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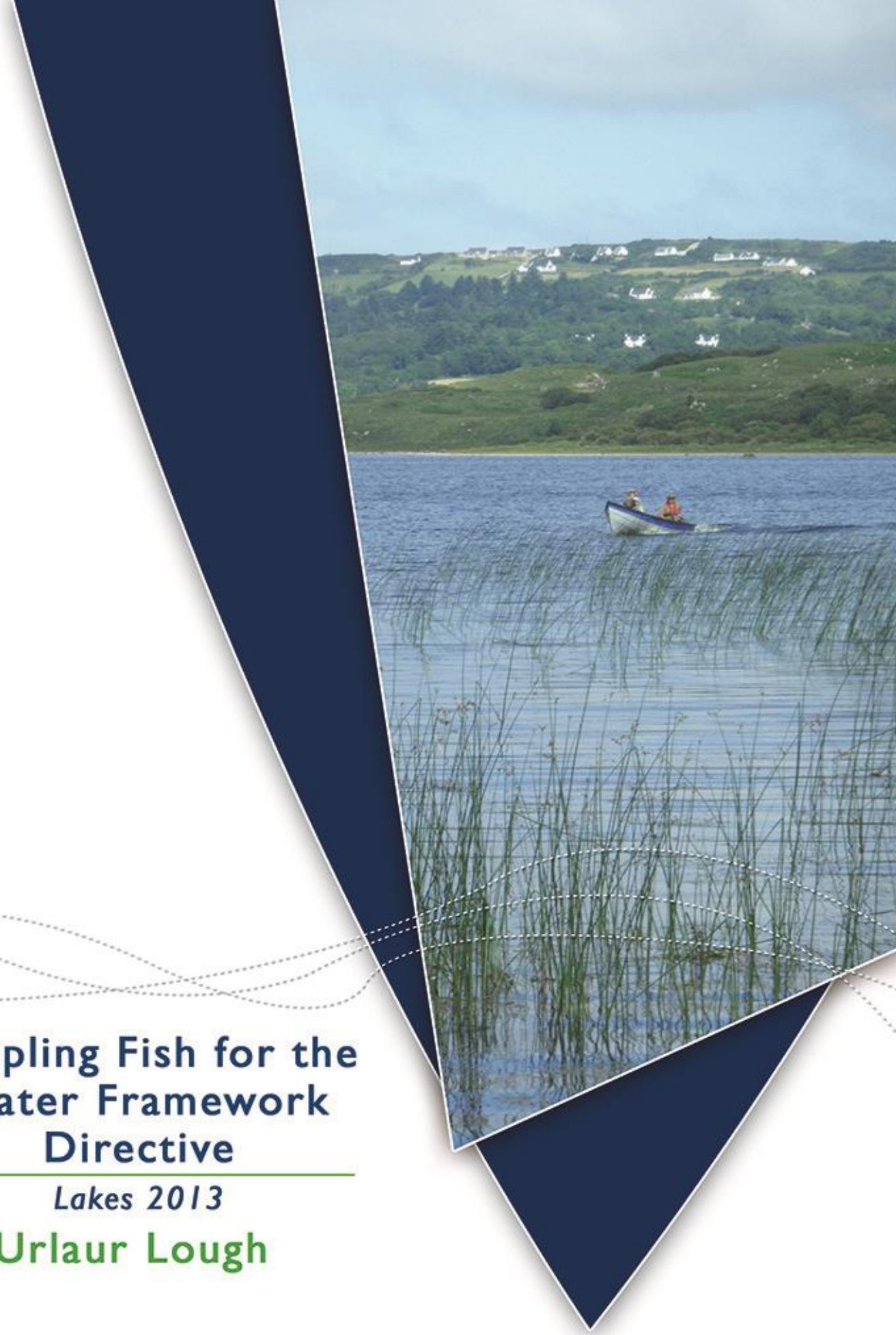

Sampling Fish for the Water Framework Directive

Lakes 2013

Urlaur Lough

Iascach Intíre Éireann
Inland Fisheries Ireland

Water Framework Directive Fish Stock Survey of Urlaur 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 Urlaur Lough, July 2013. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

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ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help and co-operation of the regional director Ms. Amanda Mooney and the staff from IFI, Limerick. 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.

1.1 Introduction

Urlaur Lough is located approximately 11km south of Ballaghaderreen, Co. Mayo (Plate 1.1, Fig. 1.1). It has an area of 114.9ha, a mean depth of <4m and a maximum depth of 11m. The lake is categorised as typology class 10 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), greater than 50ha and high alkalinity (>100mg/l $CaCO_3$).

The under lying geology of the lake is made up of carboniferous limestone. The river Lung rises in Urlaur Lough, flows through the Lung valley until it enters Lough Gara, approximately 22km north-east (ShIRBD, 2010). Urlaur Lough, along with Lough Nanoge and Lough Roe, makes up the Urlaur lakes Special Area of Conservation (SAC) (NPWS, 1999). Urlaur Lough is a hard water marl lake, a habitat listed on Annex I of the EU Habitats Directive. The aquatic flora of the lake is dominated by stoneworts (*Chara* spp.). Other aquatic species occurring in the lake include Canadian pondweed (*Elodea canadensis*), yellow and white water-lilies (*Nuphar lutea* and *Nymphaea alba*), pondweeds (*Potamogeton* spp.) and common duckweed (*Lemna minor*). Nationally important numbers of teal, mallard, pochard, whooper swan, widgeon, tufted duck and curlew have been found at the lake (NPWS, 1999). Land use practices within the site boundary are of low-intensity. These include land use for pasture and limited mechanical turf-cutting to the south-east of Urlaur Lough (NPWS, 1999).

Urlaur Lough provides an important local angling amenity and is used for national pike fishing competitions (Angling in Ireland, 2010). The lake was previously stocked with bream in 1961 but these fish failed to establish a population at that time (IFT, unpublished data). The lake was historically known to contain a moderate stock of pike, perch and eels (IFT, unpublished data).

Urlaur Lough was previously surveyed in 2010 as part of the WFD surveillance monitoring programme (Kelly *et al.,* 2011). During this survey perch and roach were found to be the dominant species present in the lake. Pike, roach x bream hybrids, eels and nine-spined stickleback were also recorded.

Plate 1.1. Urlaur Lough

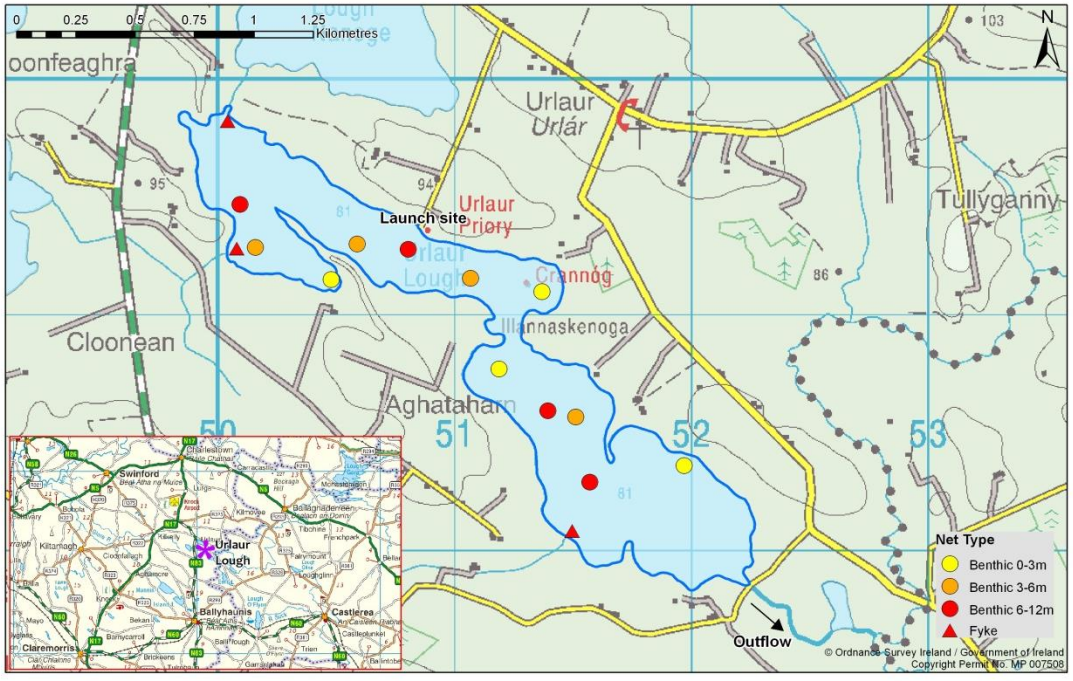

Fig. 1.1. Location map of Urlaur Lough and depths of each net (outflow is indicated on map)

1.2 Methods

Urlaur Lough was surveyed over two nights from the 24th to the 26th of July 2013. A total of three sets of Dutch fyke nets and 11 benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (4 @ 0-2.9m, 4 @ 3-5.9m and 4 @ 6-11.9m) were deployed randomly in the lake (15 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 roach, roach x bream hybrids and pike. 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 four fish species and one type of hybrid were recorded in Urlaur Lough in July 2013, with 640 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Perch and roach were the most abundant fish species recorded. Small numbers of pike, eels and roach x bream hybrids were also captured. The same species composition was recorded in 2010 with the exception of nine-spined stickleback which were only recorded in 2013.

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

Scientific name	Common name	Number of fish captured		
		Benthic mono multimesh gill nets	Fyke nets	Total
Perca fluviatilis	Perch	318	0	318
Rutilus rutilus	Roach	303	2	305
Esox lucius	Pike	9	1	10
Rutilus rutilus x Abramis brama	Roach x bream hybrid	2	0	2
Pungitius pungitius	Nine-spined stickleback	1	0	1
Anguilla anguilla	European eel	0	4	4

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 and Figures 1.2 and 1.3.

Perch was the dominant species in terms of abundance (CPUE) and roach was the dominant species in terms of biomass (BPUE). Although the mean perch CPUE and BPUE was higher in 2013 than in 2010, these differences were not statistically significant (Table 1.2; Fig 1.2 and 1.3). The mean roach CPUE was also higher in 2013 than in 2010 however this difference was not statistically significant. The mean roach BPUE was similar between 2010 and 2013 (Table 1.2; Fig 1.2 and 1.3).

Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured Urlaur Lough, July 2013

Scientific name	Common name	2010	2013
		Mean CPUE	
Perca fluviatilis	Perch	0.584 (0.170)	0.757 (0.164)
Rutilus rutilus	Roach	0.467 (0.078)	0.724 (0.254)
Esox lucius	Pike	0.020 (0.008)	0.023 (0.007)
Rutilus rutilus x Abramis brama	Roach x bream hybrid	0.013 (0.006)	0.005 (0.003)
Pungitius pungitius	Nine-spined stickleback	-	0.002 (0.002)
Anguilla anguilla	European eel*	0.033 (0.019)	0.022 (0.015)
		Mean BPUE	
Perca fluviatilis	Perch	25.922 (8.599)	27.431 (8.473)
Rutilus rutilus	Roach	76.280 (13.030)	76.278 (18.075)
Esox lucius	Pike	14.397 (8.358)	16.968 (9.525)
Rutilus rutilus x Abramis brama	Roach x bream hybrid	8.517 (4.095)	1.095 (0.749)
Pungitius pungitius	Nine-spined stickleback	-	0.002 (0.002)
Anguilla anguilla	European eel*	19.000 (13.638)	10.661 (6.895)

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

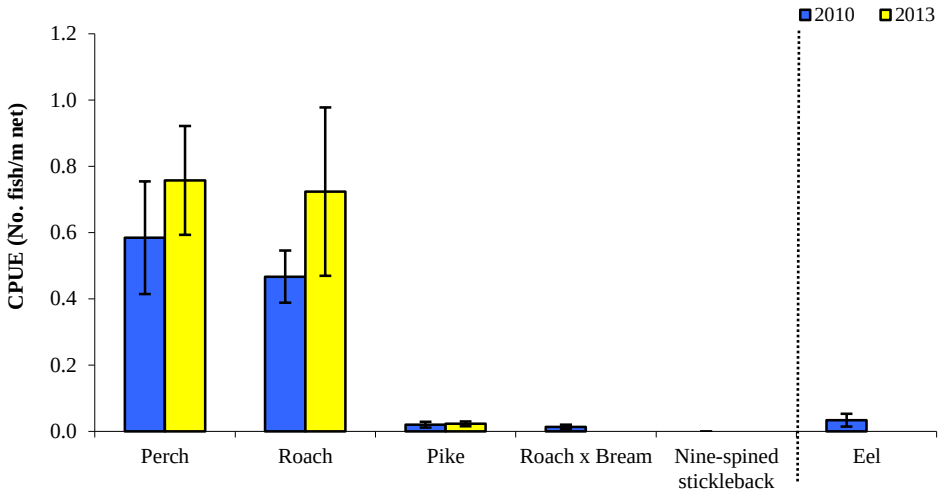

Fig. 1.2. Mean (±S.E.) CPUE for all fish species captured in Urlaur Lough (Eel CPUE based on fyke nets only), 2010 and 2013

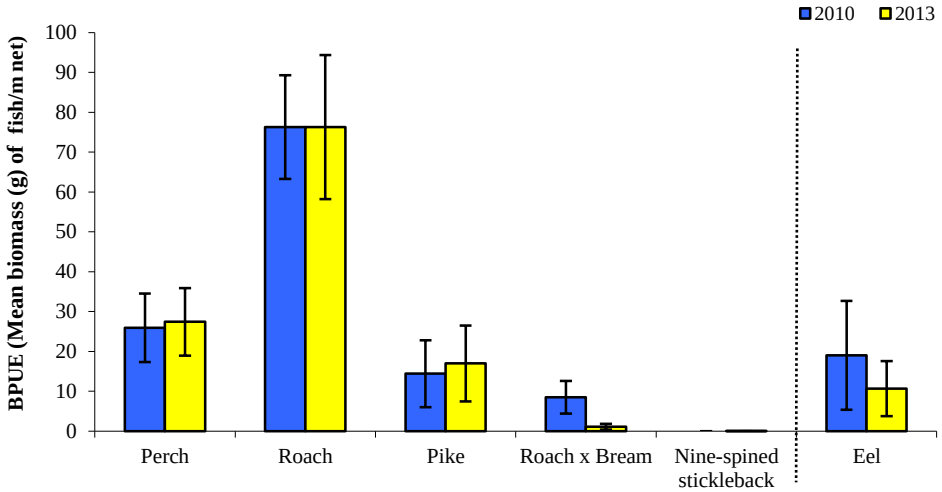

Fig. 1.3. Mean (±S.E.) BPUE for all fish species captured in Urlaur Lough (Eel BPUE based on fyke nets only), 2010 and 2013

1.3.3 Length frequency distributions and growth

Perch captured in the 2013 survey ranged in length from 3.5cm to 28.5cm (mean = 11.3cm) (Fig. 1.4) with eight age classes present, ranging from 0+ to 7+, with a mean L1 of 5.0cm (Table 1.3). The dominant age class was 1+ (Fig 1.4). Perch captured in the 2010 survey had a similar length range, age range and dominant age class (Fig. 1.4).

Roach captured in the 2013 survey ranged in length from 5.5cm to 29.2cm (mean = 14.4cm) (Fig. 1.5) with nine age classes present, ranging from 1+ to 9+, with a mean L1 of 2.6cm (Table 1.4). The dominant age class was 1+ (Fig 1.5). Roach captured in the 2010 survey had a similar length range and age range, however the dominant age class was 2+ (Fig. 1.5).

Pike ranged in length from 10.0cm to 78.0cm, roach x bream hybrids ranged in length from 22.5cm to 24.2cm and eels ranged in length from 50.5cm to 77.5cm. One nine-spined stickleback measuring 3.0cm was also captured.

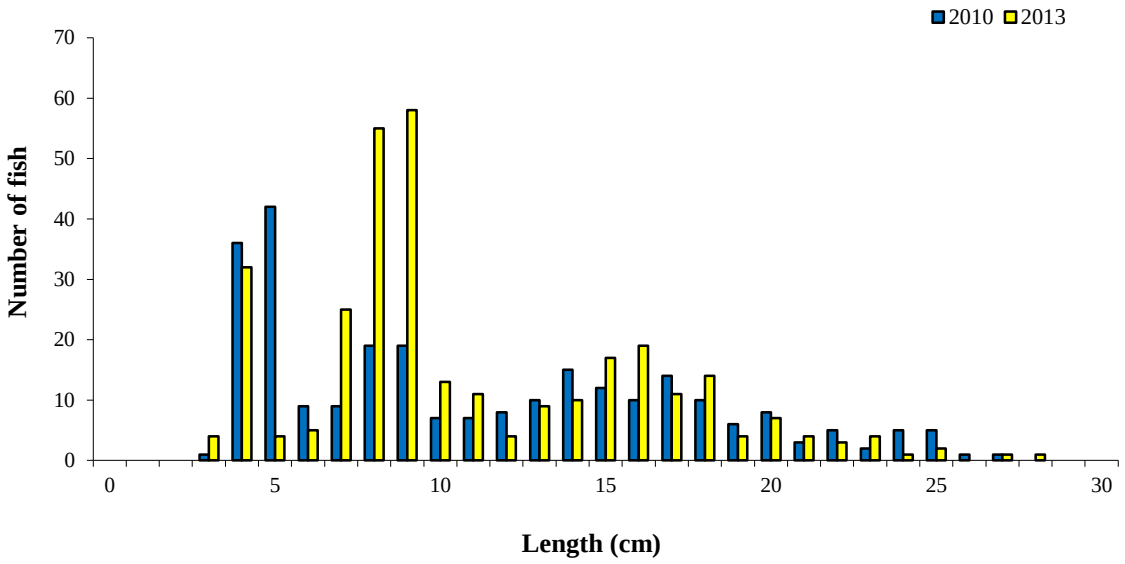

Fig. 1.4. Length frequency of perch captured on Urlaur Lough, 2010 and 2013

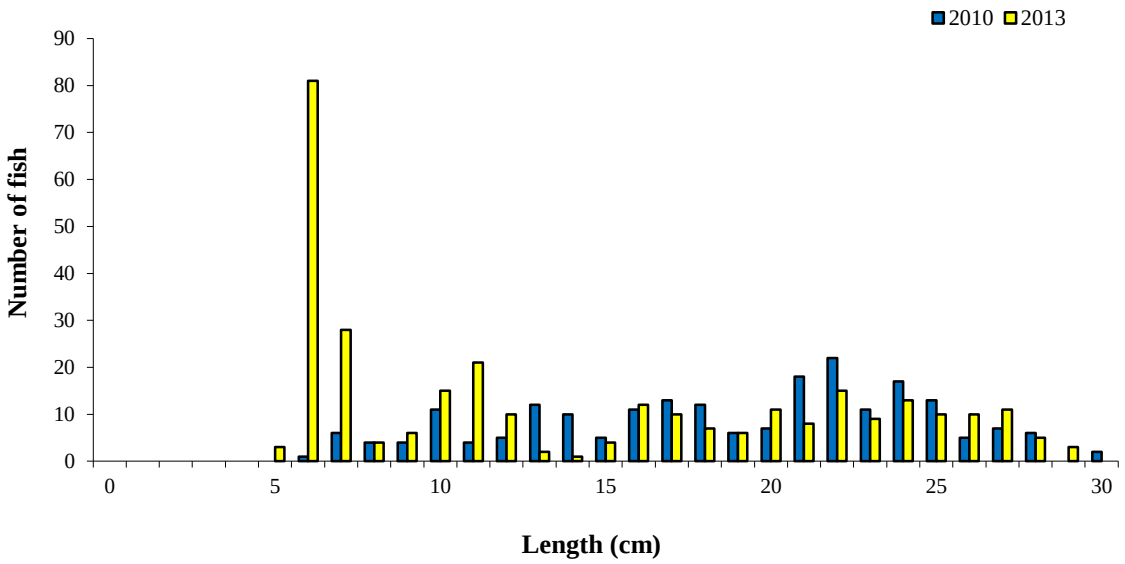

Fig. 1.5. Length frequency of roach captured on Urlaur Lough, 2010 and 2013

Table 1.3. Mean (±SE) perch length (cm) at age in Urlaur Lough, July 2013

	L_1	L_2	L_3	L_4	L_5	L_6	L_7
Mean	5.0 (0.1)	9.0 (0.2)	13.8 (0.2)	17.7 (0.5)	20.6 (1.7)	22.8 (3.0)	24.9
N	84	61	46	27	12	5	3
Range	3.5-6.9	6.7-12.0	10.2-16.9	14.5-21.2	17.3-23.2	19.8-24.9	21.8-26.5

Table 1.4. Mean (±SE) roach length (cm) at age in Urlaur Lough, July 2013

	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9
Mean	2.6 (0.1)	6.2 (0.2)	11.5 (0.3)	16.6 (0.4)	20.6 (0.3)	23.6 (0.3)	25.4 (0.4)	27.0 (0.5)	26.5 (0.6)
N	103	98	75	58	35	27	18	9	3
Range	1.5-4.9	3.6-9.9	5.7-17.6	11.3-22.0	16.9-25.7	20.4-27.5	22.4-27.4	23.8-29.0	25.3-27.3

1.4 Summary

Perch was the dominant species in terms of abundance (CPUE) and roach was the dominant species in terms of biomass (BPUE) during the 2013 survey.

Although the mean perch CPUE and BPUE was higher in 2013 than in 2010, these differences were not statistically significant. The dominant age class of perch was 1+, with ages ranging from 0+ to 7+ indicating reproductive success in each of the previous eight years.

Although the mean roach CPUE was higher in 2013 than in 2010 and BPUE was similar, these differences were not statistically significant. Roach ranged in age from 1+ to 9+ indicating reproductive success in nine of the last ten years. However, no 0+ fish were recorded. The dominant age class was 1+.

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, Urlaur Lough has been assigned an ecological status of Bad for both 2010 and 2013 based on the fish populations present.

In the 2010 to 2012 surveillance monitoring reporting period, the EPA assigned Urlaur 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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