Appropriate Assessment – Screening

Fisheries Stock Management Plan (2023)
for Loughs Conn & Cullin. Co. Mayo, Ireland

This assessment has been compiled by Inland Fisheries Ireland and evaluates the potential for significant effects on European sites from the management of fish stocks on two large lakes in Co. Mayo, both of which are designated as protected sites within the EU Natura 2000 network. It describes the importance of stock management practices for the management of the sites and assesses whether significant impacts to the habitats, species and conservation objectives are likely.

.

Contents

Contents 2
1.0 Introduction 4
2.0 Appropriate Assessment Process 5
2.1 Legislative Context 5
2.2 Stages of Appropriate Assessment 5
2.3 Guidance on Appropriate Assessment 5
2.4 Purpose of Assessment 5
3.0 Project description 6
3.1. Stock Management Plan 6
3.1.1. Characteristics of the Project 6
3.2. Purpose of the Project 7
3.3. Description of Project Site 8
3.3.1. Lough Conn 8
3.3.2. Lough Cullin 9
3.3. Project Activities 10
3.3.1. Gill Netting 10
3.3.2. Electrofishing 11
3 12
3.3.4. Transport of Equipment and Personnel 13
4.0. Natura 2000 Sites 13
4.1. Conservation Objectives 13
4.2. River Moy SAC 15
4.3. Qualifying Interests - Species 16
4.3.1. Atlantic Salmon 17
4.3.2. White Clawed Crayfish 17
4.3.3. Sea Lamprey 18
4.3.4. Brook Lamprey 19
4.3.5. Otter 19
4.4. Qualifying Interests - Habitat 20
4.4.1. Active Raised Bogs 21
4.4.2 Degraded Raised Bogs Still Capable of Regeneration 22
4.4.3. Depressions of the Peat Substrates of the Rhyncosporion 22
4.4.4. Alkaline Fens 22
4.4.5 Old Sessile Oak Woods with Ilex and Blechnum in the British Isles 22

4.4.6 Alluvial Forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnionincanae, *Salicion albae*) 22
4.5. Lough Conn and Cullin SPA 23
4.5.1. Common Scoter 24
4.5.2. Tufted Duck 24
4.5.3. Greenland White-fronted Goose 25
4.5.4. Common Gull 25
4.5.5. Wetland and Water Birds 25
5.0 Potential Significant Impacts 25
5.1. Direct Impacts 25
5.1.1. Gill-Netting 25
5.1.2. Electrofishing 26
5.1.3. Transport of Personnel, Boats and Equipment. 26
5.2. Indirect Impacts 26
5.2.1. Biosecurity 27
5.2.1. Water Quality 27
5.3. Cumulative impacts 28
5.3.1 Pontoon Hotel Development 28
5.3.2. Oweninny Windfarm (phase 3) 28
6.0 Screening Determination 28
Table 6.1. Screening matrix 29
7.0 References 30
8.0 Appendices 33

1.0 Introduction

Inland Fisheries Ireland has prepared this assessment in relation to the management of fish stocks on Loughs Conn and Cullin, which are known to support significant numbers of Atlantic salmon *(Salmo salar* L.), one of the key species (Qualifying Interests) for which the site is designated as an SAC. The principal aim of the 2023 management plan is to remove Pike (*Esox lucius* L.) by electrofishing and gill netting, from the lakes and some of their tributary rivers.

The control and removal of non-indigenous, predatory fish from valuable salmonid fisheries has been practiced for over 100 years in some parts of Ireland (Went 1957). It has been perceived as an important tool in the management of these inland waterways as quality brown trout and salmon fisheries. In Loughs Conn & Cullin, pike are known to have been introduced in relatively recent times (<200 years bp) (Pedreschi et al. 2014) and large numbers these fish have been removed, formerly by individuals with a commercial interest in salmon fisheries and in more recent times by the Inland Fisheries Trust, The North Western Regional Fisheries Board and by Inland Fisheries Ireland. In more recent years, pike removal operations have been undertaken as a conservation measure for indigenous salmonids.

Loughs Conn & Cullin were designated as a protected site (SPA) under Directive (Directive 2009/147/EC on the conservation of wild birds) in March 2010. Five bird species referred to in Article 4 and listed in Annex I of Directive 92/43/EEC are named as special Conservation Interests. In addition to this designation, both lakes form part of the River Moy Special Area of Conservation (SAC) which was designated under the Habitats Directive (Council Directive 92/ 43/EEC) in April 2003. Six habitat types and 5 species (3 fish, 1 invertebrate and 1 mammal) listed in Annex I & II of Directive 92/43/EEC are noted as qualifying interests. Pike have been managed at these sites prior and subsequent to their designation under EU directives.

In addition to the River Moy SAC and the Lough Conn & Cullin SPA, where the project area is located, there are a further 5 Natura sites connected to or within the potential zone of influence of the project. Possible impacts on the conservation objectives of these sites are considered in terms of source/pathway/receptor chains and the likelihood of impacts occurring.

In 2014, IFI published a policy document for the management of pike in salmonid fisheries (see Appendix 2). IFI staff currently carry out these operations in accordance with this policy and the Standard Operating Procedures (SOP) for management of pike stocks in salmonid waters (see appendix 3). The principal methods used for pike management and removal are gill netting and electrofishing.

One of the principal reasons for this project is the protection of Atlantic salmon (a qualifying interest at the site and a species listed in Annex II and Annex V of the directive) from predation by pike and the project is, therefore, seen as being necessary for the management of the site. However, notwithstanding the necessity for this project, any potential, significant impacts on other species or habitats which could arise as a result of the project activities are fully assessed.

2.0 Appropriate Assessment Process

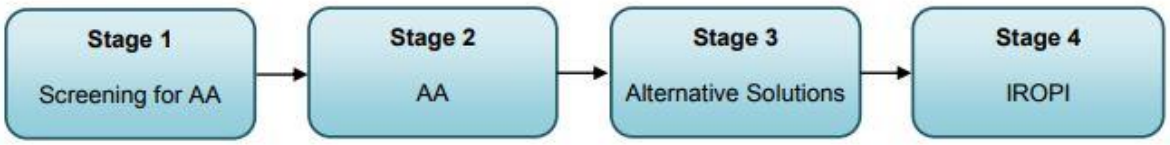
In accordance with Schedule 6(3) of the Habitats Directive 92/43/EEC (Assessment of Plans and projects significantly affecting NATURA 2000 Sites), this report has been prepared in relation to the implementation of Inland Fisheries Ireland's stock management plan for 2023 on Loughs Conn & Cullin, Co. Mayo (see appendix 1). An evaluation of potential direct, indirect and in combination effects on the conservation objectives of any Natura site wholly or partially within the zone of influence of the project is undertaken in compliance with the requirements of the AA process.

2.1 Legislative Context

Article 6(3) of the Habitats Directive requires that, in relation to European designated sites (i.e. SACs and SPAs that form the NATURA 2000 network), "any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives". A competent authority can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

2.2 Stages of Appropriate Assessment

The Appropriate Assessment process is a four-stage process with issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required. The stages are set out below and, having regard to the scale, location and potential impacts of this project on the species and habitats in any relevant or connected site, this proposal has, so far, proceeded as far as Stage 1.



2.3 Guidance on Appropriate Assessment

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2009). These guidance documents identify the staged approach to conducting an AA, as shown above. (from; Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities, DEHLG, 2009)

2.4 Purpose of Assessment

This Screening for Appropriate Assessment has been undertaken to determine the potential for significant impacts of the management of pike tocks on Loughs Conn & Cullin on a number of Natura sites in the area. The various steps in this report aim to provide the following:

- A Description of the relevant processes involved in Appropriate Assessments which may be applicable to the proposed project
- A Description of the proposed project and its purpose, including an account of the characteristics and specific activities of the proposed works that could give rise to negative impacts on species and habitats at Natura sites in the area.

- Identification of the European Sites that are situated (in their entirety or partially) within the zone of influence or otherwise connected to the proposed project
- Identification of the Qualifying Interests (QIs) and Special Conservation Interests (SCIs) for each European Site occurring either wholly or partially within the zone of influence
- Identification of the Conservation Objectives for each relevant European Site occurring either wholly or partially within the zone of influence
- Identification of potential significant impacts and pathways of impact from the project activities to the species and habitats comprising the protected sites
- Identification of other plans or projects, for which In-combination impacts would likely have significant effects.
- Provision of a screening matrix and a determination as to whether the project may require further assessment to manage impacts. (i.e. screen in/out)

3.0 Project description

This section presents information concerning the proposed plan, the project site and the specific activities which comprise the project. It details the characteristics and operations involved and describes the main components of the proposed stock management plan and what risks, if any, it may pose to the protection of species and habitats or the attainment of the conservation objectives for the relevant Natura sites.

3.1. Stock Management Plan

A stock management plan for designated wild brown trout lakes in the year 2023 has been compiled, which outlines the periods, effort (man-days) and predicted numbers of pike to be removed, having regard to the requirements of IFI's management policy for these lakes. This plan is presented in appendix 1

3.1.1. Characteristics of the Project

The characteristics of the project are described here in the context of the potential of their various elements to impact on the habitats and species which are features of the Natura sites within the zone of influence of the project. Table 3.1 below summarises the project characteristics and details of the activities.

Project Characteristic	Detail
Size, Scale, Land take	Main project activities are gill-netting and electrofishing, at various locations on Loughs Conn & Cullin and some named tributary rivers. No land take is required for the project.
Physical Changes that could take place at the site	No physical changes will take place - There is no physical alteration to the site required for the project
Resource requirements for the operation of the project (Water resources, fuel/energy, construction material, human presence)	The plan will require 153 man days for gill netting operations, 60 man days for electrofishing. Approximately 45 l of petrol will be required for powering outboard motors and 120l of diesel for transport of vehicles and equipment. Emissions from

	the combustion of this fuel are estimated to be 372kg CO_2 There are no construction materials, or additional water resources required
Duration – and description of the timescale for the various project activities including start and finish dates	Gill netting will commence in early February and cease at the beginning of April. Electrofishing will take place on 25 days dispersed throughout the year and trapping will take place for two weeks in April.
Description of any waste material arising from the project	Aside from the emissions associated with the combustion of fuels (described above) No emissions are anticipated
Description of any additional equipment or services required to implement the plan	2 different types of boat are required for gill netting and electrofishing respectively. Specifications for these are described in Appendix 3. Outboard engines fuelled by gasoline and diesel powered vehicles will also be required to transport personnel and equipment to the project site.
Description of any facilities required	Public slipways and access points will be used to transport personnel and equipment to the project site. Only established access points will be used so that disturbance to habitats is avoided.

Table 3.1. Project characteristics

3.2. Purpose of the Project

The predation of salmonids by pike has been observed and described by many professionals working in the Inland fisheries sector both in Ireland and in other states and regions where pike are considered as non-native and invasive (Ireland; O'Grady & Delanty 2008), (Alaska; Sepulveda et.al :2013), (Sweden; Bystron et al :2007), (Norway; Hesthagen: 2014). This is particularly so in the spring months when juvenile salmon and trout migrate from feeder streams to larger freshwater bodies. Rosell & Macoscar (2002), Kennedy et al (2018), Serrano et al. (2009) describe the migration of pike in large lakes in response to seasonal abundances of salmon smolts as they move from inflowing streams to lakes on their seaward migration.

Reports published by the National Parks and Wildlife Service in relation to protected habitats and species, highlight pike as a potential threat to the status of Atlantic Salmon in some Irish water-bodies designated under the EU Habitats Directive (NPWS 2007). Inland Fisheries Ireland's Water Framework Directive monitoring programme classifies fish species to one of four categories (1. Domesticated, 2. Non-native benign, 3. Non-native non-benign and 4. Invasive requiring management). Subsequent to this description pike are classified as non-native non-benign (Kelly et al., 2008; King et al., 2011). In some catchments, they can cause declines in brown trout and Atlantic salmon populations (NPWS 2007). The removal of pike to protect salmon smolts is, therefore, regarded as a necessary measure in the management of this site.

The Article 17 reports to the EU commission on The Status of EU protected Habitats and species in Ireland, states, in relation to Atlantic salmon (Council Directive 92/43/EEC Annex II animal & plant species) **"**Pike (*Esox lucius* L.) are known to prey on salmon smolts during the spring period. Salmon smolts passing through large lakes on their downward migration are frequently recorded in pike stomachs in Lough Conn and Cullin on the Moy system. Pike have been recorded accumulating in significant numbers where inflowing streams enter lakes in spring. Predation on salmon smolts also takes place on large rivers like the Boyne and Barrow, where salmon smolts have been recorded in significant numbers in pike stomachs in

spring. Pike population size is low on many large salmon rivers, such as the Nore, Suir, Slaney and Black-water, most likely due to lack of spawning areas, and thus predation on smolts is low in these systems. There have been rare incidences of large pike preying on adult salmon in both Lough Corrib and Lough Conn" (NPWS 2007)

3.3. Description of Project Site

The Project site comprises various locations on loughs Conn and Cullin (See figs 3.4 & 3.7), a pair of interconnected lakes situated in the River Moy catchment area in County Mayo. Detailed descriptions of each lake are provided in sections 3.3.1. & 3.3.2. and Figs 3.1, 3.4. & 3.7.

3.3.1. Lough Conn

Lough Conn is located in the Moy catchment in north County Mayo. This lake is connected to its immediate neighbour to the south, Lough Cullin, by a narrow channel that passes under a regional road at Pontoon village (Fig. 1). The River Deel flows into Lough Conn and exits Lough Cullin at its southern end near Foxford, just before joining the River Moy which discharges into the Atlantic at Killala Bay. The lake has a surface area of 4,704ha and a maximum depth of 37.9m. The lake is categorised as typology class 12 (as designated by the EPA for the Water Framework Directive), i.e. deep (mean depth >4m), greater than 50ha and high alkalinity (>100 mg/l CaCO3). Lough Conn is part of a Special Protection Area (SPA) (Site code: 004228) under the E.U. Birds Directive. The SPA is of special conservation interest for the following species: Greenland White-fronted Goose, Tufted Duck, Common Scoter and Common Gull. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated water birds are of special conservation interest (NPWS, 2014). Lough Conn's reputation as a fine brown trout and salmon fishery goes back to the very beginning of angling in the west of Ireland (O' Reilly, 1998). The main run of spring salmon enters Lough Conn from the end of March and continues right through April. The grilse run begins in May and continues into July (IFI, 2016). The lake was surveyed by Inland Fisheries Ireland (IFI) on eight occasions between 1978 and 2001 (1978, 1984, 1990, 1994, 1998, 2001, 2005 and 2013) as part of a brown trout fish stock assessment programme (O'Grady and Delanty, 2001). Brown trout, rudd, roach, perch and pike were captured in the surveys. Historically the lake held a population of Arctic char; however they have been extinct since C1993. Following the extirpation of the Arctic char population IFI surveyed the spawning areas where Arctic char, if present, would be congregating to spawn. The surveys were carried out during the Arctic char spawning seasons of 1991 to 1994. Three Arctic char were captured in the 1991 sampling, one fish in 1992 and none thereafter in 1993 or 1994. An examination of pike stomachs from fish captured in various parts of Lough Conn, throughout the 1990s, found no char (Igoe, et al., 2000). It is therefore reasonable to assume that Arctic char had become extinct in Lough Conn by the mid-1990s.

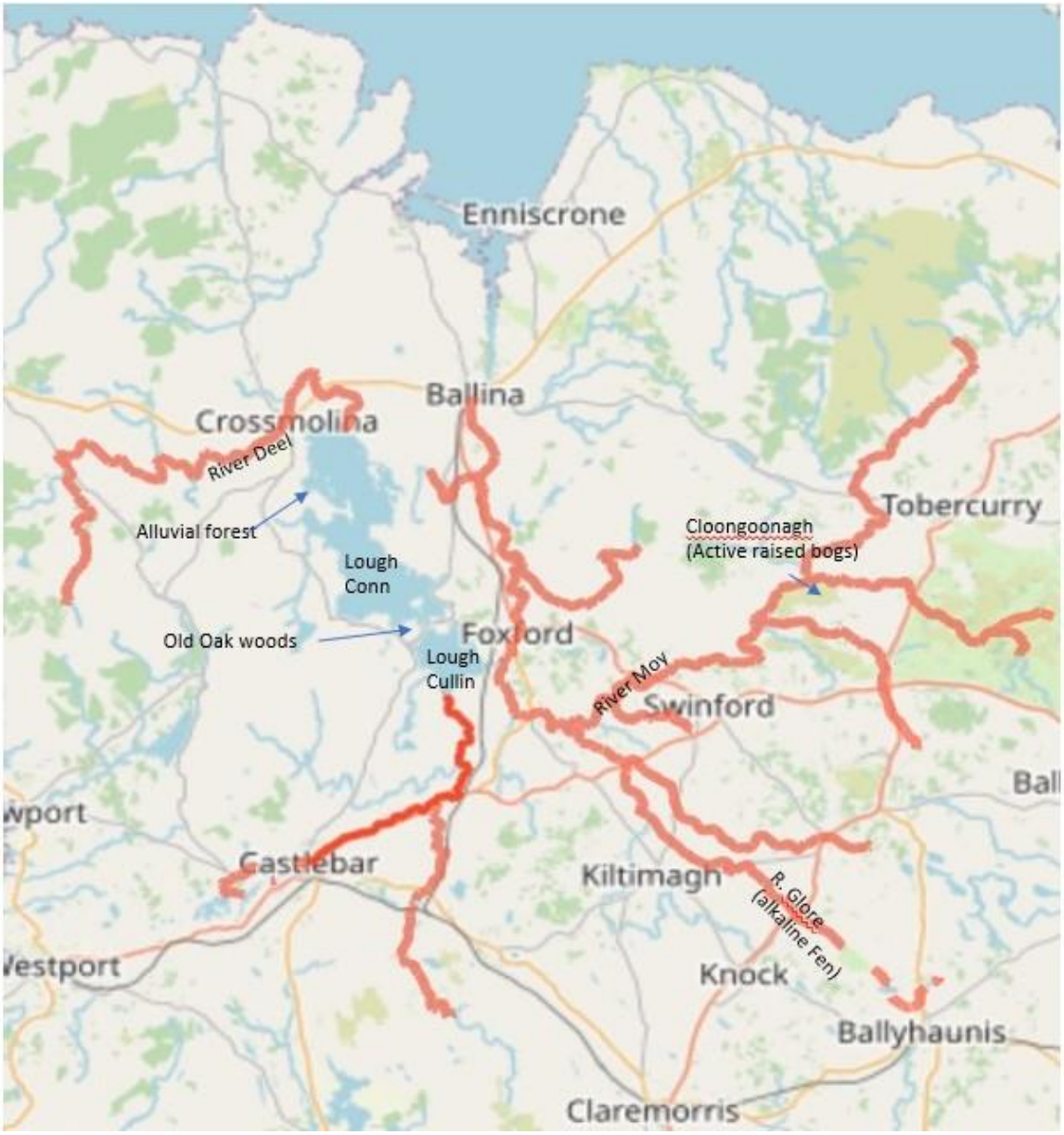


Fig 3.1. Loughs Conn & Cullin – In the context of the River Moy Catchment (in red) https://gis.epa.ie/EPAMaps/AAGeoTool with some of the important ecological features for which the site is designated

3.3.2. Lough Cullin

Lough Cullin is a large, shallow lake situated to the west of Foxford, which is connected to Lough Conn by a narrow inlet at Pontoon, Co. Mayo (Plate 1.1, Fig. 1.1). The outflow from the lake discharges directly into the River Moy south-west of Foxford (NPWS, 2004). Lough Cullin has a surface area of 1019.3ha with a maximum depth of approximately 3m (O' Reilly, 2007). The underlying geology of the lake is mainly granite with some areas of limestone present in the southern region of the catchment (NPWS, 2004). The lake is categorised as typology class 10 (as designated by the EPA for the purposes of the Water Framework Directive), i.e. shallow (100mg/l CaCO3). Lough Cullin is located within the River Moy Special Area of Conservation (SAC) (NPWS, 2005). The underlying geology of the majority of the SAC is Carboniferous limestone, with areas of Carboniferous sandstone, Dalradian quartzites and schists also present. Some of the tributaries at the east and south of Lough Conn, and all inflowing to Lough Cullin are underlain by granite. The site has been selected as a candidate SAC for containing alluvial wet woodlands, raised bog, old oak woodlands (present on the shores of Lough Cullin), degraded raised bog and Rhynchosporion depressions (Rhynchospora alba), all priority habitats

on Annex I of the E.U. Habitats Directive. This SAC has also been selected due to the presence of the following species, listed on Annex II of the same Directive – Atlantic salmon, otter, sea and brook lamprey and white-clawed crayfish (NPWS, 2005). Lough Cullin has relatively low colour and good water clarity. The phytoplankton in the lake is dominated by diatoms and blue-green algae (NPWS, 2016). Lough Cullin also supports important wintering waterfowl and is designated as a Special Protection Area, as its one of the few breeding sites for Common Scoter in Ireland (NPWS, 2005).

3.3. Project Activities

The activities which form the basis of this project are based on methodologies to capture and remove pike from the waters of the project area, to reduce predation on salmonids. Some of the activities are also carried out by way of planning and preparation for the project (i.e. transport of boats and equipment to the project site for gill-netting and electrofishing operations).

3.3.1. Gill Netting

The gill nets to be used are made from terryline fabric and range in mesh size from 5 – 10 cm. They are usually set from a small boat (5.8m) in shallow water close to areas of submerged and emergent vegetation where pike are known to spawn in the early spring months (Feb – Mar). Nets are set during the day and serviced the following morning. Sets are usually deployed in groups in a single bay or along a shoreline, with panels of 3-6x 30m nets tied together (typically, the nets fish to a depth of 2 m and are set in groups of 6 – 10 "gangs" at a predetermined location. A known pike spawning area in the littoral zones of the lake is usually targeted and re-fished for a period of 4 – 5 days.

Fig. 3.2. IFI Staff setting a gill net on L. Cullin

Fig 3.3.. A pike captured in a gillnet on L. Conn

Large pike(>85cm) captured in the nets are often alive and relatively unharmed. These are removed from the net and returned to the water in accordance with IFI's stock management policies (2014). Smaller pike (<85cm) and pike that have been damaged by the gill-nets are humanely dispatched using percussive stunning, in accordance with the provisions of IFI's SOP on pike management. All euthanised fish are disposed of using a registered animal rendering service.

L. Conn

1: McGarrigle's Bay

2: Cloonamoyne

3: Bog Bay/ Pratt's

4: Ned's bay

5: Castlehill Bay

6: Massbrook

7: Browne's Bay

8: Corryasla

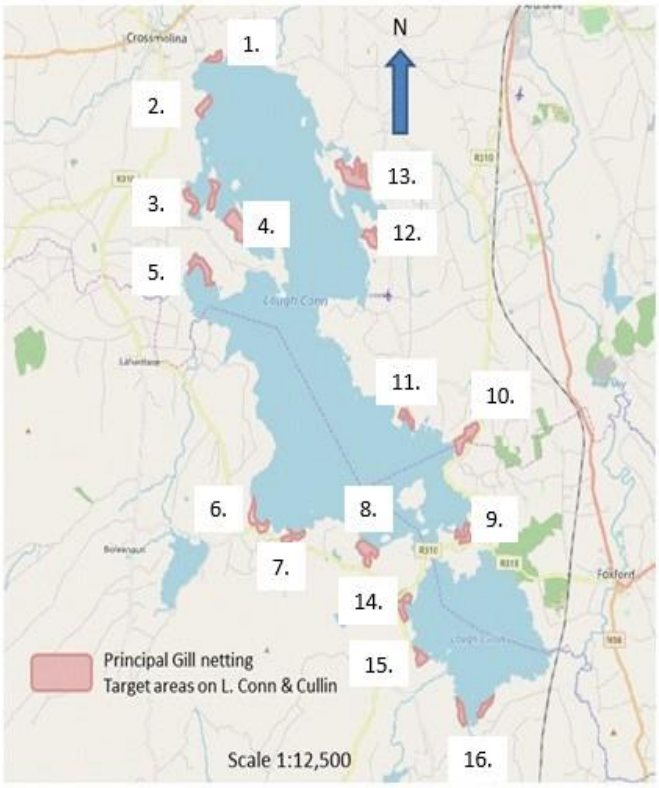
9: Six Arch Bay

10. Knockmore

11. Killeen Bay

12. Sandy Bay

13. Cloghans



L. Cullin

14: Healy's Bay

15: Simon's Bay

16: Bog Bay/ Pratt's

Fig. 3.4. Gill netting areas on L. Conn & Cullin

3.3.2. Electrofishing

Electrofishing, to remove pike, is carried out at several locations throughout Loughs Conn and Cullin and on the lower parts of some inflowing rivers (see fig. 3.7, below). Although limited in it's efficacy in open or deep water, this method can be successful in the shallow pike nursery areas and in places where salmon smolts congregate on their sea-ward migration, usually at the mouths of inflowing and outflowing rivers.

Electrofishing is carried out from a 7m flat-bottomed boat mounted with a generator and transformer. This method of fish stock management is widely used throughout the industry as it allows for the selective capture of target species without harming non-intended species See stock management SOP – appendix 3). The equipment delivers a 12V DC current via an anode operated by hand at the front of the boat. A cathode is trailed through the water at the back of the boat. The apparatus delivers sufficient electrical current to the water to render fish in the immediate vicinity, temporarily motionless. The immobilized fish are removed from the water using hand nets. Non target fish are re-released directly to the water and pike up to 75cm are retained in an on-board tank.

Fig. 3.5 Electrofishing for pike on L Cullin

Fig.3.6 A pike, immobilised by electrofishing gear

Pike captured by electrofishing are usually unharmed. These are removed from the water and placed in a tank. The target fish are removed from the water and disposed of using a registered animal rendering service. Larger pike (>85cm) are released back to the water to enhance the angling amenity.

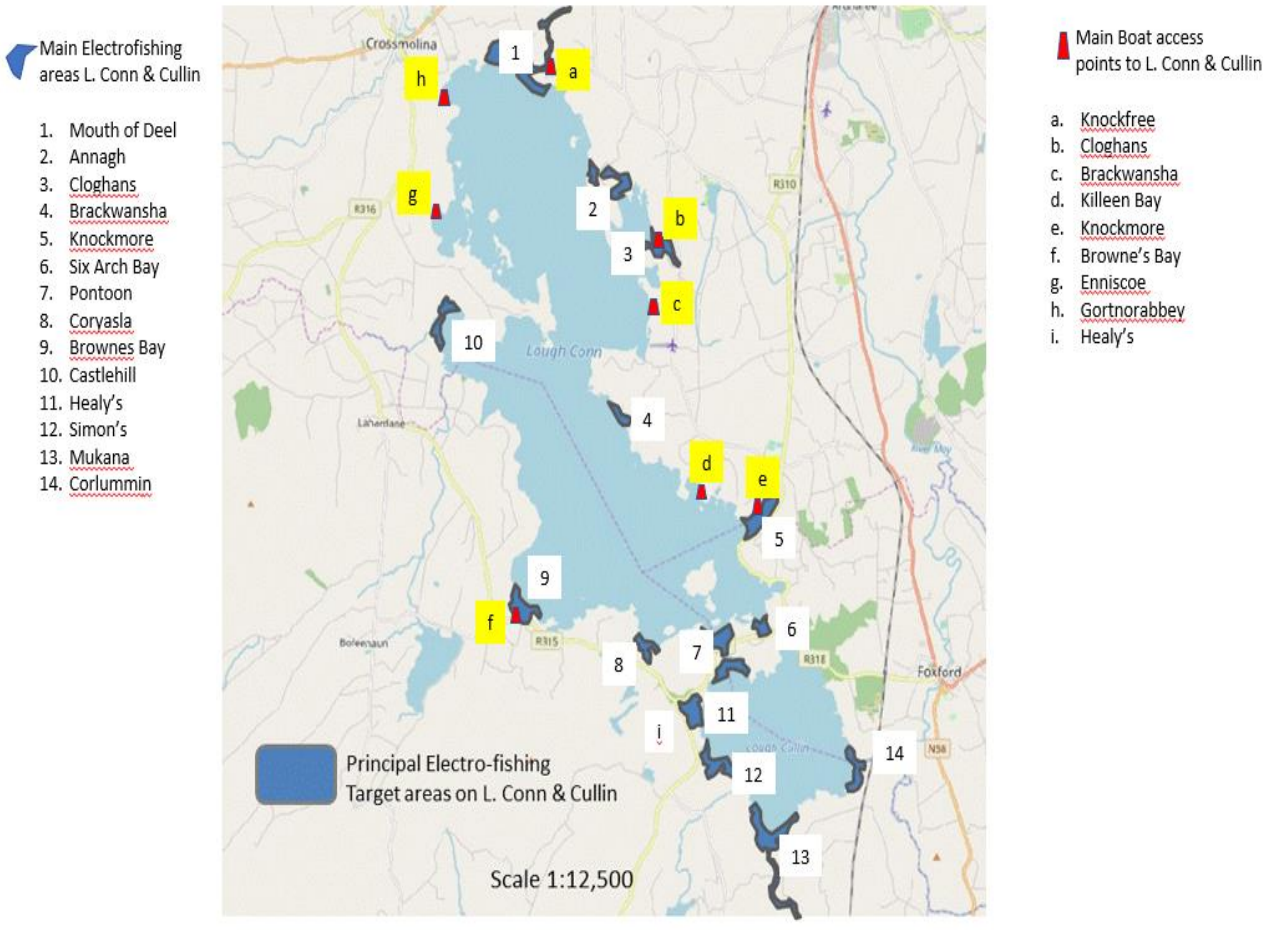


Fig 3.7. Electrofishing areas on L. Conn & Cullin

3.3.4. Transport of Equipment and Personnel

This activity involves the transport of IFI staff members with boats, outboard engines, fuel, nets and associated safety equipment to launching locations (see fig 3.7.) and from there to netting, electrofishing and trapping locations on both lakes. Details of fuel storage and the biosecurity protocols associated with equipment transport and stock management operations generally are outlined in IFI's SOP (see appendix 3)

4.0. Natura 2000 Sites

There are six Natura 2000 sites which are connected to or lie wholly or partially within the potential zone of influence of the project. The connectivity, proximity and likelihood of impacts from the project are examined in this section. As the project takes place within the River Moy SAC and the Lough Conn & Cullin SPA, these sites are examined in particular detail. Other, more peripheral Natura sites are also subject to an analysis of potential impacts.

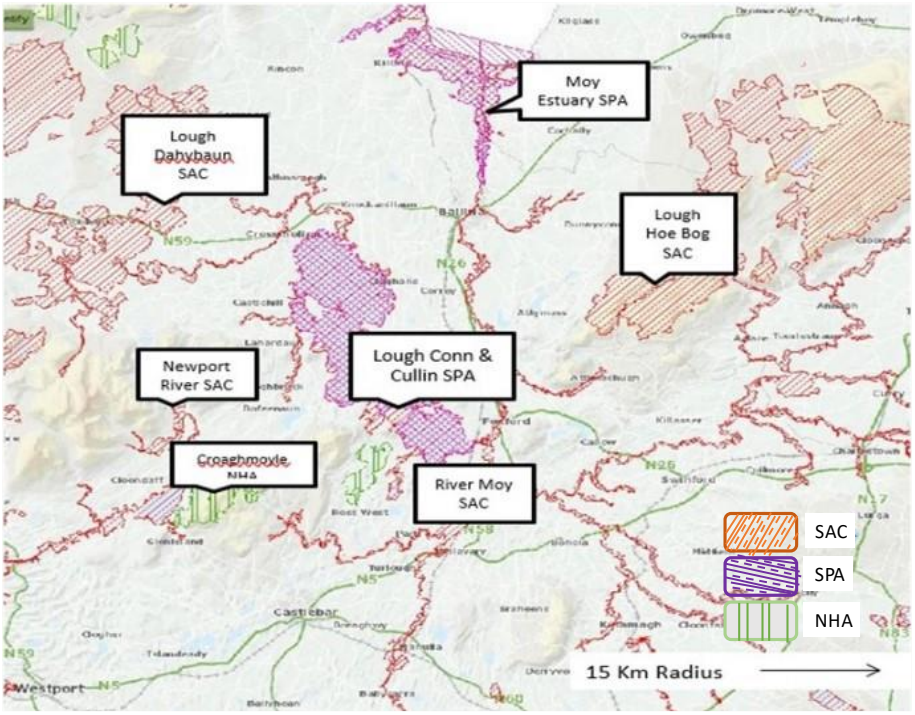


Fig 4.1. Natura Sites within the zone of influence of the project

The proximity, connectivity and the nature of the 4 peripheral sites (see table 4.1.) and qualifying interests are examined in light of the project scale, duration, resource requirements, emissions and land-take (See table 3.1.). No potential impacts were identified at these sites arising from the proposed project.

4.1. Conservation Objectives

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. In order to maintain the habitats and species within Natura 2000 sites in a favourable conservation condition, specific conservation objectives are established for each habitat and species at the site. These objectives are critical to the management of the site and should not be impacted by any plan or project.

Favourable conservation status of a habitat is achieved when:
• its natural range, and area it covers within that range, are stable or increasing,
• the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future
• the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

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

Designated Site and code	Qualifying Interests	Current Conservation threats	Potential risk from project
Lough Dahybaun SAC (002177)	Najas flexilis (Slender Naiad) [1833]	Milled peat deposits, Water quality,	Site is approximately 14 km from works area. Some hydrological Connectivity between sites via R. Deel but project area is situated downstream from this SAC and there is no activity associated with the project that would allow for works to significantly impact on this site
Newport River SAC (002144)	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] Salmo salar (Salmon) [1106]	Artificial barriers Water quality Sea lice	This site is considered sufficiently remote (C30 km) and unconnected to the project area to avoid any impacts. Qualifying interests and Conservation objectives will not be affected by project activities
Kilalla bay/Moy Estuary SAC (000458)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	Changes to flooding regime & sediment supply. Proliferation of negative indicator species (e.g. *Spartina angelica*) .	Hydrological connectivity to project site (C. 14km downstream). However, given the predicted scale, land-take, resource requirements and emissions from the project, no likely source of impact can be identified.

	Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] Petromyzon marinus (Sea Lamprey) [1095] Phoca vitulina (Harbour Seal) [1365]		
Kilalla Bay/Moy Estuary SPA(4036)	Ringed Plover (Charadrius hiaticula) [A137] Golden Plover (Pluvialis apricaria) [A140] Grey Plover (Pluvialis squatarola) [A141] Sanderling (Calidris alba) [A144] Dunlin (Calidris alpina) [A149] Bar-tailed Godwit (Limosa lapponica) [A157] Curlew (Numenius arquata) [A160] Redshank (Tringa totanus) [A162] Wetland and Waterbirds [A999]	Reduction in wetland habitat areas. Exploitation by hunting	Although sites are, hydrologically connected via the River Moy, there is no activity associated with the project that would allow for works to significantly impact on this site or its conservation objectives
Lough Hoe Bog SAC (000633)	Geyer's Whorl Snail, White-clawed Crayfish, Oligotrophic waters containing very few minerals of sandy plains (littorelletalia), Blanket bogs	Impacts on hydrological regimes (drainage/abstraction)	Very peripheral, hydrological Connectivity between sites. Project area is C 28 km downstream. Project activities and processes are very unlikely to impact on this site.

Table 4.1. Other Natura sites within the presumed zone of influence of the project

4.2. River Moy SAC

The project will take place in its entirety within the boundaries of this Natura site. There are five species and six habitat types named as qualifying interests for the site and these are given careful consideration in the context of this project.

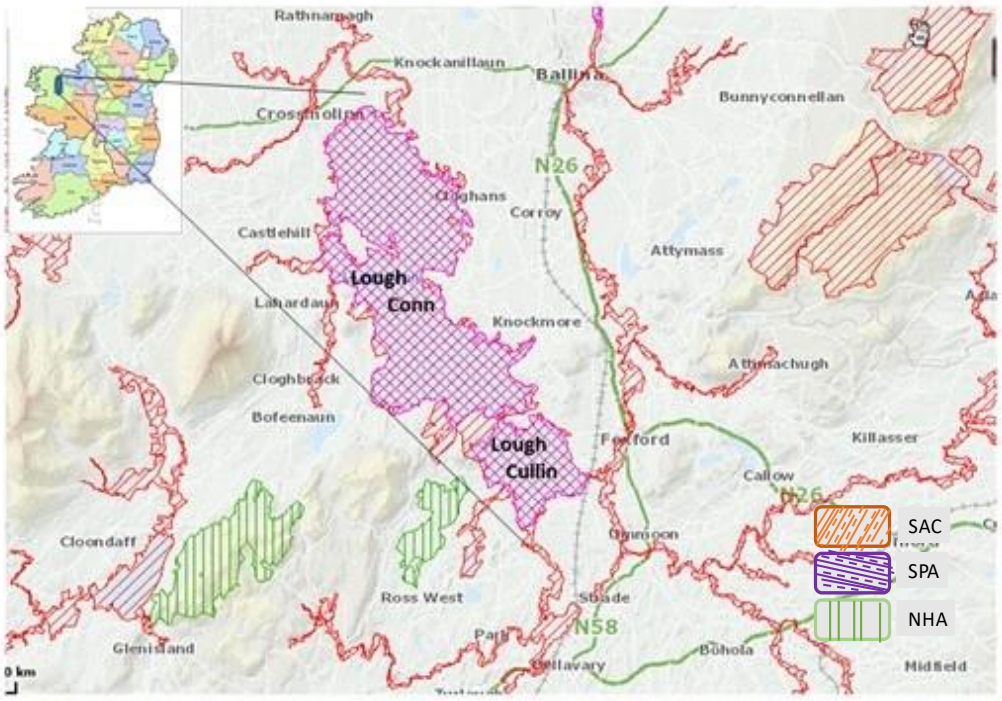


Fig. 4.1. Geographical Context of the River Moy SAC and Lough Conn & Cullin SPA

4.3. Qualifying Interests - Species

Five species (all animal) are noted as qualifying interests in the conservation objectives for the river Moy SAC. Table 4.2. below identifies these receptors as well as the known impacts which may impede them from achieving good conservation status.

Qualifying Interest	Conservation Objectives	Impacts Currently Affecting Achievement of Conservation Objectives
Atlantic Salmon (*Salmo salar*) [1106]	Maintain accessibility. Exceed conservation limit. Maintain fry/parr densities and prevent declines. Maintain suitable water quality	Declines in water quality Barriers to migration Predation/Invasive species Habitat loss or damage Commercial exploitation Salmon Aquaculture
White Clawed Crayfish (*Austropotomobius pallipes*) [1902]	Maintenance of current population and distribution - Appropriate water quality, habitat heterogeneity and females with eggs	Habitat loss or disturbance Invasive species and crayfish plague
Sea Lamprey (*Petromyzon marinus*) [1095]	Maintain accessibility, size classes and distribution	Barriers. Habitat loss Disturbance of spawning sites Disturbance to amocoetes
Brook Lamprey *(Lampetra planeri*) [1906]	Maintain accessibility, size classes and distribution	Habitat loss Disturbance of spawning sites Disturbance to amocoetes

Otter (*Lutra lutra*)	Maintain distribution and population density. Maintain adequate fish stocks as food source	Habitat loss Disturbance Declining fish stocks

Table 4.2. Qualifying Interests (Species) for the river Moy SAC

4.3.1. Atlantic Salmon

Adult Atlantic Salmon begin to appear in the river Moy around mid-February each year. The early run of multi-sea-winter salmon peaks in late April and is followed in June by the one-sea-winter fish or "grilse, which are significantly more numerous. They disperse throughout the river Moy catchment in the weeks and months following their initial migration from the marine environment and spawn in the tributary rivers between November and February (Inland Fisheries Ireland 2019).

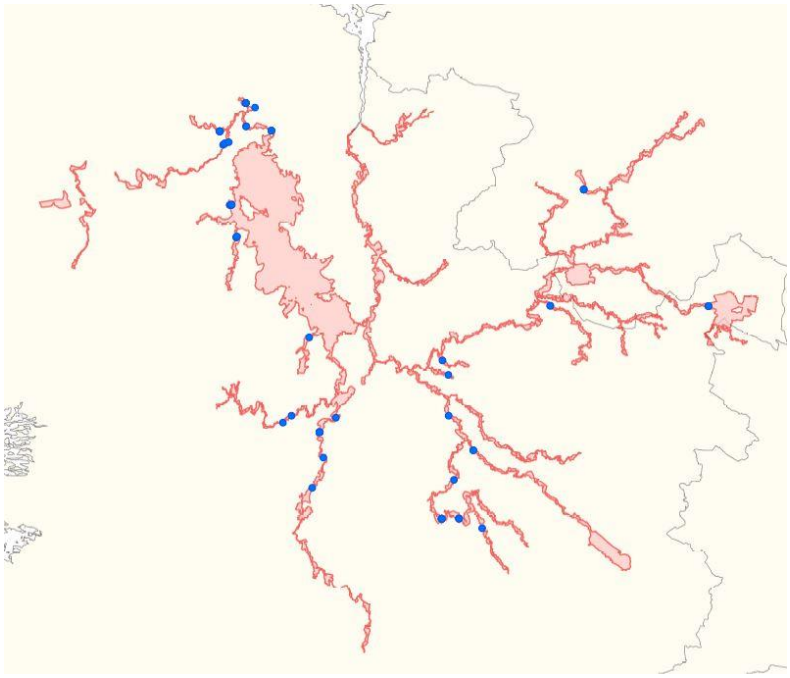
Salmon appear to be sustaining their populations above the established conservation limit in the river Moy (Standing Scientific Committee for Inland Fisheries Ireland 2018). The catch limit to recreational anglers is set at 14,810 per season. The number of spawning adult salmon required to maintain current stock levels is calculated at 15,282 and the average exploitation rate by rod and line from 2015 - 2020 is estimated at 5, 891 (IFI – WRBD annual report 2019). There is no commercial fishery for salmon on the river Moy. Concerns have been expressed by the North Atlantic Salmon Conservation Organisation (NASCO 2020) that this species is in decline throughout its range. Conservation efforts are ongoing in all member states and the responsibility for this in the Republic of Ireland rests with Inland Fisheries Ireland (IFI). The principal issues currently impacting on salmon conservation in the freshwater environment in Ireland are habitat loss, water quality deterioration, barriers to migration, competition & predation by invasive species. In the marine environment, aquaculture and commercial exploitation (mostly illegal) in are considered to be the principal threats to survival. Impacts on salmon smolt survival due to predation by pike are also described in the the Article 17 report to the EU commission (2007) on The Status of EU protected habitats and species in Ireland. This project may be seen as important to the management of Atlantic salmon at the site as one of its principal aims is to reduce salmon losses from predation by invasive fish species.

4.3.2. White Clawed Crayfish

The White Clawed Crayfish is widespread in the upper tributaries of the River Moy and the rivers which feed Loughs Conn and Cullin. It is absent from the main River Moy and the main bodies of the two lakes (Conn & Cullin). The named tributaries where crayfish have been recorded are as followqs: Upstream of Lough Conn, River Deel and its tributaries of the Toreen River, Rathnamagh River and Rappa Stream; Fiddaunglass; Addergoole River. Upstream of Lough Cullin: Tobergal River; Clydagh; tributaries of the Toormore and Manulla Rivers. Moy tributaries: Gweestion River; tributaries of the Pollagh, Glore, Yellow and Geestaun Rivers; Killeen River; Spaddagh River; Sonnagh River; Owenaher River; Owengarve River.

The main impact of conservation concern to crayfish is the introduction of spores from the *Aphanomyces* fungus which caused fatal disease in populations and is highly infectious (Reynolds 1998). Outbreaks of crayfish plague have occurred in Ireland as recently as 2019 and the disease is known to be spread from one catchment to another via equipment and clothing associated with human activity on waterways. Other impacts on crayfish are usually associated with declines in water quality and the physical disturbance of alluvial substrates where crayfish live.

Although crayfish may periodically visit loughs Conn and Cullin, there do not appear to be any permanent populations in the project area. They are also extremely unlikely to come into contact with any of the activities or equipment associated with the project as they are benthic dwelling and too small to entangle in a net with a mesh size of 5 – 10 cm. Electrofishing is unlikely to have any impact on crayfish and this method is frequently used as a method for population survey. Alonso (2001) evaluated 56 successive depletion electrofishing surveys on White-clawed crayfish and recorded no appreciable decrease in either relative density or standing biomass. Furthermore, no mortality, due to electric shock, was recorded during sampling.



4.3.2. Distribution of white clawed crayfish in the River Moy SAC

Equipment used in the project is specific to area of operation so the import of contaminated materials (i.e containing pathogens harmful to crayfish) does not arise.

4.3.3. Sea Lamprey

Sea lamprey are an anadromous obligate external parasitic fish that feed by attaching to other fish in their environment. Once they reach a threshold size, they cease feeding and migrate to freshwater rivers to mate and spawn. The river Moy has six locations where spawning of this species has been recorded (see fig 4.3.3. below). One spawning site is situated on the river Deel, which means that some Sea Lamprey migrate through Lough Cullin and Conn during their spawning run. The mesh size of gill-nets is too large to allow for lamprey to become entangled. Furthermore the time of year when lamprey migrate through the project area (April – June) does not coincide with the timing of stock management operations. Consequently, there is no potential for the project to impact on this species

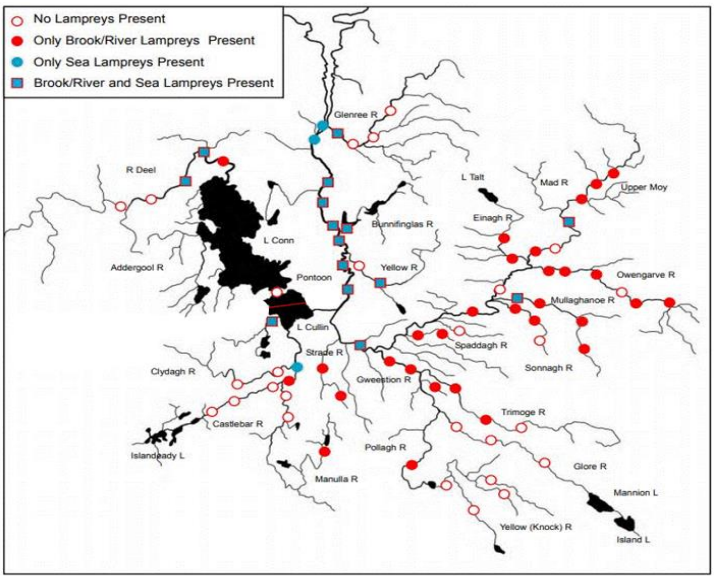


fig. 4.3.3. Distribution of Sea Lamprey spawning sites in the River Moy SAC

The juvenile stages of sea lamprey occupy benthic sediments in slow flowing parts of large rivers (O'Connor 2004). During these early life stages, they are vulnerable to disturbance of these substrates, particularly by drainage activities.

Adult sea lamprey spend most of their lives in the marine environment, feeding parasitically on other fish, particularly salmon. The reduction in numbers of suitably sized host fish is one of the principal impacts on this species while at sea.

Adult sea lamprey return to freshwater in May and June to spawn and their known spawning locations on the Moy are illustrated in fig. 4.3.3. The timing of spawning runs and the habitat requirements of both juveniles and adult spawners, indicate that they are unlikely to be vulnerable to impacts by any of the project activities.

4.3.4. Brook Lamprey

Brook lamprey are a non-parasitic form of this genera and appear to be free-living throughout the main Moy Channel and many of its proximal tributaries. There are no records of Lamprey in the project area although their presence on the river Deel would suggest that they pass through, probably on a seasonal basis (see fig. 4.3.3. above). Juvenile lamprey (ammocoetes) are known to be vulnerable to disturbance of riverine sediments where they spend much of their early life stages feeding as detritivores. (O'Connor 2003) Upon reaching adulthood, brook lamprey cease feeding altogether.

Apart from the remote possibility of encountering brook lamprey during electrofishing, their almost entirely fluvial based life cycle would indicate that they are unlikely to be impacted by any of the project activities. They are also too small (Max size 15 cm) to become entangled in a gill net.

4.3.5. Otter

Otter are also recorded throughout the River Moy SAC and are known to be present in the project area. The littoral areas of both Loughs Conn and Cullin have a 250m buffer zone established due to the presence of this species (see fig 4.3.4.)

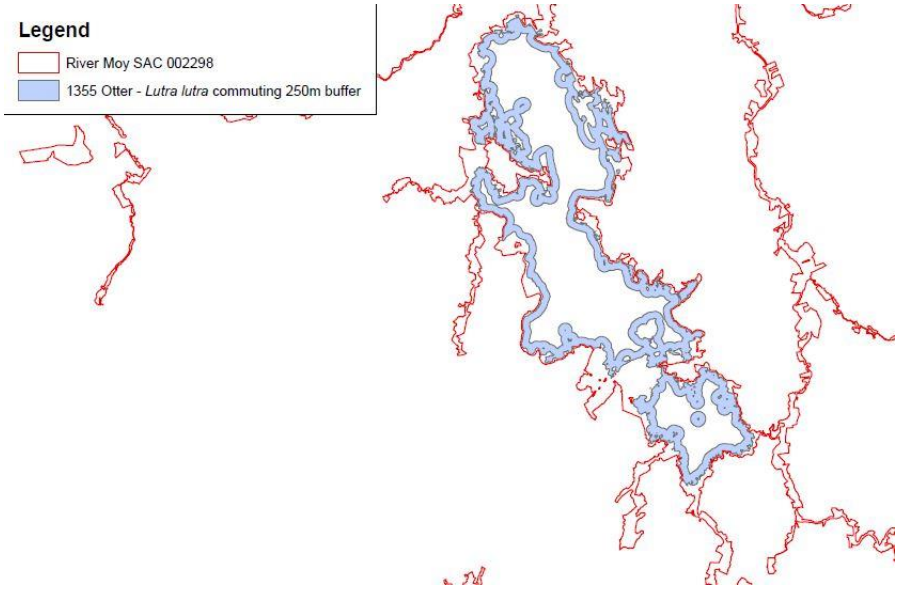


Fig. 4.3.4. Distribution of Otter in the Project area

The principal impacts of conservation concern regarding Otter is loss of appropriate riparian habitat for resting and reproduction. River drainage activities are known to impact on otter as are infrastructural developments (e.g. roads) which present barriers to movement and may introduce collision hazard (NRA 2008)

Although Otter have been observed in the vicinity of some gill netting areas, none have ever been discovered entangled in a gill-net used for stock management operations. Internationally, interactions between Otter and fishermen using gillnets suggests that otter may raid fish from gill-nets but captures of the otter themselves are not known to occur (Barberi et al 2012). Furthermore, the nature of electrofishing makes it easily detected and avoided by otter. Stock management operation are, therefore unlikely to present any risk to this species.

4.4. Qualifying Interests - Habitat

There are six habitats listed within the River Moy SAC (see table 4.1.- below), 2 of these (Active Raised bogs and Alluvial Woodlands are considered priority habitats (as indicated by *).

Qualifying Interest	Conservation Objectives	Impacts Affecting Achievement of Conservation Objectives
Active raised bogs* [7110]	Restore area (132.4ha), distribution, appropriate water levels and high bog topography. Restore typical bog flora and maintain features of local distinctiveness	Drainage, peat harvesting, Reclamation for agriculture
Degraded raised bogs still capable of natural regeneration [7120]	Re-establish peat forming capability	Drainage, peat harvesting, Reclamation for agriculture
Depressions on peat substrates of the Rhynchosporion [7150]	Maintain quality of Active raised bogs as integral part of this feature	Drainage, peat harvesting, Reclamation for agriculture

Alkaline Fens	Maintain area and distribution of this habitat. Maintain appropriate tree cover and species mix. Maintain water chemistry and quality	Drainage, Scrub removal, threats to water quality,
Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	Maintain extent, structure, sapling : pole ratio, stem density and species composition	Invasive species Encroachment
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]*	Maintain distribution, Habitat area structure, sapling: pole ratio, stem density and species composition with appropriate ratios of (Alnus and Quercus). Ensure periodic flooding	Drainage Invasive species

Table 4.4. Designated habitats in the River Moy SAC

4.4.1. Active Raised Bogs

This habitat is located mainly in the upper reaches of the River Moy SAC (see fig 4.4.1. below). It is one of two priority habitats considered to be in decline throughout its range. Current impacts are noted in table 4.4.1 above and include any activity which might alter the appropriate hydrology for active peat regeneration, or the plants associated with this feature. Impacts from the project on this habitat are considered very unlikely due to distance and the upstream location of important sites and the nature, scale and duration of the various project activities.

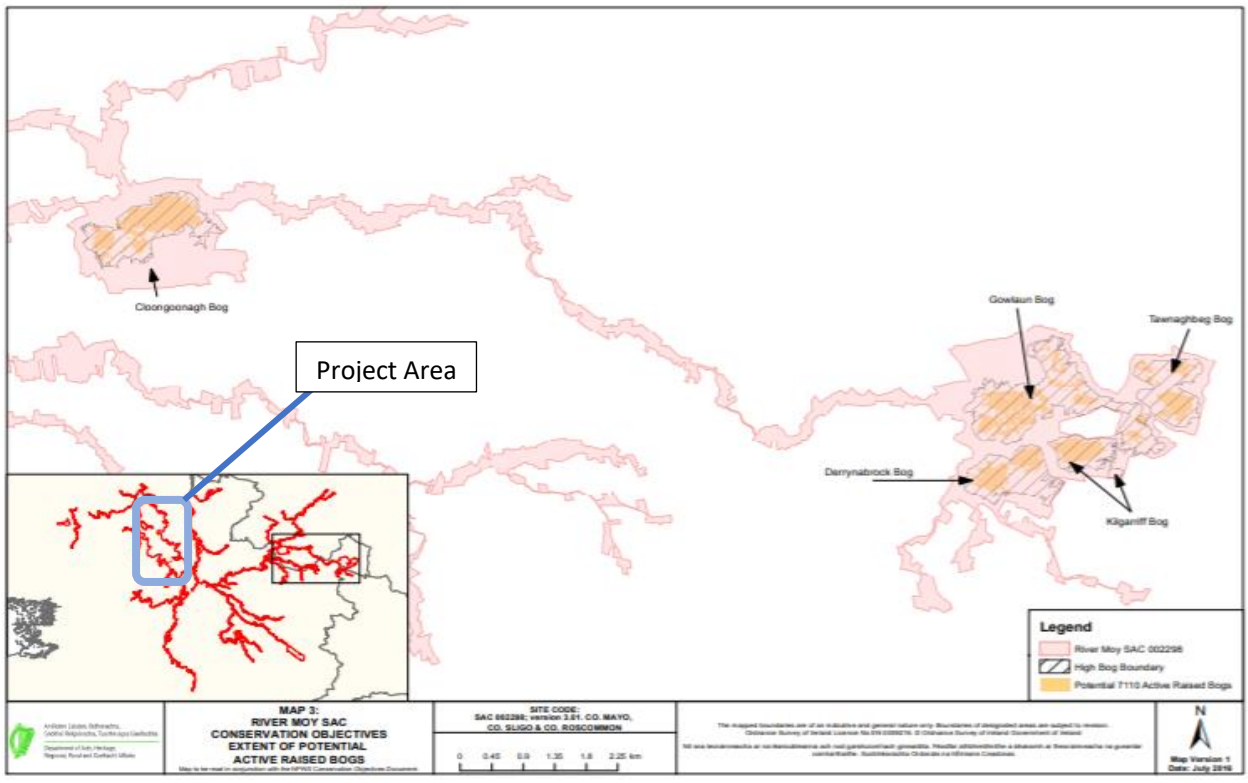


Fig 4.4.1 Distribution of Active raised bogs in the River Moy SAC

4.4.2 Degraded Raised Bogs Still Capable of Regeneration

Examples of this habitat type are fragmented throughout the SAC. Although no distribution maps are published in the Conservation Objectives for the site. Issues which are likely to impact this habitat type and, in particular prevent raised bogs from regenerating, are similar to those listed for intact bogs (above.) Drainage, land reclamation and peat harvesting have the potential to significantly impact on this habitat type as is any activity which alters or interferes with the appropriate hydrology for peat formation.

Given the nature and scale of the activities associated with IFI's 2023 stock management plan (table 3.1.), it is seen as highly unlikely that any impacts will arise on this habitat from the project.

4.4.3. Depressions of the Peat Substrates of the Rhyncosporion

Depressions on peat substrates of the Rhynchosporion is an integral part of good quality active raised bogs and thus a separate conservation objective has not been set for the habitat in River Moy SAC. Impacts on this habitat type are the same as those for both active and degraded bogs and it is therefore , reasonable to surmise that the project activities are equally unlikely to impact on this habitat.

4.4.4. Alkaline Fens

The full extent of this habitat within the SAC is unknown. An extensive area is known to occur as part of a wetland complex on the Glore River, approximately 24km upstream of the project area (see fig. 3.1.) but there are likely to be other areas present in the SAC

Factors which may impact the conservation objectives for this site include drainage or scrub removal. Both of which are activities associated with land reclamation. None of the activities associated with the project are considered likely to impact on this habitat, given its remoteness to the site and the nature of the project activities.

4.4.5 Old Sessile Oak Woods with Ilex and Blechnum in the British Isles

Old sessile oakwoods are likely to occur as mosaics with other woodland types and the total extent within the SAC is unknown. The Site at Pontoon is an extensive area of woodland and 106.3ha was mapped as this Annex I habitat type (see fig 4.4.42. below). This site is close to areas where gillnetting and electrofishing may take place. The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring "deep" woodland conditions. Topographical and land ownership constraints may restrict expansion.

Although some project activities may take place in proximity to an old sessile oakwood habitat, the nature and scale of the project activities and the ability to avoid contact with any terrestrial habitat in the area, mean that significant impacts are unlikely on this habitat type as a result of gill netting or electrofishing in the area.

4.4.6 Alluvial Forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnionincanae, *Salicion albae*)

Total extent of this habitat within the SAC is unknown and it may occur in mosaics with other woodland types. Fig 4.4.2. (below) shows surveyed woodlands including areas classified as 91E0 (2.76ha). There are also likely to be additional areas of this Annex I woodland type within the SAC. The area of this habitat identified by the NSNW occurs at Prospect (site 1800) on the western shore of Lough Conn. The sizes of at least some of the existing woodlands also need to be increased in order to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions.

One of the principal requirements of this habitat type is periodic inundation (by seasonal floods). Activities such as drainage are, therefore, likely to significantly impact alluvial forests. The current extent of this habitat

is thought to be a mere fragment of its former range due to flood relief schemes and clearance for agricultural land.

The proposed stock management plan for Loughs Conn & Cullin is situated within the designated - River Moy SAC. The proposed plan described in this report will not result in direct habitat loss within this site as habitat loss or alteration (either directly or indirectly) is not a feature of the stock management plan. No negative impact is anticipated to the protected habitats within the zone of influence of this project. Access to the project areas is also confined to existing established boat access points around the lakes. No connectivity between the protected habitats and the project activity has been identified. There is, therefore, no potential for impacts on protected habitats arising from this stock management project.

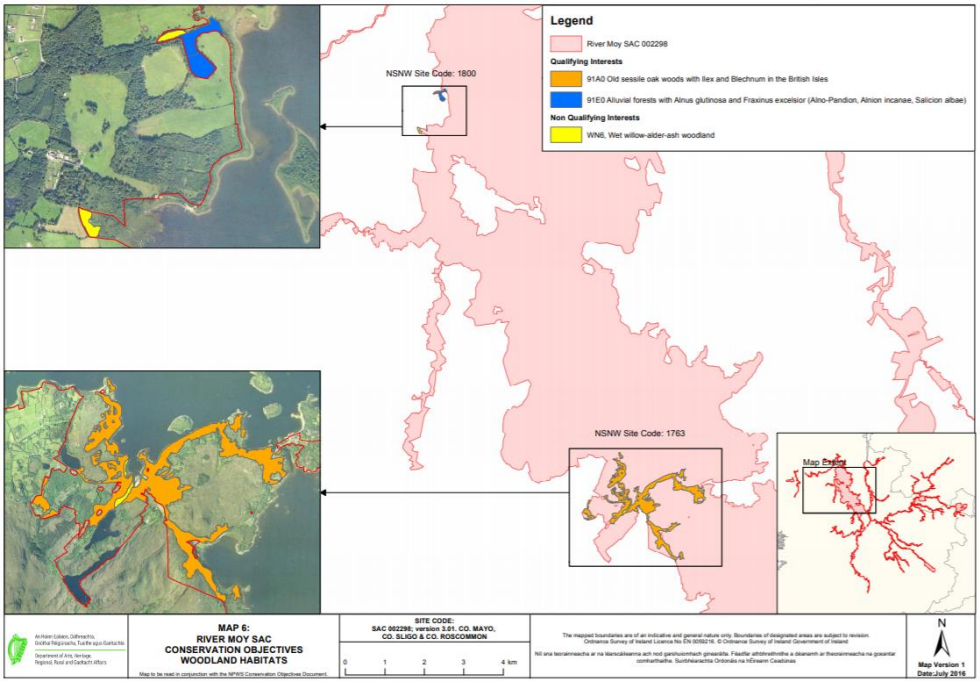


Fig. 4.4.2. The Distribution of both Designated Woodland habitat types in the project area

4.5. Lough Conn and Cullin SPA

Four bird species have been identified as Special Conservation Interests for this site. These are listed in the table below with their conservation objectives and the main threats to their status. A general grouping of “wintering waterbirds” has also been included in the conservation objectives for this site to acknowledge the importance of Ireland's wetlands to wintering waterbirds. This is because the site contains a wetland of significant importance to one or more of the species of Special Conservation Interest.

Special Conservation Interest	Conservation Objective	Potential Impacts Currently Affecting Achievement of Conservation Objectives
Tufted Duck (Aythya fuligula) [A061]	To maintain or restore the favourable conservation condition of this bird species listed as Special Conservation Interest for the L. Conn & Cullin SPA	Habitat loss, Disturbance, Exploitation by hunting

Common Scoter (Melanitta nigra) [A065	To maintain or restore the favourable conservation condition of this bird species listed as Special Conservation Interest for the L. Conn & Cullin SPA	Habitat loss, Disturbance, Predation of eggs & young by mink.
Common Gull (Larus canus) [A182]	To maintain or restore the favourable conservation condition of this bird species listed as Special Conservation Interest for the L. Conn & Cullin SPA	Habitat loss, Disturbance, Exploitation by hunting
Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]	To maintain or restore the favourable conservation condition of this bird species listed as Special Conservation Interest for the L. Conn & Cullin SPA	Habitat loss, Disturbance, Exploitation by hunting
Wetland and Waterbirds [A999]	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.	Habitat loss, Disturbance, Exploitation by hunting

Table 4.5.1. Special Conservation Interests and Conservation Objectives for the Lough Conn & Cullin SPA

The L. Conn & Cullin SPA overlaps with the project site and has four species and one general waterbird grouping which were considered in terms of their main threats and whether their populations could be impacted by the project activities. For wildfowl species that nest on or adjacent to the waterbody, predation of young birds by pike can be a significant determinant of survival and, indeed, breeding site selection (Dessborn et al 2010). It could therefore be proffered that the removal of an invasive predator with known impacts on the breeding survival of waterbirds, would have positive implications for some duck species.

4.5.1. Common Scoter

Lough Conn and Cullin is one of only four areas in the country where Common Scoter breed. This species nests on the lakes from late March and spends the winter months feeding at sea (BWI 2021). The species is considered to be in decline throughout its range in Ireland, mainly due to predation of eggs and young by invasive American mink (*Neovison vison*). This important pressure on Scoter populations at the site will not be influenced by any project activity. Another pressure, particularly on Common scoter, is the predation by pike on young birds (Robson 2017). Control and removal of this non-indigenous predatory fish is therefore likely to be beneficial to this red listed bird species.

With regard to other, less significant impacts, (i.e. disturbance) gill netting on the lakes will have ceased when Common scoter begin nesting and the nature and duration of electrofishing operations mean that they are unlikely to impact this species.

4.5.2. Tufted Duck

The Lough Conn & Cullin SPA supports a nationally important population of Tufted Duck (*Aythea fuligula*), an amber listed waterbird which has a small resident population but receives significant numbers of migratory birds during the winter months. Records show that tufted duck have not been impacted by gets or electrofishing in the past. The issues of highest conservation concern (e.g. exploitation by hunting and habitat loss – Table 4.5.1.) do not relate to any of the activities proposed by the project. In fact, pike removal is likely to be beneficial to the small resident population of breeding birds by reducing predation on their young (Dessborne et al 2010).

4.5.3. Greenland White-fronted Goose

The site is visited in the winter months by Greenland White-fronted Goose which use the lakes riparian area. They are occasionally seen on the water but prefer bogs and grasslands to feed. This amber listed goose species is listed as a rare winter visitor with a stronghold on the Wexford slobs (BWI 2021). Significant declines in this bird have been noted since the 1990s and these are thought to relate to loss of suitable nesting habitat, competition with other goose species and their relatively low reproductive rate. The Greenland White-fronted Goose is a winter visitor to sites in Ireland so their breeding takes place in the spring and summer months, far away from the project site. It is, therefore, unlikely that their populations could be impacted by any of the project activities.

4.5.4. Common Gull

This small resident gull species has a presence on all of the western lakes including Loughs Conn & Cullin, where it nests on small islands. It has suffered significant declines in recent years which has resulted in the bird's status now being amber. These declines are almost entirely related to predation by American mink (BWI 2021). None of the project activities are likely to influence the conservation or status of the common gull.

4.5.5. Wetland and Water Birds

Some members of this amalgam of bird species are present at the project area on a seasonal basis, as the wetlands associated with the site are important overwintering grounds for some species. None of these species have been recorded as unintended by-catch in gill-nets over the last 40 years probably because their feeding and general behaviour patterns are unlikely to bring them into contact with this element of the project.

5.0 Potential Significant Impacts

The significance of any potential impacts arising from the project on Natura Sites are assessed in terms of project activities including their :

- Size, Scale and Duration
- Land Take
- Physical changes arising at the site
- Resource requirements (Water, Power, construction material, Human resources)
- Disturbance
- Wastes and residues
- Additional Services

Details of these characteristics and how they relate to the project are outlined in table 3.1.

5.1. Direct Impacts

When viewed in terms of the above criteria, it is considered unlikely that significant direct impacts will occur in relation to any Natura site either wholly or partially within the zone of influence of this project. The following sub-sections examine the potential for each project activity to impact on the site and describes how significant impacts are unlikely.

5.1.1. Gill-Netting

Detailed records are available of all interactions between gill-netting activities on L. Conn & Cullin with non-target species since the time of designation (C2003). Anecdotal evidence of by-catch is also available

from IFI officers who have carried out these operations for over 30 years. Similar methods (i.e. gill-netting) have also been employed by IFI research staff for over 40 years for the purpose of stock surveys.

All records relating to these management and research activities indicate that the inadvertent capture of protected species is extremely rare or unknown and instances of these captures are confined to a small number of individuals from species such as, Cormorant, these have been encountered less than 3 times in the last 30 to 40 years (Pers Comm. Retired Fisheries Officers). None of the avian species noted as special conservation interests (see table 4.5.1.) have been recorded in gillnets.

Similarly, potential impacts from gillnetting to designated non avian species such as Atlantic salmon and Otter are considered. In assessing the potential risk to these species, the likelihood of impact to each protected species is low as the principal routes and temporal migratory patterns of Atlantic salmon at the site are well understood by IFI and their officers (see sec 4.3.1.). Gill net locations which are used do not coincide with migratory routes.

Using data from previous gill netting operations, both survey and stock management, the likelihood of disturbance to protected species was assessed. Following these considerations, it was objectively concluded that any impacts from the project activities (specifically gill netting) will not pose a significant threat to the protected species or habitats at the site.

5.1.2. Electrofishing

Because of the localised effect of the electrofishing equipment on the water (C5m radius) it is not envisaged that any protected species or habitat at the site will be impacted by this element of the project activity. Only minor disturbance (engine noise etc.) could be regarded as an issue. Non-target fish species will not be removed from the water . These will be allowed to swim away from the area where operations are being conducted. No significant disturbance is envisaged for these species. Boats and engines operated by recreational users are already a common feature at the site and this element of the project activity is regarded as no more disturbing than this.

5.1.3. Transport of Personnel, Boats and Equipment.

The principal risk of direct impact from this project activity is disturbance of protected species or habitats by movement of vehicles boats, engines and equipment. Only approved, established launching areas are used with appropriate facilities which obviate the need to come into direct vehicular contact with elements of the protected fauna or habitats

at: http://www.fisheriesireland.ie/Research/invasive-species.html All proposed works will be carried out consistent with IFI's Biosecurity Protocol for Field Work which is available at: https://www.fisheriesireland.ie/documents/73-biosecurity-protocol-for-field-survey-work-1/file.html

5.2. Indirect Impacts

Indirect impacts such as disturbance or emissions on the 2 sites, highlighted as being within the project area, are considered as unlikely given the nature, scale and duration of the project activities. Biosecurity risks are also considered to be low due to the established practices already in place as part of IFI's

biosecurity protocols which apply to all management and research activities. Methodologies for refuelling and launching of boats will also minimise indirect impacts.

Fig : 5.2.1. IFI staff member carrying out biosecurity protocol on an electrofishing boat

5.2.1. Biosecurity

The potential risk of indirect impacts to the site from the potential spread of pathogens or invasive species is considered low due to the established protocols which apply to all management activities carried out by IFI. The SAC will be protected from any such risk due to inbuilt safeguards when transporting boats and equipment to and from waterbodies. The potential for spread of invasive species is minimised by IFI's biosecurity protocols, whereby all equipment used in the project operations will be disinfected prior to and following its use on the lakes (see fig 5.2.1.). No equipment used during the project operations will be concurrently used at other sites, reducing further any potential biosecurity risk.

Japanese knotweed *(Fallopia japonica*) and Zebra mussel (*Dreissena polymorpha*) are known to be present in the general site area and strict adherence to IFI's biosecurity protocols are observed as part of any plan or project, thus avoiding the of spread. IFI provide a number of guidance documents on invasive species and their management which are available at

5.2.1. Water Quality

Water quality in the two lakes which comprise the main NATURA sites in the impact zone of the project (L. Conn & Cullin) is described by the EPA as Moderate. The EU Water Framework Directive (2000/60/EC) requires all Member States to protect and improve water quality in all waters so that we achieve good ecological status by 2015 or, at the latest, by 2027. It applies to all rivers, lakes, groundwater, and transitional coastal waters. No impacts arising from this project are envisaged on water quality.

Best practice water quality control methods including biosecurity protocols have been incorporated into the standard operating procedures (SOP's) of the stock management programme. Strict compliance with IFI's electrofishing and gill netting Standard Operating Procedures will be observed as part of this project.

5.3. Cumulative impacts

As a statutory consultee on planning issues involving aquatic habitats, Inland Fisheries Ireland receive information on any planned developments which may take place and have an impact on fisheries. The Fisheries Environmental Officer (FEO) for the RBD where the project will take place (Loughs Conn & Cullin) was requested to examine all recently received applications for Developments in the vicinity of the project area to help identify any such plans or projects so that an evaluation could be carried out on potential in combination effects. The following projects were identified and particulars of each one scrutinised to screen for potential impacts on the site.

5.3.1 Pontoon Hotel Development

Planning permission for a 14 bedroom hotel complete with effluent treatment plant at pontoon Co. Mayo was granted by An Bord Pleanála to Pontoon Anglers Hotel ltd. in May 2019 and this project is currently under construction. The authorisation allows for the removal of an existing derelict building and construction of a new hotel which will take place within 50m of Lough Cullin, in the project Area. However, the pontoon Hotel project does not involve any water based activity and no emissions to the aquatic environment are envisaged until at least 2023 (See http://www.eplanning.ie/MayoCC/AppFileRefDetails/17570/0)

Furthermore, none of the activities or characteristics associated with stock management on Loughs Conn & Cullin (see table 3.1.) are thought likely to act in concert with the construction activities proposed for this development to give rise to likely significant impacts on the site.

5.3.2. Oweninny Windfarm (phase 3)

Public consultation for the construction of a 18 turbine windfarm at Oweninny Co. Mayo commenced in December 2020. An EIAR is currently in preparation. Although this project is in the pre-planning phase, the potential for this to act in concert with the stock management operations was considered. Having evaluated the likely construction methods and the distance from the project activities and the nature of the hydrological connectivity between the two sites, it was objectively concluded that, in the event of the Oweninny windfarm project proceeding, it is unlikely to give rise to in combination effects (see: https://www.oweninnywindfarmphasethree.ie/wp-content/uploads/sites/15/2020/12/OW3_Brochure.pdf.)

6.0 Screening Determination

The preceding sub-sections have concluded that the principal activities of this project, (i.e. the removal of pike *(Esox licius L.*), by gill-netting and electro-fishing are part of the conservation and management of the site. They also indicate that there will be no significant direct, indirect or in-combination impacts to the Natura habitats or protected species at the site (see sections 4.4.1 – 4.4.6. & 4.3.1. – 4.3.5.). There will be no indirect impacts (e.g. to water quality) within designated sites (see section 5.2.1. & appendix 3) and the carrying out of pike stock management operations will be of benefit to the conservation of Atlantic salmon (see section 4.3.1.), one of the qualifying interests of the River Moy SAC, thereby making the project necessary to the management of the site.

Furthermore, considering the conclusions in the preceding subsections and bearing in mind the scope, scale, duration and timing (see table 6.1.) of the proposed project, it is concluded that no significant habitat or species impacts are likely as a result of the proposed project on Lough Conn and Lough Cullin.

Table 6.1. Screening matrix

Name of Project or Plan	**AA Screening for pike management on L. Conn& Cullin (2023)**
Name and Location of European Sites	Lough Conn & Lough Cullin SPA (Site Code:004228) River Moy SAC (Site Code:002298) Lough Dahybaun SAC (002177), Newport River SAC (002144), Moy Estuary SPA (4036), Croaghmoyle NHA (002383) and Lough Hoe Bog SAC (000633)
Description of the Project or Plan	The proposed works will comprise of the following; ▪ Setting of gill-nets to capture and remove pike from L. Conn & Cullin ▪ Electrofishing on L. Conn & Cullin to capture and re-move pike ▪ Launching and setting boats, personnel and equip-ment to and from L. Conn & L. Cullin
Is the project or plan directly connected with or necessary to the management of the site?	Yes.
Are there other projects or plans that together with the project or plan being assessed could affect the site?	No.
Project Characteristics	
Scope	Management of pike stocks at specified sites on Loughs Conn & Cullin and some named tributaries
Scale	Areas withing the confines of Loughs Conn & Cullin. Defined stretches on named tributary rives
Duration	Gill-netting Feb/Mar and Oct – Dec, Electrofishing April, May, August Sept, Oct. Dates outlined in management plan (Appendix 1)
Timing	**T**iming of gill-netting avoids potential impacts on protected species. No risk to habitats. Electrofishing is selective and low-risk to habitats & species.
Land-Take	Use of existing facilities - Project does not require land-take
Resource requirements	Fuel, personnel & equipment as indicated in plan & SOP (Appendices 1 & 2)
Emissions	Fuel/transport requirements result in approx. 372 kg Co2 No other emissions arise
Assessment of Effects	

Describe how the project or plan (alone or in combination) is likely to affect the European Site.	The potential risk from this project to protected habitats and species is low and the project is considered necessary to the management of the site. (see sections 4.2 – 4.5)
Explain why these effects are not considered significant.	An evaluation of the location, seasonal distribution and behaviour of protected species against the specific timing and nature of project activities at the site indicates that no significant risk arises to a qualifying interest or to their conservation objectives. No habitat impacts are envisaged
Data Collected to Carry Out the Assessment	
Assessment carried out by:	Inland Fisheries Ireland
Sources of data:	Inland Fisheries Ireland, National Parks & Wildlife Service Website, EPA Website & GIS Webtool. National Biodiversity Data Centre, BirdWatch Ireland
Level of assessment completed	Desktop and Site Investigations, IFI archives/records
Where can the full results of the assessment be accessed and viewed?	Inland Fisheries Ireland,
Overall Conclusion	Stage 1 Screening indicates that the proposed removal of pike from L. Conn & Cullin will not have a significant negative impact on the European sites network. Some of the species named as Qualifying Interests or Special Conservation Interests are likely to benefit from this project and the remaining species and habitats are unlikely to be impacted. Therefore, this project is deemed to "screen out" for potential impacts on a European site. A Stage 2 'Appropriate Assessment' under Article 6(3) of the Habitats Directive 92/43/EEC is not required.

7.0 References

Alonso F. (2001) Efficiency of electrofishing as a sampling method for freshwater crayfish populations in small creeks. Limnetica 20(1): 59-72. Asociacion Espaiiola de Limnologia. Madrid. Spain. ISSN: 021 3-R409

Barberi F. Machado R. Zappes C. A. & Oliviera 2012 Interactions between the Neotropical Otter (Lontra longicaudius) and gillnet fishery in the southern Brazilian Coast.
Ocean & Coastal Management Volume 63

Byström, P., Karlsson, J., Nilsson, P., Van Kooten, T., Ask, J., Olofsson, F., (2007).
Substitution of top predators: Effects of pike invasion in a subarctic lake. Freshw. Biol.
52, 1271–1280

Connor, L., Morrissey, E., Coyne, J., Corcoran, W., Cierpial, D., Gavin A., Brett A., McLoone, P., Delanty, K., Rocks, K., Gordon, P., O' Briain, R., Matson, R., McCarthy E. and Kelly, F.L. (2018) Fish Stock Survey of Lough

Cullin, August 2018. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Caumpus, Dublin 24.

O'Connor, W. (2004) A survey of juvenile lamprey populations in the Moy catchment: Irish Wildlife Manuals No. 15

Dessborn L., Elmberg, J., Englund G., (2010) Pike predation affects breeding success and habitat selection of ducks. Freshwater Biology 56(3): 579 – 589 DOI: 10.1111/j.1365-2427.2010.02525.x

Hendry K & Cragg-Hine D (2003). Ecology of the Atlantic Salmon. Conserving Natura 2000 Rivers Ecology Series No. 7. English Nature, Peterborough

Hesthagen, T., Sandlund, O.T., Finstad, A.G., Johnsen, B.O., (2014). The impact of introduced pike (Esox lucius L.) on allopatric brown trout (Salmo trutta L.) in a small stream. Hydrobiologia 744, 223–233.

IFI 2014/1-4233 (2014) Management of pike (Esox lucius L.) in designated wild brown trout (Salmo trutta L.) fisheries in Ireland. https://www.fisheriesireland.ie/media/inland-fisheries-ireland-pike-policy

Inland Fisheries Ireland (2019) Annual report for the WRBD – Moy Fishery
Unpublished WRBD-Ballina records.

Inland Fisheries Ireland, (2018) *Policies in relation to pike and the Water Framework Directive* (online) available at: (https://www.fisheriesireland.ie/Policies/why-are-pike-still-classified-as-non-native-by-inland-fisheries-ireland-within-the-context-of-the-eu-water-framework-directive.html

Accessed 28 February 2018

IFI (2016) Standard Operating Procedures for the management of pike using electrofishing apparatus https://www.fisheriesireland.ie/documents/642-pike-boat-electrofishing-sop-final-february-2016-sc/file.html

Kennedy RJ, Rosell R, Millane M,Doherty D, Allen M. (2018). Migration and survival of Atlantic salmon (*Salmo salar*) smolts in a large natural lake. J Fish Biol. 2018;93:134–137.https://doi.org/10.1111/jfb.13676

NASCO – The North Atlantic Salmon Conservation Organisation (2020) State of North Atlantic Salmon https://nasco.int/wp-content/uploads/2020/05/SoS-final-online.pdf

National Parks and Wildlife Service. (2007): # 965(Predation) The Status of EU protected Habitats and species in Ireland. Article 17 Report https://www.npws.ie/sites/default/files/publications/pdf/Art17-Vol1-web.pdf

National Roads Authority (2008) Environmental Impact Assessment of National Road Schemes – A pracitical guide. https://www.tii.ie/technical-services/environment/planning/Environmental-Impact-Assessment-of-National-Road-Schemes-Practical-Guide.pdf

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

NPWS (2021) Conservation Objectives: Lough Dahybaun SAC 002177. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

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

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

NPWS (2016) Conservation Objectives: River Moy SAC (002298). Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht

npws.ie/sites/default/files/publications/pdf/000458_Killala%20Bay-Moy%20Estuary%20SAC%20Coastal%20Supporting%20doc_V1.pdf

O'Grady M.M., Delanty K., (2008) The Ecology, Biology and Management of Pike in Irish Waters with particular reference to Wild Brown Trout Lake Fisheries - A Position Paper – January 2008 https://www.fisheriesireland.ie/documents/648-the-ecology-biology-and-management-of-pike-in-irish-waters

Tedeschi D, Kelly-Quinn M, Caffrey J., O'Grady M. and Mariani S.,(2014). Genetic structure of pike (*Esox lucius*) reveals a complex and previously unrecognized colonization history of Ireland. Journal of biogeography 41 (3), 548-560

Reynolds J. D. (1998) : Conservation & Management of White Clawed Crayfish in Ireland. Irish Wildlife Manual No. 1.

Robson H. J., (2017) Causes of Decline of Common Scoter (*Mellatina nigra*) in Scotland: Evidence from Palaeolimnology. Unpublished PhD thesis. https://discovery.ucl.ac.uk/id/eprint/10039205/1/Thesis-H-J-Robson

Rosell R. & Macoscar A. (2002) Movements of pike, Esox lucius, in Lower Lough Erne, determined by mark-recapture between 1994 and 2002 : Fisheries Management and Ecology 9(4):189 – 196 DOI: 10.1046/j.1365-2400.2002.00290.x

Sepulveda, A.J., Rutz, D.S., Ivey, S.S., Dunker, K.J., Gross, J.A., (2013). Introduced northern pike predation on salmonids in southcentral Alaska. Ecol. Freshw. Fish 22, 268–279.

Thorstad, E. B., Whoriskey, F., Uglem, I., Moore, A., Rikardsen, A. H., &Finstad, B. (2012a). A critical life stage of the Atlantic salmon Salmo salar: Behaviour and survival during the smolt and initial post-smolt migration. Journal of Fish Biology, 81, 500–542

Went, A.E.J. 1957. The Pike in Ireland. Irish Naturalists Journal 12: 177–82

8.0 Appendices

Appendix 1. **Stock Management Plan 2023 for Loughs Conn & Cullin**

Proposed Moy Catchment Stock Management Plan 2023

Western River Basin District

Gill Netting Operations

Netting will be concentrated into specific areas of Lough Conn and Lough Cullin during different periods of the pike management season. Known spawning areas are targeted during periods of spawning activity while other operations will take advantage of congregations of pike which occur in accordance with specific feeding behaviour associated with concentrations of spring and autumn salmonid migrations. Gill netting operations for 2023 is scheduled to commence on 1st February on Loughs Conn and Cullin and netting will continue until the end of March. Further gill netting operations are planned for the fourth quarter of 2023 on Lough's Conn and Cullin. These dates are outlined in the table below. An estimated 153 person days will be allocated to gillnetting operations over 51 days in 2023 on Loughs Conn and Cullin. This is a maximum achievable figure and the achievement of this will depend on factors such as weather, staff availability and Covid-19 complications.

Table 1: Proposed Gill Netting in the Moy Catchment 2023

Fishery	Period	Max Days	Max Person Days
Lough Conn/Cullin	Feb-March	41	123
Lough Conn/Cullin	Oct- Dec	10	30
	Total	**51**	**153**

Electrofishing Operations

Electrofishing (EF) operations can be carried out year-round on lakes subject to suitable weather and water conditions. As such, the period identified for EF operations on Lough Conn and Lough Cullin is much longer and can effectively run from 1st January to 31st December in any year. An estimated 60 person days will be allocated to EF operations over 15 days in 2023. This will be concentrated on Loughs Conn and Cullin and in addition to targeting the nursery margins, EF will also be used to control pike numbers in the lower reaches of a number of rivers including the Deel, Manulla and Castlebar systems. This list is not exhaustive and other rivers will be considered. There is ample observational evidence of severe predation of salmon smolts and trout near and in the mouths of salmonid nursery rivers and streams especially when salmonids are migrating in March, April and October. EF operations on some rivers will therefore be scheduled for early spring and autumn to mitigate against excessive predation of migrating salmonids. Similar to gill netting operations, the estimated days outlined are a maximum achievable figure and the achievement of this will depend on factors such as weather, staff availability and Covid-19 complications.

Table 2: Proposed Electrofishing in the Moy Catchment 2023

Fishery	Period	Max Days	Max Person Days
L. Conn & Cullin including inflowing rivers	Jan - Dec	15	60

An Appropriate Assessment Screening Report for the above stock management plan will be in place.

ConnL.Stock Management Plan 2

Appendix 2: **Inland Fisheries Ireland - Pike Management Policy 2014**

https://www.fisheriesireland.ie/sites/default/files/migrated/docman/Pike%20Policy%20Report.pdf

Pike Policy Report.pdf

Appendix 3: **Inland Fisheries Ireland - Standard Operating Procedure (SOP) for Pike Management Operations**

https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2016/Wild%20Brown%20Trout%20Fishery%20Management%20Gill%20Netting%20SOP%2029-02-2016.pdf