Lough Ennell Catchment Management Plan

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EXECUTIVE SUMMARY

Lough Ennell has a catchment that encompasses agricultural and urban areas, includes an SAC and SPA, and supports a wide range of socio-economic benefits for the community including as a designated bathing water. Despite water quality improvements since the 1970s, **the lake remains vulnerable** to nutrient and pathogen pollution, habitat change, climate change and other human pressures. This **catchment management plan seeks to address the pressures** on the lake and its catchment, to make it more resilient in future, preventing decline, and **restoring and protecting its ecological status** to at least 'Good', and better, where possible in the longer term. This plan is based on the potential for collaborative and cooperative working of stakeholders with an interest in the lake.

The onus on taking the plan to implementation is based upon the establishment of a **Memorandum of Understanding** by project partners and associated bodies and a draft MoU is provided with a view to sign up on a **voluntary basis.**

Key issues

Issues are identified under six catchment management themes:

1. Water quality and resource
2. Land use
3. Rivers and fish
4. Biodiversity & climate response
5. Communities, tourism and education
6. Project functions and cross-cutting actions

Overarching aim

An overarching aim for catchment management is defined:

To implement a catchment management programme with associated complementary actions to ensure:

i. Protection and enhancement of water quality and ecological health through reduced impacts of point source and diffuse source pollution and better management of natural habitats
ii. Enhanced socio-economic potential through an improving fishery, enhanced recreation & tourism opportunities and increases sustainability of agriculture
iii. Meaningful engagement of community in sustainable management of the lake catchment
iv. A better understanding of the processes and issues that affect water quality, ecosystems and other key factors

Objectives

Ten objectives are identified, which seek to address specific issues identified by the plan:

1. To protect and enhance WFD ecological status of all waterbodies in the catchment within life of the plan
2. To reduce the transfer of nutrients and pathogens from point source pollution
3. To reduce the transfer of nutrients and pathogens from diffuse source pollution
4. To enhance the condition of wetland habitats in the catchment
5. To promote the favourable conservation status of fish populations of the Lough Ennell catchment
6. To maintain or enhance the conservation condition of the European sites (SAC & SPA)
7. To enhance the role of the Lough Ennell catchment in climate & biodiversity emergency response
8. To enhance the tourism, amenity and recreational value of Lough Ennell
9. To enhance the meaningful engagement of the community in the protection and management of Lough Ennell
10. Ensure the LECMP is appropriately managed and resourced

Actions

Thirty eight actions are identified and indicative timescales are provided. This includes the establishment of a project partnership and a project officer as key mechanisms for delivering the plan. Indicative costs associated with these aspects are identified.

Adoption of this plan is contingent upon screening for both Appropriate Assessment (AA) and for Strategic Environmental Assessment (SEA)

1. INTRODUCTION AND OVERVIEW

1.1 Context and project origin

Lough Ennell lies to the South West of Mullingar and has a catchment area of around 50 square km and includes the River Brosna as the main inflow and outflow, and the town of Mullingar. As well as the main inflow of the River Brosna, several smaller streams enter the lough from the west and east sides and have catchments dominated by agricultural land-use.

Lough Ennell is a Special Area of Conservation (SAC), Special Protection Area (SPA) and a Ramsar site[1,2]. It is a large limestone lake, fringed by calcareous grassland, fen, marsh, wet grassland, reedbeds and mixed woodland. It supports a complex wetland ecosystem rich in lower plants and invertebrates, rare flora and as a wintering and breeding area for high numbers of waterbirds, including some populations which reach national significance.

The Lough is culturally important in holding sites of historical importance (e.g. Belvedere House and Lilliput) and is of significant social value for recreation, notably swimming and angling[3]. The lake has a designated bathing water at Lilliput and the angling on the lough is particularly notable for Brown Trout *Salmo trutta*.

Maintaining good water quality, ecosystem function and landscape is of great significance in supporting the ecological, and in turn, socio-economic value, of the lake into the future. Restoring and maintaining high water quality and the effective management and development the lake's natural habitats, can work in tandem with the development of rural and activity-based tourism to develop the full potential of the lake as a natural asset to Mullingar and the NE midlands.

Studies in 2021[4] and 2022[5], a conservation plan for Westmeath County Council lands[6], and a stakeholder workshop in 2022, highlighted key issues and opportunities at the lake. The opportunities for nature-based tourism, heritage and recreational trails and activities on and around the lake are apparent, but it is recognised that there are several key issues or constraints which need to be addressed through catchment management. These centre around water quality, associated declines in ecological functioning and both public perception and the lack of awareness of the value of the lake by the public.

In January 2023, Lough Ennell Trout Preservation Association (LETPA) were awarded funding, from LEADER, to facilitate the production of a catchment management plan for Lough Ennell. This followed several years of work by LETPA and by others such as LAWPRO[7] and Inland Fisheries Ireland (IFI), to investigate and tackle catchment issues related to water quality (particularly bathing water), and to trout stocks and spawning habitats.

The efforts of LETPA and LAWPRO culminated in a workshop in June 2022 to scope catchment management options. Several actions were identified as high priority, the most significant of which was the need for an overarching, integrated, catchment management plan with multiple stakeholders.

[1] https://rsis.ramsar.org/ris/848?language=en
[2] https://www.ramsar.org/about-the-ramsar-convention
[3] https://fishinginireland.info/trout/shannon/ennell/
[4] Lauder, A. (2021) Lough Ennell nutrient and pathogen load assessment Phase 1 catchment management scoping. Report to LAWPRO.
[5] Lauder, A. & Cussen E. (2021) Lough Ennell Wetlands Study: survey and assessment of wetland habitats at Lough Ennell. Report to LAWPRO & Westmeath County Council.
[6] Lauder, A. (2020) Conservation Land Management Recommendations for Westmeath County Council Lands at Lough Ennell. Report to Westmeath County Council
November 2019
[7] Local Authority Waters Programme https://lawaters.ie/

1.2 Purpose and approach of the plan

The plan is intended to be a concise working document for those groups and bodies signed up to its implementation or supportive of its aims and objectives. It aims to provide a clear structure, and a rationale for action in each case. It is an integrated plan, in so far as it covers the key sectors and stakeholders which are identified as influencing or affecting the health of the lake ecosystem and its catchment, or those sectors which stand to benefit from the restoration or maintenance of the lake ecosystem and a sustainable approach to catchment management.

The plan approach focuses on six management themes and provides a brief account of the issues and opportunities that are relevant to each, and provides objectives for these which are SMART[8].

The implementation of the plan is addressed through a specific section which describes a proposed means of operating as a voluntary project. This being adaptable as the project implementation progresses or as specific legislation or structures emerge which adopt elements of the delivery as necessary.

The voluntary principle being that those signing up to plan implementation recognise and commit to achieving the objectives of the plan.

2. Catchment characteristics & issues

2.1 Location & extent

Lough Ennell lies to the South West of Mullingar (see **Error! Reference source not found.**). Lough Ennell is 6.5km long and c. 2km wide, with an area of approximately 1,300 ha. It is a predominantly shallow lake with around 70% of its area is less than 8m deep and nearly half under 3m depth. The maximum depth reaches 30m.

The lake lies at an altitude of 80m and has a catchment area of approximately 50,000 hectares (50km^2) which includes the River Brosna (main inflow and outflow), and several smaller streams which drain directly to the lake.

These smaller streams include the Dysart, Barrettstown (also known as the Beagaun), Hanstown and Tudenham streams, all of which derive from largely agricultural catchments. The Lough Ennell catchment includes Lough Owel, a spring fed lake and important as the main water supply for Mullingar and as the balancing supply for the Royal Canal. Initial catchment management did not fully consider the Lough Owel basin or the canal, but the issues there and role in the catchment is noted as essential. Therefore, they should be further considered as the plan develops and is implemented. As well as being a popular fishing and amenity site (also a designated bathing water), Lough Owel holds the largest population of White-clawed Crayfish in the country. In fact, it is one of the most (if not the most) important sites for this species remaining in the world[9].

An outline of the main hydrological features of the catchment are included at Figure 1.

2.2 Water and hydrology

Water quality

The Bathing Water Regulations 2008 specifies that two parameters, *Escherichia coli* and Intestinal *Enterococci,* are monitored at identified bathing waters throughout the bathing

[8] Specific, Measurable, Achievable, Relevant, Time-bound

[9] https://www.npws.ie/sites/default/files/publications/pdf/IWM37.pdfbut

season. Laboratory reported bacterial counts from samples taken during the bathing season define the bathing water quality.

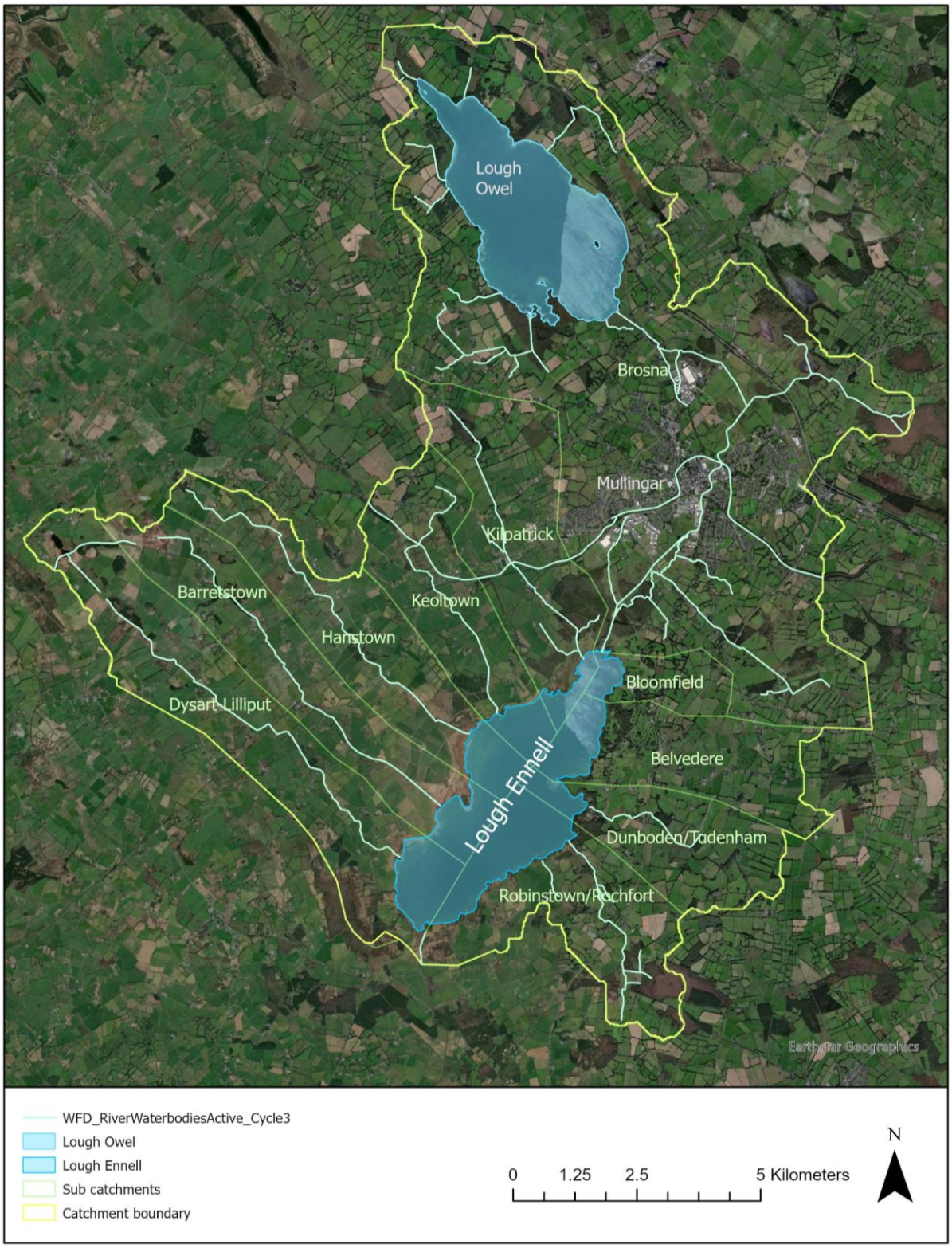

Figure 1 Lough Ennell Catchment Area

Table 1 provides the water quality metrics for each of these parameters.

The HSE document "Bathing Water and Health[10]" outlines the microbiological exceedances that should be notified to the HSE, the action levels, and recommended actions to protect public health. These are modulated by local conditions as is the case at Lough Ennell.

Table 1 Pathogen metrics for water quality at Lough Ennell bathing water

Parameter	Excellent Quality	Good Quality	Sufficient Quality
Escherichia coli (cfu/100ml)	500 (*)	1,000(*)	900 (**)
Intestinal enterococci (cfu/100ml)	200 (*)	400 (*)	330 (**)

(*) Based upon a 95-percentile evaluation
(**) Based upon a 90-percentile evaluation

Lilliput is the designated bathing water on Lough Ennell under the Bathing Water Quality Regulations 2008 (S.I. no. 79 of 2008[11]).

In 2018, there was a marked deterioration from generally "Good" to "Poor" status of the Lilliput bathing water, with *E. Coli*, including common illness-inducing VTEC strains, detected by the local authority from July 2018. Bathing prohibition continued and Ennell was classified as "Poor" for the years 2018, 2019 and 2020. This created a recognised public health risk and as such reduced the amenity value of the lake for the community and the wider perception of the lough. Once polluted bathing water can take a number of weeks to recover. During the 2021 bathing season (which had a bathing prohibition in place) water quality was classified as 'Excellent' throughout and this has broadly continued since then with favourable reports in 2022/23[12].

Despite recent improvement a better understanding of the nature of the pollution affecting Lilliput/Lough Ennell is needed to ensure sources of water pollution are eliminated or addressed through appropriate measures for the future.

Despite some improvements, past negative press[13] coverage and the recent prohibition has a significant impact on the amenity value and public perception of the site.

Nutrient loading

Lough Ennell is a designated Natura 2000 site (SAC and SPA) for 8 species and 2 habitats under the Birds and Habitats Directives. The important features include a range of aquatic organisms which, at least in part, rely on good water quality to support their populations or the habitats upon which they rely.

The Habitats Directive includes rare Annex I EU priority alkaline fen habitat and this has the potential to be adversely affected by the increased nutrient status of the lake water[14].

[10] Health Service Executive, Bathing Water Group (2019) Bathing water and health: A Health Service Executive guide for responding to incidents of microbiological pollution and other adverse circumstances in relation to both saline and fresh bathing water. HSE http://hdl.handle.net/10147/623997
[11] https://www.irishstatutebook.ie/eli/2008/si/79/made/en/print#:~:text=Citation-,1.,Bathing%20Water%20Quality%20Regulations%202008.&text=Interpretation-,2.,where%20these%20Regulations%20provide%20otherwise
[12] https://www.beaches.ie/find-a-beach/#/beach/IESHBWL25_188_0100
[13] E.g. https://www.westmeathexaminer.ie/2021/09/13/lilliput-water-quality-was-excellent-through-summer/
[14] Stanova *et al*. (2008) Management of Natura 2000 habitats. 7230 Alkaline fens (Technical report). European Commission (DG ENV B2). Available from: https://ec.europa.eu/environment/nature/natura2000/management/habitats/pdf/7230_Alkaline_fens.pdf

Lough Ennell is a designated nutrient sensitive area in accordance with the Urban Wastewater Treatment Regulations (as amended)[15].

Nutrient loading, while not ostensibly creating an apparent problem for bathing under "normal" conditions, is a well-known driver of algal blooms (e.g., as described by Benoit, 1955[16] and recognised widely since).

A shift in nutrient status, either seasonally or in the long term, can affect key interests in several ways e.g., the occurrence of toxic blue-green algal blooms (and thus potential public and animal health concerns, and also effects on aquatic macrophyte (submerged plant) communities with onward ecological effects. A direct effect on the recreational value is noted by the LETPA in potentially reducing fish catches through reduced water clarity and potentially reduced fish abundance (D. O'Malley *pers. comm.*, 2021) and this is known from several other waterbodies within Ireland (e.g. Lough Sheelin, Emy Lough) and elsewhere (e.g. Lough Leven, Scotland).

Nutrient loading also makes the wetland system less resilient to climate change. Aspects such as water temperature can interact with nutrient deposits in sediments (e.g., Wu, 2014[17]) and cause nutrient flux and can affect habitat condition and species distribution through changing species tolerances and hydrological conditions (e.g. Salimi, 2021[18]). This, in turn, creates risk to Natura 2000 site condition and is an additional pressure to other external macro level factors such as regional and global climate change effects (e.g., short stopping[19]) and invasive species pressures (Burgiel, 2010[20]).

In referring to nutrient loading the primary issue in relation to blue-green algal blooms and phytoplankton populations generally is the occurrence of the limiting nutrient phosphorus in its various forms. e.g., [21]

The occurrence and impacts of algal blooms in addition to pathogens is noted in the press in relation to a range of lakes including Lough Ennell[22, 23] and by statutory bodies (e.g., Public Health Bathing Water Group[24]). Comments noting the toxicity effects and dangers to public health are generally to the fore while the effects on the ecology, either short or long term are mainly absent, other than in angling media.

Other potential water quality issues

PFAS (per-and polyfluoroalkyl substances) are a group of chemicals used to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water. They are widely used in many everyday products such as non-stick coatings and fire fighting foam.[25]

[15] Lower Shannon (Brosna) Catchment Assessment 2010-2015 (HA 25A) https://www.catchments.ie/wp-content/files/catchmentassessments/25A%20Lower%20Shannon%20Catchment%20Summary%20WFD%20Cycle%202.pdf

[16] Benoit, R. J. (1955). Relation of Phosphorus Content to Algae Blooms. Sewage and Industrial Wastes, 27(11), 1267–1269. http://www.jstor.org/stable/25032921

[17] Wu, Y., Wen, Y., Zhou, J. et al.(2014) Phosphorus release from lake sediments: Effects of pH, temperature and dissolved oxygen. KSCE *J Civ Eng* 18, 323–329. https://doi.org/10.1007/s12205-014-0192-0

[18] Shokoufeh Salimi, Suhad A.A.A.N. Almuktar, Miklas Scholz (2021) Impact of climate change on wetland ecosystems: A critical review of experimental wetlands. *Journal of Environmental Management* 286 https://doi.org/10.1016/j.jenvman.2021.112160

[19] Elmberg, Johan & Hessel, Rebecca & Fox, A. & Dalby, Lars. (2014). Interpreting seasonal range shifts in migratory birds: A critical assessment of 'short-stopping' and a suggested terminology. *Journal of Ornithology*. 155. 571-579. DOI: 10.1007/s10336-014-1068-2

[20] Burgiel, Stanley & Muir, Adrianna. (2010). Invasive Species, Climate Change and Ecosystem-Based Adaptation: Addressing Multiple Drivers of Global Change. Global Invasive Species Programme. DOI: 10.13140/2.1.1460.8161

[21] May, L.; Defew, L.H.; Bennion, H.; Kirika, A.. 2012 Historical changes (1905-2005) in external phosphorus loads to Loch Leven, Scotland, UK. *Hydrobiologia*, 681 (1). 11-21. DOI: 10.1007/s10750-011-0922-y

[22] https://fishinginireland.info/2013/news-clippings/council-confirms-toxic-algal-bloom-on-lough-owel-westmeath-examiner/

[23] https://www.westmeathexaminer.ie/2013/07/11/bathers-and-animals-banned-from-ennell-as-dangerous-algae-found/

[24] Public Health Bathing Water Group (2018) Public Health Bathing Water Group Annual Report 2018. HSE. https://www.hse.ie/eng/health/hl/water/bathing/annual-report-2018.pdf

[25] https://www.epa.ie/our-services/monitoring--assessment/waste/chemicals/pfas/

Approximately 4,700 PFAS have been identified. They can have harmful effects on human and animal health and persist in the environment and in animal tissue for long periods where they bio-accumulate. They are colloquially referred to as “forever chemicals” and are implicated in environmental and human health issues.

PFAS have been detected in the River Brosna and there is significant public concern as a result[2627]. There is a process in place led by EPA to investigate PFAS in the catchment and this will inform the catchment management plan when outcomes are available.

PAHs (Polycyclic Aromatic Hydrocarbons)[28] are a class of chemicals formed and released during incomplete combustion or pyrolysis (burning) of organic matter, such as waste or food, during industrial processes and other human activities. Studies in animals have shown various toxicological effects; blood, reproductive and developmental toxicity and immunotoxicity and notably toxicity within aquatic ecosystems through accumulations in sediment[2930] . A number of PAHs have shown carcinogenic effects in experimental animals and it has been concluded that benzo[a]pyrene is carcinogenic to humans. They are regarded as “ubiquitous” and are likely to be present in at least 25% of Irish surface waters[31]. Sources of hazardous chemicals and their elimination from the aquatic environment is addressed in the current River Basin Management Plan (RBMP); *Water Action Plan 2024*[32] (WAP) which is discussed further in Section 2.6.

Silt and sedimentation in water courses can be a significant factor in aquatic ecosystems[33]. While sediment is a natural phenomenon, increased levels through anthropomorphic causes can lead to several negative effects and is relevant to streams in the Lough Ennell catchment. Notably for trout spawning streams, for aquatic invertebrates and plants, and in release or deposition of nutrients and other pollutants.

Siltation and calcification, stream bed and channel characteristics in surrounding streams have been the focus of several projects in recent years to improve trout spawning conditions as a result of poor conditions deriving from drainage maintenance works. Silt may be derived from several sources including drainage works, agricultural, forestry and urban surface water run-off, erosion of banks and beds of rivers through high flow rates, livestock and vehicle access to streams, and similar causes. The WAP recognises the impact of excessive sedimentation on our watercourses and includes measures to reduce sediment loss from all above mentioned sources.[32]

Other emerging water quality issues may occur and any catchment management initiative should be aware of developments to enable appropriate responses to be formulated

Hydromorphology and urban drainage

[26] EPA (2018) National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants. Environmental Protection Agency, Ireland (avaialble from: https://www.epa.ie/publications/compliance--enforcement/waste/IE_NIP-Final-Dec_2018-_website_v2.pdf)
[27] https://www.westmeathexaminer.ie/2023/07/21/duncan-angered-as-council-confirms-brosna-pollution/
[28] https://www.epa.ie/publications/research/environment--health/STRIVE_62_Zhou_PAHs_web.pdf
[29] Jesus, F. et al. (2022) A review on polycyclic aromatic hydrocarbons distribution in freshwater ecosystems and their toxicity to benthic fauna. *Science of The Total Environment*, 820 https://doi.org/10.1016/j.scitotenv.2022.153282
[30] Zheng, B. et al (2016) Distribution and ecological risk assessment of polycyclic aromatic hydrocarbons in water, suspended particulate matter and sediment from Daliao River estuary and the adjacent area, China. Chemosphere 149 (91-100) https://doi.org/10.1016/j.chemosphere.2016.01.039
[31] Department of Housing, Planning and Local Government. (2021) Significant Water Management Issues in Ireland - Public Consultation Document https://assets.gov.ie/78373/30d96d3b-a09c-431c-a3ee-790668e35e57.pdf
[32] gov.ie - River Basin Management Plan 2022 - 2027
[33] Lawler, D. et al. (2017) *SILTFLUX Literature Review.* EPA Research Report No. 176. EPA

The Lough Ennell catchment is subject to a range of hydro-morphological changes. Several water bodies within the catchment are listed as having intervention from drainage schemes or in-river structures.[34(see15)]

The lake itself was significantly lowered in the 1840s in order to free up agricultural land on its fringes and to enable control of the flow in the Brosna. Clearly this had a profound effect at the time and the resulting lake system is the outcome and has been established for nearly c. 200 years. The establishment of arterial drainage by OPW in the 1948-55 period also further contributed and is now a significant ongoing issue through maintenance.

Relatively few areas of the Lough Ennell shoreline are significantly protected or maintained but there are several piers, boathouses and small harbours which have changed the natural shape of the shoreline in places.

Of primary concern in regard to hydromorphology is the maintenance of inflow streams as drainage channels. Many of the streams in the catchment are subject to maintenance under the Arterial Drainage Act[35] and OPW are required to carry out maintenance on a periodic basis. This can have the effect of straightening, widening and deepening stream channels, which has several negative effects on the ecology of streams, such as silt deposition and removal of substrates and plant growth. This may also be implicated in the calcification of stream beds, this can be detrimental to trout spawning and rearing areas, effectively sealing off the substrate and reducing natural processes. Such hydromophological pressures are addressed in the WAP under Action Point 2.4.

The issue of urban drainage has had relatively limited investigation at Lough Ennell but with a major conurbation (Mullingar) and several major roads within the catchment (notably the N6 and N52) the effect of surface water drainage may be significant. The issue of PECs (pollutants of emerging concern) is likely to be of relevance here[3637].

The efficient drainage of urban and agricultural land can have the effect of carrying pollutants more rapidly to the lake rather than enabling attenuation of these pollutants by silt and vegetation before reaching it. This then has the potential to encourage attenuation within the lake ecosystem, and as such has both direct effects and may also store up problems for the future[38]. Agricultural and urban run-off is addressed in the WAP under Action Points 1 and 5 respectively.

The River Brosna, entering the lake, flows through a reach known as Lacy's Canal[39], this is not the original course of the Brosna. This reach is straighter and deeper. Waterways Ireland has a key role in maintaining the canals in the catchment and significantly also plays a role in maintaining this section.

Water levels across the lake are maintained predominantly by the operation and maintenance of a sluice gate on the downstream section of the Brosna River. This is operated by ESB and is subject

[34]EPA (2021) 3rd Cycle Lower Shannon (Brosna) Catchment Report (HA 25A) available from: https://catchments.ie/wp-content/files/catchmentassessments/25A%20Lower%20Shannon%20Catchment%20Summary%20WFD%20Cycle%203.pdf
[35] https://www.irishstatutebook.ie/eli/1995/act/14/enacted/en/html
[36] TII (2015) Road Drainage and the Water Environment DN-DNG-03065 https://www.tiipublications.ie/library/DN-DNG-03065-01.pdf
[37] Jasmine Humphrey, Chris Rowett, Jonathan Tyers, Mark Gregson & Sean Comber (2023) Are sustainable drainage systems (SuDS) effective at retaining dissolved trace elements?, Environmental Technology, 44:10, 1450-1463, DOI: 10.1080/09593330.2021.2004454
[38] Ghane E, Ranaivoson AZ, Feyereisen GW, Rosen CJ, Moncrief JF. Comparison of Contaminant Transport in Agricultural Drainage Water and Urban Stormwater Runoff. PLoS One. 2016 Dec 8;11(12):e0167834. doi: 10.1371/journal.pone.0167834. PMID: 27930684; PMCID: PMC5145188.
[39] https://irishwaterwayshistory.com/abandoned-or-little-used-irish-waterways/midlands-turf-waterways/lacys-canal/

Higher up the catchment, Lough Owel forms a source of drinking water and for balancing supply to the Royal canal, both of which require abstraction and features to enable that abstraction and linkages to end users. The abstraction of water from Lough Owel is likely to have significant effects on flow and water residence time in Lough Ennell.

Recent response to water quality issues

Collaboration has been vital for the protection of Lilliput bathing waters, as they have suffered from chronic agricultural pollution, resulting in poor water quality ratings from 2018 to 2020.

The bathing water closures due to pathogen loading, saw response at the the Dysart stream, which feeds immediately into the bathing water. Testing and observations indicated that this was a primary source of pathogens affecting Lilliput bathing water. The Dysart stream waterbody has a 2022-2027 Technical Environmental Objective for “Good” status. However, due to serious concerns from the continued pollution of Lilliput bathing water, it was decided to start local catchment assessment of the Dysart stream waterbodies in 2019.

LAWPRO met with Westmeath County Council and the HSE in August 2019 to outline its work programme for the Lough Ennell/Dysart PAA and how it would contribute to resolving the deteriorating status of Lilliput Bathing Waters.

An EPA led focus group, which included Westmeath County Council, the HSE, and LAWPRO identified several potential pollution sources and pathways using the EPA pollution impact potential maps. This knowledge led to a management plan for this stream, supported by measures like increased characterisation and monitoring, and a communication strategy to increase knowledge and understanding of the pressures effecting the bathing waters.

LAWPRO, ASSAP, and Westmeath County Council played key roles in implementing on the ground measures to protect the bathing water. Steps taken included knowledge exchange, implementing proactive and protective measures, removal of point sources of pollution, maintaining, and increasing the buffer zones for land spreading and low emission slurry spreading. Cooperation from landowners, the farming communities, and the various agencies improved water quality by 2021, allowing Lilliput bathing waters to be re-opened again for public use in 2022.

To safeguard Lough Ennell further, a scoping study funded by LAWPRO examined the lake's health(see**Error! Bookmark not defined.**). The findings were presented through a workshop organised with key stakeholders, the Lough Ennell Trout Preservation Association, Alan Lauder Consulting, ASSAP, Westmeath County Council, NPWS, OPW and LAWPRO staff. A roadmap was discussed on how to improve ecology, tourism, and heritage.

In conjunction with the scoping study, a data gap was identified by LAWPRO in relation to the location and conservation status of alkaline fen, a rare habitat type and a qualifying interest for the NATURA 2000 site. In 2022 LAWPRO, in collaboration with National Parks and Wildlife Service, commissioned the Lough Ennell Wetlands Study(see5) which spatially mapped the key habitats and rated their conservation status. In 2023, the European Union Habitat (Lough Ennell Special Area for Conservation 000685) Regulations, was passed, which gives statutory protection to the habitats within the Special Area of Conservation (SAC) boundary.

In 2023, Lilliput's bathing waters maintained ‘Good’ or ‘Excellent’ water quality categories, showing resilience to climate change that was experienced in June and July that year (warmest June and wettest July on record). However, ongoing management is essential for its safe recreational use by future generations, and it is hoped that this can be done through an integrated and collaborative manner.

In late 2022, LETPA secured LEADER and LAWPRO funding for an integrated catchment management plan based on the outcomes of the workshop and information from LAWPRO, EPA, NPWS, OPW, IFI and Westmeath County Council and together with the local communities are working towards developing the plan to ensure the future conservation and protection of Lough Ennell and its bathing waters.

Figure 2 Attendees to the Visioning workshop for Lough Ennell on the 13th June 2022 (funded by the LAWPRO Community Water Development fund).

2.3 Ecological interest

It is a large limestone lake fringed by calcareous grassland, fen, marsh, wet grassland, reedbeds and mixed woodland. It has significance as a highly productive lake rich in lower plants (notably Stonewort *Chara* spp.) and invertebrates, and as a wintering and breeding area for high numbers of waterbirds including some populations which reach national significance. The surrounding habitats, particularly the alkaline fen areas, are notable for a range of scarce plants.

Figure 3 Alkaline Fen at Lilliput, Lough Ennell

The angling on the lake is particularly notable for Brown Trout *Salmo trutta* but several other fish species occur: perch, roach, roach x bream hybrid, brown trout, rudd, tench, pike, Three-spined stickleback and European eel.

Designated sites

Lough Ennell is a Special Area of Conservation (SAC) and Special Protection Area (SPA), designated under the EU Habitats and Birds Directives and is also a Ramsar site[40][41]. Lough Owel, at the head of the catchment is an SAC.

The Interest of Lough Ennell SAC is summarised in the SAC site synopsis which is contained in Appendix 1. The site includes the following habitats listed on Annex I of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- Alkaline fens [7230] *
- Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp.* [3140]

Initial mapping of Alkaline fen habitats have been undertaken but a more significant eco-hydrological study would be needed to detail the condition of ecosystem function in the fen habitat.

It is notable that a conservation assessment of its lake character and benthic charaphyte communities, found the lake to be in poor conservation condition[42]. This contrasts with water quality and fish ecological status classifications.

In addition, the site supports Annex II species[43] including Brook Lamprey *Lampetra planeri*, Otter *Lutra lutra* and White-clawed Crayfish *Austropotamobius pallipes.*

Lough Owel SAC is primarily of interest for wetland habitats, notably the qualifying interest being:

- Hard oligo-mesotrophic water with benthic vegetation of Chara spp. [3140]
- Transition mires and quaking bogs [7140]
- Alkaline fens [7230]
- Austropotamobius pallipes (White-clawed Crayfish) [1092]

Special Protection Area (SPA)

Lough Ennell is of ornithological significance for wintering waterbirds, with three migratory species having populations of national importance at the point of designation. The historical baseline populations for the main species are included in the SPA site synopsis[44] but populations have declined significantly since then[45].

Birds for which the site is important and listed on Annex I of the E.U. Birds Directive.

- Pochard (Aythya ferina) [A059]
- Tufted Duck (Aythya fuligula) [A061]
- Coot (Fulica atra) [A125]
- Wetland and Waterbirds [A999]

In addition, the site formerly held a regular flock of the Annex I species, Greenland White-fronted Goose, shared with Lough Owel. These have become infrequent or absent in the last

[40] https://rsis.ramsar.org/ris/848?language=en
[41] https://www.ramsar.org/about-the-ramsar-convention
[42] Roden, C., Murphy, P. & Ryan, J. (2020) Benthic vegetation in Irish marl lakes: monitoring habitat 3140 condition 2011 to 2018. Appendix III, Site Reports. Irish Wildlife Manuals, No. 124. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland. Available from: https://www.npws.ie/sites/default/files/publications/pdf/IWM124%20Appendix%20III.pdf

[43] https://ec.europa.eu/environment/nature/conservation/species/habitats_dir_en.htm
[44] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004044.pdf
[45] NPWS/BWI IWeBS data https://c0amf055.caspio.com/dp/f4db30005dbe20614b404564be88

two decades, due in part to changing population demography and distribution of the population of this, near endemic, sub-species.

A recent analysis of breeding waterbird hotspots in Ireland, found that Lough Ennell, while somewhat data deficient, was likely to lie in the top 25% of wetlands for breeding waterbirds[46]. A full breeding waterbird survey of three Westmeath lakes (including Ennell and Owel) showed Ennell to have large populations of Great Crested Grebe and Coot and a good diversity of other species. This was somewhat in contrast to the much more impoverished waterbird fauna of Lough Owel[47]

Ramsar
Lough Ennell is listed under the Ramsar Convention. Its designation as a Ramsar site is mirrored by that of the SAC and SPA designations.

2.4 Land use

Aspects of land-use in the catchment are mentioned in previous and subsequent sections in relation to there influence on the lake water quality. Broadly summarised, land use is identified as predominantly grass based agriculture (mainly milk and beef cattle herds), a lower proportion of tillage land (mainly cereals), a low proportion of forestry and woodland cover and a range of small settlements but dominated by the urban centre of Mullingar.

In addition to agriculture there are smaller areas of natural/semi-natural habitats associated with the lake fringe and areas of peatland. Notable areas of peatland include areas adjacent to Lough Owel (at Tullaghan and Scragh) and cutover or afforested bogs to western and northern edge of Lough Ennell. In almost all cases these peatlands are highly degraded and are unlikely to form fully functional bogs as they are.

While the settlement pattern is dominated by the large urban centre of Mullingar, there is a widespread low density settlement pattern in the wider countryside.

A catchment comprising predominantly agriculture, with a single large urban area, suggests two main external pressures on catchment water quality, hydromorphology and ecology. These pressures are highlighted in other sections and how they interact with issues and pressures on the lake catchment.

Flood risk modelled by the EPA[48] suggests relatively limited flooding in medium flood event scenarios (10% risk) to land beyond the banks of streams. This is focussed primarily on small areas of primarily agricultural land and peatlands/forest, immediately above the lake and below Mullingar and another area upstream of Mullingar. Lower frequency/higher event scenarios are more extensive but remain focussed in the same areas.

2.5 Socio-economic characteristics

Lough Ennell is an important socio-economic resource. This section briefly outlines key aspects of the socio-economic contribution of the lake and its catchment in supporting these socio-economic interests.

Angling

[46] Lauder, A. & Lauder, C. (2020) Identification of breeding waterbird hotspots in Ireland. Irish Wildlife Manuals, No. 129. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland. Available from: https://www.npws.ie/sites/default/files/publications/pdf/IWM129.pdf
[47] Lauder, A. (2023) Breeding waterbird survey on three lakes in County Westmeath – Lough Ennell, Lough Owel and Lough Derravaragh. Report to Westmeath County Council.
[48] https://www.floodinfo.ie/map/floodmaps/

The lake forms part of the midlands fishery area of IFI. Annual total usage by anglers and the contribution to the local economy is unknown (a key information gap), but a conservative estimate, given the size and activity of local angling club and boat hire business and the general presence of anglers throughout the year would suggest c. 2500 - 5000 angling "visits" per annum and with associated spend in the local area this is likely worth potentially €0.5-1millon per annum and potentially significantly more. An important consideration in future would be the quantification and future monitoring of this contribution and the development of sustainable angling to build upon the lake's role.

Recreation

The lake provides a central locus for many recreation activities. Notably, the role of Lilliput as a public bathing water has driven much of the attention on the water quality of the site. Bathing water at Lough Owel is also of relevance from a catchment perspective. Numbers of people using Lilliput annually are unknown but its role as one of only three designated bathing waters in the county (and only nine inland bathing waters) is essential. This bathing water contributes an important amenity to the community but also supports activities of an outdoor activity centre which attracts in users from well outside of the county.

There are several areas of lake shore which are managed by Westmeath County Council and are managed as informal recreation space. These provide opportunities for walking and other quiet recreation as well as for wildlife watching.

Angling as noted above, is the primary boat use of the lake but other users such as kayakers and paddleboarders are possibly becoming more frequent with the rise of these activities nationally

Lough Ennell has an important role to play in providing a locus for recreational activities. This is of particular significance since in light of the increase in participation outdoor activities, particularly since the Covid-19 pandemic[49].

Heritage

The catchment of the lake includes several heritage sites of significance, perhaps most notably Belvedere House, which attracts high numbers of visitors annually and is a major contributor to local tourism as well as providing amenity space for recreation. The heritage value of the lake is part of the sense of place with which the lake is identified.

Tourism

Lough Ennell features significantly within the Westmeath County Tourism Strategy 2023-27[50]. Within a SWOT[51] analysis in the strategy several key issues relevant to the lake and its catchment are clear, including:

- '*Scenic and historic lakes with internationally recognised ecological value'*
- *'Limited service provision for outdoor recreation facilities – including water sports providers'*
- *Realise the untapped potential of our lakes for tourism'*
- *'Potential to expand the tourism facilities at Belvedere, including water-based activity provision"*
- *'Water quality, maintenance of status at bathing areas'*

[49]Pulse survey 2022: https://www.cso.ie/en/releasesandpublications/fp/fp-olodsto/pulsesurveyapril-may2022-ourlivesoutdoorsspendingtimeoutdoors/youruseoftheoutdoorssincecovid-19/
[50] https://www.westmeathcoco.ie/en/media/TourismStrategy20232027.pdf
[51] Strengths, weaknesses, opportunities, threats

The area lies within the Failte Ireland regional experience brand 'Ireland's Hidden Heartlands' with the proposition: *'Active in Nature – Yours to Uncover'*

The strategy identifies several initiatives for development which are dependent upon a healthy lake environment including development of angling, water sports, blueways and wildlife watching.

Water resources

Lough Ennell performs an important water resource management role. Lying below the Mullingar STW is a key receptor for treated wastewater from this plant. Lying at the end of the catchment before its outflow to the Brosna south westwards, it also attenuates flows from many tributaries which receive flow from a wide range of sources. The role of the lake in attenuating emissions is likely to be significant, with water quality in the Brosna, downstream, being in part mitigated for by the lake's ability to uptake of sediment, nutrients and pathogens through its ecosystem.

In addition, the role of the lake in ameliorating flows below it, to the Brosna, is likely to be significant as part of the hydromorphology of the system.

Within the wider catchment, Portloman Water Treatment Plant at Lough Owel provides the drinking water supply to more than 48,000 people in and around Mullingar. There are challenges to overcome with its management and this is highlighted by *Uisce Éireann* in the Regional Water Resources Plan for the area[52].

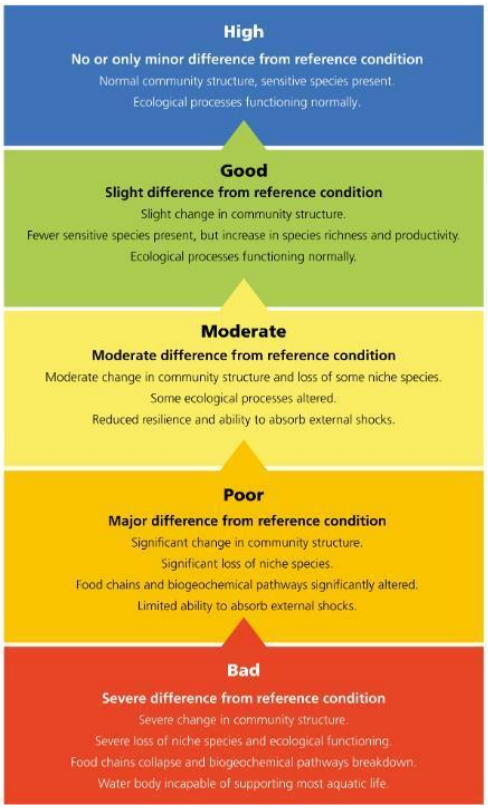

Figure 4 WFD Quality classes (source: EPA)

Health & well-being

The value of nature and outdoor "greenspace" in health and well being is increasingly recognised[53,54,55]. Lough Ennell provides an important resource for recreation and for engagement in nature for local people and visitors and is arguably more accessible than most large wetlands in the area due to its series of visitor access points. This accessibility, aligned with the acknowledged physical and mental health benefits of time in nature, is probably an under-recognised aspect of the intrinsic value of having a healthy lake ecosystem[56,57].

Maintaining and enhancing lake health through catchment management is likely to contribute to opportunities for well being. On the other

[52] https://www.water.ie/docs/rwrp-easternmidlands/2022/rwrp-em-nts/RWRP-EM-NTS.pdf
[53] https://www.theguardian.com/sustainable-business/impact-sea-lakes-rivers-peoples-health#
[54] Millennium Ecosystem Assessment (2005) Ecosystems and Human Well-Being: Wetlands And Water; Synthesis. World Resources Institute, Washington, DC. Available from: https://wedocs.unep.org/handle/20.500.11822/8735;jsessionid=AB429C487A3BE0F3ACE79BA39E129A84
[55] https://www.wwt.org.uk/our-work/projects/wetlands-and-wellbeing-our-science/
[56] Maund PR, Irvine KN, Reeves J, Strong E, Cromie R, Dallimer M, Davies ZG. Wetlands for Wellbeing: Piloting a Nature-Based Health Intervention for the Management of Anxiety and Depression. Int J Environ Res Public Health. 2019 Nov 11;16(22):4413. doi: 10.3390/ijerph16224413.
[57] White, M.P., Alcock, I., Grellier, J. et al. Spending at least 120 minutes a week in nature is associated with good health and wellbeing. Sci Rep 9, 7730 (2019). https://doi.org/10.1038/s41598-019-44097-3

hand, any decline in health of the lake system is likely to be detrimental to well being in several ways, such as reducing safe opportunities for engagement and the existential impacts of declining health of a local environment[58, 59]

2.6 The policy context

The Water Framework Directive (WFD) was adopted by EU member states in 2000. It requires that all waters are suitably protected and that measures are put in place to ensure quality of these waters is restored to at least 'Good' status (see figure 4) or good potential (with some narrow exceptions) by 2027. The Directive requires an integrated approach (i.e. across all sectors including agriculture, industry, spatial policy etc.) to the sustainable management and protection of water resources. It impacts on, and is equally impacted by, a diverse range of environmental plans and regulations. The WFD links to, and reinforces, other EU environmental directives including those relating to the protection of biodiversity (Birds and Habitats Directives), those for specific uses of waters (drinking water, bathing waters and urban wastewater directives) and those concerned with the regulation of activities undertaken in the environment (Industrial Emissions and Environmental Impact Assessment directives).

In Ireland, The River Basin Management Plan (RBMP), is the key mechanism for driving measures necessary and is prepared in 6-year cycles. The latest version, 'Water Action Plan 2024; A River Basin Management Plan for Ireland'[32] was published in 2024. It sets out the measures necessary to protect and restore water quality in Ireland up to 2027. The new Plan focuses on Integrated Catchment Planning and through a collaborative approach with key stakeholders, aims to effectively address major threats to water quality in Ireland including agricultural run-off, urban waste water and urban run-off. A new Nitrates Action Programme will tighten controls on Nitrogen and Phosphorus from agriculture, through a European project 'Farming for Water'[60] which will reduce the loss of Nitrogen, Phosphorus, pesticides and sediment from agricultural land through the implantation of nature-based Natural Water Retention Measures. The Plan also addresses threats associated with hydromorphology.

3. SECTORAL AND COMMUNITY CONSULTATION

Consultation in production of this plan has involved several steps. Engagement across various sectors and stakeholders has been good in most cases but further effort may be needed in some sectors or with additional stakeholders.

The summary outline included here identifies the steps in consultation and engagement so far.

Stage 1 Preliminary consultation

When? 2021

How? Online survey (disseminated by LAWPRO)

Who? Community groups and contacts

Key findings:

- The lake is an asset which is currently undervalued

[58] Barcaru, C (2023) How the environmental decline can affect mental health. Centre for Sustainable Healthcare (https://networks.sustainablehealthcare.org.uk/resources/how-environmental-decline-can-affect-mental-health#:~:text=Lack%20of%20access%20to%20green,stress%2C%20anxiety%2C%20and%20depression.)

[59] Cianconi P, Hirsch D, Chiappini S, Martinotti G, Janiri L. Climate change, biodiversity loss and mental health: a global perspective. BJPsych International. 2022;19(4):83-86. doi:10.1192/bji.2022.20

[60] Farming for Water European Innovation Partnership - Farming for Water EIP

- The lough is of high value to the community and to individuals
- The lough has inadequate environmental protection and management
- The top three perceived environmental issues by respondents are poor sewage treatment, agricultural run-off and septic tanks
- Recommended interventions frequently include mentions of: a management plan; tackling diffuse and point source pollution; enhanced testing; better protections; better communications of solutions
- Information gained on bathing water quality is obtained roughly equally from signage and from online sources
- There is a good understanding of the role and importance of wetland habitats at the lough and for its wildlife and environmental quality
- There is positive but fairly limited desire (score 6/10) for community involvement in management the lake
- The obstacles to community involvement are perceived mainly to be the lack of a clear pathway for involvement or lead group to take it forward and the solutions suggested revolve around leadership and funding of lead initiatives
- There are several fairly detailed suggestions of actions within the additional comments section and these include the concept of enhancing wetland buffers, the development of greater public awareness and tourism including access, the importance of proper enforcement in controlling effluent sources and the need for leadership and urgent action.

Stage 2: Visioning

When? 13 June 2022

How? In person workshop

Who? 39 attendees (+ organisers) from 14 organisations or sectors and including:

- Biodiversity interests (3+)
- Farming (4+)
- IFI (2)
- LAWPRO (2)
- LETPA & fishing (12)
- Mullingar Tidy Towns (1)
- NPWS (1)
- OPW (1)
- Rural Consultancy (1)
- Teagasc ASSAP (1)
- Tourism sector (2)
- Westmeath Co Co (1)

Key findings:

Summary issues:

- Pollution issues remain focus for most groups – everybody wants improvement
- Ongoing concern and vulnerability of bathing water quality
- Ecological trends and changes are negative and important to address – habitat change and declining quality, declines in bird and invertebrate populations
- Angling is perceived to be declining - changes in fly hatches, concern over spawning streams, changes in the lake
- Anti-social behaviour is a concern for lake users – litter, dumping, lack of dog control, scrambling, speedboats
- Lack of communications between organisations with management role
- Lack of historical data on which to make decisions

Summary opportunities:

- Water quality improvements are central to future sustainable use

- Sustainable tourism
- Sustainable trails
- Interactions with farming community have shown positive results on local level
- Opportunities for education and awareness may address some issues
- Sustainable recreation opportunities
- Angling remains a key feature and has taken a lead role

Stage 3: Plan scoping workshops

Those attending the 2022 workshop and expressing an interest for further engagement were invited to attend online workshop sessions in June 2023. Of those, 13 people registered for three of four date options and eight people attended.

The workshop presented an outline of plan content and sought discussion of gaps and views on key actions. These informed production of this plan

Those not attending were contacted for follow up engagement.

Stage 4: Draft plan presentation & plan for comment

Following production of a draft plan, further contact was made with organisations and individuals who maintained contact with the plan process, and a workshop held on 19 October 2023 to present the draft plan and seek initial views.

Twelve attendees across nine sectors and six organisations contributed.

Comments collated during the workshop were incorporated and the draft circulated on 18 December 2023 for written submissions.

Submissions were incorporated by 22 March 2024.

Stage 5: Changes to working plan

This section should be updated in future versions to reflect decisions made immediately prior to or after project launch and throughout life of the project.

4. KEY ISSUES AND PRIORITIES FOR ACTION

4.1 Overall rationale for action

The lake's role as an asset in providing essential ecosystem services to the area and community, is clear. The site is of high biodiversity value and is heavily designated, it performs an important attenuation function in buffering flows and discharges arising from its catchment, it provides recreational space and resources, is a high value landscape asset and in turn supports tourism and quality of life. Lake and catchment ecosystem health (ecological, amenity and landscape) depends on the appropriate and sustainable management of its catchment.

The catchment of Lough Ennell includes several activities and features which create pressures and risks to lake health. These include a major town (Mullingar), roads, widespread dispersed dwellings and small communities, business such as hotels and other visitor attractions, agriculture and associated land use, and recreational activity.

The key issues identified from recent studies, from consultation, and from information on emerging pressures, are described in Table 1.

Underpinning most of these aspects are the factors driving water quality, notably nutrient and pathogen loading arising from diffuse and point source pollution. The emerging threat of PFAS and similar "forever" chemicals, also creates a potential threat which needs to be better understood and monitored in the context of the lake and its ecology, to ensure impacts are mitigated.

Table 2 Main issues in the Lough Ennell catchment

Issue	Sources and impacts
Nutrient loading (P & N)	• Arising from Wastewater Treatment/septic tanks (point source) • Arising from agricultural run-off (Diffuse/Point source) • Risk of algal blooms and lack of water clarity • Long term risk to invertebrate communities • Poor conservation status of wetland habitats • Likely impacts on benthic plants • Fish populations and fishery health • Legacy issues – sediment nutrient deposition/release • Aesthetic impacts – water colour and smell • Increasing reed encroachment/access issues • Urban run–off
Pathogen loading	• Arising from Wastewater treatment/septic tanks/drainage (point source) • Arising from agricultural run-off (Diffuse source) • Bathing water quality has reached unsafe levels periodically • Contribution to poor ecological health (associated nutrients) • Aesthetic impacts – water colour and smell
Other pollutants	• e.g. PFAS - sources unknown • Lack of evidence base reduces capacity to act • Extent of risks unknown • Contaminants of emerging concern (e.g. microplastics, pesticides, hydrocarbons, lead) •
Wetland habitat (and ecosystem) condition (SAC)	• Wetland habitats around and within lake are in poor condition • Status and trend in benthic plant communities unknown – perceived to be declining after improvements in 80s • Information gap in alkaline fen condition and ecosystem function • Status and trend in benthic invertebrate communities unknown – perceived to be declining • Arterial drainage maintenance effects • Perceived decline of invertebrate hatches • Status of White-clawed Crayfish (EU Annex II species) unknown[61] • Contrast in WFD status ("Good") and NPWS conservation assessment ("Poor")
Bird populations declining (SPA)	• Declining wintering waterbird populations (not all species) • Loss of wintering White-fronted Geese • Unknown trend in breeding birds (likely decline) • On-site pressures – local ecological change • Off-site pressures – climate/flyway pressures
Trout population changes, spawning stream conditions or declining angling catch	• Hydromorphology and water quality changes in spawning streams are implicated in declining recruitment • Arterial drainage maintenance • Apparent decline in angling catch/quality – catch statistics hard to access/interpret • Impact on visitor numbers if angling uptake declines • Reputational risk – angling • Calcification problem (natural) problem for fish combines with anthropomorphic pressures to reduce spawning opportunities

[61] https://www.youtube.com/watch?v=HnCVbeukQuM

Issue	Sources and impacts
Visitor pressure and Anti-social behaviour	• Litter & dumping – aesthetic and safety • Scrambling bikes/speedboats– aesthetic and safety • Reputational risk– visitors and tourism • Visitor numbers & parking pressure • Limited sustainable access for visitors, visitors scattered, not focusing visitors on areas that are already set up for tourism • Lots of anti-social activity, burning tyres, parties
Lack of historical data on key issues & no integrated monitoring	• Reduces ability to act on an evidence basis • Reduces capacity for adaptive management • Increases lack of understanding or misunderstanding of issues
Lack of co-ordinated approach to lake management	• Opportunity cost of not developing key opportunities

The plan is aimed at identifying actions where issues are well understood and identifying information gaps, and measures to fill these gaps, where issues are less well understood or solutions have not been identified.

4.2 Management themes

Management themes are identified which encompass the primary issues identified.

The themes, and their scope are outlined in table 2 and a rationale for their inclusion is outlined here.

1. Water quality and resources

This theme is focussed on the management and monitoring of the water quality of the lake and its inflows and on the management of the water as a resource. Notably developing approaches strategies to better management of discharges from point sources (large and small), a suitable monitoring and scientific research programme to cover all key components of water quality issues and to provide better evidence for adaptive actions. This is a central theme underpinning the core purpose of the catchment management planning but is also a key contributor to understanding how other themes may enhance or interact with lake health. Issues around the role of the lake as a water resource can be addressed in this theme including its role in attenuation and the impacts of abstraction, drinking water supply etc.

2. Land use

This theme is focussed primarily at engaging with landowners and land managers within the catchment to identify and deliver ways in which land-use management and planning can reduce apparent diffuse pollution impacts or risk. This is already in action in e.g., the Dysart stream area, and this should be widened where necessary. Nature-based solutions may be essential here, including aspects such as buffer strips, small wetlands and management of water sources for livestock. Aspects such as nutrient budgeting may be available. Funding supports to advisors and to farmers to deliver these works will be important and the launch of the Farming for Water EIP[60] may play a very important role in delivery, alongside ACRES[62].

3. Rivers and fish

The inflow Tributaries and their role in maintaining trout populations is important. Fishing and the fish resource is an important aspect of tourism and the socio-economic benefits arising

[62] https://www.gov.ie/en/service/f5a48-agri-climate-rural-environment-scheme-acres/

from the lake. IFI and LETPA are already actively intervening to restore and enhance trout spawning and nursery streams, and continue to develop efforts subject to funding and resources. Fish also provide a means of monitoring lake ecological health. Other fish species for anglers may be important outside of the trout angling season, and this activity is largely unquantified and unmanaged at present. The management of angling and the fishery is also important in terms of recreational behaviour and watchful eyes on the lake.

4. Biodiversity & climate response

The lake is designated on account of its international importance in terms of its habitats and species and its bird populations. There is recognised change in these qualifying interests and likely change in the ecosystems and species that complement these priorities. Recent condition assessments for qualifying interests have indicated the site is on “Poor” conservation condition. This contrasts to the "Good” ecological status derived from water quality and fish assessments. There is a relatively poor understanding of the trends and some information gaps require to be filled, notably regarding eco-hydrology of alkaline fen and the trends in lake ecosystem function. The precarious nature of lake ecosystem health is a risk factor in the condition of biodiversity. The lake ecosystem may be affected by, or could contribute to climate change and climate adaptation. Its role in this and how it is affected will be important into the future and actions to ensure the lake ecosystem continues to support or recovers its biodiversity importance and its role in climate adaptation should be included. This is important for the intrinsic biodiversity value of the site but also for its interlinking and underpinning role in supporting all other themes. Actions under the Westmeath Climate Action Plan will likely be of relevance upon its adoption[63].

5. Communities, tourism and education

This theme will focus on the engagement of communities and visitors in protection of key lake assets. The sustainable management of the lake is vital in terms of its benefits to the community and the enjoyment of visitors. To maintain this, visitors and communities can play an important role in protecting and helping to enhance the lake and may gain direct and indirect benefits as a result. The central role of tourism as a driver for environmental health and for enhancing the local economy is a key consideration

6. Project functions and cross-cutting actions

In order to operate as coherent and effective project there are a range of structural and administrative aspects which require effort. This includes maintaining the partnership and ensuring programmes and actions are undertaken as per the plan schedule.

Table 3 Scoping of themes and measures

Theme	Scope of potential measures	Key stakeholders
1. Water Resources	• Point source pollution control • Planning guidance and policy (e.g. septic tanks) • Waste water treatment provision • Crisis response planning • Water quality science & monitoring • Emerging pollution issues • Public health measures • Nature-based solutions • Future-proofing for climate-related effects (e.g. storm overflow, flooding) • Bathing water quality	• WCC Environment • WCC Planning • LAWPRO • UÉ[64] • EPA • Independent experts • IFI • ESB[64] • OPW[64] • Waterways Ireland[64]

[63] Final plan not available at time of writing but draft CAP (July 2023) can be found here: https://consult.westmeathcoco.ie/en/consultation/westmeath-county-council-draft-climate-action-plan-2024-2029

[64] Several stakeholders are yet to be fully engaged in the plan process and will be invited for future engagement with the plan

Theme	Scope of potential measures	Key stakeholders
2. Land use	• Diffuse source pollution (agricultural run-off) • Land-use planning and policy • Land management solutions • Land management advisory support • Increasing the robustness of planning developments & decision making Investigation of issues (e.g. DOC, run-off) from forestry and degraded peatlands	• ASSAP • Individual farmers • Farming reps • LAWPRO • Forestry[64] • WCC planning
3. Rivers and fish	• River habitat management & restoration • Hydromorphology actions • Fish population surveys • Angling catch monitoring • River monitoring • Angler awareness & guidance • Angling facility development • Invertebrates (hatches etc)	• LETPA • IFI • OPW • EPA
4. Biodiversity & climate response	• Habitat management – nature conservation • Designated site management • Species and habitat monitoring & research • Invasive species management • Climate adaptation and understanding • Community and visitor biodiversity awareness	• NPWS • WCC Planning • Communities • IFI • OPW[64]
5. Communities, tourism and education	• Responsible access guidance • Community involvement & awareness • Citizen science • Sustainable management of visitor sites and enterprises • Tourism strategies & lake branding • Helping to empower community to take ownership and management of their local water environment	• WCC Tourism • Community councils/Tidy Towns groups • Failte Ireland[64] • Businesses/sites/3rd sector[64] • LAWPRO
6. Project functions and cross-cutting actions	• Secretariat • Funding • Plan revision • Monitoring and review of progress • Project communications • Partnership administration & governance	• All partners

5. LONG-TERM VISION

In looking ahead to set objectives and plan actions, a long-term vision is essential. This should describe how we would like to see Lough Ennell and its catchments in 25-50 years, in a scenario where catchment management has been operational through this period. The vision provided here is adapted from key points and aspirations discussed by stakeholders through the consultation process.

A vision for Lough Ennell by 2050

In 2023 Lough Ennell was deemed to be in "Good" ecological status but there are continuing issues and high risks within the catchment, a lack of coordinated action to maintain and enhance its ecological status, and indications that emerging threats and declining trends were apparent. By 2025, Integrated Catchment Management will be established initially by voluntary agreement. It will have built on earlier work.

By 2050, water quality will have been enhanced significantly, achieving high ecological status largely as a result of reducing the impacts of point source and diffuse pollution source which contributed high

levels of nitrogen, phosphorus, pathogens and other pollutants. As a result the lake ecosystem will be recovering, even after 25 years, the remaining nutrients and pollutions built up in sediments may still occasionally have impacts but these will be less dramatic. Monitoring of water quality will have seen a robust system implemented which has enabled key issues to be identified and tackled when they have arisen.

The catchment will see its inflow streams with naturalised buffer strips and the creation of small wetlands, both of which has helps to manage diffuse pollution transfer. This enables farms to continue to produce food and to do so in a way which has a negligible effect on the lake and streams. These feeder streams will have been significantly rehabilitated, with reduced drainage intervention and restored to support trout spawning and healthy riparian ecosystems. This in turn maintains angling as a vital driver in the rural economy by ensuring native brown trout stocks in the lake are plentiful. These in turn thrive off a diverse invertebrate community showing which should have recovered well as a result of improving water quality.

With improving water quality and sustainability, there may be farm initiatives to brand food produced in the area, generating sustainable small business as a result. The health of the lake and its management being central to this added value.

Bird populations are likely to have changed over the period. The former large populations of wintering birds are much reduced due to climate change but those that do come will continue to be supported. Proportionally, the lake will remain an important wintering site for diving ducks in particular. Breeding waterbirds will have changed too. Species with more southerly ranges may have colonised and along with resident species will be benefitting from the increased areas, of shoreline, islands and wetlands, under active habitat management and restored or created small wetlands in the wider catchment, as well as protection from invasive species like American Mink.

The lake's important habitats; its alkaline fen, swamp communities and calcareous grasslands will be much enhanced, and it's submerged aquatic plant communities better understood and in better condition with improving water quality. Targeted and focused management will be used to ensure they remain in favourable conservation status and opportunities to restore areas formerly drained or management inappropriately will be taken up. Activity to control the spread and impacts of non-native invasive species will see reduced impacts in several areas. Areas of habitats connecting to the lake edge, such as woodlands will be better managed and provided important ecological linkages to habitats in the wider countryside. People will be more aware of the importance of the lake as one of the areas richest in biodiversity in the county.

Visitors to the lake will have a greater awareness of the lakes importance. They will be able to access the lake to enjoy quiet and sustainable forms of recreation, fishing, enjoying the wildlife and heritage. The communities in the area will benefit from visitors who stay longer to walk cycle and enjoy the natural assets of the area. Walking and cycling routes in the area will include stops at appropriate sites at the lake, linking the lake more sustainably, to communities. Swimmers will continue to enjoy the lake. The blight of litter and dumping and other bad behaviour will have reduced as a result of a much greater value placed on the area by those that live near it and their active engagement in its management.

As a result of catchment management, the lake will see its ecological health improved and in turn its community thriving.

6. AIMS, OBJECTIVES & ACTIONS

6.1 Overarching aims

Deriving from the analysis of key issues and priorities, from the management themes identified, and from the results of consultation, the overarching aims for Lough Ennell catchment management in the next ten years are:

To implement a catchment management programme with associated complementary actions to ensure:

i. *Protection and enhancement of water quality and ecological health through reduced impacts of point source and diffuse source pollution and better management of natural habitats*
ii. *Enhanced socio-economic potential through an improving fishery, enhanced recreation & tourism opportunities and increases sustainability of agriculture*
iii. *Meaningful engagement of community in sustainable management of the lake catchment*
iv. *A better understanding of the processes and issues that affect water quality, ecosystems and other key factors*

6.2 Objectives & actions

Water Resources

Objective 1	Target outcome	KPIs
To protect and enhance WFD ecological status of all waterbodies in the catchment within life of the plan	Ecological status to at least from "Good" by 2030 Lilliput bathing water retains designated bathing status	1.1 Target WQS defined targets by end 2025 1.2 Monitoring programme in place WQS improved by year 3, 5 and end

Objective 2	Target outcome	KPIs
To reduce the transfer of nutrients and pathogens from point source pollution (Action Point 1 (Agriculture) – Water Action Plan 2024[32]	Point source N, P & pathogens reduced (to below target levels set) within life of plan	2.1 Target WQS defined by end 2025 (to achieve WQ enhancement) 2025 (or adjusted year) 2.2 Monitoring programme in place 2.3 WQS measurable improvement by year 5 and standards met by end of plan

Rationale

The enhancement of ecological status depends primarily on the improvement of water quality. Water quality improvements from point and diffuse pollution sources will require action, to underpin this, well defined WQS will be needed to ensure realistic targets are set which have a meaningful impact on ecological status.

To ensure progress a robust monitoring programme will be needed to ensure essential; parameters are adequately tracked.

Further actions to underpin the scientific basis for ecological status will be required alongside actions to address water quality itself.

To see improvements in water quality which will result in ecological status improvement, a range of new WQS should be defined and set and measures to address discharges to meet these standards should be set. This is likely to include setting robust conditions on waste water treatment and discharges, for domestic and public treatment facilities and may include revising existing conditions and implementing new technologies or approaches to treatment. Urban waste water and associated impacts on water quality is addressed in the WAP, under Action Point 4.

There are emerging issues deriving from recent monitoring reports of PFAS[65] in the River Brosna. Further investigation is warranted and key agencies are engaged.

Recommended actions

	Action	How?	Timescale[66]	Possible lead organisation[67]
1a	Define Water Quality Standards for entire waterbody catchment water	Working group & lead person	Immediate	LAWPRO
1b	Develop a standardised WQ monitoring programme	Working group & lead person	ST	LAWPRO/LECMP
1c	Review progress against KPIs and report to partnership with recommendations for actions	Partnership review workshop	Annual	LECMP
2a	Review waste water treatment provision and planning guidance within catchment and make recommendations	Report from Westmeath CC reviewed by steering group	ST	WCC/Uisce Éireann
2b	Increase awareness and plan response to contaminants of emerging concern within the catchment (e.g. PFAS)	Working group	Immediate	LAWPRO/EPA/WCC
2c	Determine the roll and risks associated with urban and surface water run-off	Commissioned report	ST	LAWPRO/LECMP

[65] https://www.epa.ie/our-services/monitoring--assessment/waste/chemicals/pfas/
[66] Immediate (1 year) – short term (2-5 year) – medium term (5-10 years) – long tern (>10 years)
[67] See appendix 1 for abbreviations

Land use

Objective 3	Target outcome	KPIs
To reduce the transfer of nutrients and pathogens from diffuse source pollution (Action Point 1 (Agriculture) – Water Action Plan 2024)	Diffuse source N, P & pathogen reduction reduced to target levels set within life of plan	3.1 Target WQS (to achieve WQ enhancement) defined by end 2025 3.2 Monitoring programme in place 3.3 WQS measurable improvement by year 5 and standards met by end of plan 3.4 Bathing water quality at least 'Good' or 'Excellent', at all times by 2025

Objective 4	Target outcome	KPIs
To enhance the condition of wetland habitats in the catchment	Wetland habitats enhanced to make a significant contribution to catchment condition including designated site features in favourable conservation condition	4.1 Wetland habitat inventory of catchment by year 2 4.2 Condition assessment and targets set by year 4 4.3 Wetland condition targets (extent/condition) enhanced by year 5 and met by year 10 4.4 Monitoring programme in place by year 5

Rationale

The enhancement of ecological status of the lake depends primarily on the improvement of water quality. While point sources are identified as a major source, diffuse pollution sources are also significant and predominantly derive from agricultural run off and while significant positive action has already occurred within areas of the catchment, there remains streams which are major carriers of nutrient and pathogen loading, deriving from farmland. There are several ways to attempt to address this and these can include the application of the principles of nature-based solutions (NBS) and include measures such as buffer strips and small wetlands to attenuate run off and can complement farm planning and operations measures, such as nutrient budgeting. Existing buffer strips in the catchment are already performing a role but their effectiveness, and measures to further develop the approach to these, would be worth considering (e.g. increasing width).

Wetland habitats around the lake are known, at least partially, to be in poor condition. These form a key component of the qualifying interest of the SAC and underpin bird populations important for the SPA. In the wider catchment, small wetlands and associated habitats have been reduced in extent over many decades through land improvement and drainage. The value of Lough Ennell for biodiversity and the effectiveness of the land in attenuating nutrients and pathogens can both be helped by the restoration of wetlands in the wider catchment, where these are still viable or restorable. Identifying opportunities for this, in conjunction with landowners, would be of high value in increasing the wetland integrity of Lough Ennell.

To ensure progress against these as a robust monitoring programme will be needed to ensure essential parameters are adequately tracked.

Recommended actions

	Action	How?	Timescale[68]	Possible lead org.(s)[69]
3a	Review and where necessary advocate to expand 'area for restoration'	Review in relation to RBMP	Immediate	LAWPRO
3b	Maintain actions delivered previously in Dysart stream	Working group & lead person	ST	LAWPRO/ASSAP
3c	Bathing water monitoring included within monitoring programme & develop alerts & information systems further	WCC and LAWPRO further develop existing protocols	Frequent - Annual	WCC/LAWPRO/EPA
4a	Map & identify wetland habitat resource within catchment.	Commissioned or in-house/voluntary study & inventory	ST	NPWS/WCC
4b	Identify, map and prioritise opportunities for buffer strips and wetland restoration along feeder streams	Commissioned or in-house/voluntary study & inventory	ST	LAWPRO/ASSAP
4c	Consider and Develop enhanced approach to buffer strip provision	Commissioned or in-house/voluntary study	ST	LAWPRO/ASSAP/IFI

Rivers and fish

Objective 5	Target outcome	KPIs
To promote the favourable conservation status of the fish populations of the Lough Ennell catchment	Fish populations which provide a key component of the ecological health of the lake should be in good condition and provide sustainable angling.	5.1 Fish populations reviewed and issues identified by year 2 5.2 Targets set by year 3 5.3 Angling catch bag returns system established by year 2 5.4 Progress towards targets showing positive trend by year 5 5.5 Designation of the lake as a Wild Brown Trout fishery by year 3

Rationale

A key component both of the lake ecological status and for the socio-economic and recreational interests of the area, is a healthy aquatic ecosystem which supports fish populations which are able to sustain a sport fishery. In the case of Lough Ennell this has focussed mainly on brown trout, and on pike.

[68] Immediate (1 year) – short term (2-5 year) – medium term (5-10 years) – long tern (>10 years)
[69] See appendix 1 for abbreviations

A multi-metric fish ecological classification tool (Fish in Lakes – 'FIL') is used by IFI[70],[71] to produce EQR[72] values for lakes. Lough Ennell has been assigned an ecological status of Moderate based on the last survey in 2017[73]. However the overall WFD Status for the lake is Good (EPA 2016-2021) while WFD Status for the Ennell streams are all at Moderate (EPA 2016-2021).

The ecological status does not necessarily reflect perceived changes in angling catch however, and there has been considerable concern from regular Lough Ennell trout anglers that trout catches have declined. Several reasons are put forward. While there is little evidence that stock declines have occurred, fish behaviour may have changed significantly due to ecosystem changes such as water quality and invertebrate population changes. In addition it is recognised that spawning conditions have declined over the long term and may be affecting subsequent recruitment at some level. Some feeder streams have suffered significantly due to hydro-morphological pressures and changes and pollution pressure. Works have been undertaken between LETPA and IFI (e.g. on Tudenham, Kilpatrick and Dysart streams) to rehabilitate and maintain streams.

Within the lake, the ecosystem health has a significant part to play in the health of trout stocks (and other fish) and in particular aspects such as water clarity and the presence of non-native invasive species are also of concern and their impacts on native fish and angling on the lake are not well understood.

Fish form an important socio-economic and ecological component of the lake ecosystem and further works to maintain and enhance populations identified as requiring action should be prioritised. A valuable measure of success is the range of statistics that can be collated from angling bag returns. While comprehensive bag returns can be challenging to achieve on a lake with open access, the presence of a major angling club (LETPA) enables the potential for catch statistics to be derived from returns.

There has been much work undertaken to date to address apparent negative trends with fish and angling. LETPA and IFI have worked cooperatively to develop enhanced spawning conditions in several streams. ASSAP has delivered extensive buffer strips and stick exclusion from water courses, and LETPA continue to campaign for designation of the site as a wild brown trout fishery.

Recommended actions

[70] Kelly, F.L., Harrison, A., Connor, L., Allen, M., Rosell, R. and Champ, T. (2008) FISH IN LAKES Task 6.9: Classification tool for Fish in Lakes. FINAL REPORT. Central Fisheries Board, NS Share project.
[71] Kelly, F.L., Harrison, A.J., Allen, M., Connor, L. and Rosell, R. (2012b) Development and application of an ecological classification tool for fish in lakes in Ireland. Ecological Indicators, 18, 608-619.
[72] Environmental Quality Reference values
[73] Connor, L., Coyne, J., Corcoran, W., Cierpial, D., Ni Dhonnaibhain L., Delanty, K., McLoone, P., Morrissey, E., Gordon, P., O' Briain, R., Matson, R., Rocks, K., O' Reilly, S., Brett A., Garland D. and Kelly, F.L. (2018) Fish Stock Survey of Lough Ennell, September 2017. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.
http://wfdfish.ie/wp-content/uploads/2018/11/Ennell_2017.pdf)

	Action	How?	Timescale[74]	Possible lead org.(s)[75]
5a	Fish population survey & review	IFI periodic survey (IFI National Research Programme)	ST	IFI
5b	Set targets for fish populations & population parameters	IFI advisory to LECM partnership	ST	IFI/LECMP
5d	Angling catch return system to be developed	LETPA & IFI develop a bag return system	Immediate/ST	LETPA
5e	Spawning stream restoration programme	LETPA/IFI/OPW? to identify spawning streams requiring further restoration works, define & implement programme subject to resouces	ST	LETPA
5f	Produce angler "best practice" guidance for Lough Ennell	LETPA to produce referencing existing materials and updated advice	ST	LETPA
5g	Angling awareness raising – produce media relevant to the promotion of sustainable angling as a recreation at Lough Ennell	LETPA/LECMP to commission/produce promotional media	ST	LETPA /LECMP

Biodiversity & climate response

Objective 6	Target outcome	KPIs
To maintain or enhance the conservation condition of the European sites (SAC & SPA)	Conservation condition of SAC has improved. Conservation condition of SPA has not declined.	6.1 Condition assessment of all QI features by year 2 6.2 Conservation actions identified for all QIs by year 3 6.3 Positive trends in condition for all QI features by year 6

Objective 7	Target outcome	KPIs
To enhance the role of the Lough Ennell catchment in the climate & biodiversity emergency response	Role of Lough Ennell in climate response is understood and enhanced	7.1 Research projects examining role of lake in climate adaptation established by year 4 7.2 Identification of relevant actions & targets identified by year 5 7.3 Measurable increase in awareness of community in value of Lough Ennell by year 5

Rationale

[74] Immediate (1 year) – short term (2-5 year) – medium term (5-10 years) – long tern (>10 years)
[75] See appendix 1 for abbreviations

Ireland has implemented three National Biodiversity Plans and is in production of its fourth[76] and is a signatory to the Convention on Biological Diversity[77]. Ireland has a climate action plan produced in 2023 and is a signatory to the "Paris Agreement"[78]. These recognise the critical need to achieve a transition across society to meet targets set by international agreements to achieve lasting change in relation to these global emergencies. These should be translated into local plans and policies wherever relevant. The UN Sustainable Development Goals recognises the alarming rate at which global water-related ecosystems are declining[79]. Clean water is the 6th of the 17 Sustainable Development Goals . The UN has six targets to tackle this goal, one of which is to 'protect and restore water-related ecosystems, including mountains, forest, wetlands, rivers, aquifers and lakes'. The last of the six targets emphasises the importance of including local communities in improving water management.

Ireland is bound by its commitments under the Birds and Habitats Directives to ensure that all European sites (SACs and SPAs) are in favourable conservation condition and must have plans in place to achieve this. The status of some aspects of the Lough Ennell SAC/SPA are in unfavourable condition or there are significant knowledge gaps

The achievement of favourable conservation condition for QI features is more than likely to have an overall effect on the quality of the site for biodiversity as a whole and can be taken as a proxy for this. Identifying accurately the current condition and trends in QIs and in aspects of site integrity and supporting features will require early investigation and review

The lake is likely to be negatively affected by climate change (and is already being affected in several ways) but also has the potential within its catchment to offer nature-based solutions for climate response as part of the ecosystem services it provides. These include enhancing the extent and condition of wetlands to absorb flood and weather impacts, for example. Raising awareness of the role of the importance of Lough Ennell with regard to climate and biodiversity is an aspect which underpins the relevance of catchment management planning and should be promoted as part of the efforts to engage communities in caring for the lake and its catchment.

Recommended actions

	Action	How?	Timescale[80]	Possible lead org(s)[81]
6a	Condition assessment review of SAC Qis	NPWS commissioned review	Immediate/ST	NPWS
6b	Condition assessment review of SPA Qis	NPWS commissioned review	Immediate/ST	NPWS
6c	Natura site conservation management plans and measures	Commission production of SAC & SP conservation management plans	ST	NPWS
6d	Biodiversity action plan	Commission a Biodiversity action plan to address non-QI features in addition to QI and key issues and opportunities	ST	NPWS/WCC heritage

[76] https://www.gov.ie/pdf/?file=https://assets.gov.ie/233057/f1a92f68-e668-498d-a56c-df777a19b549.pdf#page=null
[77] https://www.cbd.int/doc/legal/cbd-en.pdf
[78] https://www.epa.ie/environment-and-you/climate-change/what-is-europe-and-the-world-doing/paris-agreement/
[79] https://www.un.org/sustainabledevelopment/water-and-sanitation
[80] Immediate (1 year) – short term (2-5 year) – medium term (5-10 years) – long tern (>10 years)
[81] See appendix 1 for abbreviations

6e	Biodiversity awareness raising – events and media	Events programme developed	ST	WCC heritage/ NPWS
6f	Monitoring programme for key biodiversity	Develop and implement key surveys and monitoring to fill information gaps and provide trends	ST	NPWS/WCC
7a	Climate trends assessment to assess predicted impacts of climate change	Commission report	ST	WCC environment
7b	Ecosystem services review	Commission report	MT	WCC environment

Communities, tourism and education

Objective 8	Target outcome	KPIs
To enhance the tourism, amenity and recreational value of Lough Ennell	Access points, tourism venues, sites and routes have high quality condition, recognisable branding and provide for sustainable recreation and enjoyment of Lough Ennell by people	4.1 Plans for all public sites are in place 4.2 Reduced litter and anti-social behaviour issues at all public sites 4.3 Bathing water remains open 4.4 Measurable improvement in perception of Lough Ennell by community/visitors by year 4

Objective 9	Target outcome	KPIs
To enhance the meaningful engagement of the community in the protection and management of Lough Ennell (Action Point 6 (Public Participation) – Water Action Plan 2024)	Community is better engaged in positive management of Lough Ennell under this plan	4.1 LECMP partnership is established and includes good community representation by year 2 4.2 Measurable improvement in involvement of community, enterprise and third sector groups, in management of Lough Ennell by year 5

Rationale

The community around Lough Ennell have been engaged through surveys and workshops and there are several clear issues which need to be addressed:

- A lack of active management of public sites resulting in litter and anti-social behaviour issues
- A lack of sustainable access routes to the lake and around the catchment
- A lack of involvement in the community in management of aspects of the lake
- Relatively low awareness of the factors affecting the lake health and their solutions

The objectives outlined seeks to address these issues directly. Many of the publicly accessible sites are under the jurisdiction of the local authority or are linked to private enterprise, as such key plans and partnerships will need to be formed to enable onward sustainable management. The role of the community in assisting with this could be important and active community engagement could be achieved through the developing forum created by the plan and its partnership structure.

The lake sits prominently within the county tourism strategy and this identifies several issues and opportunities which can be, in part at least, addressed by actions under a catchment management plan. There is currently limited recognisable "lake-focussed" branding and this is an area which may assist in exploiting sustainable tourism opportunities better.

Recommended actions

	Action	How?	Timescale[82]	Possible lead org(s)[83]
8a	Review access network and site access provision around Lough Ennell	Independent review	ST/MT	WCC
8b	Ensure access sites are well maintained and resourced	Resource planning and engagement with community	ST	WCC
8c	Signage and interpretive planning for public access sites	Commissioned plan consistent with aims of	Immediate/ST	WCC
9a	Community representation on LECMP	Ensure community engagement through liaison and sign up	Immediate/ST	LECMP
9b	Baseline survey of community views	Online survey &	Annual/periodic	LECMP
9c	Engage with opportunities for lake tourism "brand" as appropriate, integral to other plans and strategies	Branding scoping exercise	ST/MT	WCC

Project functions and cross cutting actions

Objective 10	Target outcome	KPIs
Ensure the LECMP is appropriately managed and resourced	Achievement of stated plan objectives	10.1 Agreed plan (working document) by March 2025 10.2 Partnership agreement in place 10.3 Funding structure identified by end year 1

Rationale

It is recognised that the Lough Ennell Catchment Management Plan is a working document to facilitate the better coordination of expertise and existing efforts, in order to create a voluntary framework which enhances catchment management of the lake. It provides a focus for coordinating efforts, information sharing and raising awareness of actions, programmes and initiatives, from statutory and voluntary bodies, individuals and communities to help to identify, monitor and adequately resource, a wide range of actions under six themes and ten objectives,

[82] Immediate (1 year) – short term (2-5 year) – medium term (5-10 years) – long tern (>10 years)
[83] See appendix 1 for abbreviations

which seek to enhance the management of the lake catchment for the benefit of the environment and people.

To achieve this, several cross cutting actions will be required to ensure that the LECMP is appropriately managed and resourced. These include administering a project partnership, providing a communications function and forums through which partners can co-operate, maintaining a means of engaging with communities and ensuring sound financial administration and an appropriate level of governance for the nature of the project partnership that is established.

In this case, the fundamental building of the partnership centres around a voluntary "Memorandum of Understanding" and the appointment of a "Facilitation Group". These are likely to require review from time to time and mechanism to achieve this. An appropriate schedule for such review should be built in.

This plan sits within the wider policy context of the *Water Action Plan 2024*, Ireland's third River Basin Management Plan, which follows an integrated catchment management approach, through the development of 46 Catchment Management Work Plans. The work produced for this plan will assist in informing and facilitating the production and implementation of these measures at a regional level.

In the absence of a formal group, LETPA may provide an effective initial locus for the facilitation of plan sign up.

It is likely that the need to drive the facilitation of actions will need a focussed individual to achieve this. In many other successful projects of this nature a "Project Officer" is appointed to take this forward. The development of a role such as this should be determined through the Plan Steering Group SG, and suitable funding sources determined. The role would likely require strong communications and organisational skills, to work with the many different stakeholders already acting within the catchment.

Recommended actions

	Action	How?	Timescale[84]	Possible lead org(s)[85]
10a	Establish partnership	Draft MoU and seek sign up on basis of this plan	Immediate	LETPA (LECMP)
10b	Establish partnership terms of reference	Inaugural meeting	Immediate	LETPA (LECMP)
10c	Follow up administrative actions subject to 10a & b	Contingent on previous action		
10d	Review plan progress	6-monthly/annual report and meeting	Annual	LECMP
10e	Interim review	Triennial review of plan and amend as necessary	ST	LECMP
10f	Seek to establish a Project Officer post	Identify and seek funding for appointment	ST	LECMP

[84] Immediate (1 year) – short term (2-5 year) – medium term (5-10 years) – long tern (>10 years)
[85] See appendix 1 for abbreviations

7. ACTION PLAN

#	Action	How?	Timescale	Possible lead org.	Years 1	2	3	4	5	6	7	8	9	10
Objective 1: To enhance WFD ecological status of Lough Ennell within life of the plan														
1a	Define Water Quality Standards for lake water	Working group & lead person	Immediate	LAWPRO										
1b	Develop a standardised WQ monitoring programme	Working group & lead person	ST	LAWPRO/ LECMP										
1c	Review WQ progress against KPIs and report to partnership with recommendations for actions	Partnership review workshop	Annual	LECMP										
Objective 2: To reduce the transfer of nutrients and pathogens from point source pollution														
2a	Review waste water treatment provision and planning guidance within catchment and make recommendations	Report from Westmeath CC reviewed by partners	ST	WCC										
2b	Increase awareness and plan response to emerging pollutants within the catchment (e.g. PFAS)	Working group	Immediate	LAWPRO/ EPA										
Objective 3: To reduce the transfer of nutrients and pathogens from diffuse source pollution														
3a	Review and where necessary advocate to expand “Priority Areas for Action” (PAA)	Review in relation to RBMP	Immediate	LAWPRO										
3b	Maintain actions delivered previously in Dysart stream	Working group & lead person	ST	LAWPRO/ ASSAP										
3c	Bathing water monitoring included within monitoring programme & develop alerts & information systems further	WCC and LAWPRO further develop existing protocols	Frequent - Annual	WCC/ LAWPRO										
Objective 4: To enhance the condition of wetland habitats in the catchment														

#	Action	How?	Timescale	Possible lead org.	Years 1	2	3	4	5	6	7	8	9	10
4a	Map & identify wetland habitat resource within catchment.	Commissioned or in-house/voluntary study & inventory	ST	NPWS/WCC										
4b	Identify, map and prioritise opportunities for buffer strips and wetland restoration along feeder streams	Commissioned or in-house/voluntary study & inventory	ST	LAWPRO/ ASSAP										
Objective 5: To maintain and enhance the fish populations of Lough Ennell														
5a	Fish population survey & review	IFI periodic survey	ST	IFI										
5b	Set targets for fish populations & population parameters	IFI advisory to LECM partnership	ST	IFI/LECMP										
5d	Angling catch bag return system to be developed	LETPA & IFI develop an bag return system	Immediate/ST	LETPA/IFI										
5e	Spawning stream restoration programme	LETPA/IFI to identify spawning streams requiring restoration works, define & implement programme	ST	LETPA/IFI										
5f	Produce angler “best practice” guidance for Lough Ennell	LETPA to produce with IFI advisory input	ST	LETPA/IFI										
5g	Angling awareness raising – produce media relevant to the promotion of sustainable angling as a recreation at Lough Ennell	LETPA/LECMP to commission/produce promotional media	ST	LETPA /LECMP										
Objective 6: To maintain or enhance the conservation condition of the European sites (SAC & SPA)														
6a	Condition assessment review of SAC Qis	NPWS commissioned review	Immediate/ST	NPWS										
6b	Condition assessment review of SPA Qis	NPWS commissioned review	Immediate/ST	NPWS										
6c	Natura site conservation management plans	Commission production of SAC & SP conservation management plans	ST	NPWS										
6d	Biodiversity action plan	Commission a Biodiversity action plan to address non-QI features in addition to QI and key issues and opportunities	ST	NPWS/WCC										

#	Action	How?	Timescale	Possible lead org.	Years 1	2	3	4	5	6	7	8	9	10
6e	Biodiversity awareness raising – events and media	Events programme developed	ST	WCC/NPWS										
6f	Monitoring programme for key biodiversity	Develop and implement key surveys and monitoring to fill information gaps and provide trends	ST	NPWS/WCC										
Objective 7: To enhance the role of Lough Ennell in climate & biodiversity emergency response														
7a	Climate trends assessment to assess predicted impacts of climate change	Commission report	ST	WCC										
7b	Ecosystem services review	Commission report	MT	WCC										
Objective 8: To enhance the amenity and recreational value of Lough Ennell														
8a	Review access network and site access provision around Lough Ennell	Independent review	ST/MT	WCC										
8b	Ensure access sites are well maintained and resourced	Resource planning and engagement with community	ST	WCC										
8c	Signage and interpretive planning for public access sites	Commissioned plan consistent with aims of	Immediate/ST	WCC										
Objective 9: To enhance the meaningful engagement of the community in the protection and management of Lough Ennell														
9a	Community representation on LECMP	Ensure community engagement through liaison and sign up	Immediate/ST	LECMP										
9b	Baseline survey of community views	Online & in person surveys & repeats	Annual/periodic	LECMP										
9c	Engage with opportunities for lake tourism "brand"	Branding scoping exercise	ST/MT	WCC										
Objective 10: Ensure the LECMP is appropriately managed and resourced														
10a	Establish partnership	Draft MoU and seek sign up on basis of this plan	Immediate	LETPA (LECMP)										
10b	Establish partnership terms of reference	Inaugural meeting	Immediate	LETPA (LECMP)										
10c	Follow up administrative actions subject to 10a & b	Contingent on previous action												

#	Action	How?	Timescale	Possible lead org.	Years									
					1	2	3	4	5	6	7	8	9	10
10d	Review plan progress	6-monthly/annual report and meeting	Annual	LECMP										
10e	Interim review	Triennial review of plan and amend as necessary	ST	LECMP										

8. MONITORING

Specific monitoring actions are extracted and provided here for clarity and to provide additional information for the approach recommended.

Action1b Develop a standardised WQ monitoring programme

Establish a WQ working group & lead to establish and lead on development of an appropriate water quality monitoring regime. Likely to consist of lake and inflow stream monitoring covering several parameters.

Lead: LAWPRO/ LECMP
Timescale: short term – 1-2 years

Action 3c Bathing water monitoring included within monitoring programme & develop alerts & information systems further

Specific monitoring of bathing water requires intensive monitoring during summer months and this may need reviewed and developed further over existing protocols

Lead: WCC and LAWPRO
Timescale: Frequent - Annual

Action 5a Fish population survey & review

Fish population surveys to determine ecological classification are undertaken on a periodic basis. The last survey was in 2017 and a repeat as a baseline in the early period of CMP establishment would be of value with repeats at 3-5 yearly intervals

Lead: IFI
Timescale: 1-2 years and periodic

5d Angling catch bag return system to be developed

LETPA & IFI develop an bag return system in order to better monitor fish population parameters and changes to the angling catch. While such a system may not be comprehensive it has potential to add significant value. The option of bot paper and app based returns are feasible and could be rapidly developed and implemented

Lead: LETPA/IFI
Timescale: Immediate (1-2 years) and annual

6a Condition assessment review of SAC QIs

NPWS commissioned review of Alkaline fen condition, site integrity and supporting features of the SAC. Identifies key issues and potential detailed conservation actions.

Lead: NPWS
Timescale: Immediate (1-3 years)

6b Condition assessment review of SPA Qis

NPWS commissioned review of wintering waterbird populations, site integrity and supporting features of the SPA. Identifies key issues and potential detailed conservation actions.

Lead: NPWS
Timescale: Immediate (1-3 years)

6f Monitoring programme for key biodiversity

Phased and gradual development and implementation of key surveys and monitoring to fill information gaps and provide trends for key habitats and species of high biodiversity priority. Notably species which are not listed on European site Qis but provide important ecosystem services or are nationally, regionally or locally important.

Lead: WCC/NPWS
Timescale: short to medium term (1-7 years) initially

9b Baseline survey of community/visitor views

Online & in person surveys & periodic repeats to assess and re-assess community views and attitudes related to the lake, its management and issues of concern. An important means of assessing community engagement, visitor opinion and identifying emerging and specific issues of concern to people.

Lead: LECMP – lead partner to be identified
Timescale: short term for initial survey then periodic

9. PROJECT MANAGEMENT FRAMEWORK

9.1 Recommended project structure

Deriving from consultation, the proposed project structure reflects the need to include a diverse range of stakeholders and project partners and is created to provide a framework within which the roles of stakeholders can operate without providing significant additional hurdles to progress, while also providing a means of adding value through partnership working and information sharing.

It is emphasised that the plan would be delivered on a voluntary basis but that parties to the plan would commit to the delivery of their work within its normal scope but add value through information sharing and cooperative working. The potential to build significant added value through partnership working is inherently recognised by signatories.

Table 3 provides a representation of the recommended project structure

Table 4 Project structure

LECMP	The plan as an entity for guiding, recording and/or delivering agreed actions to fulfil its aims and objectives. Updated and reviewed by agreement with partners
LECMP partnership	The group of organisations and individuals who have signed up on a voluntary basis to the MoU delivery of the plan aims, objectives and actions by working cooperatively, working independently but communicating progress and outcomes, or commissioning works to fulfil specific actions.
LECMP steering group	A steering group made up of representative of signatories to the partnership – meets at a suitable frequency and identifies actions, progress and priorities.
LECMP associated bodies	Bodies or individuals who may not sign up to the MoU but who act cooperatively or in the interests of delivering specific actions or complimentary works which are consistent with the aims of the LECMP

A draft pro forma of a *Memorandum of Understanding* to create the basis for the partnership is provided at Appendix 2.

It has been recognised, through consultation, that the delivery of the plan will require a significant co-ordination function to be filled. This need is for a proactive body or individual to facilitate delivery of the plan objectives and actions, record actions by project partners and coordinate meetings, events, media etc as required. In effect a project officer or secretariat role.

Consideration of mechanisms for the appointment of a Project Officer should form an early task under theme 6.

9.2 Thematic specialist groups

The range of specialist issues to be addressed by the plan mean that those with relevant expertise and functions are best placed to work together for the best outcomes.

Specialist groups recommended are described in Table 5

Table 5 Specialist groups recommended

Thematic specialist group	Key focus	Possible organisations
Water Quality	Pollution control, WQ monitoring, WQ science, planning and development measures	WCC environment/planning, LAWPRO, EPA, Uisce Éireann, ASSAP
Land use	Engagement with agriculture and other land use, measures to reduce diffuse pollution, nature-based solutions	ASSAP, farming representatives, individual farmers, LAWPRO
Rivers and fish	Stream hydromorphology and stream habitat enhancement, monitoring fish populations, angler guidance	LETPA, IFI, OPW, LAWPRO, ASSAP
Biodiversity & climate response	Designated site management, biodiversity enhancement, nature based solutions, climate change response and mitigation through wetland management	NPWS, BirdWatch Ireland or other eNGOs, WCC climate/environment, WCC heritage, local experts
Communities, tourism and education	Sustainable recreation and tourism, management of visitor sites, community engagement in lake management	WCC tourism, communities, businesses & visitor sites, WCC heritage, active travel representatives

Groups should be able to meet and discuss issues, plan or cooperate over actions at a schedule to be set subject to the issues presented. This may vary from year to year but indicatively is likely to consist of one main meeting per annum.

9.3 Meetings schedule

A proposed meetings schedule for relevant project groups for the first five years is outlined in table 6. This provides for inaugural meetings and then mid year and end of year progress meetings for key groups and biannual meetings of the full partnership and an initial launch and then project progress conference.

Table 6 Indicative 5-year Project calendar (see appendix 3)

		Year 1			Year 2		Year 3		Year 4		Year 5	
	Project group	Initial	Progress	Annual	Progress	Annual	Progress	Annual	Progress	Annual	Progress	Annual
	Steering group	early 2024	mid 2024	end 2024	mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028
Thematic groups	**Water Quality**		mid 2024	end 2024	mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028
	Land use		mid 2024	end 2024	mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028
	Rivers and fish		mid 2024	end 2024	mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028
	Biodiversity & climate response		mid 2024	end 2024	mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028
	Communities, tourism and education		mid 2024	end 2024	mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028
	Conference/forum/ launch		mid 2024									end 2028

9.4 Reporting and progress tracking

The mechanisms for reporting and progress tracking are undefined. Definition of reporting schedules and formats will be determined during year 1, subject to greater clarity of the project structure going forward. These should, however, include the following key aspects:

- Progress in project establishment and secretariat/administration
- Progress reports from stakeholders on identified (or relevant additional actions)
- Annual review (and revision where required) of plan actions and schedules

This section should be updated in future versions to reflect decisions made prior to project launch.

9.5 Funding project operations

The plan is established on the basis that key actions identified have one or more stakeholders, as members of the plan group. The plan identifies actions which may sit within the core competencies and responsibilities of stakeholders or are part of existing work programmes or projects. Where actions are additional, stakeholders might carry out work as part of its further inclusion within work programmes, as part of their statutory or discretionary functions, or as bespoke projects either singly or in partnerships.

It is identified that the added value that the plan brings is in providing a mechanism for the coordination of key actions, the increase in awareness and participation form a wider range of bodies and individuals and the potential for the establishment of new, identified, actions which can be funded through collaborative partnerships.

The cost of project operations largely relate to the engagement of a Project Officer or similar functions, to act as coordinator and key driver of collaboration. This helps to get project actions done, to coordinate communications between the project partners and to promote, monitor and report on project progress.

The indicative costs of project operations are outlined in Table 7.

No funding sources have been identified and this is a key task in the early phases of project establishment.

Table 7 Indicative project management costs

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Comments
Project meetings	2,000.00	1,000.00	1,000.00	1,000.00	1,000.00	2 in person, per annum
Project officer	21,000.00	36,050.00	37,131.50	38,245.45	47,271.37	Salary, employment costs, T&S
PO FTE	0.3	0.5	0.5	0.5	0.6	Full time equivalent
Set up costs	5,000.00	1,000.00	1,000.00	1,000.00	1,000.00	Web, IT, branding, recruitment
contingency	2,800.03	3,805.05	3,913.20	4,024.59	4,927.20	@10%
TOTAL	**30,800.03**	**41,855.05**	**43,044.70**	**44,270.04**	**54,198.57**	

This section should be updated in future versions to reflect decisions made prior to project launch.

APPENDICES

Appendix 1 Who's who in The Lough Ennell Catchment

The organisations listed here are active within the Lough Ennell catchment and of relevance to future actions under a catchment management plan.

This appendix should be updated in future versions to reflect decisions made prior to project launch.

Local Authority Waters Programme (LAWPRO) https://lawaters.ie/

The Local Authority Waters Programme (LAWPRO) is working to identify the issues affecting water quality in every county in Ireland. Where issues are identified, they collaborate with the relevant local authority, public body, and water stakeholder to find a solution. Community engagement is the cornerstone of this approach to combine local and expert knowledge for a better understanding of what's happening in a local catchment and waterbody. Good water quality benefits everybody, it is essential for nature to flourish and our economy to thrive.

Environmental Protection Agency (EPA) https://www.epa.ie/

The EPA is an independent public body established under the Environmental Protection Agency Act, 1992. The other main instruments from which they derive their mandate are the Waste Management Act, 1996, and the Protection of the Environment Act, 2003 and Radiological Protection (Miscellaneous Provisions) Act 2014.

The EPA's purpose is to protect, improve and restore our environment through regulation, scientific knowledge and working with other. EPA vision for Ireland is that we live sustainably in a healthy environment that is valued and protected by all.

The EPA's purpose reflects our three core roles – as an environmental regulator, as a key source of trusted scientific evidence and knowledge, and as a voice for the environment through our leadership and advocacy and our commitment to collaborating and partnering with others to deliver better environmental outcomes

Key responsibilities include:

- Licensing
- National Environmental Enforcement
- Waste Management and Chemicals in the Environment
- Water Management
- Climate Science & Climate Change
- Environmental Monitoring & Assessment
- Environmental Research and Development
- Radiological Protection
- Guidance, Awareness Raising, and Accessible Information

- Partnership and networking

Agricultural Sustainability Support and Advisory Programme (ASSAP)

https://www.teagasc.ie/environment/water-quality/farming-for-water-quality-assap/

ASSAP works with farmers in a free and confidential advisory service to help improve water quality. ASSAP is run by Teagasc, Ireland's agricultural advisory service, and has funding and collaboration with other bodies including DAFM, DHPLG, LAWPRO and Dairy Sustainability Ireland.

Lough Ennell Trout Preservation Association (LETPA)

http://loughennelltpa.com/

Loch Ennell Trout Preservation Association is a long established angling club and fishery enhancement group, established in the early 1940s. It recognises the importance of looking after our water environment and wants to work in partnership with businesses, landowners and agencies as much as possible to enhance the environment of Lough Ennell and its tributaries and in turn sustainably manage the trout fishery. It has driven much of the impetus for catchment management at Lough Ennell and has been instrumental in delivering improvements to trout spawning streams and in early projects to stimulate discussion on catchment management, including the production this plan.

Some aims include:

- Developing a catchment management plan with relevant partners
- Improving and protecting the ecological health of feeder streams and the lake
- Restoring natural processes to maintain good water quality and resilient, varied habitats supporting healthy fish populations

Uisce Éireann (UE) https://www.water.ie/

Uisce Éireann is Ireland's national water utility, with responsibility for providing public water and wastewater services throughout Ireland.

UE are responsible for the operation of all public water and wastewater services including:

- Management of national water and wastewater assets
- Maintenance of the water and wastewater system
- Investment and planning
- Managing capital projects
- Customer care and billing

UE are also responsible for all of the capital investment decisions and implementation of the capital programme delivery across the country.

Inland Fisheries Ireland (IFI) https://www.fisheriesireland.ie/

The vision of IFI is to position Ireland's inland fisheries and sea angling resources as sustainably as possible for the benefit of future generations. It has statutory responsibility for the protection, development, and management of Ireland's 74,000 km of rivers and streams together with 128,000 lake hectares and a coastal 12-mile jurisdictional limit is also included. It is responsible for protecting, managing and conserving Ireland's inland fisheries and sea angling resources and administers funds that allow third parties to carry out conservation and development projects. Education and Outreach is an integral part of its work. Broadly speaking, it involves getting more people aware of fish, fishing and their local environment. Through learning IFI promotes conservation, sustainability and encourages environmental stewardship. IFI's aim is to make angling accessible to all, especially novices. It also leads on applied fisheries research to assess the conservation status of Ireland's fish species, to monitor fisheries stocks in inland and coastal waters and to explore environmental issues that have an impact on fish and their habitats. Fisheries Ireland works with a wide variety of groups and individuals at national, regional and community level as well as anglers, commercial fishermen, fisheries owners, NGO's and sporting bodies.

The general functions of IFI are to:

(a) Promote, support, facilitate and advise the Minister on the conservation, protection, management, marketing, development and improvement of Ireland's inland fisheries, including its sea angling resources.

(b) Develop and advise the Minister on policy and national strategies relating to inland fisheries and sea angling.

(c) Ensure implementation and delivery of policy and strategies developed under (b) as agreed with the Minister.

Westmeath County Council https://www.westmeathcoco.ie/en/

Is the local authority which encompasses the whole area of the Lough Ennell catchment. Local authorities are the closest and most accessible form of government to citizens. They have responsibility for the delivery of a wide range of services in their local area, with a focus on making cities, towns, villages and the countryside attractive places in which to live, work and invest. Local authority services make a significant contribution to the physical, cultural, social and environmental development of communities and include housing, planning, infrastructure, environmental protection and the provision of amenities and recreation and community infrastructure.

Westmeath County Council delivers services and implements policy across a range of areas including:

- Housing
- Environment
- Planning
- Roads and transport
- Economic development
- Community services

- Tourism
- Parks and open spaces
- Libraries
- Arts and culture
- Climate action

National Parks & Wildlife Service (of the Department of Housing, Local Government and Heritage) - NPWS: https://www.npws.ie/

The role of NPWS is:

- To secure the conservation of ecosystems and enhance populations of flora and fauna in Ireland.
- To designate and advise on the protection of habitats and species identified for nature conservation.
- To implement National and EU legislation and policies for nature conservation and biodiversity including the EU Habitats and Birds Directives.
- To manage, maintain and develop State-owned National Parks and Nature Reserves.
- To promote awareness of natural heritage and biodiversity issues through education, outreach to schools and engaging with stakeholders.
- The National Parks and Wildlife Service is part of the Heritage Division of the Department of Housing, Local Government & Heritage.

NPWS has been an active participant in the LECMP since its inception and recognises they may play in ensuring sound management and recovery of ecological interests on the lake.

Appendix 2 Draft Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING

Lough Ennell Catchment Management Plan

Date: [Insert Date]

[Organisation/Name], located at [Address], represented by [Name and Title], hereinafter referred to as [insert name]

I, or the organisation I represent, agrees to become a signatory to the Lough Ennell Catchment Management Plan, on the understanding that it commits to the delivery of the plan and agreed subsequent iterations, in so far as it is relevant to the purpose and scope of operations of the organisation. The organisation shall endeavour to communicate and cooperate in so far as is reasonable to establish a partnership for collaborative catchment management to ensure the delivery of the aims, objectives and actions identified by the plan.

Background:

Lough Ennell, situated in County Westmeath, Ireland, is a valuable natural resource and a vital component of the local ecosystem. The importance of catchment management for the long-term health of the lake and surrounding areas is recognised by signatories to this Memorandum of Understanding (MoU) and the partnership aims to:

implement a catchment management programme with associated complementary actions to ensure:

i. Enhanced water quality and ecological health through reduced impacts of point source and diffuse source pollution and better management of natural habitats

ii. Enhanced socio-economic potential through an improving fishery, enhanced recreation and tourism opportunities and increase sustainability of agriculture

iii. Engagement of community in sustainable management of the lake catchment

iv. A better understanding of the processes and issues that affect water quality, ecosystems and other key factors

Governance:

The agreement and plan are recognised as voluntary. The spirit of the agreement is to work collaboratively to deliver the aims and objectives of the plan. A plan **Steering Group** (SG) will be established, consisting of representatives from all stakeholders. The SG will meet regularly, on a schedule to be agreed, to review progress, resolve issues, and make strategic decisions.

Duration:

This MoU will remain in effect for a period of 5 years, starting from [start date]. It may be extended or revised by agreement of all parties.

Confidentiality:

All parties agree to maintain the confidentiality of sensitive information shared during the partnership.

Termination:

Parties to this MoU may terminate their involvement by providing written notice [duration] in advance. Termination will not affect ongoing projects or commitments.

Amendments:

Amendments to this MoU must be made in writing and signed by authorized representatives of both parties.

Governing Law:

This MoU will be governed by and construed in accordance with the laws of Ireland.

This Memorandum of Understanding is hereby accepted by the signatory on [DATE].

Signatory

Name:

Title:

Date:

Signed as accepted on behalf of LECMP

Name:

Title:

Date:

Appendix 3 Suggested project meetings calendar

		Year 1			Year 2		Year 3		Year 4		Year 5	
	Project group	Initial	Progress	Annual	Progress	Annual	Progress	Annual	Progress	Annual	Progress	Annual
	Steering group	early 2025	mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028	mid 2029	end 2029
Thematic groups	**Water Quality**		mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028	mid 2029	end 2029
	Land use		mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028	mid 2029	end 2029
	Rivers and fish		mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028	mid 2029	end 2029
	Biodiversity & climate response		mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028	mid 2029	end 2029
	Communities, tourism and education		mid 2025	end 2025	mid 2026	end 2026	mid 2027	end 2027	mid 2028	end 2028	mid 2029	end 2029
	Conference/forum/ launch		mid 2025									end 2029