Lough Nanoge

Sampling Fish for the Water Framework Directive - Lakes 2008

The Central and Regional Fisheries Boards

ACKNOWLEDGEMENTS

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1.1 Introduction

Lough Nanoge (Plate 1.1, Fig. 1.1) is situated in the upper catchment of the Lung River, a major tributary of the Boyle River and forms part of the Urlaur Lakes Special Area of Conservation. It has a surface area of 46ha, a mean depth of 4.5m and a maximum depth of 11.5m. The lake is categorised as typology class 11 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), smaller than 50ha and high alkalinity (>100mg/l $CaCO_3$).

There are three small lakes within the Urlaur Lakes SAC, Lough Nanoge, Lough Roe and Urlaur Lough, all of which are hard water lakes, a habitat listed on Annex I of the EU Habitats Directive. Lough Nanoge is a marl lake and its aquatic flora is dominated by stoneworts (*Chara* spp.). Land use practices at the site are of low-intensity and the shoreline consists of areas of shallow mineral soils and peat (NPWS, 1999).

Lough Nanoge holds a stock of coarse fish, including pike, perch and bream. The lake was stocked with brown trout in the past by the Inland Fisheries Trust (CFB, archival data), however, no stocking has taken place in recent years. There is no history of trout in the lake and little potential for trout spawning. The lakes of the Urlaur Lakes SAC provide an important local amenity for anglers and are thus well regarded by the local community (NPWS, 1999).

Plate 1.1. Lough Nanoge, August 2008

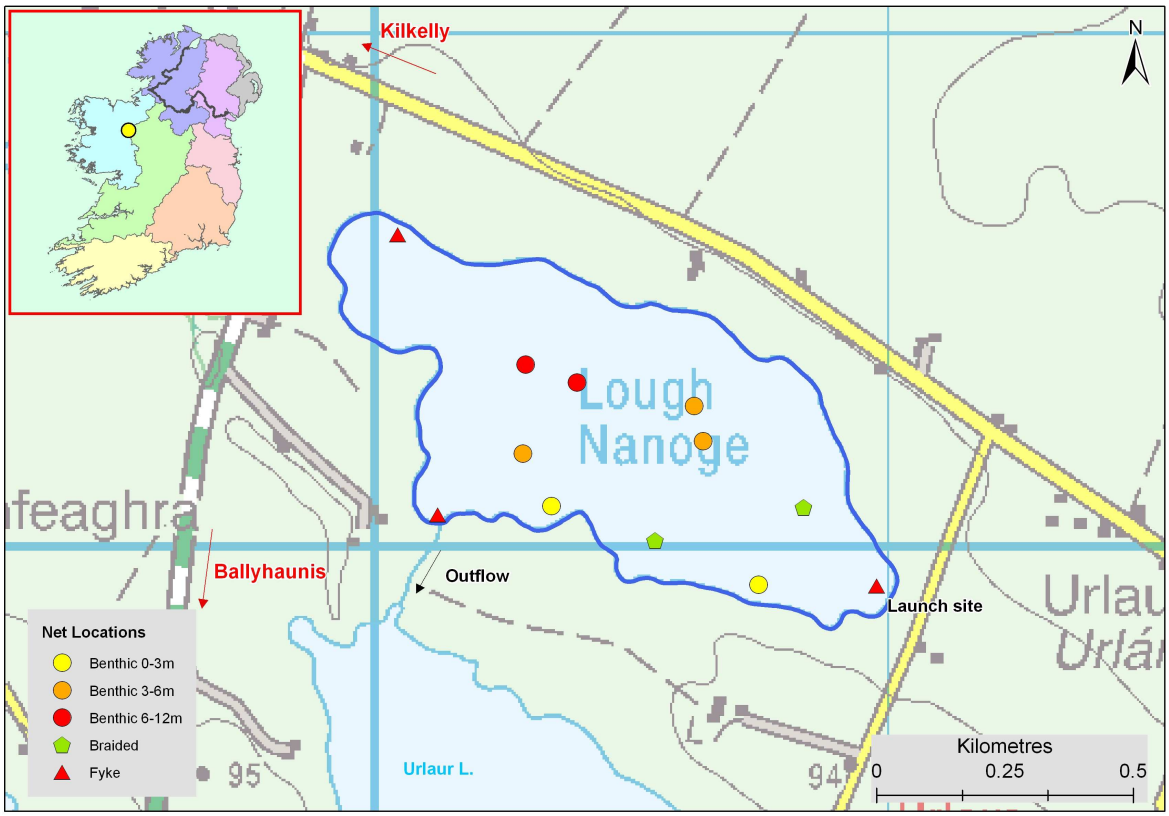

Fig. 1.1. Location map of Lough Nanoge showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

Lough Nanoge was surveyed over one night on the 14th of August 2008. A total of three sets of Dutch fyke nets and seven benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) survey gill nets (2 @ 0-2.9m, 3 @ 3-5.9m and 2 @ 6-11.9m) were deployed randomly in the lake (10 sites). The netting effort was supplemented using two benthic braided (62.5mm mesh knot to knot) survey gill nets (two additional sites). Survey locations were randomly selected 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 captured apart from perch were measured and weighed on site, and scales were removed from pike and roach. 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 four fish species were recorded on Lough Nanoge in August 2008. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 306 fish were captured during the survey. Perch was the most abundant fish species encountered in the benthic gill nets. Roach were present and small numbers of pike were also recorded. Eels were also captured during the survey.

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

Scientific name	Common name	Number of fish captured			
		Benthic mono multimesh gill nets	Benthic braided gill nets	Dutch fykes	Total
Perca fluviatilis	Perch	209	0	0	209
Rutilus rutilus	Roach	89	0	0	89
Esox lucius	Pike	5	0	1	6
Anguilla anguilla	Eel	0	0	4	4

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. Perch were the dominant fish species in terms of abundance (CPUE) and biomass (BPUE) in the lake at the time of sampling (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 Lough Nanoge, August 2008

Gear type	Perch	Pike	Roach	Eel
Mean CPUE (mean number of fish/m of net)				
Gill nets (all)	0.774	0.019	0.329	-
Fyke nets	0	0.006	0	0.022
Mean BPUE (mean weight (g) of fish/m of net)				
Gill nets (all)	49.388	11.241	37.674	-
Fyke nets	0	0.078	0	16.711

* On 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*

Perch ranged in length from 4.2cm to 28.1cm (mean = 14.3cm) (Fig. 1.2). Roach ranged in length from 10.9cm to 27.5cm (mean = 18.1cm) (Fig. 1.3). Eels ranged in length from 50.3cm to 85.0cm, and pike had lengths from 12.0cm to 65.0cm.

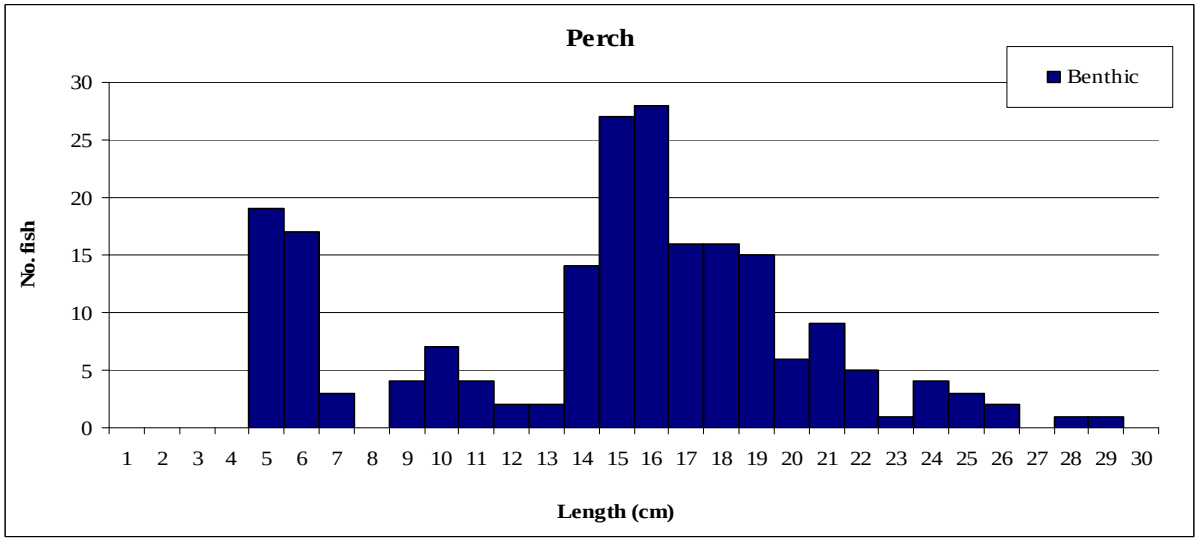

Fig. 1.2. Length frequency of perch captured on Lough Nanoge, August 2008

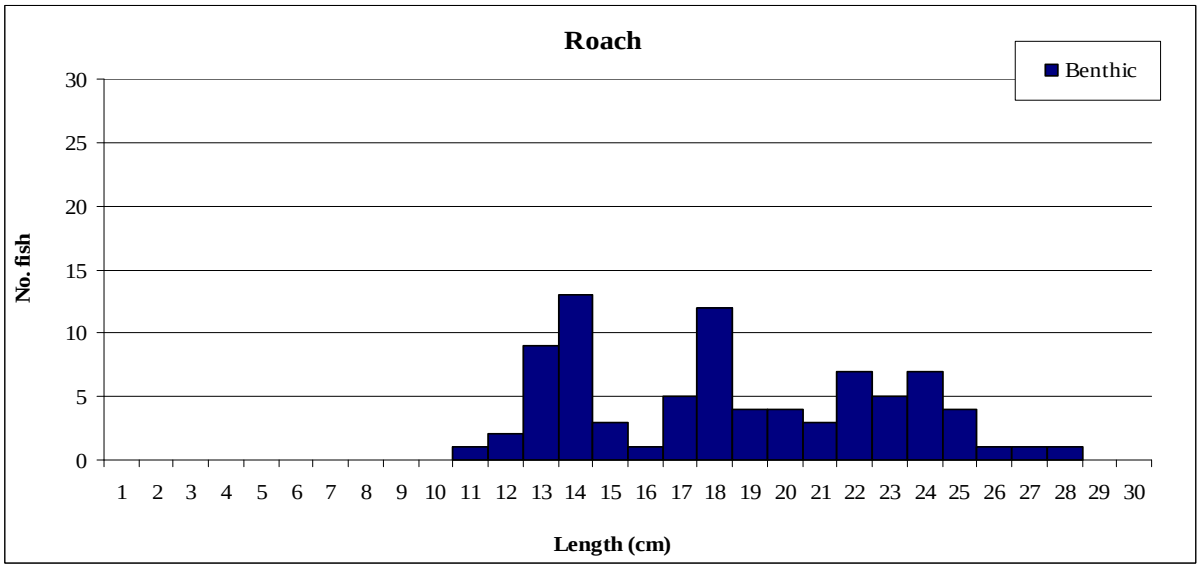

Fig. 1.3. Length frequency of roach captured on Lough Nanoge, August 2008

1.3.4 *Fish age and growth*

Eight age classes of perch, ranging from 0+ to 7+, were identified during the survey. Length frequency and age analysis revealed that 2+ perch were the dominant age class, accounting for approximately 37% of the population. The mean perch L1 was 5.2cm (Table 1.3). Roach ranged in age from 2+ to 7+. Three age classes accounted for approximately 73% of the population; 2+ (23%), 3+ (25%) and 4+ (25%). The mean roach L1 was 4.1cm (Table 1.4). Three pike were aged at 1+, 3+ and 5+.

Table 1.3. Mean (SD) perch length at age for Lough Nanoge, August 2008

	L_1	L_2	L_3	L_4	L_5	L_6	L_7
Mean	5.2 (1.04)	9.9 (1.46)	15.2 (1.62)	18.5 (2.24)	20.3 (2.02)	20.9 (0.4)	24.0
N	68	54	35	28	8	2	1
Range	31.-7.7	7.4-13.2	12.2-20.6	15.2-25	18-23.3	20.6-21.2	24-24

Table 1.4. Mean (SD) roach length at age for Lough Nanoge, August 2008

	L_1	L_2	L_3	L_4	L_5	L_6	L_7
Mean	4.1 (0.42)	7.9 (0.94)	12.5 (1.28)	17.2 (1.37)	20.1 (1.17)	22.1 (1.06)	24.6 (1.01)
N	40	40	34	29	15	7	4
Range	3.2-4.9	6.1-9.6	9.2-15	13.7-19.4	16.9-21.4	20.1-23.3	23.3-25.7

1.4 Summary

Perch was the dominant species in terms of abundance (CPUE) and biomass (BPUE) on Lough Nanoge, followed by roach, pike and eel. The mean CPUE and BPUE for perch in the lake was above average (ranked fourth in order of abundance and biomass) when compared with other lakes surveyed during 2008 (Kelly *et al*, 2009). The CPUE for roach in Lough Nanoge was similar to that in Lough Corrib Lower and Derrybrick Lough (Kelly *et al.*, 2009).

Perch and roach growth in the lake was slow in comparison with other high alkalinity lakes surveyed during 2008, e.g. Annaghmore Lake (Kelly *et al*, 2009).

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 fish classification tool has been developed for the island of Ireland (Ecoregion 1) using Republic of Ireland (CFB) and Northern Ireland (Agri-Food and Biosciences Institute) data generated during the North South Share Fish in Lakes project (Kelly *et al*, 2008). Using this tool and expert opinion on non-native/alien species, Lough Nanoge has been assigned a draft classification of poor status for fish. The EPA has assigned moderate status to Lough Nanoge in an overall interim

draft classification. This is based on physico-chemical parameters and biotic elements such as macroinvertebrates and macrophytes.

1.5 References

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

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