Long Term Management Plan for the Great Western Lakes

Strategic Environmental Assessment Environmental Report

Prepared under SI 435 of 2004 as amended.

2023

Contents

1 STRATEGIC ENVIRONMENTAL ASSESSMENT OF GREAT WESTERN LAKES CONSERVATION MANAGEMENT PLAN

1.1 INTRODUCTION

In accordance with Inland Fisheries Ireland (IFI)'s 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.

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 fisheries.

IFI's interest in eels (EC Regulation (Council Regulation 1100/2007) for the recovery of the eel stock), Arctic Char which are now only found in Lough Mask and Ferox Trout is also reflected in the draft Long Term Conservation Plan for the Great Western Lakes (**the plan**), which are the subject of this SEA process.

This is the Environmental Report that has been prepared as part of the Strategic Environmental Assessment (SEA) of the draft Long Term Management Plan for the Great Western Lakes (the plan). It sets out how the SEA has been undertaken and presents the findings of the assessment of the draft plan, together with its' reasonable alternatives. This Environmental Report complies with the requirements of the Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive) as implemented in Ireland through Statutory Instrument (SI) No.435 of 2004 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (as amended).

These regulations are a statutory requirement for plans or programmes which could have significant environmental effects, and the assessment process aims to identify where there are potential effects and how any negative effects might be mitigated.

1.2 Scale, nature and location of the plan area

Inland Fisheries Ireland (IFI) has a statutory remit under the Inland Fisheries Act of 2010 - to protect, conserve and manage Irelands inland fisheries resources. An integral part of this resource is the habitats and waters inhabited by fish species of conservation interest. This plan has been prepared for a group of waterbodies and their catchment areas to advance the conservation and restoration of their ecological integrity and thus, native fish stocks. Seven lakes and their catchments, primarily in Connaught, 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.

1.2.1 Overview of Plan

This plan sets out a series of measures which aim to address and manage many of the factors currently impacting on the ecosystems and the status of native fish stocks on the designated lakes and their catchments. Key objectives include:

- To ensure the sustainability of salmonid fish and fisheries within the designated waterbodies and to introduce measures to mitigate against the pressures currently impacting on their ecological integrity.
- To protect, manage and where they have been damaged, restore the natural attributes and aquatic biodiversity of the designated waterbodies.
- To restore damaged habitat and its potential to support sustainable wild brown trout and 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, 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 (European Communities (Birds and Natural Habitats Regulations 9 2011 (S. I. No. 477 of 2011).

The protection of other species and habitats of community interest, which are also important to the health and wellbeing of these important aquatic ecosystems, is also a vital component of the plan (NPWS 2017).

Appropriate Assessments will be carried out for all projects and management actions on the western lakes. These assessments are necessary to ensure that sensitive species and habitats, that are qualifying interests for the Natura sites are not adversely affected by any management measures proposed through this plan.

The implementation 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, aquatic habitats) within the western lake catchments.

The effects of various management strategies will be regularly evaluated and modified accordingly, to better achieve the desired outcomes. Section 11 of this plan sets out timelines for actions over an initial 5-year period that align with IFI's Corporate Plan 2021 – 2025. The resources required to implement the plan including an outline of funding and staff required is in preparation and will accompany the final draft of this plan.

It is widely recognised that native 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 native fish stocks and their habitat into the future. In order to successfully achieve the objectives and implement the measures set out in this plan, additional resources will be required. Once these have been allocated, a series of specific targets and performance indicators will be developed to ensure that critical elements within the plan are accomplished.

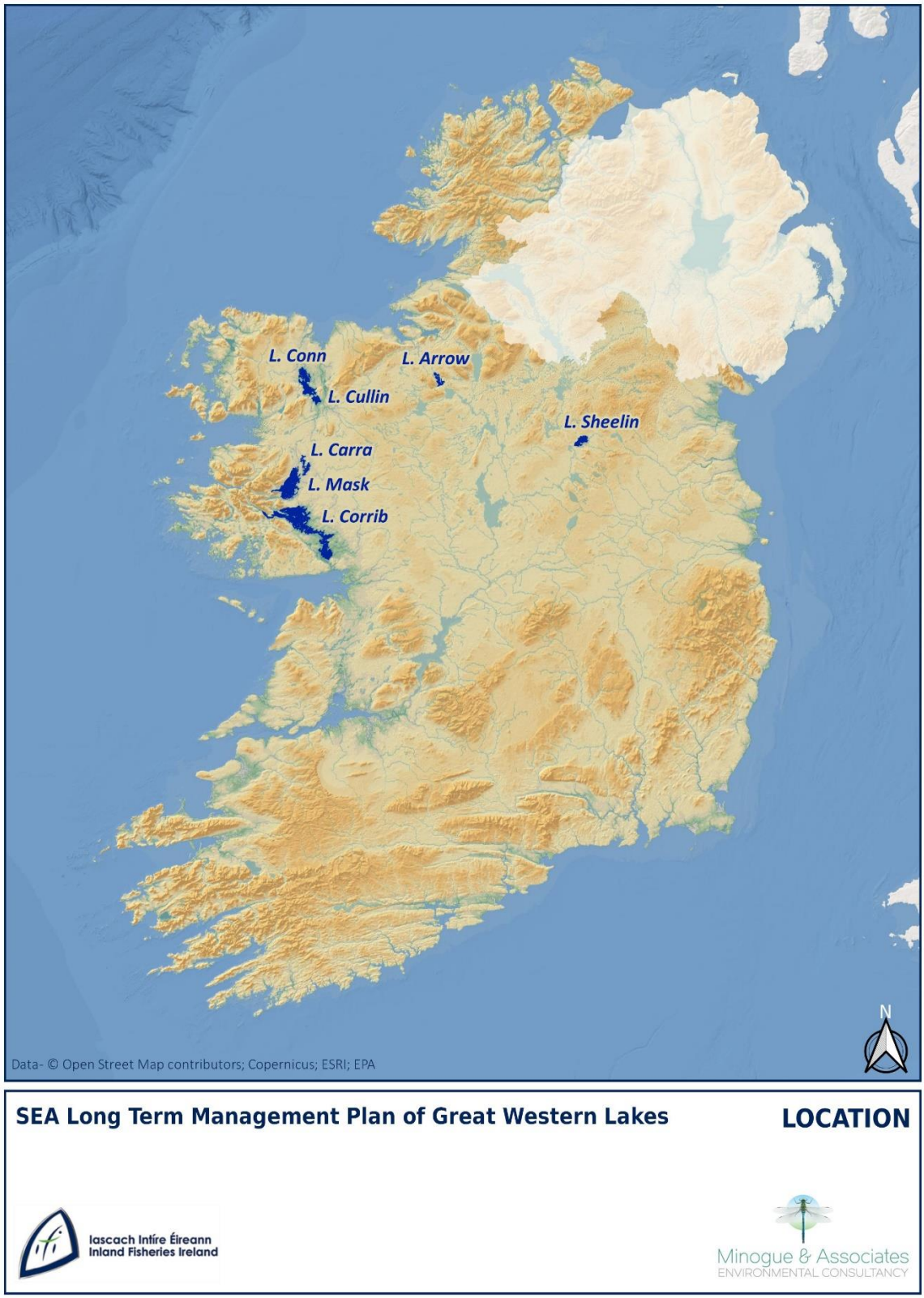
1.2.2 Other sensitive catchments

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 and other rare native fish species are severely threatened. Problems associated with invasive fish introduction, water quality pressures 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. As detail and location of these sensitive catchments are not included in this Conservation Management Plan for the Great Western lakes they are no assessed in detail in this SEA ER as they will be subject to their own plans.

Figure 1.1. below presents the locations of the Great Western lakes.

FIGURE 1-1 LOCATION OF GREAT WESTERN LAKES



1.3 Structure and preparation of this Environmental Report

Regulations contained in Schedule 2b of S.I. 435 of 2004(as amended) details the information to be contained in an Environmental Report. **Table 1.1** lists the information required and details where this information is contained in this Environmental Report.

TABLE 1-1 STRUCTURE AND CONTENT OF THIS ENVIRONMENTAL REPORT

Schedule 2B of Statutory Instrument 436 of 2004	Addressed in this SEA ER
(a) an outline of the contents and main objectives of the plan and relationship with other relevant plans	Chapter One Introduction and Chapter Two Methodology outlines contents and main objectives Chapter Three details the relationship with other relevant plans
(b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan	Chapter Four Baseline Environment provides this information
(c) the environmental characteristics of areas likely to be significantly affected	Chapter Four Baseline Environment provides this information
(d) any Issues and Threats problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or Habitats Directive	Chapter Four Baseline Environment provides this information.
(e) the environmental protection objectives, established at international, European Union or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation	Chapter Five: SEA Objectives provides this information
(f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors	Chapter Seven, Significant Effects on the Environment provides this information
(g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan	Chapter Eight, Mitigation Measures provides this information
(h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information	Chapter Six, Alternatives Considered provides this information and difficulties encountered are listed at the end of Chapter Two, Baseline Environment.
(i) a description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan	Chapter Nine, Monitoring provides this information
(j) a non-technical summary of the information provided under the above headings	This is provided as a separate document to this Environmental Report but is also available

2 Methodology

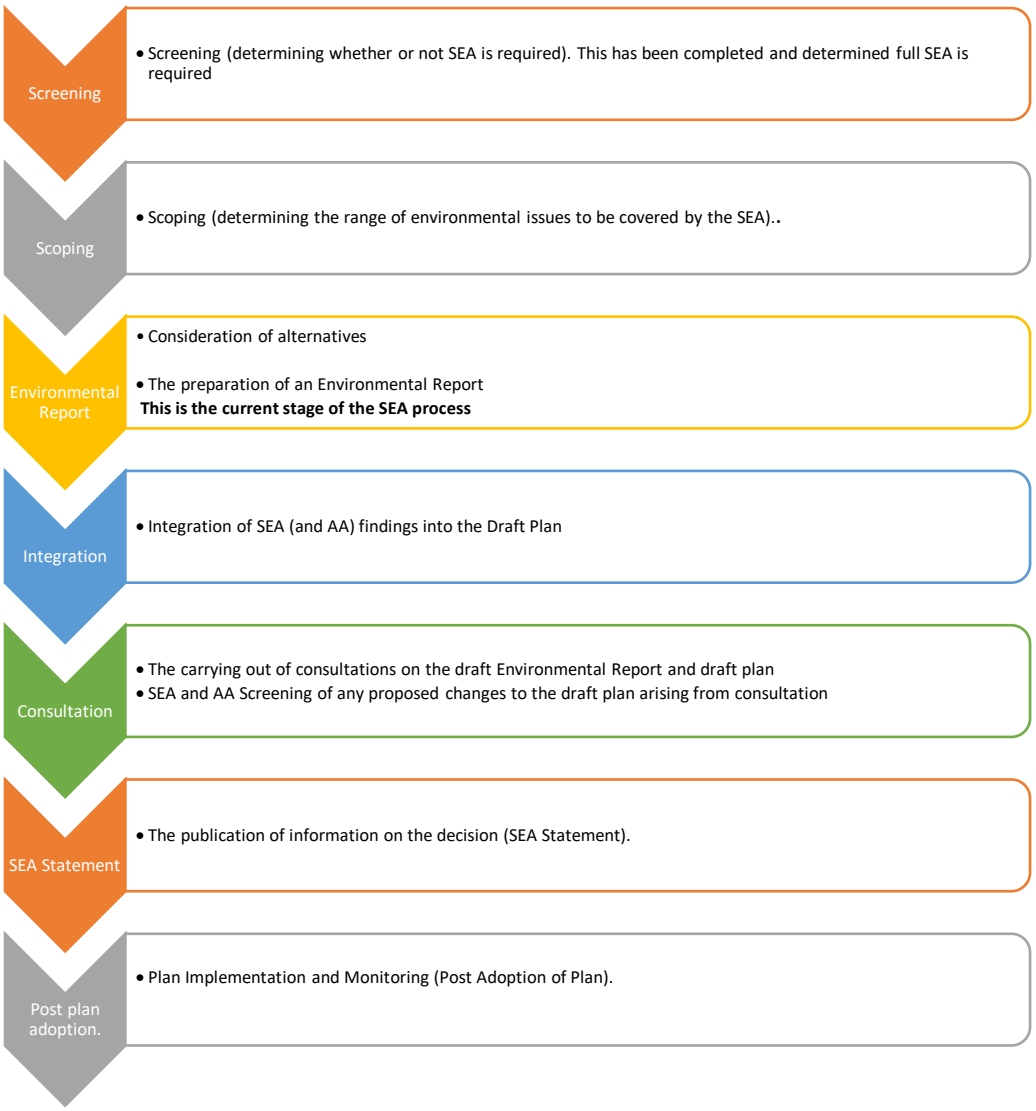
This chapter outlines the SEA methodology and the steps required for SEA. The methodology used to carry out the SEA of the plan reflects the requirements of the SEA Directive, regulations, and available guidance on undertaking SEA in Ireland, including:

- SEA Methodologies for Plans and Programmes in Ireland – Synthesis Report Environmental Protection Agency (EPA), 2003;
- Implementation of SEA Directive (2001/42/EC) Assessment of the Effects of Certain Plans and Programmes on the Environment – Guidelines for Regional Authorities and Planning Authorities - published by the Department of the Environment, Heritage and Local Government, 2004;
- Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI 436 and SI 435 of 2004);
- Planning and Development (Environmental Assessment of Certain Plans and Programmes) (S.I No 200 of 2011);
- SEA Process Checklist Consultation Draft 2008, EPA 2008;
- Circular Letter PSSP 6/2011 Further Transposition of EU Directive 2001/42/EC on Strategic Environmental Assessment;
- Guidance on integrating climate change and biodiversity into Strategic Environmental Assessment European Union 2013;
- Integrated Biodiversity Assessment -Streamlining AA, SEA and EIA Processes-Practitioners Manual, EPA Strive Report, 2013.
- SEA Resource Manual for Local and Regional Authorities, Draft Version, 2013;
- Integrating Climate Change into Strategic Environmental Assessment in Ireland – A Guidance Note, EPA, 2015;
- Developing and accessing alternatives in Strategic Environmental Assessment, EPA, 2015
- GISEA Manual: Improving the evidence base in SEA, EPA, 2017
- SEA of Local Authority Land Use Plans - EPA Recommendations and Resources 2020.
- Good practice guidance on Cumulative Effects Assessment in SEA, EPA, 2020
- Guidance on Strategic Environmental Assessment (SEA) Statements and Monitoring, EPA, 2020.
- Good Practice Guidance on SEA Screening, EPA 2021
- Good Practice Guidance Note on Strategic Environmental Assessment in the Water Sector, EPA 2022
- Strategic Environmental Assessment Guidelines for Regional Assemblies and Planning Authorities, DHLGH, 2022.

2.1 Strategic Environmental Assessment process

The steps involved in SEA are as follows:

Figure 2-1 SEA Process and stages



2.2 Screening for SEA

A SEA Screening exercise was undertaken, and it was determined that the plan will require full SEA. The following criteria triggered the need for full SEA:

1. Given the legal requirement to not consider mitigation measures as they apply to European (Natura 2000) sites, it was determined that Stage 2 Appropriate Assessment is required following the preparation of the Screening Statement in support of appropriate assessment.

2.3 Consultation

Statutory consultation for the SEA Scoping Report was undertaken in Autumn 2022, and two responses were received. In addition, wider consultation was undertaken on the emerging plan by Inland Fisheries Ireland and they have informed revisions to the draft plan, the current form of which is the focus of this SEA Environmental Report. Table 2.1 presents the summary of SEA Scoping

responses received. Section 2.3.1 presents a summary of the issues identified through the earlier, non statutory consultation undertaken by IFI in August 2022.

TABLE 2-1 SUMMARY OF SEA SCOPING SUBMISSIONS

Number		Key comments	SEA Response
1	DAERA	The SEA Team, Natural Environment Division (NED), Water Management Unit, Climate Change Unit, Marine and Fisheries Division, Inland Fisheries Division	
1.1	SEA Team	Would like the SEA Environmental Report to contain a clear statement indicating the opinion about whether or not the implementation of the of the strategy is likely to have a significant effect on Northern Ireland, in combination with any identified measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment.	Noted, agreed.
1.2	SEA Team	Notes that regarding the plan's objectives only general headings and a brief description have been provided. Alongside the objectives of the plan targets and indicators should also be provided within the Environmental Report.	Noted, the plan currently provides High Level Objectives, and Actions with timeframes.
1.3	SEA Team	Welcomes that consideration and assessment of Alternative Scenarios will be developed and explored in the Environmental Report.	Noted
1.4	NED Division	Transboundary issues arising from this plan should be considered as part of the forthcoming SEA including the potential disturbance to/impact on NI/RoI migratory/mobile species. Cross border designated sites, European sites in Northern Ireland adjacent to or with pathways to/from the Republic of Ireland, priority habitats, river basins, and other landscape types also require special attention as ecological functionality and 'views' of landscape cross political boundaries. The SEA should consider all potential impacts including those which may impact Northern Ireland both directly and indirectly. Consideration should be given to all potential impacts on NI habitats (particularly designated sites, priority habitats and those important for migratory species and NI populations) including habitat quality and conservation status.	Noted. Cross border impacts will be considered as appropriate.
1.5	NED Division	Note that an Appropriate Assessment screening has been carried out; however, this has not been provided. The scoping report does however provide the conclusions of the Appropriate Assessment screening, which concludes that for Actions 2.2, 2.3, 4.1. 5.1, 5.2 and 6.1 a Stage 2 Natura Impact Statement (NIS) will be carried out. It is unclear what the aforementioned Actions refer to as this has also not been provided. However, DAERA welcome that for each of these actions a stage 2 NIS will be carried out. NED also welcomes that future plans or projects arising from this plan will also be screened for Appropriate Assessment on a case-by-case basis. This should also be assessed at stage 2 NIS if required. The assessment should also ensure that the plan or any projects arising from this plan will not be likely to have significant effects on any designated sites, this should also consider transboundary effects on sites within Northern Ireland.	Noted.

Number		Key comments	SEA Response
		Please note following the decision of the United Kingdom to leave the European Union, the collective term of "Natura 2000" sites the network of European protected sites are now known as "National Site Network" sites within the United Kingdom, and is including Northern Ireland.	
1.6	NED Division	It may be worth including in your considerations the following: • The Wildlife (NI) Order 1985 (as amended) • Wildlife and Natural Environment Act (NI) 2011 • The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) • The Environment (NI) Order 2002 • The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 • The Strategic Planning Policy Statement (SPPS) for Northern Ireland • Planning Policy Statements (PPS – in particular PPS2 and PPS18). It should be noted that the PPS's will be superseded by Local Development Plans when they are adopted. • Biodiversity Strategy for NI to 2020 https://www.daera-ni.gov.uk/publications/biodiversity-strategy-northern-ireland-2020-0 • Draft Environment Strategy https://www.daera-ni.gov.uk/consultations/esni-public-discussion-document • The Draft NI peatland policy: https://www.daera-ni.gov.uk/consultations/ni-peatland-strategy-consultation. • The Draft Green Growth Strategy Consultation on the draft Green Growth Strategy for Northern Ireland | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk) • Northern Ireland Energy Strategy 2050 Northern Ireland Energy Strategy 2050 | Department for the Economy (economy-ni.gov.uk)	Noted, reference made as relevant to the plan.
1.7	NED Division	DAERA have a map browser for NI protected sites and known priority habitat: www.daera-ni.gov.uk/services/natural-environment-map-viewer A number of useful information sources that highlight the current state of the environment in Northern Ireland at a regional level and which could be referenced are: Northern Ireland State of the Environment Reports: https://www.daera-ni.gov.uk/publications/state-environment-report-2013 Northern Ireland Environmental Statistics Reports: https://www.daera-ni.gov.uk/articles/northern-ireland-environmental-statistics-report Other relevant web-links are; Designated Scientific Sites: www.daera-ni.gov.uk/landing-pages/protected-areas Regional Landscape Character Map viewer: https://www.daera-ni.gov.uk/services/regional-landscape-character-areas-map-viewer DAERA have a map browser for NI protected sites and known priority habitat:	Noted, reference made as relevant to the plan.

Number		Key comments	SEA Response
		www.daera-ni.gov.uk/services/natural-environment-map-viewer Our natural environment datasets are available at the link below: www.daera-ni.gov.uk/articles/download-digital-datasets Appropriate Assessments should refer to the status of habitats and species in the relevant reports available on the JNCC website as follows: UK Article 17 report for the Habitats Directive https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019/ and the UK Article 12 report for the Birds Directive https://jncc.gov.uk/our-work/european-reporting/#birds-directive-reporting	
1.8	Waste Management Unit	Notes the location of the lakes that will be the subject of the Long Term Management Plan for the Great Western Lakes.	Noted,
1.9	Waste Management Unit	The SEA should consider any potential transboundary issues in relation to the aquatic environment during all aspects / phases in relation to the implementation of the Long Term Management Plan for the Great Western Lakes. This includes (but not limited to) the potential disturbance to/impact on NI/RoI migratory/mobile species such as salmon. Such species rely on, and can be impacted by, water quality and water resource issues. The SEA should consider all potential impacts including those which may impact Northern Ireland both directly and indirectly. After due consideration the SEA should clearly state whether or not any potential impacts to the aquatic environment have been identified.	Noted, reference made as relevant to the plan.
1.10	Waste Management Unit	DAERA has published the Draft River Basin Management Plan for the 3rd cycle period which runs from 2021-2027 which should also be considered as part of the assessment. The draft plan provides an update on the health of Northern Ireland's water environment (the status of water bodies) and sets out our targets (objectives) and actions (programme of measures) on how we want to improve our water environment in the next six years. The draft plan covers the North Western, Neagh Bann and North Eastern river basin districts (RBD) and includes detailed status updates on each RBD. The documents can be downloaded from the consultation webpage: https://www.daera-ni.gov.uk/consultations/consultation-draft-3rd-cycle-river-basin-management-plan-2021-2027 It should be noted that the finalised 3rd Cycle River Basin Management Plans are due to be published later in 2022.	Noted, reference made as relevant to the plan.
1.11	Waste Management Unit	number of useful information sources are available that highlight the current state of the environment in Northern Ireland at a regional level which could be referenced including the Northern Ireland Environmental Statistics Report the latest of which currently is dated May 2021. (Water Management Unit notes the Scoping Report refers to Northern Ireland Environmental Statistics Report May 2018. The most up to date information should be utilised). Northern Ireland Environmental Statistics Reports: https://www.daera-ni.gov.uk/articles/northern-ireland-environmental-statistics-report	Noted, reference made as relevant to the plan.

Number		Key comments	SEA Response
1.12	Climate Change Unit	Climate Change Mitigation Branch refers Inland Fisheries Ireland to the recently passed Climate Change Act (Northern Ireland) 2022. https://www.legislation.gov.uk/nia/2022/31/contents/enacted The UK Climate Change Committee (CCC) recently published its Climate Risk Independent Assessment 2021 which identifies the risk and opportunities posed by climate change over the next five years. A summary for Northern Ireland can be found below. https://www.ukclimaterisk.org/independent-assessment-ccra3/national-summaries/	
1.13	Marine and Fisheries Division	The Marine Plan Team (MPT) DAERA – Marine and Fisheries Division welcome the opportunity to comment on this SEA Scoping Report. The MPT understand the Long Term Conservation Plan for Great Western Lakes has been prepared to advance the conservation and restoration of the ecological integrity of these waterbodies and their catchment areas for native fish stocks. Seven of the lakes are managed as salmonid waters. Having reviewed the documentation, the MPT comments as follows to assist with the progression of the SEA process associated with this Conservation Plan.	
1.14	Marine and Fisheries Division	SEA Scoping: It is noted the purpose of the Scoping Report is to ensure relevant environmental issues are identified so that they can be addressed appropriately in the Environmental Report, which will inform the plan. Given the location of the Great Western Lakes the potential for significant likely effects on Northern Ireland marine waters is unlikely. References to the Water Framework Directive are welcomed and it is observed that some of the lakes have hydrological linkages to Irish marine waters (particularly the Atlantic). You may wish to consider taking account of those elements of (and any relevant data related to) the Marine Strategy Framework Directive not covered by the Water Framework Directive, within the plans High Level Objective of Water Quality and the SEA Water Resources topic, in the achievement of good environmental status. It is advised any SEA Environmental Objectives should draw out marine aspects to ensure the effects on the marine environment are appropriately considered in testing the potential environmental impacts. The inclusion of the National Marine Planning Framework is noted in Annex A. It is suggested that consideration should be given to including the EU Directives on Marine Spatial Planning and the Marine Strategy Framework as part of the key documents that set out the framework within which the plan will operate. The MPT would consider that by not fully exploring / referencing the relevant marine aspects within this iterative scoping document, then it may be the case that the opportunities for the marine area and potential associated transboundary issues will not be fully considered at the Environmental Report stage.	Noted, reference made as relevant to the plan.
1.15	Inland Fisheries Division	Given the geographical location of the proposed management plan it is unlikely that there will be any significant impact to fisheries within Inland Fisheries jurisdiction. This proposed plan does not outline any	Noted, reference made as relevant to the plan.

Number		Key comments	SEA Response
		of the direct measures to be employed at this stage and thus it is hard to assess the significance of the actions to come out of it. Inland Fisheries welcomes the statement and assurance that – "The implementation of future plans and projects for the aforementioned Actions based on the guidance of this Long-term Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites. 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." DAERA Inland Fisheries should be re-consulted on any such plans within waterbodies that have a transboundary catchment.	
1.16	Inland Fisheries Division	Would recommend that the - North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan for the period 2019 – 2024, as an international commitment for Northern Ireland as part of the UK, (also the Republic of Ireland is a signatory) be included within the section: Annex A: List of key plans and programmes Table A0-1 International and EU Legislation, Plans/Programmes as this policy has the potential to impact this species and the goals of this plan.	
2	The Irish Pike Society and The Irish Federation of Pike Angling Clubs		
2.1		It is proposed here that this entire submission and all appendices is given in full, to any current or future consultant or external / internal persons engaged in undertaking Appropriate Assessment Screening, Natura Impact Statements, Stage 2 Appropriate Assessments or Strategic Environmental Assessment Reports - related to the proposed "Long-term Management Plan for the Great Western Lakes", or any future Western Lakes management plan or project, where stock management is a proposed element of the plan or project on any of the Western Lakes.	Noted, these comments are made in relation to the Appropriate Assessment process and some actions of the plan have been revised and updated since the earlier iteration following wider consultation. The points raised in relation to the Appropriate Assessment are more appropriate responded to and considered through the AA process.

Number		Key comments	SEA Response
2.2		Calls for an immediate investigation into who requested and authorised the revisions to the 'Actions' as per section 11 of the 'Long Term Management Plan for the Western Lakes'; the basis (i.e. scientific or other) for the revisions; why INVAS Biosecurity Ltd. was not given the revised 'Actions' at the Appropriate Assessment Screening Stage and why Inland Fisheries Ireland with-held the Appropriate Assessment Screening Report at the outset of the public consultation process?	As above
2.3		Considers that 'Actions' e.g. 5.2, 5.3, 7.1, 7.2 contained in the 'Long Term Management Plan for the Western Lakes' are not based on the "best scientific knowledge in the field" as per ECJ Case Law per NPWS (2009), but are instead "data-gathering of relevance in assessing the likely effects" and as such the impacts are uncertain and the Actions should be withdrawn until such a time that scientific research is complete.	As above
2.4		It is proposed here that the Plan is re-drafted to reflect measures connected specifically to the agricultural sector regarding practices and land use, including measures implied by the Nitrates Directive, Habitats Directive, EU Water Framework Directive, and the Rural Environmental Protection Scheme for such lakes, rivers and tributaries within designated Special Areas of Conservation (SAC's), by introducing a suite of environmental actions, sampling analysis and compliance conformity, to expressly improve the ecology within the waters for the primary benefit of salmonids as implied by the Programme of Government 2020.	Noted, the SEA considers and integrates the recommendations and measures from these directives where appropriate.
2.5		It is proposed here that the Plan is re-drafted to include a full risk analysis of all environmental stressors acting on the Western Lakes to include, but not limited to the following: agriculture, forestry, industry, domestic waste treatment, municipal water and waste treatment, land drainage, water extraction etc.	Noted. These are key issues facing water resources and are articulated in the draft SEA ER of the draft National River Basin Management Plan (3rd Cycle) and Nitrates Plan.
2.6		It is proposed here that Action 3.1 of the Plan is re-drafted to include for the redeployment of staff engaged in stock management to increased environmental detection and enforcement and that the Action 3.1 include for 1) retraining and upskilling of existing staff, and 2) increasing environmental officer numbers, if funding becomes available.	Noted, outside the scope of the SEA
2.7		It is proposed here that in consideration of submission item.1 of this section, that a new additional Action 3.4 is inserted into the Plan to specifically propose engagement with Mayo County Council and the project partners of the EU financed LIFE Project, Lough Carra Life to include specific consultation with catchment management groups, with the sole purpose of building a suite of comparative Agri-environmental and climate measures options for each of the Western Lakes, based on the learnings of the LIFE Project.	NOted
2.8		It is proposed here that a new additional Action 3.6 is inserted into the Plan to specifically engage with EPA to seek elevation of Lough's Corrib, Conn, Cullin, Sheelin, Arrow, Carra & Mask to 'Priority Site' status	Noted

Number		Key comments	SEA Response
		to increase frequency within the Water Framework Directive of operational and surveillance programmes for physio-chemical, hydromorphological & biological quality elements on Lough's Corrib, Conn, Cullin, Sheelin, Arrow, Carra & Mask to reflect and assist upcoming research into fish stock dynamics.	
2.9		It is proposed here that a new additional Action 3.7 is inserted into the Plan to specifically provide an 'Adaptive Management Programme' to scientifically research the link between water quality improvements and fish species responses in the Western Lakes and secure specific funding from DECC for enhanced ecological testing and monitoring to facilitate the programme.	Noted
2.10		It is proposed here that there is a considerable risk for environmental factors to continue adversely impacting on the environmental quality of the Natura 2000 sites and their salmonid species, and in this regard the consultant appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) should assess if the Plan adequately addresses this risk within the Actions proposed.	Noted
2.11		It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2 which currently include measures associated with "stock management" on each of Western Lakes, are removed from the Plan and instead replaced with an appropriate suite of enforceable regulations designed to improve, protect and monitor the water environment in each of the Natura 2000 sites in response to water quality improvement.	Noted
2.12		It is proposed here that the consultant appointed to prepare the 'Natura Impact Statement' and the 'Appropriate Assessment' for the Plan considers the implications for the integrity of the EU Water Framework Directive in Ireland, of artificially manipulating fish stocks within the Natura 2000 sites and the uncertainty this action places on the three biological elements i.e. fish composition, abundance and age structure, subsequently to be used as indicators in Ireland's EU obligation to achieve a standard of "Good Water Quality" with regard to the named lakes.	Noted
2.13		It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2 which currently include measures associated with "stock management" on each of Western Lakes, are removed from the Plan and instead replaced with an appropriate suite of enforceable regulations designed to improve, protect and monitor the water environment in each of the Natura 2000 sites in response to water quality improvement.	Noted
2.14		It is proposed that all future fish stock surveys carried out to satisfy Ireland's obligation with regard to the EU Water Framework Directive on the Western Lakes, are carried out based upon establishing the true impact of the prevailing water quality ecological drivers within the Lakes.	Noted
2.15		It is proposed here that brown trout (salmo trutta) are not directly connected with, or necessary to the management of the Special Areas of Conservation, with potential adverse impact on Annex II species salmon (salmo salar), and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.	Noted
2.16		It is proposed here that farmed trout are not directly connected with or necessary to the management of the Special Areas of Conservation with potential adverse impact on Annex II species salmon (salmo salar),	Noted

Number		Key comments	SEA Response
		native or naturalised species and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.	
2.17		It is proposed here that there may be an adverse impact on Annex ii species salmon (salmo salar), directly related to an artificially induced increase in brown trout (salmo trutta) populations through competition for food and space on salmon spawning and nursery habitats in the SAC's and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.	Noted
2.18		It is proposed here that the conservation limits for Atlantic salmon are reviewed in the context of all freshwater adverse impacts and that the brief of the consultant appointed should be extended to consider the weighting of all individual risks to include any risk associated with the Plan, and that this review be included in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.	Noted
2.19		It is proposed here that the potential adverse impact on the ecology of the lakes in the Natura 2000 sites of removing fish species as part of "stock management plans" without clear scientific evidence of the functional effectiveness of such plans at the outset, are reviewed by the consultant appointed and that this review be included in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.	Noted
2.20		It is proposed here that there may be an adverse impact on red-listed endangered and vulnerable Mayflies (Ephemeroptera), directly related to an increase in brown trout (salmo trutta) as a consequence of the objectives of the 'Long Term Management Plan for the Western Lakes' and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.	Noted
2.21		It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites if trout populations are artificially increased in the Special Areas of Conservation (SAC) - by predating to an unknown extent upon Annex ii Salmon at the early life stages and as such, the potential adverse impact on salmon should be considered in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.	Noted
2.22		It is proposed here that the objective of artificially increasing the stocks of brown trout is removed from the 'Long Term Management Plan for the Western Lakes', instead focusing on the natural fish biomasses responding to water environment improvements, as artificially increasing trout may enhance potential risk from predation on salmon alevins, parr and smolts in the spawning and nursery rivers and streams by an increased brown trout (Salmo trutta) population, which may have an adverse impact on the conservation objectives on the Natura 2000 sites.	Noted

Number		Key comments	SEA Response
2.23		It is proposed here that all scientific research available regarding avian predation on Annex ii species Salmon be reviewed to include this potential adverse impact on Annex ii salmon in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.	Noted
2.24		It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites if "stock management plans" allow for pike to be removed from lake tributaries as a consequence of the 'Long Term Management Plan for the Western Lakes' without first considering if predation on salmon smolts is negligible based on smolt run patterns and the physical characteristics of the tributary, and as such the consultant appointed should consider this potential risk to the ecology of the lakes from the adoption of a generalised removal of pike in this instance, in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.	Noted
2.25		It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2, which currently include measures associated with "stock management" on each of Western Lakes, are removed from the 'Long Term Management Plan for the Western Lakes' pending a complete review of all of the best evidence based research and modelling available as per Action 2.3 of Inland Fisheries Ireland's Corporate Plan (2021-2025) by the appointed consultants in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the impact of the Plan in each of the Natura 2000 sites.	Noted
2.26		It is suggested that the removal of pike as a potentially native species based upon the best available scientific evidence, will have an adverse impact on the integrity of the Natura 2000 sites and as such, the native status of pike in the Western Lakes should be clarified with certainty within the context of the 'Long Term Management Plan for the Western Lakes' and that management of the species should cease on the basis of existing research and that this be considered in the preparation of the Strategic Environmental Assessment Report, the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.	Noted
2.27		It is suggested that the native status of perch is reviewed per the comments of Pedreschi & Mariani (2015) and that a scientific research study is undertaken by Inland Fisheries Ireland to examine the colonization of Ireland by perch and that the potential for this species to be native is assessed in the context of the 'Long Term Management Plan for the Western Lakes' in the preparation of the Strategic Environmental Assessment Report, the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.	Noted. Pedreschi, D., Kelly-Quinn, M., Caffrey, J., O'Grady, M. & Mariani, S. (2014) Genetic structure of pike (*Esox lucius*) reveals a complex and previously unrecognized colonization history of Ireland. *Journal of Biogeography*, **41**, 548–560. And later responses is reviewed in this SEA ER. Undertaking

Number		Key comments	SEA Response
			specific new research is not a required of the SEA Directive and is not within the scope of this SEA ER.
2.28		It is proposed that the use of gill nets in each of the Western Lakes named in the 'Long Term Management Plan for the Western Lakes' may adversely impact on the Conservation Objectives of the Natura 2000 sites with regard to the disturbance of Annex ii Otters in SAC's and protected bird species in SPA's in the context of Plan where they are used to execute "stock management plans" and as such it is proposed that the use of gill nets should cease for the purpose of stock management in the Western Lakes, and that this is reviewed in the Strategic Environmental Assessment Report and by the consultant appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.	No actions of the plan specific gill nets. Section 8.2 Stock Management states the following: *Stock management programmes will entail gill netting and/or electrofishing and will run concurrently with ongoing research and modelling of fish populations. They will be modified, over time, using an adaptive management 41 framework, learning from management actions and adapting to account for changes in our knowledge of the dynamics of fish stock interactions and the response of priority species. Fish collected during these operations may, in some instances, be re-stocked to coarse fish lakes (where feasible) or used to contribute to future research programmes (e.g. biometrics, age and feeding behaviour) which will, in turn, further develop population models designed to inform future management options.*

Number		Key comments	SEA Response
2.29		Actions 4.4 & 5.3 of the 'Long Term Management Plan for the Western Lakes' specifically propose to 'encourage' and 'enable' one stakeholder group to remove and kill fish species of interest to other stakeholders, with the significant potential to further marginalise pike and coarse angling stakeholders on the Western Lakes, and as such it is proposed, on the grounds of 'Population and Human Health' that Actions 4.4 & 5.3 are assessed in the Strategic Environmental Assessment Report and by any consultant or body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.	The text of these actions have been amended in response to the wider public consultation process.
2.30		Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 of the 'Long Term Management Plan for the Western Lakes' are likely to have a significant impact upon the Western Lakes and the enjoyment and participation of angling by all angling disciplines, and as such it is proposed, on the grounds of 'Landscape' as an 'Environmental Component' of the Plan, that the 'Impact upon Areas of Special Amenity' of Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 are assessed in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.	The text of these actions have been amended in response to the wider public consultation process. The current draft actions do not specific landuse activities that could give rise to adverse impacts on landscape or visual amenity.
2.31		Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 of the 'Long Term Management Plan for the Western Lakes' are likely to lead to significant 'Adverse Visual Impacts' on the Western Lakes and as such it is proposed, on the grounds of 'Landscape' as an 'Environmental Component' of the Plan that the impact of the 'Occurrence of Adverse Visual Impacts' of Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 are assessed in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.	The text of these actions have been amended in response to the wider public consultation process.

2.3.1 Feedback from the Public Consultation on the Draft Plan for the Great Western Lakes.

IFI undertook a public consultation from Tuesday 9th August 2022 to Tuesday 20th September 2022. A series of open evenings were held at 6 locations in Sligo, Mayo, Galway and Cavan to allow stakeholders meet local staff to find out more about the plan. An online webinar was also hosted by senior management in IFI to allow any stakeholders to put questions or queries to help inform them to make a submission. 227 submissions were received, most using the online form on IFIs website. The key themes raised in the submissions are outlined below. It should be noted that these themes are taken from submissions by interested parties during the non-statutory public consultation and are not the views, thoughts, opinions of Inland Fisheries Ireland.

- Common across all themes was a broad welcome for the plan and support for increased resources for enforcement, environmental and regulation, monitoring and staffing required. Support also was identified for education and Awareness (schools, catch & release, habitats, third level) and the need for increased penalties for legislation breaches, including fish movement and an interagency approach.

- More specific comments and issues raised in relation to fish included legislative changes to byelaws, need for bag and size limits for species such as trout and chart. The need for rapid response for new fish reductions. The need to align angling season nationally or change locally including spawning streams. The Brown Trout as a qualifying interest in SACs, roach and bream as native species and the role of Pike as an apex predator.

- Stakeholder engagement was identified with regular stakeholder consultation, the advocation of a single agency with responsibility for the Great Western Lakes, along with overview of the various bodies involved in management of these lakes. Catchment management with farming representative organisations, the failure of objectives of the River Basin Management Plans was identified. The role of voluntary assistance provided to IFI eg, species removal, citizen science, water sampling, tree planting, habitat development, boat movements

- Fisheries Management and Climate Change submissions included managing the Great Western Lakes as salmonid fisheries, more decision making at local than national level, proposals to counter act climate change and creation of grant for proactive farming system to support water quality and habitats. The effects of climate change on wild fisheries not properly investigated. Fishing should be suspended during periods of high temperatures and low water levels

- Water quality: the need for IFI to have greater input into planning applications which could impact fisheries was identified as an issue; other water quality issues raised included that no fertilizer or slurry should be spread at wrong time of year or within 1km of water source. using satellite imagery to monitor. Support for increasing buffer zones using native woodlands; the use of centralised digestors in each county to collect slurry to generate electricity through anaerobic digestors; weed harvesting for rivers and lakes to be used as landfill material and concern regarding the effectiveness of the Nitrates Regulations. The need for a scoring System should be put in place for all lakes, rivers and other water bodies and no water abstraction without a license. Concern regarding the use of pesticide, algacide, herbicide and insecticide. Sewage treatment and septic tanks, leaching from biocycles, dumps adding to water quality issues.

- Invasive species. Issues identified included improved legislation/awareness for invasive species (Introductions, controls, biosecurity, penalties); proposed EU wide study on Zebra mussels, plan of action needed for invasives, support for more regular control programmes on invasive weeds including *lagrosiphon* and the control of mink.

- Stock Management: issues identified included questioning the science to support stock management, opposition to gill netting, support for wild stocks, and wider stock management programme that would include all fish, birds, animals that are a threat to salmonids, licensing of commercial coarse fishery.
- Habitat Management: issues identified included stop/reduce drainage of wetlands to counteract nutrients and improve water quality; barriers to fish migrations, implement the Habitats Directive, opposition to wind farms on /around Lough Corrib and spawning streams to not be used for hydro-electrical schemes.
- Research themes included: studies on decline of insect life required, IFI relying on pike data from the 1950's, support for regular fish stock surveys of all fish species, suggests that the evidence from recent publications by IFI haven't been considered; research around micro-plastics required and further research required on pike-trout interactions and on the effectiveness of gill netting programmes; need for trout counters on Lough Carra and Lough Mask tributaries, research to habitat destruction by bream and reduction in quality of salmonids.
- Other: No Appropriate Assessment was carried out (this is being undertaken with the SEA process), Fisheries Act to be updated, need for all stakeholders to work together to create tourism in the West of Ireland; ensure gill nets are properly marked, give control of fisheries to angling clubs; address issues arising from Aquaculture and its impact on Salmon and Sea Trout; Plan must be SMART with specific goals reviewed at agreed stages of plan and the plan needs formalising on a statutory basis

2.4 Links to Appropriate Assessment

The Habitats Directive requires, *inter alia*, that plans, and programmes undergo AA screening to establish the likely or potential effects arising from implementation of the Programme. If the effects are deemed to be significant, potentially significant, or uncertain then the plan must undergo Stage 2 AA. The AA Screening report[1] has been prepared and concluded the following:

"*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. 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 Plan 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 for the aforementioned Actions based on the guidance of this Long-term Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites. 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*."

Other requirements of the EU Birds and Habitats Directive are not addressed through the AA process such as annex IV species under Articles 12 and 13 of the Habitats Directive, Article 10 landscape features and bird habitats per Article 4 (4) of the Birds Directive. The SEA will apply the methodology for Integrated Biodiversity Assessment (EPA, 2013) and address these issues through the Biodiversity, Flora, and Fauna Section of the SEA ER.

2.5 Baseline Data

The baseline data assists in describing the current state of the environment, facilitating the identification, evaluation and subsequent monitoring of the effects of the plan. It helps identify Issues and Threats in and around the plan area and in turn these can be quantified (for certain environmental parameters) or qualified. This highlights the environmental issues relevant to each SEA parameter and ensures that the plan implementation does not exacerbate such problems. Conversely this information can also be used to promote good environmental practices and opportunities for environmental enhancement, thereby improving environmental quality where possible.

Baseline data was gathered for all parameters. Other data was gathered from the SEA ER of the North and Western Regional Economic and Spatial Strategy, relevant County Development Plan SEA Environmental Reports, NPWS, Birdwatch Ireland, Bat Conservation Ireland, National Biodiversity Centre, Irish Water, the EPA, Met Eireann and other sources as appropriate.

The SEA has also used a Geographical Information System (GIS) in the following ways:

- To provide baseline information on a range of environmental parameters;
- To assist in assessment of alternatives;

[1] Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes Invas Biosecurity July 2022

- To help assess in-combination or cumulative impacts, and
- To provide maps to illustrate environmental parameters in the SEA Environmental Report.

2.6 Approach to assessment of significant environmental impacts

The principal component of the SEA involves a broad environmental assessment of the plan. A methodology that uses the concept of expert judgement, public consultation, GIS and matrices, both to assess the environmental impact and to present the conclusions has been adopted in this SEA.

Key to assessing the above is setting a specific set of environmental objectives for each of the environmental topics. The objectives are provided in Chapter Five and include all aspects of the environment such as Cultural heritage, Population and Human health, and Biodiversity, Flora and Fauna.

The assessment described within this Environmental Report aims to highlight the potential conflicts, if they are present, between the high level objectives of the plan and the Strategic Environmental Objectives. Furthermore, the assessment examines the potential impact arising from the plan's implementation on sensitive environmental receptors.

The SEA Directive requires that information be focused upon **relevant aspects** of the environmental characteristics of the area likely to be **significantly affected** by the plan and the likely change, both positive and negative, where applicable.

Chapter Eight provides a discussion, where relevant, on the significance and type of the identified impact in accordance with current guidelines.

A key part of the SEA process has been the integration of the draft plan, the SEA and Appropriate Assessment. The SEA legislation and guidelines highlight the importance of the integration between the preparation of the draft plan and the SEA, AA processes. The iterative nature of the SEA process is such that the plan is informed by environmental considerations throughout the preparation of the plan. The Natura Impact Report is a separate document to the Environmental Report both of which accompany this draft plan.

2.7 Mitigation

Section (g) of Schedule 2B of the SEA Regulations requires information on the mitigation measures that will be put in place to minimise/eliminate any significant adverse impacts due to the implementation of the plan. Chapter Eight of this SEA ER highlights the mitigation measures that will be put in place to counter identified significant adverse impacts due to the plans' implementation.

The plan has been prepared having regard to the environmental protection objectives already within the draft plan and the iterative process between SEA and plan preparation. However, some unavoidable residual issues may remain and therefore mitigation measures are required. Chapter Eight details the mitigation measures necessary to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the plan.

2.8 Monitoring

Article 10 of the SEA Directive sets out the requirement that monitoring is to be carried out of the significant environmental effects of the implementation of the plan in order to identify at an early stage any unforeseen adverse effects and to be able to undertake appropriate remedial action. Chapter Nine presents the monitoring requirements for the plan.

2.9 Data gaps

Data gaps are present in terms of recent human health and population information. More broadly, understanding the interactions between climate change, weather events, and impacts on water and biodiversity in particular are complex. Sectoral climate change adaptation plans have been referenced and used to fill these data gaps where possible.

3 Plans policies and programmes

3.1 Introduction

Under the SEA Directive, the relationship between the plan and other relevant plans and programmes must be taken into account. The Conservation Management Plan for the Great Western Lakes is a non- statutory plan. The preparation of the plan must be considered within the context of a hierarchy of policies, plans and strategies which include international, national, regional and local level policy documents. These documents set the policy framework within which the plan will operate.

The relevant City/County Development Plans will operate as the primary land use framework for the plan and as such, key policies/objectives and environmental protective objectives and policies of each CDP will be applied during plan implementation stage should landuse related projects arise. This will be in tandem with the various existing environmental provisions by IFI for example the Environmental Charter and mitigation measures identified through this SEA and AA process.

Table 3.1 identifies the main significant environmental plans, programmes and legislation, adopted at international, European Community, national and regional level, which would be expected to influence or be influenced by the plan.

TABLE 3-1 RELEVANT PLANS, POLICIES AND PROGRAMMES

Level	Name
International/EU Union	• UN Convention of Biological Diversity, 1992 • The Convention on Wetlands of International Importance (The Ramsar Convention) 1971 and subsequent amendments • Sustainable Development Goals of the 2030 Agenda for Sustainable Development, • EU 8th Environmental Action Programme to 2030 • EU Biodiversity Strategy 2030 • EU Directive on the Conservation of Wild Birds, (2009/147/EC) 1979. Known as the Birds Directive • EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, (92/43/EEC), 1992 known as the Habitats Directive • European Communities (Birds and Natural Habitats) Regulations 2011 • The Stockholm Convention 2001 • EU Soil Thematic Strategy COM (2006) 231 • Water Framework Directive (2000/60/EC) as amended • Floods Directive (2007/60/EC) • The Drinking Water Directive (DWD), (98/83/EC) 1998 • Groundwater Directive, (2006/118/EC) 2006 • EC Bathing Water Quality Directive, (2006/7/EC) 2006 • Paris (Climate Change) Agreement • Kyoto Protocol • The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive • EU Directive on Waste, (2006/12/EC), 2006 • EU Directive on Waste (2008/98/EC), 2008 • EU Urban Waste Water Treatment Directive (91/271/EEC), 1991

Level	Name
	• Directive 2009/28/EC on the promotion of the use of energy from renewable sources • European Convention on the Protection of the Archaeological Heritage, 1992 (The Valletta Convention) • Convention for the Protection of the Architectural Heritage of Europe, 1985 (Granada Convention) • The European Landscape Convention 2000 • The Aarhus Convention • Environmental Liability Directive 2004/35/EC • SEA Directive - Assessment of the effects of certain plans and programmes on the Environment, (2001/42/EC) 2001 • Environmental Impact Assessment Directive (85/337/EEC) (97/11/EC), 1985 and Environmental Impact Assessment Directive (2014/52/EC) • The RAMSAR Strategic Plan (Ramsar Convention Secretariat, 2016 • The Convention for the Conservation of Salmon in the North Atlantic Ocean (1983) • North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan for the period 2019 – 2024, • The Convention of Migratory Species of Wild Animals (the Bonn Convention) • UK Marine Policy Statement[2] • Draft Marine Plan for Northern Ireland
National	• Project 2040 National Planning Framework (2018) • 3rd National Biodiversity Action Plan 2017-2021 • Nitrates Programme • Agri food Strategy[3] • Draft National Marine Spatial Planning Framework[4] • Draft River Basin Management Plan 2021-2027 draft DAERA • Northern Ireland Environmental Statistics Report 2021[5] • The Wildlife Acts 1976 to 2012 • Climate Action Plan 2019 • Climate Change Act (2022 Northern Ireland) • National Mitigation Plan • Sectoral Climate Change Adaptation Plans 2019 • River Basin Management Plan for Ireland 2018-2021 (3rd cycle in preparation) • Groundwater Regulations 2010 • Ireland's Hidden Heartlands • Tourism Masterplan for the Shannon Region 2020.

[2] Inserted following DAERA (N.I) Scoping Submission

[3]

[4] Inserted following DAERA (N.I) Scoping Submission

[5] ibid

Level	Name
	• Realising Our Rural Potential – the national action plan for rural development (2017) • Outdoor Recreation Plan for Public Lands and Waters in Ireland 2017 – 2021 (2017), • National Peatlands Strategy
Regional /County	• Eastern, Northern and Western Regional Economic and Spatial Strategies 2020-2032; • County/City Development Plans • County/City Climate Change Action Plans

3.2 Key implications and principles arising from the Plan, Policy and Programme Review.

Arising from the review, a number of key principles and implications for the SEA ER can be distilled. These principles have been considered through the SEA process and will serve to inform the assessment.

Table 3.2 below presents the Strategic Environmental Objectives developed for this SEA. The second column presents their relationships to the key themes of the EPA State of Ireland's Environment Report (2020) and the UN Sustainable Development Goals.

TABLE 3-2 KEY PRINCIPLES AND IMPLICATIONS FOR THE SEA OF THE LONG TERM MANAGEMENT PLAN FOR THE GREAT WESTERN LAKES FROM THE PLAN, POLICY AND PROGRAMME REVIEW.

SEA Topic	Principles for the Plan and SEA	EPA Irelands Environment 2020 Key Messages	United Nations Sustainable Development Goals
Biodiversity, Flora and Fauna	• Conserve and enhance biodiversity at all levels • Avoid and minimise effects on nationally and internationally rare and threatened species and habitats through sensitive design and consultation, recognising ecological connectivity • Facilitate species and habitat adaption to climate change • Avoid and minimise habitat fragmentation and seek opportunities to improve habitat connectivity • Ensure careful consideration of non-native invasive and alien species issues	SOE 4 Climate SOE 5 Air Quality SOE 6 Nature SEO 8 Marine SOE 11 Water Services SEO 12 Circular Economy SOE 13 Land use	SD Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Population and Human Health	• Support citizen science and stakeholder engagement	SOE3 Health and Wellbeing SOE4 Climate SOE5 Air Quality SOE 11 Water Services SOE 12 Circular Economy SOE13 Landuse	SDG 3. Ensure healthy lives and promote wellbeing for all at all ages. SDG 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. SDG 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable.
Water	• Protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem (quality, level, flow). • Maintain or improve the quality of surface water and groundwater (including estuarine, marine and transboundary waters) to status objectives as set out in the Water Framework Directive (WFD), the National River Basin Management Plan and POMS.	SOE3 Health and Wellbeing SOE5 Air Quality SOE4 Climate SOE6 Nature SOE 11 Water Services SOE13 Landuse	SDG 6. Ensure availability and sustainable management of water and sanitation for everyone SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

SEA Topic	Principles for the Plan and SEA	EPA Irelands Environment 2020 Key Messages	United Nations Sustainable Development Goals
Soil and Geology	• Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites .	SOE4 Climate SOE6 Nature SOE 11 Water Services SOE 12 Water Services SOE13 Landuse	SD Goal 12. Ensure sustainable consumption and production patterns. SD Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
Air Quality and Climate	• Adapt and improve resilience to the effects of climate change • Minimise adverse impacts associated with air and noise quality	SOE3 Health and Wellbeing SOE5 Air Quality SOE4 Climate SOE6 Nature SOE 8 Marine SOE9 Clean Energy SOE 11 Water Services SOE12 Circular Economy SOE13 Landuse	SD Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation SD Goal 12. Ensure sustainable consumption and production patterns SD Goal 13. Take urgent action to combat climate change and its impacts.
Material Assets	• Plan and provide for sustainable water management and wastewater treatment	SEO3 Health and Wellbeing SOE 5 Air Quality SOE 8 Marine SOE9 Clean Energy SOE 13 Land use SOE 11 Water Services SOE 12 Circular Economy	SD Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation SD Goal 12. Ensure sustainable consumption and production patterns SD Goal 13. Take urgent action to combat climate change and its impacts
Cultural Heritage	• Conserve, preserve and record architectural and archaeological heritage	SOE3 Health and Wellbeing SOE 12 Circular Economy SOE13 Landuse	SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable. SD 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Landscape	• Integrate green and blue network considerations • Improve landscape connectivity to surrounding area	SOE3 Health and Wellbeing	SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable.

SEA Topic	Principles for the Plan and SEA	EPA Irelands Environment 2020 Key Messages	United Nations Sustainable Development Goals
		SOE 4 Climate SOE 5 Air Quality SOE 6 Nature SEO 8 Marine SOE 11 Water Services SOE 12 Circular Economy SOE 13 Land use	SD Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

4 Environmental Baseline

4.1 Introduction

This section of the Environmental Report examines the relevant significant characteristics of the current state of the environment in relation to Biodiversity, Flora and Fauna, Population, Human Health, Water, Air Quality, Climatic Factors, Material Assets, Cultural Heritage, Landscape, , the interrelationship between these factors and the evolution of same in the absence of the plan The baseline description is focussed primarily on the Great Western Lakes and a profile of each is presented based on the catchment they are located in.

Given the shared boundaries with neighbouring local authorities, there is potential for transboundary environmental impacts on water quality, biodiversity etc. In line with the SEA Directive, the potential significant aspects of the environment likely to be affected by the plan have been described and compiled using available datasets and the scoping process. Figure 4.1 shows the lakes over aerial imagery and Figure 4.2 presents each lake as it is located within the relevant catchment area. Figures 4.3 to 4.5 present the sites designated for natural heritage within the plan area. Finally Figure 4.6 present surface water quality for the Great Western Lakes.

Thereafter, each lake is described and various figures identify cultural heritage features, and combined mapping showing Pollution Impact Potential, population density and wastewater treatment plants.

FIGURE 4-1 LOCATION OF GREAT WESTERN LAKES OVER AERIAL IMAGERY

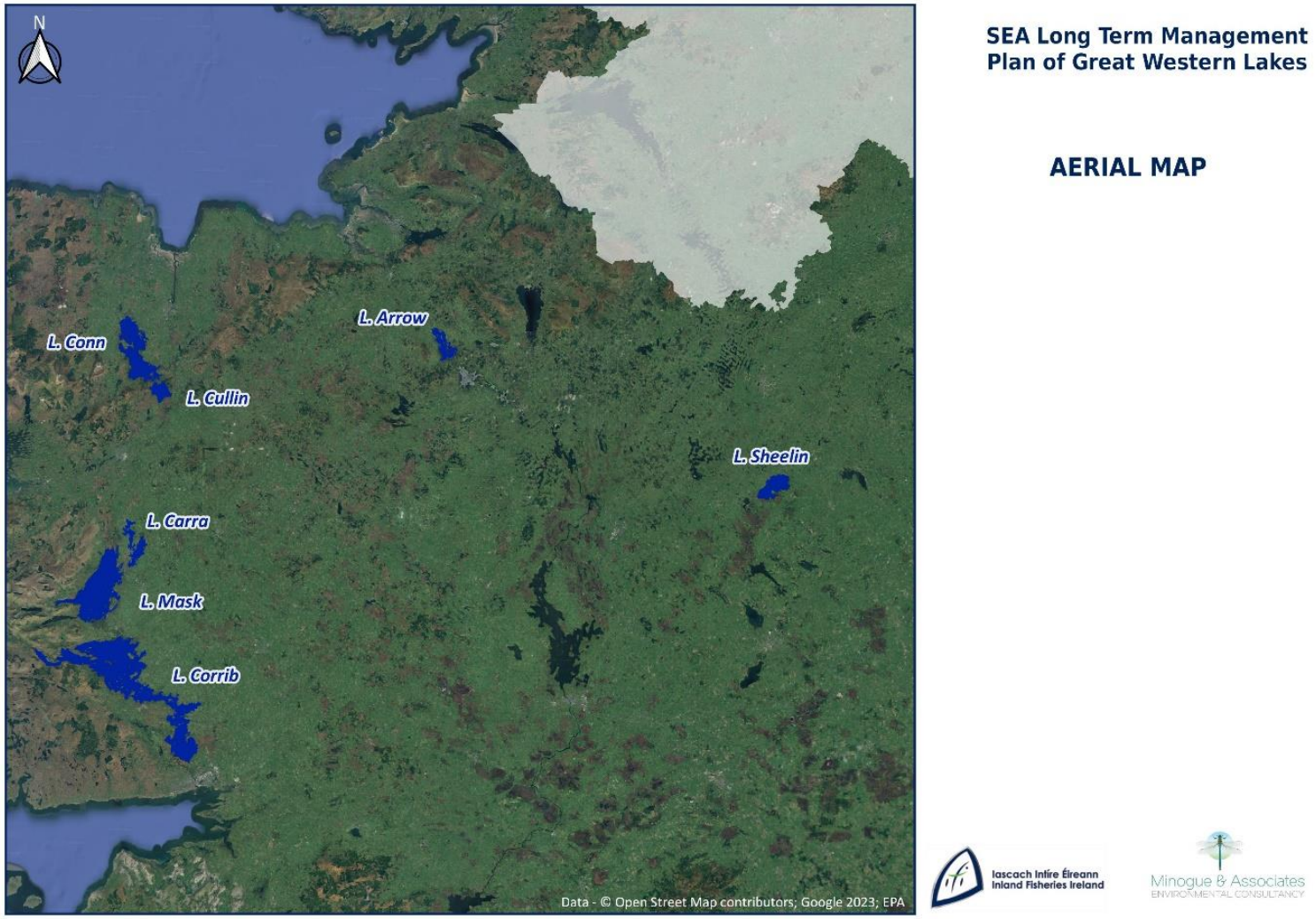


FIGURE 4-2 GREAT WESTERN LAKES WITHIN RELEVANT WFD CATCHMENT

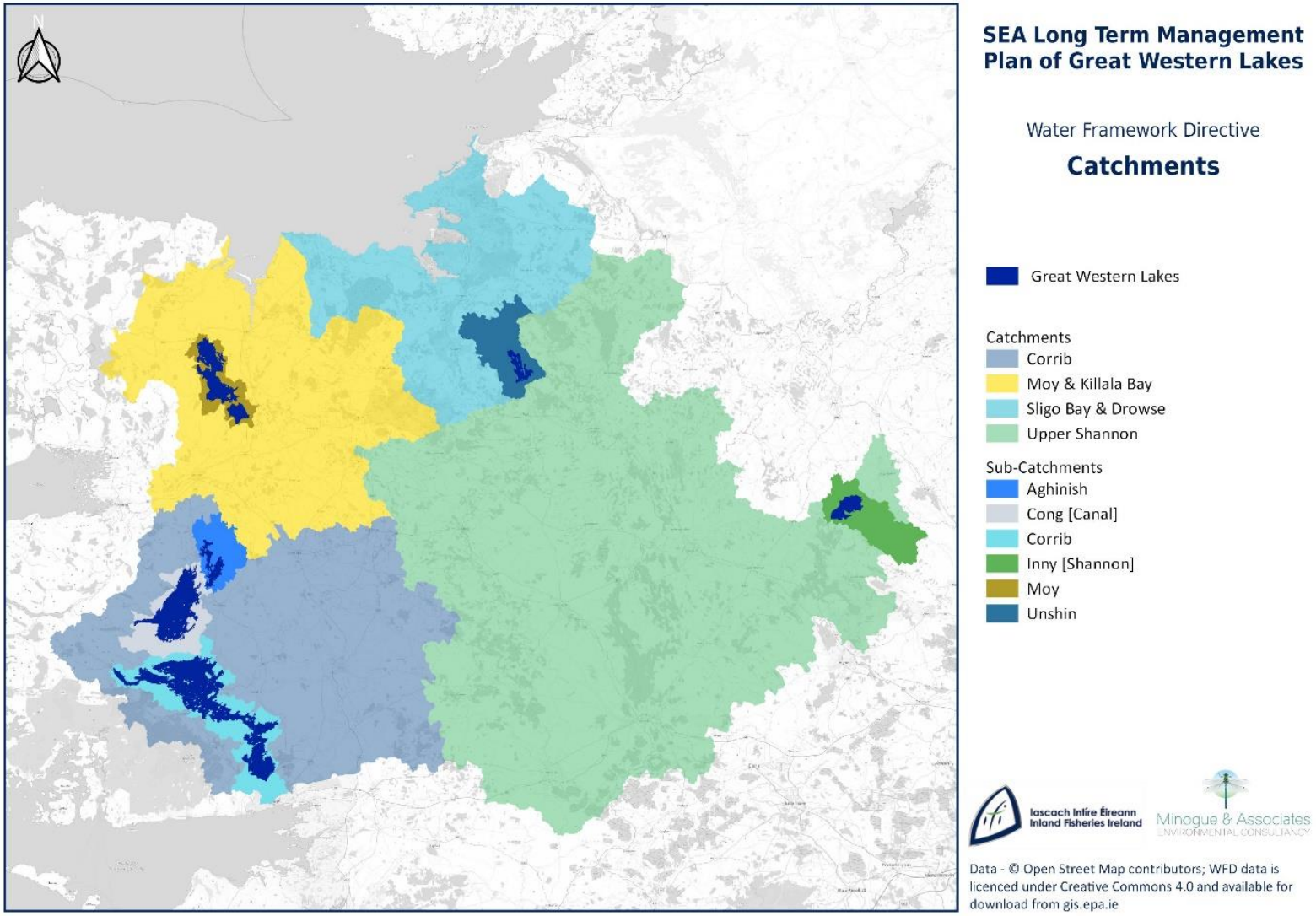


FIGURE 4-3 NATURA 2000 SITES WITHIN 5,10 AND 15KM BUFFER OF THE GREAT WESTERN LAKES

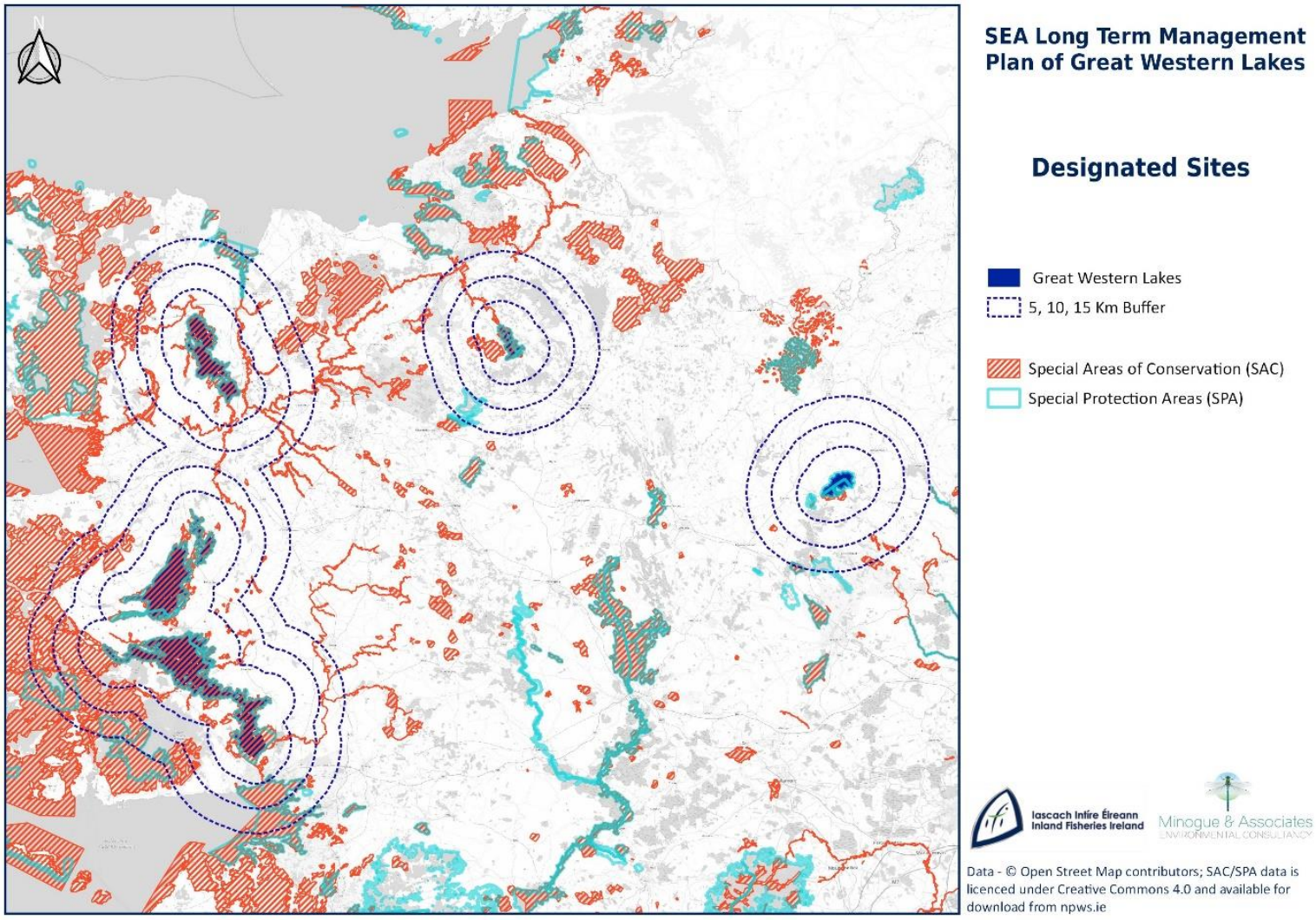


FIGURE 4-4 NATURAL HERITAGE AREAS AND PROPOSED NATURAL HERITAGE AREAS

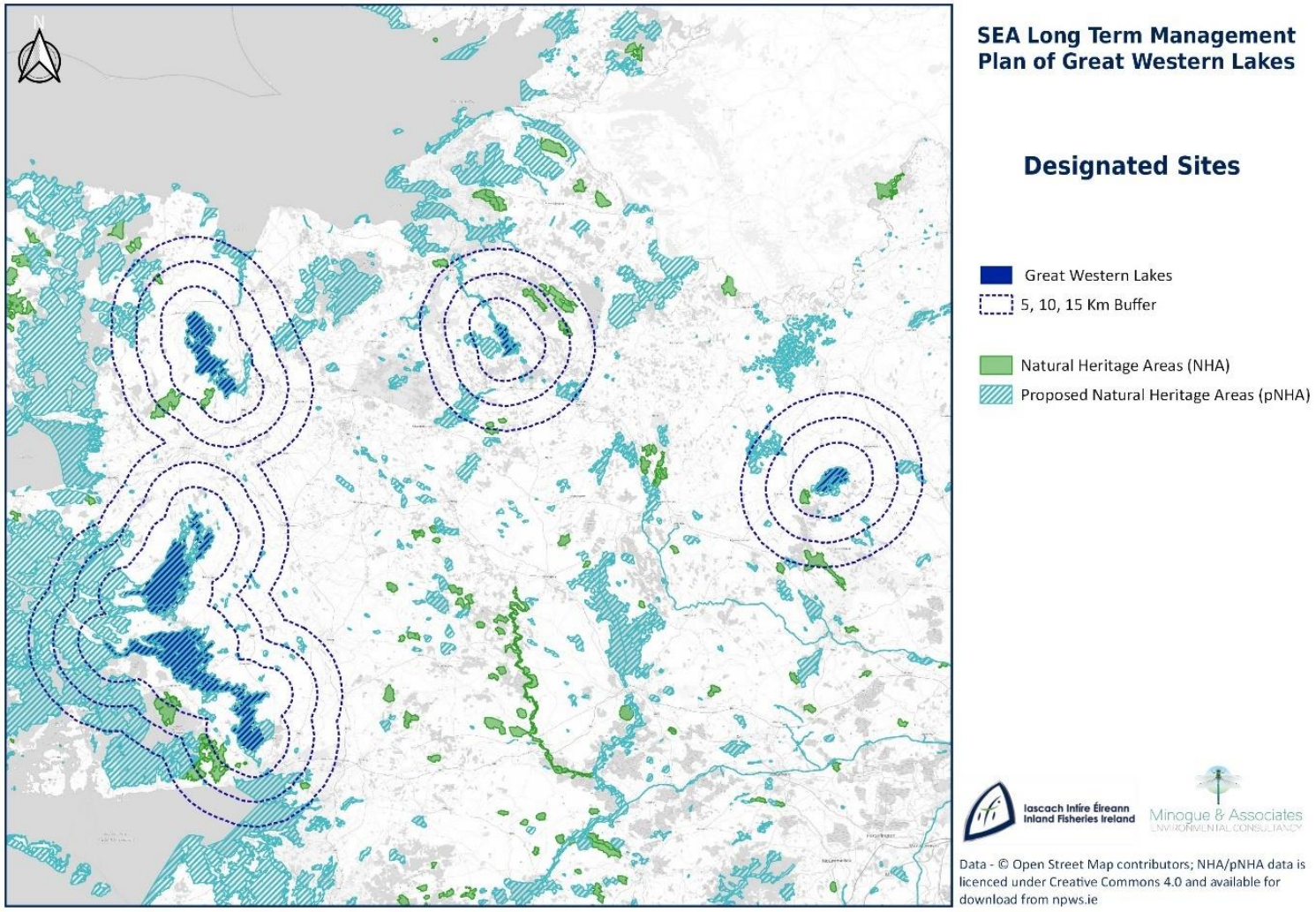
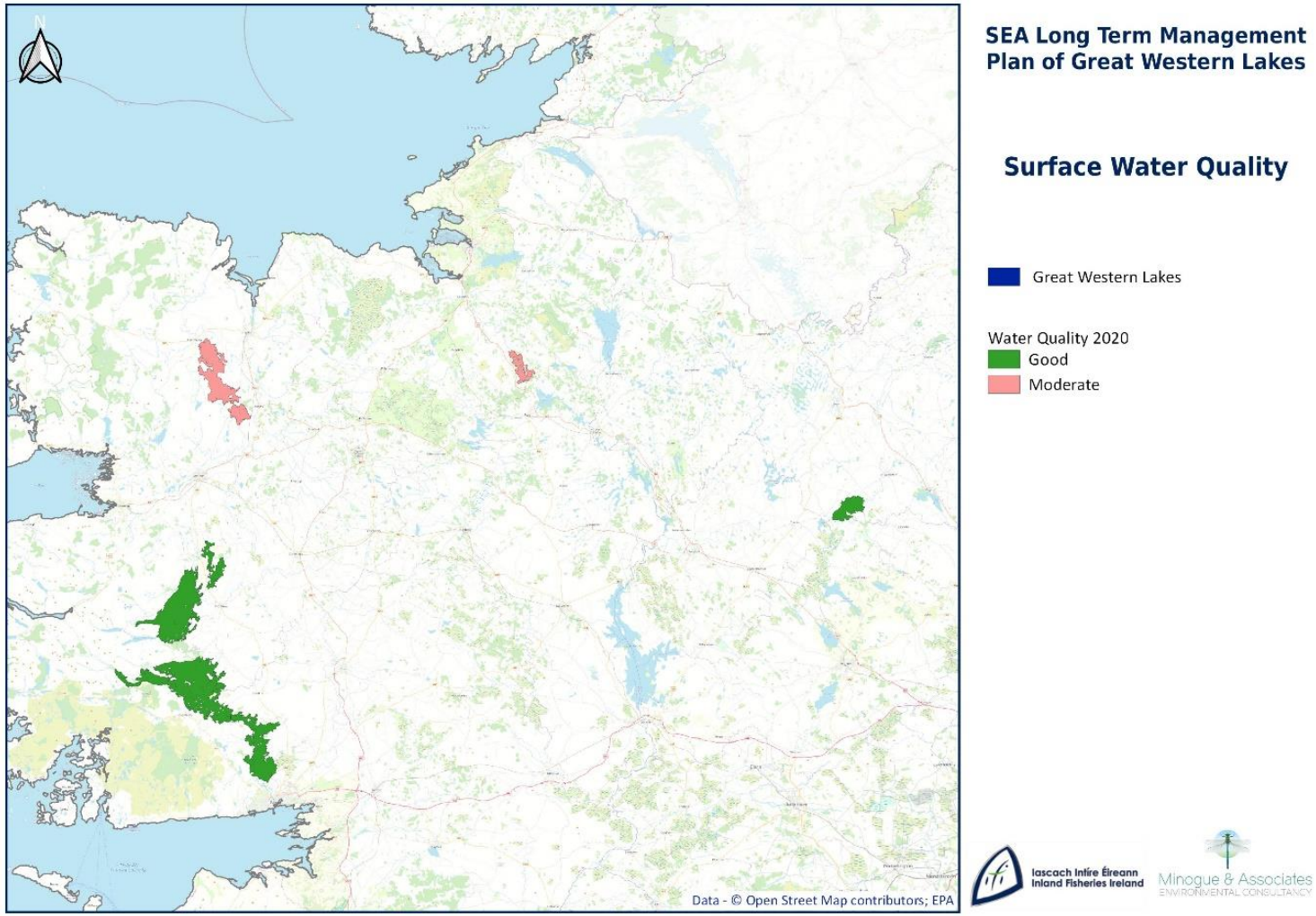


FIGURE 4-5 SURFACE WATER QUALITY OF GREAT WESTERN LAKES



4.2 Corrib Catchment

Three of the lakes are located within the extensive catchment of the Corrib. The Corrib catchment includes the area drained by the River Corrib and all streams entering tidal water between Renmore Point and Nimmo's Pier, Galway, draining a total area of 3,112km² .

The largest urban centre in the catchment is Galway City. The other main urban centres in this catchment are Tuam, Ballinrobe, Claremorris and Ballyhaunis. The total population of the catchment is approximately 116,866 with a population density of 38 people per km².

This catchment is characterised by a wide, flat, limestone plain occupying the eastern two-thirds of the catchment which terminates in the large lakes of Corrib and Mask that abut against the igneous granites of Galway and the metamorphic uplands of southwest Mayo. The entire area of this catchment east of the large lakes is karstifed and groundwater and surface water are highly interconnected in this region.

4.2.1 Lough Corrib

Overview

Lough Corrib is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240 ha (the entire site is 20,556 ha). 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 km of Maam Cross, a distance of over 50 km. The main rivers draining into Lough Corrib include the Black, Clare, Dooghta, Cregg, Cornamona, Maam, Owenriff rivers and the Cong canal which joins Lough Corrib to Lough Mask. 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, tench and stone loach.

4.2.2 Environmental Profile Lough Corrib

SEA topic	Description
Biodiversity, Flora and Fauna	The shallow, lime-rich waters of the southern basin of Lough Corrib support one of the most extensive beds of stoneworts (Charophytes) in Ireland, with species such as Chara aspera, C. hispida, C. delicatula, C. contraria and C. desmacantha mixed with submerged pondweeds (Potamogeton perfoliatus, P. gramineus and P. lucens), Shoreweed (Littorella uniflora) and Water Lobelia (Lobelia dortmanna). These Chara beds are an important source of food for waterfowl. In contrast, the northern basin contains more oligotrophic and acidic waters, without Chara species, but with Shoreweed, Water Lobelia, Pipewort (Eriocaulon aquaticum), Quillwort (Isoetes lacustris), Alternate Water-milfoil (Myriophyllum alternifolium) and Slender Naiad (Najas flexilis). The last-named is listed under the Flora (Protection) Order, 2015, and is an Annex II species under the E.U. Habitats Directive. Large areas of reedswamp vegetation, dominated by varying mixtures of Common Reed (Phragmites australis) and Common Club-rush (Scirpus lacustris), occur around the margins of the lake. Of particular note are the extensive beds of Great Fen-sedge (Cladium mariscus) that have developed over the marly peat deposits in sheltered bays, particularly in the southeast corner of the lake. Alkaline fen vegetation is more widespread around the lake margins and includes, amongst the typically diverse range of plants, the Slender Cottongrass (Eriophorum gracile), a species protected under the Flora (Protection) Order, 2015. Wet meadows dominated by Purple Moor-grass (Molinia caerulea) occur in seasonally flooded areas close to the lake shore. These support species such as Sharp-flowered Rush (Juncus acutiflorus), Jointed Rush (J. 40enudate4040s), Carnation Sedge (Carex panicea), Devil's-bit Scabious (Succisa pratensis), Creeping Bent (Agrostis stolonifera) and Tormentil (Potentilla erecta), amongst others.

SEA topic	Description
	Limestone pavement occurs along much of the shoreline in the lower Corrib basin, and supports a rich and diverse flora, including Herb-Robert (Geranium robertianum), Bloody Crane's-bill (G. sanguineum), Carline Thistle (Carlina vulgaris), Spring Gentian (Gentiana verna), Wild Thyme (Thymus praecox), Rustyback (Ceterach officinarum), Wood Sage (Teucrium scorodonia), Slender St. John's-wort (Hypericum pulchrum), Quaking-grass (Briza media) and Blue Moor-grass (Sesleria albicans). Areas of Hazel (Corylus avellana) scrub occur in association with exposed limestone pavement and these include species such as Hawthorn (Crataegus monogyna), Buckthorn (Rhamnus catharticus), Spindle (Euonymus europaeus), with occasional Juniper (Juniperus communis). Three Red Data Book species are also found in association with limestone scrub – Alder Buckthorn (Frangula alnus), Shrubby Cinquefoil (Potentilla 41enudate41) and Wood Bitter-vetch (Vicia orobus), the latter is also protected under the Flora (Protection) Order, 2015. During the most recent survey by IFI, (2020) perch, roach, bream, roach x bream hybrid, brown trout, Arctic char, pike, three-spined stickleback and eels were recorded. Lough Mask is the only remaining lake with of the 7 lakes with Artic char present. Lough Mask is noted for its populations of brown trout and ferox trout. Lough Corrib SPA is an internationally important site which supports in excess of 20,000 wintering waterbirds, including a population of Pochard that is, itself, of international importance. A further six species of wintering waterfowl have populations of national importance. The site also contains a nationally important communal roost site for Hen Harrier. Lough Corrib is the most important site in the country for breeding Common Scoter. Its populations of breeding gulls and terns are also notable, with nationally important numbers of Black-headed Gull, Common Gull, Common Tern and Arctic Tern occurring. It is of note that several species which regularly occur are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Greenland White-fronted Goose, Hen Harrier, Golden Plover, Common Tern and Arctic Tern. Lough Corrib is a Ramsar Convention site
Water	Lough Corrib is located within the WFD sub-catchment Corrib_010. The lake is of good ecological status under the WFD and of good groundwater status. The risk of the groundwater not meeting the WFD objectives are identified as not at risk at the western part of the lake, and at risk at the eastern part of the lake.
Soil and Geology	The lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north.
Air Quality and Climate	Lough Corrib is located within Zone D Air Quality Zone Rural whilst the southern part of the Lough adjacent to Galway City is classified as Zone C Other cities and large towns.
Population and Human Health	Galway City at the south of the lake is the largest settlement associated with Lough Corrib. The towns and villages of Oughterard, Cong and Headford are located on the western, northern and eastern sides of the lake respectively. The town of Oughterard is located approximately 27km north-west of Galway City via the N59 Galway – Clifden Road, which is a National Primary Route. Oughterard is designated as a Small Growth Town in the Galway County Development Plan 2022 – 2028 by virtue of the population of the town and the extensive level of local services, employment and residential stock that it offers to residents. It also serves a large rural catchment area stretching further westwards towards the town of Clifden and eastwards in the direction of the town of Maigh Cuilinn. The town is built on the banks of the Owenriff River with the Main Street, a linear settlement pattern developing in an easterly direction. Building heights vary along the N59 within the town from bungalow up to two storeys generally. The main street of the town offers inhabitants a wide variety of local services such as convenience type shopping, bank, post office, restaurants and pubs. Other local services such as schools, playing pitches, health centre and playground are all located within short walking distance of the Main Street. These local services also provide employment opportunities in the

SEA topic	Description
	town. There are also office and industrial uses which provide further and more varied employment prospects. Headford is located approximately 26km north of Galway City and 20km west of Tuam ensuring ease of access to the wider range of service provision in both of these areas. The town straddles the county boundary with County Mayo and it is strategically located along the National Secondary Road, the N84 which provides good transport links between Galway and Mayo while also acting as the main vehicular gateway to the town. The landscape, topography and natural features of the area have influenced the pattern and form of development of the Town over the years. The rural character of the surrounding landscape, rich heritage and its proximity to Lough Corrib, provide many amenity opportunities for the Town. The town is situated south of the Black River which is the county boundary with Mayo. It is an angling centre for the eastern shore of Lough Corrib, and Greenfields, some 6.5 km west of the town, is its boating harbour. Cong in County Galway is a rural settlement and is identified as a Tier IV settlement in the Mayo CDP 2022-2028. Galway City is south of Lough Corrib. As per Variation no. 5 of the City Development Plan 2017-2023, the target for the city is to reach a population of 102,900 by 2026, that is an increase of 23,000 people from the Census 2016 City and Suburbs population of 79,900. Longer term to 2031, the target for the city is to grow by a further 12,000 to 114,900 population.
Cultural Heritage	A rich and diverse archaeological record is associated with the lake and extends from a megalithic portal tomb at Menlough, several crannogs and ecclesiastical complexes such as those at Inchagoill. The 19th century saw the development of neogothic castles such as Ashford Castle and other large estates such as Ballycurrin House, as navigational features such as Annaghdown Quay, all located within 150m of the lake. Please see Figure 4. 6 for archaeological and built heritage features.
Landscape	Galway CDP 2022 -2028 identifies this as Lake Environs Landscape Character Type, with the following description: “Lough Corrib is the second-biggest lake on the island of Ireland (after Lough Neagh). It can be divided into very two distinct parts; a shallow basin underlain by carboniferous limestone in the south, and a deeper basin to the north underlain by more acidic granite, schists and sandstones. The uplands to the west of the lake include the rolling, bog covered granite hills of south Conamara, the bare Quartzite peaks of the Maumturk mountains and the high plateau of the Maumtrasna Mountains. Sheep grazing and forestry are the main land uses in these areas. In sharp contrast, the low-lying limestone plain to the east of the Lough Corrib with its large, walled fields, is used primarily for the more intensive rearing of sheep and cattle. Drumlins of glacial origin give rise to the numerous smaller, mostly wooded islands for which the lake is famous. The lake is highly prized as recreational fishery resource and is also the focus of many viewing areas and scenic drives.”
Material Assets	Oughterard is partly serviced by a public wastewater treatment plant. All of the lands identified for development potential are served by public wastewater services. Oughterard receives its water supply from the Oughterard Town Supply Scheme. Headford receives its water supply from the Tuam Regional Water Supply Scheme which is abstracted from Lough Corrib at Luimnagh. The town is served by a municipal wastewater treatment system and there is capacity within the network to accommodate development that is envisaged to take place. Headford is strategically located along the National Secondary Road, the

SEA topic	Description
	N84 which provides good transport links between Galway and Mayo while also acting as the main vehicular gateway to the Town. Galway West Water Supply Scheme: Terryland Water Treatment Plant Intake Works and Clifton Hill Rising Main have received planning consent to augment the supply of clean and safe drinking water to citizens of Galway City area. This will involve the construction of a new raw water intake on the River Corrib south of the Quincentenary Bridge in Galway City, and an associated transfer main to serve the existing Terryland Water Treatment Plant. Figure 4.7 below identifies the WWTP plants associated with Lough Corrib and the pollution impact potential via delivery points, and population density The following WWTPs discharge to Lough Mask, none are identified as priority areas and are identified as having capacity for the settlements population equivalent

WWTP Name	Pop	Type	Treatment	Agglom PE	Capacity PE	Priority	Discharge to
Claregalway	>500	Sewage Treatment	3NP – Tertiary N&P Removal	2282	6000	No	Clare River -> L Corrib
Cong	>500	Urban Waste Water + Sewage Treatment	3P – Tertiary P Removal	811	2026	No	Lough Corrib
Oughterard	>500	Urban Waste Water + Sewage Treatment	3P – Tertiary P Removal	1534	2400	No	Owenriff River -> L Corrib
Kilmaine	>500	Urban Waste Water + Sewage Treatment	2 – Secondary Treatment	178	800	No	Cross River - may flow to L Corrib

FIGURE 4-6 LOUGH CORRIB ARCHAEOLOGY AND BUILT HERITAGE

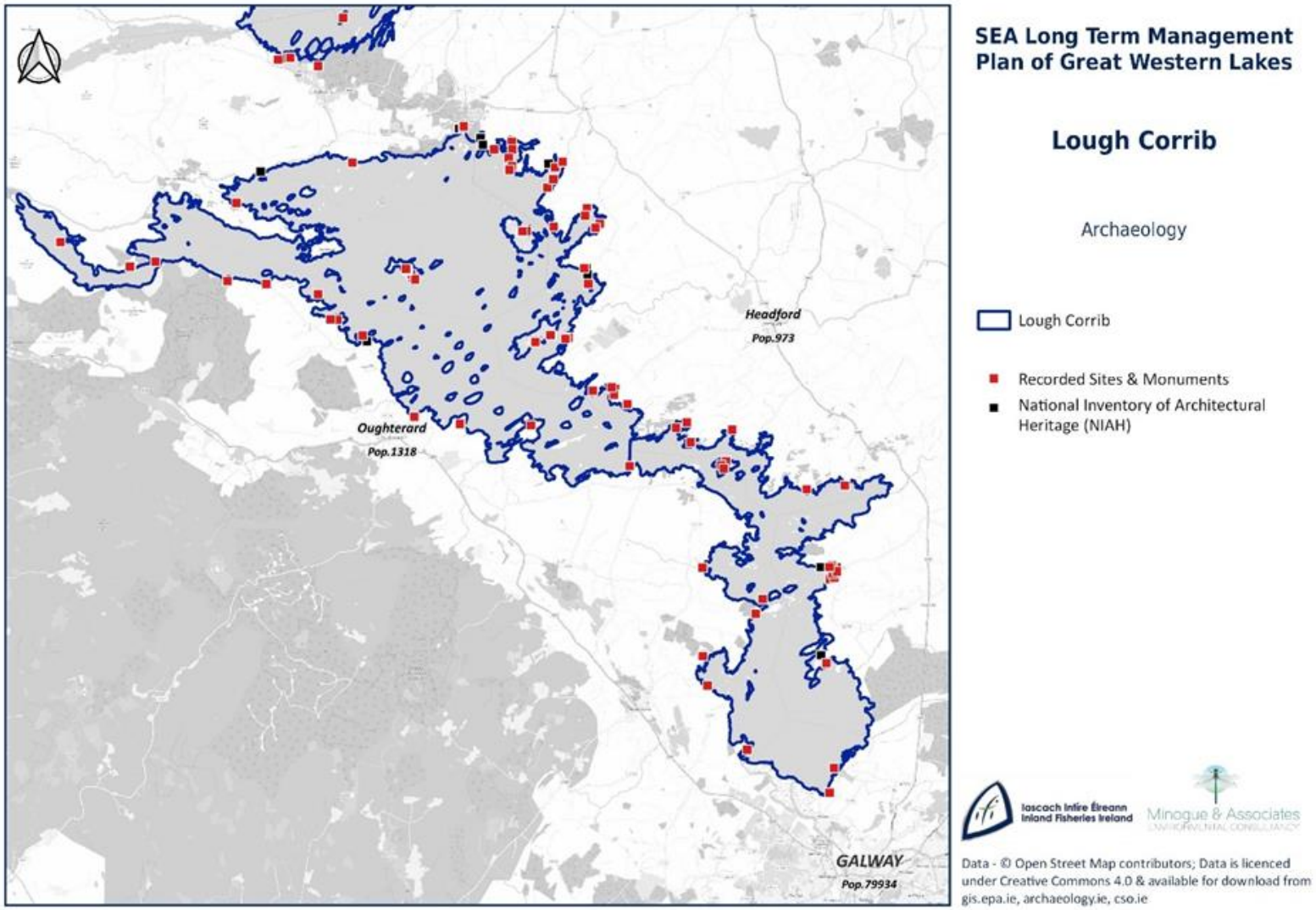
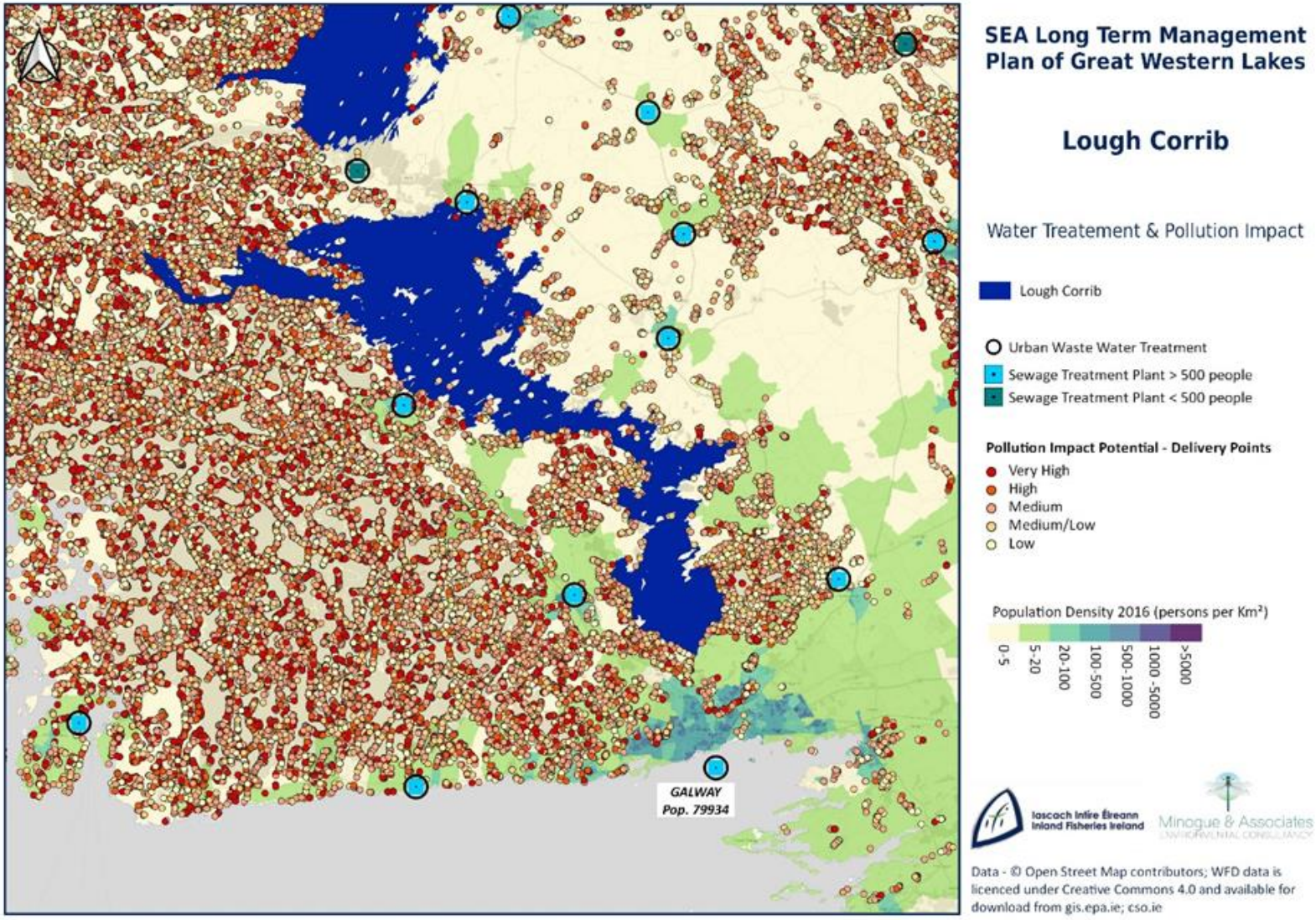


FIGURE 4-7 LOUGH CORRIB POLLUTION IMPACT POTENTIAL, EXISTING WWTPS AND POPULATION DENSITY



4.2.3 Lough Mask

Lough Mask, at over 8,000 ha, is the sixth largest lake in the country. It is located in south Co. Mayo with a small area extending across the border into Co. Galway. It extends for over 14 km along its long axis and is on average about 5 km in width.

4.2.4 Environmental Profile of Lough Mask

SEA Topic	Description
Biodiversity, Flora and Fauna	Lough Mask is an excellent example of an oligotrophic lake. Aquatic and wetland plant species present which are characteristic of this habitat include several pondweed species (Potamogeton spp.), Water Lobelia (Lobelia dortmanna) and Shoreweed (Littorella uniflora). The eastern part of the lake is shallow and is edged by a lowlying shoreline which is subject to winter flooding. An intricate mixture of plant communities has developed on the limestone, with bare pavement, scrub-dominated pavement, dry grassland and heath. A variety of wetland habitats are also present, along with significant amounts of deciduous woodland along the eastern and southern shores. The western shoreline is less diverse and lacks the limestone communities. However, the fast flowing Owenbrin River has created at its mouth an interesting delta of coarse sandy sediment. . Arctic Char (which were once found in most of the 7 lakes are now only found in Lough Mask), Lough Mask is one of the most important inland gull breeding sites in the country, with nationally important populations of three gull species. It also has a nationally important colony of Common Tern. The site supports a good diversity of wintering waterfowl, including a nationally important population of Tufted Duck. The site is also regularly utilised by a proportion of the Erriff/Derrycraff population of Greenland White-fronted Goose. The occurrence of three species, Whooper Swan, Greenland White-fronted Goose and Common Tern, is of note as these species are listed on Annex I of the E.U. Birds Directive. Part of Lough Mask SPA is a Wildfowl Sanctuary.
Water	Lough Mask is located within the WFD sub-catchment Cong_010. The main inflowing rivers are the Cloon and Robe, and the stream from Lough Carra to the north-east. The main outflow is to Lough Corrib to the south. The eastern part of the lake is edged by a low-lying shoreline which is subject to winter flooding but is considerably deeper on the western side where there is a long narrow trench with a maximum depth of 58 m. The water of the lake is moderately hard 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.
Soil and Geology	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) Soils surrounding the lough are primarily fine or coarse loamy drifts with siliceous stones or overlain on the limestone bedrock. Site Importance – County Geological Site, may be recommended for Geological NHA This County Geological Site is within the Lough Mask/Lough Carra Complex SAC (001774) and Lough Mask SPA (004062). The site is significant as it demonstrates a fine example of a solutional lake, wherein acidic waters, most probably draining eastwards from the uplands to the west, have contributed to the dissolution of the limestone. Glacial erosion may also have played a role in the development of the feature.[6]

[6] Hennessy et al. 2014 (revised 2019). Geological Survey Ireland

SEA Topic	Description
Population and Human Health	The largest town to Lough Mask is Ballinrobe, County Mayo, located to the east of the lake. Ballinrobe town is situated along the main Galway to Castlebar road at the junction of the N84 National Secondary Road and the R334 Regional Road. The population of Ballinrobe has more than doubled in size (112.8%) over the last twenty years, from 1,309 persons in 1996 (Census figures) to 2,786 persons in 2016 (Census figures). Ballinrobe is the 5th largest settlement in Mayo, the 19th largest in the Western Region and the 124th largest in the State. A dismantled railway line between runs between Ballinrobe and Claremorris, providing an opportunity to re-establish the line as a walking cycling route or as a spur of the Western Rail Corridor. Mayo County Council has carried out habitat mapping in Ballinrobe, which has informed the identification of Local Biodiversity Areas in the town, while an Action Plan has been prepared for Ballinrobe, aimed at conserving and enhancing the natural heritage of the town. The Bowers Walk is an important amenity for locals and visitors to Ballinrobe. This riverside walk stretches for approximately 3 kilometres along the River Robe starting at the bridge on Bridge Street towards Creagh Bridge and along the old towpath of the canal[7].
Air Quality and Climate	Lough Mask is located within Rural Zone D for Air quality.
Cultural Heritage	A rich and diverse archaeological record is associated with the Lough Mask and includes several crannogs, ecclesiastical site at Saint's Island, and a sweathouse at Derrymorel. Lough Mask has fewer designed landscapes and estates compared to the larger Lough Corrib but includes Petersburg House and Lough Mask House. Ballinrobe: The town has one of the highest concentrations of protected structures in Co.Mayo. This reflects the historic significance of the town and the important role these buildings play in defining its character and identity. The town has a relatively compacted form framed around a central urban block, with existing residential areas generally located outside of the town centre core. See Figure 4.8
Landscape	Lakeland Sub-policy Area 4A This distinctive area of the county comprises the landscapes of policy areas 3 and 4, which bound Lough Mask. It bounds often steep slopes and prominent ridge lines with limited shelter vegetation to the west and undulating areas of pasture, woodland and forest with underlying glacial drumlins to the east. Scenic routes and views are identified in the Mayo CDP 2022 2028 particularly along the western shoreline of Lough Mask. Islands are a feature of the lake, especially in the south-east sector.
Material Assets	Ballinrobe is served by the N84, R331 and R334 national and regional road network. The town is served by an existing municipal wastewater treatment plant (8,000PE) and a water supply from the Lough Mask Regional water supply scheme. There is sufficient capacity for the projected population increase as set out in the Core Strategy. The town also benefits from fibre optic broadband infrastructure (Metropolitan Area Network and VDSL broadband) and has a connection to the national gas grid. Figure 4.9 identifies the WWTP plants associated with Lough Mask & Lough Carra and the pollution impact potential via delivery points, and population density. The following WWTPs discharge to Lough Mask, none are identified as priority areas and are identified as having capacity for the settlements population equivalent

[7] Mayo CDP 2022-2028

SEA Topic	Description						
WWTP Name	Pop	Type	Treatment	Agglom PE	Capacity PE	Priority	Discharge to
Toormakeady	<500	Sewage Treatment	2 – Secondary Treatment	114	250	No	Glensaul River -> L Mask
Hollymount	<500	Sewage Treatment	2 – Secondary Treatment	192	192	No	Robe River -> L Mask
Roundfort	<500	Sewage Treatment	2 – Secondary Treatment	168	400	No	Robe River -> L Mask
Clonbur	>500	Urban Waste Water	2 – Secondary Treatment	395	710	No	Local stream -> L Mask
Ballinrobe Town	>500	Urban Waste Water + Sewage Treatment	3P – Tertiary P Removal	4291	8000	No	Robe River -> L Mask

4.2.5 Lough Carra

Overview

Lough Carra, which extends for over 9 km along its long axis, lies to the north-east of Lough Mask, in the Corrib catchment in Co. Mayo. 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)

4.2.6 Environmental Profile Lough Carra

SEA Topic	Description
Biodiversity, Flora and Fauna	Lough Carra is fringed by a diverse complex of limestone and wetland habitats. A wide range of wetland habitats occur around Lough Carra, including Cladium fen and alkaline fen. Great Fen-sedge (Cladium mariscus) occurs as pure stands in places but also grades into areas of alkaline fen, where it is intermixed with Black Bog-rush (Schoenus nigricans), Common Club-rush (Scirpus lacustris), Common Reed (Phragmites australis) and a number of sedge species (Carex spp.). The areas of alkaline fen are more extensive than the Cladium fens, and here Black Bog-rush is generally the dominant species. A rich diversity of flowering plant occurs in the fen communities. In addition to the fen habitats, there are sparse but widespread reed swamps, wet grassland and some freshwater marsh communities around the lake shores. Whiteclawed Crayfish (Austropotamobius pallipes), a species listed on Annex II of the E.U. Habitats Directive, has been recorded from Lough Carra. The islands in Lough Carra have traditionally supported nesting gulls. A survey in 1993 recorded Common Gull (72 individuals) and Black-headed Gull (252 individuals). The site was surveyed in 1999 as part of the Seabird 2000 Survey and 65 pairs of Common Gull and 100 pairs of Black-headed Gull were recorded. The site also supports wintering populations of a number of species including Wigeon (67), Gadwall (26), Teal (63), Mallard (140), Shoveler (38), Pochard (33), Tufted Duck (133), Goldeneye (64), Little Grebe (14) Great Crested Grebe (12) and Lapwing (243) – all figures are mean peaks for 4 of the 5 winters in the period 1995/96- 1999/2000. In the past, Lough Carra supported a population of Mallard of national importance. Part of Lough Carra SPA is a Wildfowl Sanctuary.

Water	Lough Carra is located within the WFD sub-catchment Aghinish_010. It is one of the best examples in Ireland of a hard water marl lake. It is a shallow (mean depth 1.5 m, maximum depth 18 m), predominantly spring-fed lake with only a few inflowing streams. It is connected to Lough Mask via the Keel River. The water has an alkaline pH and negligible amounts of iron and manganese. Sodium and chloride are present in relatively high concentrations. Lough Carra is classified as a mesotrophic system. Its well known pellucid green colour is due to calcareous encrustations. It has well developed stonewort communities in the submerged zones, with *Chara curta, C. desmacantha, C. rudis and C. contraria* recorded. The EPA assigned Lough Carra an overall draft ecological status of Good (Corcoran et. Al., 2020), 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 orthophosphate and Nitrogen levels and increased algal biomass in lake water samples.
Soil and Geology	The soils around Lough Carra are predominantly peat soils or loamy drifts over limestones.
Population and Human Health	Party is located on the westerns shores of Lough Carra, and Ballinrobe (described under Lough Mask) is the largest nearest town.
Air Quality and Climate	Lough Carra is located within Zone D Air Quality Zone Rural/
Cultural Heritage	31 crannogs are recorded within 150m of Lough Carra, along with tower houses, ecclesiastical sites including a church at Kilkeeran. Cloonee House once Lake View is a hunting lodge with gate lodge and the lake has a small number of features listed on the NIAH. See Figure 4.8
Landscape	Lakeland Sub-policy Area 4A This distinctive area of the county comprises the landscapes of policy areas 3 and 4, which bound Lough Mask. It bounds often steep slopes and prominent ridge lines with limited shelter vegetation to the west and undulating areas of pasture, woodland and forest with underlying glacial drumlins to the east. Highly scenic designations are identified for the northern part of Lough Carra.
Material Assets	The N84 traverses along Lough Carra. The following WWTPs discharge to Lough Mask, none are identified as priority areas and are identified as having capacity for the settlements population equivalent. Please see Figure 4x above for the WWTP plants associated with Lough Carra and the pollution impact potential via delivery points, and population density

WWTP Name	Pop	Type	Treatment	Agglom	Capacity	Priority	Discharge to
Hollymount	<500	Sewage Treatment	2 – Secondary Treatment	192	192	No	Robe River -> L Mask
Roundfort	<500	Sewage Treatment	2 – Secondary Treatment	168	400	No	Robe River -> L Mask
Ballinrobe Town	>500	Urban Waste Water + Sewage Treatment	3P – Tertiary P Removal	4291	8000	No	Robe River -> L Mask

FIGURE 4-8 LOUGH MASK AND LOUGH CARRA ARCHAEOLOGICAL AND BUILT HERITAGE

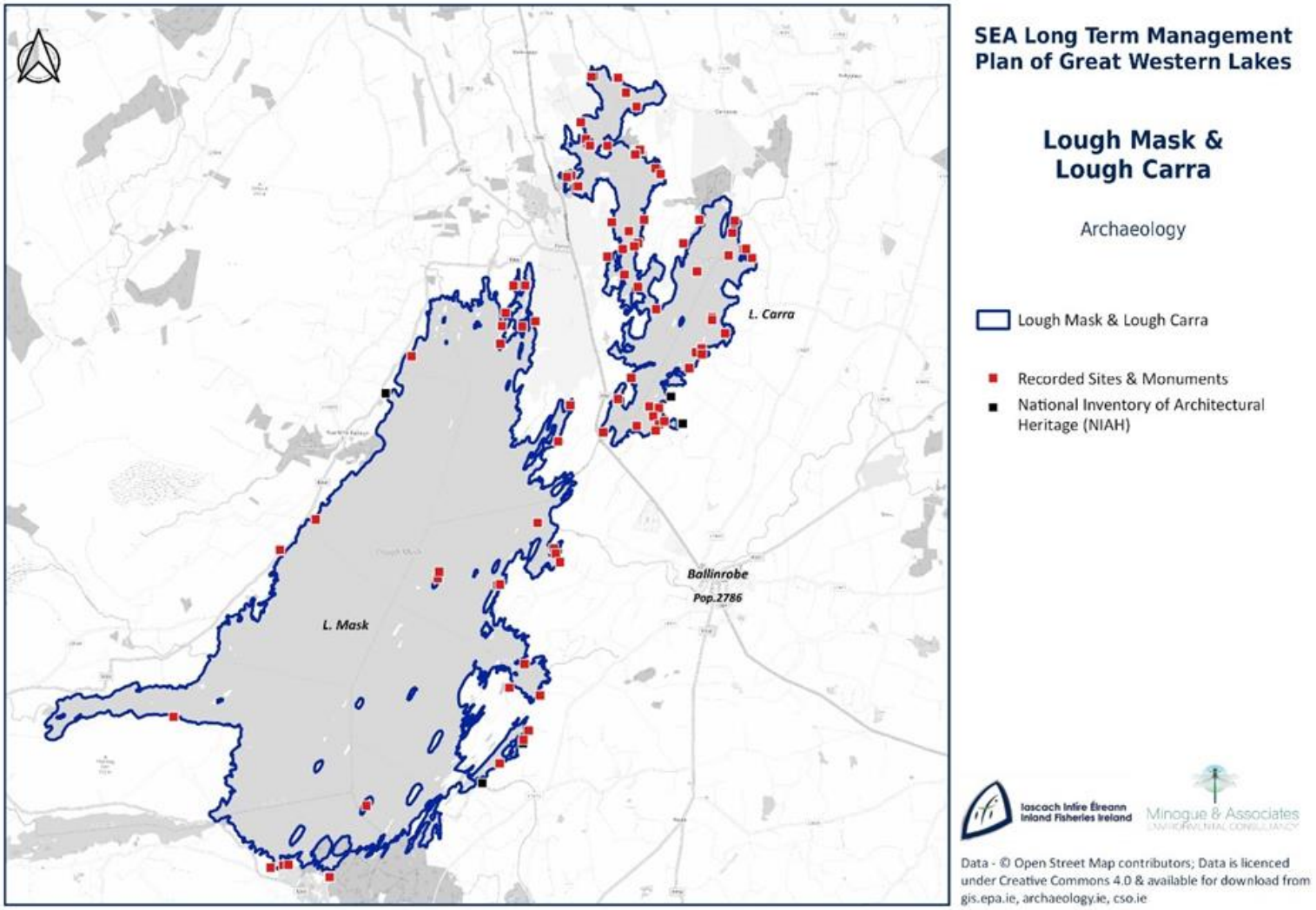
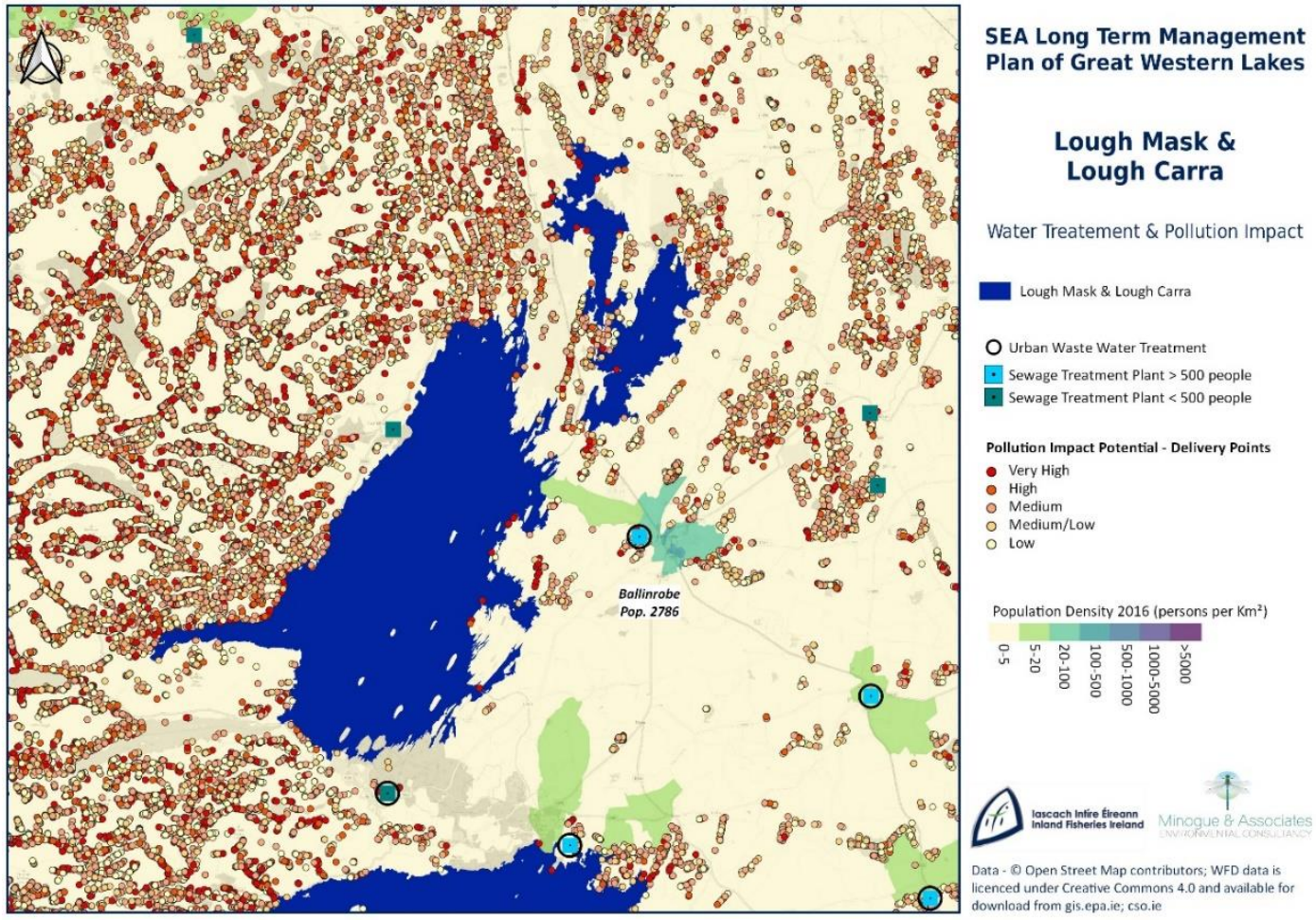


FIGURE 4-9 POLLUTION IMPACT POTENTIAL, EXISTING WWTPS AND POPULATION DENSITY



4.2.7 Moy and Killala Bay Catchment

This catchment includes the area drained by the River Moy and all streams entering tidal water in Killala Bay between Benwee Head and Lenadoon Point, Co. Sligo, draining a total area of 2,345km². The largest urban centre in the catchment is Castlebar. The other main urban centres in this catchment are Ballina, Tubbercurry, Kiltimagh, Swinford, Foxford, Enniscrone and Crossmolina. The total population of the catchment is approximately 77,262 with a population density of 33 people per km². The lowland parts of the catchment are underlain by various types of limestones while the upland areas from the Ox Mountains and Croaghmoyle are underlain by a band of igneous and metamorphic rocks. Much of the lowland area south of Lough Conn exhibits a drumlin topography. There are extensive sand and gravel aquifers lying between Swinford and Charlestown to as far south as Knock, to the east of Ballina and southwest of Crossmolina.

4.2.8 Lough Conn and Lough Cullin

Lough Conn and Lough Cullin are situated in north Co. Mayo and are connected by a narrow inlet near Pontoon. Both Lough Conn and Lough Cullin are part of an important salmonid fishery.

4.2.9 Environmental Profile Lough Conn and Lough Cullin

SEA Topic	Description
Biodiversity, Flora and Fauna	The open water of Lough Conn and Cullin is moderately hard with relatively low colour and good transparency. The phytpoplankton of the lake is dominated by diatoms and blue-green algae and there is evidence that the latter group is more common now than in former years. This indicates that nutrient inflow is occurring. The changes in Lough Conn appear to represent an early phase in the eutrophication process. Stoneworts still present include *Chara aspera, C. delicatula and Nitella* cf. *opaca.* Other plants found in the shallower portions include pondweed species (*Potamogeton* spp.). Where there is a peat influence Intermediate Bladderwort (*Utricularia intermedia*) is characteristic, while Water Lobelia (*Lobelia dortmanna*) often grows in sand. Narrow reedbeds and patches of Yellow Water-lily (*Nuphar lutea*) occur in some of the bays. The Arctic Char (*Salvelinus alpinus*), an interesting relict species from the last ice age, which is listed as threatened in the Irish Red Data Book has been recorded from Lough Conn and in only a few other lakes in Ireland. The latest reports suggest that it may now have disappeared from the site. Loughs Conn and Cullin support important concentrations of wintering waterfowl and both are designated Special Protection Areas (SPAs). A nationally important population of the Annex I species Greenland White-fronted Goose (average 113 over 6 winters 1994/95 to 1999/00) is centred on Lough Conn. Whooper Swans also occur (numbers range between 25 to 50), along with nationally important populations of Tufted Duck 635, Goldeneye 189 and Coot 464. A range of other species occur on the lakes in regionally important concentrations, notably Wigeon 303, Teal 154, Mallard 225, Pochard 182, Lapwing >1,000 and Curlew 464. Golden Plover also frequent the lakes, with numbers ranging between 700 and 1,000. Loughs Conn and Cullin are one of the few breeding sites for Common Scoter in Ireland. Breeding has occurred on Lough Conn since about the 1940s when about 20- 30 pairs were known. A census in 1983 recorded 29 pairs. Breeding was first proved on Lough Cullin in 1983 when 24 pairs were recorded. In 1995, 24-26 pairs were recorded at Lough Conn and 5 pairs at Lough Cullin. The latest survey in 1999 gives a total of 30 birds for both lakes, comprising only 5 pairs, 18 unpaired males and 2 unpaired females. The reason for the decline is not known but may be due to predation by mink, possible changes in food supply and/or redistribution to other sites. The Common Scoter is a Red Listed species.

SEA Topic	Description
Water	The main inflowing rivers to Lough Conn are the Deel, the Addergoole and the Castlehill. Lough Conn is located with the WFD sub-catchment Moy_80. The lakes have a number of small islands. 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. Lough Conn is classified as good status under the most recent WFD monitoring whilst L. Lough Cullin was assigned an ecological status of Moderate following the most recent WFD survey (2018) based on the fish populations present.
Soil and Geology	Lough Cullin: The underlying geology of the lake is mainly granite with some areas of limestone present in the southern region of the catchment (NPWS, 2004). Whilst the larger River Moy complex of which Lough Cullin is part of is predominantly underlain by Carboniferous limestone, with areas of Carboniferous sandstone, Dalradian quartzites and schists also present The complex geology In this catchment is reflected in the soil diversity with, loamy soils with gneiss and schists around the western areas, predominantly peat soils around the south, and carse loamy drift with siliceous stones to the east.
Population and Human Health	Foxford and Crossmolina are the closest towns to both lakes, whilst Ballina, a key town is located to the northeast. Crossmolina is situated on the Deel River, along the northern shores of Lough Conn, approximately 9 km west of Ballina. The town is located at the intersection of the N59 and the R315, a location from which there is ease of access to some of the most scenic places in Ireland, including Lough Conn, the Nephin Mountains and Ballycroy National Park. Crossmolina is the 2nd largest town in north Mayo and the 10th largest settlement in Mayo. The population of the town has marginally decreased (5.3%) over the last twenty years, from 1,103 persons in 1996 (Census figures) to 1,044 persons in 2016 (Census figures). The town functions primarily as a service town and provides a range of services and facilities to meet the needs of the local population. Community services within and close to Crossmolina include a national school, two secondary schools. St. Tiernan's College also provides adult education courses in the form of PLCs. Crossmolina is served by the N59 and R315 road network, which directly connects the town to the large urban centres of Ballina and Castlebar. It is served by an existing municipal wastewater treatment plant (3,150PE) and a water supply from the Lough Conn and Tobermore Well and there is sufficient capacity in this infrastructure, to accommodate additional population increases in the town over the plan period. Foxford is located in north-east Mayo, at the intersection of the N26 and N58, national routes, on the River Moy, approximately 16 km south of Ballina. Foxford is the 8th largest settlement in Mayo and the population of the town has significantly increased (39.3%) over the last twenty years, from 944 persons in 1996 (Census figures) to 1,315 persons in 2016 (Census figures). Foxford is located on the site of an ancient settlement that grew around a crossing point on the River Moy.. The modern town of Foxford is inextricably linked with and shaped by the fortunes of the Providence Woollen MillsThe
Cultural Heritage	Lough Conn: ritual sites and penitiental stations are recorded at Knockmaria or Addergoole within 150m of Lough Conn. As with the other lakes, crannogs are a frequently recorded features, plus an Augustinian house at Tirawley Bay. Lough Cullin: Crannogs are the most frequently recorded archaeological sites on Lough Cullin with one fortification recorded at Illanee Island. Pontoon has two sites on the NIAH, the former barracks and the Lodge, formerly the Pontoon Hotel. See Figure 4.10

SEA Topic	Description
Air Quality and Climate	As part of the project a national water temperature monitoring network was initiated in 2019. To date 12 index catchments (rivers and lakes), two catchments are included in this plan (i.e. Moy (Conn and Cullin) and Inny (Sheelin) (Barry et al., 2022) have been instrumented
Landscape	Areas Designated as Highly Scenic Vistas are identified around Lough Conn and Cullin in the Mayo CDP 2022-2028 The two lakes lie within the East Mayo Uplands landscape unit in the above CDP: This area is primarily made up of rugged hill country, which provides for low quality pastural land uses. It progresses from low-lying54enudated drumlins around the shores of Lough Conn and Lough Cullin, to rugged hill country where it forms the foothills at the south western end of the Ox Mountains Localised Lake Vistas are identified in the CDP as follows: This character unit envelopes parts of both Lough Conn and Lough Cullin, around the shores of which, several major roads pass. Due to the low-lying nature of54enudated environments such as this, low prospect vistas are available from the roads of the Lough and its shores. The main concern for natural linear features such as lakeshores, coastlines, and ridgelines is to avoid penetration by development that will interrupt and reduce the integrity of such elements. Given the low viewing points around the Loughs, visual intrusion by development is likely to be enhanced.
Material Assets	Three national roads run east and north of the lakes – the N58, N26 and N59. The following WWTPs discharge to Lough Conn and Cullin, none are identified as priority areas and are identified as having capacity for the settlements population equivalent. Please see Figure 4x above for the WWTP plants associated with Lough Carra and the pollution impact potential via delivery points, and population density. See Figure 4.11.

WWTP Name	Pop	Type	Treatment	Agglom	Capacity	Priority	Discharge to
Lough Conn							
Crossmolina	>500	Urban Waste Water + Sewage Treatment	3P–- Tertiary P Removal	1661	3150	No	River Deel -> L. Conn
Lahardane	>500	Urban Waste Water + Sewage Treatment	3P–- Tertiary P Removal	243	500	No	Castlehill River -> L. Conn
Lough Cullin							
Turlough	<500	Sewage Treatment	2–- Secondary Treatment	340	360	No	Castlebar River flows to L Cullin
Bellavary	<500	Sewage Treatment	2–- Secondary Treatment	320	320	No	Toormore River flows to L Cullin
Castlebar	>500	Urban Waste Water + Sewage Treatment	3NP–- Tertiary N&P Removal	18123	28000	No	Toormore River flows to L Cullin

SEA Topic		Description					
Kiltimagh	>500	Urban Waste Water + Sewage Treatment	3P–- Tertiary P Removal	1596	3333	No	River Pollagh flows to L Cullin

FIGURE 4-10 LOUGH CONN AND LOUGH CULLIN ARCHAEOLOGICAL AND BUILT HERITAGE

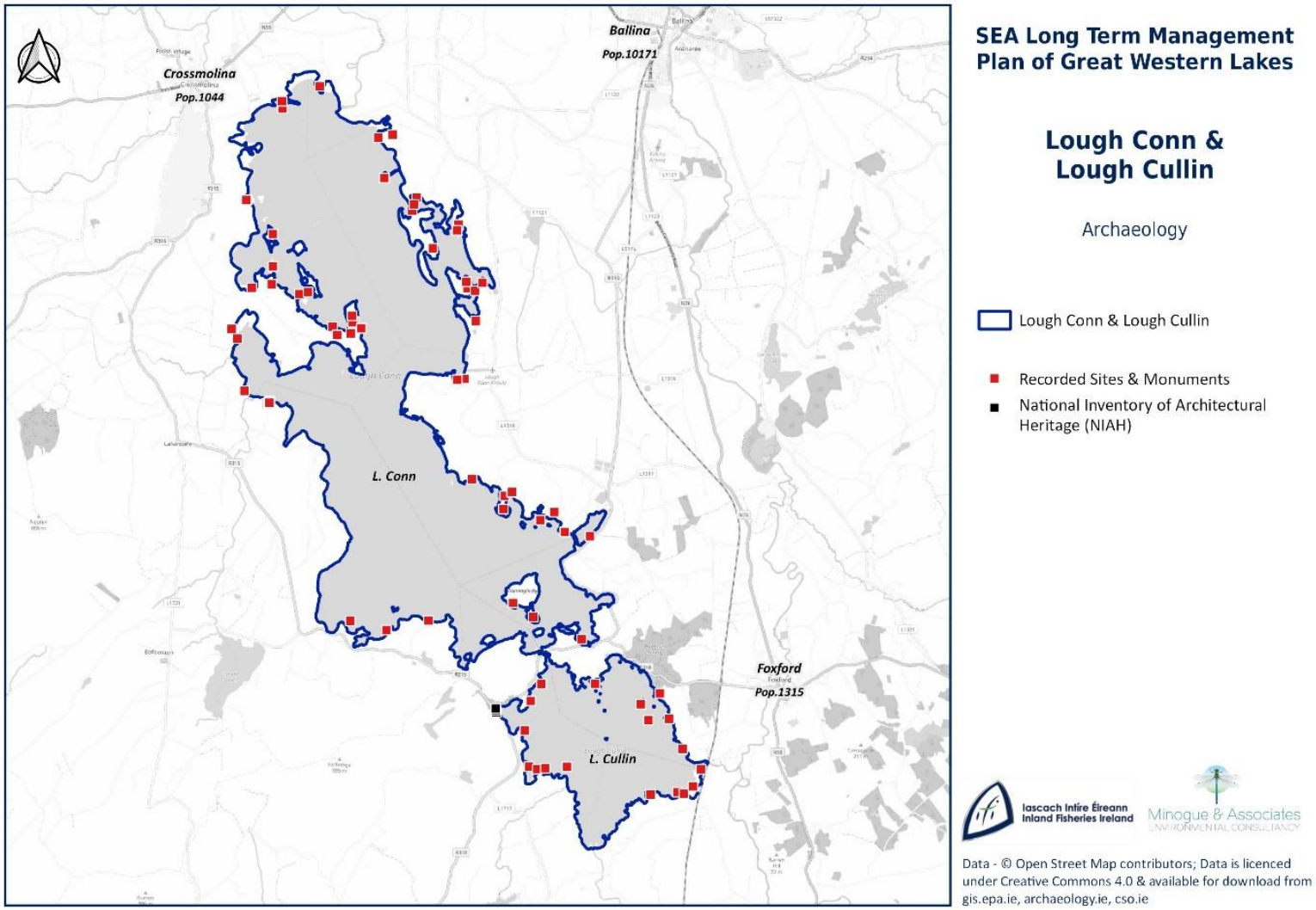
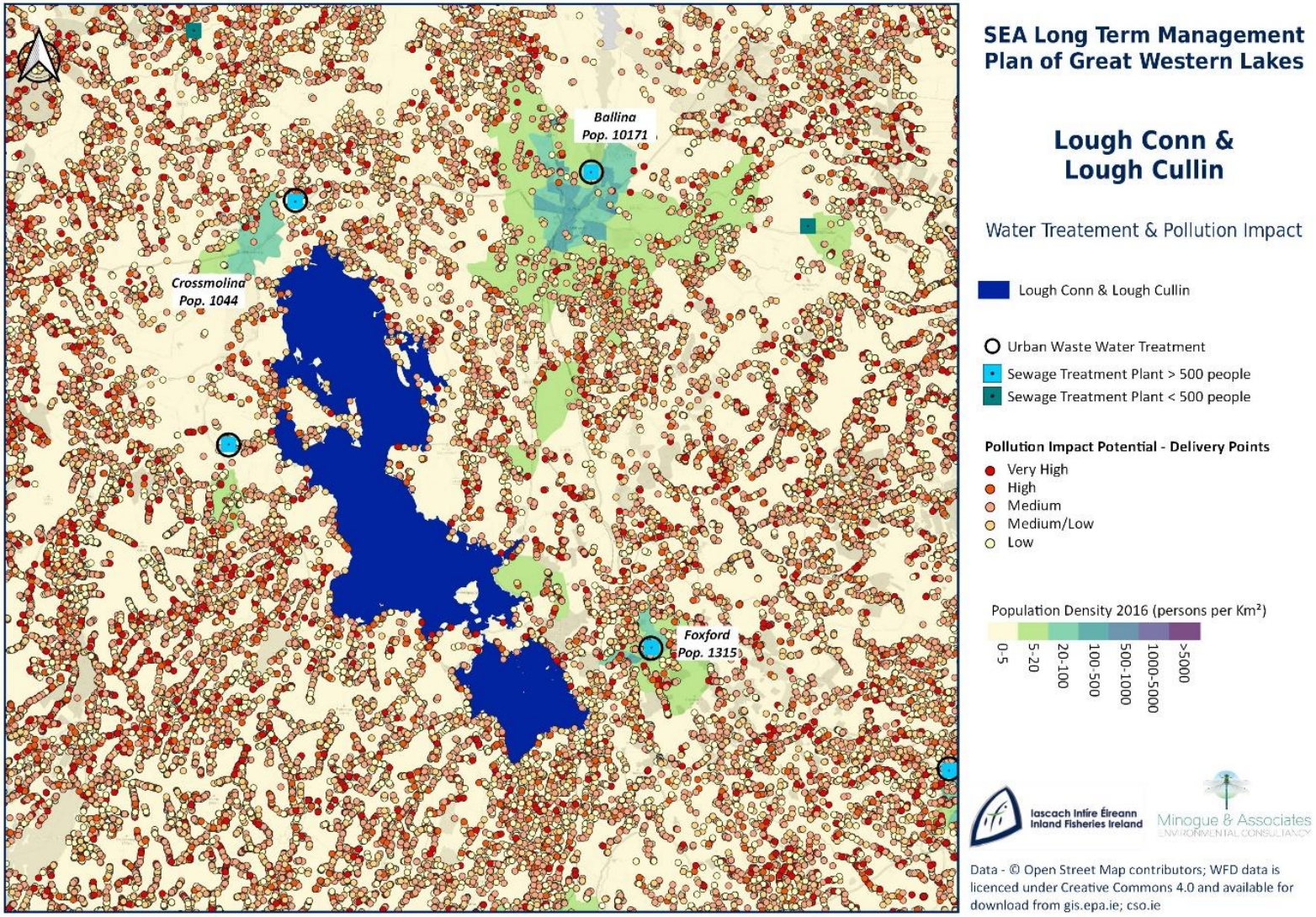


FIGURE 4-11 POLLUTION IMPACT POTENTIAL, EXISTING WWTPS AND POPULATION DENSITY



4.3 Sligo Bay and Drowse catchment, Unshin sub catchment

The Sligo Bay & Drowes catchment includes all streams entering tidal water in Sligo Bay and between Lenadoon Point and Aughrus Point, Co. Donegal. The catchment has a surface area of 1,866km² (Figure 1). The largest urban centre is Sligo. The other main urban centres are Ballymote, Collooney, Ballysadare and Manorhamilton. The total population is approximately 59,184 with a population density of 32 people per km².[8]

4.3.1 Lough Arrow

Lough Arrow, located in Counties Sligo and Roscommon, is a large limestone lake that conforms to a type listed on Annex I of the E.U. Habitats Directive. The lake is sheltered on three sides by hills and is the source of the Unshin River.

SEA Topic	Description
Biodiversity, Flora and Fauna	The shores of Lough Arrow are for the most part stony. Several bays occur in which Common Club-rush (*Scirpus lacustris*) and Common Reed (*Phragmites australis*) are found in abundance. In places the reedbeds extend out into the lake and Bogbean (*Menyanthes trifoliata*) and Yellow Iris (*Iris pseudacorus*) also occur. The lakeshore vegetation, which includes sedges (*Carex* spp.), Water Mint (*Mentha aquatica*) and Water Horsetail (*Equisetum fluviatile*), grades into areas of mossy boulders and woodland. The lakes support a diverse submerged aquatic flora. An area of wet woodland in the north-west of the site is dominated by willows (*Salix* spp.) and some Alder (*Alnus glutinosa*) occurs also. The ground flora is composed of Yellow Iris, Common Reed, rushes (*Juncus* spp.), Marsh-marigold (*Caltha palustris*), sedges and Common Marsh-bedstraw (*Galium palustre).* Areas of dry woodland to the north and south of the lake are also included in the site. The dominant species here are Ash (*Fraxinus excelsior),* Blackthorn (*Prunus spinosa*), Hawthorn (*Crataegus monogyna)* and Sycamore (*Acer pseudoplatanus*). The ground flora includes Herb-Robert (*Geranium robertianum*), Bramble (*Rubus fruticosus* agg.), Great Wood-rush (*Luzula sylvatica*), Cleavers (*Galium aparine*), Primrose (*Primula vulgaris),* and a variety of fern, moss and liverwort species. The wooded islands and some areas along the shore are used by nesting Tufted Duck , the reedbeds are also used by nesting wildfowl. In winter the lake is frequented by flocks of Tufted Duck (226), Coot (325), Little Grebe (35), Wigeon (87), Mallard (27), Pochard (36) and Goldeneye (49) (data for 2 counts over 1 season, 1984/85–- 1986/87). Lough Arrow supports the highest density of breeding Great Crested Grebe, Merganser and Tufted Duck of any of the large lakes in western Ireland. The lake is notable for its Brown Trout and Eel populations, both of which are fished. Otter, a Red Data Book species which is legally protected under the Wildlife Act, 1976, and is listed on Annex II of the E.U. Habitats Directive, has been recorded at the site.
Water	Lough Arrow is located within the WFD sub-catchment Unshin_SC_010. Lough Arrow is unusual in being a mesotrophic natural lake which has changed little in the last 40 years. It is largely spring-fed and very sheltered for its size, and, as such, is hydrologically different from most other lakes. Lough Arrow was assigned an ecological status of Good in 2018 based on the fish populations present. Water quality has since deteriorated from good to Moderate Status.
Soil and Geology	The dominant rock types in Sligo belong to the Carboniferous System (355 – 310 Ma). Carboniferous limestones are often easily dissolved by surface water or groundwater. Soil type around Lough Arrow is mainly drumlins with gleys.

[8] Sligo Bay & Drowes (catchments.ie) Accessed 08.04.2023.

SEA Topic	Description
Population and Human health	The nearest large towns are Boyle, south of Lough Arrow and Ballymote to the west of the lake. Settlement closer to the lake is dispersed with small villages of Castlebaldwin and Toberbride.
Air Quality and Climate	Lough Arrow is within Air Quality Zone D Rural .
Cultural Heritage	A church, graveslabs and font are present in the townland of Aghanagh within 150m of Lough Arrow. As with the other lakes crannogs are a common feature and Iniss supports a motte and castle. Hollybrook House is the only NIAH structure within 150m of Lough Arrow. See Figure 4.12
Landscape	The Sligo CDP identifies Lough Arrow as including visually vulnerable areas (around shoreline) and scenic routes from the N4. The rest of the lake is identified as normal rural landscape.
Material Assets	The N4 runs to the west of Lough Arrow. Lough Arrow is an important water source in terms of provision of potable water supply in three large group water supply schemes serving a large rural hinterland. The following WWTPs discharge to Lough Arrow and is not identified as priority areas and are identified as having capacity for the settlement's population equivalent. Please see Figure 4/13 below for the WWTP plants associated with Lough Arrow and the pollution impact potential via delivery points, and population density.

NAME	PopE	PLANT	TYPE	Agglommeration PE	Capacity PE	Priority	Discharges to
Ballinafad & Environs	<500	Sewage Treatment	2–- Secondary Treatment	130	150	No	Percolation area -> Ballinafad River -> Lough Arrow

FIGURE 4-12 LOUGH ARROW ARCHAEOLOGICAL AND BUILT HERITAGE

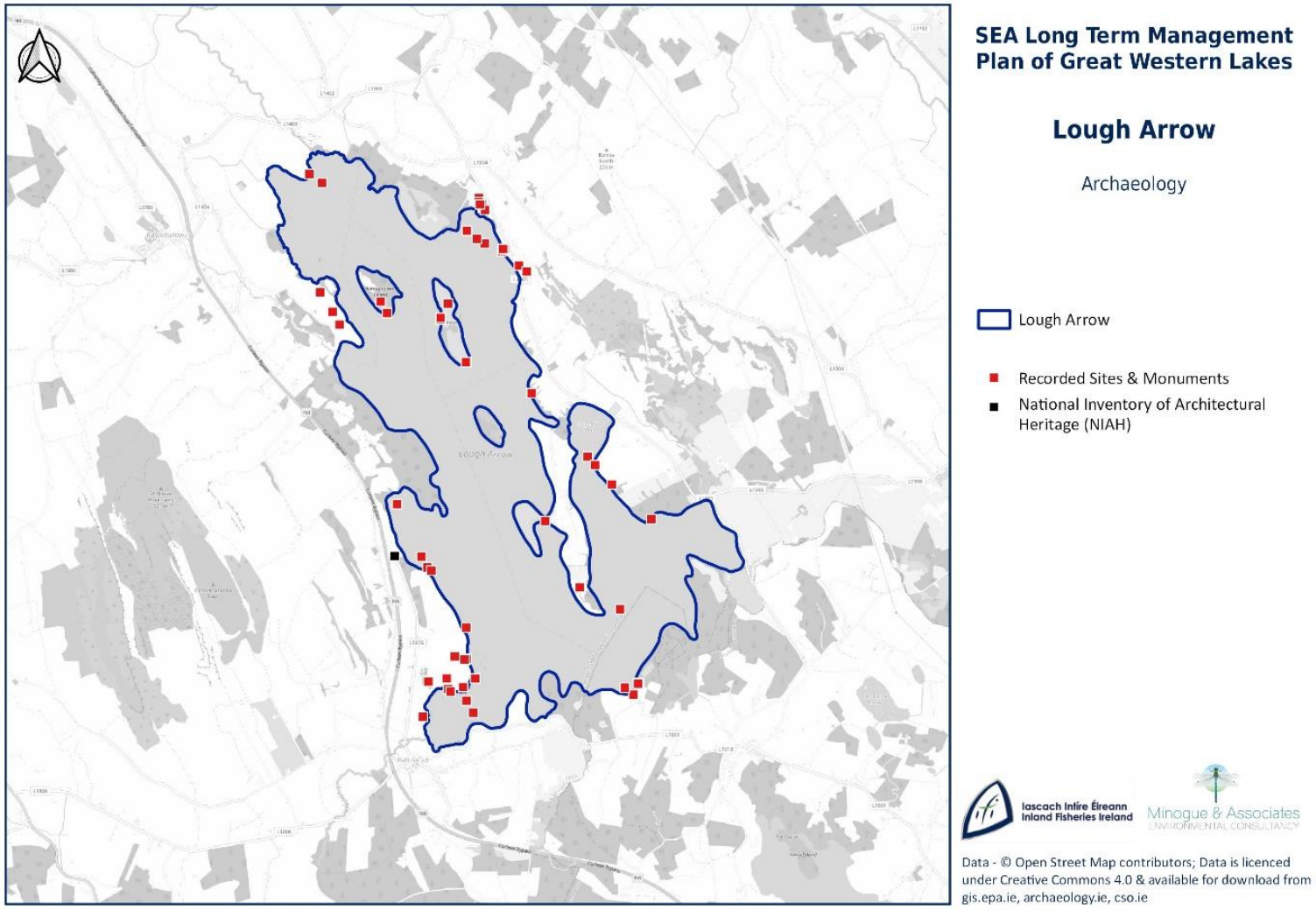
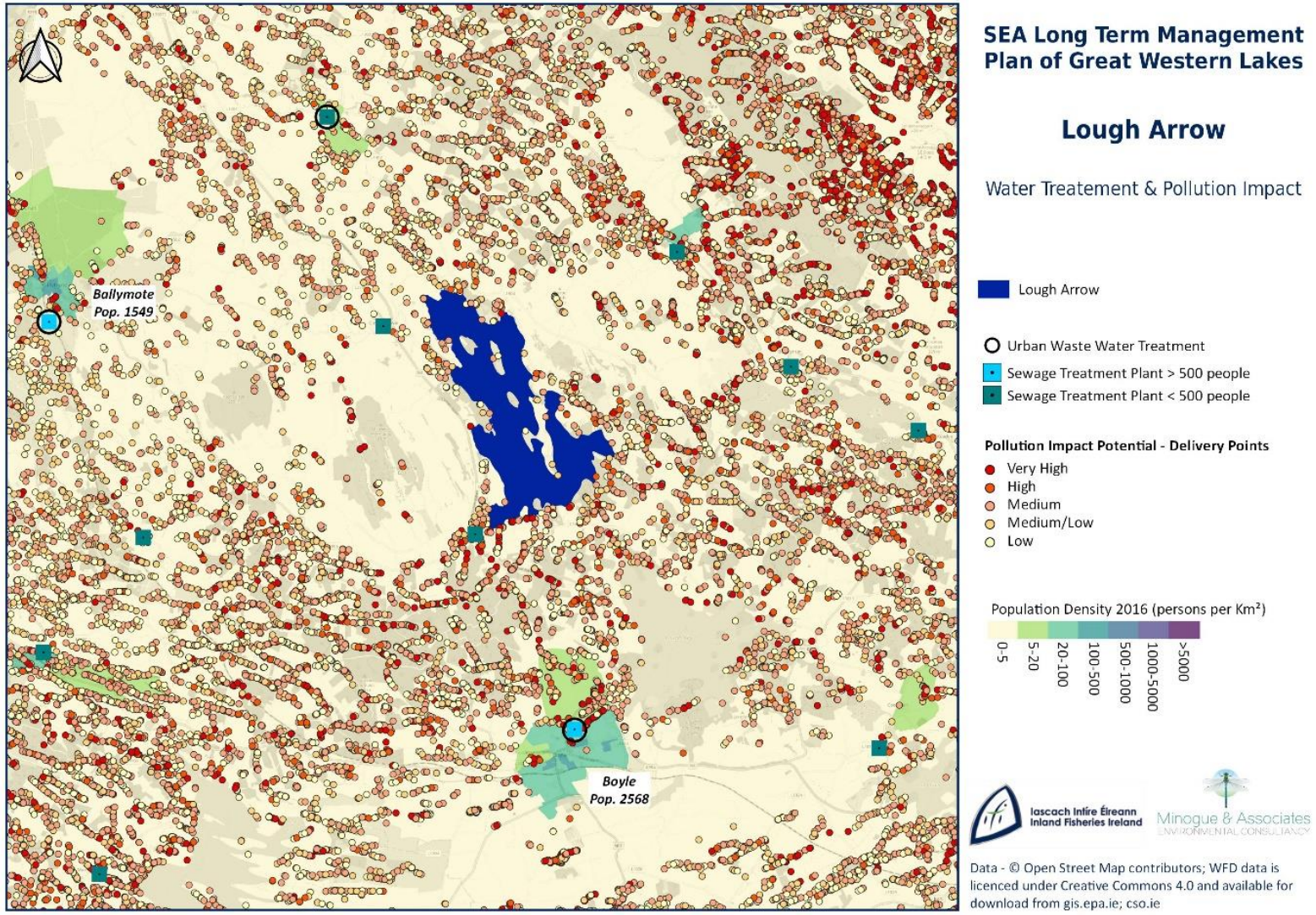


FIGURE 4-13 POLLUTION IMPACT POTENTIAL, EXISTING WWTPS AND POPULATION DENSITY



4.4 Upper Shannon catchment, Inny (Shannon) sub-catchment

4.4.1 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

SEA Topic	Description
Biodiversity, Flora and Fauna	The shore of the lake is wooded in places and there are some very small offshore islands with willows (Salix aurita and S. cinerea). The islands are fringed by swamp communities of Common Reed (Phragmites australis), Common Clubrush (Scirpus lacustris) and Bottle Sedge (Carex rostrata). A good range of Charophytes has been recorded from the lake, including Chare62enudatea, a Red Data Book species. The raised bog at Clareisland consists of a small, linear high bog extending along the shore of Lough Sheelin with only limited cutover areas to the east and west. There is an extensive wet area with frequent pools on the high bog and there is a slight slope towards the semi-natural lake margin. Clareisland Bog has a semi-natural margin with Lough Sheelin and an extensive wet area with a high cover of bog mosses and pools. Most of the pools are infilling with Bog Asphodel, White Beak-sedge and bog mosses. Great Sundew and the bog moss S. cuspidatum occur in the pools and other bog moss species occur at the pool edges, especially S. capillifolium, S. papillosum, S. magellanicum and the rare S. fuscum. The lichen Cladonia portentosa is common, along with Bog-rosemary and Cranberry growing through the bog mosses. The semi-natural margin is dominated by tall Heather with lush carpets of the moss Hypnum jutlandicum and large hummocks of the bog moss S. capillifolium. There are many deep cracks in the peat due to subsidence at the lake margin. A thin margin of Gorse (Ulex europaeus) and Downy Birch (Betula pubescens) scrub occurs at the lake edge. Lough Sheelin is a nationally important site for four species of wintering wildfowl and is one of the main Midlands lakes sites for wintering birds. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Great Crested Grebe, Pochard, Tufted Duck and Goldeneye. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.
Water	Lough Sheelin is located within the WFD sub-catchment Inny(Shannon)_010.The lake was assigned a fish ecological status in 2017, this is an improvement on previous years when it was assigned a fish ecological status of moderate. In the 2013 to 2018 Water Framework Directive surveillance monitoring reporting period, the EPA assigned Lough Sheelin an overall ecological status of Good.
Soil and Geology	The geology of the catchment is predominantly Carboniferous limestone, but Silurian/Ordovician formations underlie the western and northern drainage basin.
Population and Human health	The small settlements of Mountnugent, Ross and Finea are the closest villages to the lake. The largest town is Granard further west in County Longford.
Air Quality and Climate	Significant monitoring infrastructure has been installed in Lough Sheelin (e.g. real time data buoy monitoring temperature, dissolved oxygen and chlorophyll a) for monitor

SEA Topic	Description
	surface water and climate change; and there are plans to complement this infrastructure with novel real time monitoring instruments in two inflowing rivers in spring 2023. The lake is located within Zone D Rural Air Quality.
Cultural Heritage	Of the 14 archaeological records within 150m of the lake, 9 are crannogs. The boathouse associated with Ross House is the only structure listed on the NIAH within the 150m buffer of the lake. See Figure 4.14
Landscape	Lough Sheelin is located within the Inny River Lowlands in the Westmeath CDP 2021-2027.
Material Assets	The following WWTPs discharge to Lough Sheelin, are are not identified as priority areas. Ballyjamesduff WWTP does not have capacity for the current population equivalent of 3324 (capacity is 2200). Please see Figure 4.15 below for the WWTP plants associated with Lough Arrow and the pollution impact potential via delivery points, and population density.

NAME	PopE	PLANT	TYPE	Agglommeration PE	Capacity PE	Priority	Discharges to
Mountnugent	<500	Sewage Treatment	2–- Secondary Treatment	46	350	No	Mountnugent River -> L Sheelin
Ballyjamesduff	>500	Urban Waste Water + Sewage Treatment	3P–- Tertiary P Removal	3324	2200	No	Pound Stream

Figure 4-14 Lough Sheelin Archaeological and Built Heritage

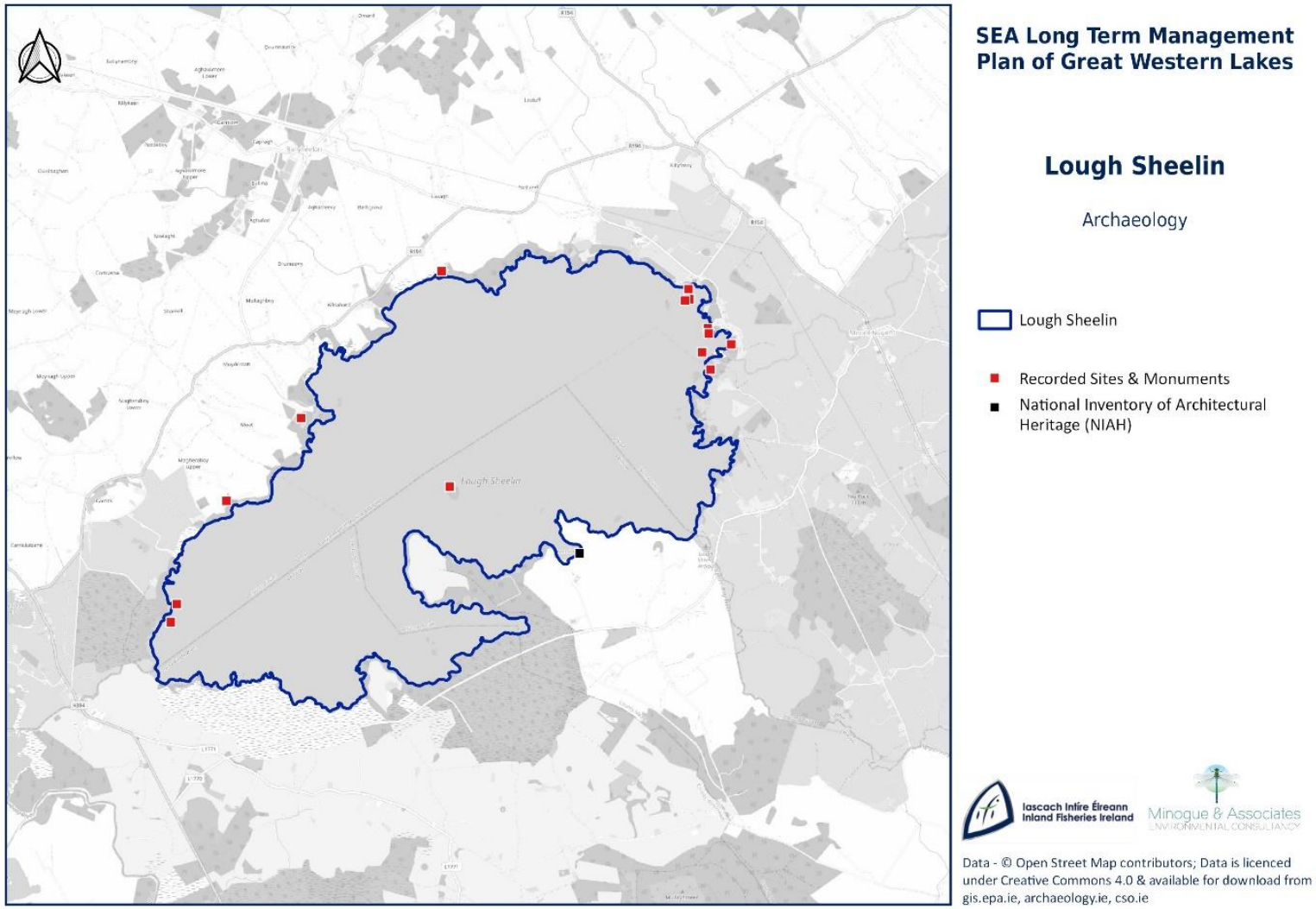
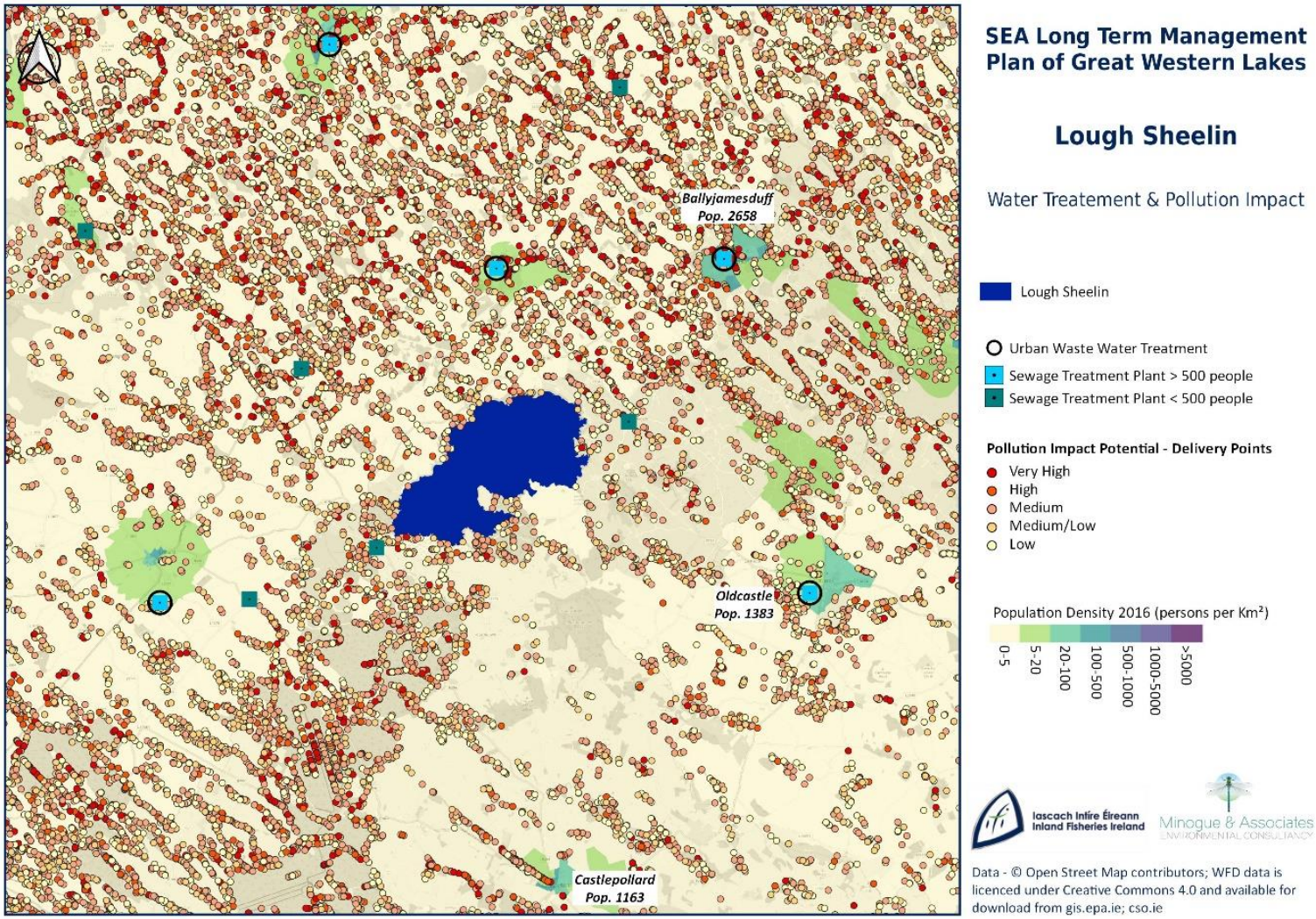


Figure 4-15 Pollution Impact Potential, Existing WWTPs and Population density



4.5 Other sensitive 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 and other rare native fish species are severely threatened. Problems associated with invasive fish introduction, water quality pressures 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.

4.6 Key Environmental Issues

4.6.1 Water Quality[9]

Water Quality is the most important factor influencing the ecological health of the western lakes, Their wider catchments and the fish communities they support. It has been declining in some areas and rivers over the last 3 decades although a rating of good status was assigned to all but one of these (L. Cullin) based on the most recent WFD-fish stock surveys.

However, the disappearance of Arctic char, periodic algal blooms and the failure of many of the Annex1 habitats and Annex 2 species associated with the Western lakes to meet their conservation objectives under the Habitats Directive, indicate that water quality on the western lakes and their wider catchments is not in a sustainable condition in the long term.

The sources of pollution have changed over recent decades with point sources, e.g., wastewater treatment plants and diffuse sources, e.g. septic tanks being significant issues in the past. These pressures are usually known and generally subject to monitoring and risk assessment by the relevant public authority.

Although some water quality pressures still arise from these sources, the principal concern is now related to nutrient loss from agricultural lands with forestry being a more significant pressure in areas of low agricultural activity. Degraded hydromorphology, (i.e. from barriers or physical damage caused to watercourses) is also a significant pressure in the western lakes catchments). This impact is often a cause for the failure of waterbodies to achieve good ecological status under the provisions of the Water Framework Directive and can also compound nutrient problems.

Significant areas of marginal land within the western lakes catchments have been reclaimed for use in intensive agricultural enterprises and the increased application of fertilisers and slurries on these lands has led to excessive inputs of Nitrogen and Phosphorus to many watercourses.

Salmonids are the most sensitive group of fish to pollution and so are most profoundly impacted by water quality and hydromorphology problems.

The 3rd cycle of River Basin Management Plan (RBMP) for the period of 2022-2027 is currently being prepared by Department of Housing, Local Government and Heritage (DHLGH) in line with the EU Water Framework Directive (WFD) (2000/60/EC). The Third Cycle Draft River Basin Management Plan 2022-2027 Consultation Report has been published. Key issues raised within the ten most prominent themes are summarised below.

Water Quality / Pollution – Key issues raised included the need for clear water governance and adequate investment; lack of specific measures to improve water quality in the plan; inefficient liaison with water stakeholders; transparency from authorities working in the water sector; large number of

[9] Text from IFI Draft Conservation Management Plan for Great Western Lakes

water bodies being subjected to wastewater pollution and extensive arterial drainage; lack of prosecution for defaulters and impact of water quality on public health.

Agricultural Practices – Key issues raised included the lack of recognition of the conflict between agriculture and WFD targets; urgency related to nutrient pollution; need for better incentives for farmers to promote good practices; stronger enforcement; need for WFD specific farm assessments; and the heavy reliance on Agricultural Sustainability Support and Advisory Programme (ASSAP).

Public Engagement and Awareness – Key issues raised included the inadequate public participation measures in the plan; need for a comprehensive, transparent, and participative public engagement programme; role for citizen science programmes and community involvement with provision of appropriate funding for same; and the need for simple and effective complaints channel for the public to report any pollution event. The importance of education in relation to water quality, agricultural practices, and invasive species was also raised in submissions.

Local Authority – A lot of issues were highlighted in relation to the Local Authorities including lack of funding; lack of adequate resourcing; availability of training to deliver necessary measures; role of Local Authorities to sustain, drive, fund, and coordinate community involvement; development and implementation of the proposed catchment management plans.

Level of ambition – The key issues raised on this issue in the submissions was that the level of ambitions in the plan is considered inadequate. It was noted that there is a need for measures to be more targeted, measurable, timebound and based on more Key Performance Indicators (KPIs). More focussed targeted climate change measures dealing with flooding, sea level rise and storage/reservoirs along with coastal specific measures were also recommended.

Sewage Pollution – Key issues raised included the onerous and strict nature of the grant application process for domestic waste water treatment system (DWWTS); more investment and inspectors for proper inspection of all the malfunctioning DWWT setups; the need for the Irish Water Investment Plan to end sewage pollution from all the waste water treatment plants identified as the main pollution source; and the urgent need for upgrade or replacement of specific WWTP was noted.

Department / Agency – Key issues included the need for every department/agency to carry out an internal review in respect of its role under the RBMP; the RBMP must ensure that a joined-up approach is taken to the preservation of water quality and waste water management; a single lead agency must be identified and resourced adequately to monitor and uphold key performance metrics for successful implementation of the plan.

Co-ordination – Key issues were the need for greater coordination among the implementation bodies in particular Local Authorities and the Department of Agriculture, Food and the Marine (DAFM); the imperative of policy coherence between water, climate and biodiversity plans and measures; clarity on the responsibilities of different stakeholders towards the improvement of water quality; requirement for a strong collaborative approach; and the need to work positively with the farming sector to deliver improvements in water quality.

Funding – References were related to the significant need for appropriate funding and resourcing to deliver necessary measures.

Forestry – Key issues included the requirement for WFD specific assessment and site-specific conditions for all planting and felling licences in the forestry sector.

Peat – Requirement for a list of all waterbodies that have been impacted by peat extraction to be included in the plan, need for peat-specific targets, prohibition of wetland drainage, need for a National Wetland Restoration Plan; and incentives and grants to support such measures.

Shellfish waters / aquaculture – Better integration for shellfish waters / aquaculture in the plan; need for all potential pressures from aquaculture to be included in the plan and need for effective monitoring to be put in place.

Other – Requirement of restoration programme including re-meandering, re-establishment of natural riparian zones etc.; urgency to halt the release of hazardous substances into waterbodies; constant need for compliance assurance and need for proper monitoring to track the progress of plan implementation etc.

The links between water quality, invasive species such as Roach which thrive in lakes with with poor or deteriorating water quality and interactions with climate change are a complex and significant environmental issue facing all the Great Western lakes.

TABLE 4-1SUMMARY FROM DRAFT 3RD CYCLE CATCHMENT REPORT[10]

Catchment	Summary
Corrib Catchment Lough Corrib Lough Mask Lough Carra	Morphological impacts and excess nutrients remain the most prevalent issues in the Corrib Catchment with each impacting 27 and 18 waterbodies respectively in Cycle 3. For lake waterbodies, the main significant issues are nutrient pollution (2), sediment (2) and morphological impacts (2). For the At Risk groundwater bodies the significant issue is nutrient pollution and diminution of quality of associated surface waters for chemical reasons, which are impacting all four groundwater bodies. Of the three lakes within this catchment, Lough Mask is at significant pressure from agriculture, and domestic wastewater, whilst a number of rivers that drain to the lakes are identified as pressure from a variety of anthropogenic sources including hydromorphology, agriculture and domestic wastewater. Currently all three lakes are classified as being of 'good' ecological status in 2019. Lough Corrib Upper, and Carra are not identified as being 'at risk' of not meeting the WFD 2027 good ecological status, however Lough Mask is identified as being at risk of not meeting this WFD 2027 status. Lough Mask and Lough Carra are identified for Priority Actions under the draft 3rd WFD action plan for the following reasons: Lough Carra: *Existing Review Priority Area for Action. Keep however focus will be on inputting catchment & continued Review of research or project results by others for this lake. IFI: Important brown trout lake.* Lough Mask: *At Risk WB. HSO. Focus will be on inputting catchment & will work with IFI. important lake for Arctic char and brown trout*
Moy and Killala Bay Catchment Lough Conn and Lough Cullin	A summary of issues for the water bodies at risk in this catchment is presented below: Excess nutrients and morphological impacts remain the most prevalent issues in the Moy and Kilalla Bay catchment with each impacting 30 waterbodies in Cycle 3. Sediment is impacting 15 waterbodies, and hydrological and organics are impacting eight and seven waterbodies, respectively. For rivers, the main significant issues are morphological impacts (28), nutrient pollution (25), sediment (13), organic pollution (7) and hydrological impacts (7). • For Lakes, the main significant issues are nutrient pollution (2), sediment (2), morphological impacts (1) and hydrological impacts (1). o For the only At Risk transitional waterbody (Moy Estuary) the significant issue is nutrient pollution. O For the two At Risk groundwater bodies (Clare-Corrib & Cong-Robe) the significant issues are nutrient pollution and diminution of quality of associated surface waters for chemical reasons. Both Lough Conn and Lough Cullin are identified as being at risk of not meeting the WFD objectives in the draft 3rd

10

Catchment	Summary
	cycle of the WFD[11] monitoring and are identified for Priority actions under the draft 3rd WFD cycle for restoration for the following reasons: *Existing Priority Area for Action Water Body. Important lake for brown trout and other fish species, under pressure from invasives, and other factor*
Sligo Bay and Drowse Catchment Lough Arrow[12]	Excess nutrients remain the most prevalent issue in the Sligo Bay & Drowes Catchment impacting 22 waterbodies in Cycle 3 and morphological issues are impacting 17 waterbodies. For Lakes, the main significant issues are nutrient pollution (5), followed by hydrological impacts (3), sediment (2), hydrological issues (1) and unknown impacts. Lough Arrow is identified for action (restoration) through LAWPRO in the draft 3rd WFD for the following reasons: *Proposed by Sligo, IFI and NPWS— Water quality has deteriorated from good to Moderate Status. Lough Arrow is an important water source in terms of provision of potable water supply in three large group water supply schemes serving a large rural hinterland. There is also a public water supply scheme groundwater source located within the catchment area of the lake. The lake is also important in terms of angling and recreation and tourism potential. Designated site under Natura legislation.*
Upper Shannon Catchment (Inny) Lough Sheelin[13]	Excess nutrients and morphological impacts remain the most prevalent issues in the Upper Shannon catchment (Figure 12) impacting 30 and 23 waterbodies, respectively, in Cycle 3. Sediment is impacting 11 waterbodies and organics are impacting seven waterbodies. For lake waterbodies, the main significant issues are nutrient pollution (5), morphological (4), sediment (3), hydrological impacts (2) and organic (1).

4.6.2 Invasive Species:

The plan identifies the following non native species as requiring management, some of which such as Bream have been removed on a trial basis (at Lough Mask) and charophyte beds appeared to recover rapidly. See Table 4.2 for overview of invasive species requiring management.

TABLE 4-2 Non Native Species in the Great Western Lakes requiring management

Non Native Species requiring management	Summary	Presence
Pink Salmon (Oncorrhyncus gorbusha	This species of Pacific salmon has found its way to and may have established populations in some of the western lake catchments. Although potential colonisation is at an early stage, this non-native species could severely impact on local fish populations (as has already occurred in Norway) and is cause for concern	Corrib, Conn, Cullin Arrow* (* Identified in outflowing river
Pike (Esox licuis)	This is one of the most significant threats to native fish stocks as pike and brown trout do not coexist in smaller lakes. Consequently, their introduction to previously uncolonized waters means that salmonids in these systems may become extinct unless rigorous management and removal can be achieved. This plan recommends the removal of any legislative protection conferred on pike (e.g. Bye-law 809) in waters where they are newly introduced. It also recommends that teams of IFI officers are deployed to manage and remove pike rapidly, if they are discovered in previously uncolonized waters.This legislation should also be reviewed in waters that are specifically designated for salmonids	L. Arrow, Conn, Cullin, Carra, Mask, Corrib, Sheelin

[11] Moy and Kilalla Bay (catchments.ie) accessed 27.03.2023
[12] Sligo Bay & Drowes (catchments.ie) Accessed 08.04.2023
[13] Upper Shannon (catchments.ie) accessed 08.04.2023

Non Native Species requiring management	Summary	Presence
Perch (Perca fluviatilis	Perch were introduced to Ireland, probably in the middle ages and more recently to all of the western lakes where they are now abundant. They are a shoaling species and feed mainly aquatic invertebrates, zooplankton and small fishes. Perch are an extremely fecund fish that spawn in early summer with a female laying ribbons of up to 75,000 eggs amongst submerged vegetation. Their bold and aggressive feeding behaviour makes them a threat to juvenile salmonids both through direct predation and competition for food. Like roach, previous attempts to exert any meaningful control on perch populations on the western lakes have been unsuccessful so no dedicated stock control measures are proposed. However, consideration will be given to the rapid response removal of perch where they are newly introduced and could threaten native stocks, particularly of arctic char.	L. Arrow, Conn, Cullin, Carra, Mask, Corrib, Sheelin
Bream	The common bream is a cyprinid fish that is found in most river systems and nutrient rich lakes in Europe. They feed on invertebrates found in the sediments on the lake or river bed and shallow pits can sometimes be observed in the aftermath of feeding shoals of bream. They are a relatively slow growing and long lived species with low fecundity and a tendency to spawn, only when seasonal conditions are favourable. Bream have been recorded in all of the western lakes and are thought to be relatively recent.	L. Arrow, Conn, Cullin, Carra, Mask*, Corrib, Sheelin
Chub	The chub is widespread across Europe, but it is not native to Ireland. Adult chub are a shoaling fish and are voracious predators that will eat almost any prey they can get their mouth around. For this reason, introduced chub threaten native species either by eating them, especially smaller juvenile fish, or by competing with them for food. They prefer to inhabit large lowland rivers with a moderate flow of water but are sometimes found in tributaries or deeper pools in rivers. There have been no records of Chub from any of the western lakes but their presence in a major tributary of L. Sheelin is cause for concern..	L Sheelin
Roach	Roach are a highly invasive extremely fecund species of cyprinid fish and are now present in all of the Western lakes and are extremely numerous on lower L. Corrib, Conn, Cullin and Sheelin. Roach have brought about profound ecological change in many of the Irish lakes to which they were introduced over the last 50 years. Precise dates for the founding events of the roach stocks in each of the designated lakes are unknown but successive surveys over the last 3-4 decades indicate that they are relatively recent (<50 years b.p) but have grown rapidly since then.	L. Arrow, Conn, Cullin, Mask, Corrib, Sheelin

Invasive plant species recorded in the Great Western Lakes include:

- Curly waterweed (Lagarosiphon major) is an invasive species of European Union Concern (EU Regulation 2016/1141) that was first recorded in Lough Corrib in 2005.
- New Zeland Pygmyweed (Crassula helmsii) have 38 been discovered on Corrib circa 2010
- extensive stands of the invasive alien species Nuttall's waterweed (Elodea nuttallii) in bays throughout the lake of Lough Arrow
- Lough Sheelin 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

4.6.3 Climate Change

The likely impacts of climate change on Irelands landscape and ecosystems are currently being considered and assessed by various agencies including IFI. A targeted research programme "the Climate Change Mitigation Research Programme" (CCMRP) is underway to address a knowledge gap related to the impacts of climate change on Ireland's fish species and their habitats. The primary objective of the CCMRP programme is to build an evidence-based assessment programme to evaluate the impact of climate change on the Irish inland fisheries sector, with the aim of informing and building capacity for fisheries conservation and protection measures. The work is being carried out

through a series of work packages including the establishment of a long-term monitoring network for fish, water temperature and other environmental variables, undertaking a species vulnerability assessment, developing species distribution models, assessing potential mitigation/adaptation strategies and education.

Water Quality and Water Services Infrastructure Climate Change Sectoral Adaptation Plan identifies a number of impacts on fish and water quality, water dependant habitats from climate change, including:

- Increased stormwater from weather events: Environmental risks: High pollutant concentrations and loads could negatively affect ecosystem health, impacting fish, aquatic invertebrates and vegetation, either directly through toxic effects of pollutants or indirectly through habitat damage caused by excess sediment or processes such as eutrophication caused by high nutrient loads.
- Drought conditions: Environmental risks: High pollutant concentrations and loads could negatively affect ecosystem health. One potentially significant impact is the increase in nutrient concentration in rivers, lakes, reservoirs and coastal water resulting in more frequent eutrophication and algal and cyanobacterial blooms. These processes are likely to be enhanced by high temperatures, which are often associated with low precipitation.
- Low water levels combined with depletion of dissolved oxygen (DO) due to eutrophication and algal blooms, and the toxic effects of cyanobacteria, may result in increased fish kills and significant damage to, or local extinctions of pollution sensitive species such as freshwater pearl mussels.
- Increased temperature: Increased temperature is likely to change the range of many species, particularly where species already have distinct or narrow distributions, for example montane species or coldwater fish species that will not have areas of higher altitude/latitude to move to where temperatures are cooler. Changes in the geographical range of native or naturalised species may result in them becoming 'invasive' to a region within Ireland in which they move to where they were not previously found.
- Water quality impacts, for example changing lake nutrient dynamics or bank erosion and sedimentation due to invasive species. The impacts described above may also impact on the resilience of aquatic habitats and ecosystems to other water quality pressures.
- Service provision: water service provision may be affected due to invasive species. Zebra mussels can block water intake pipes and have indirect impacts, for example changing nutrient cycles in lakes and causing a decline in native species.
- Lowered water tables due to climate change can modify hydrological conditions leading to increased nutrient and sediment transport to rivers and lakes resulting in significant water quality problems and toxic impacts for freshwater ecology, suchas fish. This is particularly the case for degraded peatlands, which comprise most of the Irish peatland resource, as these systems can no longer retain water, nutrients and sediment as they do in undisturbed settings. Warmer temperatures also increase the rates of microbial decomposition and could cause an increase in dissolved organic carbon (DOC) in water released from the peatland.

4.7 Evolution of the Great Western Lakes in the absence of the Plan

TABLE 4- 3Evolution of Great Western Lakes in absence of the plan

SEA topic	Evolution of same
Biodiversity, Flora and Fauna	Flora and fauna, habitats and ecological connectivity would be protected under existing provisions at legal and policy level. There would be limited considerations of the inter-connections between such issues including water quality, water dependent habitats, species decline and loss. With the absence of focus on Biodiversity and Climate change under the plan including actions, collaboration, enforcement and research these actions would not be maximised and availed off fully and within the timeframe required..
Population, Human health	Core issues including stakeholder engagement, collaboration around catchment management would not be as comprehensively addressed in the absence of the plan. As many of the actions are cross cutting for example habitat restoration, in turn, benefits accrue under this topic for improved water quality, habitat resilience and potentially healthier fish stock. In combination, effects relating to human health and air quality, water quality and climate change would not be availed of.
Air Quality and Climate	In the absence of the plan, there may be fewer opportunities to support adaptation to climate change such as increased flooding and integrating actions to improve habitats for fish.
Water Resources including flood risk	Supporting softer interventions may not be supported. Research and innovation to support a high quality aquatic environment would be missed. Potential effects across a number of other topics such as biodiversity and flora and fauna, human health.
Soil and Geology	Legislation relating to water related activities would apply. There would be less opportunity to strategically plan for soil and geology through research and the potential interactions between terrestrial and water resources.
Material Assets	Existing objectives that relate to this parameter would apply. The current legislation which provides for the protection and enhancement of the water resources and quality at the European, National, Regional and County level will protect and maintain existing water bodies in the Plan area.
Landscape	In combination effects would continue relating to the interaction of landuse, agricultural activities and parameters such as soil, water and biodiversity.
Cultural Heritage	Legislation and guidance from international and national level afford both the architectural and archaeological elements a high level of protection. However, intangible cultural heritage and vernacular features which are not protected could continue to be lost through loss of piers, slipways etc. The potential setting of archaeological sites may in combination be adversely affected.
Inter-relationships	The potential for in combination effects arising due to the absence of the plan would be potentially significant. Evolution of the environment in the absence of the plan could generate effects in terms of loss of ecological connectivity and non-designated habitats. Disturbance and significant ongoing negative effects on biodiversity, flora and fauna through absence of controls, monitoring, data gathering and support for actions such as catchment management that can

	provide multiple benefits. The support for stakeholders as well. Effects of climate change on the recreational fish sector, combined with loss of opportunity to adapt to climate change and provide for restoration of natura 2000 sites and evidence based decision making would be minimised. Potential adverse effects on water quality for, freshwater and groundwater with accompanying interactions across all SEA parameters.

5 Strategic Environmental Objectives

5.1 Introduction

Having established the environmental baseline under each of the environmental parameters in the preceding chapter, the key environmental issues have been identified. Taking account of these issues a series of Strategic Environmental Objectives have been compiled as a mechanism for ensuring environmental protection. The SEOs are applied as follows:

1. As measures against which the implementation of the strategic priorities of the plan can be assessed for potential environmental impacts.

2. As measures for monitoring any actual environmental impacts as a consequence of implementing the draft Strategy, by devising a series of targets and indicators for each of the SEOs.

SEOs are distinct from the objectives of the plan, although they will often overlap and are developed from International, National and Regional policies which generally govern environmental protection objectives. Such policies include those of various European Directives which have been transposed into Irish law, all of which are intended to be implemented at County level and integrated into any Plan or Strategy for the County. In this regard Table 15.1 below links the SEOs developed for this draft Strategy with the key themes of the EPA State of Ireland's Environment (2020) and the relevant goals from the United National Sustainable Development Goals. The SEA Directive requires that the evaluation of Plans and Programmes focus upon the relevant aspects of the environmental characteristics likely to be significantly affected. In compliance with this requirement, SEOs have been developed for the relevant environmental parameters, tailored to the environmental issues specific to the Plan area and are set out in Table 5.1.

TABLE 5-1 STRATEGIC ENVIRONMENTAL OBJECTIVES

SEA Topic	Principles for the Plan and SEA
Biodiversity, Flora and Fauna	BFF1:Conserve and enhance biodiversity at all levels BFF2:Avoid and minimise effects on nationally and internationally rare and threatened species and habitats through sensitive design and consultation, recognising ecological connectivity BFF3:Facilitate species and habitat adaption to climate change BFF 4:Avoid and minimise habitat fragmentation and seek opportunities to improve habitat connectivity BFF 5:Ensure careful consideration of non-native invasive and alien species issues
Population and Human Health	PHH1:Support citizen science and stakeholder engagement
Water	W1:Protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem (quality, level, flow). W2:Maintain or improve the quality of surface water and groundwater (including estuarine, marine and transboundary waters) to status objectives as set out in the Water Framework Directive (WFD), the National River Basin Management Plan and POMS.
Soil and Geology	SG 1:Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites .
Air Quality and Climate	AQ 1:Adapt and improve resilience to the effects of climate change AQ 2:Minimise adverse impacts associated with air and noise quality
Material Assets	MA 1:Plan and provide for sustainable water management and wastewater treatment
Cultural Heritage	CH 1:Conserve, preserve and record architectural and archaeological heritage
Landscape	L1:Integrate green aand blue network considerations L2 Improve landscape connectivity to surrounding area

6 Consideration of Alternatives

6.1 Introduction

The development and assessment of alternatives is a legal requirement under the SEA Directive and Regulations. Article 5(1) of the SEA Directive and 13E(1) of the Planning Development (Strategic Environmental Assessment) Regulations 2004 (as amended 2011) requires that alternatives are considered as follows within the Environmental Report:

- **Reasonable** alternatives taking into account the objectives and the geographical scope of the plan or programme;
- The alternatives are **identified, described** and **evaluated**;
- An outline of the **reasons** for selecting the alternatives dealt with;
- A **description of how the assessment was undertaken** including any difficulties (such as technical deficiencies or lack of know-how encountered in compiling the required information.

The SEA Statement, which is required at the end of the plan-making and SEA process, must include and summarise "the reasons for choosing the plan as adopted, in the light of other reasonable alternatives dealt with" (13**I**(c) of the SEA Regulations).

In the preparation, consideration and assessment of alternatives regard has been had throughout the process, to the draft "Developing and Assessing Alternatives in Strategic Environmental Assessment" – Good Practice Guidance February 2014[14].

6.2 Alternatives considered.

The alternatives considered in this regard are set out below:

ALTERNATIVE 1 - CURRENT SITUATION (BUSINESS AS USUAL)

This current situation presents Alternative 1 (Business as Usual) to be considered by the SEA. Under this alternative, the existing trends and patterns of in relation to the current conservation actions relating to the Great Western Lakes via current IFI programme and practices would apply. This would include for example working with LAWPRO, ongoing monitoring and fish surveys and research. Resources and funding streams would be maintained at the annual allocation basis with no prioritisation of actions.

ALTERNATIVE 2 – PRIORITISE CONSERVATION ACTIONS ON THE CORRIB CATCHMENT

This alternative would entail the three lakes of the Corrib catchment – Lough Corrib, Lough Mask and Lough Carra being the focus on conservation actions. This catchment is one of the largest and the three lakes represent a significant ecological resource. Given Lough Mask is identified as being at risk of not meeting WFD objectives, there is merit in focusing intervention through this approach. This approach would prioritise Lough Mask as it is the only lake identified at risk of not meeting the WFD objectives due a range of pressures many of which are diffuse sources. Much of the water that moves from Lough Mask to Lough Corrib does so via subterranean channels. The shallow mean depth of Lough Mask of 5m and its classification as an oligiotrophic lake contributes to its sensitivity and vulnerability in terms of responding to diffuse inputs as well as subterranean connections with Lough Corrib. Agriculture and domestic wastewater are identified in the draft Catchment Assessments for the Corrib as a significant pressure on Lough Mask. The remaining Great Western Lakes of Lough Conn, Lough Cullin (Moy and Killala Bay catchment), and Lough Arrow (Sligo Bay and Drowse

[14] EPA

catchment) with Lough Sheelin (Upper Shannon Catchment) would be managed under existing IFI measures and interventions.

ALTERNATIVE 3 –MULTI- CATCHMENT APPROACH
This would entail the seven Great Western Lakes being the focus on conservation actions through actions responsive to the challenges facing each lake, combined with interventions around habitat improvement and riparian habitat improvement. The challenges facing each lake and their catchments are complex and include pressure from agriculture, forestry and domestic wastewater. This alternative would support the need for a number of stakeholders and agencies to work together to improve water quality through reduction in sources of pollution, habitat improvements and addressing invasive species as well as supporting communities around the lakes.

6.3 Approach to the Assessment of Alternatives

In undertaking this assessment of alternatives, the following approach was applied:

- Review of environmental effects identified for the Great Western Lakes
- Professional judgement and expertise in SEA.

The alternatives were assessed using the following criteria as shown in **Tables 6.1 and 6.2** below.

This Section presents the assessment of potential environmental effects for each Alternative Scenario. This is undertaken by assessing each alternative against the SEOs presented in Chapter 5 of this SEA ER and repeated below.

Table 6-1 Strategic Environmental Objectives used in the evaluation of alternatives.

SEA Topic	Principles for the Plan and SEA
Biodiversity, Flora and Fauna	BFF 1: Conserve and enhance biodiversity at all levels BFF 2: Avoid and minimise effects on nationally and internationally rare and threatened species and habitats through sensitive design and consultation, recognising ecological connectivity BFF 3: Facilitate species and habitat adaption to climate change BFF 4: Avoid and minimise habitat fragmentation and seek opportunities to improve habitat connectivity BFF 5: Ensure careful consideration of non-native invasive and alien species issues
Population and Human Health	PHH 1: Support citizen science and stakeholder engagement
Water	W1: Protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem (quality, level, flow). W2: Maintain or improve the quality of surface water and groundwater (including estuarine, marine and transboundary waters) to status objectives as set out in the Water Framework Directive (WFD), the National River Basin Management Plan and POMS.
Soil and Geology	SG 1:Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites .
Air Quality and Climate	AQ1: Adapt and improve resilience to the effects of climate change AQ2: Minimise adverse impacts associated with air and noise quality
Material Assets	MA 1:Plan and provide for sustainable water management and wastewater treatment
Cultural Heritage	CH 1:Conserve, preserve and record architectural and archaeological heritage
Landscape	L1: Integrate green and blue network considerations L2: Improve landscape connectivity to surrounding area

It is informed by the environmental baselines as well as the policy review. The assessment of Alternatives is categorised as follows:

Table 6-2 Criteria used in the evaluation of the alternatives

No likely interaction with /insignificant impact with SEOs	O	Potential conflict with SEOs – likely to be mitigated	⇳
Likely to improve status of SEOs	🡅	Probable conflict with SEOs – unlikely to be mitigated	🡇

Technical difficulties in developing and assessing the alternatives relate to data gaps and understanding at catchment level, interactions between issues such as climate change, agricultural and other sectoral emissions, hydrogeology considerations.

6.5 Summary Evaluation against SEOs

1. Alternative 1 - Current Situation (Business as Usual)
2. Alternative 2 – Prioritise conservation actions on the Corrib catchment.
3. Alternative 3 –Multi- catchment approach.

TABLE 6-3 CONSIDERATION OF ALTERNATIVES

Alternative	↑	↓	↕	O
Alternative 1: Current Situation (Business as Usual)		BFF 1-5 W 1-2 PHH 1	SG 1 L1,2 MA1 AQ1,2	CH1
Commentary This current situation presents **Alternative 1 (Business as Usual)** to be considered by the SEA. Under this alternative, the existing trends and patterns of in relation to the current conservation actions relating to the Great Western Lakes via current IFI programme and practices would apply. This would include for example working with LAWPRO, ongoing monitoring and fish surveys and research. This alternative represents the continuation of the current approach and does not therefore provide for more targeted opportunities to address the main environmental challenges and their interaction. This alternative does not perform well with the achievement of the SEOS, in particular addressing issues that adversely affect the habitats and species that are listed in Annex I and II of the Habitats Directive. The chance to maximise actions to address invasive species, water quality issues, effects of climate change and stakeholder collaboration and engagement are not explored within this current business as usual scenario. Given the adverse trends of environmental parameters, this alternative the sustainable management of the Great Western Lake In relation to potential landuse effects under this alternative, adverse effects on SEOs may be mitigated through development management; however, the complex issues that face the environmental quality of the Great Western Lakes requires a multi faceted approach including research, and collaboration, not necessarily covered by the statutory planning and consenting system.				
Alternative 2: Prioritise conservation actions on the Corrib catchment.	BFF1-5 W1,2 PHH1	BFF1-5 W1,2 PHH1	SG1 L1,2 MA1 AQ1,2 CH1	

Alternative	↑	↓	↕	O
Commentary Alternative 2 – Prioritise conservation actions on the Corrib catchment. This alternative would entail the three lakes of the Corrib catchment – Lough Corrib, Lough Mask and Lough Carra being the focus on conservation actions. This catchment is one of the largest and the three lakes represent a significant ecological resource. Given Lough Mask is identified as being at risk of not meeting WFD objectives, there is merit in focusing intervention through this approach. The remaining Great Western Lakes of Lough Conn, Lough Cullin (Moy and Killala Bay catchment), and Lough Arrow (Sligo Bay and Drowse catchment) with Lough Sheelin (Upper Shannon Catchment) would be managed under existing IFI measures and interventions. This alternative would prioritise the three lakes of the Corrib Catchment. Given the scale and diversity of these lakes, in addition to Lough Mask being at risk of not meeting WFD objectives, the focus of interventions would be on the three lakes. This would facilitate actions to improve environmental quality in particular addressing invasive species, water quality and collaboration. This alternative through its focus on the lakes of the Corrib catchment would result in positive interactions for a number of parameters for this catchment in particular biodiversity and water. However, as the focus of the plan would be spatially and geographically confined to three of the seven Great Western Lakes, the other lakes would not gain the level of attention, research and interventions with accompanying declines in a number of parameters for these lakes including Biodiversity and Water. This alternative could result in the absence of targeted interventions and other plan element across other catchments of the Great Western Lakes and could result in failure to address the environmental challenges of these other lakes.				
Alternative 3: Multi catchment approach	BFF 1-5 W1,2 PHH1 AQ1,2 L1,2 SG1 MA1		MA1 CH1	
Commentary Multi- catchment approach. This would entail the seven Great Western Lakes being the focus on conservation actions through actions responsive to the challenges facing each lake, combined with interventions around habitat improvement and riparian habitat improvement. This alternative represents the most landscape scale response to addressing environmental issues on the Great Western Lakes and therefore is assessed as providing the greatest positive interactions with the SEOS in particular Biodiversity, Flora and Fauna, Water, Popualtion and Air Quality/Climate with indirectly positive interactions on Landscape and Soil and Geology via riparian planting and habitat enhancements. The potential interactions across all				

Alternative	↑	↓	↕	O
waterbodies ie groundwater and surface water is more comprehensively addressed. The issue of addressing water quality in all four catchments (Corrib, Moy and Killala, Sligo Bay and Drowse and Upper Shannon) is very complex and diffuse sources are a particular issue, this requires collaboration and stakeholder engagement working with community groups as well as state sector to address this key issue that in turn impacts across other environmental resources and is the principle critical issue for the health of these ecosystems.				

6.4 Preferred Alternative

Based on the assessment table above, Alternative 3 is identified as the most sustainable alternative for the Conservation Management Plan for the Great Western lakes for the following reasons:

- It provides for a longer term, strategic approach to addressing the environmental challenges facing the lakes in particular, water quality issues, invasive species, stakeholder engagement and climate change, taking into consideration sustainability issues
- It focuses on engagement, awareness raising, research across key environmental issues, and interventions to address these
- As the relevant city/county development plans will remain the primary landuse and planning framework for any new development activities, many of this SEOS would be achieved through the implementation of the existing environmental measures in each CDP.

The SEA and AA processes to date have also recommended a number of additional mitigation measures under this preferred alternative to support awareness raising, education and landuse measures that will further improve the environmental performance of the Conservation Management Plan for the Great Western Lakes.

7 Assessment of significant effects

7.1 Introduction

The purpose of this section of the Environmental Report is to predict and evaluate as far as possible the environmental effects of implementing the draft plan. Having established the environmental baseline and the key environmental sensitivities for the plan area in Chapter 4, and the Strategic Environmental Objectives in Chapter 5, an assessment for any potential environmental effects from implementing the draft plan can be undertaken.

The potential for landuse effects arising relate to two elements of the plan and these will be subject to their own environmental assessment (SEA, AA and EIA) processes as relevant. =Inland Fisheries Ireland have integrated all recommendations arising from the SEA and AA processes into the plan.

Table 7.2 identifies the likely significant environmental effects of the plan. The effects are categorised as significant positive effects, significant adverse effects if unmitigated and residual adverse non-significant effects after mitigation.

Environmental impacts which occur will be determined by the nature and extent of multiple or individual projects and site-specific environmental factors.

7.2 Transboundary considerations and effects

The SEA process to date has considered the potential for transboundary effects. SEA Scoping was undertaken with the Northern Ireland Department of Agriculture, Environment and Rural Affairs who provided a response to the Scoping Report including recommendations in terms of policies/plans, baseline information and other suggestions. These have been integrated to the SEA.

Considering the detailed mitigation integrated through the SEA and AA processes to the plan, it has been determined that significant adverse transboundary environmental effects are not identified for the Conservation Management Plan for the Great Western Lakes.

7.3 Approach to the assessment

Two elements of assessment have been undertaken which include:

1. An assessment of the objectives of the Plan - (Section 7.4)
2. An assessment of cumulative and in-combination effects (Section 7.5).

The assessment process has been undertaken using matrix assessments which reflect ratings in relation to potential significant effects on the environment as a result of implementation. The matrix assessment ratings used are as follows:

No likely interaction with /insignificant impact with SEOs	O	Potential conflict with SEOs – likely to be mitigated	⇳
Likely to improve status of SEOs	🡅	Probable conflict with SEOs – unlikely to be mitigated	🡇

- Profound: An impact which obliterates sensitive characteristics.

- Moderate: An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.
- Slight: An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Imperceptible: An impact capable of measurement but without noticeable consequences.

Thirdly the potential duration of identifiable impacts is discussed. The following terms are used:

- Short: Impact lasting one to seven years.
- Medium: Impact lasting seven to fifteen years.
- Long term: Impact lasting fifteen to sixty years.
- Permanent: Impact lasting over sixty years.
- Temporary Impact lasting for one year or less.

7.4 Assessment of Objectives and Actions of the Long Term Management Plan of the Great Western Lakes

TABLE 7-1 ASSESSMENT MATRIX

High Level Objectives	Start	Finish	↑	↓	↕	O
HLO 1: Stakeholder Engagement						
Action 1.1 Establish a communication schedule. Identify and engage with existing catchment groups, federations, Clubs, trusts and associations to assist with the progression of common catchment management goals.	2023	Review needed after 5 years	All SEOs			
Positive direct impacts on PHH SEOS relating to engagement and communication. The 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. Indirectly through collaboration and common catchment management goals, positive impacts on BFF, W and MA SEOS.						
Action 1.2: Where such groups have not yet been established, engage local communities, stakeholders and relevant authorities in the protection, development and conservation of their lake and river catchments through the establishment of more Catchment Management Associations for the Western Lakes. Action	2023	Review after 5 years	All SEOs			
Positive interactions with PHH to allow for establishment of groups for other lakes where these do not exist. Capacity building within groups being established also interacts positively with PHH, and indirectly with BFF, W SEOs. The engagement of local stakeholders and authorities will improve the protection, development and conservation of the relevant river catchments						
1.3: Enhance communication mechanisms and networks between IFI, relevant stakeholder groups, state agencies, farming organisations, academic institutions, local communities and catchment groups	2023	Ongoing	All other SEOs		PHH	
As with the above actions, this is positive in relation to PHH and indirectly for other SEOS. The improvement of communication between stakeholders and authorities to improve the protection, development and conservation of their river catchments is positive. 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.						
HLO 2: Climate Action and Biodiversity						
Action 2.1: Identify manageable factors which will contribute to the climate resilience of sensitive habitats and species.	started	TBC				

High Level Objectives	Start	Finish	↑	↓	↕	O
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 as well as other non designated habitats and sites. Positive interactions with BFF, W, AQ SEOs directly and indirectly positive interactions across other SEOS by identifying factors that will provide resilience to sensitive habitats and species, some of which are highly vulnerable to climate change effects.						
2.2: Maintain existing woodland where it occurs and promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate high temperatures and nutrient / sediment run-off.	started	Reviewevery 5 years	All SEOs			
Potential plans or projects associated with this action may include, but is not limited to, the fencing of watercourses, planting of native trees/plant species, installation of cattle drinkers, management of riparian habitat and the stabilisation of riparian zones. This Action will require pedestrian access with tools and machinery and possibly plant and machinery access to areas where plans or projects are to take place. As standard practice within IFI the works associated with these Actions follow several Guidance documents including; Appendix 2 'Biosecurity Measures for working in (or beside) Rivers' (IFI 2012); Appendix 3 'Standard Operating Procedure - Cleaning of gravels and spawning habitat maintenance' (IFI 2020); Appendix 4 'Standard Operating Procedure - Hedge Pruning and Tree Maintenance'; Appendix 5 'Guidelines on protection of fisheries during construction works in and adjacent to waters' (IFI 2016); and Appendix 6 'EP 10 Silt Management, page 58 of the "Environmental Guidance: Drainage Maintenance & Construction" handbook' (OPW 2019). The implementation of standard construction and operational phase controls in compliance with a Method Statement, IFI Guidelines/ Protocols, OPW, Water Pollution Acts, Local Authorities and the National Parks and Wildlife Service conditions will ensure protection of Natura 2000 habitats and species. The maintenance of existing woodland is positive for retention of soils and water retention and depends on the nature, species mix age and extent of woodland in terms of wider biodiversity benefits. Aquatic buffer zones are proven to provide a range of benefits and robust, appropriate buffers informed by robust surveys. This action will interact directly and long term across BFF, AQ, SG and W SEOS, with indirect positive interactions for PHH,L, and MA.						
Action 2.3: Develop spatial network models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased droughts, flood frequency and severity.	started	TBC	All SEOs			
Strategic planning to model native woodlands is positive and should be used to inform the species mix and promote ecological riparian corridors. The use of most recent data including the new Landcover map, as well as other datasets such as the High Nature Value, Pollution Impact Pathways datasets should be used. Positive interactions across all SEOS. Potential plans or projects associated with this action may include, but is not limited to, the fencing of watercourses, planting of native trees/plant species, management of riparian habitat and the stabilisation of riparian zones. This Action will require pedestrian access with tools and machinery and possibly plant and machinery access to areas where plans or projects are to take place. As standard practice within IFI the works associated with these Actions follow several Guidance documents including; Appendix 2 'Biosecurity Measures for working in (or beside) Rivers' (IFI 2012); Appendix 3 'Standard						

High Level Objectives	Start	Finish	↑	↓	↕	O
Operating Procedure - Cleaning of gravels and spawning habitat maintenance' (IFI Future plans or projects arising from this proposed Action must be Screened for Appropriate Assessment on a case-by-case basis. This can be viewed as a mitigation measure. If this mitigation measure is correctly implemented the Action, alone or in combination with other projects, will not have a significant adverse effect on the integrity of the Natura 2000 Network. 70 2020); Appendix 4 'Standard Operating Procedure - Hedge Pruning and Tree Maintenance'; Appendix 5 'Guidelines on protection of fisheries during construction works in and adjacent to waters' (IFI 2016); and Appendix 6 'EP 10 Silt Management, page 58 of the "Environmental Guidance: Drainage Maintenance & Construction" handbook' (OPW 2019). The implementation of standard construction and operational phase controls in compliance with a Method Statement, IFI Guidelines/ Protocols, OPW, Water Pollution Acts, Local Authorities and the National Parks and Wildlife Service conditions will ensure protection of Natura 2000 habitats and species						
HLO 3: Water Quality						
Action 3.1: Enhance the current statutory powers of Inland Fisheries Ireland by authorising officers to enforce the relevant provisions of the Habitat Regulations	2023	Review need every 5 years	All SEOs			
Improvement of implementation of the Habitats Regulations and stronger enforcement is positive directly for W, BFF and PHH SEOS. Cumulative positive impacts on other SEOS.						
Action 3.2: Enhance the capacity of IFI to detect and enforce water quality offences by using all available technology and increasing the number of Fisheries Environmental Officers working in the catchment areas of the Western lakes.	2023	2028	All SEOs			
Improvement of implementation and compliance with Water Quality Regulations, as above, stronger and effective monitoring and compliance and enforcement is positive to deter adverse behaviour. Positive for BFF, W, PHH SEOs in particular. Cumulative positive impacts on other SEOS.						
Action 3.3: 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 need every 5 years	All SEOS			
Improvement of working relationships with environmental authorities will allow for better collaboration and sharing of knowledge and data around enforcement.. Positive for BFF, W, PHH SEOs in particular. Cumulative positive impacts on other SEOS.						
Action 3.4: Provide information and assistance with the designation of nutrient sensitive catchments and areas for action.	ongoing	2028	All SEOs			
Improvement of implementation and compliance with Water Quality Regulations and underpinning with scientific data. Positive for BFF, W, PHH SEOs in particular. Cumulative positive impacts on other SEOS						
HLO 4 Invasive Species						

High Level Objectives	Start	Finish	↑	↓	↕	O
Action 4.1: Remove and/or manage high risk invasive species through strategic stock management and weed management programmes.	started	Review need every 5 years	All SEOs		BFF PHH	
A definition of an invasive alien species must be made clear prior to the establishment of any strategic stock management and weed management programmes. Ensure proper biosecurity for staff or any persons or groups involved with IAS management. Potential impacts include the accidental spread/dispersal of IAS, petrochemical/silt pollution and the disturbance/destruction of protected habitats and species. The plan identifies invasive species that require management and these will be prioritised. As above mitigation recommended as well as standard IFI biosecurity measures. Positive interactions at strategic level for BFF, W, SG and L in particular. 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 Longterm Management Plan for the Great Western Lakes may present uncertain impacts on Natura 2000 sites. As the details of the future plans or projects associated to this action are as yet unknown, the potential for adverse impacts are uncertain.						
Action 4.2: Continue to use digital and conventional media to alert the public about potentially harmful invasive species in the western lakes and their wider catchments.	started	Review need every 5 years	All SEOS			
Increased awareness of the presence and impacts of IAS in these lakes and catchments will benefit local, catchment wide and national biosecurity goals, giving rise to positive interactions with BFF, W, SG and PHH SEOs.						
Action 4.3: Provide biosecurity advice and resources to stakeholder groups to prevent the spread of invasive species in the western lakes.	started	Review need every 5 years	All SEOS			
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. Education and advice in relation to this is positive as it builds capacity within the wider community. Careful design and delivery of biosecurity training is important.						
Action 4.4: Encourage relevant stakeholder groups to participate in a range of conservation activities including the management of invasive species.	Started	Review need every 5 years	All SEOS			
Encourage relevant stakeholder groups to participate as long as biosecurity advice is provided and adhered to, and appropriate biosecurity equipment is made available. At strategic level, positive interactions with BFF, W, SG, L and PHH SEOs.						
Action 4.5: Enhance legislation and increase penalties for the illegal transfer of live fish			All SEOs			

High Level Objectives	Start	Finish	↑	↓	↕	O
Increase awareness of the adverse effects that such transfers can cause; improve biosecurity practice. At strategic level, positive interactions with BFF, W, SG, L and PHH SEOs through stronger regulatory framework reflecting the risk of this issue.						
HLO 5: Stock Management						
Action 5.1: Produce stock management plans annually, on a local RBD basis, to reduce impacts on salmonids from other fish populations	started	Review need every 5 years	BFF W AQ Ma		Other SEOS	
This should generate positive interactions with BFF and W SEOs in particular with co benefits for other parameters. The protection of Native Species of High Conservation value through stock management plans produced annually, on a local RBD basis, involves the management of several Non-Native fish species. Native fish species may be subject to pressures from other species through predation, competition for spawning habitat and other resources and even reported habitat destruction. 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. 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. 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.						
Action 5.2: Adjust stock management plans as population models on each of the lakes are refined.	started	TBC	All SEOs			
This should generate positive interactions with BFF and W SEOs in particular with co benefits for other parameters. The protection of Native Species of High Conservation value through stock management plans produced annually, on a local RBD basis, involves the management of several Non-Native fish species. Native fish species may be subject to pressures from other species through predation, competition for spawning habitat and other resources and even reported habitat destruction. 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. 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. 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 Longterm 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. 31 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						

High Level Objectives	Start	Finish	↑	↓	↕	O
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.						
Action 5.3: Enable local stakeholder groups to contribute to population modelling and research programmes including creel surveys (through citizen science).	started	TBC	BFF PHH W Other SEOs		PHH	
Positive interactions by capacity building and citizen science potential of this action, this results in positive longer term impacts with PHH, BFF and W SEOS in particular. As noted below from the NIS, it is important that support and guidance is provided to local stakeholder group to support capacity, technical understanding and quality. 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)).						
Action 5.4: Develop risk matrix for Atlantic salmon and trout based on physical characteristics of each waterbody and the implications of these for predation and survival bottlenecks			BFF W PHH Other SEOs			
This will enhance the survival opportunities for these fish species. The design and implementation of a risk matrix will support evidence based decision making for these species with appropriate responses development based on each waterbody of the Great Western lakes, positive direct interactions with BFF, W SEOs in particular; indirect positive interactions with other SEOS.						
HLO 6: Habitat Restoration						
Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.	Underway in Corrib, Mask, Cara, Sheelin and Conn Started	Review need every 5 years	All SEOs			

High Level Objectives	Start	Finish	↑	↓	↕	O
Targeted and appropriate restoration projects that are underpinned by scientific studies and assessment is of considerable benefit. Surveyed, designed and implemented properly and where appropriate in tandem with relevant stakeholders this action could generate positive impacts across all SEOs and include co benefits for SEOS such as L, SG and MA in addition to direct positive interactions with BFF, W SEOs. Potential plans or projects associated with this action may include, but is not limited to, the fencing of watercourses, planting of native trees/plant species, installation of cattle drinkers, stabilisation of riparian zones, installation of spawning gravels, cleaning of existing gravels, installation of instream structures and the management of riparian zones. This Action will require pedestrian access with tools and machinery and possibly plant and machinery access to areas where plans or projects are to take place. As standard practice within IFI the works associated with these Actions follow several Guidance documents including; Appendix 2 'Biosecurity Measures for working in (or beside) Rivers' (IFI 2012); Appendix 3 'Standard Operating Procedure - Cleaning of gravels and spawning habitat maintenance' (IFI 2020); Appendix 4 'Standard Operating Procedure - Hedge Pruning and Tree Maintenance'; Appendix 5 'Guidelines on protection of fisheries during construction works in and adjacent to waters' (IFI 2016); and Appendix 6 'EP 10 Silt Management, page 58 of the "Environmental Guidance: Drainage Maintenance & Construction" handbook' (OPW 2019). The implementation of standard construction and operational phase controls in compliance with a Method Statement, IFI Guidelines/ Protocols, OPW, Water Pollution Acts, Local Authorities and the National Parks and Wildlife Service conditions will ensure protection of Natura 2000 habitats and species						
Action 6.2: Streamline administrative processes to bring habitat restoration projects through planning processes to fruition with maximum efficiency.	started	2023	All SEOs			
Improvement of overall efficiency relating to habitat restoration is positive across the following SEOS in particular BFF, W, SG and PHH and L. Indirectly positive effects that are cross cutting relating to overall habitat restoration and increasing ecosystem services functioning						
Action 6.3: Ensure that all relevant environmental protection processes are in place to avoid damage to other sensitive species and habitats	started	ongoing	All SEOs			
This action represents good practice and should be implemented and adhered to throughout. Where required, appropriate guidance and environmental protection measures should be applied to each waterbody reflecting particular local characteristics and challenges.						
HLO 7: Research						
Action 7.1: Continue to develop new and refine existing fish stock monitoring programmes (e.g. WFD) to provide the necessary data for fish population models for the western lakes	2022	ongoing	All SEOs			
These programmes should not be restricted to salmonids but also include those fishes that may impact on salmonid populations. Positive interactions at strategic level across all SEOS especially BFF and W.						

High Level Objectives	Start	Finish	↑	↓	↕	O
Action 7.2: Use all available sources of data incl. WFD surveys, Stock management and, where appropriate, angling returns to feed into population models for the western lakes.	started	ongoing	All SEOs			
Ensure the veracity of angler returns, where possible- could be a monitoring consideration. This measure is included under Section 9 Monitoring						
Action 7.3: Continue research on climate change impact under current programmes (CCMRP) to help improve resilience in catchments and species.	started	ongoing	All SEOs			
Develop and continually upgrade climate impact models. This should underpin urgent action to meet national and EU requirements and increase resilience to climate change impacts. Positive interactions with AQ, PHH , W and BFF SEOS.						
7.4: Continue to develop IFI's Brown Trout Research Policy with recommendations for the future conservation of all sub-species	started	ongoing	BFF PHH W Other SEOs			
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. Currently research policy with no direct landuse effects but will inform recommendations for all sub species. Positive interactions with BFF and PHH SEOs.						

7.5 Cumulative impacts and interrelationships

The approach to this cumulative impact assessment is as follows:

1. Assessment of existing plans and policies that may interact with the draft plan and

2. Assessment of cumulative effects in terms of environmental sensitivity

This section concludes with a figure illustrating the significant interrelationships between the draft strategy and environmental parameters.

7.5.1 Summary of cumulative and in combination effects from other plans and programmes.

The potential for impacts from other plans and programmes relates primarily to the interaction between the IFI plans, landuse plans, and other related strategies. The interaction between the sectoral climate change adaptation plans has further potential to interact with the plan as sectors including water, transport, cultural heritage and biodiversity all interact and relate to potential effects from the implementation of the plan.

Table 7-2 In combination effects with other plans, policies, programmes

Plan/Directive/	Function	In combination
Inter-agency cooperation	IFI will continue to work with other relevant agencies, particularly LAWPRO and engage with established catchment groups, angling Federations, rivers trusts and associations to assist with the progression of common catchment management goals. Where such groups have not yet been established, IFI will continue to participate in the encouragement of local communities, stakeholders and relevant authorities to form local Catchment Management Groups for the Western Lakes. These will engage with communities, particularly, farming groups, to help raise awareness and assist with the implementation of measures to address water quality and habitat issues. IFI will endeavour to improve communication mechanisms with catchment organisations and relevant authorities, while continuing to enhance networking and reporting relationships at various levels within the organisations.	Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off Buffer zones will overlap with adjacent stakeholder lands. 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 Planting schemes will overlap with adjacent stakeholder lands. Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes Infestations will overlap with adjacent stakeholder lands. Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations Management sites will overlap with stakeholder catchments. Action 5.2: Adjust stock management plans as population models on each of the lakes are refined Management sites will overlap with stakeholder catchments. Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects. Restoration projects will overlap with adjacent stakeholder lands
IFI Climate Action Framework Plan	This action plan runs for three years and covers themes including corporate action, energy (transport, building etc) and monitoring. This provides for IFI to embed climate action to all activities.	No adverse in combination effects are identified in relation to the action plan. Positive in combination effects in tandem with the Conservation Management Plan.
Wild Salmon and Sea Trout Tagging Scheme (S.I. No. 585 of 2018) and	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 provide for the use of brown tags in specified rivers which are identified in Schedule 4.	Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off Improved habitat and water quality for salmonids 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 Improved habitat and

Plan/Directive/	Function	In combination
series of associated Bye-Laws		water quality for salmonids Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes Improved habitat quality for salmonids 80 Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations Improved habitat quality for salmonids Action 5.2: Adjust stock management plans as population models on each of the lakes are refined Improved habitat quality for salmonids Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects. Improved habitat quality for salmonid
	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/wpcontent/uploads/2021/11/WAWWEB-pub.pdf	Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off N/A 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 Planting regimes may overlap with areas targeted for tourism Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes Infestations may overlap with areas targeted for tourism Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations Stock management sites may overlap with areas targeted for tourism Action 5.2: Adjust stock management plans as population models on each of the lakes are refined Stock management sites may overlap with areas targeted for tourism Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects. Restoration projects may overlap with areas targeted for tourism
Nitrates Directive	The Government has published Ireland's Fifth Nitrates Action Programme. The Programme sets out new measures that have been introduced since the Fourth Programme. Ireland's Nitrates Action Programme is given effect by the European	tion 2.2: Promote the establishment of significant aquatic buffer zones to enhance

Plan/Directive/	Function	In combination
	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. 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	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 Improved habitat and water quality for salmonids Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes Improved habitat and water quality for salmonids through reduced sedimentation Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations N/A Action 5.2: Adjust stock management plans as population models on each of the lakes are refined N/A Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects. Improved habitat and water quality for salmonids
Water Framework Directive	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 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.	Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off Improved habitat and water quality for salmonids 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 Improved habitat and water quality for salmonids Action 4.1: Remove and/or manage harmful invasive alien species through strategic stock management and weed management programmes Improved habitat and water quality for salmonids 82 Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations N/A Action 5.2: Adjust stock management plans as population models on each of the lakes are refined N/A Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects. Improved habitat and water quality for salmonids
Fisheries Maintenance	IFI intends to carry out annual maintenance projects on 46 river sections throughout the Lough Corrib catchment starting in July 2022 until the end of	Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment

Plan/Directive/	Function	In combination
Projects in the Lough Corrib Catchment from 2022 to 2026	February 2027. The projects are necessary to the management of Lough Corrib SAC and aims to maintain the habitat required by Atlantic Salmon (Salmo salar) as a Qualifying Interest (QI) throughout the Corrib catchment. The objectives of the project are to ensure necessary Salmon migratory routes are free of obstruction; to ensure that the spawning substrates present can be utilised; and to ensure that excessive tunnelling is minimised through selective riparian pruning	run-off Improved habitat and water quality for salmonids 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 Improved habitat and water quality for salmonids Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects. Improved habitat and water quality for salmonids
National Biodiversity Action Plan 2023-2027	The Plan will aim to improve the governance of biodiversity in Ireland so that we can better respond to the biodiversity crisis. This means ensuring a 'whole of Government', 'whole of society' approach to this crisis, and properly recognising biodiversity's contributions to people, the economy and society. The Plan will also address the connections between biodiversity and climate change, and the need to enhance the evidence base for biodiversity conservation policy and practice. The Plan has been in development since October 2021. Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off Improved habitat and water quality for salmonids 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 Improved habitat and water quality for salmonids Action 4.1: Remove and/or manage harmful invasive alien species through 83 The first phase of work involved an extensive review of national, European, and international policies, strategies, legislation and science relating to biodiversity. This review helped to inform a first draft of the Plan, which was circulated to an initial group of stakeholders for feedback. The feedback from this first group of stakeholders is currently being incorporated into a second draft of the Plan, which will be issued for public consultation later in 2022. The final version of the Plan will be published in early 2023, to allow the recommendations of the ongoing Citizens Assembly on Biodiversity (published on 5th April 2023) to be reviewed and incorporated where appropriate	Action 2.2: Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off Improved habitat and water quality for salmonids 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 Improved habitat and water quality for salmonids Action 4.1: Remove and/or manage harmful invasive alien species appropriate. Action 5.1: Produce stock management plans annually, to reduce impacts on salmonids from other fish populations Improved habitat quality for salmonids Action 5.2: Adjust stock management plans as population models on each of the lakes are refined Improved habitat quality for salmonids Action 6.1: Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects. Improved habitat quality for salmonids

Plan/Directive/	Function	In combination
National Planning Framework	The purpose of the NPF is to provide a focal point for spatial plans throughout the planning hierarchy. It will provide a framework for the new Regional Spatial and Economic Strategies (RSESs) by the three Regional Assemblies and the associated enhancement of the economic development focus of local authorities as per the Local Government Reform Act 2014. The NPF will co- ordinate the strategic planning of urban and rural areas in a regional development context to secure overall proper planning and development as well as co-ordination of the RSES's and city/ county development plans in addition to local economic and community plans and local area plans and other local development.	A NIR and SEA was prepared for this plan and an Appropriate Assessment was completed. The Appropriate Assessment concluded that, subject to mitigation measures proposed in the NIR, there will be no adverse effects to the integrity of any European Sites as a result of the implementation of this Plan. The SEA concluded that subject to full implementation of mitigation measures no likely significant effects on the environment are identified.
Regional Economic and Spatial Strategies	The RSES are strategic plans which identify regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives. At this strategic level it provides a framework for investment to better manage spatial planning and economic development throughout the Region A	NIR and SEA were prepared for these plans and concluded that, subject to mitigation measures proposed in the NIR and SEA, there will be no adverse effects to the integrity of any European Sites or significant adverse environmental effects as a result of the implementation of this Plan.
County Development Plans	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.	All CDPs will provide the statutory planning framework for projects arising from the plan. The application of development management standards, environmental consenting processes including EIA, AA and SFRA as appropriate will apply. All CDPs are subject to AA and SEA and no in combination effects are identified
Strategic Planning Policy Statement for Northern Ireland.	A planning policy for Northern Ireland that informs future landuse plans.	This was subject to full SEA and HRA and a finding of no significant effects were determined

7.5.2 Cumulative impacts and environmental sensitivity.

The interrelationships between environmental parameters and how they interact with each other is complex and variable. Notwithstanding that, clear relationships can be seen between water resources and a number of other parameters which serves to signify yet again the importance of water quality management and monitoring. The relationship between biodiversity, soil and water is complex but critical. Interrelationships also exist between cultural heritage, landscape, biodiversity and population; degraded habitats can contribute to deterioration in the landscape setting of built heritage sites and subsequent changes in how people perceive a cultural heritage asset.

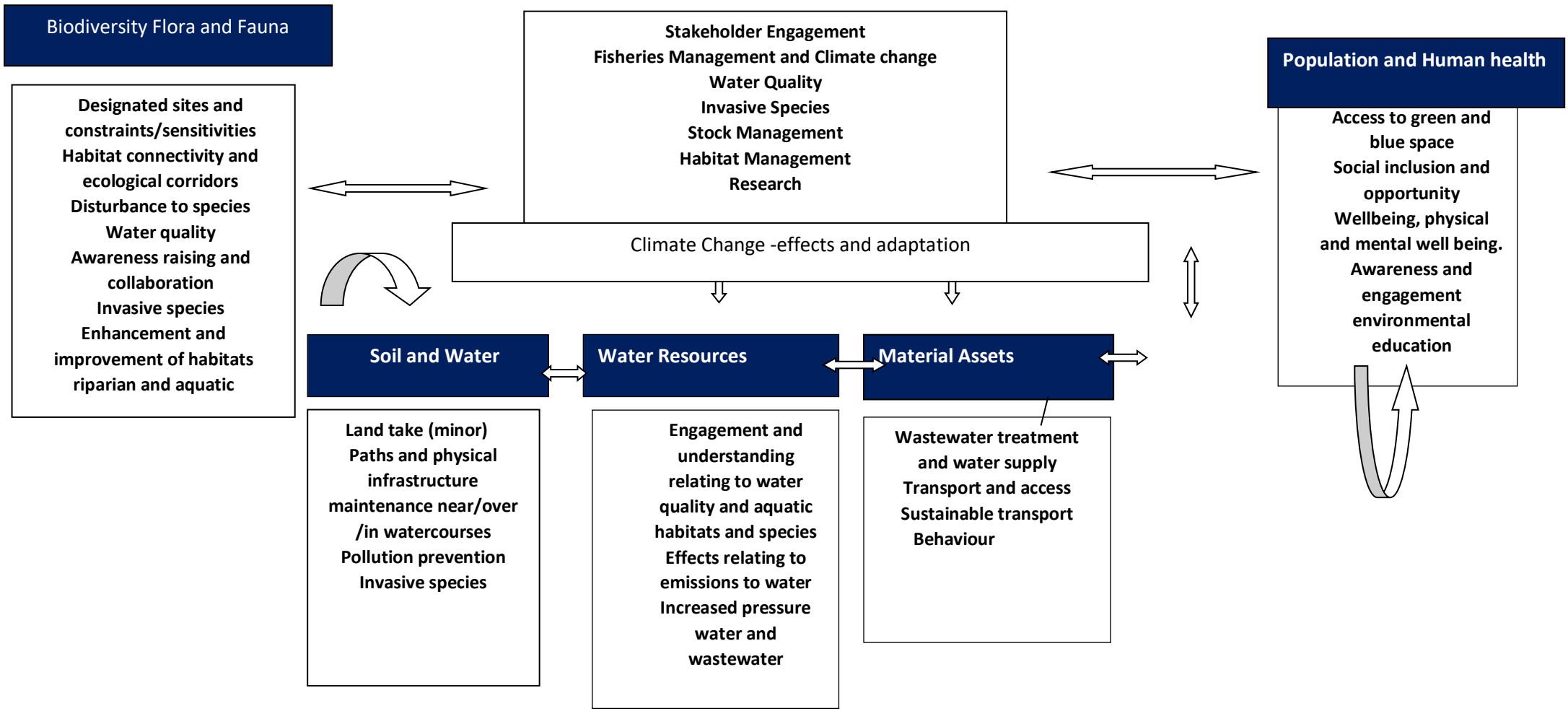
Cumulative impacts may arise from the implementation of the Conservation Plan if significant interventions are provided in more sensitive locations. These could give rise to disturbance to sensitive species, could lead to local erosion and off site impacts, loss of local landscape character and increase run off or soil erosion. This is envisaged under a scenario where poor baseline data or insufficient survey work is undertaken in tandem with any proposals. Additionally, where clusters or significant increases in numbers participating in outdoor activities arise, the above effects could occur.

As the plan does not set the framework for development consent, any projects will be subject to compliance and adherence with provisions of the relevant City/County Development plan and environmental consenting process.

The integration and commitment to sustainability in the plan is positive across all SEA parameters.

Figure 7.1 identifies the key interrelationships of the environmental parameters Although all such parameters may be considered interrelated and may impact on each other at some level, the purpose of this Figure is to show the significant relationships only.

Figure 7-1 INTER-RELATIONSHIPS AND IN COMBINATION EFFECTS



8 Mitigation Measures

This chapter outlines the mitigation measures that will prevent, reduce, and offset as much as possible any significant adverse effects on the environment of the plan area resulting from the implementation of the Long Term Management Plan for the Great Western Lakes. Section (g) of Schedule 2B of the SEA Regulations (as amended) requires: *'The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the Plan'*.

Mitigation involves ameliorating significant negative effects. Where the environmental assessment identifies significant adverse effects, consideration is given in the first instance to preventing such impacts or where this is not possible, to lessening or offsetting those effects. Mitigation measures can be generally divided into those that:

- Avoid effects;
- Reduce the magnitude or extent, probability and/or severity of effect;
- Repair effects after they have occurred, and
- Compensate for effects, by balancing out negative impacts with positive ones.

The following sections present mitigation measures from the SEA and AA processes.

8.1 SEA and AA mitigation measures amendment to text

TABLE 8-1 Mitigation Measures

Action	SEA/AA mitigation measure
1.3: Enhance communication mechanisms and networks between IFI, relevant stakeholder groups, state agencies, farming organisations, academic institutions, local communities and catchment groups	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.
Action 4.1: Remove and/or manage high risk invasive species through strategic stock management and weed management programmes.	A definition of an invasive alien species must be made clear prior to the establishment of any strategic stock management and weed management programmes. Ensure proper biosecurity for staff or any persons or groups involved with IAS management
Action 5.3: Enable local stakeholder groups to contribute to population modelling and research programmes including creel surveys (through citizen science).	It will be important that proper guidance is provided to these stakeholders and that the data provided is regularly monitored for its accuracy
Action 6.3: Ensure that all relevant environmental protection processes are in place to avoid damage to other sensitive species and habitats	This action represents good practice and should be implemented and adhered to throughout. Where required, appropriate guidance and environmental protection measures should be applied to each waterbody reflecting particular local characteristics and challenges.
Action 7.1: Continue to develop new and refine existing fish stock monitoring programmes (e.g. WFD) to provide the necessary data for fish population models for the western lakes	These programmes should not be restricted to salmonids but also include those fishes that may impact on salmonid populations.
Action 7.2: Use all available sources of data incl. WFD surveys, Stock management and, where appropriate, angling returns to feed into population models for the western lakes.	Ensure the veracity of angler returns, where possible- could be a monitoring consideration. This measure is included under Section 9 Monitoring

8.2 IFI Standard Practice Mitigation Measures and Guidance Documents.

As standard practice within IFI the works associated with these Actions follow several Guidance documents including;

Appendix 2 'Biosecurity Measures for working in (or beside) Rivers' (IFI 2012);

Appendix 3 'Standard Operating Procedure - Cleaning of gravels and spawning habitat maintenance' (IFI Future plans or projects arising from this proposed Action must be Screened for Appropriate Assessment on a case-by-case basis.

Appendix 4 'Standard Operating Procedure - Hedge Pruning and Tree Maintenance';

Appendix 5 'Guidelines on protection of fisheries during construction works in and adjacent to waters' (IFI 2016); and

Appendix 6 'EP 10 Silt Management, page 58 of the "Environmental Guidance: Drainage Maintenance & Construction" handbook' (OPW 2019).

Biosecurity measures for Field Surveys (IFI 201):
research_biosecurity_biosecurity_for_fieldsurveys_2010.pdf (fisheriesireland.ie)

Link to all IFI Biosecurity protocols: Research theme: Biosecurity | Inland Fisheries Ireland

The implementation of standard construction and operational phase controls in compliance with a Method Statement, IFI Guidelines/ Protocols, OPW, Water Pollution Acts.

Please also see: Standard Operating Procedure Hedge Pruning and Tree Maintenance May 2020

8.3 Mitigation Measure 1 -SEA

- To ensure the assessment of all planning applications in the Plan area have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report and SEA Environmental Report of the Long Term Management Plan for the Great Western Lakes
- In implementing this Long Term Management Plan for the Great Western Lakes, ensure compliance with the IFI Environmental Charter, relevant County/City Development Plans and local area plan objectives and policies relating to environmental management and the protection of statutory Conservation Areas and ensure compliance with specific environmental management measures relating to this plan.
- To require project planning to be fully informed by ecological and environmental constraints at the earliest stage of project development and any necessary assessment to be undertaken, including assessments of disturbance to species, protected under the Wildlife Act and/or the Flora Protection Act.
- Should projects arise from the plan, they will have to be consistent and comply with the various statutory provisions including requirements for AA, EIA and other licencing requirements as appropriate that form the statutory decision making and consent-granting framework, of which the plan is not part and does not contribute towards
- Ensure that proposals for developments located within identified or potential flood risk areas, or which may exacerbate the risk of flooding elsewhere, are assessed in accordance with the provisions of the Flood Risk Management Guidelines (DoEHLG/OPW 2009) and Circular

PL2/2014 (or any updated/superseding document), the relevant policies, objectives and guidelines within this plan and shall also take account of the National CFRAM Programme Flood Hazard Mapping and Flood Risk Management Plans when they become available.

8.4 Mitigation Measure 2 -SEA. Construction Environmental Management Plan (CEMP)

A CEMPS shall be prepared in advance of the physical elements proposed as part of this Plan and will be implemented throughout. Such plans shall incorporate relevant mitigation measures indicated below.

- IFI and the relevant Planning Authority will be informed in advance of construction activities in sensitive environmental areas.
- IFI and relevant Planning Authority will be informed of all construction or maintenance works located within the vicinity of European Sites, NHAs or pNHAs or in the vicinity of watercourses linked to these designated conservation areas. Monitoring of works in these locations will be undertaken and the results of monitoring will be provided to IFI and the relevant planning authority
- Where works are undertaken in/adjacent to sensitive environmental receptors all construction/maintenance staff will be inducted by means of a "Tool-box Talk" which will inform them of environmental sensitivities and the best practice to be implemented to avoid disturbance to these receptors
- All construction and maintenance works will be undertaken in accordance with the following guidance documents:
    - Inland Fisheries Ireland's Requirements for the Protection of Fisheries Habitat during Construction and Development Works.
    - CIRIA (Construction Industry Research and Information Association) Guidance Documents
    - Control of water pollution from construction sites (C532)
    - Control of water pollution from linear construction projects: Technical Guidance (C648)
    - Control of water pollution from linear construction projects: Site Guide (C649)
    - Environmental Good Practice on Site (C692)
    - NRA Guidance Documents
    - Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes
    - Guidelines for the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads
    - Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, during and Post Construction of National Road Schemes
- Any excavations and/or vegetation removal will minimised during construction and/or maintenance works.

- Excavated material will not be stored immediately adjacent to watercourses.
- Disturbance to natural drainage features should be avoided during the construction and/or maintenance of routes.
- Construction machinery should be restricted to public and or site roads. As a general rule machinery should not be allowed to access, park or travel over areas outside the footprint of proposed walking/cycling routes.
- During route maintenance no construction activities should be undertaken at watercourse crossing in wet weather conditions.
- Suitable prevention measures should be put in place at all times to prevent the release of sediment to drainage waters associated with construction areas and migration to adjacent watercourses To reduce erosion and silt-laden runoff, create, where possible, natural vegetation buffers and divert runoff from exposed areas, control the volume and velocity of runoff, and convey that runoff away from.
- Where necessary drainage waters from construction areas should be managed through a series of treatment stages that may include swales, check dams and detention ponds along with other pollution control measures such as silt fences and silt mats
- Where vegetation removal associated with treelines, hedgerows, individual mature trees, scrub or woodland is required, this shall only be undertaken outside the breeding bird season, between March and August inclusive.
- Where extensive areas of ground are to be exposed during route construction or maintenance dust suppression should be undertaken during periods of dry weather.
- All chemical substances required during construction and/or maintenance works will be stored in sealed containers.
- Any refuelling or lubrication of machinery will not be undertaken within 50m of a watercourse
- Spill kits will be required on site during construction and/or maintenance works.
- Ensure non-native, invasive species do not occur at construction/maintenance areas, or if occurring, are not spread as a results of works. The NRA Guidance on invasive species, outlined above will be adhered to.
- Disseminate information on sensitive ecological receptors, such as sensitive habitats, breeding upland birds etc. occurring adjacent to or in the wider area surrounding routes. This information will aim to educate recreational users on the conservation status and sensitivities of such receptors to encourage responsible usage of routes.
- Provide route facilities, such as trail-heads in areas away from sensitive habitats and species.

CEMPs typically provide details of intended construction practice for the proposed development, including:

a) location of the sites and materials compound(s) including area(s) identified for the storage of construction refuse

b) location of areas for construction site offices and staff facilities

c) details of site security fencing and hoardings

d) details of on-site car parking facilities for site workers during the course of construction

e) details of the timing and routing of construction traffic to and from the construction site and associated directional signage

f) measures to obviate queuing of construction traffic on the adjoining road network

g) measures to prevent the spillage or deposit of clay, rubble or other debris

h) alternative arrangements to be put in place for pedestrians and vehicles in the case of the closure of any public right of way during the course of site development works

i) details of appropriate mitigation measures for noise, dust and vibration, and monitoring of such levels

j) containment of all construction-related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained; such bunds shall be roofed to exclude rainwater

k) disposal of construction/demolition waste and details of how it is proposed to manage excavated soil

l) a water and sediment management plan, providing for means to ensure that surface water runoff is controlled such that no silt or other pollutants enter local water courses or drains

m) details of a water quality monitoring and sampling plan

n) if peat is encountered - a peat storage, handling and reinstatement management plan

o) measures adopted during construction to prevent the spread of invasive species (such as Japanese Knotweed)

p) appointment of an ecological clerk of works at site investigation, preparation and construction phases

8.4.1 Biosecurity Measures

The following measured to reduce risk of spread of alien and invasive species are recommended:

- Any soil or topsoil required within the plan area will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed none are present.
- All machinery will be thoroughly cleaned and disinfected prior to arrival and departure from the site to prevent colonisation or introduction of invasive species. This process will be detailed in the contractor's method statement.
- Inland Fisheries Ireland and Canoeing Ireland have produced guidelines for the disinfection of paddle sport equipment to prevent the spread of invasive species. These should inform awareness raising for recreational users.
- research_biosecurity_biosecurity_for_fieldsurveys_2010.pdf (fisheriesireland.ie)

Future plans or projects arising from this proposed Action must be Screened for Appropriate Assessment on a case-by-case basis.

9 Monitoring

9.1 Introduction

It is proposed, in accordance with the SEA Directive, to base monitoring on a series of indicators which measure changes in the environment, especially changes which are critical in terms of environmental quality, for example water pollution levels. Monitoring will focus on the aspects of the environment that are likely to be significantly impacted upon by the implementation of the plan.

The targets and indicators are derived from the Strategic Environmental Objectives (SEOs) discussed in Chapter Five. The target underpins the objective whilst the indictors are used to track the progress of the objective and targets in terms of monitoring of impacts.

The monitoring programme will consist of an assessment of the relevant indicators and targets against the data relating to each environmental component. Similarly, monitoring will be carried out frequently to ensure that any changes to the environment can be identified.

It is proposed that the SEA monitoring reporting should be undertaken as a mid term review of the plan. Should new data or the following occur, additional monitoring will be required:

- Significant spread of invasive species
- Illegal waste activity
- Water pollution incidents (not resulting from oil spills).

In turn the list below is subject to review at each reporting stage to reflect new data. Should the monitoring regime identify significant impacts (such as impacts on designated sites) early on in the plan implementation, this should trigger a review of the plan and monitoring regime. In addition, the identification of positive impacts from monitoring should also be reported as this will assist in determining successful environmental actions.

The following monitoring thresholds will apply for the three issues listed above are presented below in Table 9.1. Table 9.2 overleaf presents the overall monitoring regime.

Table 9-1 Thresholds for remedial action by Inland Fisheries Ireland

Events	Action
• **Significant spread of invasive and alien species (IAS)**	Any new introduction of IAS in areas where it was not present beforehand. To be cross referenced with IFI Biosecurity measures checklist and works statement. Remedial action must be prioritised to minimise and eradicate newly introduced IAS.
• **Illegal waste activity**	Incidents of illegal waste activities associated with projects arising from the plan. Remedial actions must be prioritised to address illegal waste activity.

It is recommended that data arising from planning applications, particularly in terms of environmental constraints mapping and Environmental Impact Statements be integrated into the GIS and monitoring system. This will assist in assessing cumulative impacts also, in particular ecology and water quality.

Table 9-2 SEA Monitoring Programme

SEA Topic Strategic Environmental Objectives	Monitoring Requirement and Data Source
Biodiversity, Flora and Fauna	
Conserve and enhance biodiversity at all levels **Avoid and minimise effects on nationally and internationally rare and threatened species and habitats through sensitive design and consultation, recognising ecological connectivity** **Facilitate species and habitat adaption to climate change** **Avoid and minimise habitat fragmentation and seek opportunities to improve habitat connectivity** Ensure careful consideration of non-native invasive and alien species issues Ensure the veracity of angler returns, where possible	• Condition of European sites [data source: NPWS (6 yearly reporting)] •Implementation of SEA and AA mitigations from plans arising from the Conservation Management Plan for the Great Western Lakes (IFI and relevant Local Planning Authority) •Status of surface water bodies (including transitional and coastal) [data source: EPA]. IFI River, Lake and Transitional waters Fish Stock Surveys (Data source: IFI under Water Framework Directive) Use all available sources of data incl. WFD surveys, Stock management and, where appropriate, angling returns to feed into population models for the western lakes (Action 7.2). Triannual monitoring of fish stocks of Great Western lakes Percentage increase or area in m2 of additional riparian habitat created adjacent Great Western Lakes and rivers. Percentage increase in buffers at m2.
Population and human health	

Support citizen science and stakeholder engagement	Number of new catchment management associations for Great Western Lakes (Action 1.2) Number of citizen science programmes Number of training hours/projects on citizen science and awareness raising eg; fish returns, biosecurity etc. Data source: IFI, LAWPRO
Water	
Protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem (quality, level, flow). Maintain or improve the quality of surface water and groundwater (including estuarine, marine and transboundary waters) to status objectives as set out in the Water Framework Directive (WFD), the National River Basin Management Plan and POMS.	Status of surface water bodies (river, lake, transitional and coastal including transboundary) as reported by the EPA Water Monitoring Programme for the WFD [data source: EPA]. IFI River, Lake and Transitional waters Fish Stock Surveys (Data source: IFI under Water Framework Directive)
Soil and Geology	
Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites .	• Condition of European sites [data source: NPWS Geological Survey of Ireland and Planning Authorities
Climate Change, Air Quality	

Adapt and improve resilience to the effects of climate change Minimize adverse impacts associated with air and noise quality	IFI Environmental Management Systems Key actions -energy(transport), energy (buildings), water and wastewater Data source: IFI Action 2 of IFI Climate Action Framework Plan Develop a climate monitoring and mitigation strategy for the Inland Fisheries Resource. Research and monitoring of climate change under HLO 2 Climate Action and Biodiversity and HLO 7 Research
Material Assets	
Plan and provide for sustainable water management and wastewater treatment	IFI Environmental Management Systems Key actions -energy(transport), energy (buildings), water and wastewater Data source: IFI Action 2 of IFI Climate Action Framework Plan
Cultural Heritage	
Conserve, preserve and record architectural and archaeological heritage	Planning applications (data source: relevant Planning Authority and IFI)
Landscape	
Integrate green network considerations Improve landscape connectivity to surrounding area	Planning applications (data source: relevant Planning Authority and IFI) Increase in riparian habitat at Great Western Lakes

10 Next Steps

As part of this SEA process, Inland Fisheries Ireland will also be undertaking statutory consultation with the appropriate environmental authorities in Ireland. In addition, transboundary consultation will be undertaken with Northern Ireland. The following consultees be consulted on the draft plan, SEA ER and accompanying Natura Impact Report for the draft plan. In addition, informal transboundary consultation will be undertaken with Northern Ireland as part of the SEA and plan making process.

Consultee

- Environmental Protection Agency
- Department of the Housing, Local Government and Heritage
- Development Applications Unit, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs
- Department of Agriculture, Food, and the Marine
- Department of the Environment, Climate and Communications
- Northern Ireland: Department of Agriculture, Environment and Rural Affairs