Lough Alewnaghta

Sampling Fish for the Water Framework Directive - Lakes 2009

The Central and Regional Fisheries Boards

ACKNOWLEDGEMENTS

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1.1 Introduction

Lough Alewnaghta (Plate 1.1, Fig 1.1) is located north of the town of Whitegate, Co. Clare, close to the western shore of Lough Derg. It has a surface area of 54ha, a mean depth of <4m and a maximum depth of approximately 4.5m. The Derrainy River is the main stream flowing into the lake. Lough Alewnaghta is connected to Lough Derg by its outflow, which flows into Lough Derg close to Rinbarra Point on the western shore of the lake (Fig. 1.1).

Lough Alewnaghta is categorised as typology class 6 (as designated by the EPA for the purposes of the Water Framework Directive), i.e. shallow (<4m), greater than 50ha and moderate alkalinity (20-100mg/l CaCO3). The geology in the area consists of sandstone and limestone.

Plate 1.1. Lough Alewnaghta

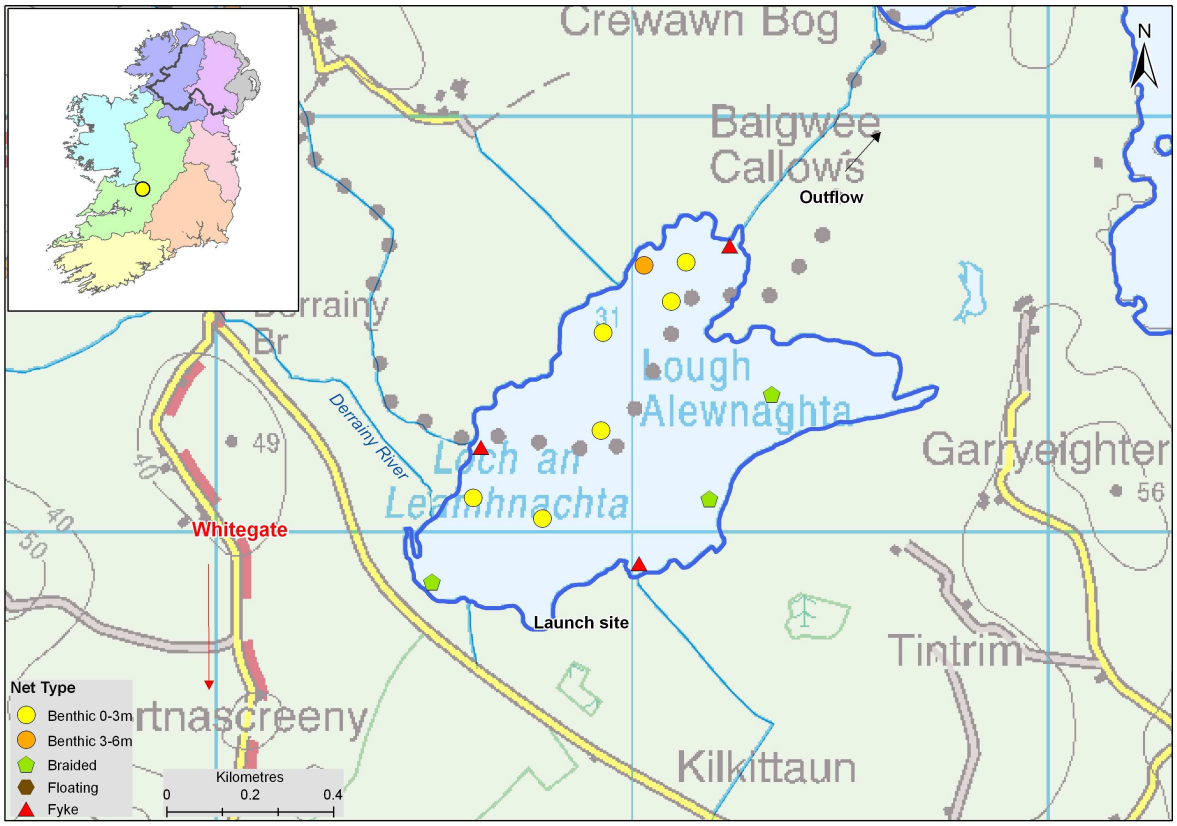

Fig. 1.1. Location map of Lough Alewnaghta showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

Lough Alewnaghta was surveyed over two nights from the 24th to the 26th August 2009. A total of three sets of Dutch fyke nets and seven benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (6 @ 0-2.9m and 1 @ 3-5.9m) were deployed randomly in the lake (10 sites). The netting effort was supplemented using three benthic braided (62.5mm mesh knot to knot) survey gill nets at three additional sites. Survey locations were randomly selected within each depth zone 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 all roach, pike and roach x bream 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 four fish species and one type of hybrid were recorded in Lough Alewnaghta during the survey, with 505 fish being captured (Table 1.1). Perch was the most abundant fish species recorded, followed by roach and roach x bream hybrids. One eel and one pike were also captured in the fyke nets.

Table 1.1. Number of each fish captured by each gear type during the survey on Lough Alewnaghta, August 2009

Scientific name	Common name	Number of fish captured			
		Benthic mono multimesh gill nets	Benthic braided gill nets	Fyke nets	Total
Perca fluviatilis	Perch	411	0	0	411
Rutilus rutilus	Roach	53	1	1	55
Rutilus rutilus x Abramis brama	Roach x Bream hybrid	23	14	0	37
Esox lucius	Pike	0	0	1	1
Anguilla anguilla	European eel	0	0	1	1

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 are summarised in Table 1.2. The differences in the mean perch CPUE and mean roach CPUE between Lough Alewnaghta and two other similar lakes (White Lough and Muckno Lough) were assessed and no significant differences were found (Fig. 1.2 and 1.3).

Table 1.2. Mean (S.E.) CPUE and BPUE of each fish species captured on Lough Alewnaghta, August 2009

Scientific name	Common name	
		Mean CPUE
Perca fluviatilis	Perch	1.06 (0.32)
Rutilus rutilus	Roach	0.14 (0.06)
Rutilus rutilus x Abramis brama	Roach x bream hybrid	0.10 (0.03)
Esox lucius	Pike	0.001 (0.001)
Anguilla anguilla	European eel	0.01 (0.01)
		Mean BPUE
Rutilus rutilus x Abramis brama	Roach x bream hybrid	62.00 (27.46)
Perca fluviatilis	Perch	16.83 (5.68)
Rutilus rutilus	Roach	11.48 (4.91)
Esox lucius	Pike	0.22 (0.22)
Anguilla anguilla	European eel	2.30 (2.30)

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

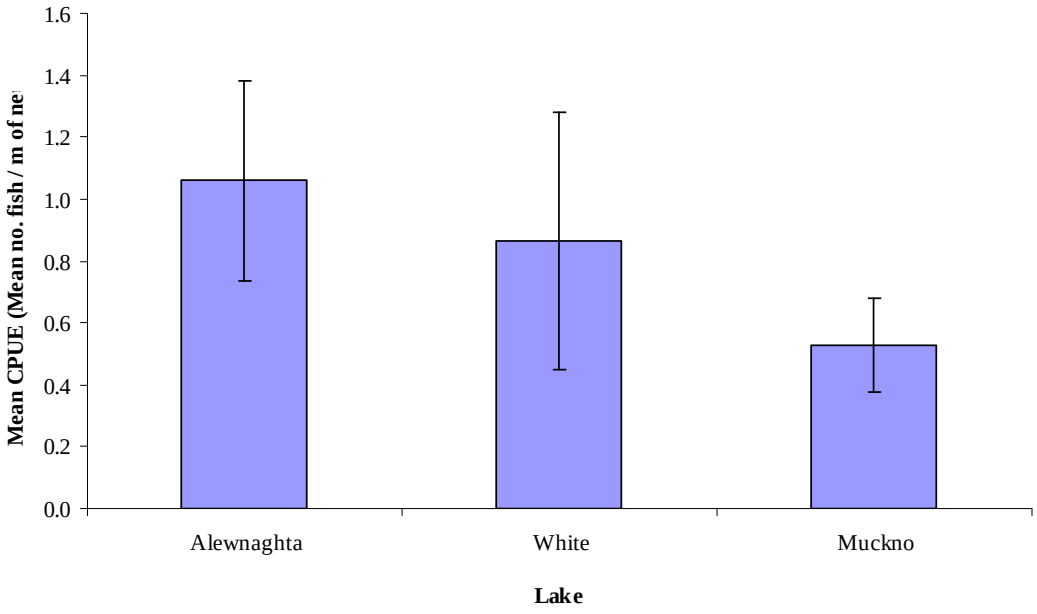

Fig. 1.2. Mean (±S.E.) perch CPUE in three lakes surveyed during 2009

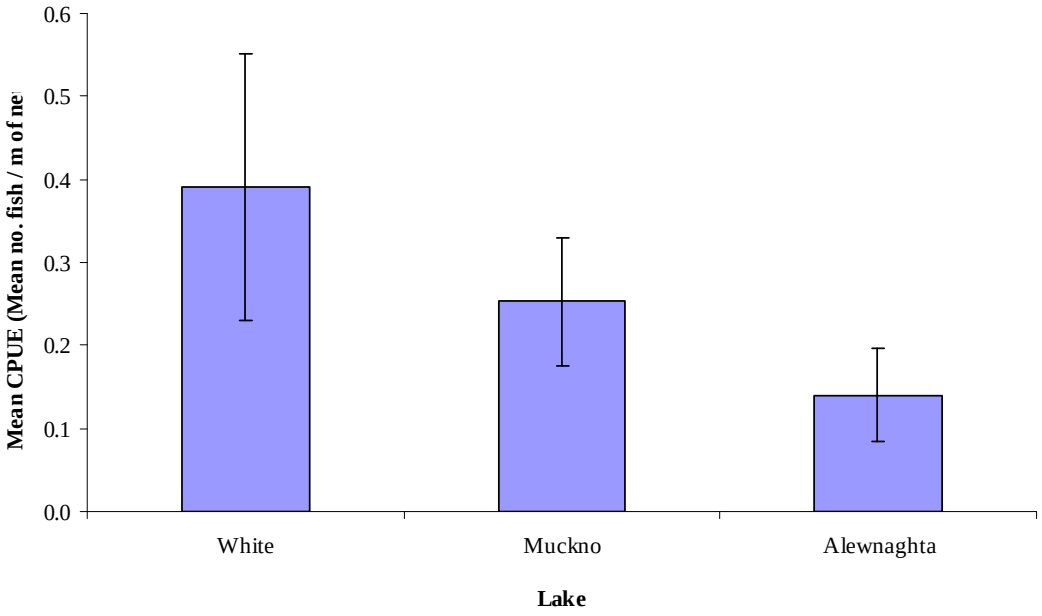

Fig. 1.3. Mean (±S.E.) roach CPUE in three lakes surveyed during 2009

1.3.3 Length frequency distributions

Perch ranged in length from 4.0cm to 24.9cm (mean = 8.39cm) (Fig. 1.4). Roach ranged in length from 6.5cm to 34.2cm (mean = 14.2cm) (Fig. 1.5). Roach x bream hybrids ranged in length from 7.8cm to 40.8cm. One pike measuring 21.3cm and one eel measuring 57.0cm were also captured.

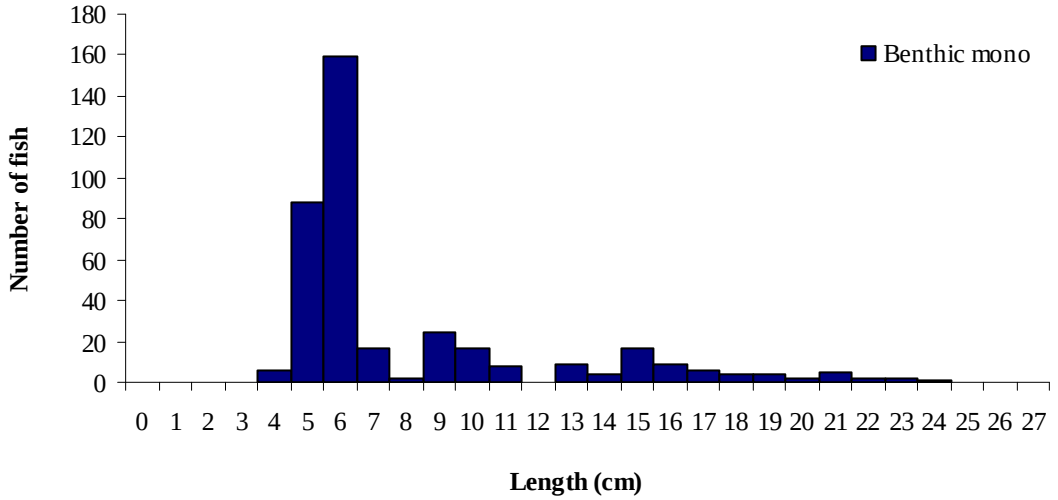

Fig. 1.4. Length frequency of perch (n=386) captured on Lough Alewnaghta, August 2009

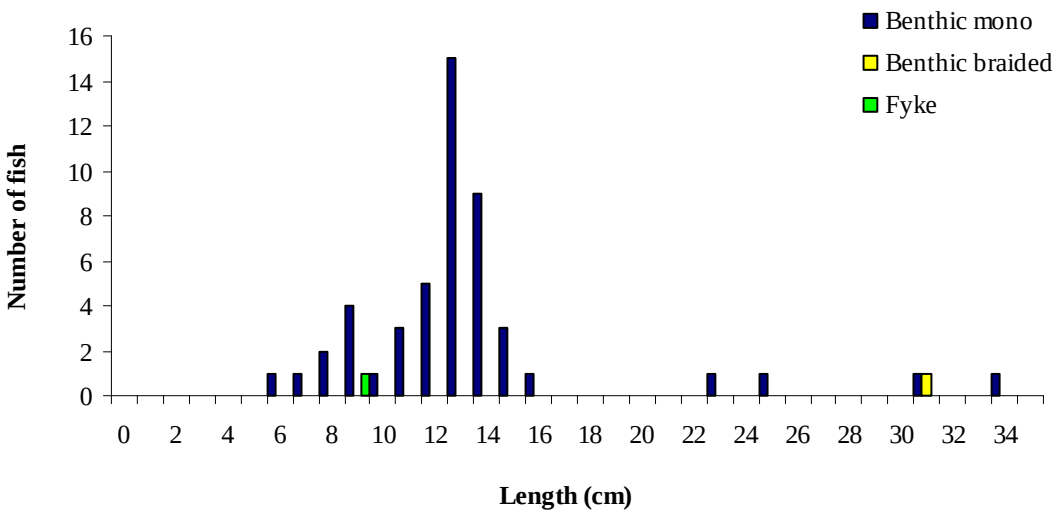

Fig. 1.5. Length frequency of roach (n=51) captured on Lough Alewnaghta, August 2009

1.3.4 Fish age and growth

Six age classes of perch were present, ranging from 0+ to 5+, with a mean L1 of 5.7cm (Table 1.3). The dominant age class was 0+, corresponding to the 4cm to 7cm length class (Fig. 1.4). Eight age classes of roach were present, ranging from 1+ to 12+, with 2+ being the dominant age class. The mean L1 for roach was 3.6cm (Table 1.4). Nine age classes of roach x bream hybrids were present, ranging from 1+ to 13+ and the single pike captured was aged 2+.

Table 1.3. Mean (±SE) perch length (cm) at age in Lough Alewnaghta, August 2009

	L_1	L_2	L_3	L_4	L_5
Mean	5.7 (0.1)	10.1 (0.2)	16.4 (0.5)	19.8 (0.6)	21.9
N	78	54	20	10	1
Range	3.6-7.5	7.7-13.4	10.8-19.9	17.1-22.4	21.9-21.9

Table 1.4. Mean (±SE) roach length at age for Lough Alewnaghta, August 2009

	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9	L_{10}	L_{11}	L_{12}
Mean	3.7 (0.1)	8.3 (0.2)	13.1 (0.6)	18.1 (0.6)	20.7 (0.7)	22.0 (0.9)	24.9 (1.0)	26.7 (1.2)	28.7 (1.2)	30.1 (0.9)	31.9 (0.9)	33.5
N	33	30	7	5	4	3	3	3	3	3	2	1
Range	2.7-4.9	6.5-10.4	11.0-15.8	16.9-20.2	19.1-22.6	20.3-23.5	23.3-26.7	25.0-29.0	26.7-30.9	28.6-31.6	31.0-32.8	33.5-33.5

1.4 Summary

Perch was the dominant species in terms of abundance (CPUE) and roach x bream hybrids were the dominant species in terms of biomass (BPUE).

The mean perch CPUE in Lough Alewnaghta was slightly higher when compared to other similar type lakes; however, these differences were not statistically significant. The dominant age class of perch was 0+. Perch ranged in age from 0+ to 5+, indicating reproductive success in each of the previous five years.

The mean roach CPUE in Lough Alewnaghta was relatively low when compared to other similar type lakes; however, these differences were not statistically significant. Roach ranged in age from 1+ to 12+ indicating reproductive success in the last number of years.

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 WFD multimetric fish classification tool has been developed for the island of Ireland (Ecoregion 17) using CFB and Agri-Food and Biosciences Northern Ireland (AFBINI) data generated during the NSSHARE Fish in Lakes project (Kelly *et al.*, 2008). Using this tool, Lough Alewnaghta has been assigned a fish classification of Moderate status.

The EPA has assigned an overall status of Moderate to Lough Alewnaghta in an interim draft classification. This is based on physico-chemical parameters and biotic elements such as macroinvertebrates, macrophytes and fish.

1.5 References

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

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