Templehouse Lake

Sampling Fish for the Water Framework Directive - Lakes 2008

The Central and Regional Fisheries Boards

ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help and co-operation of the CEO Mr. Vincent Roche, the ACEO Dr. John Conneely and their staff from the North Western Regional Fisheries Board. The authors would also like to gratefully acknowledge the help and cooperation from all their colleagues in the Central Fisheries Board (CFB).

Mr. Roderick Perceval, Templehouse, Co. Sligo provided access to the lake and his help is gratefully acknowledged.

The authors would also like to acknowledge the funding provided for the project from the Department of Communications, Energy and Natural Resources for 2008.

1.1 Introduction

Templehouse Lake (Fig. 1.1) is situated approximately six kilometres south of Ballymote, Co. Sligo in the Owenmore catchment. The lake is located on the private 405 hectare Templehouse Estate. The lake has a surface area of 118.6ha, mean depth of 2.6m and maximum depth of 5.3m. The underlying geology is carboniferous limestone. The lake falls into typology class 10 (as designated by the EPA for the Water Framework Directive), i.e. shallow (mean depth <4m), greater than 50ha and high alkalinity (>100 mg/l $CaCO_3$).

Templehouse Lake forms part of the Templehouse and Cloonacleigha Loughs Special Area of Conservation . It has been designated as a SAC under the EU Habitats Directive due to the diversity of habitats present; namely hard oligo-mesotrophic waters containing benthic vegetation made up of *Chara* spp. (hard water lakes with stoneworts) and a water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho- Batrachion* vegetation (submerged or floating river vegetation). Templehouse Lake in particular supports typical aquatic vegetation for hard water lakes, with well developed and diverse marginal vegetation (NPWS, 2006).

The lake is well known for its coarse fishing and supports populations of pike, bream, rudd, perch and eels. Templehouse Estate promotes angling and regularly plays host to fishing competitions. Densities of pike have been described by the North Western Regional Fisheries Board as good, with individuals of up to 13.6kg present. The lake was surveyed in 1980 by the Inland Fisheries Trust and was found to have good stocks of bream, rudd and pike (IFT, unpublished data).

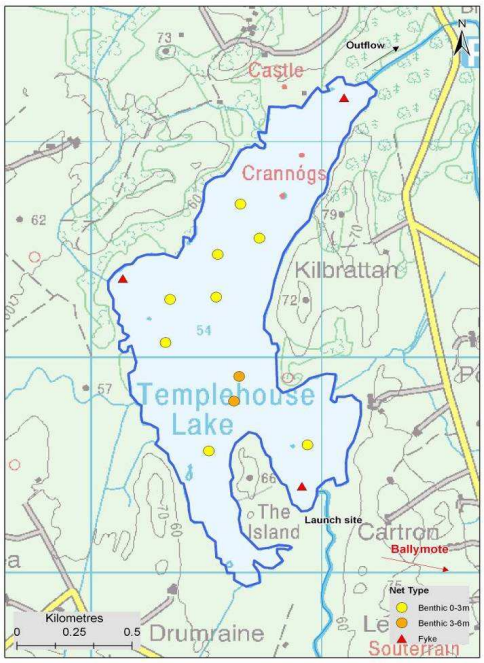

Fig. 1.1. Location map of Templehouse Lake showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

The lake was surveyed over one night on the 6th of October 2008. A total of three sets of Dutch fykes and 10 benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) survey gill nets (8 @ 0-2.9m and 2 @ 3-5.9m) were deployed randomly in the lake (13 sites). Survey locations were randomly selected using a grid placed over a 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 trout, rudd, roach, pike, bream and hybrids. 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*

A total of seven fish species and two types of hybrids were recorded on Templehouse Lake in October 2008. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 276 fish were recorded during the survey. Roach were the most abundant fish species encountered in the benthic gill nets. One brown trout was recorded. Eels were also captured during the survey.

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

Scientific names	Common names	Number of fish captured		
		Benthic mono multimesh gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	1	0	1
Rutilus rutilus	Roach	169	1	170
Perca fluviatilis	Perch	59	1	60
	Roach x bream hybrids	17	0	17
Esox lucius	Pike	9	0	9
	Roach x rudd hybrids	9	0	9
Scardinius erythrophthalmus	Rudd	2	0	2
Abramis brama	Bream	2	0	2
Anguilla anguilla	Eel	0	6	6

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 Templehouse Lake, October 2008

Gear type	Brown trout	Roach	Perch	Bream	Pike	Rudd	RuddxRoach	RoachxBream	Eel
Mean CPUE (mean number of fish/m of net)									
Gill nets	0.003	0.563	0.197	0.007	0.030	0.007	0.030	0.057	-
Fyke nets	0	0.006	0.006	0	0	0	0	0	0.033
Mean BPUE (mean weight (g) of fish/m of net)									
Gill nets	0.090	40.350	9.474	2.710	17.597	2.993	10.912	15.508	-
Fyke nets	0	0.111	0	0	0	0	0	0	10.894

* In the rare occasion where biomass data was unavailable for an individual fish, this was determined from a length/weight regression for that species

1.3.3 *Length frequency distributions*

Roach ranged in length from 4.5cm to 31.6cm (mean = 14.7cm) (Fig. 1.2). Perch had recorded lengths from 5.2cm to 29.0cm (mean = 16.0cm) (Fig. 1.3). Roach x bream hybrids ranged in length from 15.5cm to 32.5cm. A small number of rudd x roach hybrids were also recorded, with lengths ranging from 15.2cm to 33.3cm. Eels ranged in length from 43.2cm to 62.2cm. Nine pike were captured, ranging in length from 38.0cm to 48.8cm.

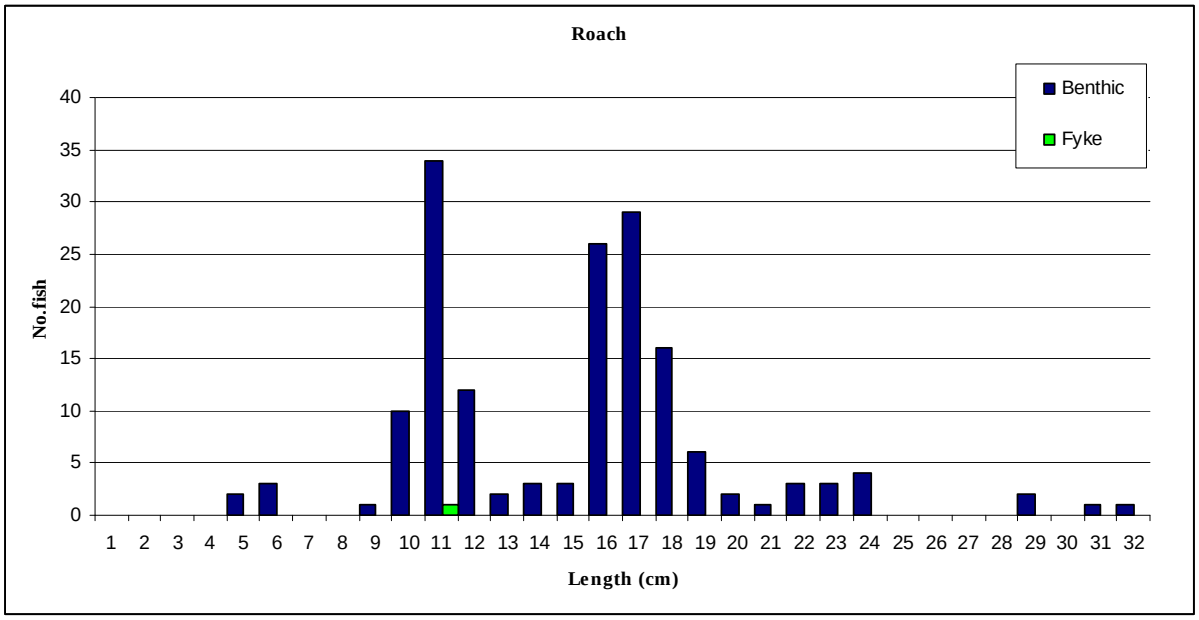

Fig. 1.2. Length frequency of roach captured on Templehouse Lake, October 2008

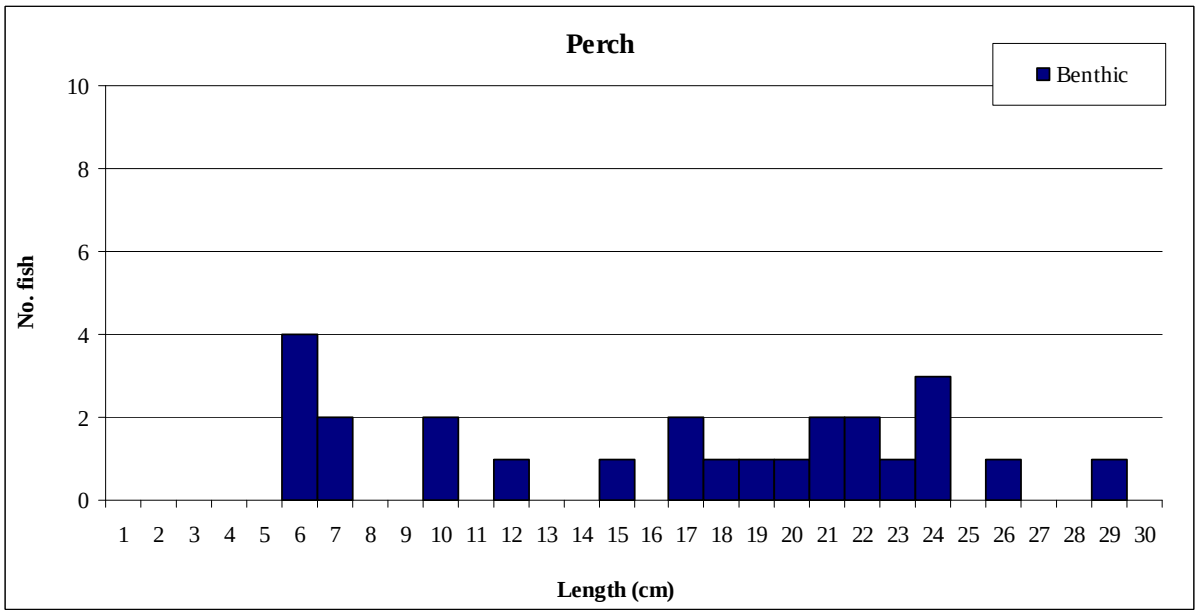

Fig. 1.3. Length frequency of perch captured on Templehouse Lake, October 2008

1.3.4 *Fish age and growth*

Roach ranged in age from 1+ to 7+. Mean roach L1 was 4.3cm. Perch ranged in age from 0+ to 4+ (Table 1.4). Mean perch L1 was 5.6cm. Roach x bream hybrids were aged from 2+ to 9+. Rudd x roach hybrids ranged from 3+ to 10+. The two pike captured were aged 1+ and 2+. Two specimens of rudd (6+ and 8+) were also recorded. The single brown trout captured was aged 1+.

Table 1.3. Mean roach growth rates (and SD) for Templehouse Lake, October 2008

	L_1	L_2	L_3	L_4	L_5	L_6	L_7
Mean	4.3 (0.42)	8.4 (1.03)	12.3 (1.26)	16.4 (1.68)	21.5 (1.5)	25.8 (0.94)	28.1 (1.23)
N	57	50	39	30	7	4	3
Range	3.3-5.2	6.3-10.7	10.4-15.5	14.1-21.2	20.2-24.2	25-27	26.9-29.4

Table 1.4. Mean perch growth rates (and SD) for Templehouse Lake, October 2008

	L_1	L_2	L_3	L_4
Mean	5.6 (0.71)	11.5 (1.59)	17.0 (1.88)	19.5 (2.41)
N	16	13	11	8
Range	4.8-7.3	8.7-14.1	14.5-20.3	16.3-23.3

1.4 Summary

Roach was the dominant species in Templehouse Lake, followed by perch and roach x bream hybrids.

The mean CPUE for roach in Templehouse Lake was above average when compared with other high alkalinity lakes surveyed during 2008, e.g. Lough Sheelin and Cavetown Lake (Kelly *et al*., 2009). The CPUE for perch was the lowest for the high alkalinity lakes sampled. The lake also had the highest CPUE for bream and pike compared to other high alkalinity lakes (Kelly *et al*., 2009).

Roach growth was average in Templehouse Lake when compared to other lakes of high alkalinity surveyed, e.g. Corglass Lake and Derrybrick Lough. Perch had an average growth rate in comparison to other high alkalinity lakes, e.g. Lough Egish and Lough Nanoge.

Historically bream, rudd and pike were present in the lake. Unfortunately roach (a non-native species in Ireland) entered the lake post 1980 and have now become the dominant fish species in the lake. Results show that roach have almost completely displaced the rudd population due to hybridization and competition.

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 1) using Agri-Food and Biosciences Institute Northern Ireland (AFBINI) and CFB data (Kelly *et al*., 2008). Using this tool and expert opinion, Templehouse Lake has been assigned a draft classification of moderate status for fish. The EPA has assigned an overall status of bad to Templehouse Lake in an interim draft classification. This is based on physico-chemical parameters and biotic elements such as macroinvertebrates and macrophytes.

1.5 References

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