Energy for generations

ESB SUSTAINABLE RIVERS ANNUAL REPORT

(YEAR ENDING DECEMBER 2024)

A report on ESB Sustainable Rivers Conservation activities to the Department of Environment, Climate and Communications.

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Table of Contents

Introduction

ESB has been responsible for the management and preservation of fisheries on the rivers where we work since the beginning of ESB's hydro generation operations in Ireland.

ESB's fleet of hydroelectric stations have a combined production capacity of 220MW located on five rivers across Ireland. Together, they provide enough renewable energy to supply up to 180,000 customers, contributing to ESB's Driven to Make a Difference: Net Zero by 2040 strategy. Complementing ESB's overarching ambition to eliminate carbon from electricity, our strategy commits to stepping forward on social and environmental responsibility. In support of ESB's Driven to Make a Difference: Net Zero by 2040 Strategy, ESB's Sustainable Rivers Strategy was launched in 2023. This Strategy further outlines the steps ESB is making in River Connectivity, Sustainability, Nature Positive Initiatives, and stepping forward into the Communities that we operate in.

ESB's Sustainable Rivers Team continues the conservation works through the operation of three salmon conservation hatcheries, the river habitat restoration programme, and the eel trap and transport programme, as well as day to day fisheries management activities. You can find the details of these activities for 2024 in the following report.

This work is only possible thanks to the support and partnership of local and national stakeholders which includes angling clubs, community groups, University College Cork, Queens University Belfast, Inland Fisheries Ireland, The Marine Institute, The Department of Environment, Climate and Communications, The Department of Agriculture, Food and the Marine and The Department of Agriculture, Environment and Rural Affairs, Northern Ireland.

On behalf of ESB, I would like to thank each of our stakeholders for their guidance and support over the past year.

Jim Dollard,
Executive Director Generation & Trading

Fisheries Conservation Financial Report

1st January to 31st December 2024

Financial Report for the year ended 31.12.2024	€'000
Income	€57
Direct Costs	
Payroll	€1,205
Materials & Other Costs	€2,838
Total Direct Costs	€4,043
Depreciation	€201
Finance Costs	€0
Total Operating Expenditure	€4,244
Operating Loss	**-€4,187**

Chapter 1. ESB Sustainable River Strategy

Fish passage consultants undertaking an assessment of the Cathaleen's Fall fish pass.

In 2023 ESB updated our fisheries conservation strategy. The updated strategy is aligned with ESBs' Driven to Make a Difference: Net Zero by 2040 Strategy.

It consists of a suite of high-level principles that are effectively a road map for ESB as it delivers a new strategy for rivers on which we operate.

This Strategy is structured around the following three strategic goals:

1. Shift the balance between fisheries conservation and renewable generation based on scientific evidence.
2. Implement a Nature Positive Approach along 30% of ESB owned river channels or lakeside habitats by 2030.
3. Commit to a measurable net gain of ESB's contribution to our communities through sustainability initiatives.

The development and implementation of actions under each of these high- level goals will be based on the application of scientific and other technical expert advice; the outcome of trials and feasibility studies; and consultation with key stakeholders.

Projects already commenced include:

- River Erne: Two key areas for improvement have been identified at hydro stations— repurposing the Erne smolt gates and the addition of a lamprey trap located at the lower end of Cathleen's Fall fish pass.
- River Clady: Construction of a new vertical slot fish pass at Gweedore Weir.
- Lower Shannon: Blackwater River: ESB is evaluating the replacement options of an aging wooden fish ladder.

In parallel, ESB is engaging with fish passage experts both in Ireland and internationally to explore innovative solutions, e.g., behavioral guidance systems, fish-friendly turbines, and novel fish pass technologies.

In addition, planning and identification of suitable habitat improvement projects have commenced. Community engagement on ESB's commitment to sustainability and social responsibility will continue throughout the life of the Strategy.

Community engagement on ESB's commitment to sustainability and social responsibility will continue throughout the life of the Strategy.

An assessment of the Cathaleen's Fall station fish pass.

The view of one of the pools in the de-watered Cliff station fish pass.

Chapter 2. River's Introduction

2.1. The River Shannon - An T'Sionainn

A view of the four Ardnacrusha penstocks which take water from the headrace canal to the turbine units.

A view of one of the Ardnacrusha penstock pipes and the Ardnacrusha Borland Fish lock behind.

The River Shannon catchment area including that of the estuary covers approximately 17% of the area of Ireland. It is the longest river in Ireland and has a total main channel length of almost 400km, of which 25% is estuarine. The lakes of the catchment are naturally productive and can be generally classified as either semi-enriched (mesotrophic) or enriched (eutrophic). Much of the main river channel is lake like in character reflecting its size, regulated flow and low gradient (falling just 20m over 200km, south of Lough Allen). The largest of the Shannon lakes are Loughs Allen (35km^2), Ree (105km^2) and Derg (117km^2), with the most important tributaries of the Shannon being the Boyle and Suck to the west and the Inny, Brosna, Little Brosna, Nenagh and Mulkear to the east.

Discharge on the River Shannon is regulated at Parteen Regulating Weir. Parteen Regulating Weir diverts water into a headrace canal supplying the 85MW Ardnacrusha generating station and allows a statutory compensation flow (10m^{3}sec^{-1}), equal to the low summer flow before the Shannon scheme, to flow down the Old Shannon River channel.

Ardnacrusha generating station, constructed between 1925 and 1929, harnesses the 10,400km^2 of the catchment area upstream. During the 1930's, Ardnacrusha supplied almost 90% of the electricity needs but today it accounts for less than 1.1% of the Republic of Ireland's requirement. However, the ability to generate electricity at short notice when electricity demand suddenly increases make it very important generation asset in Ireland.

ESB controls the fishing rights of the entire River Shannon, and the role of the maintenance and preservation of the entire fishery resources is undertaken by the ESB Sustainable Rivers Team. The River Shannon fisheries are managed in co-operation with:

- Inland Fisheries Ireland (IFI)
- National Parks & Wildlife Service
- The Department of Environment, Climate and Communications
- The Marine Institute

In addition to the above agencies, both angling and
community groups are becoming increasingly involved. ESB extends this strong co-operative approach to the management of the Shannon fisheries with Inland Fisheries Ireland staff and the Shannon Fisheries Partnership Group.

A view of one of the generators at Ardnacrusha station.

An outline of the various programmes of work that ESB Sustainable Rivers Team are involved with, and the time periods involved are shown in Table 1.

Table 1. The annual work programmes completed by ESB staff during the year.

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Salmon Conservation												
Adult broodstock trapping												
Stripping broodstock												
Hatchery egg to fry stage												
Restocking juvenile salmon (unfed, fry, parr)												
Smolt release												
Eel Conservation												
Silver Eel Trap and Transport												
Juvenile Eel Trap and Transport												
Conservation Management												
Electrical fishing surveys												
Fish Counters (Operation and Management)												
Smolt & elver generation protocols												
River Enhancement & Conservation												
Tree/Shrub clearance (with NPWS)												
Instream habitat works												
Construction of fishing stands, stiles & footbridges												

IFI drone footage showing Ardnacrusha station on the Lower Shannon.

IFI drone footage showing the Lower Shannon below the Ardnacrusha tailrace.

2.2. The River Erne - An Éirne

The River Erne is a transboundary river system, with large stretches in both Northern Ireland and the Republic of Ireland. It has a catchment area of 4,374km^2, rises in Co. Cavan and flows for almost 100km through Loughs Gowna and Oughter and Upper and Lower Lough Erne before entering the sea at Ballyshannon, Co. Donegal.

The hydroelectric scheme was constructed during 1946-1955 and consists of two generating stations. The capacity of the Erne scheme today is 20MW at Cliff and 45MW at Cathaleen's Fall. The hydro scheme involved major drainage works within the mid–catchment area and significant cross border co-operation during construction. A total of 98.8% of the catchment area is harnessed for hydroelectricity generation. The scheme also involved the creation of Assaroe Reservoir (2.3km^2) between the two hydroelectric installations. The River Erne has an average annual flow of 98.1m^{3}sec^{-1}.

ESB owns the fishing rights in the Lower River Erne, Assaroe Reservoir and some tributaries in Co. Donegal. The remaining catchment area of the Erne is under the control of the Department of Agriculture, Environment and Rural Affairs (DAERA, Northern Ireland) and Inland Fisheries Ireland (IFI).

2.3. Clady and Crolly - An Chláidigh agus an Chroithlí

The Clady River, situated in North Donegal was harnessed for the generation of electricity during the 1950's. The scheme involved the creation of a diversion canal and penstock from the Clady River approximately 3km from the sea and the transfer via this canal and penstock to a generating station, which discharges to the Crolly estuary. Both small moorland river systems have a combined catchment area of 153km^2. The Clady drains Lough Nacung, the outflow of which is regulated by Gweedore regulating weir. Due to the diversion of water, Clady salmon destined for the River Clady may enter the Crolly estuary at times depending upon discharge.

2.4. The River Liffey - An Life

The River Liffey, having a catchment area of 1,369km^2, rises in the Wicklow mountains and flows over 50km before entering the sea at Dublin. Three hydroelectric generating stations were constructed on the river during the 1940's. In addition to the supply of water for hydroelectric generation, the 5,600-acre reservoir also provides a water supply to Dublin city. A total of 62% of the catchment lies above Leixlip generating station, which was commissioned in 1949. The two upstream stations, Poulaphouca and Golden Falls, are situated at the historical upper limit of salmon distribution in the catchment, respectively.

In addition to salmon and brown trout, the River Liffey holds stocks of roach, bream, roach-bream hybrids, perch, tench, pike, rudd and eel. Coarse fishing predominates on the Leixlip and Poulaphouca reservoirs, whereas the best trout fishing is from Lucan upstream. The best salmon fishing is noted on the stretch of river between Straffan and Islandbridge. ESB controls the fishing rights on the reservoirs, and in the immediate vicinity of the power stations.

2.5. River Lee - An Laoí

The River Lee flows eastwards for over 90km and has a catchment area of 1,253km2 and a mountainous region near Gougane Barra Lake in an average flow of 27.1m^3sec^{-1}. West Cork to enter the sea at Cork City (Figure 1).

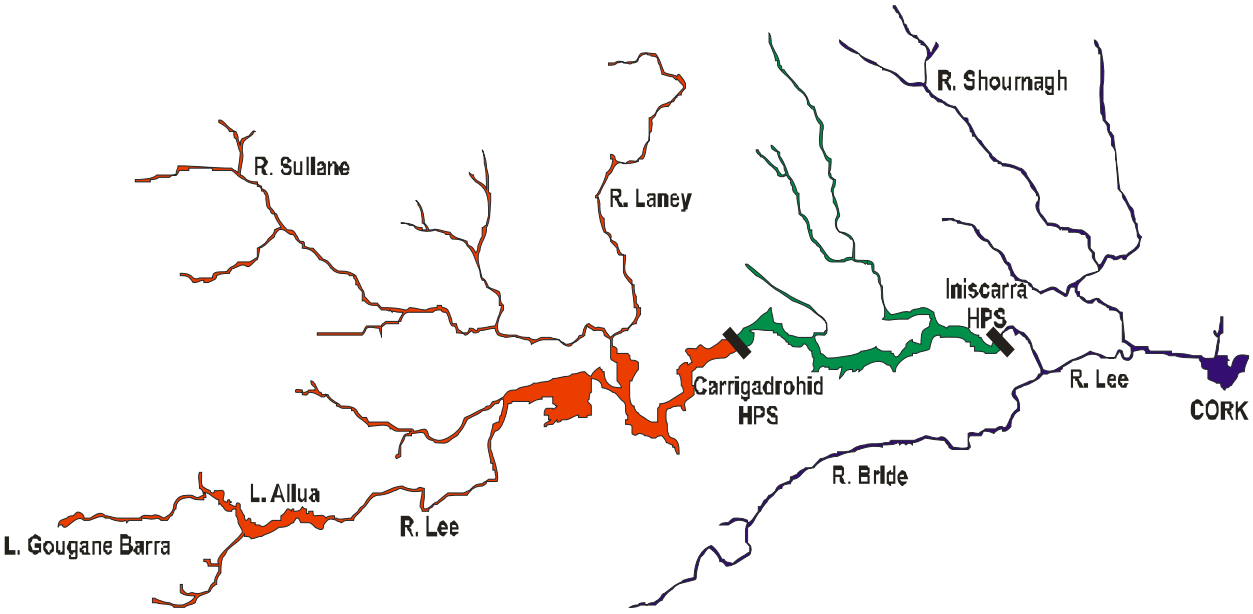


Figure 1. The River Lee catchment with the lower, middle and upper catchment areas differentiated by colour.

Blackrock Castle on the River Lee.

The central valleys of the River Lee were flooded as the result of construction of the hydroelectric scheme. Construction commenced in 1953, and both Carrigadrohid and Iniscarra generating stations were commissioned in 1957. Two large reservoirs were created, Carrigadrohid (5.3km^2) and Iniscarra (9.3km^2), upstream of both stations. A significant percentage (27%) of the Lee catchment is located downstream of the hydroelectric station, and this area comprises the Shournagh, Martin and Bride tributaries where naturally spawned salmon stocks occur. The tidal section of the River Lee is approximately 14.5km downstream of Iniscarra. The fishing rights of the reservoirs and some river stretches located downstream of Iniscarra dam are controlled by ESB.

In addition to salmon and eel, the other main fishable species within the Lee system also include brown trout, pike, perch, rudd, roach and bream. The River Lee offers some excellent coarse fish angling, as there are significant stocks of coarse fish species within each of the two reservoirs.

Chapter 3. Atlantic Salmon

Table 2 shows a summary of the five ESB regulated hydro-electric catchments in terms of salmon.

Table 2. Details each of the ESB hydro regulated catchments in terms of the three catchments where hatchery salmon are produced and return to the hatcheries. The salmon census data for the five catchments are also included.

Shannon	87,622	715	93	276,295
Lee	69,430	44	151	0
Clady	-	130	-	-

3.1 The River Shannon Salmon

Since initiation of the River Shannon Salmon Management Programme in 1990, ESB has been proactive in the conservation of the salmon population of the River Shannon. Prior to the Shannon Scheme, the river was renowned as a producer of large multi-sea winter salmon and grilse. With the advent of the hydroelectric scheme, there was a significant reduction of the spawning and nursery habitat in the Old River Shannon channel. In 1959, a Borland– MacDonald fish-lock was constructed at Ardnacrusha and a salmon hatchery unit was constructed at Parteen Regulating Weir. Mitigation measures involved the restocking of the Shannon catchment with annual releases of juvenile salmon produced at this hatchery. However, although the Shannon scheme caused major changes for salmon in the river, the impact of extensive drainage schemes, water regulation and canalisation, intensive farming, afforestation and water pollution have also impacted negatively. Increased marine and coastal exploitation levels since the 1960's followed by the incidence of Ulcerated Dermal Necrosis (UDN), and more recently decreasing marine survival have also added to the reduction in numbers of self-sustaining stocks of salmon (Figure 2).

A section of the Ardnacrusha tailrace.

Angling along the 'Longshore' stretch of the Lower River Shannon.

The overall purpose of the River Shannon Salmon Management Programme is to assist the recovery of wild salmon populations in the cascade catchment area, provide reared smolt to support the recreational fisheries in the Lower Shannon and to protect the biodiversity and ecological productivity of wild salmon populations in the Shannon catchment.

The more specific objectives of the programme were:

- To ensure that the maximum possible number of salmon enter the cascade catchment annually to spawn.
- To investigate fish passage issues for adult and juvenile migrating salmon. Specific areas to be investigated were:

1. The efficiency rate of the Borland MacDonald fish lift located in Ardnacrusha.
2. Smolt passage through a Kaplan turbine located at Ardnacrusha was independently assessed based upon the results of a Heisey Tag test in 2004. The survival rate of salmon smolt migrating during the annual Ardnacrusha salmon smolt and juvenile eel generation protocol has been calculated at 89.4%.
3. To increase understanding of salmon populations using micro tagged batch releases of salmon parr, an extensive electrofishing programme and continued restocking of both unfed fry and parr.

- To involve as many statutory and community groups as possible in the execution of the programme.
- An instream and bank side habitat enhancement programme to be applied to selected catchments.

Since 1991, all hatchery reared smolt have been adipose fin-clipped and selected breeding lines have been micro tagged, thus allowing the separation of reared, wild, grilse and multi-sea winter adult salmon. The restocking programme since 1991 has moved to large scale unfed fry planting with the retention of unfed fry for smolt production the following year. These unfed fry plantings are evaluated using electric fishing equipment. The performance of these unfed fry has generally been good compared to the first baseline survey (1990-1992).

The 'Longshore' area of the River Shannon where the Ardnacrusha tailrace enters the Old River Shannon.

Anaesthetised hatchery reared salmon smolt being adipose fin clipped in readiness for their April release from Parteen hatchery.

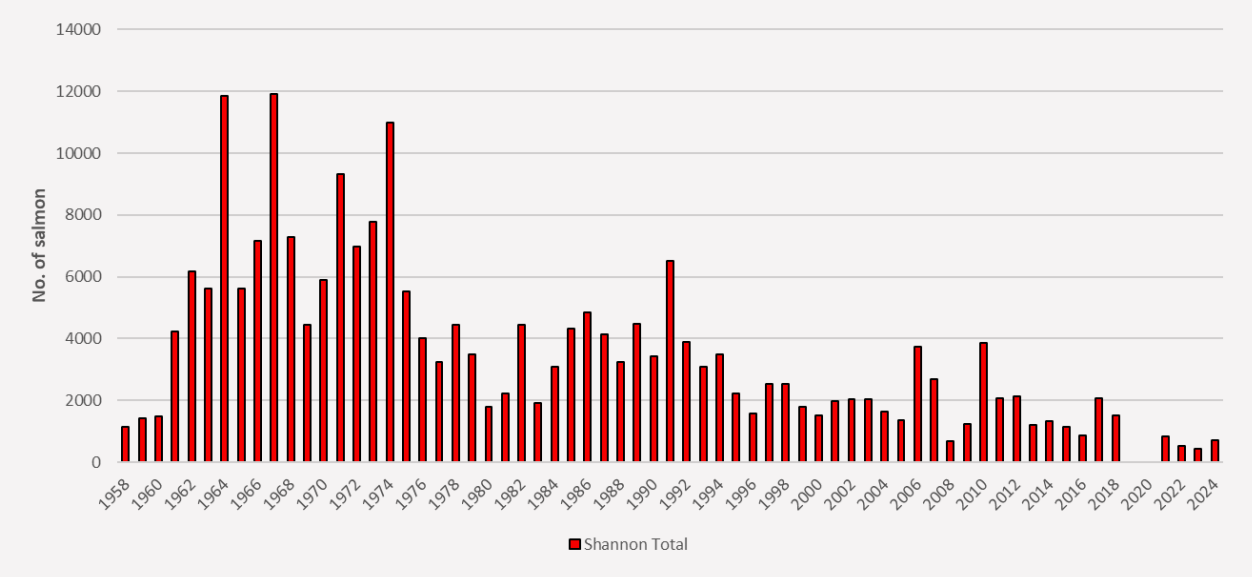


Figure 2. The number of ascending adult salmon through Ardnacrusha and Parteen Regulating Weir on the Lower Shannon catchment for the period 1959 to 2024.

The salmon stocks ascending our fish passes have reduced significantly over the years. This is aligned to international salmon stocks. International studies reflect that this reduction is because of a combination of factors including, freshwater habitat loss and degradation. The changes in natural marine cycles are also causing both fewer and smaller fish returning. ESB, under our Sustainable Rivers Strategy are investing in the fish passage infrastructure to increase connectivity and passage for all fish species.

River Shannon Salmon Breeding and Genetics Programme

The Parteen Salmon Breeding Programme was initiated in 1990, and it forms an integral part of the overall Shannon Salmon Management Plan. The mass selection-breeding programme involves two main breeding lines (grilse or one-sea winter fish, and Multi-Sea Winter (MSW) fish), that have been held separately since the start of the Programme. These two fish types are bred and reared separately at the hatchery prior to release to the sea as smolts. The two main objectives of the programme were to:

- Use selective breeding to significantly increase the percentage of fish returning as MSW salmon.
- To increase the weight of both MSW and grilse salmon.

In summary, the River Shannon salmon breeding programme at Parteen since 1990 has:

- Established pedigreed grilse and two-sea winter lines of salmon returning to the River Shannon.
- Increased significantly the proportion of two- sea-winter salmon in the return to the River Shannon and to the hatchery.
- Proved that selective breeding can increase significantly the size and weight of returning grilse.
- Provided hypotheses to explain the inheritance of maturation phenotypes in salmon.
- Shown that males grow faster than females at sea.
- Given an indication that females return to the coast earlier than males.
- Provided pedigreed salmon for breeding experiments and stimulated further genetic research on salmon.

The present breeding protocol has the aim of increasing the genetic variability within the selected two-sea - winter lines by crossing between year classes.

The genetic sampling of all returning hatchery bred fish and the hatchery fish used in the brood stock programme continued in 2024. The sub-sampling of the fish classified as wild also continued but was restricted when compared with previous years. In respect to the former, a collection of samples, from which DNA can be retrieved, exists now for every fish returning to the hatchery between 2010 and 2024. The combination of this material, in addition to information on each individual's size, sex and age, including potentially information on individual parentage, make this a very valuable resource for research and ultimately for the management of the hatchery programme.

The River Suck tributary on the River Shannon.

A bridge over the River Suck at Abbeyshrule.

Parteen Hatchery

Parteen hatchery was constructed at Parteen Regulating Weir in 1959 and was extended in 1970. A phased refurbishment project was initiated in 1997, and the hatchery now has a capacity to incubate up to 4 million salmon ova with an upper limit of 400 pairs of salmon. The hatchery infrastructure has been improved further with the provision of a new water intake line and filtration system. In addition, a new food control sequence for feeding fish was added. Approximately 90,000 adipose fin-clipped smolt are released each year as part of the ranching programme. The main goal of the conservation hatchery is to assist the recovery of wild salmon populations upstream of Parteen and Ardnacrusha and secondly to increase knowledge of salmon, using an educational centre. An educational centre located at the hatchery provides a resource for visiting school tours and other interested parties. Present management of the ESB hatchery has continued to be of a high standard (ISO 14001).

Over the past 30 years, surplus ova and juvenile salmon have been used at both national and international levels to help restore salmon stocks of the Rivers Erne, Lee, Deel and the Rhine, Meuse and Thames. The use of Shannon ova in these European salmon restoration schemes promotes international fisheries co-operation and Ireland's unique freshwater fisheries resource. However, in more recent times the Shannon hatchery stock has been used exclusively for the restoration of Shannon salmon stocks.

A view of Ardnacrusha station and the tailrace behind.

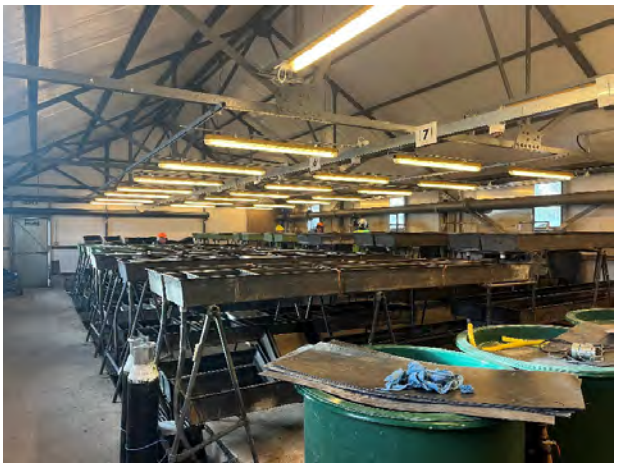
Due to past hatchery salmon mortality events there has been a significant upgrade to the infrastructure and running of the site. This investment and operational changes includes:

- The installation of oxygen monitoring equipment.
- The inlet valves have been changed with larger valves added.
- The existing filtered water supply for the hatchery unit has also been extended for the 'first-feeding' tanks. It is planned that the filtered water supply for the entire farm be upgraded in 2025
- The frequency of water sampling has been increased for the critical 'first-feeding' period. The water sampling now also includes planktonic sampling.
- There has been an increase of veterinarian visits and sampling of fish at the site.
- Staffing has been increased for both weekends and holiday periods. Automatic alarm systems have been added for water levels and oxygen levels.
- A new water filtration system and an associated pipework has also been added.
- The same operational and infrastructural changes will also be applied to the other two salmon rearing sites on the Erne and Lee.
- All of the three ESB salmon hatcheries are ISO 14001 accredited and are often used as an education facility with frequent use by local school, college tour groups and other interested groups.

A view of the downstream section of the Ardnacrusha spillway.

The Ardnacrusha juvenile eel trap with the green coloured climbing substrate and the cooling water being discharged beside the juvenile eel trap ramp. Cooling water from the station is also discharged at the entrance to the Ardnacrusha fish lift as a fish attraction flow.

The egg boxes and troughs in the Parteen hatchery unit.



Production of Juvenile Hatchery Reared Salmon

The juvenile salmon restocking of the Upper Shannon catchment in 2024 is shown in Table 3. In 2024, there was a release of 276,295 juvenile salmon into the upper catchment.

Table 3. The number of juvenile salmon released from Parteen hatchery in 2024.

Date of Release	Number Released	Release Site
Unfed fry		
April 7 - 8th	276,295	Big Brosna (Clodiagh River)
Smolts		
April 4th	62,272	Fin clipped Grilse (Parteen hatchery)
April 4th	25,350	Fin clipped and micro-tagged MSW (Parteen hatchery)
Total	**87,622**	

A total of 87,622 fin-clipped salmon smolts were released from Parteen hatchery in April 2024 using a fish pump. These comprised both multi-sea winter (MSW) smolt and grilse (one-sea winter fish) (Table 3).

Characteristics of hatchery broodstock collected at Parteen during 2024

Identical Grilse and MSW (Multi-Sea Winter) designation characteristics are used for Parteen, Carrigadrohid and Ballyshannon hatcheries. These characteristics are that females up to 71cm and males up to 84cm are One- Sea Winter (1SW) or grilse, whereas salmon larger than these are considered to be MSW salmon. Using these designation characteristics, of the 2024 hatchery returns, just 7 female and 2 male were MSW fish. A total of 93 salmon (62 wild and 31 hatchery salmon) entered the salmon trapping facility located at the Parteen regulating Weir fish pass (Table 4). This trap, which is used for collecting broodstock (hatchery salmon are retained for breeding purposes and wild fish are released above the trap), was used from the 5/10/24 and was removed on the 26/11/24.

Table 4. The monthly number of adult salmon either removed from the fish pass trap (hatchery salmon) or else released above the trap (wild salmon) located at Parteen Weir in 2024.

	Wild	Hatchery	Total
October	49	20	69
November	13	11	24
Total	**62**	**31**	**93**

Adult Salmon Census for 2024

The number of salmon are assessed entering the Upper Shannon catchment using two automatic infra-red Vaki 'Riverwatcher' units. These are located at the upper exit point of the Borland fish lift in Ardnacrusha generating station and on the Parteen Regulating Weir fish pass. An upstream adult salmon trap is also situated on one of the pools of the Parteen Regulating Weir fish pass which is used to collect ranched hatchery salmon for the period late September to December. A service level agreement was entered into with Inland Fisheries Ireland for the ESB fish counter maintenance, service and the production of census data reports.

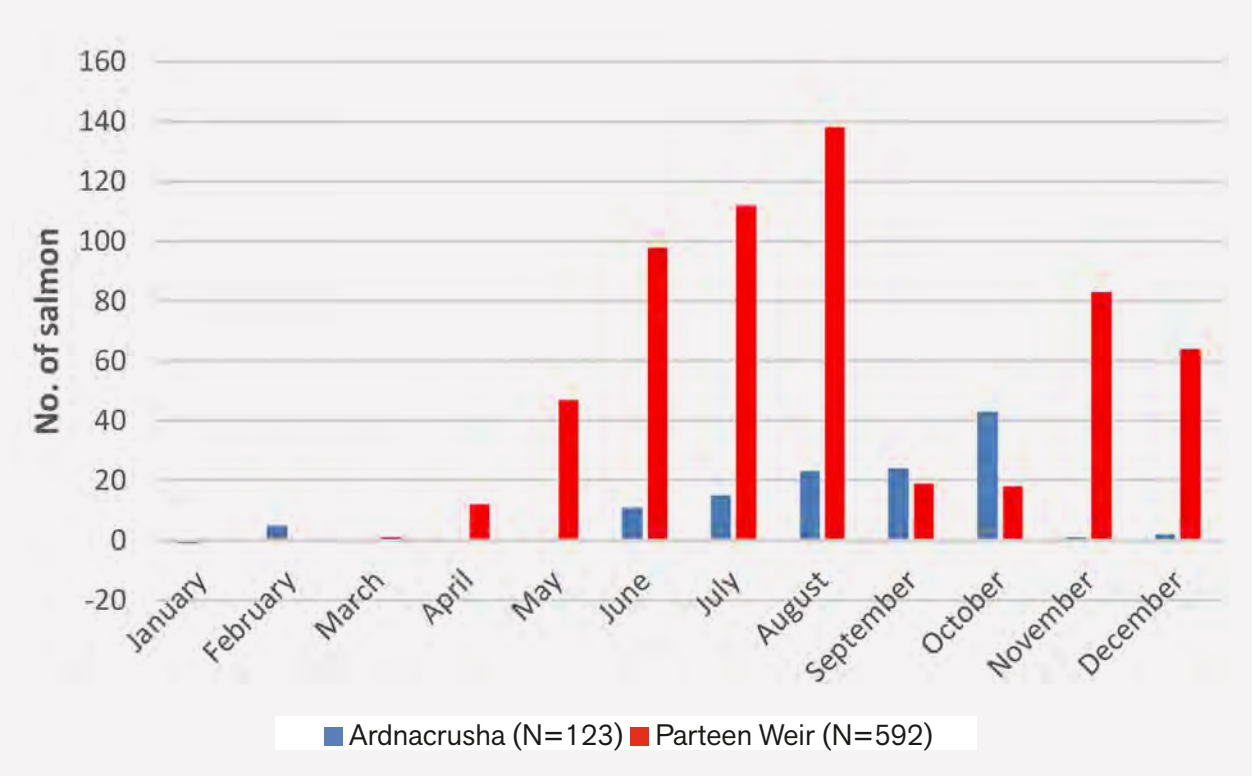
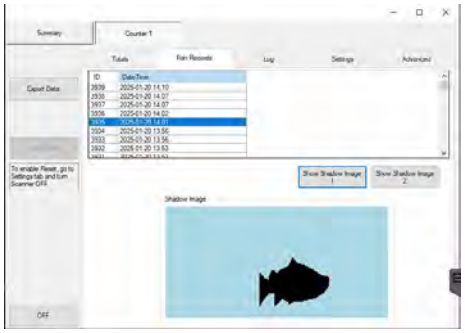


Figure 3. The Parteen Weir census and Ardnacrusha fish census data for 2024.

Both fish passes operated fully during the year. It should be noted that at present, it appears nationally and internationally as if very low marine smolt survival rates are having a serious negative effect upon Irish salmon populations. A comparison with more recent years is shown in Table 5.

Table 5. The number of wild salmon ascending the R. Shannon from 2000-2024. # The Ardnacrusha census data for 2009, 2014 and 2017 were partial counts or were not counted during 2020 and 2021.

Year	Ardnacrusha Station	Parteen Weir	Total
2000	190	320	510
2001	286	343	629
2002	157	670	827
2003	433	422	855
2004	25	563	588
2005	216	583	799
2006	102	224	326
2007	150	589	739
2008	105	203	308
2009#	62	112	174#
2010	-	706	706
2011	848	1101	1859
2012	523	371	894
2013	328	689	1017
2014#	10	457	467#
2015	385	455	840
2016	493	660	1153
2017	665	210	875#
2018	1161	920	2081
2019	638	883	1521
2020	-	-	-
2021	-	-	-
2022	379	655	1034
2023	82	455	537
2024	123	592	715



A Vaki Riverwatcher image of a salmon ascending the fish pass at Parteen Weir.

Recreational salmon fisheries of the Shannon

The main salmon recreational fisheries are located on the Old River, between Parteen Weir and Limerick City. The most famous of these is the Castleconnell fishery. Up to 2016, the Lower River Shannon operated on a catch and release system for all wild salmon, whereas a bag- limit operated for hatchery salmon. For 2024, the River Shannon was open for the 'catch and release' only of salmon. It was 'Open' for trout and coarse fishing.

Fisheries Protection and Regulation

For the 2024 season, Inland Fisheries Ireland (IFI) staff were engaged by ESB Sustainable Rivers to provide fishery protection services on the Lower Shannon and Mulkear Rivers. IFI are also responsible for the Shannon's 'Managed Fisheries' (which includes the Suck, Brosna, Little Brosna, Camlin and Inny Catchments). Some on-the-spot fines were issued for minor offences in the fisheries, and several nets were seized. IFI staff responded to several calls about illegal fishing and successful prosecutions were taken.

The Annual Shannon Smolt and Elver Generation Protocol

The Shannon smolt generation protocol involves dusk and dawn generation to near maximum efficiency during the months of April and May and early June. Generation tracks the seasonal cycle of dusk and dawn and begins one hour before and ceases one hour after dusk/dawn. Due to the upward movement of elvers within the Lower Shannon, there is no generation in the interim night-time period. ESB is committed to working with all Government Agencies including An Garda Síochána, Local Authorities, Environmental Protection Agency and the National Parks and Wildlife Service and Angling Groups in seeking to educate and identify those at risk of damaging the fishery environment.

The salmon stocks ascending our fish passes have reduced significantly over the years. This is aligned to international salmon stocks. International studies reflect that this reduction is because of a combination of factors including, freshwater habitat loss and degradation. The changes in natural marine cycles are also causing both fewer and smaller fish returning. ESB, under our Sustainable Rivers Strategy are investing in the fish passage infrastructure to increase connectivity and passage for all fish species.

A IFI kayak patrol on the Mulkear River.

An IFI fisheries protection patrol on the Lower Shannon.

3.2 The River Erne Salmon

The annual numbers of salmon entering the Erne system remained at a high level until the late 1960's, but thereafter fell to lower levels (Figure 4).

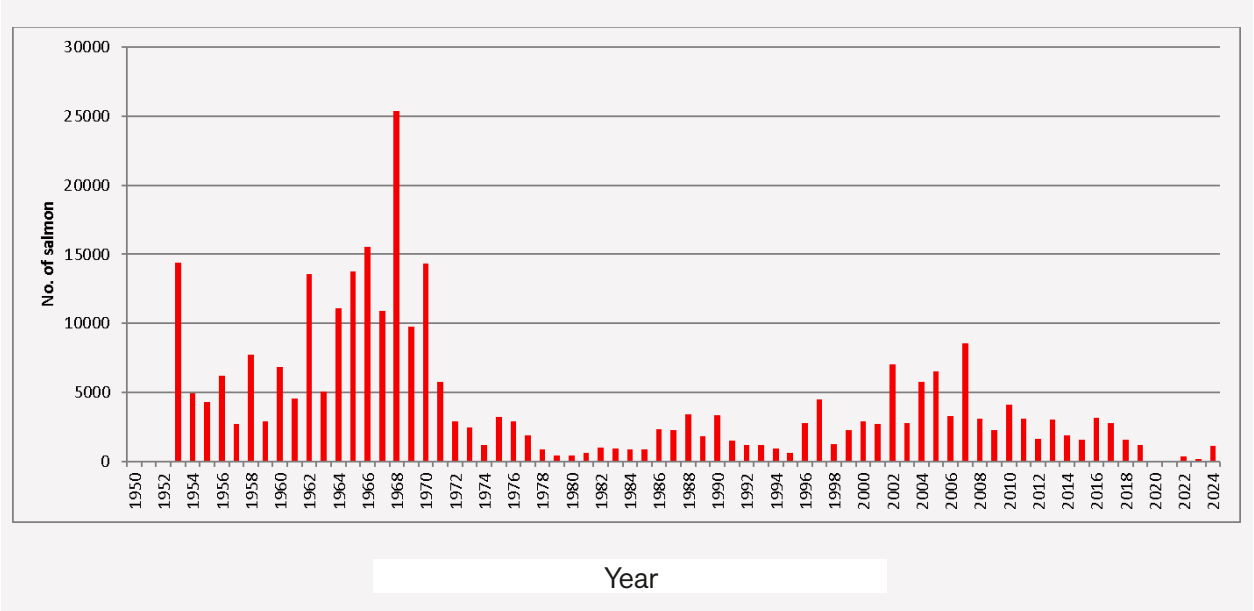


Figure 4. The number of salmon ascending the fish pass at Cathaleen's Fall hydroelectric generating station on the Lower Erne from 1953 to 2024. There was no census data for 2020 and 2021.

Although the Erne scheme had an impact upon salmon in the river, particularly within the lower reaches between Belleek and the sea, the impact of extensive drainage schemes in the middle and upper catchment areas, water regulation and canalisation, intensive farming, afforestation and extensive water pollution have also impacted negatively. Increased marine and coastal exploitation levels since the 1960's followed by the incidence of Ulcerated Dermal Necrosis (UDN), and more recently decreasing marine survival have also added to the reduction in numbers of self- sustaining stocks of salmon.

The River Erne Salmon Management Programme was initiated in 1995. It was a cross-border programme set up to address the problem of low salmon runs in the Erne catchment. The programme was funded through European Union Interreg II and was comprised of several partners in Northern Ireland and the Republic Ireland. A list of recommendations was produced by the scientific steering group for the future work necessary to achieve the aim of a self-sustaining wild population of salmon and thus, to establish a high-quality rod fishery. Arising from these recommendations, an ESB Sustainable Rivers Work Plan was formulated to list and assess the various areas that ESB is directly involved in.

These areas are:

- The restocking and ranching activities of the Ballyshannon Hatchery
- Juvenile salmon passage
- Adult salmon passage

Ballyshannon Hatchery

Ballyshannon hatchery has been operating since 1983 and is located immediately downstream of Cathaleen's Fall generating station. The water intake for the hatchery is taken at 4.2m depth from Assaroe Reservoir. Hatchery operations in the past have been affected by poor water quality in the Lower River Erne. The addition of a 'Bermuli' filter and a sand-pressure filter unit to the fish farm and hatchery building unit intake has resulted in greatly improved water quality, thus resulting in the production of higher quality ova, unfed fry and juvenile salmon. The current annual target production for this facility was approx. 1.5 million unfed fry and 50,000 - 60,000 smolts for release into the Erne catchment.

Due to the recent Technical Expert Group on Salmon (TEGoS) advice, the hatchery salmon restocking in the northern section of the Erne ceased from 2024 onwards and there will be a sequential reduction in the restocking within the southern section of the Erne over the next few years. Also, the number of salmon smolts which are ranched to sea each year will reduce over the next number of years. This is in line with the ESB Sustainable Rivers strategy where there will be a focus upon fisheries connectivity projects.

River Erne salmon breeding and genetic Programme

The current breeding programme at Ballyshannon utilises Erne ranched salmon and these have been divided into two groups: Grilse and multi sea winter (MSW) salmon. These two lines are held separately, and mating is on a one-to-one basis to ensure genetic diversity. The designation characteristics for returning adults salmon are that females up to 71cm and males up to 84cm are one-sea-winter salmon (1SW) or grilse, whereas salmon larger than these are considered to be multi sea-winter (MSW) salmon.

Hatchery broodstock collected at Ballyshannon during 2024

In total 2 female salmon were >71cm, and no males were > 84cm. A total of 117 hatchery salmon were taken as broodstock in November and December, and of these, 25 pairs of salmon were stripped in 2024.

Production of juvenile hatchery reared salmon

During 2024, a total of 148,201 juvenile salmon were produced from the 2023 adult salmon broodstock returns. The release locations of these juvenile salmon and the months of release are given in Table 6. A total of 50,447 adipose fin-clipped salmon smolt were released from Ballyshannon hatchery during April 2024. It is planned to reduce this to circa 30,000 smolts for ranching to sea in 2025.

Table 6. Details of the numbers of juvenile salmon and their location of release on the River Erne in 2024.

Month		Stock Stage	Release Catchment	Fish No.
February	Non fin-clipped	Pre-smolt	Swanlinbar River	40,100
April	Fin-clipped	Smolts	Erne Estuary	50,447
February		Summer Fry	Swanlinbar River	57,654
			Total	**148,201**

Adult Salmon Census for 2024

Returning adult salmon numbers are assessed using a 'Vaki Riverwatcher' automatic fish counter. This counter utilises infra-red technology and provides information on fish movements and behaviour of fish within the fish pass at Cliff station. Most salmon tend to ascend the Cliff fish pass towards the evening time. The 2024 census data of previous years in shown in Table 7 and for the 2024 season in Table 8.

Table 7. The annual census of salmon ascending the fish pass located at Cliff hydroelectric station on the River Erne for the period 1999-2024.

Year	Number of salmon
2024	1,109
2023	187
2022	379
2020 and 2021	No Data
2019	1,184
2018	1,564
2017	2,775
2016	3,174
2015	1,565
2014	1,910
2013	3,038
2012	1,672
2011	2,068
2010	2,284
2009	1,136
2008	2,411
2007	2,962
2006	1,238
2005	1,280
2004	947
2003	849
2002	1,444
2001	475
2000	311

An upstream adult salmon trap, situated in one of the pools of the Cathaleen's Fall fish pass, is located at Cathaleen's Fall stations. In line with previous years, this trapping facility was only used towards the end of the year (October-December). The reason for the short period of use is to minimise any negative effect to the main wild run of fish (the wild salmon run usually peaks for the months of June/July/August). Thus, it was possible to avoid handling the fresh run wild salmon whilst at the same time ensuring that enough hatchery reared returning salmon were trapped and used for restocking purposes at Ballyshannon hatchery. However, the non-operation of the trap during the early summer period also meant that the 'hatchery' or 'wild' component of the adult census figure could not be fully assessed since the normally operating Vaki counter does not differentiate between 'hatchery reared' and 'wild' salmon at this site. The census data for 2024 is shown in Table 8. No blockages within the pools of either Cliff or Cathaleen's Fall fish passes occurred during 2024. The adult trap was set on the 8th November 2024 and ceased on the 10th December 2024. During this time a total of 134 salmon (117 hatchery and 26 wild), were intercepted using the adult salmon trap (Table 9 and Figure 5) located within Cathaleen's Fall fish pass. All wild salmon trapped were released into the pool immediately above the trap (Table 9).

Stripping of all the adult hatchery broodstock was undertaken on the 4th of December 2024. A total of 25 pairs of salmon were stripped. All additional adult broodstock were released into the Swanlinbar River over a three-day period (21st-23rd December 2024). These were surplus to the requirements of Ballyshannon hatchery. Due to the recent Technical Expert Group on Salmon advice (TEGoS), the restocking of the Erne catchment will gradually reduce over the next few years. Also, there will be a phased reduction in the number of salmon smolt ranching output.

From 2004 to present, halogen lights were fitted and operational to the underside of the downstream platform, i.e. the bottom 8 pools of the fish pass. The lights are switched off for the period 12 midnight to 4am. These lights were fitted in an area of poor lighting (which may impede upward fish movement). In addition to these lights, the draft tube gates were removed from this area in 2005, thus allowing natural light to penetrate the entire area. Since then, the significant 'holding up' of adult salmon within this previously dimly lit area has been eliminated.

During 2024, further genetic sampling of Erne salmon was undertaken using the adult trap facilities located at Cathaleen's Fall fish pass. Sub-samples of individual fish tissue from hatchery salmon were sent to University College Cork.

Table 8. The numbers of adult salmon and trout ascending the fish pass at Cliff station and passing through the Vaki Riverwatcher where they are counted.

	Salmon			Trout		
	Upward	**Downward**	**Nett Up**	**Upward**	**Downward**	**Nett Up**
January	0	0	0	0	1	-1
February	1	3	-2	0	1	-1
March	0	5	-5	0	2	-2
April	0	0	0	1	2	-1
May	1	0	1	0	0	0
June	19	0	19	0	0	0
July	154	0	154	0	0	0
August	212	1	211	2	0	2
September	146	0	146	3	0	0
October	730	239	491	28	24	2
November	184	90	94	16	9	7
December	1	1	0	10	9	1
Total	**1448**	**339**	**1109**	**60**	**48**	**7**

Table 9. The trapping of hatchery broodstock and wild salmon for the latter end of 2024. All hatchery fish are removed to the hatchery, whereas all wild fish are released above the trap.

	Salmon Within Trap				Salmon Removed From Above Trap			
	Hatchery		**Wild**		**Hatchery**		**Wild**	
	Male	Female	Male	Female	Male	Female	Male	Female
November	26	21	5	2	23	27	7	7
December	4	14	0	1	0	2	2	2
Total	**30**	**35**	**5**	**3**	**23**	**29**	**9**	**9**

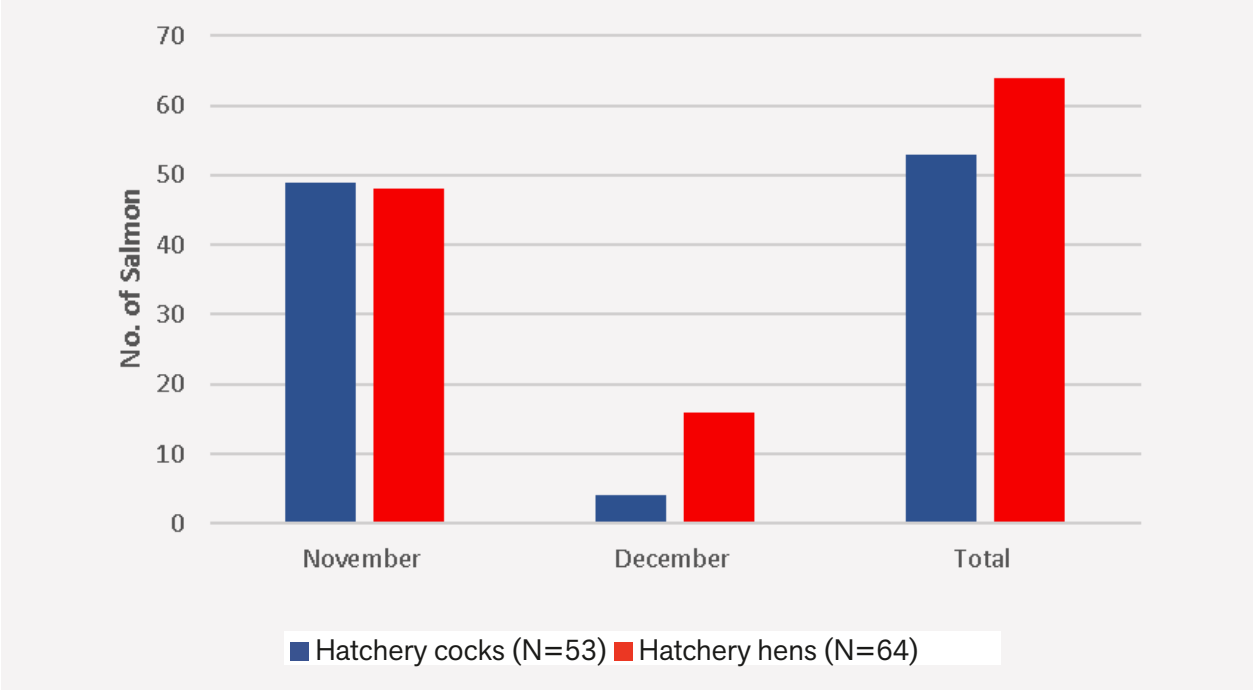


Figure 5. The number of hatchery broodstock taken from within and above the fish trap located at Cathaleen's Fall station fish pass for the latter end of 2024. All hatchery fish are removed to the hatchery as broodstock.

The Annual Erne Stations Smolt and Elver Generation Protocol

The Erne stations smolt generation protocol involves dusk and dawn generation to near maximum efficiency during the months of April and May and early June. Generation tracks the seasonal cycle of dusk and dawn and begins one hour before and ceases one hour after dusk/dawn. Due to the upward movement of elvers within the Erne estuary, there is no generation in the interim night-time period. For 2024 this continuous generation protocol was always maintained for both Cliff and Cathaleen's Fall generating stations.

3.3 The Clady and Crolly Salmon

The Clady River estuary at Bunbeg village.

A juvenile salmon captured during the 2024 electrofishing survey of the Clady catchment.

Salmon and Recreational Angling

Adult salmon ascending the upper Clady River pass through the fish lock located at Gweedore Weir. The census data for 2024 is shown in Figure 6 and Table 11. These indicate that salmon returns were only average when compared to previous years. The Clady and Crolly Rivers were both open as recreational salmon angling fisheries for 2024. In some of the previous years, both rivers had operated as catch and release fisheries (C+R), and were lightly fished, most likely due to the C+R status. However, both catchments have always been open for brown trout fishing. Fishing permits were made available on the Inland Fisheries Ireland website IFI again supplied an angling boat on the shores of Lough Nacung on the Clady system for visiting anglers to access the Lough.

Two seasonal Fisheries Officers were employed in a dual role covering both fisheries protection and development.

Details of their 2024 work is as follows:

Protection

When compared to 2023, there was a significant increase in angling activity and salmon numbers captured by anglers, and this was reflected in the sale of permits. The increase in salmon numbers captured was very evident on the Crolly river, especially during the month of July 2024. On the Clady River fish were recorded in all sections of the river from Gweedore Bridge to the sea at Bunbeg. In general angler compliance with the wild salmon and sea trout regulations was very high with a total of four Fixed Penalty Notices being issued over the year for angling related offences.

Water samples from the Clady River for environmental DNA analyses by University College Cork.

IFI officers carried out regular foot patrols at low water on the Gweedore estuary to ensure no nets were fixed on the main channel. Coastal patrols were carried out from Rannafast Bay to Gweedore Estuary and to Bunaninver Bay in the north. The main aim of these coastal patrols was to detect illegal fixed nets set from the coast which would target salmon and sea trout destined for the Clady and Crolly River systems. During 2024, two nets were seized on the Clady River by IFI protection staff.

Over the 2024 season there were two unattended net seizures on the Clady River. One net was washed onto the riverbank, the second net was concealed in the undergrowth. In response to these seizures, several covert surveillance operations and foot patrols were carried out at these locations. No further illegal activity was detected.

During 2024, ESB Sustainable Rivers staff completed a catchment-wide electric fishing survey of the Clady catchment. The purpose of this study was to establish the density and geographic status of the extant wild salmon populations for the river. Only salmon, trout, and eel were recorded. Tissues samples from the released salmon and trout were retained for University College Cork genetic analyses. The densities of salmon, trout, and eel are shown in Table 10. As expected, salmon fry densities decreased towards the upper catchment where brown trout population predominated. Similarly, the eel was only recorded within the lower catchment areas surveyed.

An illegal unattended fixed net on the Clady River.

Electric fishing sites surveyed by ESB staff during 2024 on the lower section of the Clady River.

Electric fishing sites surveyed by ESB staff during 2024 on the lower section of the Clady River.

Electric fishing sites surveyed by ESB staff during 2024 on the lower section of the Clady River.

Electric fishing site surveyed by ESB staff during 2024 on the lower section of the Clady River.

Electric fishing site surveyed by ESB staff during 2024 on the upper section of the Clady River.

Electric fishing site surveyed by ESB staff during 2024 on the upper section of the Clady River.

Electric fishing site surveyed by ESB staff during 2024 on the upper section of the Clady River.

In the first few weeks of the season, IFI officers concentrated upon bank clearance along the access pathways to both rivers' systems. During times of reduced angling activity, the staff focused on angling access development and maintenance work. Strimming and selective pruning of riverside vegetation was also conducted to improve angler access to pools and to prevent excessive shading of the river.

A fresh rod caught grilse salmon being returned to the Clady River during 2024.

Table 10. The results of the 2024 electric fishing survey of the Clady River.

Site name	Clady Catchment	Time Finished	Area Finished (m2)	No. Salmon	Salmon / min-1	No. Trout	Trout / min-1	No. Eel	Eel / min-1
Gweedore Bridge	Main channel	20	220	16	0.8	2	0.1	2	0.1
Residential Access, Coshclady	Main channel	20	200	103	5.2	3	0.2	2	0.1
Resdiential Access, Coshclady	Main channel	29	300	13	0.4	3	0.1	4	0.1
Bunbeg Bridge, Bunbeg	Main channel	18	225	19	1.1	2	0.1	1	0.1
Altmore, Forest Road Bridge	Clady, Altmore stream	18	49.5	16	0.9	11	0.6	0	0.0
Slab Culvert, Binmore	Glentornan stream	17	72	11	0.6	13	0.8	0	0.0
Road Bridge, Dunlewy	Devlin River	22	203	23	1.0	7	0.3	0	0.0
Dunlewy Road Bridge	Croaniv Burn	14	210	10	0.7	1	0.1	0	0.0

Table 11. The adult salmon and sea trout census data for 2024. This data is recorded by the Vaki Riverwatcher fish counter located on the Clady River at Gweedore Weir.

	Salmon			Trout		
	Upward	Downward	Nett Upward	Upward	Downward	Nett Upward
January	0	0	0	1	1	1
February	1	4	-3	2	0	2
March	1	3	-2	7	5	2
April	0	2	-2	8	12	-4
May	7	0	7	37	8	29
June	40	9	31	58	0	58
July	56	2	54	5	0	5
August	43	0	43	0	2	-2
September	0	0	0	5	1	4
October	1	0	1	4	5	-1
November	1	0	1	8	8	0
December	0	0	0	3	4	-1
Total	**150**	**20**	**130**	**138**	**46**	**46**

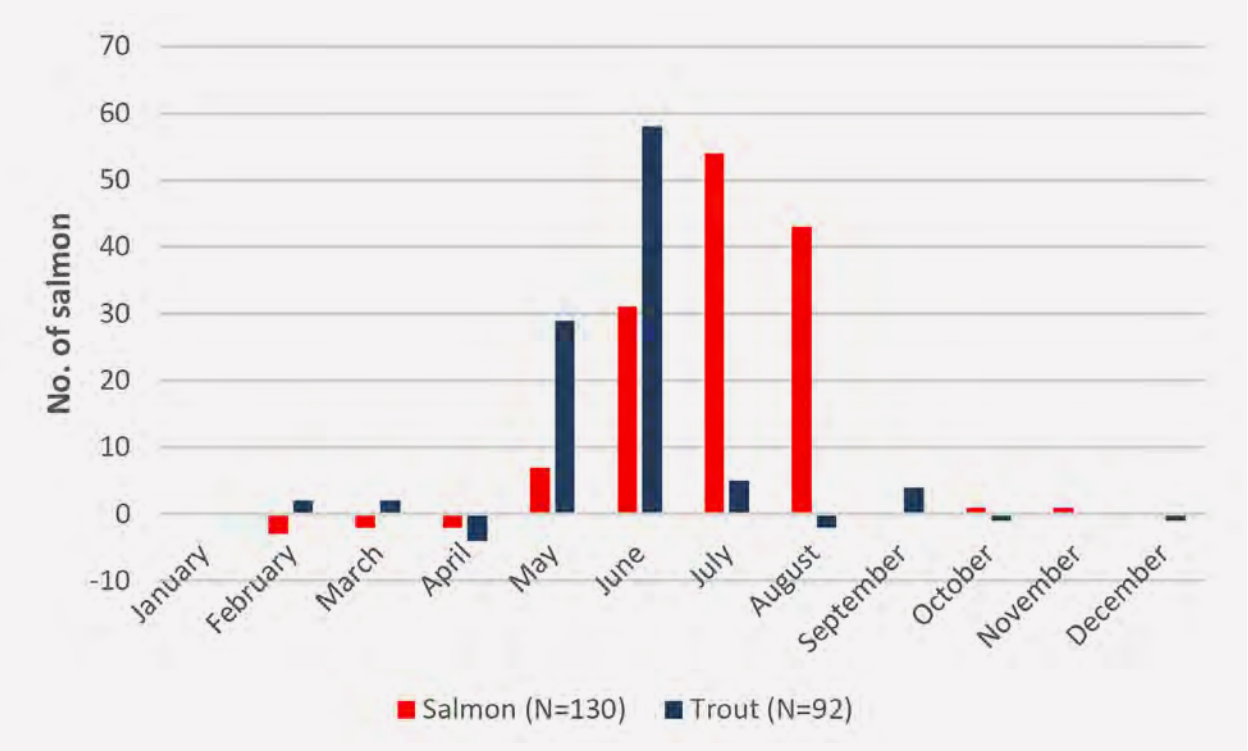


Figure 6. The monthly census data for adult salmon and trout ascending the Borland fish lift located at Gweedore Weir on the Clady River in 2024.

Inland Fisheries Ireland staff on a kayak patrol on the Crolly estuary.

IFI staff clearing angling access paths and providing a footbridge on the Clady and Crolly Rivers.

IFI staff clearing angling access paths and providing a footbridge on the Clady and Crolly Rivers.

IFI staff clearing angling access paths and providing a footbridge on the Clady and Crolly Rivers.

3.4 The River Liffey Salmon

Salmon entering the upper Liffey need only ascend the fish pass at Leixlip generating station, as only this station lies in the path of these migrating fish.

A fish counter is sited on the upper end of the fish lift at Leixlip hydro station. It is a 'Logie' resistivity type counter with one channel covering the width of the fish lift chute and provides a full count of salmon that pass up-river past this point of the river.

The 2024 annual census of the numbers of salmon shows that 193 salmon ascended the fish pass at Leixlip from February onwards (Figure 7). This indicates that the fishery installation (fish pass and spillway gates), is working satisfactorily and that enough smolts are not using the Kaplan turbine as a downstream route. The census figure of 193 compares to 387 in 2023 and just 81 in 2022 (which was the lowest on record).

The IFI operated fish census counter from the lower site at Islandbridge showed that 172 salmon ascended the weir. However, this is only a partial count as many fish ascend the section of weir not covered by the fish counter.

During the annual smolt season (mid-March to mid- June 2024), a salmon smolt and elver generation protocol was implemented which allows for the continuous spilling of surface water through a spillway gate and through the fish lift located at the station.

Water spilling into the upper entry point of the Leixlip station Borland fish lock, during the 2023 salmon smolt and elver generation protocol.

Leixlip reservoir.

Water spillage through the 'trash flap' gate at Leixlip station as part of the 2024 smolt generation protocol.

Recreational fisheries of the River Liffey

Although owned and managed by ESB, Poulaphouca reservoir is currently leased to the Dublin Trout Anglers Association. The fishery, located at Blessington, Co. Wicklow, is a mixed one and there is provision of easy access points and car parking facilities. During 2024, a total of 4,500 yearling trout were released monthly into Poulaphouca. In addition to these released fish, the survivors of stockings in previous years were also captured during 2024. There were reports of good catches of wild fish during the month of June, but low water levels impacted fishing during the later months. Fishing was also good on Poulaphouca reservoir, but low water levels impacted fishing during the later months. Poor pike fishing was reported at both sites, which was like previous years.

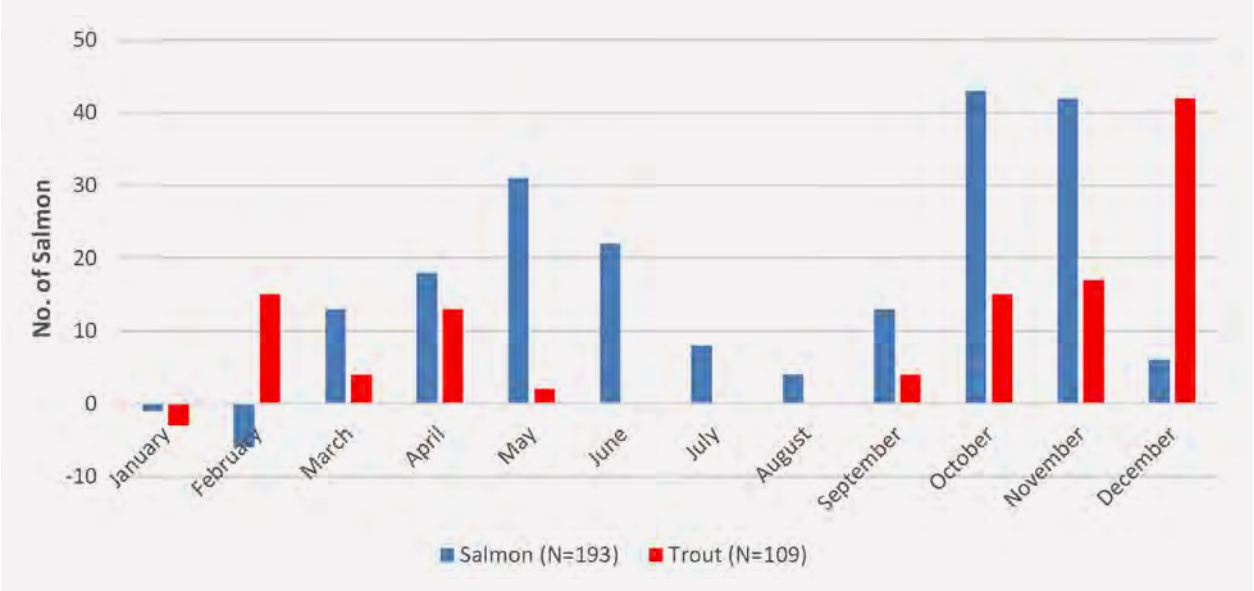


Figure 7. The monthly census data of the Leixlip fish counter for 2024.

3.5 The River Lee Salmon

Initiated in 1994, the River Lee Management Programme aims to assess the status of salmon populations in the catchment, with a view to managing stocks at acceptable levels of abundance.

Due to the decline of Upper River Lee salmon large numbers of fingerling salmon of River Shannon origin were stocked out into the area above Carrigadrohid dam. The results obtained from smolt traps on the Borland- MacDonald fish-locks during the 1960's indicated that the smolt output was poor, and as a result, the area downstream of Carrigadrohid was concentrated upon for restocking purposes.

Carrigadrohid hatchery was established in 1956 as a smolt producing facility with the objective of releasing smolt downstream of Iniscarra dam. Reared smolt were adipose fin clipped in selected years and it was determined that virtually all adults returning to Iniscarra were of hatchery origin. Since 1993, all reared smolt have been adipose fin- clipped and selected lines have also been coded wire tagged. This has facilitated the separation of reared and wild adult salmon.

An electric fishing survey, carried out in 1993, indicated that naturally spawned juvenile salmon occurred at all sites sampled below Iniscarra and at satisfactory densities. However, upstream of Iniscarra, juvenile salmon were present only at sites close to the reservoirs. These sites were surveyed again in 2001, 2003, 2005 and 2009 and the results were similar to the 1993 survey in that a very healthy salmon population predominated below Iniscarra station, whereas only isolated populations were to be above the stations (largely as a result of restocking efforts).

The area above the two stations has been annually restocked with juvenile salmon and, in addition, a smolt generation protocol has been introduced to facilitate downward smolt migration.

The River Lee breeding and genetic programme

Of the 151 reared salmon transferred to the hatchery in 2024, just 3 females were designated as multi sea winter (MSW) fish. Both MSW and grilse designation characteristics are used for Carrigadrohid, Parteen and Ballyshannon hatcheries. The designation characteristics are that females up to 71cm and males up to 84cm are considered to be one sea-winter (1SW) or grilse, whereas salmon larger than these are considered to be MSW salmon.

Carrigadrohid hatchery

Carrigadrohid hatchery was officially opened in 1956 and extended in 1970. It is located immediately downstream of Carrigadrohid generating station. The annual target production is 1 million unfed fry and 50,000 smolts for release into the Lee catchment. There is no commercial aquaculture activity in the hatchery unit.

Recently laid down fertilised ova at the Carrigadrohid hatchery unit.

Production of ova, unfed fry, parr and smolt

A total of 69,430 fin-clipped salmon smolts were released into the lower reaches of the Lee in during the period 26th March - 3rd April 2024 (Table 12). The release site is Iniscarra cemetery located below Iniscarra station.

Table 12. The number of juvenile salmon (smolts) released from Carrigadrohid hatchery in 2024.

Smolt	Location of Release	Month	Number released
Lee	Below Iniscarra station (Iniscarra Graveyard)	March 26th - April 3rd	69,430

Adult salmon census for 2024

The automatic fish counting system is situated at the upper exit of the Borland-MacDonald fish lift located at Iniscarra station and was fully operational for 2024.

The operation of the fish lock was continuous for the year and adult trap began operation on the 1st of October and ended on the 11th of December 2024. Flood conditions on the Lee, with both full generation and spillage, effectively ended the salmon run in late November. All ascending hatchery salmon (n=151) were removed from the upper chamber of the fish-lock and transferred to Carrigadrohid hatchery. All wild salmon (n=28) were immediately released above Iniscarra station. The monthly capture of salmon is shown in Figure 8 and Table 13. All adipose fin- clipped or reared salmon were removed and retained at Carrigadrohid hatchery for breeding purposes. The stripping programme began on the 2nd of November and ended on the 28th of December. In total 56 pairs were successfully stripped and a small number of fish which remained unripe in late December 2024 Upper River Lee. All stripped hatchery fish (which were not micro- tagged), were released at Iniscarra cemetery which is located below Iniscarra station.

The stripping of the broodstock resulted in a total of 112,600 fertilised ova.

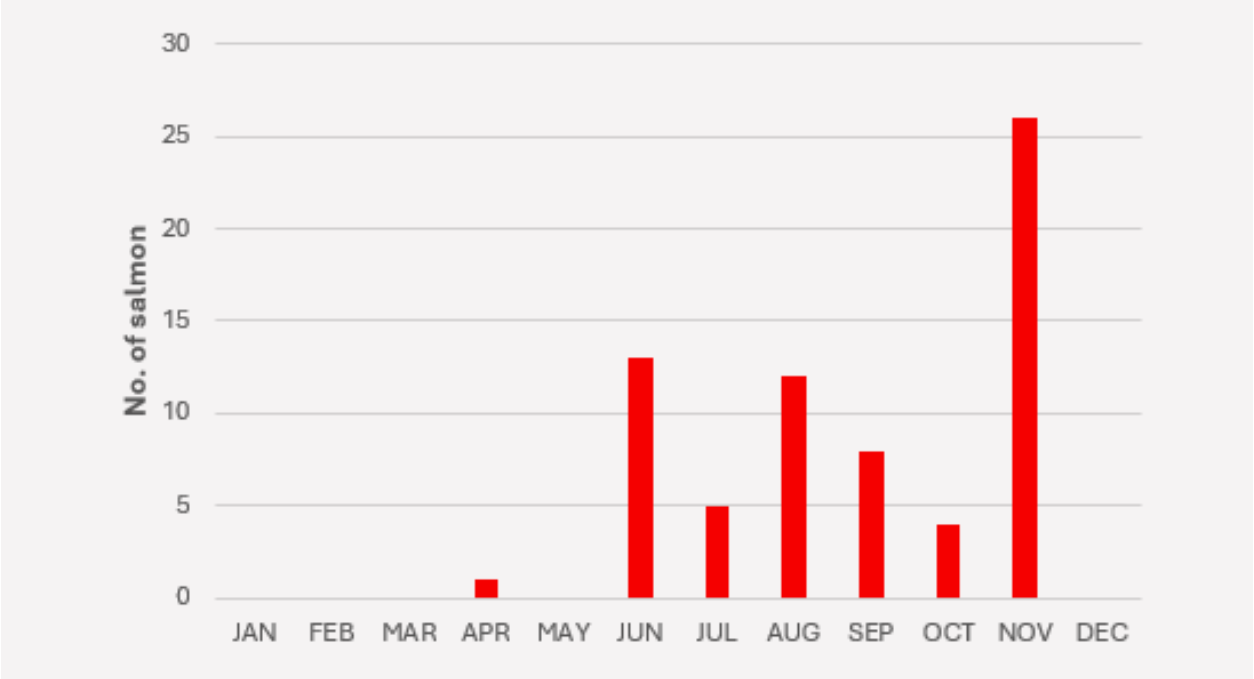


Figure 8. The monthly census of adult salmon (n=44) ascending the Iniscarra station fish pass for 2024.

Performance of the River Lee Recreational Salmon Fisheries in 2024

At the ESB Iniscarra fishery, the declared catch was 84 salmon. Previous years catches are shown in Table 15. Of the 84 rod captured salmon in 2024, 40.9% were wild salmon, the remainder being hatchery adipose fin-clipped salmon. The weight of the catches ranged from 3lbs to 11lbs. The monthly distribution of the declared rod catch is shown in Table 14 and Figure 7.

Table 14. The performance of the Iniscarra salmon rod fishery during 2024.

Year	Rod Catch
2024	83
2023	79
2022	82
2021	55
2020	88
2019	29
2018	30
2017	72
2016	62
2015	35
2014	128
2013	78
2012	302
2011	200
2010	218
2009	372
2008	131
2007	574
2006	227

Table 15. The monthly distribution of rod captured salmon, (n=84) on the ESB owned Iniscarra fishery for 2024.

	Wild	Hatchery	Total
April	3	3	6
May	6	9	15
June	6	13	19
July	10	11	21
August	4	7	11
September	5	7	12
	34	**50**	**84**

The ESB owned section of the Lee fishery located downstream of Iniscarra station fished poorly in the beginning of the season with catches falling slightly towards the season's end (Figure 9). This was despite the large numbers of anglers present on the fishery particularly in the early morning and during evenings. 'Catch and release' of salmon was commonly practiced by many anglers and the routine checking of permits by ESB and IFI staff helped with the management of the fishery. The largest salmon (5 in total) recorded on the Iniscarra fishery were caught in April, May and early June and were all 11lbs weight. Two were hatchery fish and three were wild.

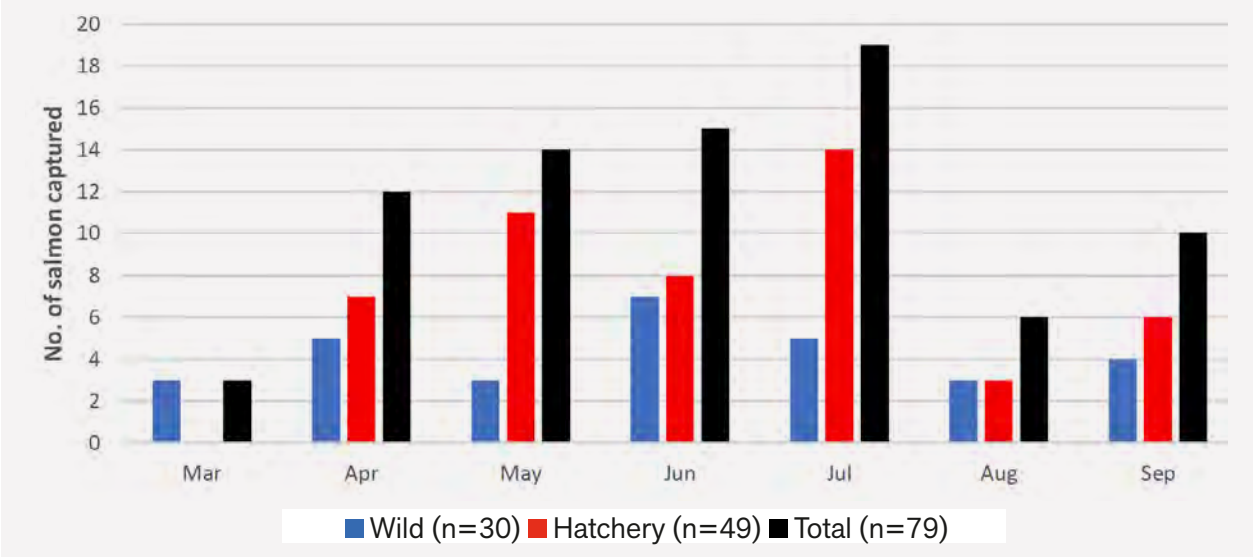


Figure 9. The 2024 monthly capture of hatchery and wild salmon on the Iniscarra angling fishery.

Table 13. The 2024 monthly capture of hatchery and wild salmon in the Iniscarra station adult salmon trap.

	Hatchery (n=124)		Wild (n=21)		
	Male	**Female**	**Male**	**Female**	**Total**
November	90	61	25	3	179
December	0	0	0	0	0
Total	**90**	**61**	**25**	**3**	**179**

Lee generating protocol to assist smolt migration

A night-time generating protocol was implemented at Carrigadrohid generating station during the months of April, May and June for the 2024 smolt season. As in previous years, water was discharged continuously (approximately $3m^3sec^{-1}$), through the fish-locks in order to encourage smolts to descend via this route. No night-time generation is undertaken at Iniscarra, except when necessary, during flood episodes. High discharges are maintained on the lower River Lee immediately after the release of the adipose fin- clipped reared smolts to assist smolt migration.

Chapter 4. River Enhancement & Conservation Work

In general, specific areas of the Shannon catchment which have been selected for habitat restoration works, are those catchments which have been previously drained, and which presently suffer from having a homogenous canalised type of habitat, with a capacity of supporting a limited number of fish species and life stages. The list of sites to be worked upon is also reviewed by the Shannon Fisheries Partnership Group which is a partnership arrangement made up of ESB Sustainable Rivers, Inland Fisheries Ireland (IFI) and local angling clubs.

The catchments worked upon in 2024 included:
1. The Mulkear.
2. Castleconnell.
3. The Little Brosna (Camcor tributary).
4. The Ballyfinboy River.

Appropriate Assessments (AA) are carried out, the need for which originates from Article 6(3) of the EU Habitats Directive (Directive 92/43/ EEC). This considers whether a plan or project, alone or together with other plans and projects, is likely to have significant effects on any European Sites. This is in view of the best scientific knowledge and the conservation objectives of the respective sites. European Sites are those identified as sites of European Community importance designated as Special Areas of Conservation (SAC) under the Habitats Directive or as Special Protection Areas (SPA) under the Birds Directive.

Each specific site work plan is drafted by IFI staff working in partnership with ESB Sustainable Rivers staff. Where appropriate, the Office of Public Works (OPW) and the National Parks and Wildlife Service (NPWS) are notified of these works, and a screening report for an Appropriate Assessment document is completed. Permission for access to individual work sites is also requested from the local landowners and with the co-operation of the local angling clubs and other recreational riverine users.

Due to some of the selected areas having undergone arterial drainage during the past few decades, the individual plans aim to change the physical habitat from a drained homogeneous area towards re-creating a naturally heterogeneous habitat. As a result, many stages of fish will be able to inhabit the newly formed areas, and many species of fish will be able to populate a given stretch of river. All the areas being worked upon have a favourable water quality status to ensure the survival of the various fish populations both during and after the habitat works.

The habitat work programme may be categorised into two different areas:
(1) Instream work: This work involves the recreation of the riffle-glide-pool sequence that would normally be representative of a healthy, un-drained river. However, in many drained rivers this riffle-glide- pool sequence has been removed as part of the drainage process and the bed of the river has been altered and/or lowered. Thus, a homogeneous or ‘canalised’ river is what remains after the drainage work, which is unsuitable for a naturally balanced fish population. In general, the number of fish species occupying an area, and the number of individual fish, is greatly increased if a variety of habitats are present. Instream works includes building stone vortex weirs and alternating deflector placement of random boulders, spawning gravel and rock armor bank protection. The timing of the work is especially important as spawning fish may be present during the late autumn to late spring

months. Therefore, all instream works are scheduled for the period May to mid- September. The flood conveyancing capacity of each the rivers remains unaffected, as all in-river structures are designed and built to be submerged in high flow conditions without any damage to the structure or riverbank.

(2) Riparian/bank side work: This work is carried out during the winter months as tree pruning is prohibited under law during the bird nesting season. Works include the removal of excess overhanging vegetation, where it causes excessive shade or 'tunnelling' of the river. Excessive tunnelling by riverbank vegetation prevents light entering the river and thereby reduces the instream productivity. An example of this would be that aquatic plants would be absent where excess riverbank shade exists. Their absence would decrease the source of food for aquatic insects and there would also be a reduction in the amount instream cover available for resident fish to hide and the final task would be to fence the riverbank areas with post and wire, although provision is occasionally made for cattle drinking areas (depending upon land use and the landowner's view). Cattle drinking areas aim to provide restricted access to the river (within a discrete area), whilst preventing cattle trampling in an entire river bank area, which thereby may cause later erosion. Provision is made for access to the river by footpaths, gates, footbridges, stiles etc., but only after the prior permission of the landowner. Fencing is to the farming 'Acres' scheme standard where required.

ESB habitat works completed during 2024

ESB habitat works were completed at several locations during 2024. The following sections show a selection of photographs which along with some text helps to explain the wide variety, scale and quality of the work completed by ESB Sustainable Rivers staff. Where works were either uncompleted or partially completed in 2024 (due to unplanned changes such as the weather (rainfall/ river discharges) or prioritisation of other ESB work, or where the progress of these works be slower than planned, these sites will be completed in 2025.

Mulkear

During 2024, routine maintenance of existing structures was carried out on the Mulkear. This included clearing footpaths and fish access section of riverbank and completing some extensive repairs to previously constructed angling access points.

Ballyclough Weir on the Mulkear River, prior to work commencing.

Ballyclough Weir on the Mulkear River, being cleared to allow access onto the weir wall.

Clearing footpaths and swing gates at access points on the banks of the Mulkear fishery.

A recently cleared access point on the Mulkear fishery.

A bankside footpath prior to clearing. on the Mulkear fishery.

A bankside footpath after clearance. on the Mulkear fishery.

Castleconnell

Angling access works and general maintenance of the area were completed throughout Castleconnell during 2024. Work was carried out along the riverbanks where some selective clearance was undertaken. The spraying of emerging Giant Hogweed with glyphosate was undertaken by the Castleconnell Fishery Association (CFA). Giant hogweed is one of the first plants to emerge in Spring and in 2024 the CFA had persons (courtesy of the Castleconnell CE scheme), committed to the program for the months of April and May. The best return from this selective spraying is during the early months before other growth catches up. Volunteers from the CFA also 'adopted' a stretch of river to identify straggler plants and spray them in later months. Around June/July the CFA sprayed the other highly invasive non-native plant, the Himalayan Balsam, which was present but not as pervasive. This was mainly done at the bottom of the fishery (Beats 5 and 6).

The Little Brosna (Camcor River)

During 2024, the Riverstown section of the Little Brosna River was worked upon. Site access points were replaced, and stock proof-fencing was erected.

A wooden stile which will be replaced with a pedestrian gate.

A pedestrian gate recently erected at Riverstown section of the Little Brosna in 2024.

The Ballyfifinboy River

A section of the Ballyfinboy River Co. Tipperary was worked upon in 2024. The works included rock armour for badly eroded riverbanks, removal of largescale blockages of deadwood and within river trees, the provision of cattle drinking areas (rather than full access for livestock to the entire river). Random boulders were placed in the previously homogeneous channel to provide cover for fish and help with the creation of territories. The final task was the provision of livestock fencing to the ACRES standard.

An area of the Ballyfinboy River where bank slippage has occurred. The large limestone boulders have been delivered to the site and aligned along the riverbank. A tracked machine will selectively place these along the riverbank to prevent further slippage.

A length of riverbank where rock armoring of the bankside has been completed.

Chapter 5. The European Eel

Eel Trap & Transport volumes are impacted by a number of environmental factors including water discharge and volumes, lunar cycle, weather patterns and associated water temperatures. While ESB has extended the Eel fishing periods to maximise the catches for the Trap & Transport, volumes in Erne catchment have declined by 40% on 2023. ESB will continue to observe and assess these trends.

The following Table 16 summarises the Trap and Transport of eel that occurred during 2024 for both the silver eel and juvenile eel.

Table 16. The 2024 silver eel catches, the sites fished, and the relationship to the annual targets according to the National Eel Management Plan. Also included are the 2024 juvenile eel catches for the three catchments.

	Trap and Transport Catch (Kg)	National Eel Management Plan Target	Relation to Target	No of Silver Eel T&T Fishing Crew Sites	Juvenile Eel Catch (Kg)
Shannon	32,248	30%	97.4%	3	196.55
Erne	29,081	50%	81%	5	1,791.6
Lee	1,162	500Kg	232.4%	1	0.1
Totals	**62,491**				**1,988.35**

Eel Trap & Transport volumes are impacted by a number of environmental factors including water discharge and volumes, lunar cycle, weather patterns and associated water temperatures. While ESB has extended the Eel fishing periods to maximise the catches for the Trap & Transport, volumes in Erne catchment have declined by 40% on 2023. ESB will continue to observe and assess these trends.

5.1 The River Shannon Eel

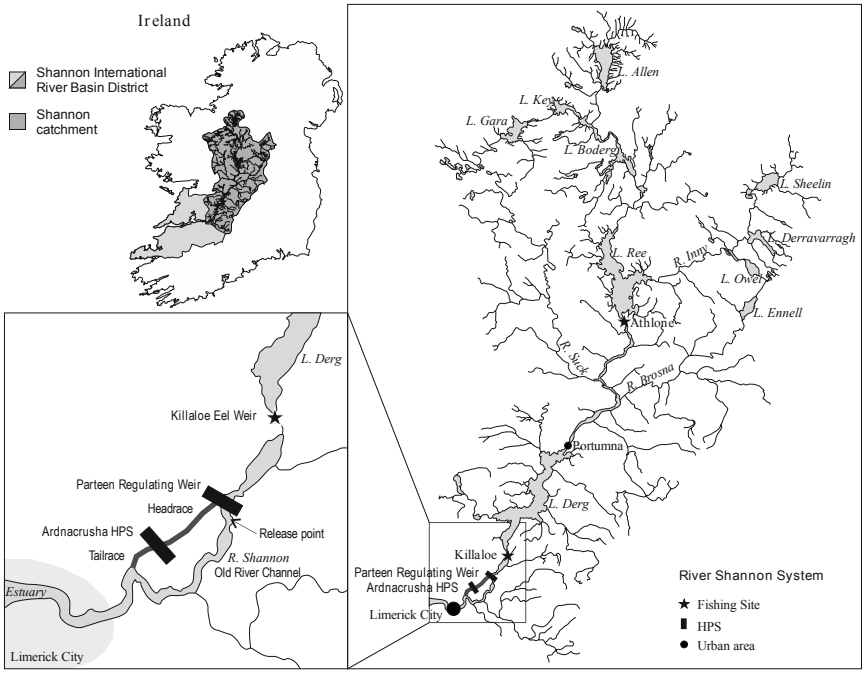


Figure 10. Map of River Shannon catchment with conservation fishing sites, release point and Ardnacrusha Hydro Power Station (HPS) indicated.

During the 2024/25 season, eel fishing for the Trap and Transport programme took place at three sites: two in Athlone and one in Killaloe (Figure 10). Fishing started in the last week of August 2024 at Athlone and in the first week of October 2024 at Killaloe. While fishing ended in January 2025, it continued at Killaloe until the beginning of March 2025. A total of 30,240 kg of eels were captured at Athlone (28,107 kg at the Jolly Mariner site and 2,133 kg at the Yacht Club site), with an additional 2,078 kg caught at Killaloe. Of the Killaloe catch, a total of 70kg was used for scientific sampling. The total trap and transport catch for the season amounted to 32,248 kg (Figure 11).

An aerial photograph of Ardnacrusha station.

An aerial photograph of Parteen Regulating weir on the Old River Shannon and the Ardnacrusha intake gates on the headrace canal.

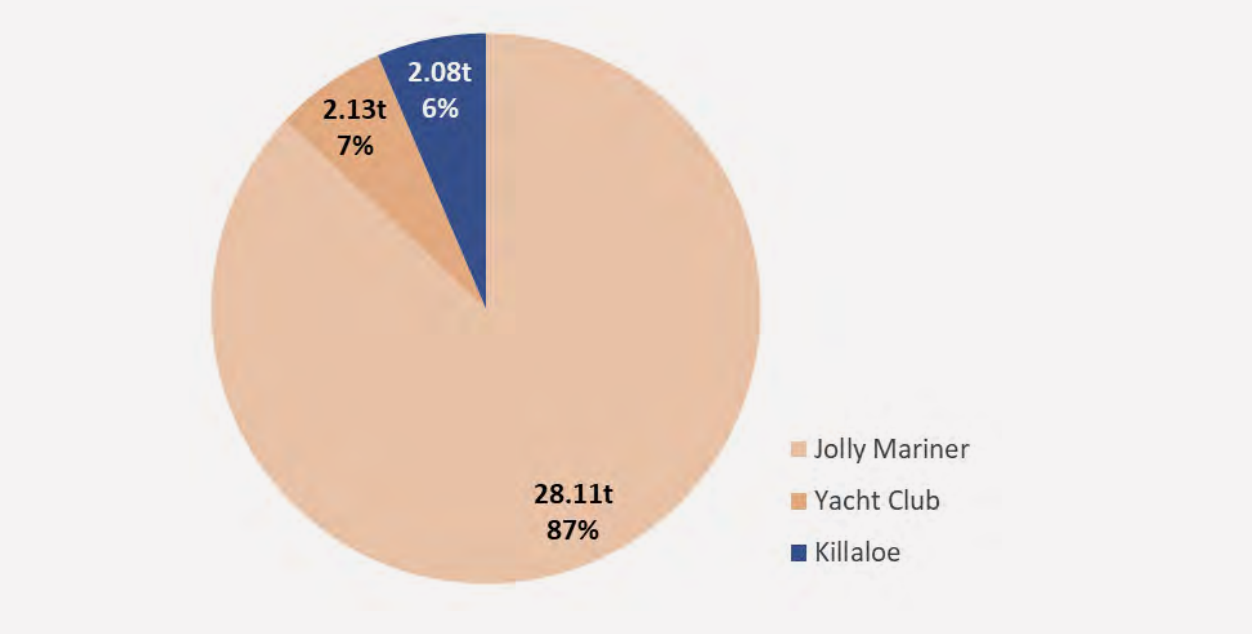


Figure 11. The proportions of the total capture of silver eel during the 2024/2025 season.

The total Trap and Transport catch in 2024/25 was 8.4 tons higher than the previous season and represents the highest T&T capture since the 2018/19 season (Figure 12). The Jolly Mariner fishing site for most of the catch, with 28.1 tons, making up 87% of the total eel capture for the season. Notably, there was a 59.1% increase in the catch at this site compared to the 2023/24 silver eel fishing season.

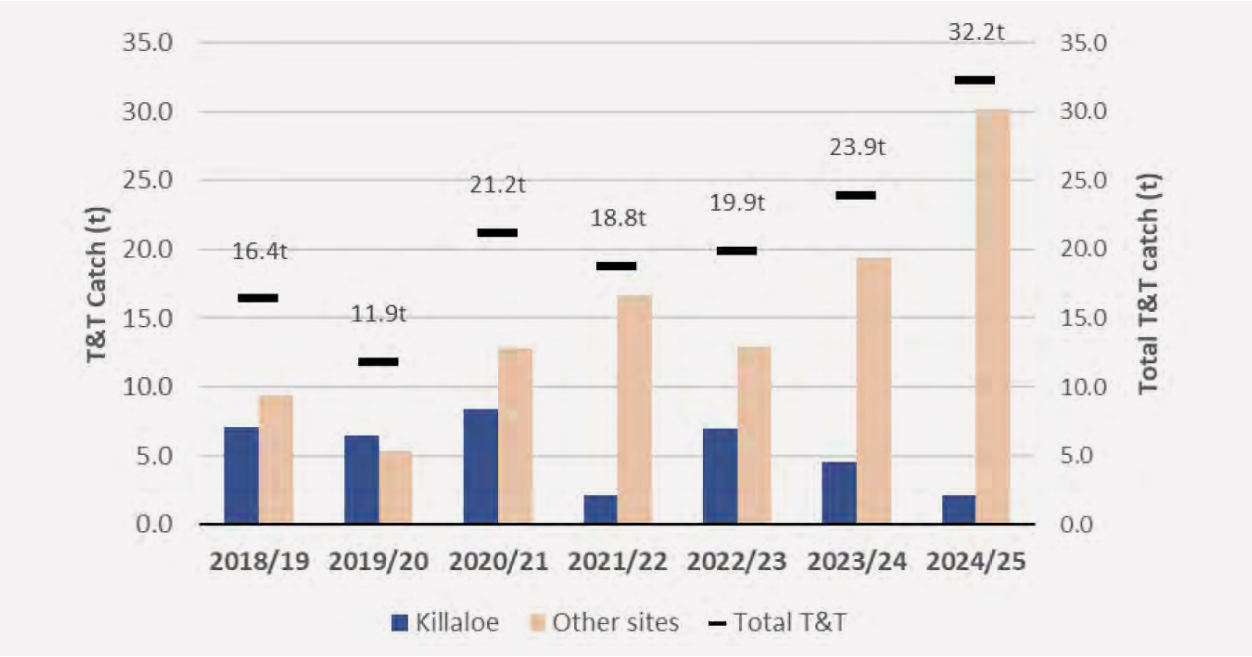


Figure 12. The Shannon trap and transported silver eel catches, released over the past seven years, showing the proportion of Killaloe and other site catch contributions.

The average discharge during the 2024/25 season was 189.9 m^3sec^{-1}, which is 49% lower than the previous season's average of 373.7 m^3sec^{-1}. Water spillage accounted for 5.5% of the total seasonal River Shannon discharge (Fig. 13). The spillage consisted only of the statutory 10 m^3/s released through the old river channel and the Ardnacusha station fish pass. Daily catch rates at the Killaloe eel weir are displayed in Figure 14, along with variations in discharge and spillage. The highest catches were recorded during the first moon quarter phase in November and the last moon quarter phase in January.

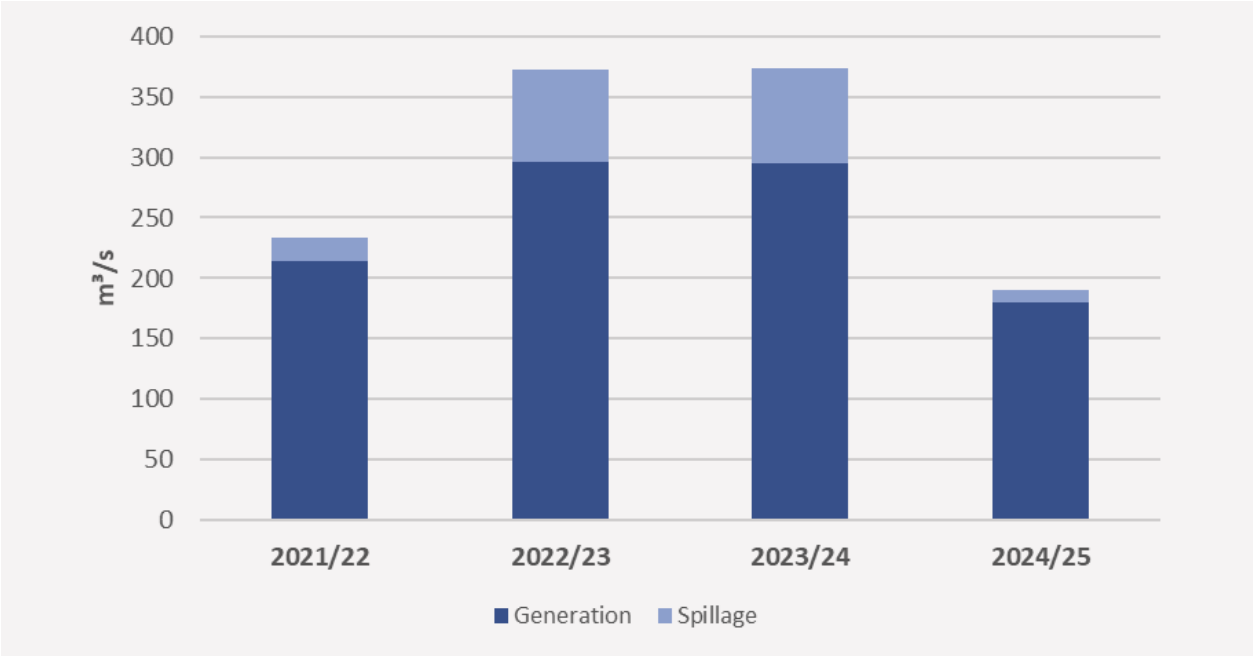


Figure 13. The River Shannon average seasonal discharge in 2024 and a comparison with previous years.

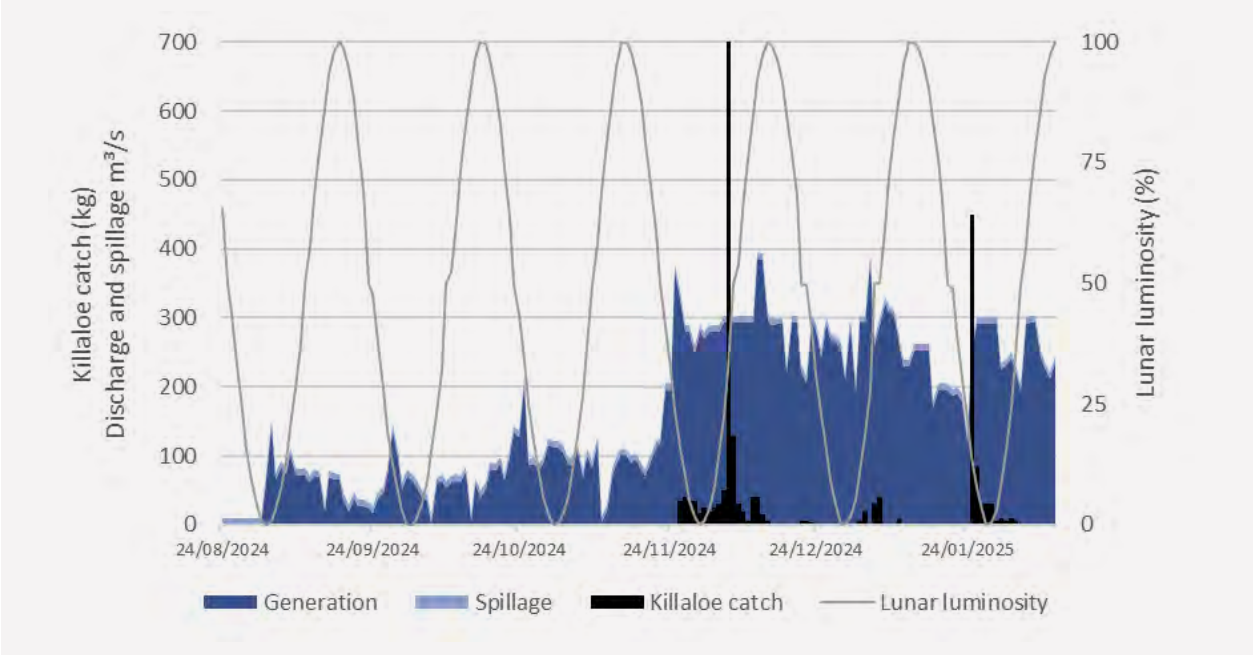


Figure 14. The variation in daily catches at the Killaloe fishing site, in relation to the lunar cycle, discharge and spillage during the 2024/25 season.

Production and escapement data for the River Shannon are summarized in the flow diagram (Figure 15). The estimated production of 37,356 kg is derived from the trap and transport catch at Killaloe, using a fishing efficiency rate of 29.2%, along with the catch from the two Athlone sites. This efficiency rate for Killaloe is based on fourteen Mark-Recapture experiments conducted by the University of Galway between 2016/17 and 2019/20. In total, 32,248 kg (86.3% of the production) was transported beyond the hydropower station via trap and transport. Of the 5,038.4 kg that passed beyond the Killaloe weir, it is estimated that 384.8 kg (7.6%) migrated through the Old River Channel. This estimate is based on the amount of spillage to the Old River Channel, determined using a regression model derived from historical telemetry studies of migration route selection. An estimated mortality rate of 21.15% (984.2 kg) occurred at the Ardnacrusha hydropower station from the 4,653.6 kg that entered the headrace, leaving 4,054.2 kg to continue downstream. This results in an escapement of 36,302.2 kg, or 97.4% of the total production.

The estimates for production, escapement, and trap and transport quantities over the last six years are generally consistent, except for the 2021/22 season, where production was 13 tons lower (Figure 16). The percentage of escapement relative to production has remained high throughout, ranging from 86.8% to 97.4%.

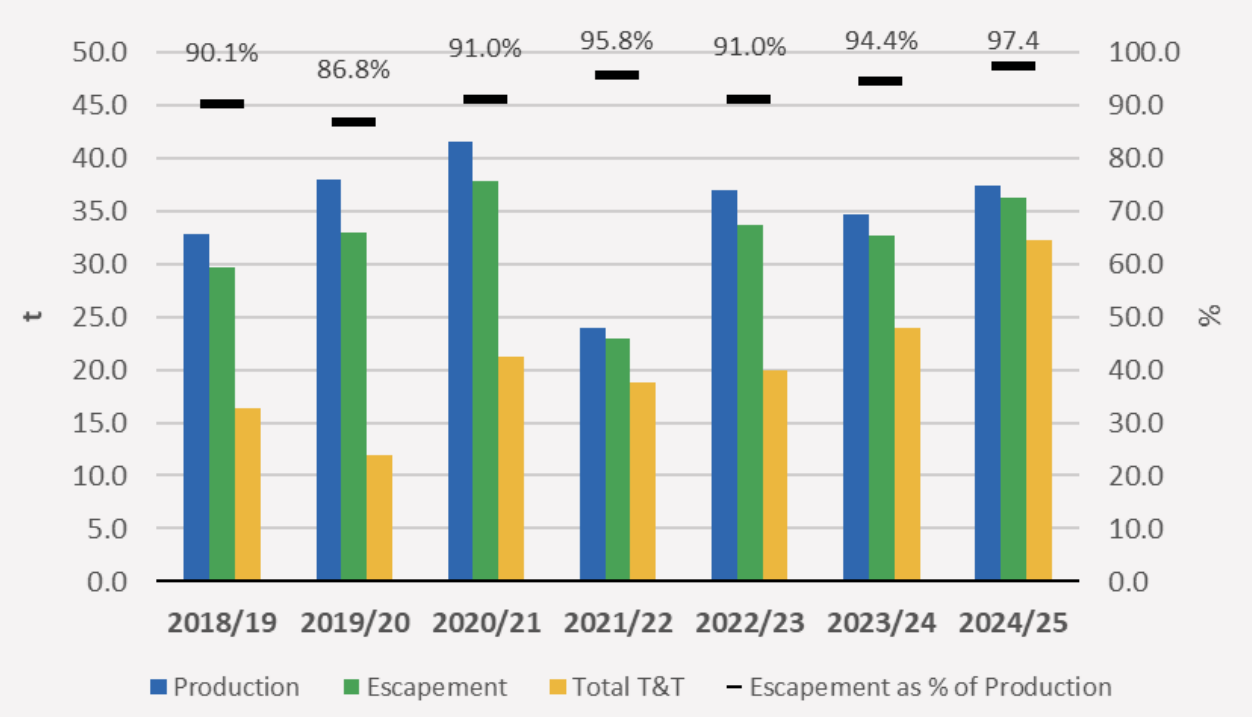
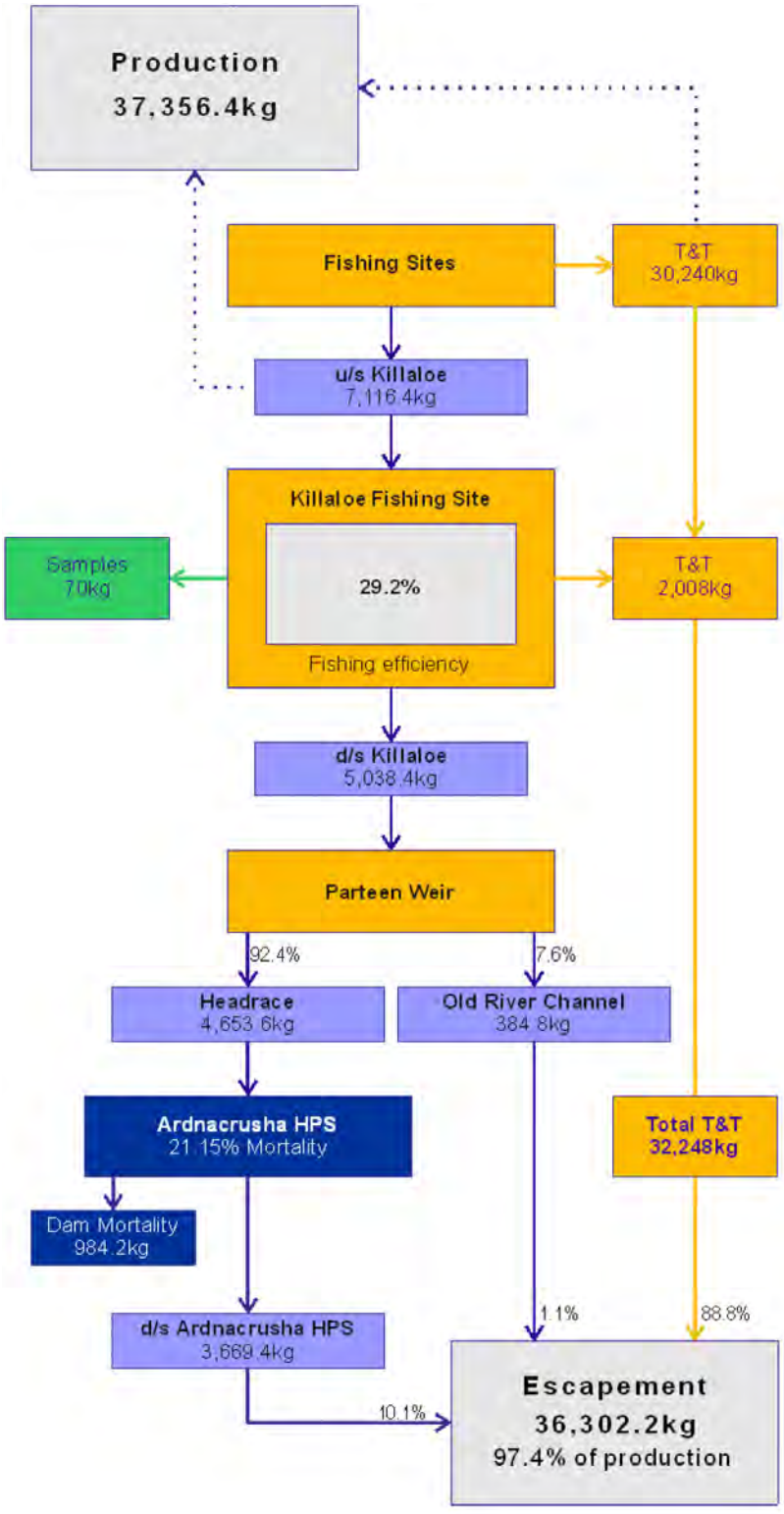


Figure 16. Estimates of eel production, escapement, trap and transport quantities and escapement as a percentage of production values in last seven subsequent years.



1. Total trap and transport catch as reported by the crew at Killaloe eel weir.

2. The fishing efficiency rate for Killaloe is based on 14 mark-recapture experiments conducted by NUIG between 2016/17 and 2019/20. No eels were tagged at this site since.

3. The biomass upstream was estimated using actual catch data collected at the site and the estimated efficiency rate.

4 & 5. A regression model, based on historic telemetry data is used to calculate the proportion of eels migrating downstream of Killaloe which migrate via the Old River Channel or Ardnacrusha headrace. This regression model uses the proportion of total flow released to each channel daily to estimate the biomass of downstream migrating eels travelling via each route.

6. Production is estimated as the biomass of eels captured upstream of the Killaloe combined with an estimate of the remaining biomass of uncaptured silver eels migrating to Killaloe eel weir.

7. Escapement is calculated as the biomass of eels surviving dam passage, eels circumnavigating Ardnacrusha station via the Old River Channel and eels released as part of T&T operations.

Figure 15. A summary of the analysis of silver eel production and escapement in the River Shannon during the 2024/25 eel migration season.

Shannon Eel Stock Enhancement

ESB has been capturing upward migrating juvenile eel at several Lower Shannon locations for many decades. In recent times, efforts have been concentrated at Ardnacrusha station and Parteen Regulating Weir. The three Parteen Regulating Weir and three Ardnacrusha located juvenile eel traps were put into service on the 15th of March 2024.

Fishing activity ceased at all sites on the 6th of September. A total catch of 196.55kg was captured and transported during 2024 (Table 17). This compares to a total of 974.2, 656.43kg, 102.4kg, 1,172.6kg and 13.4kg for 2023, 2022, 2021, 2020, and 2019.

The catches of juvenile eel (151.9kg) at Parteen Regulating Weir were a mixed catch of fingerling eel and elver. All catches of juvenile eel are released into the Shannon catchment above Ardnacrusha station and Parteen Weir. The results of the 2024 elver catches again show the Shannon catch to be in decline (like the European eel population trend). The trapping of juvenile eel will continue in 2025. The Ardnacrusha elver traps have been extensively refurbished over the period 2017-2020. These refurbishments included;

- The provision of increased water supplies at a variety of differing locations to the old Ardnacrusha elver ramp trap. Water from existing discharge points was also diverted and now discharge close to, or onto the ramp area. This increased discharge helps attract juvenile eel to the main trapping area.
- The provision netting at all sites to deter avian predators.
- A walkway was added to allow easy access to the large ramp area. This will also allow regular servicing/maintenance of the site.
- The replacement of the older mat climbing substrate with a new bristle type of matt substrate. These bristle mats are of varying spacing intervals which therefore facilitate juvenile eels of varying length and climbing abilities to access the traps.
- New elver traps were added at two extra locations. These were designed to allow for differing bristle matt spacing sizes to reflect the different sizes/ages of the upward migrating juvenile eel.

The climbing substrate used for the juvenile eel traps.

The climbing substrate used for the juvenile eel traps.

Table 17. The catch of juvenile eel at the three ESB operated locations for 2024. The entire catch of 196.55kg was released into the Shannon catchment above Parteen Regulating Weir and Ardnacrusha Generating Station. These catches represent both elver and larger juvenile or 'bootlace' eel (particularly those captured at Parteen Regulating Weir).

	Parteen Weir			Ardnacrusha			Total
	Old Trap (Fish Pass)	New Trap (Fish Pass)	Middle Bank	Large Trap	Fish Pass Trap	Mechanical Workshop Trap	
March (15/3/2024)	0.7	0	0	0	0	0	0.7
April	14.7	0	0	0.15	0	0	14.85
May	101.4	0.02	0	1.01	0	0	102.43
June	12.9	0.19	0	2.52	0	0.27	15.88
July	15.7	0.17	0	36.0	0	0.26	52.13
August	6.0	0.02	0	4.42	0	0.02	10.46
September (6/9/24)	0.1						0.1
Total catch	**151.5**	**0.4**	**0**	**44.1**	**0**	**0.55**	**196.55kg**

5.2. The River Erne Eel Programme

The River Erne, a transboundary system, is Ireland's second largest river system and features a vast lake habitat. During the 2024/25 silver eel season, estimates of eel production and escapement, along with an analysis of downstream population dynamics, were carried out in line with protocols established in previous years.

The River Erne, which includes an extensive lake system, drains a catchment area of 4,375 km^2. Upstream of the two lowermost hydropower dams, the system encompasses a total wetted area of 26,197 hectares (Figure 17). Discharge from the river, regulated for both flood control and hydroelectric power, is measured at Cathaleen's Fall, the downstream dam (Figure 17). During the 2024/25 silver eel fishing season, the mean seasonal discharge was 91 m^3sec-1, and the maximum of 210 m^3sec-1. Flow regulation at the hydropower dams and the Portora Gates weir influences the timing of silver eel migration in the lower river reaches. The two dams are separated by Assaroe Reservoir, a man-made balancing reservoir covering 235 hectares. From the lower dam, the river flows through a 1.5 km tailrace canal into marine waters at Ballyshannon, eventually reaching the Atlantic Ocean in Donegal Bay.

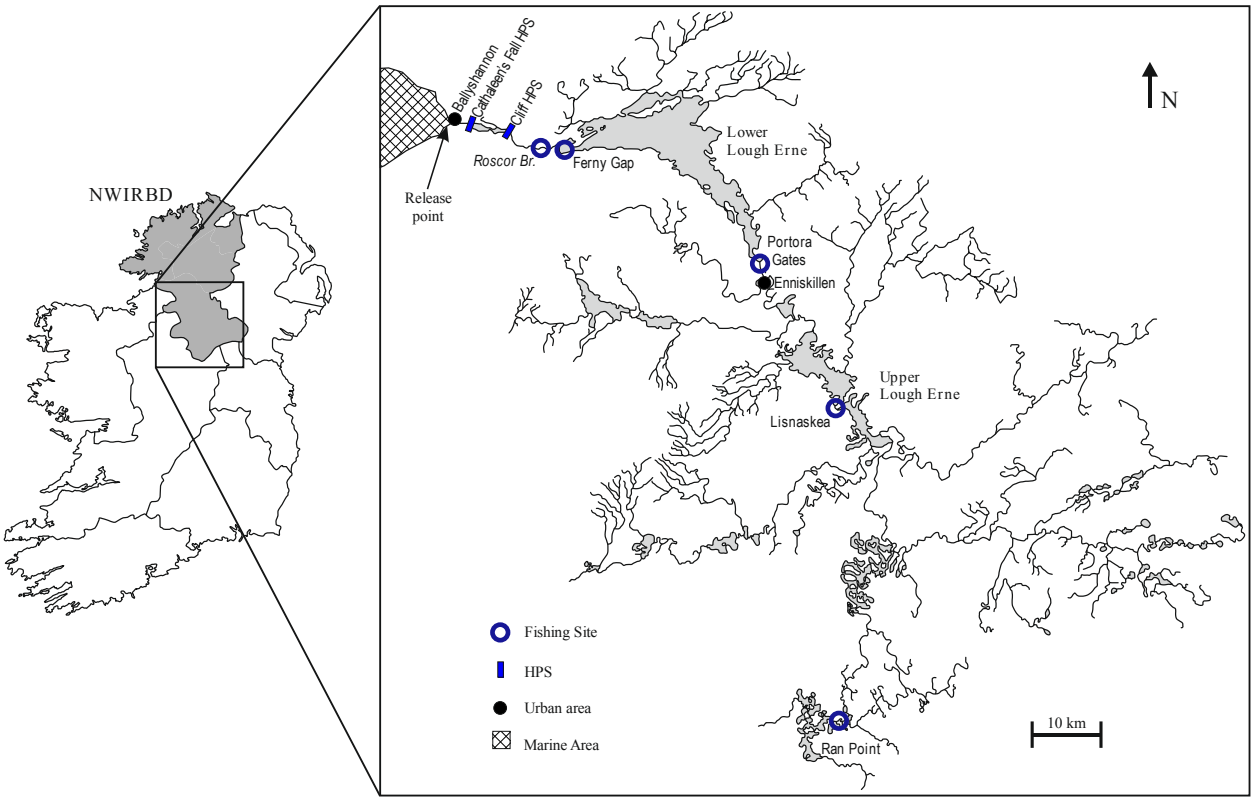


Figure 17. A map of River Erne catchment with conservation fishing sites, release point, and hydropower dams indicated.

The lower hydropower facility at Cathaleen's Fall features a 29 metre head and is equipped with two Kaplan turbines, providing a total generating capacity of 45 MW. It also includes three single spillway gates. Located 5.2 km upstream, the Cliff hydropower dam has a 12 metre head and is also fitted with two Kaplan turbines with a combined output of 20 MW, along with three double spill gates installed on a weir structure.

During the 2024/25 season, the River Erne system was fished at four sites, with their locations shown on the map (Figure 17). Roscor Bridge, the lowermost site, was not fished this season. Fishing began in the last week of August 2024 at the Ferny Gap site and concluded in February 2025. The proportions of the total catch from each site are illustrated in Figure 18. The total catch contributing to the Trap and Transport programme amounted to 29,081 kg, which is 18.95 tonnes or 39.4%, less than the previous season, and the lowest recorded in the past six seasons (Figure 19). This decline was primarily attributed to very low water discharge, with a mean seasonal flow of 91 m^3/sec-1, which is 46.5% lower from 170 m^3/sec-1 in the 2023/24 season, and 36.4% lower from 143 m^3/sec-1 in the 2022/23 season (Figure 20). Other environmental factors referenced on page 48 had a lesser impact during 2024.

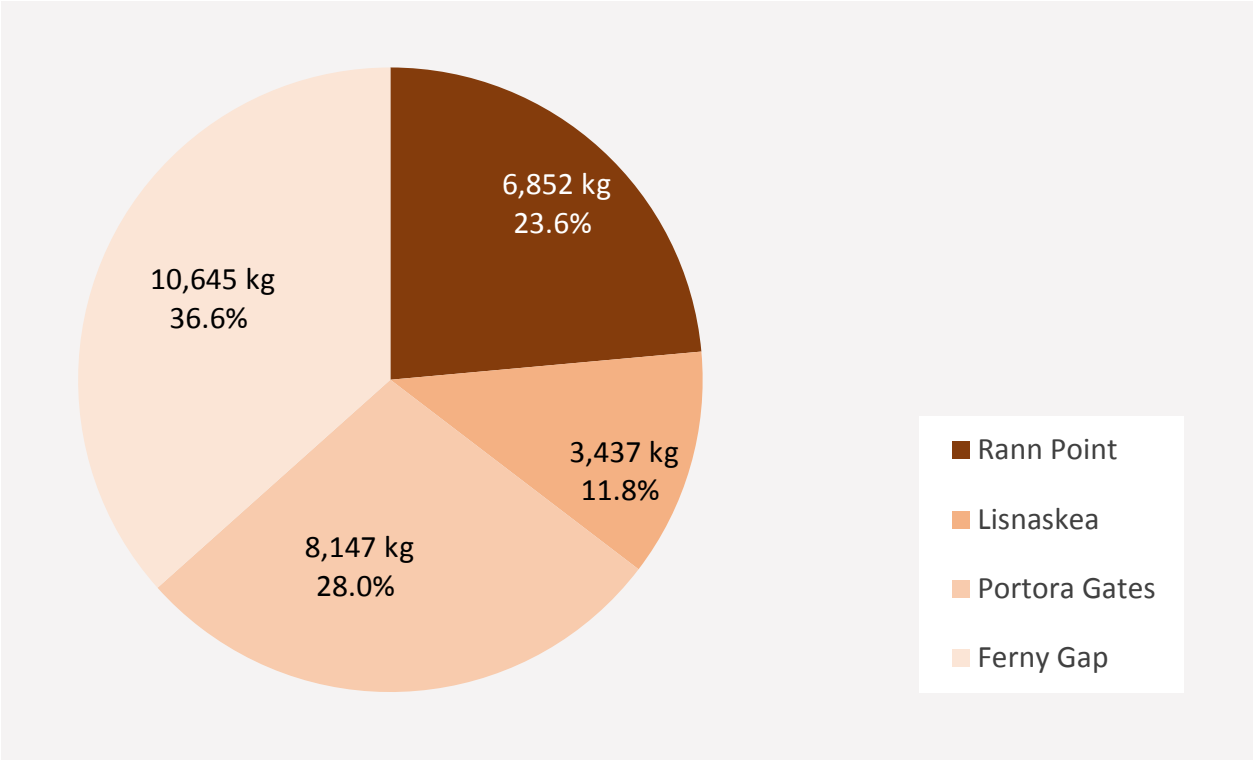


Figure 18. The proportions of the River Erne trap and transport catch obtained in each fishing location in the 2024/2025 season.

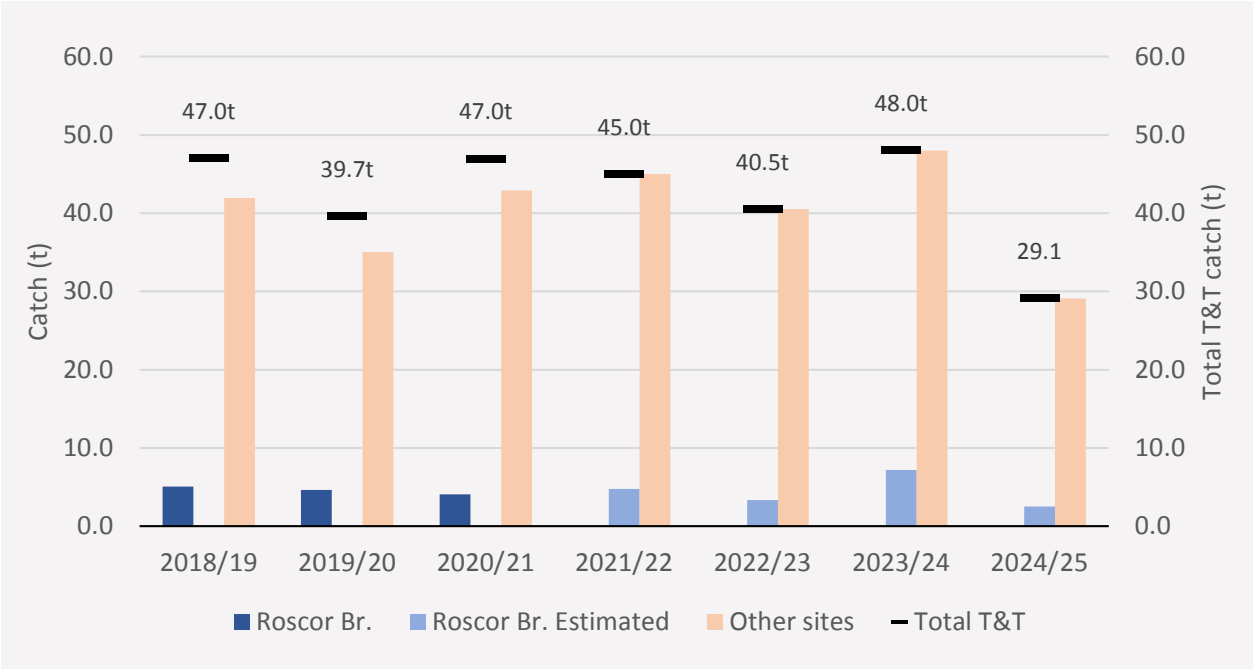


Figure 19. Total Erne Trap and Transport Program, Erne silver eel catches, released in seven subsequent years, along with proportion of Roscor Bridge fishing site catch contributions. Estimated Roscor Bridge catch in 2021/22 - 2024/25 was only used for calculations.

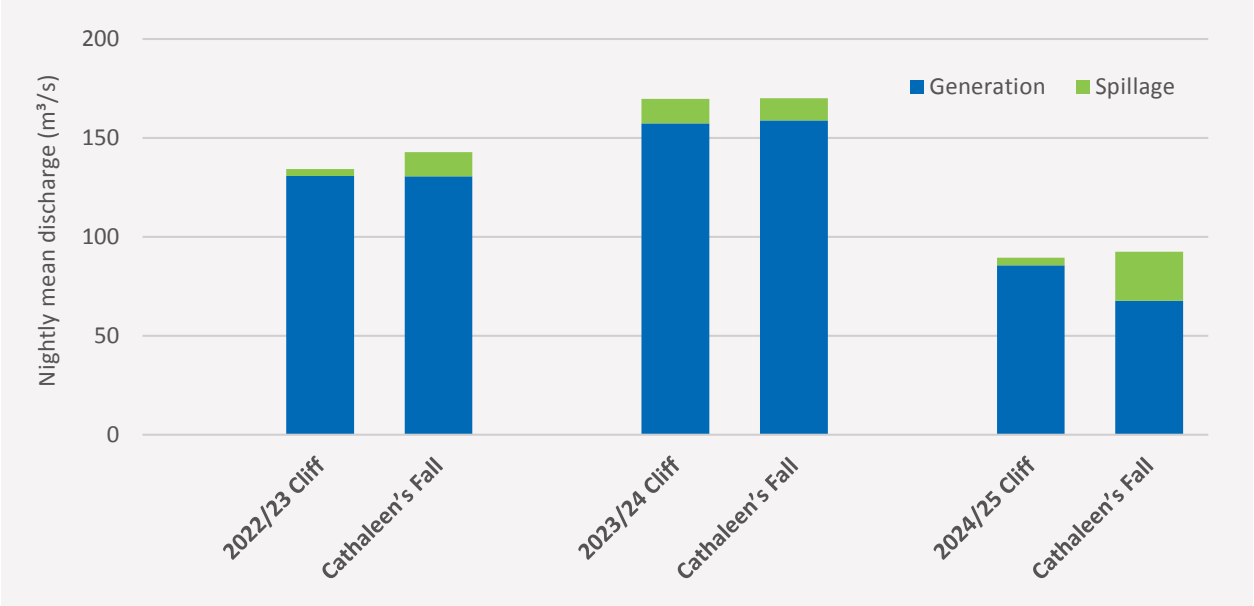


Figure 20. The mean nightly values of discharge at Cliff and Cathaleen's Fall hydropower stations during last three silver eel fishing seasons.

Because there was no fishing activity at Roscor Bridge during the season, previously the lowermost and most scientifically significant site, production estimates had to rely on the established correlation between catches at Roscor Bridge and Ferny Gap. This relationship has been monitored, recorded, and analysed since the 2010/11 season, and is statistically significant.

The Ferny Gap fishing site located in the lower section of Lower Lough Erne, an area marked by complex bathymetry and fluctuating hydrological conditions. Eels are captured using two leader nets, one equipped with three Coghill nets and the other with four, as well as five-winged river nets. Leader nets are deployed across shallow, wide channels between the mainland and islands, while river nets are positioned in the main navigational channel (4 nets) and a side channel (1 net). Due to the site's structural complexity, it is not considered suitable for use as a scientific model site (Figure 21). Daily catch variations at Ferny Gap are presented in Figure 22, along with water discharge and the lunar cycle.

Figure 21. A An aerial photo of lowermost section of lower Lough Erne

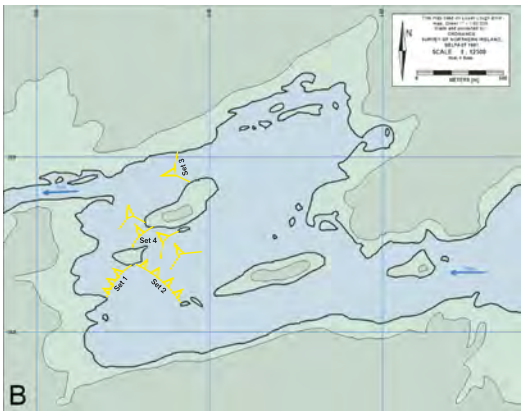


Figure 21. B Map of Ferny Gap fishing site nets arrangement.

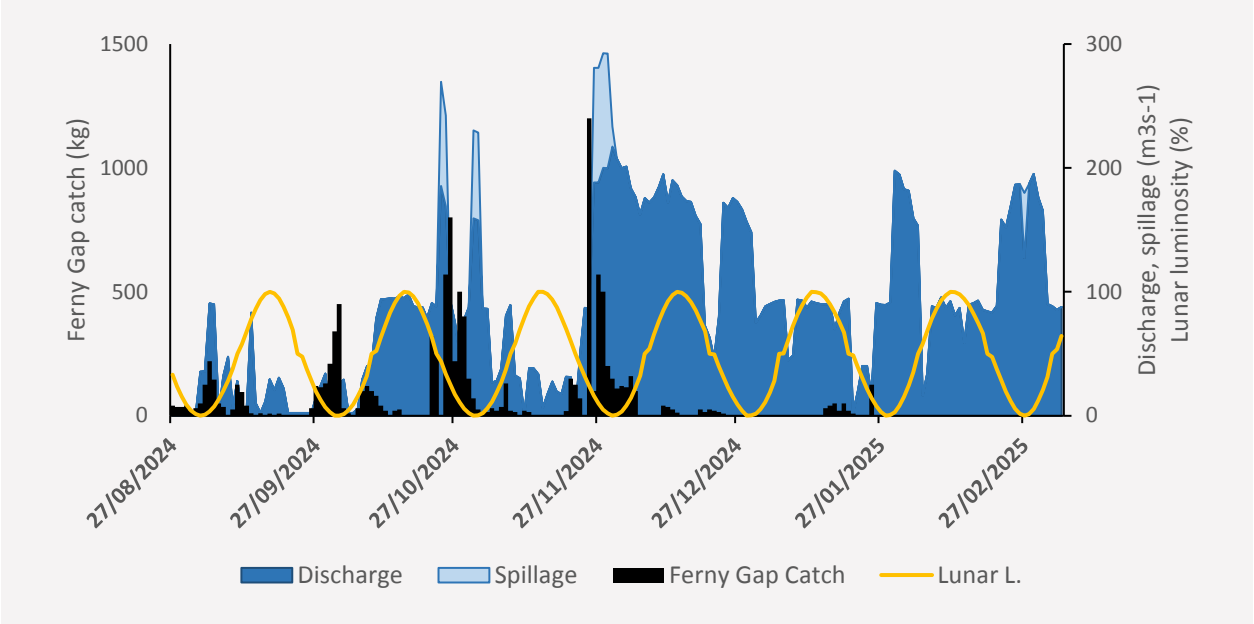


Figure 22. The variation in daily catches at the Ferny Gap fishing site, in relation to lunar cycle and discharge during the 2024/25 season.

Although the Roscor Bridge site has not been fished in the past four seasons, it remains crucial for analysing silver eel migration and for calculating eel production and escapement in the River Erne system. Situated 750 metres downstream from the outflow of Lower Lough Erne (Figure 23), the site offers a well-defined river section that allows for accurate assessment of the biomass of eels that escape capture.

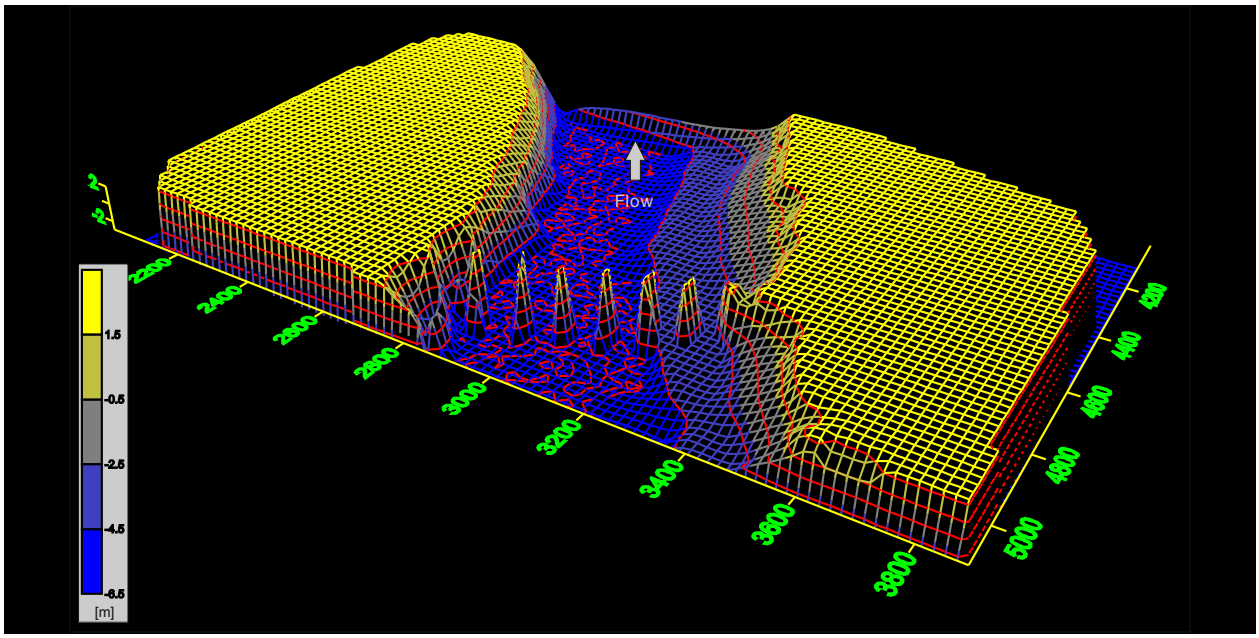


Figure 23. The bathymetry map of Roscor Bridge fishing site, upstream view.

In previous years, eel biomass at Roscor Bridge was estimated using daily catch data alongside results from extensive mark–recapture studies However, past seasons revealed limitations with Roscor Bridge as a monitoring site, particularly during periods of low discharge and catch levels, which often led to extended inactivity among fishing crews. During such times, the necessary catch records for production estimates were unavailable. This highlighted the need for and led to the development of alternative monitoring protocols to support the quantification of eel migrations at the site when Trap and Transport (T&T) catch data are lacking. Drawing on over a decade of scientific monitoring, catch levels at the Roscor Bridge fishing site can be reliably predicted. For the 2024/25 silver eel migration season, the estimated total catch at Roscor Bridge was 2,476 kg. In the same period, 29,081 kg of eels were transported via the Trap and Transport programme from the four upstream fishing sites. Production and escapement estimates were based on fishing efficiency rates derived from multiple mark–recapture studies conducted by the University of Galway at the experimental Roscor Bridge site between 2010/11 and 2015/16. These studies reported efficiency rates of 9.78% at low discharge levels (<130 m^3sec^{-1}) and 18.43% at high discharge levels (>130 m^3sec^{-1}). These efficiency values, applied to the estimated catch at Roscor Bridge and adjusted for flow conditions during the season, yielded a total estimated biomass of 22,085 kg of eels arriving at the site.

Silver eel production for the 2024/25 season was estimated at 51,166 kg (Figure 25), with an escapement estimate of 41,422 kg, representing 81.0% of total production. The Trap and Transport programme accounted for 29,081 kg, or 56.8% of total production, surpassing the 50% target by 3,498 kg. An estimated 22,085 kg of eels bypassed the fishing sites and continued downstream through the hydropower stations at Cliff and Cathaleen's Fall. Mortality rates at these stations were based on historic telemetry studies by the University of Galway, which take into account dam operation patterns throughout the season. Estimated eel mortality was 5,626 kg (25.5%) at Cliff HPS and 4,118 kg (25.0%) at Cathaleen's Fall HPS. A total of 12,341 kg of eels are estimated to have successfully passed the hydropower stations, and when combined with the 29,081 kg transported via the Trap and Transport programme, the total escapement for the 2024/25 season was estimated at 41,422 kg.

Over the past six seasons, the average escapement as a percentage of production was 82.2%, compared to 81.0% in 2024/25. Estimates of production, escapement, and Trap and Transport quantities over the last seven years have remained relatively consistent, showing no significant trends (Figure 24).

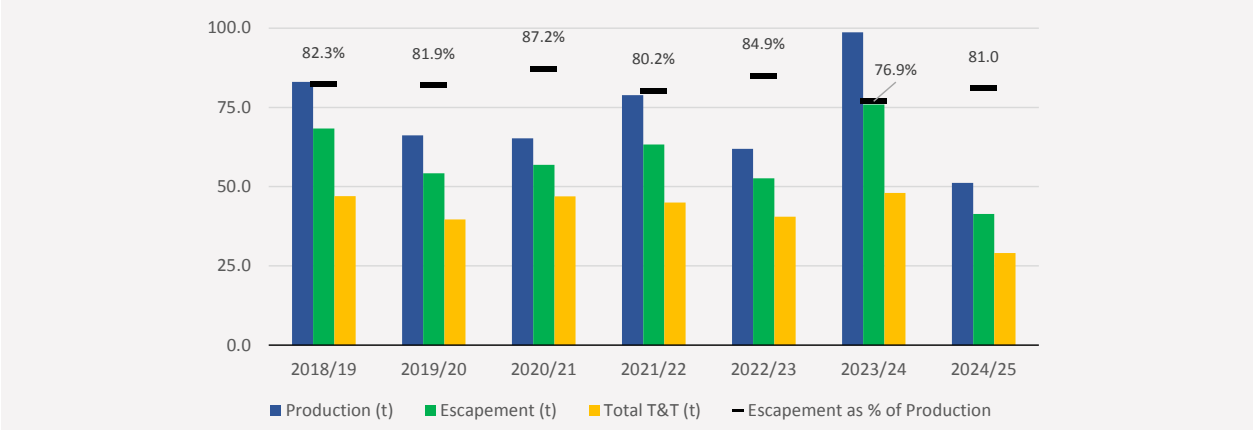
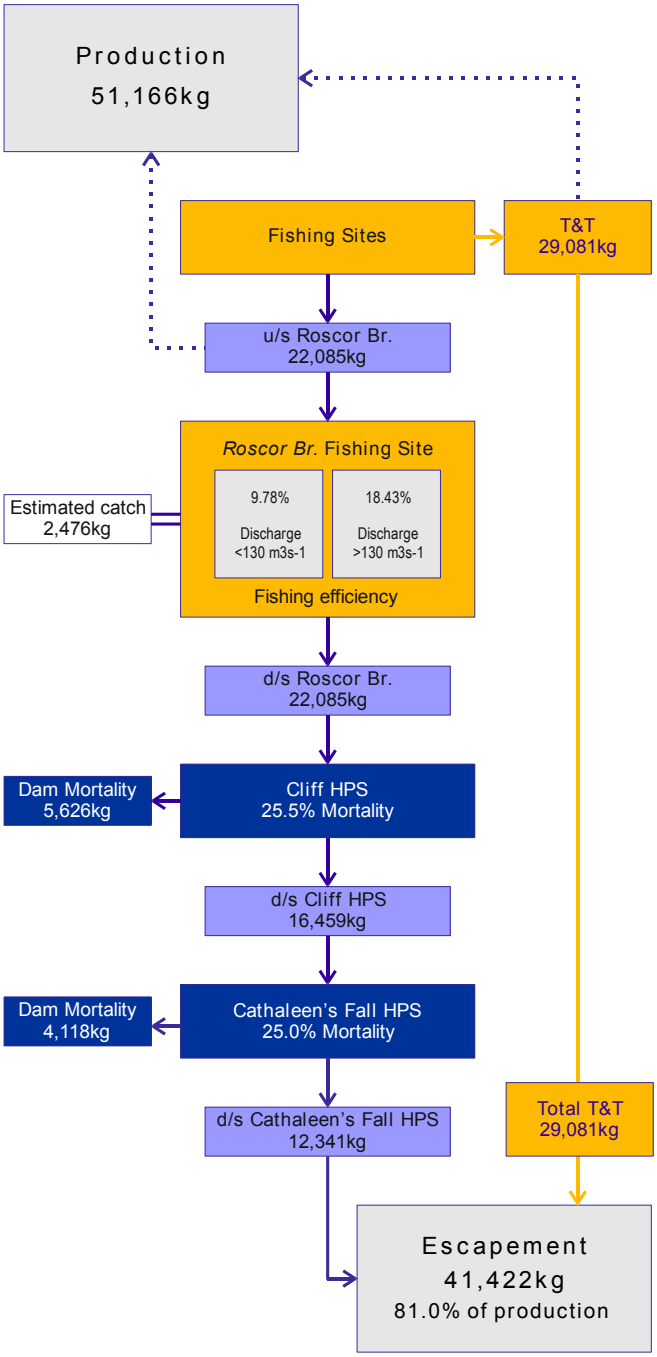


Figure 24. Estimates of production and escapement, along with Trap and Transport quantities and escapement as a percentage of production, over the past seven consecutive years.

From the 2018/19 season to 2024/25, total estimated silver eel production in the River Erne system amounted to 506.5 tonnes. Of this, 413.2 tonnes (81.6%) were estimated to have escaped. The Trap and Transport programme relocated a total of 296.3 tonnes of eels over this period, representing a substantial proportion of both escapement (71.7%) and production (58.5%). This exceeds the 50% Trap and Transport target by 8.5%, equivalent to an additional 42.99 tonnes of eels. Total mortality over the seven seasons was estimated at 93.4 tonnes, accounting for 18.4% of the total production.



1. Total trap and transport catch as reported by the five Erne eel fishing crews.

2. The fishing efficiency rate for Roscor Bridge. is based on 14 mark-recapture experiments conducted by NUIG between 2016/17 and 2019/20. No eels were tagged at this site since.

3. The biomass upstream was estimated using actual catch data collected at the site and the estimated efficiency rate.

4 & 5. A regression model, based on historic telemetry data is used to calculate the proportion of eels migrating downstream. This regression model uses the proportion of total flow released to estimate the biomass of downstream migrating eels.

6. Production is estimated as the biomass of eels captured upstream of the two Erne hydro stations combined with an estimate of the remaining biomass of uncaptured silver eels migrating through the two stations.

7. Escapement is calculated as the biomass of eels surviving dam passage, at both Cliff and Cathaleen's Fall stations.

Figure 25. The summary of silver eel production and escapement analysis in the River Erne during the 2024/25 season.

Erne Eel Stock Enhancement

A total catch of 1791.6kg was reported for the three Cathaleen's Fall elver traps during 2024. Details of the catch per month are shown in Table 18. All three traps were closed on the 8th of September. The catch of elver for the period 1959 to 2024 is shown in Figure 26. The 'R. Erne Elver Monitoring/ Trapping Protocol' (agreed between ESB, Inland Fisheries Ireland and Department of Agriculture, Environment and Rural Affairs, Northern Ireland), involves more frequent surveillance and emptying of these elver traps. During the period 2014 - 2018, significant upgrades were also carried out on the trap infrastructure which included the provision of greater water supplies and improved aeration systems. New elver ramp climbing substrates were also fitted to each of the three climbing ramps. A new entrance onto the ramp at the Southbank trap was added in 2017 to allow direct access from the fish pass entrance. An additional new trap (Northern Bank) was added to the two pre-existing Cathaleen's Fall traps in 2015.

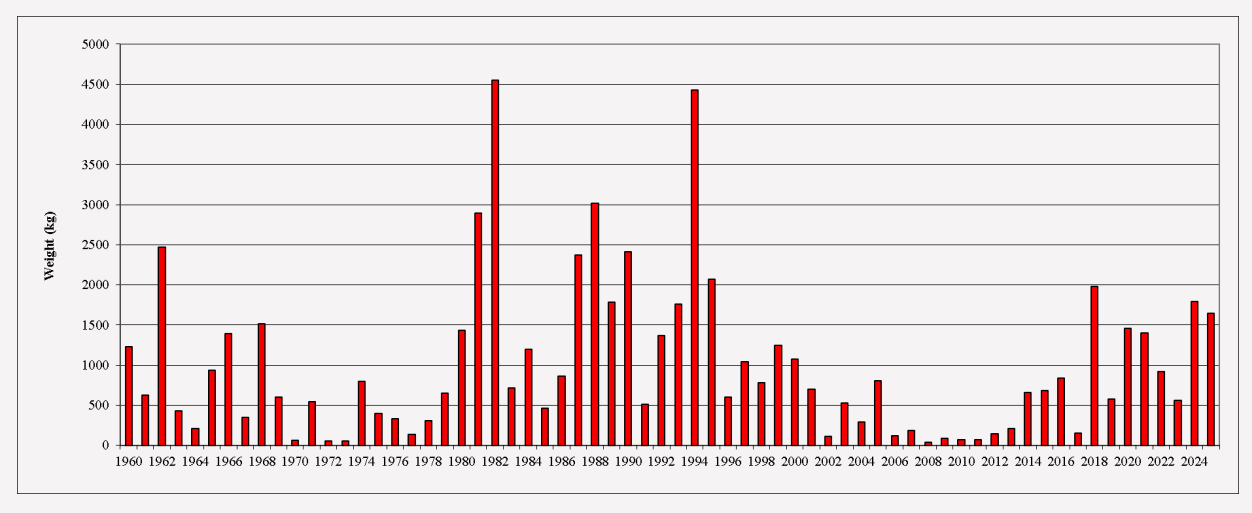


Figure 26. The catch of juvenile eel from Cathaleen's Fall generating station for 1960-2024.

Table 18. The catch and release locations of elver captured at Cathaleen's Fall generating station for each month of trapping in 2024.

	Fish Pass Trap	G5 Trap	Northern Bank Trap	Total Catch (Kg)
March (16th)	0	0	0	0
April	0	0	0	0
May	449.2	926.5	265.5	1641.4
June	53.3	50.6	8.9	112.8
July	8.7	12.0	0.2	20.9
August	7.6	7.4	0	15
September (6th)	1.1	0.4	0	1.5
Total	**519.9**	**996.9**	**274.6**	**1791.6**

5.3 The River Lee Eel

The River Lee Silver Eel Trap and Transport Programme

River Lee catchment is the largest part of the South- Western River Basin District (SWRBD), with a catchment area of 1,253 km^2 and a mean annual discharge of 27.1 m^{3}sec^{-1}. The river was harnessed for hydroelectricity generation between 1953 and 1957 when the Carrigadrohid and Iniscarra generating stations were commissioned. Large reservoirs were created upstream of the two dams. The Iniscarra reservoir with the area of 9.3 km^2, and the Carrigadrohid reservoir with the area of 5.3 km^2 (Figure 27). Natural lakes of the upper parts of the river system, like L. Allua and L. Gouganebarra are known to be inhabited by eel populations. Eels are also widespread in the lower parts of the river basin, with 27% of the catchment area being downstream of Iniscarra HPS, and in parts of Cork Harbour. River Lee discharges 14.5 km below Iniscarra Hydro Station.

Figure 27. Map of River Lee catchment with release point and hydropower dams indicated.

In the 2024/25 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 1,162 kg over 10 nights from 26th August until 4th September (Figure 28). The total catch of 1,162 kg exceeds the annual 500kg target for the river. This is another good catch following a similar level in previous years (Figure 29). Nets were set in the original riverbed within the body of the flooded area, which are the deepest sections of the Iniscarra reservoir. Weather conditions, flow of water, and an experienced crew allowed for a good catch despite the bright moon phase (Figure 28). The silver eel trap and transport catches since 2009 onwards, and the relation to the National Eel Management Plan targets are shown in Table 19.

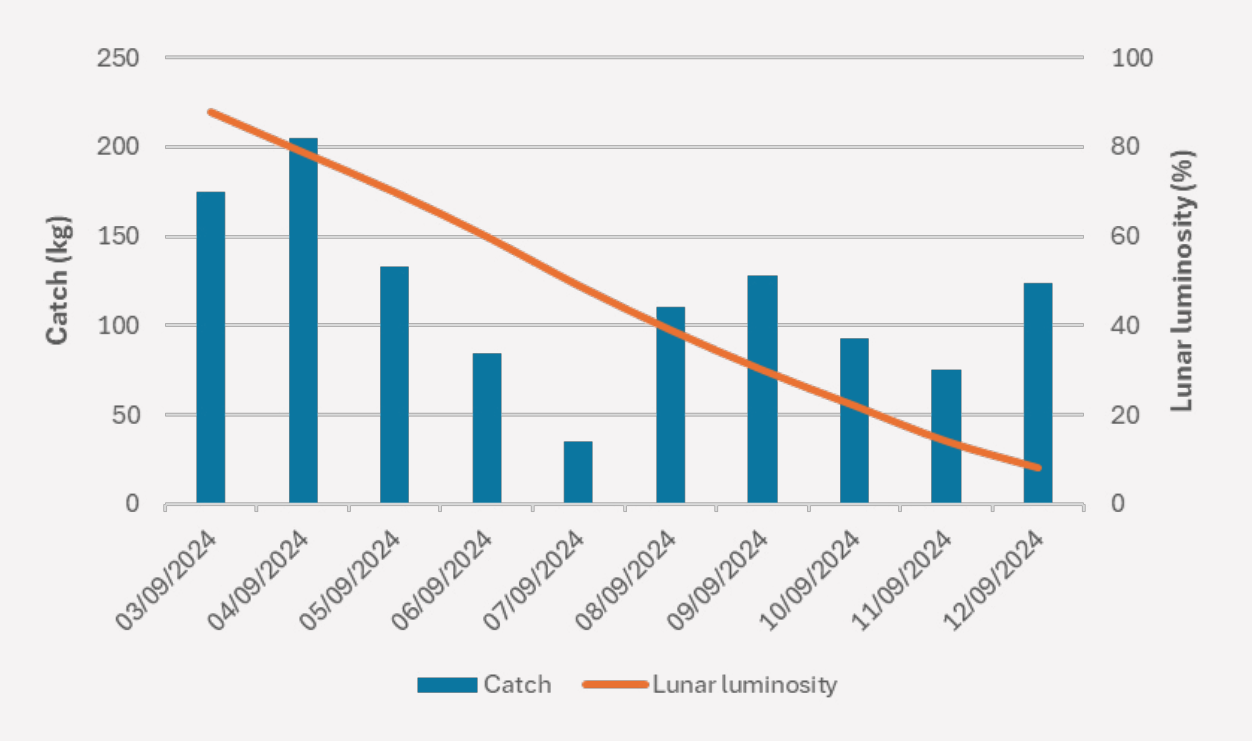


Figure 28. The variations in daily silver eel catches in relation to the lunar cycle.

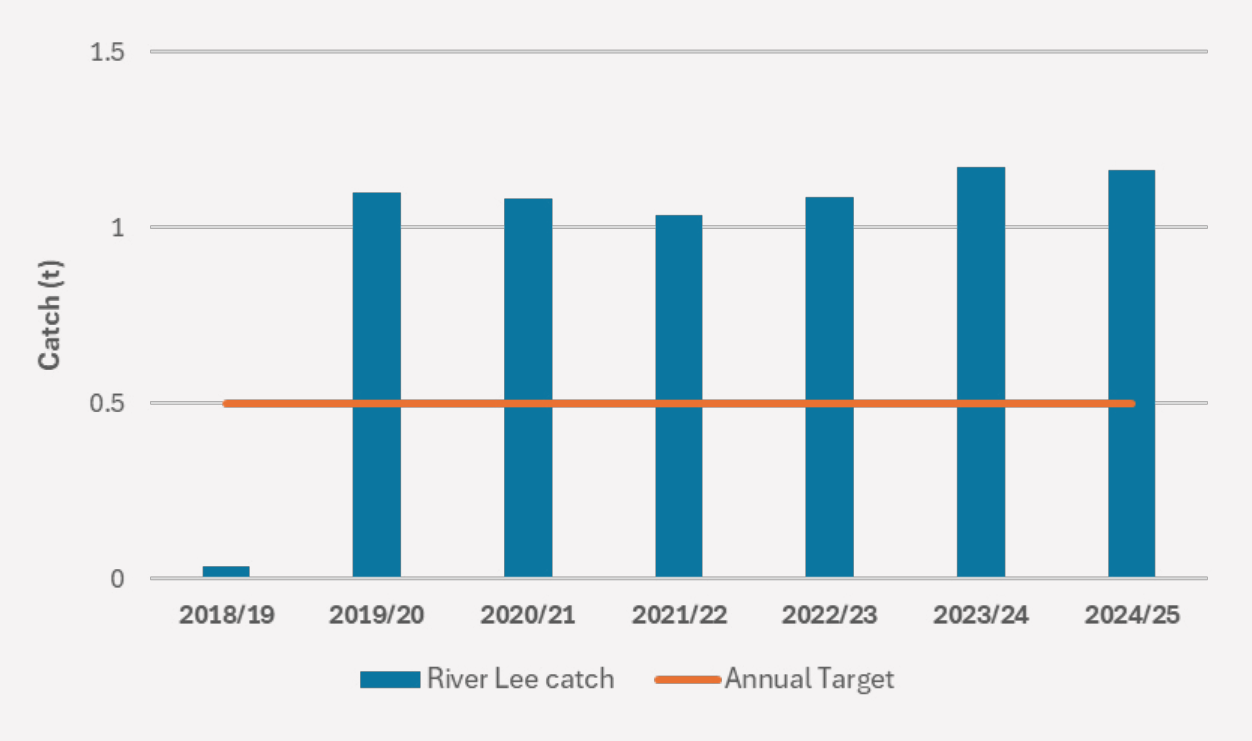


Figure 29. The variations in the River Lee silver eel trap and transport program catches in the last six fishing seasons.

Table 19. The total amount of silver eel trapped and transported on the River Lee from 2009-2024, and the amount captured and transported relative to the target of 500kg as set in the National Eel Management Plan.

Year	Amount Transported (t)	Target	Relation to Target
2009	0.079	0.5	16%
2010	0.278	0.5	56%
2011	0.731	0.5	146%
2012	0.234	0.5	47%
2013	0.824	0.5	165%
2014	0.670	0.5	134%
2015	0.515	0.5	103%
2016	0.0435	0.5	8.7%
2017	0.542	0.5	108.4%
2018	0.035	0.5	0.7%
2019	1.098	0.5	219.6%
2020	1.082	0.5	216.4%
2021	1.033	0.5	206.6%
2022	1.087	0.5	217.4%
2023	1.173	0.5	234.6%
2024	1,162	0.5	232.4%
Total	**6,638.95 tonnes**		

Carrigadrohid Hydropower Station.

Iniscarra Hydropower Station.

Lee Eel Stock Enhancement

An elver trap was first put in place in the area immediately below Iniscarra station during 2008. The total catch for 2024 was 225g (Table 20). These juvenile eels were primarily 'bootlace eel' rather than elvers. The trap operated from the 15th of March until the 15th of September 2024. Unlike previous years when catches occurred during June-August, the entire 2024 catch was recorded in July. The catches were released into the mid-catchment of the River Bride, which enters the River Lee below Iniscarra station.

As the juvenile eel trap is located at Iniscarra station, which is mid-catchment, catches are low and are like previous years, as there is a significant area of available habitat below this trapping location.

Table 20. The catches of the Iniscarra elver trap in 2024.

	Catch Amount
March (began 15th)	0
April	0
May	0
June	0
July	225g
August	0
September (until 15th)	0
Total	**225g**

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