foxtail (*Alopecurus pratensis*), Sweet Vernal-grass (*Anthoxanthum odoratum*), Ribwort Plantain (*Plantago lanceolata*), Daisy (*Bellis perennis*) and occasional Soft Rush (*Juncus effusus*). The periphery of amenity grassland where mowing or cutting is difficult have taller vegetation adjacent to the scrub habitat outside of the managed habitat within the amenity area.

Wet grassland (GS4)

The field in the centre of the route, skirted by the proposed alignment is classified as wet grassland, supporting a typical *Juncus*-type wet grassland community, with extensive stands of Soft Rush.

Treeline (WL2) / Mixed broadleaved woodland (WD4) / Scrub (WS1)

The canal bank extending from the downstream side of Aghoo Bridge to Lock 4 is almost entirely fringed by a linear treeline which widens in parts to comprise a mixed broadleaved woodland. Species of trees and shrubs present included Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*) and Alder (*Alnus glutinosa*). Hawthorn (*Crataegus monogyna*), Sally (*Salix cinerea ssp. oleifolia*) and Blackthorn (*Prunus spinosa*) occur in the understory, or as scrub. A number of mature Beech (*Fagus sylvatica*) which are obviously of a greater age than the other trees along the embanked section of the canal alignment were noted within the treeline.

The alder trees in the treeline were sub-mature and varied between three and six metres in height. Alder and Sally were the most frequent species. The wider band of trees in the middle portion of the route, adjacent to the north east corner of the field and also occurring at the approach to Lock 4 were almost entirely dominated by immature Alder.

Canals (FW3)

The Shannon Erne Waterway (Ballyconnell Canal), also called the Woodford River, as named by the EPA, adjoining the proposed walkway route is approximately 15-20 metres wide. The Woodford River lies within the Erne catchment, Water Framework Directive (WFD) catchment number 36. The Erne is a transboundary catchment, existing both north and south of the international boundary between Northern Ireland and the Republic of Ireland. The Woodford River flows across the international boundary approximately 2km downstream of Ballyconnell town, from where it continues to flow for a further 12km to Upper Lough Erne. Its confluence point is in the vicinity of Coragh townland, approximately 5km north of Belturbet.

The banks were predominantly covered with Bramble (*Rubus fruticosus* spp. agg.) scrub and Ivy (*Hedera helix*). The riverbanks along the survey stretch were experiencing considerable erosion and undercutting. In places, slumping of the riverbank or bank collapse had occurred. A visual assessment of true emergent or floating macrophytes identified these species as rare or absent, due to the steep banks, thalweg depth and uniform maintenance of the channel. The canal waterway banks were generally steep and fringing vegetation was poorly developed. Previous studies of the Shannon Erne waterway (Woodford River) have recorded small amounts of Unbranched Bur-reed (*Sparganium emersum*) and Small Pondweed (*Potamogeton berchtoldii*), with Yellow Water Lily (*Nuphar lutea*) where backwaters occur.

Stonewalls and other stonework (BL1)

Aghoo Bridge (at the extreme western end of the walkway route) has been classified as stonewalls and other stonework (BL1).

3.3 Fauna

3.3.1 Birds

Few bird species were recorded during the site walkover, limited to common species in the Irish countryside. There are no habitats of note present which would support breeding or wintering bird species of conservation importance along the alignment of the proposed development. No species listed in either Annex I of the EU Birds Directive or the Birds of Conservation Concern in Ireland Red or Amber lists were recorded. Species identified included: Woodpigeon (*Columba palumbus*), Wren (*Troglodytes troglodytes*), Blackbird (*Turdus merula*), Magpie (*Pica pica*) and Rook (*Corvus frugilegus*).

3.3.2 Mammals

The only mammal of which signs were recorded during the site visit was Otter (*Lutra lutra*). A sprainting site was recorded on the ledge beneath Aghoo Bridge, on river right. This location was previously recorded as a sprainting site during previous ecological surveys commissioned by Waterways Ireland.

Based on an evaluation of the habitats present within the route corridor, it is likely that additional mammal species may occur including common species such as: Pygmy Shrew (*Sorex minutus*), Field Mouse (*Apodemus sylvaticus*) and Brown Rat (*Rattus norvegicus*). Irish Stoat (*Mustela erminea*), Pine Marten (*Martes martes*), Fox (*Vulpes vulpes*), Irish Hare (*Lepus timidus hibernicus*), Rabbit (*Oryctolagus cuniculus*) and Hedgehog (*Erinaceus europaeus*) are also likely to occur within the route corridor or adjacent habitats including the treeline corridor and agricultural fields.

No Badger signs were noted and no setts were recorded along the route of the proposed development. However, it is almost certain that there are Badgers (and their setts) in the wider area, outside of the zone of influence of this project.

Still or relatively still water like the waterway and the fringing treeline comprises optimal foraging territory for bats. It is highly likely that Daubenton's Bat (*Myotis daubentonii*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Common Pipistrelle (*Pipistrellus pipistrellus*) and possibly other species like Natterer's Bat (*Myotis nattereri*) regularly feed and commute along the waterway. Forest bats like Brown Long eared Bat (*Plecotus auritus*) may also occur associated with a number of mature beech trees along the alignment. The majority of trees within the study area are immature alder and provide limited (low) bat roost potential. Similarly, the masonry arch of Aghoo Bridge has been re-pointed and good potential roost sites (i.e. cracks and crevices in the masonry) were not observed. Older bridges provide suitable roosting habitat particularly for Daubenton's bat; however, Aghoo Bridge was evaluated as comprising low bat roost potential.

3.3.3 Fish

The waterway within the survey area is very homogenous in nature in terms of channel profile, flow type, scarcity of good riparian and aquatic vegetation structure and lack of marginal or off-channel fish habitat. The channel within the survey area offers poor fish nursery habitat.

A total of six fish species were recorded by IFI during sampling in the Lough Erne waterway system. Perch was the most abundant fish species recorded, followed by roach, eels and roach/bream hybrids. Small numbers of bream, brown trout and pike were also captured. Due to the nature of the channel, the Woodford River provides moderate-good holding habitat for adult fish species. Although, there

are no pool areas within the survey area, the flow is a slow glide. The Woodford River also provides connectivity to the series of lakes located upstream of the survey area and to the tributaries of the Rivers Yellow, Blackwater and Bawnboy. Upper Lough Erne and the Woodford River system support brown trout, eel, lamprey and a diverse population of coarse fish species; thus, the survey area is an important fish passage channel between these waterbodies. The conservation status and legal protection afforded to the fish species recorded within the Shannon-Erne waterway, evaluated to occur within the Shannon Erne waterway / Woodford River, are presented in Table 1.

Table 1. Conservation and legal status of fish species recorded by IFI in the Erne System

Common Name	Scientific Name	Red list status ¹	National legal status	EU legal status
Brown trout	<i>Salmo trutta</i>	Least Concern	Regulated by national legislation governing closed seasons and supporting habitats, e.g. Fisheries Act 1959 (and Amendments); EC (Quality of Salmond Waters) Regulation, 1988.	No
Bream	<i>Abramis brama</i>	Not evaluated	Fisheries Act 1959 (and Amendments) and national coarse fishing bye-laws.	No
Roach	<i>Rutilus rutilus</i>	Least Concern	Fisheries Act 1959 (and Amendments) and national coarse fishing bye-laws.	No
Rudd	<i>Scardinius erythrophthalmus</i>	Least Concern	Fisheries Act 1959 (and Amendments) and national coarse fishing bye-laws.	No
Tench	<i>Tinca tinca</i>	Least Concern	Fisheries Act 1959 (and Amendments) and national coarse fishing bye-laws.	No
Perch	<i>Perca fluviatilis</i>	Least Concern	Fisheries Act 1959 (and Amendments) and national coarse fishing bye-laws.	No
Pike	<i>Esox lucius</i>	Least Concern	Fisheries Act 1959 (and Amendments) and national coarse fishing bye-laws.	No
Eel	<i>Anguilla anguilla</i>	Critically Endangered	Fisheries Act 1959 (and Amendments) and national bye-laws.	Yes EU Eel Regulation 1100/2007
Brook Lamprey	<i>Lampetra planeri</i>	Least Concern	Fisheries Acts 1959 (and Amendments) and national bye-laws	Yes EU Habitats Directive Annex II and Annex V species

3.3.4 Invertebrates

White-clawed crayfish (*Austropotamobius pallipes*) are a protected species listed under the Wildlife Act (2000) and on Annex II of the EC Habitats Directive (1992). There are numerous records of this species from the Erne system, being found in both lakes and rivers throughout the catchment. According to the records of the NBDC, White-clawed crayfish have been recorded in tributaries of the Woodford River, but not within the Woodford River itself. Crayfish have been recorded in the Dromore stream and upstream of Bellaboy Lough on the Bawnboy River, a tributary of the Blackwater River, by EPA biologists in 2007 and 2013, respectively.

Crayfish live within refuges in these waterbodies, such as under rocks and stones, submerged logs and tree roots, algal mats and beds of macrophytes. Although crayfish are typically associated with using

¹ King *et al.* (2011)

physical refuges in a river channel, they will also burrow into the base of riverbanks, especially where suitable refuges are limited (Holdich *et al.*, 2006).

Evidence of crayfish was recorded from an otter spraint at Aghoo Bridge, indicating the local presence of this species within the foraging range of the otter. Although crayfish may not occur directly within the works area the current assessment evaluates it as likely and measures for the protection of this species are incorporated into the mitigation measures.

The non-native invasive species Zebra mussel (*Dreissina polymorpha*) is present in the Shannon Erne Waterway / Woodford River (Minchin *et al.*, 2003). Zebra mussel is listed as an invasive species on the Third Schedule of the Birds and Habitats Regulations (2011) thus requiring management and preventative biosecurity measures in place for the control and avoidance of spread.

3.4 Significance of the Ecological Receptors

3.4.1 Designated Sites

The Screening for Appropriate Assessment which accompanies this planning application (Waterways Ireland, 2020) concludes that there are no pathways for impacts which would have the potential for significant effects on any designated European Site (SAC/SPA). There are no pathways for impacts which could give rise to significant effects on any nationally designated conservation site (NHA/pNHA), where the closest designation is Garadice Lough Woodland pNHA located 6.5 km over land and 7.5km via hydrological connection downstream. Furthermore, this designated site comprises a terrestrial woodland habitat and thus is not connected to the potential impacts arising from the development, regardless of their small scale and extent.

There are no designated conservation sites either at a European or National level which are identified as potential significant ecological receptors in the context of the EclA.

3.4.2 Habitats and Flora

The wet grassland and amenity grassland habitats that are contained within the site of the proposed development are of low ecological value in the local context. The Shannon Erne waterway (Woodford River) and the continuous treeline/mixed broadleaved woodland which follows the southern bank are evaluated as being of local importance (higher value) and are therefore included as sensitive ecological receptors.

3.4.3 Fauna

The ecological survey and desk study evaluated the potential for and presence of protected species listed in Annexes II, IV or V of the EU Habitats Directive, the Flora (Protection) Order (1999), Annex I of the EU Birds Directive, and the BoCCI Red or Amber lists. It is likely that the flora and fauna occurring within the route of the proposed development are also generally distributed in the wider local environment.

Based on desk-study records commissioned by Waterways Ireland within the Shannon Erne Waterway and the presence of suitable habitat features identified on site, the following species are identified as likely to occur and are included as sensitive ecological receptors:

- Otter (listed on Annex II and IV) occurs throughout the waterway, with sprainting signs recorded at Aghoo Bridge. No otter holts were recorded along the route or adjacent habitats.
- Bat species (all listed on Annex IV) including Daubenton's, Pipistrelles (Common and Soprano) and potentially Natterer's Bat due to the presence of mature trees within the route corridor.

- Coarse fish and brook lamprey (Annex II species) based on records and previous studies within the Shannon Erne Waterway. Suitable habitat for juvenile lamprey is limited, with few bank margins supporting deposited silt.
- White-clawed Crayfish (Annex II species) is considered likely to occur based on previous records from the waterway, and evidence of local occurrence in otter feeding remains (spraint).

4. ASSESSMENT OF IMPACTS

4.1 Potential Construction Phase Impacts

4.1.1 Habitat Loss

The proposed development will require construction within the understory of scrub and treeline habitat along the route. The route also includes a footprint within wet grassland currently managed as agricultural grassland and some amenity grassland at the Lock 4 terminal end. The areas intended for site compounds at either end of the works area are currently surfaced with gravel surfacing and tarmac at the Aghoo Bridge and Lock 4 ends, respectively. These locations are therefore of low ecological significance.

Approximately 390m of surfaced trackway will be installed for the proposed route, of this approximately 195m will be within linear treeline and scrub habitat adjacent to the waterway. There is no requirement to clear mature trees within the route, with the proposed development being between 1.5m-3m in width variable based on the requirement to avoid removal of mature trees occurring on the bank of the waterway and road verge. Therefore, the habitat loss calculations are based on the extent of the proposed cycle route located within the Waterways Ireland property boundary along the waterway corridor and within the field margin which is in private ownership. The total area of the proposed Blueway boundary is less than 1,170m².

The habitats affected by the proposed works are common in a local, national and international context and none comprise high diversity or represent naturalness with regard to botanical communities present. Construction will require branch trimming and the removal of scrub and immature trees within the route alignment.

Best Practice and Mitigation

- Mature trees are to be retained along the route to preserve the heritage, biodiversity and amenity value within the alignment. The route will be narrowed at these locations to accommodate the root protection zone for individual mature trees.

4.1.2 Earth Works

Construction of the proposed Blueway amenity route will involve excavation of a small amount of soil to establish a base level. This creates the potential for sediment and/or nutrient run-off, especially if soil is stored in an unconsolidated state for a period of time. Suspended solids or nutrients resulting from the decomposition of organic material could potentially enter the adjacent waterway. The proposed development includes for a temporary site compound and designated spoil storage area at each terminal end. Based on the quantity of material to be removed during the installation of the works and the requirement for re-use of material within the site for the creation of berms and landscaping, it is considered unlikely that washout, erosion and siltation would be significant.

Best Practice and Mitigation

- Measures specified in the outline CEMP will be implemented in full (See Appendix 1).

- Excavation and infilling will be carried out in small progressive stages.
- Any topsoil that is of use for landscaping will be stored on the site. Where this is required during the construction phase, it will be stored at designated locations set back from the waterway and covered, to avoid excessive sediment run-off or windblow.
- Whilst no significant run off of silt-laden run off is anticipated, given the proposed construction methodology, the site will be regularly monitored by construction staff for signs of run-off such as silt in surrounding vegetation and measures will be put in place to prevent this where necessary. This may include the provision of a solid containment berm (of soil) or alternatively the erection of a silt fence. A silt fence may be constructed by attaching a sheet of geotextile membrane to a stock fence and burying the bottom of it into the ground. Thus allowing water to pass through but not the heavier fraction of the sediment.
- Excavations will be carried out using a suitably sized excavator.
- Any excavated soil that is not re-used will be disposed of to a Local Authority approved waste disposal facility.
- In all circumstances, excavation depths and volumes will be minimised and excavated material will be re-used where possible.

4.1.3 Hydrocarbon usage

The use of hydrocarbons during the works leads to the potential for pollution to enter environment, including drainage ditches and, potentially, the canal. Leaks in poorly maintained plant and machinery could lead to hydrocarbon dispersal over the site. Leaks in fuel storage tanks and spillages during refuelling operations could lead to larger releases of hydrocarbons into the environment.

Best practice and Mitigation

The use of machinery at the site carries the potential for accidental hydrocarbon contamination of the area, by fuel spillages or oil leaks for example. The works will be carried out in accordance with the following measures to avoid such impacts:

- Measures specified in the outline CEMP will be implemented in full (See Appendix 1).
- Mobile storage such as fuel bowsers will be banded to 110% capacity to prevent spills. Tanks for bowsers and generators shall be double skinned.
- When not in use, all valves and fuel trigger guns from fuel storage containers will be locked.
- All plant refuelling will take place on site using mobile fuel bowsers. Only dedicated trained & competent personnel will carry out refuelling operations. Plant refuelling will take place as far as practicable from watercourses. A spill kit and drip tray shall be on site at all times and available for all refuelling operations. Equipment shall not be left unattended during refuelling. All pipework from containers to pump nozzles will have anti siphon valves fitted.
- Strict procedures for plant inspection, maintenance and repairs shall be detailed in the contractor's method statements and machinery shall be checked for leaks before arrival on site.
- All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed.
- All major repair and maintenance operations will take place off site.
- Care will be taken at all times to avoid contamination of the environment with contaminants other than hydrocarbons, such as uncured concrete or other chemicals.
- The plant refuelling procedures described above shall be detailed in the contractor's method statements.

4.1.4 Disturbance to Fauna during the Works Stage

The proposed plans and projects will result in increased levels of noise and activity around the towpath during the works period, in particular when stripping topsoil applying surface dressings, and conducting maintenance works. Mammal species present along the waterway corridor and utilising the treeline as a commuting corridor along the bank may potentially be affected. Otter and bat species occurring along the waterway and treeline corridor are crepuscular in nature, foraging at dawn and dusk. There are no works required which would give rise to significant habitat loss for either of these mammal species, with mature trees to be retained during the works, as well as limited interference with the bank of the waterway, limited to specific bank revetment sections. Therefore, mammal species are unlikely to be significantly impacted by disturbance from the proposed works.

Best practice and Mitigation

No mitigation necessary for mammal species as the works will be short term in duration, limited in extent between Aghoo Bridge and Lock 4 and comprise a continuation of the existing walkway and amenity use at either end of the route.

Water quality protection measures and pre-commencement surveys for Crayfish and Lamprey, as specified in the Outline CEMP will be implemented in full to avoid significant effects on these species (see Appendix 1).

4.1.5 Spread of Invasive Species

The proposed works will involve the use of machinery on site and the movement of soil and will create disturbed ground that may be subject to introduction or colonization with invasive species. No invasive species were recorded within the proposed working area or access locations to the alignment.

Best Practice and Mitigation

- Measures specified in the outline CEMP will be implemented in full (See Appendix 1).
- In the event that additional topsoil and quarried stone is required on the site, it will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present.
- All machinery will be thoroughly cleaned and disinfected prior to arrival and departure from the site to prevent the colonization/spread of invasive species. This process will be detailed in the contractor's method statement.
- Sites of infestation identified on site prior to works commencing shall be clearly marked and avoided during the works. The importance of preventing the spread of invasive species will form part of a tool box talk to all personnel prior to construction stage.

4.2 Potential Operational Phase Impacts

Provision of the Blueway amenity route is expected to increase human activity and attract an increased number of visitors. The effect of such an increase in human activity at the site is difficult to assess but three potential impacts are identified: increased visitor numbers could lead to 1) disturbance of local faunal communities, 2) an increase in trampling and towpath erosion and 3) littering/dumping.

Taking account of the scale and extent of the route, in addition to the existing connectivity to an operational Blueway and the low sensitivity of the ecological receptors in the immediate vicinity, the operational impacts are considered to be minor. It is also noted that the waterway itself is currently in use as a navigation channel with vessels passing through Lock 4 and the entire length of the works area. Increased visitor activity in the area does have the potential to cause some disturbance to fauna.

Generally, mammalian species of concern are crepuscular in nature, while the majority of disturbance by visitors to the route will be during daylight hours. No lighting is proposed for the route.

4.3 Significance of Effects on Sensitive Ecological Receptors

4.3.1 Designated Sites

There are no designated conservation sites identified which would be significantly affected by the proposed development.

4.3.2 Habitats and Flora

With the retention and protection of mature trees occurring within the alignment, there are no significant impacts with regard to habitats and flora identified as significant ecological receptors within the short extent of the development route.

Specific measures are proposed to avoid the potential for introduction or spread of non-native, invasive flora species; detailed in the outline CEMP (Appendix 1). With the implementation of these biosecurity measures there are no significant effects identified with regard to invasive species.

4.3.3 Fauna

The habitats within the site provide foraging areas and breeding habitat for a range of common and well-distributed species.

Birds

No significant impacts on local bird populations are expected.

Mammals

It is widely acknowledged that habitat fragmentation is an existing and growing cause of habitat degradation and biodiversity loss in the EU and elsewhere. Fragmentation also restricts the natural movement of species, e.g. for foraging, breeding, migration and dispersal. In relation to the current development, the dominant feature providing habitat connectivity is the Shannon Erne waterway which provides suitable habitat for otter and provides potential commuting corridor habitat on the bankside.

The current project will not significantly impact on any natural commuting/foraging corridors. Retention of the aquatic commuting corridor has been built into the project design and commuting shall not be significantly hindered during the construction or operational phase of the development.

The NPWS Threat Response Plan² for Otter acknowledges that *“Little evidence has come to light in recent studies to suggest that disturbance by recreation is a significant pressure.”* It also identifies that Otter are known to travel significant distances from streams and lakes in search of new territory and feeding areas. Consequently the construction of the Blueway route, as a continuation of an existing blueway, is deemed unlikely to adversely affect the commuting and foraging potential of Otter. As such, the proposed works are unlikely to cause any significant habitat fragmentation.

Badgers are likely to be present in the area, although no setts were found within or adjacent to the proposed alignment. The long-term impacts on Badgers are expected to be Negligible.

² NPWS (2009)Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.

Since no mature trees will be removed during the construction of the development and no lighting is proposed, impacts on bats are likely to be Negligible.

In the light of the large areas of similar habitats in the wider vicinity, the magnitude of potential impacts on other vertebrates (e.g. Fox, Pygmy Shrew, Hedgehog, rodents and Frog) is expected to be Negligible.

Fish and Fisheries

The proposed works will require limited bank revetment works along the navigation channel as part of ongoing maintenance works to prevent ongoing bank slippage and erosion. This work will require the installation of rock armour along sections of the bank. Protective measures for the avoidance of impacts on lamprey and coarse fish generally are specified with regard to water quality and translocation, detailed further in the outline CEMP (Appendix 1). With the implementation of these measures there are no significant effects identified with regard to fish species.

Invertebrates

Evidence of White-clawed crayfish was recorded during the field surveys, as well as prior records from the waterway based on the desk study results. Water quality protection measures, as well as specific mitigation measures for the avoidance of impacts on this Annex II species are set out in the outline CEMP. With the implementation of these measures there are no significant effects identified with regard to this species.

Specific measures are proposed to avoid the potential for introduction or spread of non-native, invasive fauna species; detailed in the outline CEMP (Appendix 1). With the implementation of these biosecurity measures there are no significant effects identified with regard to invasive species.

No other invertebrate species were identified as significant ecological receptors within the works area or wider zone of influence.

5. Overall Recommendations and Mitigation Measures

The proposed works have the potential to impact upon the water quality of the waterway, via the release of silt laden runoff, sediment inputs or hydrocarbon spills. A project-specific Construction and Environmental Management Plan (CEMP) shall be prepared for the project, incorporating all elements included in this document as mitigation measures, as well as the requirements of the outline CEMP (Appendix 1). The CEMP shall address issues such as, but not limited to, the location of the site compound, the storage and bunding of chemicals and fuels, site facilities, spill kits, waste management, training records and water collection systems. The CEMP shall be prepared with consideration to the following guidance and best practice:-

- C532 Control of water pollution from construction sites: guidance for consultants and contractors;
- C648 Control of water pollution from linear construction projects;
- SP156 Control of water pollution from construction sites – guide to good practice;
- C515 Groundwater control – design and practice; and
- Inland Fisheries Ireland 2016 '*Guidance on Protection of Fisheries during Construction Works In and Adjacent to Waters*'.

Clearance of scrub or other vegetation will take place outside of the bird nesting season, excluding the period from March to August.

During construction works, existing excavated material should be used where possible, with importation of material only where necessary. Material to be re-used should be stored in a suitable manner to avoid potential for impact to water quality. Imported material should come from a suitably assessed quarry, where there is no risk of importation of invasive species.

If crayfish are found to be present, hand searching and trapping of crayfish shall be conducted under licence from NPWS prior to the commencement of works. Crayfish shall be translocated to suitable habitats upstream, which shall be identified prior to the translocation process. The collection of crayfish should be carried out between July and October inclusive. This shall avoid the risk of encountering females carrying eggs or their hatched young.

If lamprey are found to be present, electrofishing of the works area should take place prior to the commencement of instream works using appropriate methodologies, ensuring that ammocoetes are not immobilised within the sediment. Prior to electrofishing, areas of suitable habitat shall be identified for the translocation of lamprey. These receptor areas shall be identified in consultation with IFI. Lamprey shall be recovered from the works area and translocated to the respective suitable habitat upstream of the works.

Areas in which lamprey are found should be retained where possible. In areas where this is not possible, such substrates should be relocated to channel margins within the survey stretch. If coarse fish are found to be using the instream aquatic vegetation for spawning, this vegetation shall be retained where possible. In areas where it is not possible to retain instream vegetation, re-instatement of such vegetation should take place once the works are completed.

All contractors should incorporate strict biosecurity protocols into their Construction Environmental Management Plans. This will include a detailed description of the protocols employed for the thorough cleaning and disinfection of all machinery prior to arrival and departure from the site, to prevent the spread of invasive species. The appointed Contractor will need to provide evidence that this has been completed. A species-specific invasive management plan shall be prepared to prevent the introduction and further spread of invasive species at the site, including crayfish plague. The best practice principles of Check-Clean-Dry guidance of the Non-Native Species Secretariat (NNNS) and IFI biosecurity protocols (IFI, 2010) should be considered during the compilation of this plan. The management plan shall include, but is not limited to, the following:

- Location of invasive species within the works area;
- Tool box talk for staff prior to commencement of works;
- Appropriate washing facilities of machinery and equipment and collection and containment of resultant washings/ materials and cleaning/ dry facilities of personnel clothing and footwear;
- Appropriate storage and disposal of all chemicals used in the control of invasive species;
- All chemicals used for the control of invasive species shall be compatible with use near water;
- Importation of materials to site shall comply with Regulation 49 of the EC (Birds and Natural Habitats) Regulations 2011 S.I 477/2011.

Construction will include best practice with regard to adjacent watercourses – the prevention of pollution and protection of the riverbank and its flora and fauna. Work should be completed in accordance with Eastern Regional Fisheries Board *'Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites'* and should include the best practice and mitigation measures described above in Section 8.2. In addition, all work completed should be in compliance with the Wildlife Act, 1976 and Amendment, 2000.

Appendix 1 Outline Construction Environmental Management Plan

1. Introduction

The proposed works, comprising the construction of a public access Blueway or Recreational Trail from Aghoo Bridge to Lock 4, along the south bank of the Shannon-Erne Waterway along the Woodford River Section and within Waterways Ireland's landholding, will be completed following the conditions and requirements of the relevant planning consent.

The measures for the protection of environmental and ecological sensitivities outlined in this document will form a key component of the measures to be delivered by the Contractor and the Proponent on site, to be developed in advance of the Contract appointment and will be integrated into the Contractor's Construction Environmental Management Plan (CEMP). The requirements outlined in this document are advisory, setting out a course of action to achieve compliance on site with reference to the specification of the required planning consent.

The appointed Contractor must comply with and implement all relevant Irish and EU safety, health and environmental legislation. The Contractor shall be responsible for ensuring that any developments or changes to regulation and environmental legislation are complied with, including but not limited to those requirements set out herein.

2. Construction Management Structure

2.1 Communication

The Contractor shall employ a suitably experienced and qualified Environmental Site Representative (ESR) to undertake implementation of the Contractor's CEMP, in respect of all environmental requirements.

The ESR shall be present on-site whenever work is in progress. Environmental Roles and Responsibilities for the Contractor's site team and the procedures that will be followed to achieve the overall aims for the contract will be set out in the Contractor's CEMP.

The ESR shall be the point of contact for dealing with environmental issues for WI, as well as for the Contractor's employees, sub-contractors, relevant authorities/environmental bodies, and members of the public. This will include the provision of environmental tool-box talks and inductions for all site-staff on site at any given time in order to ensure the ecological sensitivities and requirements are communicated to all operatives. Their role may also involve communications with staff of Inland Fisheries Ireland (IFI) and National Parks and Wildlife Services (NPWS).

The Contractor will provide a hierarchy of communication outlining the roles and responsibilities for their team, with particular reference to environmental management, compliance and emergency procedures. This will be set out in the Contractor's CEMP.

Waterways Ireland, as the Employer, will provide ecological advisory input throughout construction to advise on mitigation implementation and for the review and approval of works Method Statements which relate to ecological sensitivities via the WI Environment Team.

The Contractor will be responsible for obtaining relevant ecological licensing requirements; for instance relating to disturbance of features with suitability for roosting bats, or habitats containing crayfish, lamprey, or nesting birds.

Waterways Ireland will work with the Contractor to assist in obtaining the required consents and licences.

2.2 Emergency Response

The Contractor shall develop an Emergency Response Plan (ERP) based on standard protocols, outlining the chain of communication and responsibility for action. This must account for potential events on site including flooding, significant rainfall, pollution event / contaminant spill, etc.

The Contractor must identify relevant staff, trained in the use of spill kits and emergency response procedures.

A spill kit shall be maintained at a designated refuelling location within the compound in good working order, and checked daily.

Spill kits will additionally be carried with each working crew. Any hydrocarbon leakages or spillages will be notified to the ESR.

Any spill kit items used in the course of works should be appropriately disposed of and all used items should be replenished back to the on-site spill kits.

Emergency Response requirements will be displayed at specific locations throughout the site.

2.3 Documentation

The Environmental Management Measures shall be incorporated into the Contractor's CEMP, as more certainty in terms of the proposed layout, construction methods and programme of works are finalised by the Contractor.

The Contractor's CEMP will be finalised prior to commencement of construction and with the approval of Waterways Ireland .

The Contractor will be responsible for providing separate task-specific method statements for the different elements of the project, addressing the construction items identified below, as well as those elements identified in the Contract Documents.

The Contractor's Method Statement will itemise each work step sequentially, identifying the machinery / equipment required and how works set up, completion and demobilisation will be undertaken for each component.

2.4 Timing of Works – Environmental Scheduling

Precise timings and phasing of the proposed works are not known at this stage, as this will be dependent upon the approval of funding to complete the works. Once planning consent is in place, and Contractor appointment will immediately follow confirmation of project budget approval. Works completed within the required tender period will require approval and formal derogation from Inland Fisheries Ireland (IFI) in the event that the Contractor cannot comply with seasonal restrictions. For works within the salmonid close season (October-May inclusive), it is required that a derogation for working instream is in place.

The breeding bird closed season provided for in Article 40 of the Wildlife (Amendment) Act will apply; this requires works to clear ground, trees and scrub to cease between March to August inclusive. Any works within this period requires approval and derogation from National Parks and Wildlife Service (NPWS).

Timing of ecological protection measures must take account of any requirement for the salvage and translocation of lamprey and crayfish, to be completed under licence by qualified fisheries biologists / aquatic ecologists.

- This will comprise a Section 14 licence from IFI (Department of Communications) or in conjunction with IFI staff for lamprey and a Section 23/34 licence from NPWS for White-clawed crayfish.

Adherence to work hours for traffic management and public interaction will be implemented in line with further stipulations in the Contract Documents.

3. Ecological Management for Construction Elements

The works method statement to be completed by the Contractor shall incorporate the following methods for protection of environmental and ecological sensitivities.

3.1 Site Access and Vegetation Clearance

1. Prior to any site access and ground clearance works, WI Environment staff will accompany the Contractor along the works area to mark trees for retention along the route. Trees for retention may require trimming or pollarding or coppicing (for alder and willow, respectively) and root protection zones will be demarcated.
2. Removal of trees in winter, and clearance of rank vegetation / scrub will be undertaken outside of the bird nesting season, unless approved by WI and required authorisation in place.
3. Where trees require removal, the root base will be left intact in all instances where bank removal and rock revetment work is not required.
4. Where trees can be retained, adjacent to or within bank works and culvert installations, this shall be facilitated with regard to the required root protection zones appropriate to the size of the tree in question. The minimum number of trees will be removed, with trees retained where possible.
5. In advance of bank clearance works, and prior to any bank grading or instream works, all river bank sections will be visually checked from a boat to identify the presence of Kingfisher nesting holes.
6. If nesting burrows are identified within bank sections to be lost through revetment, these must be checked for presence of active nests. This will be completed by WI environment staff and any follow up works required will be under the direction of WI environment staff. Nests can only be closed under licence from NPWS, new nesting burrows will need to be integrated into suitable bank faces within the walkway length to offset any loss.
7. Bank sections which are not identified for revetment or stabilisation, culvert installation or filling of cattle drinks will be left intact. No bank clearance will be undertaken within these sections.
8. The baseline ecological surveys (2019) did not identify otter holts within the works area. Prior to works commencing, pre-construction confirmatory surveys for otter are required along the length of the works area including either side of the pathway. The works area will be surveyed by WI environment staff to ascertain the presence of active otter holts and couches (resting/feeding places). Otter is listed as an Annex II and Annex IV species under the Habitats Regulations (2011) and it is an offence to disturb or destroy such sites; appropriate licencing must be in place in advance.

9. Post and wire fencing, with sheep wire fencing, will not require specific mammal passes to be installed.
10. Any trees which are identified for removal and evaluated to have a moderate-high potential as winter bat roosts will require a confirmatory pre-construction survey by a qualified bat ecologist in advance of felling. The licencing and approvals process will be supervised by WI.
11. In the event that pre-construction, confirmatory surveys identify the presence of roosting bats, despite the findings of the original baseline surveys, additional protocols for tree-felling and associated mitigation would depend on the numbers and species present, and would be subject to licencing from the NPWS. Measures could include hand removal of individual branches, under supervision of an ecologist licensed to handle bats. It is emphasised that baseline ecological surveys have not identified trees with high bat roost potential on site.

3.2 Instream works at Aghoo Bridge and Rock Revetment along banks

For the completion of rock revetment works, the Contractor shall incorporate the required protection measures for protected species, including crayfish and lamprey, as detailed below.

1. Submerged bank material will be graded below waterlevel and not removed from the watercourse. It is expected that this will be undertaken by pushing the existing slumped bank material out into the channel to create the required grade for placement of revetment stone. This will result in the mobilisation of fine silt and substrate in the river channel; however, it is not considered feasible to install a silt curtain within the waterway. Furthermore, such silt control measures are considered counter-productive to the lamprey management.
2. Bank and instream grading will only be carried out on one side of the canal and will not extend beyond the thalweg (centre of the navigation). The navigation invert level will not be altered.
3. Bank regrading in advance of stone placement will give rise to increased suspended solids in the watercourse. Bank material above the water level is not to be pushed into the water but graded back for use in reinstatement. The majority of the channel is comprised of compacted gravel substrate, the only soft material is expected to be associated with slumped banks and culvert / cattle drink locations. No soil or spoil material is identified for removal off-site.
4. No bank clearance or grading will be undertaken, except at locations specified for rock revetment works. Compaction and final grade will be achieved only following the initial dispersal of soft substrate which may contain lamprey.
5. No land-based machinery is permitted to access instream within the river (e.g. tracking / compaction) for undertaking instream works.
6. Prior to any machinery entering the watercourse, a test for lamprey abundance will be completed with IFI staff utilising a sample bucket dig and sorting on the bankside. Additional sweep-net silt sampling can be undertaken as required, to be completed by WI Environment staff to determine whether lamprey juveniles (ammocoetes) are present. If sweep-net sampling access is difficult, an excavator bucket will be used to take a test sample for sorting on the bankside. Initial silt / substrate sampling has indicated compacted sediment within the works area and low potential for juvenile lamprey.
7. Where lamprey are found to occur, an estimate of abundance (per m²) will be undertaken for each works section where positive records are found.

8. It is proposed that the bank grading works will proceed in a slow manner and the material disturbance, pushed out from the bank, will cause many of the lampreys to disperse in the current. It is proposed not to remove the surface silt substrate from the water, rather let the material disperse within the canal and allow lamprey to relocate downstream.
9. Crayfish often utilise clay banks, burrowing holes in the bank as refuges, or using cobble, boulder and tree roots to hide beneath. Each rock revetment works area will be hand-searched under licence by WI Environment staff under licence, or by a suitably qualified aquatic ecologist. Crayfish trapping will be completed at three locations along the entirety of the works reach, using standard Trappy crayfish traps to evaluate presence / absence and abundances should this species occur within the works area.
10. Should Crayfish be present, these will be collected where accessible and stored during the salvage operation in buckets filled with canal water. Crayfish will be translocated to an undisturbed location downstream of each works location. The priority is to minimise time out of the water and to ensure careful and timely relocation to the canal main channel.
11. Stone to be used must be fully washed at the quarry / source location. Limestone material is required within limestone bedrock geology and sandstone material where the bedrock geology is acidic sandstone to ensure water quality protection.
12. Silt loading must be managed visually on site based on the plume / washout when dumped in the river. If stone loads arrive on site unwashed, the next loads will not be permitted for unloading until evidence of washing is provided.