



Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes

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1. INTRODUCTION

Inland Fisheries Ireland (IFI) is the statutory body with the responsibility for the protection, development and management of the inland fishery resource within the State (Inland Fisheries Act 2010). Inland Fisheries Ireland (IFI) is responsible for the day-to-day management of our inland fisheries resource, which includes the protection, management, conservation and improvement of inland fisheries, including sea angling. IFI enforces fisheries legislation, sets conservation limits for salmon and sea trout fisheries, and issues fishing licences and permits. It is also responsible for fisheries and habitat development, and for providing scientific research and management advice to the Minister for the Environment, Climate Action and Communications

Historically, a number of large limestone lakes in the west of Ireland have been managed preferentially as wild Brown trout (*Salmo trutta*) fisheries. In accordance with Inland Fisheries Ireland's (IFI) most recent policy direction and their statutory remit for the management of Ireland's inland fisheries resources, seven lakes, primarily in the west of Ireland, are managed as salmonid waters. These lakes are Loughs Corrib, Mask, Carra, Cullen, Conn, Arrow and Sheelin. The emphasis of proposed management programmes for these lakes will be to protect, conserve and, where possible, enhance their natural attributes and native biodiversity which will, in turn, optimise their potential as sustainable wild Brown trout and, in some cases, Atlantic salmon (*Salmo salar*) fisheries. Atlantic salmon are listed in Annex II of the EU Habitats Directive (92/43/EEC) and their conservation is mandated in European countries. Brown trout are not specifically protected by the EU Habitats Directive. IFI's interest in other fish species not specifically protected by the EU Habitats Directive include the European eel (*Anguilla anguilla*) (Council Regulation (EC) No 1100/2007, establishing measures for the recovery of the stock of European eel), Arctic Char (*Salvelinus alpinus*) (Threatened Red Data Book Fish species, but now only found in Lough Mask) and Ferox trout (*Salmo ferox*) (large, long-lived trout that are behaviourally and genetically distinct from other wild Brown trout stocks) is also reflected in the plan. Through a series of targeted actions, connected to an overall strategy (The Long-term Management Plan for the Great Western Lakes), IFI will coordinate programmes under 7 categories of High-Level Objectives (HLO). Each HLO aligns to IFI's Corporate Plan (2021 to 2025) and is outlined in the following Sections of this document with an associated proposed series of actions.

1.1. INVAS Biosecurity Company Background

INVAS Biosecurity Ltd. is an Irish company that uses the most up-to-date applied research and science to inform its environmental consultancy and contracting services. The team includes experienced contractors and world-renowned scientists. The company specialises in the control and management of harmful invasive species on land and in water, and on developing materials and methods to conduct and promote best biosecurity practice by all. Clients include State and semi-State organisations, cross-border bodies, Local Authorities, Consultants, Contractors, among others. Staff are currently involved with a number of national and multi-national European projects, all with a primary focus on the judicious management of invasive species.

Prof Joe Caffrey (Company Director), who joined INVAS in January 2015, having been a Senior Research Officer (SRO) with IFI since 1976. While working with IFI and its predecessor organisations, Joe was the SRO-in-charge of the Invasive Species Section within Research. Joe is also a biosecurity specialist who has prepared protocols for national bodies and targeted stakeholders and has developed new and innovative biosecurity products for broad-scale use. He has a broad range of experience with invasive terrestrial and aquatic plant sampling, identification, control and management, as well as habitat restoration post-traumatic events (e.g. biological invasions). Since the year 2000, he has been involved in several major national and international projects, mostly dealing with invasive species management, including;

- Life+ CAISIE from 2009 to 2013 – project leader
- Interreg IVA CIRB from 2010 to 2014 – project partner
- Life+ Mulkear from 2009 to 2014 – technical advisor
- EPA 3-year project on ‘Prevention, control and eradication of invasive alien species’ (2016 –2020), where INVAS is project partner with IT Sligo and QUB
- River Suck peat siltation project, monitoring salmonid stocks in the River Suck tributaries 1980 – 1984.

With a specialist skillset including;

- Netting for fish using all net types (e.g. braided / multimesh gill, fyke, seine, trawl) in streams, rivers, canals, lakes and estuaries

- Electrofishing in small streams and from boats in large rivers/lake littorals, using 240v and 600v pulsed electricity
- Stream/river rehabilitation techniques
- Habitat restoration post-traumatic events (e.g. biological invasions, dredging)
- Lake fishery creation (including design, planting, fish stocking) in cutaway bogs
- Biosecurity specialist who has prepared protocols for targeted stakeholders (e.g. anglers, boaters, paddle sports, divers, field staff, etc.) and has developed new and innovative biosecurity products for broad-scale use.

Dr. William Earle has a Ph.D. in invasive species management and is working full-time as a biosecurity manager with INVAS since 2016. His Ph.D. focused on *Lagarosiphon major*, an aquatic invasive weed that can severely impacts on salmonids, particularly in Lough Corrib. William is responsible for Invasive Alien Species (IAS), macrophyte and ecological field surveys using drone and GPS technology. He is in charge of GIS mapping and map production in INVAS, as well as site survey reports and Appropriate Assessment preparation. William has produced AA Screenings and NIS reports for IFI on the management of Natura sites and their Conservation Objectives throughout Ireland, with some of the most relevant projects including;

- Appropriate Assessment Stage 1 Screening for Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2020 & 2021
- Appropriate Assessment Stage 1 Screening for Conservation of Salmon and Sea Trout (Draft Nets and Snap Nets) Bye-law, 2021 & 2022
- AA Screening & Natura Impact Statement for numerous River Enhancement Plans in the Corrib Catchment 2019 to present
- Appropriate Assessment Screening for the Management of *Lagarosiphon major* in Lough Corrib 2020
- Appropriate Assessment Stage 1 Screening for Fisheries Maintenance Projects the Lough Corrib Catchment in 2020.

1.2. Legislative context of Appropriate Assessment

The Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) provide a legal framework for Europe's nature conservation policies. In Ireland, both Directives have combined to establish an ecological network of protected areas, known as Natura 2000 sites, which require special consideration when planning projects or developments. The network consists of Special Protection Areas (SPA), for the protection of Annex I birds, regular migratory birds and their habitats, and Special Areas of Conservation (SAC) for the protection of Annex I habitats and Annex II flora and fauna, other than birds. Also included as part of the network are candidate Special Areas of Conservation (cSAC) and proposed Special Protection Areas (pSPA).

Article 6 (3) of The Habitats Directive sets out the requirement for Appropriate Assessment in relation to Natura 2000 sites for any plan or project that is likely to have a significant effect on the conservation objectives of a Natura 2000 site. An Appropriate Assessment is an evaluation of the potential effects of the proposed plans, on their own or in combination with other projects, on the habitat types and species protected by the Natura 2000 network.

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.”

Each stage of the Appropriate Assessment (AA) method is a source of origin for the next stage. Each decision made will influence the outcome of the assessment, so a careful approach to the documentation of the results at each stage is needed for sufficient traceability and transparency of each decision. The AA will provide a detailed investigation into the possible risks that a proposed plan or project may have on a Natura 2000 site, with respect to its objectives for conservation. The aim of an AA is not to prohibit a project, plan or activities. An AA is to address any concern for possible threats that a project or plan may have to Natura 2000 sites,

with Article 6(3) at the forefront of each decision in each stage, this includes any decision relating to funding and other supports.

1.1. Stages

The European Commission's methodological guidance¹ promotes a four-stage process, as set out below, to complete an Appropriate Assessment:

- Stage 1 – Screening for Appropriate Assessment

Stage 1 involves determining whether a project or plan, individually or combined with another, requires an AA screening. An AA screening is a thorough impact assessment that identifies whether a project or plan will have any effect on a Natura 2000 site, relating to the tests of Article 6 (3). If a project or plan is considered to have significant or possibly significant effects, or it is uncertain whether the Natura 2000 site will be affected, an AA screening will be necessary with the process proceeding to stage 2. Modification of the AA screening can only be done in the circumstances that the impact on the Natura 2000 site can be prevented by doing so. If the project or plan is deemed to have no risk of impact on the site, full evidence and justification must be provided.

- Stage 2 – Appropriate Assessment

The AA requires a description of the Natura 2000 site(s) that could be affected, with data, information, and analysis of the possible effects on the site, provided in a Natura Impact Statement (NIS). This AA must also include measures that can be taken to reduce or prevent any possible impacts on the site. There is no defined method for the AA, but it must be conducted based on scientific evidence and methods. The NIS must be prepared by ecological specialists and with input from other relevant experts such as hydrologists or engineers. The NIS must be prepared for advocate of the project or plan to submit to a capable authority for review. The capable authority proceeds with the AA after successful review of the NIS. The project or plan will have to be stopped or it will be required to proceed to stage 3 if it cannot avoid or mitigate the impacts on the Natura 2000 site.

¹ European Communities (2002). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites. Methodological Guidance on the Provision of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Communities, Luxembourg

- Stage 3 – Alternative Solutions and

Alternative solutions to the project or plan are reviewed in this stage. These alternatives may allow the project or plan to be carried out with no significant effects to the Natura 2000 site. If any alternative is considered, the proposal must revert to stage 2 of the appropriate assessment. The alternative must be reviewed before the test of Article 6(4) is carried out. The project or plan must be abandoned if no alternatives reduce or avoid the risk on the Natura 2000 site. If the negative impacts on the site can be completely avoided, the project or plan can be approved for progression.

- Stage 4 – The ‘IROPI Test’ (Imperative Reasons of Overriding Public Interest)

If the project or plan will have no harmful effects on the Natura 2000 site, it can now move on to be authorised by planning officials to decide on the approval or refusal of the project or plan. Imperative reasons of overriding public interest, there are no alternatives that are less damaging and the identification of actions that will offset the possible damages are the only exceptions for the approval of a project or plan, if there is still a threat to the conservation of the Natura 2000 site. The proposal must then go through the steps of Article 6(4). These extra measures are taken for special protection of the habitats and species listed in Annex I. IROPI reasons include concerns about public health and safety, or importance for the environment. Reasons that are not included here must be decided by the commission, with any measures that will compensate the damage to be approved by the minister.

2. PROJECT DESCRIPTION

2.1. Background

An integral part of IFI's responsibility is in the management of habitats and waters inhabited by fish species of conservation interest. The Long-term Management Plan for the Great Western Lakes has been prepared for a group of waterbodies and their catchment areas to advance the conservation and restoration of their ecological integrity and thus, resident fish stocks. The seven lakes and their catchments are managed as salmonid waters in Ireland. These waterbodies are large by Irish standards (1,266 - 16,562 ha.) and are generally based on carboniferous limestone. Their bathymetry, water chemistry and unique assemblages of flora and fauna has resulted in the evolution of rare and highly valued ecosystems that offer an abundance of services to society and the natural environment. The lakes have become an integral part of the European Natura 2000 network and immense centres for recreational and cultural activity, particularly angling.

This Plan sets out a series of measures which aim to address and manage many of the factors currently impacting on the ecological integrity and the status of resident fish stocks on the designated lakes and their catchments. There are three key objectives set out in the Long-term Management Plan for the Great Western Lakes:

1. to ensure the sustainability of salmonid fish within the designated waterbodies and to introduce measures to mitigate against the pressures currently impacting on their ecological integrity;
2. to protect, manage and where they have been damaged, restore the natural attributes and biodiversity of the designated waterbodies; and
3. to optimise existing habitat and its potential to support sustainable wild Brown trout and Atlantic salmon fisheries.

Although this Plan relates primarily to the conservation and management of salmonid fish, the importance of their co-dependence and relationship with other, resident flora and fauna must also be recognised. All seven lakes and significant parts of their catchments are designated as Special Areas of Conservation (SAC) or Special Protection Areas (SPA) under European Legislation (Council Directive 92/43/EEC). The protection of other species and habitats of

community interest, which are also important to the health and integrity of these important aquatic ecosystems, is also a vital component of the Plan.

The NPWS website (accessed 14/07/2022) provides guidance on Conservation Plans for ‘habitats and species other than those for which a Natura 2000 site has been selected’:

*“Other site-specific conservation objectives, dealing with habitats and species other than those for which a Natura 2000 site has been selected, may be set when a **conservation management plan** is compiled for that site.*

Conservation plans have been drawn up for a number of sites. Such plans include descriptive information and a management framework section that outlines objectives and strategies. However, these objectives may have been superseded by the site's Conservation Objectives. Maps are produced to accompany text including indicative habitat maps. The final stage of plan preparation is a three-month period of public consultation.

Conservation statements are written as a precursor to conservation plans. They are intended to provide useful site-specific information to landowners, other land managers, local authorities and other stakeholders. They list and describe qualifying features, other habitats and species, land use and management issues. They also state generic conservation objectives, but these may have been superseded by the site's Conservation Objectives. A boundary map and indicative habitat map accompanies each statement.”

This Stage 1 Appropriate Assessment Screening outlines the key actions proposed as part of the Long-term Management Plan for the Great Western Lakes. It will determine whether the proposed HLOs, alone or in combination with any other Project or Plan, will have the potential for significant effect on the Conservation Objectives of a Natura 2000 site or its associated Features of Interest. However, it must be noted at this point that Appropriate Assessments will also be carried out for all specific future proposed projects and management actions on these Great Western Lakes. These assessments will be necessary to ensure that sensitive species and habitats, that are qualifying interests for the Natura 2000 sites, are not adversely affected by any fisheries management measures proposed resulting from the implementation of this Plan.

The implementation of the Long-term Management Plan for the Great Western Lakes will require a multi-disciplinary, multi-agency approach and will seek to engage local communities and other interested stakeholders within the catchment areas. The Plan also endorses the concept of adaptive management, whereby actions and measures are periodically assessed in

terms of their benefits and impacts on critical receptors (e.g. salmonid stocks, water quality) within the western lake catchments. This concept will utilise the most up to date survey data and other scientific information to inform decision making within the parameters of the Actions proposed in the Long-term Management Plan for the Great Western Lakes. The effects of various management strategies will be regularly evaluated by IFI and modified accordingly, to better achieve the desired outcomes. Existing management systems are already in place for the protection of certain salmonid species through Regulations, such as the Wild Salmon and Sea Trout Tagging Scheme (S.I. No. 585 of 2018) and a series of associated Bye-Laws to protect fish stocks of both species in Ireland. Through this Regulation, Conservation Limits (CL) and Atlantic Salmon surplus are annually assessed on a catchment-by-catchment basis, providing up to date information for management.

It is widely recognised that resident fish stocks, water and habitat quality have declined on the western lakes over the last three decades. This Plan proposes a series of actions aimed at redressing these declines and, in association with other relevant state authorities and local communities, IFI will endeavour to achieve improvements that will secure resident fish stocks and their habitat into the future.

2.2. Description of the proposed project

The preparation of the Long-term Management Plan for the Great Western Lakes could be interpreted as the preparation of a national Plan, as defined by the Habitats Directive. For this reason, IFI wishes to carry out an Appropriate Assessment for the preparation of the Plan, in reference to the Habitats Directive. The purpose of the Appropriate Assessment is to determine if the actions proposed as part of the Plan have the potential to have an adverse impact on the integrity of the associated Natura 2000 sites. This AAS will concentrate specifically on the seven lakes and their catchments designated as salmonid lakes by IFI. The EU Water Framework Directive (2000/60/EC) (WFD) establishes a framework for the protection, improvement and management of surface water and groundwater. The Catchment dataset is built on clusters of subcatchments. All Natura 2000 sites within the WFD catchments for each lake system and those with a hydrological connection downstream will be assessed.

A list of proposed actions has been clearly set out as part of the Long-term Management Plan for the Great Western Lakes. Using this predefined list, an initial desktop study was carried out to assess if each of the proposed actions have the potential to have an uncertain or adverse impact on the integrity of any Natura 2000 site (Table 3.1). The actions deemed to have a

potential for uncertain or adverse impacts will then be used to Screen In or Out any Natura 2000 site for a Stage 2 NIS. This table will provide a list of potential impacts that the preliminary establishment of each proposed action may have.

Future projects based on the proposed actions within the Long-term Management Plan for the Great Western Lakes are likely to take place within, upstream/downstream of or in close proximity to several Natura 2000 sites. As the specific details of several proposed projects are yet unknown, the full extent of their potential for adverse impacts is impossible to determine. As a consequence, each of the plans or projects that will arise under the guidance of the Long-term Management Plan for the Great Western Lakes will need to be Screened for Appropriate Assessment on a case-by-case basis, taking into account up to date, objective scientific information.

2.2.1. The Great Western Lakes

The following summary descriptions are extracted from IFI's Water Framework Directive (WFD) fish sampling reports. (See <http://wfdfish.ie>)

2.2.2. Lough Arrow

Lough Arrow is a limestone lake situated in Co. Sligo, approximately 24km south-east of Sligo town and 6.4km north-west of Boyle, Co. Roscommon. It is sheltered on three sides by hills and is the source of the Unshin River. Lough Arrow is the smallest of the Western lake catchments fed largely by springs on the lake bed and as such is hydrologically different from most lakes in Ireland (Roscommon County Council, 2009).

Lough Arrow has a surface area of 1,266ha, with a mean depth of 9m and a maximum depth of 33m. It is categorised as typology class 12 (as designated by the EPA for the purposes of the Water Framework Directive), i.e. deep (>4m), greater than 50ha with high alkalinity (>100mg/l CaCO₃). It is of major conservation significance as it conforms to a type (hard water lake) listed in Annex I of the EU Habitats Directive. The shores of the lake are, for the most part, stony, although the common club-rush (*Scirpus lacustris*) and common reed (*Phragmites australis*) occur abundantly in several bays (NPWS, 1999). Recent research conducted on the lake has reported the presence of extensive stands of the invasive alien species Nuttall's waterweed (*Elodea nuttallii*) in bays throughout the lake.

The lake was once stocked with hatchery reared in brown trout but this practice was discontinued (circa 2005) and there does not appear to be any genetic remnant in current stocks. Artificial augmentation of stocks in the western lakes was largely abandoned in the late 1990s and replaced with fisheries enhancement programmes. In the Lough Arrow catchment, spawning and nursery areas for brown trout were restored over the period 1998 to 2000 involving re-creation of pools and natural meander patterns, fencing of streams from livestock and the placing of additional spawning gravels in streams where appropriate (O' Grady, 2004). Adult wild brown trout average 0.45kg in weight, with fish up to 2.7kg having been taken by anglers in the past. Up to 1994, only perch, pike and brown trout were recorded in stock surveys, although three-spined stickleback were also recorded in the stomachs of pike. Rudd were encountered for the first time in 2002 and were captured again in the 2007 survey. The lake was also previously surveyed by IFI for the WFD fish monitoring programme in 2009, 2012 and 2015 (Kelly et al., 2010, 2013 and 2016). During the 2015 survey, perch were found to be the dominant species present in the lake. Brown trout, roach, three-spined stickleback, roach x bream hybrids, bream, rudd, pike and eels were also captured during the survey. Lough Arrow was assigned an ecological status of Good in 2018 based on the fish populations present. In previous years the lake was also assigned Good status. The Waters of the Ballysadare River catchment (including the Unshin and Lough Arrow) are open for angling in 2022 with a fish surplus of 2,013 Atlantic Salmon above the Conservation Limit set for the catchment (Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2021).

2.2.3. Lough Conn

Lough Conn is located in the Moy catchment in north County Mayo. It is connected to its immediate neighbour to the south, Lough Cullin, by a narrow channel that passes under a regional road at Pontoon village. The River Deel flows into Lough Conn and exits Lough Cullin at its southern end near Foxford, before joining the River Moy which discharges into the Atlantic at Killala Bay. The lake has a surface area of 4,704ha and a maximum depth of 37.9m. The lake is categorised as typology class 12 (as designated by the EPA for the Water Framework Directive), i.e. deep (mean depth >4m), greater than 50ha and high alkalinity (>100 mg/l CaCO₃). Lough Conn is part of a Special Protection Area (SPA) (Site code: 004228) under the E.U. Birds Directive. It also forms part of the River Moy SAC where Atlantic Salmon are a qualifying interest.

The SPA is of special conservation interest for the following species: Greenland White-fronted Goose, Tufted Duck, Common Scoter and Common Gull. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated water birds are of special conservation interest. Lough Conn's reputation as a fine brown trout and salmon fishery goes back to the very beginning of angling in the west of Ireland. The main run of spring salmon enters Lough Conn from the end of March and continues right through April. The grilse run begins in May and continues into July.

The lake was surveyed by Inland Fisheries Ireland (IFI) on eight occasions between 1978 and 2001 (1978, 1984, 1990, 1994, 1998, 2001, 2005 and 2013) as part of a brown trout fish stock assessment programme. Brown trout, rudd, roach, perch and pike were captured in the surveys. Historically the lake held a population of Arctic char; however, they have been extinct for some time. Following the apparent collapse of the Arctic char population IFI surveyed the spawning areas where Arctic char, if present, would be congregating to spawn. The surveys were carried out during the Arctic char spawning seasons of 1991 to 1994. Three Arctic char were captured in the 1991 sampling, one fish in 1992 and none thereafter in 1993 or 1994. An examination of pike stomachs from fish captured in various parts of Lough Conn, throughout the 1990s, found no char. It is now established that Arctic char had become extinct in Lough Conn by the mid-1990s. Based on the fish populations present, Lough Conn was assigned an ecological status of Good in 2016, the most recent survey under the WFD. In the 2010 to 2015 surveillance monitoring reporting period, the EPA also assigned Lough Conn an overall ecological status of Good. The Waters of the Moy River catchment (including the Lough Cullin and Lough Conn) are open for angling in 2022 with a fish surplus of 12,555 Atlantic Salmon above the Conservation Limit set for the catchment (Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2021).

2.2.4. Lough Cullin

Lough Cullin is a large, shallow lake situated to the west of Foxford, which is connected to Lough Conn by a narrow inlet at Pontoon, Co. Mayo. The outflow from the lake discharges directly into the River Moy south-west of Foxford (NPWS, 2004). Lough Cullin has a surface area of 1019.3ha with a maximum depth of approximately 3m (O' Reilly, 2007). The underlying geology of the lake is mainly granite with some areas of limestone present in the southern region of the catchment (NPWS, 2004). The lake is categorised as typology class 10

(as designated by the EPA for the purposes of the Water Framework Directive), i.e. shallow (100mg/l CaCO₃).

Lough Cullin is located within the River Moy Special Area of Conservation (SAC) (NPWS, 2005). The underlying geology of the majority of the SAC is Carboniferous limestone, with areas of Carboniferous sandstone, Dalradian quartzites and schists also present. Some of the tributaries at the east and south of Lough Conn, and all inflowing to Lough Cullin are underlain by granite. The site has been selected as a candidate SAC for containing alluvial wet woodlands, raised bog, old oak woodlands (present on the shores of Lough Cullin), degraded raised bog and *Rhynchosporion* depressions (*Rhynchospora alba*), all priority habitats on Annex I of the E.U. Habitats Directive.

This SAC has also been selected due to the presence of the following species, listed on Annex II of the same Directive – Atlantic salmon, otter, sea and brook lamprey and white-clawed crayfish. Lough Cullin has relatively low colour and good water clarity. The phytoplankton in the lake is dominated by diatoms and blue-green algae. Lough Cullin also supports important wintering waterfowl and is designated as a Special Protection Area, as its one of the few breeding sites for Common Scoter in Ireland (NPWS, 2005). Lough Cullin was once regarded as one of Ireland's premier brown trout fisheries but was often considered to be the 'poor relation' of Lough Conn. Historically, in angling terms, Lough Cullin was noted for supporting a large population of relatively small (brown trout (O' Grady and Delanty, 2001). Today brown trout averaging 0.3kg to 0.45kg are often caught, with some weighing up to 1.8kg (O' Reilly 2007). The lake was also regarded as a very important salmon fishery and receives a run of salmon during the spring and summer months (NPWS, 2004; O' Reilly, 2007). In fact, all the salmon, of which there can be many, destined for Lough Conn and its inflowing rivers must pass through Lough Cullin. The Waters of the Moy River catchment (including the Lough Cullin and Lough Conn) are open for angling in 2022 with a fish surplus of 12,555 Atlantic Salmon above the Conservation Limit set for the catchment (Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2021).

Lough Cullin was previously surveyed in 1994, 1998 and 2001 as part of a fish stock assessment by IFI's research section using seven-panel benthic braided survey gill nets. These surveys revealed that the brown trout population declined between 1995 and 2001. Eutrophication problems have been evident in the lake in recent years. There was a population of rudd in the lake since the 1960s; however roach, a highly prolific non-native species, became

established in the lake in the 1990s. The lake was also previously surveyed by IFI for the WFD fish monitoring programme in 2009, 2012 and 2015. During the 2015 survey, roach were found to be the dominant species present in the lake. Perch, brown trout, tench, eels and pike were also captured during the survey. Lough Cullin was assigned an ecological status of Moderate following the most recent WFD survey (2018) based on the fish populations present.

2.2.5. Lough Carra

Lough Carra is situated in County Mayo and forms the most northerly part of the Great Western Lakes system of Loughs Corrib, Mask and Carra. It is located approximately 5km north of Ballinrobe, Co. Mayo. Lough Carra is the largest marl lake in Ireland, with a surface area of approximately 1600ha. It is a hard water lake which acquires most of its water via the feeder streams that flow in at various points around its perimeter (Huxley and Huxley, 2009) with some contributions from ground-water springs. The majority of the lake is shallow with a mean depth of approximately 1.8m; however, there are sections of the lake where depths reach over 19m (Huxley and Huxley, 2009). Lough Carra is well known for its green/blue colour which is due to the formation of calcareous encrustations (NPWS, 2004). The lake contains well developed stonewort communities with *Chara curta*, *C. desmacantha*, *C. rudis* and *C. contraria* also recorded (NPWS, 2004). Dense and expanding stands of *Myriophyllum verticillatum* have been recorded in the lake over the past decade. It is categorised as typology class 10 (as designated by the EPA for the purposes of the Water Framework Directive (WFD)), i.e. shallow (100mg/l CaCO₃).

The average size of the brown trout taken from Lough Carra is greater than any of the other western lakes as they grow rapidly in this rich ecosystem. Lough Carra is believed to be one of the few remaining wild brown trout calcareous lakes within the EU (Irvine et al. 2003). During the 1990s fishery rehabilitation and enhancement works were undertaken in Lough Carra's spawning streams by Inland Fisheries Ireland (IFI) and this led to increased recruitment of juvenile brown trout to the lake (O' Grady, 2009). The lake was surveyed eight times from 1978 to 2009 as part of IFI's brown trout research programme using seven-panel benthic braided survey gill nets; brown trout, perch and pike were recorded on all sampling occasions. The most recent results (March 2009) using this survey method suggested that the lake supported an excellent and healthy stock of brown trout (IFI, 2009). More recently, the lake was surveyed by IFI for the WFD fish surveillance monitoring programme in 2009, 2012 and 2015 (Kelly et al., 2010, 2013 and 2016). In these surveys, Perch were the most numerous fish

with brown trout numbers declining slightly. In the 2013 to 2018 surveillance monitoring reporting period, the EPA assigned Lough Carra an overall draft ecological status of Good, based on all monitored physico-chemical and biological elements, including fish.

Notwithstanding this relatively recent designation, lough Carra has experienced a significant deterioration in water quality over the last decade. Recent EPA reports indicate rises in ortho-phosphate and Nitrogen levels and increased algal biomass in lake water samples. These worrying trends lead to the formation of the Lough Carra Catchment Association in 2018. This community-based group aims to engage people living and farming in the Carra catchment area to help reduce harmful nutrient inputs. They have succeeded in raising awareness in the local community of the problems facing Lough Carra but their greatest challenge, one that is facing all of the great western lakes, is in shifting the current emphasis away from intensification of agriculture in sensitive western catchments to a more environmentally friendly land management policy. The Waters of the Corrib River catchment (including the Lough Corrib, Lough Mask and Lough Carra) are open for angling in 2022 with a fish surplus of 4,139 Atlantic Salmon above the Conservation Limit set for the catchment (Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2021).

2.2.6. Lough Mask

Lough Mask is situated north of Lough Corrib, adjacent to the town of Ballinrobe, Co. Mayo. It is the sixth largest lake in Ireland with a surface area of approximately 8,218ha. The length of the lake from north to south is approximately 16km and the width is approximately 6.4km at its widest point. 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. It is generally a shallow lake with a mean depth of 5m; however, it attains a maximum depth of 57m along a long narrow trench on the western shore of the lake (NPWS, 2004). The lake is categorised as typology class 12 (as designated by the EPA for the purposes of the WFD), i.e. deep (>4m), greater than 50ha and high alkalinity (>100mg/l CaCO₃).

The underlying geology of Lough Mask is Carboniferous limestone, with areas of shale and sandstone, and it is an excellent example of a lowland oligotrophic lake (NPWS, 2004). Lough Mask, Carra and Cloon make up the Lough Carra/Lough Mask Special Area of Conservation (SAC) complex. Six habitats listed on Annex I of the EU Habitats Directive are found in this

site, including two priority habitats - limestone pavement and *Cladium* fen (NPWS, 2004). This is also an important SAC for otter, a species that is listed on Annex II of the E.U. Habitats Directive. The zebra mussel, an invasive species in Ireland, was confirmed to be present in Lough Mask in 2008.

Roach, an invasive fish species was first recorded in a fish stock assessment survey in 1996, since then the population has spread throughout the lake. 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 largest ferox trout can reach up to 9kg in weight (O' Reilly, 2007). The lake was previously surveyed in 1996 as part of Inland Fisheries Ireland's (IFI) brown trout stock assessment programme using seven-panel benthic braided survey gill nets. Five fish species were recorded at that time; brown trout, Arctic char, pike, perch and a single roach. More recently the lake was surveyed by IFI for the WFD fish monitoring programme in 2009, 2012 and 2015 (Kelly et al., 2010, 2013 and 2016). During these surveys, perch, roach, brown trout, bream, Arctic char, eels, pike, stone loach and roach x bream hybrids were recorded.

Lough Mask was 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. The Waters of the Corrib River catchment (including the Lough Corrib, Lough Mask and Lough Carra) are open for angling in 2022 with a fish surplus of 4,139 Atlantic Salmon above the Conservation Limit set for the catchment (Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2021).

2.2.7. *Lough Corrib*

Lough Corrib, the largest of the western lakes and the second largest lake in Ireland (after Lough Neagh), is situated in Co. Galway in the River Corrib catchment. The lake stretches from outside Galway city to within three kilometres of Maam Cross, a distance of over 50 kilometres. The main rivers draining into Lough Corrib include the Black, Clare, Dooghta, Cregg, Owenriff rivers and the Cong canal which joins Lough Corrib to Lough Mask.

The lake can be divided into two parts: Lower Lough Corrib - a relatively shallow basin underlain by carboniferous limestone in the south (Fig. 1.1), and Upper Lough Corrib - a larger, deeper basin underlain by more acidic granite, schists, shales and sandstones to the north. The lake has a surface area of 16,562Ha (5,042ha Lower Lough and 11,520ha Upper Lough), and has a maximum depth of 42m. The lower lake is categorised as typology class 10 (as designated

by the EPA for the Water Framework Directive), i.e. shallow (mean depth <4m – Total hardness >100mg/l CaCO₃) and the upper lake fits into typology class 12, i.e. deep (mean depth >4m), greater than 50ha and high alkalinity (>100mg/l CaCO₃).

The lake supports 14 protected habitats and six species, including salmon that are listed on Annex I and Annex II respectively of the EU Habitats Directive (NPWS, 2004). It is one of the best game fisheries in the world and is internationally renowned for its brown trout fishing. The lake is known to hold brown trout, salmon, perch, roach, bream, roach x bream hybrids, eels, 3-spined stickleback, 9 spine stickleback pike and stoneloach. Unfortunately, roach, a non-native invasive fish species, was first identified in Lower Lough Corrib in the early 1980s and subsequently spread to all corners of the lake. High numbers of roach were observed in routine netting operations on the lake from the late 1980s until 1992 when a decline in the stock was observed. It was during this period that Arctic char were thought to have disappeared from L. Corrib. In early 2007, large numbers of the protozoan parasite *Cryptosporidium* sp. were detected in water from the lake, leading to contamination of the public water supply and an outbreak of cryptosporidiosis in Galway city.

Another unwelcome visitor to the lake is the highly invasive plant species *Lagarosiphon major* (also known as "Curly Waterweed") which was first identified in the lake in 2005. This rapidly colonizing plant has already excluded native plant species from bays in which it has become established. The Zebra mussel (*Dreissena polymorpha*), another invasive species in Ireland was first recorded in Lough Corrib during 2007 and it is thought they were introduced to the lake in 2000/2001.

Lough Corrib has been included in Inland Fisheries Irelands long term water quality monitoring programme of lake ecosystems since 1975. The lake is currently classified as mesotrophic. It was previously surveyed to assess its fish stocks by Inland Fisheries Ireland (formerly the Central Fisheries Board and the Western Regional Fisheries Board) in 1986 and 1996

Lough Corrib has been included in Inland Fisheries Irelands long term water quality monitoring programme of lake ecosystems since 1975. The lake is currently classified as mesotrophic. It was previously surveyed to assess its fish stocks by Inland Fisheries Ireland (formerly the Central Fisheries Board and the Western Regional Fisheries Board) in 1986 and 1996. The Waters of the Corrib River catchment (including the Lough Corrib, Lough Mask and Lough Carra) are open for angling in 2022 with a fish surplus of 4,139 Atlantic Salmon above the

Conservation Limit set for the catchment (Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2021).

2.2.8. *Lough Sheelin*

Lough Sheelin is situated in counties Cavan, Meath and Westmeath in the Inny sub-catchment of the River Shannon Basin District. The lake is located north-east of Finnea, Co. Westmeath. It is seven kilometres long and has a surface area of 1,900 hectares. The River Inny flows through the lake. Lough Sheelin is a relatively shallow lake with a mean depth of 4.4m, a maximum depth of 15m, and 51% of the lake is less than 5m in depth. The geology of the catchment is predominantly Carboniferous limestone, but Silurian/Ordovician formations underlie the western and northern drainage basin.

The lake is eutrophic, and is categorised as typology class 12 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and high alkalinity (>100 mg/l CaCO₃). In the 1960s and 1970s Lough Sheelin was one of Ireland's top trout angling lakes, managed and developed by the Inland Fisheries Trust (now Inland Fisheries Ireland). Phosphorus originating from intensive agricultural developments has caused progressive enrichment of Lough Sheelin since the early 1970s (Champ, 1998 and 2003). This has resulted in the trout population diminishing and the fish stock becoming dominated by cyprinids. The lake has been stocked with brown trout in the past, with approximately 16,000 2+ fish introduced in 2004, followed by between 3,000 and 6,000 per year thereafter. Stocking of brown trout into the lake ceased in 2011. The water quality in the lake and the catchment was monitored on a continuous basis by Inland Fisheries Ireland (previously the Shannon Regional Fisheries Board and the Central Fisheries Board) from the 1970s to 2015. A modest decrease in the total phosphorus loadings to the lake was noted between 1988 and 2005, suggesting that the phosphorus losses from the catchment declined during that period but more recent data from 2006 to 2014, indicates that there has been no improvement in the nutrient loadings to the lake.

Zebra mussels (*Dreissena polymorpha*), an invasive species in Ireland, were first noted in Lough Sheelin during 2003 and it is thought they were introduced to the lake in 2000 and 2001. Large populations of the mussel have been evident in the lake since 2004.

The fish population in Lough Sheelin has been surveyed regularly since 1978 by Inland Fisheries Ireland using a gill netting technique that was developed in the late 1970s to assess

trout stocks (trout > 19.8cm in length) on selected lake fisheries. Other fish species are also captured as a by-catch during these surveys. This work has proved to be an effective management tool in illustrating the fluctuations in fish stocks over time. An extensive database has been developed based on this method. The standing crop of trout (>19.8cm) in Lough Sheelin varied between 100,000 and 120,000 fish in the early 1980s and has since decreased substantially. Unfortunately roach, a non-native invasive species, were introduced into the lake during the 1970s and their population has fluctuated dramatically since that time. Lough Sheelin currently holds stocks of brown trout, pike, perch, roach, roach hybrids, tench, 3-spined stickleback, 9-spined stickleback and eels. The Waters of the Lower Shannon River catchment (below Parteen Weir) are partially open for Catch and Release angling in 2022 with no fish surplus of Atlantic Salmon above the Conservation Limit set for the catchment (Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2021). The Waters of the Upper Shannon River catchment (above Parteen Weir) are closed for Atlantic Salmon angling in 2022. Atlantic Salmon are not designated as site specific Conservation Objectives for any SAC from the upstream extent of the Lower River Shannon SAC at Killaloe to the River Inny and Lough Sheelin.

2.2.9. Other Salmonid Catchments

The issues currently impacting on vulnerable salmonid stocks are not confined to the lakes included in this plan. There are numerous river and lake systems, particularly in the western counties from Donegal to Kerry where salmonids are severely threatened. Problems associated with invasive fish introduction and aquaculture are of particular concern in some of these catchments.

A series of separate plans are proposed for these catchments which will seek to address the issues currently impacting on these waterbodies and their fish stocks.

3. STAGE 1 APPROPRIATE ASSESSMENT SCREENING OF NATURA 2000 SITES

3.1. Preliminary Determination of the Potential for Significant Effects of the Proposed Actions

This assessment identifies effects that may arise directly or indirectly as a result of the implementation of the actions proposed in the The Long-term Management Plan for the Great Western Lakes, or in-combination with any other project. Each Action will be assessed individually to determine the potential for any plan or project to impact on the integrity of any Natura 2000 site (Table 3.1). As The Long-term Management Plan for the Great Western Lakes is a strategic plan, there are no detailed projects being assessed here. Only general impacts may be predicted with further Appropriate Assessment Screenings to be carried out for site specific projects under actions determined to have the potential for significant or uncertain effects on the Conservation Objectives or Features of Interest on Natura 2000 sites.

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Table 3.1: Through a series of targeted actions, connected to an overall strategy, IFI will coordinate programmes under 7 categories of High-Level Objectives (HLO). A modified version of Table 1 from the Long-term Management Plan for the Great Western Lakes is reproduced here to provisionally determine if an action is likely to have any potential impacts on the integrity of any Natura 2000 site. A determination is then made as to whether a site should be further assessed due to the potential for uncertain or adverse impacts.

HLO 1. (Section 4)	Stakeholder Engagement	Start	Finish	Potential impacts of proposed actions on Natura 2000 sites	Preliminary determination of the potential for uncertain or adverse impacts on any Natura 2000 site
<u>Action 1.1:</u> Identify and engage with established catchment groups, federations, Clubs, trusts and associations to assist with the progression of common catchment management goals.		2022	Review needed after 5 years	Development and enhancement of site-specific management goals through the engagement of local and national stakeholders. Creation of an awareness among stakeholders of the diversity and worth of the resident fishes (and associated fauna, flora and habitat) in these lakes, and the work being conducted to protect them.	No further Assessment required. The potential impacts of stakeholder engagement will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of interest.
<u>Action 1.2:</u> Where such groups have not yet been established, engage local communities, stakeholders and relevant authorities in the protection, development and conservation of their river catchments through the establishment of more Catchment Management Associations for the Western Lakes.		2022	Review needed after 5 years	Engagement of local stakeholders and authorities to improve the protection, development and conservation of their river catchments	No further Assessment required. The potential impacts of stakeholder engagement will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of interest.

<u>Action 1.3:</u> Enhance communication mechanisms and networks between IFI, other relevant stakeholder groups, state agencies, farming organisations, academic institutions, local communities and catchment groups.		2022	Ongoing	<p>Positive: Improve communication between stakeholders and authorities to improve the protection, development and conservation of their river catchments.</p> <p>It will be important to ensure that the communication is a two-way process, to derive the maximum benefit from the wide range of stakeholders engaged.</p>	<p>No further Assessment required.</p> <p>The potential impacts of improved communication and stakeholder engagement will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of interest.</p>
HLO 2. (Section 5)	Climate Action & Biodiversity	Start	Finish	Potential impacts of proposed actions on Natura 2000 sites	Preliminary determination of the potential for uncertain or adverse impacts on any Natura 2000 site
<u>Action 2.1:</u> Identify manageable factors which will contribute to the climate resilience of sensitive habitats and species.		Started	TBC	Climate resilience of sensitive habitats and species will play a key role in maintaining the Conservation Objectives of the Natura 2000 network into the future.	<p>No further Assessment required.</p> <p>The potential impacts of the identification of manageable factors which will contribute to the climate resilience of sensitive habitats and species will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.</p>
<u>Action 2.2:</u> Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off.		Started	Review needed after 5 years	The establishment of significant aquatic buffer zones has the potential to enhance biodiversity and ameliorate nutrient /sediment run-off. This can have positive impacts on water and instream habitat quality. These projects should be accompanied by long term invasive alien species	<p>Further Assessment required due to potential for uncertain or adverse impacts.</p> <p>This Action fundamentally aims to improve the management and condition of habitat quality for the long-term sustainability of salmonid populations. The implementation of future plans and projects based on the guidance of the Long-term Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites.</p>

			<p>management plans, reporting systems and action plans for new incursions.</p> <p>Potential impacts include the accidental spread/dispersal of IAS, petrochemical/silt pollution and the disturbance/destruction of protected habitats and species.</p>	<p>Future plans or projects arising from the development of this action in relation to promotion for the establishment of significant aquatic buffer zones must be Screened for Appropriate Assessment on a case-by-case basis. This action can be viewed as a mitigation measure and following the precautionary principle, will necessitate a Stage 2 NIS.</p>
<p><u>Action 2.3:</u> Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity.</p>	TBC	TBC	<p>Tree planting should be carefully managed to avoid tunnelling of river channels but which will provide optimal shading to facilitate the reinstatement of habitats which are suitable for salmonids. Other important riparian plant species must also be considered to allow for high levels of biodiversity in aquatic and transitional zones. These projects should be accompanied by long term invasive alien species management plans, reporting systems and action plans for new incursions.</p> <p>Potential impacts include the accidental spread/dispersal of IAS, petrochemical/silt pollution and the disturbance/destruction of protected habitats and species.</p>	<p>Further Assessment required due to potential for uncertain or adverse impacts.</p> <p>This Action fundamentally aims to improve the management and condition of habitat quality for the long-term sustainability of salmonid populations. The implementation of future plans and projects based on the guidance of this Long-term Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites.</p> <p>Future plans or projects arising from the development of this action in relation to development of models to inform the strategic planting of native woodlands must be Screened for Appropriate Assessment on a case-by-case basis. This action can be viewed as a mitigation measure and following the precautionary principle, will necessitate a Stage 2 NIS.</p>

HLO 3. (Section 6)	Water Quality	Start	Finish	Potential impacts of proposed actions on Natura 2000 sites	Preliminary determination of the potential for uncertain or adverse impacts on any Natura 2000 site
<u>Action 3.1:</u> Enhance the current statutory powers of Inland Fisheries Ireland by authorising officers to enforce the relevant provisions of the Habitat Regulations.		2022	Review needed after 5 years	Improvement of implementation of the Habitats Regulation	No further Assessment required. The potential impacts of the enhancement of the current statutory powers of Inland Fisheries Ireland will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.
<u>Action 3.2:</u> Enhance the capacity of IFI to detect and enforce water quality offences by increasing the number of Fisheries Environmental Officers working in the catchment areas of the Western lakes.		2022	2027	Improvement of implementation and compliance with Water Quality Regulations	No further Assessment required. The potential impacts of the enhancement the capacity of IFI to detect and enforce water quality offences will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.
<u>Action 3.3:</u> Continue to improve and enhance working relationships with key environmental authorities in the western lake catchments so that information is shared effectively and increased efficiencies, with regard to environmental enforcement, are achieved.		Started	Review needed after 5 years	Improvement of working relationships with environmental authorities	No further Assessment required. The potential impacts of the improved and enhanced working relationships with key environmental authorities will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.
Action 3.4: Provide information and assistance with the designation of nutrient sensitive catchments and areas for action.		TBC	TBC	Improvement of implementation and compliance with Water Quality Regulations	No further Assessment required. The potential impacts of providing information and assistance with the designation of nutrient sensitive catchments and areas for action will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.

HLO 4. (Section 7)	Invasive Species	Start	Finish	Potential impacts of proposed actions on Natura 2000 sites	Preliminary determination of the potential for uncertain or adverse impacts on any Natura 2000 site
<u>Action 4.1:</u> Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes.		Started	Review needed every 5 years	<p>A definition of an invasive alien species must be made clear prior to the establishment of any strategic stock management and weed management programmes.</p> <p>Ensure proper biosecurity for staff or any persons or groups involved with IAS management.</p> <p>Potential impacts include the accidental spread/dispersal of IAS, petrochemical/silt pollution and the disturbance/destruction of protected habitats and species.</p>	<p>Further Assessment required due to potential for uncertain or adverse impacts.</p> <p>This Action fundamentally aims to improve the management and condition of habitat quality for the long-term sustainability of salmonid populations. The implementation of future plans and projects based on the guidance of this Long-term Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites.</p> <p>As the details of the future plans or projects associated to this action are as yet unknown, the potential for adverse impacts are uncertain. Future plans or projects arising from the development of this action in relation to removal and/or management of harmful invasive species must be Screened for Appropriate Assessment on a case-by-case basis. This action can be viewed as a mitigation measure and following the precautionary principle, will necessitate a Stage 2 NIS.</p>
<u>Action 4.2:</u> Continue to use digital and conventional media to alert the public about potentially harmful invasive species in the western lakes.		Started	Review needed every 5 years	<p>Increased awareness of the presence and impacts of IAS in these lakes and catchments will benefit local, catchment wide and national biosecurity goals</p>	<p>No further Assessment required.</p> <p>The potential impacts of the continued use of digital and conventional media to alert the public about potentially harmful invasive species in the western lakes will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.</p>

<u>Action 4.3:</u> Provide biosecurity advice and resources to stakeholder groups to prevent the spread of invasive species in the western lakes.	Started	Review needed every 5 years	Ensure that stakeholders are aware of the importance of proper biosecurity and of how best this should be implemented by users of these Great Lake systems.	No further Assessment required. The potential impacts of the provision of biosecurity advice and resources will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.
<u>Action 4.4:</u> Encourage relevant stakeholder groups to participate in a range of conservation activities including the management of invasive species.	TBC	TBC	Encourage relevant stakeholder groups to participate as long as biosecurity advice is provided and adhered to, and appropriate biosecurity equipment is made available.	No further Assessment required. The potential impacts of the encouragement of relevant stakeholder groups to participate in a range of conservation activities including the management of invasive species does not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest as long as biosecurity advice is provided and adhered to, and appropriate biosecurity equipment is made available. All works will comply with IFI Biosecurity Protocols (Appendix 2). Biosecurity protocols are considered to be standard practice when carrying out any form of work in or near a watercourse and is not specific mitigation measure required where works are carried out in or near a Natura 2000 site. No specific mitigation measures are required for the protection of designated sites.
<u>Action 4.5:</u> Enhance legislation and increase penalties for the illegal transfer of live fish.	Started	TBC	Increase awareness of the adverse effects that such transfers can cause; improve biosecurity practice.	No further Assessment required. The potential impacts of the enhancement of legislation and increased penalties for the illegal transfer of live fish will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.

HLO 5. (Section 8)	Stock Management	Start	Finish	Potential impacts of proposed actions on Natura 2000 sites	Preliminary determination of the potential for uncertain or adverse impacts on any Natura 2000 site
<u>Action 5.1:</u> Produce stock management plans annually, to reduce impacts on salmonids from other fish populations.		Started	Review needed every 5 years	Where there is empirical evidence that other fishes (e.g. bream, perch, roach, pike) are having a direct and adverse impact on salmonid fish populations, stock management plans to mitigate this should be produced.	<p>Further Assessment required due to potential for uncertain or adverse impacts.</p> <p>This Action fundamentally aims to improve the management and condition of habitat quality for the long-term sustainability of salmonid populations. The implementation of future plans and projects based on the guidance of this Long-term Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites. Annual fish stock management plans, including those for 2022, must be Screened for Appropriate Assessment on a case-by-case basis.</p> <p>As the details of the future plans or projects associated to this action are as yet unknown, the potential for adverse impacts are uncertain. Future plans or projects arising from the development of this action in relation to the production of stock management plans annually must be Screened for Appropriate Assessment on a case-by-case basis. . This action can be viewed as a mitigation measure and following the precautionary principle, will necessitate a Stage 2 NIS.</p>
<u>Action 5.2:</u> Adjust stock management plans as population models on each of the lakes are refined.		2022	TBC	It will be important to continually provide updated information on the status of fish populations in these lakes. This data will be required not only for salmonids but also for the fish species deemed to be impacting the salmonids in these watercourses.	<p>Further Assessment required due to potential for uncertain or adverse impacts.</p> <p>This Action fundamentally aims to improve the management and condition of habitat quality for the long-term sustainability of salmonid populations. The implementation of future plans and projects based on the guidance of this Long-term Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites. Annual fish stock management plans, including those for 2022, must be Screened for Appropriate Assessment on a case-by-case basis.</p>

				As the details of the future plans or projects associated to this action are as yet unknown, the potential for adverse impacts are uncertain. Future plans or projects arising from the development of this action in relation to the adjustment of stock management plans as population models on each of the lakes are refined must be Screened for Appropriate Assessment on a case-by-case basis. . This action can be viewed as a mitigation measure and following the precautionary principle, will necessitate a Stage 2 NIS.
<u>Action 5.3:</u> Enable local stakeholder groups to contribute to population modelling and research programmes (through citizen science).	2022	TBC	Stakeholders should be encouraged to become involved in providing data for population modelling and contributing to research programmes. It will be important that proper guidance is provided to these stakeholders and that the data provided is regularly monitored for its accuracy. (The latter reflects the fact that some stakeholders may have motives that are not totally in alignment with the objectives of the IFI management plans (e.g. pike anglers vs salmonid anglers)).	No further Assessment required. The potential impacts of enabling local stakeholder groups to contribute to population modelling and research programmes will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.
<u>Action 5.4:</u> Develop risk matrix for Atlantic salmon and trout based on physical characteristics of each waterbody and the implications of these as survival bottlenecks.	TBC	TBC	This will enhance the survival opportunities for these fish species.	No further Assessment required. The potential impacts of the development of a risk matrix for Atlantic salmon and trout based on physical characteristics of each waterbody will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.

HLO 6. (Section 9)	Habitat Restoration	Start	Finish	Potential impacts of proposed actions on Natura 2000 sites	Preliminary determination of the potential for uncertain or adverse impacts on any Natura 2000 site
<u>Action 6.1</u> : Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.	Underway in Corrib, Mask, Cara, Sheelin and Conn	Review needed every 5 years	<p>Projects aim to provide additional habitat for spawning and juvenile salmonids, improved spawning and increase production of juveniles.</p> <p>This will be achieved through riparian management and protection, substrate augmentation and addition and the installation of instream structures to improve the physical diversity of channels to enhance instream habitat.</p> <p>Potential impacts include the accidental spread/dispersal of IAS, petrochemical/silt pollution and the disturbance/destruction of protected habitats and species.</p> <p>Each project must be subject to a thorough impact assessment that identifies whether a project or plan will have any effect on a Natura 2000 site, relating to the tests of Article 6 (3). Site-by-site issues, including but not limited to protected species present, IAS present, sensitive habitats, nesting birds, other local issues, must be considered as in all Appropriate Assessment Screenings.</p>	<p>Further Assessment required due to potential for uncertain or adverse impacts.</p> <p>This Action fundamentally aims to improve the management and condition of habitat quality for the long-term sustainability of salmonid populations. The implementation of future plans and projects based on the guidance of this Long-term Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites.</p> <p>As the details of the future plans or projects associated to this action are as yet unknown, the potential for adverse impacts are uncertain. Future plans or projects arising from addressing the salmonid habitat deficits in the western lakes catchments through targeted restoration projects must be Screened for Appropriate Assessment on a case-by-case basis. This action can be viewed as a mitigation measure and following the precautionary principle, will necessitate a Stage 2 NIS.</p>	

<u>Action 6.2:</u> Streamline administrative processes to bring development projects through planning processes to fruition with maximum efficiency.		Started	2022	This will improve overall efficiency.	No further Assessment required. The potential impacts of streamlining the administrative processes to bring development projects through planning processes to fruition with maximum efficiency will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.
<u>Action 6.3:</u> Ensure that all relevant environmental protection processes are in place to avoid damage to other sensitive species and habitats.		Ongoing	Ongoing		No further Assessment required. The potential impacts of ensuring that all relevant environmental protection processes are in place does not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.
HLO 7. (Section 10)	Research	Start	Finish	Potential impacts of proposed actions on Natura 2000 sites	Preliminary determination of the potential for uncertain or adverse impacts on any Natura 2000 site
<u>Action 7.1:</u> Continue to refine existing fish stock monitoring programmes (e.g. WFD) to provide the necessary data for fish population models for the western lakes.		2022	Ongoing	These programmes should not be restricted to salmonids but also include those fishes that may impact on salmonid populations.	No further Assessment required. The potential impacts of ensuring that the continued refining of existing fish stock monitoring programmes will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.
<u>Action 7.2:</u> Use all available sources of data incl. stock management and angling returns to feed into fish population models for the western lakes.		Started	Ongoing	Ensure the veracity of angler returns, where possible.	No further Assessment required. The potential impacts of ensuring that the use of all available sources of data to feed into fish population models for the western lakes will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.

<u>Action 7.3:</u> Continue to develop climate impact models under current research programmes (CCMP) to improve resilience in catchments and species.	Started	Ongoing	Develop and continually upgrade climate impact models.	<p>No further Assessment required.</p> <p>The potential impacts of ensuring that the continued development of climate impact models under current research programmes (CCMP) to improve resilience in catchments and species will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.</p>
<u>Action 7.4:</u> Develop a bespoke research programme with recommendations for the future conservation of all sub-species of wild Brown trout.	TBC	TBC	Some of these sub-species of trout are endemic to one or more of these lakes and will greatly benefit from the development of such a programme.	<p>No further Assessment required.</p> <p>The potential impacts of the development of a bespoke research programme with recommendations for the future conservation of all sub-species of wild Brown trout will not have any foreseeable adverse impacts on the Conservation Objectives of any Natura 2000 site or their Features of Interest.</p>

3.2. Stage 1 Screening of Natura 2000 Sites Potentially Effected by Plans or Projects Resulting from the Proposed List of Actions

A list of Natura 2000 sites within the WFD catchments of the 7 Great Western Lakes, including those sites with a direct hydrological link downstream are presented in Table 3.2 to 3.5. Plans or projects arising from the actions selected for further assessment must consider the potential for significant impacts in Natura 2000 sites identified in the table. Each site will be Screened In or Out based on the list of Actions where further assessment has been deemed necessary. This determination is driven by the potential for uncertain or significant effect identified in Table 3.1 for each Action. The details of plans or projects arising from each of the following Actions are not yet known and the full extent of their potential for uncertain or significant effects cannot be fully determined. As a result, Natura 2000 sites within the WFD Catchment area and with a hydrological connection to each of the 7 Great Western Lakes will be Screened In. Those Natura 2000 sites beyond the immediate hydrometric area but with a hydrological pathway to the site where no uncertain or significant impact can be foreseen will be Screened Out at this time. The list of Actions where an additional site specific AA Screening will be required include:

- Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off;
- Action 2.3: Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity;
- Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes;
- Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations;
- Action 5.2: Adjust stock management plans as population models on each of the lakes are refined;
- Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.

Table 3.2: A list of NATURA 2000 sites and their Features of Interest within the WFD catchments of Lough Corrib, Mask and Carra. Also included are those sites with a direct hydrological link downstream.

Site Name/Code	Features of Interest	Screened In/Out for Stage 2 Natura Impact Statement
Special Protection Areas within the WFD Catchment area of Lough Corrib, Mask and Carra		
Lough Corrib SPA 004042	Gadwall (<i>Anas strepera</i>) [A051] Shoveler (<i>Anas clypeata</i>) [A056] Pochard (<i>Aythya ferina</i>) [A059] Tufted Duck (<i>Aythya fuligula</i>) [A061] Common Scoter (<i>Melanitta nigra</i>) [A065] Hen Harrier (<i>Circus cyaneus</i>) [A082]	In

	Coot (<i>Fulica atra</i>) [A125] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Common Gull (<i>Larus canus</i>) [A182] Common Tern (<i>Sterna hirundo</i>) [A193] Arctic Tern (<i>Sterna paradisaea</i>) [A194] Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] Wetland and Waterbirds [A999]	
Lough Mask SPA 004062	Tufted Duck (<i>Aythya fuligula</i>) [A061] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Common Gull (<i>Larus canus</i>) [A182] Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183] Common Tern (<i>Sterna hirundo</i>) [A193] Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] Wetland and Waterbirds [A999]	In
Lough Carra SPA 004051	Common Gull (<i>Larus canus</i>) [A182]	In
Special Protection Areas beyond the WFD Catchment area with a direct hydrological link		
Inner Galway Bay SPA (Marine) 004031	Black-throated Diver (<i>Gavia arctica</i>) [A002] Great Northern Diver (<i>Gavia immer</i>) [A003] Cormorant (<i>Phalacrocorax carbo</i>) [A017] Grey Heron (<i>Ardea cinerea</i>) [A028] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Red-breasted Merganser (<i>Mergus serrator</i>) [A069] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Lapwing (<i>Vanellus vanellus</i>) [A142] Dunlin (<i>Calidris alpina</i>) [A149] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Turnstone (<i>Arenaria interpres</i>) [A169] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Common Gull (<i>Larus canus</i>) [A182] Sandwich Tern (<i>Sterna sandvicensis</i>) [A191] Common Tern (<i>Sterna hirundo</i>) [A193] Wetland and Waterbirds [A999]	Out Located downstream of the catchment in the marine habitat
Special Areas of Conservation within the WFD Catchment area of Lough Corrib, Mask and Carra		
Lough Corrib SAC 000297	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]	In

	<p>Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]</p> <p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]</p> <p>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]</p> <p>Active raised bogs [7110]</p> <p>Degraded raised bogs still capable of natural regeneration [7120]</p> <p>Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]</p> <p>Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]</p> <p>Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220]</p> <p>Alkaline fens [7230]</p> <p>Limestone pavements [8240]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>Bog woodland [91D0]</p> <p><i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</p> <p><i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p> <p><i>Lampetra planeri</i> (Brook Lamprey) [1096]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p><i>Najas flexilis</i> (Slender Naiad) [1833]</p> <p><i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]</p>	
Lough Carra/Mask Complex SAC 001774	<p>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</p> <p>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoetes-Nanojuncetea</i> [3130]</p> <p>Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]</p> <p>European dry heaths [4030]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]</p> <p>Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]</p> <p>Alkaline fens [7230]</p> <p>Limestone pavements [8240]</p>	In

	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303] <i>Lutra lutra</i> (Otter) [1355] <i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]	
Levally Lough SAC 000295	Turloughs [3180]	In
Kildun Souterrain SAC 002320	<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	In
Derrinlough (Cloonkeenleananode) Bog SAC 002197	Degraded raised bogs still capable of natural regeneration [7120]	In
Mocorha Lough SAC 001536	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]	In
Clyard Kettle-holes SAC 000480	Turloughs [3180] Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]	In
Skealaghan Turlough SAC 000541	Turloughs [3180]	In
Ardkill Turlough SAC 000461	Turloughs [3180]	In
Greaghans Turlough SAC 000503	Turloughs [3180]	In
Kilglassan/Caheravoos tia Turlough Complex SAC 000504	Turloughs [3180]	In
Carrowkeel Turlough SAC 000475	Turloughs [3180]	In
Tower Hill House SAC 002179	<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	In
Moore Hall (Lough Carra) SAC 000527	<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	In
Ballymaglancy Cave, Cong SAC 000474	Caves not open to the public [8310] <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	In
Maamturk Mountains SAC 002008	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130]	In

	<p>Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]</p> <p>Siliceous rocky slopes with chasmophytic vegetation [8220]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Najas flexilis</i> (Slender Naiad) [1833]</p>	
Connmara Bog Complex SAC 002034	<p>Coastal lagoons [1150]</p> <p>Reefs [1170]</p> <p>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</p> <p>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]</p> <p>Natural dystrophic lakes and ponds [3160]</p> <p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p> <p>European dry heaths [4030]</p> <p>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Transition mires and quaking bogs [7140]</p> <p>Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]</p> <p>Alkaline fens [7230]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p><i>Euphydrias aurinia</i> (Marsh Fritillary) [1065]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p><i>Najas flexilis</i> (Slender Naiad) [1833]</p>	In
Mweelrea/Sheeffry/Erriff Complex SAC 001932	<p>Coastal lagoons [1150]</p> <p>Annual vegetation of drift lines [1210]</p> <p>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]</p> <p>Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</p> <p>Embryonic shifting dunes [2110]</p> <p>Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</p> <p>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</p> <p>Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) [2150]</p> <p>Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) [2170]</p> <p>Humid dune slacks [2190]</p> <p>Machairs (* in Ireland) [21A0]</p> <p>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</p>	In

	<p>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]</p> <p>Natural dystrophic lakes and ponds [3160]</p> <p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p> <p>European dry heaths [4030]</p> <p>Alpine and Boreal heaths [4060]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p><i>Hydrophilous</i> tall herb fringe communities of plains and of the montane to alpine levels [6430]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Transition mires and quaking bogs [7140]</p> <p>Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]</p> <p>Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220]</p> <p>Alkaline fens [7230]</p> <p>Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110]</p> <p>Calcareous rocky slopes with chasmophytic vegetation [8210]</p> <p>Siliceous rocky slopes with chasmophytic vegetation [8220]</p> <p><i>Vertigo geyeri</i> (Geyer's Whorl Snail) [1013]</p> <p><i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail) [1014]</p> <p><i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p><i>Petalophyllum ralfsii</i> (Petalwort) [1395]</p> <p><i>Najas flexilis</i> (Slender Naiad) [1833]</p>	
Cloughmoyne SAC 000479	Limestone pavements [8240]	In
Shrule Turlough SAC 000525	Turloughs [3180]	In
Lough Lurleen Bog/Glenamaddy Turlough SAC 000301	<p>Turloughs [3180]</p> <p>Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidentium</i> p.p. vegetation [3270]</p> <p>Active raised bogs [7110]</p> <p>Degraded raised bogs still capable of natural regeneration [7120]</p> <p>Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]</p>	In
Williamstown Turloughs SAC 002296	Turloughs [3180]	In

Lisnageeragh Bog and Ballinastack Turlough SAC 000296	Turloughs [3180] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	In
Gortnandarragh Limestone Pavement SAC 001271	Limestone pavements [8240]	In
Ross Lake and Woods SAC 001312	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara spp.</i> [3140] <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	In
Special Areas of Conservation beyond the WFD Catchment area with a direct hydrological link		
Galway Bay Complex SAC (Marine) 000268	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glaucio-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Turloughs [3180] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davalliana</i> [7210] Alkaline fens [7230] Limestone pavements [8240] <i>Lutra lutra</i> (Otter) [1355] <i>Phoca vitulina</i> (Harbour Seal) [1365]	Out Located downstream of the catchment in the marine habitat

Table 3.3: A list of NATURA 2000 sites and their Features of Interest within the WFD catchments of Lough Conn and Cullin. Also included are those sites with a direct hydrological link downstream.

Site Name/Code	Features of Interest	Screened In/Out for Stage 2 Natura Impact Statement
Special Protection Areas within the WFD Catchment area of Lough Conn and Cullin		

Lough Conn and Lough Cullin SPA 004228	Tufted Duck (<i>Aythya fuligula</i>) [A061] Common Scoter (<i>Melanitta nigra</i>) [A065] Common Gull (<i>Larus canus</i>) [A182] Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] Wetland and Waterbirds [A999]	In
Special Protection Areas beyond the WFD Catchment area with a direct hydrological link		
Killala Bay/Moy Estuary SPA 004036	Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Sanderling (<i>Calidris alba</i>) [A144] Dunlin (<i>Calidris alpina</i>) [A149] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Wetland and Waterbirds [A999]	Out Located downstream of the catchment in the marine habitat
Special Areas of Conservation within the WFD Catchment area of Lough Conn and Cullin		
River Moy SAC 002298	Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>) [6510] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] Alkaline fens [7230] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092] <i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355]	In
Bellacorrick Bog Complex SAC 001922	Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] Alkaline fens [7230] <i>Vertigo geyeri</i> (Geyer's Whorl Snail) [1013] <i>Saxifraga hirculus</i> (Marsh Saxifrage) [1528]	In
Lough Hoe Bog SAC 000633	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Blanket bogs (* if active bog) [7130] <i>Vertigo geyeri</i> (Geyer's Whorl Snail) [1013] <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	In

Ox Mountains Bog SAC 002006	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] <i>Vertigo geyeri</i> (Geyer's Whorl Snail) [1013] <i>Saxifraga hirculus</i> (Marsh Saxifrage) [1528]	In
Lough Nabrickkeagh Bog SAC 000634	Blanket bogs (* if active bog) [7130]	In
Owenduff/Nephin Complex SAC 000534	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the <i>Ranunculum fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] Alpine and Boreal heaths [4060] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355] <i>Saxifraga hirculus</i> (Marsh Saxifrage) [1528] <i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]	In
Balla Turlough SAC 000463	Turloughs [3180]	In
Special Areas of Conservation beyond the WFD Catchment area with a direct hydrological link		
Killalla Bay/Moy Estuary SAC 000458	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glaucio-Puccinellietalia maritimae</i>) [1330] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190]	Out Located downstream of the catchment in the marine habitat

	<i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail) [1014] <i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Phoca vitulina</i> (Harbour Seal) [1365]	
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Table 3.4: A list of NATURA 2000 sites and their Features of Interest within the WFD catchments of Lough Arrow. Also included are those sites with a direct hydrological link downstream.

Site Name/Code	Features of Interest	Screened In/Out for Stage 2 Natura Impact Statement
Special Protection Areas within the WFD Catchment area of Lough Arrow		
Lough Arrow SPA 004050	Little Grebe (<i>Tachybaptus ruficollis</i>) [A004] Tufted Duck (<i>Aythya fuligula</i>) [A061] Wetland and Waterbirds [A999]	In
Special Protection Areas beyond the WFD Catchment area with a direct hydrological link		
Ballysadare Bay SPA 004129	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Dunlin (<i>Calidris alpina</i>) [A149] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Redshank (<i>Tringa totanus</i>) [A162] Wetland and Waterbirds [A999]	Out Located downstream of the catchment in the marine habitat
Special Areas of Conservation within the WFD Catchment area of Lough Arrow		
Unshin River SAC 001898	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355]	In
Lough Arrow SAC 001673	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]	In
Bricklieve Mountains and Keishcorran SAC 001656	Turloughs [3180] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210] Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>) [6510] Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>) [8120] <i>Euphydrys aurinia</i> (Marsh Fritillary) [1065] <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	In

Knockalongy and Knockachree Cliffs SAC 001669	<i>Trichomanes speciosum</i> (Killarney Fern) [1421]	In
Ox Mountains Bog SAC 002006	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] <i>Vertigo geyeri</i> (Geyer's Whorl Snail) [1013] <i>Saxifraga hirculus</i> (Marsh Saxifrage) [1528]	In
Cloonakillina Lough SAC 001899	Transition mires and quaking bogs [7140]	In
Templehouse and Cloonacleigha Loughs SAC 000636	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	In
Turloughmore (Sligo) SAC 000637	Turloughs [3180]	In
Doocastle Turlough SAC 000492	Turloughs [3180]	In
Flughany Bog SAC 000497	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	In
Boleybrack Mountain SAC 002032	Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] Blanket bogs (* if active bog) [7130]	Out No direct hydrological connection
Arroo Mountain SAC 001403	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220] Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>) [8120]	Out No direct hydrological connection

	Calcareous rocky slopes with chasmophytic vegetation [8210]	
Ben Bulbin, Gleniff And Glenade Complex SAC 000623	<p>Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p> <p>European dry heaths [4030]</p> <p>Alpine and Boreal heaths [4060]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]</p> <p>Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]</p> <p>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Transition mires and quaking bogs [7140]</p> <p>Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220]</p> <p>Alkaline fens [7230]</p> <p>Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110]</p> <p>Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietia rotundifolia</i>) [8120]</p> <p>Calcareous rocky slopes with chasmophytic vegetation [8210]</p> <p><i>Vertigo geyeri</i> (Geyer's Whorl Snail) [1013]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p>	Out No direct hydrological connection
Lough Gill SAC 001976	<p>Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation [3150]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0]</p> <p><i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p> <p><i>Lampetra planeri</i> (Brook Lamprey) [1096]</p> <p><i>Lampetra fluviatilis</i> (River Lamprey) [1099]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p>	Out No direct hydrological connection
Special Areas of Conservation beyond the WFD Catchment area with a direct hydrological link		
Ballysadare Bay SAC 000622	Estuaries [1130]	Out

	Mudflats and sandflats not covered by seawater at low tide [1140] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] <i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail) [1014] <i>Phoca vitulina</i> (Harbour Seal) [1365]	Located downstream of the catchment in the marine habitat
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Table 3.5: A list of NATURA 2000 sites and their Features of Interest within the WFD catchments of Lough Sheelin. Also included are those sites with a direct hydrological link downstream.

Site Name/Code	Features of Interest	Screened In/Out for Stage 2 Natura Impact Statement
Special Protection Areas within the WFD Catchment area of Lough Sheelin		
Lough Sheelin SPA 004065	Great Crested Grebe (<i>Podiceps cristatus</i>) [A005] Pochard (<i>Aythya ferina</i>) [A059] Tufted Duck (<i>Aythya fuligula</i>) [A061] Goldeneye (<i>Bucephala clangula</i>) [A067] Wetland and Waterbirds [A999]	In
Lough Kinale and Derragh Lough SPA 004061	Pochard (<i>Aythya ferina</i>) [A059] Tufted Duck (<i>Aythya fuligula</i>) [A061] Wetland and Waterbirds [A999]	In
Lough Derravaragh SPA 004043	Whooper Swan (<i>Cygnus cygnus</i>) [A038] Pochard (<i>Aythya ferina</i>) [A059] Tufted Duck (<i>Aythya fuligula</i>) [A061] Coot (<i>Fulica atra</i>) [A125] Wetland and Waterbirds [A999]	In
Garriskil Bog SPA 004102	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	In
Glen Lough SPA 004045	Whooper Swan (<i>Cygnus cygnus</i>) [A038]	In
Lough Iron SPA 004046	Whooper Swan (<i>Cygnus cygnus</i>) [A038] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Shoveler (<i>Anas clypeata</i>) [A056] Coot (<i>Fulica atra</i>) [A125] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] Wetland and Waterbirds [A999]	In
Special Protection Areas beyond the WFD Catchment area with a direct hydrological link		
Lough Ree SPA 004064	Little Grebe (<i>Tachybaptus ruficollis</i>) [A004] Whooper Swan (<i>Cygnus cygnus</i>) [A038] Wigeon (<i>Anas penelope</i>) [A050]	Out

	Teal (<i>Anas crecca</i>) [A052] Mallard (<i>Anas platyrhynchos</i>) [A053] Shoveler (<i>Anas clypeata</i>) [A056] Tufted Duck (<i>Aythya fuligula</i>) [A061] Common Scoter (<i>Melanitta nigra</i>) [A065] Goldeneye (<i>Bucephala clangula</i>) [A067] Coot (<i>Fulica atra</i>) [A125] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Lapwing (<i>Vanellus vanellus</i>) [A142] Common Tern (<i>Sterna hirundo</i>) [A193] Wetland and Waterbirds [A999]	Located downstream of the catchment beyond 15km
Middle Shannon Callows SPA 004096	Whooper Swan (<i>Cygnus cygnus</i>) [A038] Wigeon (<i>Anas penelope</i>) [A050] Corncrake (<i>Crex crex</i>) [A122] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Lapwing (<i>Vanellus vanellus</i>) [A142] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Wetland and Waterbirds [A999]	Out Located downstream of the catchment beyond 15km
Lough Derg (Shannon) SPA 004058	Cormorant (<i>Phalacrocorax carbo</i>) [A017] Tufted Duck (<i>Aythya fuligula</i>) [A061] Goldeneye (<i>Bucephala clangula</i>) [A067] Common Tern (<i>Sterna hirundo</i>) [A193] Wetland and Waterbirds [A999]	Out Located downstream of the catchment beyond 15km
River Shannon and River Fergus Estuaries SPA 004077	Cormorant (<i>Phalacrocorax carbo</i>) [A017] Whooper Swan (<i>Cygnus cygnus</i>) [A038] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Pintail (<i>Anas acuta</i>) [A054] Shoveler (<i>Anas clypeata</i>) [A056] Scaup (<i>Aythya marila</i>) [A062] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Lapwing (<i>Vanellus vanellus</i>) [A142] Knot (<i>Calidris canutus</i>) [A143] Dunlin (<i>Calidris alpina</i>) [A149] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Greenshank (<i>Tringa nebularia</i>) [A164] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Wetland and Waterbirds [A999]	Out Located downstream of the catchment in the marine habitat
Special Areas of Conservation within the WFD Catchment area of Lough Sheelin		
Moneybeg and Clareisland Bogs SAC 002340	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120]	In

	Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	
Derragh Bog SAC 002201	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120]	In
Ardagullion Bog SAC 002341	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	In
Garriskil Bog SAC 000679	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	In
Ballymore Fen SAC 002313	Transition mires and quaking bogs [7140]	In
Special Areas of Conservation beyond the WFD Catchment area with a direct hydrological link		
Lough Ree SAC 000440	Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation [3150] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Alkaline fens [7230] Limestone pavements [8240] Bog woodland [91D0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Lutra lutra</i> (Otter) [1355]	Out Located downstream of the catchment beyond 15km
River Shannon Callows SAC 000216	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>) [6510] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Lutra lutra</i> (Otter) [1355]	Out Located downstream of the catchment beyond 15km
Lough Derg, North-east Shore SAC 002241	<i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Taxus baccata</i> woods of the British Isles [91J0]	Out Located downstream of the catchment beyond 15km

<p>Lower River Shannon SAC 002165</p>	<p>Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] <i>Salicornia</i> and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) [6410] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] <i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Salmo salar</i> (Salmon) [1106] <i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349] <i>Lutra lutra</i> (Otter) [1355]</p>	<p>Out Located downstream of the catchment in the marine habitat</p>
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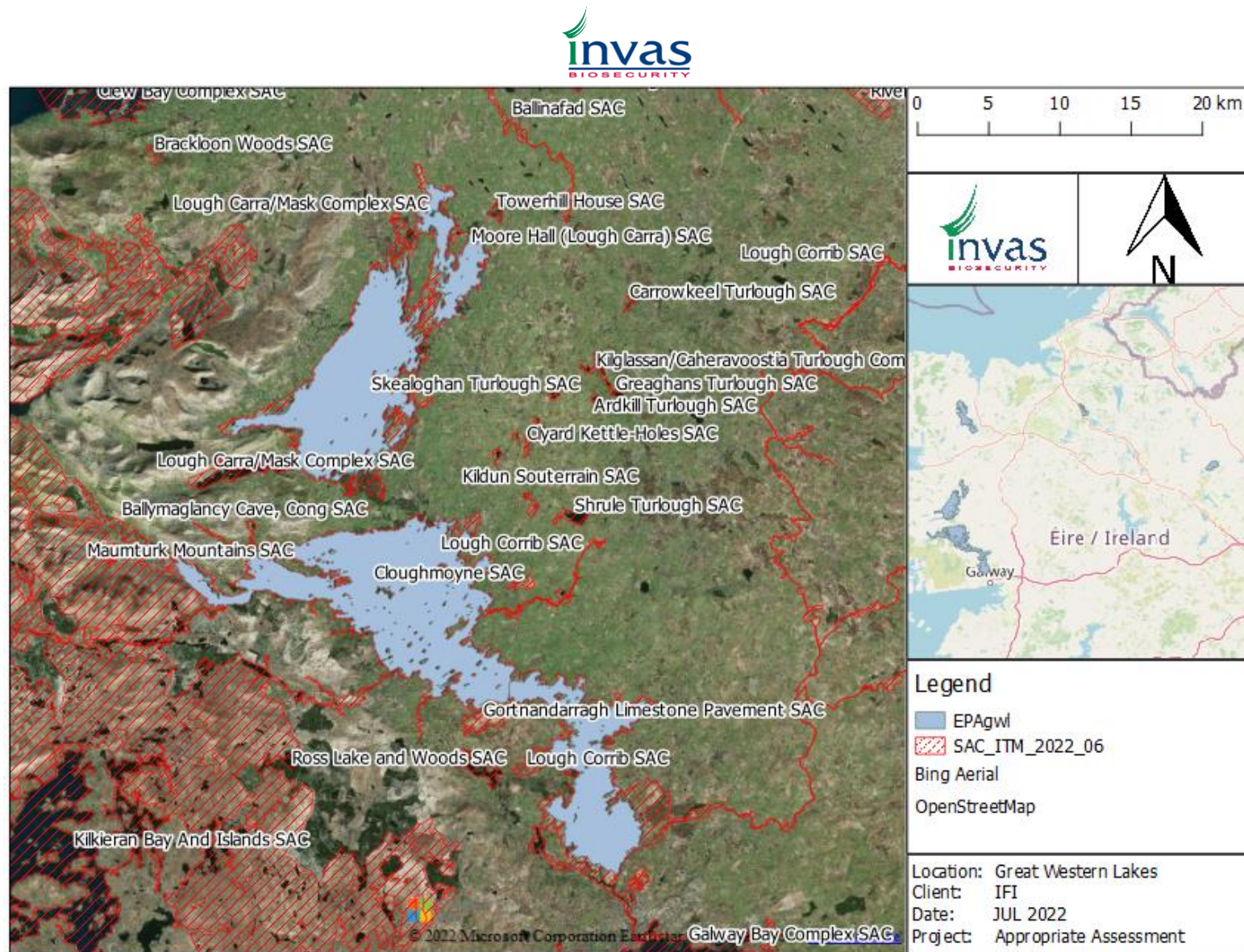


Figure 2.2: A map of the Special Areas of Conservation in proximity to Lough Corrib, Mask, and Carra.

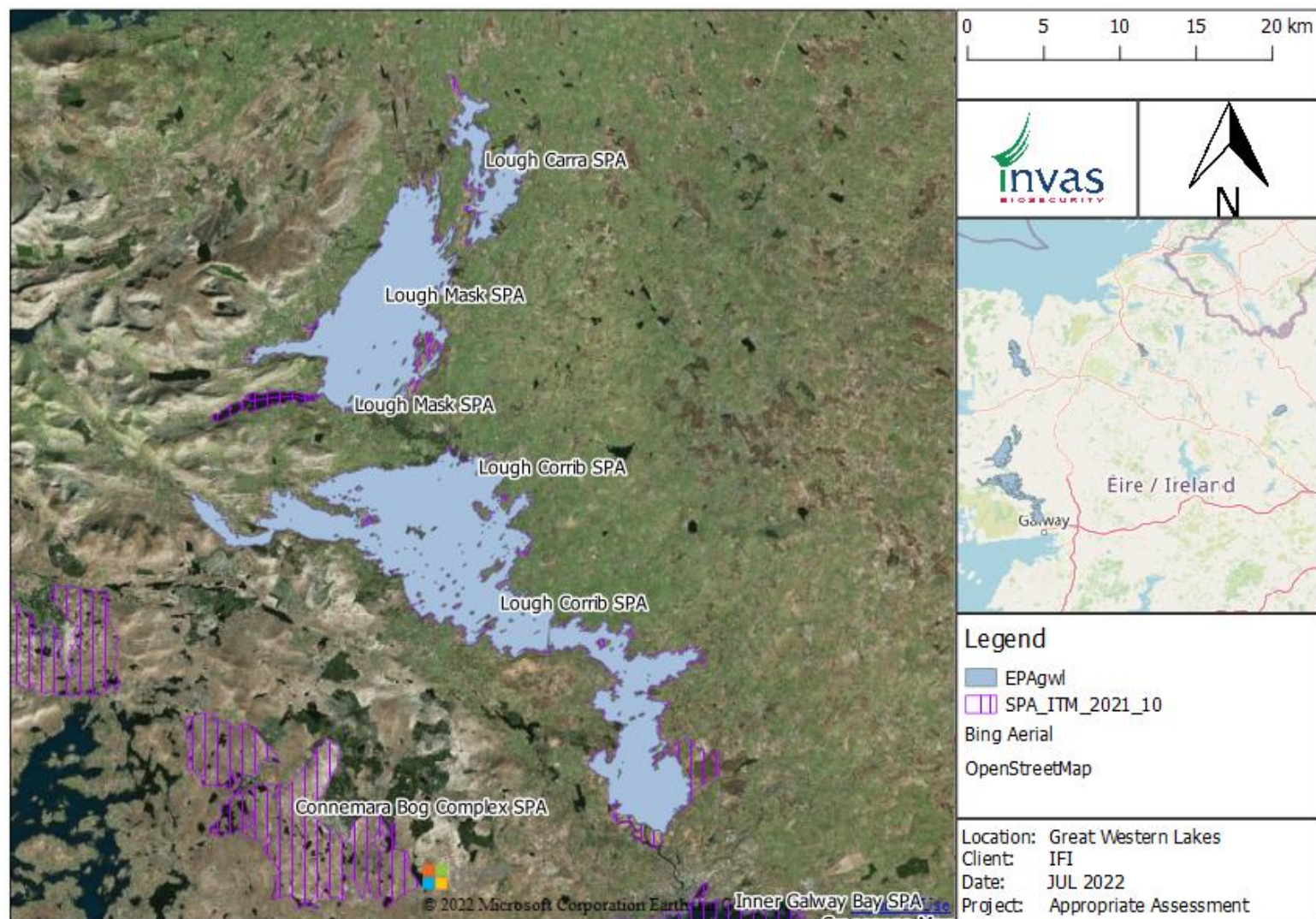


Figure 2.3: A map of the Special Protection Areas in proximity to Lough Corrib, Mask, and Carra.

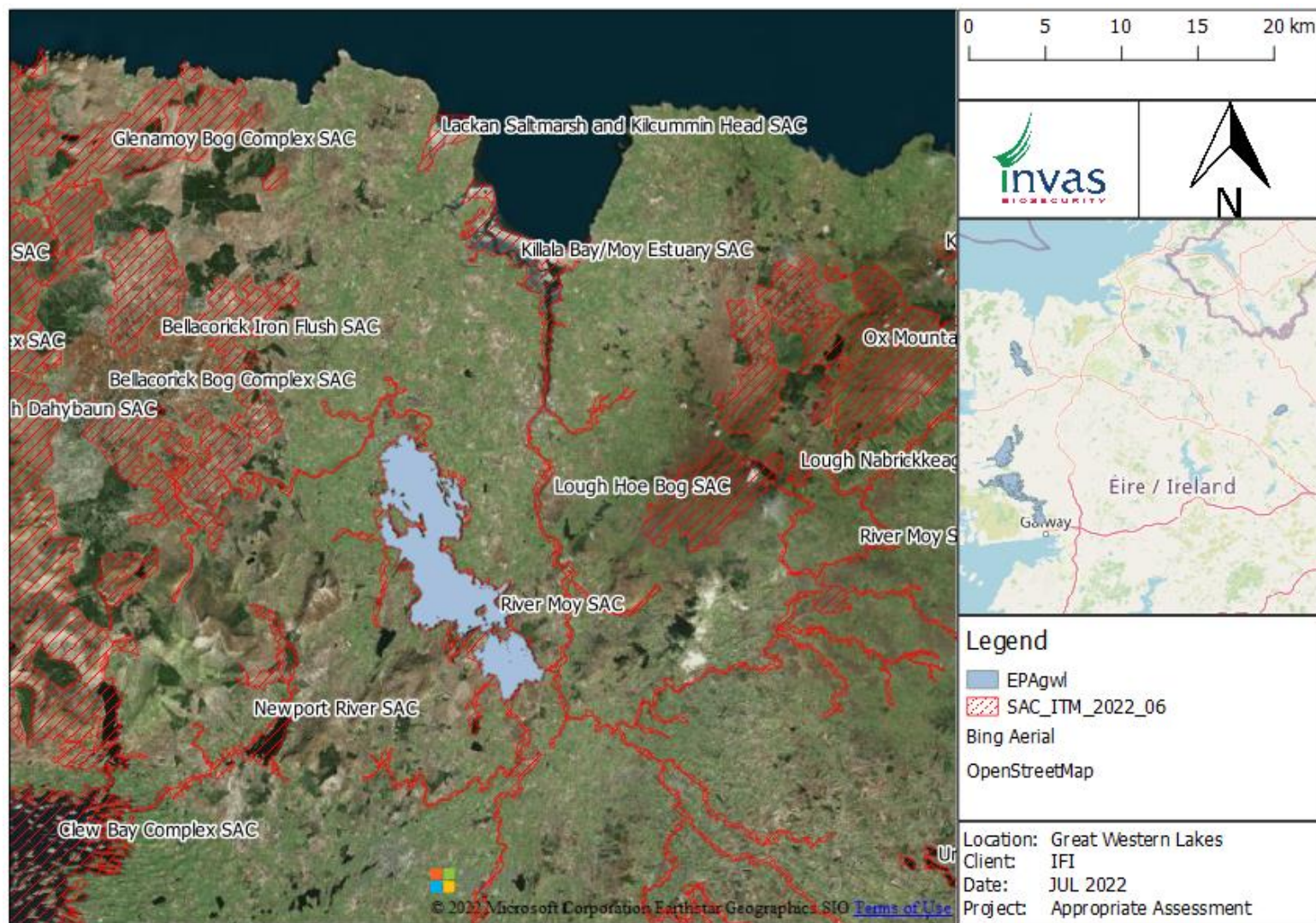


Figure 2.4: A map of the Special Areas of Conservation in proximity to Lough Conn and Cullin.

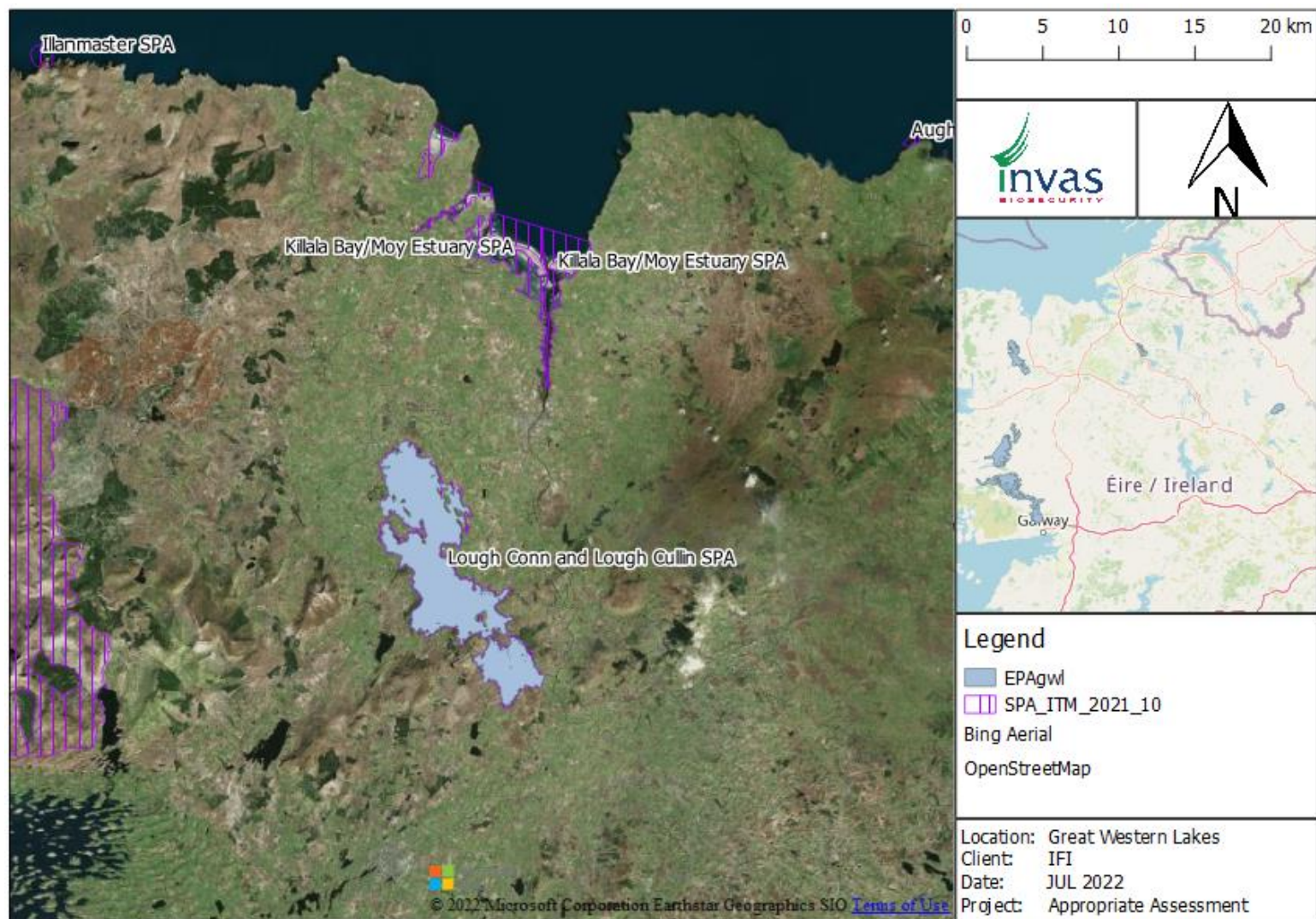


Figure 2.5: A map of the Special Protection Areas in proximity to Lough Conn and Cullin.

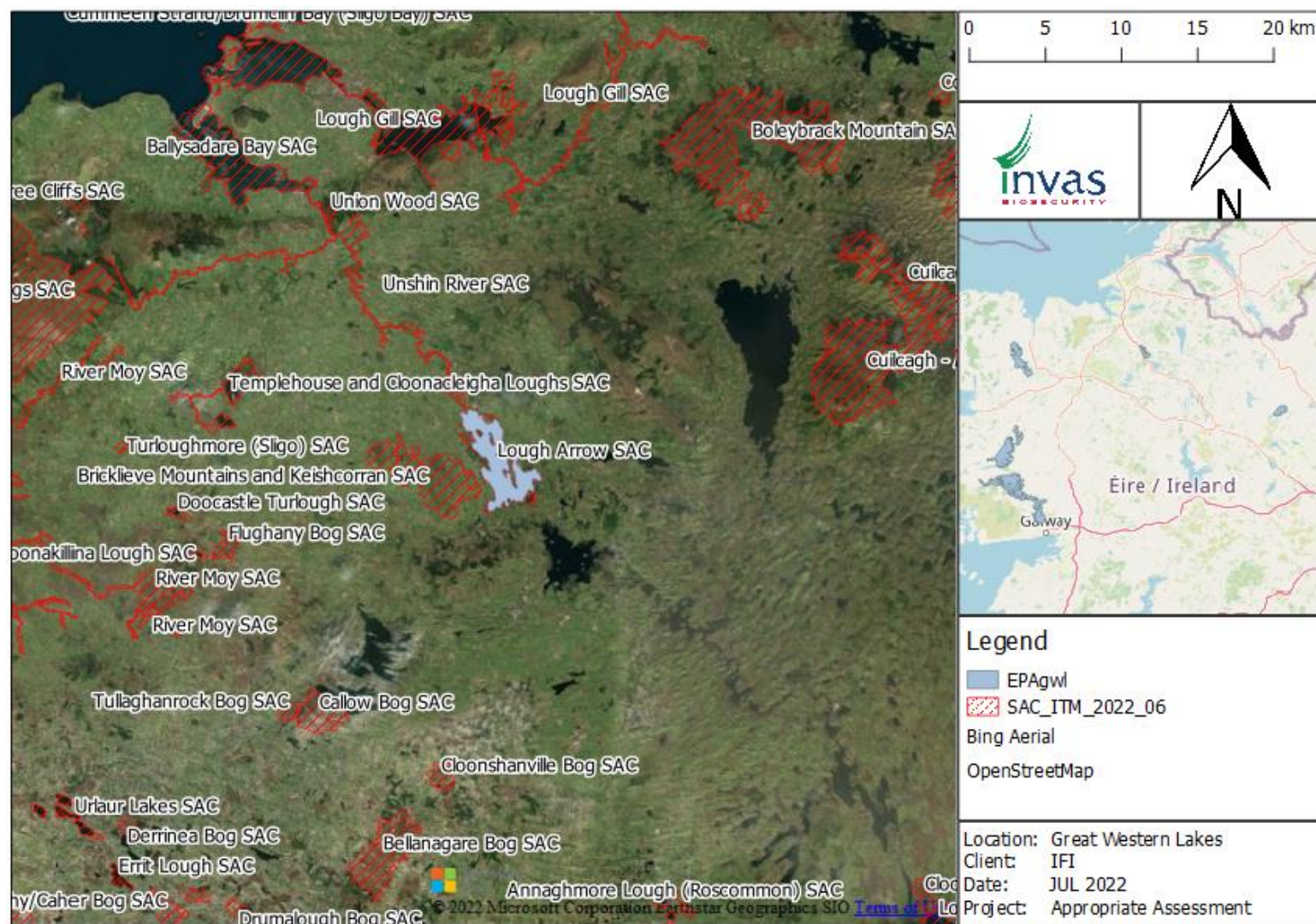


Figure 2.6: A map of the Special Areas of Conservation in proximity to Lough Arrow.

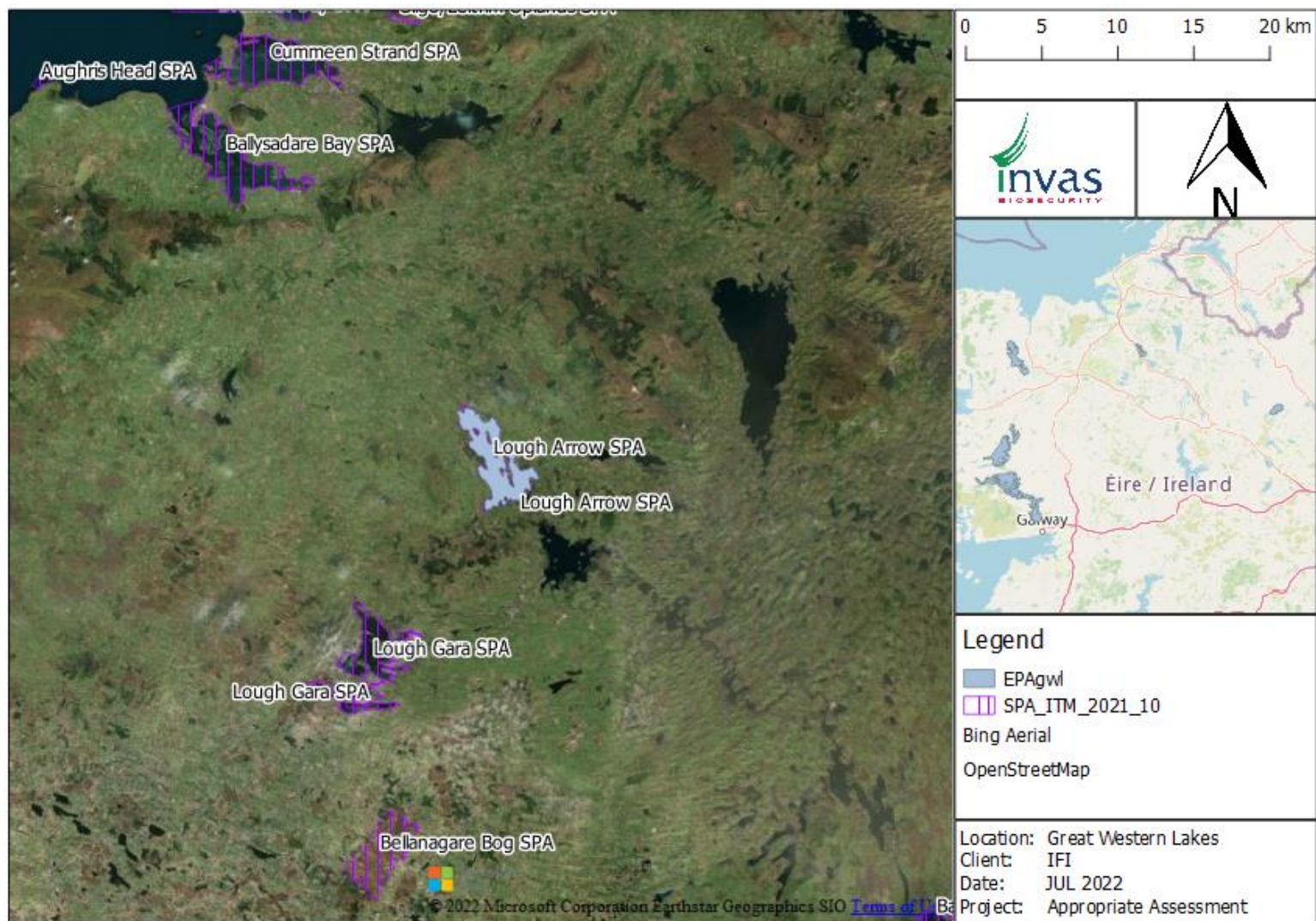


Figure 2.7: A map of the Special Protection Areas in proximity to Lough Arrow.

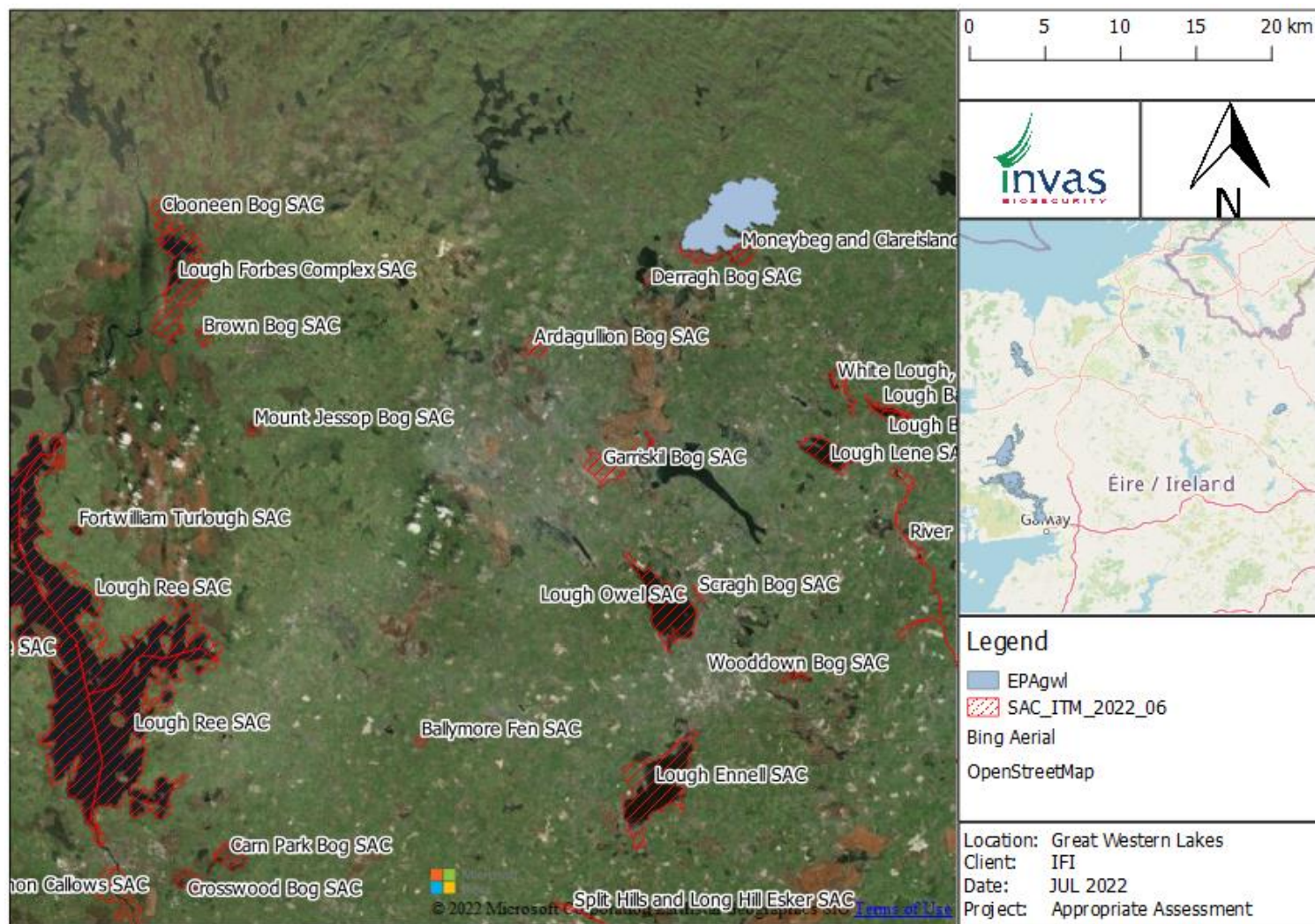


Figure 2.8: A map of the Special Areas of Conservation in proximity to Lough Sheelin.

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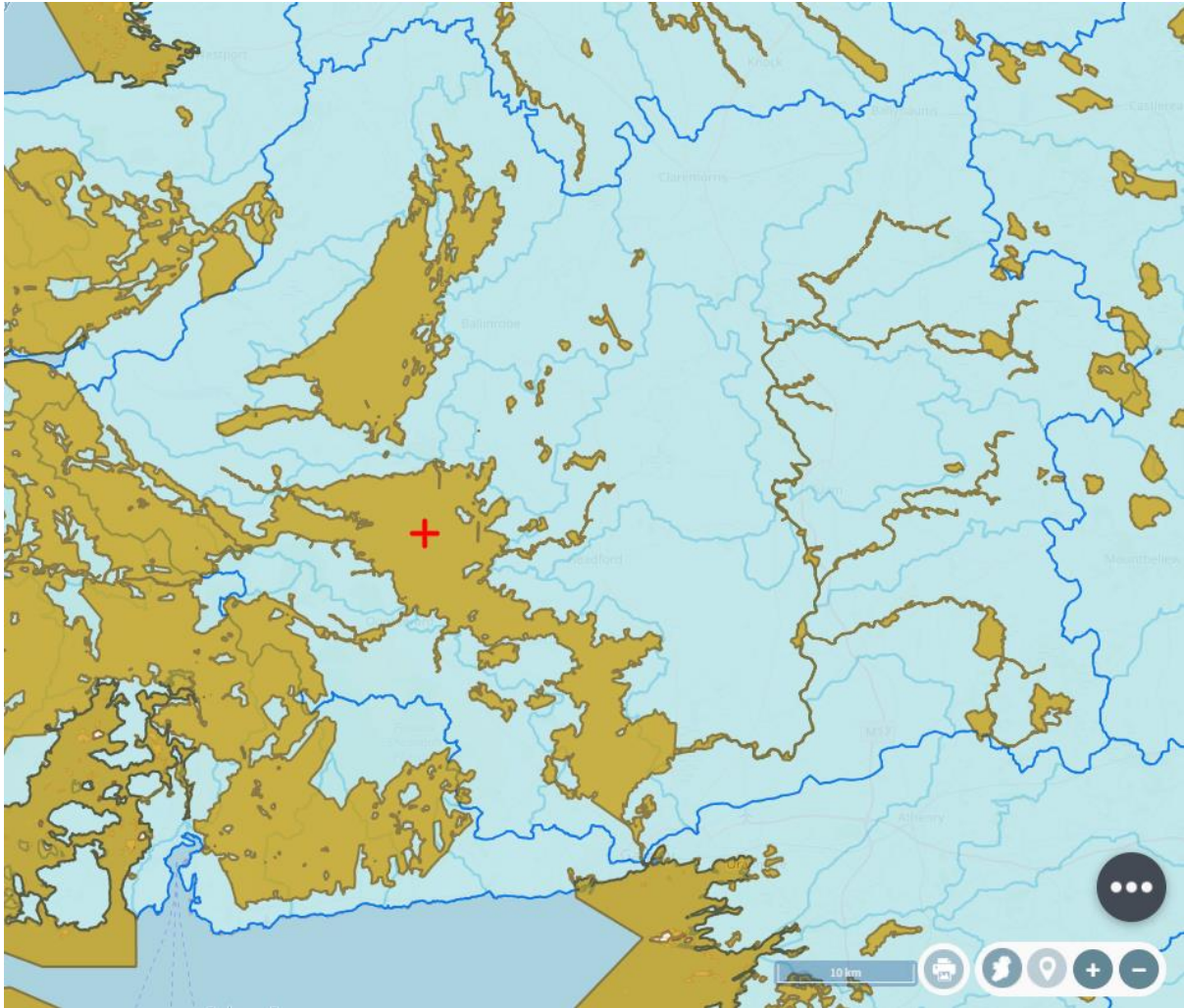


Figure 2.10: A map of the Special Areas of Conservation within the catchment and sub-catchments of Lough Corrib, Mask, and Carra from the EPA AAGeoTool website (25/07/22).

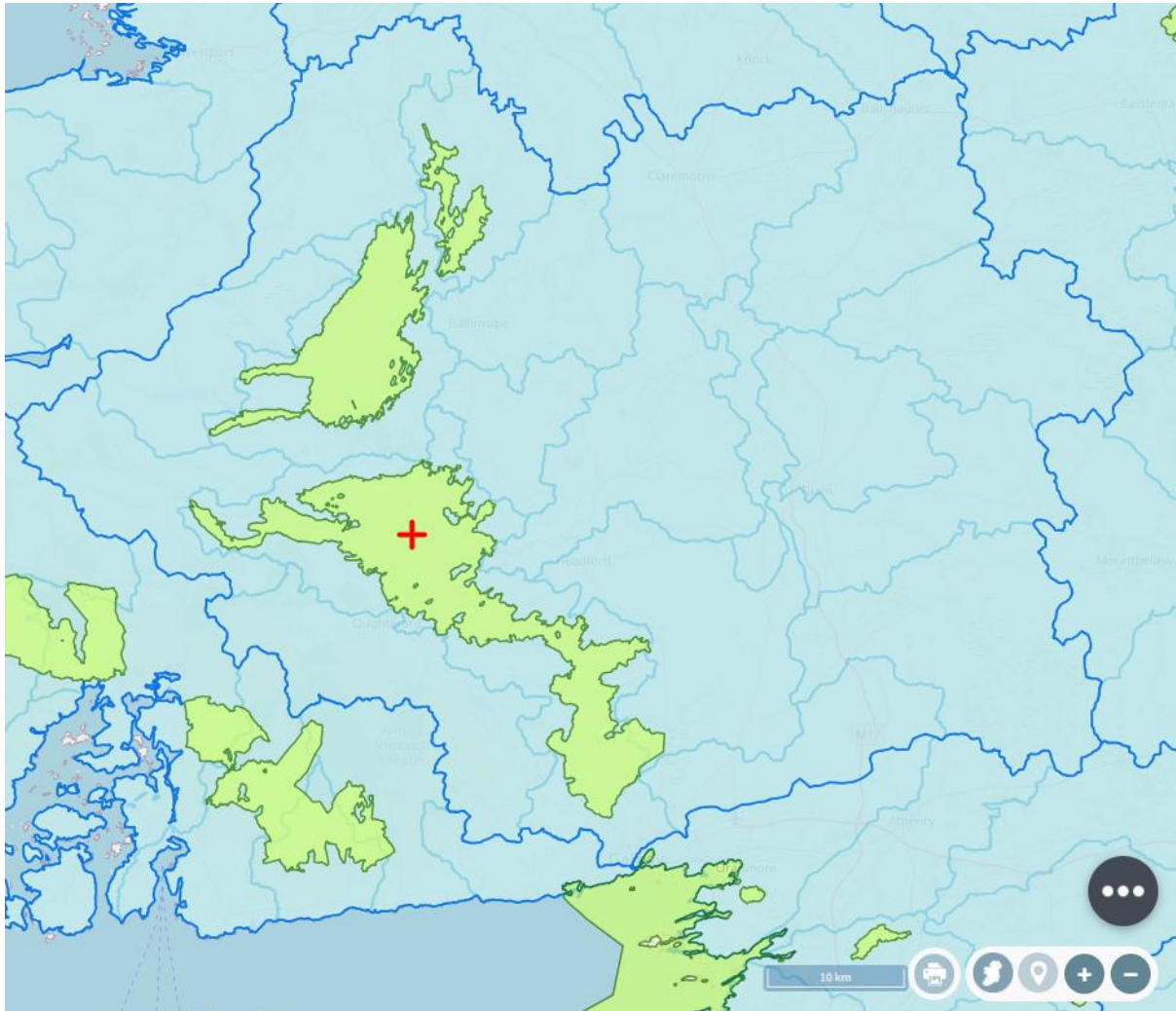


Figure 2.11: A map of the Special Protection Areas within the catchment and sub-catchments of Lough Corrib, Mask, and Carra from the EPA AAGeoTool website (25/07/22).

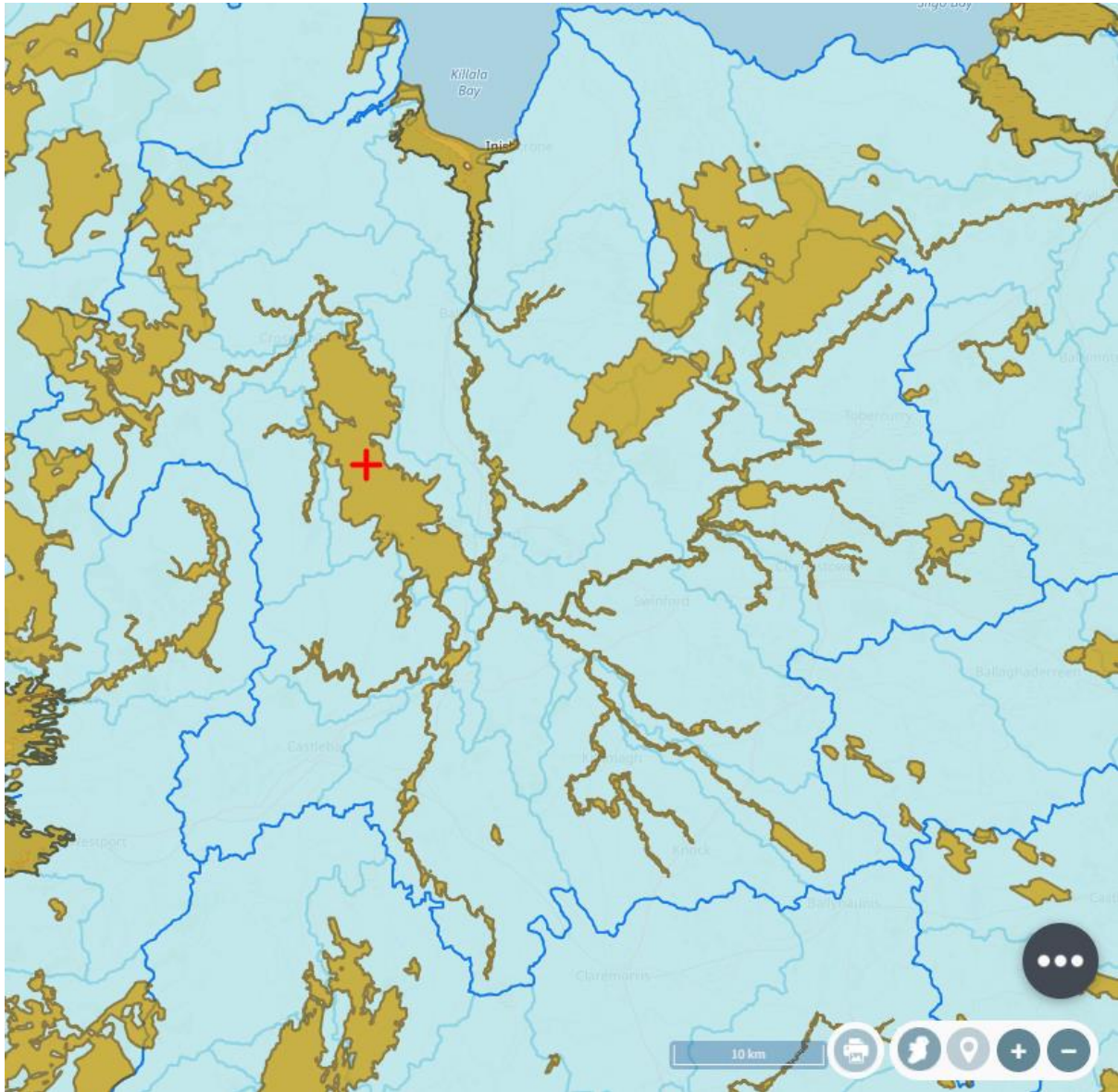


Figure 2.12: A map of the Special Areas of Conservation within the catchment and sub-catchments of Lough Conn and Cullin from the EPA AAGeoTool website (25/07/22).

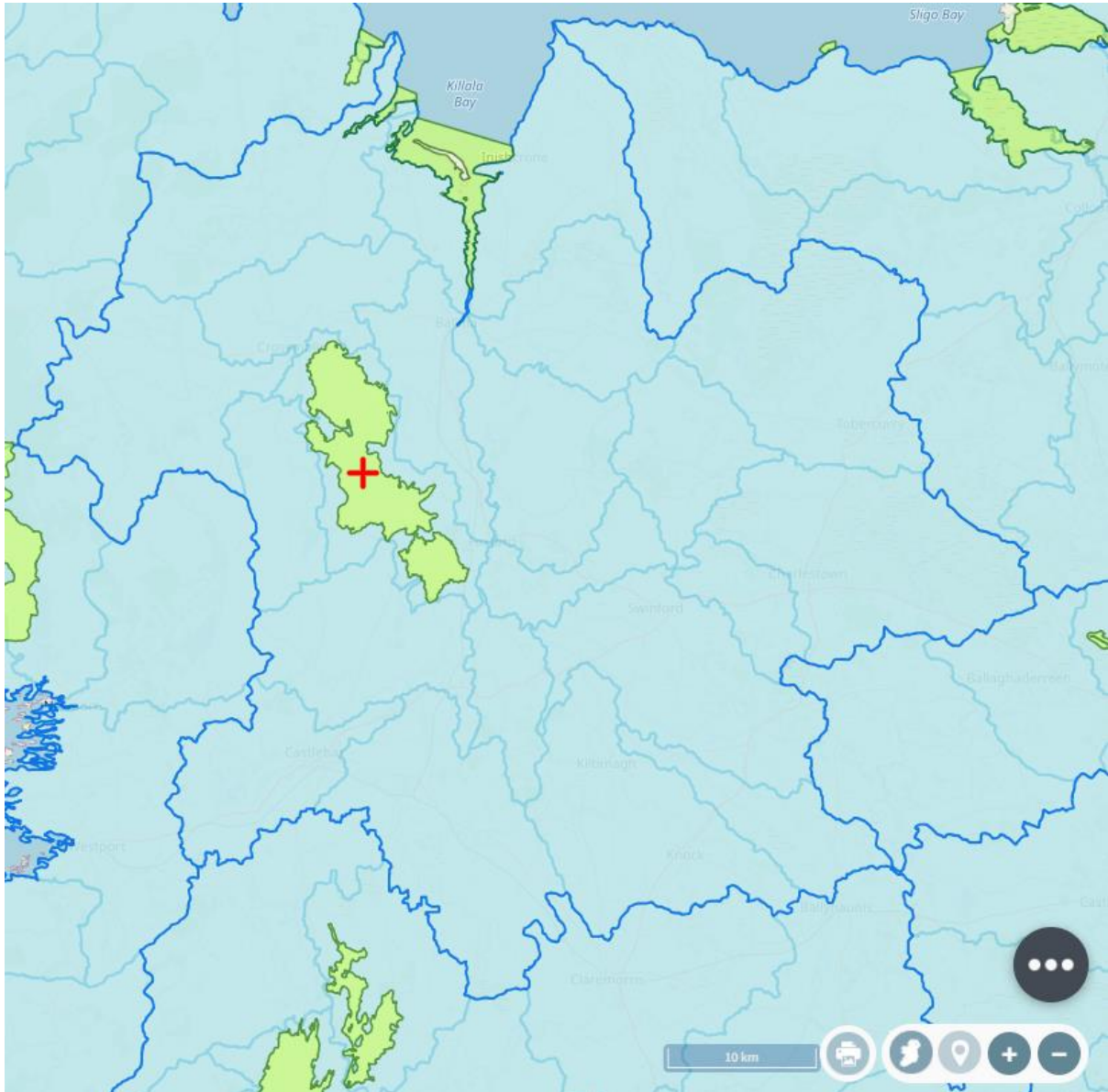


Figure 2.13: A map of the Special Protection Areas within the catchment and sub-catchments of Lough Conn and Cullin from the EPA AAGeoTool website (25/07/22).

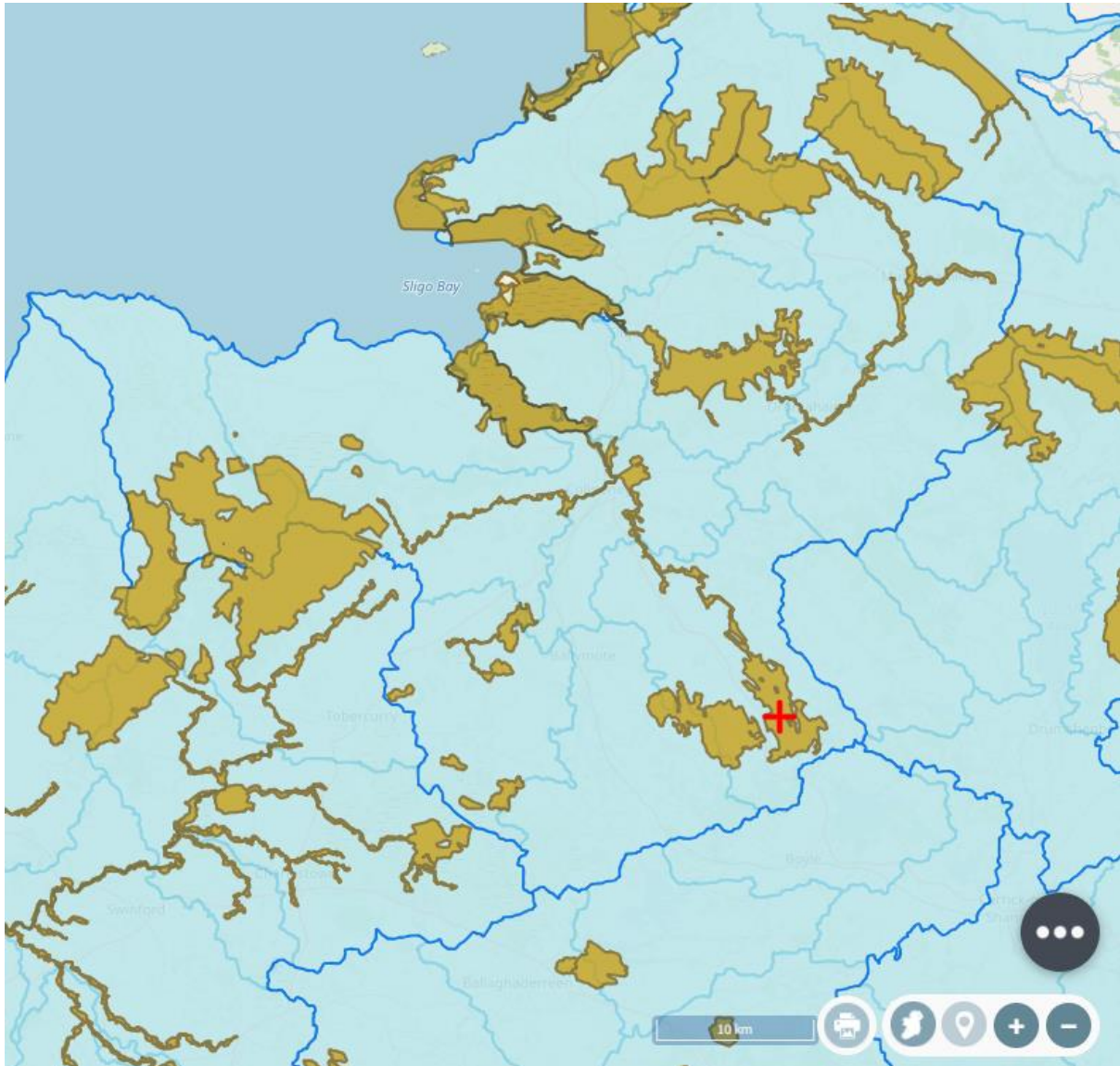


Figure 2.14: A map of the Special Areas of Conservation within the catchment and sub-catchments of Lough Arrow from the EPA AAGeoTool website (25/07/22).

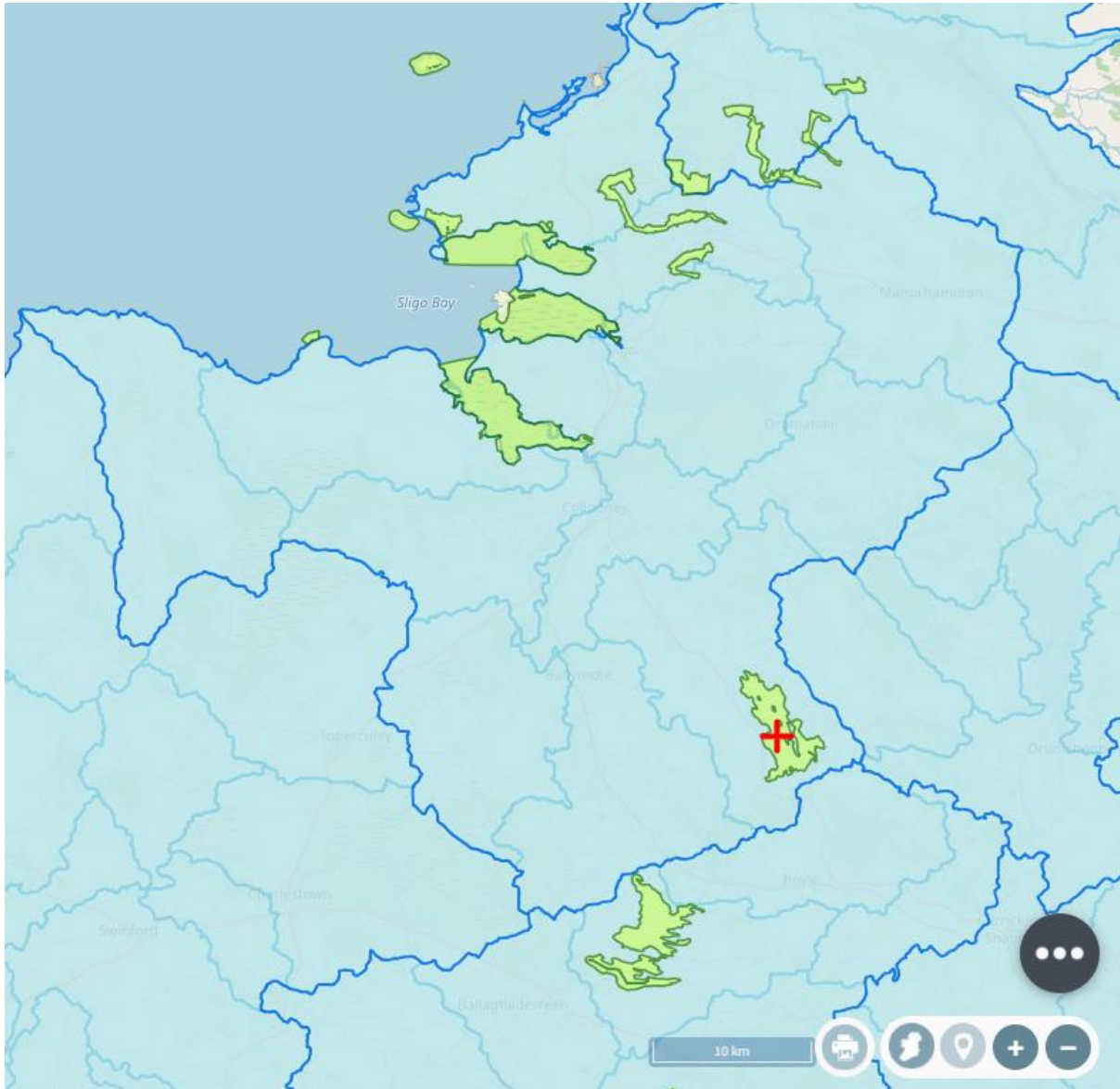


Figure 2.15: A map of the Special Protection Areas within the catchment and sub-catchments of Lough Arrow from the EPA AAGeoTool website (25/07/22).

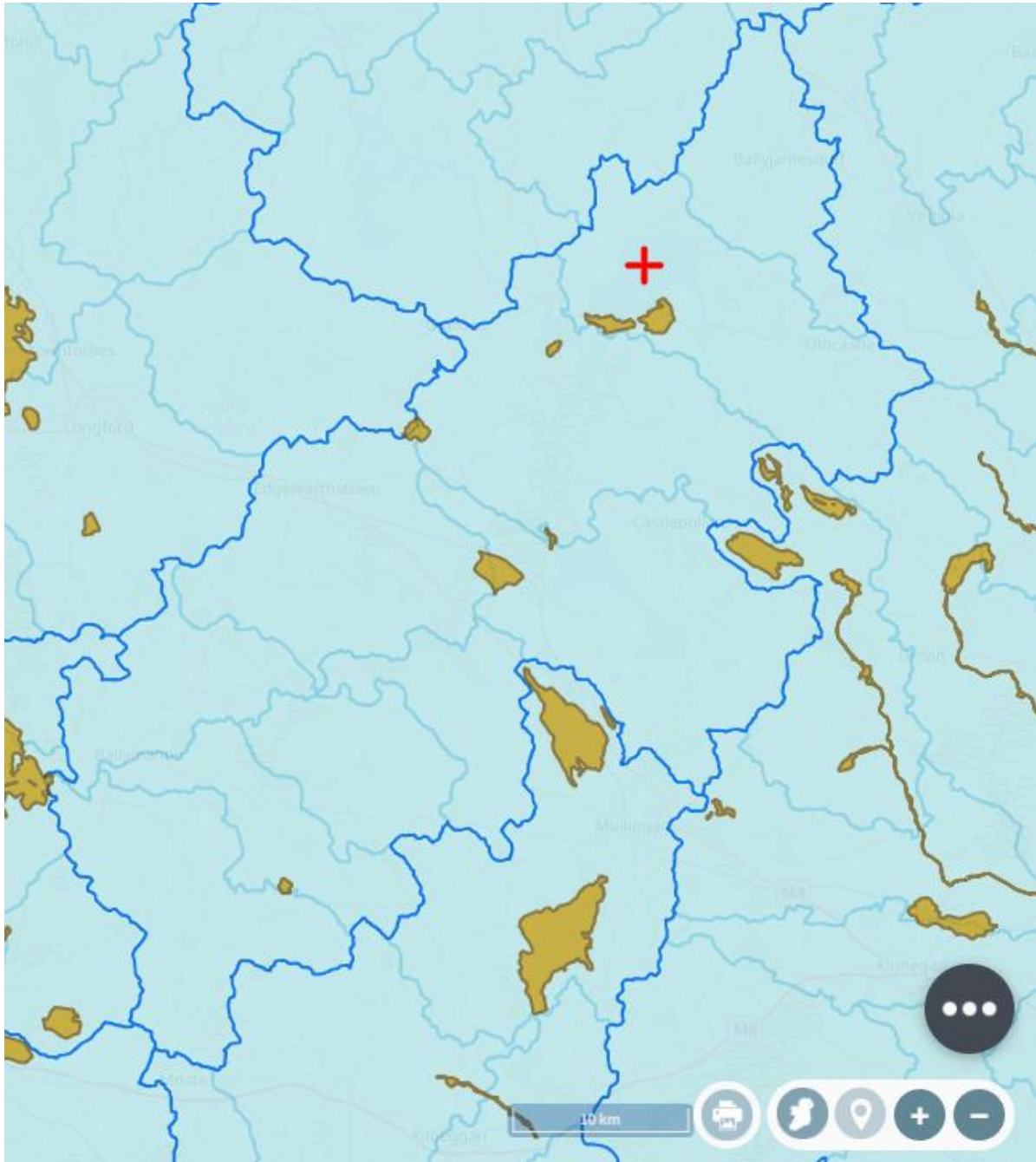


Figure 2.16: A map of the Special Areas of Conservation within the catchment and sub-catchments of Lough Sheelin from the EPA AAGeoTool website (25/07/22).

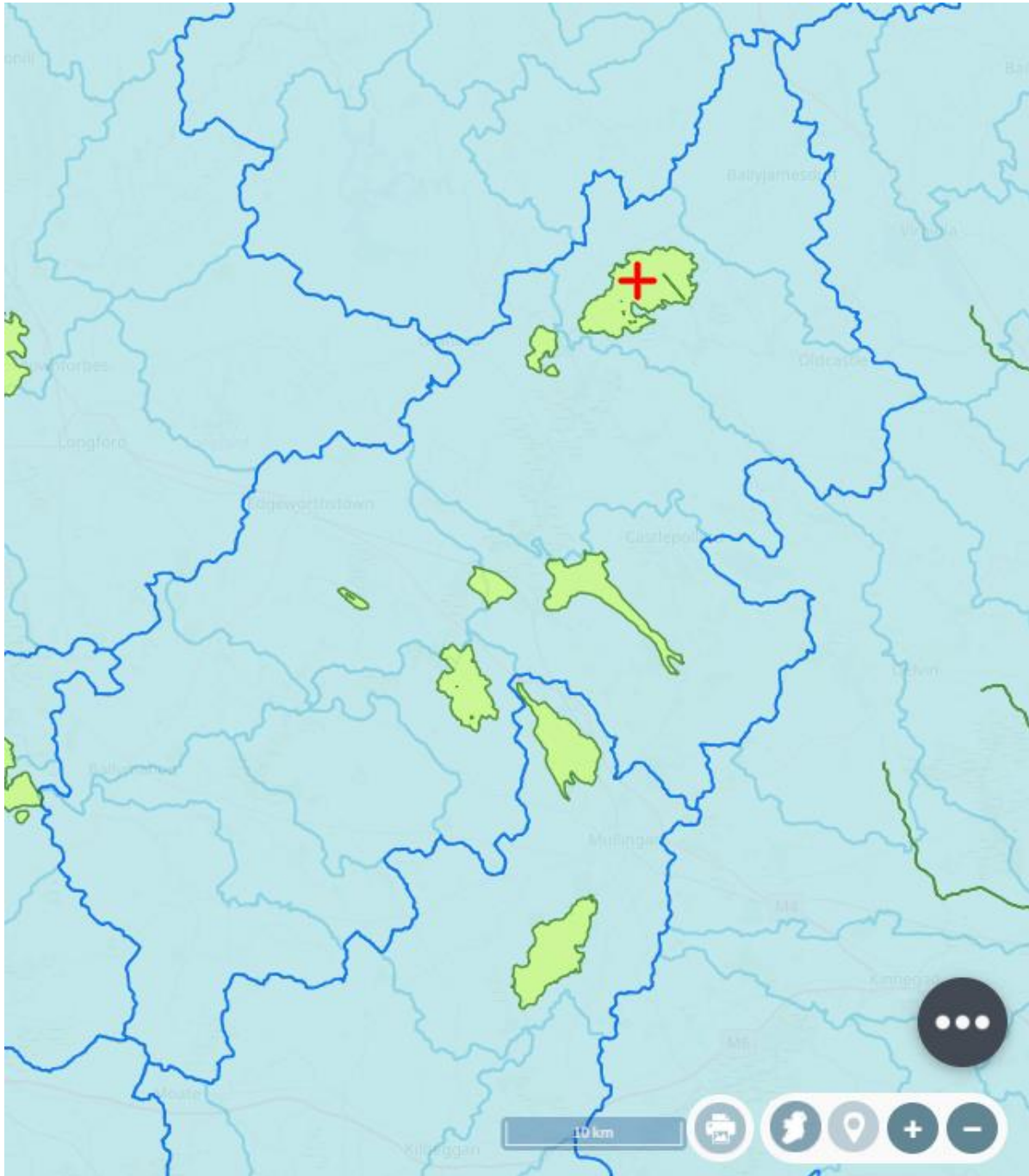


Figure 2.17: A map of the Special Protection Areas within the catchment and sub-catchments of Lough Sheelin from the EPA AAGeoTool website (25/07/22).

4. IN-COMBINATION ASSESSMENT

4.1. Source/Pathway/Receptor Assessment

4.1.1. Source

The development of the Long-term Management Plan for the Great Western Lakes may result in direct or indirect impacts on Natura 2000 sites through some of the proposed Actions (Action 2.2, 2.3, 4.1, 5.1, 5.2 and 6.1). Future projects based on the proposed actions within the Long-term Management Plan for the Great Western Lakes are likely to take place within, upstream/downstream of or in close proximity to several Natura 2000 sites. As the details of several proposed project are yet unknown, their potential for adverse impacts are uncertain. Each of the plans or projects that will arise under the guidance of the Long-term Management Plan for the Great Western Lakes will need to be Screened for Appropriate Assessment on a case-by-case basis, taking into account up to date, objective scientific information. This action can be viewed as a mitigation measure.

4.1.2. Pathway

There is a potential for 'direct' pathway impacts from any plans/projects arising from the Long-term Management Plan for the Great Western Lakes to Natura 2000 sites contained within the catchments of the designated lakes.

4.1.3. Receptor

The Natura 2000 site receptors of any proposed plans/projects in Great Western Lakes or their catchments must be assessed on a case-by-case basis. Natura 2000 sites potentially impacted by plans or projects arising from the Long-term Management Plan for the Great Western Lakes have been outlined in Section 3.

4.2. In-Combination Effects

In relation to existing Plans, Schemes, Strategies and Directives there is a potential for in-combination effects that may have an uncertain or adverse impact on a Natura 2000 site (Table 4.1). Arterial Drainage Schemes are likely to have overlapping works zones. The promotion of the Wild Atlantic Way and associated angling activity may increase biosecurity risks for overseas and domestic travellers with limited knowledge of IAS. Local development plans may have overlapping works zones and site designations with future plans and projects arising from the Long-term Management Plan for the Great Western Lakes. There is also the potential for positive effects associated with

each action including the engagement of local stakeholders, promotion of action plans and knowledge relating to pollution and IAS and habitat enhancement and restoration.

Table 4.1: A list of plans and schemes assessed for in-combination effects.

Plan/Scheme/ Strategy/Directive	Function	Potential for in-combination impacts
Arterial Drainage Schemes	Arterial Drainage Schemes were carried out under the Arterial Drainage Act, 1945 to improve land for agriculture and to mitigate flooding. Rivers, lakes weirs and bridges were modified to enhance conveyance, embankments were built to control the movement of flood water and various other work was carried out under Part II of the Arterial Drainage Act, 1945. The purpose of the schemes was to improve land for agriculture, to ensure that the 3 – year flood was retained in bank this was achieved by lowering water levels during the growing season to reduce waterlogging on the land beside watercourses known as callows. Flood protection in the benefiting lands was increased as a result of the Arterial Drainage Schemes.	<p><i>Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off</i> Buffer zones may overlap with Arterial Drainage Scheme access routes.</p> <p><i>Action 2.3: Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity</i> Planting schemes may overlap with Arterial Drainage Scheme access routes.</p> <p><i>Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes</i> Infestations may overlap with Arterial Drainage Scheme access routes.</p> <p><i>Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations</i> N/A</p> <p><i>Action 5.2: Adjust stock management plans as population models on each of the lakes are refined</i> N/A</p> <p><i>Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.</i> Restoration projects may overlap with Arterial Drainage Scheme access routes.</p>
Wild Salmon and Sea Trout Tagging Scheme (S.I. No. 585 of 2018) and series of associated Bye-Laws	These Regulations amend the Wild Salmon and Sea Trout Tagging Scheme Regulations 2013 to provide for, the quotas of fish that can be harvested by commercial fishing engines and rod and line from those rivers identified in Schedule 2. The Regulations also	<p><i>Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off</i> Improved habitat and water quality for salmonids</p>

	<p>provide for the use of brown tags in specified rivers which are identified in Schedule 4.</p>	<p><i>Action 2.3: Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity</i> Improved habitat and water quality for salmonids</p> <p><i>Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes</i> Improved habitat quality for salmonids</p> <p><i>Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations</i> Improved habitat quality for salmonids</p> <p><i>Action 5.2: Adjust stock management plans as population models on each of the lakes are refined</i> Improved habitat quality for salmonids</p> <p><i>Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.</i> Improved habitat quality for salmonids</p>
Promotion of the Wild Atlantic Way	<p>The Wild Atlantic Way is a tourism trail on the west coast, and on parts of the north and south coasts, of Ireland. The 2,500 km driving route passes through nine counties and three provinces, stretching from County Donegal's Inishowen Peninsula in Ulster to Kinsale, County Cork, in Munster, on the Celtic Sea coast. Recreational angling is promoted as part of the Wild Atlantic Way (https://fishinginireland.info/wp-content/uploads/2021/11/WAW-WEB-pub.pdf)</p>	<p><i>Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off</i> N/A</p> <p><i>Action 2.3: Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity</i> Planting regimes may overlap with areas targeted for tourism</p> <p><i>Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes</i> Infestations may overlap with areas targeted for tourism</p> <p><i>Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations</i> Stock management sites may overlap with areas targeted for tourism</p>

		<p><i>Action 5.2: Adjust stock management plans as population models on each of the lakes are refined</i></p> <p>Stock management sites may overlap with areas targeted for tourism</p> <p><i>Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.</i></p> <p>Restoration projects may overlap with areas targeted for tourism</p>
Nitrates Directive	<p>The Government has published Ireland's Fifth Nitrates Action Programme. The Programme sets out new measures that have been introduced since the Fourth Programme.</p> <p>Ireland's Nitrates Action Programme is given effect by the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2022 (S.I. No. 113 of 2022). The regulations contain specific measures to protect surface waters and groundwater from nutrient pollution arising from agricultural sources.</p> <p>The Fifth Nitrates Action Programme was developed following an initial public consultation, which was held in late 2020, and a second consultation period that concluded in September 2021. A third consultation period focused on the draft Natura Impact Statement and draft Strategic Environmental Assessment for the Programme was concluded on January 2022. Approximately 700 submissions were received during the three consultation periods and these have informed the final Programme.</p>	<p><i>Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off</i></p> <p>Improved water quality</p> <p><i>Action 2.3: Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity</i></p> <p>Improved habitat and water quality for salmonids</p> <p><i>Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes</i></p> <p>Improved habitat and water quality for salmonids through reduced sedimentation</p> <p><i>Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations</i></p> <p>N/A</p> <p><i>Action 5.2: Adjust stock management plans as population models on each of the lakes are refined</i></p> <p>N/A</p> <p><i>Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.</i></p> <p>Improved habitat and water quality for salmonids</p>
WFD	<p>The Water Framework Directive [WFD] (2000/60/EC) establishes a legal framework to protect and restore clean water across Europe and to ensure its long-term, sustainable use, requiring an</p>	<p><i>Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off</i></p> <p>Improved habitat and water quality for salmonids</p>

	<p>integrated approach across sectors. The main tool for implementing the WFD is through the RBMPs. The 1st Cycle plans covered the period 2010-2015, with the 2nd Cycle implemented late and covering the period 2018-2021. The 3rd Cycle plan covers the period 2022-2027.</p>	<p><i>Action 2.3: Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity</i> Improved habitat and water quality for salmonids</p> <p><i>Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes</i> Improved habitat and water quality for salmonids</p> <p><i>Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations</i> N/A</p> <p><i>Action 5.2: Adjust stock management plans as population models on each of the lakes are refined</i> N/A</p> <p><i>Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.</i> Improved habitat and water quality for salmonids</p>
Local development plans	<p>A development plan consists of a written statement and series of maps that describe how your local authority aims to use particular areas, for example, residential, industrial or agricultural areas. It also sets out development objectives for the area, such as plans to improve roads and local amenities.</p>	<p><i>Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off</i> Buffer zones may overlap with local development</p> <p><i>Action 2.3: Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity</i> Planting schemes may overlap with local development</p> <p><i>Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes</i> Infestations may overlap with local development</p>

		<p><i>Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations</i> N/A</p> <p><i>Action 5.2: Adjust stock management plans as population models on each of the lakes are refined</i> N/A</p> <p><i>Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.</i> Restoration projects may overlap with local development</p>
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5. CONCLUSIONS

The proposed Long-term Management Plan for the Great Western Lakes is likely to contribute to the maintenance or restoration of the favourable conservation condition of habitats and species within Natura 2000 sites where they have been designated as a feature of interest. However, the potential for adverse impacts on Natura 2000 sites are uncertain. Potential impacts as a result of the proposed Actions include the accidental spread/dispersal of IAS, petrochemical/silt pollution and the disturbance/destruction of protected habitats and species (including, but not limited to, Atlantic Salmon, Freshwater pearl mussel, Lamprey, Otter, White-clawed crayfish). Impacts may occur during or after the implementation of the proposed Actions including the establishment of buffer zones, planting programs for native trees, management of IAS, fish stock management plans and restoration of salmonid habitat. These enhancement works are likely to contribute to the long-term improvement in salmonid fish stocks and their habitats, with the potential for added benefits to local biodiversity.

Based on the above AA Screening a Natura Impact Statement is required in relation to Actions 2.2, 2.3, 4.1, 5.1, 5.2 and 6.1. This Long-term Management Plan for the Great Western Lakes fundamentally aims to improve the management and condition of habitat quality for the long-term sustainability of salmonid populations. Although the specific details of plans or projects arising from the implementation of the aforementioned Actions based on the guidance of the Long-term Management Plan, there is the potential for significant or uncertain impacts on Natura 2000 sites within the WFD catchments of each of the Lakes. As a result, future plans or projects arising from the proposed actions in this Plan must be Screened for Appropriate Assessment on a case-by-case basis. This action can be viewed as a mitigation measure and following the precautionary principle, will necessitate a Stage 2 NIS for each of the actions that have been screened in.

6. REFERENCE MATERIAL

DEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin.

Department of the Environment, Climate and Communications - Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations 2021.

European Communities (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Environment Directorate-General of the European Commission.

European Commission (2018). Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission, Brussels.

European Communities (Birds and Natural Habitats) Regulations 2011. SI No. 477/2011.

European Court of Justice Judgement in the case of People over Wind and Peter Sweetman v Coillte in relation to Appropriate Assessment.

IFI Biosecurity Protocol for Field Survey Work (2010) - https://www.fisheriesireland.ie/sites/default/files/2021-06/research_biosecurity_biosecurity_for_fieldsurveys_2010.pdf

NPWS website (accessed 14/07/2022) - <https://www.npws.ie/protected-sites/conservation-management-planning#:~:text=Conservation%20objectives%20for%20SACs%20and,might%20impact%20on%20these%20sites.>

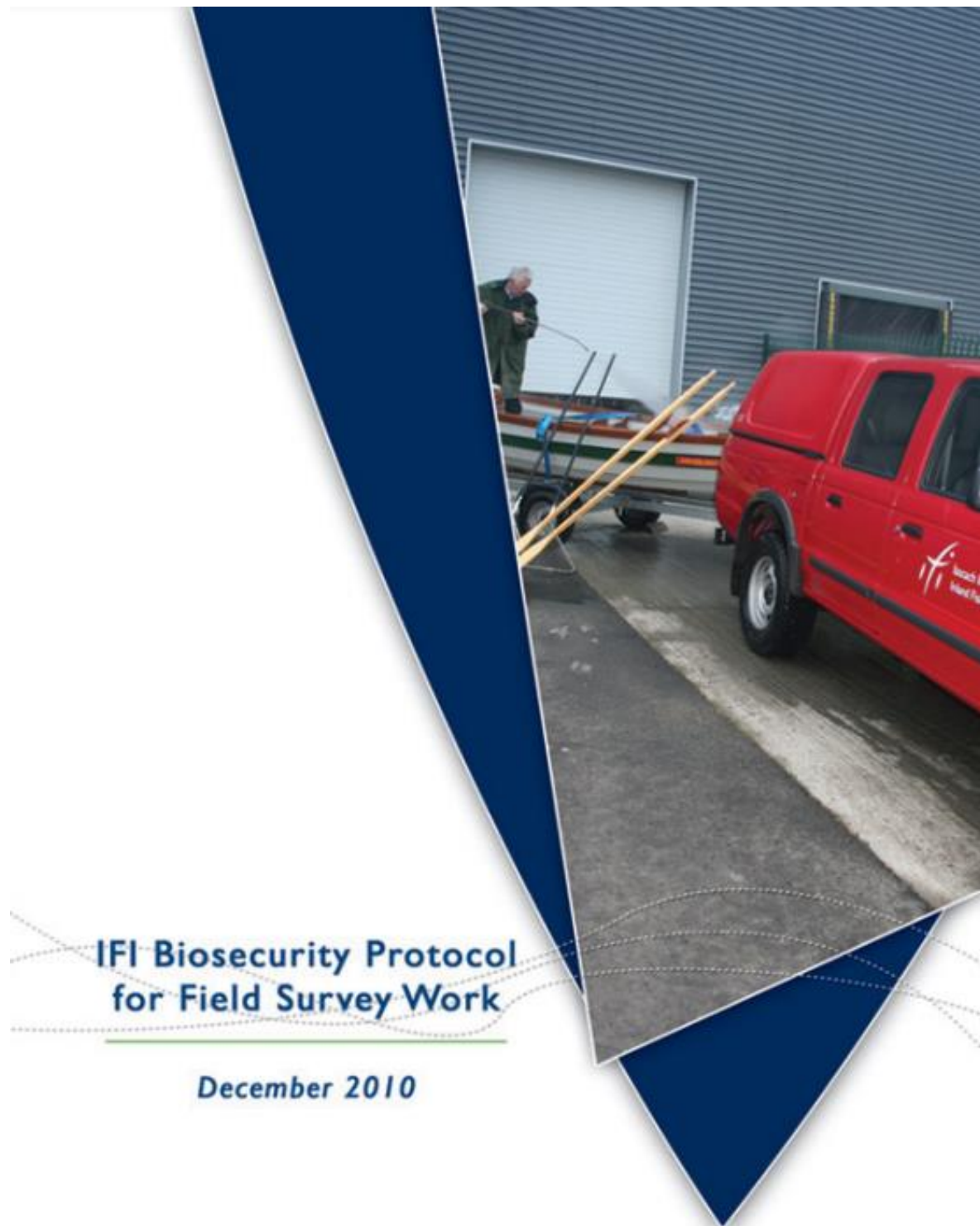
NPWS (2010) Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular Letter NPWS 1/10 & PSSP 2/10. Department of Environment, Heritage and Local Government, Dublin.

Appendices

Appendix 1: Locations of salmonid fish farms along the coast of Ireland (Marine Institute).



Appendix 2: Biosecurity Measures for working in (or beside) Rivers.



**IFI Biosecurity Protocol
for Field Survey Work**

December 2010

Biosecurity Protocol for Field Survey Work

Invasive species are an ever present threat in our aquatic and riparian systems and it is imperative that none of our field operations exacerbate the risks to the environment and to the economy that are posed by these species. Fish parasites, pathogens and diseases also represent a significant threat to the health status of our watercourses. The introduction or transfer of such pathogens or diseases has the potential to wipe out large populations of fish in affected waters or catchments. Vigilance is required if we are to stop the spread of invasive species and fish diseases, and it is imperative that we in IFI lead by example in the ongoing struggle against these significant threats to our fishery watercourses.

The need for basic biosecurity in our fisheries operations must become ingrained in the psyche of our staff if we are to do our part to stop the spread of hazardous invasive species and fish pathogens. Much to do with biosecurity involves awareness, common sense and agreed procedures. Listed below are some basic procedures that must be implemented when conducting field survey work.

Each field vehicle must carry a 'disinfection box'. This should contain Virkon Aquatic or another proprietary disinfectant, a spray bottle, cloths or sponges, a scrubbing brush and protective gloves.

On completion of any field operation, all equipment used must be treated according to the procedures listed below. Equipment in this respect includes the following: boats, trailers, outboard motors, anchors and rope, weights, tanks, buckets and bins, all PPE (including boots, wellingtons, waders, wetsuits, dry suits, waterproof clothing, life jackets, diving apparatus, etc.) and any technical or sampling apparatus used as part of the survey. Protective gloves must be worn when using any disinfectant solution in any of the procedures listed below.

- Visually inspect all equipment that has come into contact with the water for evidence of attached plant or animal material, or adherent mud or debris. This should be done before leaving the site.
- Remove any attached or adherent material (fish, fish scales, vegetation and debris) before leaving the site of operation.
- Ensure that all water is drained from boats, live wells and other water retaining compartments, outboard motors, tanks and other equipment before transportation elsewhere.
- High-pressure steam cleaning, with water > 40 degrees C, is recommended for boats (including oars, row locks, attachment ropes, anchors and buoys), trailers and outboard motors that are being moved from one watercourse to another. Many roadside garages provide these facilities. If it is not possible to steam clean the equipment, a normal power hose must be used. After cleaning visually inspect the equipment to ensure that all adherent material and debris has been removed.

- It is recommended to apply disinfectant, using the spray bottle from the 'disinfection box', to the undercarriage and wheels of the vehicle and trailer after steam cleaning or power hosing.
- Wet or live wells and other water retaining compartments in survey boats must be cleaned, rinsed or flushed with a 1% solution of Virkon Aquatic or another proprietary disinfection product. Alternatively, a 5% solution (100 ml / 20 litre solution) of chlorine bleach should be used. Rinse thoroughly with clean water.
- Tanks that are used to stock or transfer live fish should be thoroughly washed with a 1% solution of Virkon Aquatic or another proprietary disinfection product. Alternatively, a 5% solution (100 ml / 20 litre solution) of chlorine bleach should be used. All disinfected equipment must be thoroughly rinsed with clean water.
- Outboard motors should be flushed with a 1% solution of Virkon Aquatic or another proprietary disinfection product, or with water > 40 degrees C. Alternatively, a 5% solution (100 ml / 20 litre solution) of chlorine bleach should be used. Facilities will be provided at IFI stores countrywide to accommodate this operation.
- Nets (to include monofilament and braided gill nets, fyke nets and seine nets) must be cleaned of all vegetation and debris before returning to base. The clean nets must then be placed in a freezer for a period of four days (3 days will suffice for monofilament nets). Following this treatment the nets must be soaked in a 1% solution of Virkon Aquatic or a proprietary disinfectant for a period of not less than 15 minutes and thoroughly rinsed thereafter. Where these proprietary disinfectants are not available the nets must be soaked in a 5% solution (100 ml / 20 litre solution) of chlorine bleach for 1 hour and thoroughly rinsed after.
An SOP on 'Management and Disinfection of Survey Nets' is available on request from IFI Swords.
- Footwear should be dipped in or scrubbed with a disinfectant solution (e.g. 1% solution of Virkon Aquatic or another proprietary disinfection product) and thoroughly dried afterwards.
- All PPE should be visually inspected and any attached vegetation or debris removed. Where appropriate, the gear should be wiped down with a cloth soaked in 1% solution of Virkon Aquatic or another proprietary disinfection product. Alternatively, a 5% solution (100 ml / 20 litre solution) of chlorine bleach should be used. Rubber gloves must be worn when undertaking this procedure.
- Sampling equipment (e.g. electrofishing electrodes and cable, grab samplers, meter sticks, buckets and bins, etc.) must be cleaned, rinsed or wiped down with or dipped in a suitable disinfectant solution.
- Landing nets and hand nets must be dipped in disinfectant solution and rinsed in clean water.

- All field equipment must be suitably disinfected before being returned to the IFI Swords warehouse for storage. Staff will be requested to sign a prepared form detailing the nature of the disinfection process carried out and the date on which this was conducted.

Note

Disinfectants must be used with care and in strict accordance with the manufacturer's instructions. They must be disposed of safely and never in close proximity to open waters,

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