APPENDIX VII

Iascach Intíre Éireann
Inland Fisheries Ireland

Screening for Appropriate Assessment

Stock Management Lough Inagh

Inland Fisheries Ireland

Cashel

County Galway

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1. SUMMARY OF FINDINGS

1.1 SCREENING FOR APPROPRIATE ASSESSMENT

Project Title	Stock Management Lough Inagh_WRBD
Project Proponent	Inland Fisheries Ireland, Cashel, County Galway
Project Location	Lough Inagh, Connemara, Co.Galway
Conclusion	It has been objectively concluded during the screening process that the Natura 2000 sites within 15km of the proposed project are not likely to be significantly impacted by the proposed work. The management strategy will have a positive effect on the Annex II species Salmo Salar and have no effect on the Annex I habitat These sites are: • Mweelrea/Sheefry/Erriff Complex SAC 001932 • Connemara Bog Complex SAC 001529 • West Connacht Coast SAC 002998 • The Twelve Bens Garraun Complex SAC 002031 • Maumturk Mountain SAC 002008

2. INTRODUCTION

2.1 PURPOSE OF ASSESSMENT

This Screening for Appropriate Assessment has been undertaken to determine the potential for significant impacts of the proposed stock management and removal of perch from Lough Inagh. The proposed works are to determine the population size and structure of the introduced perch population and limit the effects of the species on salmon and sea trout fry due to increased competition for food and resources within the lake system. The stock management project may prevent the species from expanding further within the Ballinahinch River catchment

This Screening for Appropriate Assessment has been undertaken by Inland Fisheries Ireland, Cashel, County Galway.

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
- National Parks and Wildlife Service (NPWS)
- Teagasc soil area maps (NBDC website)
- Geological Survey Ireland (GSI) area maps
- Environmental Protection Agency (EPA) water quality data
- Western River Basin District (WRBD) datasets (Water Framework Directive)
- 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 receiving environment
- 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 screening stage

4.1 MANAGEMENT OF NATURA 2000 SITES

- The proposal is connected with the management of a Maumturk Mountain SAC

4.2 DESCRIPTION OF PLAN/PROJECT

4.2.1 Brief Project Description

The proposed stock management involves the sampling, population locating, Population density and removal of perch from the Lake. The perch are to be removed via perch traps which have been developed by IFI and its predecessor the Western Regional Fisheries Board. All traps in modern day use have otter guards.

- Deployment of perch traps in designated areas of Lough Inagh initially
- Deployment of Perch traps to ascertain the spread and size of the population
- Ascertain the most effective areas to deploy the traps
- Removal of the perch caught in the traps from the Lake

4.2.2 Purpose of the Project

The project proposes to determine the population size and structure of the introduced perch population and limit the effects of the species on salmon and sea trout fry due to increased competition for food and resources within the lake system. The stock management project may prevent the species from expanding further within the Ballinahinch River catchment.

4.2.3 Site Location

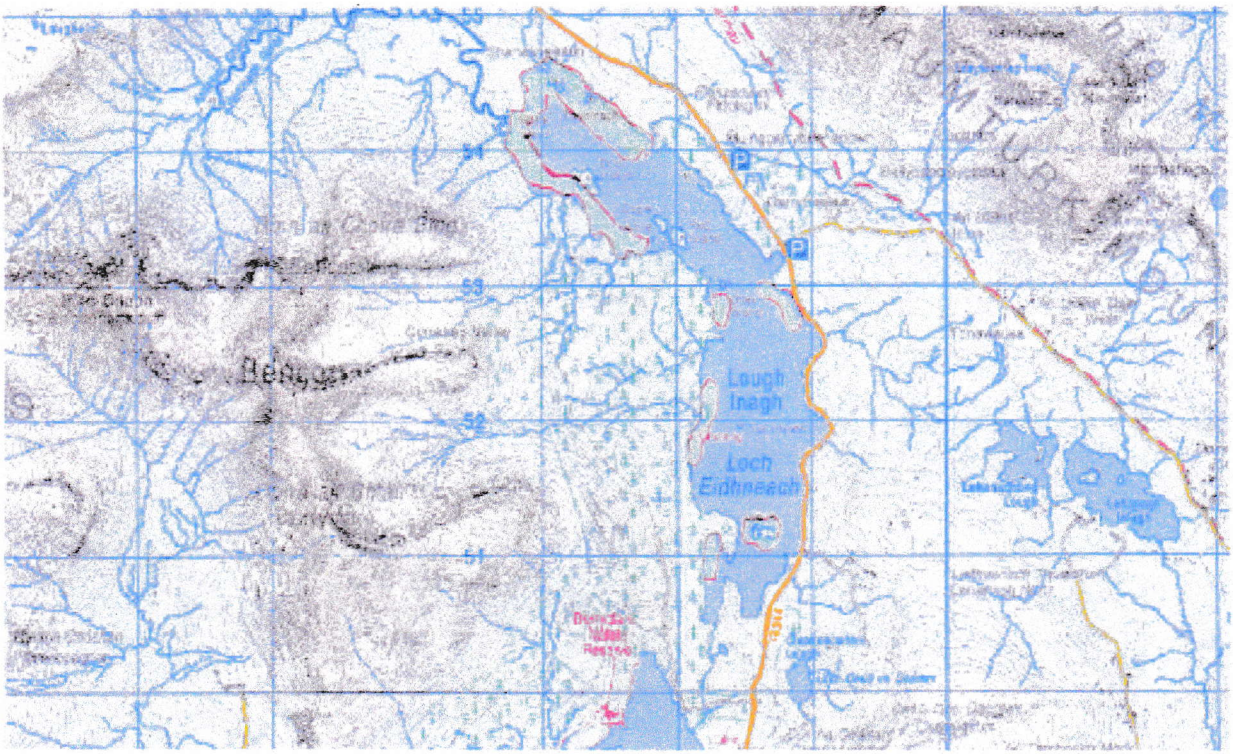

Fig.1 Site location in Lough Inagh

4.2.4 Description of the Site

The proposed stock management will be limited to Lough Inagh. Lough Inagh is fed from several mountain streams in the area, but most importantly from the Gleninagh River that starts high up in the Gleninagh Valley on the slopes of Benbaun and Bencollaghduff, and the Tooreennacoona River. After flowing into Lough Inagh, the river flows into Derryclare Lough, and then into Ballynahinch Lake, where it eventually joins the Owenmore River and flows into Bertraghboy Bay. The lake is located on the upper end of the Ballinahinch system. These rivers and lough Inagh provide significant habitat and nursery area for the Owenmore River system and a significant proportion of the multi sea winter salmon stock emanate from this valley. The lake and production areas provide habitat for sea trout and artic charr. Both species have diminished populations in the last twenty years.

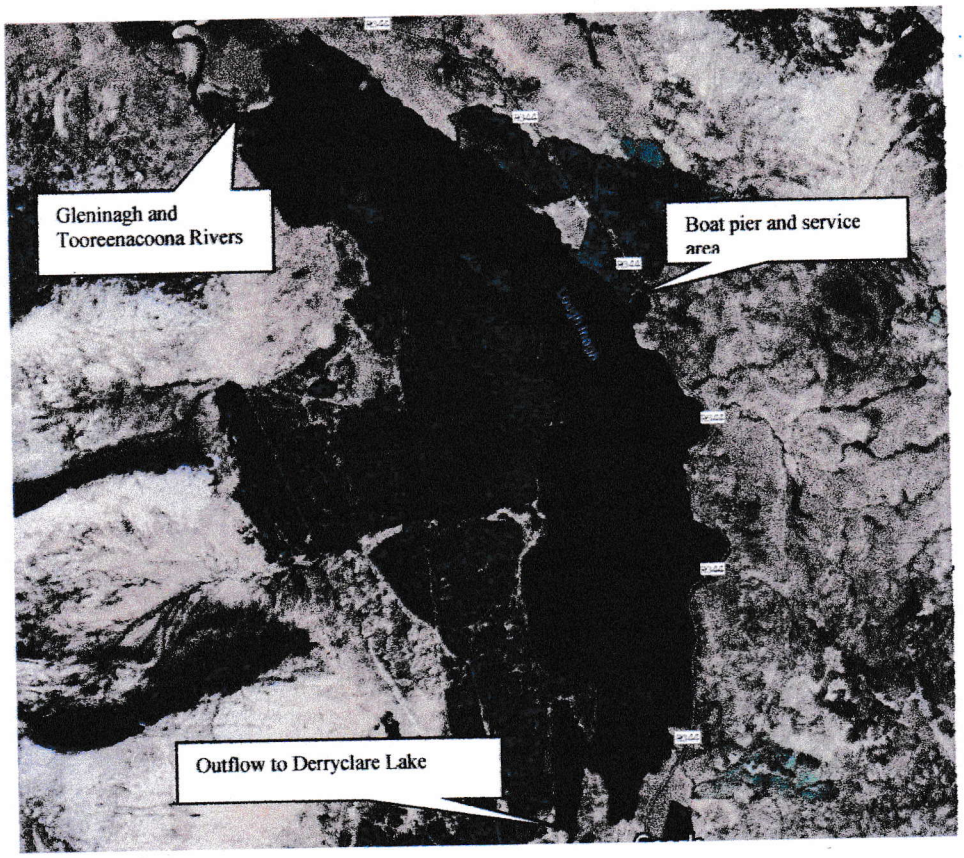

Fig.2 Arial view showing Lough Inagh

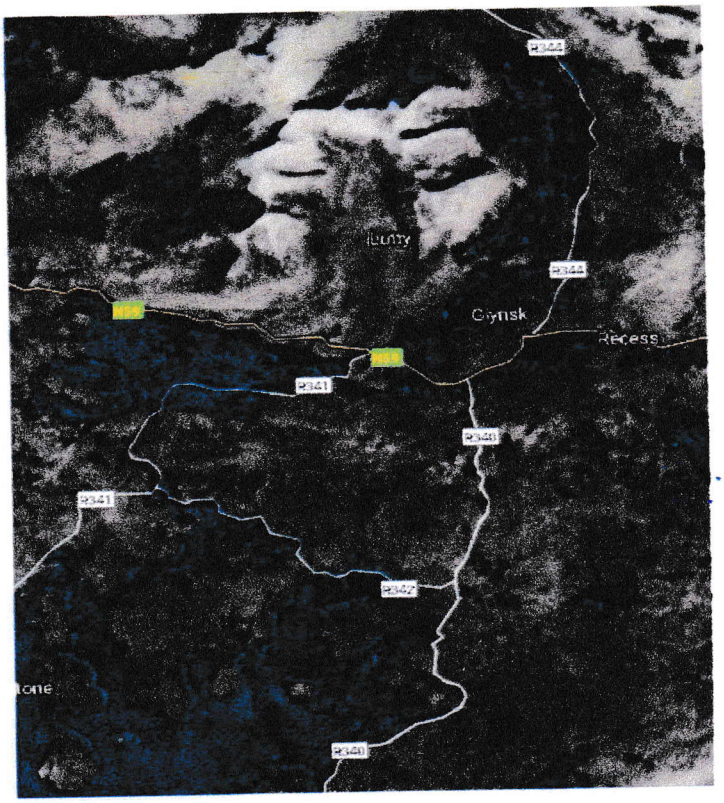

Fig.3 Ballinahinch/Owenmore Catchment

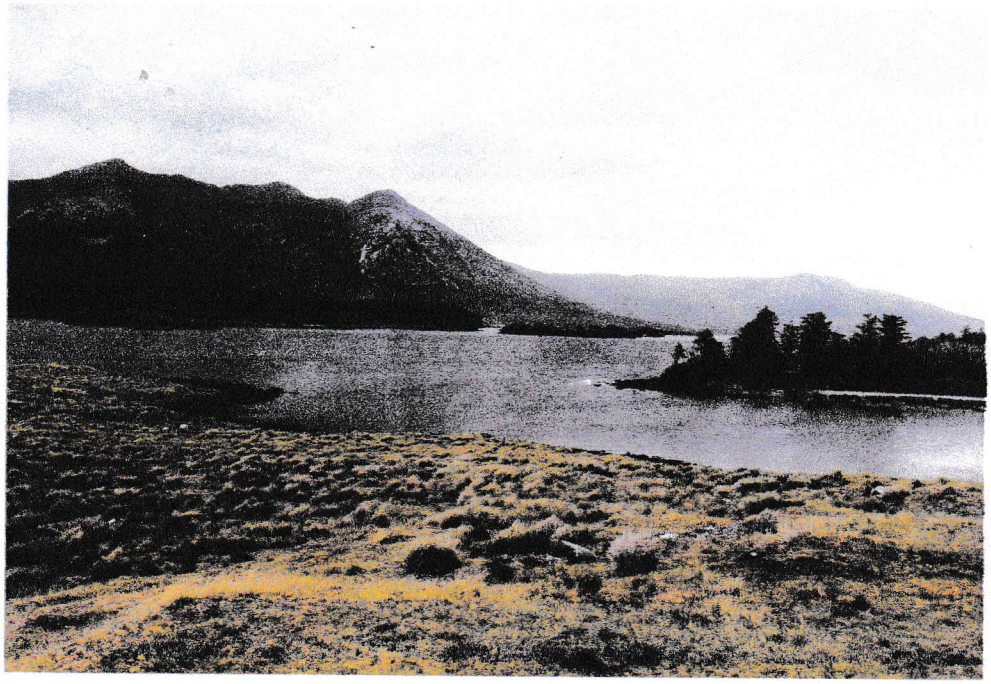

Fig 4 Photo of Lough Inagh

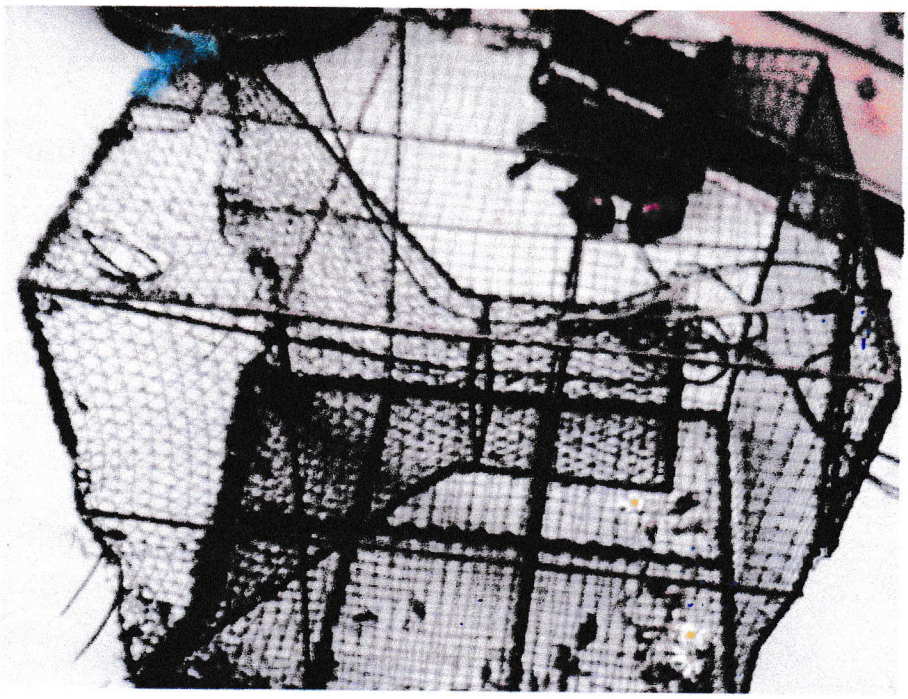

Fig 5 Photo of trap with Otter guard in funnel

4.2.5 Characteristics of the Project

The proposal is described in the below table.

Size, Scale, Area, Land Take	Perch traps are 0.75m wide and 0.55m deep. No land take within any Natura 2000 site is required as they are temporary placements. Anchoring system also not required as the metal in the structure and weight will keep them in position
Details of physical changes that will take place during the various stages of implementing the proposal	No physical changes required
Description of resource requirements for the construction/operation and decommissioning of the proposal (Moorings, ropes, bouys, etc)	Traps will be deployed and marked by 12mm rope and buoy. Trap, rope and buoy will be recovered in full at the end of the operational period and stored at the base in Cashel
Description of timescale for the various activities that will take place as a result of implementation (including likely start and finish date)	It is anticipated that the project will start in March and run to the middle of May. The project is weather dependent and significant down time is expected. Traps will not be deployed in poor weather conditions
Description of wastes arising and other residues (including quantities) and their disposal	Waste from this project will be limited to the disposal of the samples/fish on completion of each phase of the project. Samples will be frozen if required.
Identification of wastes arising and other residues (including quantities) that may be of particular concern in the context of the Natura 2000 network	Waste as described above to be removed using SOP's and disposed of using a licensed rendering plant.
Description of any additional services required to implement the project or plan, their location and means of construction	None

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

The following site specific methodology will be in place during the setting up phase of the project and also will cover destocking of sample traps.

4.2.6.1 Storage and transport of traps

The methodology for trapping will be as follows:

All traps will be stored in Cashel base and transported to Lough Inagh when required. Standard traps will be modified and fitted with Otter guards, to prevent Otters entering the trap during operations. All traps damaged during operations will be removed for repair and replaced from surplus stock until repaired. Fish will be euthanized on site using a priest and will be stored in a water tight sealed bag for transport to Cornamona for disposal.

4.2.6.2 Invasive species/Biosecurity measures

IFI provide a number of guidance documents on invasive species and their management which are available at: http://www.fisheriesireland.ie/Research/invasive-species.htmlall proposed works will be carried out consistent with these documents including disinfection of boats, transport tanks, nets, bins and any equipment used in the project. Biosecurity Protocol for field survey works is available at https://www.fisheriesireland.ie/Biosecurity/biosecurity-protocol-for-field-survey-work.html.

The introduction of Perch into Lough Inagh would characterise the species as invasive to this lake. During the operations other invasive species may be found. Any invasive species found in the Lake will be reported to IFI research division and information gathered for the Water Frameworks Report.

4.2.7 Identification of Other Projects or Plans or Activities

A search of the granted planning applications of townlands adjacent to the shores north and south of Inagh was carried out using the Galway County Council online planning system. Existing activities within the shore line catchment area include peat harvesting, agriculture, forestry, and on-site waste water treatment systems (i.e. septic tanks), and Lough Inagh Lodge treatment plant and water extraction. Forestry management plans have been agreed with NPWS and Coillte on the Lake shore of Derryclare to protect the catchment from habitat degradation.

4.3 IDENTIFICATION OF NATURA 2000 SITES

4.3.1 Zone of Impact Influence

The screening stage of AA involves compiling a 'long list' of European sites within a zone of potential impact influence for later analysis which may or may ultimately not be significantly impacted upon by the proposal. All Natura 2000 sites within 15km of the proposal location will be characterised in the context of the rationale for designation and qualifying features, in accordance with NPWS guidance. In line with the precautionary principle, this report 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 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 Natura 2000 site. If there are any significant, potentially significant, or uncertain effects, it will be necessary to proceed to Appropriate Assessment and submit an NIS.

4.3.2 Identification of Natura 2000 and Ramsar Sites

Adopting the precautionary principle in identifying potentially affected European sites, it has been decided to include all cSACs and SPAs/Ramsar sites, within a 15km radius of the proposal site. The Convention on Wetlands of International Importance especially as Waterfowl Habitat, more commonly known as the Ramsar Convention, was ratified by Ireland in 1984. Ramsar sites are also subject to AA screening. Although not specifically required, it would be considered best practice toinclude Ramsar sites (classified under the Ramsar Convention 1971) in the appropriate assessment.

The proposed site is outside 15kms of the Lough Cahasy, Lough Baun and Roonah Lake SAC. Natura 2000 sites within 15 kilometres of the proposed site were considered initially as per the NPWS guidance document. This Initial screening revealed that the following sites lie within 15km radius of the development;

Table 1 below, lists designated cSACs, SPA and Ramsar sites within 15km or the zone of influence of the proposal site including their proximity

Table 1: Designated conservation sites within 15km radius of proposal site

No.	Designated Site	Site Code	Proximity of proposed site to nearest point of designated site
1	Mweelrea/Sheefry/Erriff Complex SAC	001932	Approx. 7km to the east/north
2	Connemara Bog Complex SAC	001529	Approx. 4 km to South
3	West Connacht Coast SAC	002998	Approx. 15 kms
4	The Twelve Bens Garraun Complex SAC	002031	Located within this SAC
5	Maumturk Mountain SAC	002008	Approx. <1 km

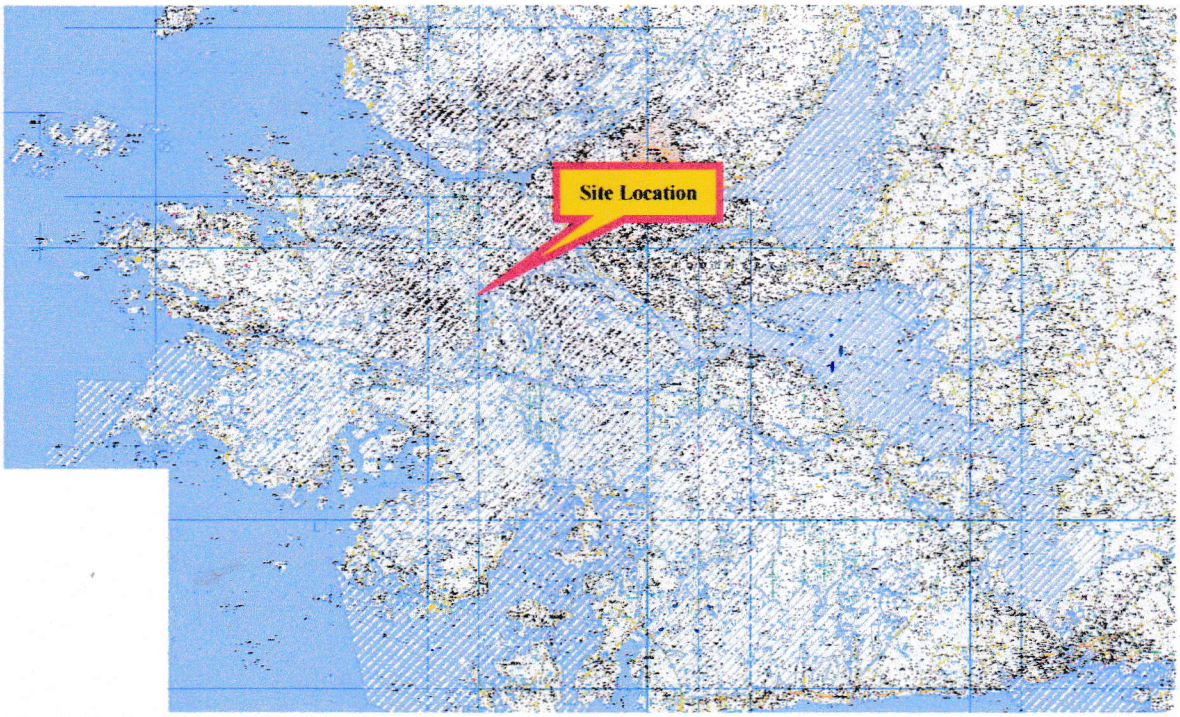

Fig. 5 Site location within the Twelve Bens Garraun Complex SAC

4.3.3 Characteristics of Natura 2000 and Ramsar Sites

The following table (Table 2) lists the features of interest for the cSACs and SPA sites that lie within 15km of the project site. Information pertaining to designated sites is from site synopses, conservation objectives and other information available on www.npws.ie and on the Ramsar website.

Table 2 Designated sites with qualifying interests of conservation interest

Designated Site	Qualifying interests of conservation interest
Mweelrea/Sheefry /Erriff Complex SAC (001932)	Coastal lagoons [1150] Annual vegetation of drift lines [1210] Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330] Mediterranean salt meadows (*Juncetalia maritimi)* [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Atlantic decalcified fixed dunes *(Calluno-Ulicetea)* [2150] Dunes with Salix repens ssp. argentea *(Salicion arenariae)* [2170] Machairs (* in Ireland) [21A0] Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)* [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the *Rhynchosporion* [7150] Petrifying springs with tufa formation (*Cratoneurion)* [7220] Alkaline fens [7230] Siliceous scree of the montane to snow levels *(Androsacetalia alpinae and Galeopsietalia ladani)* [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] *Vertigo geyeri* (Geyer's Whorl Snail) [1013] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Petalophyllum ralfsii* (Petalwort) [1395] *Najas flexilis* (Slender Naiad) [1833]
West Connacht Coast SAC (2998)	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]
The Twelve Bens Garraun Complex SAC (002031)	Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)* [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae and/or Isoeto-Nanojuncetea* [3130] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130]

	Depressions on peat substrates of the *Rhynchosporion* [7150] Siliceous scree of the montane to snow levels *(Androsacetalia alpinae and Galeopsietalia ladani)* [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] Old sessile oak woods with *Ilex and Blechnum* in the British Isles [91A0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Najas flexilis* (Slender Naiad) [1833
Connemara Bog Cpmplex SAC	Coastal lagoons [1150] Reefs [1170] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Northern Atlantic wet heaths with Erica *tetralix* [4010] European dry heaths [4030] *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the *Rhynchosporion* [7150] Alkaline fens [7230] Old sessile oak woods with Ilex and *Blechnum* in the British Isles [91A0] *Euphydryas aurinia* (Marsh Fritillary) [1065] Salmo salar (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Najas flexilis* (Slender Naiad) [1833
Maumturk Mountain SAC	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Northern Atlantic wet heaths with Erica *tetralix* [4010] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the *Rhynchosporion* [7150] Siliceous rocky slopes with *chasmophytic* vegetation [8220] *Salmo salar* (Salmon) [1106] *Najas flexilis* (Slender Naiad) [1833]

4.3.4 Conservation Objectives

According to the Habitat's Directive, the *conservation status of a natural habitat* will be taken as 'favorable' 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 favorable 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 'favorable' 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.

The specific conservation objectives for each site are available on www.npws.ie

Site specific and more detailed conservation objectives were available for the following sites:

- Maumturks Mountain SAC
- Connemara Bog Complex SAC
- Mweelrea/Sheefry/Erriff Complex SAC
- West Connacht Coast SAC
- Mweelrea/Sheefry/Erriff Complex SAC

Generic conservation objectives were available for the remaining sites listed in table 1 above.

All conservation objectives together with other designated site information are available on http://www.npws.ie/protectedsites/

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.	• Potential by catch • Use of containment traps and equipment • Handling of samples
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;***	• No direct habitat loss to Natura 2000 sites. • Biosecurity Risk • Results based annual cycle • Two staff required in off peak season • Use of existing facilities at Inagh. Pier will be closed to public (Gates Locked) but

Land-take; ***Distance from Natura 2000 Site or key features of the Site;*** ***Resource requirements;*** ***Emissions;*** ***Duration of project operation etc.; and*** ***Other.***	accessible to staff on project • Boat to be moored at the pier for the duration of the project

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 the proposed project on Lough Inagh is likely to have significant effects on a Natura 2000 site.

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 and an evaluation is made as to whether the Appropriate Assessment process can conclude at Stage 1, screening, or whether it needs to progress to stage 2, full Appropriate Assessment.

4.5.1 Natura 2000 Sites Outside the Zone of Impact Influence

It is considered that the project is within the influence of The Twelve Bens Garraun Complex SAC.One of the qualifying interests for this SAC is *Salmon Salar* and the protection of its habitat to ensure that the species is maintined at the current level or at a more favourable status. The project is to ensure that the SAC objectives are met in the future and to try and prevent further damage to the habitat of the Annex II species. The direction of flow and the nature of the trapping proposed will ensure that the conditions required to initiate a potential 'source-pathway-target' vector connecting the proposal site to other 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 project and, therefore, it is objectively concluded that no significant impact on these sites is reasonably foreseeable as a result of the proposed Lough Inagh stock management project. A test is now carried out to check if the sites listed in Table 1 above, are within the significant impact influence of the proposed project. These sites are listed in Table 3 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.

Table 3: Designated sites within 15km/within zone of significant impact influence of the proposed project, and whether the sites are considered to be within the zone of significant impact influence of the proposed project, with rationale

Natura 2000 site	Features of Interest/Qualifying Interest	Within Impact Zone	Rationale
Mweelrea/Sheefry /Erriff Complex SAC (001932)	Coastal lagoons [1150] Annual vegetation of drift lines [1210] Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330] Mediterranean salt meadows *(Juncetalia maritimi)* [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Atlantic decalcified fixed dunes *(Calluno-Ulicetea)* [2150] Dunes with *Salix repens ssp. argentea (Salicion arenariae)* [2170] Machairs (* in Ireland) [21A0] Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)* [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae and/or Isoeto-Nanojuncetea* [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the *Rhynchosporion* [7150] Petrifying springs with tufa formation (*Cratoneurion)*[7220] Alkaline fens [7230]	**NO**	Due to the fact that the designated project sites are south of Killary Harbour and not connected by catchment influence. The SAC will not be impacted. Information gathered from the project will contribute to future management plans and conservation efforts for annex II species Atlantic Salmon (*Salmo salar*)

	Siliceous scree of the montane to snow levels *(Androsacetalia alpinae and Galeopsietalia ladani)* [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] *Vertigo geyeri* (Geyer's Whorl Snail) [1013] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Petalophyllum ralfsii* (Petalwort) [1395] *Najas flexilis* (Slender Naiad) [1833]		
West Connacht Coast SAC (2998)	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	**NO**	The project will have no impact on the SAC. Project is a freshwater project which flow into the sea on the Connemara coast at Toombeola , south of Slyne head
Connemara Bog Complex	Coastal lagoons [1150] Reefs [1170] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Northern Atlantic wet heaths with Erica *tetralix* [4010] European dry heaths [4030] *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the *Rhynchosporion* [7150] Alkaline fens [7230] Old sessile oak woods with Ilex and *Blechnum* in the British Isles [91A0] *Euphydryas aurinia* (Marsh Fritillary) [1065]	**NO**	

	Salmo salar (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Najas flexilis* (Slender Naiad) [1833		
Maumturk Mountain SAC	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Northern Atlantic wet heaths with Erica *tetralix* [4010] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the *Rhynchosporion* [7150] Siliceous rocky slopes with *chasmophytic* vegetation [8220] *Salmo salar* (Salmon) [1106] *Najas flexilis* (Slender Naiad) [1833]	**NO**	
The Twelve Bens Garraun Complex SAC (002031)	Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)* [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae and/or Isoeto-Nanojuncetea* [3130] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the *Rhynchosporion* [7150] Siliceous scree of the montane to snow levels *(Androsacetalia alpinae and Galeopsietalia ladani)* [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] Old sessile oak woods with *Ilex and Blechnum* in the British Isles [91A0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Najas flexilis* (Slender Naiad) [1833	**YES**	Located within the SAC this project aims to protect and retain the current and qualifying status of the annex II species Salmo Salar in this catchment and to prevent the spread of the introduced species within the greater catchment. All traps for the project have Otter guards. *Margaritifera margaritifera* (Freshwater Pearl Mussel) are present in Grid L94 the Recess catchment of the Ballinahinch system. A significant threat to the pearl mussel is antagonism arising from the introduction of species. There is a legal requirement to protect the species under Article 17 Habitats Directive 2007. *Lutra lutra* (Otter). A walk over survey found the presence of otters particularly on the lower Owenmore River and Estuary, where significant activity was recorded.

It is objectively concluded that no significant impacts are reasonably foreseeable on the following designated sites as a result of the programme of works described at section 4.2 above. These SAC/SPA sites will not be considered further in this document. These include;

- **Mweelrea/Sheefry/Erriff Complex SAC (001932)**
- **West Connacht Coast SAC (002998)**
- **Maumturk Mountain SAC (002008)**
- **Connemara Bog Complex (000234)**

4.5.2 Natura 2000 sites within the zone of potential impact influence

Therefore, the following assessment focuses on the potential of the proposed project in Lough Inagh, to significantly impact on the remaining designated sites, listed in Table 4, below.

Table 4: Designated sites potentially within zone of significant impact influence

Natura 2000 Site	Site Code	Proximity of proposed site to nearest point of designated site
The Twelve Bens Garraun Complex SAC	(002031)	Located within the SAC

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

Only those features of the proposed project 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 4 above) are considered.

A number of factors were examined at this stage and dismissed or carried forward for NIS (stage 2) if required. The likely significant/potential significant impacts on SAC, SPA Sites in the area were examined in the context of the following:

The conservation objectives for this Annex I habitats are:

• To restore the favorable conservation condition of Alpine and Boreal heaths in The Twelve Bens/Garraun Complex SAC.

• To restore the favourable conservation condition of Blanket bogs (* if active bog) in The Twelve Bens/Garraun Complex SAC.

• To restore the favourable conservation condition of Depressions on peat substrates of the Rhynchosporion in The Twelve Bens/Garraun Complex SAC. 4

• To restore the favourable conservation condition of Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) in The Twelve Bens/Garraun Complex SAC.

• To restore the favourable conservation condition of Calcareous rocky slopes with chasmophytic vegetation in The Twelve Bens/Garraun Complex SAC.

• To restore the favourable conservation condition of Siliceous rocky slopes with chasmophytic vegetation in The Twelve Bens/Garraun Complex SAC.

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 project to trap introduced perch in Lough Inagh for a limited period during the annual cycle will not lead to any loss of habitat in the Twelve Bens Garraun Complex SAC. The project proposes to have a positive effect on the Annex II species Salmo Salar and to maintain the conservation status of same within this SAC. The effects of the operations on other protected species *Lutra lutra* (Otter) are limited as the level of activity of this species is focused on the lower Owenmore and estuary. Modern traps include an Otter guard which protects the otter population but also protects the operator from encountering otters or mink during operations. The complete removal of traps from the lake to the Cashel base after each trapping cycle will ensure that the project is targeting a specific time, location and species. There is no requirement for storage on the pier or lake edge.

4.5.6 Disturbance and/or Displacement of Species

The project will be completed within a short time frame which will ensure no disturbance or displacement of any listed species within the SAC. The density of traps will be limited to areas which are perch abundant and where spawning is likely to occur. Other areas within the proposed work sites will be excluded if they are unsuccessful to ensure that the most efficient use of resources and time are availed of. This dynamic approach ensures that the disturbance to all species will be very limited. Annex I habitat will not be disturbed or affected by the project

4.5.7 Habitat loss and disturbance

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 within nearby designated sites. Therefore, considering the conclusions in the preceding subsections and bearing in mind the location, scope, scale, duration and timing of the proposed works, it is concluded that no significant habitat or species fragmentation impacts are reasonably foreseeable as a result of the proposed project.

4.5.8 Cumulative/In-combination Impacts

There is no cumulative effect of the project on the system. Lough Inagh is not part of the Water framework sampling programme and has not been sampled in the preceding ten years. Perch being sampled and removed have been introduced in recent years. The stock management will have a population limiting effect when carried out at the right time and place. The removal of fish with spawning capability is the priority. By focusing on this section of the population the population can be limited in its expansion within the Ballinahinch catchment. The timing and strategic placement of the traps will ensure focused sampling with no by catch.

4.6 CONCLUSION OF SCREENING STAGE

In conclusion, to determine the potential impacts, if any, of the proposed project in Lough Inagh and surrounding waters, a screening process for Appropriate Assessment was undertaken. The proposed project is within 15km of five Natura 2000 sites.

- **Mweelrea/Sheefry/Erriff Complex SAC (001932)**
- **Connemara Bog Complex SAC (001529)**
- **West Connacht SAC (002998)**
- **Twelve Bens Garraun Complex SAC (002031)**
- **Maumturk Mountain SAC (002008)**

It has been objectively concluded during the screening process that all the sites within 15km of the project are not likely to be significantly impacted by the proposed project.

5. REFERENCES

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NPWS, protected site and qualifying interests https://www.npws.ie/protected-sites/sac

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 VIII

Iascach Intíre Éireann
Inland Fisheries Ireland

WFD SWMI Consultation,
Water Quality Section,
Department of the Environment, Community and Local Government,
Newtown Road,
Wexford.

10th December 2015

Re: Significant Water management Issues in Ireland (SWMI) public consultation document.

Dear Sir/Madam,

Inland Fisheries Ireland (IFI) welcomes this opportunity to comment on the Significant Water management Issues in Ireland (SWMI) public consultation document.

IFI is a fisheries focused environmental agency, the principal functions of which are enshrined in Section 7 of the Inland Fisheries Act 2010. These functions are to promote, support, facilitate and advise the Minister on the conservation, protection, management, marketing, development and improvement of inland fisheries, including sea angling. IFI policy is aimed at maintaining a sustainable fisheries resource through preserving the productive capacity of fish habitat by avoiding habitat loss and by mitigating harmful alteration to habitat.

We welcome the opportunity of working with other agencies. It is extremely important to engage and network with other sectors and organisations that interact with the water environment in order to create a better outcome with regard to policy and decision making at a national, regional and local level. IFI consider ourselves as a primary partner in working on these issues.

Please find Inland Fisheries Ireland's observations outlined below, specific comments are listed and broken down according to the 16 relevant issues in the document.

Issue 1 Affordability and Prioritisation

Question: What are the issues you believe we should prioritise for the next cycle of river basin management plans e.g. the protection of high-status water bodies, improved management of bathing waters, the protection of drinking water sources?

Some issues that need prioritising for the next cycle of river basin management plans are as follows:

- Protection of high-status water bodies (see issue 16)
- Improvement of moderate/poor/bad status water bodies
- Waste water treatment plants, diffuse pollution (caused by agriculture and future concern with the upcoming Harvest 2020, on site waste water treatment plants), hydromorphology and invasive species
- Agriculture has many regulations in place with the GLAS scheme, GAP regulations etc., therefore a strict continuation of these regulations and stricter enforcement and supplementary measures are essential.

[redacted]

- A continued focus on waste water from both private septic tanks and water treatment plant upgrades are essential
- Possible stricter controls relating to forestry e.g. unsuitable lands should not be replanted - peat soils with monoculture crops requiring drainage/ fertilisation and a moratorium on reclamation of unsuitable/low fertility lands could be prioritised until sustainable alternative uses can be introduced e.g. planting using suitable indigenous species of trees.

Issue 2: Public Engagement

Question: What recommendations do you have to improve public participation in water management?

Catchment management groups have been established by IFI and also by local community groups with assistance from public bodies or under their own direction, for example, the IFIs Inny Catchment Management and other Groups, Mulkear Life and IRD Duhallow Project were successful in engaging the public, therefore the expertise of IFI and other groups should be accessed.

Water management should be featured in the school curriculum. An increase and expansion of the level of engagement with school children through the use of field trips and other educational tools e.g. web-based game interaction is desirable. IFIs 'Something Fishy' programme, the Dublin Angling Initiative or other educational school programmes with a focus on the environment have been extremely successfully in educating the community through a 'bottom up' approach.

Public information evenings, involving angling groups/diving clubs/water users in planning and the new WFD water officer posts will help inform the public.

The Reuters Institute, Digital News Report 2015 offers important insights into how the Irish public engage with the various media, both traditional and digital stating that 'although online news as a platform is dominant, traditional media are still highly prevalent'. The report demonstrates a broad generational division, and notes the continuing importance of TV and radio. These channels cannot be overlooked at this point in time.

Social media's role is rising globally and Ireland has above average usage with digital users (of all ages) in Ireland among the most active internationally. Content is driven by users, therefore ensuring users engage is critical to the dissemination of messages as sharing news is the means most users actively participate in. A successful social media plan for public engagement that inspires trust and reliance on the entity will require openness, transparency and the ability to respond in a timely manner.

Issue 3 Organisational Coordination

Question: Are other coordination mechanisms in addition to the above required?

Better co-ordination is required between relevant agencies and a mechanism needs to be put in place for capturing and reporting information from all.

Issue 4 Coordination of Plan Implementation

Question: What other plans and programmes do you think have a material impact on water management?

How do you suggest we seek to improve coordination of activities between the various plans?

It is extremely important to engage and network with other sectors and organisations that interact with the water environment in order to create a better outcome with regard to policy and decision making.

IFI are heavily involved in hydromorphology assessments on rivers for fish passage, etc., therefore, a greater coordination between agencies is required and available information should better communicated in order to ensure all available information is sought and the correct decisions are made going forward.

- IFI barrier group (working group)
- Environmental Rivers Enhancement Programme (EREP)/Office of Public Works (OPW)
- IFI catchment management plans

Issue 5 Land-use Planning and Water

Question: How can objectives of river basin (catchment) plans be included in land-use plans in a way that is effective?

How can the requirements of land-use plans influence river basin plans?

How can planning policy and practise be improved so as to enhance our water environment?

- Optimal locations for planning (no flood plains)
- Locations of wells and on site waste water treatment plants
- Priority investment into waste water and water treatment plants to accommodate the future increase in population
- Strict protocols and over-seeing of new slatted sheds, farmyards, etc. that may come from Harvest 2020
- The RBMPs should drive land-use plans alongside flood management plans and not the other way around, i.e. land-use plans should not influence the RBMPs
- Current planning legislation does not adequately address all aspects of land drainage and reclamation which can alter hydrological characteristics of river catchments. Legislation should address this issue in relation to lands outside Protected Areas to include all land types. The success or failure of the implementation of this phase of the WFD will depend to a great extent on the approach taken to development of lands by those with responsibility for this development (owners, planners, environmental authorities etc). Novel approaches could be explored such as the provision of financial incentives to landowners e.g. 'set aside model' which may offset the potential economic impact of not developing land in certain ways could assist in achieving the objectives of the WFD.

Issue 6 Floods and Water

Question: What else is needed to align flood risk mitigation and water quality management?

With the increasing incidents of flooding in Ireland, investment into flood relief and contingency plans is paramount. One of the main causative factors in urban areas is changes in land drainage practices and reclamation of water-retaining areas upstream of these centres. The analysis of land use change and its effects on the hydrology of whole river catchments is crucial. This aspect of flood

management has to be addressed with a review of measures which can be introduced to retain and slow the movement of waters from upstream (less populated) portions of catchment areas.

River flood plains are an integral part of the river system and a major feature in the control of flooding. While the effects of flooding are generally associated with impacts on urban areas, change in hydrology patterns also affect fisheries and other water resource usage. Increased peak flood events cause erosion, destruction of river banks and interference with spawning grounds and other critical ecological system components. Conversely, increased rates of runoff lead to extended duration of low flow events affecting water resource usage e.g. for abstraction, effluent assimilation capacity (Eutrophication), reduction in ecological productivity etc. Prevention of further loss of flood plain areas and re-establishment of the hydrological functions of wetlands and bogs to regulate the water cycle and reduce direct runoff is essential.

Mitigation measures for climate change, e.g. more planting of trees along river watercourses to provide stability and shading for fish species. See issue 8 and 10 regarding nutrient enrichment and fine sediment which would all pose a potential problem with more flooding and higher flows.

- Improved storm overflow systems to deal with heavy rainfall and flooding
- Improved run off of roads
- Flood risk management plans, land use plans and RBMP should all be integrated and looked at together

Issue 7 Biodiversity Management and Water

Question: What, if any, are the major concerns you would have in relation to our aquatic biodiversity in Ireland?

The primary function of IFI is the protection, management and conservation of the inland fisheries resource.

The incorporation of a reference to Inland Fisheries Ireland and to the protected freshwater fish species such as Atlantic salmon, shad and lamprey species which are listed under Annex II of the Habitats Directive and pollan which is listed under Annex V, is recommended in this section.

The protective function of native riparian woodland and its role in the preservation of biological diversity is fully supported by IFI.

Growth of invasive plant groups such as Giant Hogweed, Himalayan Balsam and Japanese Knotweed along with *Rhododendron* and *Gunnera* constitutes a significant adverse impact on the riparian ecology of watercourses. The tall and dense stands that these species can form impact by shrouding out the native species. These invasive plant species produce a lot of seeds and can disperse widely and rapidly. They commonly spread in a downstream manner, therefore ideal treatment would involve treatment from the top of a catchment downwards. IFI recommend strict management of these invasive species and incentives to landowners to eradicate them. A series of protocols are available in respect to management/irradiation of the various nuisance species. IFI have an invasive species App for iPhones to help identify and report findings. Stricter control on the sale of these species in garden centres, etc. may also help control the spread.

There is a huge benefit to consultation at a local level in addition to the formal processes. IFI are represented on some working groups and view these meetings as essential opportunities to share the vast bank of information on the conservation, protection, management, marketing, development and improvement of inland fisheries. Liaising with NPWS and IFI regarding sensitive species when drawing up plans is essential in obtaining an overall view of changes in biodiversity.

A loss or threat to our native and sensitive fish species e.g. Arctic char, pollan and shad is a concern for IFI. Arctic char is an important indicator species for lakes yet there is little legislation and no designated sites for their protection. The loss or threats to the native white-clawed crayfish due to the presence of the crayfish plague (*Aphanomyes astaci*). The movement of non-native species and invasive species is another major threat to biodiversity. The lack of legislative enforcement to control this is evident (see issue 15 on invasive species).

While Ireland has a wide diversity of protected aquatic habitat and species there are also vast areas outside of protected sites requiring equal protection and effective targeted management.

Issue 8 Pollution of waters caused by nutrient enrichment

Question: What other actions do you think could be put in place to reduce the pollution of waters caused by nutrient enrichment?

Much of the forestry in Ireland is located in the headwaters of our river systems. These streams may not be recognised as fish or macroinvertebrate habitat however their importance to the fisheries resource cannot be overstated. Best operational practice through strict adherence to the relevant updated guidelines (such as the *Code of Best Practice, Forestry and Water Quality Guidelines* and *Forest Biodiversity Guidelines*) should ensure compliance with fisheries requirements in the majority of cases. Environmental impacts associated with forestry, aerial fertilisation and harvesting needs to be tightly controlled. However, many commercial forestry sites were planted long before the above guidelines were in place and are on 'difficult sites' of high altitude with steep slopes and peaty soils. The potential negative impacts on water quality during the establishment and harvesting phases at such sites are likely to outweigh the potential environmental benefits from replanting. It is our opinion that many of these 'legacy' sites would not now be considered as suitable sites for afforestation. When an area for replanting could contribute to a delay in the recovery of that surface water system to good status then no replanting on these sites may be the only sustainable option. We recommend an expansion of the physio-chemical and biological monitoring programme in these catchments to address any issues that may arise. In nutrient sensitive water catchments consideration should now be given to the introduction of afforestation exclusion zones, with new plantations prohibited thereby avoiding potential future impacts.

Site drainage associated with single / multi residential development is an important feature in surface water quality protection. Where surface ponding or leachate from waste water systems becomes an issue, peripheral site drainage acts as a direct conduit for pollutants to enter waters.

To prevent this eventuality, criteria for site approval should be based on a site's natural soil type and percolation characteristics, the use of imported media and site drainage to facilitate waste water disposal is arguably unsustainable and requires further investigation.

Extensive development in unsewered areas (e.g. one-off housing) and their associated land drainage systems, gives rise to increased surface runoff to waters. This runoff in combination with agricultural drainage contributes significantly to changing surface water flow regimes. Sustainable drainage systems dealing with site surface waters for all rural development should be supported. More incentives are needed to monitor and have appropriate percolation around private septic tank areas or yard run off areas from farms or industry.

More resources are needed to perform 'spot checks' on farms, private septic tank areas and increase 'high visibility' of agencies on the ground, this has been proven to reduce pollution offences. Stricter fines should also be enforced if proven to be responsible for pollution. Perhaps better coordination between agencies with regard to enforcement would prove beneficial.

Fine sediment is a problem for spawning gravels in rivers and on lake shores with regard to brown trout and char spawning where it clogs up the gravels and causes deoxgenation. Nitrogen (N) and phosporus (P) cause weed growth, choking of rivers and deoxygenation in rivers (see issue 10).

There is no mention of the guidance document "*Guidance for the Farming Community on Protection of Water Resources and Habitat Quality from Impacts due to Livestock Access to Waters*". This leaflet describes the problems as a result of livestock access to waters. It identifies benefits to the farming and wider community that result from eliminating such access, and contains practical recommendations on reducing and where possible eliminating livestock access to waters. There is also no mention of the new initiative launched by Teagasc and IFI in 2014 "*Minding our Watercourses*" which details best practice management of watercourses for farmers. It is emphasised in the document that proper management of farm watercourses whether large rivers or small streams is critical to ensuring high levels of biodiversity.

The Nitrates Regulation should address land reclamation in all areas. Currently certain forms of reclamation are not controlled by the regulations resulting in lands (marginal) being left unvegetated over the winter periods with an associated high risk of sediment and nutrient runoff. A knowledgebase of existing measures (e.g. through agri-planning mechanisms) which have proven effective in controlling / preventing sediment loss is recommended.

Issue 9 Water and Health

Question: What further actions would you suggest be taken to reduce health risks from waters?

IFI have concerns in relation to the use of certain herbicides and pesticides including Cypermethrin which has become a topic in recent years. Herbicides and pesticides if they find their way into watercourses have a detrimental effect on fish (especially juveniles) and aquatic life. It is important that the toxicological and environmental effects on humans are investigated, especially in areas of abstraction for potable supplies. Cattle access can also pose a serious risk to water quality through walking around in the watercourse (*Cryptosporidium*). We suggest this issue is addressed especially in areas of abstraction for potable supplies or fish spawning areas.

The tight control of the chemical that is used to 'scour' drinking water pipes. Chemicals from tailings ponds in old mining areas need to be monitored/rehabilitated. What is the timeline for the detailed studies and management plans for historic mines?

Issue 10 Fine Sediment

Question: How do you think this issue should be tackled?

Fine sediment is a problem for fish when it clogs up the gravels where they spawn in rivers and along lake shores and causes deoxgenation. Nitrogen (N) and phosporus (P) cause weed growth, choking of rivers and spawning feeder streams around lakes which in turn causes deoxygenation which is detrimental to fish species.

In rural areas the first line of defence is to maintain land cover and prevent soil erosion in the first instance. The second line of defence is to trap the material before it reaches the stream network. Extensive land improvement works are on-going throughout the country. In effect where lands are being improved/reclaimed they lend themselves to sediment runoff. This practice needs regulation as it constitutes a serious threat to water quality.

Cattle access can also pose a serious risk to water quality through walking around and excreting in the watercourse. We suggest this issue is addressed particularly in areas of abstraction for potable supplies or fish spawning areas.

The concentration of N and P in a waterbody is a key indicator of water quality and because of their enriching effect and potential health problems in areas where water is abstracted for potable use.

The use of buffer zones/riparian zones should be encouraged and mandatory in some areas depending on topography to prevent the input of sediment and nutrients into watercourses. The use of buffer zones along watercourses is greatly supported. Buffer zones provide breathing space or non-farmed area between actively managed land and the natural ecosystem. Buffer zones along watercourses may or may not be fenced, depending on whether land is stocked or not. Where land is stocked, the buffer zone requires fencing. Buffer zones reduce lateral transport of nutrients and of sediment from land to watercourses, with multiple benefits for water quality and instream habitat. These zones are particularity useful in intensive tillage farming where ploughing and spraying is frequently carried out on top of the banks. Such practices contribute to substantial losses of silt and nutrients to the watercourse, with consequences in terms of instream weed growth and requirement for channel maintenance. These zones also eliminate trampling of the banks from livestock and adding more sediment to the watercourse. Native tree planting along river banks provide stability and reduce bank erosion and subsequent runoff of fine sediment. The use of Alder due to its tendency to become extremely dense causing tunnelling and over shadowing has become problematic for fisheries management, therefore the planting of Birch, Willow and Rowan with the exclusion of Alder is now recommended.

There should be strict management of sediment traps throughout all forestry felling processes and on-going de-silting of these traps is essential. Silt traps should be mandatory when working in all watercourses and building sites/farmyards where runoff is occurring (especially after heavy rain).

Forestry roads must allow for unhindered upstream and downstream movement of fish and aquatic life at all times. No machinery should enter a channel at certain times of the year.

The back washing of sand filters at water treatment plants into streams is another area of concern that may need more investigation.

Issue 11 Physical Changes

Question: Are there other issues regarding physical modifications on waterways that should be highlighted now?

The Environmental Rivers Enhancement Programme (EREP) is an Office of Public Works (OPW) funded project that is being co-ordinated and managed by IFI. The programme focuses on the enhancement of drained salmonid rivers in Ireland. These drained rivers are a result of a number of large and small scale arterial drainage schemes which were carried out, across the country, by the OPW since the 1940's. While such works substantially reduced flooding in many areas and brought much benefit to agriculture there were unfortunately some negative impacts on fisheries, angling and on the river corridor habitat. EREP began in 2008 and is still ongoing. The programme involves two different approaches to enhancement, these being capital enhancement and enhanced maintenance respectively. All enhancement designs are prepared by IFI and works are implemented by OPW. Monitoring of the enhancement works by IFI consists of carrying out pre and post works habitat assessments on representative river stretches with the resulting improvements being reported through the River Basin Management Plans (RBMP's) under the Water Framework Directive.

IFI are also involved in hydromorphology assessments on rivers, therefore, a greater coordination between agencies is required here to ensure all available information is sought and the correct decisions are made going forward. It is extremely important that angling clubs and local drainage boards, for example, are implementing environmentally friendly measures set out under the EREP programme when carrying out instream works.

Agricultural practices and forestry development continue to result in altered hydrological regimes in our surface waters and constitute fundamental risks in terms of water quality and ecological status. Currently large areas of marsh, wetland, marginal and unproductive lands are being drained, (incorporating the removal of hedgerows and river riparian areas) with a view to facilitating increased agricultural production (beef/dairy/tillage etc.). This drainage is occurring in both Protected (SAC, NHA, SPA) and unprotected areas and warrants careful consideration and potentially associated urgent action. An inventory of all weir, bridge and other in-stream structures and culverts is required with an associated impact risk assessment to determine existing and potential impacts on aquatic habitat, communities, river continuity, fragmentation etc. Water abstraction intake structures, some of which are located in prime fish spawning and nursery areas, should be included in the assessment e.g. private and public authority water supply intakes. Such an inventory would identify any disused intakes / instream structures with the potential to impact on ecological status and river continuity and their removal could be prioritised. Areas where river culverting has taken place with associated aquatic habitat loss and fragmentation could also be addressed via mitigation measures with the aim of habitat restoration. Interference, alteration or culverting of water systems in both rural and urban areas (with limited exceptions e.g. to provide access) should be avoided.

Issue 12 Abstraction and Flows

Question: Is the abstraction of waters a significant issue in your area and, if so, do you have views on how this might be addressed?

Abstraction demands on the available water resource have increased dramatically (at certain times of the year) with associated increased pressure on aquatic ecosystems. IFI are aware of some locations where draw down of water is causing impact to local fish populations, a detailed list of these can be provided upon request. Each river catchment could be allocated a water abstraction budget based on the flow requirement of the biological components present. Enhanced regulation via permit / authorisation of all abstractions from surface and ground waters is desirable.

Abstraction can have detrimental effects on fish species that spawn on the lake shore or in riverine areas where gravels become 'dried out' at certain times of the year, in particular Arctic char, brown trout and salmon. Possible issues that may arise through over abstraction of water are:

- Loss of habitat - a smaller stream will support fewer fish, particularly territorial species
- Blockage of migration pathways
- Loss of spawning or nursery areas due to reduced flow or 'dried out' areas in a waterbody
- Changes to habitat quality from heating, reduced oxygenation and reduced dilution of effluents and pollution
- Drying out of riffles (the major food production areas of stream systems)
- Entrainment of juvenile and larval fishes in pump intakes, particularly on the upstream migration

In relation to the protection and conservation of the fisheries resource, the publication "Guidelines on the Planning, Design, Construction and Operation of Small-scale Hydro Electric Schemes and Fisheries" provides information on critical flow requirements for fisheries. These guidelines have

relevance to Water Framework Directive (2000/60/EC) implementation where the overall objective is to ensure there is no deterioration in water status. Associated hydro-morphological pressures must be addressed so as to ensure the biological status and, by association the fishery status of waters is maintained or improved.

Landfills, Quarries, Mines and Contaminated Lands.

Water-table drawdown is of particular relevance in quarries where excavation extends into ground water strata and lowers the water table with resulting dewatering of surrounding surface waters. There are several developments where surface waters are impacted by ground water drawdown - in some instances the zone of influence extends a kilometre or more resulting in dewatered streams and impact on aquatic habitats. Actions should include an Impact Assessment of potential high risk site locations to identify the degree of ground water drawdown and extent of surrounding waters impacted; assessment should recommend mitigation measures to eliminate / offset impacts.

Issue 13 Hazardous Chemicals

Question: Are you satisfied with the existing approaches taken to control and prevent chemicals in the environment?

Are there any additional chemicals of concern that are currently not being considered in Ireland?

IFI have concerns in relation to the use of certain herbicides and pesticides including Cypermethrin which has become a topic in recent years. Sheep dip is a hazardous chemical on mayfly/stonefly, crayfish and other aquatic species in a watercourse which fish may feed on. Herbicides and pesticides if they find their way into watercourses have a detrimental effect on fish (especially juveniles) and aquatic life. It is important that the toxicological and environmental effects on aquatic species are taken into consideration when deciding to use herbicides and pesticides of any sort.

Pharmaceuticals in waterbodies are likely to be an environmental issue into the future. Pharmaceuticals are synthetic or natural chemicals that can be found in prescription medicines, over-the-counter therapeutic drugs and veterinary drugs. Pharmaceuticals contain active ingredients that have been designed to have pharmacological effects and confer significant benefits to society. They can be introduced into water sources through sewage, which carries the excreta of individuals and patients who have used these chemicals, from uncontrolled drug disposal (e.g. discarding drugs into toilets) and from agricultural runoff comprising livestock manure. They have become chemicals of emerging concern to the public because of their potential to reach drinking-water. In Sweden, samples of fish (perch) were found to be contaminated with 23 pharmaceuticals, including antidepressants (such as Prozac), sedatives, antibiotics, painkillers and anti-cancer drugs. Baltic Sea salmon have been found contaminated with ethinyl estradiol, used in the contraceptive pill. Researchers in Athlone IT found vitellogenin (a marker for endocrine disruption in male fish downstream of waste water treatment plants in several rivers.

Chemicals from tailings ponds in old mining areas need to be monitored/rehabilitated. What is the timeline for the detailed studies and management plans for historic mines?

Issue 14 Climate Change

Question: How can we best plan to ensure the climate resilience of our water resources and aquatic ecosystems?

Ireland's native fish populations such as salmon, brown trout and Arctic char are cold water species and are more vulnerable to climate change and warming of waters than those fish species that have been introduced over the last 100 years. Mitigation measures for climate change, e.g. more planting of trees along river watercourses to provide stability and shading for native fish species. See issue 8 and 10 regarding nutrient enrichment and fine sediment which would all pose a problem with more flooding and higher flows.

With the increasing incidents of flooding in Ireland, investment into flood relief and contingency plans is paramount.

Issue 15 Invasive Alien Species

Question: What actions do you think we need to take to manage alien species in Ireland?

National Parks and Wildlife Services (NPWS) are the lead agency in monitoring and controlling invasive species in Ireland. IFI's funding to date for invasive species monitoring has been mainly from EU funding and IFI is very keen to see this area been strictly monitored.

Growth of invasive plant groups such as Giant Hogweed, Himalayan Balsam and Japanese Knotweed along with *Rhododendron* and *Gunnera* constitutes a significant adverse impact on the riparian ecology of watercourses. The tall and dense stands that these species can form impact by shrouding out the native species. These invasive plant species produce a lot of seeds and can disperse widely and rapidly. They commonly spread in a downstream manner; therefore ideal treatment would involve treatment from the top of a catchment downwards. IFI recommend strict management of these species and incentives to landowners to eradicate them. A series of protocols are available in respect to management/irradication of the various nuisance species. IFI have an invasive species App for iPhones to help identify and report findings. Stricter control on the sale of these species in garden centres etc. may also help control the spread.

The spreading of unwanted invasive/non-native species, such as the zebra mussel, is a growing problem. Procedures are required for disinfection of angling equipment or monitoring equipment in order to prevent dispersal of alien species and other organisms to uninfected waters. IFI have launched various biosecurity protocols, e.g. Disinfection of Angling Equipment, Disinfection of Boats and Boating Equipment, Disinfection Guidelines for Paddle Sports Enthusiasts, etc.

The native Irish freshwater fish fauna has been augmented by a large number of non-native species (e.g. perch, pike, dace, bream, tench, roach and rainbow trout). These have been introduced either deliberately or accidentally, e.g. angling activities, aquaculture and the aquarium trade. A non-native species is one that has been either intentionally or accidentally released into an environment outside of its natural geographical habitat range. Many non-native fish species have become established in the wild throughout Irish lakes and rivers, e.g. perch, roach, rudd and bream. Roach is a species which has been shown to affect salmonid production and cause a decline in brown trout angling catches. Within a few years of being introduced into a water body they can become the dominant species due to their high fecundity and they usually displace brown trout. Water bodies with non-native invasive fish species such as roach will not meet high status for WFD purposes due to the presence of these species. Future introductions of non-native species will also lead to a downgrading of the ecological status of a water body.

Stricter border control and stronger legislation for moving these species internally in Ireland is needed. Heavier fines if found transporting these invasive species into Ireland and within the country. Stricter control and tighter regulations on the sale of these species in pet shops, garden centres and other retailers may also help control the spread. More public awareness of the matter is required, for example, information evenings for anglers and countryside users.

Issue 16 Loss of High Status Waters

Question: How can we better protect High Status Waters?

WFD established a framework for the comprehensive management of water resources within the European Community, inland, estuarine, coastal and groundwater. The fundamental objectives of the WFD are to maintain high status of waters where it exists, to prevent any further deterioration in existing status and to ensure that all waters achieve good status by 2015, in compliance with the Surface Water regulations 2009 and Groundwater regulations 2010. These regulations impose a duty on all to undertake their functions in a manner that ensures compliance with the objectives of the River Basin Management Plans.

- Possible stricter controls and more incentives to farmers/landowners who farm/live in high status areas
- Better interaction with all farm/land owners, public awareness or face to face interaction from for example Teagasc advisors

I trust you will take our concerns and comments on board.

Yours sincerely,

Dr. Cathal Gallagher, Head of Research and Development,

Inland Fisheries Ireland

APPENDIX IX

Appropriate Assessment – Screening

Iascach Intíre Éireann
Inland Fisheries Ireland

Fisheries Stock Management Plan (2024) for Lough Arrow Co. Sligo, Ireland

Summary /Abstract

This assessment was compiled in February 2024 by Suitably qualified staff from Inland Fisheries Ireland with specialist knowledge and training on environmental processes and legislation. It aims to evaluate the potential for significant effects on Natura 2000 sites from the management of fish stocks on Lough Arrow, a large (C1,260 Ha) calcareous lake in Co. Sligo, which is designated within the EU Natura 2000 network of European sites. It describes the background and importance of stock management for the conservation of native salmonids and the maintenance of sustainable, recreational wild brown trout fisheries. It's main purpose is to assess whether significant effects to the habitats, species and conservation objectives of the Natura sites wholly or partially within the potential zone of influence are likely as a result of this project.

Contents

1.0 Introduction

Inland Fisheries Ireland has prepared this assessment in relation to the management of fish stocks on Lough Arrow, which supports a significant wild brown trout (*Salmo trutta*) recreational fishery. The principal aim of the 2024 management plan is to remove Pike (*Esox lucius* L.) which are known to prey on brown trout (O'Grady & Delanty 2008) from the lake by electrofishing and gill netting.

The control and removal of non-indigenous, fish from valuable salmonid fisheries has been practiced for over 100 years in some parts of Ireland (Went 1957). It has been perceived as an important tool in the management of these inland waterways as quality wild brown trout fisheries. In Lough Arrow, pike are thought to have been introduced approximately 250 years bp (Pedreschi et al. 2014) and large numbers these fish have been removed, formerly by the Inland Fisheries Trust, the North Western Regional Fisheries Board and by Inland Fisheries Ireland. In more recent years, pike removal operations have been undertaken as a conservation measure for indigenous salmonids (O'Grady & Delanty 2008).

Lough Arrow was designated as a protected site (Special Protection Area) under the Birds Directive (Directive 2009/147/EC on the conservation of wild birds) in March 2011. Two bird species and the general grouping of wetland and Waterbirds referred to in Article 4 and listed in Annex I of Directive 92/43/EEC are named as Special Conservation Interests. Lough Arrow was also designated as a Special Area of Conservation (SAC) with just one habitat type (Hard Oligo-Mesotrophic waters with benthic vegetation of Chara spp.) listed as a qualifying interest. However, in addition to this designation, the lake is also directly connected to another Natura site, The Unshin River SAC which has 4 habitat types and 2 species listed in Annex I & II of Directive 92/43/EEC noted as qualifying interests . The two sites are considered contiguous and are therefore considered equally for the purposes of this assessment

In addition to its designation as an SPA and SAC, where the project area is located, there are a further 5 Natura 2000 sites connected to or within the potential zone of influence of the project. Possible significant effects on the conservation objectives of these sites are also considered in terms of source/pathway/receptor chains and the likelihood of impacts occurring.

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

The principal purpose for this project is the conservation of an important recreational wild brown trout fishery. These operations are part of a suite of measures to develop this fishery and maintain sustainable trout numbers. Other actions include the enhancement of spawning and nursery habitat in the small tributary streams which feed into the lake and the engagement with other agencies to safeguard its water quality. Any potential, significant impacts on other species or habitats which could arise as a result of this stock management project activities are fully assessed. Other activities associated with the development of this fishery are subject to separate assessments.

2.0 Appropriate Assessment Process

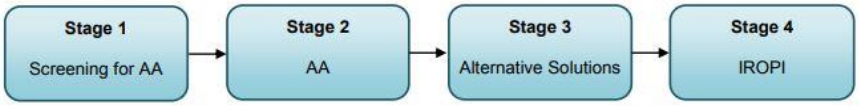
In accordance with Schedule 6(3) of the Habitats Directive 92/43/EEC (Assessment of Plans and projects significantly affecting NATURA 2000 Sites), this report has been prepared in relation to the implementation of Inland Fisheries Ireland's stock management plan for 2024 on Lough Arrow, Co. Sligo (see appendix 1). An evaluation of potential direct, indirect and in-combination effects on the conservation objectives of any Natura site wholly or partially within the zone of influence of the project is undertaken in compliance with the requirements of the AA process.

2.1 Legislative Context

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

2.2 Stages of Appropriate Assessment

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



2.3 Guidance on Appropriate Assessment

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2009). More recently, the Office of the Planning Regulator (OPR 2021) has produced updated guidance with clear instruction on the legislative context subsequent to over 20 years of case law relating to the habitats directive. Inland Fisheries Ireland has also produced specific guidance for Appropriate Assessments in the vicinity of watercourses, which also provides a framework for this assessment. These guidance documents identify the staged approach to conducting an AA, as shown above. (from; Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities, DEHLG, 2009)

2.4 Purpose of Assessment

This Screening for Appropriate Assessment has been undertaken to determine the potential for significant effects of the management of pike stocks on Lough Arrow on a number of NATURA 2000 sites in the Zone of Influence. In accordance with planning guidance (OPR 2021) the various steps in this report aim to provide the following:

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- A Description of the relevant processes involved in Appropriate Assessments which may be applicable to the proposed project

- A Description of the proposed project and its purpose, including an account of the characteristics and specific activities of the proposed works that could give rise to negative impacts on species and habitats at Natura sites in the area.
- Identification of the European Sites that are situated (in their entirety or partially) within the zone of influence or otherwise connected to the proposed project
- Identification of the Qualifying Interests (QIs) and Special Conservation Interests (SCIs) for each European Site occurring either wholly or partially within the zone of influence
- Identification of the Conservation Objectives for each relevant European Site occurring either wholly or partially within the zone of influence
- Identification of potential significant impacts and pathways of impact from the project activities to the species and habitats comprising the protected sites
- Identification of other plans or projects, for which In-combination impacts could have significant effects.
- Provision of a screening matrix and a determination as to whether the project may require further assessment to manage impacts. (i.e. screen in/out)

2.5. Screening Assessment Indicators

As set out in the 2021 OPR guidance, the task of establishing whether a plan or project is likely to have an effect on 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 any potential effects identified could be significant. The precautionary principle approach is required. Once potential source pathway receptor chains are established, the effects that may arise from the proposed project are identified and 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

3.0 Project description

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

3.1. Stock Management Plan

A stock management plan for designated wild brown trout lakes in the year 2024 has been compiled, which outlines the periods, effort (man-days) and predicted numbers of pike to be removed, having regard to the requirements of IFI's management policy for these lakes. This plan is presented in appendix 1.

3.1.1. Characteristics of the Project

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

Project Characteristic	Detail
Size, Scale, Land take	Main project activities are gill-netting and electrofishing at various locations on Lough Arrow. No land take is required for the project.
Physical Changes that could take place at the site	No physical changes will take place - There is no physical alteration to the site required for the project.
Resource requirements for the operation of the project (Water resources, fuel/energy, construction material, human presence)	The plan will require 60 man days for gill netting and, 45 man days for electrofishing. Approximately 32 l of petrol will be required for powering outboard motors and 30l of diesel for transport of vehicles and equipment. Emissions from the combustion of this fuel are estimated to be 156kg CO_2 There are no construction materials, or additional water resources required.
Duration – and description of the timescale for the various project activities including start and finish dates	Gill netting will commence in early March and cease at the beginning of April. Electrofishing will take place on 15 days throughout the period between April and October.
Description of any waste material arising from the project	Aside from the emissions associated with the combustion of fuels (described above) there will also be approximately 875kg of fish carcass. This will be disposed of off-site by an approved animal waste disposal service. No discharge of waste materials to the environment are anticipated.
Description of any materials equipment or services required to implement the project	2 different types of boat are required for gill netting and electrofishing respectively. Specifications for these are described in the stock management SOP - Appendix 3. Outboard engines fuelled by gasoline and diesel powered vehicles will also be required to

	transport personnel and equipment to the project site.
Description of any facilities required	A purpose built slipway, which provides access to Lough Arrow, is located immediately adjacent to the base of operations. This access point will be used to transport personnel and equipment to the project site. Other established access points which may, occasionally, be used will be used so that disturbance to habitats is avoided.

Table 3.1. Project characteristics

3.2. Purpose of the Project

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

Reports published by the National Parks and Wildlife Service in relation to protected habitats and species, highlight pike as a potential threat to native fish species in some Irish water-bodies designated under the EU Habitats Directive (NPWS 2007). Inland Fisheries Ireland's Water Framework Directive monitoring programme assigns various fish species found in Irish inland waters to one of four categories (1. Domesticated, 2. Non-native benign, 3. Non-native non-benign and 4. Invasive requiring management). Subsequent to this description pike are classified as non-native non-benign (Kelly et al. 2018). In some catchments, they can cause declines in indigenous wild brown trout populations. The removal of pike is, therefore, regarded as a necessary measure in sustaining wild brown trout fisheries.

3.3. Description of Project Site

The Project site lies entirely within the boundaries of Lough Arrow, a large limestone lake in the northern part of Ireland's Western River basin District. This Natura site is designated as an SAC for one habitat type, (Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.) A description of the lake is provided in section 3.3.1. (below)

3.3.1. Lough Arrow

Lough Arrow is a large limestone lake situated in Co. Sligo, approximately 24km south-east of Sligo town and 6.4km north-west of Boyle, Co. Roscommon (See cover picture and Fig. 3.1). The lake is sheltered on three sides by hills and is the principal source of the Unshin River. It has a small catchment fed largely by springs on the lake bed and as such is hydrologically different from most lakes in Ireland (Roscommon County Council 2009). Lough Arrow has a surface area of 1266ha, with a mean depth of 9m and a maximum depth of 33m. The lake is categorised as typology class 12 (as designated by the EPA for the purposes of the Water Framework Directive), i.e. deep (>4m), greater than 50ha and high alkalinity (>100mg/l $CaCO_3$).

Lough Arrow is of major conservation significance as it conforms to a type (hard water lake) listed in Annex I of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora . It also supports a number of important bird species (Council Directive 2009/147/EC on the

conservation of wild Birds) and is regarded as a wetland site of significant importance to a number of protected wildfowl species.

The River Unshin which has it's origins in Lough Arrow also supports populations of otter (a Red Data Book species which is legally protected under the 1976 Wildlife Act and is listed on Annex II of Directive 92/43/EEC) (NPWS, 2007). The shores of the lake are, for the most part, stony, although the common club-rush (*Scirpus lacustris*) and common reed (*Phragmites australis*) occur abundantly in several bays (NPWS, 1999). Two comprehensive surveys of submerged vegetation in the lake were undertaken in 1984 and 2001, during which the open water aquatic flora was found to be dominated by species of *Chara, Potamogeton sp.* and *Elodea canadensis*, whilst the shallow (<0.5m) areas commonly contained *Litorella sp*., *Potamogeton filiformis* and *Myriophyllum alterniflorum* (King, 2002).

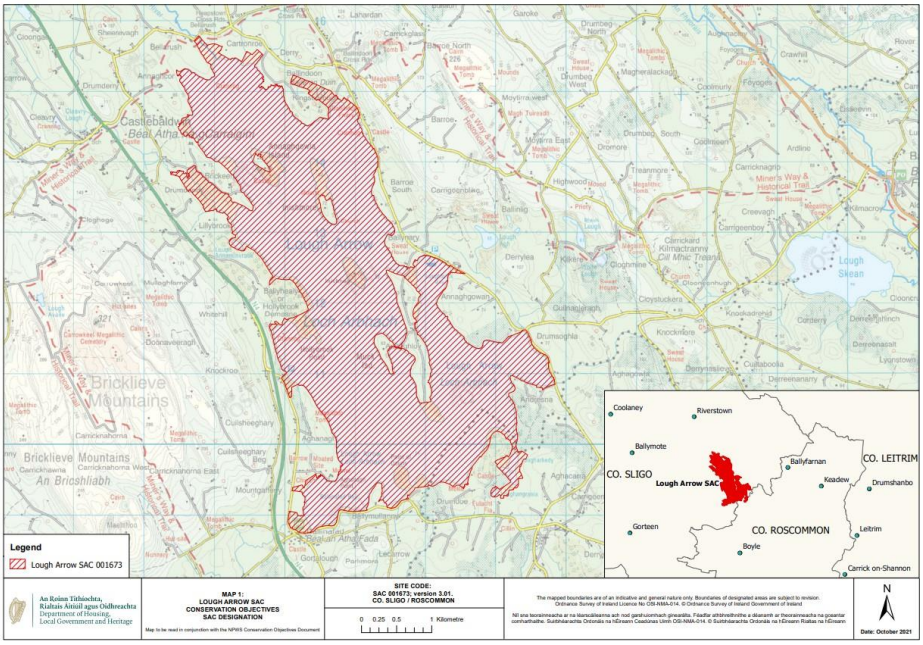

Fig 3.1. Lough Arrow SAC (Reproduced from NPWS 2021)

3.3. Project Activities

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

3.3.1. Gill Netting

The gill nets to be used are made from terryline fabric and range in mesh size from 5 – 10 cm. They are usually set from a small boat (5.8m) in shallow water close to areas of submerged and emergent vegetation where pike are known to spawn in March. Nets are set during the day and serviced the following morning.

Sets are usually deployed in groups in a single bay or along a shoreline, with panels of 3-6x 30m nets tied together (typically, the nets fish to a depth of 2 m and are set in groups of 6 – 10 "gangs" at predetermined locations (fig. 3.4.). Known pike spawning areas, usually in the littoral zones of the lake, are usually targeted and re-fished for a period of 4 – 5 days.

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

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

Fig. 3.4. Gill netting areas on L. Arrow

3.3.2. Electrofishing

Electrofishing, to remove pike, is carried out at several locations throughout Lough Arrow. (see fig. 3.7, below). Although limited in it's efficacy in open or deep water, this method can be successful in the shallow pike nursery areas and in places where trout congregate on their spawning migration, usually at the mouths of inflowing and outflowing rivers.

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

Fig. 3.5 Electrofishing for pike

Fig.3.6 A pike, immobilised by electrofishing gear

3.3.3. Transport of Equipment and Personnel

This activity involves the movement of IFI staff members with boats, outboard engines, fuel, nets and associated safety equipment to the netting and electrofishing areas on the lake (see fig 3.7.) The embarkation point will be from the slipway at the IFI base (See fig 3.1). Details of fuel storage and the biosecurity protocols associated with equipment transport and stock management operations generally are outlined in IFI's SOP (see appendix 3)

Fig 3.7. Main Electrofishing areas on L. Arrow

4.0. Natura 2000 Sites

This section considers all relevant Natura 2000 sites, their habitats and species, in terms of their proximity, connectivity and, hence, possible vulnerability to significant impacts from the project.

4.1 Project Site

The project will take place within the site boundaries of the lough Arrow SAC and SPA. The River Unshin which is contiguous with lough Arrow is sufficiently connected to the project area to be considered as part of the site, these sites are examined in particular detail (see table 4.1). Other, more peripheral Natura 2000 sites are also subject to an analysis of potential effects. Potential source, receptor pathways for each site are considered.

Site Name	Qualifying Interests	Conservation Objectives
Lough Arrow SAC	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140]	To maintain or restore the favorable conservation condition of the Annex I Habitat for which the SAC has been selected
Lough Arrow SPA	Little Grebe (Tachybaptus ruficollis) [A004] Tufted Duck (Aythya fuligula) [A061] Wetland and Waterbirds [A999]	To maintain or restore the favorable conservation condition of the wetland habitat at Lough Arrow SPA as a resource for the regularly-occurring migratory waterbirds that utilize it.
River Unshin SAC	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Salmo salar (Salmon) [1106] Lutra lutra (Otter) [1355]	To maintain or restore the favorable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected

Table 4.1. Qualifying interests for the sites associated with the project area

4.2. Lough Arrow SAC

The project will take place in its entirety within the boundaries of this Natura site. One Annex 1 habitat type is named as a qualifying interests for the site and this is given careful consideration in the context of potential impacts from the project.

4.3. Lough Arrow SPA

The project will take place in its entirety within the boundaries of this Natura site. There are 2 bird species and one species grouping named as qualifying interests for the site and these are also considered in the context of potential impacts from the project.

4.4. River Unshin River SAC

This site is contiguous and directly connected with the project area. Four habitat types and two protected species are named as qualifying interests for this site and these are given individual consideration in section 5.

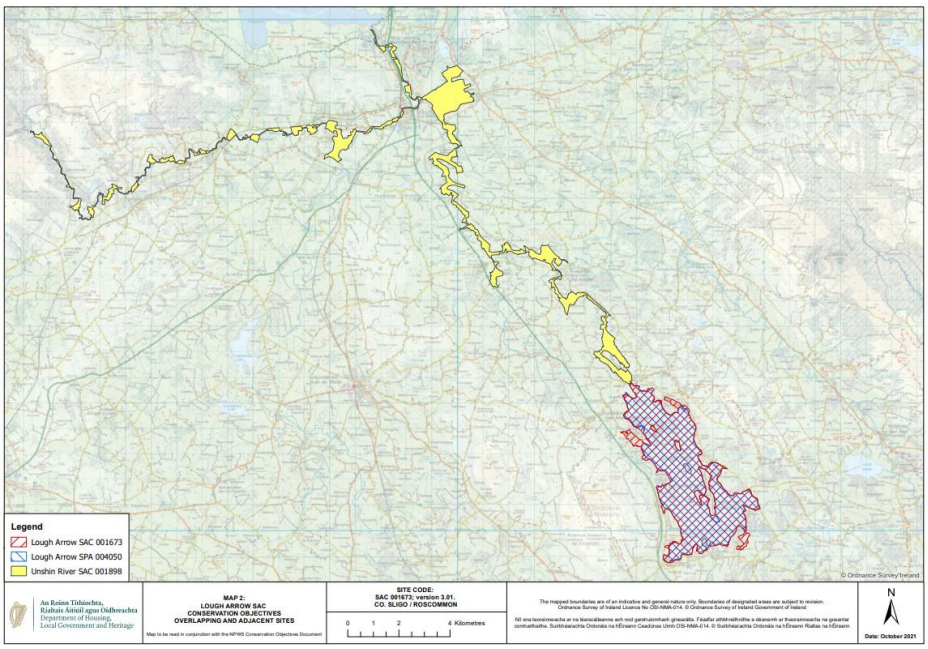

Fig. 4.1. L. Arrow SAC & SPA and Unshin River SAC

4.5. Other Sites

In addition to the 3 primary sites, where the project will take place, there are an additional 4 Natura 2000 sites which are connected to or lie within the potential zone of influence of the project. The connectivity, proximity and likelihood of impacts to these sites from the project are also examined in this section.

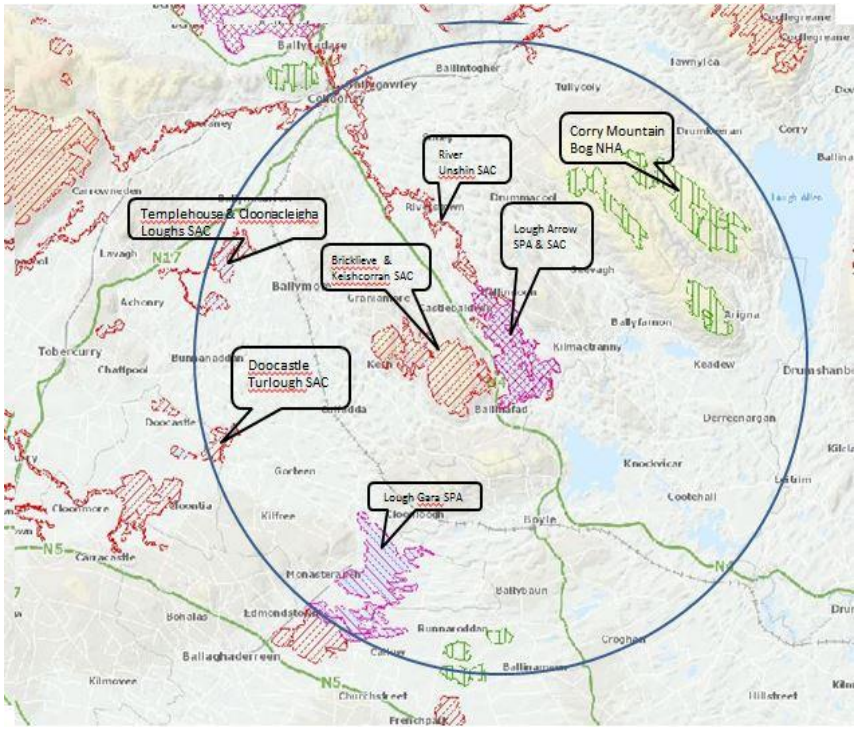

Fig 4.2. Natura Sites connected to or within the potential zone of influence of the project

4.6. The Zone of Influence

The presumed zone of influence from the project area is approximately 15km or where there is a direct hydrological connection or biodiversity corridor to the project site and its activities. This presumed zone incorporates 5 additional sites which could be impacted by the project (see table 4.2.). The possibility of interconnectivity or potential source, impact pathways are evaluated here, to assess whether impacts from the project are likely.

Natura Site and code	Qualifying Interests	Distance from and Connectivity with project
Bricklieve Mountains and Keishcorran SAC 001656	- Turloughs [3180] - Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] - Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) [8120] - Euphydryas aurinia (Marsh Fritillary) [1065]	Site is >500m from project although unconnected hydrologically

	- Austropotamobius pallipes (White-clawed Crayfish) [1092]	
Ballysadare Bay SAC) 000622	- Estuaries [1130] - Mudflats and sandflats not covered by seawater at low tide [1140] - Embryonic shifting dunes [2110] - Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] - Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] - Humid dune slacks [2190] - Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] - Phoca vitulina (Harbour Seal) [1365]	Directly connected to but somewhat distant from (19.5km) the project - via river Unshin
Flughany Bog SAC 000497	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150]	Approximately 15km from project area – No Connectivity
Templehouse and Cloonacleigha (000636)	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.[3140] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]	Approximately 15km from project area – No Connectivity
Lough Gara SPA	Whooper Swan Cyngus cyngus [A038] Greenland white fronted Goose Answer albifrons flavirostris [A395]	14km – No connectivity

Table 4.2. Characteristics & proximity of Other Natura 2000 sites within the presumed zone of influence of the project

4.7. Interconnectivity between Sites

The five sites in table 4.1. were evaluated in terms of potential impacts from the project in terms of the project characteristics (see table 3.1) and any potential source impact pathways that could be identified. When the proximity, connectivity and the nature of the above sites (see table 4.1.) and qualifying interests are examined in light of the project scale, duration, resource requirements, emissions and land-take (See table 3.1.), it can justifiably be concluded that these sites are unlikely to be impacted by the project. They are therefore, screened out at this stage.

4.7.1. Bricklieve Mountains and Keishcorran SAC[001656]

Only One site is sufficiently close to the project area to warrant consideration with regard to source impact pathways. This is the Bricklieve Mountains and Keishcorran SAC[001656] which is less than 500m from the closest point to the project area. However, there is no identifiable connection between the static habitats named as qualifying interests for this SAC. The two sites, they are separated by a significant road corridor (N4) and the Bricklieve SAC is upslope from the project area. There is, therefore very little likelihood of impacts arising to any annex 1 habitat at this site as a consequence of the project.

Two annex 2 species (White-clawed crayfish and Marsh fritillary) are included as qualifying interests for the Bricklieve mountain and Keshcorran SAC. Crayfish are only found in Lough Labe which is 4km from the project site with no hydrological connection. As this is an aquatic species with limited potential for overland movement, it is unlikely that they will be found at or near the project site. The impact of principal concern to the conservation of this species is the fungal pathogen *Aphanomyces astaci* which is carried by non-native crayfish species. The introduction of invasive crayfish or spores which have been spread by them is not likely to arise as a result of this project.

Evidence of marsh fritillary breeding at the Bricklieve site has resulted in this threatened butterfly species to be named as a qualifying interest. The conservation issues of concern for this species are habitat (species rich grassland) and scrub encroachment. Niether of these threats could be seen as attributable to the project and It is therefore unlikely that any project activity could impact on the qualifying species at the Bricklieve mountain and Keshcorran SAC.

4.7.2 Ballysadare Bay SAC [000622]

A second of the peripheral sites has a strong hydrological connection, via the Unshin river, to the project area. This is the Ballysadare Bay SAC which although connected is 19.5 km from the site. However, it still requires consideration due to the obvious potential pathway for impacts. Taking into account the lack of emissions likely for this project, the fact that there is no requirement for land-take or materials, it can be concluded that impacts are very unlikely at this site.

4.7.3. Faughany Bog SAC, Templehouse and Cloonacleigha lakes SAC & Lough Gara SPA

These three sites are significantly removed from the project area. Although templehouse and Cloonacleigha lakes are technically, hydrologically connected, they are a considerable distance in an upstream direction away from the project area. Given the potential for emissions, land-take and general nature of the project activities, it is unlikely that impacts on any of these sites could be reasonably foreseen.

5.0. Qualifying Interests – Habitats & Species

Any potential impacts from the project are considered here in the context of the various habitats, species and Conservation Objectives which are set out for each of the Natura sites (Lough Arrow SAC/SPA & River Unshin SAC) overlapping with the project site. Where specific conservation objectives for habitats at the project sites are not published, more detailed objectives for the same habitat type at other sites for which specific objectives are stated, are used.

5.1. Conservation Objectives

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

5.2. - Habitats

The particular Habitats for which the three principal sites are designated are noted as qualifying interests in the conservation objectives for the sites. Table 4.2. below identifies these receptors as well as the impacts which could prevent them from achieving their conservation objectives.

Qualifying Interest (Habitat)	Conservation Objectives	Impacts Currently Affecting the Achievement of Conservation Objectives
Hard Oligo-Mesotrophic waters with benthic vegetation of Chara spp.	Typical species present in good condition, and demonstrating typical abundances and distribution Maintain appropriate hydrological regime & substratum necessary to support the habitat. Maintain/Restore high water quality and low algal biomass and low DOC as measured by Secchi depth Maintain fringing habitats	Declines in Water quality (primarily due to agricultural inputs to watercourses and waste-water discharges are considered to be the most significant impact on this habitat
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]	Maintain appropriate hydrological regime, groundwater contribution and variety/extent of substratum necessary to support the typical species and vegetation composition of the habitat Maintain / Restore good biological status and concentrations of nutrients required to support appropriate communities	Nutrient inputs which impact water quality, causing increased turbidity and reduction of euphotic zone. Sedimentation can also impact on species of stonewort.
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia) (* important orchid sites)	At least seven positive indicator species present, including two "high quality" species- Negative indicator species collectively not more than 20% cover. Less than 20% disturbance by grazing	Overgrazing, scrub encroachment, Invasive plant species
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	To maintain or restore the favourable conservation condition of the Annex I habitat(s) for which the SAC has been selected	Loss of habitat to commercial forestry. Also prone to colonisation by invasive plants (e.g. *Rhododendron ponticum*.)
91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*	Area stable or increasing where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size. Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semimature trees and shrubs; and well-developed herb layer – Maintain appropriate hydrological regime necessary for maintenance of alluvial vegetation	Sites require seasonal inundation and are impacted by land drainage which reduces flood frequency. Habitat loss through scrub and woodland clearance for agriculture.

Table 5.1. Qualifying Interests (Habitats) and their conservation objectives for Lough Arrow and the River Unshin SAC

5.2.1. Hard Oligo-Mesotrophic waters with benthic vegetation of Chara spp

This habitat type forms the basis of the SAC and is found throughout the project area. It is assumed that all project activities will take place in this habitat type. Although there are obvious source impact pathways from the project to this habitat, the nature of the project activities together with the re-fuelling and biosecurity protocols outlined in the SOP (Appendix 3) mean that impacts are unlikely

Nutrient release, drainage, land reclamation and emissions to surface waters have the potential to significantly impact on this habitat type as is any activity which alters or interferes with the good ecological status of the waterbody. Any issues which are likely to impact this habitat and, in particular on water quality and clarity are not likely to arise as a result of any project activity.

Benthic vegetation of the Chara species, although not vascular plants, can be vulnerable to physical disturbance and their brittle branchlets can be easily broken. They form dense covering on lake beds and are very important refuges and habitats for complex assemblages of invertebrate species. The potential for charophytes to be damaged by the project activities, particularly launching of boats and gill-netting have been considered but the potential for significant impacts are considered low. This is because Access to the lake will be restricted to established slipways and piers, minimising any disturbance to littoral areas or vegetation. Once set, the nets occupy a single transect line of contact with the lake bed. They are anchored by small weights and not moved for a period of days until their removal from the area. Their potential to damage areas of charophyte is therefore limited.

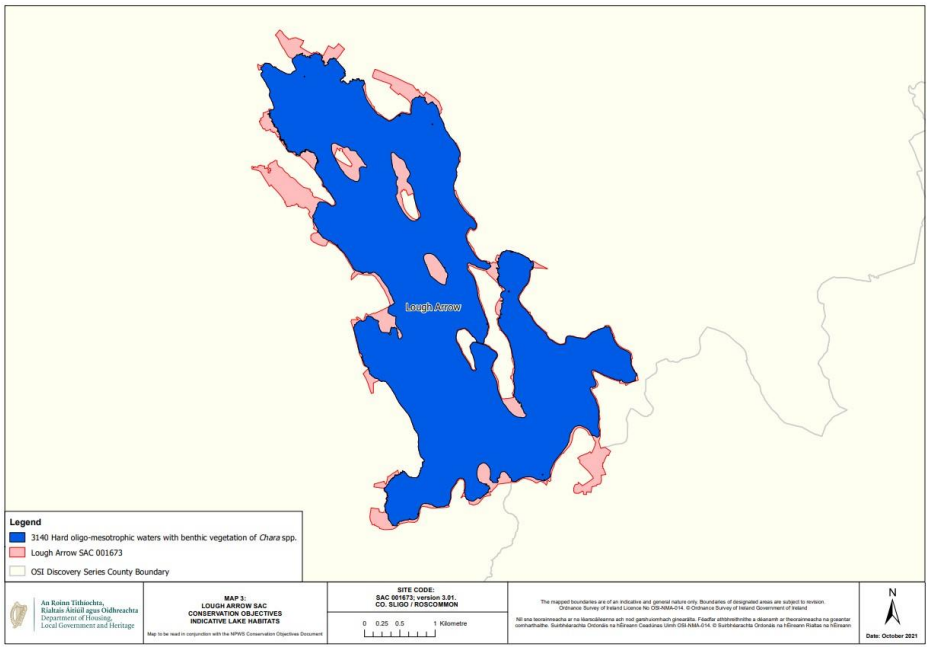

Fig. 5.1. Distribution of the qualifying annex 1 habitat in the L. Arrow SAC

5.2.2 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]

This habitat is located mainly in the upper and middle reaches of the River Unshin SAC. It is one of two priority habitats considered to be in decline throughout its range. Current impacts are noted in table 4.4.1

above and include any activity which might affect water quality or hydrology. Activity which releases sediment (e.g. drainage or earthworks) can severely impact the plants associated with this feature. Impacts from the project on this habitat are considered very unlikely as no emissions to surface water or earthworks likely to give rise to sedimentation will take place.

5.2.3. Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia) (* important orchid sites)

The full extent of this terrestrial habitat within the SAC is not mapped. An extensive area is known to occur as part of a wetland area where the Unshin River flows from L. Arrow , immediately adjacent to the project area (see fig. 3.1.) but there are likely to be other areas present in the SAC

Factors which may impact the conservation objectives for this site include drainage or land reclamation. None of the activities associated with the project are considered likely to impact on this habitat, given its remoteness to the site and the nature of the project activities. Any movement of personnel with take place in the small area adjacent to the IFI base and slipway and will not result in disturbance of this habitat.

5.2.4. Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)

This habitat is described as a semi-natural wet grassland which has been modified by human (grazing) activity but not fertilised. It has been severely impacted by agricultural intensification and has largely been replaced by improved grassland with little or no ecological value. Remaining stands of this habitat are vulnerable to growth of vigorous plant species such as bracken and encroachment by scrub.

Only small fragments of this habitat remain in the Lough Arrow and River Unshin SAC and these have not been fully mapped. However, given the nature and scale of this project and the type of activity envisaged, it is unlikely that any impacts will arise.

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

Total extent of this habitat within the SAC is also unknown and it may occur in mosaics with other woodland types. There a number of small woodlands of this type on the upper and middle reaches of the Unshin river. There are also likely to be additional areas of this Annex I woodland type within the SAC. The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring ‘deep’ woodland conditions.

One of the principal requirements of this habitat type is periodic inundation (by seasonal floods). Activities such as drainage are, therefore, likely to significantly impact alluvial forests. The current extent of this habitat is thought to be a mere fragment of its former range due to flood relief schemes and clearance for agricultural land.

The proposed stock management plan for Lough Arrow is situated within the designated SAC. The proposed plan described in this report will not result in direct habitat loss within this site as habitat loss or alteration (either directly or indirectly) is not a feature of the stock management plan.

No negative impact is anticipated to the protected habitats within the zone of influence of this project. Access to the project areas is also confined to one existing established boat access point beside the IFI base. No connectivity between the protected habitats and the project activity has been identified. There is, therefore, no potential for impacts on protected habitats arising from this stock management project.

5.3. Qualifying Interest and Special Conservation Interests - Species

Only two species are named as qualifying interests for the relevant SACs (L. Arrow & River Unshin) and these both occur in the River Unshin. They are Atlantic salmon (*Salmo salar*) and Otter (*Lutra lutra*). An additional 2 bird species and one species grouping are named as special conservation interests for the Lough Arrow SPA.

Qualifying Interest (Species)	Conservation Objectives	Impacts
Atlantic Salmon *(Salmo salar*)	Maintain accessibility. Exceed conservation limit. Maintain fry densities and prevent declines. Maintain suitable water quality	Declines in water quality Barriers to migration Habitat loss or damage Commercial exploitation Salmon Aquaculture
Otter (*Lutra lutra*)	Maintain distribution and population density. Maintain adequate fish stocks as food source	Habitat loss Disturbance Declining fish stocks
Little Grebe (*Tachybaptus ruficollis)* [A004]	Long term population trend stable or increasing - No significant decrease in the range, timing or intensity of use of areas by little grebe, other than that occurring from natural patterns of variation	Poor water quality effecting food supply
Tufted Duck (*Aythea fuligula*)[A061]	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA	Hunting and commercial exploitation – Poor water quality effecting food supply
Wetland and waterbirds [A999]	To maintain or restore the favourable conservation condition of the wetland habitat at Lough Arrow SPA as a resource for the regularly-occurring migratory waterbirds that utilise it	Hunting and commercial exploitation – Poor water quality effecting food supply Invasive American mink – Impacting on breeding success

Table 5.3. Qualifying interests and Special Conservation Interests for Lough Arrow SPA and the River Unshin SAC

5.3.1. Atlantic Salmon

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

Salmon appear to be sustaining their populations above the established conservation limit in the Owenmore/Ballysodare river generally. (Standing Scientific Committee for Inland Fisheries Ireland 2010) The catch limit to recreational anglers is set at 3,304 per season. The number of spawning adult salmon required to maintain current stock levels is calculated at 7,400 and the average exploitation rate by rod and line from 2015 - 2020 is estimated at approximately 2,500 (IFI – WRBD annual report 2019). There is no commercial fishery for salmon on the Ballysodare river. However, concerns have been expressed by the North Atlantic Salmon Conservation Organisation (NASCO 2020) that this species is in decline throughout its range. Conservation efforts are ongoing in all member states and the responsibility for this in the Republic of Ireland rests with Inland Fisheries Ireland (IFI). The principal issues currently impacting on

salmon conservation in Ireland are habitat loss and water quality deterioration in the freshwater environment and aquaculture and commercial exploitation, in the marine environment.

Although an important conservation species on the river Unshin, Atlantic salmon have not been recorded in the Lough Arrow SAC. It is assumed that salmon use the Unshin, Owenmore and Owenbeg rivers (all tributaries of the Ballysodare river) as spawning grounds but do not migrate as far as L. Arrow which is at the upstream extremity of the Unshin river. The likelihood of this species being impacted by any project activity is, therefore, very low. Particularly given the measures in place to avoid any deleterious matter entering the waters where the stock management project takes place.

Commented [BD2]: pike removal?

5.3.2. Otter

Otter are also recorded throughout the Lough Arrow and River Unshin SAC and are known to be present in the project area. The Lake is not designated for Otter but, as the river Unshin, is closely connected and is designated for this species, an evaluation of potential source impact pathways is carried out for this species.

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

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

5.4. Special Conservation Interests (L. Arrow SPA)

The L. Arrow SPA overlaps with the project site and has two species and one general waterbird grouping which were considered in terms of their likely behaviour and movements and whether these could be impacted by the project activities.

5.4.1. Little Grebe

Lough Arrow is noted as a breeding site for little grebe (*Tachybaptus ruficollis*). This is a resident species which nests in reed beds on the margins of the lake from late March and is present all year round. The species is listed as least conservation concern. Pressures on little grebe populations include predation by invasive American mink and loss of suitable nesting sites due to land drainage. Neither of these pressures arise as a result of any project activity.

5.4.2. Tufted Duck

The majority of the Tufted duck population on Loug Arrow are overwintering birds who will have departed from the lake by mid to late March (BWI 2023). Potential impact on this species has been ruled out on the basis of the timing of the project activity, precedent for stock management operations and international research findings. Like otters, this bird species has not been recorded in or close to the project's gill nets or

in those of research surveys over many decades of operation. It is therefore, not considered to be at risk (see also section 6.1.1.).

5.3.3 Wintering Waterfowl

The site also supports a good diversity of wintering waterfowl species, including Pochard, (*Aythya ferina)*, the population being of national importance. A range of other duck species are also present on the lake, including Common Scoter (*Melanitta nigra)* and Red breasted merganser (*Mergus serrator)*. Common gull (*Larus canus*) and Goldeneye (*Bucephala clangula*). None of these species have been recorded as unintended by-catch in gill-nets over the last 40 years probably because their feeding and general behaviour patterns are unlikely to bring them into contact with this element of the project

5.4. Potential for Impacts on Special Conservation Interests

An indication of the activities likely to give rise to impacts on the various species for which the site is designated are described in schedule 4 of the Statutory Instrument (S.I. No. 289/2011) -Site specific Operations requiring consent - These are: Reclamation, including infilling, cutting, uprooting or otherwise removing plants, Introduction, or re-introduction of plants or animals not found in the area, construction or alteration of tracks, paths, roads, bridges, culverts or access routes. Burning, topping, clearing scrub or rough vegetation or reseeding. Drainage works including digging, deepening, widening or blocking a drain, watercourse or waterbody. Water abstraction, sinking of boreholes and wells. Planting of trees or multi-annual bioenergy crops. Developing or allowing the development or operation of recreational/ visitor facilities or activities, at a commercial scale.

None of the project activities will involve any of those outlined in the preceding list. Over many years of stock management operations, IFI operatives have never recorded inadvertent captures of any bird species listed as special conservation interests on Lough Arrow

On the basis of the known pressures likely to impact on protected bird species and bearing in mind the nature scale and duration of project activities, it can be concluded that there will be no habitat loss, damage or disturbance to protected birds in the Lough Arrow SPA.

6.0 Potential Significant Effects

The significance of any potential effects arising from the project on Natura 2000 Sites are assessed in terms of project activities including their :

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

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

Impact Receptors

6.1. Direct Effects

When viewed in terms of the above criteria, it is considered unlikely that significant direct effects will occur in relation to any Natura 2000 site either wholly or partially within the zone of influence of this project. The following sub-sections examine the potential for each project activity to impact on the site and describes how significant impacts are unlikely.

6.1.1. Gill-Netting

Detailed records are available of all interactions with non-target species with regard to gill-netting activities on L. Arrow since the time of designation (C2011). Anecdotal evidence of by-catch is also available from IFI officers who have carried out these operations and similar for over 30 years. Similar methods (i.e. gill-netting) have also been employed by IFI research staff for over 40 years for the purpose of stock surveys.

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

Similarly, potential impacts from gillnetting to designated non avian species such as Atlantic salmon and Otter are considered. In assessing the potential risk to these species, the likelihood of impact to each protected species is considered to be low as salmon do not occur in the project area and Otters are not vulnerable to impacts from gill-netting.

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

Consultations were also carried out with NPWS staff in the region to discuss species and habitats which could be vulnerable to disturbance by the project activities. Although some species are at greater risk

than others due to specific behaviours, the level of risk posed is considered low enough to be disregarded as a potential threat to the status of any species at the site.

6.1.2. Electrofishing

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

6.1.3. Transport of Personnel, Boats and Equipment.

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

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

6.2. Indirect Impacts

Indirect impacts such as disturbance or emissions on the 2 sites, highlighted as being within the project area, L. Arrow SAC and SPA, are considered as unlikely given the nature, scale and duration of the project activities as well as the biosecurity protocols in place. Methodologies for refuelling and launching of boats will also minimise indirect impacts (see appendix 2).

Fig : 6.1. IFI staff member carrying out biosecurity protocol on an electrofishing boat

6.2.1. Biosecurity

A risk of indirect impacts to the site could arise from the potential spread of pathogens or invasive species to the SAC when transporting boats and equipment to and from waterbodies. To eliminate this potential for spread of invasive species and in accordance with IFI's biosecurity protocols, all equipment used in the project operations will be disinfected prior to, and following its use on the lakes (see fig 5.2.1.). Japanese knotweed *(Fallopia japonica*) and Zebra mussel (*Dreissena polymorpha*) are known to be present in the general site area and strict adherence to these protocols will be necessary to avoid their spread. IFI provide a number of guidance documents on invasive species and their management which are available at www.fisheriesireland.ie.

6.2.2. Water Quality

Water quality in the lake which comprises the main NATURA site in the impact zone of the project (L. Arrow SAC,SPA & River Unshin SAC)) is described by the EPA as Good. However, the last available, comprehensive assessment of water quality on Lough Arrow was carried out in 2009. This result may have changed since that time.

The EU Water Framework Directive (2000/60/EC) requires all Member States to protect and improve water quality in all waters so that we achieve good ecological status by 2015 or, at the latest, by 2027. It applies to all rivers, lakes, groundwater, and transitional coastal waters. No impacts arising from this project are envisaged on water quality.

Standard IFI water quality control methods including biosecurity protocols have been incorporated into the standard operating procedures (SOP's) of the stock management programme. Strict compliance with IFI's electrofishing and gill netting Standard Operating Procedures and implementation of proposed avoidance measures, the Lough Arrow proposed stock management plan, in combination with other activities in the general area, will not cause significant negative adverse impacts to Lough Arrow SAC, Lough Arrow SPA, or the river Unshin SAC or any other nearby designated sites.

6.3. Impact Indicators

A more detailed screening for potential significant effects is carried out here for particular species where potential sources and pathways were identified and could therefore, not immediately be ruled out. The following indicators of impact are this used to conclude analysis :

- Loss/Alteration
- Fragmentation
- Disruption
- Disturbance/Displacement
- Changes to Key Elements

Using these indicators (Europa.eu 2020) the relevant receptors are more thoroughly screened in the following tables.

Atlantic Salmon (*Salmo salar*)	
Indicator	**Potential for Impact**
Loss/Alteration	Salmon are present only in the Unshin and Owenmore river and have not been recorded in L. Arrow (WFD.fish 2018) where the project will take place. As there are no emissions envisaged the project is not predicted to result in any loss or alteration to salmon populations
Fragmentation	For fragmentation of salmon populations to occur, some level of capture or disturbance to migration would need to arise as part of the project operations. Evidence from previous management and survey operations, Given that salmon will not be present at the project site during operations, no fragmentation of their populations are likely.
Disruption	Disruption to this species is also not likely to arise due to the scale and duration of this project as well as the locations of project operations.
Disturbance/Displacement	Because of the timing and location of gill netting and electrofishing operations and the known distribution of local salmon populations, it is unlikely that disturbance or displacement of this species will arise.
Changes to Key Elements	

Commented [BD3]: positive effects?

Otter (*Lutra lutra*)	
Indicator	**Potential for Impact**
Loss/Alteration	Gill netting in an area where Otters are likely to be present, provides an obvious source of impact on this species. However, previous stock management programmes on Lough Arrow have shown that this species has never been encountered in nets. This is thought to be due to the ability of otters to avoid gill net entanglement (Barberi *et al.* 2012) even though they occasionally feed on captured fish.
Fragmentation	For fragmentation of otter populations to occur, significant capture or disturbance to movement would need to arise as part of the project operations. Evidence from previous management and survey operations, which use gill netting and electrofishing,

Commented [BD4]: Positive effects?

	indicate that this is not the case. Interception of otters in gill nets has not occurred to date and they easily avoid electrofishing operations.
Disruption	Disruption to this species as it goes about its movement, feeding and couching behavior, is also not likely to arise due to the scale and duration of this project and the fact that nets and electrofishing operations are easily avoided by this species.
Disturbance/Displacement	Physical disturbance to otter habitat or their displacement from holts will not arise as part of the project, as no heavy machinery is involved. Direct disturbance to otters themselves is also unlikely as periods spent in any one location will be brief (20 - 30 mins daily) and IFI records (as well as international studies) show that they are not at risk from gill nets (Barberi *et al*. 2012)
Changes to key Elements	The key elements of this species relevant to this project is the ability to move, undisturbed to and from couching and feeding areas. Impacts on these elements from the project activities are not likely for the reasons outlined above and the ability of otters to avoid nets and electrofishing operations is well established. Increases in the biomass of trout resulting from reduced pike predation may have positive effects on otter survival due to increased food availability.

Tufted Duck (*Aythea filligula)*	
Indicator	**Potential for Impact**
Loss/Alteration	Gill netting in an area where tufted duck are known to be present provides an obvious source of impact on this species. However, previous stock management programmes on Lough Arrow have shown that this species has not been encountered in nets. This is thought to be due to the specific location of nets and the tendency of this species to avoid human activity
Fragmentation	For fragmentation of Tufted duck populations to occur, significant capture or disturbance to movement and/or feeding would need to arise as part of the project operations. Evidence from previous management and survey operations, which use gill netting and electrofishing, indicate that this is not the case. Interception of wildfowl in gill nets is very rare, largely due to net location and the tendency of birds to avoid areas of human activity on the lakes.
Disruption	Disruption to this species is also not likely to arise due to the scale and duration of this project as well as limited number of netting locations used at any one time during operations.

Disturbance/Displacement	Although 8 locations where gill netting is likely to be carried out have been identified, a maximum of two of these will be occupied at any one time. This means that birds which may be feeding in any location are free to move around the lake to avoid disturbance and have a wide variety of alternative locations to feed. Hunting and shooting are not permitted on these lakes so no potential for cumulative disturbance arises.
Changes to key Elements	The key elements of this species relevant to this project is the ability to feed and shelter on these sizeable inland waterways, particularly during the winter months. Impacts on these elements from the project activities are not likely for the reasons outlined above.

Little Grebe (*Tachybaptis ruficolis)*	
Indicator	**Potential for Impact**
Loss/Alteration	Gill netting in an area where little grebe are known to be present provides an obvious source of impact on this species. However, previous stock management programmes on Lough Arrow have shown that this species has not been encountered in nets. This is thought to be due to the specific location of nets and the tendency of this species to avoid human activity.
Fragmentation	For fragmentation of little grebe populations to occur, significant capture or disturbance to movement and/or feeding would need to arise as part of the project operations. Evidence from previous management and survey operations, which use gill netting and electrofishing, indicate that this is not the case. Interception of wildfowl in gill nets is very rare, largely due to net location and the tendency of birds to avoid areas of human activity on the lakes.
Disruption	Disruption to this species is also not likely to arise due to the scale and duration of this project as well as limited number of netting locations used at any one time during operations.
Disturbance/Displacement	Although 8 locations where gill netting is likely to be carried out have been identified, a maximum of two of these will be occupied at any one time. This means that birds which may be feeding in any location are free to move around the lake to avoid disturbance and have a wide variety of alternative locations to feed. Hunting and shooting are not permitted on these lakes so no potential for cumulative disturbance arises.
Changes to key Elements	The key elements of this species relevant to this project is the year-round residency on these sizeable inland waterways, where it breeds and rears young. Impacts on these elements

	from the project activities are not likely for the reasons outlined above.

6.5. Cumulative impacts

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

6.5.1 N4 Road Realignment Project

This project involves the realignment and construction of a 14.5 km stretch of road between Drumfin and Tubberbride (see map below) together with access roads and tie-ins. There are 4 overbridges, six underbridges and two river bridges. Some drainage works are also envisaged in the vicinity of the river Unshin.

Fig 6.1. Map of the road realignment project adjacent to the project area

At its closest point, the new road passes within 1km of the western shore of L. Arrow. It also passes within 500m of some parts in the lower reaches of the Unshin river. Significant mitigations have been incorporated into the project design, including wetland construction and the provision of compensatory habitat. IFI have been closely involved in the monitoring of this project with regard to potential impacts on the fisheries resource. No impacts on Lough Arow or the River Unshin have been recorded as a result of this project.

Fig 6.2. Aerial photo of compensatory habitat provided by the N4 road realignment project

The project is now at an advanced stage and was completed in September 2021. However, the increased volumes and traffic speeds are being monitored to assess the likelihood of ongoing disturbance impacts. None of the activities or characteristics associated with stock management on Lough Arrow (see table 3.1.) are thought

likely to act in concert with the disturbance elements for this development to give rise to likely significant in-combination impacts on the site

7.0 Screening Determination

The preceding sub-sections have concluded that the principal activities of this project, (i.e. the removal of pike *(Esox licius L.*), by gill-netting and electro-fishing are necessary for the maintenance of a sustainable wild brown trout fishery at the site. They also indicate that there will be no significant direct, indirect or in-combination effects to the Natura 2000 habitats or species at the site (see sections 4.4.1 – 4.4.6. & 4.3.1. – 4.3.5.). There will be no significant impacts to water quality within designated sites (see section 5.2.1. & appendix 3) and the carrying out of pike stock management operations could be of benefit to the conservation of Atlantic salmon in the adjacent River Unshin SAC.

Furthermore, considering the conclusions in the preceding subsections and bearing in mind the scope, scale, duration and timing (see table 3.1.) of the proposed project, it is concluded that no significant habitat or species impacts are likely as a result of the proposed stock management programme on Lough Arrow SAC/SPA and the River Unshin SAC.

Table 7.1. Screening matrix

Name of Project or Plan	**AA Screening for pike management on L. Arrow (2024)**
Name and Location of European Sites	Lough Arrow SAC/SPA & River Unshin SAC (project area) Bricklieve Mountains and Keishcorran SAC (500m) Ballysadare Bay SAC (19.5km) Templehouse & Cloonacleigha Loughs SAC (14.5km) Lough Gara SPA Flughany Bog SAC (15km
Description of the Project or Plan	<u>The proposed works will comprise of the following;</u> ▪ Setting of gill-nets to capture and remove pike from L. Arrow ▪ Electrofishing on L. Arrow to capture and remove pike ▪ Launching boats, personnel and equipment on from L. Arrow
Is the project or plan directly connected with or necessary to the management of the site?	No.
Are there other projects or plans that together with the project or plan being assessed could affect the site?	No.
Assessment of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the European Site.	The risk from this project to protected habitats and species or to the integrity of a natura 2000 site is deemed to be not significant and the project is considered required for the management of the fishery
Explain why these effects are not considered significant.	Given the re-fuelling protocols and biosecurity measures outlined in IFI's SOP for stock management, habitats are unlikely to be impacted in any way. Based on previous

	experience (40 years). Damage to protected species are unknown and therefore unlikely to occur in this instance.
List of agencies consulted:	Inland Fisheries Ireland National Parks & Wildlife Service, EPA, BWI
Response to consultation.	Screening required – Monitoring of potential impacts should be on-going
Data Collected to Carry Out the Assessment	
Assessment carried out by:	Inland Fisheries Ireland
Sources of data:	Inland Fisheries Ireland, National Parks & Wildlife Service Website, EPA Website & GIS Webtool. National Biodiversity Data Centre, NRA, Irish Water
Level of assessment completed	Desktop and Site Investigations, IFI archives/records
Where can the full results of the assessment be accessed and viewed?	Inland Fisheries Ireland, Website
Overall Conclusion	Stage 1 Screening indicates that the proposed stock management plan on L. Arrow will not have a significant negative effect on the European sites network. Therefore, a Stage 2 'Appropriate Assessment' under Article 6(3) of the Habitats Directive 92/43/EEC is not required. The site synopsis for the L. Arrow SAC states that "the lake is notable for its Brown Trout and Eel populations". Although these species do not feature in Annex ii, the plan may contribute to the conservation of the site's "typical species" and improve its EQR in the context of the Water Framework Directive.

Commented [BD5]: positive effects?

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8.0 Appendices

Appendix 1. Lough Arrow Stock Management Plan 2024

Iascach Intíre Éireann
Inland Fisheries Ireland

Proposed Lough Arrow/

Stock Management Plan 2024

Western River Basin District

Gill Netting Operations

Netting will be concentrated into specific areas on Lough Arrow during different periods of the pike management season. Known, spawning areas are targeted during periods of maximum spawning activity while other operations will take advantage of congregations of pike which occur in accordance with specific feeding behaviour associated with concentrations of spring and autumn salmonid migrations. Gill netting operations for 2024 will commence in February on Arrow subject to suitable weather conditions. Netting will continue until the end of March at which point operations will incrementally decrease. An estimated 90 person days will be allocated to gill netting operations on Lough Arrow in 2024.

Table 1: Proposed Gill Netting in Lough Arrow 2024

Year	Fishery	Period	Days	Person Days	Estimated number of Pike to be removed
2024	Lough Arrow	Feb-April*	30	90	Maximum yield

An asterisk* denotes that dates may change. (The proposed start date would be week starting 19th Feb, however if conditions and levels were suitable, we may begin on the week starting 12th Feb)

Electrofishing Operations

Electrofishing (EF) operations can be carried out year round on lakes subject to suitable weather and water conditions. As such, the period identified for EF operations on L Arrow will be for the period from May through to late August. It is also planned for electrofishing operations on the Garravogue during the Salmon smolt run (May-July). An estimated 27 person days will be allocated to EF operations over 9 days in 2024 on Loughs Arrow and Gill.

Table 2: Proposed Electrofishing in Lough Arrow 2024

Year	Fishery	Period	Days	Person Days	Estimated number of pike to be removed
2024	Lough Arrow	May - Aug	6	18	Maximum yield

Appendix 2. **SITE SYNOPSIS Version date: 6.11.2013 1 of 2 001673_Rev13.Doc Site Name: Lough Arrow SAC**

Site Code: 001673

Lough Arrow, located in Counties Sligo and Roscommon, is a large limestone lake that conforms to a type listed on Annex I of the E.U. Habitats Directive. The lake is sheltered on three sides by hills and is the source of the Unshin River. Lough Arrow is unusual in being a mesotrophic natural lake which has changed little in the last 40 years. It is largely spring-fed and very sheltered for its size, and, as such, is hydrologically different from most other lakes. 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): [3140] Hard Water Lakes The shores of Lough Arrow are for the most part stony. Several bays occur in which Common Club-rush (*Scirpus lacustris*) and Common Reed (Phragmites australis) are found in abundance. In places the reedbeds extend out into the lake and Bogbean (*Menyanthes trifoliata*) and Yellow Iris (Iris pseudacorus) also occur. The lakeshore vegetation, which includes sedges (Carex spp.), Water Mint (Mentha aquatica) and Water Horsetail (Equisetum fluviatile), grades into areas of mossy boulders and woodland. The

lakes support a diverse submerged aquatic flora. An area of wet woodland in the north-west of the site is dominated by willows (Salix spp.) and some Alder (*Alnus glutinosa*) occurs also. The ground flora is composed of Yellow Iris, Common Reed, rushes (Juncus spp.), Marsh-marigold (Caltha palustris), sedges and Common Marsh-bedstraw (Galium palustre). Areas of dry woodland to the north and south of the lake are also included in the site. The dominant species here are Ash (Fraxinus excelsior), Blackthorn (Prunus spinosa), Hawthorn (Crataegus monogyna) and Sycamore (Acer pseudoplatanus). The ground flora includes Herb-Robert (Geranium robertianum), Bramble (Rubus fruticosus agg.), Great Wood-rush (Luzula sylvatica), Cleavers (Galium aparine), Primrose (Primula vulgaris), and a variety of fern, moss and liverwort species. The wooded islands and some areas along the shore are used by nesting Tufted Duck, while the reedbeds are also used by nesting wildfowl. In winter the lake is frequented by flocks of Tufted Duck (226), Coot (325), Little Grebe (35), Wigeon (87), Mallard (27), Pochard (36) and Goldeneye (49) (data for 2 counts over 1 season, 1984/85 - 1986/87). Lough Arrow supports the highest density of breeding Great Version date: 6.11.2013 2 of 2 001673_Rev13.Doc Crested Grebe, Merganser and Tufted Duck of any of the large lakes in western Ireland. The lake is notable for its Brown Trout and Eel populations, both of which are fished. Otter, a Red Data Book species which is legally protected under the Wildlife Act, 1976, and is listed on Annex II of the E.U. Habitats Directive, has been recorded at the site. Lough Arrow and its environs incorporate a variety of habitats, including the E.U. Habitats Directive Annex I listed habitat, hard water lake. The site also supports important numbers of birds. The diversity of lakeshore vegetation and the presence of protected species, in particular Otter, adds to the conservation significance of the site.

Appendix 3

Pike Policy

Prepared by the Pike Policy Review Group

August 2014

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Pike Policy Review Group

Management Recommendations

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:

1. 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 X

DEPARTMENT OF THE ENVIRONMENT, CLIMATE AND COMMUNICATIONS

INLAND FISHERIES ACTS 1959 TO 2017

CONSERVATION OF SALMON AND SEA TROUT BALLYSADARE (CLOSED RIVERS) BYE-LAW NO. C.S. 336, 2024

I, Eamon Ryan, Minister for the Environment, Climate and Communications, in exercise of the powers conferred on me by section 57 of the Inland Fisheries Act 2010 (No. 10 of 2010) (as adapted by the Communications, Climate Action and Environment (Alteration of Name of Department and Title of Minister) Order 2020 (S.I. No. 373 of 2020)), hereby make the following bye-law:

1. (1) This Bye-law may be cited as the Conservation of Salmon and Sea Trout Ballysadare (Closed River) Bye-Law No. C.S. 336, 2024.

(2) This Bye-law comes into operation on the day of its making.

2. In this Bye-law -

"fish" has the meaning assigned to it by the Inland Fisheries Acts 1959 to 2017.

3. (1) Notwithstanding anything contained in any other Bye-law, it is prohibited for a person -

(a) to take, or attempt to take, or to fish for or to attempt to fish for, or to aid or assist in the taking or fishing for any fish, or

(b) to be in possession of any fish,

in the waters of the Ballysadare River system in the No. 12 or Sligo District.

GIVEN under my hand,

17 July 2024.

EAMON RYAN

_____

Minister for the Environment, Climate

and Communications.

EXPLANATORY NOTE

(This is not part of the Bye-law and does not purport to be a legal interpretation.)

This Bye-law prohibits the taking, or attempting to take, fishing for or attempting to fish for, aiding or assisting the taking of, or to be in possession of any fish in waters specified in the bye-law.

FOOTNOTE

Section 57 (7) of the Inland Fisheries Act, 2010 provides that any person aggrieved by this Bye-law may within 28 days after its publication in the Iris Oifigiúil, appeal against same to the High Court.

APPENDIX XI

DEPARTMENT OF COMMUNICATIONS, ENERGY AND NATURAL RESOURCES.

FISHERIES ACTS 1959 to 2006

NORTH WESTERN FISHERIES REGION - LOUGH CONN AND LOUGH CULLIN (CONSERVATION OF BROWN TROUT) BYE-LAW NO. 827, 2007.

I, Eamon Ryan, Minister for Communications, Energy and Natural Resources, in exercise of the powers conferred on me by section 9 (as amended by section 3 of the Fisheries (Amendment) Act 1962 (No. 31 of 1962)) of the Fisheries (Consolidation) Act 1959 (No. 14 of 1959), section 33 of the Fisheries (Amendment) Act 1962, the Fisheries (Transfer of Departmental Administration and Ministerial Functions) Order 1977 (S.I. No. 30 of 1977) (as adapted by the Communications, Marine and Natural Resources (Alteration of Name of Department and Title of Minister) Order 2007 (S.I. No. 706 of 2007)) and having complied with the requirements of Regulation 31 of the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997), hereby make the following bye-law:

1. This Bye-law may be cited as the North Western Fisheries Region - Lough Conn and Lough Cullin (Conservation of Brown Trout) Bye-law No.827, 2007.

2. This Bye-law comes into operation on 1 January 2008.

3. Notwithstanding anything contained in Article 3 of Bye-law No. 552, 1971 and of Bye-law No. 690, 1994, it is prohibited for any person to-

   (a) take or kill any brown trout less than 30.48 cm (12 inches) in length measured in a straight line from the tip of the snout to the fork of the tail or,

   (b) have in his or her possession any such fish on or near the banks of the waters,

   in Lough Conn and Lough Cullin in the No. 11 or Ballina District.

4. Any brown trout taken inadvertently in contravention of Article 3 shall be handled carefully and returned without avoidable injury to the waters immediately upon being taken.

GIVEN under my Official Seal,
28 November 2007.

Eamon Ryan
Eamon Ryan
Minister for Communications,
Energy and Natural Resources

EXPLANATORY NOTE

(This is not part of the Bye-law and does not purport to be a legal interpretation).

This Bye-Law prescribes at 30.48cm (12 inches) the minimum size of brown trout which may be taken in Lough Conn and Lough Cullin effective from 1 January 2008.

FOOTNOTE

Section 11 of the Fisheries (Consolidation) Act, 1959 provides that any person aggrieved by this Bye-law may within 28 days after its publication in the Irish Oifigiuil, appeal against same to the High Court.

APPENDIX XII

Iascach Intíre Éireann
Inland Fisheries Ireland

Designated Salmonid Waters Byelaw
Submission to Public Consultation

August 2021

Author(s):	Inland Fisheries Ireland
Description of Content:	Submission to Department of the Environment, Climate and Communications

Byelaw Proposal

On page 66 of the programme for Government it states that the government intends to "Legislate to designate our western lakes as salmonid lakes".

IFI welcomes the Government's commitment to recognise these exceptional limestone lakes which are unique in Europe as salmonid – in particular wild brown trout - lakes. The intention of the designation of these lakes as 'salmonid' lakes from IFI's perspective needs to be fully explained. This requires some background.

Background:

Since the 1950's, and probably before, the main large limestone lakes of Ireland were selectively managed as wild brown trout fisheries. Few countries have such a unique resource whereby there is adequate spawning in clean rivers for wild trout to breed and this is complimented by limestone lakes with extensive stoneworth (*Charaphyte sp*) beds in which an abundance of invertebrate life exists on which the wild trout, which migrate down from the nursery streams, feed and grow quickly.

In the earlier years the fish fauna of these lakes was less diverse – over time more species appeared in these lakes as a result of anthropogenic activity and as a consequence most of these lakes have additional non-native species competing with the trout for food.

Under the management of the Inland Fisheries Trust all the large limestone lakes – some of which were originally known as the 'Crown Lakes' were managed selectively for wild brown trout angling. This entailed removing predator and competitor species as part of a management programme. It is IFI's policy and intention that the lakes in the Schedule to this draft bye-law will continue to be managed into the future with the reduction, through both angling and direct management, of both competitor and predator species into the future.

Proposed Designation:

The designation of these lakes is welcomed by IFI but should be simple. They are already designated in terms of the established management policy of Inland Fisheries Ireland and the agencies that preceded it such as the Central and Regional Fisheries Boards and the Inland Fisheries Trust and also marketing of these lakes as wild brown trout fisheries. However, there was never formal recognition of this. In the view of IFI, it is unclear that this byelaw, as currently drafted, actually achieves the intent of IFI to protect these lakes and enshrine their management in such a manner that they are primarily wild brown trout fisheries and competing or predator species shall be removed to improve the opportunity for trout to survive and grow.

On another detail, in view of the fact that some of the lakes in question are remote from the sea and have no migratory salmon component to their population – the byelaw would be best worded to specify wild brown trout as opposed to salmonid.

Conflicting Byelaws:

One of the over-riding concerns of Inland Fisheries Ireland in the past 15 years was the fact that two bye-laws introduced in 2006, (specifically to prohibit the widescale harvest of pike and coarse fish from certain waters in Ireland), was directly in conflict with the management policy of the then Central and Regional Fisheries Boards. This was intended as a 'stop-gap' measure to address a particular threat – but the anomaly caused by these byelaws in respect of the management and marketing of the Great Western Lakes as wild brown trout fisheries has continued for an inordinate period of time. The proposal to designate these lakes as salmonid (or wild brown trout) lakes must address this inconsistency once and for all.

It is evident that unless the lakes in the Schedule to the draft byelaw are excepted from the provisions of the two Byelaws – namely Byelaw 806 and Byelaw 809 of 2006 the byelaw as it stands does not achieve its stated aim of protecting the wild brown trout status of the lakes. In fact these byelaws have resulted in fish species which have become 'naturalised' in these lakes are now afforded equal protection to the native species which have been there since the retreat of the last ice age. This is contrary to the aims of the Habitats Directive and fisheries legislation in general.

Stock Assessments, Carrying Capacity and Angling Returns:

The draft byelaw as currently stated also appears to bind IFI into a massive undertaking in terms of regular stock assessments of all the lakes in the schedule (7) including most of the largest lakes in the country and such an assessment will also require surveys of all feeder rivers and streams. This will require very significant additional resources for IFI to be able to deliver on this component annually. Coupled with the assessment of the stocks IFI will be required to identify the carrying capacity of the lakes, the current stock and the 'harvestable surplus' available to anglers. IFI have never done such a detailed stock assessment for any of these lakes previously and the cost of such a commitment into the future for seven lakes will be very substantial.

The logical extension from this would be that the complimentary element to this will be an assessment of the fishing effort and catch of trout on the lakes in question. Previously voluntary "Creel Census" returns were introduced for some of these lakes but with limited success. Creating a system for all anglers to make required returns will be another significant administrative burden and may be seen by some as the precursor to the introduction of a 'fee or licence for trout angling' on these lakes which, it is clear, will never be an acceptable funding mechanism.

Without the substantial additional resources annually to carry out all these requirements IFI will not be in a position to fulfil the terms of the byelaw. This may lead to IFI being in breach of the byelaw which would be an unacceptable scenario. Furthermore, the byelaw as currently worded empowers the Minister – a politically elected public representative to amend the plans of IFI – prepared by fishery management professionals and scientists 'as he sees fit'. This leaves the future

management of these vitally important lakes open to potential pressure for change from lobby groups and takes it away from professional fisheries managers where such expertise exists and should remain.

Summary & Recommendations:

In the light of the foregoing IFI propose that a more manageable approach be adopted. One that addresses the fundamental anomalies of the 2006 byelaws and also encourages anglers to play their part in the future management of the lakes.

IFI believes this matter would benefit from further discussion and debate prior to finalising the wording of the proposed byelaw. This should involve detailed discussion with the relevant stakeholders in particular the local resident, local anglers, key tourist interests including guides, angling centres as well as local angling clubs. The buy-in from these sectors is fundamental to the success of the future management of these lakes. However, should that approach not be possible at this stage IFI proposes that the byelaw be amended to include the following:

(1) Calling the byelaw the Designated Wild Brown Trout Waters Bye-Law .....

(2) Defining "designated waters" as means the waters designated as wild brown trout waters under Article 3; which shall be managed by Inland Fisheries Ireland specifically for wild brown trout (Salmo trutta) in all its forms and subspecies.

(3) Defining "wild brown trout" as meaning fish of the species (Salmo trutta) including Ferox, Sonaghan and Gillaroo trout.

(4) Specifying that the designated waters shall be managed specifically as premier wild brown trout fisheries. Management shall include the unrestricted removal of predator and competitor species either by direct management or angling.

(5) Exempting the waters in the schedule from the provisions of Byelaw 806 of 2006 – for example:- The waters in Schedule 1 Column 2 of this byelaw shall be excluded from the bag limit and size provisions of byelaw 806 of 2006 namely a person may take (by angling) and kill more than 4 coarse fish and including fish less than or greater than 25 cms measured in a straight line from the tip of the snout to the fork of the tail.

6. Exempting the waters in the schedule from the provisions of Byelaw 809 of 2006 – for example:- The waters in Schedule 1 Column 2 of this byelaw shall be excluded from the bag limit and size provisions of byelaw 809 of 2006 namely a person may take (by angling) or kill more than one

pike including pike less than or greater than greater than 50 cms measured in a straight line from the tip of the snout to the fork of the tail.

7. Include a general provision for the proper management of the fishery – i.e. - IFI shall do whatever it deems necessary for the proper management of the lakes in Schedule 1 as wild brown trout fisheries.

8. Leave the transfer provision in the proposed regulation:- (a) A person shall not put or transfer into the designated waters fish of any species without the prior written consent of IFI. (b) An application for the prior written consent of IFI referred to in paragraph (a) shall be made in writing to IFI.