

National Research Survey Programme

Lakes 2023

Corglass Lough

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Iascach Iníre Éireann
Inland Fisheries Ireland

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Fish Stock Survey of Corglass Lough, August 2023



**Iascach Intíre Éireann
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National Research Survey Programme

Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

CITATION: McLoone, P., Corcoran, W., Bateman, A., Cierpial, D., Cornthwaite, Y., Gordon, P., Heagney, B., Hyland, J., McCarthy, E., O’Keeffe, K., Robson, S., Twomey, C., and Kelly, F.L. (2024). Fish Stock Survey of Corglass Lough, August 2023. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

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1. Introduction

Corglass Lough is situated in the Erne catchment, north of Killeshandra, Co. Cavan (Plate 1.1 and Figure 1.1). The lake has a surface area of 34ha and is relatively shallow, with a mean depth of 1.6m and a maximum depth of 6m. The lake is categorised as typology class 9 (as designated by the EPA for the Water Framework Directive), i.e. shallow (mean depth <4m), less than 50ha and high alkalinity (>100mg/l CaCO₃). Corglass Lough is located within the Lough Oughter and its associated loughs Special Area of Conservation (NPWS, 2013). The geology of the area is predominantly Lower Carboniferous Limestone. The lake is a popular coarse fishery and has historically held a good stock of coarse fish species, including rudd, roach, perch, bream, pike, tench, roach x bream hybrids and roach x rudd hybrids (M. Fitzpatrick, *pers. comm.*).

Corglass Lough has been surveyed on five occasions since 2005 (2005, 2008, 2011, 2014 and 2017) (Kelly *et al.*, 2007, 2009, 2012a, 2015, Connor *et al.*, 2018). During these surveys, roach and perch have typically dominated fish stocks with roach x bream hybrids, tench, pike and eel also recorded in most surveys.

This report summarises the results of the 2023 fish stock survey carried out on the lake using Inland Fisheries Ireland's fish in lakes monitoring protocol. The protocol is WFD compliant and also provides insight into fish stock status in the lake.



Plate 1.1. Corglass Lough.

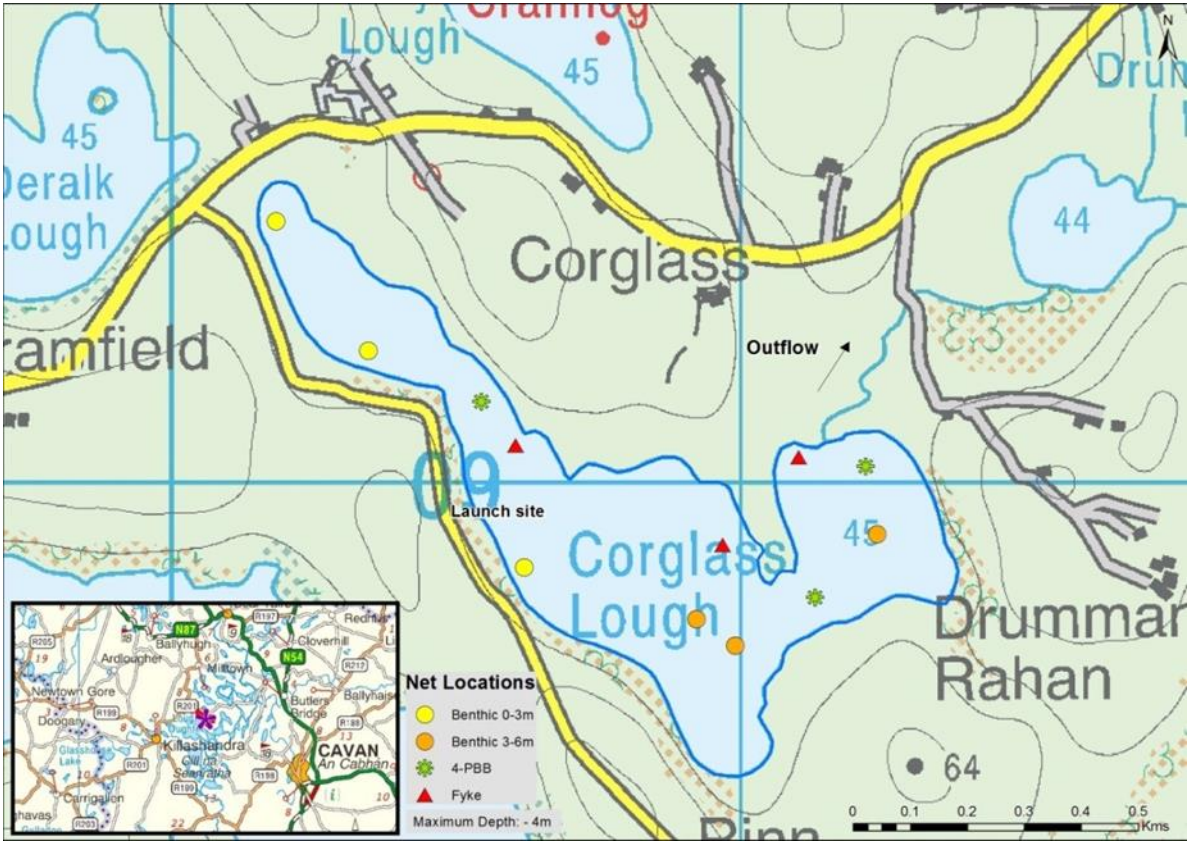


Figure 1.1. Location map of Corglass Lough showing net locations and depths of each net (outflow is indicated on map).

2. Methods

2.1. Netting methods

Corglass Lough was surveyed over two nights from the 15th to the 17th of August 2023. A total of three sets of Dutch fyke nets, six benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (BM CEN) (3 @ 0-2.9m and 3 @ 3-5.9m) were deployed. The netting effort was supplemented using four-panel benthic braided survey gill nets (4-PBB) at three additional sites. The four-panel survey gill nets are composed of four 27.5m long panels each a different mesh size (55mm, 60mm, 70mm and 90mm knot to knot). Nets were deployed in the same locations as were randomly selected in the previous surveys (12 sites). A handheld GPS was used to mark the precise location of each net. The angle of each gill net in relation to the shoreline was randomised.

All fish apart from perch were measured and weighed on site and scales were removed from a sub-sample of other species. Live fish were returned to the water whenever possible (*i.e.* when the likelihood of their survival was considered to be good). Samples of fish were retained for further analysis. Fish were frozen immediately after the survey and transported back to the IFI laboratory for later dissection.

2.2. Fish diet

Total stomach contents were inspected, and individual items were identified to the lowest taxonomic level possible. The percentage frequency occurrence (%FO) of prey items were then calculated to identify key prey items (Amundsen *et al.*, 1996).

$$FO_i = \left(\frac{N_i}{N} \right) * 100$$

Where:

FO_i is the percentage frequency of prey item i ,

N_i is the number of fish with prey i in their stomach,

N is total number of fish with stomach contents.

2.3. Biosecurity - disinfection and decontamination procedures

Procedures are required for disinfection of equipment to prevent dispersal of alien species and other organisms to uninfected waters. A standard operating procedure was compiled by Inland Fisheries Ireland for this purpose (Caffrey, 2010) and is followed by staff in IFI when moving between water bodies.

3. Results

3.1. Species Richness

Four fish species and one cyprinid hybrid type were recorded in Corglass Lough in August 2023. A total of 373 fish were captured (Table 3.1). Roach and perch were the most numerous fish species recorded, and together represented c. 94% of all fish captured. Tench, pike and roach x bream hybrids were also captured. Similar species compositions were observed in earlier surveys (Kelly *et al.*, 2009, 2012a, 2015, Connor *et al.*, 2018). No rudd, bream or European eels were captured in the 2023 survey.

Table 3.1. Number of each fish species captured by each gear type during the survey on Corglass Lough

Scientific name	Common name	Number of fish captured			
		BM CEN	4-PBB	Fyke	Total
<i>Rutilus rutilus</i>	Roach	183	0	1	184
<i>Perca fluviatilis</i>	Perch	164	0	4	168
<i>Tinca tinca</i>	Tench	2	8	0	10
<i>Esox lucius</i>	Pike	4	0	2	6
<i>Rutilus rutilus x Abramis brama</i>	Roach x bream hybrid	2	3	0	5

3.2. Fish abundance

Fish abundance (mean CPUE) and biomass (mean BPUE) were calculated as the mean number/weight of fish caught per metre of net. For all fish species except eel, CPUE/BPUE is based on all nets, whereas eel CPUE/BPUE is based on fyke nets only. Roach was the dominant species with respect to abundance (CPUE) and biomass (BPUE) (Table 3.2).

Table 3.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Corglass Lough

Scientific name	Common name	Mean CPUE (\pm S.E)	Mean BPUE (\pm S.E)
<i>Rutilus rutilus</i>	Roach	0.509 (0.267)	29.019 (13.622)
<i>Perca fluviatilis</i>	Perch	0.461 (0.213)	12.683 (4.414)
<i>Tinca tinca</i>	Tench	0.011 (0.004)	13.121 (5.754)
<i>Esox lucius</i>	Pike	0.013 (0.007)	11.330 (7.690)
<i>Rutilus rutilus x Abramis brama</i>	Roach x bream hybrid	0.007 (0.005)	3.624 (2.828)

Note: Where biomass data was unavailable for an individual fish, this was determined from a length/weight regression for that species (Connor *et al.*, 2017).

3.3 Species Profiles

Roach

Roach captured during the 2023 survey ranged in length from 7.4cm to 26.2cm (mean = 13.3cm) (Figure 3.1). In 2023, the roach population was dominated by small fish (<20cm). Larger fish (i.e. >20cm) were less prominent compared to earlier surveys of the lake. Roach were relatively short lived and were aged between 1+ and 6+. All intervening age classes were present in the sample aged (Table 3.3). Fish aged between 1+ and 3+ (15cm – 21cm) dominated the population and older age groups were comparatively poorly represented (Figure 3.1 and Table 3.3).

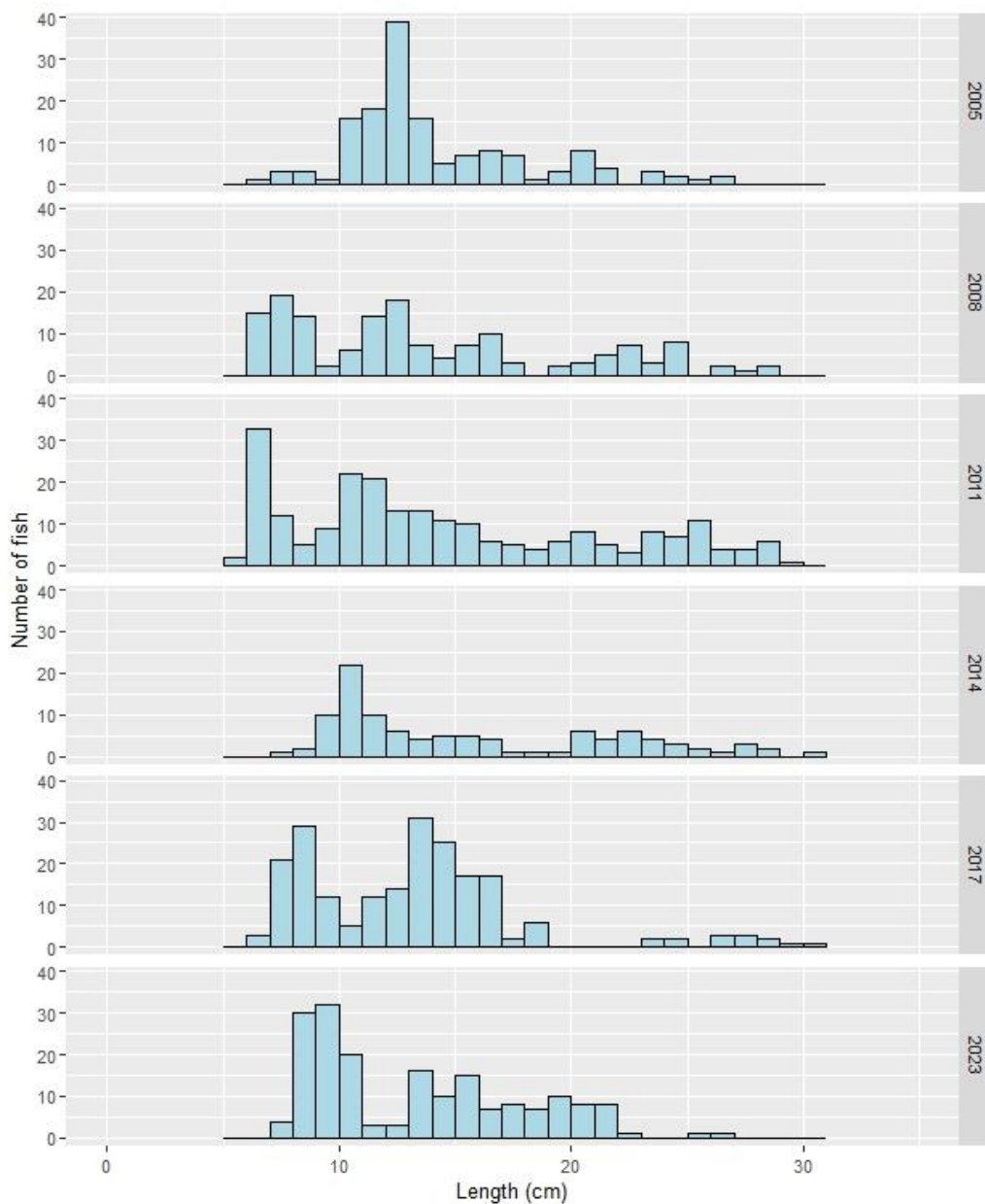


Figure 3.1. Length frequency of roach captured on Corglass Lough between 2005 and 2023.

Table 3.3. Summary age data from roach captured on Corglass Lough, August 2023. Number of fish and length ranges of all fish aged in the sample is presented.

Length (cm)	Age class					
	1+	2+	3+	4+	5+	6+
N	15	26	17	9	2	2
Mean	8.9	13.8	18.2	20.7	23.8	23.8
Min	7.4	9.3	15.4	19.7	22.4	21.4
Max	11.2	17.2	21.6	21.9	25.2	26.2

Roach populations have fluctuated across all surveys of the lake since 2005 and no clear trends in population abundance (CPUE) or biomass (BPUE) was apparent (Figure 3.2).

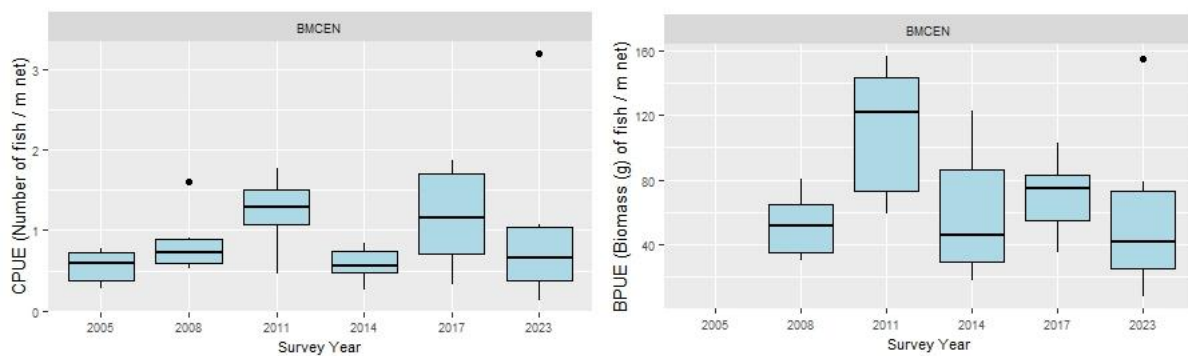


Figure 3.2. CPUE and BPUE of roach captured during surveys of Corglass Lough between 2005 and 2023. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots.

Perch

Perch captured during the 2023 survey ranged in length from 5.0cm to 26.9cm (mean = 8.8cm) (Figure 3.3). The population in 2023 was heavily dominated by small, juvenile fish. Perch were aged between 0+ and 6+ and all intervening age groups were present. Fish aged from 0+ (5cm – 7cm) to 3+ (19cm – 22cm) together represented c. 71% of all fish in the sample aged (Figure 3.3). 0+ fish represented a large proportion of all fish captured. Older year classes were comparatively poorly represented. Mean L1 (i.e. length at the end of the 1st year) was 6.0cm (Table 3.4).

Perch abundance (CPUE) and biomass (BPUE) have fluctuated across all surveys of the lake since 2005. No clear trends are apparent and the population appears relatively stable (Figure 3.4).

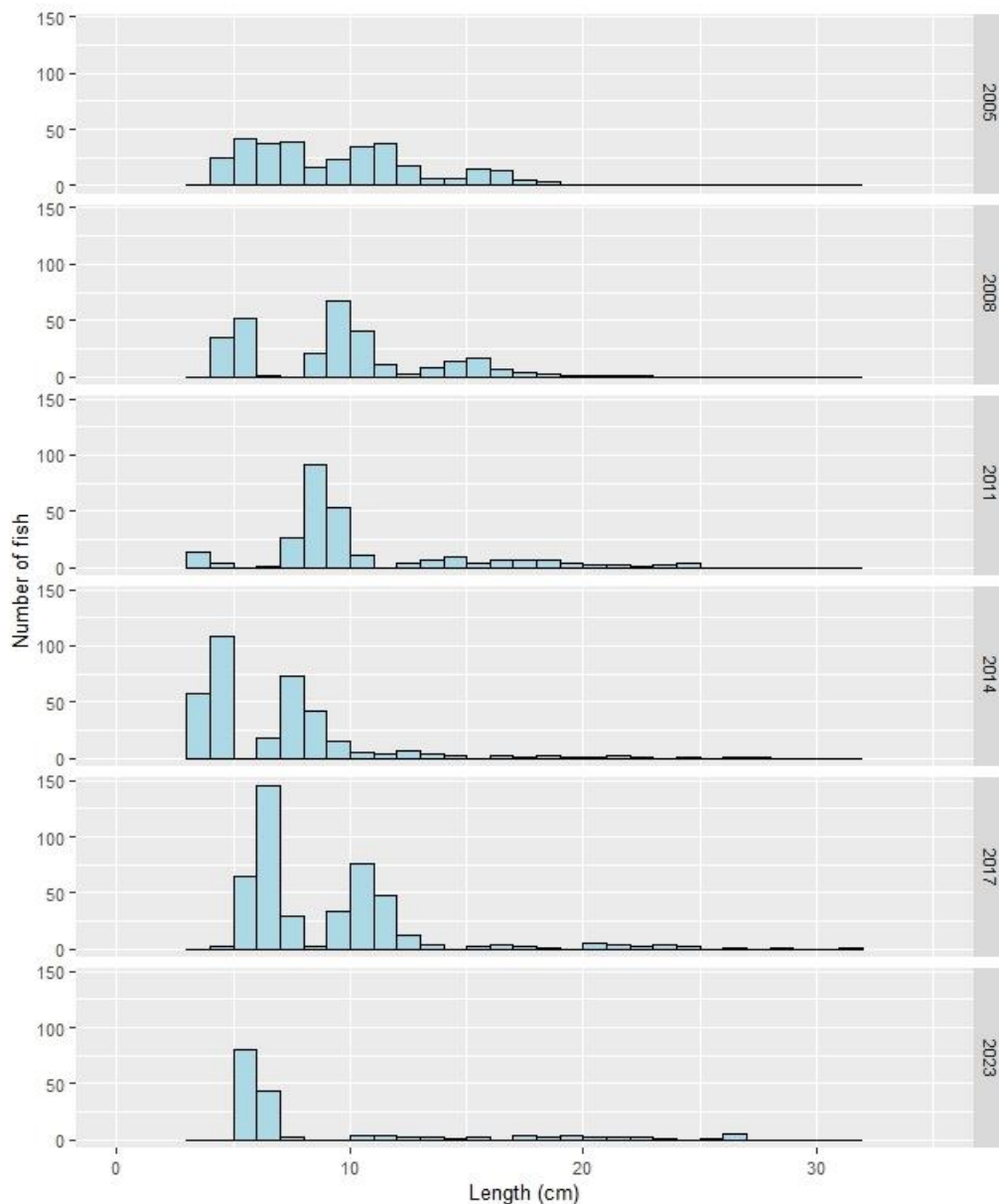


Figure 3.3. Length frequency of perch captured on Corglass Lough between 2005 and 2023.

Table 3.4. Mean (\pm S.E.) perch length (cm) at age for Lough Corglass, August 2023

Length (cm)	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆
Mean (\pm S.E.)	6.0 (0.14)	10.6 (0.21)	16.4 (0.30)	20.4 (0.50)	23.5 (0.68)	25.6 (0.65)
N	39	26	15	9	6	2
Range	4.7-8.7	8.0-12.4	14.0-17.9	18.5-23.4	21.0-25.3	25.0-26.3

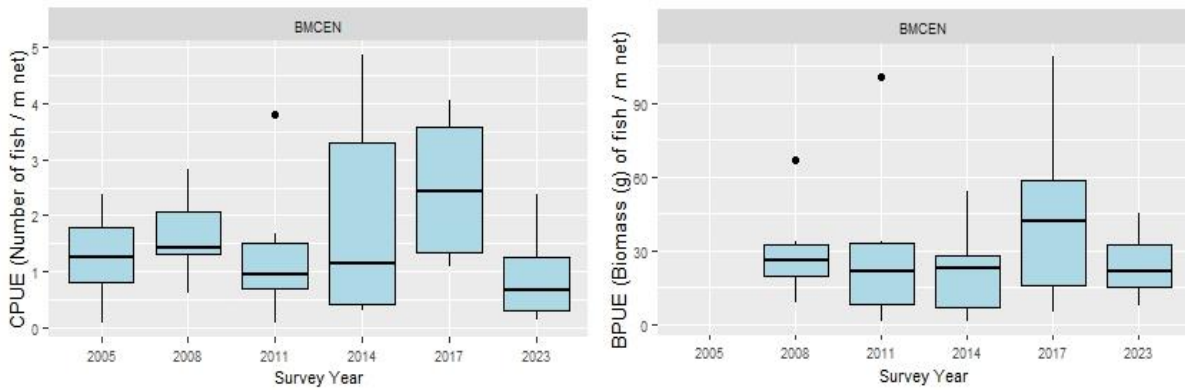


Figure 3.4. CPUE and BPUE of perch captured during surveys of Corglass Lough between 2005 and 2023. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots.

Other species

Tench captured during the survey ranged in length from 7.8cm to 51.3cm. The majority were older mature fish 5+ to 7+ measuring greater than 40cm in length. One small juvenile fish (7.3cm) was also recorded.

Pike measured between 17.9cm and 68.1cm and were aged between 0+ and 8+.

Roach x bream hybrids measured between 16.1cm and 46.1cm and were aged between 2+ and 13+.

Abundance (CPUE) and biomass (BPUE) of European eel have declined since 2008. No European eel were recorded in the 2023 survey (Figure 3.5).

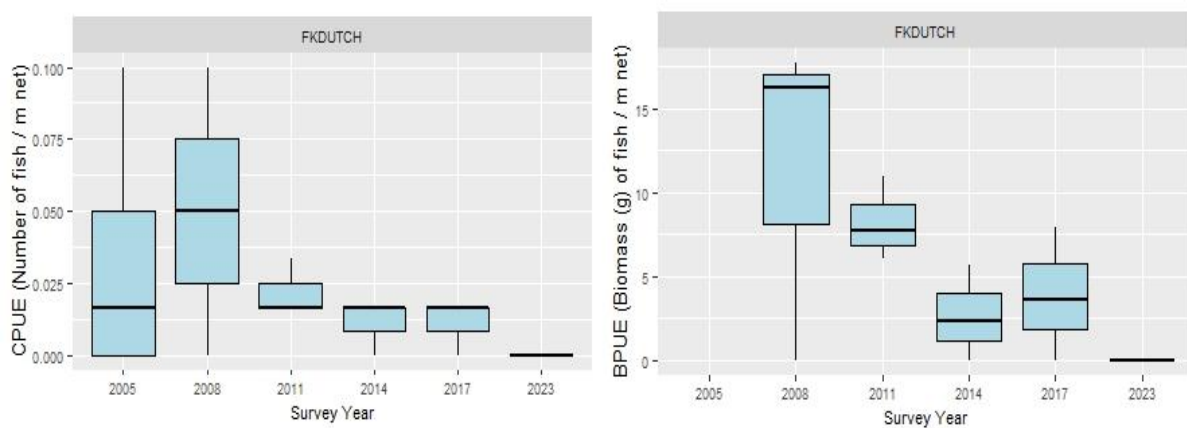


Figure 3.5. CPUE and BPUE of eel captured during surveys of Corglass Lough between 2005 and 2023. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots.

4. Stomach and diet analysis

The dietary analysis conducted provides insight to the prey of examined fish immediately prior to capture. Longer term and seasonal studies provide a more robust assessment of fish diet. The stomach contents of a subsample of perch and pike captured during the survey were examined and are presented below.

Perch

A total of 36 perch stomachs were examined. Twenty-two (61%) were empty. Fourteen stomachs contained food. Invertebrates were the sole prey type recorded in eight (57%) stomachs and were found together with zooplankton in two (14%) stomachs. Zooplankton was the sole prey type

recorded in two (14%) stomachs. Fish remains were recorded in two (14%) perch stomachs (Figure 3.6).

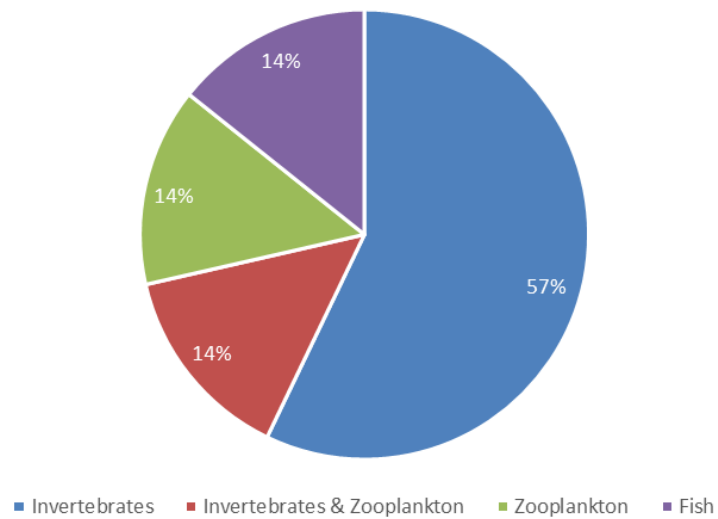


Figure 3.6. Diet of perch (N=14) captured on Corglass Lough, August 2023 (%FO).

Pike

Two pike stomachs were available for analysis. Both stomachs contained invertebrates.

4. Summary and fish ecological status

A total of four fish species and one cyprinid hybrid type were recorded in Corglass Lough in August 2023. Roach were the dominant species in terms of abundance (CPUE) and biomass (BPUE). Populations of the two most abundant species were dominated by smaller and younger fish, and recruitment appears to be regular and stable. The roach population is relatively short lived, with the oldest fish aged at 6 years old.

No bream were recorded in the survey. However, the presence of younger and smaller roach x bream hybrids (which requires both parent species to spawn (Hayden *et al.*, 2010)) indicated that there is an extant population of bream which is recruiting to the lake.

The presence of juvenile tench, which was the first capture of a tench <35cm in any survey of the lake and may indicate increased spawning and recruitment of this species.

Classification and assigning lakes with an ecological status is a critical part of the WFD monitoring programme. It allows for the identification and prioritisation of lakes that currently fall short of the minimum “Good Ecological Status” that is required if Ireland is not to incur penalties. A multimetric fish ecological classification tool (Fish in Lakes – ‘FIL’) was developed for the island of Ireland (Ecoregion 17) using IFI and Agri-Food and Biosciences Institute Northern Ireland (AFBINI) data generated during the NSSHARE Fish in Lakes project (Kelly *et al.*, 2008). This tool was further developed during 2010 (FIL2) in order to make it fully WFD compliant, including producing EQR (Ecological Quality Ratio) values for each lake and associated confidence in classification (Kelly *et al.*, 2012b).

Using the FIL2 classification tool, Corglass Lough has been assigned an ecological status of Poor for 2023 based on the fish populations present (Figure 4.1)

In the 2016 to 2021 surveillance monitoring reporting period, the EPA assigned Corglass Lough an overall ecological status of Bad, based on all monitored physio-chemical and biological elements, including fish (EPA 2021).

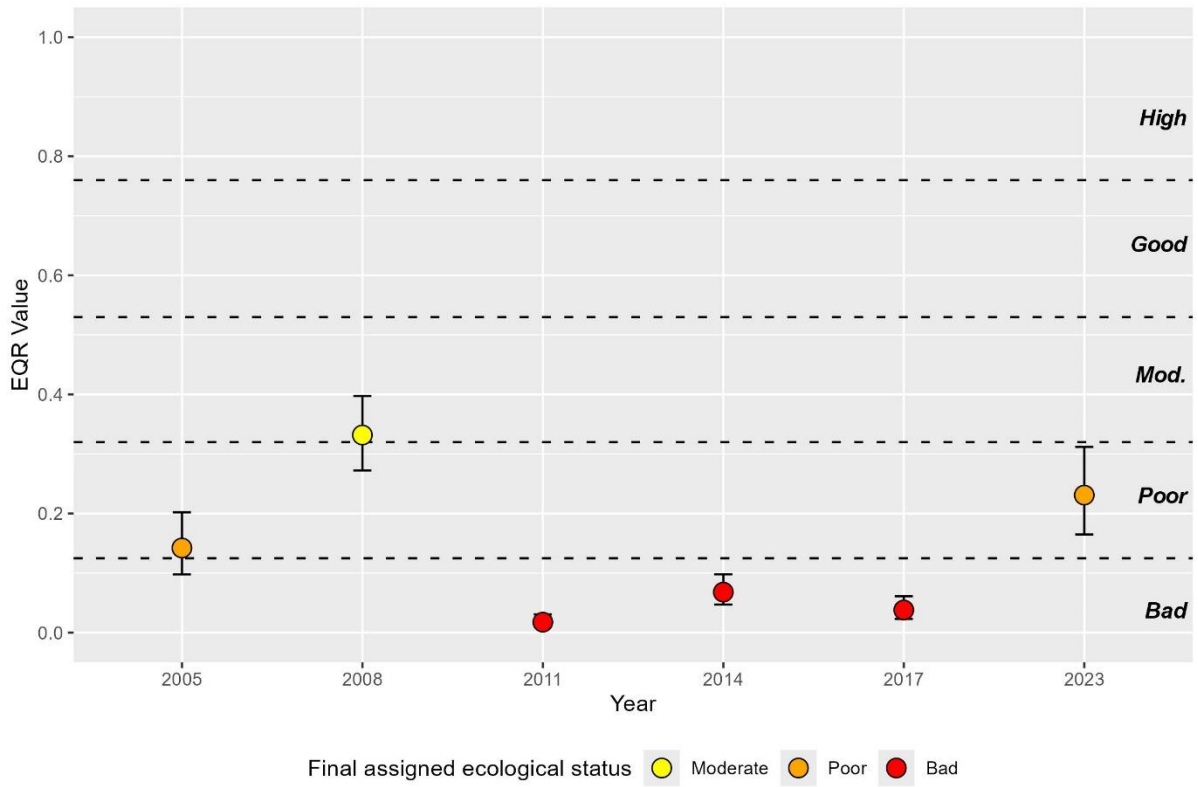


Figure 4.1. Fish ecological status, Corglass Lough, between 2005 and 2023 (dashed line indicates EQR status boundaries).

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**Inland Fisheries Ireland
3044 Lake Drive,
Citywest Business Campus,
Dublin 24,
Ireland.
D24 CK66**

**www.fisheriesireland.ie
info@fisheriesireland.ie**

+353 1 8842 600

