Derrybrick Lough

Sampling Fish for the Water Framework Directive - Lakes 2008

The Central and Regional Fisheries Boards

ACKNOWLEDGEMENTS

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1.1 Introduction

Derrybrick Lough is located in the Erne catchment, north-east of Killeshandra and approximately five kilometres south-west of Belturbet. The lake is situated at an altitude of 48m above sea level, has a surface area of 36ha, mean depth of 2.1m and a maximum depth of 4.9m. The lake is categorised as typology class 9 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), less than 50ha and high alkalinity (>100mg/l CaCO3). Derrybrick Lough is located within the Lough Oughter and its associated loughs Special Area of Conservation (NPWS, 2002). The geology of the area is predominantly Lower Carboniferous Limestone.

A previous survey by the Inland Fisheries Trust (IFT) in 1969 established rudd, bream, perch, pike and rudd x bream hybrids to be present in the lake (IFT, unpublished data). A second survey in August 1980 found that roach were numerous, there was a poor stock of rudd, small bream, small perch, a fair stock of pike and a good stock of roach x bream hybrids (up to 1,125g) (IFT, unpublished data). The lake was also surveyed by the Central Fisheries Board (CFB) and the Northern Regional Fisheries Board (NRFB) in 2005 as part of the NS Share Fish in Lakes project, and this survey found that roach followed by perch were the dominant fish species in the lake (Kelly *et al*., 2007). Pike, roach x bream hybrids and eels were also present.

Plate 1.1. Derrybrick Lough, looking north across the lake

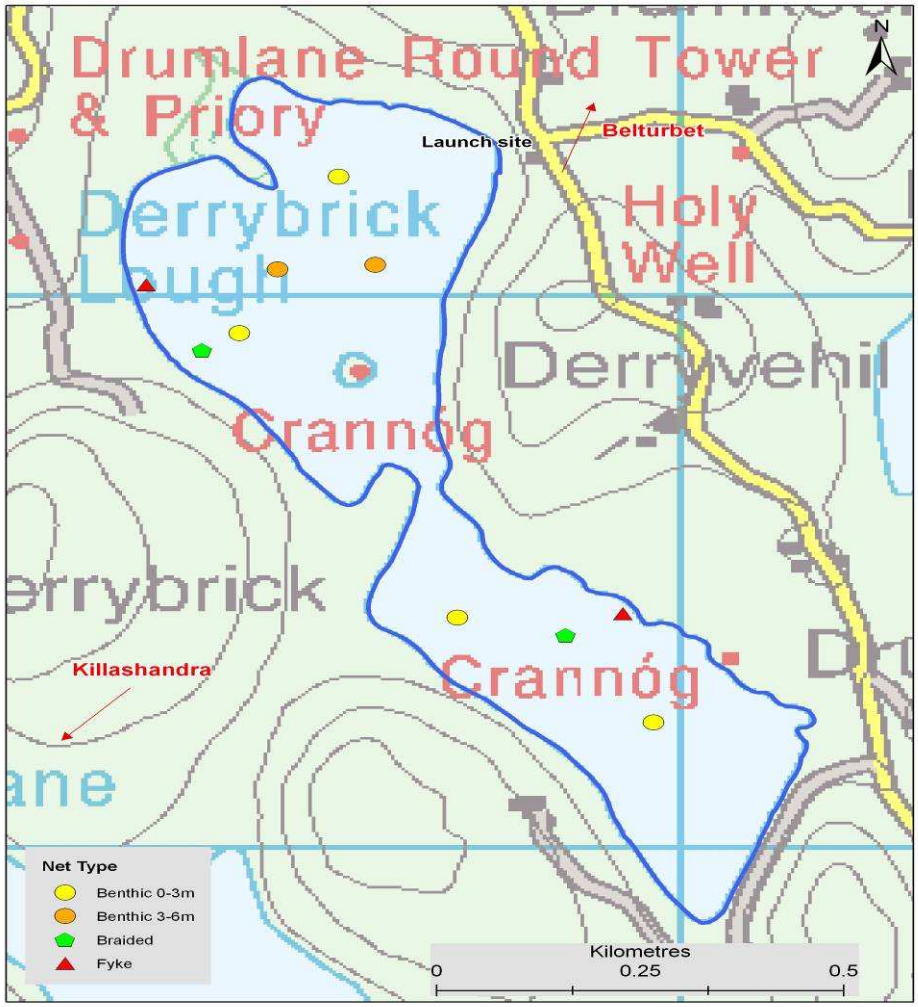

Fig. 1.1. Location map of Derrybrick Lough showing locations and depths of each net

1.2 Methods

The lake was surveyed over one night on the 29th of September 2008. A total of two sets of Dutch fyke nets and six benthic monofilament multimesh (12 panel, 5-55mm mesh size) survey gill nets (4 @ 0-2.9m and 2 @ 3-5.9m) were deployed randomly in the lake (eight sites). The netting effort was supplemented using two benthic braided survey gill nets (62.5mm mesh knot to knot) at two additional sites. Survey locations were selected randomly using a grid placed over the map of the lake. 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 roach, 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 returned to the laboratory for further analysis.

1.3 Results

1.3.1 *Species richness*

Five fish species and one hybrid were recorded in Derrybrick Lough during the survey. The number of each species captured by each gear type is shown in Table 1.1. A total of 270 fish were captured. Perch was the most common fish species, followed by roach, eel, roach x bream hybrids, pike and bream. In contrast, in the 2006 survey, four fish species and one hybrid were encountered during the survey (Kelly *et al.*, 2007). Furthermore, in 2006, roach were the most common fish species captured, followed by perch, pike, roach x bream hybrid and eel. No pure bream were captured during the 2005 survey.

Table 1.1. List of fish species recorded (including numbers captured) during the survey on Derrybrick Lough, September 2008

Scientific name	Common name	Number of fish captured			
		Benthic mono multimesh gill nets	Benthic braided multimesh gill nets	Fyke nets	Total
Perca fluviatilis	Perch	170	0	3	173
Rutilus rutilus	Roach	77	0	0	77
	Roach x bream hybrid	3	3	0	6
Esox lucius	Pike	1	0	0	1
Abramis brama	Bream	1	0	0	1
Anguilla anguilla	Eel	0	0	12	12

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per metre of net, i.e. mean CPUE. Fish biomass was calculated as the mean weight of fish caught per metre of net, i.e. mean BPUE. A summary of CPUE and BPUE data for each species and gear type is shown in Table 1.2.

Table 1.2. Mean CPUE (mean number of fish per m of net) and mean BPUE (mean weight of fish per m of net) for all fish species recorded on Derrybrick Lake, September 2008

Gear type	Roach	Perch	Pike	RoachxBream hybrids	Bream	Eels
Mean CPUE (mean number of fish/m of net)						
Gill nets (all)	0.321	0.708	0.004	0.026	0.004	-
Fyke nets	0	0.025	0	0	0	0.1
Mean BPUE (mean weight (g) of fish/m of net)*						
Gill nets (all)	27.967	13.4	8.333	40.623	0.829	-
Fyke nets	0	0.683	0	0	0	24.183

1.3.3 *Length frequency distributions*

Length frequency data for perch and roach are shown in Figures 1.2 and 1.3 respectively. In 2008, perch ranged in length from 5.6cm to 27.5cm (Fig. 1.2), compared with a range of 6.0cm to 23.1cm in

2005. In 2008, roach ranged in length from 4.0cm to 32.5cm (Fig. 1.3), compared with a range of 3.0cm to 29.0cm in 2005. In 2008, roach x bream hybrids ranged in length from 31.7cm to 46.8cm. In 2005, there was only one hybrid captured which measured 19.1cm. Eels ranged in length from 33.0cm to 62.0cm in 2008. In 2005, pike ranged in length from 20.2cm to 32.2cm. In the 2008 survey, the only pike observed escaped from the net before it could be measured.

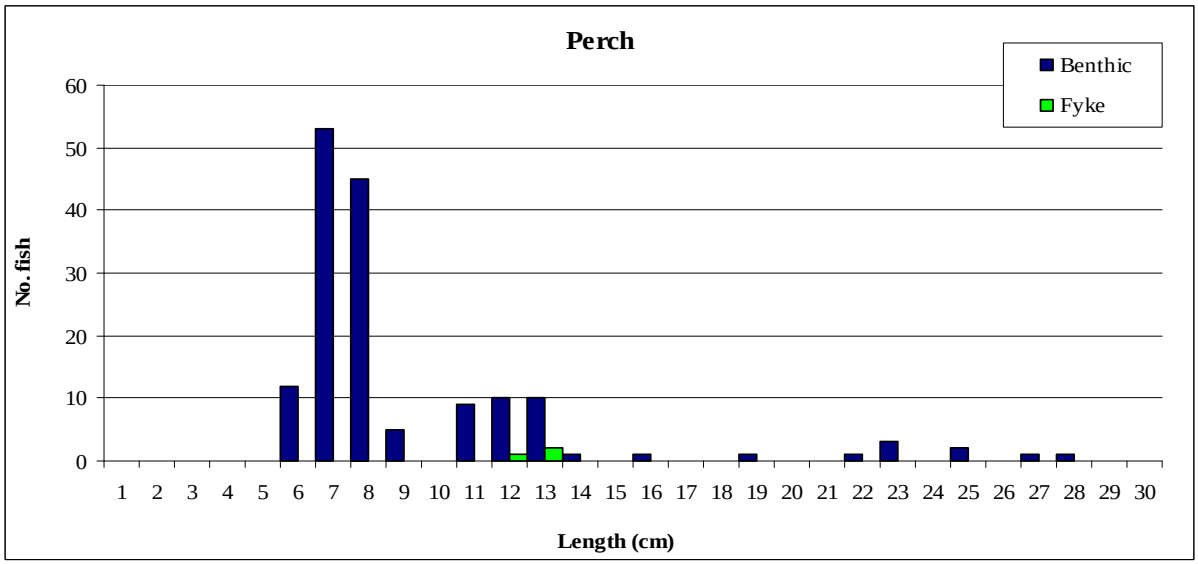

Fig. 1.2. Length frequency of perch captured on Derrybrick Lough, September 2008

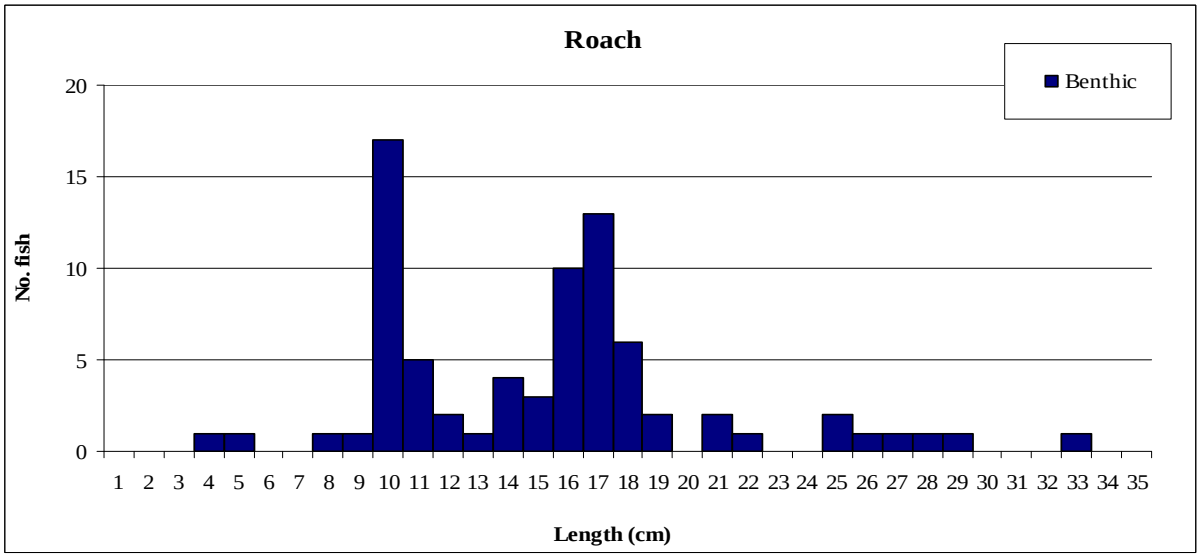

Fig. 1.3. Length frequency of roach captured on Derrybrick Lough, September 2008

2.3.4 *Fish age and growth*

Perch ranged in age from 0+ to 5+. Mean perch L1 was 6.9cm. Perch captured during the 2005 survey tended to be younger than those captured in the current survey and ranged in age from 0+ to 3+. In 2005, the mean perch L1 was 7.1cm. The ages for roach in both 2005 and 2008 ranged from 1+ to 7+ (Table 1.4). Mean roach L1 was 4.4cm in 2008 and 3.3cm in 2005. Roach x bream hybrids ranged in age from 5+ to 12+. A single bream was aged at 4+.

Table 1.3. Mean (SD) perch length at age (cm) in Derrybrick Lough, September 2008

	L_1	L_2	L_3	L_4	L_5
Mean	6.9 (0.68)	12.9 (2.08)	19.3 (2.13)	21.7 (2.81)	29.4
N	31	11	6	2	1
Range	5.5-8.6	10.6-16.4	16.3-22	19.7-23.7	29.4

Table 1.4. Mean (SD) roach length at age (cm) in Derrybrick Lough, September 2008

	L_1	L_2	L_3	L_4	L_5	L_6	L_7
Mean	4.4 (0.45)	9 (1.15)	15 (1.79)	20.8 (2.09)	26.4 (1.51)	27.8	30.4
N	35	30	13	7	2	1	1
Range	3.1-5.1	7.1-11.5	11.7-17	18.7-24.3	25.3-27.5	27.8	30.4

1.4 Summary

Derrybrick Lough is a naturally eutrophic water body located in County Cavan in the Erne catchment. In the 2008 survey, five fish species and one hybrid were recorded (i.e. similar species composition to 2005). Perch was the most abundant species, followed by roach. Mean CPUE for perch was also high (0.733 fish/m net) in comparison with other high alkalinity lakes surveyed (Kelly *et al*., 2009). In contrast, the mean CPUE for perch in 2005 was low in comparison to the other high alkalinity lakes surveyed at the time, e.g. Lough Egish, Deralk Lake and Bawn Lake (Kelly *et al*., 2007).

Furthermore, the mean CPUE for roach in the lake in 2008 survey was the second highest when compared with other high alkalinity lakes surveyed, with only Cavetown Lough having a higher CPUE for roach (Kelly *et al*., 2009). This is evident even after a decrease in roach CPUE between 2005 and 2008.

Derrybrick Lough had the highest CPUE for eels among the high alkalinity lakes studied, and conversely had the lowest CPUE for pike when compared with similar lakes such as Lough O'Flynn (Kelly *et al*., 2009).

Perch growth was very fast in comparison with other high alkalinity lakes, e.g. Corglass Lough and Lough Egish. Roach in Derrybrick Lough had the fastest growth rate in comparison with other high alkalinity lakes surveyed in 2008, e.g. Corglass Lough and Lough Annaghmore.

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 new WFD multimetric fish classification tool has been developed for the island of Ireland (Ecoregion 17) using Agri-Food and Biosciences Institute Northern Ireland (AFBINI) and CFB data (Kelly *et al*., 2008). Using this tool and expert opinion, Derrybrick Lough has been assigned a draft classification of moderate. This is the same status class that was assigned to the lake in 2005. The EPA has assigned moderate status to Derrybrick Lough in an overall interim draft classification. This is based on physico-chemical parameters and biotic elements, such as macroinvertebrates, macrophytes and fish.

1.5 References

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