

Sampling Fish for the Water Framework Directive

Lakes 2013

Lattone Lough



Iascach Intíre Éireann
Inland Fisheries Ireland

Water Framework Directive Fish Stock Survey of Lattone Lough, July 2013

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CITATION: Kelly, F.L., Connor, L., Morrissey, E., Coyne, J., Matson, R., Feeney, R. and Rocks, K. (2014)
Water Framework Directive Fish Stock Survey of Lattone Lough, July 2013. Inland Fisheries Ireland, 3044
Lake Drive, Citywest Business Campus, Swords, Dublin 24.

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ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the co-operation of the Department of Culture, Arts and Leisure (DCAL). Cooperation and assistance from the Agri Food Biosciences Institute Northern Ireland (AFBINI) is also gratefully acknowledged. The authors would also like to gratefully acknowledge the help and cooperation of all their colleagues in IFI, Swords.

The authors would also like to acknowledge the funding provided for the project from the Department of Communications, Energy and Natural Resources for 2013.

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1.1 Introduction

Lattone Lough lies along the B52 Garrison-Belcoo road, almost 9km from Garrison, Co. Fermanagh (Plate 1.1, Fig. 1.1). It is divided almost equally in a north-west/south-east direction by the Northern Ireland/Republic of Ireland border. 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 CaCO₃). It holds a stock of brown trout averaging 0.23kg (O'Reilly, 2007).

Lattone Lough was previously surveyed in 2006 and 2010 as part of the NSSHARE Fish in Lakes Project and the WFD monitoring programme respectively (Kelly *et al.*, 2007 and Kelly *et al.*, 2011), with perch being the dominant species recorded (Kelly *et al.*, 2011). Brown trout, roach, eels, roach x bream hybrids and bream were also recorded.



Plate 1.1. Lattone Lough

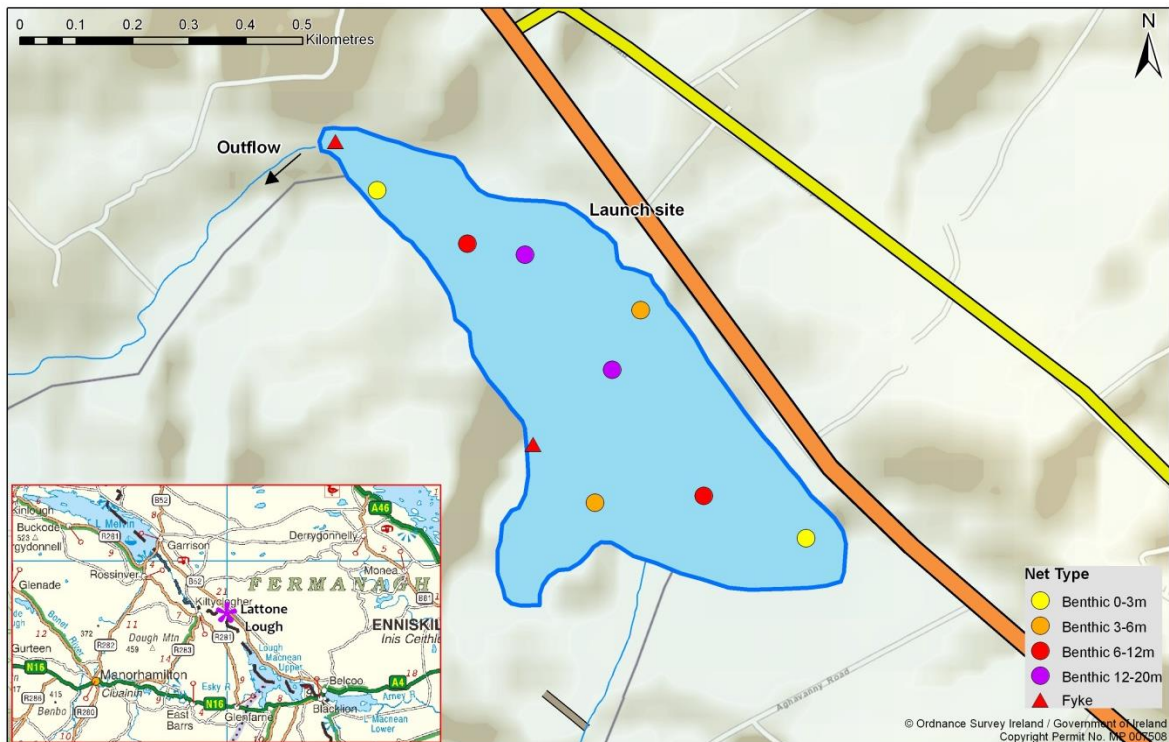


Fig. 1.1. Location map of Lattone Lough showing net locations and depths of each net (outflow is indicated on map)

1.2 Methods

Lattone Lough was surveyed over one night on the 29th of July 2013. A total of two sets of Dutch fyke nets and eight benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (2 @ 0-2.9m, 2 @ 3-5.9m, 2 @ 6-11.9m and 2 @ 12-19.9m) were deployed in the lake (10 sites). Nets were deployed in the same locations as were randomly selected in the previous survey. 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 all brown trout, roach and bream. 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.

1.3 Results

1.3.1 Species Richness

A total of five fish species were recorded in Lattone Lough in July 2013, with 455 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Perch was the most abundant fish species recorded, followed by eels, bream, brown trout and roach. The same species composition was recorded in 2010 with the exception of roach x bream hybrids and tench which were not recorded in the current survey.

Table 1.1. Number of each fish species captured by each gear type during the survey on Lattone Lough, July 2013

Scientific name	Common name	Number of fish captured		
		Benthic mono multimesh gill nets	Fyke nets	Total
<i>Perca fluviatilis</i>	Perch	406	11	417
<i>Salmo trutta</i>	Brown trout	6	1	7
<i>Abramis brama</i>	Bream	13	0	13
<i>Rutilus rutilus</i>	Roach	3	0	3
<i>Anguilla anguilla</i>	European eel	0	15	15

1.3.2 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. Mean CPUE and BPUE for all fish species captured in the 2010 and 2013 surveys are summarised in Table 1.2. Mean CPUE and BPUE for all species is illustrated in Figure 1.2 and 1.3.

Perch was the dominant species in terms of both abundance (CPUE) and biomass (BPUE). Although the mean perch and brown trout CPUE and BPUE were higher in 2013 than in 2010, these differences were not statistically significant (Table 1.2; Fig 1.2 and 1.3).

Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured in Lattone Lough, 2010 and 2013

Scientific name	Common name	2010	2013
Mean CPUE			
<i>Salmo trutta</i>	Brown trout	0.020 (0.011)	0.022 (0.010)
<i>Perca fluviatilis</i>	Perch	1.216 (0.497)	1.372 (0.521)
<i>Rutilus rutilus</i>	Roach	0.003 (0.003)	0.010 (0.005)
<i>Rutilus rutilus x Abramis brama</i>	Roach x bream hybrid	0.003 (0.003)	-
<i>Abramis brama</i>	Bream	0.013 (0.010)	0.043 (0.030)
<i>Tinca tinca</i>	Tench	0.002 (0.002)	-
<i>Anguilla anguilla</i>	European eel*	0.008 (0.008)	0.125 (0.025)
Mean BPUE			
<i>Salmo trutta</i>	Brown trout	1.966 (1.075)	2.802 (1.361)
<i>Perca fluviatilis</i>	Perch	52.135 (26.268)	61.102 (24.674)
<i>Rutilus rutilus</i>	Roach	1.500 (1.500)	1.064 (0.553)
<i>Rutilus rutilus x Abramis brama</i>	Roach x bream hybrid	1.443 (1.443)	-
<i>Abramis brama</i>	Bream	1.910 (1.689)	20.672 (15.447)
<i>Tinca tinca</i>	Tench	0.600 (0.600)	-
<i>Anguilla anguilla</i>	European eel*	1.983 (1.983)	23.392 (8.775)

Note: On the rare occasion where biomass data was unavailable for an individual fish, this was determined from a length/weight regression for that species.

*Eel CPUE and BPUE based on fyke nets only

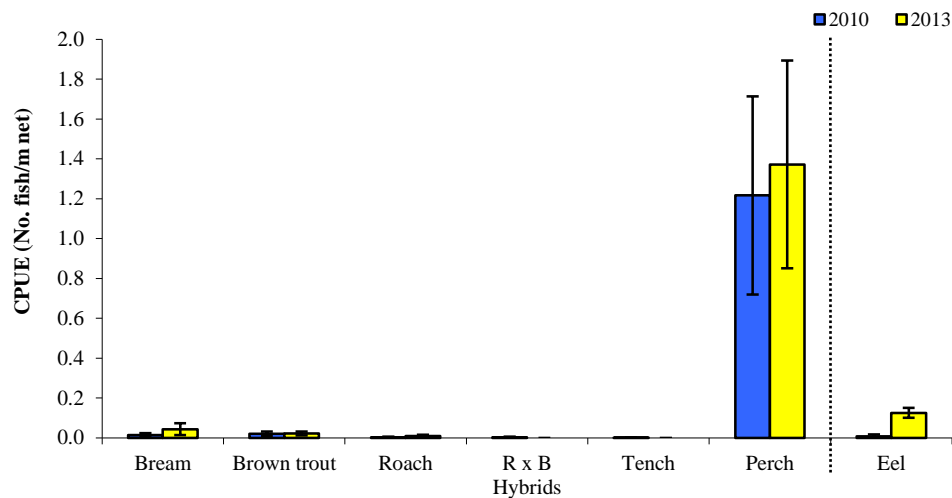


Fig. 1.2. Mean (\pm S.E.) CPUE in Lattone Lough (Eel CPUE based on fyke nets only), 2010 and 2013

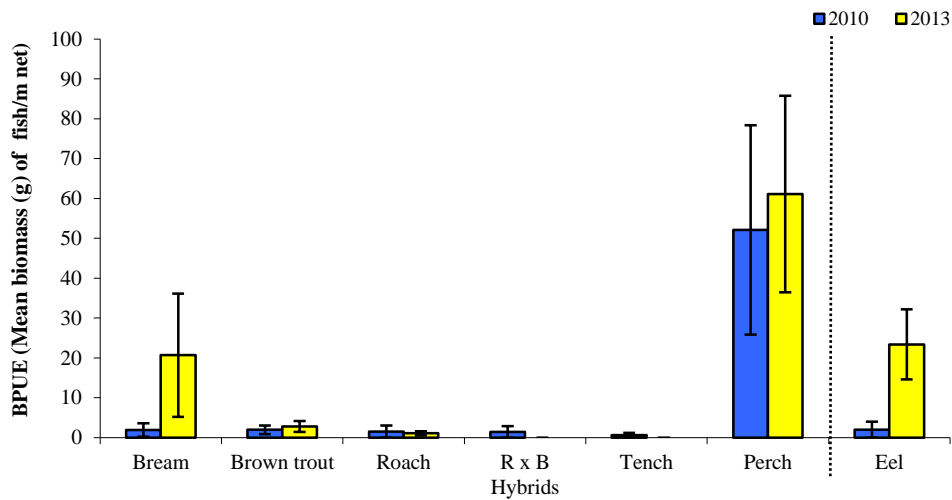


Fig. 1.3. Mean (\pm S.E.) BPUE for all fish species captured in Lattone Lough (Eel BPUE based on fyke nets only), 2010 and 2013

1.3.3 Length frequency distributions and growth

Perch captured during the 2013 survey had a length range of 4.2cm to 34.7cm (mean = 14.3cm) (Fig. 1.4) with nine age classes present, ranging from 0+ to 11+, with a mean L1 of 5.6cm (Table 1.3). The dominant age class was 4+ (Fig 1.4). Perch captured in the 2010 survey had a similar length and age range and dominant age class (Fig. 1.4).

Eels captured during the 2013 survey ranged in length from 39.8cm to 56.5cm (mean = 48.7) (Fig.1.5). One eel measuring 57.3cm was recorded in 2010 (Fig.1.5).

Bream captured during the 2013 survey ranged in length from 13.0cm to 18.0cm (age classes ranged from 2+ to 6+) and roach ranged in length from 17.0cm to 19.5cm (two roach were aged 4+ and 6+ respectively).

Brown trout during the 2013 survey ranged in length from 14.5cm to 24.9cm (Fig 1.6), with two age classes present ranging from 1+ to 3+, with a mean L1 of 6.9cm (Table 1.4). The dominant age class was 3+ (Fig 1.6). In the 2010 survey, brown trout ranged in length from 17.2cm to 25.0cm (mean = 20.3cm) with age classes ranging from 2+ to 4+. The dominant age class was 2+ (Fig 1.6).

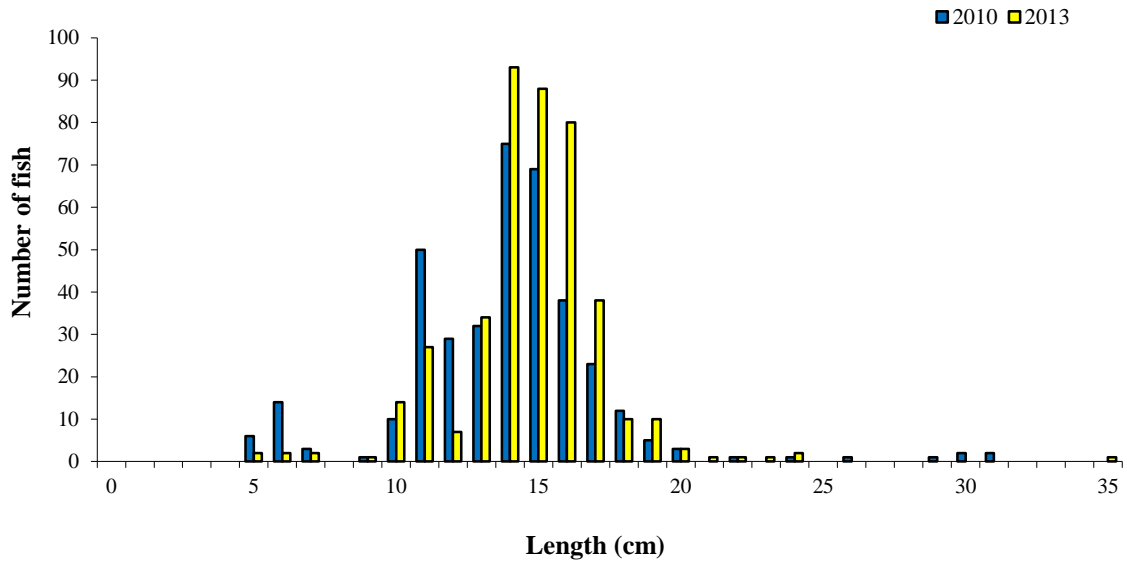


Fig. 1.4. Length frequency of perch captured in Lattone Lough, 2010 and 2013

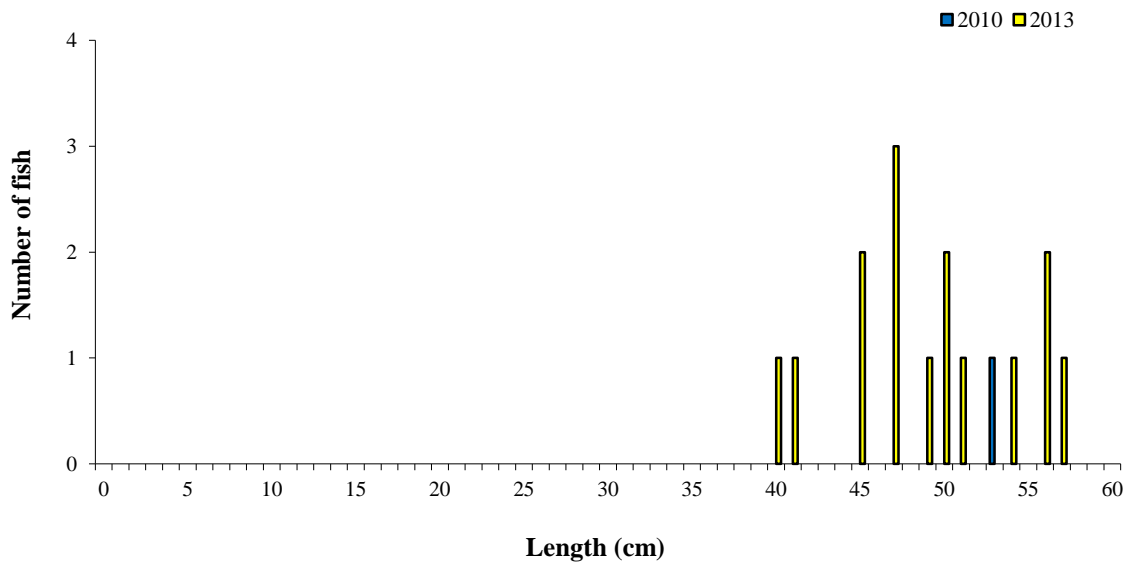


Fig. 1.5. Length frequency of eels captured in Lattone Lough, 2010 and 2013

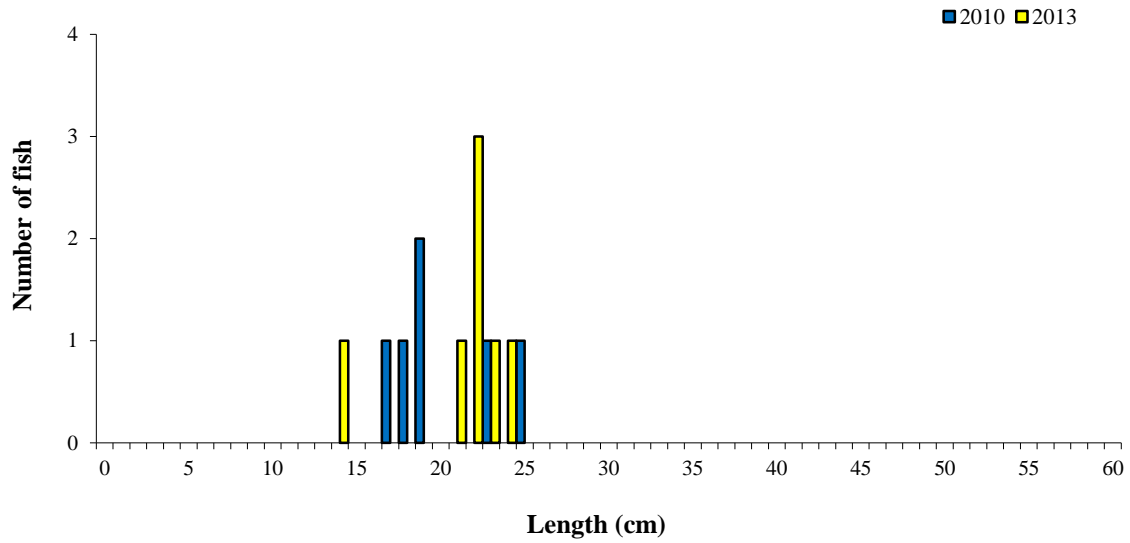


Fig. 1.6. Length frequency of brown trout captured in Lattone Lough, 2010 and 2013

Table 1.3. Mean (\pm SE) perch length at age (cm) for Lattone Lough, July 2013

	L₁	L₂	L₃	L₄	L₅	L₆	L₇	L₈	L₉	L₁₀	L₁₁
Mean	5.6 (0.1)	10.0 (0.1)	12.5 (0.1)	14.2 (0.2)	15.7 (0.3)	17.0 (0.4)	19.1 (0.8)	24.3	29.0	31.4	33.3
N	56	52	42	35	29	23	11	1	1	1	1
Range	4.0- 7.0	7.8- 11.5	10.6- 14.2	12.5- 17.6	13.3- 19.3	14.2- 21.7	14.8- 22.5	24.3- 24.3	29.0- 29.0	31.4- 31.4	33.3- 33.3

Table 1.4. Mean (\pm SE) brown trout length (cm) at age for Lattone Lough, July 2013

	L₁	L₂	L₃
Mean	6.9 (0.6)	14.2 (0.8)	20.6 (0.6)
N	6	5	5
Range	5.0-8.6	12.5-16.0	18.8-22.4

1.4 Summary

Perch was the dominant species in terms of both abundance (CPUE) and biomass (BPUE).

Although the mean perch CPUE and BPUE was higher in 2013 than in 2010, these differences were not statistically significant. Perch ranged in age from 0+ to 11+ indicating reproductive success in nine of the previous twelve years. The dominant age class was 4+.

Although the mean brown trout CPUE and BPUE was higher in 2013 than in 2010, these differences were also not statistically significant. Brown trout ranged in age from 1+ to 3+.

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 by 2015 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 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 Bad for both 2010 and 2013 based on the fish populations present.

Lattone Lough has been subject to the illegal stocking of non-native fish species over the last few years, with roach, bream, roach x bream hybrids and tench all being recorded in recent surveys. Non-native species can have significant impacts on the native fish species present. Direct effects such as predation by pike on native salmonid species (Fitzmaurice, 1984) and indirect effects such as highly fecund roach populations out competing brown trout for limited resources (Fitzmaurice, 1984) can have serious ecological consequences on the native fish species. The fact that Lattone Lough is situated in the same catchment upstream from Lough Melvin, an ecologically sensitive water body with unique brown trout populations, serves to heighten the threat caused by the illegal stocking of non-native species to this lake. Furthermore, introduction of non-native species will serve to downgrade the ecological status of a water body for WFD purposes.

In the 2010 to 2012 surveillance monitoring reporting period, the EPA assigned Lattone Lough an overall draft ecological status of Bad, based on all monitored physico-chemical and biological elements, including fish.

1.5 References

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