

The background of the entire page is a photograph of numerous eels, likely Japanese eels, packed closely together in a white plastic tray with a perforated bottom. The eels are dark, almost black, and their bodies are curved and tangled. The lighting is somewhat dim, highlighting the texture of the eels' skin and the grid pattern of the tray.

**ACTIVITY REPORT
OF THE
TECHNICAL EXPERT GROUP ON EEL
2023**

**REPORT OF THE TECHNICAL EXPERT GROUP ON EEL TO
THE NORTH-SOUTH STANDING SCIENTIFIC COMMITTEE ON
INLAND FISHERIES (NSSSCIF)**

Nov 2024

Disclaimer: This report includes data and analyses that are supplied by various agencies for the purposes of supporting the implementation of the Eel Management Plans in Ireland. The data will be subject to scientific review for the National Report to the EU in 2024.

The data and analyses are part of an on-going scientific assessment and are, therefore, preliminary and may be subject to change, updating or reanalysis. Some data may also be submitted for peer-review publication. The contents of this report should not be reproduced without the prior permission of the Technical Expert Group on Eel.

The Technical Expert Group on Eel would like to
note the sad passing of Christopher Moriarty in January 2024

Glossary of terms

Glass eel	Young, unpigmented eel, recruiting from the sea into continental waters. WGEEL consider the glass eel term to include all recruits of the 0+ cohort age. In some cases, however, also includes the early pigmented stages.
Elver	Young eel, in its first year following recruitment from the ocean. The elver stage is sometimes considered to exclude the glass eel stage, but not by everyone. To avoid confusion, pigmented 0+cohort age eel are included in the glass eel term.
Bootlace, fingerling	Intermediate sized eels, approx. 10–25 cm in length. These terms are most often used in relation to stocking. The exact size of the eels may vary considerably. Thus, it is a confusing term.
Yellow eel (Brown eel)	Life-stage resident in continental waters. Often defined as a sedentary phase, but migration within and between rivers, and to and from coastal waters occurs. This phase encompasses the elver and bootlace stages.
Silver eel	Migratory phase following the yellow eel phase. Eel characterized by darkened back, silvery belly with a clearly contrasting black lateral line, enlarged eyes. Downstream migration towards the sea, and subsequently westwards. This phase mainly occurs in the second half of calendar years, though some are observed throughout winter and following spring.
Assisted Upstream Migration	the practice of trapping and transporting juvenile eel within the same river catchment to assist their upstream migration at difficult or impassable barriers, without significantly altering the production potential (Bbest) of the catchment
Eel River Basin or Eel Management Unit	“Member States shall identify and define the individual river basins lying within their national territory that constitute natural habitats for the European eel (eel river basins) which may include maritime waters. If appropriate justification is provided, a Member State may designate the whole of its national territory or an existing regional administrative unit as one eel river basin. In defining eel river basins, Member States shall have the maximum possible regard for the administrative arrangements referred to in Article 3 of Directive 2000/60/EC [i.e. River Basin Districts of the Water Framework Directive].” EC No. 1100/2007.
River Basin District	The area of land and sea, made up of one or more neighbouring river basins together with their associated surface and groundwaters, transitional and coastal waters, which is identified under Article 3(1) of the Water Framework Directive as the main unit for management of river basins. The term is used in relation to the EU W F D.
Stocking	Stocking (not restocking) is the practice of adding fish [eels] to a waterbody from another source, to supplement existing populations or to create a population where none exists.
Trap & transport	Traditionally, the term trap and transport referred to trapping recruits at impassable obstacles and transporting them upstream and releasing them. Under the EMPs, trap and transport (or catch and carry) now also refers to fishing for downstream migrating silver eel for transportation around hydropower turbines.
European Maritime Fisheries and Aquaculture Fund (EMFAF)	EMFAF is an EU fund running from 2021 to 2027 to support EU common fisheries policy (CFP), the EU maritime policy and the EU agenda for international ocean governance. It also helps achieve the UN’s sustainable Development Goal 14 and European Green Deal.
EEL REFERENCE POINTS/POPULATION DYNAMIC	
B_0	The amount of silver eel biomass that would have existed if no anthropogenic influences had impacted the stock.
$B_{current}$	The amount of silver eel biomass that <u>currently</u> escapes to the sea to spawn.
B_{best}	The amount of silver eel biomass that would have existed if no anthropogenic influences had impacted the <u>current</u> stock.
ΣF	The fishing mortality <u>rate</u> , summed over the age-groups in the stock, and the reduction effected.
ΣH	The anthropogenic mortality <u>rate</u> outside the fishery, summed over the age-groups in the stock, and the reduction effected.
R	The amount of glass eel used for restocking within the country.
ΣA	The sum of anthropogenic mortalities, i.e. $\Sigma A = \Sigma F + \Sigma H$

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Executive Summary

International Advice; ICES - 2024

The format of the ICES advice has changed for 2024, ICES now provides advice on fishing opportunities and on conservation aspects. The advice for eels for 2024 is:

ICES Advice on fishing opportunities

ICES advises that when the precautionary approach is applied, there should be zero catches in all habitats in 2024. This applies to both recreational and commercial catches and includes catches of glass eels for restocking and aquaculture.

ICES advice on conservation aspects

ICES advises based on ecosystem-based management consideration that:

- *All non-fisheries related anthropogenic mortalities should be zero.*
- *The quantity and quality of eel habitats should be restored; this includes connectivity and the physical, chemical and biological properties of the habitats.*

Stock development over time

"The status of European eel remains critical."

"In the "Elsewhere Europe" index series it was 8.8% in 2023 (provisional) and 11.3% in 2022 (final). The yellow eel recruitment index for 2022 was 9% (final) of the 1960–1979 geometric mean. Time-series from 1980 to 2023 show that eel recruitment remains at a very low level."

National Advice

A letter from DGMARE was received on the 24/08/2023 relating to updating and fully implementing national Eel Management Plans. A meeting was held on the 14th September 2023 between DECC, IFI, ESB, DAERA and AFBI along with members from the TEGE to discuss the letter and future plans for the eel management in Ireland. At this meeting it was agreed that the management plan should be updated.

Irish EMP Management Actions 2021 - 2024

Under the EU Regulation (EC No. 1100/2007) four main management actions were included in the Irish Eel Management Plans aimed at reducing eel mortality and increasing silver eel escapement in Irish waters. These were a cessation of the commercial eel fishery and closure of the market, mitigation of the impact of hydropower, including a comprehensive silver eel trap and transport plan, ensure upstream migration of juvenile eel at barriers and improve water quality including fish health and biosecurity issues.

1. *Reduction in Fishing*

All regions reported on the continued closure of the fishery with no licences issued and the eel fishery, with the exception of L. Neagh, also remained closed in N. Ireland. Some illegal fishing was reported which led to seizures of gear in the Shannon IRBD, Eastern RBD and the Southeastern RBD. Reliable trade (import/export) data remains unavailable to the TEGE.

2. **Hydropower Impact**

Mitigation of hydropower involved a comprehensive trap and transport system for migrating silver eels on the Shannon, Erne and Lee, the targets for 2009-2011 were set out in the Eel Management Plans and these were subsequently modified on the Erne for the 2015-2017 period to allow for the transport of 50% of the annual silver eel production and a rolling target based on a 3-year basis allowing shortfalls in one year to be made up the following year. A long-term shortfall should not be carried forward indefinitely.

The total quantity of silver eel released from the three catchments was 73,082 kg.

In the 2023 season, the **River Shannon** trap and transport total of 23,882 kg represented 68.9% of silver eel production and, therefore, exceeded the 30% target. The EMP requirement was met on the basis of the agreed (3 year rolling mean value) protocol.

In the **River Erne**, the trap and transport annual target (50% of silver eel production) was not exceeded in the 2023/2024 season. The trap and transport catch of 48,027 kg at the four fishing sites represented 48.7% of the production (not exceeding the 50% target by 1,324 kg).

In the 2023/2024 season, fishing took place on the **River Lee** at several different locations between 26th August and 4th September 2023. The total catch was 1,173 kg, which exceeds the annual target for the river of 500 kg.

For the *Shannon*, an estimated 21.15% mortality was applied to the 2023 data. The estimated silver eel mortality at Ardnacrusha hydropower station was 1,931 kg.

For the *Erne*, total mortality was estimated to be 13,358 kg (26.4 %) at Cliff HPS and 9,485 kg (25.4 %) at Cathaleen's Fall

3. **Obstacles to migration**

Work continues on managing existing barriers (management action 3) using the IFI developed I-BAST application to date 28,053 structures have been assessed, 25,763 were classified as being 'not a barrier' with 7,882 classified as a 'potential barrier' requiring further work.

4. **Improve Water Quality, fish health and biosecurity**

In 2023, the EPA produced an update to the water quality for Ireland's rivers, lakes, transitional / coastal water and groundwater using information collected in 2022. This report found that there had been no significant change in biological water quality in Irish rivers or lakes in 2022 however the report does not that any improvements recorded were offset by declines elsewhere. There were 17 in 2023 down from the 25 reported fish kills in 2022.

Irish EMP Monitoring Actions

A close link between the management actions and eel-stock targets will be established by implementing a comprehensive monitoring and stock assessment programme. This will allow for direct feedback to management based on response of the stock to management actions.

Silver Eel Assessment

Silver eels are being assessed by annual fishing stations on the Shannon, Erne, Burrishoole, Fane and Barrow catchments in 2023/2024.

Shannon

In 2023/2024, conservation eel fishing was conducted at three sites, two at Athlone, and one at Killaloe.

A total of 19,437 kg of eels were caught at Athlone (17,669 kg at the Jolly Mariner site and 1,768 kg at the Yacht Club site), and a further 4,445 kg were caught at Killaloe, giving an overall Trap and Transport catch of 23,882 kg.

Silver eel production was estimated to have been 34,660 kg and escapement was estimated to be 32,729kg, 94% of the production.

Burrishoole

Silver eel trapping was continued in Burrishoole in 2023/24 and the total run amounted to 3,133 eels (up to end March '24). As in other years, the highest proportion of the total catch (89%) was made in the Salmon Leap trap. The mean weight of eels has dropped to an average of about 146g with an estimated sex ratio of 43% in 2023.

Erne

The total catch contributed to the Trap and Transport programme was 48,027 kg. The silver eel production was estimated to be 98,702 kg with escapement estimated at 75,859 kg, 76.9% of the production.

Fane

In 2023, silver eel catches at the Fane Fishery were lower than the previous year's numbers with a total catch of 356 kg (1,001 eels including batch weighs). These catches were made over 40 nights fished. Due to high water levels in September, fishing began on 22nd September and continued through to mid December.

R. Barrow

In 2023, after 20 nights of fishing, a total of 53.1 kg of silver eels were captured at the Ballyteiglea Lock (Barrow Silver Eel Fishery). This equated to 203 eels, with the majority being caught in September during moderate flood events.

Recruitment

For 2023, a value of 97 kg of elvers were caught in the index traps at Ardnacrusha. This was a considerable drop from that recorded in 2022 (570 kg).

The 2023 season was good for recruitment in the Erne with 479 kg collected in the index traps at the station.

ICES (2023) noted a decrease in recruitment for the "Europe Elsewhere" series. The estimated figure was 8.8% (provisional) in 2023, a decrease from 11.3% (final) for 2022.

1 Introduction

1.1 EU Regulation

The EC Regulation (Council Regulation 1100/2007) for the recovery of the eel stock required Ireland to establish eel management plans for implementation in 2009. Under the EC Regulation, Ireland should monitor the eel stock, evaluate current silver eel escapement and post-evaluate implemented management actions aimed at reducing eel mortality and increasing silver eel escapement.

The Irish Eel Management Plan submitted to the EU on the 9th January 2009 and accepted by the EU in June 2009 outlined the main management actions aimed at reducing eel mortality and increasing silver eel escapement to the sea. The four main management actions were as follows;

- a cessation of the commercial eel fishery and closure of the market
- mitigation of the impact of hydropower, including a comprehensive trap and transport plan to be funded by the ESB
- to ensure upstream migration of juvenile eel at barriers
- to improve water quality

Under the EC Regulation (EC No. 1100/2007), each Member State shall report to the Commission initially every third year until 2018 and subsequently every six years. At a meeting of the EU Fisheries Council in January 2018 it was agreed to continue to report every 3 years until there is scientific evidence of recovery signs for the eel population across Europe. The most recent report, was submitted on the 30th August 2021 using the ICES datacall, addressing the following;

- monitoring time series of recruits, yellow eel abundance and silver eel abundance
- Commercial, recreational and other fishery landings
- Releases of eels to other waters
- Aquaculture production
- Overview of Eel management plan
- the effectiveness and outcome of the Eel Management Plans
- biomass indicators
- anthropogenic mortality rates
- use of eel caught of less than 12 cm in length

The European Commission's Directorate-General for Maritime Affairs and Fisheries (DG MARE) has commissioned an external Study on the evaluation of the Eel Regulation. The purpose of the evaluation is to assess the measures to protect European eel under the Eel Regulation, and in particular the contribution of the national Eel Management Plans established and implemented under this Regulation to the recovery of the stock of European eel. The report on the evaluation is [available](#) on line. The overall conclusion is presented here:

The adoption of the Eel Regulation has been an important milestone in the long process towards the recovery of the European eel. It remains as relevant now as it was in 2009. Nevertheless, despite notable progress in reducing fishing effort and a concerted attempt to develop a pan-EU management framework, the status of eel remains critical. The Regulation's success in ensuring the recovery of the European eel is still far from certain, as it is widely recognised that the recovery of the European eel will take many decades. In this respect, further ambition is needed to implement the Regulation with a greater focus on non-fisheries related measures.

European Commission, Directorate-General for Maritime Affairs and Fisheries, MacNab, S., Luchetta, G., Nimmo, F., et al., Evaluation of the Eel Regulation : final report, Publications Office, 2020, <https://data.europa.eu/doi/10.2771/679816>

1.2 Technical Expert Group on Eel (TEGE)

An expert group on eel has been in existence since 2010 formerly known as the Standing Scientific Committee on Eel and since 2017 as the Technical Expert Group on Eels.

1.2.1 Background

The North-South Standing Scientific Committee for Inland Fisheries (NSSSCIF) was formed in 2017 to support the provision of scientific advice relating to the conservation and sustainable exploitation of the inland fisheries resource with advice provided in response to requests from Department of Environment, Climate Change and Communications (DECC) and its agency Inland Fisheries Ireland (IFI) from Ireland (IRL), the Department of Agriculture, Environment and Rural Affairs (DAERA) from Northern Ireland (NI) and the Loughs Agency (LA) a North-South Implementation Body. This group was also tasked to give consideration to the coordination and effective use of scientific resources for data collection and research projects linked to the above. The NSSSCIF Term of Reference (TOR) facilitates the formation of Expert Groups drawn from within the membership of the Committee, or additional invitees as required, to advise and contribute on any particular species, aquatic habitat or biosecurity issues. To this end the NSSSCIF has established an eel expert group to provide scientific advice to guide the NSSSCIF and IFI management in the decisions and policy development aimed at ensuring the recovery of Ireland's eel stocks as outlined in Ireland's National Eel Management plan.

1.2.1.1 Purpose

The NSSSCIF requests the Expert Group on Eel to provide a report, details outlined in Appendix A, on the status of eel stocks for the purpose of reporting to the EU in line with the Eel Regulation (EC1100/2007). The NSSSCIF may also request the Expert Group on Eel to provide scientific advice on the implications of proposed management decisions or policies on eel or seek advice on scientific matters in relation to eel. All scientific advice provided by the Expert Group on Eel will be considered by the NSSSCIF and presented as independent advice.

1.2.2 Term of Reference

1. The technical group shall carry out an appropriate assessment of eel stocks (juvenile, yellow and silver eel) in accordance with the EU Regulation for each Eel Management Unit and transboundary plan.
 - a. Update the national stock assessment framework in line with EU reporting requirements and assess the level of contemporary silver eel escapement with respect to the EU 40% target.
 - b. The appropriate assessments for all fishery districts, River Basin Districts and transboundary plans shall take account of the different habitat types, lakes, rivers and transitional waters.
2. The technical group shall complete a scientific assessment of the implementation of the relevant monitoring and management objectives identified in the National EMP, in line with the reporting requirements for the regulation (see Appendix I for National Management plan objectives)

3. Compile a stock assessment report and scientific advice as required in support of the report to the EU in line with the timeframes outlined in the eel regulation.
4. Oversee the updating of the national eel database and quality control of the data.
 - a. This should include the long term data series
 - i. National recruitment time series
 - ii. Silver eel index sites
5. Address any requests for scientific advice received from NSSSCIF.

1.3 Meeting Activities

The TEGE met three times during the 2023/2024 to monitor and report on the 2023 survey year in addition to email correspondence.

14 th September 2023	Citywest
22 nd November 2023	Video Conference
20 th February 2024	Video Conference

2 International Advice from ICES

2.1 Introduction to ICES Advice

The International Council for Exploration of the Seas (ICES) is the prime source of scientific advice on the marine ecosystem to governments and international regulatory bodies that manage the North Atlantic Ocean and adjacent seas. The ICES Council has delegated its advisory authority to the Advisory Committee or ACOM. ACOM has established the mechanisms necessary to prepare and disseminate advice subject to a protocol satisfying the following criteria:

- Objectivity and integrity;
- Openness and transparency;
- Quality assurance and peer review;
- Integrated advice – based on an ecosystem approach;
- Efficiency and flexibility;
- National consensus;

Therefore, ACOM is the sole competent body in ICES for scientific advice in support of the management of coastal and ocean resources and ecosystems. It designs strategies and processes for preparation of advice, manages advisory processes, and creates and delivers advice, subject to direction from the Council. The content of scientific advice is solely ACOM's responsibility not subject to modification by any other ICES entity. ACOM has one member from each member country under the direction of an independent chair appointed by the Council. ACOM works on the basis of scientific analysis prepared in the ICES expert groups and the advisory process include peer review of the analysis before it can be used as basis for the advice. In the case of eel, the relevant expert group is the Joint EIFAAC/ICES/GFCM Working Group on Eel (WGEEL).

2.2 ICES Advice on Eel for 2024

European Eel throughout its natural range (reproduced from the ICES Advice published on 01 November 2023)

ICES Advice 2023, ele.2737.nea. <https://doi.org/10.17895/ices.advice.21907860>

The format of the ICES advice has changed for 2023. ICES now provides advice on fishing opportunities and on conservation aspects.

ICES Advice on fishing opportunities

ICES advises that when the precautionary approach is applied, there should be zero catches in all habitats in 2024. This applies to both recreational and commercial catches and includes catches of glass eels for restocking and aquaculture.

ICES advice on conservation aspects

ICES advises based on ecosystem based management consideration that:

- All non-fisheries related anthropogenic mortalities should be zero.
- The quantity and quality of eel habitats should be restored; this includes connectivity and the physical, chemical and biological properties of the habitats.

Stock development over time

The status of European eel remains critical. Indices of both glass and yellow eel recruitment strongly declined from 1980 to 2011. Index values correspond to the recruitment as a percentage of the 1960–1979 geometric mean. Glass eel recruitment in the “North Sea” index area was 0.4% in 2023 (provisional) and 0.7% in 2022 (final). In the “Elsewhere Europe” index series it was 8.8% in 2023 (provisional) and 11.3% in 2022 (final). The yellow eel recruitment index for 2022 was 9% (final) of the 1960–1979 geometric mean. Time-series from 1980 to 2023 show that eel recruitment remains at a very low level.

ICES cannot assess the exploitation status relative to maximum sustainable yield (MSY) or precautionary approach (PA) reference points because the reference points are undefined. The 1960–1979 geometric mean recruitment is considered a likely limit reference point (Rlim). Given that the current recruitment estimate has been below Rlim for many years, it is assumed that current biomass is below a potential Blim. Therefore, while stock-size reference points are also undefined, it is considered that the stock size is well below potential biological limit reference points.

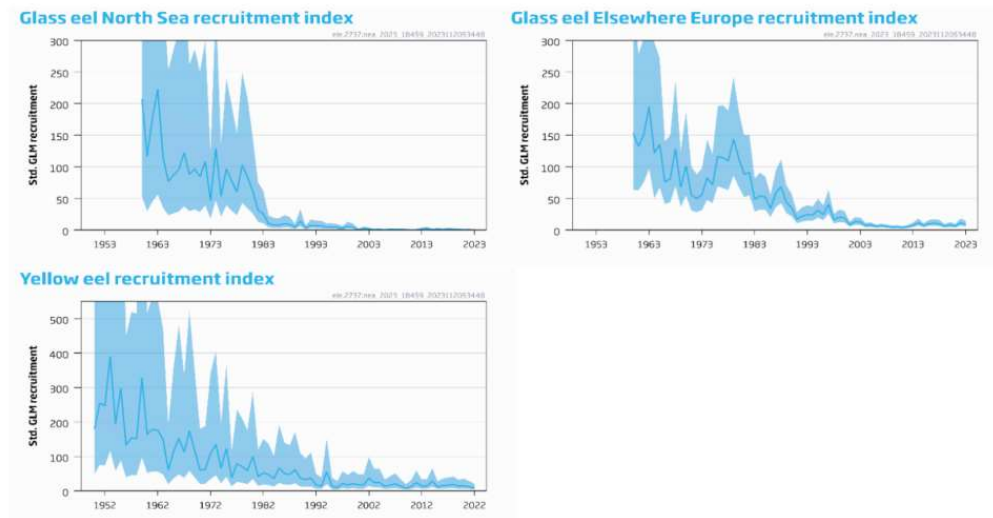


Figure 2-1 (ICES Advice): European eel. Indices, geometric mean of estimated glass eel recruitment for the continental “North Sea” (top-left panel) and “Elsewhere Europe” (top-right panel) series. A statistical model was fitted to 60 time-series comprising either pure glass eel or a mixture of glass and yellow eels (34 “North Sea” and 26 “Elsewhere Europe”). The results were scaled in percentage to the 1960–1979 geometric mean. The “North Sea” series are from Norway, Sweden, Germany, Denmark, the Netherlands, UK, and Belgium; the “Elsewhere” series are from UK, Ireland, France, Spain, Portugal, and Italy. In the Baltic area, recruitment occurs at the yellow eel stage only, and series are thus not included in the glass eel recruitment index. Bottom panel: estimated yellow eel recruitment trends for Europe. A statistical model was fitted to 21 yellow eel time-series and scaled in percentage to the 1960–1979 geometric mean. The series are from Denmark, Germany, Ireland, Sweden, France, and UK. The horizontal line on each panel represents the likely Rlim (calculated from the 1960–1979 geometric mean). Ribbons show the 95% prediction interval of the GLM ($1.96 * \text{standard error}$).

Link to Eel Advice for 2024

ICES. 2023. European eel (*Anguilla anguilla*) throughout its natural range. In Report of the ICES Advisory Committee, 2023. ICES Advice 2023, ele.2737.nea.
<https://doi.org/10.17895/ices.advice.21907860>

3 National Advice

A letter from DGMARE was received on the 24/08/2023 relating to updating and fully implementing national Eel Management Plans. A meeting was held on the 14th September 2023 between DECC, IFI, ESB, DAERA and AFBI along with members from the TEGE to discuss the letter and future plans for the eel management in Ireland. At this meeting it was agreed that the management plan should be updated.

4 Management Actions – a scientific assessment

4.1 Introduction

There are four main management actions included in the Irish Eel Management Plans aimed at reducing eel mortality and increasing silver eel escapement in Irish waters. These are a cessation of the commercial eel fishery and closure of the market, mitigation of the impact of hydropower, including a comprehensive silver eel trap and transport plan, ensure upstream migration of juvenile eel at barriers and improve water quality including fish health and biosecurity issues.

Every three years, each Member State must submit details of;

- monitoring,
- effectiveness and outcome of Eel Management Plans
- contemporary silver eel escapement
- non-fishery mortality
- Policy regarding enhancement/stocking

4.2 Management Action No. 1 Reduction of fishery to achieve EU target

4.2.1 Introduction

The target set for the Irish Eel Management Plan was to have zero fishing mortality and reduce illegal capture and trade to as near zero as possible.

In May of 2009 Eamon Ryan, Minister for Communications, Energy and Natural Resources passed two Bye laws closing the commercial and recreational eel fishery in Ireland. There have been subsequent bylaws prohibiting being in possession of an eel within the state. The most recent was issued in 2024.

- Bye-Law No 858, 2009 prohibits the issue of eel fishing licences by the regional fisheries boards in any Fishery District.
- Bye-law No C.S. 303, 2009 prohibits fishing for eel, or possessing or selling eel caught in a Fishery District in the State until June 2012. (revoked).
- Bye-law No C.S. 312, 2012 prohibits fishing for eel, or possessing or selling eel caught in a Fishery District in the State until June 2015. (revoked).
- Bye-law No C.S. 312, 2015 prohibits fishing for eel, or possessing or selling eel caught in a Fishery District in the State until June 2018.
- Bye-Law No C.S. 335, 2024 prohibits fishing for eel, or possessing or selling eel caught in a Fishery District in the State (Appendix 2)

It should be noted that since EU Commission ratification of the Ireland/UK NWIRBD transboundary plan in March 2010, the fishery in the NI portion of the Erne was closed from April 2010.

In late 2018 the Department of Communications, Climate Change and Energy announced the creation of a Support Scheme for Former Eel Fisherpersons to address the hardship experienced by commercial eel fisherpersons.

4.2.2 **Action 1a: Report closure of fishery**

All management regions confirmed a closure of the eel fishery for the 2023 season with no commercial or recreational licences issued (Appendix 3). The eel fishery, with the exception of the strictly managed L. Neagh, also remained closed in N. Ireland in 2023.

4.2.3 **Reports of illegal fishing activity**

Ireland:

For the complete modelling of silver eel escapement, information is required on the levels of illegal fishing and illegal catch. Therefore, this information is required on an annual basis. A questionnaire was circulated to the IFI Regions and the Department of Agriculture, Environment and Rural Affairs (DAERA) in Northern Ireland and the Loughs Agency (Appendix 3), summarised into Table 4-1. ERBD found traps (n=6) and set lines (n=6) but believe these were targeting other species, e.g. coarse fish and crayfish. Low levels of illegal activity were reported in the ShIRBD, with seizures in Lough Ree, Lough Derravaragh and the Ratty Rivers. Two illegal nets were seized in the SERBD in the River Nore but they were targeting salmon but would have the potential to catch eel. The poor quality of the export data currently available to the TEGE makes it difficult to determine the level of illegal catch. There were no instances of seizures of illegal or undocumented eel shipments.

Transboundary:

DAERA reported increased patrols in the Erne but no illegal activity detected (Table 4-1).

4.2.4 **Action 1b: Recreational Fishery**

The Bye Law No CS 319 2015 prohibiting the possession of eel caught in Ireland expired in June 2018 and was renewed in March 2024. The Bye Law CS 335 2024 states that it is prohibited to take or attempt to take or to fish or aid or assist in the taking or fishing for eel. It is also prohibited to be in possession of or sell or offer for sale or rewarded or to purchase eel caught or taken by any means. This Bye Law was issued without a review date.

4.2.5 **Action 1c: Diversification of the Fishery**

No update for 2023

Table 4-1 Details of illegal activity within the regions and transboundary Northern Ireland, 2023.

	ERBD	LA	DAERA	NWRBD	SHRBD	SERBD	SWRBD	WRBD Galway	WRBD Ballina
Silver T&T programme	No	No	Yes	Yes	Yes	No	Yes	No	No
Illegal trading related to T&T	No	No	No	No	No	No	No	No	No
Estimated level of illegal fishing	Low	nr	None	Low	Low	None	None	None	None
Number of gear seizures	12			0	17	1	0	0	0
Gear types seized	Set lines, traps	nr	n.a.		n.a.	Weir net	n.a.	n.a.	n.a.
Number of eel dealer interceptions	0	nr	0	0	0	0	0	0	0
Estimated tonnage on board	n.a.	nr	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Declared origin of cargos	n.a.	nr	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

n.a.= not applicable, nr = not reported

4.3 Management Action No. 2. Mitigation of hydropower

4.3.1 Action 2a: Trap and Transport

The targets were set for the trap and transport system in the Irish Eel Management Plan 2009-2011. These were subsequently modified, following the experience of the first three year programme, for the 2012-2014, 2015-2017, 2018 – 2021 and 2022-2024 periods the targets are as follows:

Shannon: Trap and transport 30% of the annual production (unchanged)

Erne: Trap and transport 50% of the annual silver eel production. A rolling target on a 3-year basis allowing shortfalls in one year to be made up the following year. A consistent long-term shortfall could not be carried forward indefinitely.

Lee: Trap and transport 500 kg of the annual escapement (unchanged)

4.3.1.1 2023 Trap and Transport Results

The total amounts of silver eel trapped and transported in each of the three rivers in 2023 are presented in Table 4-2 to 4-4. The separate detail sheets of the amounts transported from each site on each date are presented as an Appendix to this report (Appendix 4).

In the **River Shannon** the trap and transport total of 23,882 kg represented 69% of silver eel production (using the escapement estimate adjusted to account for nights not fished) and, therefore, exceeded the 30% target, the EMP requirement was met on the basis of the agreed (3 year rolling mean value) protocol (Table 4-2).

In the **River Erne**, the trap and transport annual target (50% of silver eel production) for the River Erne was not reached in the 2023/2024 season. The quantity (48,027 kg) transported for safe release at Ballyshannon represented 49% of the estimated silver eel production (98,702 kg) for the river system for the season (Table 4-3).

In the 2023/24 season, fishing took place on Iniscarra reservoir in the last week of August and first week of September. Eels were caught using fyke nets (N=70). The total catch was 1,173 kg over 10 nights from 26th August until 4th September (Table 4-4), which exceeds the annual target for the river of 500 kg.

Table 4-2: Total amounts (t) of silver eel trapped and transported in the Shannon, 2009-2023, and the success relative to the targets set in the EMPs

Year	Bbest	Bcurrent	HPS Mort kg	T&T Target	Amount Transported (kg)	Relation to target	3 yr Running Average
2009	74,382	66,788	4,095	30% of run	23,730	31%	31%
2010	68,920	60,170	8,210	30% of run	27,768	40%	36%
2011	65,558	57,885	7,673	30% of run	25,680	39%	37%
2012	67,931	58,836	9,095	30% of run	24,228	36%	38%
2013	79,970	70,775	9,195	30% of run	22,561	28%	34%
2014	70,725	62,980	6,950	30% of run	26,438	37%	34%
2015	70725*	65798*	4,656	30% of run	19,957	28.2%*	31%
2016	38,608	32,920	3,062	30% of run	16,711	43%	36%
2017	34,139	31,191	2,948	30% of run	16,737	49%	40%
2018	32,580	29,613	2,967	30% of run	16,411	50%	47%
2019	38,028	33,011	5,017	30% of run	11,853	31%	44%
2020	41,548	37,810	3,738	30% of run	21,229	51%	44%
2021	23,903	22,902	1,001	30% of run	18,751	78%	53%
2022	36,943	33,629	3,314	30% of run	19,929	54%	61%
2023	34,660	32,729	1,931	30% of run	23,882	69%	67%

Table 4-3 Total amounts (t) of silver eel trapped and transported in the Erne 2009-2023, and the success relative to the targets set in the EMPs. Note change of target on the Erne in 2012

Year	Bbest	Bcurrent	HPS Mort kg	T&T Target	Amount Transported (kg)	Relation to target	3 yr Running Average
2009			20,960	22t	9,383	42.6	
2010	41,232	37,942	3,047	34t	19,334	56.9	46.9
2011	42,855	40,011	2,394	39t	25,405	65.1	59.3
2012	67,666	57,366	10,215	50% of run	34,660	51%	51%
2013	73,330	64,285	8,809	50% of run	39,319	54%	52%
2014	72,493	66,525	5,859	50% of run	48,126	66%	57%
2015	78,034	71,650	6,333	50% of run	54,706	56%	59%
2016	62,871	51,377	11,494	50% of run	38,264	61%	61%
2017	68,810	58,539	10,271	50% of run	43,470	63%	60%
2018	83,033	68,244	14,896	50% of run	47,004	57%	60%
2019	66,175	54,209	11,966	50% of run	39,651	60%	60%
2020	65,263	56,885	8,378	50% of run	46,957	72%	63%
2021	78,876	62,286	15,590	50% of run	45,000	57%	63%
2022	61,941	52,615	9,326	50% of run	40,531	65%	65%
2023	98,702	75,859	22,843	50% of run	48,027	49%	57%

Table 4-4 Total amounts (t) of silver eel trapped and transported in the Lee 2009-2023, and the success relative to the targets set in the EMPs.

Year	Bbest	Bcurrent	HPS Mort kg	T&T Target	Amount Transported (kg)	Relation to target	3 yr Running Average
2009				0.5t	79	16%	16%
2010				0.5t	278	56%	36%
2011				0.5t	731	146%	73%
2012				0.5t	230	46%	83%
2013				0.5t	824	165%	119%
2014				0.5t	670	134%	115%
2015				0.5t	527	105%	135%
2016				0.5t	44	9%	83%
2017				0.5t	542	108%	74%
2018				0.5t	35	7%	41%
2019				0.5t	1,098	220%	112%
2020				0.5t	1,082	216%	148%
2021				0.5t	1,033	207%	214%
2022				0.5t	1,087	217%	213%
2023				0.5t	1,173	235%	220%

4.3.1.2 Improvements to T+T programme

The fishing season has been extended in the Shannon and Erne, starting earlier and finishing later.

4.3.2 Action 2b: Quantify Turbine Mortality

4.3.2.1 Shannon

No update for 2023

4.3.2.2 Erne

No update for 2023

4.3.3 Action 2c: Engineered Solution

In the Erne system, the ESB have an ongoing project in place for the repurposing of the Erne hydro stations smolt gates. These will be developed into surface deflection facilities which will allow for the future bypass route for migratory fish. Following 2024 planning and design it is expected construction will take place in 2025. In the lower Shannon an investigation by CDM Smith on mitigating fish passage is complete. The report is with the Department of Housing, Local Government and Heritage.

4.3.4 **Action 2c: Other solutions**

A pilot study on the potential of light deflection techniques to divert eel migration away from the lights was tested in Lough Erne by AFBI and Queens University. See Section 5.4.6

4.4 **Management Actions No. 3. Ensure upstream migration at barriers**

Under the National Eel Management Plan, objective 7 requires the evaluation of upstream colonisation: migration and water quality effects. Lasne and Laffaille (2008) found that while eels are capable of overcoming a wide array of obstacles the resulting delay in migration can have an impact on the eel distribution in the catchment. Knowledge of what constitutes a barrier for eels (at different life stages) will assist in the estimation of eel population densities and escapement for future management plan reviews. The EU Habitats Directive (Directive 92/43/EEC) and Water Framework Directive (2000/60/EC) both require the assessment of barriers to fish migration.

4.4.1 **Action 3a: Existing barriers (inc. small weirs etc.)**

To fulfil its remit to produce a georeferenced database of barriers to fish passage on the Irish river network, the National Barriers Programme (NBP) team has performed a desk-based survey to identify potential barriers at a national scale, collating significant volumes of geospatial data from state agencies, such as the OPW, OSi, TII, Waterways Ireland, and Irish Rail, as well as historic IFI barrier surveys. This has produced a geodatabase of 73,076 potential barriers, which are being assessed using field surveys and desk-based analysis photographs or video of barrier sites. Using the IFI developed I-BAST application to date 28,053 structures have been assessed, 25,763 were classified as being 'not a barrier' with 7,822 classified as a 'potential barrier' requiring further work. Detailed assessments using the SNIFFER survey have been carried out on 255 structures in advance of mitigation works (Figure 4-1).

In the ESB operated Clady River a fish lift is being replaced with a vertical slot fish pass, this work is scheduled for 2024.

4.4.2 **Action 3b: New potential barriers**

IFI have created an internal group to review the 2012 'Guidelines for Small Scale Hydro Schemes'.

4.4.3 **Action 3c: Assisted migration and stocking**

Assisted upstream migration takes place at the ESB Hydropower Stations on the Shannon (Ardnacrusha, Parteen), Erne (Cathaleen's Fall), Liffey and Lee. This has been a long-term objective to mitigate against the blockage of the HPSs under ESB Legislation (Sec 8, 1935). On the Erne and Shannon, elvers and bootlace eel are transported upstream from the fixed elver traps. These programmes outlined in the EMP were continued in 2023. The catches shown in Table 7-1 were transported upstream. On the Erne, the distribution of elvers throughout the catchment is by cross-border agreement between IFI and DAERA.

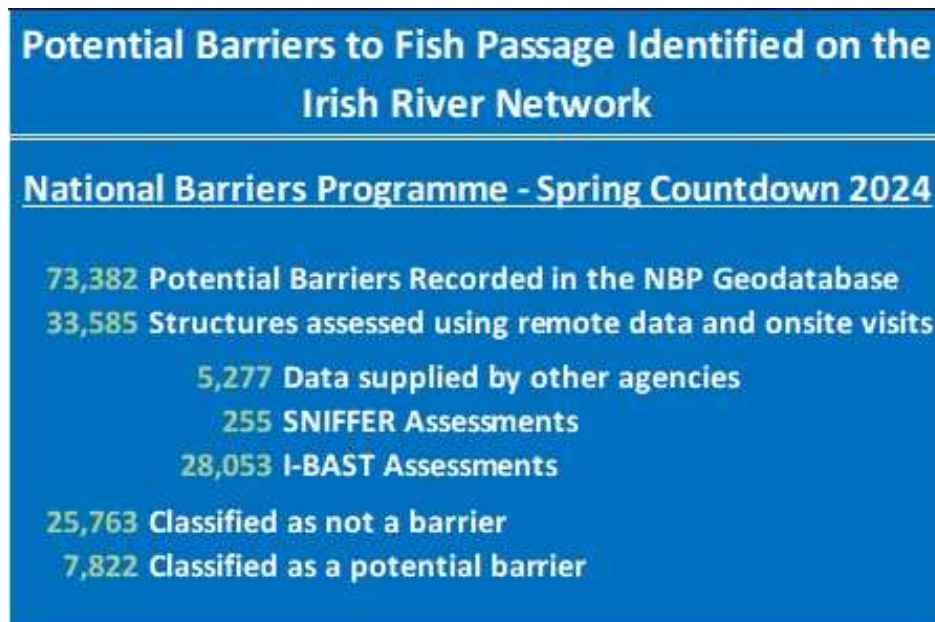


Figure 4-1 Summary description of barrier identification & mitigation.

4.5 Management Action No. 4 Improve water quality

4.5.1 General water quality – Compliance with the Water Framework Directive

In 2023, the EPA produced an update to the water quality for Ireland’s rivers, lakes, transitional / coastal water and groundwater using information collected in 2022 (see download link below). This report found that there had been no significant change in biological water quality in Irish rivers or lakes in 2022. The rate of decline was found to largely match the rate of improvement. Nitrate concentrations were noted as being too high in 40% of rivers and in 20% of estuaries, and this was attributed to agricultural runoff. There was no indication of reductions in nitrate levels. Phospahte concentrations were too high in 28% of rivers and 36% of lakes. The sources were noted as wastewater discharges and agricultural sources. These levels have generally remained stable in recent year. Nitrate and phosphorous concentration to the marine environment have been increasing since 2013. Loads of both nutrients were higher in 2022 than the levels recorded in 2021, this has led to a continuation of pressures to marine water bodies.

<https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/Water-Quality-2022-Indicator-Report-Web.pdf>

4.5.2 WFD monitoring – fish

Inland Fisheries Ireland is responsible for delivering the fish monitoring element of the WFD in Ireland. Eel are included in the WFD (fish) monitoring of rivers, lakes and transitional waters. Summary reports are available for all sites surveyed (www.wfdfish.ie). All reports are uploaded to the website <http://wfdfish.ie/>.

Results from 2022 are reported in section 6.2 of this report.

4.5.3 Fish Kills

National fish kills are reported in the IFI annual reports and published online. A review of the data was carried out recently and the numbers in the table will have changed from previous TEGE reports.

<http://www.fisheriesireland.ie/Corporate/corporate-publications.html>

There were 25 reported fish kills in 2022 and 17 in 2023 at the time of writing (Table 4-5 Fish kill data 2007 – 2023).

Table 4-5 Fish kill data 2007 – 2023

Year	No of Fish Kills
2007	18
2008	27
2009	13
2010	34
2011	26
2012	10
2013	36
2014	22
2015	23
2016	30
2017	14
2018	39
2019	20
2020	5
2021	41
2022	25
2023	17

4.5.4 Prevalence of *Anguillicola crassus*

Considered ubiquitous across Europe and since last reported (Becerra-Jurado *et al.*, 2014) it continues to spread through Irish water courses. The agencies involve continue to monitor swimbladder health in monitoring sites from MI, IFI, LA and AFBI. There is a new PhD at Queens University assessing reproductive fitness and spawner quality of migrating silver eels from the heavily constrained waterbody community of Lough Erne; this work will look at *A. crassus* impacts along with other metrics for eel health an update on this work is in section 5.4.5.

5 Silver Eel Assessment

(refers to Ch. 7.2.1 of the National EMP Report, 2008)

5.1 Introduction

The Council Regulation (EC) No 1100/2007 sets a target for silver eel escapement to be achieved in the long-term - 40% escapement of silver eels compared to the pristine level of escapement (pre 1980's). Ireland is therefore required to provide an estimate of contemporary silver eel escapement. The Regulation also requires post-evaluation of management actions by their impact directly on silver eel escapement. Quantitative estimates of silver eel escapement are required both to establish current escapement and to monitor changes in escapement

relative to this benchmark. Furthermore, the sex, age, length and weight profile of migrating silver eels are important for relating recruitment or yellow eel stocks to silver eel escapement. Quantifying migrating silver eel between September and December, or even January/February the following year, annually is a difficult and expensive process but it is the only way of ultimately calibrating the outputs of the assessments.

Silver eels are being assessed by annual fishing of index stations on the Erne, Shannon, Burrishoole, Barrow and Fane catchments (Table 5-1). Figure 5-1 shows the sampling locations in 2023..

There are three monitoring objectives in relation to silver eels:

1. Synthesise available information into a model-based management advice tool.
2. Estimate silver eel escapement (in collaboration with ESB, NUIG, Marine Institute)
3. Estimate silver eel escapement indirectly using yellow eels.

In Ireland escapement and mortality is calculated for two ESB catchments by the National University of Ireland Galway (Shannon, Erne), for the Burrishoole system by the Marine Institute and for the Fane and Barrow system by Inland Fisheries Ireland.

Table 5-1: The locations where silver eel escapement will be assessed.

Catchment	Priority	2021	2022	2023	Method
Erne	High	√	√	√	Coghill net / Mark-recapture
Shannon	High	√	√	√	Coghill net / Mark-recapture
Burrishoole	High	√	√	√	Trap
Fane	High	√	√	√	Coghill net / Mark-recapture
Barrow	High	√	√	√	Coghill net / Mark-recapture

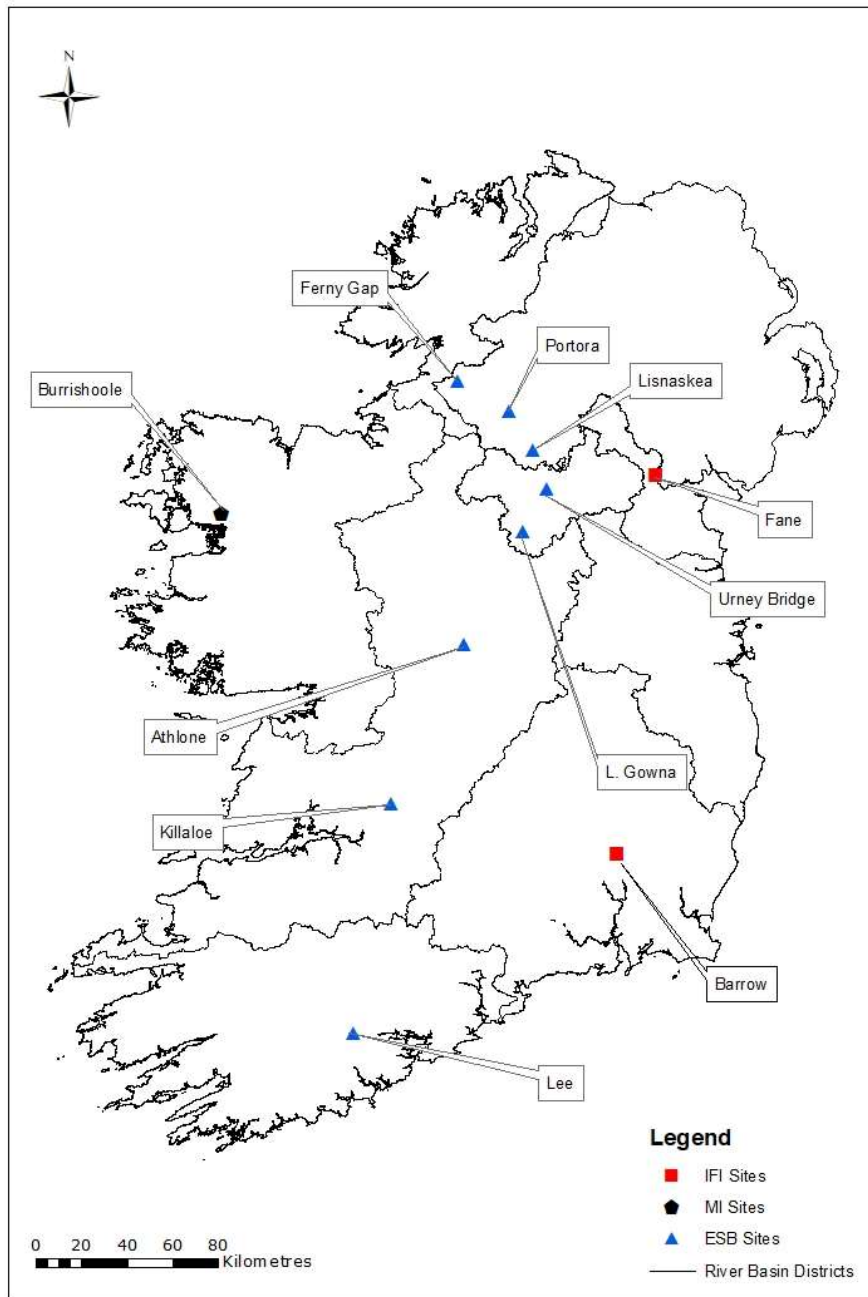


Figure 5-1 Silver eel monitoring locations, 2023

5.2 Shannon

The River Shannon is Ireland's largest river, and its extensive lake ecosystems offer some of the country's best eel habitat. It has been the focus of much of the eel population studies in Ireland to date.

5.2.1 Catch

In 2023/24 season, conservation eel fishing was conducted at three sites: two at Athlone, and one at Killaloe (Figure 5-2). Fishing began on the second week of September 2023 at Athlone and the first week October 2023 at Killaloe. Fishing ceased at Athlone in December 2023, but continued at Killaloe until mid-February 2024. A total of 19,437 kg of eels were caught at Athlone (17,669 kg at the Jolly Mariner site and 1,768 kg at the Yacht Club site), and a further 4,445 kg were caught at Killaloe, giving an overall Trap and Transport catch of 23,882 kg (Figure 5-3). The overall Trap and Transport capture in 2023/24 is 4 tonnes higher than in the previous season, and higher than any T&T capture in the last 5 years.

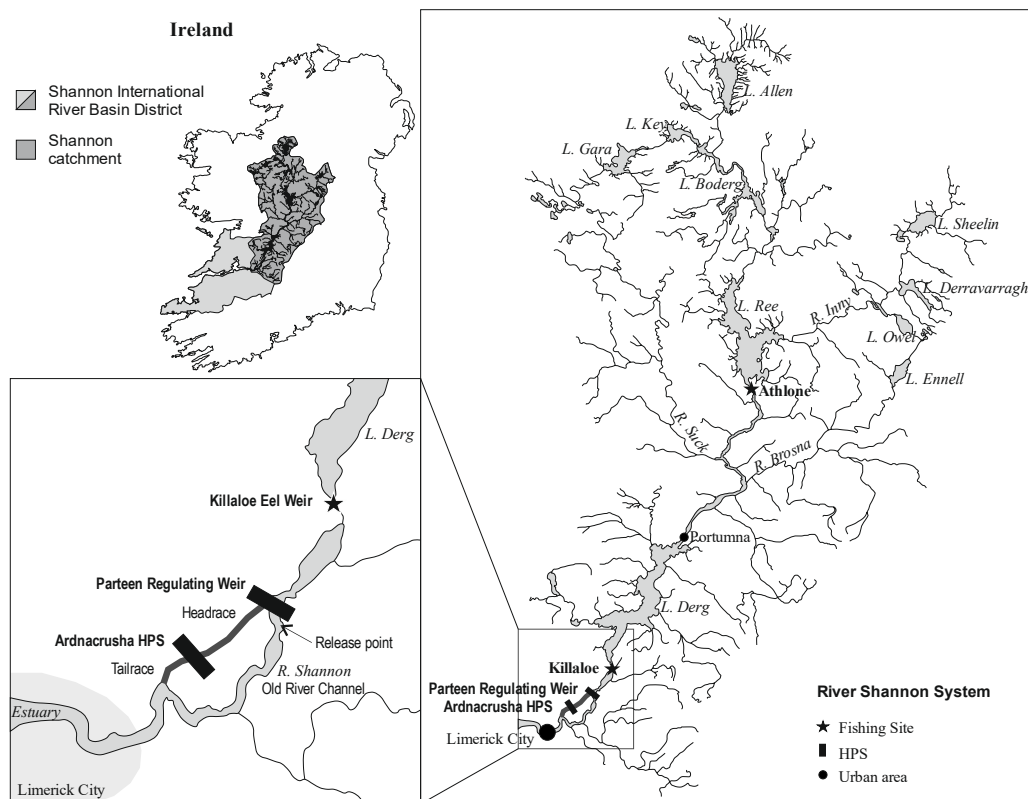


Figure 5-2 Map of River Shannon catchment with conservation fishing sites, release point and Ardnacrusha HPS indicated.

Daily catch rates at Killaloe are shown in Figure 5-4, along with variation in discharge and spillage. Discharge was variable during the season with little spillage. Highest catches were recorded during the last and first quarter phases in November and December 2023.

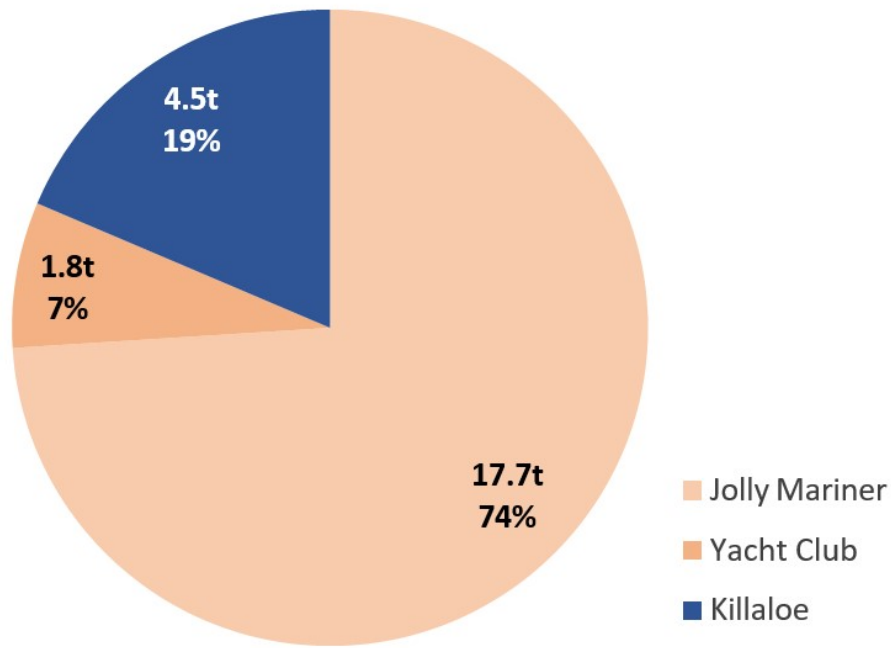


Figure 5-3 The relative quantities of silver eels contributed by fishing crews to the River Shannon T&T during the 2023/2024 season

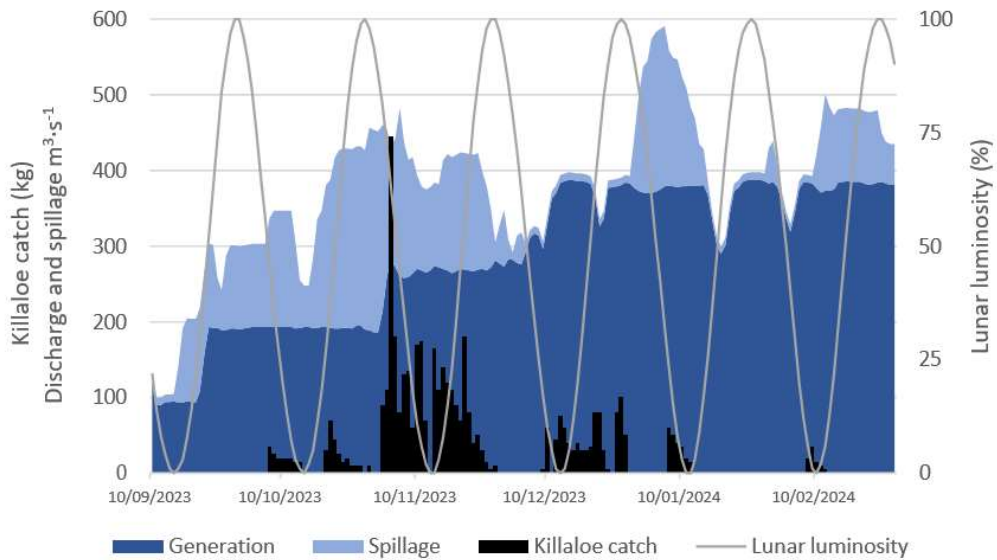


Figure 5-4 The seasonal variation in daily catches at the Killaloe eel weir during the 2023/24 fishing season together with variation in discharge via Ardnacrusha and as spillage to the Old River Shannon channel

5.2.2 Mark Recapture

No update for 2023

5.2.3 Production and Escapement

Production and escapement figures for the River Shannon are summarised in the flow diagram (Figure 5-5). Production of 34,659 kg is estimated by the trap and transport catch at Killaloe using the fishing efficiency rate of 29.2%, together with the catch from the two Athlone sites. This fishing efficiency rate at Killaloe is based on Mark-Recapture experiments (n = 14) conducted by the University of Galway from 2016/17 – 2019/20 (MacNamara *et al.*, 2014; Lenihan *et al.*, 2021). In total 23,882 kg (68.9% of production) was moved beyond the hydropower station through trap and transport. Of the 10,777.6 kg that moved beyond Killaloe weir, it is estimated that 1,647.5 kg (15.2 %) migrated via the Old River Channel. This is determined by the amount of spillage to the Old River Channel, using a regression model based on historical telemetry studies of route selection (MacNamara *et al.*, 2014). An estimated 21.15% mortality (1,931 kg) at Ardnacrusha hydropower station of the 9,130.0 kg that entered the headrace, leaves 7,199.1 kg progressing downstream. This gives an escapement of 32,728.6 kg, or 94.4 % of production.

The estimates of production and escapement, together with trap and transport quantities for the last six years are comparable except for the 2021/22 season, where production was 13 t lower (perhaps due to lower than usual Shannon water flows). The value of escapement as a percentage of production remains high, ranging from 86.8% to 95.5%. An explanation of how calculations are carried out is available in Appendix 5 Figure A5-1. It should be noted that since 2020 no ground thruthing via updated Mark Recapture study or length frequency analysis has taken place.

Current and annual figures for production and escapement for the Shannon are shown in Table 5-2. An explanation of how calculations are carried out is available in Appendix 5 Figure A5-1.

Table 5-2 Production and escapement estimations on the River Shannon from 2016

Year	Production (kg)	Escapement (kg)	% of Production
2022/23	34,660	32,729	94
2022/23	36,943	33,629	91
2021/22	23,903	22,902	95.8
2020/21	41,548	37,810	91
2019/20	38,028	33,011	86.8
2018/19	32,850	29,613	90.9
2017/18	34,139	31,191	91.4
2016/17*	38,608	32,920	85.3

*Figure raised to account for gaps in fishing due to flood event

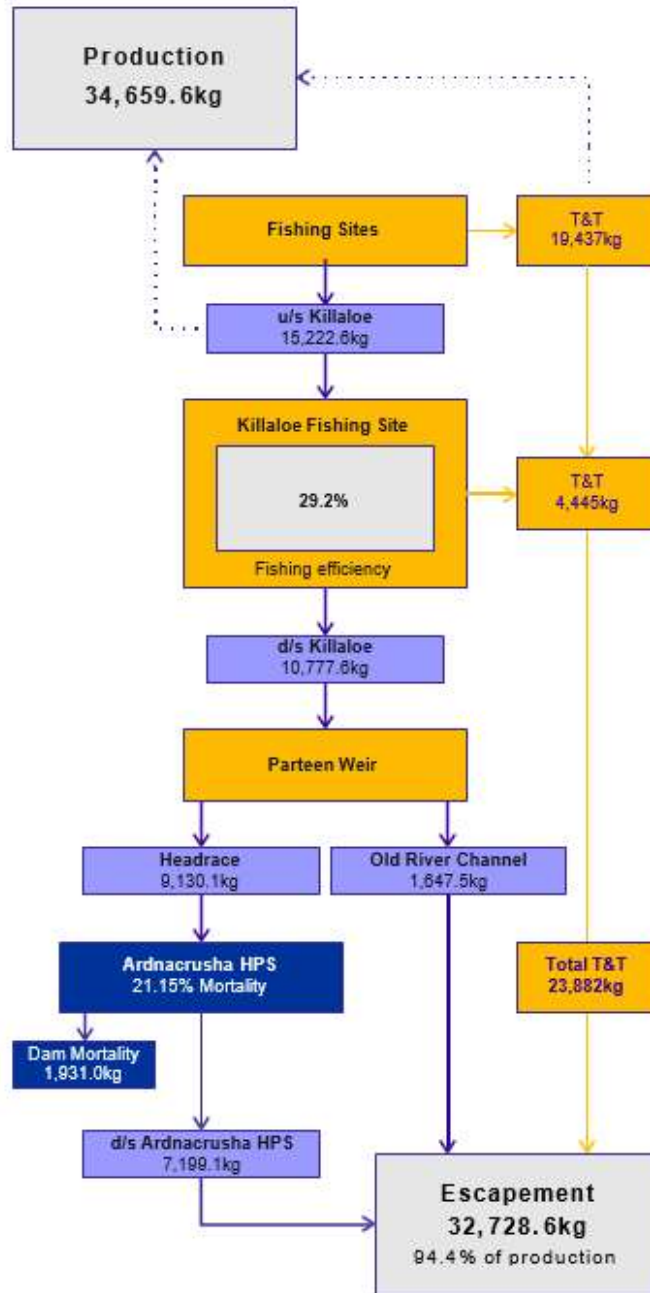


Figure 5-5 A summary of the analysis of silver eel production and escapement in the River Shannon during the 2023/24 eel migration season. See Appendix 5 for further explanation

5.2.4 Length

No length frequencies for 2023

5.3 Burrishoole

The only total silver eel production and escapement data available in Ireland is for the Burrishoole catchment in the Western RBD, a relatively small catchment (0.3% of the national wetted area), in the west of Ireland. The Burrishoole consists of rivers and lakes with relatively acid, oligotrophic, waters (Figure 5-6). The catchment has not been commercially fished for yellow eels, has not been stocked and there are no hydropower turbines.

The eels have been intensively studied since the mid-1950s; total silver eel escapement from freshwater was counted since 1970 (Poole *et al.*, 1990; Sandlund *et al.*, 2017; Poole, data unpublished); and an intensive baseline survey was undertaken in 1987-88 (Poole, 1994). The detailed nature of the Burrishoole data makes it suitable for model calibration and validation (e.g. Dekker *et al.*, 2006; Walker *et al.* 2011).

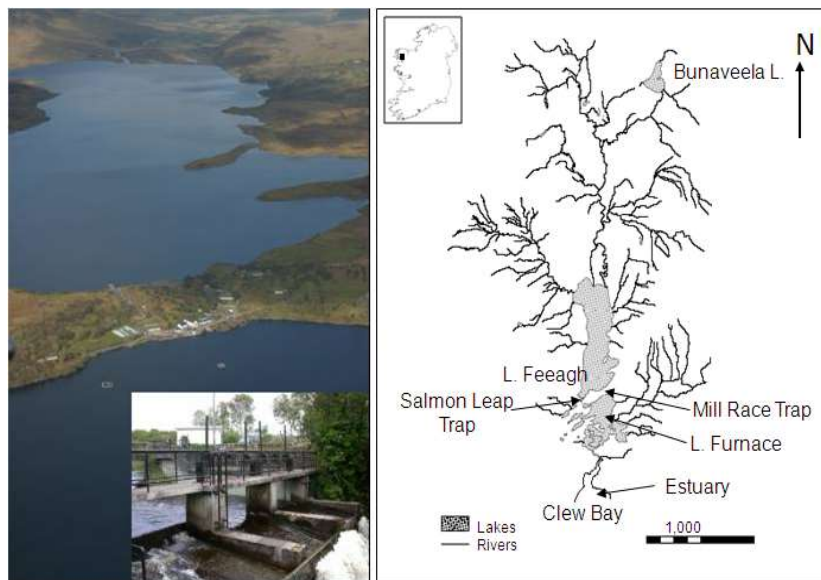


Figure 5-6 An aerial view of the Burrishoole catchment, looking north over the tidal Lough Furnace, in the foreground, and the freshwater Lough Feeagh: inset shows the silver eel downstream trap at the "Salmon Leap". A map of the Burrishoole catchment showing the locations of the traps.

Catch

The total run amounted to 3133 eels (end March '24). As in other years, the highest proportion of the total catch (89.7%) was made in the Salmon Leap trap. The silver eel season in 2023 opened early with some silvers being recorded in late June and July. A rise in water level throughout July and August in gave small pulses of eels but then low water levels delayed any further activity until mid-September. A flood on the 19th/20th September led to a large pulse of eels and again, rising water levels in early November supported a few nights of good eel numbers. A final large flood in early December yielded a few eels but there was little activity after that (Figure 5-7).

In 2023, the timing of the run was 7% migrating up to the end of August, and 44% in September leading to an earlier run than that recorded in 2022 (Table 5-3). Figure 5-7 shows the daily counts of silver eels.

Table 5-3 Timing and numbers of the 2023/2024 silver eel run.

	Salmon Leap	Mill Race	Total	%
May	2	0	2	0.1
June	2	1	3	0.1
July	40	17	57	1.8
August	129	21	150	4.8
September	1216	168	1384	44.2
October	472	42	514	16.4
November	918	70	988	31.5
December	30	3	33	1.1
Jan. 2024	2	0	2	0.1
February	1	0	1	0.0
March	0	0	0	0.0
April	0	0	0	0.0
Total	2812	322	3134	

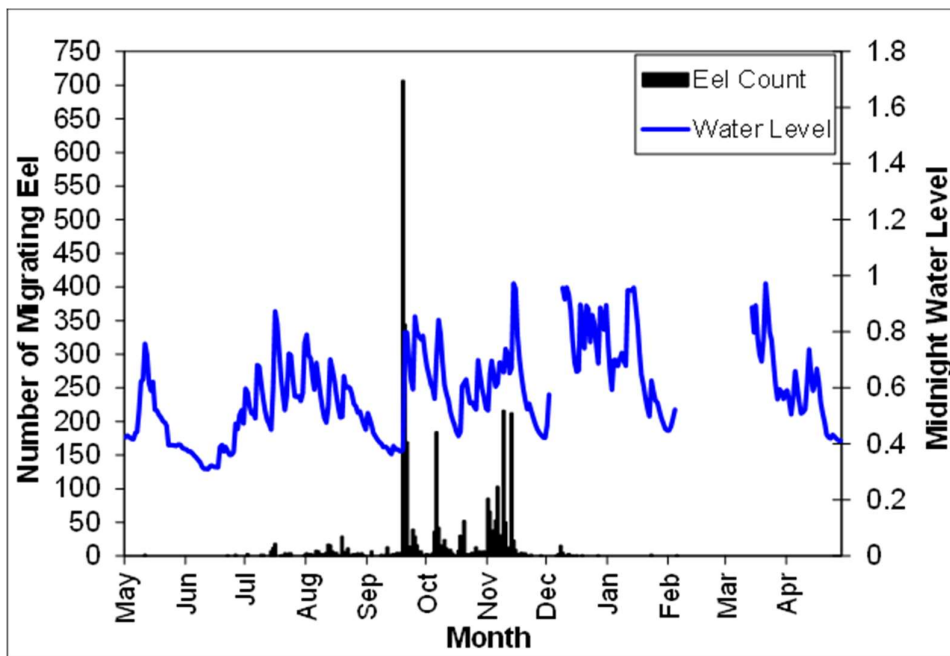


Figure 5-7 Daily counts of downstream migrating silver eel and mid-night water level (m).

Length, weight & sex

Sampling of individual eels (n = 985) gave an average length of 41.7cm (range: 27.8 – 96.1cm), an average weight of 146g and the proportion of male eels was 42.6%. The length frequency is presented in Figure 5-8 along with those 2021 and 2022 for comparison. The lack of eels above 46/47cm was once again notable and a notable decline in size of males was also evident.

The long-term trend in numbers and average weight is presented in Figure 5-9. The mean weight has dropped to an average of about 166g in the last three years and the sex ratio in 2021 of 50.4% males was the highest recorded since 1990.

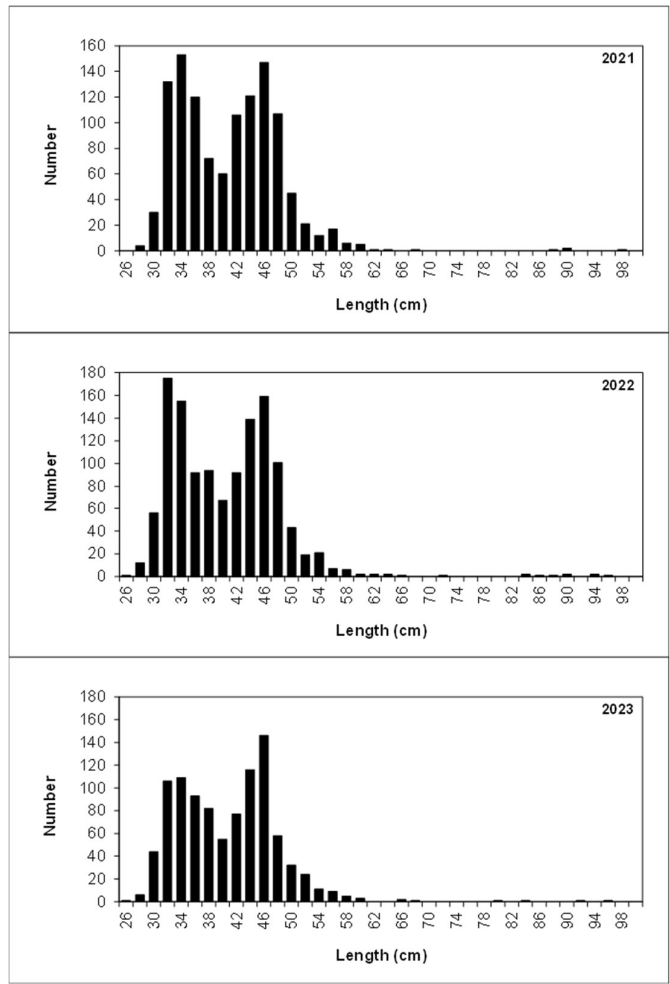


Figure 5-8 Length frequency of samples of silver eels trapped in the Burrishoole downstream traps, 2021 (1165), 2022 (1255) and 2023 (985). Note one eel in 2022 at 25.8cm was plotted as 26cm.

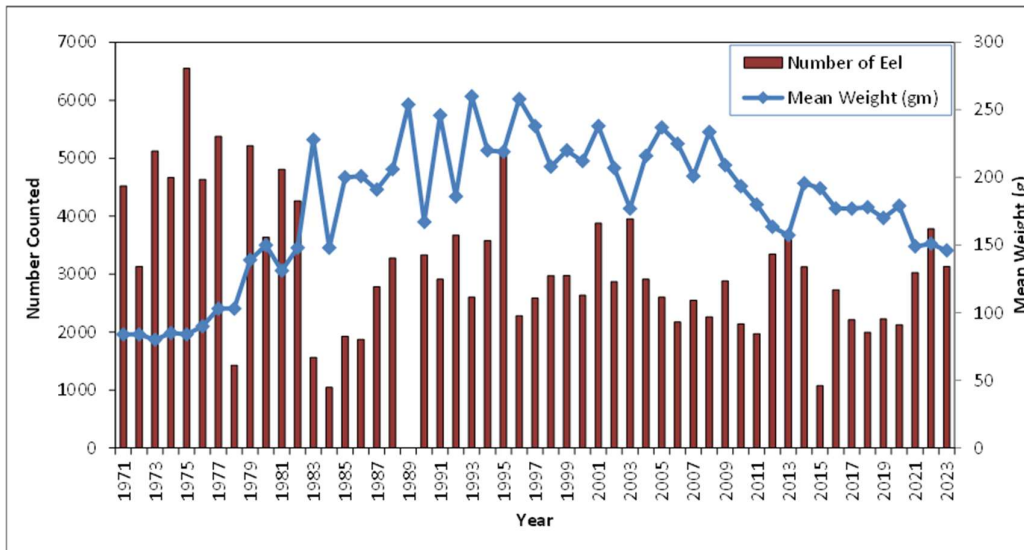


Figure 5-9 Annual number and mean weight of silver eels trapped in the Burrishoole downstream traps.

5.4 Erne Transboundary

The River Erne, a transboundary system, is the second largest river system in Ireland, with an extensive lake habitat. The River Erne conservation fishery and trap and transport (T&T) programme was monitored by researchers from the Agri Food and Biosciences Institute (AFBI) and Dariusz Nowak.

5.4.1 Catch

In 2023/24 the River Erne system was fished at 4 sites (5 during last season) and the locations of these are indicated on the map (Figure 5-10). Roscor Bridge, the lowermost site, was not fished during 2023/2024 season. Fishing on other sites started on the end of the first week of August 2023 at Portora Gates fishing site, followed by other crews from the last week of August and the first week of September. Fishing activities finished in December 2023, except Ferry Gap, which fished until the 16th January 2024. The total catch contributed to the Trap and Transport programme weighed 48,027 kg. The proportions caught at each site are shown in Figure 5-11. The total T&T catch in 2023/24 season was almost 8 tonnes more than the previous season, and higher than in the previous 5 season.

The variation in the daily catches at the Ferry Gap fishing site are shown in Figure 5-12, with catch levels (and therefore fish migration) affected by discharge level and lunar cycle stage.

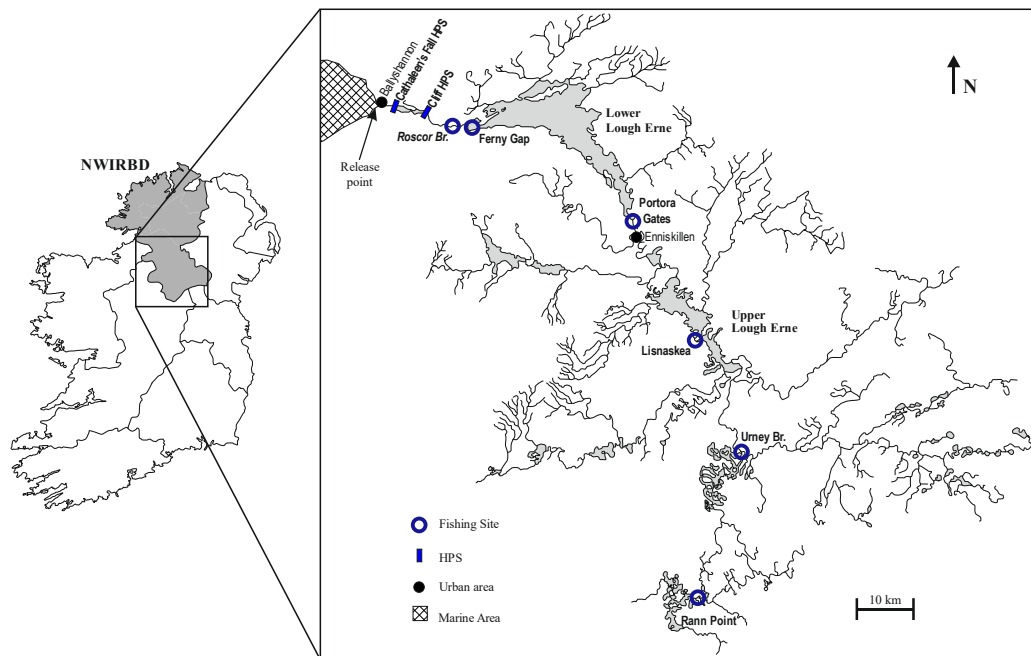
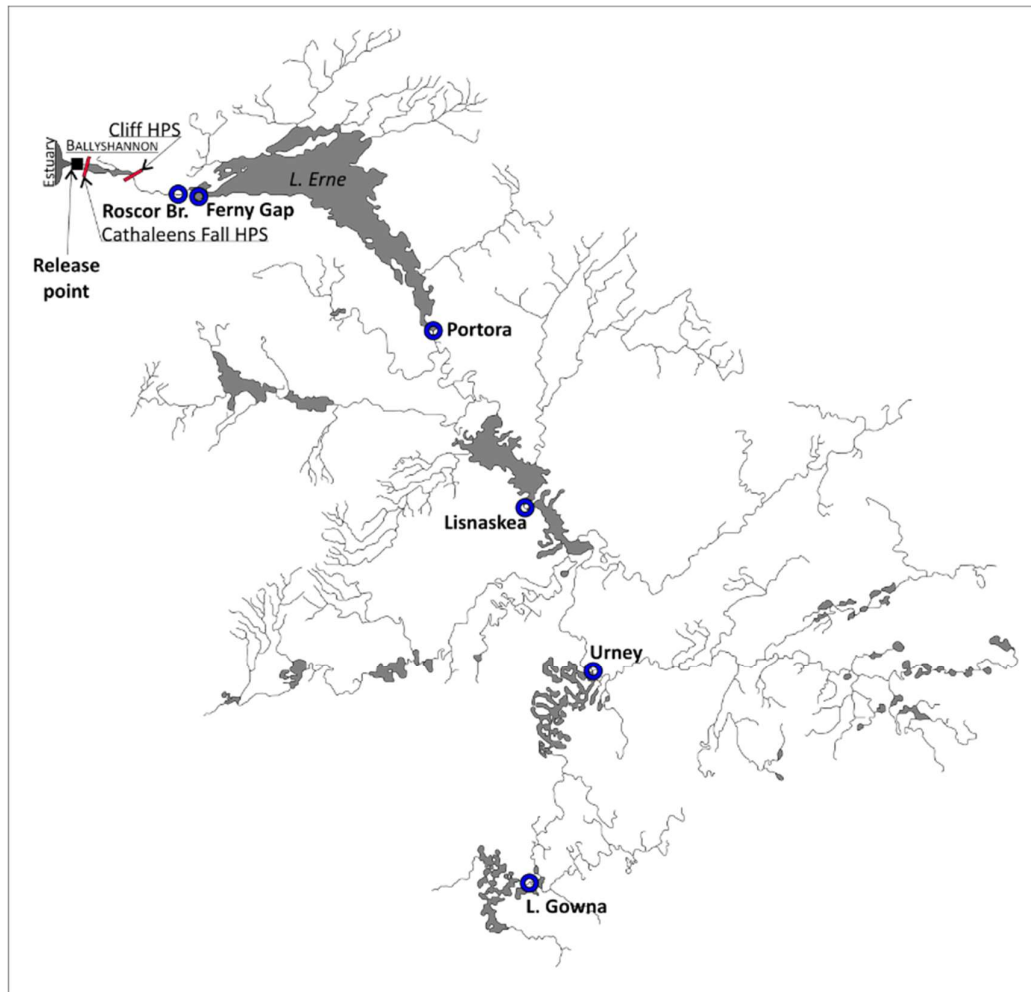


Figure 5-10 Map of River Erne catchment with conservation fishing sites for 2023/24, release point and hydropower dams indicated.

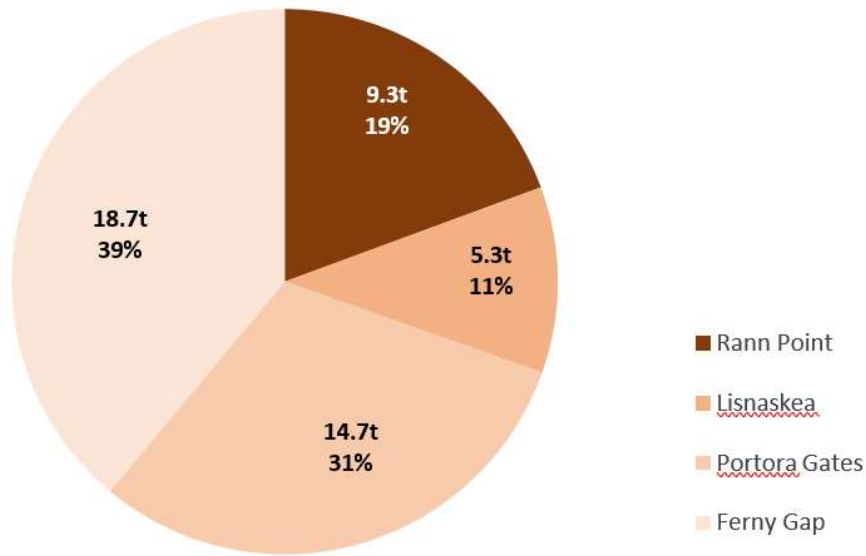


Figure 5-11 Proportions of the River Erne trap and transport catch obtained by each fishing crew in the 2023/2024 season

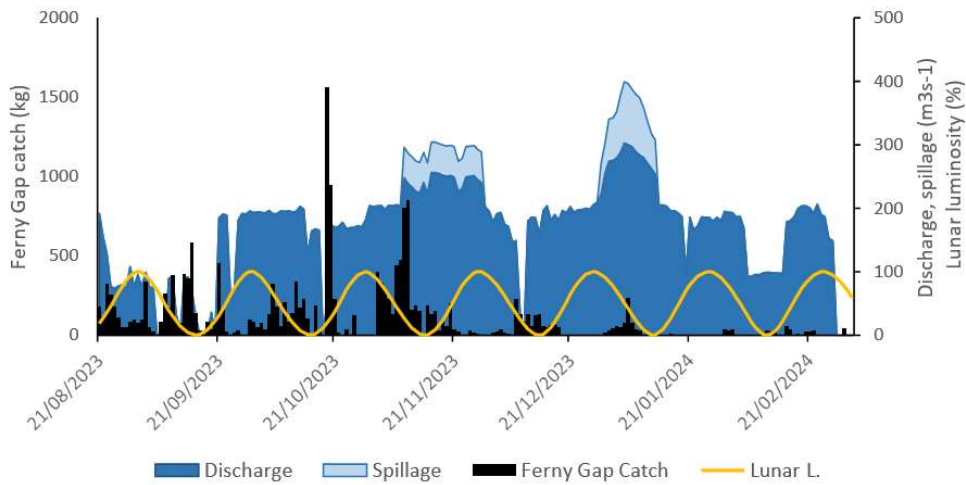


Figure 5-12 Variation in daily catches at Roscor Bridge fishing site, in relation to lunar cycle and discharge during the 2023/24 season

5.4.2 Production and Escapement

Although not fished during the 2021/22, 2022/23 and 2023/24 seasons, the Roscor Bridge site is vital to the analysis of silver eel migrations and to the calculation of eel production and escapement for the River Erne (Figure 5-13). The site, located 750 metres downstream of the outflow point of lower Lough Erne (Figure 5-10), provides a discrete river section from which it is possible to accurately assess the biomass of uncaptured eels. In previous years this

biomass has been estimated based on daily catch records at Roscor Bridge combined with the results of extensive mark–recapture experiments (McCarthy *et al.*, 2019). However, it was noted in previous seasons that Roscor Bridge had limitations as a monitoring site with low discharge and catch levels frequently leading to prolonged periods of fishing crew inactivity. When this occurred, catch records required for the calculation of production were unavailable. This prompted the development of alternative monitoring protocols capable of assisting with the quantification of eel migrations at this site in the absence of T&T catch records.

Based on over a decade of scientific observation, it is possible to predict catch levels on Roscor Bridge fishing site (McCarthy *et al.*, 2014, McNamara *et al.*, 2014; Lenihan *et al.*, 2021). In 2023/2024 silver eel migration season, it was estimated that the total catch would be 7,145 kg at Roscor Bridge fishing site. 48,027 kg of eels were moved by trap and transport from the four fishing sites upstream of Roscor Bridge. Fishing efficiency rates for calculating production and escapement were based on several mark/recapture experiments carried out by the University of Galway, at the experimental fishing site at Roscor Bridge from 2010/11 to 2015/16 at low discharge (< 130 m³·s⁻¹= 9.78%) and high discharge (> 130 m³·s⁻¹= 18.43%) (McCarthy *et al.*, 2016; McCarthy *et al.*, 2019). These were used with estimated Roscor Bridge catch to calculate the biomass of eels arriving there (50,675 kg), based on the flow conditions throughout the season.

The silver eel production was estimated to be 98,702 kg (Figure 5-13), and escapement was estimated to be 75,859 kg (76.9% of production). The trap and transport catch of 48,027 kg at the four fishing sites represented 48.7% of the production (not exceeding the 50% target by 1,324 kg). 50,675 kg of eels are estimated to have passed the weir and moved through the hydropower stations at Cliff and Cathaleen’s Fall. Mortality at each station is based on historic telemetry work conducted by the University of Galway (McCarthy *et al.*, 2014) at the two stations, depending on the operations of the dams throughout the season. Total mortality was estimated to be 13,358 kg (26.4 %) at Cliff HPS and 9,485 kg (25.4 %) at Cathaleen’s Fall (Table 5-4) Table 5-4 Mortality rates (based on unpublished NUIG telemetry results) at two hydropower stations, depending on station operation

In total, 27,832 kg of eels are estimated to have navigated beyond the hydropower stations, and with the trap and transport quantity of 48,027 kg, a total escapement of 75,859 kg is estimated. The average value of escapement as a percentage of production was 83.1% in last five years, where in 2023/24 season it is 76.9%. An explanation of how calculations are carried out is available in Appendix 5 Figure A5-1. It should be noted that since 2020 no ground thruthing via updated Mark Recapture study or DIDSON counts has taken place in the Erne catchment. AFBINI have undertaken length data collection of the trap and transport catch.

Table 5-4 Mortality rates (based on unpublished NUIG telemetry results) at two hydropower stations, depending on station operation

Operation	Cliff	Cathaleen’s Fall
No flow	0%	0%
Generation & Spillage	7.9%	7.7% (half load) 15.4% (full load)
Generation only (no spillage)	26.7%	27.3%
Overall mortality 2018/19	19.6%	26.8%
Overall mortality 2019/20	23.9%	25.5%
Overall mortality 2020/21	25.4%	27.3%
Overall mortality 2021/22	26.7%	27.3%
Overall mortality 2022/23	25.3%	24.5%
Overall mortality 2023/24	26.4%	25.4%

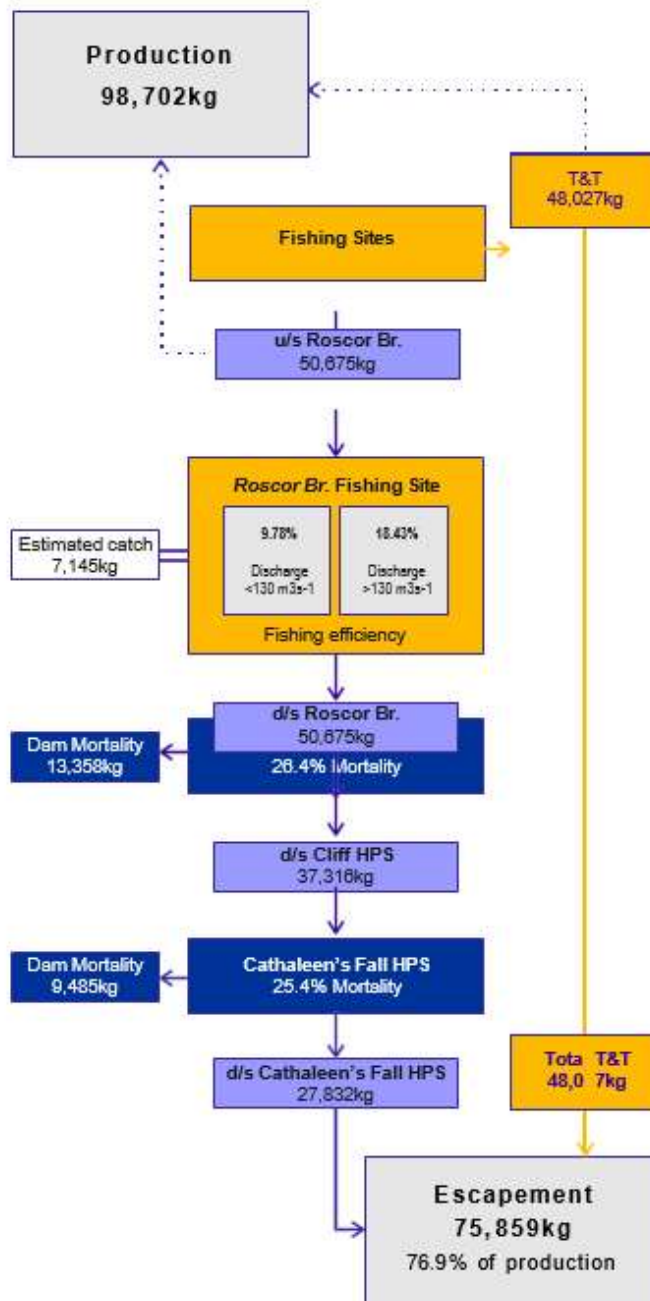


Figure 5-13 A summary of the analysis of silver eel production and escapement in the River Erne during the 2023/2024 eel migration season. See Appendix 5 for further explanation

5.4.3 Length Frequency

No length frequencies for 2023; see next section for River Erne length frequencies collected by AFBI.

5.4.4 AFBI Length Frequency

By way of the request from EU COMM and TEGE for additional data to enhance the calculations of silver eel production from those EMU's impacted by hydro and operated under T&T fisheries. This data has been a requirement under the EMP but is now also required to fill out the eel data calls for eels being released – i.e. to convert from biomass to numbers and provide an indication of gender. The Erne locations were fished for silver eels during the following months of the 2023-24 season.

- Ferny Gap (August – January)
- Portora (August – February)
- Lady Craigavon Bridge (ULE) (September – December)

These analyses were focused on the key lunar darks throughout Autumn and Winter of 2023-24 up until the point that fishing ceased mid-February. Every eel captured or held in tanks for that respective fishing period was measured.

A total of 4,148 eels were measured for length with summary stats presented in Table 5-5. Individual length frequencies for this data set have been provided to the TEGE for necessary production calculations and for storage on the new all Ireland database.

Table 5-5 Erne silver eel length measurements and summary stats for 2023-24 (NI sites only)

Location	Date	n	Mean Length (mm)	Min (mm)	Max (mm)
Ferny Gap	15-Aug	265	596	360	1001
Ferny Gap	12-Sep	232	571	340	880
Ferny Gap	12-Oct	341	552	320	940
Ferny Gap	12-Nov	315	528	310	880
Ferny Gap	12-Dec	257	586	340	910
Ferny Gap	Jan-24	162	598	320	900
Portora	14-Aug	245	703	360	980
Portora	12-Sep	296	649	370	930
Portora	17-Oct	242	635	340	950
Portora	12-Nov	295	647	340	930
Portora	12-Dec	293	633	330	900
Portora	Jan-24	349	699	350	1000
Portora	Feb-24	201	671	330	950
ULE Lisnaskea	12-Sep	187	633	360	940
ULE Lisnaskea	15-Oct	70	662	441	1040
ULE Lisnaskea	12-Nov	175	694	340	940
ULE Lisnaskea	12-Dec	223	662	350	1000

5.4.5 Lough Erne Silver eel health and spawner quality survey overview

5.4.5.1 Introduction

The 2023 Lough Erne silver eel survey was completed alongside the annual Trap and Transport length frequency analysis conducted by AFBI from September to December 2023 in conjunction with Queen's University Belfast. The results from this survey are being applied to a QUB PhD assessing reproductive fitness and spawner quality of migrating silver eels from the heavily constrained community of Lough Erne. Due to constraints at the outflow of this system, namely, two hydro-electric dams leading from Erne, migrants from this system encounter difficulties accessing the sea. The overarching aim of this PhD is to examine how constrained access of eels to the sea impacts individual migrating spawners, the ensuing reproducing eel communities in the Atlantic Ocean, and consequences impacting juvenile eel communities across the range of the European eel.

To quantify silver eel reproductive fitness and the quality of spawners leaving these systems, several health parameters are assessed. Macroscopic examinations will be employed to assess the prevalence and mean intensity of endohelminth parasites within the gut and swim bladders as well as examining the viral load of haematological viral pathogens. Contaminant presence, type and concentrations within the body fat will be assessed using mass-spectrometry techniques with focus on heavy metal pollutants. On top of these assessments, percentage body fat will be assessed with non-invasive Distell fat meter techniques followed by standard laboratory lipid analysis. Female fecundity by egg count is also examined. These new assessments into the spawner quality of European eels on Lough Erne builds upon an existing knowledge base of biological quality parameters, addressing conservation efforts and potentially advising in the modification of existing eel management policies locally and across Europe. Within Lough Erne, a total sample size of 100 eels spread across males (n=50) and females (n=50) were collected from known trap and transport conservation fishing sites within Upper and Lower Lough Erne, shown in Figure 5-14, between September 2023 and December 2023. Length, weight, and body fat analysis using a handheld Distell fat meter were recorded along with prevalence and intensity of the swim bladder parasite *Anguillicola crassus* as basic biometric data at the site prior to the removal of the digestive tract, gonads and liver for laboratory analysis and the removal of the head for cranial dissection and otolith age analysis. The remaining carcasses were frozen for examination contaminants within body fat along with lipid analysis. The data produced from this PhD complements recommendations within WGEEL reports (ICES, 2021) to examine the effect of sublethal impacts, with a focus on contaminant exposure and parasites/diseases, on spawner quality subsequently the ability of silver eels to successfully migrate. From these recommendations, the creation of a silver eel quality database for lough erne will be produced over 3 consecutive years (2022-2024). To ensure consistency of the data collection samples will be collected from the same fishing sites and using similar methodologies. An in-depth silver eel database will also be developed for Lough Neagh as part of the PhD. This will allow for not only the fulfilment of ICES recommendations but will also provide a novel comparison of two separate large lake systems to be completed. An extract of the findings from the first survey connected to the Lough Erne silver eel quality database is produced below with more detailed outputs to follow in a future thesis submission.

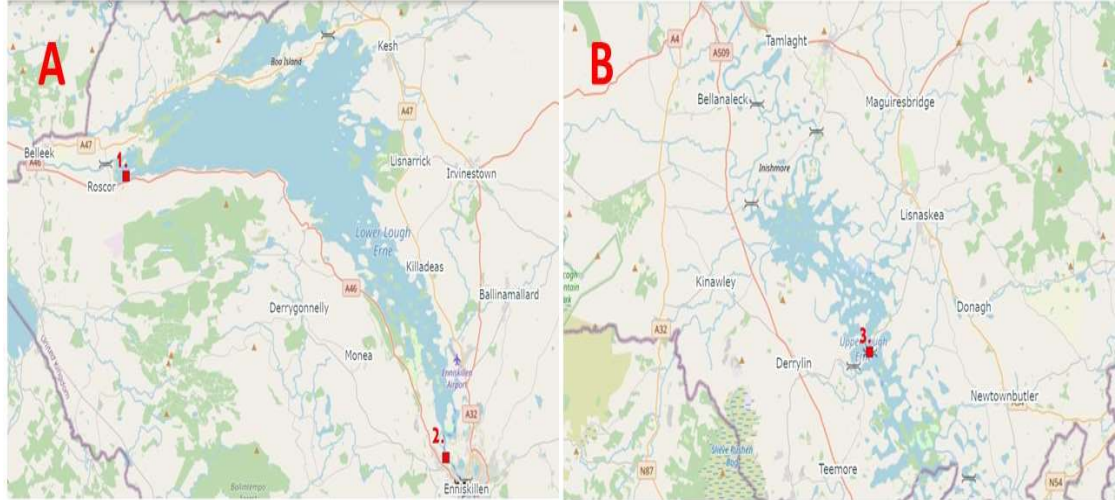


Figure 5-14 Map of Trap and transport sites used on (A) Lower Lough Erne and (B) Upper Lough Erne.

5.4.5.2 Results

5.4.5.2.1 Length / Weight Relationship

A summary of the samples collected within the 2023 L. Erne silver eel health and quality survey is produced in Table 5-6 with comparisons between male and female samples also present. A strong length/weight relationship was also recorded for eels captured and processed during this survey (figure 2).

Table 5-6 Summary statistics of 2023 silver eel survey on L. Erne

	N	Mean Length	Max Length	Min Length	Mean Weight	Max Weight	Min Weight
All	100	539	980	327	406	2196	69
Male	50	397	497	327	119	421	69
Female	50	680	980	460	692	2196	156

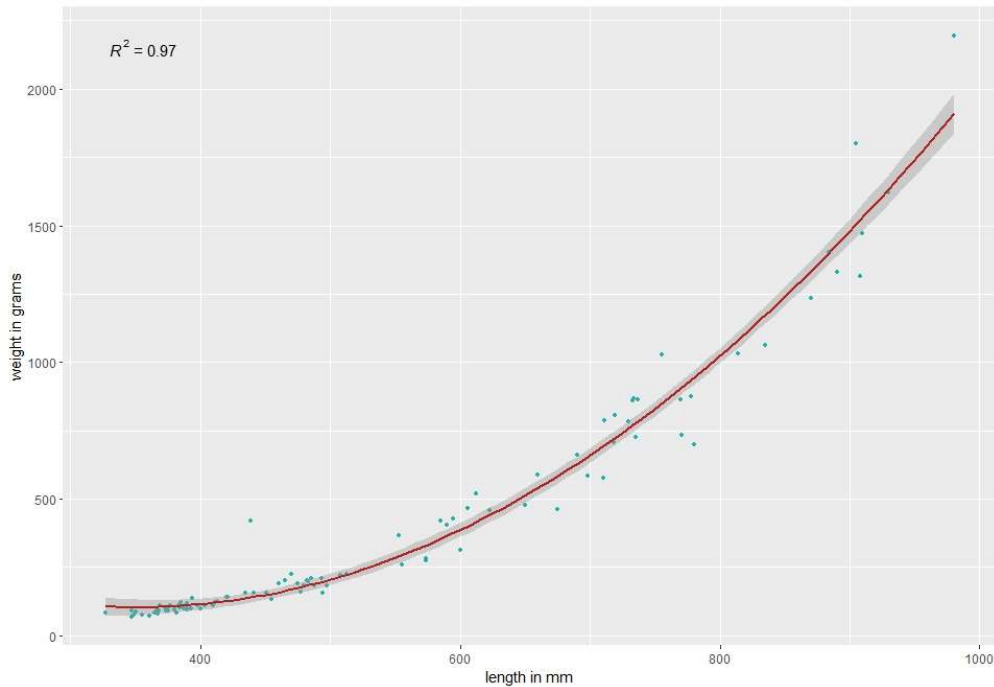


Figure 5-15 Length/weight relationship from 2023 silver eel survey on L. Erne (n=100)

5.4.5.2.2 Silver eel Fat content

Preliminary fat content measurements using a Distell handheld fat meter show a mean percentage body fat of 20.7% (n=100). Results as shown in Figure 5-16 show a clear divide in percentage body fat between males (mean body fat = 20.1%, n=50) and females (mean body fat = 18.1%, n=50) with male individuals displaying generally high body fat percentages than female counterparts.

Previously, WKPGMEQ (ICES, 2015) reported the Distell Fat meter to be inaccurate for the measurement of individual silver eel samples. Inconsistencies with the device have been related to differences in the water content between eel life stages (Tesch, 2003) for example. To account for any discrepancies within this dataset, a detailed laboratory calorific lipid analysis is currently ongoing with an attempt to produce a silver eel fat meter correction factor based on similar attempts by Pohlmann *et al.*, 2019.

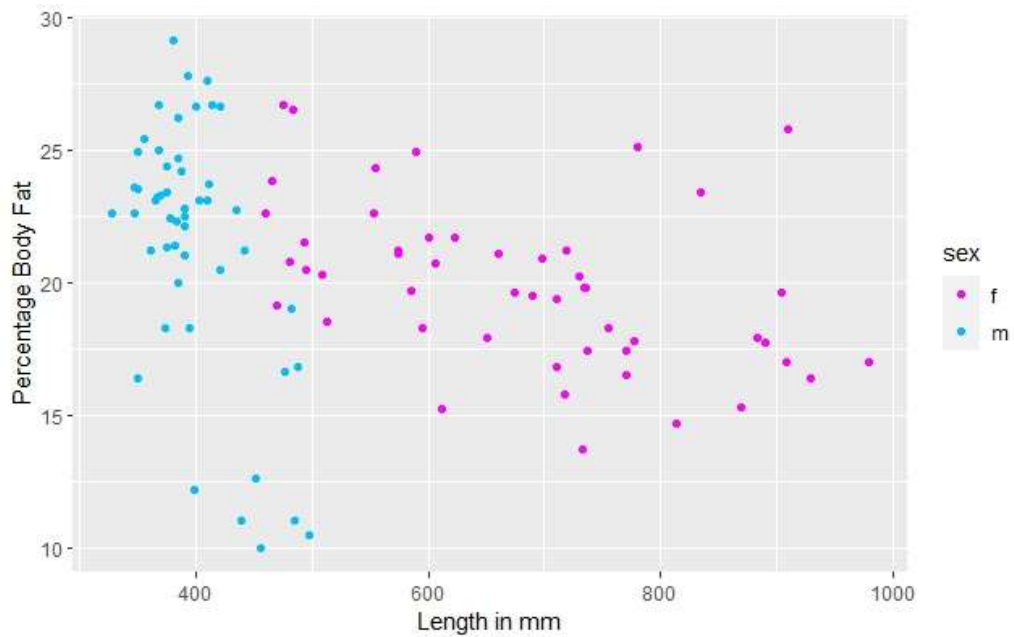


Figure 5-16 Fat content from 2023 L. Erne silver eel health and quality survey (n=100)

5.4.5.2.3 *Anguillicola crassus*

The prevalence and infection intensity of the invasive swim bladder nematode *Anguillicola crassus* was examined as part of the spawner quality assessment within this survey. Table 5-7 shows the prevalence of this parasite within all samples (n=100) with comparisons made between males (n=50) and females (n=50). Figure 4 demonstrates the quantity of swim bladders assessed within this survey that are opaque versus translucent possibly suggesting that although the prevalence of *A. crassus* within the individuals sampled was 72%, a large number of individuals from the population may have had previous infections.

Table 5-7 parasite infection parameters of invasive swim bladder parasite *A. crassus* collected during L. Erne silver eel survey.

	Mean Intensity	Max Intensity	Min Intensity	% prevalence
All	21	33	0	73
Male	7	34	0	74
Female	20	16	0	72

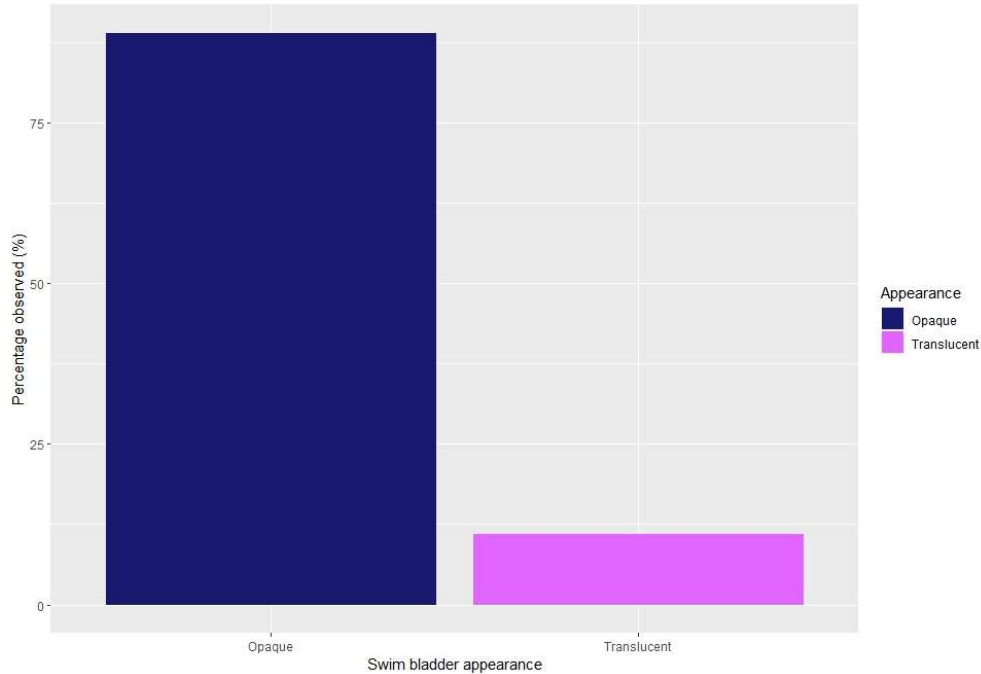


Figure 5-17 Percentage of swim bladders appearing opaque or translucent

5.4.6 Deflection Light Array

Lough Erne is constrained by two large hydroelectric dams at the mouth of River Erne (Cliff Dam and Cathleen Falls). These dams present a considerable barrier to migrating silver eels and have a high recorded eel mortality for individuals that pass-through turbines if not caught in the Trap and Transport fishery. To reduce the number of individuals passing through these turbines, a light array eel deflection method proof of concept was piloted at Portora sluice gate on Lough Erne at the beginning of 2024 (Figure 5-18). Other methods of deflection (bubble curtain, electric screens, and sound) were eliminated from the study due to cost and engineering requirements in order to install and operate. These methods were deemed unsuitable for testing as part of a biological degree. The simple design of the suspended light array also has potential for a tech transfer between sites on the lough and in other systems as it requires a smaller, more portable generator to power in comparison to the other deflection methods.

The aim of the trial was based on a simple proof of concept using a known inefficient net on the sluice gates. Using the array, eels were corralled towards this net to improve its catch efficiency (4% to 21%, Figure 5-19) whilst still keeping full access to the open boating channel beside the gates as access is permanently required between the upper and lower lough. The site was fished for a total of 26 days (14 nights with lights off and 12 with lights on) and centred around a new moon phase, a known benchmark for the height of the eel run each month.

Results from this pilot showed promising success with the array design. Net 4 (poor efficiency) increased as observed in Figure 5-19. Differences between catches from nets 1-3 in comparison to net 4 when the array was deactivated was statistically significant ($p= 0.0003$) whereas differences in catches between nets 1-3 and net 4 showed no statistical significance with the light array active ($p = 0.74$). Further proving the success of the array, the evenness in nets 1-3 remaining similar under both light treatments suggested a possible divergence of eels from an

open channel into the capture nets at the gates, thereby reducing the potential turbine related eel mortality. Previous experience from the fishers on this site and their optimism after seeing the difference in catches in the field provided a qualifying factor to assist the quantification of the results inferred by the data. A fuller assessment of the array will be completed during the 2024 silver eel fishing season on Lough Erne beginning August.



Figure 5-18 Photograph of deflection light array in operation with nets 1-3 lit and net 4 (circled) in darkness.

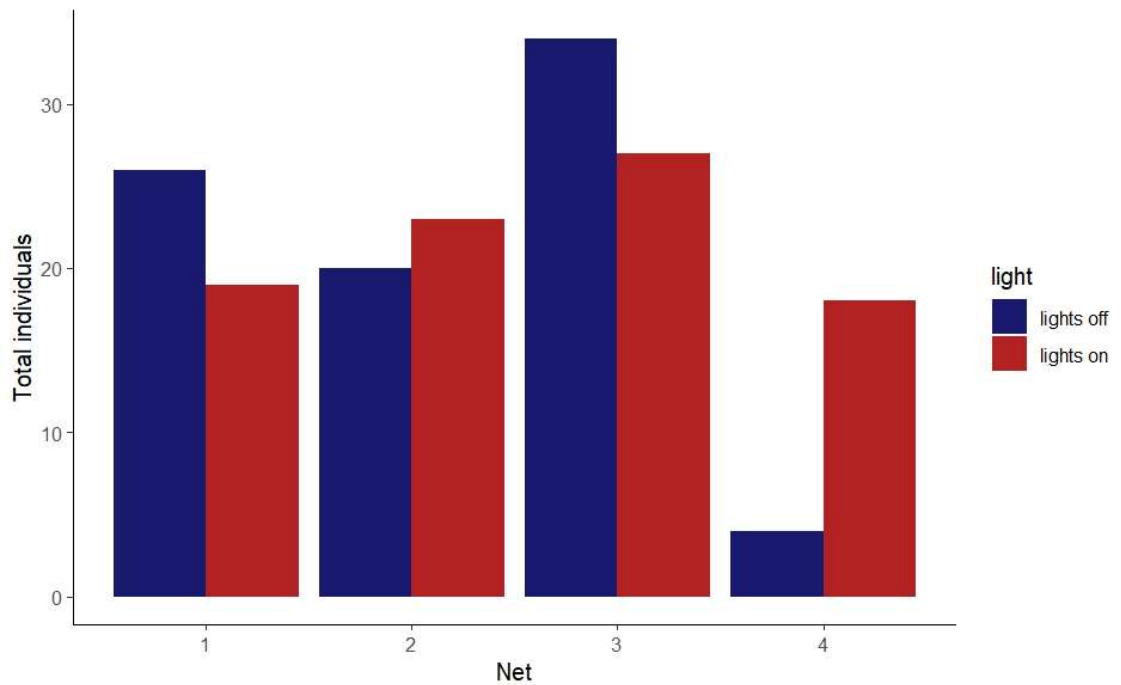


Figure 5-19 Comparison of total catch breakdown by net with the array ON and OFF

5.5 Fane

The Fane is a relatively small catchment within the Eastern River Basin District (ERBD) with the silver eel fishery located in the upper reaches of the system approximately 28 km from the coast. The catchment has a riverine wetted area of 84 ha (0.84 km²) and a lacustrine wetted area of 553 ha (5.53 km²). A research silver eel fishery was carried out on the Clarebane River on the outflow of Lough Muckno in the Fane catchment from 2011 to the present (Figure 5-20). The site was the location of a commercial fishery until 2008.

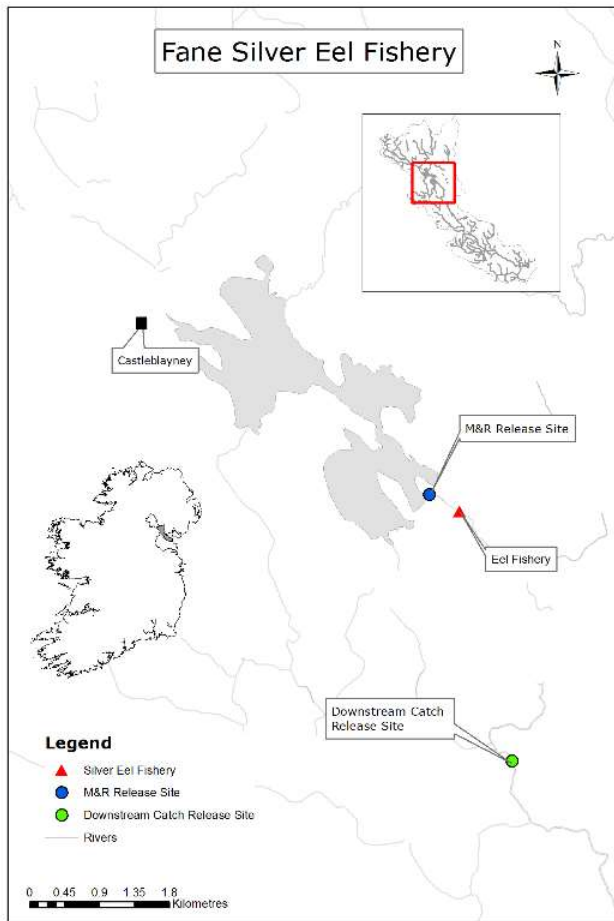


Figure 5-20 Map of silver eel fishing and release locations within the Fane catchment, 2023 (Insets: Map of Ireland with Fane catchment (shaded) and Neagh-Bann River Basin District (outlined) and detail of Fane catchment rivers with sampling location indicated (red box)).

5.5.1 Silver Eel Catch

In 2023, silver eel catches at the Fane Fishery were lower than the previous year's numbers with a total catch of 356 kg (1,001 eels including batch weighs), (Table 5-8). These catches were made over 40 nights fished, however nightly catches were generally low but persistent. Due to high water levels in September, fishing began on 22nd September and continued through to mid December, (Figure 5-21). Once water temperature readings declined below 10°C catches dwindled (Figure 5-22).

Table 5-8 Silver eel catch record for Fane Fishery, 2011 – 2023.

Year	No. Days Fished	Catch (kg)	No of Eels
2011	13	268	1,433
2012	21	448	1,195
2013	19	1,151	3,097
2014	25	797	2,542
2015	23	730	1,810
2016	9	76	206
2017	20	770	2,376
2018	34	725	1,974
2019	26	500	1,323
2020	27	465	996
2021	22	550	1,203
2022	37	912	1,953
2023	40	356	1,001

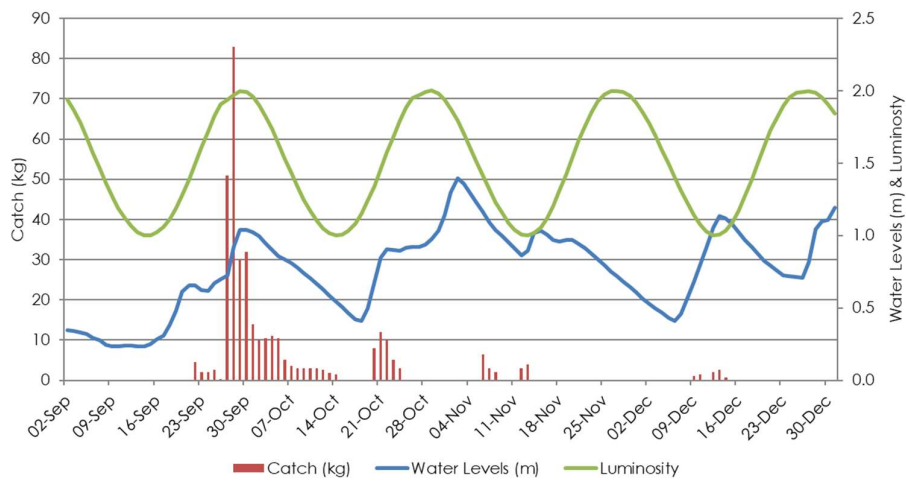


Figure 5-21 Catch (kg), water levels (m) and luminosity for the Fane Fishery, 2023.

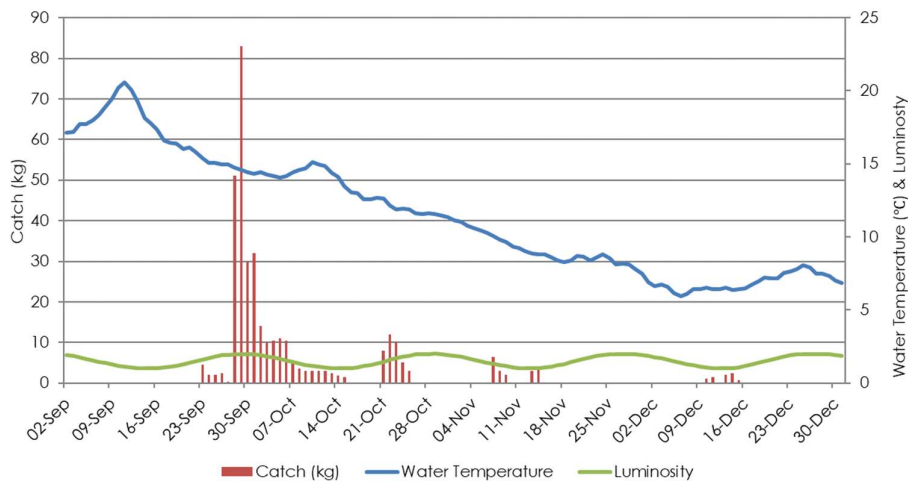


Figure 5-22 Catch (kg), water temperature (°C) and luminosity for the Fane Fishery, 2023.

5.5.2 Mark Recapture

There was no tagging of silver eels carried out during the 2023 season due to a lack of resources and manpower. There were however a total of 14 recaptures from previous years noted from batch weighing. These recaptures were from previous tagging surveys of yellow eels on Lough Muckno in 2012 (n = 1), 2016 (n = 10) and 2017 (n = 3). Table 5-9 below depicts numbers of tagged eels with number and percentages of recaptures from each each year (2014-2023).

Table 5-9 Mark-recapture results for Fane Silver Eel Fishery 2014-2023.

Year	No. Tagged	No. Recaptured	% Recapture
2014	272	80	29
2015	296	100	34
2016	0	0	0
2017	126	26	20.6
2018	365	46	12.6
2019	188	28	14.9
2020 *	0	n.a.	n.a.
2021	54	0	0
2022	150	12	8
2023 **	0	n.a.	n.a.

* No PIT tags were deployed in 2020 due to the COVID-19 Lockdown.

** No PIT tags were deployed in 2023 due to reduced staffing levels.

5.5.3 Eel Biology

The average length of eel was 48.3 cm (ranging from 27.5 cm to 91.7 cm), (Figure 5-23 and Figure 5-24, Table 5-10). The average weight was 0.267 kg (ranging from 0.040 kg to 1.870 kg), (Table 5-10). The length frequency of the silvers catch shows similar numbers of males to females however the proportion of the catch that was measured was comparatively lower than in previous years (Figure 5-23 and Figure 5-24). Therefore, it may not be a true reflection of length frequency. The usual trend is a high sharp peak depicting male silvers in the 30 cm length classes, followed by a broader, shallower peak depicting females from approximately 45 cm in length onwards to the maximum length recorded for the season. Out of the 350 eels measured, 169 had head widths recorded. 14.79% of these were broadhead eels (n = 25), (Figure 5-25).

Table 5-10 Length and weight data for processed silver eels from the Fane Fishery, 2011 – 2023.

Year	No. Eels	Mean Length (cm)	Min. Length (cm)	Max. Length (cm)	Mean Weight (kg)	Min. Weight (kg)	Max. Weight (kg)	Total Weight (kg)
2011	1433	43.8	30.4	91.7	0.187	0.044	1.709	268
2012	1541	47.1	31.4	96.0	0.251	0.050	2.090	387
2013	1165	49.2	30.8	96.6	0.289	0.030	1.952	337
2014	1334	50.4	30.4	95.0	0.292	0.045	1.721	389
2015	1622	54.0	31.2	96.6	0.370	0.030	2.045	599
2017	427	51.9	30.9	94.7	0.332	0.014	1.751	142
2018	634	54.1	27.5	95.5	0.367	0.042	2.200	232
2019	337	50.8	23.4	91.4	0.313	0.052	1.461	106.86
2020	87	50.2	22.0	86.5	0.29	0.057	1.200	25.25
2021	180	54.3	29.0	82.7	0.352	0.035	1.400	63.32
2022	551	56.2	29.6	94.2	0.411	0.016	2.033	226.64
2023	350	48.3	27.5	91.7	0.267	0.040	1.9870	93.54

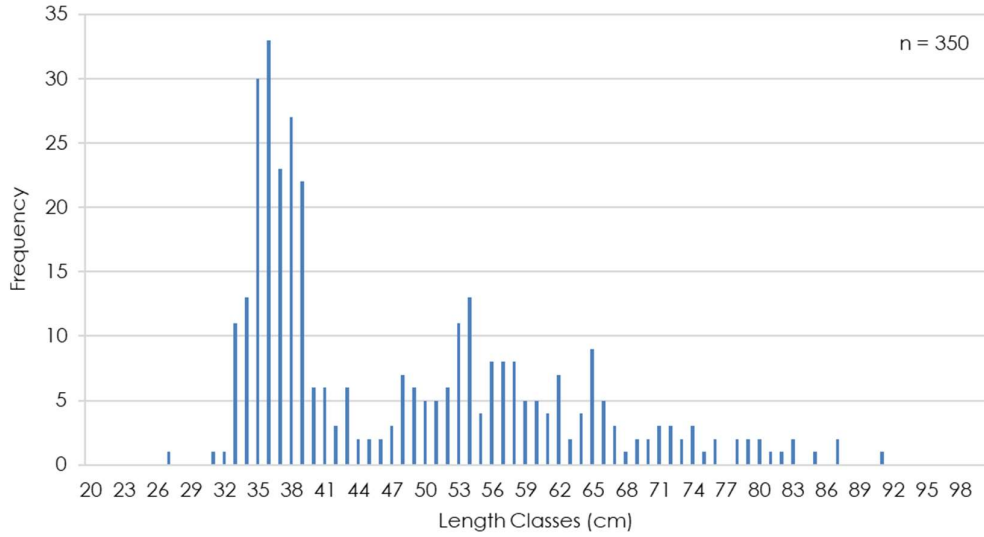


Figure 5-23 Length frequency for silver eels caught at the Fane Fishery, 2023.

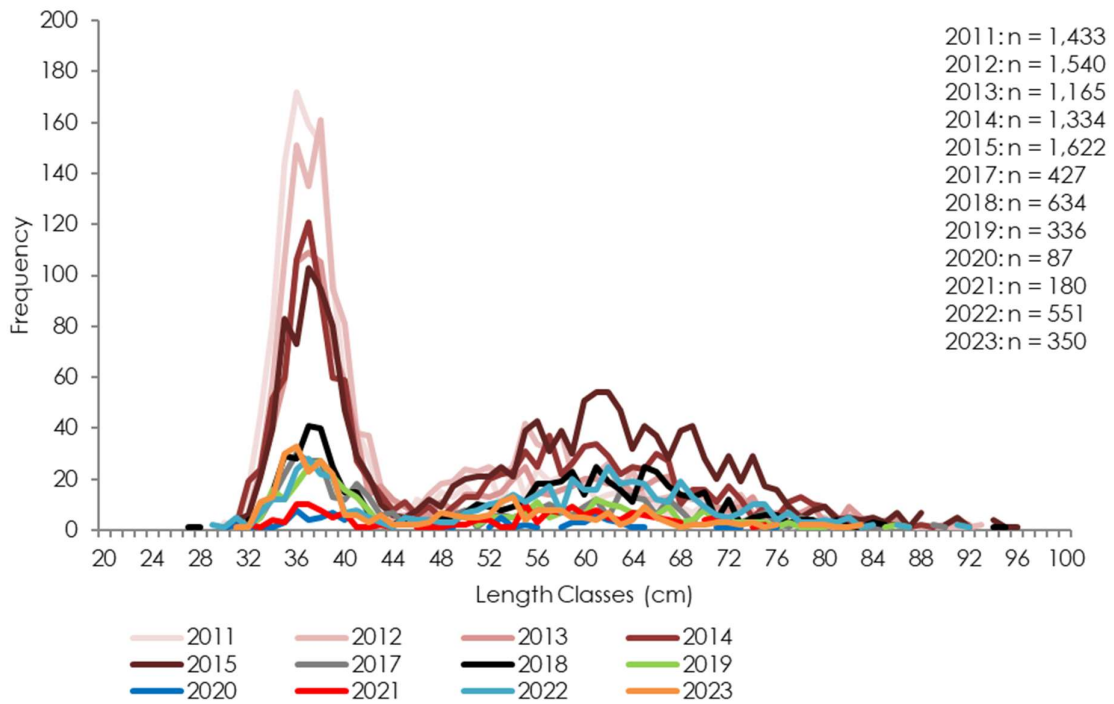


Figure 5-24 Length frequency for silver eels caught at the Fane Fishery, 2011 – 2023.

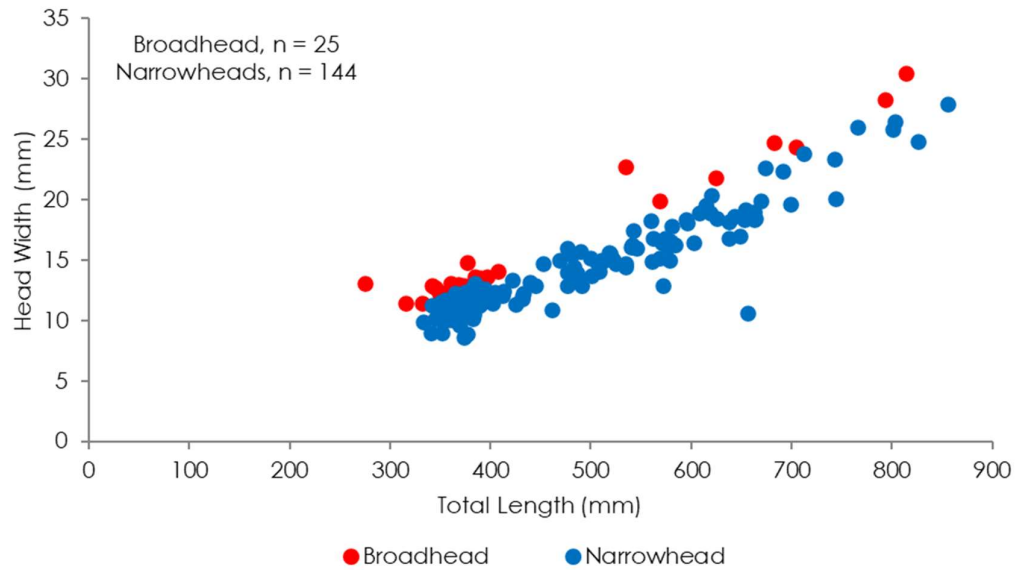


Figure 5-25 Broadhead and narrowhead records for the Fane Fishery, 2023.

5.6 Barrow

The Barrow catchment is a large riverine catchment located on the east coast of Ireland in the South Eastern River Basin District (SERBD). The catchment has a riverine wetted area of 72,780 ha (727.8 km²). The SERBD is 60% calcareous bedrock which makes it a very productive habitat for eels. There has historically been a commercial fishery on the River Barrow and the presence of historical catch will aid in the assessment of the current silver eel escapement levels from the river. There is also historical research data on the River Barrow from the Fisheries Research Centre which is available to Inland Fisheries Ireland. The assessment of the silver eel stocks from a river dominated catchment will help highlight any difference in production and escapement of eels compared with catchments with large lake/lacustrine wetted areas. The Barrow is the first riverine dominated silver eel index catchment assessed to date.

The fishing location is situated upstream of the town of Graiguenamanagh; approximately 5km upstream from the tidal limit (estuary) in the River Barrow (Figure 5-26). The location of the Ballyteiglea Lock fishing site means that over 99% of the River Barrow freshwater wetted area is above the fishing site. Four nets were fished from openings on the Ballyteiglea Lock gates of the canal section of the River Barrow during the silver eel season. Historically the commercial fishery in the River Barrow concentrated effort on the canal lock gates.

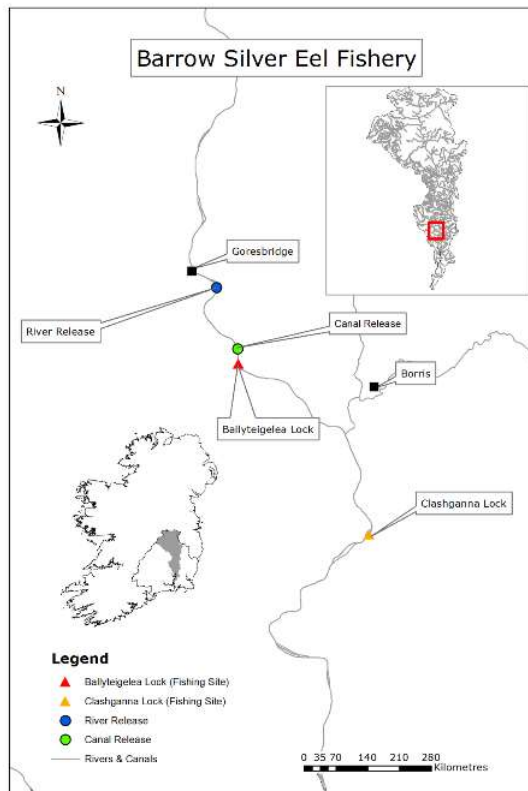


Figure 5-26 Map of silver eel fishing and release locations within the Barrow catchment, 2023 (Insets: Map of Ireland with Barrow catchment (shaded) and South Eastern River Basin District (SERBD) (outlined) and detail of Barrow catchment rivers with sampling location indicated (red box)).

5.6.1 Eel catch

In 2023, after 20 nights of fishing, a total of 53.1 kg of silver eels were captured at the Ballyteiglea Lock (Barrow Silver Eel Fishery). This equated to 203 eels, with the majority being caught in September during moderate flood events. Due to a lack of resources available in 2023, the catches were not measured rather all eels were batch weighed and counted before being released back to the Barrow River.

Despite later flooding events occurring through October, November and December, the catch numbers tapered off considerably until several nights of zero catch were recorded in October and then consistently throughout November and December, signaling the end of the migration runs (Figure 5-27 and Figure 5-28). Declines in water temperature, (particularly those in early December) would have further reduced catches at this time (Figure 5-28). The catch details at this location since its inception in 2014 to the current sampling in 2023 are highlighted in Table 5-11.

Table 5-11 Silver eel catch record for Barrow Fishery, 2014 – 2023.

Year	No. Days Fished	Catch (kg)	No of Eels
2014	22	174	1,223
2015	20	128	687
2016	25	193	880
2017	24	273	1,388
2018	28	391	2,808
2019	24	179	1,329
2020	29	248	1,163
2021	20	193	1,200
2022	21	199	1,055
2023	20	53.1	203

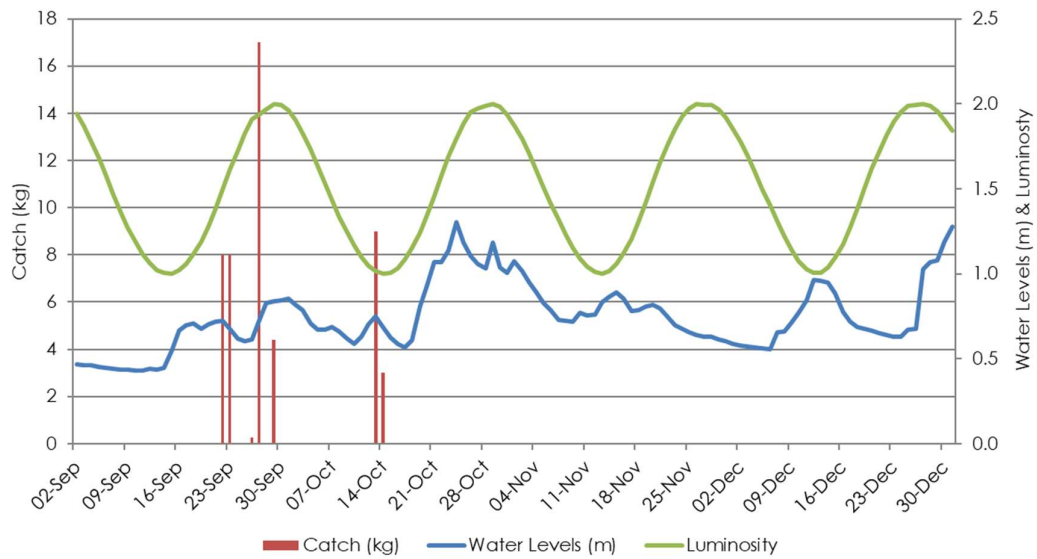


Figure 5-27 Catch (kg), water levels (m) and luminosity for the Barrow Fishery, 2023.

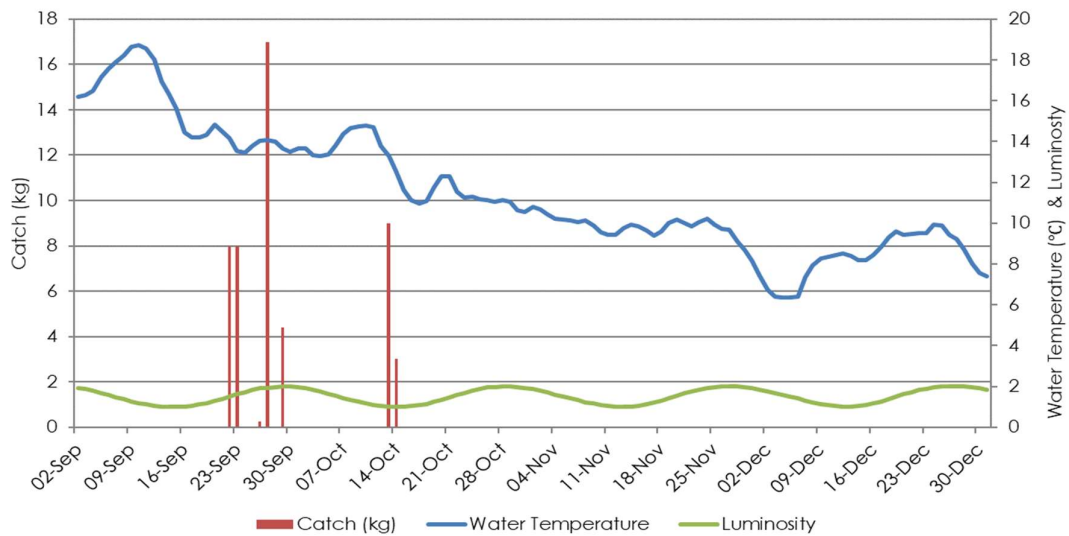


Figure 5-28 Catch (kg), water temperatures (°C) and luminosity for the Barrow Fishery, 2023.

5.6.2 Mark Recapture

There was no tagging of Barrow silver eels in 2023. No recaptures from previous years were noted. The Table 5-12 below depicts numbers of tagged eels with number and percentages of recaptures from each each year (2015-2023).

Table 5-12 Mark-recapture results for Barrow Silver Eel Fishery 2015-2023.

Year	No. Tagged	No. Recaptured	% Recapture
2015	279	41	14.7
2016	48	21	43.7
2017	51	8	15.7
2018	432	61	14.1
2019	202	52	25.7
2020 *	0	n.a.	n.a.
2021	99	1	1.01
2022	153	5	3.3
2023 **	0	n.a.	n.a.

* No PIT tags were deployed in 2020 due to the COVID-19 Lockdown.

** No PIT tags were deployed in 2023 due to reduced staffing levels.

5.6.3 Eel Biology

There were no morphometrics recorded from Barrow silver eels in the 2023 season due to a lack of resources. All catches were batch weighed, counted and released back to the Barrow River. The details of catches from previous years are listed in

Table 5-13 below.

Table 5-13 Length and weight data for processed silver eels from the Barrow Fishery, 2014 – 2022.

Year	No. of Eels	Mean Length (cm)	Min Length (cm)	Max Length (cm)	Mean Weight (kg)	Min Weight (kg)	Max Weight (kg)	Total Weight (kg)
2014	811	41.4	27.6	76.2	0.140	0.033	0.742	113.578
2015	730	41.8	31.5	77.4	0.149	0.050	0.873	108.730
2016	681	45.2	32.0	77.8	0.195	0.052	0.860	132.983
2017	351	45.5	26.2	81.8	0.203	0.025	1.078	71.337
2018	853	39.5	21.3	72.3	0.1212	0.0100	0.7390	103.379
2019	292	38.2	31.6	69.3	0.1084	0.0520	0.6830	31.538
2020	305	45.6	31.4	75.8	0.2070	0.051	0.849	63.233
2021	551	41.3	30.4	79.2	0.151	0.052	0.983	82.970
2022	288	44.9	24.1	79.4	0.192	0.002	1.201	55.481

6 Yellow Eel Stock Assessment

This section refers to Ch. 7.2.2 of the National EMP Report, 2008

Yellow-eel stock monitoring is integral to gaining an understanding of the current status of local stocks and for informing models of escapement, particularly within transitional waters where silver eel escapement is extremely difficult to measure directly. Such monitoring also provides a means of evaluating post-management changes and forecasting the effects of these changes on silver eel escapement. The monitoring strategy aims to determine, at a local scale, an estimate of relative stock density, the stock's length, age and sex profiles, and the proportion of each length class that migrate as silvers each year. Furthermore, individuals from this sample will be used to determine levels of contaminants and parasites to assess spawner quality. Two classes of survey methodologies will be employed eel specific surveys and multi-species surveys, mainly involving standardised fyke netting and electro-fishing. Table 6-1 gives the locations for eel specific lake and transitional waters to be surveyed in the 2021 - 2023 period.

Fyke net surveys carried out between 1960 and 2008 by State Fisheries Scientists will provide a useful benchmark against which to assess the changes in stock. The yellow eel monitoring strategy will rely largely on the use of standard fyke nets. Relative density will be established based on catch per unit (scientific survey) effort.

Water Framework Directive general fish surveys were undertaken on lakes (fyke nets, gill-nets and hydro acoustics), rivers (electro-fishing and fyke nets) and transitional waters (fyke nets, seine nets & beam trawls) in 2017 which adds significantly to the national eel specific programme. The WFD is being undertaken on a three-year rolling cycle by Inland Fisheries Ireland. The National programme of yellow eel monitoring in 2017, as laid out in the EMPs, was undertaken by Inland Fisheries Ireland with additional support from the Marine Institute (Table 6-1).

Under the Irish Eel Management Plan a number of key monitoring objectives were outlined. A monitoring programme for the years 2018 – 2020 will aim to meet these objectives:

- 2.1 Estimate silver eel escapement using indirect assessment from yellow eel stocks.
3. Monitor the impact of fishery closure on yellow eel stock structure.
4. Inter-calibration with water framework sampling.
5. Compare current and historic yellow eel stocks.
6. Establish baseline data to track changes in eel stock over time.
8. Determine parasite prevalence and eel quality.

6.1 Eel specific surveys 2023

Yellow eel surveys took place in 2 lakes, 2 transitional waters and 1 riverine catchment (Figure 6-1 and Table 6-1). The lakes surveyed were Lough Feeagh and Bunaveela Lough by MI. The transitional waters were Lough Furnace and Lower Lough Furnace in Burrishoole (by MI) and river electric-fishing was carried out in the Erriff river catchment in 2023 by IFI along with a detailed River Hydromorphology Assessment Technique (RHAT) survey of the Erriff catchment in conjunction with the electrofishing.

The yellow eel surveys need to meet a number of objectives, to monitor the impact of fishery closure on yellow eel stock structure, compare with historic eel surveys, establish baseline data set, evaluate impedance of upstream migration and determine parasite prevalence within Ireland. Samples of eels are measured for length, weight, and INDICANG style morphological features associated with silvering (eye measurements, pectoral fin measurements, and pigmentation). At selected locations eels are retained for further analysis in the laboratory. These analyses include age, growth, sex determination, parasite prevalence and diet.

Table 6-1 Monitoring Programme 2021 - 2023

RBD	Location	Water body	Life stage	2021	2022	2023
SHIRBD	ESB Shannon	Catchment	Silver	√	√	√
NWIRBD	ESB Erne	Catchment	Silver	√	√	√
WRBD	Burrishoole	Catchment	Silver	√	√	√
SERBD	Barrow	River	Silver	√	√	√
ERBD/NBRBD	Fane	River	Silver	√	√	√
NWIRBD	Erne	Lake	Silver		√	√
SHIRBD	Ardnacrusha	River	Elver	√	√	√
SHIRBD	Maigue	River	Elver	√	√	√
SHIRBD	Feale	River	Elver	√	√	√
SHIRBD	Inagh	River	Elver	√	√	√
NWIRBD	Erne	River	Elver	√	√	√
ERBD	Liffey	River	Elver	√	√	√
WRBD	Ballysadare	River	Elver			√
WRBD	Corrib	River	Elver	√	√	√
WRBD	Burrishoole	River	Elver	√	√	√
SHIRBD	Parteen	River	Yellow	√	√	√
NWIRBD	Erne	Lake	Yellow	√	√	
ERBD	Boyne	River	Yellow	√		
SWRBD	M Blackwater	River	Yellow		√	
SERBD	Barrow	River		√	√	
ERBD	Muckno	Lake	all	√	√	
SHIRBD	Owel	Lake	all	√	√	
WRBD	Shramore/Burrishoole	River	Yellow	√	√	√
WRBD	Lough Feeagh	Lake	Yellow	√	√	√
WRBD	Lough Furnace	T. water	Yellow	√	√	√
Ireland	WFD Rivers	Rivers	Yellow	√	√	√
Ireland	WFD Lakes	Lakes	Yellow	√	√	√
Ireland	WFD Transitional	T. water	Yellow	√	√	√



Figure 6-1 Locations of yellow eel surveys carried out in 2023.

6.1.1 Burrishoole

Poole *et al.* (2024): *Eel recruitment and stock have been in decline since at least the mid 1980s. So far, much research has focussed on conservation objectives and estimating silver eel production in response to the EU Regulation (EC 1100/2007) and most surveys have been on waters subject to exploitation and/or stocking. The aim of this study is to examine a 35-year yellow eel survey dataset to determine relative abundance trends while accounting for survey design, and important physical and operational covariates. Chains of ten, or sometimes five, fyke nets were fished at fixed sites in four lakes on a catchment in the west of Ireland not impacted on by exploitation or stocking. Captured eels (10,474) were counted for each trap, and eel weight was recorded for each chain of nets (5515 net nights fished). Data were analysed using a generalised additive model (GAM) that included smoothed trends over time and covariates day-of-year, depth, gradient, site and net chain. Yearly trends and between-chain variability were significant for all locations with trap depth and gradient being important for some lakes. Standardised trends by number and mass declined markedly in both tidal areas – 84.7% and – 89.5% by count and – 93.5% and – 89.5% by weight; significant declines (– 39.2% by count and – 54.1% by weight) were found in one of the freshwater lakes with the other, the one farthest upstream, having had changes over time but no significant difference between the start and end. This study provides a framework for analysing long-term fyke net catch data for eel, which may be useful for the international analysis of eel survey data.*

Poole, R., Minto, C., Cooney, J., Drumm, A., Hughes, P., Murphy, M., Nixon, P., Sweeney, D. & O'Leary, C. (2024). Standardising long-term eel (*Anguilla anguilla*) fyke net survey data reveals covariate effects and improves estimates of declining relative abundance. *Fisheries Research*, 272; <https://doi.org/10.1016/j.fishres.2024.106938>

All four locations in Burrishoole were fished in 2023, Bunaveela, Feeagh, Furnace (Transitional) and lower Furnace, (Transitional) (Figure 6-2).



Bunaveela Lough is located in the upper reaches of the catchment. It has a surface area of 42 ha and a maximum depth of 23 m. Bunaveela L. was fished in the traditional style (sets of 10 nets perpendicular to the shore) in 2023 (22nd June 2023), with chains of 10 nets fished at three sites. In total 5 eels were caught with a catch per unit of effort of 0. 0.17 eels/net/night (Table 6-2). The average length was 39.9 cm and ranged in length

from 35.6 cm to 45.6 cm (Figure 6-3), and a total weight of 0.62 kg caught. No eels were PIT tagged and no recaptures were recorded.

Lough Feeagh has a surface area of 395 ha and an average depth of 14.5 m (with several areas >35m in depth). L. Feeagh was fished in the traditional style (sets of 10 nets perpendicular to the shore) in 2023 (18-19th July 2023), with chains of 10 nets fished at six sites for one night each. In total, 56 eels were caught with a catch per unit effort (CPUE) of 0.93 eels/net/night (Table 6-2). The average length of eels was 46.0 cm and ranged in length from 31.9 cm to 82.8 cm (Figure 6-3), with a total weight of 11.7 kg caught over the two nights. No eels were PIT tagged and four previously tagged eels were recorded, one tagged in 2009 at Site A, one tagged in 2017 at Site C and two tagged in 2018 at Site C, all recaptures were made at the same site as where they were tagged.

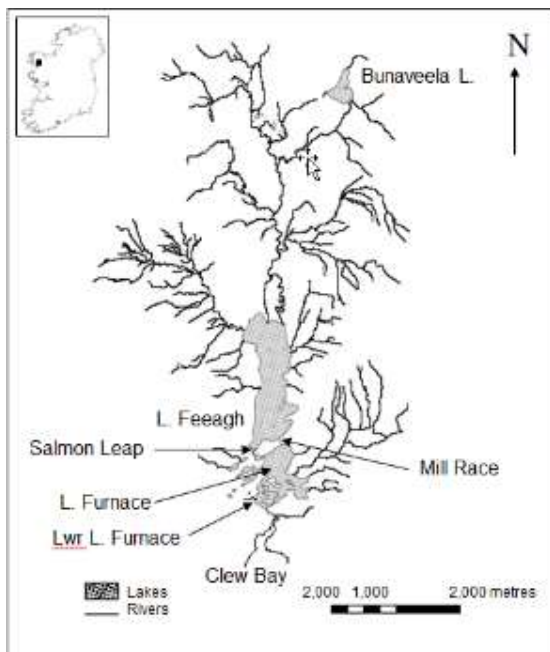


Figure 6-2 Map of Burrishoole showing the lakes surveyed.

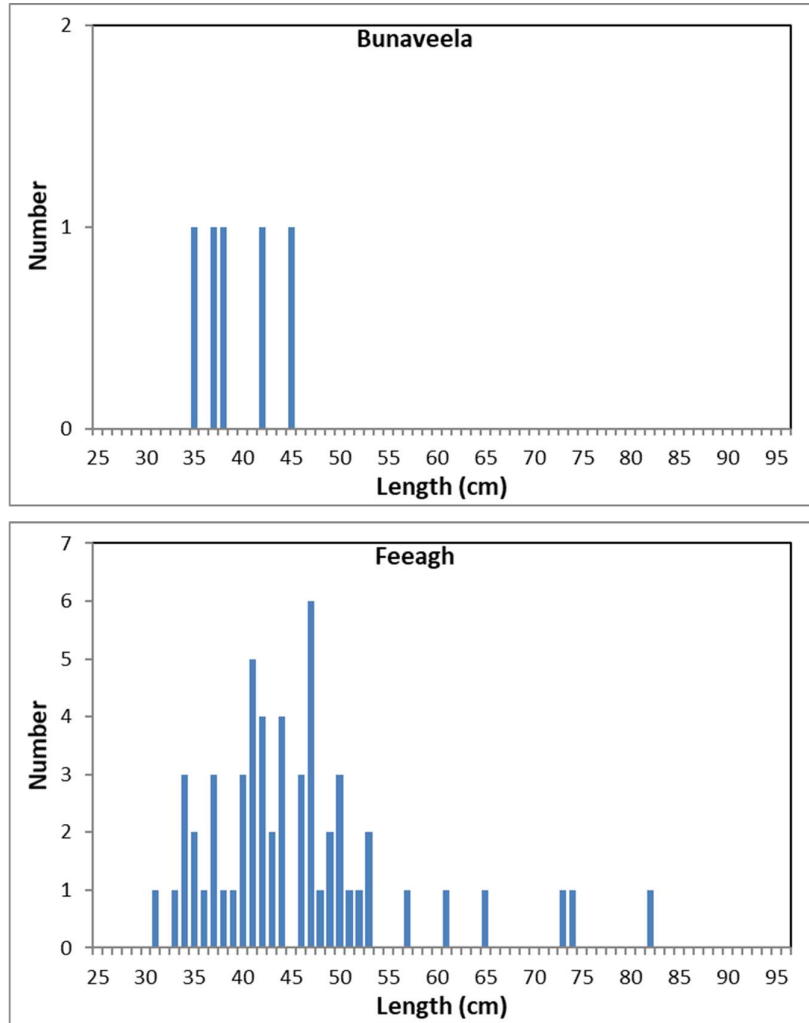


Figure 6-3 Length frequency of yellow eels captured at Bunaveela L. (n=5) (top), and L. Feeagh (n=56) (bottom), in 2023.

6.1.2 IFI lake surveys 2023

There were no yellow eel lake surveys carried out by EMP in 2023 due to limited staff resources. The team accompanied the WFD team on Lough Derg to ensure morphometric measurements were taken of the eels caught on the lake.

6.1.3 River Erriff electric-fishing survey, 2023

A catchment-wide electric-fishing program was devised, utilising bankside electric-fishing (without the use of stop nets). The bankside approach was used as it is believed to be a useful method of catching and estimating minimum eel densities along stretches of river and is a semi-quantitative approach. In each site, one bank is randomly selected and fished in a single timed pass and a second pass focuses on the opposite bank. On average, individual passes

were between 4 and 19 minutes duration. A total of 28 sites were fished in 2023 using this methodology.

The Erriff catchment was divided into upper, middle and lower zones and a comparable number of sites were fished in each zone. The survey electric-fishing was carried out using Hans- Grassl™ back-pack equipment. The packs were set to the recommended frequency for catching eels of 20 Hz (hertz). Voltage was site dependent and was set between 200-375 V (volts), (pulsed DC), in order to turn fish in differing conductivity conditions.

6.1.3.1 Results

During this survey, only 8 eels were successfully captured over the 28 sites. Of these 8 eels, 1 was captured using the bankside (semi-quantitative) method at one site (Figure 6-4), while 7 were caught using the 3-pass depletion (quantitative) method across three sites (Figure 6-5). The average length of the measured eels was 21.6 cm (min: 15.5 cm; max: 32.5 cm), while the average weight was 0.030 kg (min: 0.007 kg; max: 0.062 kg). There were a further 11 eels sighted during electric-fishing on the catchment (bankside: n=7 and depletion: n=4) that were not captured due to difficulty in catching eels among large rocky stream substrates. Captured and observed eels cover 4 of the 28 sites in this survey. The majority of the sites showed a complete paucity of eel during the survey. All captured eels were released after biometrics were taken and no eels were returned to the laboratory for analyses from this survey (Table 6-3).

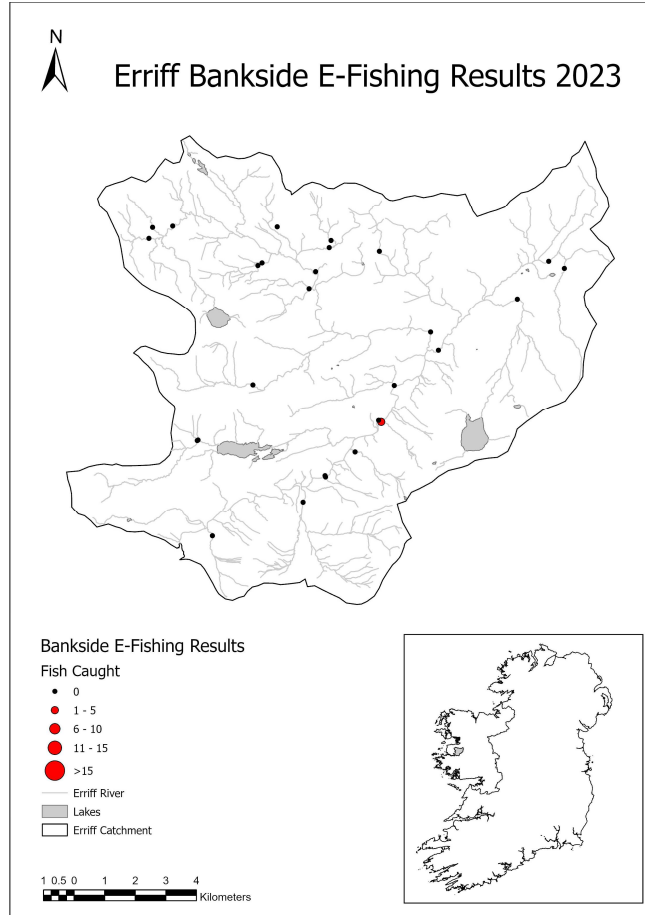


Figure 6-4 River Erriff bankside electric-fishing catch results, 2023. Insets: Map of Ireland with Western River Basin District (WRBD) (outlined) and Erriff catchment (shaded).

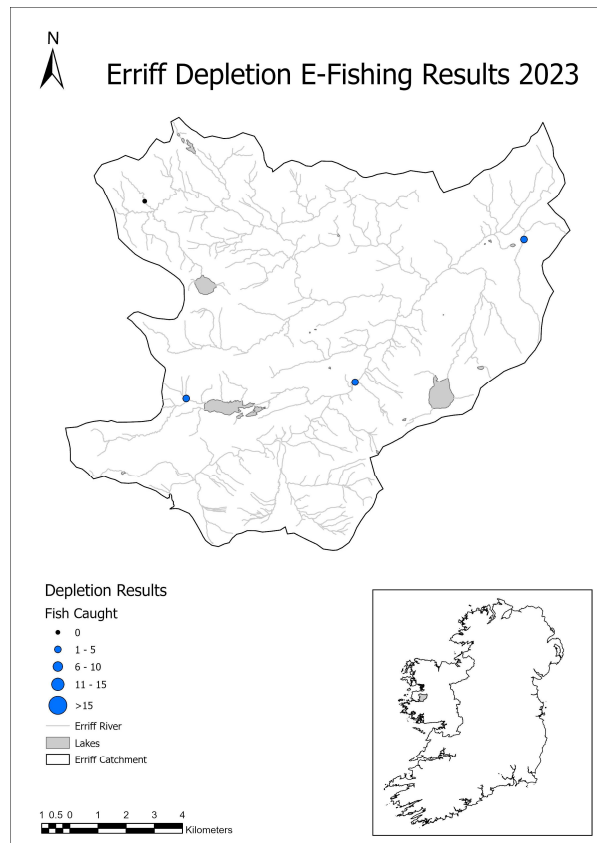


Figure 6-5 River Erriff depletion electric-fishing catch results, 2023. Insets: Map of Ireland with Western River Basin District (WRBD) (outlined) and Erriff catchment (shaded).

6.1.3.2 EMP Erriff catchment RHAT surveys, 2023

A total of 23 out of the 28 Erriff electric-fishing sites were RHAT surveyed using the spot check methodology by the EMP Team. The results of these surveys showed that the majority of the sites fell in to “High” and “Good” hydromorphological status (50% and 42% of the total sites respectively), (Figure 6-6 and Figure 6-7). Two sites (8.3%) were classified as “Moderate”. There were no “Poor” or “Bad” classifications noted in the results. These data suggest that the eel numbers of the Erriff catchment are not influenced by impaired hydromorphological habitat status, as the majority of sites fell into the “High” and “Good” categories of classification. Hence hydromorphological status does not necessarily explain the low catch numbers noted on the Erriff.

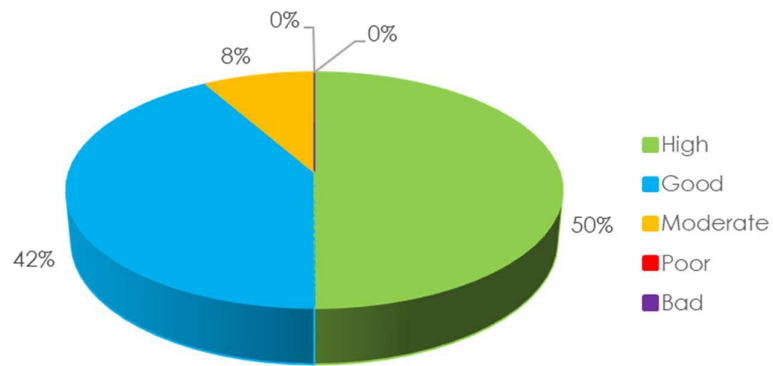


Figure 6-6 River Erriff RHAT survey results carried out by the EMP Team, 2023.

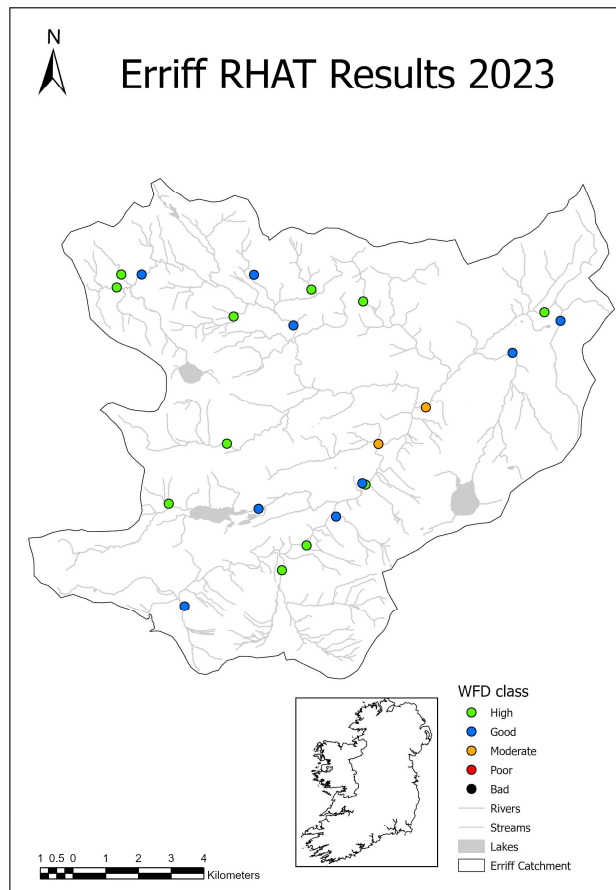


Figure 6-7 River Erriff RHAT survey results carried out by the EMP Team, 2023. Inset: Map of Ireland with Western River Basin District (WRBD) (outlined) and Erriff catchment (shaded).

6.1.4 Transitional Waters

6.1.4.1 Burrishoole Transitional Waters

Lough Furnace, the tidal lough, has a surface area of 125ha north of Nixon's Island and 16ha between Nixon's Island and the mouth of the estuarine river (Lower Lough Furnace). The main lough has a maximum depth of 21.5m. Furnace is heavily stratified with significant areas of deoxygenated water in the main basin. L. Furnace was fished in the traditional style (sets of 10 nets perpendicular to the shore) in 2023 (27-28th July & 12th July 2023), with chains of 10 nets fished at the 6 core sites in one night each. Three chains of nets were fished at the Back of the House (10 & 13th July 2023), which is a shallow tidal area between the lough and the estuarine river.

In L. Furnace, 80 eels were caught with a catch per unit effort (CPUE) of 1.00 eels/net/night (Table 6-4). The average length was 41.2cm ranging from 30.5cm to 71.8cm (Figure 6-9). A total weight of 11.18kg was caught. No eels were PIT tagged and no recaptures were recorded.

In Lower Lough Furnace (Back of the House), 58 eels were caught with a catch per unit effort (CPUE) of 1.93 eels/net/night (Table 6-4). The eels average length was 48.4cm ranging in length from 31.8cm to 83.5cm (Figure 6-9), with a total weight of 13.90kg caught. No eels were PIT tagged and six were recaptured, all tagged in 2019 in the Back of the House. No eels were sacrificed in this survey from Lower Lough Furnace. With all the tagging, there is no evidence so far of adult yellow eel >30cm moving between BOH and Furnace, or between Furnace and Feeagh, or vice versa.

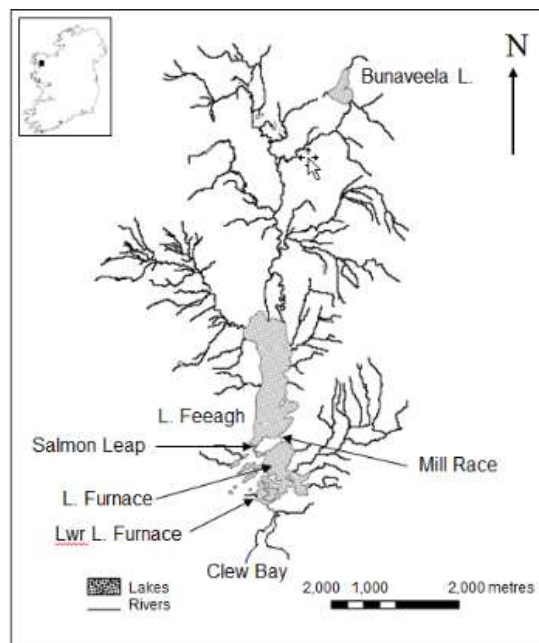


Figure 6-8 Location of Lough Furnace and Lwr Lough Furnace in the Burrishoole catchment.

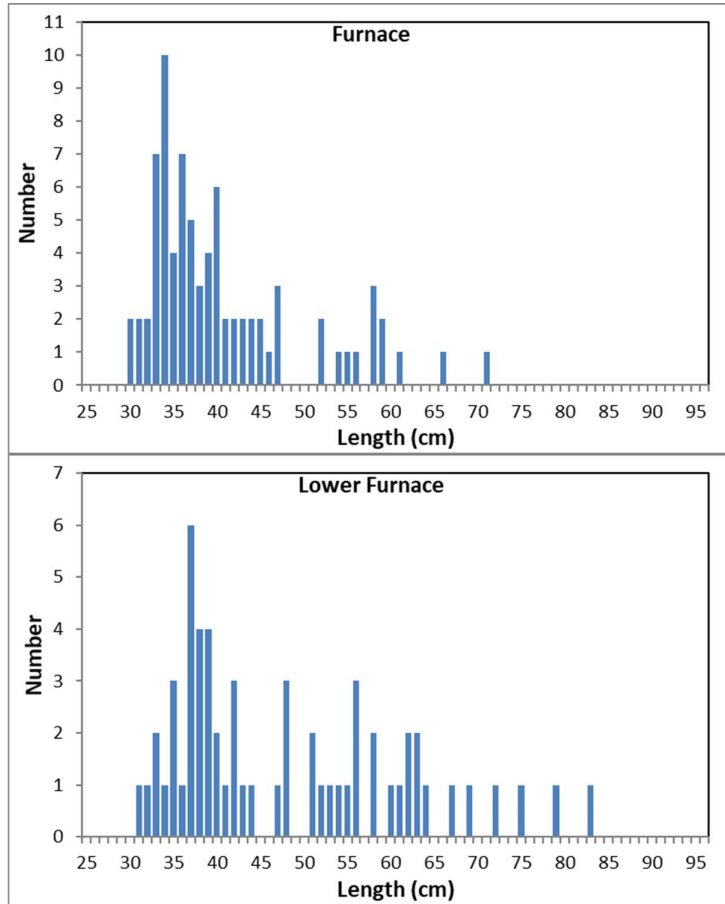


Figure 6-9: Length frequency of yellow eels captured at Lough Furnace (n = 79) (top) and lower Lough Furnace (n = 59) (bottom), in 2023.

Table 6-2 Catch detail from yellow eel lakes surveys 2023.

Lake	Dates	No. Eels	Net*Nights	CPUE	Total Weight (kg)	Mean Length (cm)	Min Length (cm)	Max Length (cm)
Bunaveela	Jun-23	5	30	0.17	0.62	39.9	35.6-	45.6
Feeagh	Jul-23	56	60	0.93	11.70	46.0	31.9	82.8

Table 6-3 Catch detail from River Erriff electric-fishing surveys 2023.

River	No. Eels	Average Length (cm)	Min Length (cm)	Max Length (cm)	Average Weight (kg)	Min Weight (kg)	Max Weight (kg)	Total Weight (kg)
R. Erriff	8	21.7	15.5	32.5	0.030	0.007	0.062	0.239

Table 6-4 Transitional Waters yellow eel survey data 2023

Lake	Dates	No. Eels	Net*Nights	CPUE	Total Weight (kg)	Mean Length (cm)	Min Length (cm)	Max Length (cm)
Furnace	Jun/Jul-23	80	80	1.00	11.18	41.2	30.5	71.8
Lwr Furnace BOH	Jul-23	58	30	1.93	13.90	48.4	31.8	83.5

6.2 Water Framework Directive

6.2.1 Introduction

In December 2000, the European Union introduced the Water Framework Directive (WFD) (2000/60/EC) as part of a standard approach for all countries to manage their water resources and to protect aquatic ecosystems. The fundamental objectives of the WFD are to protect and maintain the status of waters that are already of good or high quality, to prevent any further deterioration and to restore all waters that are impaired so that they achieve at least good status by 2027. A key step in the WFD process is for EU Member States to assess the health of their surface waters through national monitoring programmes. Monitoring of all biological elements including fish is the main tool used to classify the status (high, good, moderate, poor and bad) of each water body. The responsibility for monitoring fish has been assigned to Inland Fisheries Ireland. A national fish stock surveillance monitoring programme has been initiated at specified locations in a 3-year rolling cycle.

Locations for WFD sampling sites for 2022 surveys are shown for lakes, rivers and transitional waters (Figure 6-10).

6.2.2 2022 Results

6.2.2.1 Lakes:

In 2022, 24 lakes were sampled with eels present in all 19 (79% of lakes). A total of 138 eels were caught during lake surveys (fyke net catches). They ranged in length from 25 to 83 cm with an average length of 48.7 cm. A mean CPUE of 0.79 was found across all lakes where eels were caught. While the highest CPUE value for eels was found in Upper Lough MacNea (CPUE = 2.67, n = 24 eels) the lowest were noted in Lough Beltra (CPUE = 0.17, n = 2 eel captured) (Appendix 6 WFD, Tables A6 1 and A6 2).

6.2.2.2 Rivers:

A total of 169 sites were fished in 2022. Of these, eels were captured at 37 river sites leaving 132 sites showing a paucity of eel. The WFD river sites therefore had a 21.8% eel presence rate, with 11.2% of sites with having <10 individual captured eels. The highest catch at any site was 93 eels on the River Dodder (Footbr. Beaver Row_B) in Dublin. A total of 251 eels were caught across all 169 sites, ranging from 6.3 to 64.0 cm in total body length (Mean: 20.8 cm), (Appendix 6 WFD, Tables A6 3, A6 4 and A6 5). Densities (where eels were present) ranged from 0.0001 eels per m² (in the River Erne, (Kilconny Belturbet_A), n=3 eels, The River Funshion, (Br. u/s Blackwater R confl_A), n=1 eel and the Munster Blackwater, (Killavullen Br._A), n=3 eels) up to 0.0907 eels per m² in the River Dodder (Footbr. Beaver Row_B, n=93 eels).

6.2.2.3 Transitional Waters:

A total of 12 estuary sites (across 6 estuaries) were covered in the 2022 surveys. A total of 168 eels were captured ranging in length from 22 to 75 cm (mean: 28.2 cm). European eel were caught at all but one of these estuaries (Upper Suir Estuary had no eel catch). CPUE values for transitional water sites ranged from 0.08 (Tolka Estuary, n=1 eel) to 5.17 (New Ross, n=62 eels) (Appendix 6 WFD, Tables A6 6 and A6 7).

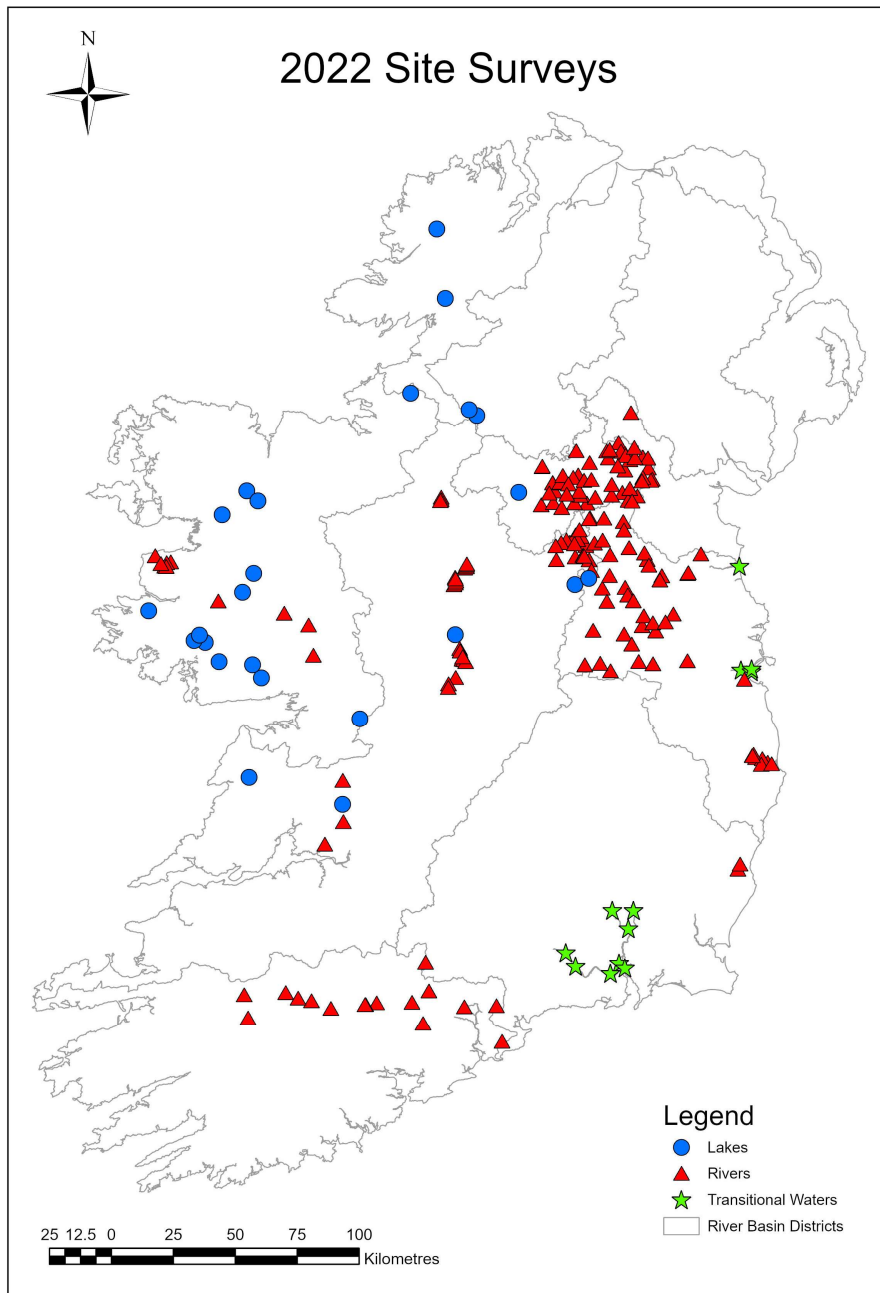


Figure 6-10 Location of WFD survey sites, 2022.

6.3 Summary

Bunaveela L. was fished in the traditional in 2023, with a total of 5 eels caught with a catch per unit of effort of 0.017 eels/net/night. Lough Feeagh caught 56 eels with a catch per unit effort (CPUE) of 0.93 eels/net/night with a total weight of 11.7 kg caught over the two nights.

The Erriff bankside semi-quantitative electric-fishing method enabled the whole catchment to be assessed for the presence and absence of eels. In 2023, only 1 eel was captured on the Erriff, using the bankside methodology, and 7 eels were captured via the depletion method. The 2023 results showed a general uneven distribution of eel around the Erriff catchment, with many areas of good quality habitat being underutilized. The Erriff catches and sightings of eel were on the inflow to Tawnyard Lough, the main channel of the Erriff and the Glenacally river (a large tributary to the main channel nearby Tawnyard Lough). Both the Fane and Kells Blackwater systems (lacustrine systems with Lough Muckno and Lough Ramor respectively), had uneven eel distributions and catches were noted at sites near the catchments lake. The majority of the RHAT surveys carried out by the EMP Team on the Erriff sites resulted in hydromorphological status of “High” and “Good”. The low eel catch numbers on the Erriff remain unexplained however, it would seem that impaired hydromorphological habitat status is not responsible for the paucity of eels seen during the survey.

7 Recruitment

(refers to Ch. 7.3 of the National EMP Report, 2008)

7.1 Introduction

Many studies have focused on sampling the active phase of elver migration into freshwater (Gollock *et al.*, 2011; Jessop 2000; Knights and White 1998; Moriarty 1986, Naismith and Knights 1988; O'Connor 2003; Piper *et al.*, 2012; Reynolds *et al.*, 1994). Elvers exhibit counter current behaviour once they start actively migrating upstream. This means that instead of moving with the current as they do in the estuary, they now avoid the river current which will carry them downstream. To avoid the current, the elvers tend to migrate along the banks of the river and seek out slack water. At this time the elvers are congregated in schools near the bank of the river where they can be trapped.

The sites monitored are shown in Figure 7-1.

The elver traps used on the Erne and the Shannon by the ESB are permanent brush ladders, based on the fixed ramp style traps designed by O'Leary and reported in an EIFAC technical paper on 'Eel Fishing gear and techniques in 1971, leading to holding boxes fitted with freshwater supplies. They are sited at the main hydro installations at Ardnacrusha and Parteen on the Shannon, Cathaleen's Fall on the Erne and Inniscarra Dam on the Lee. They are described in more detail in the Irish SSCE reports.

The elver traps used by IFI are also based on the fixed ramp style traps. They have been cited in various studies with modifications being made to the traps (Gollock *et al.*, 2011; Jessop 1995; Jessop 2000, Moriarty 1986, Naismith and Knights 1988). Elvers and young yellow eels will encounter the ramp and ascend due to the flow of water attracting them upstream. The elver migration season extends from April to August, with migration influenced by water temperature and river discharge. White and Knights 1997 reported not catching juvenile eels in any numbers until temperatures rose above 15-16°C in mid-June /early July, peaking at

>20°C. The pattern of distribution across a season has been described as waves of runs of short duration but repeated over the season (Jessop 2000). Where possible the traps are located downstream of a structure (e.g. weir or waterfalls) in order to get a flow of water to feed the traps. The structure also acts as a bottleneck restricting the ability of elvers utilising the whole river to ascend.

Elver traps currently run by the MI on the Burrishoole (IE_West) and the Liffey (IE_East) are O’Leary type bristle ramp traps with gravity fed water supplies.

The aim of the long-term monitoring programme is to set up a number of sites as an index of recruitment in order to get an understanding of changes to relative abundance of recruitment since the implementation of the Eel Regulation. It is not intended to make assumptions on the whole catch entering the river as the proportion of elvers avoiding the traps is not known and is difficult to quantify. The elver traps sample a proportion of the elver migration in a standardised way and when operating for a number of years a trend in recruitment is observed.

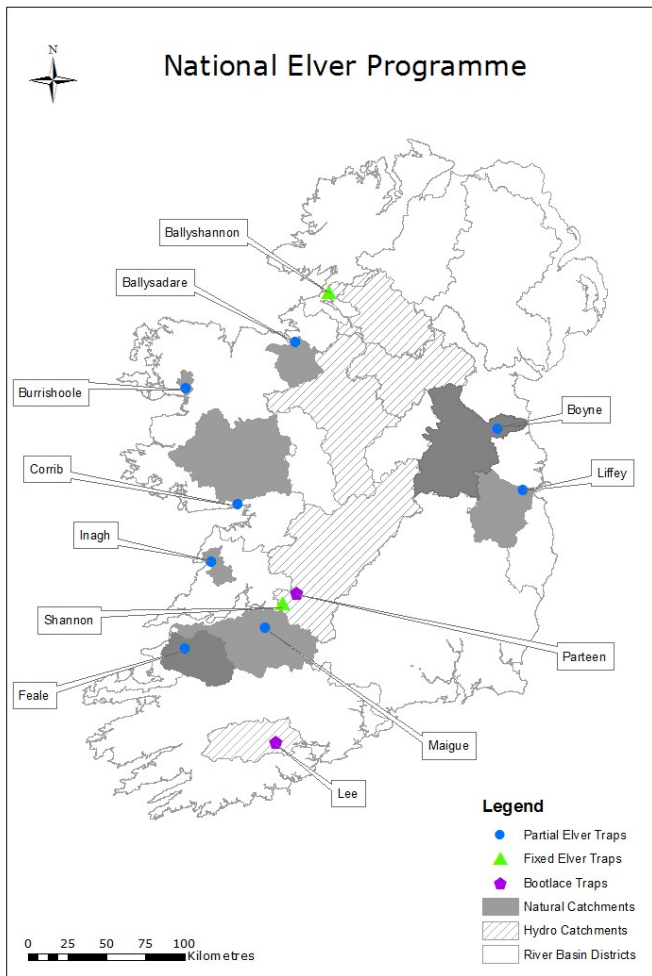


Figure 7-1 Location of recruitment monitoring stations in Ireland.

7.2 0+ Recruitment

There is no authorised commercial catch of juvenile eel in Ireland, but some fishing has been authorised in the past under Sec. 18 of the Fisheries Act for enhancement of the fisheries. Catches are made at impassable barriers, and this is reported in the relevant Regional Eel Management Plans.

ICES (2022) noted an increase in recruitment for the Europe Elsewhere series; the estimated figure was 9.7% (provisional) an increase from 5.5% (final) for 2021. The increase is based on increased recruitment in the Irish recruitment series that was not visible in the Bay of Biscay index sites.

7.2.1 Shannon & Erne

Long-term monitoring of elver migrating at Ardnacrusha (Shannon) is undertaken by the ESB and at Cathaleen's Fall (Erne) by the ESB in conjunction with DAERA and AFBI (Figure 7-2).

In the Erne recruitment has shown an increase each year since 2011 with the highest catch in 2018 since 1995.

For 2023 a value of 97 kg of elvers were caught in the index traps at Ardnacrusha (total catch all traps = 134kg); this was a considerable drop from that recorded in 2022.

The 2023 season was good for recruitment for the Erne with 479 kg collected in the index traps at the station (total catch all traps = 571kg).

7.2.2 Other Locations

Long-term monitoring of migrating elvers also takes place at on the Feale, Inagh, Maigue, Liffey and Burrishoole Rivers (Table 7-1).

The Ballysadare elver trap was returned to operation for the elver monitoring season of 2023 after a period of inoperation particularly during to the COVID-19 pandemic. The trap was once again operated by the Ballysadare Fishing Club and had catches totalling to 1.5 kg of elver (2,466 individual elver) and 0.658 kg of yellow eel (n=157). The trap on the Corrib is located within the elver pass of the Galway weir. The trap caught 118.1 kg of elvers in 2023 and operated from May until October. The Feale trap at Listowel ran from May to August. A total of 0.436 kg of elvers (n=670) and 0.06 kg of yellow eels (n=14) were caught for the entire season with the highest catch in May. The elver trap on the River Inagh in Ennistymon ran from April to September. The total catch of elvers for the season was 0.611 kg (n=1,057), 0.272 kg of yellow eels (n=27) were also caught during the survey period. The Maigue trap in Adare ran from May to September. The Maigue total catch of elvers for the season was 0.403 kg (n=298) and a further 0.269 kg of yellow eels (n=104). Elver catches in the Liffey are comprised of both glass eel and young yellow eel. Catches are influenced by water levels on the weir. 4.08kg were caught in 2023, compared to 5.66 kg in 2022.

In Burrishoole in 2007, a small O'Leary style elver trap was installed in the outflow of the large release pond in Furnace. This provides some indicative data of the relative annual abundance of young eel recruitment. By numbers, the catch is predominantly zero age class glass eel

(“elvers”) of various levels of pigmentation, but by weight the young yellow eels moving out of Lough Furnace make a more significant contribution. Age reading in 2023 indicated these were predominantly 1-year olds but ranged up to 9 years of age (Maguire, F. TCD). Figure 7-3 gives the annual weight of recruits trapped and compares with catches in a similar trap in the 1980s. These current levels are about 10 times lower than those of the 1980s in the same location. There was an increase in 2023 compared to 2021 and 2022, but still far below the historical levels. The increase in 2023 was mainly due to young yellow eel.

Measurements of elvers and bootlace in 2022, the first in almost 30 years, indicated an average length for elvers (zero age glass eel) of 7.4 cm, weight of 0.36 gm. The bootlace eel had an average length of 12.4 cm, weight of 2.91 gm. In 2023, the average size of elvers was 7.34 cm and a weight also of 0.37 g. The bootlace (young yellow eel) were, 10.6 cm in length and 1.89 g weight.

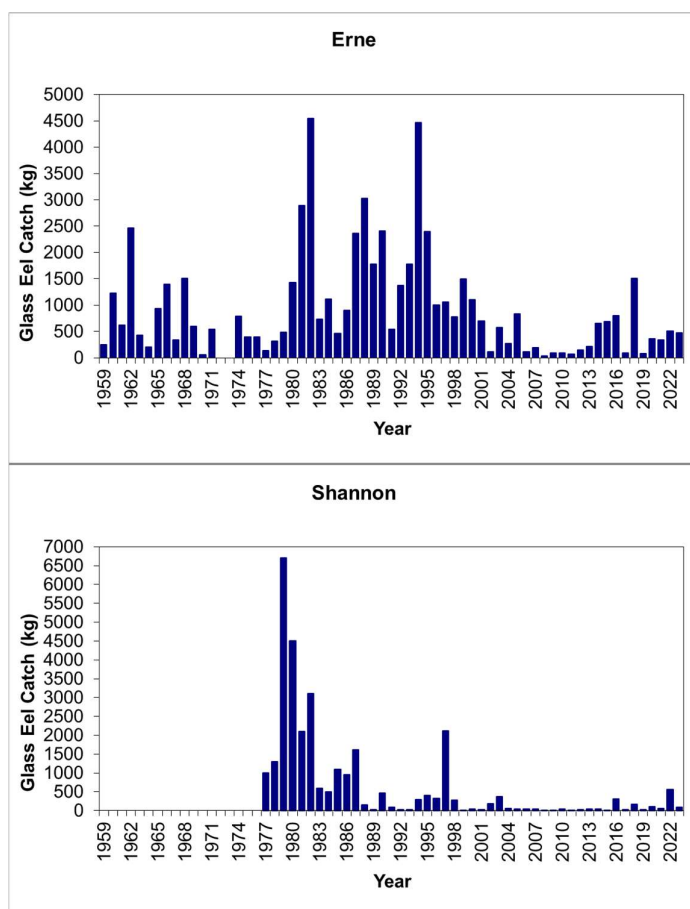


Figure 7-2 Annual elver catches (t) in the traps at Ardnacrusha (Shannon) and Cathaleen’s Fall (Erne) – data from ESB. Full trapping of elvers took place on the Erne from 1980 onwards indicated by the arrow. Erne 2015 onwards does not include the additional new trap.

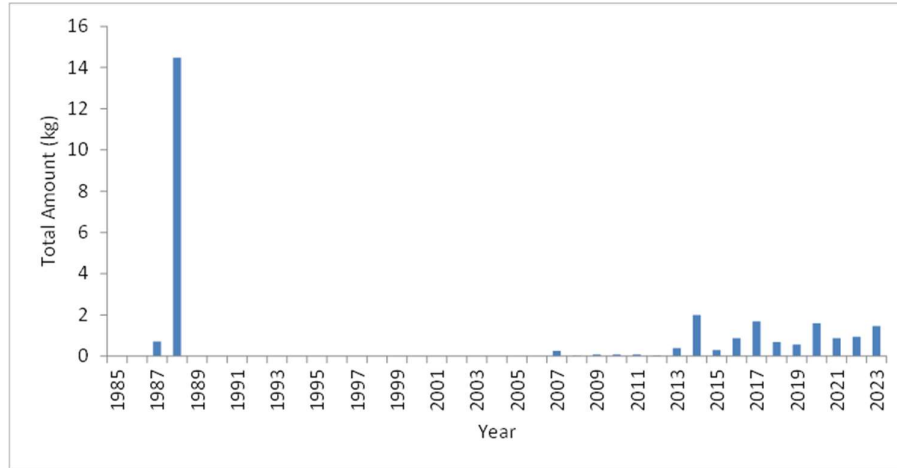


Figure 7-3 Total quantities (kg) of recruits in the Burrishoole index trap, including all ages.

Table 7-1: Glass eel catches (kg), 1985 to 2023 (blanks = not fished). Only index stations included for Erne and Shannon

Year	Erne Index traps	Shannon Ardnacrusha	R Feale	R Maigue	R Inagh	Sh. Estuary Glass Eels	R. Liffey Fish Pass	Burrishoole
1985	463	1093	503					
1986	898	948						
1987	2367	1610						0.7
1988	3033	145						14.5
1989	1781	27						
1990	2409	467						
1991	546	90						
1992	1371	32						
1993	1785	24						
1994	4463	287	70	14				
1995	2400	398	0	194				
1996	1000	332	0	34	140			
1997	1065	2120	407	467	188	616		
1998	782	275	81	8	11	484		
1999	1500	18	135	0	0	416		
2000	1100	39	174	0	120	43		
2001	699	27	58	2	18	1		
2002	113	178	116	5		37		
2003	576	378	36	72	111	147		
2004	269	58.126	0	0	24	1		
2005	838	41.36	0	1	0	41		
2006	118	42	1	0	4	3		

Year	Erne Index traps	Shannon Ardnacrusha	R Feale	R Maigue	R Inagh	Sh. Estuary Glass Eels	R. Liffey Fish Pass	Burrishoole
2007	189	45	0	0	39	12		0.259
2008	38.7	7	0	0	83	2		0.028
2009	88.3	7.75	42					0.089
2010	96.6	49.7	20	3	1	3		0.094
2011	74.34	7.239	7	5	15			0.084
2012	145.71	22.525	47		*		0.5	0.053
2013	214.7	46.615	68	14	44		1.1	0.393
2014	659.37	45.085	5	29**	40		0.3	2.000
2015	686.17	11.42	3	15	25		0.2	0.300
2016	805.06	317.2	30.5	29	51		0.4	0.870
2017	94.95	29.7	15	9	20		0.5	1.691
2018	1508.4	165.2	3.2	n/a	5.4		6.3	0.697
2019	83.99	34.6	7.6	n/a	2.12		1.5	0.569
2020	358	112	0.915	0.254	5.26		1.8	1.591
2021	336	62.25	0.409	1.15	0.564		2.7	0.876
2022	509.2	570	7.11	10.17	4.31		5.7	0.943
2023	479	97	0.436	0.403	0.611		4.1	1.473

7.3 Young Yellow Eel Recruitment

Monitoring of juvenile yellow eel migrating at Parteen Regulating Weir (Shannon) and Inniscarra on the R. Lee takes place using fixed brush traps.

The data for Parteen is presented in Figure 7-4. In 2009 and 2010, due to maintenance work by ESB at the Parteen regulating weir the discharge patterns were less favourable than in 2008. This may partly account for the poor catches recorded in 2009 & 2010. However, catches in the original Parteen hatchery trap continued to decline in 2011, 2012 and 2013. The catch in 2015 was 301.1 kg and in 2016 it was 890 kg.

A new trap was installed in 2012 on the Shannon at Parteen, on the opposite bank (Co. Clare). In Parteen in 2022 the main catch was 91.43 kg and the new trap catch was 5.27 kg.

In Parteen in 2023 the main catch was 820 kg and the new trap catch was 20.1 kg. Catches in 2023 were considerably higher than the previous two years.

In 2010, less than one kg was recorded in the Inniscarra trap on the River Lee and in 2011, 48 kg were recorded. The catch has declined since 2011 with only 0.6 kg recorded in 2014 and 0.94 kg in 2015. The catch remained low in 2016 (1.1 kg) and in 2017 it was 13.8 kg.

In 2018, the Inniscarra trap only trapped 0.8 kg, likely due to low water levels and closure of the fish pass.

In 2019, the Inniscarra trap only trapped 0.8 kg, likely due to low water levels and closure of the fish pass.

In 2020 the trap operated from the 16th March until the 27th September. Like previous years, the catches were largely recorded for the period early June to the end of August.

The trap operated from 15th March until 7th September 2021. The catches were released into the mid catchment of the River Bride which enters the River Lee below Iniscarra station. A total of 0.445 kg of elver were caught in 2021.

The trap operated from 15th March until 7th September 2022. The catches were released into the River Bride. A total of 1.04 kg of elver were caught in 2022.

The trap operated from 15th March until the 7th September 2023. The catches for the season were 1.190 kg.

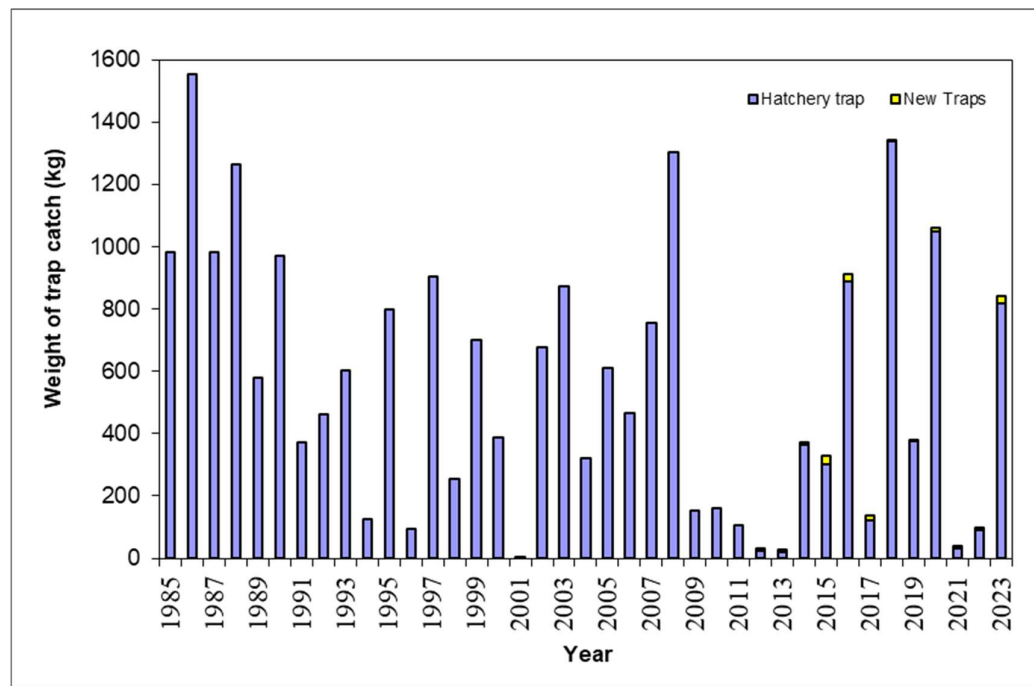


Figure 7-4 Juvenile yellow eel catches (kg) at Parteen Weir, 1985 to 2023. From 2012, a second trap was installed on the opposite bank (Clare) and in 2015 near the hatchery (Tipperary) and these data are included in the graph as separate bars.

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Appendix 1: Members of the Technical Expert Group on Eel 2021-2024

The TEGE is comprised of the following representatives:

Dr. Ciara O'Leary	Inland Fisheries Ireland
Dr. Colm Fitzgerald	Inland Fisheries Ireland
Dr. Russell Poole	Marine Institute
Dr. Denis Doherty	Electric Ireland
Dr. Robert Cruikshanks	Inland Fisheries Ireland
Dr. Derek Evans	Agri-Food & Bioscience Institute, N. Ireland
Dr. Sarah McLean	Loughs Agency

The following experts were invited to attend relevant meetings.

Jonathan McDowell	Queens University
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Appendix 2: Conservation of Eel Fishing Bye-law No. C.S. 335, 2024

**DEPARTMENT OF THE ENVIRONMENT, CLIMATE AND COMMUNICATIONS
INLAND FISHERIES ACTS 1959 TO 2017
CONSERVATION OF EEL FISHING BYE-LAW NO. C.S. 335, 2024**

I, Eamon Ryan, Minister for the Environment, Climate and Communications, in exercise of the powers conferred on me by section 57 of the Inland Fisheries Act 2010 (No. 10 of 2010) (as adapted by the Communications, Climate Action and Environment (Alteration of Name of Department and Title of Minister) Order 2020 (S.I. No. 373 of 2020)), at the request of Inland Fisheries Ireland, and for the purpose of giving full effect to the State's Eel Management Plan under Council Regulation (EC) No. 1100/2007 of the 18 September 2007¹, hereby make the following byelaw:

1. (1) This Bye-law may be cited as the Conservation of Eel Fishing Bye-law No. C.S. 335, 2024.

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

2. (1) Notwithstanding anything contained in any bye-law fixing the annual close season, it is prohibited for a person –

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

(b) to be in possession of or sell or offer for sale or reward, or to purchase eel caught or taken by any means,

in any fishery district.

(2) In this Article "eel" means eel of the species *Anguilla anguilla*.

3. The Conservation of Eel Fishing Bye-Law No. C.S. 319, 2015 is revoked.

GIVEN under my hand,

28 March 2024.

EAMON RYAN

Minister for the Environment,
Climate and Communications.

EXPLANATORY NOTE

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

This Bye-law prohibits the taking, or attempting to take, fishing for or attempting to fish for, aiding or assisting the taking of or fishing for, eel in any fishery district in the State. It also prohibits being in possession of, selling or offering for sale or reward, or purchasing eel caught or taken by any means in any fishery district in the State. This bye-law applies to eel and all of its life stages.

FOOTNOTE

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

Appendix 3: Reports on Fisheries closures, illegal fishing and other management actions from the IFI RBD's.

Eel Management Information 2023

River District Basin: **EASTERN / NEAGH BANN River Basin District**

Date: **1 Jan- 31 Dec 2023**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 319, 2015:

The above Bye law expired on 30 June 2018 and has not been renewed

The eel fishery in the EASTERN / NEAGH BANN RBD remained closed throughout 2023.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the EASTERN / NEAGH BANN RBD during 2023.

Estimated level of illegal fishing: The estimated level of illegal activity was very low for 2023 in the IFI Dublin area. Illegal activity specifically targeting eels was not recorded. Patrols concentrated on lakes / rivers throughout the Region. Seized gear (6 set lines and 6 traps) were capable of catching eels but no eels were found. Set lines were targeting a variety of fish species and traps were thought to be targeting crayfish.

Insert No. of alleged or confirmed reports

Main catchments where illegal activity occurred: NIL

Number of gear seizures: 12

Gear types seized: 6 set lines, 6 traps

Insert quantity/length of gear seized

Number of Eel Dealer Interceptions: NIL

Estimated tonnage on board: NIL

Declared origin(s) of cargos: NIL

Describe Action taken: NIL

General impression of levels of illegal activity since the cessation of the commercial fishery: Low levels of illegal activity recorded, any eels recorded were a by-product when coarse fish were found / seized in nets (however very few eels found in any nets in 2023)

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD? NIL

(If 'Yes', please insert quantity transported).

What was the total catch transported (kg)?: NIL

Was there any evidence of illegal trading of eel in conjunction with the T&T programme: NIL

General impression of the programme: NIL

Management Action 3. Ensure Upstream Migration at Barriers

(List/ tabulate any sites etc where barriers were removed or elver access improved etc)

IFI staff noted that elvers were trying to cross Cappogue weir, River Dee, on the north bank side up a vertical concrete slab in late April 2023. In order to lessen the impact of crossing the weir, a ramp was constructed partly at IFI's Creevy depot with completion on site during installation at Cappogue Weir.



Photographs 1-3. Elvers trying to negotiate the vertical face at Cappogue Weir (L), construction (C) & installed elver ramp (R).

All applications for infrastructural and other developments etc. which could impact on upstream fish/eel migrations are reviewed and submissions are made in an effort to ensure that the free passage of fish is maintained / improved. Natural debris barriers to upstream migration arising from floods etc were removed at a number of locations during 2023.

Management Action 4. Improve Water Quality

(List any sites or actions which have significantly improved WQ to the benefit of eels)

IFI's environmental function focuses on water quality / habitat improvement and can broadly be broken into 3 main themes – a. regulatory & enforcement (planning / licensing / compliance / responsive enforcement action); b. collaboration / liaison / industry expert; c. stewardship and advocacy. IFI field staff respond to and investigate what can be termed 'water pollution' complaints received by IFI on a 24/7/365 basis. Investigations are often carried out in co-operation and close liaison with staff in Local Authorities, the E.P.A., Waterways Ireland or other bodies / agencies. Investigations can extend to pollution incidents on cross-border rivers, where close cooperation with staff from relevant agencies in Northern Ireland is required. Typical regulatory non-emergency complaints include poor quality discharges to watercourses, illegal dumping, and issues relating to developments beside or close to rivers. IFI's goal is to protect and conserve all fish populations and their habitats.

Local Authorities and other agencies are obliged under legislation to notify and engage Inland Fisheries Ireland on certain planning matters where an impact on the fisheries resource is possible. These agencies also require stakeholders (under their statutory powers) to consult with Inland Fisheries Ireland, and subsequently submit proof of compliance with Inland Fisheries Ireland's requirements as a component of the national formal planning system. Beyond local pre-planning and planning a constant demand exists for input to Local Authority Development Plans, Screening and Scoping on Strategic Environmental Assessments (SEA) relating to major plans and national policies, Regional Planning Guidelines, Local Area Plans etc. SAC, SPA and NHA catchment plans and projects are subject to Appropriate Assessment (AA) where Inland Fisheries Ireland are also prescribed and notifiable.

Infrastructural elements impacting on surface waters (e.g. schemes such as wastewater/water treatment plants, water abstractions for potable supply, flood relief schemes, roads projects, housing, commercial waterside development) are evaluated and assessed from a fisheries legislative perspective. From design through to construction, Inland Fisheries Ireland environmental staff are involved in close liaison with the relevant parties (often public agencies and bodies), their design teams and the various contractors 'on the ground' to ensure habitat protection, control of pollution and conservation of the fisheries resource.

Eel Management Information 2023

River District Basin: **Northwestern River Basin District**

Date: **1 Jan- 31 Dec 2023**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 319, 2015:

The above Bye law expired on 30 June 2018 and has not been renewed

The eel fishery in the North Western RBD remained closed throughout 2023.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the North Western RBD during 2023.

Estimated level of illegal fishing:

Illegal activity was very low in the district. Protection staff conducted patrols of all historical eel catchment sites from late summer with no illegal or suspicious eel fishing activity noted.

Insert No. of alleged or confirmed reports

Main catchments where illegal activity occurred: n/a

Number of gear seizures: Nil

Gear types seized: n/a

Insert quantity/length of gear seized

Number of Eel Dealer Interceptions:

Estimated tonnage on board: n/a

Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?

Trap and Transport conservation fishing commenced in September on the Upper Erne and finished up on the 20th December 2023

What was the total catch transported (kg)?: 9,310 kg

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No

General impression of the programme:

The ESB trap & truck programme ran well again during 2023 with good working relations between contracted Eel fishermen, ESB staff and IFI protection officers. Initial silver eel catches were low in September and October due to weather conditions and water temperatures.



Management Action 3. Ensure Upstream Migration at Barriers

A significant barrier to fish and eel migration was addressed at the Mill bridge, Wateraughy in Co. Cavan through the lowering of the bridge apron during bridge renovation works conducted by contractors (Triur) on behalf of the local authority (Cavan Co. Council). This bridge is on the main Erne River and represented a significant barrier to fish migration previously.



Before and After images of the Mill bridge, Wateraughy, Co. Cavan showing lowering of bridge apron to aid fish migration.

Management Action 4. Improve Water Quality

(List any sites or actions which have significantly improved WQ to the benefit of eels)

Please include any relevant photographs of elver and/or silver eel trap & truck activities or seized gear.

Eel Management Information 2023

River District Basin: [_ShRBD_River Basin District](#)

Date: [1 Jan- 31 Dec 2023](#)

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 319, 2015:

The above Bye law expired on 30 June 2018 and has not been renewed

[The eel fishery in the ShRBD remained closed throughout 2023.](#)

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

[No eel fishing licences were issued by the ShRBD during 2023.](#)

Estimated level of illegal fishing:

Insert No. of alleged or confirmed reports

Main catchments where illegal activity occurred: Very little activity encountered this year. Some seizures of fykes in Lough Ree and Inny catchment. Lower than previous years for Lough Ree. No seizures on Lough Derg. Fyke nets were seized on the Ratty river which were left abandoned and hidden in bushes, they were not used recently.

Number of gear seizures:

Gear types seized:

[17 fyke nets:](#)

[3 from Lough Ree](#)

[7 from Gaine \(Lough derravaragh\)](#)

[7 from Ratty River](#)

10 standard fyke nets approx. 12m length each.

Number of Eel Dealer Interceptions: nil

Estimated tonnage on board:

Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

[Some potential illegal eel activity on the Inny catchment and Lough Ree. Seizures on Ree reduced in 2023 than in the previous few years \(not including Covid years\).](#)

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?

(If 'Yes', please insert quantity transported).

Athlone, River Shannon – 19,437kgs

Killaloe, River Shannon – 4,150kgs (to early January 2024)

What was the total catch transported (kg)?: 23,882g (to mid February 2024)

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

nil

General impression of the programme:

Working fine.

Management Action 3. Ensure Upstream Migration at Barriers

(List/ tabulate any sites etc where barriers were removed or elver access improved etc)

Any key photos ?

Management Action 4. Improve Water Quality

(List any sites or actions which have significantly improved WQ to the benefit of eels)

Please include any relevant photographs of elver and/or silver eel trap & truck activities or seized gear.

Eel Management Information 2023

River District Basin: **South Eastern River Basin District**

Date: **1 Jan- 31 Dec 2023**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 319, 2015:

The above Bye law expired on 30 June 2018 and has not been renewed

The eel fishery in the South Eastern RBD remained closed throughout 2023.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the South Eastern RBD during 2023.

Estimated level of illegal fishing: **Nil – none detected.**

Two illegal weir nets were seized, although these were most likely designed to take salmon, they may have the potential to catch eels as they act like a fyke net. The nets/traps were seized from the River Delour in Co Laois, an important trib of the River Nore. These traps are designed to fit into a fish pass to capture fish moving through the pass.



Insert No. of alleged or confirmed reports

Main catchments where illegal activity occurred:

Nil

Number of gear seizures: **1** Gear types seized: **Weir nets (as above)**

Insert quantity/length of gear seized

Number of Eel Dealer Interceptions: **Nil**

Estimated tonnage on board: **N/A** Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

There was no illegal activity detected during the year and no intelligence gathered to give rise to suspicions that any was occurring.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD? **No**

(If 'Yes', please insert quantity transported).

What was the total catch transported (kg)?: **N/A**

Was there any evidence of illegal trading of eel in conjunction with the T&T programme: **No**

General impression of the programme:

Management Action 3. Ensure Upstream Migration at Barriers

(List/ tabulate any sites etc where barriers were removed or elver access improved etc)

Any key photos ?

A number of small bridge repair works were planned and completed.

SERBD staff worked closely with Local Authorities to remove small barriers whilst the LA were carrying out bridge repair works. This will improve access for eels and other species. The bridge used to be blocked constantly with debris and formed a barrier. The old pipes/culverts sat above the water level creating a jump for fish.



Figure XX Bridge before and after repair works

Management Action 4. Improve Water Quality

(List any sites or actions which have significantly improved WQ to the benefit of eels)

A number of follow-up visits were made for previously identified habitat infringements on the King's, Glory, Tullaroan, Arrigle and Munster catchments in the SERBD. Below is a photo of a new silage base constructed by one landowner in the Tullaroan Catchment in response to IFI's investigations. In the Glory Catchment the landowner has invested in road-sweeping machinery to keep his yard clean. The polluting stream entering the Arrigle River is now clear of sewage fungus. A temporary diversion berm is still in place on the landowner's property.

All these measures prevent nutrients and sediment from entering the watercourses and significantly improve WQ to the benefit of eel and other species.



Figure XX Silage Slab with new base in the Tullaroan Catchment



Figure XX Concrete berm to prevent run-off from yard (Arrigle Catchment)



Figure XX Pollution of the Arrigle River

Please include any relevant photographs of elver and/or silver eel trap & truck activities or seized gear.

Eel Management Information 2023

River District Basin: South-West River Basin District

Date: 1 Jan- 31 Dec 2023

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 319, 2015:

The above Bye law expired on 30 June 2018 and has not been renewed

The eel fishery in the SWRBD remained closed throughout 2023.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the SWRBD during 2023.

Estimated level of illegal fishing: Nil

No reports or suspicions of illegal eel fishing during the year.

Main catchments where illegal activity occurred:

Number of gear seizures: Nil

Gear types seized:

Number of Eel Dealer Interceptions: Nil

Estimated tonnage on board:

Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD? Yes

1,173 Kg

What was the total catch transported (kg)? 1,173 Kg trapped over 10 dates (26th August – 4th September 2023). No mortalities reported.

Was there any evidence of illegal trading of eel in conjunction with the T&T programme: No

General impression of the programme: No issues arose.

Eel mortalities as a result of pollution incident-

An estimated 100 silver eels were killed as a result of a chemical discharge to the Browns Mills Stream, Co. Cork in July 2023. While a thorough investigation was completed and the likely causative agent identified as an agricultural pesticide, insufficient evidence to bring forward a prosecution was obtained.

Management Action 3. Ensure Upstream Migration at Barriers

Management Action 4. Improve Water Quality

Please include any relevant photographs of elver and/or silver eel trap & truck activities or seized gear.

Eel Management Information 2023

River District Basin: Western(Galway) River Basin District

Date: 1 Jan- 31 Dec 2023

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 319, 2015:

The above Bye law expired on 30 June 2018 and has not been renewed

The eel fishery in the WRBD (G) remained closed throughout 2023.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the WRBD(G) during 2023.

Estimated level of illegal fishing:

Insert No. of alleged or confirmed reports

Main catchments where illegal activity occurred:

Number of gear seizures: 0

Gear types seized: 0

Insert quantity/length of gear seized

Number of Eel Dealer Interceptions: 0

Estimated tonnage on board: N/A

Declared origin(s) of cargos: N/A

Describe Action taken: N/A

General impression of levels of illegal activity since the cessation of the commercial fishery:

There was no evidence of any instances of illegal eel fishing in the Galway District of the WRBD during 2023.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?

N/A

(If 'Yes', please insert quantity transported).

What was the total catch transported (kg)? N/A

Was there any evidence of illegal trading of eel in conjunction with the T&T programme: N/A

General impression of the programme: N/A

Management Action 3. Ensure Upstream Migration at Barriers

(List/ tabulate any sites etc where barriers were removed or elver access improved etc)

Any key photos ? N/A

Management Action 4. Improve Water Quality

(List any sites or actions which have significantly improved WQ to the benefit of eels)

N/A

Please include any relevant photographs of elver and/or silver eel trap & truck activities or seized gear.

Eel Management Information 2023

River District Basin: **WRBD-B**

Date: **1 Jan- 31 Dec 2023**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 319, 2015:

The above Bye law expired on 30 June 2018 and has not been renewed

The eel fishery in the WRBD-B remained closed throughout 2023.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the WRBD-B during 2023.

Estimated level of illegal fishing: Very low

Insert No. of alleged or confirmed reports

One report of illegal eel fishing on Lough Gill. Fish trap monitored for some time – no evidence of being serviced and removed in December – no eels trapped.



Main catchments where illegal activity occurred:

Number of gear seizures: Nil

Gear types seized:

Insert quantity/length of gear seized

Number of Eel Dealer Interceptions: Nil

Estimated tonnage on board:

Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?

(If 'Yes', please insert quantity transported).

What was the total catch transported (kg)?:

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

General impression of the programme:

Management Action 3. Ensure Upstream Migration at Barriers

(List/ tabulate any sites etc where barriers were removed or elver access improved etc)

Any key photos ?

Management Action 4. Improve Water Quality

(List any sites or actions which have significantly improved WQ to the benefit of eels)

Please include any relevant photographs of elver and/or silver eel trap & truck activities or seized gear.

Appendix 4: Silver Eel Trap and Transport Tables: Erne, Shannon and Lee

Appendix 4- 1 River Shannon Silver Eel Weekly Collection Sheet 2023/24

Wk No.	Week Ending	Jolly Mariner, Athlone	Yacht Club, Athlone	Kilaloe Eel Weir	Total for Week
1	12/08/23	Not Fishing	Not Fishing	Not Fishing	
2	19/08/23	Not Fishing	Not Fishing	Not Fishing	
3	26/08/23	Not Fishing	Not Fishing	Not Fishing	
4	02/09/23	Not Fishing	Not Fishing	Not Fishing	
5	09/09/23	0	0	0	
6	16/09/23	0	0	0	
7	23/09/23	1163	0	0	
8	30/09/23	952	0	0	
9	07/10/23	0	0	0	
10	14/10/23	1370	159	155	
11	21/10/23	1609	332	15	
12	28/10/23	1143	0	205	
13	04/11/23	0	0	240	
14	11/11/23	2609	349	1030	
15	18/11/23	3781	463	830	
16	25/11/23	0	0	740	
17	02/12/23	3028	159	60	
18	09/12/23	0	0	0	
19	16/12/23	898	174	285	
20	23/12/23	1116	132	360	
21	30/12/23	Not Fishing	Not Fishing	Not Fishing	
22	06/01/24	Not Fishing	Not Fishing	230	
23	13/01/24	Not Fishing	Not Fishing	220	
24	20/01/24	Not Fishing	Not Fishing	0	
25	27/01/24	Not Fishing	Not Fishing	0	
26	03/02/24	Not Fishing	Not Fishing	0	
27	10/02/24	Not Fishing	Not Fishing	0	
28	17/02/24	Not Fishing	Not Fishing	75	
29	24/02/24	Not Fishing	Not Fishing	Not Fishing	

Wk No.	Week Ending	Jolly Mariner, Athlone	Yacht Club, Athlone	Kilaloe Eel Weir	Total for Week
30	02/03/24	Not Fishing	Not Fishing	Not Fishing	
31	09/03/24	Not Fishing	Not Fishing	Not Fishing	
Total to Date(kgs)		17669	1768	4445	23882
Wk No.	Week Ending	Jolly Mariner, Athlone	Yacht Club, Athlone	Kilaloe Eel Weir	Total for Week
Catch Quota per Location		No Quota	No Quota	No Quota	

Appendix 4- 2 River Erne Silver Eel Weekly Collection Sheet 2023/24

Week No.	Week Ending	Lisnaskea	Ferny gap	Portora	Urney Bridge	Lough Gowna	Total for Week
1	12/08/2023	0	0	0	Not fishing	0	0
2	19/08/2023	0	0	0	Not fishing	0	0
3	26/08/2023	0	1091	912	Not fishing	0	2003
4	02/09/2023	0	610	283	Not fishing	0	893
5	09/09/2023	0	528	294	Not fishing	0	822
6	16/09/2023	0	2176	777	Not fishing	0	2953
7	23/09/2023	389	915	380	Not fishing	0	1684
8	30/09/2023	0	0	0	Not fishing	0	0
9	07/10/2023	530	1100	523	Not fishing	0	2153
10	14/10/2023	0	1483	192	Not fishing	930	2605
11	21/10/2023	0	3064	0	Not fishing	0	3064
12	28/10/2023	455	432	1165	Not fishing	0	2052
13	04/11/2023	0	1056	0	Not fishing	0	1056
14	11/11/2023	1224	3098	3209	Not fishing	1413	8944
15	18/11/2023	1282	1025	1821	Not fishing	1541	5669
16	25/11/2023	602	421	1441	Not fishing	1805	4269
17	02/12/2023	0	0	0	Not fishing	1959	1959
18	09/12/2023	0	0	0	Not fishing	0	0
19	16/12/2023	0	838	592	Not fishing	919	2349
20	23/12/2023	824	391	1759	Not fishing	770	3744
21	30/12/2023	Not Fishing	0	0	Not fishing	Not fishing	0
22	06/01/2024	Not Fishing	453	1355	Not fishing	Not fishing	1808
23	13/01/2024	Not Fishing			Not fishing	Not fishing	0
24	20/01/2024	Not Fishing			Not fishing	Not fishing	0
25	27/01/2024	Not Fishing			Not fishing	Not fishing	0

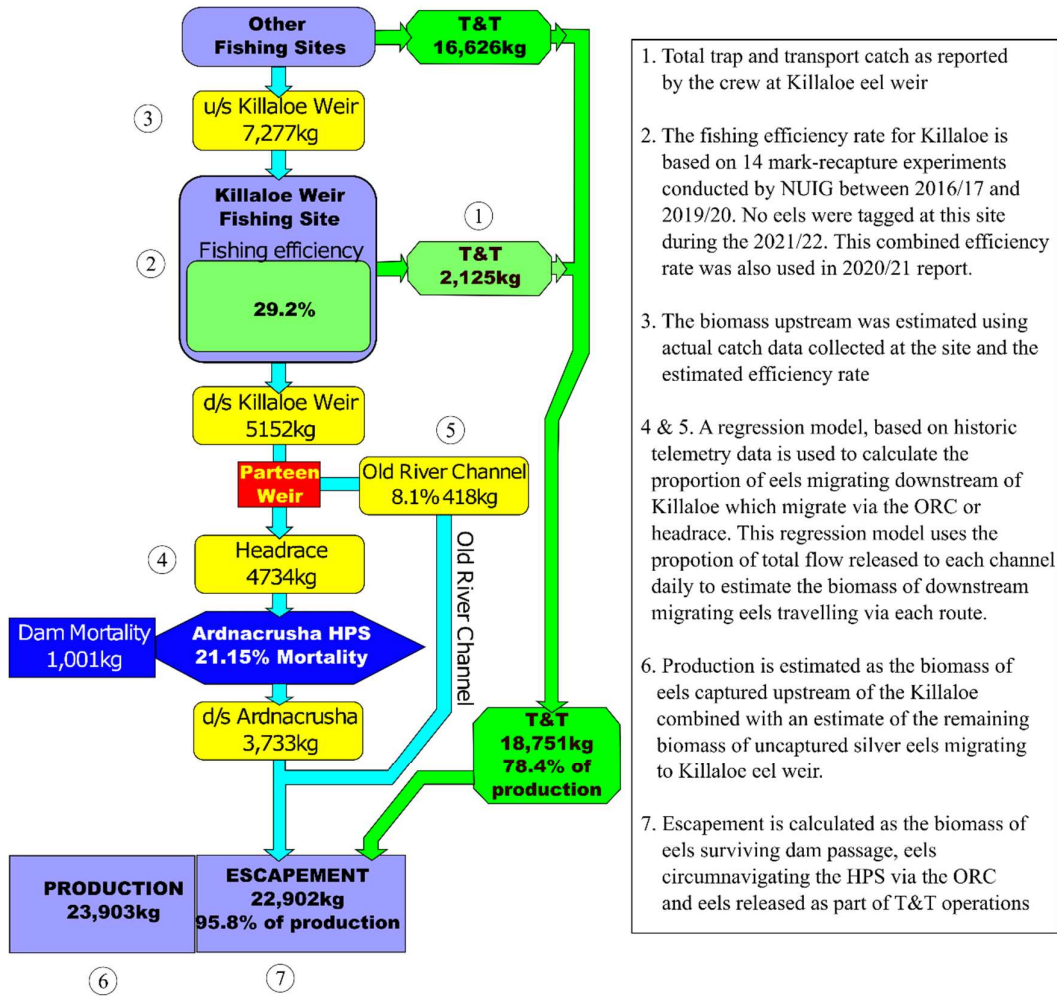
Week No.	Week Ending	Lisnaskea	Ferny gap	Portora	Urney Bridge	Lough Gowna	Total for Week
26	03/02/2024	Not Fishing			Not fishing	Not fishing	0
27	10/02/2024	Not Fishing			Not fishing	Not fishing	0
28	17/02/2024	Not Fishing			Not fishing	Not fishing	0
29	24/02/2024	Not Fishing			Not fishing	Not fishing	0
30	02/03/2024	Not Fishing			Not fishing	Not fishing	0
Total to Date(kgs)		5306	18681	14703	0	9337	48027
Week No.	Week Ending	Brian Reid	Patrick Quinn	Roy Shaw	James Dalton - Urney Bridge	Ruairi Coleman - Lough Gowna	Total for Week

Table 4-3 River Lee Silver Eel Weekly Collection Sheet 2023

Date	Location	Total Weight of Catch (kg)	Total to Date (kg)
26/08/2023	Boat Centre Iniscarra	92	92
27/08/2023	Boat Centre Iniscarra	127	219
28/08/2023	Boat Centre Iniscarra	190	409
29/08/2023	Boat Centre Iniscarra	104	513
30/08/2023	Boat Centre Iniscarra	155	668
31/08/2023	Boat Centre Iniscarra	122	790
01/09/2023	Boat Centre Iniscarra	93	883
02/09/2023	Boat Centre Iniscarra	75	958
03/09/2023	Boat Centre Iniscarra	110	1,068
04/09/2023	Boat Centre Iniscarra	105	1,173
Total Catch for Season			1,173

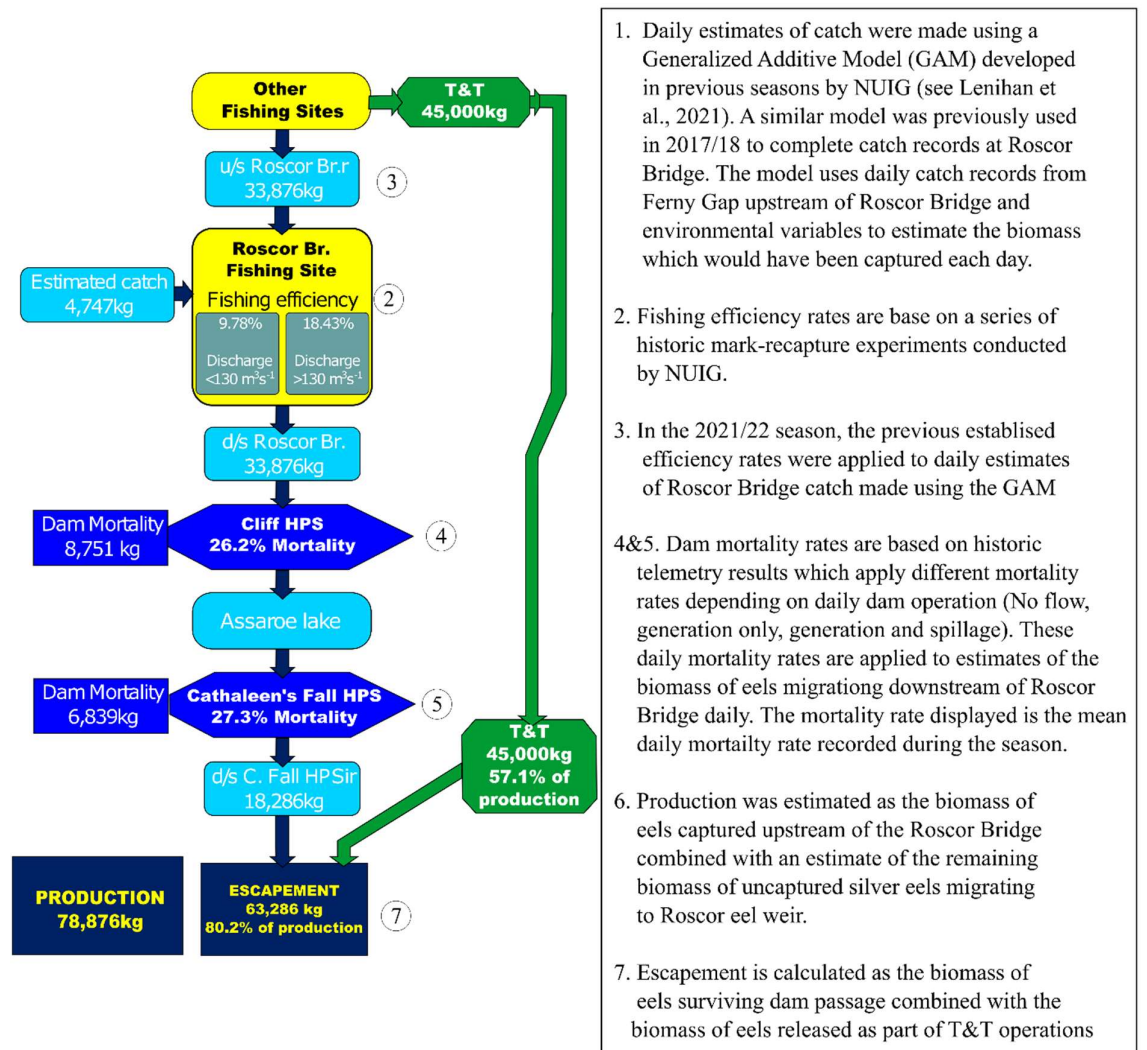
Appendix 5: Silver eel flow diagram explanation

Shannon Flow Diagram



A5 1 Flow diagram explanation for the Shannon catchment

Erne Flow Diagram



A5 2 Flow diagram explanation for Erne catchment

Appendix 6: Water Framework Directive

Table A6 1 Summary data from WFD Lakes Survey, 2022.

RBD	Lake	No Nights	No of Eels	CPUE	Average Length (cm)	Min Length (cm)	Max Length (cm)	Average Weight (kg)	Min Weight (kg)	Max Weight (kg)	Total Weight (kg)
ERBD	Bane (Boyne), Lough	1	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ERBD	Lene, Lough	1	1	0.33	48.0	48.0	48.0	0.174	0.174	0.174	0.174
NWRBD	Barra, Lough	1	9	1.50	41.1	27.0	53.0	1.143	0.039	2.789	10.289
NWRBD	Eske, Lough	1	6	0.40	40.0	33.5	46.9	0.093	0.017	0.167	0.560
NWRBD	Glasshouse Lake	1	3	0.50	58.7	52.0	71.5	0.362	0.193	0.695	1.087
NWRBD	MacNean Lower, Lough	1	3	0.50	62.7	61.0	65.0	0.426	0.394	0.472	1.278
NWRBD	MacNean Upper, Lough	1	24	2.67	48.4	25.0	67.0	0.229	0.031	0.514	5.491
SHRBD	Bridget, Lough	1	7	1.17	43.8	35.5	56.5	0.163	0.084	0.316	1.143
SHRBD	Lickeen Lough	1	10	1.11	47.7	36.5	58.0	0.177	0.074	0.319	1.769
SHRBD	Ree, Lough	1	15	0.71	59.7	51.5	72.5	0.384	0.216	0.778	5.767
WRBD	Ardderry Lough	1	1	0.33	46.0	46.0	46.0	0.176	0.176	0.176	0.176
WRBD	Ballyquirke, Lough	1	1	0.33	42.5	42.5	42.5	0.126	0.126	0.126	0.126
WRBD	Beltra, Lough	1	2	0.17	46.1	29.2	63.0	0.479	0.440	0.518	0.958
WRBD	Carra, Lough	1	7	1.17	53.4	36.0	78.5	0.333	0.088	0.808	2.331
WRBD	Conn, Lough	1	20	0.74	46.6	32.9	83.0	0.212	0.064	1.200	4.232
WRBD	Cullin, Lough	1	12	1.00	37.9	25.0	50.0	0.111	0.031	0.223	1.336
WRBD	Glenade Lough	1	1	0.33	49.6	49.6	49.6	0.187	0.187	0.187	0.187
WRBD	Kylemore, Lough	1	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
WRBD	Lettercraffoe, Lough	1	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
WRBD	Mask, Lough	1	10	0.53	58.3	48.0	82.3	0.446	0.224	1.256	4.457
WRBD	Maumwee, Lough	1	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
WRBD	Rea, Lough	1	7	1.17	55.1	45.5	63.0	0.303	0.171	0.432	2.121
WRBD	Ross (Corrib), Lough	1	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
WRBD	Shindilla, Lough	1	2	0.33	33.0	30.0	36.0	0.070	0.052	0.088	0.140

Table A6 2 Length frequency data from WFD Lakes Surveys, 2022.

RBD	Lake	No of							
		Eels	20 - 29 cm	30 - 39 cm	40 - 49 cm	50 - 59 cm	60 - 69 cm	70 - 79 cm	> 80 cm
ERBD	Bane (Boyne), Lough	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ERBD	Lene, Lough	1	0	0	1	0	0	0	0
NWRBD	Barra, Lough	9	1	3	3	2	0	0	0
NWRBD	Eske, Lough	7	0	3	4	0	0	0	0
NWRBD	Glasshouse Lake	3	0	0	0	2	0	1	0
NWRBD	MacNean Lower, Lough	3	0	0	0	0	3	0	0
NWRBD	MacNean Upper, Lough	24	1	4	10	4	5	0	0
SHRBD	Bridget, Lough	7	0	3	3	1	0	0	0
SHRBD	Lickeen Lough	10	0	2	4	4	0	0	0
SHRBD	Ree, Lough	16	0	0	0	8	5	3	0
WRBD	Ardderry Lough	1	0	0	1	0	0	0	0
WRBD	Ballyquirke, Lough	1	0	0	1	0	0	0	0
WRBD	Beltra, Lough	2	1	0	0	0	1	0	0
WRBD	Carra, Lough	7	0	1	3	0	1	2	0
WRBD	Conn, Lough	21	0	5	11	2	1	1	1
WRBD	Cullin, Lough	12	1	5	5	1	0	0	0
WRBD	Glenade Lough	1	0	0	1	0	0	0	0
WRBD	Kylemore, Lough	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
WRBD	Lettercraffoe, Lough	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
WRBD	Mask, Lough	10	0	0	2	5	2	0	1
WRBD	Maumwee, Lough	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
WRBD	Rea, Lough	7	0	0	1	4	2	0	0
WRBD	Ross (Corrib), Lough	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
WRBD	Shindilla, Lough	2	0	2	0	0	0	0	0

Table A6 3 Summary data from WFD Rivers Survey, 2022.

RBD	River Name	River Site	Methodology	Density (no/m²)	No. Eels
ERBD	Athboy (Bunboggan) River	Bunboggan_A	TEF (Handset)	0.0000	0
ERBD	Athboy (Bunboggan) River	Bunboggan_A	TEF (Handset)	0.0000	0
ERBD	Athboy (Gibbonstown) River	Gibbonstown Br._A	TEF (Handset)	0.0000	0
ERBD	Athboy River	Br. nr Clonleasan Ho_A	ADEF (Handset)	0.0000	0
ERBD	Athboy River	Fordrath_A	TEF (Handset)	0.0239	2
ERBD	Blackwater Kells (Assan), River	Assan Northwest_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells (Assan), River	Drummanduff_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells (Cross Water), River	Crosswater Br._A	TEF (Handset)	0.0148	1
ERBD	Blackwater Kells (Eighter), River	Eighter_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells (Moynalty), River	Ballynamona_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells (Moynalty), River	Gravelstown_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells (Moynalty), River	Kilbeg Lower_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells (Moynalty), River	Rossmeen_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells (Seefin), River	Greaghadosan_A	TEF (Handset)	0.0220	1
ERBD	Blackwater Kells (Tatestown), River	Milestown_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells (Tatestown), River	Tatestown_A	TEF (Handset)	0.0000	0
ERBD	Blackwater Kells, River	Just u/s L. Ramor_A	ADEF (Handset)	0.0153	24
ERBD	Blackwater Monaghan, River	Newmills Br._A	ADEF (Handset)	0.0000	0
ERBD	Boyne (Barora), River	County Br._A	TEF (Handset)	0.0000	0
ERBD	Boyne (Barora), River	Mullagh Br._A	TEF (Handset)	0.0000	0
ERBD	Boyne (Boycetown), River	Milltown Br._A	TEF (Handset)	0.0000	0
ERBD	Boyne (Knightsbrook), River	Dangan Southwest_A	TEF (Handset)	0.0000	0
ERBD	Boyne (Knightsbrook), River	Knightsbrook_A	TEF (Handset)	0.0000	0
ERBD	Boyne (Mattock), River	Mattock GAA_A	TEF (Handset)	0.0312	2
ERBD	Boyne (Riverstown), River	Mill Land South_A	TEF (Handset)	0.0000	0
ERBD	Boyne (Skane), River	Kilmessan Br._A	TEF (Handset)	0.0214	1
ERBD	Boyne (Stoneyford), River	Archerstown East_A	TEF (Handset)	0.0000	0
ERBD	Boyne (Stoneyford), River	Southhill East_A	TEF (Handset)	0.0000	0
ERBD	Boyne (Tremblestown), River	Kilnagross Br._A	TEF (Handset)	0.0000	0
ERBD	Boyne (Tromman), River	Boards Mill_A	TEF (Handset)	0.0198	1
ERBD	Boyne (Yellow), River	Clonmore_A	TEF (Handset)	0.0000	0
ERBD	Boyne (Yellow), River	Garr Br._A	TEF (Handset)	0.0000	0
ERBD	Boyne, (Coolree) River	Kilmurray North_A	TEF (Handset)	0.0000	0
ERBD	Boyne, (Deel Raharney) River	Ballyadams_A	TEF (Handset)	0.0000	0
ERBD	Boyne, (Longwood) River	Knockanally New Br._A	TEF (Handset)	0.0000	0
ERBD	Boyne, (Longwood) River	Longwood East_A	TEF (Handset)	0.0182	2
ERBD	Boyne, River	Boyne Br._B	ADEF (Handset)	0.0000	0
ERBD	Boyne, River	Slane Castle Demesne (LHB)_A	Partial survey (Boat)	0.0000	0
ERBD	Boyne, River	Slane Castle Slip (RHB)_A	Partial survey (Boat)	0.0000	0
ERBD	Dodder, River	Footbr. Beaver Row_B	ADEF (Handset)	0.0907	93
ERBD	Rye Water	Kildare Br._A	ADEF (Handset)	0.0159	4

RBD	River Name	River Site	Methodology	Density (no/m ²)	No. Eels
ERBD	Vartry (Carrick) River	Monduff_A	TEF (Handset)	0.0338	1
ERBD	Vartry (Tomdarragh) River	Tomdarragh Woods_A	TEF (Handset)	0.0000	0
ERBD	Vartry (Tomdarragh) River	Tomdarragh_A	TEF (Handset)	0.0000	0
ERBD	Vartry River	Annagolan Br._A	ADEF (Handset)	0.0000	0
ERBD	Vartry River	Ashford Br._A	ADEF (Handset)	0.0183	16
ERBD	Vartry River	Clore_A	TEF (Handset)	0.0263	3
ERBD	Vartry River	Knockadreet_A	TEF (Handset)	0.0000	0
ERBD	Vartry River	Newrath Br._A	ADEF (Handset)	0.0136	14
ERBD	Vartry River	Nun's Cross Br._A	ADEF (Handset)	0.0105	12
NBIRBD	Annalee (Bunnoe) River	Dianmore Br._A	TEF (Handset)	0.0000	0
NBIRBD	Annalee (Milltown) River	Tullybrick_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Bunnoe) River	Ardglushin_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Bunnoe) River	Killygragy North_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Bunnoe) River	Rossnaglogh East_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Cavan) River	Carrickane_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Cavan) River	Clonagonnell_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Cavan) River	Deredis Lower_A	ADEF (Boat)	0.0000	0
NWIRBD	Annalee (Cavan) River	Lisreagh South_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Gortin) River	Tullyvin Br._A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Killyvann) River	Drumkeeran_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Knappagh) River	Dunaree Latin_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Knappagh) River	Dunaree North_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Knappagh) River	Readuff West_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Knappagh) River	Tullyglass_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Knockatee) River	Lisnacark_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Larah) River	Clifferna North_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Larah) River	Larah Br._A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Larah) River	McShanes Br._A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Larah) River	Rathkenny Br._A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Latteriff) River	Kilcrossbeg_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Lough Dermot) River	Lisnadarragh_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Madabawn) River	Corraneary Church_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Madabawn) River	Madabawn Church_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Plush) River	Drumliff East_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Ratrussan) River	Hardware Shop_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Ricehill) River	Drumlaunaght_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Rossollus) River	Doonhamlet Community Centre_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Stradone) River	Corrawillin_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee (Tullaghaloyst) River	Coolcanadas_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee River	Annafarney Br._A	TEF (Handset)	0.0000	0
NWIRBD	Annalee River	Lisataggart_A	TEF (Handset)	0.0000	0
NWIRBD	Annalee River	0.2km d/s Cavan R confl_A	Partial survey (Boat)	0.0000	0

RBD	River Name	River Site	Methodology	Density (no/m ²)	No. Eels
NWIRBD	Cavan (Annageliff) River	Shankill Substation_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Annaneese) River	Corrybrannan_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Avaghon Lake) River	Leagh_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Bannaghroe) River	Aghnaglogh East_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Cremoyle) River	Drumgavny_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Edenbrone) River	Anveyerg South_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Lisquigny) River	Tiromedan_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Major Lough) River	Killycrom_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Rockcorry) River	Cornawall East_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Rossollus) River	Cabragh South_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore (Rossollus) River	Cabragh South_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore River	Bluebell Nature Farm_A	TEF (Handset)	0.0000	0
NWIRBD	Dromore River	Drummuck_A	ADEF (Handset)	0.0047	1
NWIRBD	Dromore River	Knappagh_A	TEF (Handset)	0.0000	0
NWIRBD	Erne, River	Bellahillan Br._A	ADEF (Boat)	0.0000	0
NWIRBD	Erne, River	Kilconny Belturbet (LHB)_A	Partial survey (Boat)	0.0007	2
NWIRBD	Erne, River	Kilconny Belturbet (RHB)_A	Partial survey (Boat)	0.0001	1
NWIRBD	Finn Monaghan River	Cumber Br._A	ADEF (Boat)	0.0000	0
SERBD	Banoge River	Br. u/s Owenavorrhagh R confl_A	ADEF (Handset)	0.0334	14
SERBD	Banoge River	Br. u/s Owenavorrhagh R confl_A	ADEF (Handset)	0.0334	14
SERBD	Owenavorrhagh River	Br. N of Ballinamona_A	ADEF (Handset)	0.0041	1
SHIRBD	Broadford River	Br. u/s Doon Lough_A	ADEF (Handset)	0.0000	0
SHIRBD	Cross River	Br. u/s Shannon River_A	Boomboat	0.0000	0
SHIRBD	Cross River	Br. u/s Shannon River_A	Boomboat	0.0000	0
SHIRBD	Gourna River	Br. u/s Owenogarney R confl_A	ADEF (Handset)	0.0108	8
SHIRBD	Gourna River	Br. u/s Owenogarney R confl_A	ADEF (Handset)	0.0108	8
SHIRBD	Graney Shannon River	Caher Br. S of L. Graney_A	ADEF (Handset)	0.0047	1
SHIRBD	Graney Shannon River	Caher Br. S of L. Graney_A	ADEF (Handset)	0.0047	1
SHIRBD	Inny (Ballinrink) River	Ballinrink_A	TEF (Handset)	0.0000	0
SHIRBD	Inny (Bellsgrave) River	Kilnahard_A	TEF (Handset)	0.0000	0
SHIRBD	Inny (Crover) River	Crover_A	TEF (Handset)	0.0000	0
SHIRBD	Inny (Crover) River	Four Half Moons_A	TEF (Handset)	0.0000	0
SHIRBD	Inny (Magheraboy) River	Magheraboy Lower_A	TEF (Handset)	0.0000	0
SHIRBD	Inny (Millbrook) River	Drumone_A	TEF (Handset)	0.0000	0
SHIRBD	Inny (Williamstown) River	Williamstown South_A	TEF (Handset)	0.0000	0
SHIRBD	Inny River	Br. 1 km S of Oldcastle_A	ADEF (Handset)	0.0000	0
SHIRBD	Inny River	Dairy farm_A	TEF (Handset)	0.0000	0
SHIRBD	Inny River	Glebe_A	TEF (Handset)	0.0000	0
SHIRBD	Inny River	Jobson's Br._A	TEF (Handset)	0.0000	0
SHIRBD	Mountnugent (Kildorough) River	Drumroragh East_A	TEF (Handset)	0.0000	0

RBD	River Name	River Site	Methodology	Density (no/m ²)	No. Eels
SHIRBD	Mountnugent (Kildorough) River	Kildorough_A	TEF (Handset)	0.0000	0
SHIRBD	Mountnugent (Oldtully) River	Barconny_A	TEF (Handset)	0.0000	0
SHIRBD	Mountnugent (Rassan) River	Rassan_A	TEF (Handset)	0.0000	0
SHIRBD	Mountnugent River	Kilnacrott_A	TEF (Handset)	0.0000	0
SHIRBD	Mountnugent River	Mountnugent Br._A	ADEF (Handset)	0.0000	0
SHIRBD	Shannon (Upper), River	Ballyleague Br. Lanesboro_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Battle Br._B	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Bogganfin_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Bunnaribba_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Bunnaribba_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Caldragh_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Carrickobreen_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Carrickynaghtan_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Clonmacnoise: at Jetty_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Cloonfad_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Creevagh_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Devenish Island_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Hillquarter_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Kilnacarrow_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Lanesboro_B	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Lanesboro_C	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Lanesboro_D	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Tarmonbarry_A	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Tarmonbarry_B	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Tarmonbarry_C	Boomboat	0.0000	0
SHIRBD	Shannon (Upper), River	Tarmonbarry_D	Boomboat	0.0000	0
SHIRBD	Shannon Canal	Athlone Canal_A	Boomboat	0.0000	0
SWRBD	Allow (Monvara) River	Monvara_A	TEF (Handset)	0.0162	1
SWRBD	Araglin River	Elizabeth's Br._A	ADEF (Handset)	0.0122	14
SWRBD	Awbeg Buttevant River	Kilcummer Br._A	ADEF (Handset)	0.0016	1
SWRBD	Blackwater Munster (Awbeg), River	Bannagh Br._A	TEF (Handset)	0.0000	0
SWRBD	Blackwater Munster (Ballydesmond), River	Ballydesmond_A	TEF (Handset)	0.0000	0
SWRBD	Blackwater Munster (Finnow), River	Ballynafeaha_A	TEF (Handset)	0.0292	2
SWRBD	Blackwater Munster, River	Killavullen Br. (LHB)_A	Partial survey (Boat)	0.0005	2
SWRBD	Blackwater Munster, River	Killavullen Br. (RHB)_A	Partial survey (Boat)	0.0001	1
SWRBD	Blackwater Munster, River	Lismore Br. (RHB)_A	Partial survey (Boat)	0.0002	3
SWRBD	Blackwater Munster, River	Nohaval Br._A	ADEF (Handset)	0.0025	1
SWRBD	Bride Waterford, River	Footbr. N of Ballynella_A	ADEF (Handset)	0.0060	5
SWRBD	Dalua River	Footbr. SW of Liscongill_A	ADEF (Handset)	0.0024	2
SWRBD	Finisk River	Modelligo Br._A	ADEF (Handset)	0.0042	2
SWRBD	Funshion, River	Br. u/s Blackwater R confl_A	ADEF (Boat)	0.0001	1

RBD	River Name	River Site	Methodology	Density (no/m²)	No. Eels
SWRBD	Funshion, River	Brackbaun Br._A	ADEF (Handset)	0.0000	0
SWRBD	Funshion, River	Brackbaun Br._A	ADEF (Handset)	0.0000	0
SWRBD	Licky River	Br. NE of Glenlicky_B	ADEF (Handset)	0.0126	6
WRBD	Black Shrule River	Br. at Kilshanvy_A_B_C	ADEF (Handset)	0.0000	0
WRBD	Bunowen Louisburgh (Bellakip) River	Cartoor_A	TEF (Handset)	0.0317	1
WRBD	Bunowen Louisburgh (Bellakip) River	Cregganroe North_A	TEF (Handset)	0.0000	0
WRBD	Bunowen Louisburgh (Castle) River	Carrowmore road_A	TEF (Handset)	0.0000	0
WRBD	Bunowen Louisburgh (Srahnacloy) River	Srahnacloy Ford_A	TEF (Handset)	0.0000	0
WRBD	Bunowen Louisburgh (Tangincartoor) River	Srahnacloy West_A	TEF (Handset)	0.0000	0
WRBD	Bunowen Louisburgh River	Tully Br._A	ADEF (Handset)	0.0079	4
WRBD	Clare (Abbert), River	Bridge at Bullaun_A	ADEF (Handset)	0.0000	0
WRBD	Clare (Abbert), River	Bridge at Bullaun_A	ADEF (Handset)	0.0000	0
WRBD	Nanny Tuam, River	u/s Weir Br._A	ADEF (Handset)	0.0000	0
WRBD	Owenbrin River	Br. u/s L. Mask_A	ADEF (Handset)	0.0000	0
WRBD	Owenbrin River	Br. u/s L. Mask_A	ADEF (Handset)	0.0000	0

Table A6 4 Length frequency data from WFD River Surveys, 2022.

RBD	River Name	River Site	No. Eels	5-9 cm	10-19 cm	20-29 cm	30-39 cm	40-49 cm	50-59 cm	60-69 cm	70-79 cm	>80 cm
ERBD	Athboy River	Fordrath_A	2	0	0	1	1	0	0	0	0	0
ERBD	Blackwater Kells (Cross Water), River	Crosswater Br._A	1	0	0	0	0	1	0	0	0	0
ERBD	Blackwater Kells (Seefin), River	Greaghadossan_A	1	0	0	0	0	1	0	0	0	0
ERBD	Blackwater Kells, River	Just u/s L. Ramor_A	24	0	9	12	3	0	0	0	0	0
ERBD	Boyne (Mattock), River	Mattock GAA_A	2	0	1	0	1	0	0	0	0	0
ERBD	Boyne (Skane), River	Kilmessan Br._A	1	0	0	0	1	0	0	0	0	0
ERBD	Boyne (Tromman), River	Boards Mill_A	1	0	1	0	0	0	0	0	0	0
ERBD	Boyne, (Longwood) River	Longwood East_A	2	0	2	0	0	0	0	0	0	0
ERBD	Dodder, River	Footbr. Beaver Row_B	93	2	62	24	5	0	0	0	0	0
ERBD	Rye Water	Kildare Br._A	4	0	1	0	2	0	1	0	0	0
ERBD	Vartry (Carrick) River	Monduff_A	1	0	0	1	0	0	0	0	0	0
ERBD	Vartry River	Ashford Br._A	16	1	11	4	0	0	0	0	0	0
ERBD	Vartry River	Clore_A	3	0	2	0	1	0	0	0	0	0
ERBD	Vartry River	Newrath Br._A	14	0	8	3	3	0	0	0	0	0
ERBD	Vartry River	Nun's Cross Br._A	12	0	5	5	2	0	0	0	0	0
NWIRBD	Dromore River	Drummuck_A	1	0	0	0	0	0	1	0	0	0
NWIRBD	Erne, River	Kilconny Belturbet (RHB)_A	1	0	0	0	0	0	1	2	0	0
SERBD	Banoge River	Br. u/s Owenavorrhagh R confl_A	14	0	7	7	0	0	0	0	0	0
SERBD	Owenavorrhagh River	Br. N of Ballinamona_A	1	0	0	1	0	0	0	0	0	0
SHIRBD	Gourna River	Br. u/s Owenogarney R confl_A	8	1	6	0	1	0	0	0	0	0
SHIRBD	Graney Shannon River	Caher Br. S of L. Graney_A	1	0	0	0	1	0	0	0	0	0
SWRBD	Allow (Monvara) River	Monvara_A	1	0	1	0	0	0	0	0	0	0
SWRBD	Araglin River	Elizabeth's Br._A	14	0	3	11	0	0	0	0	0	0

RBD	River Name	River Site	No. Eels	5-9 cm	10-19 cm	20-29 cm	30-39 cm	40-49 cm	50-59 cm	60-69 cm	70-79 cm	>80 cm
SWRBD	Awbeg Buttevant River	Kilcummer Br._A	1	0	1	0	0	0	0	0	0	0
SWRBD	Blackwater Munster (Finnow), River	Ballynafeaha_A	2	0	1	1	0	0	0	0	0	0
SWRBD	Blackwater Munster, River	Killavullen Br. (LHB)_A	2	0	1	1	0	0	0	0	0	0
SWRBD	Blackwater Munster, River	Killavullen Br. (RHB)_A	1	0	1	0	0	0	0	0	0	0
SWRBD	Blackwater Munster, River	Lismore Br. (RHB)_A	3	0	1	0	1	1	0	0	0	0
SWRBD	Blackwater Munster, River	Nohaval Br._A	1	0	0	1	0	0	0	0	0	0
SWRBD	Bride Waterford, River	Footbr. N of Ballynella_A	5	0	1	2	1	1	0	0	0	0
SWRBD	Dalua River	Footbr. SW of Liscongill_A	2	0	0	2	0	0	0	0	0	0
SWRBD	Finisk River	Modelligo Br._A	2	0	2	0	0	0	0	0	0	0
SWRBD	Funshion, River	Br. u/s Blackwater R confl_A	1	0	0	0	1	0	0	0	0	0
SWRBD	Licky River	Br. NE of Glenlicky_B	6	0	3	3	0	0	0	0	0	0
WRBD	Bunowen Louisburgh (Bellakip) River	Cartoor_A	1	0	0	0	1	0	0	0	0	0
WRBD	Bunowen Louisburgh River	Tully Br._A	4	0	3	1	0	0	0	0	0	0

Table A6 5 Summary length and weight data from WFD Rivers Surveys, 2022.

RBD	River Name	River Site	No. Eels	Average Length (cm)	Min Length (cm)	Max Length (cm)	Average Weight (kg)	Min Weight (kg)	Max Weight (kg)	Total Weight (kg)
ERBD	Athboy River	Fordrath_A	2	28.0	25.0	31.0	n.a.	n.a.	n.a.	n.a.
ERBD	Blackwater Kells (Cross Water), River	Crosswater Br._A	1	46.0	46.0	46.0	n.a.	n.a.	n.a.	n.a.
ERBD	Blackwater Kells (Seefin), River	Greaghadossan_A	1	41.0	41.0	41.0	n.a.	n.a.	n.a.	n.a.
ERBD	Blackwater Kells, River	Just u/s L. Ramor_A	24	21.7	11.0	32.5	n.a.	n.a.	n.a.	n.a.
ERBD	Boyne (Mattock), River	Mattock GAA_A	2	27.0	17.0	37.0	n.a.	n.a.	n.a.	n.a.
ERBD	Boyne (Skane), River	Kilmessan Br._A	1	36.0	36.0	36.0	n.a.	n.a.	n.a.	n.a.
ERBD	Boyne (Tromman), River	Boards Mill_A	1	17.0	17.0	17.0	n.a.	n.a.	n.a.	n.a.
ERBD	Boyne, (Longwood) River	Longwood East_A	2	16.0	15.0	17.0	n.a.	n.a.	n.a.	n.a.
ERBD	Dodder, River	Footbr. Beaver Row_B	93	17.9	6.3	33.0	n.a.	n.a.	n.a.	n.a.
ERBD	Rye Water	Kildare Br._A	4	32.9	12.5	57.0	n.a.	n.a.	n.a.	n.a.
ERBD	Vartry (Carrick) River	Monduff_A	1	28.0	28.0	28.0	n.a.	n.a.	n.a.	n.a.
ERBD	Vartry River	Ashford Br._A	16	15.6	9.0	24.0	n.a.	n.a.	n.a.	n.a.
ERBD	Vartry River	Clore_A	3	22.5	15.5	35.0	n.a.	n.a.	n.a.	n.a.
ERBD	Vartry River	Newrath Br._A	14	20.7	10.0	34.0	n.a.	n.a.	n.a.	n.a.
ERBD	Vartry River	Nun's Cross Br._A	12	22.8	12.0	34.0	n.a.	n.a.	n.a.	n.a.
NWIRBD	Dromore River	Drummuck_A	1	51.0	51.0	51.0	n.a.	n.a.	n.a.	n.a.
NWIRBD	Erne, River	Kilconny Belturbet (RHB)_A	1	59.7	55.0	64.0	n.a.	n.a.	n.a.	n.a.
SERBD	Banoge River	Br. u/s Owenavorrhagh R confl_A	14	19.8	12.0	28.0	n.a.	n.a.	n.a.	n.a.
SERBD	Owenavorrhagh River	Br. N of Ballinamona_A	1	29.0	29.0	29.0	n.a.	n.a.	n.a.	n.a.
SHIRBD	Gourna River	Br. u/s Owenogarney R confl_A	8	16.5	9.0	36.0	n.a.	n.a.	n.a.	n.a.
SHIRBD	Graney Shannon River	Caher Br. S of L. Graney_A	1	35.0	35.0	35.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Allow (Monvara) River	Monvara_A	1	14.0	14.0	14.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Araglin River	Elizabeth's Br._A	14	21.7	10.0	29.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Awbeg Buttevant River	Kilcummer Br._A	1	15.5	15.5	15.5	n.a.	n.a.	n.a.	n.a.
SWRBD	Blackwater Munster (Finnow), River	Ballynafeaha_A	2	22.7	17.3	28.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Blackwater Munster, River	Killavullen Br. (LHB)_A	2	19.8	12.0	27.5	n.a.	n.a.	n.a.	n.a.

RBD	River Name	River Site	No. Eels	Average Length (cm)	Min Length (cm)	Max Length (cm)	Average Weight (kg)	Min Weight (kg)	Max Weight (kg)	Total Weight (kg)
SWRBD	Blackwater Munster, River	Killavullen Br. (RHB)_A	1	10.0	10.0	10.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Blackwater Munster, River	Lismore Br. (RHB)_A	3	29.0	15.0	42.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Blackwater Munster, River	Nohaval Br._A	1	23.0	23.0	23.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Bride Waterford, River	Footbr. N of Ballynella_A	5	28.6	18.5	40.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Dalua River	Footbr. SW of Liscongill_A	2	22.5	21.0	24.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Finisk River	Modelligo Br._A	2	12.5	12.0	13.0	n.a.	n.a.	n.a.	n.a.
SWRBD	Funshion, River	Br. u/s Blackwater R confl_A	1	32.5	32.5	32.5	n.a.	n.a.	n.a.	n.a.
SWRBD	Licky River	Br. NE of Glenlicky_B	6	20.3	15.0	26.0	n.a.	n.a.	n.a.	n.a.
WRBD	Bunowen Louisburgh (Bellakip) River	Cartoor_A	1	31.0	31.0	31.0	n.a.	n.a.	n.a.	n.a.
WRBD	Bunowen Louisburgh River	Tully Br._A	4	17.3	10.0	29.5	n.a.	n.a.	n.a.	n.a.

Table A6 6 Summary data from WFD Transitional Waters Surveys, 2022.

RBD	Transitional Water	No. Nights	No. Nets	No. Eels	CPUE	Average Length (cm)	Min Length (cm)	Max Length (cm)
ERBD	Boyne Estuary	1	21	14	0.67	37.3	29.0	51.0
ERBD	Liffey Estuary Lower	1	6	1	0.17	25.0	25.0	25.0
ERBD	Liffey Estuary Upper	1	9	1	0.11	42.0	42.0	42.0
ERBD	Tolka Estuary	1	12	1	0.08	30.0	30.0	30.0
SERBD	Barrow Nore Estuary Upper	1	6	12	2.00	36.6	27.0	54.0
SERBD	Barrow Suir Nore Estuary	1	12	3	0.25	32.0	29.0	38.0
SERBD	Lower Suir Estuary	1	12	14	1.17	32.4	25.0	40.0
SERBD	Middle Suir Estuary	1	21	30	1.42	43.9	30.0	60.0
SERBD	New Ross Port	1	12	62	5.17	38.5	22.0	55.0
SERBD	Nore Estuary	1	12	14	1.17	37.6	29.0	58.0
SERBD	Upper Barrow Estuary	1	18	16	0.89	35.8	22.0	75.0
SERBD	Upper Suir Estuary	1	6	0	0.67	n.a.	n.a.	n.a.

Table A6 7 Length frequency data from WFD Transitional Waters Surveys, 2022.

RBD	Transitional Water	No.	0-9 cm	10-19 cm	20-29 cm	39-39 cm	40-49 cm	50-59 cm	60-69 cm	70-79 cm	>80 cm
		Eels									
ERBD	Boyne Estuary	14	0	0	2	8	1	3	0	0	0
ERBD	Liffey Estuary Lower	1	0	0	1	0	0	0	0	0	0
ERBD	Liffey Estuary Upper	1	0	0	0	0	1	0	0	0	0
ERBD	Tolka Estuary	1	0	0	0	1	0	0	0	0	0
SERBD	Barrow Nore Estuary Upper	12	0	0	2	7	1	2	0	0	0
SERBD	Barrow Suir Nore Estuary	3	0	0	2	1	0	0	0	0	0
SERBD	Lower Suir Estuary	14	0	0	4	7	3	0	0	0	0
SERBD	Middle Suir Estuary	30	0	0	0	10	9	9	2	0	0
SERBD	New Ross Port	62	0	0	7	29	14	12	0	0	0
SERBD	Nore Estuary	14	0	0	1	8	3	2	0	0	0
SERBD	Upper Barrow Estuary	16	0	0	7	3	4	1	0	1	0
SERBD	Upper Suir Estuary	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.