Iascach Intíre Éireann
Inland Fisheries Ireland

Screening for Appropriate Assessment

Owenriff Stock Management Plan 2023

Inland Fisheries Ireland

Western River Basin District

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1. SUMMARY OF FINDINGS

1.1 SCREENING FOR APPROPRIATE ASSESSMENT

Project Title and Background	**A proposed stock management programme for the Owenriff system, County Galway.** This is the sixth year of the Owenriff Stock Management Plan which commenced in 2018. The programme will concentrate on the removal of pike *(Esox lucius)* from this salmonid fishery which contains stocks of wild brown trout *(Salmo trutta)* and Atantic salmon *(Salmo salar).* The proposed methods are gill netting, electrofishing and use of perch traps/fyke nets on up to eight lakes and a restricted section of the main channel of the Owenriff River itself. It is anticipated that this programme will assist in the recovery of stocks of Atlantic salmon *(Salmo salar)* and indeed brown trout *(Salmo trutta)* which have become depleted in the system since the deliberate introduction of pike to the system in the years prior to 2009.
Project Proponent	Inland Fisheries Ireland, Teach Breac, Earls Island, Galway
Project Location	Owenriff River and associated lakes in the Owenriff catchment across numerous townlands approximately 26km to the north west of Galway City, in west County Galway.
Conclusion	As Atlantic salmon are classified an Annex II and Annex V species under the provisions of the EU Habitats Directive coupled with Atlantic salmon being a feature of interest of Lough Corrib SAC, management of pike stocks is necessary to the management of the Lough Corrib SAC. It has been objectively concluded during the screening process that the Natura 2000 sites within the zone of influence of the proposed sites are not likely to be significantly impacted by the proposed stock management plan. These sites are: • Lough Corrib cSAC 000297 • Maamturk Mountains SAC 002008 • Lough Corrib SPA 004042 • Ross Lake and Woods SAC 001312 • Kilkieran Bay and Islands SAC 002111 • Lough Carra/Mask Complex SAC 001774 • Lough Mask SPA 004062 • Connemara Bog Complex SPA 004181 • Connemara Bog Complex SAC 002034 • Cloughmoyne SAC 000479 • Gortnagarragh Limestone pavement SAC 001271 • Mocorha Lough SAC 001536 Based on the above, this Appropriate Assessment Screening Report concludes that the proposed project is necessary to the management of the Lough Corrib SAC, and that significant effects on Natura 2000 sites are not likely.

2. INTRODUCTION

2.1 PURPOSE OF ASSESSMENT

This Screening for Appropriate Assessment has been undertaken to determine the potential for significant impacts on a proposal to carry out a stock management plan on the Owenriff system, County Galway in 2023, on nearby sites with European conservation designations (i.e. Natura 2000 Sites).

This Screening for Appropriate Assessment has been undertaken by Inland Fisheries Ireland.

2.2 LEGISLATIVE CONTEXT

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and of wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (79/409/EEC) seeks to protect birds of special importance by the designation of Special Protected Areas (SPAs). It is the responsibility of each member state to designate SPAs and cSACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. Further information is available at:

http://ec.europa.eu/environment/nature/legislation/habitatsdirective/

http://www.npws.ie/planning/appropriateassessment/

The current assessment was conducted within this legislative framework and also the DoEHLG (2009) guidelines. As outlined in these, it is the responsibility of the proponent of the project (in this case Inland Fisheries Ireland) to provide a comprehensive and objective Screening for Appropriate Assessment, which can then be used by the competent authority in order to conduct the Appropriate Assessment if deemed necessary (DoEHLG, 2009).

2.3 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 in Appendix 1. This proposal has proceeded as far as Stage 1.

3. ASSESSMENT METHODOLOGY

3.1 APPROPRIATE ASSESMENT GUIDANCE

This Screening for Appropriate Assessment, or Stage 1, has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC, 2001) and the European Commission Guidance 'Managing Natura 2000 sites' (EC, 2000) and guidance prepared by the NPWS (DoEHLG, 2009).

3.2 DESK STUDY

In order to complete the Screening for Appropriate Assessment certain information on the existing environment is required. A desk study was carried out to collate available information on the site's natural environment. This comprised a review of the following publications, data and datasets:

- OSI Aerial photography and 1:50000 mapping www.osi.ie
- National Parks and Wildlife Service (NPWS) www.npws.ie
- Teagasc soil area maps http://maps.biodiversityireland.ie/
- Geological Survey Ireland (GSI) area maps www.gsi.ie
- Environmental Protection Agency (EPA) water quality data www.epa.ie
- Western River Basin District (WRBD) datasets (Water Framework Directive)
- Inland Fisheries Ireland (IFI) website www.fisheriesireland.ie
- Sampling fish for the Water Framework Directive www.wfdfish.ie
- National Biodiversity Data Centre https://biodiversityireland.ie/
- Other information sources and reports footnoted in the course of the report

3.3 SCREENING FOR APPROPRIATE ASSESSMENT

As set out in the NPWS guidance, the task of establishing whether a plan or project is likely to have an effect on a Natura 2000 site(s) is based on a preliminary impact assessment using available information and data, including that outlined above, and other available environmental information, supplemented as necessary by local site information and ecological surveys. This is followed by a determination of whether there is a risk that the effects identified could be significant. The precautionary principle approach is required.

Once the potential impacts that may arise from the proposal are identified the significance of these is assessed through the use of key indicators:

- Habitat loss
- Habitat alteration
- Habitat or species fragmentation
- Disturbance and/or displacement of species
- Water quality and resource

4. SCREENING FOR APPROPRIATE ASSESSMENT

Screening for Appropriate Assessment (Stage 1) determines the need for a full Appropriate Assessment (Stage 2) and consists of a number of steps, each of which is addressed in the following sections of this report:

- Establish whether the proposed project is necessary for the management of a Natura 2000 site
- Description of the proposed stock management plan
- Identification of Natura 2000 sites potentially affected
- Identification and description of individual and cumulative impacts of the proposed project
- Assessment of the significance of the impacts on the integrity of Natura 2000 sites
- Conclusion of the screening stage

4.1 MANAGEMENT OF NATURA 2000 SITES

This proposal is connected with and necessary to the conservation management of a Natura 2000 site, ie. Lough Corrib SAC. A report published by the National Parks and Wildlife Service (NPWS) (NPWS, 2007) 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. This report (NPWS, 2007) specifically refers to the Corrib catchment of which the Owenriff system forms part of. In the NPWS publication "Ireland Red List No. 5, Amphibians, Reptiles and Freshwater Fish" (2011) the status of Irish pike is considered "non-native, non-benign". Certain fish including pike are classified as 'non-benign', signifying an adverse impact on the ecology of the water in which they occur (King et al, 2011).

When considering the above and bearing in mind that Atlantic salmon are classified an Annex II and Annex V species in the provisions of the EU Habitats Directive, coupled with Atlantic salmon being a qualifying interest of this SAC, management of pike stocks is necessary in the Owenriff catchment as it forms part of the Lough Corrib SAC.

4.2 DESCRIPTION OF PLAN/PROJECT

4.2.1 Project Description

Stock management operations are carried out on six lake catchments in the Western River Basin District (WRBD); Loughs Corrib, Mask, Carra, Conn, Cullin & Arrow. The Owenriff system forms part of the Corrib catchment. A relatively recent deliberate introduction of pike into this system has contributed to numbers of salmon and brown trout being depleted. Several anglers contacted the Western Regional Fisheries Board (predecessor to IFI) in 2009 after they discovered pike in Loughs Boffin and Agraffard which are both acidic lakes and never had a pike population previously. These lakes form part of the Owenriff system. Following the Western Regional Fisheries Board's own investigations, a significant number of juvenile pike were found, indicating that not only had pike been introduced but they had already successfully spawned. These lakes are a significant distance upstream from Lough Corrib but the system was protected from pike by a large impassable waterfall. The

Western Regional Fisheries Board described the deliberate introduction at the time as "environmental vandalism".

The Owenriff Fish Population Rehabilitation Plan was published in 2018 and stated that *"if actions to control or eradicate pike in the Owenriff are not undertaken it is reasonable to infer that there will be an ongoing decline in ecological biodiversity in the catchment"* (IFI, 2018). The case for implementing a fisheries rehabilitation plan to protect the biodiversity and prevent further decline of fish stocks in the Owenriff catchment is endorsed by EU and national legislation and international guidelines, i.e. EU Water Framework Directive, EU Habitats Directive, Water Policy Regulations and the Food and Agriculture Organization of the United Nations (IFI, 2018).

The purpose of the Owenriff rehabilitation plan is to develop a project that can be undertaken to promote the recovery of the brown trout (both resident and migratory Corrib) and salmon populations in both lakes and rivers and to prevent further decline. In order to control pike within the system IFI commenced an extensive netting and electrofishing operation in 2018 and have continued the operation since.

Electrofishing is planned to continue along with gill nets, fyke nets and perch/pike traps which will be deployed where appropriate.

4.2.2 Purpose of the Project

Stock Management is undertaken on certain systems for the conservation of salmonids in waters which are managed by IFI as salmonid fisheries. A copy of IFI's current pike and brown trout polices are included in the Appendices of this report. These stock management operations are informed by scientific research, are based on best practice and carried out in accordance with IFIs pike and trout management policies under strict standard operating procedures. Stock management in relation to pike on Lough Corrib has been carried out by IFI and its predecessors; the Western Regional Fisheries Board and the Inland Fisheries Trust since the mid 1950's.

The predation of salmonids by pike has been observed and described by many professionals working in the inland fisheries sector both in Ireland (O'Grady & Delanty, 2008) and in other states and regions where pike are considered as non-native and invasive e.g. Alaska (Sepulveda *et al*., 2013) and Sweden (Byström et al, 2007). This is particularly so in the spring months when juvenile salmon and trout migrate from feeder streams to larger freshwater bodies. Pike are a predatory fish that can reduce stocks of salmon and trout, and their numbers are managed on certain wild trout fisheries that are recognised as internationally important. They can predate heavily on young salmon and trout as they migrate downstream from nursery habitats, and as a result can have a large impact on stocks.

The Article 17 report to the EU Commission (2007) on the status of EU protected habitats and species in Ireland, states in relation to Atlantic salmon that *"pike 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 Corrib on the Corrib system"* (NPWS, 2007). The Owenriff sub catchment forms part of the Corrib system.
There have been rare incidences of large pike preying on adult salmon in both Lough Corrib and Lough Conn, and two grilse of 4lb and 5lb were recorded in one large pike on one occasion (NPWS, 2007).

Pike have been recorded accumulating in significant numbers where inflowing streams enter lakes in spring.

The proposed operations should have a significant impact on the reduction in numbers of pike in the system. Electrofishing will not be carried out in sections of the river where populations of freshwater pearl mussel are present. These areas are highlighted in Figs. 3 & 4 below. Weather conditions and water levels will have a major impact on the proposed work programme. Assuming suitable weather and water levels, the proposed works and timings for 2023 are detailed below:

Quarter	Month	Person Days	
		Gill Nets, Fyke Nets & Perch traps	Electro Fishing & Other Methods
Q1	Jan - March	20	0
Q2	April - June	20	20
Q3	July - Sept	20	20
Q4	Oct - Dec	0	10
Total		**60**	**50**

IFI may alter the plan in accordance with the efficacy of the different techniques in an effort to maximise productivity.

Owenriff Stock Management Plan welcomed by Minister Kyne

In a press release on Tuesday, 28th November 2017 Sean Kyne TD, Minister with responsibility for Inland Fisheries, welcomed the development, by Inland Fisheries Ireland (IFI), of a specific stock management plan for Galway's Owenriff system aimed at removing pike from the system as a significant step forward. The full text of this statement can be found at: https://www.fisheriesireland.ie/news/press-releases/minister-kyne-welcomes-owenriff-stock-management-plan-and-survey-by-inland It is also included in the Appendices of this report.

4.2.3 Site Locations

The proposed site locations for this stock management programme occur at numerous waterbody locations throughout the Owenriff system. This includes electrofishing on a section of the main channel between Lough Bofin and Lough an Droichid. This location is approximately 1.9km upstream of the nearest population of *Margaritifera margaritifera* and approximately 4.5 km downstream of the next nearest population of *Margaritifera margaritifera*. Lakes where operations are proposed are named below. The Owenriff River flows through Oughterard which is situated approximately 26km Northwest of Galway City and discharges to Lough Corrib.

The Owenriff catchment drains approximately 6715Ha. The Owenriff system consists of the Owenriff River and a series of five small lakes: Loughs Ateann (Leadmine), Agraffard, Adrehid, Bofin and Loch Aphreahragan. The system also has two other small lakes on another adjoining stream, Loch Beg and Shannaghree Lough. There are some other smaller lakes and ponds on other tributaries which have

not been investigated to date. Pike were not recorded during the Water Framework Directive survey of Lettercraffroe carried out in 2019 which is also a part of the system, due to an impassable waterfall on the tributary through which it drains into the main channel.

The Owenriff catchment lies within the larger Lough Corrib catchment and the Western River Basin District.

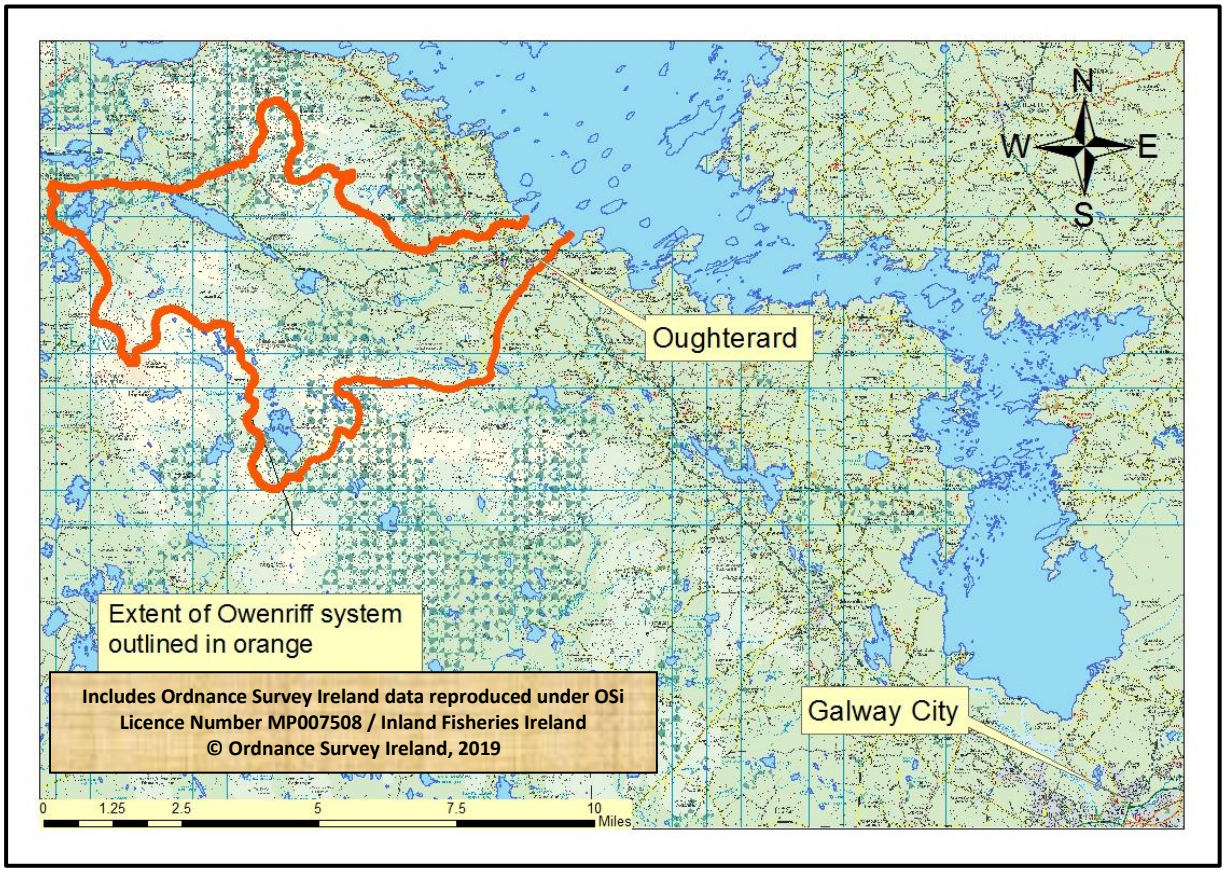

Fig.1: Location of the Owenriff system in relation to Galway City and Lough Corrib (OSI, 2019)

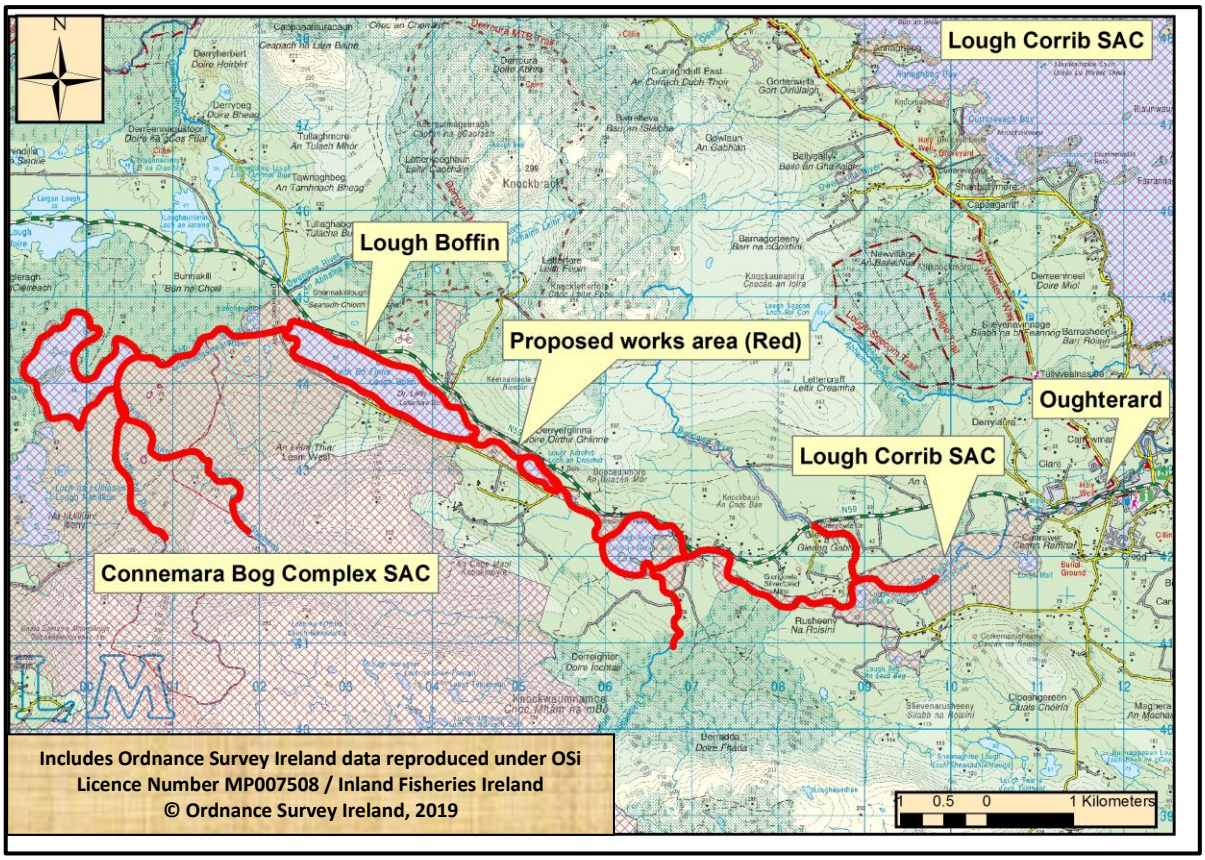

Fig. 2: Proposed works area highlighted in red showing their locations within two Natura 2000 sites - Connemara Bog Complex SAC and Lough Corrib SAC (OSI, 2019)

4.2.4 Description of the Site

The proposed sites are located in a rural area of west County Galway. The Owenriff River discharges to Lough Corrib downstream of Oughterard. Based on the Corine land cover data, which is obtained from aerial imagery http://www.eea.europa.eu/publications/COR0-landcover the most common Corine land use type within the Owenriff catchment is peat bogs (64.03%). Transitional woodland scrub accounts for 12.29% and coniferous forests 11.53%. The remaining land use types can be seen in Figure 2. The catchment is predominately acid geology with the exception of the segment of the Owenriff River in the vicinity of Oughterard which is dominated by lower Avonian/carboniferous rocks. There are significant waterfalls on the system located on the Owenriff at Canrawer, Oughterard, the Glengawbeg at Derryeighter and a smaller obstruction on the Sruffaunboy at Illeny. (Freshwater Pearl Mussel-Owenriff Sub-Basin Management Plan,2010). The catchment is dominated by peat soils. The Owenriff River and tributaries are mainly located within the Lough Corrib SAC of which Atlantic salmon and Freshwater Pearl Mussel are qualifying interests. Stocks of pike have been managed on Lough Corrib prior to and subsequent to the designation of the lake as an SAC. It should be noted that Lettercraffroe Lake and the Glengawbeg system and much of the western part of the catchment is located within the Connemara Bog Complex SAC. The Owenriff River and its catchment holds stocks of Atlantic salmon and brown trout however the stock of both species has depleted since the deliberate introduction of pike to the system.

A fish stock survey of the Owenriff catchment carried out by IFI in 2017 established that *"in general, minimum density estimates for brown trout and salmon were relatively poor at many of the river sites*

surveyed during 2017 and that there is evidence to suggest that salmon and brown trout numbers in river sub-catchments across the Owenriff catchment have declined since the previous survey in 1997" (IFI, 2018).

A Water Framework Directive survey of selected lakes within the Owenriff catchment in 2018 further supports the reduction in numbers of salmonids; *"brown trout appeared to have a significantly lower mean minimum density across the Owenriff catchment in the 2018 survey compared to 1997. Results also indicate that brown trout recruitment is also lower in 2018 than 1997" (IFI, 2019).*

The Owenriff system is fundamentally important in terms of spawning and nursery habitat for both salmon and trout in the larger Corrib catchment. The Owenriff River is listed on the first schedule of the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 - S.I. No. 296/2009.

In order to comply with the reporting requirements of the Water Framework Directive water quality assessments have been conducted for certain catchments and sub-catchments. These reports can be viewed on the EPA and WFD web sites. The EPA monitors the water quality in the Owenriff catchment at six locations.

Table 1: Locations of latest water quality monitoring by the EPA on the Owenriff catchment including Q Values

River	Site Details	Q Value	Year	Status
GLENGAWBEG	Bridge u/s of Agrafard Lake	4	2019	Good
Owenriff	1km upstream of Oughterard Bridge	4-5	2018	High
Owenriff	1km downstream of Agrafard Lake	4-5	2018	High
Owenriff	Bridge upstream of Lough Corrib	4-5	2019	High
Owenriff	D/s Sew Treatment Works- Oughterard	4	2018	Good
Owenriff	D/S Oughterard WWTP	4	2019	Good

The above table displays EPA Q-Values for water quality monitoring locations in the Owenriff catchment from data available from 2019. Values range from 4 (Good Status) to 4-5 (High Status) in the catchment (EPA, 2021).

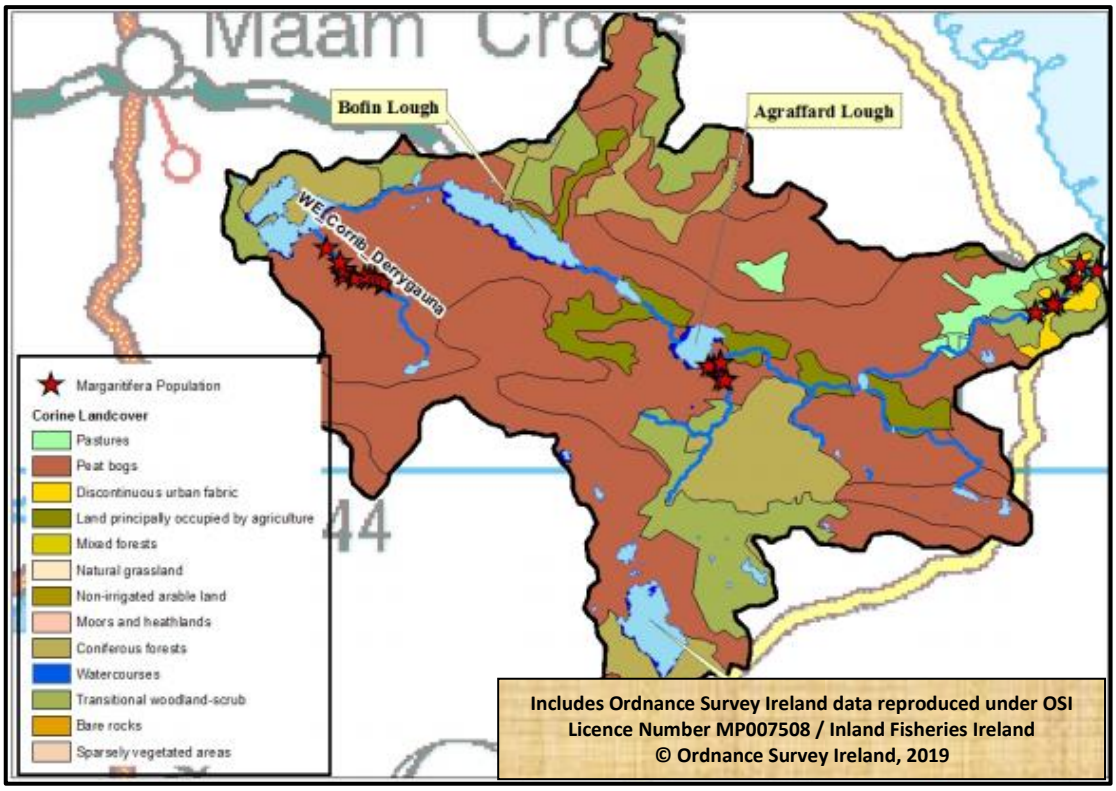

Fig 3: Corine Landcover within the Owenriff catchment & locations of populations of *Margaritifera margaritifera* (Source: Freshwater Pearl Mussel Owenriff Sub-Basin Management Plan)

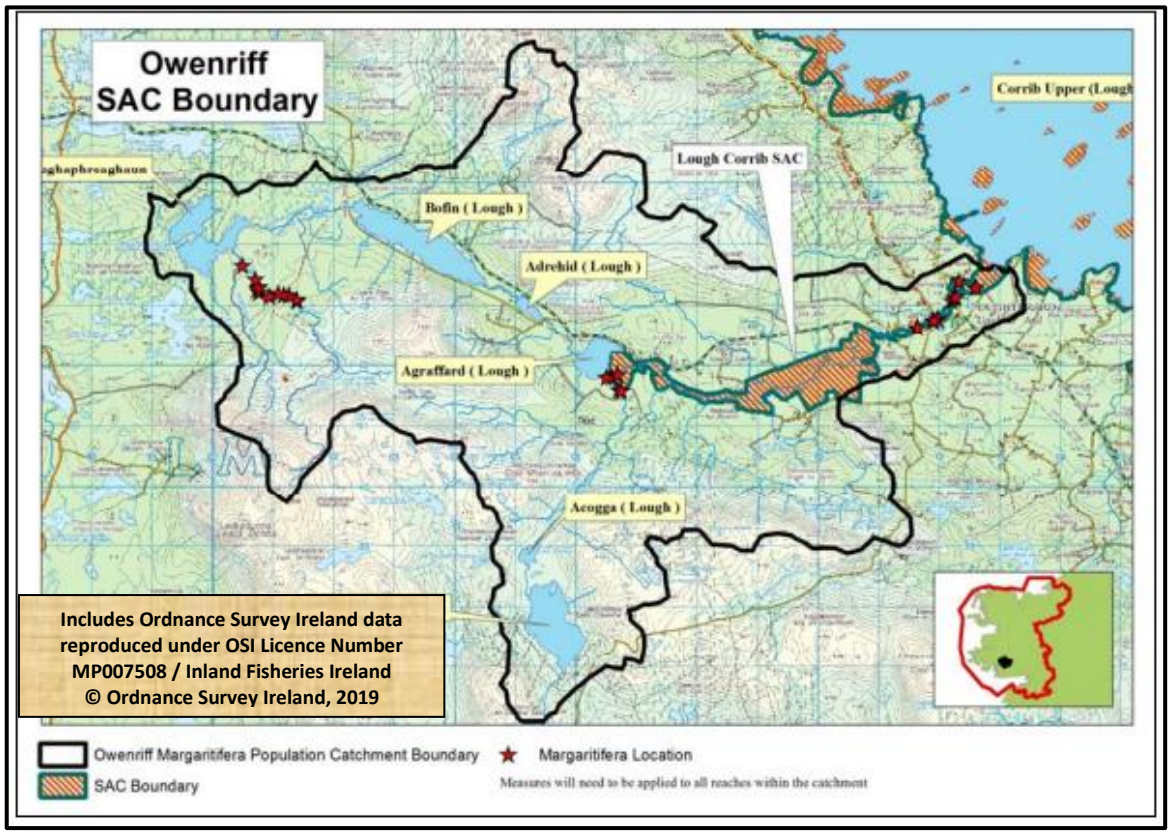

Fig 4: Map of Owenriff SAC boundary showing distribution of freshwater pearl mussel populations (Source: Freshwater Pearl Mussel Second Draft Owenriff Sub-Basin Management Plan)

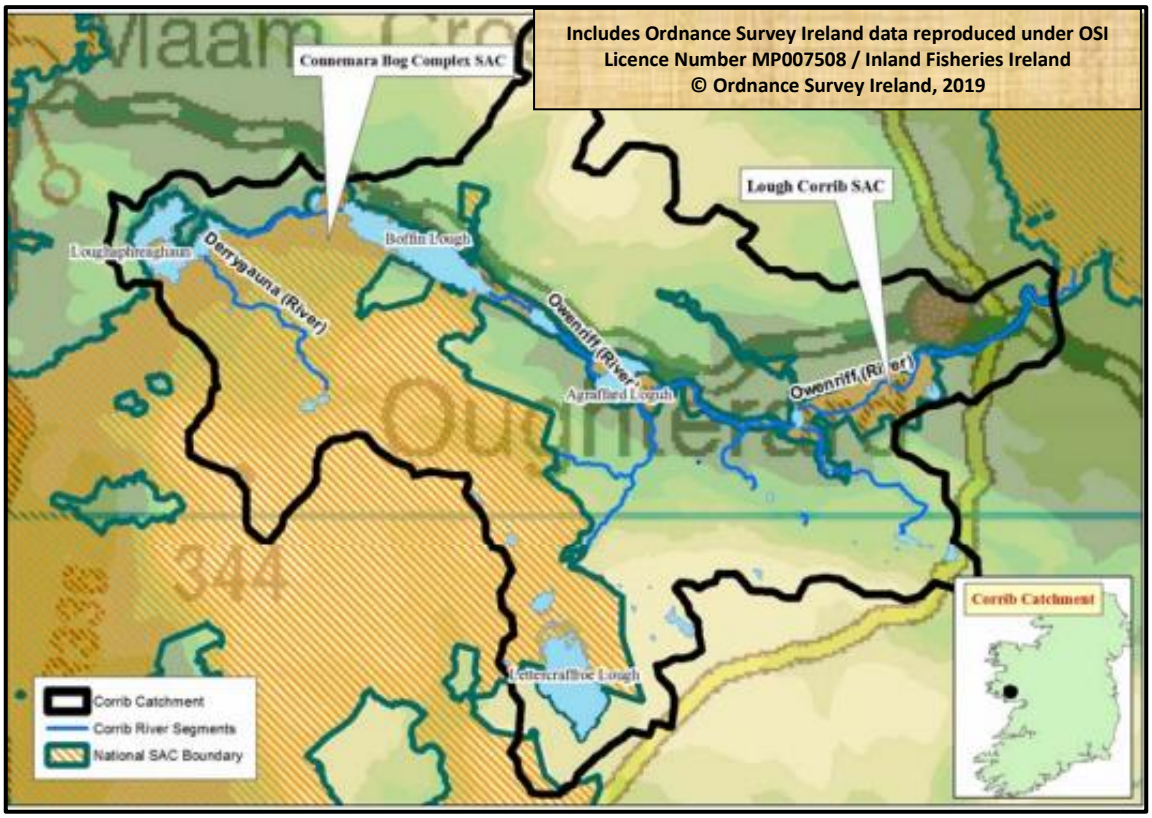

Fig.5: Overview of Owenriff Catchment indicating extent covered by SAC boundary (Source: Freshwater Pearl Mussel Owenriff Sub-Basin Management Plan)

4.2.5 Characteristics of the Project

The proposal is described in the below table.

<table>
<tr><td>Size, Scale, Area, Land Take</td><td>Electro-fishing, gill netting/fyke netting and use of perch traps on a restricted section of the Owenriff River and lakes in the catchment including Loughs Ateann (Leadmine), Agraffard, Adrehid, Bofin and Loch Aphreahragan, Loch Beg and Shannaghree Lough. Gill netting will focus on targeted lake pike spawning areas only. River Electrofishing will be solely focused on targeted pike areas and will be confined to the area of river between Lough Bofin and Lough Adrehid. This is approximately 1.9 km upstream of the nearest population of Margaritifera margaritifera and approximately 4.5 km downstream of the next nearest population of Margaritifera margaritifera having no impact on these populations. No land take within any Natura 2000 site is required.</td></tr>
<tr><td>Details of physical changes that will take place during the various stages of implementing the proposal</td><td>No physical changes are expected. Gill nets and perch traps will be set at various locations in the lakes but electrofishing in areas where populations of freshwater pearl mussel exist is not a concern as electrofishing will not be carried out in these areas</td></tr>
<tr><td>Description of resource requirements for the construction/operation and decommissioning of the proposal (water resources, construction material, human presence etc.)</td><td>The proposed 2023 Owenriff stock management programme will require 110 person days. Two staff will be required for each crew deployed on netting operations. Three staff will be required for boat mounted electrofishing operations and additional staff will be essential where remote areas are being accessed.</td></tr>
<tr><td>Description of 2023 timescale for the various activities that will take place as a result of implementation (including likely start and finish date)</td><td>
<table>
<tr><th>Activity</th><th>Period</th><th>Person Days</th></tr>
<tr><td>Gill/Fyke Netting/Perch Traps</td><td>Jan-Sept 2023</td><td>60</td></tr>
<tr><td>Electrofishing & other methods</td><td>April-Dec 2023</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Description of wastes arising and other residues (including quantities) and their disposal</td><td>It is not anticipated that any waste will be generated from this work apart from pike carcasses which will be disposed of through a licenced renderer. It is proposed that appropriately trained personnel will euthanise all pike immediately following capture.</td></tr>
<tr><td>Identification of wastes arising and other residues (including quantities) that may be of particular concern in the context of the Natura 2000 network</td><td>None anticipated. Sedimentation/disturbance to populations of freshwater pearl mussel will not be a concern during electrofishing operations in the main channel as these activities will only be carried out in a restricted section of the main channel where populations are not present. Impacts to downstream populations will not arise either.</td></tr>
<tr><td>Description of any additional services required to implement the project or plan, their location</td><td>Electro-fishing boats and associated equipment, appropriate boats and outboard engines. Four-wheel drive vehicles. Quad bike. Refueling is not anticipated to be carried out onsite but in the case where it may have to occur; all refueling will take place 50 m from any watercourse.</td></tr>
</table>

4.2.6 Site Specific Methodology (Elements of the project designed to protect habitats and species)

The following standard operating practices (SOPs) will be in place throughout the proposed Owenriff stock management plan.

4.2.6.1 Refueling of outboard motors/generators/quad bikes etc.

All refueling will be carried out off site away from watercourses. In the unlikely event of refueling being required onsite, tanks and drums will be stored in secure, impermeable storage area, a minimum of 50m from drains and open water. Procedures and contingency plans will be set up to deal with an emergency accidents or spills.

4.2.6.2 Standard Operating Procedures in relation to stock management plans

All operations will be undertaken in strict compliance with IFI's electrofishing and gill netting Standard Operating Procedures and in compliance with the provisions of IFI's most recent 2020 Safety Statement. All IFI staff involved in this project will have completed comprehensive fish health, welfare and handling training and will carry out their job consistent with best practice in mind.

Inland Fisheries Ireland's Standard Operating Procedure (SOP) For Pike management operations using gill nets is available at: https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2016/Wild%20Brown%20Trout%20Fishery%20Management%20Gill%20Netting%20SOP%2029-02-2016.pdf

The gill nets to be used range in mesh size from one inch to two and a half inches, knot to knot, pulled. They are usually set from an appropriate boat in shallow water close to areas of emergent vegetation where pike are known to spawn in the early spring months. 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. Nets can be set singularly (30m) or joined together to form a longer net which will measure a maximum of 120m for the Owenriff plan. Typically, the nets fish to a depth of 1.5 m. A known pike spawning area in the littoral zones of the lake is usually targeted and re-fished for an appropriate period. Perch traps may be deployed. These will be set in locations of the lake which have varying depths and will be inspected daily similar to gill net inspections.

Electrofishing is carried out from flat-bottomed boats between 3m and 5m in length mounted with a generator and transformer. This equipment delivers an electrical current to the water which renders all fish in the immediate vicinity of the apparatus, temporarily motionless. The immobilized fish are removed from the water using hand nets. Non target fish are released directly to the water and pike are retained in an on board holding area.

Inland Fisheries Ireland's Standard Operating Procedure (SOP) For Pike management operations using electrofishing apparatus is available at: https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2016/Pike%20Boat%20Electrofishing%20SOP%20Final%20February%202016%20SC.pdf

Fig. 6: IFI staff member servicing a gill net for stock management purposes

Fig 7: IFI staff members carrying out electrofishing in accordance with IFI's electro-fishing SOP

It should also be noted that this stock management programme will be carried out in strict compliance with IFI's pike and brown trout policies. A copy of these policies is included in the Appendices of this document. Permission will be sought from local landowners prior to carrying out the plan where deemed appropriate.

4.2.6.3 Invasive species and Biosecurity

In accordance with IFI's biosecurity protocols, all equipment will be disinfected prior to, and following its use on the system to avoid introduction of invasive species such as Zebra Mussel or *Lagarosiphon major*. IFI provide a number of guidance documents on invasive species and their management which are available at: https://www.fisheriesireland.ie/search?keywords=invasive+species All proposed works will be carried out strictly in accordance with IFI's Biosecurity Protocol for Field Work which is available at: https://www.fisheriesireland.ie/sites/default/files/migrated/docman/biosecurityforfieldsurveys2010.pdf

Fig 8: IFI staff member carrying out the agreed biosecurity protocol on an electrofishing boat

4.2.7 Identification of Other Projects or Plans or Activities

Projects/developments in or adjacent to the Owenriff / Corrib catchment were considered as part of this report. The ongoing Lagarosiphon Research Lough Corrib (LARC) Project was identified as a project within Lough Corrib along with the adjacent Lough Corrib Stock Management Programme. Annual drainage maintenance carried out by the OPW on selected channels in the Corrib catchment was also identified. No other projects or plans were identified as relevant to impact on this stock management plan.

4.3 IDENTIFICATION OF NATURA 2000 SITES

4.3.1 Zone of Impact Influence

All Natura 2000 sites within the zone of impact influence of the project along with those with a direct pathway will be characterised. In line with the precautionary principle, this report also considers any Natura 2000 sites that lie outside 15km that may be significantly impacted as a result of the proposed works. Following this, the potential impacts and associated pathways associated with the proposal will be identified before an assessment is made of the likely significance of these impacts. As described above, the test for the screening for Appropriate Assessment is to assess, in view of best scientific knowledge, if the development, individually or in combination with other plan/project is likely to have a significant effect on a Nature 2000 site.

4.3.2 Identification of Natura 2000 Sites

There are twelve 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 Lough Corrib SAC and the Connemara Bog Complex SAC, these sites are examined in particular detail. Other, more peripheral Natura sites are also subject to an analysis of potential impacts.

Consideration regarding potential biodiversity corridor links to sites >15km (i.e. in the same catchment) were also included as part of this assessment. A portion of the catchment also lies within the Connemara Bog Complex SAC. Table 2 below, lists designated SACs and SPA sites within the zone of influence of the Owenriff stock management plan including their proximity. No other designated sites beyond 15km were identified as having a biodiversity corridor/direct pathway associated with this programme which could impact on a feature of interest.

Table 2: Designated conservation sites within the zone of influence of the stock management plan

No.	Designated Site	Site Code	Proximity of proposed site
1	**Lough Corrib SAC**	**000297**	**Sites are situated in this SAC**
2	Maamturk Mountains SAC	002008	Approx 2.8km to the north west
3	Lough Corrib SPA	004042	Approx. 4km to the east
4	Ross Lake and Woods SAC	001312	Approx 7km to the south east
5	Kilkieran Bay and Islands SAC	002111	Approx. 8.5km to the west
6	Lough Carra/Mask Complex SAC	001774	Approx. 12.5km to the north
7	Lough Mask SPA	004062	Approx. 12.5km to the north
8	Connemara Bog Complex SPA	004181	Approx. 1km to the south
9	**Connemara Bog Complex SAC**	**002034**	**Sites are situated in this SAC**
10	Cloughmoyne SAC	000479	Approx. 10km to the north east
11	Gortnandarragh Limestone pavement SAC	001271	Approx. 5.5km to the south east
12	Mocorha Lough SAC	001536	Approx. 14.7km to the north east

4.3.3 Conservation Objectives

According to the Habitat's Directive, the *conservation status of a natural habitat* will be taken as 'favourable' within its biogeographic range when:

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

According to the Habitat's Directive, the conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' within its biogeographic range when:

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

Site specific and more detailed conservation objectives were available for the following sites where a potential impact couldn't be ruled out at this stage, namely Lough Corrib SAC and Connemara Bog Complex SAC. A detailed list of the conservation objectives for the Lough Corrib SAC is available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000297.pdf

A detailed list of the conservation objectives for the Connemara Bog Complex SAC is available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002034.pdf The conservation objectives for Lough Corrib SAC and Connemara Bog Complex above were downloaded and consulted in the preparation of this report

Table 3: Qualifying interests of Lough Corrib SAC including main threats

Habitat name (cSAC Qualifying Feature)	Habitat code	Main Threats to the qualifying feature
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	3140	Fertilisation, grazing, forestry, leisure fishing, hunting, human induced hydraulic changes, eutrophication and Invasive species.
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea	3130	Fertilisation, grazing, forestry, leisure fishing, hunting, human induced hydraulic changes, eutrophication and Invasive species.

Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)	3110	Fertilisation, grazing, forestry, burning, leisure fishing, hunting, peat extraction, dispersed habitation, discharges, sport and leisure structures, pollution, drainage, erosion , invasive species.
Molinia meadows on calcareous, peaty or clavey-silt-laden soils (Molinion caeruleae)	6410	Drainage and burning; afforestation; invasive species; grazing; dumping; fertilisation; restructuring agricultural land; communication routes; cultivation; mowing/cutting; modification of inland water structures; sand and gravel extraction.
Active raised bogs	7110	Peat Cutting, grazing, burning.
Old sessile oak woods with Ilex and Blechnum in British Isles	91A0	Internal effects include inappropriate grazing levels and invasive species, whereas external threats include clearance for agriculture or felling for timber.
Alkaline fens	7230	Fertilisation, grazing , forestry, burning, leisure fishing, hunting, peat extraction, dispersed habitation, discharges, sport and leisure structures, pollution, drainage, erosion , invasive species.
Calcareous fens with Cladium mariscus and species of the Caricion davallianae	7210	Overgrazing, Restructuring agricultural land holding, Peat Extraction, Mechanical removal of peat, Water pollution. Landfill, land reclamation and drying out, general. Infilling ditches, dykes, ponds, marshes and pits.
Limestone pavements	8240	Removal of limestone pavement, removal of scrub, dispersed habitation, stock feeding, agricultural improvement, quarry, disposal inert material, electricity lines, infilling wetlands, routes, abandonment of grazing, agricultural structure, burning, discharges, disposal household waste, dumping dredgings, forestry, grazing, improved access, landfill, nautical sports, paths and restructuring agric land holding.
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)	6210	Invasion by a species, Undergrazing, Fertilisation, Agricultural improvement, Abandonment of pastoral systems, Sand & gravel extraction.
Bog woodland	91D0	Burning, Mechanical removal of peat, Drainage.
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	3260	Fertilisation, grazing, forestry, peat extraction, pollution, drainage, invasive species.
Petrifying springs with tufa formation (Cratoneurion)	7220	Peat cutting, arterial drainage, local drainage, water abstraction, agricultural reclamation.
Degraded raised bogs still capable of natural regeneration	7120	Peat cutting, arterial drainage, local drainage, water abstraction, agricultural reclamation.
Depressions on peat substrates of the Rhynchosporion	7150	Peat cutting; drainage and burning; afforestation; invasive species; grazing; dumping; fertilisation; restructuring agricultural land; communication routes; cultivation;

		mowing/cutting; modification of inland water structures; sand and gravel extraction.
Otter (*Lutra lutra*)	1355	Use of pesticides, fertilization, hunting, trapping, poisoning, water pollution, infilling of ditches, dykes, ponds, pools, marshes or pits, management of aquatic and bank vegetation for drainage purposes, removal of sediments, canalization of inland water course.
Slender Naiad (*Najas flexilis*)	1833	Water pollution, water abstraction, invasive species, forestry and farming.
Atlantic Salmon (*Salmo salar*)	1106	Water pollution, invasive species, forestry, farming and fishing.
Freshwater Pearl-mussel (*Margaritifera margaritifera*)	1029	Water pollution, water abstraction, invasive species, forestry and farming.
Sea Lamprey *(Petromyzon marinus)*	1095	Fish passages, water pollution (including discharges), commercial fishing, invasive species, forestry and farming.
Brook Lamprey *(Lampetra planeri)*	1096	Fish passages, water pollution (including discharges), commercial fishing, invasive species, forestry and farming.
Lesser Horseshoe Bat (*Rhinolophus hipposideros)*	1303	Loss of suitable summer and winter roosting sites due to the demolition or renovation of derelict buildings for human occupation, loss of commuting routes linking roosts to foraging sites, and loss of suitable foraging sites are the major threats to this species. The use of insecticides, habitat destruction such as felling of trees and scrub clearance and deterioration of old buildings.
White-clawed Crayfish (*Austropotamobius pallipes)*	1092	Water pollution, invasive species, forestry and farming.
Shining Sickle-moss (*Drepanocladus vernicosus*)	1393	Fertilisation, Abandonment of pastoral systems, Undergrazing, Forestry planting, Water pollution, Drainage

Table 4: Qualifying Interests of Connemara Bog Complex SAC including main threats

Habitat name (cSAC Qualifying Feature)	Habitat code	Main Threats to the qualifying feature
Coastal lagoons	1150	Flooding, storms, sedimentation
Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)	3110	Fertilisation, grazing, forestry, burning, leisure fishing, hunting, peat extraction, dispersed habitation, discharges, sport and leisure structures, pollution, drainage, erosion , invasive species.
Molinia meadows on calcareous, peaty or clavey-silt-laden soils (Molinion caeruleae)	6410	Drainage and burning; afforestation; invasive species; grazing; dumping; fertilisation; restructuring agricultural land; communication routes; cultivation; mowing/cutting; modification of inland water structures; sand and gravel extraction.
Blanket bogs (if active bogs)	7130	Peat Cutting, grazing, burning.

Transition mires and quaking bogs	7140	Drainage and burning
Old sessile oak woods with Ilex and Blechnum in British Isles	91A0	Internal effects include inappropriate grazing levels and invasive species, whereas external threats include clearance for agriculture or felling for timber.
Alkaline fens	7230	Fertilisation, grazing , forestry, burning, leisure fishing, hunting, peat extraction, dispersed habitation, discharges, sport and leisure structures, pollution, drainage, erosion , invasive species.
Reefs	1170	Invasive species, pollution, dams
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	3260	Fertilisation, grazing, forestry, peat extraction, pollution, drainage, invasive species.
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea	3130	Fertilisation, grazing, forestry, peat extraction, pollution, drainage, invasive species.
Natural dystrophic lakes and ponds	3160	Fertilisation, grazing, forestry, peat extraction, pollution, drainage, invasive species.
Northern Atlantic wet heaths with Erica tetralix	4010	Burning, nutrient enrichment, overgrazing, succession
European dry heaths	4030	Burning, nutrient enrichment, overgrazing, succession
Depressions on peat substrates of the Rhynchosporion	7150	Peat cutting; drainage and burning; afforestation; invasive species; grazing; dumping; fertilisation; restructuring agricultural land; communication routes; cultivation; mowing/cutting; modification of inland water structures; sand and gravel extraction.
Otter (*Lutra lutra*)	1355	Use of pesticides, fertilization, hunting, trapping, poisoning, water pollution, infilling of ditches, dykes, ponds, pools, marshes or pits, management of aquatic and bank vegetation for drainage purposes, removal of sediments, canalization of inland water course.
Slender Naiad (*Najas flexilis*)	1833	Water pollution, water abstraction, invasive species, forestry and farming.
Atlantic Salmon (*Salmo salar*)	1106	Water pollution, invasive species, forestry, farming and fishing.
Euphydryas aurinia (Marsh Fritillary)	1065	Agricultural improvement; inappropriate management of sites including abandonment of grazing; and the increasing fragmentation and isolation of its habitats.

4.4 IDENTIFICATION OF POTENTIAL IMPACTS

Potential likely ecological impacts arising from the project are identified in this section.

Description of elements of the project likely to give rise to potential ecological impacts sites.	• The proposed stock management programme is to be carried out on waters which form part of the Lough Corrib SAC and the Connemara Bog Complex SAC. • Population of *Margaritifera margaritifera* present in the Owenriff River however no electrofishing will be carried out in areas where these populations exist. Electrofishing will be solely focused on targeted pike areas. In the river this will be confined to the area of river between Lough Bofin and Lough Adrehid which is approximately 1.9 km upstream of the nearest population of *Margaritifera margaritifera* and approximately 4.5 km downstream of the next nearest population of *Margaritifera margaritifera* having no impact on these populations. • Use of equipment/vehicles/boats near watercourses (fuel/oil spills). • Increased noise levels (generators/outboard engines/equipment/human activity)
Describe any likely direct, indirect or secondary ecological impacts of the project (either alone or in combination with other plans or projects) by virtue of: ***Size and scale;*** ***Land-take;*** ***Distance from Natura 2000 Site or key features of the Site;*** ***Resource requirements;*** ***Emissions;*** ***Excavation requirements;*** ***Transportation requirements;*** ***Duration of construction, operation etc.;***	• No direct habitat loss to Natura 2000 sites. • Use of vehicles and equipment working close to the river/lake increases risk of fuel and oils pollution. • This plan establishes that electrofishing will not be carried out at or near sites where *Margaritifera margaritifera* are present. See preceding section. This is screened out as a result. • This stock management plan is not situated in any SPA. • Owenriff River important migratory route for salmon and trout. Salmonid stocks are depleted since a deliberate introduction of pike. This programme should have a positive impact to two qualifying interests on Lough Corrib SAC; Atlantic salmon and *Margaritifera margaritifera.* Pearl mussel life history is complicated, and the larval stage (glochidia) released to the river are inhaled by passing salmonid fish which act as the pearl mussels' temporary hosts. The interaction/interdependence between *Margaritifera margaritifera* and salmonids is further explored in Section 4.5.6.

4.5 ASSESSMENT OF SIGNIFICANCE OF POTENTIAL IMPACTS

This section considers the list of sites identified in section 4.3 above together with the potential ecological impacts identified in the previous section and determines whether this proposed stock management plan for the Owenriff system is necessary to the management of a Natura site or is likely to have significant effects on a Natura 2000 site. It should be noted that Atlantic salmon are classified an Annex II and Annex V species in the EU Habitats Directive and due to Atlantic salmon being a feature of interest of this SAC, management of pike stocks is necessary to the management of the Lough Corrib

SAC. For this reason, it is concluded that it is not necessary to proceed to Stage 2, full Appropriate Assessment.

An initial assessment is made in section 4.5.1, below, to determine if all sites within that likely zone of impact can be considered to be within the functional zone of a potential impact influence of the impacts identified in section 4.4 above. This assessment is conducted in compliance with the DoEHLG (2009, as amended 2010) and considers the scope, scale, nature, size and location of the project and the sensitivities of the ecological receptors particularly the features of interest and the conservation objectives that pertain. Once this determination is completed the significance of the potential significant impacts affecting the sites considered to be within a zone of potential impact influence are assessed in terms of magnitude/extent, probability and duration.

4.5.1 Natura 2000 Sites outside the Zone of Impact Influence

Some sites are outside the zone of significant impact influence of the proposed Owenriff system stock management plan, due to the size, scale and location of the proposed works and because the ecology of the species and/or the habitat in question is neither structurally nor functionally linked to the proposal works. Therefore, the conditions required to initiate a potential 'source-pathway-target' vector connecting the proposal site to these designated sites will not be created. It is further considered that no potential impact pathway connects these designated sites to the location of the proposed works and, therefore, it is objectively concluded that no significant impact on these sites is reasonably foreseeable as a result of the proposed Owenriff system stock management plan.

If the sites within Table 2 are within the zone of influence, they will be further explored in Table 5 below along with an outline rationale for their exclusion and will not be considered further in this document. These sites have been screened out according to guidance outlined by the NPWS, 2009.

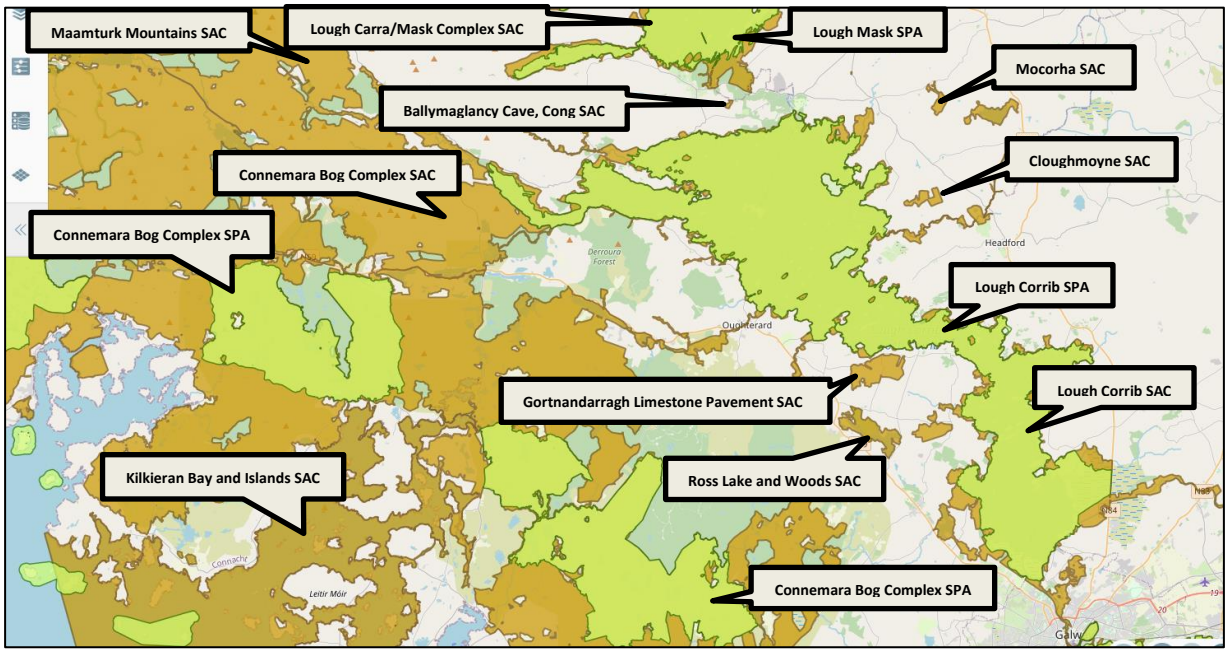

Fig 9: Natura sites within the zone of influence of the Owenriff stock management plan (EPA Maps, 2023)

Table 5: Designated sites within the zone of influence of the proposed stock management programme, with justification for no potential impact

Designated Site	Site Code	Potential Impact	Justification
Maamturk Mountains SAC	002008	No significant effects are likely	The nature of this stock management plan will not have any impact on this SAC as no project activity occurs within the footprint of the SAC, the distance involved and due to the features of interest which are: • Oligotrophic waters containing very few minerals of sandy plains • Northern Atlantic wet heaths with *Erica tetralix* • Alpine and Boreal heaths • Blanket bogs • Depressions on peat substrates of the *Rhynchosporion* • Siliceous rocky slopes with chasmophytic vegetation • *Salmo salar* (Salmon) • *Najas flexilis* (Slender Naiad)
Lough Corrib SPA	004042	No significant effects are likely	The project activities are not located in this SPA and the distance between the site and the SPA is considered sufficient, therefore no significant impacts
Ross Lake and Woods SAC	001312	No significant effects are likely	Located approximately 7km to the southeast. and designated for Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*. and Lesser Horseshoe Bat. There is no direct pathway for the proposed stock management plan to impact on this Natura site therefore no significant impacts
Kilkieran Bay and Islands SAC	002111	No significant effects are likely	Due to the considerable distance separating both sites (8.5km) and no pathway the proposed works will not have significant impacts on this designated site.
Lough Carra/Mask Complex SAC	001774	No significant effects are likely	Lough Carra/Mask Complex SAC drains into Lough Corrib SAC so it is considerably upstream (approximately 12.5km) and a grating on the Cong Canal/River restricts passage of fish from Lough Corrib to Lough Mask. As a result there will be no significant impacts.
Lough Mask SPA	004062	No significant effects are likely	Lough Mask SPA is located approximately 12.5km upstream and due to the considerable distance between these sites and Lough Mask SPA being upstream, therefore no significant impacts
Connemara Bog Complex SPA	004181	No significant effects are likely	The project activities are not located in this SPA and the distance between the site and the SPA is considered sufficient, therefore no significant impacts
Cloughmoyne SAC	000479	No significant effects are likely	Located on the eastern side of Lough Corrib approximately 10km away and designated for Limestone pavement only. There is no pathway for the proposed stock management plan to impact on this Natura site therefore no significant impacts

Gortnandarragh Limestone pavement SAC	001271	No significant effects are likely	Located on eastern side of Lough Corrib. There is no pathway for the proposed stock management plan to impact on this Natura site therefore no significant impacts
Mocorha Lough SAC	001536	No significant effects are likely	Located on the eastern side of Lough Corrib. There is no pathway for the proposed stock management plan to impact on this Natura site therefore no significant impacts

It is concluded that no significant effects are reasonably foreseeable on the following designated sites as a result of the stock management programme described at section 4.2 above.

These SAC/SPA sites will not be considered further in this document. These include;

- **Maamturk Mountains SAC 002008**
- **Lough Corrib SPA 004042**
- **Ross Lake and Woods SAC 001312**
- **Kilkieran Bay and Islands SAC 002111**
- **Lough Carra/Mask Complex SAC 001774**
- **Lough Mask SPA 004062**
- **Connemara Bog Complex SPA 004181**
- **Cloughmoyne SAC 000479**
- **Gortnagarragh Limestone pavement SAC 001271**
- **Mocorha Lough SAC 001536**

4.5.2 Natura 2000 sites within the zone of potential impact influence

Therefore, the following assessment focuses on the potential of the proposed Owenriff system stock management programme to significantly impact on the remaining designated sites, listed in Table 6.

Table 6: Designated sites within zone of potential impact influence

Natura 2000 Site	Site Code	Justification
Lough Corrib SAC	000297	Proposed stock management programme located within this site
Connemara Bog Complex SAC	002034	Proposed stock management programme located within this site

4.5.3 Assessment of potential impacts to designated sites potentially within the zone of impact influence

Only those features of the proposed stock management plan on the Owenriff system that may result in a significant/potentially significant effect on qualifying features and conservation objectives of the identified Natura 2000 sites, potentially within the zone of influence (listed in Table 6 above) are

considered. A number of factors were examined at this stage and dismissed or carried forward for NIS (stage 2) if required. The likelihood of significant effects to a Natura 2000 site from the project was determined based on a number of indicators including:

- Habitat loss
- Habitat alteration
- Habitat or species fragmentation
- Disturbance and/or displacement of species
- Water quality and resource

The likelihood of significant cumulative/in-combination effects is assessed in Section 4.5.8, below.

4.5.4 Habitat Loss and Alteration

The proposed stock management programme on the Owenriff system is situated within the designated sites of Lough Corrib SAC and the Connemara Bog Complex SAC. The proposal described in this screening 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 discrete access points. 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 project.

The proposed stock management plan will involve the setting of gill nets and perch traps in up to eight lakes which form part of the Owenriff system along with electrofishing in the lakes and a restricted section of the main channel where no populations of freshwater pearl mussel are present. Pike will be removed offsite and disposed of through a licenced renderer. All movement of vehicles into and out of the launch sites will happen so as to ensure no damage to any terrestrial habitat. Landowner permission will be secured before work commences when appropriate. No significant habitat loss or alteration is reasonably foreseeable within Lough Corrib SAC or the Connemara Bog Complex SAC as a result of the proposed stock management programme on the Owenriff system

4.5.5 Water Quality

Water quality is a feature of interest of Lough Corrib SAC. Conservation Objective 3260 states *"to maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation in Lough Corrib SAC"*. This is further defined by following a target – *"to maintain appropriate water quality to support the natural structure and functioning of the habitat"*. The Owenriff River discharges to the Atlantic Ocean through Lough Corrib immediately downstream of Oughterard. Due to the fact that the Owenriff River and catchment supports a stock of migratory salmon, brown trout and freshwater pearl mussel impacts to water quality as a result of the proposed programme are considered important. The Owenriff River has a depleted stock of Atlantic salmon considered to be as a result of a deliberate introduction of pike that predate on salmonids. Saying that, Lough Corrib itself has a good stock of Atlantic salmon, is meeting its conservation limit for same with a total allowable catch of 3331 for 2023. The Water Framework Directive Ecological Status is considered "Good Status" in both the Upper Corrib and Lower Corrib.

The refueling methodology, detailed in section 4.2.6.1 above, will prevent significant impacts to water quality as a result of accidental fuel/oil spills. Therefore, due to the fact that the likelihood of accidental spills happening is extremely low and the SOP's that will be in place to prevent significant impacts to water quality, no significant water quality impacts are reasonably foreseeable within Lough Corrib SAC or the Connemara Bog Complex SAC as a result of the proposed stock management programme on the Owenriff system.

4.5.6 Disturbance and/or Displacement of Species

Species that use the areas immediately adjacent to the proposed stock management programme, may be subject to certain levels of disturbance during the project. The main disturbance will be as a result of the increase in noise due to presence of vehicles, boats, outboard engines, generators and humans. This disturbance is not considered as having a significant effect to species and habitats.

Atlantic salmon

Gill nets and perch traps will be set strategically in locations to target pike only. These locations are chosen based on years of designing and implementing stock management plans in the Corrib catchment and the tacit knowledge held by IFI staff is considerable. The established migratory routes and behaviours of salmon will be taken into account and regular (daily) servicing of nets will take place. In assessing the potential risk to these species, the likelihood of impact to Atlantic salmon is considered to be low as the principal routes and temporal migratory patterns of Atlantic salmon at the site are well understood by IFI staff. It should be noted that this stock management programmes objective is to assist in the recovery of salmon and trout populations.

Because of the localised effect of the electrofishing equipment on the water it is not envisaged that any of the species listed as qualifying interests of the site will be impacted by the project activity. Fish captured by electrofishing are almost always completely unharmed.

It should be noted that as Atlantic salmon are classified an Annex II and Annex V species under the provisions of the EU Habitats Directive coupled with Atlantic salmon being a feature of interest of Lough Corrib SAC, management of pike stocks is necessary to the management of the Lough Corrib SAC.

Protected Bird Species

The Owenriff Stock Management Plan is not located within the footprint of any Special Protection Area (SPA).

Brook Lamprey

The brook lamprey *(Lampetra planeri)* is the smallest of the three lampreys recorded in Ireland typically reaching no more than 15-18cm in length. Unlike the sea lamprey *(Petromyzon marinus)* and the river lamprey (Lampetra fluviatilis), the brook lamprey is non-parasitic and non-migratory as an adult, living

its entire life in freshwater. Adults spawn in spring, excavating shallow nests in relatively small sized gravels in areas of reduced flow. After hatching, the larvae called ammocoetes drift or swim downstream to areas of river bed with a fine silt composition. They burrow into this bed material and live as filter feeders over a period of years before transforming into young adult fish. The Overall Status is assessed as Favourable. Brook lamprey are a qualifying interest in Lough Corrib SAC. In a study undertaken by Ecofact Environmental Consultants Ltd. on behalf of NPWS in 2006 concentrating on lamprey on the Owenriff system, no brook lamprey were found (O'Connor, 2007). As part of a "Sampling fish for the Water Framework Directive" fish stock survey carried out by IFI on the Owenriff in 2015 no brook lamprey were recorded (Kelly et al, 2015).

Brook lamprey can be found in both large and small river channels, although they are more typically found in smaller rivers (IFI, 2022) so stock management activities in the Owenriff system lakes will not impact on them as they are unlikely to be present. Due to the physiological nature of lamprey, it is unlikely that they could be captured in gill nets. The type of gill net being used for this stock management programme does not target lamprey and they have not been caught in previous stock management programmes on Lough Corrib (M Butler IFI 2022, personal communication, 14 January).

There is a possibility of encountering brook lamprey during electrofishing as their almost entirely fluvial based life cycle would indicate that their presence in juvenile form in river areas where electrofishing may be taking place is possible. Electrofishing is the standard methodology used for assessing lamprey (O'Connor 2007) and it is considered to be low impact. It is envisaged that due to this, the nature and site locations of the stock management plan and the unlikelihood of interaction with lamprey, there will be no negative impact to brook lamprey as a result of the Owenriff stock management plan.

Sea Lamprey

Sea lamprey is a qualifying interest of Lough Corrib SAC. The life cycle of the sea lamprey *(Petromyzon marinus)* contains both a marine phase and a freshwater phase. Adult sea lamprey ranging in length from 60 to 100 cm, live at sea as external parasites on host fish. Adult lamprey migrate in spring into freshwater to excavate redds or spawning nests in gravelled areas of large rivers. Records of non-migratory or 'land-locked' sea lamprey have been reported in Irish lakes including Lough Corrib. Barriers to upstream migration (e.g. weirs which limit access to spawning beds and juvenile habitat are considered the major impediment to good conservation status for sea lamprey. The Overall Status of this species is assessed as Bad. In a study undertaken by Ecofact Environmental Consultants Ltd. on behalf of NPWS in 2006 concentrating on lamprey in the Owenriff system, no sea lamprey were found (O'Connor, 2007). In a fish stock survey carried out by IFI in 2019 of Lettercraffoe Lake (part of Owenriff catchment) no sea lamprey were recorded (Kelly et al, 2017). As part of a "Sampling fish for the Water Framework Directive" fish stock survey carried out by IFI on the Owenriff in 2019 no sea lamprey were recorded either (Corcoran et al, 2020).

Due to the physiological nature of sea lamprey, it is highly unlikely that they could be captured in stock management gill nets. The type of gill net being used for this stock management programme does not target lamprey and they have not been caught in previous stock management programmes on Lough Corrib (M Butler IFI 2022, personal communication, 14 Jan). It is envisaged that due to this, the nature and site locations of the stock management plan and the unlikelihood of interaction with lamprey, there will be no negative impact to sea lamprey as a result of this proposed stock management plan.

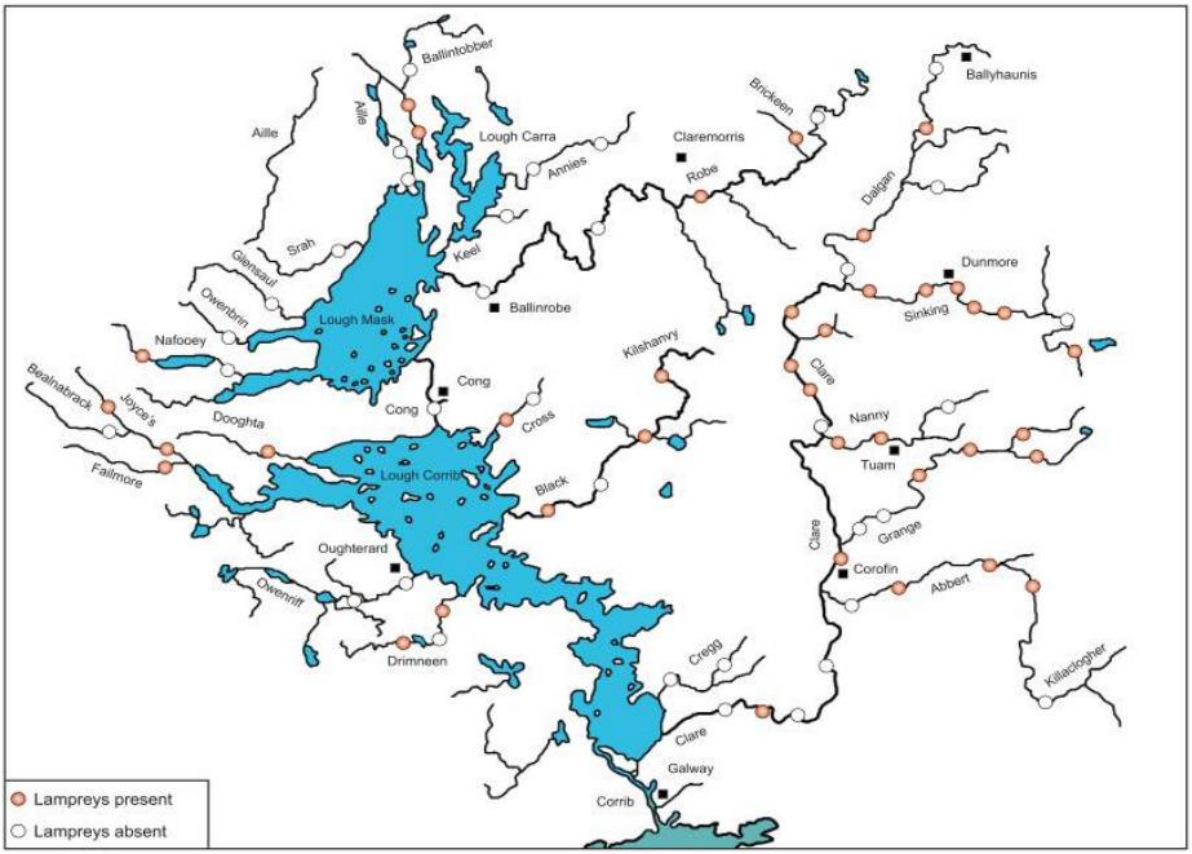

Fig. 10: Map of the Corrib catchment showing the 77 sites surveyed for Lamprey in 2006 (O'Connor, 2007)

White-clawed crayfish

The white-clawed crayfish *(Austropotamobius pallipes)* is the largest non-marine invertebrate found in Ireland. Adults can grow to approximately 11cm in length. In Ireland it occurs in small and medium-sized lakes as well as rivers and streams and this is considered to be due to the lack of competition from other crayfish species. The absence of nonnative species from North America also means the Irish population is at less risk from the crayfish plague, although plague events have occurred in Ireland. This disease kills white-clawed crayfish and is the principal cause of decline in Britain and parts of Europe. There is no shortage of potential habitat for the species. However, the threat from disease introduction is severe and not likely to disappear and as a result future prospects are considered Inadequate. The key objective is to maintain the Ireland's status as free of both non-native species and the crayfish plague disease.

Unfortunately, during 2019 a break out of Crayfish Plague was identified on the Clare River system which is within the Corrib catchment. The Overall Status is assessed as Inadequate. White-clawed crayfish is a qualifying interest in Lough Corrib SAC. As part of a "Sampling fish for the Water Framework Directive" fish stock survey carried out by IFI on the Owenriff in 2015 no white-clawed crayfish were recorded (Kelly et al, 2015). The type of gill net being used for this stock management programme does not target crayfish and they have not been caught in previous stock management programmes on Lough Corrib (M Butler IFI 2022, personal communication, 14 January).

Electrofishing is frequently used as a method for crayfish population survey, and it is internationally recognized as being relatively harmless to this species. 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. As a result, it is envisaged that there will be no negative impact to these crayfish as a result of the proposed Owenriff stock management plan.

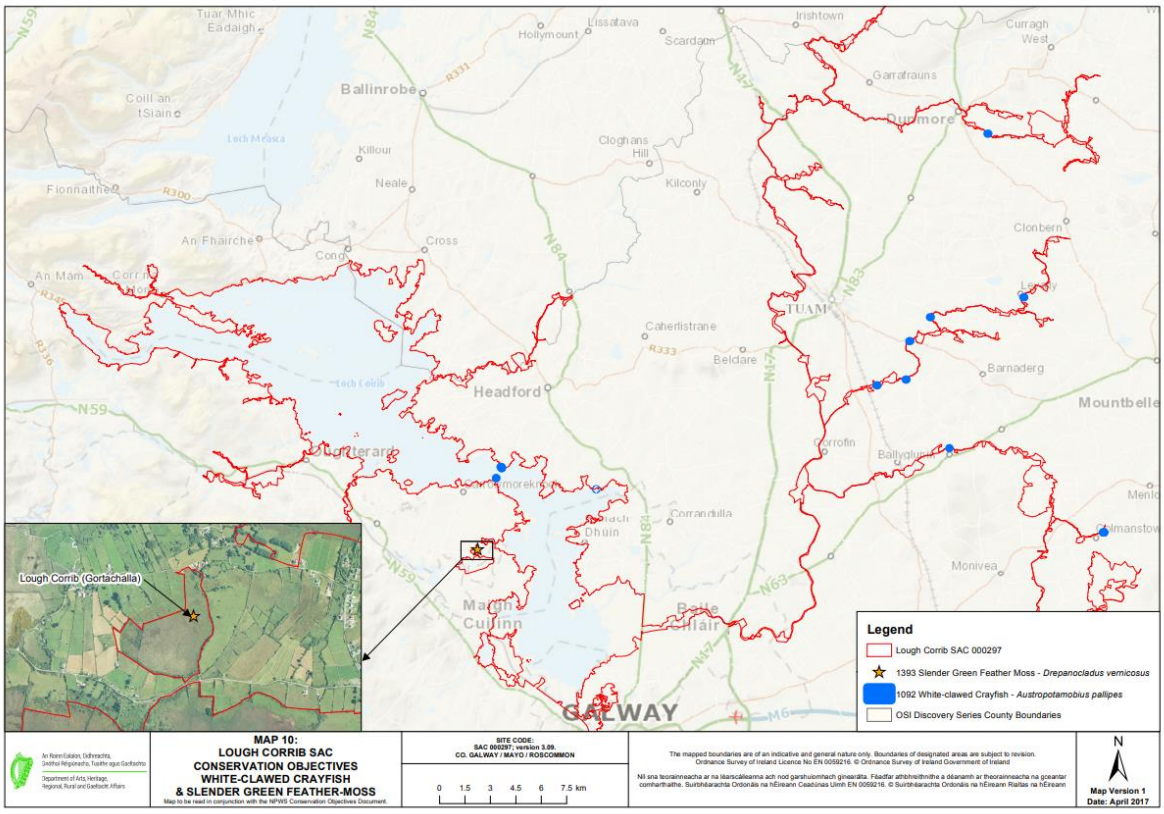

Fig.11: Lough Corrib SAC Conservation Objectives, White Clawed Crayfish & Slender Green Feather Moss (NPWS, 2017)

Freshwater pearl mussel

The Owenriff catchment is considered a "Margaritifera sensitive area" and is listed on the first schedule of the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 - S.I. No. 296/2009 which aims to support the achievement of favourable conservation status for this species. The freshwater pearl mussel is a bivalve, which is a type of mollusc or snail with a body that is almost completely enclosed between a pair of shells. For most of its life it is a filter feeder, and large quantities of water are pumped through the animal's siphons and food particles are trapped and passed to the mussel's mouth. The adult pearl mussel burrows to two-thirds of its shell depth, and is almost sessile in nature, often not moving for 100 years.

Pearl mussel life history is complicated, and the larval stage are called glochidia. A percentage of the glochidia released to the river will be inhaled by passing salmonid fish (Bauer & Vogel, 1987), which act as the pearl mussels' temporary hosts. Glochidia are simple organisms with little more than a pair of shells, an adductor muscle to snap them shut, and a layer of cells which can absorb and digest nutrients (Ziuganov et al, 1994). The valves close on a filament of the salmonid gills, and nourishment

is taken from this fish host until the glochidia are large and mature enough to exist independently (Nezlin et al. 1994; Ziuganov et al. 1994). During this time, they increase to about six times their original length. Those glochidia that survive on the fish develop into young mussels. Freshwater pearl mussel are associated with salmonid waters as outlined above but requiring a higher water quality than salmonids.

The freshwater pearl mussel is protected under Annex II and V of the EU Habitats Directive and is legally protected in Ireland under Schedule 1 of the Wildlife Act. The freshwater pearl mussel is also on the following red data lists:

- IUCN Red Data List as Endangered
- Red Data (Ireland) as Critically Endangered

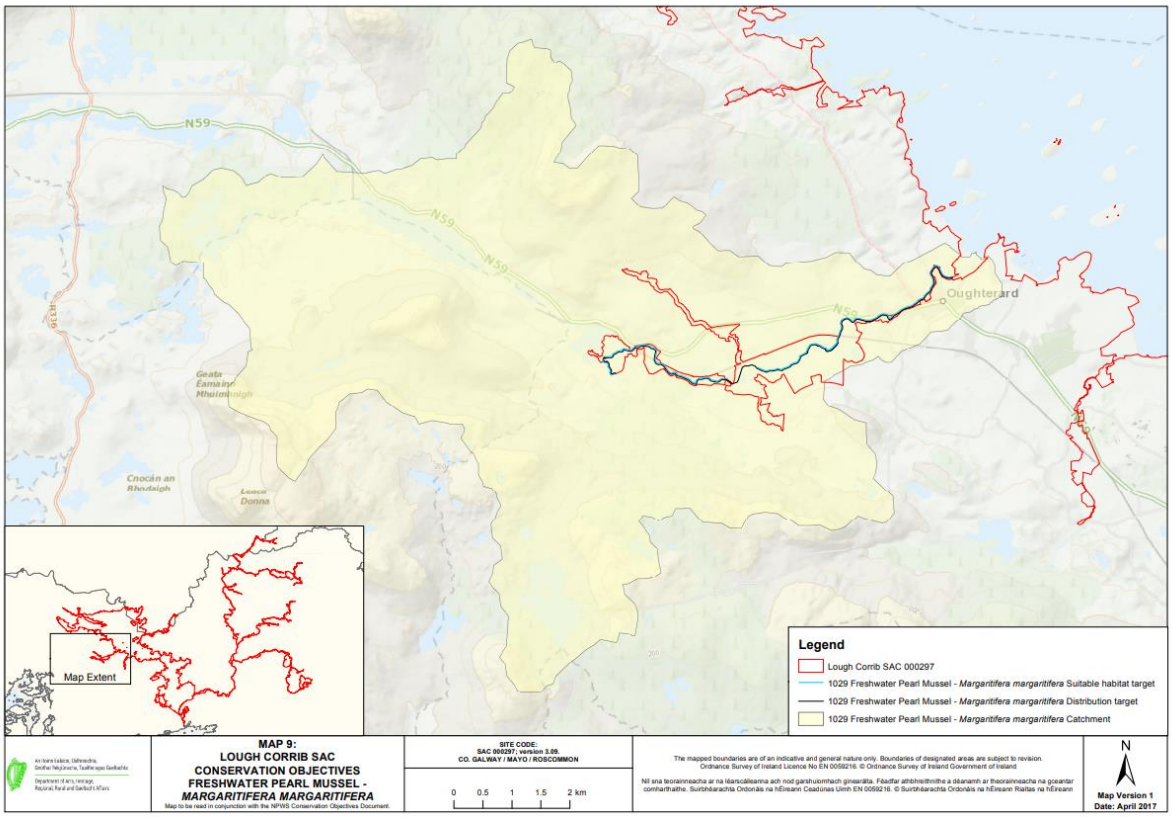

Fig.12: Lough Corrib SAC Conservation Objectives, Freshwater Pearl Mussel (NPWS, 2017)

Freshwater pearl mussel is a qualifying interest of Lough Corrib SAC and the Owenriff River supports a population of freshwater pearl mussel, the distribution of which can be seen in Figures 3 and 4. There has been a considerable decline in species distribution and numbers of freshwater pearl mussel in Ireland and across the EU. In Ireland, the latest Article 17 Report (2019) produced by NPWS indicates that the overall assessment of conservation status for freshwater pearl mussel is "Bad" and deteriorating, with few locations with recruiting populations showing near-adequate replenishment. The decline of pearl mussel populations in Ireland has mostly occurred from the continuous failure to produce new generations of mussels because of the loss of clean gravel beds, which have become infiltrated by fine sediment and/or over-grown by algae or macrophytes (Ecofact, 2015).

Section 3.6.1 "Other Pressures" in the sub catchment plan *Freshwater Pearl Mussel, Second Draft-Owenriff Sub catchment Plan, 2010* states *"The Western Regional Fisheries Board (now Inland Fisheries Ireland) now faces significant costs associated with restoring the Owenriff system to its original status as required under the EU Water Framework Directive. In view of the threat posed to salmonids (the hosts of the pearl mussel) by the unauthorized introduction of pike into many of the lakes in the Owenriff catchment. NPWS fully support the work which will need to be undertaken by the Western Regional Fisheries Board in order to restore these lakes to their original status which will also benefit the freshwater pearl mussel in achieving Favourable Conservation Status".*

Effect of electrofishing and gill netting on freshwater pearl mussel

This stock management plan does not propose to electrofish areas of the main channel where populations of freshwater pearl mussel are present. Hastie and Young carried out two experiments in the River South Esk cSAC, north-east Scotland in 2003 to test the effects of electrofishing on *Margaritifera margaritifera*. In the first experiment, two areas of mussel bed were marked out as treatment and control sites and the former was electric-fished using standard equipment. The mussels were examined 10 minutes, 24 hours and 35 days after treatment, and their shell valve closure responses, burrowing capabilities and gravidities were recorded as signs of normal functioning. In the second experiment, individual mussels were marked as treatments and controls and the former were electric-fished. These mussels were examined as before. No mortalities occurred and no significant differences in 'functioning' between treatments and controls were observed in either experiment. Since no measureable treatment effect could be demonstrated, it appears that electrofishing did not adversely affect the short-term survival of *Margaritifera margaritifera* (Hastie and Young, 2003).

This stock management plan does not propose to electro-fish areas of the main channel where populations of freshwater pearl mussel are present but the above would suggest that no negative impact to the freshwater pearl mussel would take place.

Gill netting will only take place on the lake systems within the Owenriff system, so there is no potential for this project activity to directly impact on freshwater pearl mussel, which are an exclusively river dwelling species. It is not envisaged that any negative effect to freshwater pearl mussel populations will occur as a result of the Owenriff stock management plan. No significant disturbance or displacement of species is reasonably foreseeable within Lough Corrib SAC or the Connemara Bog Complex SAC as a result of the proposed stock management programme on the Owenriff system.

Otter

Otter is also listed on Annex II of the E.U. Habitats Directive. Lough Corrib is considered one of the best sites in the country for Otter, due to the sheer size of the lake and associated rivers and streams, and also the generally high quality of the habitats. The Owenriff catchment forms part of the Corrib system. The lakes on the Owenriff system provide significant angling/leisure/boating and a significant amount of existing boating activity takes place.

The principal impacts of conservation concern regarding Otter is loss of appropriate riparian habitat for resting and reproduction. Disturbance can restrict access of wildlife to habitats and can alter habitats.

There will be no impact/damage/obstruction to the breeding and resting places of otters. Otters mark their territories with their droppings known as “spraints”.

Local IFI staff have confirmed that no otter has been recorded as being caught in Owenriff stock management plan gill nets since the commencement of stock management operations on the Owenriff system in 2018. The nature of electrofishing makes it easily detected and avoided by Otter.

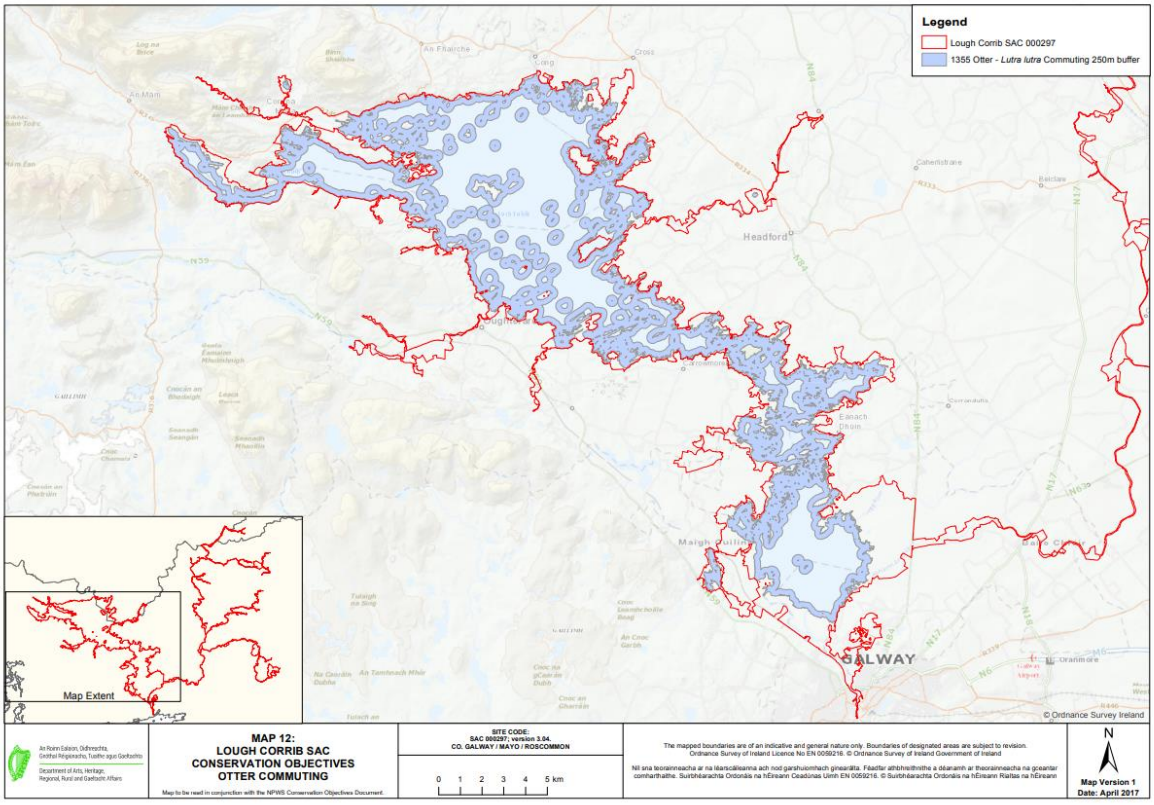

Fig.13: Lough Corrib SAC Conservation Objectives, Otter Commuting (NPWS, 2017)

In approximately thirty years of designing, implementing and reporting on stock management programmes on the Great Western Lakes, Fisheries Inspector Martin Butler communicated that an otter has never been reported as being caught in a gill net on Lough Corrib, of which the Owenriff form’s part (M Butler IFI 2022, personal communication, 14 Jan). No significant disturbance or displacement of species is reasonably foreseeable within Lough Corrib SAC or Connemara Bog Complex SAC as a result of the proposed stock management programme on the Owenriff system.

4.5.7 Habitat or Species Fragmentation

The preceding sub sections have concluded that there will be no significant direct or indirect habitat loss to any designated site nor will there be any direct or indirect disturbance or displacement of any species, along with the fact that there will be no significant impacts to water quality within nearby designated sites. Indeed, the carrying out of the Owenriff stock management plan should have a positive impact on two qualifying interests of the Lough Corrib SAC; namely Atlantic salmon and freshwater pearl mussel. Therefore, considering the conclusions in the preceding subsections and bearing in mind the location, scope, scale, duration and timing of the proposed stock management

plan, it is concluded that no significant habitat or species fragmentation impacts are reasonably foreseeable as a result of the proposed stock management programme on the Owenriff system.

4.5.8 In-combination effects

The in-combination effects from carrying out the Owenriff stock management programme can be considered positive. This programme is necessary for the management of Lough Corrib SAC. Firstly, stocks of Atlantic salmon in the Owenriff system have depleted since the deliberate introduction of pike which was reported in 2009. As Atlantic salmon are cited in Annex II and Annex V of the EU Habitats Directive and salmon are a feature of interest in Lough Corrib SAC, the implementation of this stock management plan should assist in the achieving of favourable status of Atlantic salmon in the Owenriff system. Similarly, as Atlantic salmon provides a host for juvenile *Margaritifera margaritifera*, increasing numbers of Atlantic salmon will provide an enhanced prospect for this fundamental part of the life cycle of the freshwater pearl mussel *Margaritifera margaritifera*.

Lough Corrib Stock Management Plan

This Owenriff Stock Management Plan in combination with the adjacent Lough Corrib Stock Management Plan is likely to have a positive effect in terms of assisting in the maintaining of favourable status of Atlantic salmon in the Corrib system and Lough Corrib SAC.

LARC (Lagarosiphon Research Lough Corrib)

Ongoing research and management of the aquatic invasive species *Lagarosiphon major* occurs on Lough Corrib which is downstream of the Owenriff Stock Management Plan. The CAISIE Project developed the weed control measures currently used on the lake, including mechanical harvesting and hand removal by scuba divers. The Lagarosiphon Research Lough Corrib (LARC) project aims to build on the success of the earlier CAISIE Project by testing new technologies to find and map *Lagarosiphon major.* Control operations are broken into four categories (i.e. mechanical (harvesting), physical, chemical and biological). Although few new mechanical control methods have been developed in recent times there has been some innovation related to fragment containment methods during and after harvesting/cutting, e.g. bubble curtains and debris collectors (sea bins and skimmer boats). Light exclusion still remains one of the most efficient physical control methods for controlling invasive aquatic plants. Progress has also been made in the area of biological control (Morrisey et al., 2020). The in-combination effects of this LARC project in conjunction with the Owenriff stock management plan are not considered significant apart from that whilst carrying out stock management activities on Lough Corrib, IFI staff can identify new areas of *Lagarosiphon major* spread and track the progress and success of current management activities.

Strictly complying with IFI's electrofishing and gill netting Standard Operating Procedures, the Owenriff stock management plan, in combination with other activities in the general area, will not cause significant negative adverse impacts to Lough Corrib SAC, Connemara Bog Complex SAC and other nearby designated sites.

4.6 CONCLUSION OF SCREENING STAGE

In conclusion, this stock management programme is necessary for the management of Lough Corrib SAC. To determine the potential effects, if any, of the proposed stock management plan on nearby Natura 2000 sites, a screening process for Appropriate Assessment was undertaken. It has been objectively concluded during the screening process that all the sites within the zone of influence of the plan and those with a direct or indirect pathway are not likely to be significantly impacted by the proposed stock management plan and these include:

- Lough Corrib cSAC 000297
- Maamturk Mountains SAC 002008
- Lough Corrib SPA 004042
- Ross Lake and Woods SAC 001312
- Kilkieran Bay and Islands SAC 002111
- Lough Carra/Mask Complex SAC 001774
- Lough Mask SPA 004062
- Connemara Bog Complex SPA 004181
- Connemara Bog Complex SAC 002034
- Cloughmoyne SAC 000479
- Gortnagarragh Limestone pavement SAC 001271
- Mocorha Lough SAC 001536

Based on the above, this Appropriate Assessment Screening Report is considered sufficient and the requirement to progress to Stage 2 and submit a Natura Impact Statement (NIS) is not required. Significant impacts to Natura 2000 sites are not likely.

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Appendix 1
Stages of Appropriate Assessment

Stage 1 - Screening
This is the first stage of the Appropriate Assessment process and that undertaken to determine the likelihood of significant impacts as a result of a proposed project or plan. It determines need for a full Appropriate Assessment.
If it can be concluded that no significant impacts to Natura 2000 sites are likely then the assessment can stop here. If not, it must proceed to Stage 2 for further more detailed assessment.

Stage 2 - Natura Impact Statement (NIS)
The second stage of the Appropriate Assessment process assesses the impact of the proposal (either alone or in combination with other projects or plans) on the integrity of the Natura 2000 site with respect to the conservation objectives of the site and its ecological structure and function. This is a much more detailed assessment that Stage 1. A Natura Impact Statement containing a professional scientific examination of the proposal is required and includes any mitigation measure to avoid, reduce or offset negative impacts.
If the outcome of Stage 2 is negative i.e. adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned.

Stage 3 - Assessment of alternative solutions
A detailed assessment must be undertaken to determine whether alternative ways of achieving the objective of the project/plan exists.
Where no alternatives exist the project/plan must proceed to Stage 4.

Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain
The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a Natura 2000 site where no less damaging solution exists.

Appendix 2

IFI Pike Policy

Inland Fisheries Ireland Pike Policy

Prepared by the Pike Policy Review Group August 2014

1. Executive summary.

Pike are widely distributed in Ireland and are an important component of the national angling resource. Pike thrive in the majority of Irish waters and rapidly establish themselves as the top fish predator. In productive watercourses, pike can grow to 40 lb, although fish of this size are not common. Many waters support good numbers of 10, 20 and even 30 lb pike and these are the principal quarry of the specialist pike angler. Many of these waters are also productive wild brown trout fisheries; trout is a species that can be heavily preyed upon by pike. IFI formed a group comprising internal and external experts to support the development of a policy on pike. This group would review existing pike policy and make recommendations in respect of new measures that would ensure the conservation of the species, while also protecting the broader aquatic resource. The policy group consulted broadly with pike, trout and coarse angling clubs and federations, and with a diversity of interested stakeholder groups. Based on discussions with the above groups, the best available scientific advice and following the best precautionary principles, the expert policy group put forward recommendations to ensure the best management of pike in Irish waters into the future.

2. Scope and objectives.

The Pike Policy Review Group was charged with developing policy that would ensure the conservation and protection of pike and their aquatic habitat, while also facilitating long-term sustainable social and economic value for all stakeholders. The policy aimed to follow the best precautionary principles while being cognisant of enhancing and conserving the environment for all species. The group would consider the development of policies for the management and development of pike angling, in addition to the conservation and protection of pike. Towards this end, the expert group considered all substantive issues relating to pike, associated species (primarily brown trout) and the aquatic habitat. The group confined its deliberations to the development of policy and not to matters relating to its implementation.

3. Policy development process.

The procedure on policy development is laid down by IFI. It is a very broad consultative process involving a wide diversity of stakeholders – IFI senior management, the Board of IFI, management personnel in DCENR, the National Inland Fisheries Forum and statutory consultees. It is intended that any document produced would be subject to review after three years. The policy group consisted of seven members Dr Joe Caffrey (IFI Swords) who acted as chairperson, John Chambers and John Crudden (both IFPAC), Michael Callaghan (NARA), Josie Mahon (IFI Blackrock), Liam Gavin (IFI Galway) and Mark Corps (IFI Swords). Sandra Doyle provided the secretariat services to the committee. The group met on four occasions between October 2011 and February 2012.

4. Group terms of reference.

A broad range of issues that might affect or influence policy development for pike were discussed by the group. These included the following:

• Best practice internationally.

• Irish and European legislation relating to this area.

• Existing legislation in this area.

• Corporate and other governance issues of relevance.

• The role of the private sector in the development of this resource.

While the meetings were confidential, it was deemed prudent, in certain circumstances and in respect of certain issues, to seek the input of external committee executives or other interested parties. Only when the review group agreed that this was worthwhile or, indeed, necessary, was permission to consult with these groups granted.

5. Policy recommendations.

The policy recommendations that follow were considered by the review group to be central policy issues that should be formalised by IFI. They aim to provide a framework on which to base sound and informed management of pike in Ireland into the future.

5.1 General.

1. IFI should recognise pike as an integral part of Ireland's freshwater biodiversity resource.

2. IFI should recognise pike as a valuable component of the national angling asset and as an important socio-economic driver in the country.

5.2 Pike distribution.

1. IFI should compile a comprehensive database that will inform about the detailed distribution of pike in waters throughout Ireland. It is important that details on waters that currently support pike populations and those that do not currently harbour any pike is available. The database should be updated on an ongoing basis.

5.3 Marketing of pike angling.

This group acknowledges the value the socio economic study of recreational angling has placed on angling in Ireland. As a follow on from such an exercise, the group feel that, in relation pike angling the study will inform future decisions on the protection, conservation, management and promotion of this and other species in this country. Specifically, it is recommended that:

1. Fisheries in Ireland should be marketed according to their angling potential, without compromising their primary management practices.

2. A greater marketing effort should be focused on pike angling in order to fully exploit the socio-economic potential of this species in Ireland. This should specifically include the promotion of junior and female pike angling while also recognising the importance of newer angling methods, such as fly fishing for pike. The latter represents an ever-increasing market in Europe and the USA.

3. Any Irish watercourse that regularly produces pike in excess of 1 metre in length should be actively promoted by IFI and Failte Ireland as a specimen pike fishing venue.

5.4 Management of pike in designated managed wild brown trout fisheries.

Pike management is currently operated by IFI in a small number of designated, managed wild brown trout fisheries in Ireland. These include Loughs Corrib, Mask, Carra, Conn, Cullin, Arrow and Sheelin, and a limited number of river catchments. Research conducted by IFI scientists in the past indicated that pike removal from waters such as Loughs Ennell, Owel and Derravarragh was deemed unnecessary at this time and, as a consequence, these operations were terminated. Pike management in these waters currently involves the removal of pike by netting and/or electric fishing. In addition, under Section 59 of the Fisheries Act, IFI is permitted to authorise designated angling clubs to fish for and kill pike that are caught during permitted angling competition on specified watercourses. In respect of pike management in designated managed wild brown trout fisheries, the review group recommends the following:

1. The selection of waters on which annual pike management operations will be conducted in the future will be informed by best available scientific advice. Any proposed changes from the current list of waters scheduled for pike control will be discussed with relevant stakeholders.

2. As part of ongoing IFI pike management programmes, all pike greater than or equal to 85 cm in fork length that are captured will be returned alive to the water from which they were taken.

3. The 85 cm size limit will be reviewed by IFI scientists, in consultation with the relevant stakeholders, after three years of operation. If it is considered at that time that the change in size limit has adversely affected resident wild brown trout stocks, an adjustment to the 85 cm size limit will be recommended.

4. Healthy pike of less than 85 cm that are captured during pike management programmes in these designated brown trout fisheries will be transferred to suitable recipient waters. Where possible, these waters should be within the same geographical area in order to reduce the stress imposed on the pike by the transportation process and in order to reduce costs associated with the operations. Only pike that are deemed to be in good physical condition will be transferred. Those pike that are not sufficiently healthy to survive the transfer operation will be euthanized.

5. Where trout angling clubs are permitted by IFI to assist in pike management programmes (i.e. to catch pike on rod and line) in specified waters, IFI will provide, or support the provision of, facilities to ensure that rod-caught pike of less than or equal to 85 cm will be transferred to suitable recipient waters.

5.5 Recommended legislative change.

Conservation of Pike Bye-Law No. 805 (2006) prohibits the killing of any pike greater than 50 cm in length.

1. It is recommended that, in designated managed wild brown trout fisheries, the current bye-law be amended to prohibit the killing of any pike greater than or equal to 85 cm in length. All larger rod-caught pike will be returned to the water alive. In all other waters of the State an angler will be permitted to take and kill one pike of less than or equal to 50 cm in length (as per the existing bye-law).

2. It is recommended that a media campaign to announce the changes to the existing bye-law should be mounted and appropriate signage erected at key pike angling venues.

3. It is recommended that any S59 authorisations to kill pike during angling competitions on specified wild brown trout fisheries will be considered on a case by case basis and any pike caught over 85cm will be released back into the waters.

5.6 Research programmes.

1. A list of watercourses that are suitable to receive pike from IFI pike management operations should be formulated by IFI. This list will be informed by IFI fish stock survey data.

2. It is recommended that targeted research on the efficacy of pike transfer programmes be conducted and that studies commence as soon as practicable. Research that has been conducted by IFI to quantitatively evaluate the efficacy of pike transfer operations (in respect of overall survival, growth, sustainability and catchability of transferred pike) has been inconclusive to date. Studies should be conducted in Cloondroon Lake, which has received significant numbers of netted and tagged pike from Lough Carra over the last number of years, and in Loughs Sheever and Slevens, where tagged pike from Lough Sheelin were introduced in 2011. Further such programmes should be conducted in 2013, as resources permit.

5.7 Biosecurity.

All anglers should strictly adhere to biosecurity protocols, both pre- and post- all angling sessions, in order to ensure that no invasive species and harmful fish pathogens are introduced or spread within the country.

1. Best biosecurity practice guidelines for anglers, and other key stakeholder groups, have been produced by IFI (see www.fisheriesireland.ie) and these should be circulated widely among key stakeholder groups.

2. Because of the seriousness of the risk associated with invasive species and fish pathogens, it is recommended that strict adherence to these guidelines should be made a condition of membership of all angling clubs and Federations.

3. It is further recommended that information boards and facilities to disinfect angling tackle and protective clothing should be provided at all major air and sea ports in Ireland. It should also be

mandatory for anglers travelling from abroad to show proof that their tackle (including nets, pike sacks, stink bags and protective footwear) has been disinfected prior to entering the country. Failing this, the tackle must be disinfected at the point of entry into the country.

4. International collaboration in respect of biosecurity matters must be encouraged.

5. In order to ensure that no invasive species or fish pathogens are transferred with the pike or the transfer water during IFI pike transfer operations, a best practice guide for moving fish from one watercourse to another has been produced by IFI and it is recommended that this be adhered to during all such operations.

5.8 Handling and conservation of pike.

The review group endorsed the 'Pike (Esox lucius) Handling and Conservation' leaflet that was produced by IFI and agreed that it provided comprehensive information on both angling and handling methods for pike anglers. The review group recommends that:

1. This leaflet should be advertised by IFI and copies should be circulated widely among the domestic and visiting pike angling community.

2. Angling clubs and Federations should urge their members to carefully read the leaflet and to strictly adhere to the advice given.

3. This same practice should also be adopted by pike angling competition organisers to minimise pike mortality or damage caused to hooked pike during these events.

5.9 Angler contribution.

1. It is the view of the review group that anglers should contribute towards the protection, management, development and promotion of angling and the aquatic environment in Ireland. It is recommended, however, that the mechanism(s) whereby this contribution will be gathered should be explored by a group or forum separate from the current Policy Review Groups.

2. The idea of creating a National Angler Registration Scheme is one that was well received within the Pike Policy Review Group.

5.10 Authorised persons.

The review group recognises that there is an issue with increased levels of illegal activity specifically relating to the killing of pike, in breach of the Conservation of Pike Bye-law No. 805 (2006). This is a countrywide problem, although certain geographical areas are targeted more than others. The committee recommends that:

IFI senior management investigate methods of dealing with the illegal killing of pike (and other fish species) and develop and implement an appropriate plan to address the problem, with relevant stakeholders.

5.11 Littering.

The review group recognises that the riparian habitat associated with our lakes, rivers and canals is an integral part of the fishery ecosystem and its status can significantly influence not only the productivity of the watercourse but also the experience felt by the angler. The review group recognises that there is a significant problem with littering and that this can act as a deterrent to angling. The review group recommends that:

1. IFI, in cooperation with other relevant State agencies, assist in the maintenance of these riparian habitats in order to ensure that biodiversity is enhanced, invasive species are discouraged and/or eliminated and ready and safe access for anglers is maintained.

Appendix 3

IFI Brown Trout Policy

Inland Fisheries Ireland Brown Trout Policy
Prepared by the Brown Trout Policy Review Group August 2014

Brown Trout Policy Review Group Management Recommendations

1. Executive summary.

Brown trout are one of the very few indigenous fish species in Ireland. Geographically, they are widespread, being found in every catchment in the country. In socio-economic terms, this fish species is very important, being highly regarded as an angling species by both Irish and tourist anglers alike. Because of its temperate climate and the shallow productive nature of its lakes, Ireland is the only country in Western Europe where lakes can support large trout stocks, which provides unique angling opportunities for fly fishermen. The relatively poor fish fauna in Ireland compared to other European countries means that Irish waters generally have a high capacity to support brown trout populations in the absence of many competitor and predatory fish species found in other European waters. Against this background Inland Fisheries Ireland (IFI) set up an expert group to review and draft a new policy in relation to the management of Irish brown trout stocks both from conservation and a broader fishery management perspective. Members of the group included experienced IFI personnel from a broad range of disciplines – biological, fisheries management and marketing. Irish angling interests were also well represented on this group (three members). This expert group had lengthy discussions on a broad range of pertinent issues and consulted widely with all interested parties within this sphere. Following all consultations and taking cognisance of the best available scientific advice, the expert group put forward recommendations that they felt were in the best interests of managing the brown trout resource in Ireland in the form of a policy.

2. Scope and objectives.

The Brown Trout Policy Review Group were charged with the generation of recommendations that would ensure the long-term sustainable management of this resource from both a conservation perspective while still retaining the socio-economic value of this resource to the community. The group did so in the knowledge that the trout's greatest piscivorous predator, the pike, also had a socio-economic value in some of the larger lake trout fisheries. The group confined its deliberations to policy issues, purposely omitting comment in relation to implementation issues. The group decided that a number of broader issues, while relating in part to brown trout policy, deserved consideration in their own right and, as such, lay beyond the objectives of this group. These are listed in Appendix 1.

3. Policy development process for the Brown Trout Policy Group.

The procedure on policy development is laid down by IFI. It is a very broad consultative process involving a wide diversity of stakeholders – IFI senior management, the Board of IFI, management personnel in DCENR, the National Inland Fisheries Forum and statutory consultees. It is intended that

any document produced would be subject to review after three years. The policy group consisted of seven members – Dr. Martin O'Grady (IFI Swords) who acted as chairperson, Martin Butler (IFI, Galway), Marcus Muller (IFI, Ballina) and William Walsh (IFI, Blackrock). John Chambers (IFPAC), Eamon Moore (TAFI) and Eamon Ross (NARA). Ms.Sandra Doyle (IFI, Swords) acted as secretary to the group. The group met on four occasions between October 2011 and February 2012.

4. Terms of reference.

The group were careful to take cognisance of the following before generating policy recommendations: • Best practice internationally. • Irish and European legislation relating to this area. • Existing legislation in this area. • Corporate and other governance issues of relevance. • The role of the private sector in the development of this resource.

5. Policy recommendations.

The following areas were considered to be central policy issues in relation to the management of brown trout stocks that should be incorporated into any documentation on this subject. A summary of the recommendations is provided here in relation to each of these areas.

5.1 Recommendations in the legislative area.

1. Consider the introduction of a national minimum size limit (20cm).
2. Seek to have a national "bag limit"- perhaps in line with the new national sea trout bag limit.
3. Seek the inclusion by the EU of Irish brown trout stocks in the Annex I or II species list of the Habitats Directive. On-going genetic studies of this species are illustrating the rich diverse nature of these stocks in Ireland and showing that the trout populations in our larger rivers are complex stocks entirely reliant on recruitment from their tributary sub-catchments. Failing the introduction of such a measure, consider the designation of the more important trout waters as National Heritage Areas (NHAs). The group feel strongly that wild Irish trout stocks be recognised and respected formally in law under the Fisheries Acts.
4. Consider the designation of specific rivers and lakes as managed wild brown trout fisheries. The inference here is that these waters would be managed to optimise brown trout stocks. In some instances (not all) this would recognise the validity of pike management programmes, the necessity for different regulations in relation to pike angling (see Section 5.4) and the particular sensitivity of such waters to organic pollution problems. The available IFI survey data base would place the following specific waters in this category: Lakes – Loughs Leane, Inchiquin, Corrib, Mask, Carra, Cullen, Conn, Melvin, Sheelin, Ennel, Derravaragh, Arrow, Inchiquin and Loughrea Lake. Rivers – Certain sections of many catchments which are known by IFI personnel to support quality brown trout stocks. For example, the Clare, Black and Robe Rivers in the Corrib, the Suir in Munster, the Liffey in Leinster and many more.
5. A ban on the sale of rod caught wild brown trout from any source.
6. IFI should be accommodated in law with the power to temporarily close fisheries and/or adjust regulations for brown trout fisheries in the interests of conservation in a speedier fashion than is currently available with the "bye-law system".

5.2 Recommendations in relation to hatcheries and stocking programmes.

Consideration should be given to incorporating the following into any new policy document:
1. Stocking of inbred diploid hatchery brown trout fish should be confined to ponds and lakes where an inadequate trout native trout stock is present because of a lack of spawning opportunities.
2. Supplementation of existing large natural brown trout stocks should be confined to the introduction of triploid fish.
3. The current practice of stripping wild trout, rearing them in hatchery conditions and then releasing them in either their natal stream or another watercourse should be licensed only on the basis of scientific evidence that shows that such an exercise is not likely to impinge on the natural production of the channel where the fish are being stripped or interfere with the genetic makeup of stocks in the recipient waters.
4. IFI should make every effort to redirect the anglers' focus from hatcheries to habitat enhancement projects by running educational programmes and involving anglers in pilot projects in this field.

5.3 Water quality issues.

The review group has expressed the view that the attainment and maintenance of high water quality in any brown trout fishery should be an absolute priority in any policy document relating to the management of this species. Research in recent years has illustrated clearly that trout cannot tolerate polluted conditions and require water quality values ≥ Q 3 on the EPA scale to survive. In relation to "designated brown trout waters" (see 5.1 point 4 on previous page) a special effort should be made to ensure compliance with the terms of the Water Framework Directive

5.4 Management of pike populations in designated managed wild brown trout fisheries.

The review group feel that some changes are desirable in relation to current policy on this issue. The following proposals are made:
1. The group accept the science in relation to the necessity for controlling pike stocks in "designated managed wild brown trout fisheries" – a list of these waters has been provided above in Section 5.1.4. Scientific evaluation has shown that, currently, pike management is not necessary in a few of the aforementioned waters – Loughs Derravaragh and Ennel. This is an irrelevant issue currently in relation to Loughs Leane and Melvin where no pike are present. In accepting the science there is a recognition that IFI have to undertake pike removal exercises in the aforementioned waters.
2. It is the group's view that IFI should, in relation to designated managed brown trout fisheries:
• Transfer all live pike captured, where possible, to designated coarse fisheries.
• Release all live pike captured that are ≥ 85cm in length.
• It is suggested that pike angling should be permitted on these trout fisheries with the angler being entitled to retain one fish per day that is < 85 cm in length. All pike captured by anglers' ≥ 85 cm in length should be returned alive. There is no inference here that the same regulations should apply to other pike fisheries in Ireland. Recommendations in relation to angling rules on other pike fisheries are entirely a matter for the Pike Policy Review Group.
• In the event of a trout angling group holding a pike angling competition on a designated wild brown trout fishery the same rules should apply. In these circumstances surplus pike (more than one fish per angler, per day, for fish < 85 cm) should be retained alive, if possible, and transferred to a suitable coarse fishery, assistance from IFI personnel will be crucial to the success of this operation. In certain restricted circumstances IFI may also authorise designated angling clubs to fish for and kill pike that

are caught during permitted angling competitions on designated watercourses. However all pike ≥ 85 cm caught in such competitions should be released alive.

5.5 Policy issues in relation to the licensing of State owned brown trout fisheries.

1. Consider a ten-year license strategy with performance reviews at two-year intervals.
2. A strategic plan should be made by the licence holder for the proper development of the fishery to comply with a development framework of the State body made in consultation with the angling community. The plan should be for a three to five year period and be comprehensive in terms of defining its objectives.
3. Clear regulations for all aspects of managing the fishery should be specified and enforced.
4. Regular angling returns should be made to the State.
5. Clear IFI signage should be in position at fishery boundaries, particularly in riverine situations. Signs should display the Inland Fisheries Ireland name and logo, and designation or number of the fishery. Signs should also display the opening and closing dates of the fishery. The licence holders name, logo and entitlement could appear on a secondary sign affixed below the permanent sign.

5.6 Habitat enhancement issues.

After water quality issues, the question of habitat maintenance/enhancement is regarded as the single most important issue in relation to ensuring the long-term viability of quality brown trout stocks. Any policy document in relation to this species should:
1. Recognise this fact and ensure that available resources are directed towards addressing shortfalls in this area.
2. Understand that many such programmes (shrub pruning or placement of spawning gravels in drained rivers for example) are not capital works programmes but cyclical and, of necessity, repetitive in nature.
3. Acknowledge that regular ecological/genetic surveys are essential in helping to pinpoint problem areas and measure change, thereby ensuring maximum returns on investment in this area. This is particularly important given the acceleration in recent years in relation to the introduction of exotic species – zebra mussels in most trout lakes, the spread of dace through the Rivers Barrow and Suir Catchments and the likely spread of asian clams through many catchments currently of importance as brown trout fisheries.
4. Continued liaison with a range of other State Agencies is crucial in ensuring that proposed changes in Government policy are not likely to impinge negatively on the brown trout resource.

5.7 Future research programmes.

It is crucial that wild brown trout research should continue, in tandem with developmental and marketing programmes in this field. Key features should include;-
1. On-going survey programmes to monitor change in the more important brown trout fisheries are essential - as a means of both assessing the effectiveness of various developmental exercises and evaluating the impact of new invasive species on the ecology of the resource.
2. Complete a micro-satellite DNA analysis of trout stocks in all designated managed trout fisheries in the country. The completion of such studies to date on Loughs Corrib, Mask, Ennel, the Rivers Boyne and Suir systems, in combination with available ecological data, has moved IFI's capacity to manage

these fisheries to a much higher level. Ensure that a DNA analysis programme becomes an integral part of all future large scale monitoring programmes in important brown trout catchments.
3. Strive to achieve a close working liaison between IFI research, operational and marketing staffs to ensure that all relevant personnel are kept abreast of the status of trout stocks.
4. Ensure that the current EREP (Environmental River Enhancement Programme) programme) with OPW continues. An on-going programme over the next 20 years is required to restore all drained brown trout rivers. A completion of this exercise could greatly increase the availability of quality riverine brown trout angling water and further enhance the recruitment of trout to the quality lake trout fisheries.

5.8 Marketing of brown trout angling in Ireland.

This group acknowledges the value the socio economic study of recreational angling has placed on angling in Ireland. As a follow on from such an exercise, the group feel that, in relation to brown trout in particular, investigation in relation to the following areas would be important:
• Diversity of brown trout angling product in Ireland
• Quality and quantity of prime brown trout waters
• Key brown trout angling products & defined market segments
• Key target markets
• Standards for “promotable” brown trout angling tourism
• Competitiveness
• Availability and accessibility of brown trout waters for tourist anglers
• Quality and quantity of angling infrastructure (angler-friendly accommodation, guiding services, boat hire etc.)
• Up-skilling and training for the supply side of the industry
• SWOT Analysis

5.9 Biosecurity.

All anglers should strictly adhere to biosecurity protocols, both pre- and post- all angling sessions, in order to ensure that no invasive species and harmful fish pathogens are introduced or spread within the country.
1. Best biosecurity practice guidelines for anglers, and other key stakeholder groups, have been produced by IFI (see www.fisheriesireland.ie) and these should be circulated widely among key stakeholder groups.
2. Because of the seriousness of the risk associated with invasive species and fish pathogens, it is recommended that strict adherence to these guidelines should be made a condition of membership of all angling clubs and federations.
3. It is further recommended that information boards and facilities to disinfect angling tackle and protective clothing should be provided at all major air and sea ports in Ireland. It should also be mandatory for anglers travelling from abroad to show proof that their angling equipment has been disinfected prior to entering the country. Failing this, the tackle must be disinfected at the point of entry into the country.
4. International collaboration in respect of biosecurity matters must be encouraged. Appendix 1 The brown trout policy group felt that the following list of items, while of concern to brown trout policy were broader issues that need to be addressed in other fora.

5. Angler contributions towards the management costs of inland fisheries.
6. A policy directed at the control of invasive species.
7. The necessity to develop on the findings of the socio-economic study on recreational angling.
8. A redefined role for water keepers in Ireland.
9. Tackling the question of litter control in and around fishery locations.
10. The question of regularising insurance issues for all national and tourist anglers and minimising costs in this area.

Appendix 4
Site Synopsis for Lough Corrib SAC

SITE SYNOPSIS
Version date: 01.12.2015

Site Name: Lough Corrib SAC
Site Code: 000297

Lough Corrib is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240 ha (the entire site is 20,556 ha). The lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north. The surrounding lands to the south and east are mostly pastoral farmland, while bog and heath predominate to the west and north. A number of rivers are included within the cSAC as they are important for Atlantic Salmon. These rivers include the Clare, Grange, Abbert, Sinking, Dalgan and Black to the east, as well as the Cong, Bealanabrack, Failmore, Cornamona, Drimneen and Owenriff to the west. In addition to the rivers and lake basin, adjoining areas of conservation interest, including raised bog, woodland, grassland and limestone pavement, have been incorporated into the site.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3110] Oligotrophic Waters containing very few minerals [3130] Oligotrophic to Mesotrophic Standing Waters [3140] Hard Water Lakes [3260] Floating River Vegetation [6210] Orchid-rich Calcareous Grassland* [6410] Molinia Meadows [7110] Raised Bog (Active)* [7120] Degraded Raised Bog [7150] Rhynchosporion Vegetation [7210] Cladium Fens* [7220] Petrifying Springs* [7230] Alkaline Fens [8240] Limestone Pavement* [91A0] Old Oak Woodlands [91D0] Bog Woodland* [1029] Freshwater Pearl Mussel (Margaritifera margaritifera) [1092] White-clawed Crayfish (Austropotamobius pallipes) [1095] Sea Lamprey (Petromyzon marinus) Version date: 01.12.2015 2 of 5 000297_Rev15.Docx [1096] Brook Lamprey (Lampetra planeri) [1106] Atlantic Salmon (Salmo salar) [1303] Lesser Horseshoe Bat (Rhinolophus hipposideros) [1355] Otter (Lutra lutra) [1393] Slender Green Feather-moss (Drepanocladus vernicosus) [1833] Slender Naiad (Najas flexilis)

The shallow, lime-rich waters of the southern basin of Lough Corrib support one of the most extensive beds of stoneworts (Charophytes) in Ireland, with species such as Chara aspera, C. hispida, C. delicatula, C. contraria and C. desmacantha mixed with submerged pondweeds (Potamogeton perfoliatus, P. gramineus and P. lucens), Shoreweed (Littorella uniflora) and Water Lobelia (Lobelia dortmanna). These Chara beds are an important source of food for waterfowl. In contrast, the northern basin contains more oligotrophic and acidic waters, without Chara species, but with Shoreweed, Water Lobelia, Pipewort (Eriocaulon aquaticum), Quillwort (Isoetes lacustris), Alternate Water-milfoil (Myriophyllum alternifolium) and Slender Naiad (Najas flexilis). The last-named is listed under the Flora (Protection) Order, 2015, and is an Annex II species under the E.U. Habitats Directive. Large areas of reedswamp vegetation, dominated by varying mixtures of Common Reed (Phragmites australis) and Common Club-rush (Scirpus lacustris), occur around the margins of the lake. Reedswamp usually grades into species-rich marsh vegetation characterised by Slender Sedge (Carex lasiocarpa), Water

Mint (Mentha aquatica), Water Horsetail (Equisetum fluviatile) and Bogbean (Menyanthes trifoliata). Of particular note are the extensive beds of Great Fen-sedge (Cladium mariscus) that have developed over the marly peat deposits in sheltered bays, particularly in the southeast corner of the lake. Alkaline fen vegetation is more widespread around the lake margins and includes, amongst the typically diverse range of plants, the Slender Cottongrass (Eriophorum gracile), a species protected under the Flora (Protection) Order, 2015.

Wet meadows dominated by Purple Moor-grass (Molinia caerulea) occur in seasonally flooded areas close to the lake shore. These support species such as Sharp-flowered Rush (Juncus acutiflorus), Jointed Rush (J. articulatus), Carnation Sedge (Carex panicea), Devil's-bit Scabious (Succisa pratensis), Creeping Bent (Agrostis stolonifera) and Tormentil (Potentilla erecta), amongst others. This large site contains four discrete raised bog areas and is selected for active raised bog, degraded raised bog, Rhynchosporion and bog woodland. Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (Sphagnum spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, Sphagnum lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (Rhynchospora alba) and/or Brown Beak-sedge (R. fusca), and at least some Version date: 01.12.2015 3 of 5 000297_Rev15.Docx of the following associated species, Bog Asphodel (Narthecium ossifragum), sundews (Drosera spp.), Deergrass (Scirpus cespitosus) and Carnation Sedge. At Addergoole, on the eastern shores of Lough Corrib, there is an important area of western raised bog. This bog area is one of the most westerly, relatively intact raised bogs in the country. There are also other substantial areas of raised bog along various tributaries of the Corrib in east Co. Galway, namely Slieve Bog, Lough Tee Bog and Killaclogher bog. The active parts of these bogs mostly correspond to the wettest areas, where there are well-developed surface features with hummocks, lawns and pools. It is in such areas that Rhynchosporion vegetation is best represented. The dominant species is the aquatic bog moss Sphagnum cuspidatum, which is usually accompanied by Bogbean, White Beak-sedge, Bog Asphodel, Common Cottongrass (Eriophorum angustifolium), Bog Sedge (Carex limosa) and Great Sundew (Drosera anglica). Brown Beak-sedge, a locally rare plant of wet bog pools, has been recorded from a number of the bog areas within the site. At Addergoole a substantial bog lake or soak occurs and this is infilling with large rafts of Rhynchosporion vegetation at present. This area is associated with an important area of wet bog woodland dominated by Downy Birch (Betula pubescens). The largest part of the uncut high bog comprises degraded raised bog. Degraded bog is dominated by a raised bog flora which tends to be rather species-poor because of disturbance and/or drying-out. The most conspicuous vascular plant species are usually Carnation Sedge, Heather (Calluna vulgaris), Cottongrasses, Cross-leaved Heath (Erica tetralix), Bog Asphodel and Deergrass. Bog-rosemary (Andromeda polifolia) and Cranberry (Vaccinium oxycoccos), two species indicative of raised bog habitat, are frequent on both degraded and active areas of raised bog. Sphagnum cover is generally low within degraded areas due to a combination of drying-out and frequent burning. Limestone pavement occurs along much of the shoreline in the lower Corrib basin, and supports a rich and diverse flora, including Herb-Robert (Geranium robertianum), Bloody Crane's-bill (G. sanguineum), Carline Thistle (Carlina vulgaris), Spring Gentian (Gentiana verna), Wild Thyme (Thymus praecox), Rustyback (Ceterach officinarum), Wood Sage (Teucrium scorodonia), Slender St. John's-wort (Hypericum pulchrum), Quaking-grass (Briza media) and Blue Moor-grass (Sesleria albicans). Areas of Hazel (Corylus avellana) scrub occur in

association with exposed limestone pavement and these include species such as Hawthorn (Crataegus monogyna), Buckthorn (Rhamnus catharticus), Spindle (Euonymus europaeus), with occasional Juniper (Juniperus communis). Three Red Data Book species are also found in association with limestone scrub - Alder Buckthorn (Frangula alnus), Shrubby Cinquefoil (Potentilla fruticosa) and Wood Bitter-vetch (Vicia orobus), the latter is also protected under the Flora (Protection) Order, 2015. Open areas of orchid-rich calcareous grassland are also found in association with the limestone exposures. These can support a typically rich vegetation, including many orchids such as Pyramidal Orchid (Anacamptis pyramidalis), Common Spotted-orchid (Dactylorhiza fuchsii), Early-purple Orchid (Orchis mascula), Frog Orchid (Coeloglossum Version date: 01.12.2015 4 of 5 000297_Rev15.Docx viride), Fragrant Orchid (Gymnadenia conopsea), Marsh Helleborine (Epipactis palustris), Greater Butterfly-orchid (Platanthera chlorantha) and Irish Lady's-tresses (Spiranthes romanzoffiana). The latter is protected under the Flora (Protection) Order, 2015. The Hill of Doon, located in the north-western corner of the lake, is a fine example of a Sessile Oak (Quercus petraea) woodland. The understorey is dominated by Sessile Oak, Holly (Ilex aquifolium) and occasional Juniper. There are occasional Yew (Taxus baccata) and Ash (Fraxinus excelsior), and a well-developed ground layer dominated by Bilberry (Vaccinium myrtillus), Hard Fern (Blechnum spicant) and Wood Rush (Luzula sylvatica). Woodland also occurs on some of the islands in the lake. A number of the rivers in the site support submerged and floating vegetation of the Ranunculion fluitantis and Callitricho-Batrachion, including mosses. For example, in the River Corrib species such as Shining Pondweed (Potamogeton lucens), Perfoliate Pondweed (Potamogeton perfoliatus), Small Pondweed (P. berchtoldii), Yellow Waterlily (Nuphar lutea), White Water-lily (Nymphaea alba) and stoneworts (Chara spp.) occur. The rare and Annex II-listed Slender Green Feather-moss (Drepanocladus [Hamatocaulis] vernicosus) is found at the fen at Gortachalla, north-east of Moycullen. Here it is widespread around the margins, and this constitutes a large and significant population in the national context. A very large population of another rare moss, Pseudocalliergon trifarium, is also found in this area.

The lake is rated as an internationally important site for waterfowl. Counts from 1984 to 1987 revealed a mean annual peak total of 19,994 birds. In the past a maximum peak of 38,281 birds was recorded. The lake supports internationally important numbers of Pochard (average peak 8,600) and nationally important numbers of the following species: Coot (average peak 6,756), Mute Swan (average peak 176), Tufted Duck (average peak 1,317), Cormorant (average peak 110) and Greenland Whitefronted Goose (average peak 83). The latter species is listed on Annex I of the E.U. Birds Directive. The Coot population is the largest in the country and populations of Tufted Duck and Pochard are second only to Lough Neagh. Breeding pairs of Common Scoter on the lake number 30-41 (1995 data), as well as breeding populations of Arctic Tern and Common Tern. Other bird species of note recorded from or close to the lake recently include Hen Harrier, Whooper Swan, Golden Plover and Kingfisher. All of these species are listed on Annex I of the E.U. Birds Directive. Otter and Irish Hare have been recorded regularly within this site. Both of these species are listed in the Red Data Book and are legally protected by the Wildlife Act, 1976.

Otter is also listed on Annex II of the E.U. Habitats Directive. Lough Corrib is considered one of the best sites in the country for Otter, due to the sheer size of the lake and associated rivers and streams, and also the generally high quality of the habitats. Atlantic Salmon (Salmo salar) use the lake and rivers as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be Version date: 01.12.2015 5 of 5 000297_Rev15.Docx endangered or locally threatened elsewhere in Europe and is listed on Annex II of the E.U. Habitats Directive. Lough Corrib is also a well-known fishing

lake with a very good Trout (Salmo trutta) fishery. The lake has a population of Sea Lamprey (Petromyzon marinus), a scarce, though probably under-recorded species listed on Annex II of the E.U. Habitats Directive. Brook Lamprey (Lampetra planeri), also listed on Annex II, are also known from a number of areas within the site. A population of Freshwater Pearl Mussel (Margaritifera margaritifera), a species listed on Annex II of the E.U. Habitats Directive, occurs within the site. White-clawed Crayfish (Austropotamobius pallipes), also listed on Annex II, is well distributed throughout Lough Corrib and its in-flowing rivers over limestone. A summer roost of Lesser Horseshoe Bat, another Annex II species, occurs within the site - approximately 100 animals were recorded here in 1999.

The main threats to the quality of this site are from water polluting activities resulting from intensification of agricultural activities on the eastern side of the lake, uncontrolled discharge of sewage which is causing localised eutrophication of the lake, and housing and boating development, which is causing the loss of native lakeshore vegetation. The raised bog habitats are susceptible to further degradation and drying out due to drainage and peat cutting and, on occasions, burning. Peat cutting threatens Addergoole Bog and already a substantial area of it has been cut away. Fishing and shooting occur in and around the lake. Introduction of exotic crayfish species or the crayfish fungal plague (Aphanomyces astaci) could have a serious impact on the native crayfish population. The bat roost is susceptible to disturbance or development. Despite these ongoing issues, however, Lough Corrib is one the best examples of a large lacustrine catchment system in Ireland, with a range of habitats and species still well represented. These include 15 habitats which are listed on Annex I of the E.U. Habitats Directive, six of which are priority habitats, and nine species which are listed on Annex II. The lake is also internationally important for birds and is designated as a Special Protection Area.

Appendix 5
Site Synopsis – Connemara Bog Complex SAC

SITE SYNOPSIS Version date: 08.12.2015 1 of 5 002034_ Rev15.Docx
Site Name: Connemara Bog Complex SAC
Site Code: 002034

The Connemara Bog Complex SAC is a large site encompassing the majority of the south Connemara lowlands in Co. Galway. The site is bounded to the north by the Galway–Clifden road and stretches as far east as the Moycullen–Spiddal road. The site supports a wide range of habitats, including extensive tracts of western blanket bog, which form the core interest, as well as areas of heath, fen, woodlands, lakes, rivers and coastal habitats. The site is underlain predominantly by various Galway granites, with small areas along the northern boundary of Lakes Marble, schist and gneiss. The Roundstone Bog area has a diverse bedrock geology composed mainly of the basic intrusive rock, gabbro. An area of rock, possibly Cambrian in age, called the Delaney Dome Formation occurs in the north-west of this area. Gabbro also occurs in the Kilkieran peninsula and near Cashel. The whole area was glaciated in the last Ice Age which scoured the lowlands of Connemara.

The Connemara Bog Complex is characterized by areas of deep peat surrounded by rocky granite outcrops covered by heath vegetation. However, the main habitat within this site is lowland Atlantic blanket bog, as most of the area is covered by blanket peat greater than 1 m in depth. A mosaic of different communities exists in association with the blanket bog, including hummock/hollow systems, interconnecting bog pools, flushes, transition and quaking mires, freshwater marshes, lakeshore, lake and river systems. The key plant species of lowland blanket bog are Black Bog-rush (Schoenus nigricans), Purple Moor-grass (Molinia caerulea), Crossleaved Heath (Erica tetralix), Deergrass (Scirpus cespitosus), Common Cottongrass (Eriophorum angustifolium), Bog Asphodel (Narthecium ossifragum), White Beak-sedge (Rhynchospora alba) and bog moss species (Sphagnum spp.). Rhynchosporion vegetation is found on the blanket bog by lake and pool margins, in wet hollows and in quaking areas. Species such as White Beak-sedge, Common Cottongrass, Bogbean (Menyanthes trifoliata), sundews (Drosera spp.) and bog mosses are common. Areas of wet heath are widespread throughout this site, where blanket peat becomes shallower. There is a limited amount of dry heath, with species such as Western Gorse (Ulex gallii), St. Dabeoc's Heath (Daboecia cantabrica) and Bell Heather (Erica cinerea) recorded. Both oligotrophic and dystrophic lakes are found within Connemara Bog Complex SAC, with the greatest concentration in the west of the site. The latter type are generally smaller, have a mainly peaty bottom and there is generally an abrupt transition from blanket bog to open water. Oligotrophic lakes in this site typically have shallow margins, with a mixed rocky/peaty bottom. Typical plant species of the lake edges include Water Lobelia (Lobelia dortmanna), Pipewort (Eriocaulon aquaticum), Shoreweed (Littorella uniflora), Many-stalked Spike-rush (Eleocharis multicaulis) and Bulbous Rush (Juncus bulbosus). The rare species Slender Naiad (Najas flexilis) and Pillwort (Pilularia globulifera) have both been recorded from oligotrophic lakes at this site. Species commonly encountered in dystrophic lakes/pools include the bog mosses Sphagnum auriculatum var. auriculatum and S. cuspidatum, along with White Beak-sedge, Lesser Bladderwort (Utricularia minor), Pipewort and Bogbean. The main river systems within the site are the Owenmore (Ballynahinch) river,

the Glashanasmearany and Derrygauna rivers (to the south of Lough Bofin), the Cashla river (which flows out of Glenicmurrin Lough), the Glengawbeg river (which connects Lough Agraffard and Lettercraffoe Lough) and the Owenboliska river and its tributaries (north of Spiddal). Vegetation associated with some of these waterways includes Alternate Water-milfoil (Myriophyllum alternifolium), Bulbous Rush, Floating Club-rush (Scirpus fluitans), water-lilies, Great Fen-sedge (Cladium mariscus), Bog Pondweed (Potamogeton polygonifolius), Broad-leaved Pondweed (P. natans), Water Horsetail (Equisetum fluviatile) and the liverwort Scapania undulata.

Within this site, areas of transition mire occur mainly along the margins of lakes and bog streams. The surface of such areas is typically quaking and there is often evidence of base-enrichment. Typical plant species include Bog-sedge (Carex limosa), Slender Sedge (C. lasiocarpa), Bog Pondweed, Bogbean, Blunt-flowered Rush (Juncus subnodulosus), Common Cottongrass, Purple Moor-grass and White Beak-sedge. Locally there may be some Great Fen-sedge or Black Bog-rush. The rare and legally protected species Slender Cottongrass (Eriophorum gracile) occurs in this habitat. Moss cover is variable. Areas of Molinia meadow at this site contain species such as Purple Moor-grass, Meadow Thistle (Cirsium dissectum), Sharp-flowered Rush (Juncus acutiflorus) and Tormentil (Potentilla erecta). The community occurs on wet acid soils. There are a number of areas of old oak woodland, but the woodland at Shannawoneen, north of Spiddal, is the best known. This woodland lies in the valley of the Owenboliska river. It provides a good example of a Sessile Oak (Quercus petraea) dominated canopy woodland, although there is also a lot of Downy Birch (Betula pubescens). Other examples of this habitat at the site are found at Ballynahinch, Glendollagh, Derrywaking Lake, as well as on some of the lake islands. The invasive alien shrub Rhododendron (Rhododendron ponticum) is found in some areas of woodland.

There are some limited, but nonetheless well developed, examples of alkaline fen at this site. These fens are often species-rich, and support species not typically found in association with blanket bog areas - e.g. Dioecious Sedge (C. dioica), Black Bog-rush, Broad-leaved Cottongrass (E. latifolium), the moss Campylium stellatum and Lesser Clubmoss (Selaginella selaginoides). Four main lagoons occur within this site: Lough Ahalia, Doire Bhanbh, Lough Aconeera and Salt Lake. All four are regarded as saline lake lagoons and they range in size from 1–90 ha. The smallest (Doire Bhanbh) is quite shallow and surrounded by Common Reed (Phragmites australis) swamp, while the three larger lagoons are relatively deep and are surrounded by moorland and exposed granite. Salt Lake contains a serpulid worm reef. Lough Ahalia consists of a series of basins, and these are deep in places, with an unusual salinity structure. The lowest lake is relatively shallow (0–4 m) and brackish throughout, while the middle lake is deep (13 m) and permanently stratified, with water below 3 m depth measuring 14 ppt.

The flora and fauna of this lagoon system are extremely diverse, with many communities found. This, along with Lough Aconeera, is the only known site in Ireland for the Red Data Book stonewort Chara balthica. Another Red Data Book plant, Lamprothamnium papulosum, also occurs, as well as Chara aspera and C. virgata. An unusual form of Fennel Pondweed (Potamogeton pectinatus) occurs in high salinity water. There are a number of other notable records of plant and animal from this lagoon. Lough Aconeera is less remarkable in terms of flora and fauna, but nonetheless supports a sizeable number of lagoonal specialists.

Nine species protected under the Flora (Protection) Order, 2015, occur within this site: Forked Spleenwort (Asplenium septentrionale), Parsley Fern (Cryptogramma crispa), Bog Hair-grass

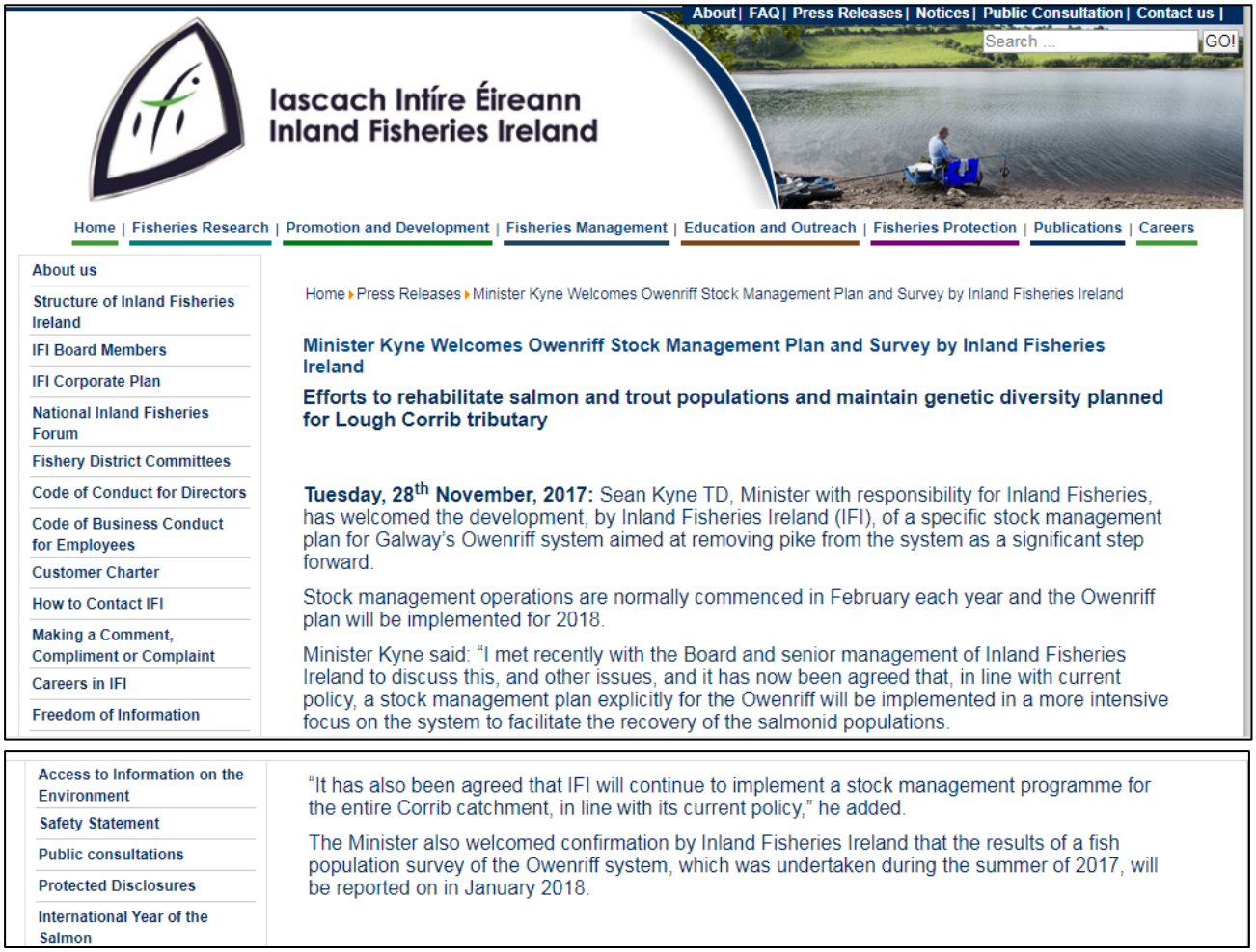
(Deschampsia setacea), Slender Cottongrass, Bog Orchid (Hammarbya paludosa), Slender Naiad, Heath Cudweed (Omalotheca sylvatica), Pillwort and Pale Dog-violet (Viola lactea). Rare and threatened species such as Dorset Heath (Erica ciliaris), Mackay's Heath (Erica mackaiana) and Green-winged Orchid (Orchis morio) also occur within this site. All of the above species are listed in the Irish Red Data Book, and Slender Naiad is listed on Annex II of the E.U. Habitats Directive. The Annex II butterfly species, Marsh Fritillary, is known to occur at this site. Atlantic Salmon, a species listed under Annex II of the E.U. Habitats Directive, occurs in many of the rivers within the site.

The Cashla and Ballynahinch systems are good examples of western acidic spate rivers which support the species. Good spawning and nursery grounds for the species occur in these systems. Arctic Char occurs in a number of lakes within the site: Ballynahinch Lake, Glenicmurrin Lough and Lough Shindilla. The species has also been reported from Lough Oorid and Lough Glendollagh in the past, but has not been recorded from these lakes in recent years. Arctic Char is listed as threatened in the Irish Red Data Book. Otter have been recorded as occurring in the Connemara Bog Complex. Irish Hare, another mammal listed in the Red Data Book, occurs on the site. Common Frog breeds on the site. The site is of national importance for wintering populations of Greenland Whitefronted Goose. Small flocks (up to 30) are found on Roundstone Bog and also use the bogs between Recess and Maam Cross. In April 1989 a synchronised ground and air census of the Connemara bogs located 7 flocks of Greenland White-fronted Goose, totalling 134–137 birds. In 1991/93 wintering numbers were considered to be approximately 60 birds. There is an internationally important breeding area for Cormorants at Lough Scannive with 218 pairs present in 1985 in a colony which is known to have existed pre-1968. Golden Plover, a species listed on Annex I of the E.U. Birds Directive, nests at up to four locations in the site, with a maximum of two pairs noted at any one location.

Another Annex I species known to be present in the site is Merlin. Lough Naskanniva is an important inland breeding site for Common Terns (up to 60 pairs in 1977 and 1992) and Choughs, both of which are also Annex I species under the E.U. Birds Directive. The main damaging operations and threats in the Connemara Bog Complex are peat cutting, over-grazing and afforestation. Extensive peat extraction using 'Difco' machines has become common in the region in recent years, and cutting by excavator and hopper is also increasing. The hand-cutting of peat is less threatening as it is usually on a much smaller scale, but nonetheless it should be controlled within the site. Over-grazing and poaching by sheep and cattle is a widespread problem within the site, with erosion of peat ensuing. The above operations are the most extensive but other threats and potentially damaging operations include land drainage and reclamation, fertilization, quarrying and dumping. In summary, the Connemara Bog Complex encompasses a large area of relatively undamaged lowland Atlantic blanket bog of high conservation significance both in Ireland and at a European level. The site also contains good examples of at least 13 other habitats listed on Annex I of the E.U. Habitats Directive, as well as four species listed in Annex II. Further, the site supports a number of threatened and protected plant species. The site is internationally important for Cormorant and nationally important for Greenland White-fronted Goose, and contains nesting sites for Golden Plover.

Appendix 6

Minister Kyne welcomes Owenriff stock management plan and survey by Inland Fisheries Ireland



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Minister Kyne Welcomes Owenriff Stock Management Plan and Survey by Inland Fisheries Ireland

Efforts to rehabilitate salmon and trout populations and maintain genetic diversity planned for Lough Corrib tributary

Tuesday, 28th November, 2017: Sean Kyne TD, Minister with responsibility for Inland Fisheries, has welcomed the development, by Inland Fisheries Ireland (IFI), of a specific stock management plan for Galway's Owenriff system aimed at removing pike from the system as a significant step forward.

Stock management operations are normally commenced in February each year and the Owenriff plan will be implemented for 2018.

Minister Kyne said: "I met recently with the Board and senior management of Inland Fisheries Ireland to discuss this, and other issues, and it has now been agreed that, in line with current policy, a stock management plan explicitly for the Owenriff will be implemented in a more intensive focus on the system to facilitate the recovery of the salmonid populations.

"It has also been agreed that IFI will continue to implement a stock management programme for the entire Corrib catchment, in line with its current policy," he added.

The Minister also welcomed confirmation by Inland Fisheries Ireland that the results of a fish population survey of the Owenriff system, which was undertaken during the summer of 2017, will be reported on in January 2018.