National Research Survey Programme

Lakes 2024

Lattone Lough

IFI/2025/1-4775

Iascach Intíre Éireann
Inland Fisheries Ireland

fisheriesireland.ie

Fish Stock Survey of Lattone Lough, September 2024

Iascach Intíre Éireann
Inland Fisheries Ireland

National Research Survey Programme

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

CITATION: McLoone, P., Corcoran, W., Cierpial, D., Flynn, E., McCarthy, O'Brien, M., McGonagle, K., Piaskowy. J., Robson, S., Szocs, A., Tavano, A., Twomey T., Gallagher, K*. and Kelly, F.L. (2025). Fish Stock Survey of Lattone Lough, September 2024. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

*Agri-Food and Biosciences Institute (AFBI) Belfast.

Cover photo: Lough Caum, Co. Kerry © Inland Fisheries Ireland. Photo by Daniel Cierpial.

ACKNOWLEDGEMENTS

The survey was carried out in cooperation with and with the support of colleagues from AFBI (Agri Food and Biosciences Institute) Northern Ireland.

The authors wish to gratefully acknowledge the help and co-operation of all their colleagues in Inland Fisheries Ireland.

The authors would also like to acknowledge the funding provided for the project from the Department of Housing, Local Government and Heritage and Department of Communications, Climate Action and Environment / Department of Climate, Energy and the Environment for 2024.

1. Introduction

Lattone Lough is located within the Garrison Lowlands Landscape Character Area (NIEA, 2010) and the Lough Melvin catchment. The lake has a surface area of 32ha, a mean depth > 4m and a maximum depth of 14.7m. The lake falls into typology class 7 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), less than 50ha and moderate alkalinity (20-100mg/l $CaCO_3$).

It holds a stock of brown trout averaging 0.5lb (0.23kg) (O' Reilly, 2007). The lake has been developed as a coarse fishery, and access for angling has been provided along the northern shore of the lake.

Lattone Lough has been previously surveyed on four occasions (2005, 2010, 2013 and 2021) using IFI's fish in lakes monitoring protocol (Kelly *et al.*, 2007, 2011 and 2014; McLoone *et al.,* 2022). During the 2021 survey, roach were found to be the most abundant species present in the lake. Perch, bream, roach x bream hybrids and brown trout were also captured during the survey. One pike was captured in 2005, but this species has not been reported in subsequent surveys of the lake. The cyprinids, roach, bream, roach x bream hybrids and tench were all recorded for the first time in the 2010 survey.

This report summarises the results of the 2024 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. IFI survey boat on Lattone Lough, September 2024.

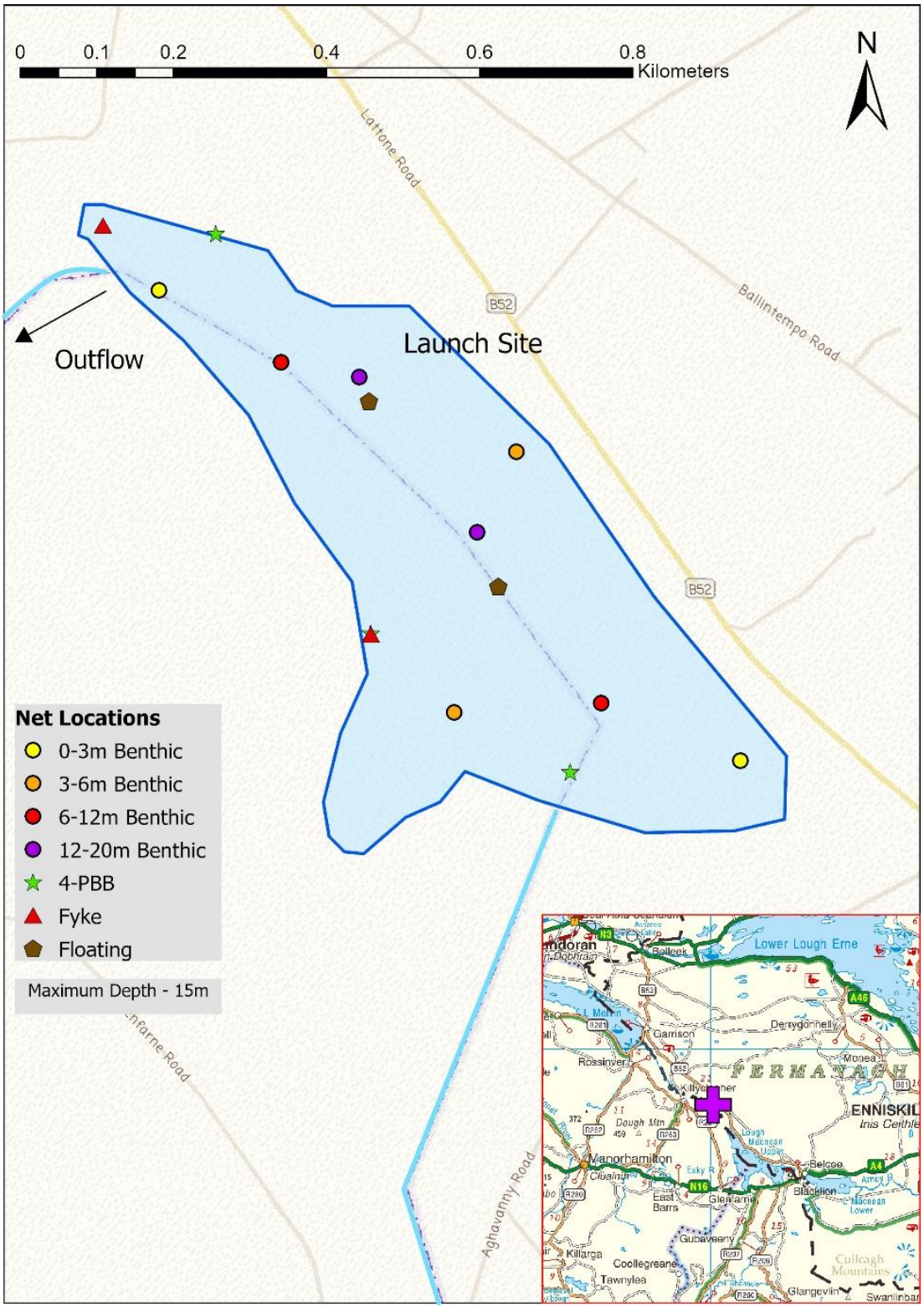

Figure 1.1. Location map of Lattone Lough showing locations and depths of each net.

2. Methods

2.1. Netting methods

Lattone Lough was surveyed over two nights from the 9th to the 10th of September 2024. A total of three sets of Dutch fyke nets, eight benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (BM CEN) (2 @ 0-2.9m, 2 @ 3-5.9m, 2 @ 6-11.9m and 2 @ 12-19.9m) and two floating monofilament multi-mesh (FM CEN) (12 panel, 5-55mm mesh size) CEN standard survey gill nets were deployed in the lake (13 sites). 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. 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).

$$\mathbf{FO}_i = \left(\frac{\boldsymbol{N_i}}{\boldsymbol{N}}\right) * \mathbf{100}$$

Where:
$\mathbf{FO}_i$ is the percentage frequency of prey item i,
$\boldsymbol{N_i}$ is the number of fish with prey i in their stomach,
$\boldsymbol{N}$ 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

Five fish species and one type of cyprinid hybrid were recorded in Lattone Lough in September 2024. A total of 296 fish were captured. The number of each species captured by each gear type during the survey is shown in Table 3.1. Perch and roach were the most numerous fish species recorded. Together they represented *c*. 81% of all fish captured in the survey. Bream, brown trout, roach x bream hybrids, and European eels were also captured. A similar species mix has been recorded in all surveys of the lake since 2010 when roach, bream and their hybrid were all captured for the first time (Kelly *et al.*, 2007, 2011 and 2014; McLoone *et al.,* 2022).

Table 3.1. Number of each fish species captured by each gear type during the survey on Lattone Lough, September 2024.

Scientific name	Common name	Number of fish captured				
		BM CEN	FMCEN	4-PBB	Fyke	Total
Perca fluviatilis	Perch	121	2	1	1	125
Rutilus rutilus	Roach	89	23	0	2	114
Abramis brama	Bream	28	0	6	0	34
Salmo trutta	Brown trout	10	2	0	0	12
Rutilus rutilus x Abramis brama	Roach x bream hybrid	9	0	0	0	9
Anguilla anguilla	European eel	0	0	0	2	2

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. Perch and roach were the dominant species with respect to abundance (CPUE). Perch and bream were the dominant species in terms of biomass (BPUE) (Table 3.2).

Table 3.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Lattone Lough, September 2024.

Scientific name	Common name	Mean CPUE (± S.E)	Mean BPUE (± S.E)
Perca fluviatilis	Perch	0.275 (0.182)	12.284 (6.528)
Rutilus rutilus	Roach	0.251 (0.143)	6.564 (3.623)
Abramis brama	Bream	0.066 (0.026)	13.387 (4.758)
Salmo trutta	Brown trout	0.027 (0.013)	4.673 (2.538)
Rutilus rutilus x Abramis brama	Roach x bream hybrid	0.020 (0.014)	2.431 (1.686)
*Anguilla anguilla**	European eel	0.017 (0.000)	2.472 (0.284)

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). *Eel CPUE and BPUE based on fyke nets only.

Plate 3.1 Processing the catch on Lattone Lough, September 2024.

3.3. Species Profiles

Roach

Roach captured during the 2024 survey ranged in length from 6.2cm to 18.3cm (mean = 10.9cm) (Figure 3.2). While the length range has increased in 2021 and 2024 compared to the earlier surveys (as a result of an increasing population), the maximum length of roach has remained relatively stable. Roach were aged between 1+ and 4+ and all intervening age classes were represented in the sample aged (Table 3.3). The population was dominated by 1+ (6cm – 9cm) and 2+ (12cm – 15cm) fish (Table 3.3 and Figure 3.2). Together these age cohorts represented *c.* 84% of all roach aged.

The abundance (CPUE) and biomass (BPUE) of roach greatly increased in 2021 compared to earlier surveys of the lake. This increase appears to have stabilised in 2024 (Figure 3.1).

Table 3.3. Summary age data from roach captured on Lattone Lough, September 2024. Number of fish and length ranges of all fish aged in the sample is presented.

Length (cm)	Age class				
	0+	1+	2+	3+	4+
N	-	16	21	6	1
Mean	-	7.8	12.4	16.9	17.1
Min	-	6.2	8.0	15.7	17.1
Max	-	9.4	15.3	17.7	17.1

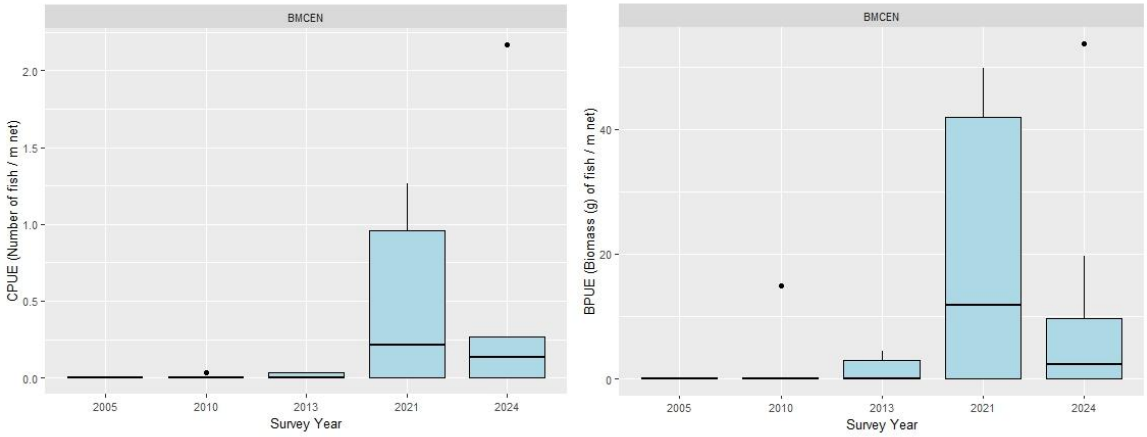

Figure 3.1. CPUE and BPUE of roach captured during surveys of Lattone Lough between 2005 and 2024. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots.

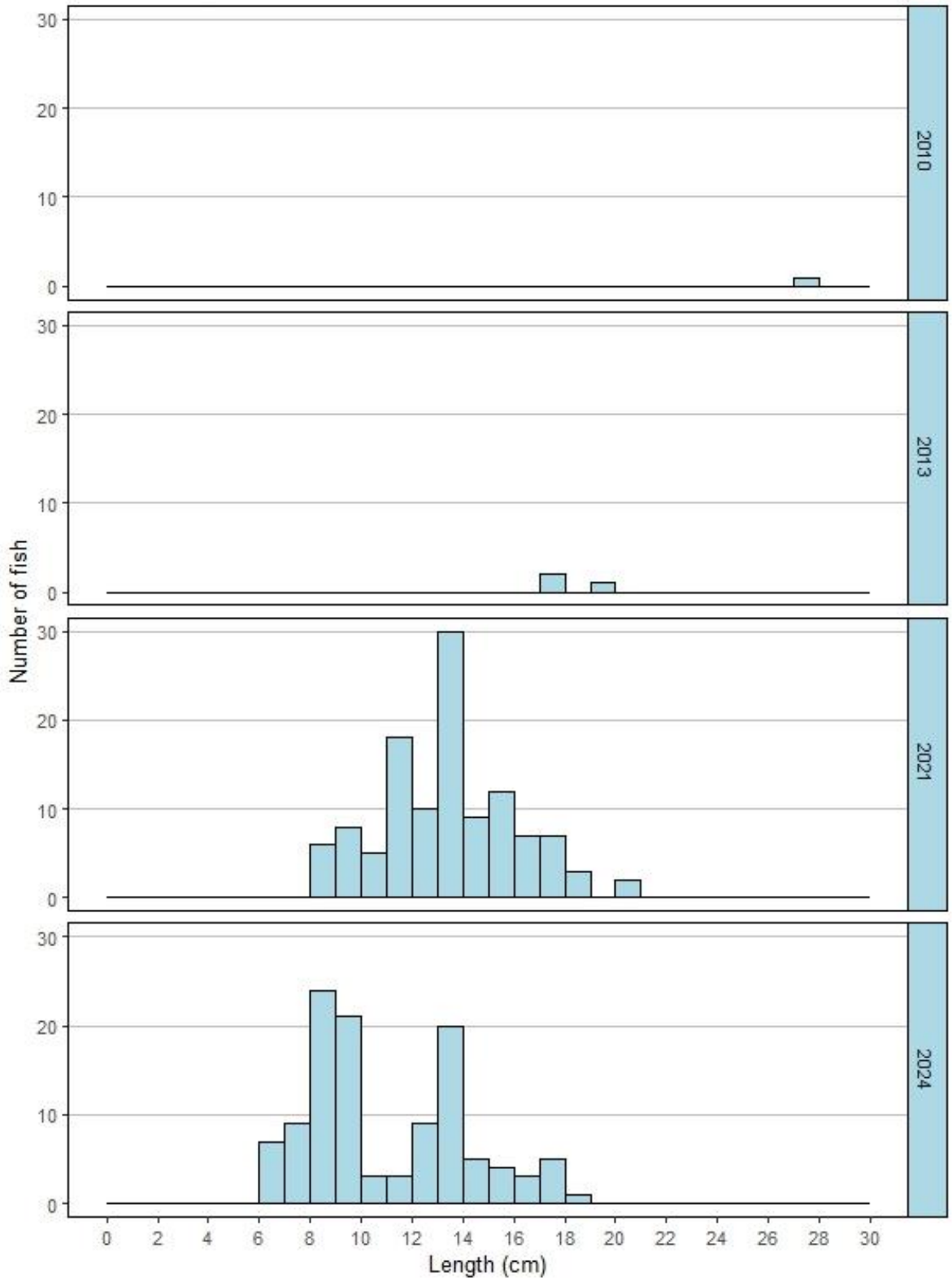

Figure 3.2. Length frequency of roach captured on Lattone Lough between 2005 and 2024 (no roach were recorded in the 2005 survey).

Perch

Perch captured in the 2024 survey ranged in length from 4.5cm to 37.2cm (mean = 10.8cm) (Figure 3.4). The overall length range has remained relatively similar across all surveys of the lake. However, the numbers and proportion of these cohorts were reduced in 2021 and 2024 compared to earlier surveys. The persistence of small numbers of larger perch (i.e. >25cm) is a consistent feature of the perch population in the lake. Perch were aged between 0+ and 5+ and all intervening age classes were represented in the sampled aged (Table 3.4). Perch aged between 1+ (9cm – 15cm) and 2+ (13cm – 21cm) dominated the population, representing *c.* 74% of all the fish aged (Figure 3.4). Mean L1 (i.e. length at the end of the 1st year) was 6.1cm (Table 3.4).

Perch abundance (CPUE) and biomass (BPUE) were both much lower in 2021 and 2024 compared to the earlier surveys of the lake (Figure 3.3).

Table 3.4. Mean (±S.E.) perch length (cm) at age for Lattone Lough, September 2024

	L_1	L_2	L_3	L_4	L_5	L_6
Mean (±S.E.)	6.1 (±0.12)	12.1 (±0.42)	15.9 (±0.94)	20.1 (±1.47)	21.6 (±3.24)	26 (±3.83)
N	43	25	11	7	3	3
Range	4.6–7.9	8.2–16.6	10.7–22.1	13.4–25	15.6–26.7	19.7–32.9

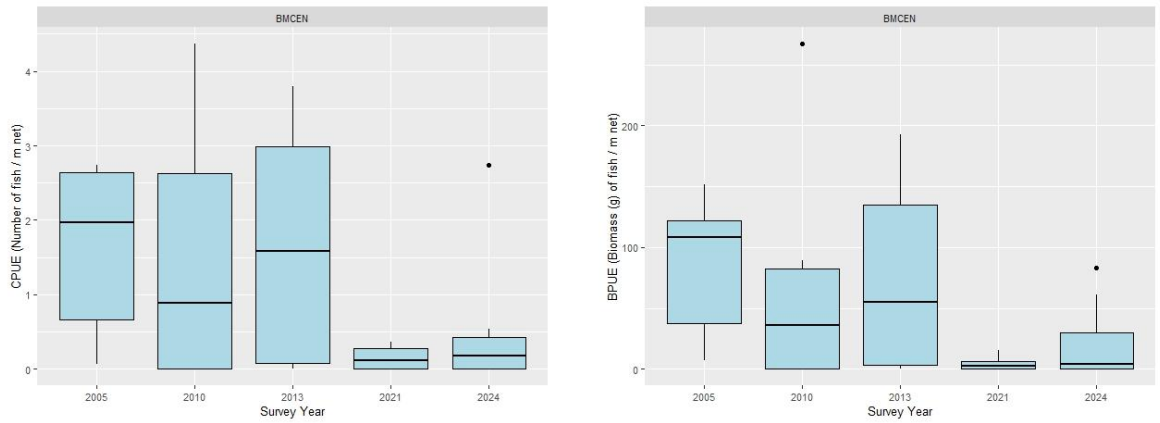

Figure 3.3. CPUE and BPUE of perch captured during surveys of Lattone Lough between 2005 and 2024. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots.

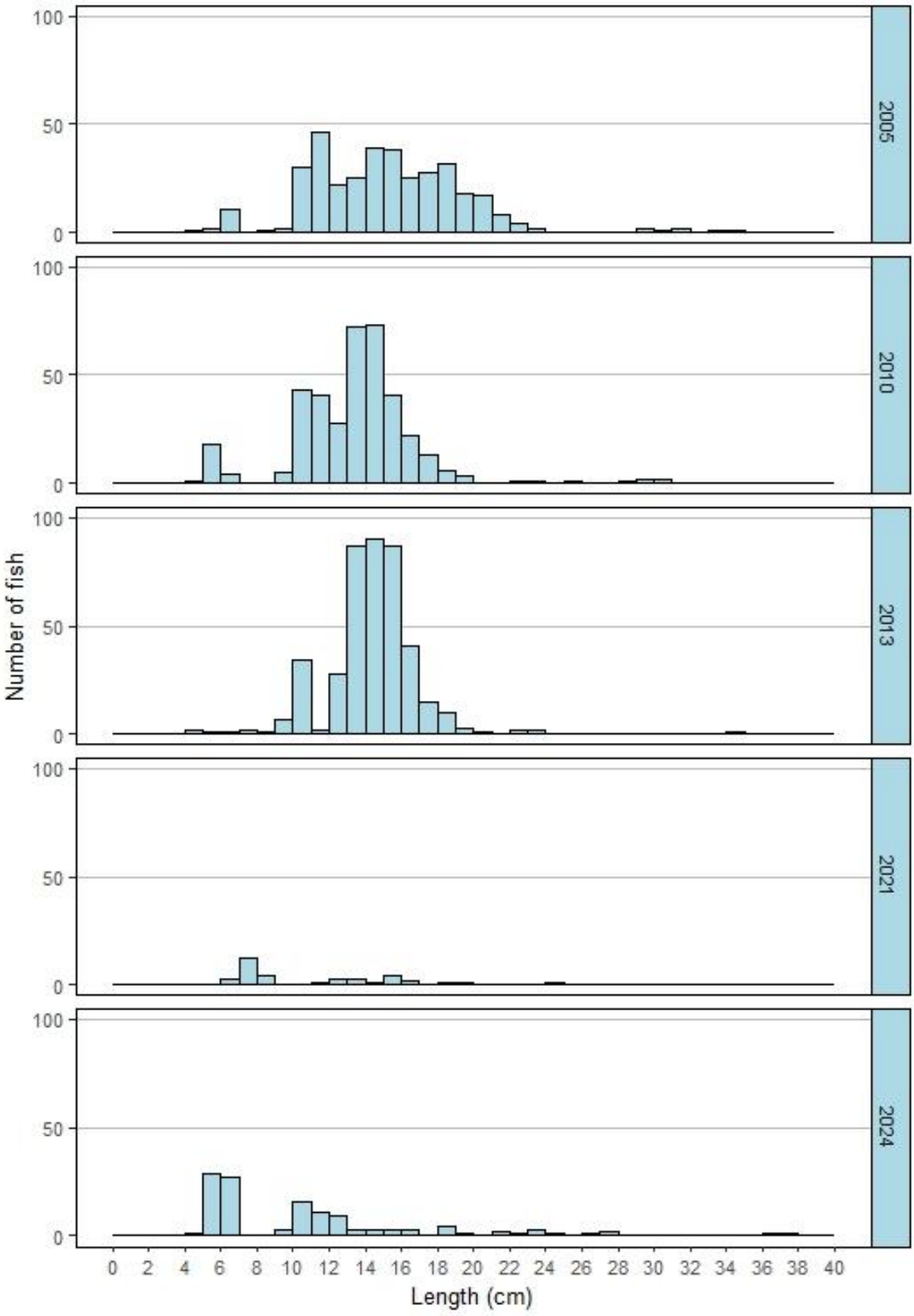

Figure 3.4. Length frequency of perch captured on Lattone Lough between 2005 and 2024.

Bream

Bream ranged in length from 8.0cm to 31.8cm (mean = 22.1cm) in 2023 (Figure 3.6). Bream were aged between 3+ and 10+ and all intervening age classes were present in the sample aged (Table 3.5). Three to five year old fish (14cm - 22cm) were the most abundant year classes and together represented *c.* 67% of all the fish in the sample aged. Eight year old bream (34cm -3 5cm) were also prominent in the sample aged (Figure 3.6 and Table 3.5).

A gradual increasing trend in both abundance (CPUE) and biomass (BPUE) was evident across all surveys of the lake (Figure 3.5).

Table 3.5. Summary age data from bream captured on Lattone Lough, September 2024. Number of fish and length ranges of all fish aged in the sample is presented.

Length (cm)	Age class										
	0+	1+	2+	3+	4+	5+	6+	7+	8+	9+	10+
N	-	-	-	8	8	6	3	-	6	-	2
Mean	-	-	-	15.6	18.1	18.6	21.7	-	35.4	-	41.5
Min	-	-	-	14.2	16.8	15.5	20.7	-	34.1	-	37.3
Max	-	-	-	17.8	20.1	22.1	23.1	-	37.2	-	45.7

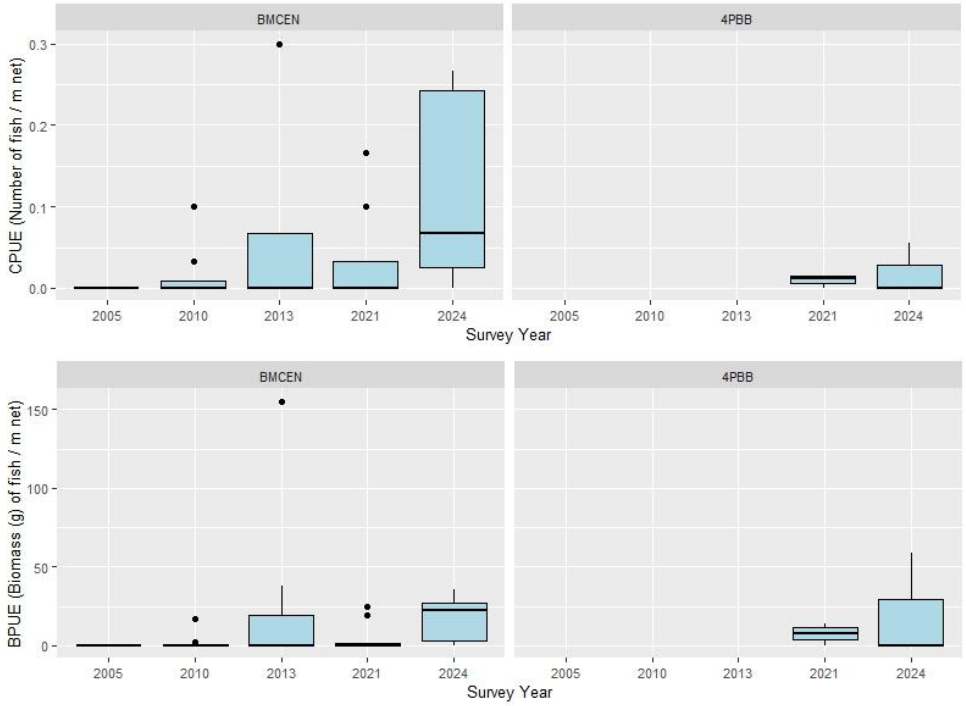

Figure 3.5. CPUE and BPUE of bream captured during surveys of Lattone Lough between 2005 and 2024. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots

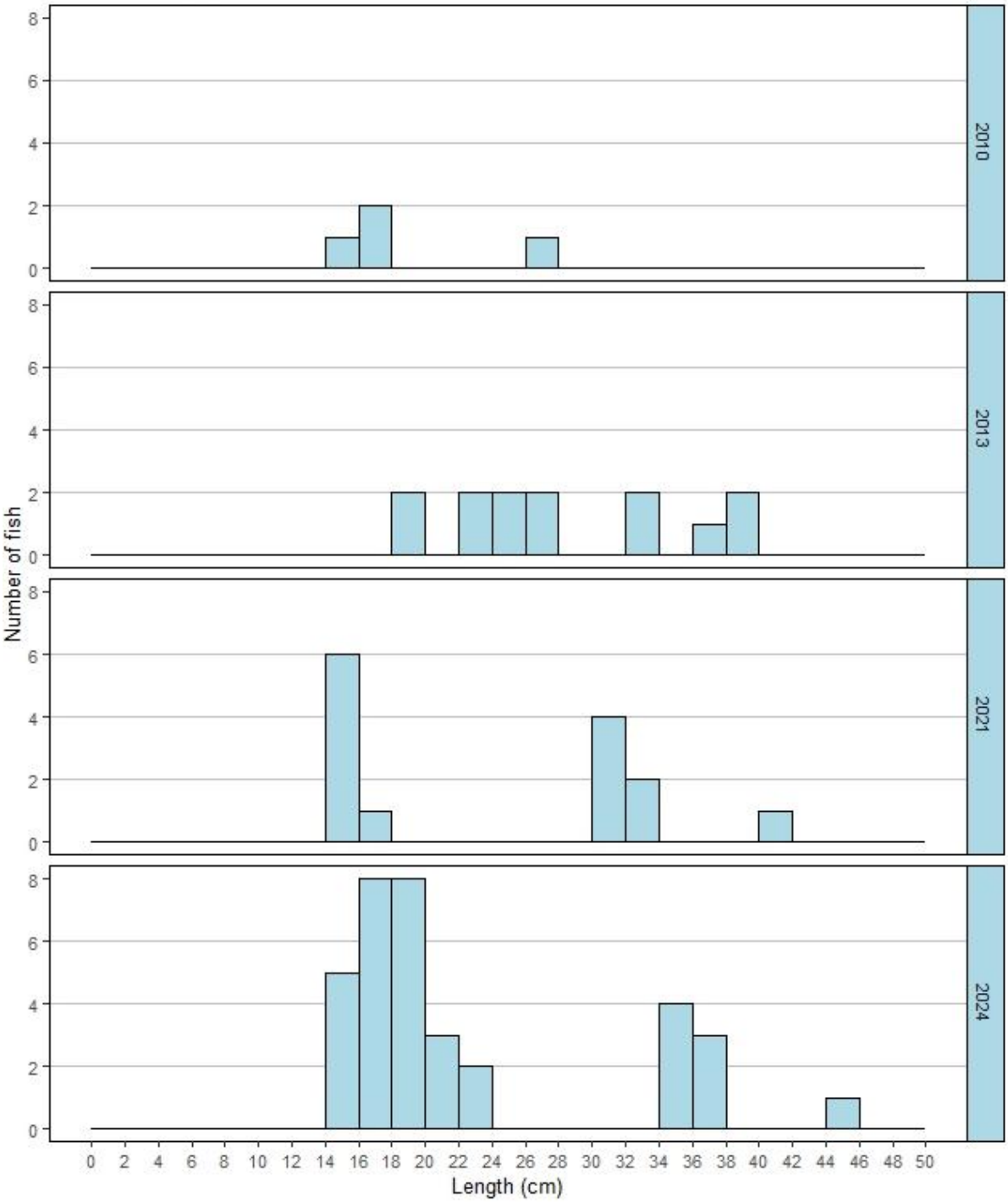

Figure 3.6. Length frequency of bream captured on Lattone Lough between 2005 and 2024 (no bream were recorded in the 2005 survey).

Brown trout

Brown trout captured during the 2024 survey ranged in length from 16.5cm to 31cm (mean 23.8). (Figure 3.8). Brown trout were aged between 2+ and 5+ and all intervening age classes were present in the sample aged. No one age class dominated the population. Mean L1 (i.e. length at the end of the 1st year) was 6.9cm (Table 3.6).

The downward trend in brown trout abundance (CPUE) and biomass (BPUE) apparent from 2005 to 2021 appears to have stabilised (Figure 3.7). A large proportion of brown trout were captured in floating survey gill nets in the 2005 survey. These nets were not then deployed until the 2024 survey. Two brown trout were recorded in the floating survey gill nets in 2024.

Table 3.6. Mean (±S.E.) brown trout length (cm) at age for Lattone Lough, September 2024

Length (cm)	L_1	L_2	L_3	L_4	L_5
Mean (±S.E.)	6.9 (0.50)	13.2 (1.04)	18.9 (0.84)	22.6 (0.51)	25.1 (0.62)
N	9	9	7	4	2
Range	5.3-10.1	9.4-18.3	16.3-21.7	21.4-23.8	24.4-25.7

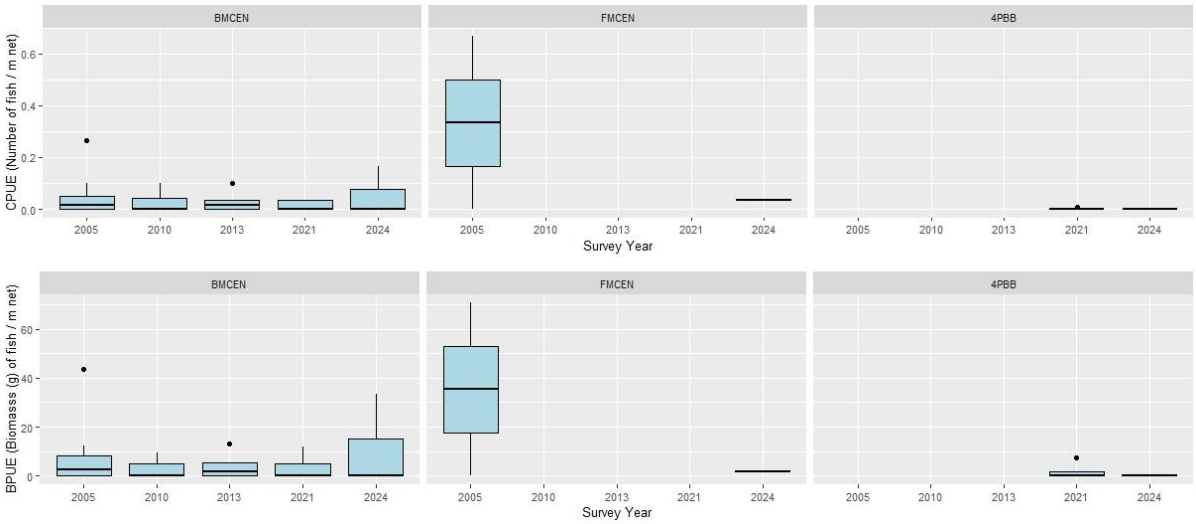

Figure 3.7. CPUE and BPUE of brown trout captured during surveys of Lattone Lough between 2005 and 2024. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots

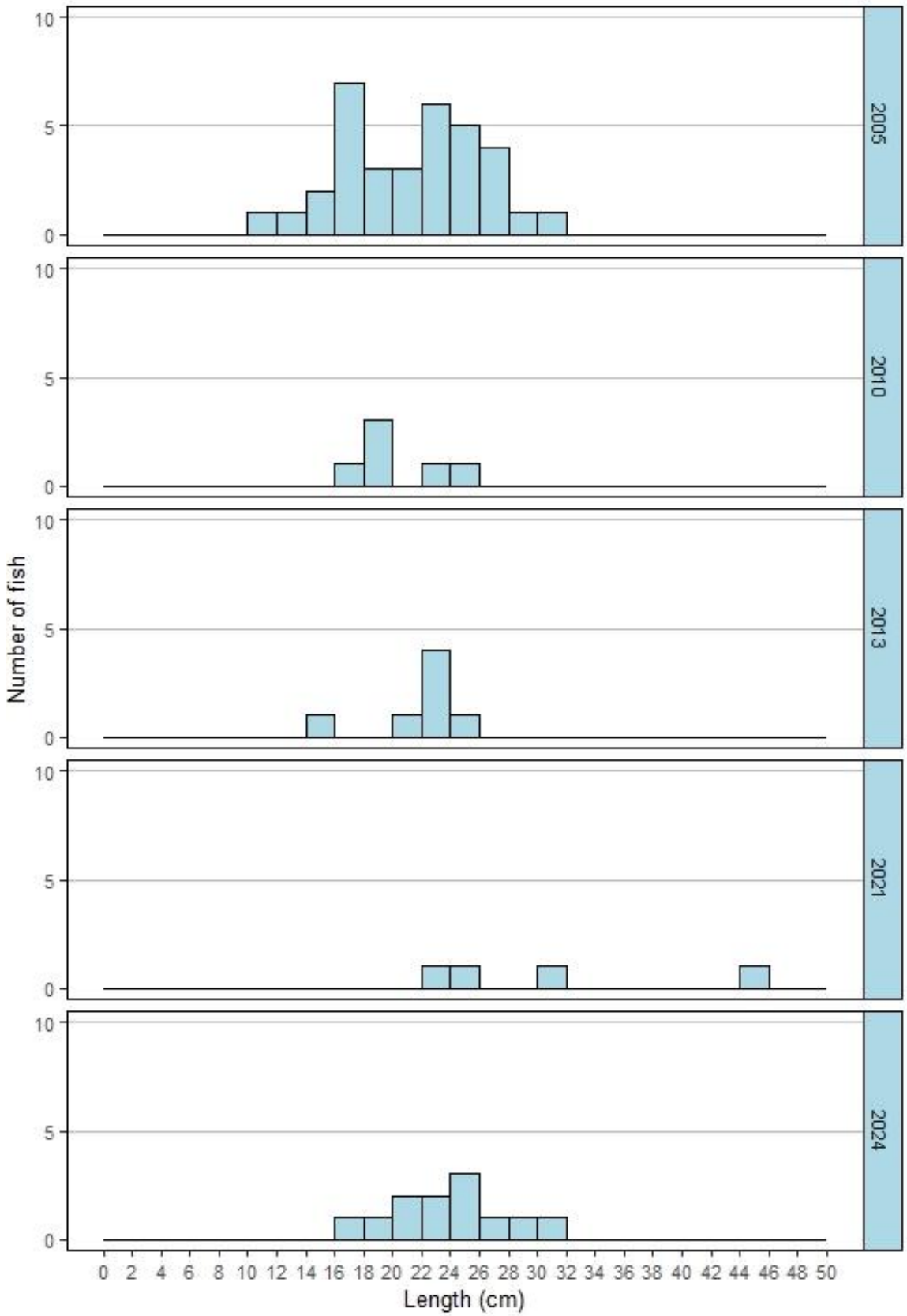

Figure 3.8. Length frequency of brown trout captured on Lattone Lough between 2005 and 2024.

Other fish species

Roach x bream hybrids captured during the 2024 survey ranged in length from 14.8cm to 24.9cm (mean= 24.9cm) (Figure 3.9). Roach x bream hybrids were aged between 3+ and 7+ (Table 3.7). Three and four year old fish (3+ and 4+; 16cm – 21cm) dominated the population aged (Table 3.7 and Figure 3.9).

The abundance (CPUE) and biomass (BPUE) of roach x bream hybrids increased in 2021 compared to earlier surveys of the lake. This increase appears to have stabilised (Figure 3.10)

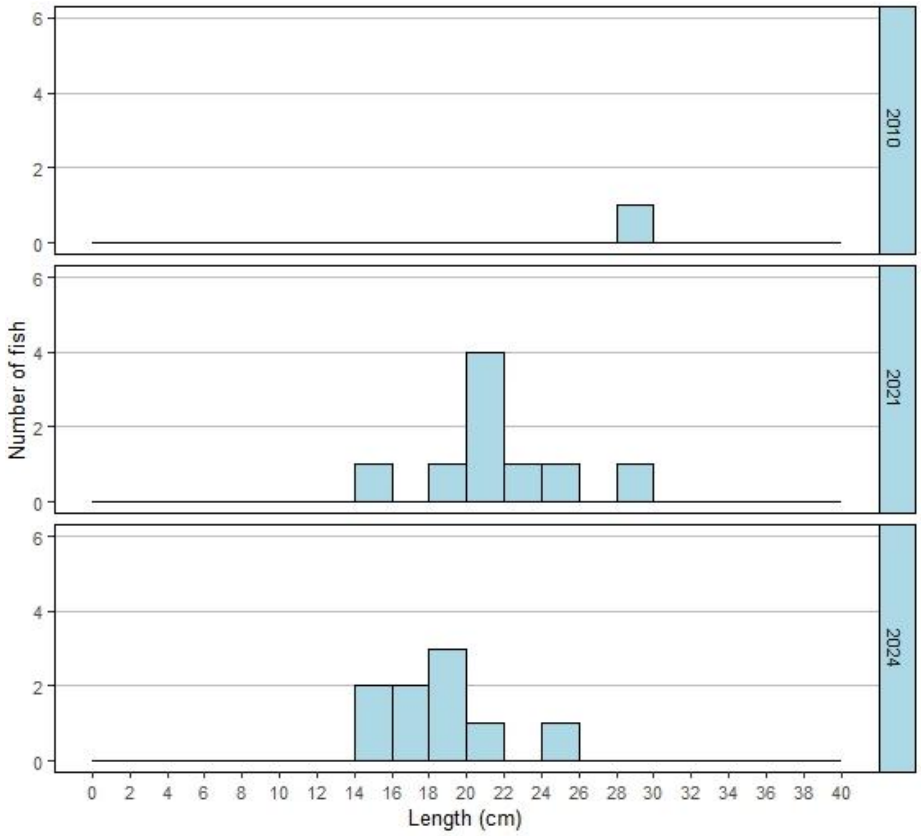

Figure 3.9. Length frequency of roach x bream hybrids captured on Lattone Lough between 2005 and 2024. No roach x bream hybrids were recorded in 2013.

Table 3.7. Summary age data from roach x bream hybrids captured on Lattone Lough, September 2024. Number of fish and length ranges of all fish aged in the sample is presented.

Length (cm)	Age class							
	0+	1+	2+	3+	4+	5+	6+	7+
N	-	-	-	4	4	-	-	1
Mean	-	-	-	16.2	18.9	-	-	24.9
Min	-	-	-	14.8	16.7	-	-	24.9
Max	-	-	-	18.5	21.8	-	-	24.9

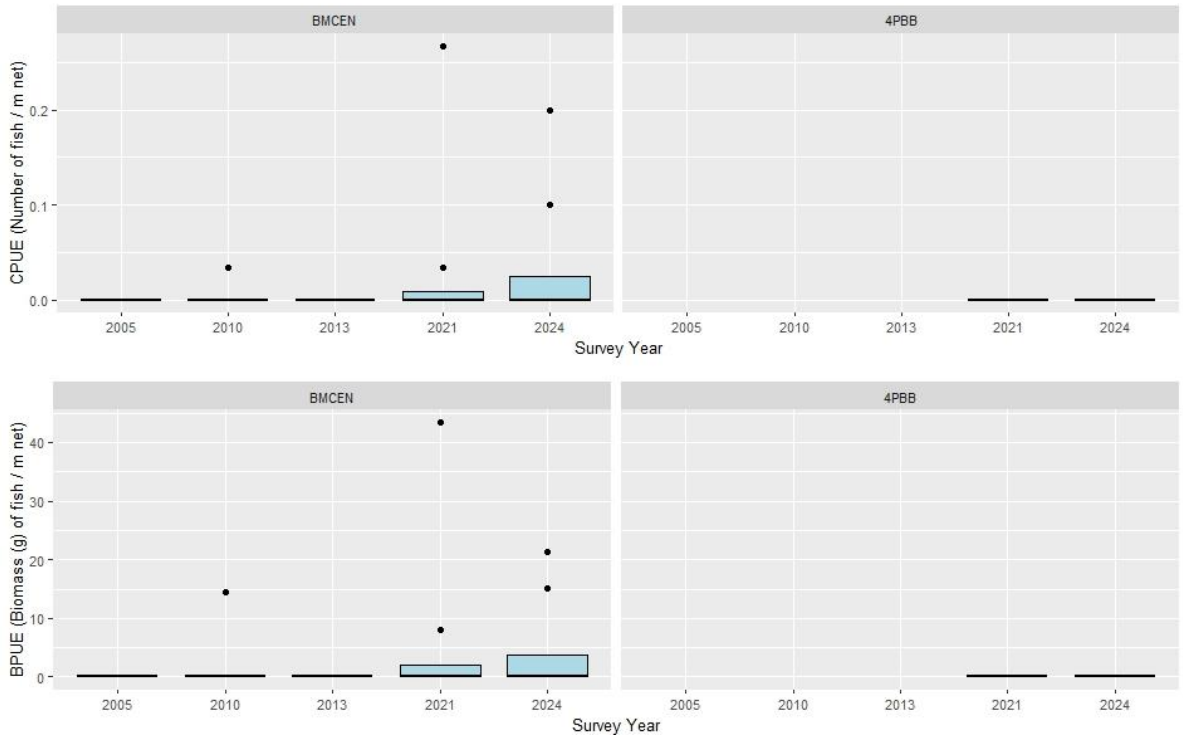

Figure 3.10. CPUE and BPUE of roach x bream hybrids captured during surveys of Lattone Lough between 2005 and 2024. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots.

Two European eels were captured in 2024. Abundance (CPUE) and biomass (BPUE) have fluctuated across all surveys of the lake. No European eels were captured in the 2021 survey (Figure 3.11)

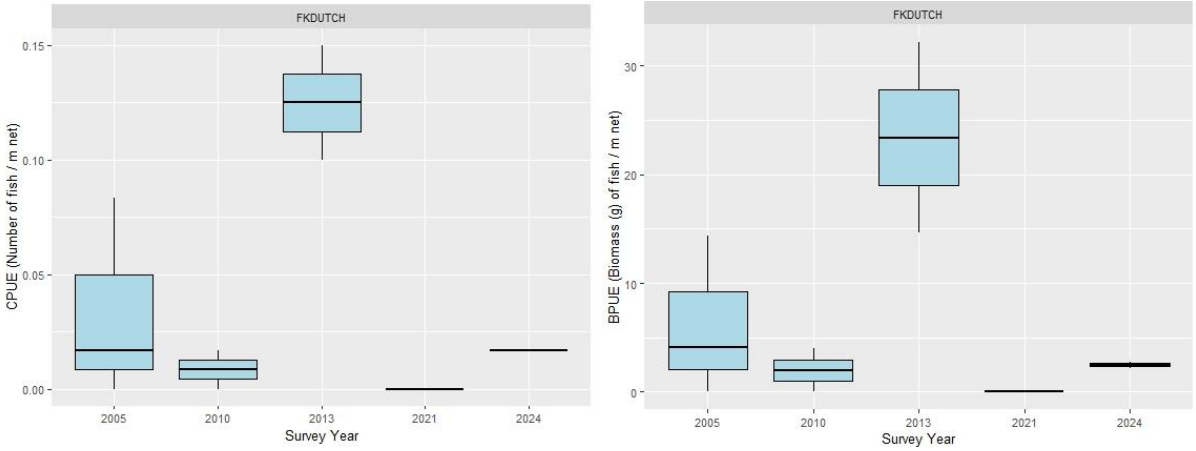

Figure 3.11. CPUE and BPUE of European eels captured during surveys of Lattone Lough between 2005 and 2024. Figures are expressed as numbers of fish captured per linear meter of net deployed. The horizontal bars represent the median value of the sample, while the 75th and 25th percentiles are marked by the upper and lower boundary of each box. The vertical 'whiskers' show the data range. Outliers are marked by dots

3.4. 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 brown trout captured during the survey were examined and are presented below.

Perch

A total of 40 perch stomachs were examined. Twenty-six stomachs contained food (65%). Fish was the sole prey type recorded in 9 (34%) perch stomachs and was recorded together with invertebrates in two (8%) perch stomachs. Zooplankton was the sole prey type recorded in eight (31%). Invertebrates were the sole prey type recorded in 17 (27%) perch stomachs. (Figure 3.11).

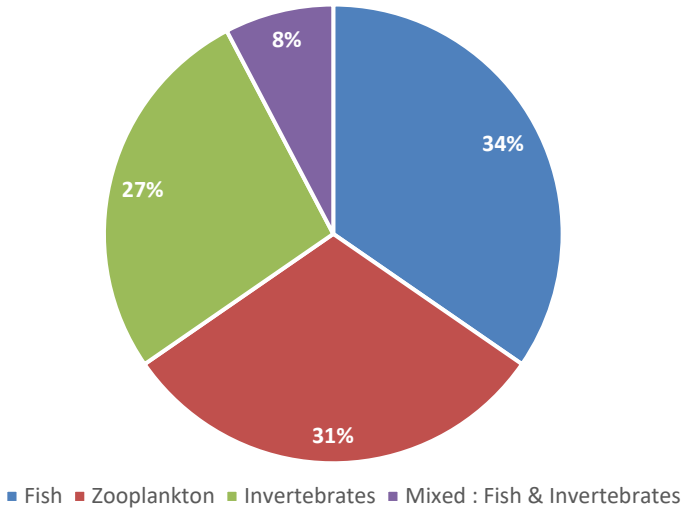

Figure 3.11. Diet of perch (N =26) captured on Lattone Lough, 2024 (% FO).

Brown trout

A total of four brown trout stomachs were examined. One was empty. Fish was the sole prey type recorded in two trout stomachs, while invertebrates were recorded in the remaining stomach.

4. Summary and fish ecological status

Five fish species and one type of cyprinid hybrid were recorded in Lattone Lough in September 2024.

Perch and roach were the dominant species with respect to abundance (CPUE) while perch and bream were the dominant species in terms of biomass (BPUE).

The two most abundant species (i.e. perch and roach) are both recruiting regularly in the lake.

First recorded in 2010, the roach population has expanded and was the second most abundant species captured in the 2024 survey. The population was dominated by smaller and younger fish, and all roach were aged 4+ or younger. This short life history may be a feature of roach in the lake.

In contrast, the perch population, although dominant in terms of abundance (CPUE), was lower in 2021 and 2024 compared to previous surveys of the lake. Despite this, perch biomass (BPUE) was still relatively high in comparison to other species captured in 2024. This was influenced by the persistence of much larger perch within the population.

Bream were captured for the first time in the 2010 survey. The abundance and biomass of this species has also increased since that time. Bream are longer lived than roach, and while several year classes were missing from the sample, there is evidence that recruitment to the adult population is now occurring regularly in the lake.

Hybridisation between roach and bream requires spawning populations of both parent species (Hayden *et al*., 2010). Despite the increase in populations of both roach and bream, there is no concomitant noticeable increase (at this time) in the hybrid population in the lake.

Results of the current survey highlight how cyprinid populations continue to increase in Lattone Lough since the first records in 2010. Lattone Lough is part of the Lough Melvin catchment and is directly connected to Lough Melvin *via* the County River. The lake poses a very real potential colonisation source for these species which are not native to Lough Melvin and roach were recorded in the County River in 2022 (Delanty *et al*., 2024). While the roach is listed as a non-native species subject to restrictions under Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 [SI. 477], bream and its hybrid with roach are also potentially invasive within Lough Melvin. Roach and roach x bream hybrids were recorded for the first time within Lough Melvin itself in 2021 (McLoone *et al.*, 2022). While no roach x bream hybrids were recorded, roach were recorded in greater numbers in the 2024 Lough Melvin survey (McLoone *et al*., 2025). The establishment of

novel cyprinid species and their hybrids in the wider catchment poses a potential threat to the endemic salmonid populations in Lough Melvin.

Classification and assigning lakes with an ecological status is a critical part of the WFD monitoring programme. It allows River Basin District managers to identify and prioritise 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) to make it fully WFD compliant, including producing EQR values for each lake and associated confidence in classification (Kelly *et al*., 2012).

Using the FIL2 classification tool, Lattone Lough has been assigned an ecological status of Moderate for 2024 based on the fish populations present. Lattone lough was assigned a status of Bad following all previous WFD compliant fish stock surveys of the lake (Figure 4.1).

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

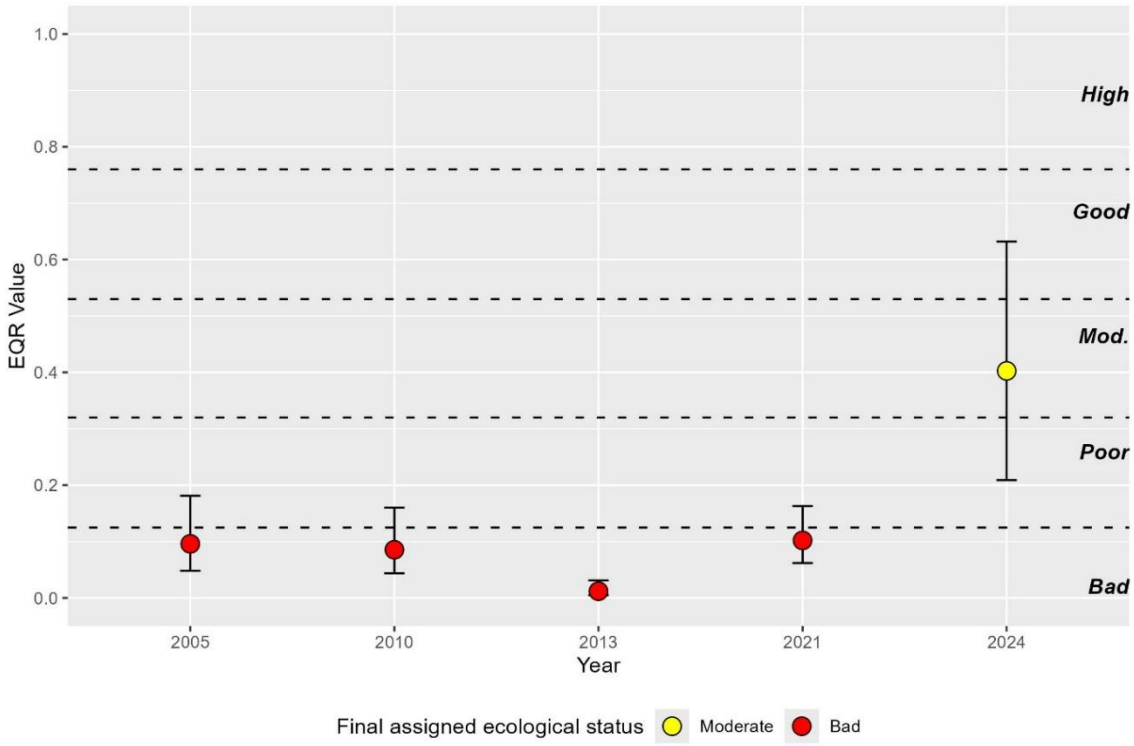

Figure 4.1. Fish ecological status, Lattone Lough, between 2005 and 2016 (dashed line indicates EQR status boundaries).

5. References

Amundsen, P.A., Gabler, H.M. and Staldvik F.J. (1996) A new approach to graphical analysis of feeding strategy from stomach contents data—modification of the Costello (1990) method. *Journal of Fish Biology,* **48,** 607–614.

Caffrey, J. (2010) *IFI Biosecurity Protocol for Field Survey Work*. Inland Fisheries Ireland.

Connor, L., Matson, R. and Kelly, F.L. (2017) Length-weight relationships for common freshwater fish species in Irish lakes and rivers. *Biology and Environment: Proceedings of the Royal Irish Academy*, **117** (2), 65-75.

Delanty, K., Feeney, R. Fitzgerald, C. (2024). *Lough Melvin Catchment Electrofishing Survey 2022*. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland

EPA. (2021) https://gis.epa.ie/EPAMaps/ Data - Catchments.ie - Catchments.ie. Accessed in May 2025.

Kelly, F.L., Harrison, A., Connor, L., Allen, M., Rosell, R. and Champ, T. (2008) *FISH IN LAKES Task 6.9: Classification tool for Fish in Lakes. FINAL REPORT*. Central Fisheries Board, NS Share project.

Kelly, F.L., Harrison, A.J., Allen, M., Connor, L. and Rosell, R. (2012) Development and application of an ecological classification tool for fish in lakes in Ireland. *Ecological Indicators*, **18**, 608-619.

Hayden, B., Pulcini, D., Kelly-Quinn, M., O'Grady, M., Caffrey, J., McGrath, A. and Mariani, S. (2010). Hybridisation between two cyprinid fishes in a novel habitat: genetics, morphology and life-history traits. *BMC Evolutionary Biology*, **10 (1)**, 1-11.

Kelly, F.L., Connor, L. and Champ, W.S.T. (2007) *A Survey of the Fish Populations in 46 lakes in the Northern Regional Fisheries Board, June to September 2005 and 2006*. North South Shared Aquatic Resource (NS Share) Lakes Project.

Kelly, F., Harrison, A., Connor, L., Matson, R., Morrissey, E., Wogerbauer, C., Feeney, R., O'Callaghan, R. and Rocks, K. (2011) *Sampling Fish for the Water Framework Directive – Summary Report 2010*. Inland Fisheries Ireland.

Kelly, F.L., Harrison, A., Connor, L., Morrissey, E., Wogerbauer, C., Matson, R., Feeney, R., O'Callaghan, R. and Rocks, K. (2011) *Water Framework Directive Fish Stock Survey of Lattone Lough, August 2010*. Inland Fisheries Ireland.

McLoone, P., Corcoran, W., Bateman, A., Cierpial, D., Gavin, A., Gordon, P., McCarthy, E., Twomey, C., Burke, E., Matson, R., Robson, S., Duffy, P., Donovan, R. and Kelly, F.L. (2022) *Fish Stock Survey*

of Lough Melvin, July 2021. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

McLoone, P., Corcoran, W., Cierpial, D., Flynn, E., McCarthy, O'Brien, M., McGonagle, K., Piaskowy. J., Robson, S., Szocs, A., Tavano, A., Twomey T., and Kelly, F.L. (2025) *Fish Stock Survey of Lough Melvin, July 2024*. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

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

www.fisheriesireland.ie
info@fisheriesireland.ie

+353 1 8842 600