

3 CHARACTERISTICS OF THE RECEIVING ENVIRONMENT

3.1 METHODOLOGY FOLLOWED

A preliminary walkover survey of the study area was undertaken on the 16th of December 2015 and a follow-up survey was conducted on the 18th of May 2016. The timing of the May site visit falls within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith et al., 2011). These surveys were carried out in accordance with NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). A walkover survey was repeated in March 2018, September 2019 and May 2020. A walkover survey of the river channel between the Jack Garrett Bridge and Lough Conn was undertaken in March 2019 to identify any areas of Annex I Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0] with the potential to be affected by the proposed scheme.

Habitat mapping was undertaken with regard to guidance set out in 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011). Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010), while mosses and liverworts nomenclature follows 'Mosses and Liverworts of Britain and Ireland - a field guide' (British Bryological Society, 2010).

The walkover surveys were designed to detect the presence, or likely presence, of a range of protected species. Otter surveys were conducted as per NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). These involved a search for all Otter signs e.g. spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the Otter habitat (NPWS 2009, Threat Response Plan: Otter (2009-2011)). The area surveyed for otter included dedicated searches of both banks for a distance of over 150 metres upstream and downstream of the proposed works areas on the River Deel and along the length of the Mullenmore Stream. A dedicated Otter survey also followed the guidance as set out in NRA (2008) 'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes'. This was repeated in March 2018, April and July 2019 and in May 2020. In addition, signs of otter were recorded during the multi-disciplinary walkover surveys that were undertaken on the site.

Habitats considered to be of ecological significance and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive 92/43/EEC were identified and assessed. Woodland habitats were found to have potential to correspond with Annex I classification and were subject to detailed assessment.

During field surveys, searches for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) were conducted. Regulations 49 and 50 of these Regulations include legislative measures to deal with the dispersal and introduction of invasive alien species. Regulation 50 has not yet been commenced. IAS are also addressed by EU Regulation 1143/2014, which seeks to address the problem of invasive alien species in a comprehensive manner so as to protect native biodiversity and ecosystem services, as well as to minimise and mitigate the human health or economic impacts that these species can have.

The multi-disciplinary walkover surveys comprehensively covered the entire study area.

The woodlands, located adjacent to the River, which had been identified during the habitat surveys were assessed in greater detail in May 2015, May 2016 and March 2018 and were then further classified according to criteria set out in the National Survey of Native Woodlands 2003 – 2008 (Perrin *et al*, 2008). Detailed surveys of the riparian woodlands downstream of the proposed scheme but within the benefitting lands were undertaken on the 23rd and 24th July 2019. A Woodland Assessment Report detailing the findings of the woodland survey is provided as Appendix V.

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys 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.

Surveys were carried out on site during all seasons. Summer is usually the most appropriate time of year for ecological surveys, though even in summer some wintering species may not be recorded and thus surveys were carried out throughout the year.

Additionally, vantage point (VP) bird surveying was undertaken on a monthly basis for fifteen months between January 2016 and March 2017. Data on bird observations and flight activity was collected from a scanning arc of 180° and a 2km radius by an observer at a fixed location for three hours per month to provide a good indication of the levels of bird activity at the site over a long period. The area focussed on was the washlands adjacent to and within the Lough Conn And Lough Cullin SPA and the VP locations were located to the north of this area. Further, updates to these surveys were not required as the scheme design was developed to avoid significant physical works in the Washlands area associated with the construction of the proposed development.

Table 3.1 summarises the field surveys completed to date in relation to the proposed scheme.

Survey Type	Dates of Survey	Survey Locations
Woodland Survey	6 th May 2015	Banks of River Deel downstream of intake structure
Preliminary Walkover Survey	16 th December 2015	Entire study area
Multi-disciplinary walkover survey Otter Survey	18 th May 2016	Entire Study Area
Woodland Surveys	18 th May 2016	Washlands
Multi-disciplinary walkover survey Otter Survey Invasive Species Survey Crayfish Survey	May 2017	Entire Study Area Crayfish Survey in River Deel adjacent to the intake structure and flow control structure

Ecological Assessments associated with SI works and flow measurements	Throughout 2016 & 2017	Entire Study area and locations in the wider area up and downstream of the proposed scheme
Multi-disciplinary walkover survey Otter Survey Invasive Species Survey Crayfish Survey	March 2018	Entire study area. Crayfish Survey in River Deel adjacent to the intake structure and flow control structure
Walkover Survey of the River Deel downstream of Jack Garrett Bridge to Lough Conn – to identify potential alluvial woodland habitats within the benefitting lands	6 th 7 th & 8 th March 2019	River Deel and its banks downstream of Jack Garrett Bridge
Crayfish Survey	April 2019	River Deel adjacent to the intake structure and flow control structure
Dedicated surveys of woodlands downstream of Jack Garrett Bridge in the benefitting lands and Marsh within washlands	23 rd , 24 th July 2019	Entire study area
Otter Survey	July 2019	River Deel at intake structure and flow control structure
Multi-disciplinary walkover survey	19 th September 2019	Verification of previous walkover surveys
Walkover of River Bed measuring particle size of substrate (to inform hydromorphological assessment)	21 st 22 nd October 2019	River Deel from upstream of the Intake Structure to downstream of the Jack Garrett Bridge
Dedicated fisheries habitat survey	12 th May 2020	Upstream of intake structure to Jack Garrett Bridge
Multi-disciplinary ecological walkover Survey	12 th May 2020	Entire study area

Table 3.1 Summary of Ecological Surveys Completed to Date

3.2 DESK STUDY RESULTS

3.2.1 EPA Water Quality Data

The River Deel is fed by the Slieveclaur stream and the Shanvolahan stream. The EPA Envision map viewer was consulted on 12th May 2020 regarding the water quality status of rivers and streams within the study area. The Biotic Index of Water Quality (BIWQ) was developed in Ireland by the Environmental Protection Agency (EPA). Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their relative abundance within a sample. A number of sampling stations occur along the River Deel which is connected to the proposed works site. Q-values for a number of these sampling stations and their location in regard to the site of proposed works are shown in Table 3.2 below:

Sampling Station	Location (in regard to proposed works site)	Q-Value Rating
Ford u/s Deel R (Main Flow)	Upstream	4 (Good)
Deel Bridge	Upstream	4 (Good)
Ford S.W. of Knockbrack	Upstream	4 (Good)
Ford at Ballymulty	Upstream	5 (High)
Ford E. of Ballycarroon	Upstream	4 -5 (High)
Crossmolina Bridge	Downstream	4 (Good)
S.E of Crossmolina	Downstream	4 (Good)
800m d/s Crossmolina Bridge	Downstream	4 -5 (High)
N.W. rectory near old Abbey	Downstream	4 (Good)
Knockadangan Bridge	Downstream	4 -5 (High)
Bridge at Castle Gore	Downstream	4 -5 (High)

Table 3.2 Water Quality Sampling Stations along the River Deel

River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive and have been superseded by the National River Basin Management Plan 2018 - 2021. The online EPA Envision map viewer provides access to water quality information at individual waterbody level and at Water Management Unit level for all the River Basin Districts in Ireland. Waterbodies can relate to surface waters (these include rivers, lakes, estuaries [transitional waters] and coastal waters) or to groundwater.

Waters from the proposed development will flow into Lough Conn. Lough Conn was designated a Moderate trophic status and a Good ecological status according to EPA sampling carried out in 2009.

3.2.2 River Moy SAC (002298)

The Conservation Objectives document and Natura 2000 Data Form for this site as available on the NPWS website was reviewed during this assessment. Information in relation to the conservation objectives of the QI's and site-specific pressures and threats for the SAC is detailed below.

Review of Conservation Objectives

The relevant QIs and the associated conservation objectives of the site are presented in Table 3.3. The Targets and Attributes for the relevant habitats and species, as described in the River Moy SAC Conservation Objectives supporting documents, were reviewed and considered in this assessment.

Qualifying Interest	Conservation Objective
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)* [91E0]	To maintain the favourable conservation condition of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) in River Moy SAC
Whiteclawed Crayfish (<i>Austropotamobius pallipes</i>) [1092]	To maintain the favourable conservation condition of White-clawed Crayfish in River Moy SAC.
Sea Lamprey (<i>Petromyzon marinus</i>) [1095]	To maintain the favourable conservation condition of Sea Lamprey in River Moy SAC.
Brook Lamprey (<i>Lampetra planeri</i>) [1096]	To maintain the favourable conservation condition of Brook Lamprey in the River Moy SAC.
Salmon (<i>Salmo salar</i>) [1106]	To maintain the favourable conservation condition of Salmon in the River Moy SAC.
Otter (<i>Lutra lutra</i>) [1355]	To maintain the favourable conservation condition of Otter in the River Moy SAC.

Table 3.3. Qualifying Interests and Conservation Objectives (Version 1, 2016)

Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures and activities with potential to effect on the SAC were reviewed and considered in relation to the proposed works. These are provided in Table 3.4.

Negative Impacts			
Rank	Threats and pressures [code]		Inside/outside/both [i] o [b]
H	B01	forest planting on open ground	.b
M	D04.02	aerodrome, heliport	b
H	I01	invasive non-native species	b
H	H01.05	diffuse pollution to surface waters due to agricultural and forestry activities	b
M	C01.03	Peat extraction	b
H	A02.01	agricultural intensification	b
H	B05	use of fertilisers (forestry)	B

Rank: H = high, M = medium, L = low

i = inside, o = outside, b = both

Table 3.4. Site-specific threats, pressures and activities with potential to have effects on the SAC

Annex I Habitats of the River Moy SAC (002298)

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (91E0)*

This habitat has been mapped on the western shore of Lough Conn, however, the total extent of this habitat within the River Moy SAC is unknown. The SSCO document states that it is likely that additional areas of this Annex I woodland type exist within the SAC which may occur in mosaics with other woodland types.

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (91E0)* has been previously recorded along the River Deel downstream of Crossmolina Town but are not mapped on the Site SSCO document..

Annex II species of River Moy SAC (002298)

Whiteclawed Crayfish (*Austropotamobius pallipes*) [1092]

The general distribution of white-clawed crayfish in the SAC is that it is widespread in the upper tributaries of the River Moy including the rivers which feed Loughs Conn and Cullin such as the River Deel where the proposed development is located. It is absent from the main River Moy. Alien crayfish species are identified as a major direct threat to this species and as a disease vector. According to the conservation objectives there should be no decline in heterogeneity or habitat quality for this species.

Lamprey species

River Moy SAC is designated for two species of lamprey; Sea Lamprey (*Petromyzon marinus*) and Brook Lamprey (*Lampetra planeri*).

Artificial barriers can block or cause difficulties to lampreys' up- and downstream migration, thereby limiting species to lower stretches and restricting access to spawning areas (Rooney et al 2015). Potential habitat for this species was recorded within vicinity of the proposed works along the River Deel.

Salmon (*Salmo salar*) [1106]

River Moy SAC is designated for Atlantic Salmon. Potential habitat for this species was recorded within vicinity of the proposed works along the River Deel.

Otter (*Lutra lutra*) [1355]

River Moy SAC is designated for Otter. According to the site-specific conservation objectives the extent of terrestrial habitat is mapped and calculated as 1,068.8ha extent of terrestrial habitat and 1,248.2ha extent of freshwater (lake) habitat. Potential habitat for this species was recorded within and surrounding the watercourses associated with the proposed works.

3.2.3 Lough Conn & Lough Cullin SPA (004228)

The Conservation Objectives document and Natura 2000 Data Form for this site as available on the NPWS website was reviewed during this assessment. Information in relation to the conservation objectives of the SCI's and site-specific pressures and threats for the SPA is detailed below.

Review of Conservation Objectives

The Lough Conn & Lough Cullin SPA has the generic Conservation Objectives (Version 7, 2020):

- 1. To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*
- 2. To maintain or restore the favourable conservation condition of the wetland habitat at Lough Conn and Lough Cullin SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.*

Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures and activities with potential to effect on the SPA were reviewed and considered in relation to the proposed works. These are provided in Table 3.5.

Negative Impacts			
Rank	Threats and pressures [code]		Inside/outside/both [i] o [b]
M	B	Sylviculture, forestry	o
M	A08	Fertilisation	o
H	F02.03	Leisure fishing	i
L	I01	Invasive non-native species	I

Rank: H = high, M = medium, L = low

i = inside, o = outside, b = both

Table 3.5. Site-specific threats, pressures and activities with potential to have effects on the SPA

3.3 FIELD STUDY RESULTS

3.3.1 Flora

The habitats present are shown on the Habitat Map, Figure 3.1. The habitats recorded on or in the vicinity of the site of, the proposed scheme are listed below. The habitat names are followed by their corresponding habitat reference code (in brackets). A detailed description of the region and its flora is also provided below.

Eroding River (FW1)

Depositing River (FW2)

Drainage Ditches (FW4)

Limestone Marl Lake (FL3)

Hedgerows (WL1)

Treelines (WL2)

Scrub (WS1)

Riparian Woodland (WN5)



Wet Willow Alder Ash Woodland (WN6)

Mixed Broadleaved Woodland (WD1)

Improved Agricultural Grassland (GA1)

Dry Meadow & Grassy Verges (GS2)

Marsh (GM1)

Wet grassland (GS4)

Buildings & Artificial Surfaces (BL3)

Spoil and Bare Ground (ED2)

A detailed survey of woodlands within and close to the study area was also completed. Detailed results are provided in Appendix V. The results have informed the habitat descriptions as outlined below.

Intake Structure, Flow Control Structure and Diversion Channel

The western extent of the study area begins at the River Deel in the townland of Cartrongillbert. The river is classified as an Eroding river (FW1). The river is fast flowing with no significant growth of macrophytes and little sand or silt at this location. The substrate was dominated by cobbles with some areas of very coarse gravels. The river has regularly dried out for extended periods over at least the last three years. The river is shown at the location of the flow control structure in Plate 3.1 with water flowing in it. It is then shown in Plate 3.2 in a dry state. The river itself was fringed in this area with a line of mature broad-leaved trees with sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*), grey willow (*Salix cinerea*), alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) found along the riparian fringe and classified as a Tree Line (WL2) on the left (western) bank and Mixed Broadleaved Woodland (WD1) on the right bank.



Plate 3.1 River Deel in flow at the location of the flow control structure.



Plate 3.2. River Deel with no flow at the location of the flow control structure.

The flow control structure is located within the River Deel approximately 100m downstream of the intake weir. In this area, the river is bordered by a Tree Line (WL2) on the western bank, which separates it from a field of Improved Agricultural Grassland (GA1). This tree line is dominated by sycamore, ash and willow species. Works associated with the flow control structure will be located in this field. The tree line is shown as viewed from the field in Plate 3.3. The eastern bank in this area is formed by a steep wooded bank that leads up to the public road. This area is dominated by species including ash, hazel and hawthorn (*Crataegus monogyna*) and with a ground flora of ivy (*Hedera helix*) with hart's tongue fern (*Asplenium scolopendrium*) and the occasional occurrence of species including wood avens (*Geum urbanum*), dandelion (*Taraxicum officinale* agg.) and seedlings of ash, sycamore and hawthorn. This woodland is shown in Plate 3.4 and is classified as Mixed Broadleaved Woodland (WD1) the subject of a detailed habitat assessment as provided in Appendix V.

Moving downstream on the River Deel, the river is outside the construction footprint but will be the subject of ongoing maintenance by the OPW as part of the River Moy drainage scheme following construction of the proposed flood relief project. The OPW are currently responsible for drainage maintenance on the River Deel as far up the catchment as the Jack Garrett Bridge in Crossmolina. Following completion of the currently proposed scheme, they will manage the section of the river between the intake weir and the Jack Garrett Bridge. This maintenance will involve only minor removal of branches as necessary. The left (west) bank of the river is fringed with a tree line almost along the entire length between the intake weir and the urban centre of Crossmolina Town. The right bank comprises a steep bank of Mixed Broadleaved Woodland (WD1) at the location of the flow control structure. This continues approximately half way to Crossmolina Town and is regularly cut as part of roadside hedge trimming and to facilitate utility infrastructure. In areas along this section, a fringe of riparian trees has developed in a narrow band at the base of the bank, where silts have been deposited. These fringes are narrow strips that are classified as Wet Willow Alder Ash Woodland (WN6). Evidence of tree cutting and dumping of garden rubbish was evident in this area. The bank and associated riparian strip were the subject of detailed assessment as set out in Appendix V – the woodland Assessment. The northern section of the right bank, as it moves into Crossmolina, is closely bordered by the public road but has a tree line along most of its length until it reaches the riverside park in Crossmolina itself.



Plate 3.3. Tree Line in the vicinity of the flow control structure, as viewed from the field to the west.



Plate 3.4. Mixed Broadleaved Woodland on the eastern bank of the river by the flow control structure

The proposed intake structure and associated works border the river for approximately 150 metres with the intake structure located outside the SAC and in the adjacent field. The section of bank within the study area supports a wide bank of deposited silty material with growth of plant species including marsh marigold (*Caltha palustris*), cow parsley (*Anthriscus sylvatica*), and Meadowsweet (*Filipendula ulmaria*) (Plate 3.5). This wide bank is separated from the adjoining lands by an old earthen bank, on top of which is a Tree Line (WL2), which is dominated by Sycamore and Ash and used to form the boundary with the adjacent agricultural field. This marks the boundary of the River Moy SAC. This field was in agricultural production until at least 2000 (aerial photography) but now forms part of the grounds of a dwelling house. There were no trees within the field in 2005 when the house was under construction (or recently constructed) but in the intervening years, scrubby woodland has grown up adjacent to the old field boundary. This is classified as Wet willow-alder-ash woodland (WN6) but is very scrubby and includes only immature trees with scrub encroaching into the field/garden. The intake structure will be located in this area of recently established scrub and woodland (Plates 3.6 & 3.7). A narrow section of Mixed Broadleaved Woodland (WD1) is located between the local road and the River Deel at the northern end of the intake structure and continues to the flow control structure and beyond. A small stand of Japanese Knotweed (*Fallopia japonica*) is located adjacent to the public road at this location. It is shown on Figure 3.1 and is currently under active management by the OPW.



Plate 3.5 River Deel in dry conditions at the location of the intake structure





Plate 3.6 Wet-willow-alder-ash (WN6) woodland which has recently encroached on to Dry-meadows and grassy verges grassland (GS2) field .



Plate 3.7 Immature woodland where the intake structure is proposed

Moving south-east, the proposed scheme footprint will consist of the channel and access road for the rest of its length. The study area encompasses both Cartrongillbert and Mullenmore North townlands in this location and is dominated by species-poor Wet grassland (GS4) and Improved agricultural grassland (GA1) (Plates 3.8 & 3.9). Hawthorn (*Crataegus monogyna*) Hedgerows (WL1) demarcate the field

boundaries and a small area of hawthorn dominated Scrub (WS1) with gorse (*Ulex europaeus*), elder (*Sambucus nigra*) and bramble (*Rubus fruticosus* agg.) was found along one of the field boundaries. Other small patches of bramble Scrub (WS1) were recorded in scattered locations adjacent to field boundaries. Moving to the east, small man made drainage ditches were recorded running parallel to hedgerows. Stands of the non-native invasive species Japanese Knotweed (*Fallopia japonica*) were recorded on the approach to and adjacent to the R315 (Plate3.10).



Plate 3.8 Wet grassland (GS4) demarcated with hedgerows (WL1) and scrub (WS1) where proposed diversion channel will be constructed.



Plate 3.9 Improved agricultural grassland (GA1) within the final section of the diversion channel footprint