Iascach Intíre Éireann
Inland Fisheries Ireland

Screening for Appropriate Assessment

Lough Mask Stock Management Plan 2023

Inland Fisheries Ireland

Western River Basin District

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1. SUMMARY OF FINDINGS

1.1 SCREENING FOR APPROPRIATE ASSESSMENT

Project Title	**A proposed stock management programme for Lough Mask** which borders two counties; Galway and Mayo. The programme will concentrate on the removal of pike *(Esox lucius)* from Lough Mask which contains (amongst other species) stocks of wild brown trout *(Salmo trutta)* and Arctic char *(Salvelinus alpinus).* The proposed methods are gill netting and electrofishing on Lough Mask itself and electrofishing the lower sections of selected inflowing river systems, primarily the River Robe. This programme has been carried out since the 1950s by Inland Fisheries Ireland (IFI) and the predecessors to IFI; the Western Regional Fisheries Board (WRFB) and the Inland Fisheries Trust (IFT).
Project Proponent	Inland Fisheries Ireland, Western River Basin District, Galway
Project Location	Lough Mask and lower sections of the Robe River across numerous townlands west of Ballinrobe, in Counties Mayo and Galway.
Conclusion	It has been concluded during the screening process that the Natura 2000 sites within 15km of the proposed sites are not likely to be significantly impacted by the proposed stock management plan. These sites are: ▪ Lough Corrib cSAC 000297 ▪ Lough Corrib SPA 004042 ▪ Moorehall (Lough Carra) SAC 000527 ▪ Kildun Souterrain SAC 002320 ▪ Towerhill House SAC 002179 ▪ Skealoghan Turlough SAC 000541 ▪ Kilglassan/Caheravoostia Turlough SAC 000504 ▪ Mocorha Lough SAC 001536 ▪ Clyard Kettle Holes SAC 000480 ▪ Ballymaglancy Cave Cong SAC 000474 ▪ Mweelrea/Sheeffry/Erriff Complex SAC 001832 ▪ Lough Carra SPA 004051 ▪ Lough Carra/Mask Complex SAC 001774 ▪ Lough Mask SPA 004062 No sites beyond 15km will be significantly impacted by the proposed stock management plan either. Based on this process, this Appropriate Assessment Screening Report is considered sufficient and the requirement to progress to Stage 2 and submit an NIS is not required. Significant impacts to Natura 2000 sites are not likely.

2. INTRODUCTION

2.1 PURPOSE OF ASSESSMENT

This Screening for Appropriate Assessment has been undertaken to determine the potential for significant impacts on a proposal to carry out a stock management plan on Lough Mask which straddles Counties Galway and Mayo, on nearby sites with European conservation designations (i.e. Natura 2000 Sites).

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

3.3 SCREENING FOR APPROPRIATE ASSESSMENT

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

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

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

4. SCREENING FOR APPROPRIATE ASSESSMENT

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

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

4.1 MANAGEMENT OF NATURA 2000 SITES

This stock management programme is not connected with or necessary to the conservation management of a Natura 2000 site.

4.2 DESCRIPTION OF PLAN/PROJECT

4.2.1 Project Description

In accordance with IFI's current policies on both pike and trout, stock management operations are carried out on six lake catchments in the Western River Basin District (WRBD); Loughs Corrib, Mask, Carra, Conn, Cullin & Arrow, all of which are designated managed wild brown trout fisheries. This stock management programme concentrates on Lough Mask. Gill netting and electrofishing (EF) operations are planned for Lough Mask and full details of the proposed start and finish dates are provided for in Table 1 below.

The EF operations will be carried out in accordance with IFI's Standard Operating Procedures (SOPs) for both electrofishing and gill netting operations. Where feasible pike captured during electrofishing operations will be relocated to recognised pike fisheries. All staff handling pike will do so in accordance with IFI's SOPs and all have received fish health, handling and welfare training. All pike carcasses will be appropriately disposed of with an approved rendering company.

It should be noted that the delivery of this plan is dependent on suitable weather conditions, availability of personnel and all equipment remaining fully operative. It should be borne in mind that the staff involved in this stock management programme will at the same time effectively be patrolling the lakes, monitoring angling activity, identifying water quality issues, monitoring for aquatic invasives or the spread of existing invasives and effectively maintaining a presence which acts as a deterrent to illegal activity.

Table 1: Details of stock management operations planned for Lough Mask in 2023

Planned operations for Lough Mask in 2023	Period	Person days
Gillnetting	Feb – March	140
Electrofishing	Jan – Dec	180*

The asterisk* denotes that this figure of 180 person days relates to the Corrib catchment in total (Loughs Corrib, Mask and Carra)

4.2.2 Purpose of the Project

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

The predation of salmonids by pike has been observed and described by many professionals working in the inland fisheries sector both in Ireland (O'Grady & Delanty, 2008) and in other states and regions where pike are considered as non-native and invasive e.g. Alaska (Sepulveda et al, 2013) and Sweden (Byström et al, 2007). This is particularly so in the spring months when juvenile salmon and trout migrate from feeder streams to larger freshwater bodies.

In a position paper produced by the Central Fisheries Board in 2008 titled *"The ecology, biology and management of pike in Irish waters with particular reference to wild brown trout lake fisheries"* the authors state that "given the capacity of pike in Lough Corrib and Mask to consume very large numbers of trout and the ability of these populations of pike to expand, should additional fodder fish (more trout) become available, it is imperative that pike control operations continue on these large lakes to ensure a continuity of quality trout angling in future years" (O'Grady & Delanty, 2008).

In the NPWS report "Ireland Red List No. 5, Amphibians, Reptiles and Freshwater Fish" (2011) the status of Irish pike is considered "non-native, non-benign". Certain fish including pike are classified as 'non-benign', signifying an adverse impact on the ecology of the water in which they occur (King et al, 2011).

Gill Netting Operations

Netting on Lough Mask is scheduled for the months of February and March 2023. This will require 140 person days effort. However, it should be noted that weather and other factors can impact on these operations. In general, gill nets will be set along the margins of the lakes to intercept pike moving in and out of known pike spawning areas. All pike will be handled carefully, quickly euthanised and all pike of ≥85cm will be returned immediately subject to this being viable. Efforts will be made to relocate viable pike ≤85cm removed from the nets to recognised pike fisheries, where staff resources permit. Nets will be serviced daily and will not be set if there are concerns in relation to weather conditions the following day. Routine analysis of stomach contents will be undertaken for research purposes.

Electrofishing Operations

The main focus of Electrofishing (EF) operations will be to target juvenile pike in the nursery areas around the margins of the lake. Having regard to the fact that EF operations can be carried out year-round, it is envisaged that EF operations on Lough Mask will be carried out at any time during the year when weather conditions are suitable subject to the maximum number of days electrofishing specified for the lake. Electrofishing operations are scheduled for 180 person days in the Corrib catchment (Loughs Corrib, Mask and Carra) during 2023. Throughout these operations IFI will be cognisant of

the migratory game fish moving through the system and every effort will be made to minimise any impact on these species. In addition to targeting the nursery margins, EF will also be used to control pike numbers in the lower reaches of a number of rivers, mainly the Robe River. There is ample evidence of severe predation of juvenile trout near and in the mouths of nursery rivers and streams, especially when salmonids are migrating for spawning purposes.

4.2.3 Site Locations

The proposed site locations for this stock management programme occur at numerous waterbody locations throughout Lough Mask itself including the lower sections of certain inflowing rivers to Lough Mask. The principal areas where stock management (gill netting and electrofishing) will be carried out will be:

- Upper Lough Mask
- Rosshill
- Maamtrasna
- Dringeen
- Ballinchalla
- Ballygarry
- Srah/Tourmakeady
- Cloon Lake
- Cushlough.

See Figures 2,3 and 4.

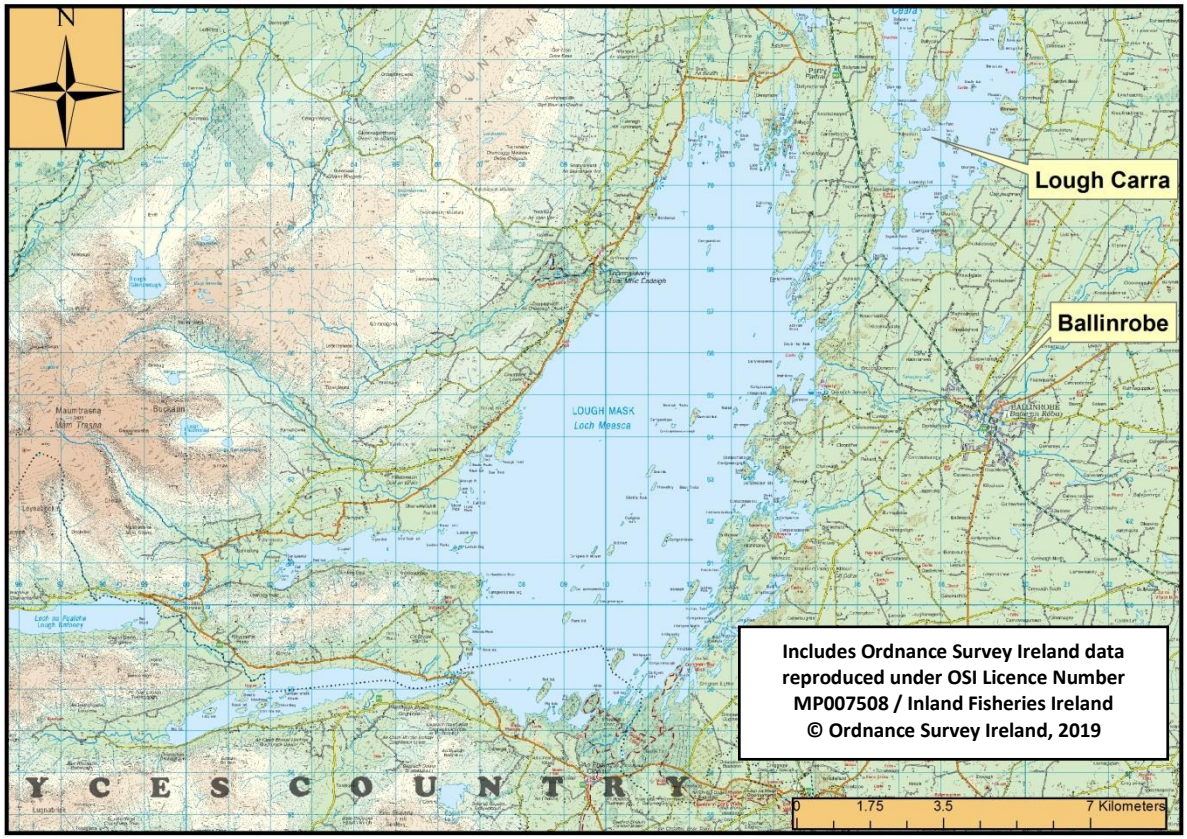

Fig.1: Location of Lough Mask in relation to Ballinrobe and Lough Carra to the north (OSI, 2019)

4.2.4 Description of the Site

Lough Mask, at over 8,000 ha, is the sixth largest lake in the country and with a maximum depth of 58 m it is one of the deepest. It is located in south Co. Mayo with a small area extending across the border into Co. Galway. It extends for over 14 km along its long axis and is on average about 5 km in width. On the western side, Lough Mask is overlooked by the Partry Mountains, while to the east the landscape is largely low-lying agricultural land. The nearest large town is Ballinrobe which is about 4 km east of Lough Mask. The underlying geology is of Carboniferous limestones, with some shales and sandstones (NPWS, 2015). The main rivers flowing into Lough Mask are the Cloon, Robe, Owenbrin, Finny, Glensaul, Glentraig and the Keel River, which is the out flowing river from Lough Carra. Lough Mask is linked to Lough Corrib by the Cong Canal. Lough Mask, Carra and Cloon make up the Lough Carra/Lough Mask Complex Special Area of Conservation (SAC). The eastern part of the lake is edged by a low-lying shoreline which is subject to winter flooding but is considerably deeper on the western side where there is a long narrow trench with a maximum depth of 58 m.

The water of the lake is moderately hard. Islands are a feature of the lake, especially in the south-east sector. The deep waters of Lough Mask are home to a population of the glacial relict fish species Arctic Char *(Salvelinus alpinus),* and a rare shrimp *(Niphargus spp.)* is also found in these waters. Lough Mask is an internationally renowned wild brown trout fishery. The zebra mussel, an invasive species in Ireland, was confirmed to be present in Lough Mask in 2008. Lough Mask discharges to the Atlantic Ocean through Lough Corrib and lies within the Western River Basin District. The Lough Carra/Mask complex SAC supports nine protected habitats and three species that are listed on Annex I and Annex II respectively of the EU Habitats Directive.

Angling and fish stocks in Lough Mask

Lough Mask is considered one of the top wild brown trout fisheries in Ireland and is economically important to the communities around the lake, providing employment in rural areas in tourism angling and ancillary businesses, as well as providing a valuable amenity for local anglers. It draws thousands of visitors annually to enjoy some of the best brown trout fishing in Ireland, and some would say the world. The lake is known to hold stocks of brown trout, perch, roach, bream, roach x bream hybrids, Arctic char, eels, stoneloach and pike. Lough Mask is noted for its populations of brown trout and ferox trout, with the average size of brown trout ranging from 0.6kg to 1.4kg. The larger ferox trout can reach up to 9kg in weight (O'Reilly, 2007).

Lough Mask produces catches of brown trout to wetfly fishing from mid-February is excellent in April and May and during the latter part of the season it also provides first class wild brown trout angling. The lake is famous for dapping the mayfly, daddy long legs and grasshopper. Angling is currently worth €836 million to Ireland's economy annually, supporting upwards of 11,000 jobs. Within this, brown trout angling contributes approximately €148,000 annually (IFI, 2016). Lough Mask hosts the World Cup Trout Fly Championship every August where anglers travel from all over the world to compete in this exciting international angling event. Stocks of pike have been managed on Lough Mask prior to and subsequent to the designation of the lake as an SAC and SPA.

Fish Stock Survey of Lough Mask – 2019

The latest data available in terms of fish stocks for Lough Mask is based on a fish stock survey carried out by IFI in 2019 as part of the Water Framework Directive surveillance monitoring programme. A total of eight fish species and one type of hybrid were recorded in Lough Mask in July 2019. Perch was the dominant species in terms of abundance (CPUE) and roach was the most dominant species in terms of biomass (BPUE) captured in the survey gill nets during the 2019 survey. The mean brown trout CPUE was relatively similar to the CPUE recorded in previous surveys. The mean BPUE fluctuated across the four sampling occasions but was lower in 2019 than that recorded in 2009 and 2015v (IFI, 2020).

Brown trout captured during the 2019 survey ranged in length from 6.2 to 78.5cm. Nine age classes ranging from 0+ to 10+ were recorded, indicating reproductive success throughout the previous 11 years. Growth rate analysis indicates brown trout in Lough Mask, display a fast growth rate according to the classification scheme of Kennedy and Fitzmaurice (1971). Perch CPUE and BPUE were higher than the figures recorded in the 2012 and 2015 surveys; however both values were less than those recorded in the 2009 survey (IFI, 2020).

Perch ranged in length from 5.0cm to 37.9cm in the 2019 survey. Eight age classes were present, ranging from 1+ to 8, indicating reproductive success in eight of the last nine years. The absence of 0+ perch is most likely due to the timing of the survey. In early summer 0+ perch are unlikely to be of sufficient size to be captured in the survey gill nets. The dominant age class was 1+. Mean roach abundance (CPUE) was higher in 2019 than 2012 and 2015; however it was lower than the figure calculated for 2009. The mean BPUE for roach between 2012 and 2019 was relatively similar, but was also lower than the figure for 2009. All year classes from 3+ to 11+ were recorded in the sample aged, which was dominated by older, larger cohorts.

Lough Mask has been assigned an ecological status of “Good” for 2019 based on the fish populations present. The lake was also assigned “Good” fish status in 2009, 2012 and 2015. In the 2013 to 2018 surveillance monitoring reporting period, the EPA assigned Lough Mask an overall draft ecological status of Good, based on all monitored physico-chemical and biological elements, including fish (IFI, 2020).

Water Quality

In order to comply with the reporting requirements of the Water Framework Directive water quality assessments have been conducted for certain catchments and sub-catchments. These reports can be viewed on the EPA and Water Framework Directive web sites. In the context of the reporting requirements of the Water Framework Directive (Lake Waterbody WFD Status 2013-2018) Lough Mask indicates ‘Good Ecological Status’ for the lower lake and ‘High Ecological Status’ for Upper Lough Mask. The EPA also monitors general water quality in Lough Mask. The latest data available classifies the lake as mesotrophic.

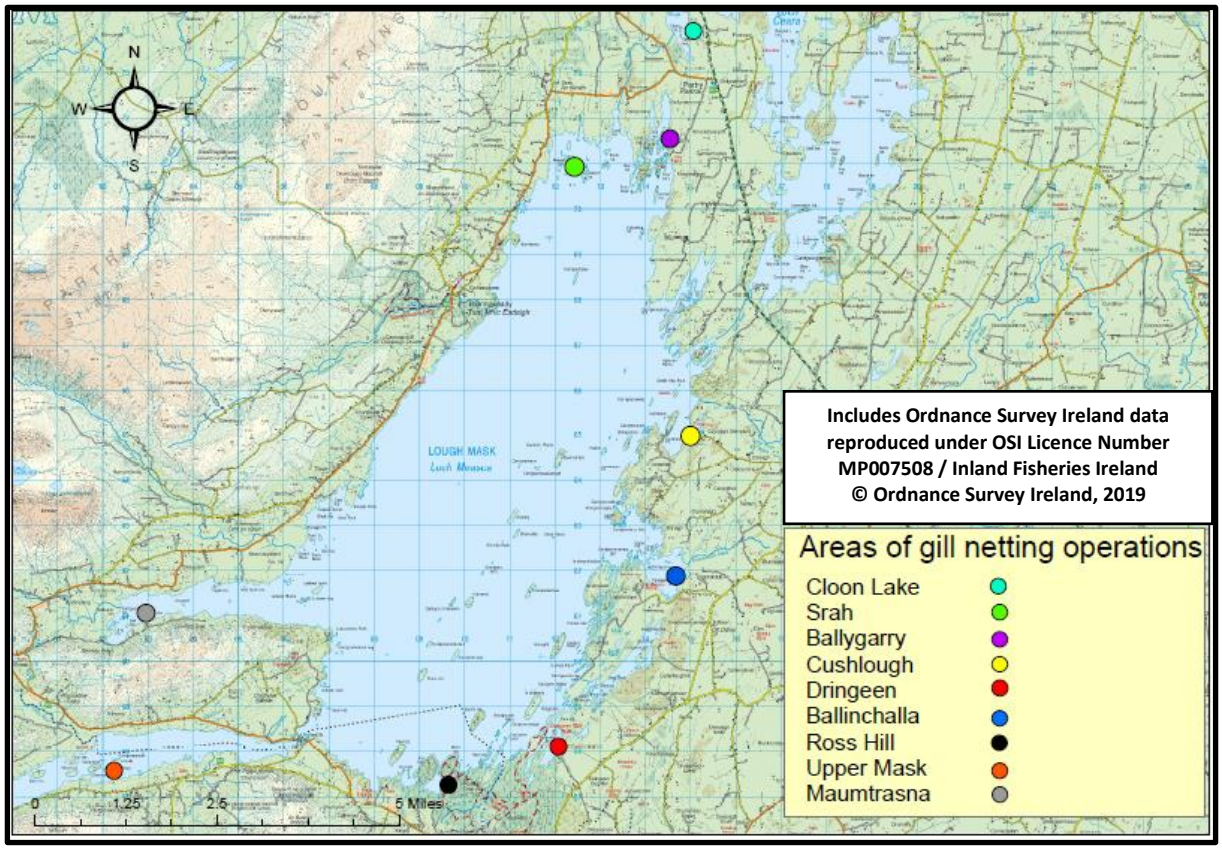

Fig 2: Locations of proposed gill netting sites in Lough Mask for the 2023 programme (OSI, 2019)

Fig 2 and Fig 4 should be read in conjunction with Fig 3 which outlines the extent of the Natura 2000 protected sites

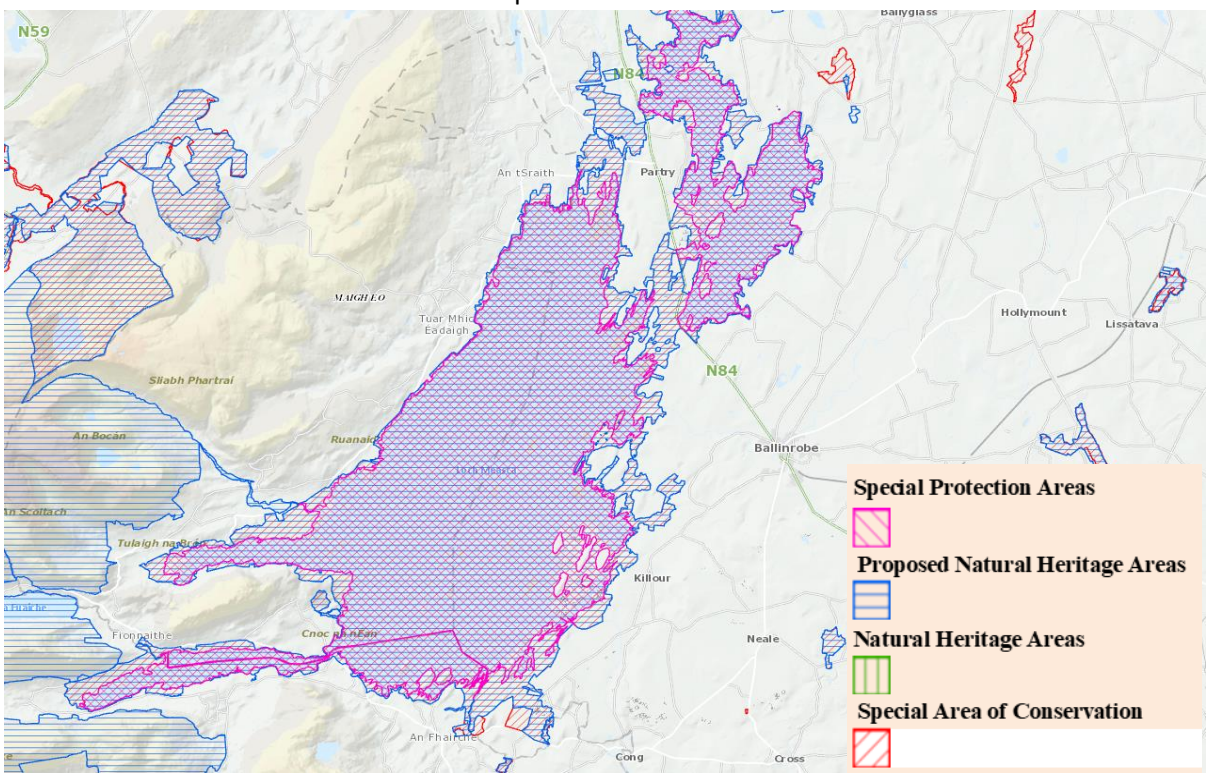

Fig 3: Lough Mask showing the extent of Lough Mask SPA and Lough Carra/Mask Complex SAC (NPWS, 2022)

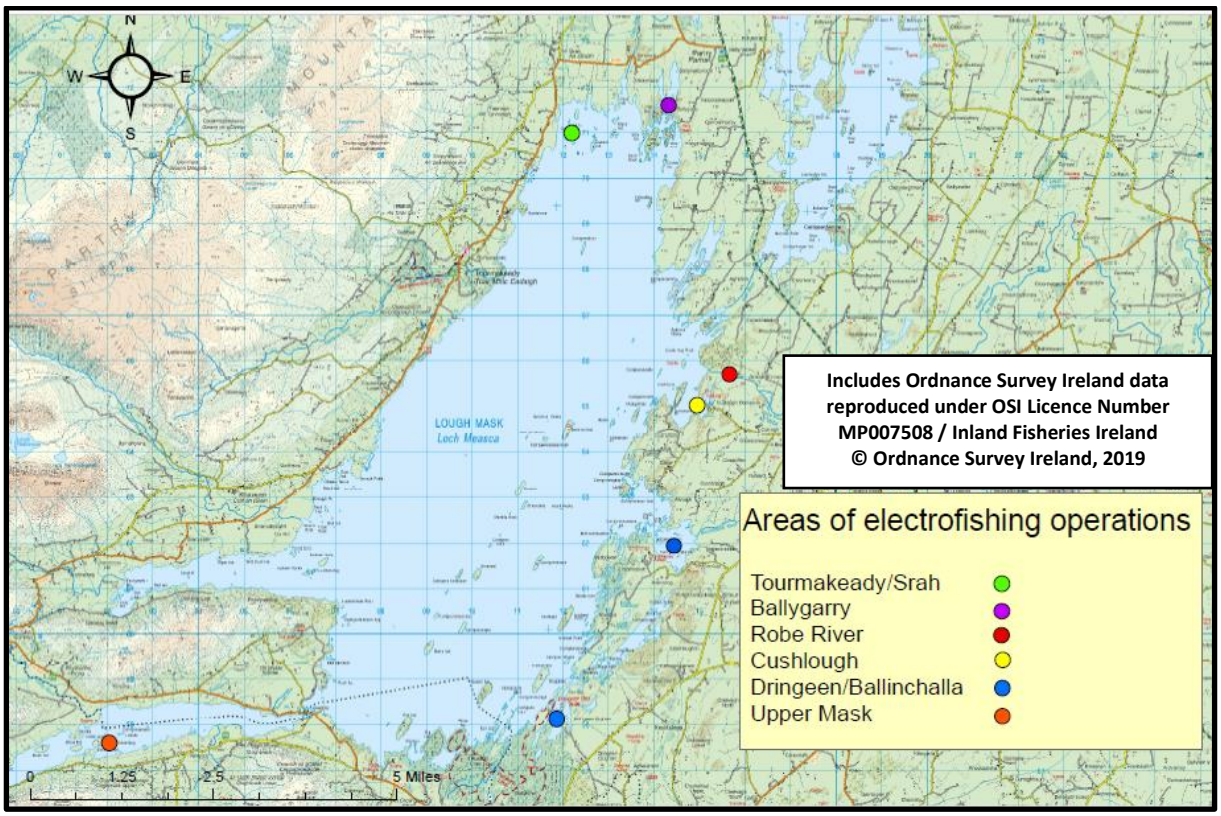

Fig 4: Map of areas where electrofishing operations are planned in Lough Mask (OSI, 2019)

4.2.5 Characteristics of the Project

The proposal is described in the table below.

Size, Scale, Area, Land Take	Electro-fishing and gill netting at numerous locations in Lough Mask (See Section 4.2.3). No land take within any Natura 2000 site is required
Details of physical changes that will take place during the various stages of implementing the proposal	No physical changes are expected. Gill nets will be set at various locations in the lake detailed in maps preceding this section.
Description of resource requirements for the operation and decommissioning of the proposal (water resources, construction material, human presence etc)	The proposed stock management programme will require 140 person days for Gill Netting and 180 person days* for Electrofishing. Two staff will be required for each crew deployed on netting operations. Three staff will be required for boat mounted electrofishing operations. ***Refers to the Corrib catchment in total**
Description of timescale for the various activities that will take place as a result of	The programme is scheduled to commence in February 2023 and the gill netting part of the

implementation (including likely start and finish date)	programme will be completed by the end of March 2023. In addition to this, electrofishing operations may take place over the calendar year to the maximum number of person days agreed.
Description of wastes arising and other residues (including quantities) and their disposal	No wastes apart from the pike carcasses will be generated. It is proposed that appropriately trained personnel will euthanise all pike immediately following capture. The carcasses will be disposed of through a licenced renderer. Any unanticipated wastes will be disposed of at an approved licenced landfill site
Identification of wastes arising and other residues (including quantities) that may be of particular concern in the context of the Natura 2000 network	None anticipated.
Description of any additional services required to implement the project or plan, their location	Electro-fishing boats and associated equipment, appropriate boats and outboard engines. Four wheel drive vehicles. Quad bike. Refueling is not anticipated to be carried out onsite but in the case where it may have to occur; all refueling will take place 50 m from any watercourse.

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

The following standard methodologies or standard operating practices (SOPs) will be in place throughout the proposed Lough Mask stock management plan.

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

All refueling will be carried out off site away from watercourses. In the unlikely event of refueling being required onsite, tanks and drums will be stored in secure, impermeable storage area, a minimum of 50m from drains and open water. Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage. Only designated trained operators will be authorised to refuel outboard engines/generators on site and emergency spill kits will be present at equipment for all refueling events. Procedures and contingency plans will be set up to deal with an emergency accidents or spills.

4.2.6.2 Standard Operating Procedures in relation to stock management plans

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

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

The gill nets to be used range in mesh size from one inch to four inches, knot to knot when pulled. They are usually set from an appropriate boat in shallow water close to areas of emergent vegetation where pike are known to spawn in the early spring months. Nets are set during the day and serviced the following morning. Sets are usually deployed in groups in a single bay or along a shoreline. Nets can be set singularly (30m) or joined together to form a longer net which will measure a maximum of 240m for the Lough Mask plan. Typically, the nets fish to a depth of 1.5 m. A known pike spawning area in the littoral zones of the lake is usually targeted and re-fished for an appropriate period.

Fig. 5: IFI staff member servicing a standard gill net for stock management purposes

Electrofishing is carried out from flat-bottomed boats between 3m and 5m in length mounted with a generator and transformer. This equipment delivers an electrical current to the water which renders all fish in the immediate vicinity of the apparatus, temporarily motionless. The immobilized fish are removed from the water using hand nets. Non target fish are released directly to the water and pike are retained in an on board holding area. Inland Fisheries Ireland's Standard Operating Procedure (SOP) For Pike management operations using electrofishing apparatus is available at: https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2016/Pike%20Boat%20Electrofishing%20SOP%20Final%20February%202016%20SC.pdf

Fig 6: IFI staff members carrying out electrofishing in accordance with IFI's electro-fishing SOP

It should also be noted that this stock management programme will be carried out in strict compliance with IFI's pike and brown trout policies. A copy of these policies is included in the Appendices of this document.

4.2.6.3 Invasive species and Biosecurity

In accordance with IFI's standard biosecurity protocols, all equipment will be disinfected prior to, and following its use on the system to avoid introduction of invasive species.

The Zebra mussel *(Dreissena polymorpha)* was first recorded in Lough Mask during 2008 and is well established now. Consideration will also have to be given to prevent the spread of other invasive species that are present in the Lough Mask catchment such as Japanese knotweed which is known to be established in the system.

IFI provide a number of guidance documents on invasive species and their management which are available at: https://www.fisheriesireland.ie/search?keywords=invasive+species

All proposed works will be carried out strictly in accordance with IFI's Biosecurity Protocol for Field Work which is available at: https://www.fisheriesireland.ie/sites/default/files/migrated/docman/biosecurityforfieldsurveys2010.pdf

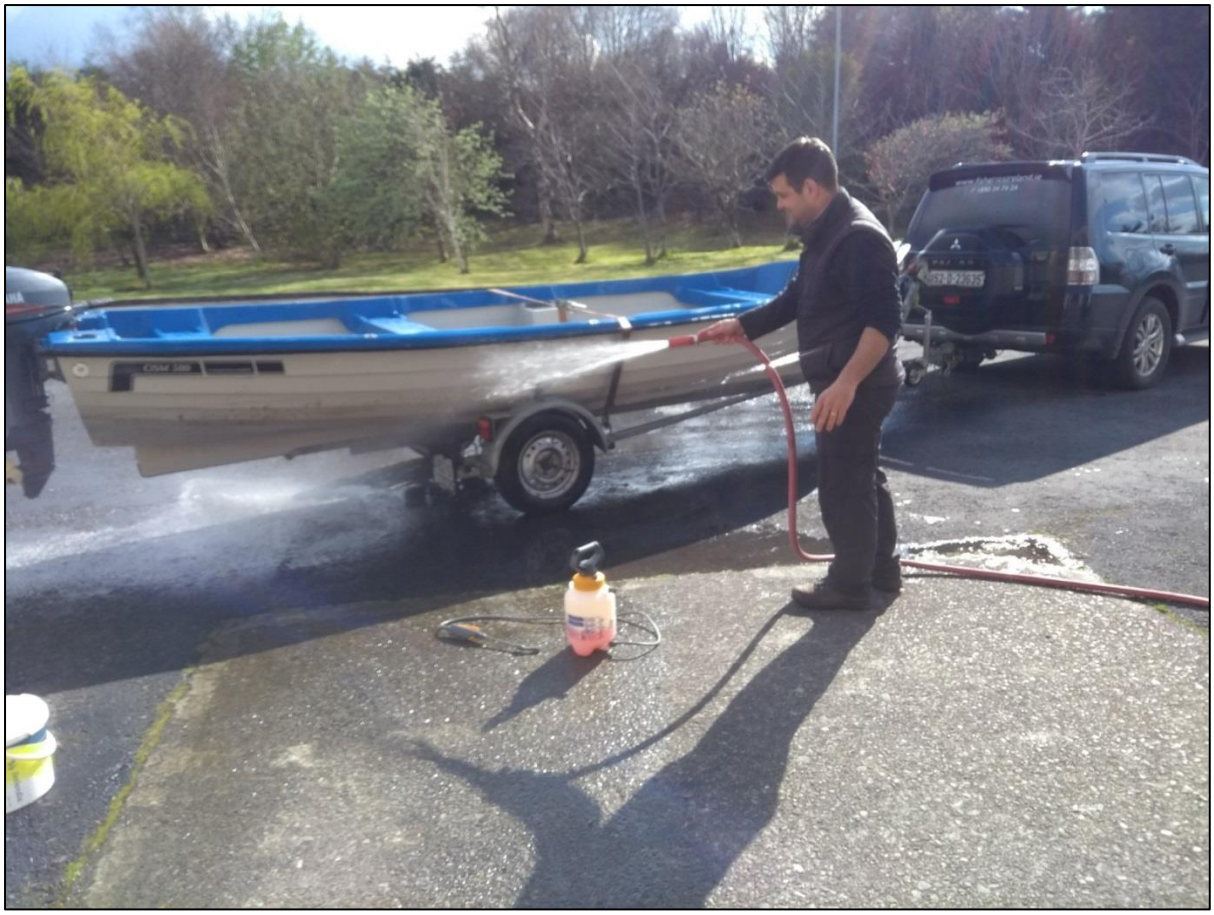

Fig 7: IFI staff member carrying out IFI's biosecurity protocol on a lake boat used for gill netting

4.2.7 Identification of Other Projects or Plans or Activities

Other proposed projects in or adjacent to Lough Mask were considered as part of this Appropriate Assessment Screening Report. Drainage maintenance activities carried out by the OPW in the Lough Mask catchment were identified. The OPW consult IFI in relation to these annual activities. No projects or plans were identified as relevant to this stock management plan apart from similar stock management plans which are being implemented by IFI on the adjacent Corrib catchment lakes - Lough Corrib (downstream) and Lough Carra (upstream).

4.3 IDENTIFICATION OF NATURA 2000 SITES

4.3.1 Zone of Impact Influence

The screening stage of AA involves compiling a 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, along with those with an indirect / direct pathway to other sites outside 15km, 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 plans/projects 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 a Natura Impact Statement (NIS). For the purpose of this stock management programme, the zone of influence includes the Natura 2000 sites highlighted in Table 2 below.

4.3.2 Identification of Natura 2000 Sites

Adopting the precautionary principle in identifying potentially affected European sites, it has been decided to include all cSACs and SPAs within a 15km radius of the proposal site. Consideration regarding potential biodiversity corridor links to sites >15km (i.e. in the same catchment) were also included as part of this assessment. The proposed sites are situated within the Lough Carra/Mask Complex SAC and the Lough Mask SPA. Natura 2000 sites within 15 kilometres of the proposed sites were considered initially as per the NPWS guidance document.

Due to the nature of the proposed stock management programme and the multiple sites associated with the programme within the lake, the 15km zone of inclusion was measured from Devenish Island in Lough Mask.

This Initial screening revealed that the following sites lie within 15km radius of the stock management programme. No other designated sites beyond 15km were identified as having a biodiversity corridor/direct pathway associated with this programme which could impact on a feature of interest.

Table 2 below, lists designated cSACs and SPA sites within 15km or the zone of influence of the proposal site including their proximity.

Table 2: Designated conservation sites within 15km radius of proposal sites

Designated Site	Site Code	Proximity to designated site
Lough Corrib cSAC	000297	Approx. 11.5km to the south
Lough Corrib SPA	004042	Approx. 11.5km to the south
Moorehall (Lough Carra) SAC	00527	Approx 12km to the north east
Lough Carra/Mask Complex SAC	**001774**	**Located in this SAC**
Lough Mask SPA	**004062**	**Located in this SPA**
Kildun Souterrain SAC	002320	Approx. 10 km to the south east
Towerhill House SAC	002179	Approx. 13.4 km to the north
Skealoghan Turlough SAC	000541	Approx. 12.7km to the east
Kilglassan/Caheravoostia Turlough SAC	000504	Approx. 14.7 km to the east
Mocorha Lough SAC	001536	Approx. 14 km to the south east
Clyard Kettle Holes SAC	000480	Approx. 10.5km to the south east
Ballymaglancy Cave Cong SAC	000474	Approx. 9.5km to the south
Mweelrea/Sheeffry/Erriff Complex SAC	001832	Approx. 10.9km to the west
Lough Carra SPA	004051	Approx. 5.6km to the north

4.3.3 Conservation Objectives

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

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

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

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

Site specific and detailed conservation objectives were available for the following sites where a potential impact couldn't be ruled out at this stage, namely Lough Carra/Mask Complex SAC and Lough Mask SPA.

A detailed list of the latest conservation objectives (2021) for the Lough Carra/Mask Complex SAC is available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001774.pdf

A detailed list of the latest conservation objectives (2021) for Lough Mask SPA is available at:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004062.pdf

The conservation objectives for Lough Carra/Mask Complex SAC and Lough Mask SPA above were downloaded and consulted in the preparation of this report.

Table 3: Qualifying interests of Lough Carra/Mask Complex SAC including main threats

Habitat name (cSAC Qualifying Feature)	Habitat code	Main Threats
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	3140	Fertilisation, grazing, forestry, leisure fishing, hunting, human induced hydraulic changes, eutrophication and Invasive species.
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea	3130	Fertilisation, grazing, forestry, leisure fishing, hunting, human induced hydraulic changes, eutrophication and Invasive species.
Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)	3110	Fertilisation, grazing, forestry, burning, leisure fishing, hunting, peat extraction, dispersed habitation, discharges, sport and leisure structures, pollution, drainage, erosion , invasive species.
European dry heaths	4030	Fertilisation, grazing , forestry, burning, sport and leisure structures, pollution, drainage, erosion , invasive species
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	91EO	Invasive species, hydrological changes/drainage, grazing, nutrient enrichment, harvesting, burning, erosion, introduction of pathogens, Use of pesticides
Alkaline fens	7230	Fertilisation, grazing , forestry, burning, leisure fishing, hunting, peat extraction, dispersed habitation, discharges, sport and leisure structures, pollution, drainage, erosion , invasive species.
Calcareous fens with Cladium mariscus and species of the Caricion davallianae	7210	Overgrazing, Restructuring agricultural land holding, Peat Extraction, Mechanical removal of peat, Water pollution. Landfill, land reclamation and drying out, general. Infilling ditches, dykes, ponds, marshes and pits.
Limestone pavements	8240	Removal of limestone pavement, removal of scrub, dispersed habitation, stock feeding, agricultural improvement, quarry, disposal inert material, electricity lines, infilling wetlands, routes, abandonment of grazing, agricultural structure, burning, discharges, disposal household waste, dumping dredgings, forestry, grazing, improved access, landfill, nautical sports, paths and restructuring agricultural land holding.
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)	6210	Invasion by a species, Undergrazing, Fertilisation, Agricultural improvement, Abandonment of pastoral systems, Sand & gravel extraction.

Drepanocladus vernicosus (Slender Green Feather-moss)	1393	Nutrient enrichment, altered grazing regimes, atmospheric pollution, forest creation, disturbance or drainage
Otter (*Lutra lutra*)	1355	Use of pesticides, fertilization, hunting, trapping, poisoning, water pollution, infilling of ditches, dykes, ponds, pools, marshes or pits, management of aquatic and bank vegetation for drainage purposes, removal of sediments, canalization of inland water course.
Lesser Horseshoe Bat (*Rhinolophus hipposideros)*	1303	Loss of suitable summer and winter roosting sites due to the demolition or renovation of derelict buildings for human occupation, loss of commuting routes linking roosts to foraging sites, and loss of suitable foraging sites are the major threats to this species. The use of insecticides, habitat destruction such as felling of trees and scrub clearance and deterioration of old buildings.

Table 4: Features of Interest in Lough Mask SPA

Species name (SPA Qualifying Feature)	Species code
Lesser Black-backed gull *(Larus fuscus)*	A183
Tufted Duck *(Aythya fuligula)*	A061
Black-headed Gull *(Chroicocephalus ridibundus)*	A179
Common Gull *(Larus canus)*	A182
Common Tern *(Sterna hirundo)*	A193
Greenland White-fronted Goose *(Anser albifrons flavirostris)*	A395
Wetland and Waterbirds	A999

4.4 IDENTIFICATION OF POTENTIAL IMPACTS

Potential likely ecological impacts arising from the stock management programme are identified in this section.

Description of elements of the project likely to give rise to potential ecological impacts sites.	• Use of equipment/vehicles/boats near watercourses (fuel/oil spills). • Increased noise levels (generators/outboard engines/equipment/human activity)
Describe any likely direct, indirect or secondary ecological impacts of the project (either alone or in combination with other plans or projects) by virtue of: ***Size and scale;*** ***Land-take;*** ***Distance from Natura 2000 Site or key features of the Site;*** ***Resource requirements;*** ***Emissions;*** ***Excavation requirements;*** ***Transportation requirements;*** ***Duration of construction, operation etc.; and*** ***Other.***	• The proposed stock management programme is to be carried out on waters which form part of the Lough Carra/Mask Complex SAC. There will be no direct habitat loss or significant effects to protected habitats / species in the SAC as a result of this project. • This stock management plan is situated in the Lough Mask SPA. The level of risk posed is considered low enough to be disregarded as a potential threat to the status of any protected species in the SPA. • Use of vehicles and equipment working close to the river/lake increases risk of fuel and oils pollution. Refueling will be carried out off site • Lough Mask is a renowned wild brown trout fishery. This programme should have a positive impact on stocks of wild brown trout in the catchment.

4.5 ASSESSMENT OF SIGNIFICANCE OF POTENTIAL IMPACTS

This section considers the list of sites identified in section 4.3 above together with the potential ecological impacts identified in the previous section and determines whether this proposed stock management plan for Lough Mask 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 some sites are outside the zone of significant impact influence of the proposed Lough Mask stock management plan, due to the size, scale and location of the proposed works and because the ecology of the species and/or the habitats in question is neither structurally nor functionally linked to the proposal works. Therefore, the conditions required to initiate a potential 'source-pathway-target' vector connecting the proposal site to these designated sites will not be created. It is further considered that no potential impact pathway connects these designated sites to the location of the proposed works and, therefore, it is concluded that no significant impact on these sites is reasonably foreseeable as a result of the proposed Lough Mask stock management plan.

Lough Mask discharges to Lough Corrib which supports a population of Atlantic salmon. Atlantic salmon are a feature of interest of Lough Corrib SAC but not a feature of interest in Lough Carra/Mask Complex SAC.

A test is now carried out to check if the sites listed in Table 2 above, are within the significant impact influence of the proposed stock management plan. These sites are listed in Table 5 below, along with an outline rationale for their exclusion, and will not be considered further in this document. These sites have been screened out according to guidance outlined by the NPWS.

Table 5: Designated sites within 15km/within zone of significant impact influence of the proposed stock management programme, with justification for no potential impact

Designated Site	Site Code	Potential Impact	Justification
Lough Corrib SAC	000297	No Impact	Located approximately 11.5km to the south and Lough Mask drains into this SAC. A similar stock management programme is in place in this SAC with a projected overall improvement to two Annex II species (Atlantic salmon and freshwater pearl mussel) A grating on the Cong Canal is in place to prevent fish migration from Lough Corrib to Lough Mask and vice versa so no significant impacts
Lough Corrib SPA	004042	No impact	Located approximately 11.5km to the south. Although sites are hydrologically connected via the Cong Canal/River, there is no activity associated with the project that would allow for works to significantly impact on this site or its conservation objectives
Moorehall (Lough Carra) SAC	00527	No impact	Located approximately 12km to the northeast and designated for protection of lesser horseshoe bats only, therefore no significant impacts
Kildun Souterrain SAC	002320	No impact	Located approximately 10 km to the southeast. There is no pathway for the proposed stock management plan to impact on this Natura 2000 site therefore no significant impacts
Towerhill House SAC	002179	No impact	Located approximately 13.4 km to the north and designated for the protection of Lesser horseshoe bats only, therefore no significant impacts
Skealoghan Turlough SAC	000541	No impact	Located approximately 12.7km to the east. There is no pathway for the proposed stock management plan to impact on this Natura 2000 site therefore no significant impacts
Kilglassan/Caheravoostia Turlough SAC	000504	No impact	Located approximately 14.7 km to the east. There is no pathway for the proposed stock management plan to impact on this Natura 2000 site therefore no significant impacts
Mocorha Lough SAC	001536	No impact	Located approximately 14 km to the south east and designated for the protection of Calcareous fens. There is no pathway for the proposed stock management plan to impact

			on this Natura 2000 site therefore no significant impacts
Clyard Kettle Holes SAC	000480	No impact	Located approximately 10.5km to the south east and designated for protection of Calcareous fens and turloughs only. There is no pathway for the proposed stock management plan to impact on this Natura 2000 site therefore no significant impacts
Ballymaglancy Cave Cong SAC	000474	No impact	Located approximately 9.5km to the south and designated for caves not open to the public and Lesser horseshoe bat only. There is no pathway for the proposed stock management plan to impact on this Natura 2000 site therefore no significant impacts
Mweelrea/Sheeffry/Erriff Complex SAC	001832	No impact	Located approximately 10.9km to the west. There is no pathway for the proposed stock management plan to impact on this Natura 2000 site therefore no significant impacts
Lough Carra SPA	004051	No impact	Located approximately 5.6km to the north, upstream of Lough Mask. Only one bird species is listed as a qualifying interest (common gull). This bird is also listed in the Lough Mask SPA and has been screened out from possible impact, therefore no significant impacts to Lough Carra SPA.

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

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

- Lough Corrib cSAC 000297
- Lough Corrib SPA 004042
- Moorehall (Lough Carra) SAC 00527
- Kildun Souterrain SAC 002320
- Towerhill House SAC 002179
- Skealoghan Turlough Turlough SAC 000541
- Kilglassan/Caheravoostia Turlough SAC 000504
- Mocorha Lough SAC 001536
- Clyard Kettle Holes SAC 000480
- Ballymaglancy Cave Cong SAC 000474
- Mweelrea/Sheeffry/Erriff Complex SAC 001832
- Lough Carra SPA 004051

4.5.2 Natura 2000 sites within the zone of potential impact influence

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

Table 6: Designated sites within zone of potential impact influence

Natura 2000 Site	Site Code	Justification
Lough Carra/Mask Complex SAC	001774	Proposed stock management programme located within this site
Lough Mask SPA	004062	Proposed stock management programme is located within this site

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

Only those features of the proposed stock management plan on Lough Mask that may result in a significant/potentially significant effect on qualifying features and conservation objectives of the identified Natura 2000 sites, potentially within the zone of influence (listed in Table 6 above) are considered. A number of factors were examined at this stage and dismissed or carried forward for NIS (stage 2) if required. An NIS is not required in this case. The likelihood of significant effects to a Natura 2000 site from the project was determined based on a number of indicators including:

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

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

4.5.4 Habitat Loss and Alteration

The proposed stock management programme on Lough Mask is situated within the designated sites of Lough Carra/Mask Complex SAC and Lough Mask SPA. The proposal 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 terrestrial habitats within the zone of influence of this project and all activity associated with the project is entirely confined to the aquatic zone. Due to the nature of the stock management programme and associated methodologies it is anticipated that no impact is foreseen to aquatic habitats as a result of the programme either. Setting of nets for pike in Lough Mask will not have any impacts on benthic Chara vegetation as the very nature of the exercise will not interact negatively

with the benthic Chara vegetation. Access to the project areas is also confined to existing established boat access points around the lakes. No connectivity between the protected habitats and the project activity has been identified. There is, therefore, no potential for impacts on protected habitats arising from this stock management project. The proposed stock management plan will involve the setting of gill nets at a number of locations on Lough Mask along with scheduled electrofishing in established pike areas. Pike will be removed offsite and disposed of through a licenced renderer. All movement of vehicles into and out of the launch sites will happen so as to ensure no damage to any terrestrial habitat. Recognized public launching areas will be prioritized for this process. It is not likely that landowner permission will be required as the launching areas are mainly all public. No significant habitat loss or alteration is reasonably foreseeable within Lough Carra/Mask Complex SAC or Lough Mask SPA as a result of the proposed stock management programme on Lough Mask.

4.5.5 Water Quality

Lough Mask discharges to the Atlantic Ocean through Lough Corrib and then Galway Bay. The catchment supports (amongst other species) a stock of wild brown trout and a glacial relict fish - Arctic char. The status of Arctic char in Ireland is currently considered “vulnerable” on the IUCN Red Data List and is extremely susceptible to water pollution, eutrophication and oxygen depletion. (King et al, 2011). Impacts to water quality as a result of the proposed programme are therefore considered extremely important. Arctic char captured in the 2019 survey ranged in length from 10.1 cm to 23.7cm, with a mean length of 15.4cm. Lough Mask is renowned for its stock of wild brown trout which also require good water quality. In the context of the reporting requirements of the Water Framework Directive (Lake Waterbody WFD Status 2013-2018) Lough Mask indicates ‘Good Ecological Status’ for the lower lake and ‘High Ecological Status’ for Upper Lough Mask. The latest data available classifies the lake as mesotrophic.

Potential impairment of water quality as a result of the proposed project includes accidental fuel/oil spills from equipment/boat engines during refueling activities near/within the watercourses. These impacts are considered highly unlikely due to the fact that all refueling will be carried out off site. The refueling methodology, detailed in section 4.2.6.1 above, will prevent significant impacts to water quality as a result of accidental fuel/oil spills. Therefore, due to the fact that the likelihood of accidental spills happening is extremely low and the SOP’s that will be in place to prevent significant impacts to water quality, no significant water quality impacts are reasonably foreseeable within Lough Carra/Mask Complex SAC and Lough Mask SPA as a result of the proposed stock management programme on Lough Mask.

4.5.6 Disturbance and/or Displacement of Species

Species that use the areas immediately adjacent to the proposed stock management programme, otters for example, may be subject to certain levels of disturbance during the project. The main disturbance will be as a result of the increase in noise due to presence of vehicles, boats, outboard engines, generators and humans. Disturbance can restrict access of wildlife to habitats and can alter habitats. However, any impacts are expected to be extremely slight and in the immediate location of the proposed stock management plan.

Otter

Otter is listed on Annex II of the E.U. Habitats Directive. Lough Mask provides excellent habitat for Otter due to the size of the lake and associated rivers and streams. The main disturbance will be as a result of the increase in noise due to presence of vehicles, boats, outboard engines, generators and humans plus the unlikely potential for entanglement in gill nets. Disturbance can restrict access of wildlife to habitats and can alter habitats. In approximately thirty years of gill netting on the Great Western Lakes, an Otter has never been encountered in the nets (M Butler IFI 2022, personal communication, 14 January). The nature of electrofishing makes it easily detected and avoided by Otter.

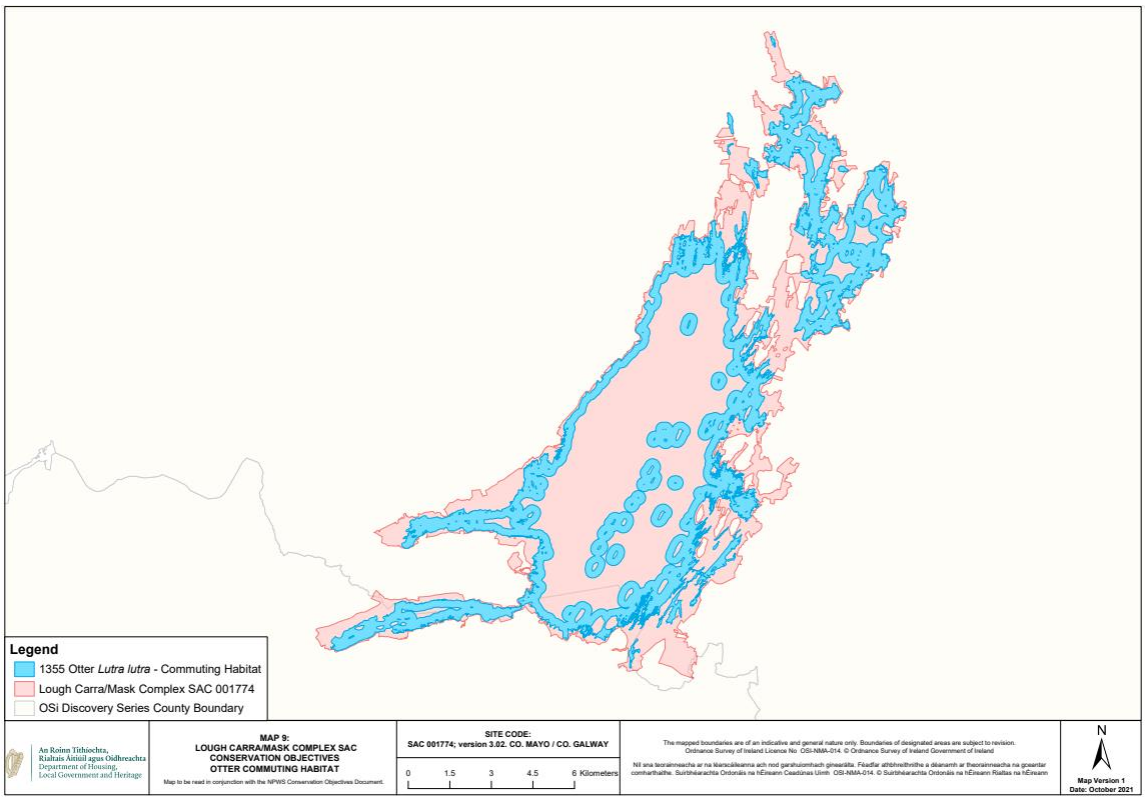

Fig.8: Lough Carra/Mask Complex SAC Conservation Objectives – Otter commuting habitat (NPWS, 2021)

There will be no impact/damage/obstruction to the breeding and resting places of otters. Otters mark their territories with their droppings known as “spraints”. Any obvious areas where spraints or otter footprints are visible will be noted and gill nets will not be set in areas where otter activity is acknowledged / recorded. Nets will be serviced daily. No significant disturbance or displacement of Otter is reasonably foreseeable within Lough Carra/Mask Complex SAC as a result of the proposed stock management programme on Lough Mask.

Lough Mask SPA - Protected Bird Species

Lough Mask is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greenland White-fronted Goose, Tufted Duck, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The E.U. Birds Directive pays attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The Lough Mask SPA overlaps with the project site. Gill netting / electrofishing is not listed as a potential impact or threat to the Conservation Objectives for the Lough Mask SPA.

When considering the number and nature of particular listed bird species, their typical locations, their non-diving behaviours, breeding patterns & behaviours and timing of the stock management plan, a number of the listed birds in Lough Mask SPA can be considered ruled out from being impacted upon in the Lough Mask stock management programme. These are: Black Headed Gull, Common Gull, Lesser Black backed Gull and Greenland White Fronted Goose.

Lough Mask is one of the most important inland gull breeding sites in the country, with nationally important populations of three gull species. It also has a nationally important colony of Common Tern (NPWS, 2014). Local IFI staff confirmed that nets in Lough Mask are usually set "sub surface" so the potential for interaction with non-diving birds is extremely low.

IFI staff members who have been engaged in stock management operations for up to 30 years on Lough Mask have communicated that the inadvertent capture of the protected bird species listed as qualifying interests is noted by them as extremely rare or unknown. Experience relating to fisheries research netting activities indicates likewise.

Birdwatch Ireland (2022) describes the Greenland White Fronted Goose as a *"Scarce winter visitor to wetlands in Wexford and western Ireland from October to April which grazes on a range of plant material taking roots, tubers, shoots and leaves. It forages over peat bogs, dune grassland, and occasionally salt marsh, with the use of agricultural grassland increasing in recent years.".* Breeding takes place away from Ireland. They are occasionally seen on the water but prefer bogs and grasslands to feed. It is, therefore, unlikely that their populations could be impacted by the project activity.

In relation to the Common Tern, it is unlikely to have any interaction with the stock management programme due to the fact that it is a summer visitor to Ireland, overwinters in west and south Africa and usually breeds on islands in the lake from April (Birdwatch Ireland, 2022). In this regard, it is highly unlikely that gill netting will have any negative impact to the Common Tern.

Lough Mask SPA supports a nationally important population of Tufted Duck (*Aythea fuligula*), an amber listed waterbird which is present in winter. Records show that tufted duck have not been impacted by nets or electrofishing in the past. The issues of highest conservation concern (e.g. predation of young, exploitation by hunting and habitat loss) do not relate to any of the activities proposed by the project. A study completed by Dessborn et al. in 2011 entitled *"Pike predation affects breeding success and habitat selection of ducks"* demonstrated high fitness costs for ducks breeding on lakes with pike. In this regard, pike removal is likely to be beneficial to populations of certain breeding ducks by reducing predation on their young.

Based on numbers present, their locations and behaviours and their likelihood to interact with this stock management plan it is considered extremely unlikely that any of these listed protected birds will be impacted upon as a result of this stock management plan.

Experience from many years of previous gill netting operations for stock management operations, it was concluded that the project activities (specifically gill netting) will not pose a significant threat to the protected bird species or habitats at the site.

White-clawed crayfish

The white-clawed crayfish *(Austropotamobius pallipes)* is the largest non-marine invertebrate found in Ireland. Adults can grow to approximately 11cm in length. In Ireland it occurs in small and medium-sized lakes as well as rivers and streams and this is considered to be due to the lack of competition from other crayfish species. The absence of nonnative species from North America also means the Irish population is at less risk from the crayfish plague, although plague events have occurred in Ireland. This disease kills white-clawed crayfish and is the principal cause of decline in Britain and parts of Europe. There is no shortage of potential habitat for the species. However, the threat from disease introduction is severe and not likely to disappear and as a result future prospects are considered Inadequate. Unfortunately, an outbreak of Crayfish Plague was confirmed in the Clare River (Corrib catchment) during mid-2019. The key objective is to maintain Ireland's status as free of both non-native species and the crayfish plague disease. The Overall Status is assessed as Inadequate.

White-clawed crayfish is not a qualifying interest in Lough Carra/Mask Complex SAC but it is cited in Annex II of the EU Habitats Directive and they have been recorded in Lough Mask. In a study undertaken by Ecofact Environmental Consultants Ltd. in 2007 concentrating on white clawed crayfish in the Corrib catchment, no crayfish were caught at the sites assessed within the Corrib catchment including Lough Mask, although crayfish were recorded in Lough Mask in 2004 and 2006 and may well still be present, but not detected on the 2007 survey (O'Connor, 2009). The type of gill net being used for this stock management programme does not target crayfish and they have not been caught in previous stock management programmes (M Butler IFI 2022, personal communication, 14 January).

Electrofishing is frequently used as a method for crayfish population survey, and it is internationally recognized as being relatively harmless to this species. Alonso (2001) evaluated 56 successive depletion electrofishing surveys on White-clawed crayfish and recorded no appreciable decrease in either relative density or standing biomass. Furthermore, no mortality, due to electric shock, was recorded during sampling.

It is envisaged that due to the nature and design of this stock management programme there will be no negative impact to crayfish as a result of the proposed Lough Mask stock management plan. No significant disturbance or displacement of species is reasonably foreseeable within Lough Carra/Mask Complex SAC and Lough Mask SPA as a result of the proposed stock management programme on Lough Mask.

4.5.7 Habitat or Species Fragmentation

The preceding sub sections have concluded that there will be no significant direct or indirect habitat loss to any designated site nor will there be any direct or indirect disturbance or displacement of any species, along with the fact that there will be no significant impacts to water quality within nearby designated sites. Therefore, considering the conclusions in the preceding subsections and bearing in mind the location, scope, scale, duration and timing of the proposed stock management plan, it is concluded that no significant habitat or species fragmentation impacts are reasonably foreseeable as a result of the proposed stock management programme on Lough Mask.

4.5.8 In-combination Effects

Both the Mayo and Galway County Development Plans in complying with the requirements of the Habitats Directive requires that all projects and plans that could affect Natura 2000 sites would be initially screened for Appropriate Assessment and if requiring Stage 2 AA, that appropriate mitigation measures would be put in place to avoid, reduce or ameliorate negative impacts. In this way any "in-combination" impacts with plans or projects for the project/plan site and surrounding townlands in which the development is located, would be avoided.

The "in-combination" impacts from the carrying out of the Lough Mask stock management programme are expected to be positive in relation to salmonids, (brown trout and Atlantic salmon). Lough Mask doesn't support a stock of Atlantic salmon but does support a stock of wild brown trout and discharges into Lough Corrib SAC. This Lough Mask stock management programme in combination with the adjacent Lough Corrib and Owenriff Stock Management Plans is expected to have a positive impact to the adjacent Lough Corrib SAC. As Atlantic salmon are cited in Annex II and Annex V of the EU Habitats Directive and as salmon are a feature of interest in Lough Corrib SAC, the implementation of these stock management plans should assist in the maintaining of favourable status of Atlantic salmon in the Corrib system and the restoring of favourable status of Atlantic salmon and brown trout to the Owenriff system. Best practice water quality control methods including biosecurity protocols have been incorporated into the standard operating procedures (SOP's) of the Lough Mask stock management programme. Strict compliance with IFI's electrofishing and gill netting Standard Operating Procedures along with other applicable SOP's the Lough Mask stock management plan, in combination with other activities in the general area, should not cause any reasonably foreseeable negative impacts to Lough Carra/Mask Complex SAC, Lough Mask SPA and other nearby designated sites.

4.6 CONCLUSION OF SCREENING STAGE

In conclusion, to determine the potential effects, if any, of the proposed Lough Mask stock management plan on nearby Natura 2000 sites, a screening process for Appropriate Assessment was undertaken. No potential biodiversity corridor links to sites >15km have been identified. The proposed development is within 15km of 15 Natura 2000 sites. It has been objectively concluded during the screening process that all the sites within 15km of the plan are not likely to be significantly effected by the proposed Lough Mask stock management plan and these include:

- **Lough Corrib cSAC** **000297**
- **Lough Corrib SPA** **004042**
- **Moorehall (Lough Carra) SAC** **000527**
- **Kildun Souterrain SAC** **002320**
- **Towerhill House SAC** **002179**
- **Skealoghan Turlough SAC** **000541**
- **Kilglassan/Caheravoostia Turlough SAC** **000504**
- **Mocorha Lough SAC** **001536**
- **Clyard Kettle Holes SAC** **000480**
- **Ballymaglancy Cave Cong SAC** **000474**
- **Mweelrea/Sheeffry/Erriff Complex SAC** **001832**
- **Lough Carra SPA** **004051**
- **Lough Carra/Mask Complex SAC** **001774**
- **Lough Mask SPA** **004062**

Based on this process, this Appropriate Assessment Screening Report is considered sufficient and the requirement to progress to Stage 2 and submit a Natura Impact Statement (NIS) is not required. The proposed stock management programme will not have significant effects on Natura 2000 sites.

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6. APPENDICES

APPENDIX 1

Stages of Appropriate Assessment

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

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

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

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

APPENDIX 2

IFI Pike Policy

Inland Fisheries Ireland Pike Policy

Prepared by the Pike Policy Review Group August 2014

1. Executive summary.

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

2. Scope and objectives.

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

3. Policy development process.

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

4. Group terms of reference.

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

• Best practice internationally.

• Irish and European legislation relating to this area.

• Existing legislation in this area.

• Corporate and other governance issues of relevance.

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

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

5. Policy recommendations.

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

5.1 General.

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

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

5.2 Pike distribution.

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

5.3 Marketing of pike angling.

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

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

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

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

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

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

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

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

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

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

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

5.5 Recommended legislative change.

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

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

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

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

5.6 Research programmes.

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

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

5.7 Biosecurity.

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

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

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

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

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

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

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

5.8 Handling and conservation of pike.

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

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

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

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

5.9 Angler contribution.

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

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

5.10 Authorised persons.

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

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

5.11 Littering.

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

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

APPENDIX 3

IFI Brown Trout Policy

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

Brown Trout Policy Review Group Management Recommendations

1. Executive summary.

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

2. Scope and objectives.

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

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

The procedure on policy development is laid down by IFI. It is a very broad consultative process involving a wide diversity of stakeholders – IFI senior management, the Board of IFI, management personnel in DCENR, the National Inland Fisheries Forum and statutory consultees. It is intended that any document produced would be subject to review after three years. The policy group consisted of seven members – Dr. Martin O'Grady (IFI Swords) who acted as chairperson, Martin Butler (IFI, Galway), Marcus Muller (IFI, Ballina) and William Walsh (IFI, Blackrock). John Chambers (IFPAC), Eamon Moore (TAFI) and Eamon Ross (NARA). Ms.Sandra Doyle (IFI, Swords) acted as secretary to the group. The group met on four occasions between October 2011 and February 2012.

4. Terms of reference.

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

5. Policy recommendations.

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

5.1 Recommendations in the legislative area.

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

regulations for brown trout fisheries in the interests of conservation in a speedier fashion than is currently available with the "bye-law system".

5.2 Recommendations in relation to hatcheries and stocking programmes.

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

5.3 Water quality issues.

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

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

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

• In the event of a trout angling group holding a pike angling competition on a designated wild brown trout fishery the same rules should apply. In these circumstances surplus pike (more than one fish per angler, per day, for fish < 85 cm) should be retained alive, if possible, and transferred to a suitable coarse fishery, assistance from IFI personnel will be crucial to the success of this operation. In certain restricted circumstances IFI may also authorise designated angling clubs to fish for and kill pike that are caught during permitted angling competitions on designated watercourses. However all pike ≥ 85 cm caught in such competitions should be released alive.

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

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

5.6 Habitat enhancement issues.

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

5.7 Future research programmes.

It is crucial that wild brown trout research should continue, in tandem with developmental and marketing programmes in this field. Key features should include;-

1. On-going survey programmes to monitor change in the more important brown trout fisheries are essential - as a means of both assessing the effectiveness of various developmental exercises and evaluating the impact of new invasive species on the ecology of the resource.
2. Complete a micro-satellite DNA analysis of trout stocks in all designated managed trout fisheries in the country. The completion of such studies to date on Loughs Corrib, Mask, Ennel, the Rivers Boyne and Suir systems, in combination with available ecological data, has moved IFI's capacity to manage these fisheries to a much higher level. Ensure that a DNA analysis programme becomes an integral part of all future large scale monitoring programmes in important brown trout catchments.
3. Strive to achieve a close working liaison between IFI research, operational and marketing staffs to ensure that all relevant personnel are kept abreast of the status of trout stocks.
4. Ensure that the current EREP (Environmental River Enhancement Programme) programme) with OPW continues. An on-going programme over the next 20 years is required to restore all drained brown trout rivers. A completion of this exercise could greatly increase the availability of quality riverine brown trout angling water and further enhance the recruitment of trout to the quality lake trout fisheries.

5.8 Marketing of brown trout angling in Ireland.

This group acknowledges the value the socio economic study of recreational angling has placed on angling in Ireland. As a follow on from such an exercise, the group feel that, in relation to brown trout in particular, investigation in relation to the following areas would be important:

- Diversity of brown trout angling product in Ireland
- Quality and quantity of prime brown trout waters
- Key brown trout angling products & defined market segments
- Key target markets
- Standards for "promotable" brown trout angling tourism
- Competitiveness
- Availability and accessibility of brown trout waters for tourist anglers
- Quality and quantity of angling infrastructure (angler-friendly accommodation, guiding services, boat hire etc.)
- Up-skilling and training for the supply side of the industry
- SWOT Analysis

5.9 Biosecurity.

All anglers should strictly adhere to biosecurity protocols, both pre- and post- all angling sessions, in order to ensure that no invasive species and harmful fish pathogens are introduced or spread within the country.
1. Best biosecurity practice guidelines for anglers, and other key stakeholder groups, have been produced by IFI (see www.fisheriesireland.ie) and these should be circulated widely among key stakeholder groups.
2. Because of the seriousness of the risk associated with invasive species and fish pathogens, it is recommended that strict adherence to these guidelines should be made a condition of membership of all angling clubs and federations.

3. It is further recommended that information boards and facilities to disinfect angling tackle and protective clothing should be provided at all major air and sea ports in Ireland. It should also be mandatory for anglers travelling from abroad to show proof that their angling equipment has been disinfected prior to entering the country. Failing this, the tackle must be disinfected at the point of entry into the country.

4. International collaboration in respect of biosecurity matters must be encouraged. Appendix 1 The brown trout policy group felt that the following list of items, while of concern to brown trout policy were broader issues that need to be addressed in other fora.

5. Angler contributions towards the management costs of inland fisheries.

6. A policy directed at the control of invasive species.

7. The necessity to develop on the findings of the socio-economic study on recreational angling.

8. A redefined role for water keepers in Ireland.

9. Tackling the question of litter control in and around fishery locations.

10. The question of regularising insurance issues for all national and tourist anglers and minimising costs in this area.

APPENDIX 4

Site Synopsis for Lough Mask SPA

SITE SYNOPSIS
SITE NAME: LOUGH MASK SPA
SITE CODE: 004062

Lough Mask, at over 8,000 ha, is the sixth largest lake in the country. It is located in south Co. Mayo with a small area extending across the border into Co. Galway. It extends for over 14 km along its long axis and is on average about 5 km in width. The underlying geology is of Carboniferous limestones, with some shales and sandstones. The main inflowing rivers are the Cloon and Robe, and the stream from Lough Carra to the north-east. The main outflow is to Lough Corrib to the south. The eastern part of the lake is edged by a low-lying shoreline which is subject to winter flooding but is considerably deeper on the western side where there is a long narrow trench with a maximum depth of 58 m. The water of the lake is moderately hard. Islands are a feature of the lake, especially in the south-east sector. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greenland White-fronted Goose, Tufted Duck, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern.

The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. Lough Mask is one of the most important sites in the country for breeding gulls and a survey in 1999 recorded Black-headed Gull (329 pairs), Common Gull (124 pairs) and Lesser Black-backed Gull (286). Whilst higher numbers of nesting gulls have been recorded in the recent past, the 1999 populations of the three species still accounted for 2.4%, 7.8% and 6% of the respective national totals. The lake is also a traditional breeding site for Common Tern, with 44 pairs in 1995 and 39 pairs in 1999. In winter the site has a range of waterfowl, especially diving duck, with the Tufted Duck population (453) being of national importance - all figures are mean peaks for 4 of the 5 winters in the period 1995/96 to 1999/2000. It also supports Whooper Swan (54) and is visited at times by part of the Erriff/Derrycraff population of Greenland White-fronted Goose (peak count of 62 in 1995/96). Other species using the site include Mute Swan (49), Whooper Swan (54), Wigeon (84), Teal (99), Mallard (101), Pochard (65), Goldeneye (89), Red-breasted Merganser (12), Little Grebe (17), Cormorant (36), Coot (112) Lapwing (31) and Curlew (75). Lough Mask is one of the most important inland gull breeding sites in the country, with nationally important populations of three gull species. It also has a nationally important colony of Common Tern. The site supports a good diversity of wintering waterfowl, including a nationally important population of Tufted Duck. The site is also regularly utilised by a proportion of the Erriff/Derrycraff population of Greenland White-fronted Goose. The occurrence of three species, Whooper Swan, Greenland White-fronted Goose and Common Tern, is of note as these species are listed on Annex I of the E.U. Birds Directive. Part of Lough Mask SPA is a Wildfowl Sanctuary.

APPENDIX 5
Site Synopsis – Lough Carra/Mask Complex SAC

SITE SYNOPSIS
Site Name: Lough Carra/Mask Complex SAC
Site Code: 001774

This site is dominated by two large lakes, Lough Mask and Lough Carra, and includes the smaller Cloon Lough. Most of the site is in Co. Mayo, with a small portion in Co. Galway. On the western side, the site is overlooked by the Partry Mountains, while to the east the landscape is largely low-lying agricultural land. The nearest large town is Ballinrobe which is about 4 km east of Lough Mask. The general geological character of the area is Carboniferous limestones, with some shales and sandstones on the western side of Lough Mask. The underlying geology results in a great diversity of habitats, which support many scarce and rare plants and animals. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3110] Oligotrophic Waters containing very few minerals [3130] Oligotrophic to Mesotrophic Standing Waters [3140] Hard Water Lakes [4030] Dry Heath [6210] Orchid-rich Calcareous Grassland* [7210] Cladium Fens* [7230] Alkaline Fens [8240] Limestone Pavement* [91E0] Alluvial Forests* [1303] Lesser Horseshoe Bat (Rhinolophus hipposideros) [1355] Otter (Lutra lutra) [1393] Slender Green Feather-moss (Drepanocladus vernicosus)

Lough Mask, at over 8,000 ha, is the sixth largest lake in the country and with a maximum depth of 58 m it is one of the deepest. It is an excellent example of an oligotrophic lake. Aquatic and wetland plant species present which are characteristic of this habitat include several pondweed species (Potamogeton spp.), Water Lobelia (Lobelia dortmanna) and Shoreweed (Littorella uniflora). The eastern part of the lake is shallow and is edged by a lowlying shoreline which is subject to winter flooding. An intricate mixture of plant communities has developed on the limestone, with bare pavement, scrub-dominated pavement, dry grassland and heath. A variety of wetland habitats are also present, along with significant amounts of deciduous woodland along the eastern and southern shores. The western shoreline is less diverse and lacks the limestone communities. However, the fast flowing Owenbrin River has created at its mouth an interesting delta of coarse sandy sediment. Lough Carra, which is hydrologically linked to Mask, is one of the best examples in Ireland of a hard water marl lake. It is a shallow (mostly less than 2 m), predominantly spring fed, lake with only a few streams flowing into it. Its wellknown pellucid green colour is due to calcareous encrustations. It has well developed stonewort communities in the submerged zones, with Chara curta, C. desmacantha, C. rudis and C. contraria recorded.

Lough Carra, like the eastern and southern shores of Mask, is fringed by a diverse complex of limestone and wetland habitats. The limestone pavement within this site represents the northern limit of the limestones of Clare and Galway. The limestone is variable in character, from open bare pavement to areas covered with dense scrub. Associated with the pavement are areas of dry calcareous grassland and dry heath. Characteristic species of the rocky, limestone formations where soil may only occur in pockets include Bloody Crane'sbill (Geranium sanguineum), Yellow-wort

(Blackstonia perfoliata), Blue Fleabane (Erigeron acer), Wild Madder (Rubia peregrina) and Rustyback (Ceterach officinarum). Areas of calcareous grassland, often orchid-rich, occur interspersed amongst the limestone. These grasslands support species such as Carline Thistle (Carlina vulgaris), Quaking-grass (Briza media), Blue Moor-grass (Sesleria albicans), Sweet Vernal-grass (Anthoxanthum odoratum), Cowslip (Primula veris), Common Knapweed (Centaurea nigra), Fairy Flax (Linum catharticum), Lady's Bedstraw (Galium verum) and Wild Thyme (Thymus praecox). A good diversity of orchid species have been recorded from these grasslands, including Pyramidal Orchid (Anacamptis pyramidalis), Early-purple Orchid (Orchis mascula), Bee Orchid (Ophrys apifera), Fragrant Orchid (Gymnodenia conopsea) and Dense-flowered Orchid (Neotinea maculata). Several of these species, notably Dense-flowered Orchid and Spring Gentian (Gentiana verna), are typical Burren species and occur here towards the northern end of their distribution. The scrub vegetation is variable in character, with extensive areas dominated by Hazel (Corylus avellana) and Hawthorn (Crataegus monogyna), with Buckthorn (Rhamnus catharticus), Alder Buckthorn (Frangula alnus), Spindle (Euonymus europaeus) and Ash (Fraxinus excelsior). The dry heath is well developed in places and is characterised by Gorse (Ulex europaeus), Bell Heather (Erica cinerea), Heather (Calluna vulgaris) and St. Dabeoc's Heath (Dabeocia cantabrica). The diminutive orchid Lesser Twayblade (Listera cordata) occurs within the heath communities.

A wide range of wetland habitats occur around Lough Carra and along parts of the eastern and southern shores of Lough Mask, including Cladium fen and alkaline fen. Great Fen-sedge (Cladium mariscus) occurs as pure stands in places but also grades into areas of alkaline fen, where it is intermixed with Black Bog-rush (Schoenus nigricans), Common Club-rush (Scirpus lacustris), Common Reed (Phragmites australis) and a number of sedge species (Carex spp.). The areas of alkaline fen are more extensive than the Cladium fens, and here Black Bog-rush is generally the dominant species. A rich diversity of flowering plant occurs in the fen communities. In addition to the fen habitats, there are sparse but widespread reed swamps, wet grassland and some freshwater marsh communities around the lake shores. Broadleaved deciduous woodland occurs fairly frequently around much of the shores of the lakes and on some of the islands. This is often scrub-type woodland, which may be either dry (dominated by Hazel, Hawthorn and Ash) or wet. In the case of the latter, dominant species include birches (Betula spp.), willows (Salix spp.) and Alder (Alnus glutinosa). The wet areas of woodland flood seasonally and represent alluvial woodland, a habitat that is listed with priority status on Annex I of the E.U. Habitats Directive. These are particularly well developed in the Ballykine and Clonbur areas of Lough Mask. In some places the woodlands contain Sessile Oak (Quercus petraea), Holly (Ilex aquifolium) and Rowan (Sorbus aucuparia). A high concentration of rare plants is found at this site. Five species protected under the Flora (Protection) Order, 2015, occur: Irish St. John's-wort (Hypericum canadense), Chives (Allium schoenoprasum), Pillwort (Pilularia globulifera), Irish Lady's-tresses (Spiranthes romanzoffiana), and Small Cudweed (Logfia minima). Two other Red Data Book plants, Alder Buckthorn and Bird's-nest Orchid (Neottia nidus-avis), also occur, along with two Red Data Book stonewort species, Chara curta and C. rudis. The Owenbrin area of the site supports a population of the rare bryophyte Drepanocladus vernicosus, a species listed on Annex II of the E.U. Habitats Directive. This is the only known lake shore site for the species, which is usually found in upland flushes in association with blanket bog.

A large loft in the stable block of Curramore House provides a summer breeding site of the Lesser Horseshoe Bat, a species listed on Annex II of the E.U. Habitats Directive. The bats gain access to the

loft through windows that extend from the ground floor to the loft area. The building is surrounded by mixed woods and is close to the shores of Lough Mask; both of these habitats provide ideal foraging habitat for the bats. In 1993 more than 100 bats were counted at this site, which makes it of international importance. A second internationally important summer roost of Lesser Horseshoe Bats occurs within the site at Ballykyne, near Clonbur. Over 150 bats have been counted at this site in recent years. The site provide excellent habitat for Otter, also an Annex II species, and the area has Pine Marten (Martes martes), a species listed in the Irish Red Data Book.

The site has important bird interests, both in winter and summer. It provides feeding areas for part of the Erriff/Derrycraff population of Greenland White-fronted Goose. This flock has declined somewhat in recent years but is still of national importance, with an average spring peak from 1989-94 of 124 birds. The following count figures are the averages from surveys in January 1995 and January 1996: Wigeon 167, Mallard 397, Shoveler 57, Pochard 91, Tufted Duck 757, Goldeneye 158, Lapwing 233 Version date: 08.12.2015 4 of 4 001774_Rev15.Docx and Curlew 118. Also, 68 Whooper Swan and 25 Gadwall were recorded in January 1996. The Shoveler, Tufted Duck and Goldeneye populations are of national importance. Both lakes are traditional sites for breeding gulls and terns. In 1995, 44 pairs of Common Tern nested at Lough Mask, while in 1992 a census of gulls at both lakes resulted in the following counts: Black-headed Gull 1,451 pairs, Common Gull 407 pairs and Lesser Black-backed Gull 361 pairs. The Common Gull colony represents 11.3% of the national total, and the Lesser Black-backed Gull colony is 6.9% of the total.

The deep waters of Lough Mask are home to a population of the glacial relict fish species Arctic Char (Salvelinus alpinus), and a rare shrimp (Niphargus spp.) is also found in these waters. Lough Mask is a very important Brown Trout fishery. Whiteclawed Crayfish (Austropotamobius pallipes), a species listed on Annex II of the E.U. Habitats Directive, has been recorded from Lough Carra. This site is of considerable conservation importance as it has good examples of nine habitats listed on Annex I of the E.U. Habitats Directive, four of which are listed with priority status. Some of these habitats are amongst the best examples of their kind in the country. It is also selected for two Annex II mammal species and an Annex II moss. The site is of ornithological importance for both wintering and breeding birds. A relatively large number of rare or localised plant and animal species occur, including the glacial relict Arctic Char.