Dromore Lough

Sampling Fish for the Water Framework Directive - Lakes 2009

The Central and Regional Fisheries Boards

ACKNOWLEDGEMENTS

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1.1 Introduction

Dromore Lough is a limestone rich water body located approximately 10km north of Ennis and 6km east of Corrofin, County Clare (Plate 1.1, Fig. 1.1). It has a surface area of 49ha, a maximum depth of 20m and a mean depth of 5.9m. The main outflow from Dromore Lough to the River Fergus is via Black Lake (Fig. 1.1). The lake is categorised as typology class 11 (as designated by the EPA for the purposes of the Water Framework Directive), i.e. deep (mean depth >4 m), less than 50 ha and high alkalinity (>100 mg/l CaCO3).

Dromore Lough is located in the Dromore Woods and Loughs Special Area of Conservation (NPWS, 2002). The lake is important both regionally and nationally as a waterfowl sanctuary. Species encountered in the area, listed on Annex I of the EU Birds Directive, include the little grebe, the whooper swan and the hen harrier. Kestrel, sparrowhawk, wigeon, gadwall, teal, tufted duck, coot, lapwing and curlew are also present (NPWS, 2002). Dromore Lough and its surrounding area provides important habitat for a number of mammal species. These include pine marten, otter, badger, fox and stoat. One of the largest nursery colonies of the Lesser Horseshoe Bat in Ireland is located along the shores of Dromore Lough. This nursery is of international importance as the lesser horseshoe bat is a rare and endangered species listed on Annex II of the EU Habitats Directive (NPWS, 2002).

The lake holds tench, perch, rudd, pike and eels (IFT unpublished data). Historically, the lake has produced brown trout up to 2.5kg in weight (O'Reilly, 2007).

Plate 1.1. (a) Dromore Lough (b) with castle on the northern shore

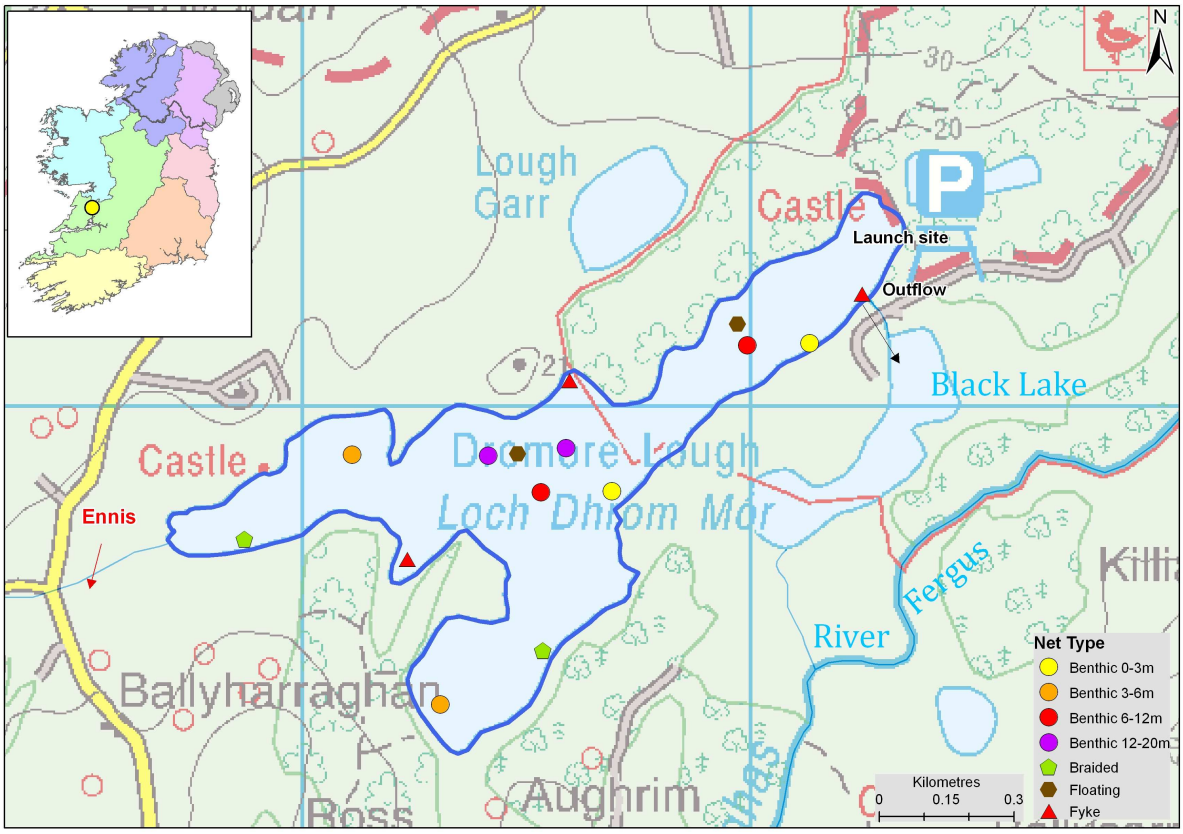

Fig. 1.1. Location map of Dromore Lough showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

Dromore Lough was surveyed over two nights between the 2nd and the 4th of September 2009. A total of three sets of Dutch fyke nets, eight benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (2 @ 0-2.9m, 2 @ 3-5.9m, 2 @ 6-11.9m and 2 @ 12-19.9m) and two surface monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets were deployed randomly in the lake (13 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 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 rudd 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

A total of four fish species were recorded on Dromore Lough in September 2009, with 228 fish being captured (Table 1.1). Perch was the most abundant fish species recorded. Small numbers of rudd and pike were also recorded. Eels were captured in fyke nets only.

Table 1.1. List of fish species recorded (including numbers captured) during the survey on Dromore Lough, September 2009

Scientific name	Common name	Number of fish captured				
		Benthic mono multimesh gill nets	Benthic braided gill nets	Surface mono multimesh gill nets	Fyke nets	Total
Perca fluviatilis	Perch	190	0	0	16	206
Scardinius erythropthalmus	Rudd	1	0	8	0	9
Esox lucius	Pike	2	1	0	1	4
Anguilla anguilla	European eel	0	0	0	9	9

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 between Dromore Lough and four other similar lakes were assessed and found to be statistically significant (Kruskal-Wallis, $P<0.05$) (Fig. 1.2). Independent-Samples Mann-Whitney U tests between each lake showed that Dromore Lough had a significantly higher mean perch CPUE than Lough Bunny ($z = -2.086$, $P<0.05$) and Muckanagh Lough ($z = -2.943$, $P<0.001$).

The differences in the mean rudd CPUE between Dromore Lough and four other similar lakes were also assessed and found to be statistically significant (Kruskal-Wallis, $P<0.001$) (Fig. 1.3). Independent-Samples Mann-Whitney U tests between each lake showed that Dromore Lough had a significantly lower mean rudd CPUE than Lough Gur ($z = -3.801$, $P<0.001$).

Table 1.2. Mean (S.E.) CPUE and BPUE on Dromore Lough, September 2009

Scientific name	Common name	
		Mean CPUE
Perca fluviatilis	Perch	0.458 (0.134)
Scardinius erythropthalmus	Rudd	0.020 (0.012)
Esox lucius	Pike	0.009 (0.004)
Anguilla anguilla	European eel	0.100 (0.019)
		Mean BPUE
Perca fluviatilis	Perch	34.270 (11.953)
Esox lucius	Pike	15.403 (8.853)
Scardinius erythropthalmus	Rudd	1.264 (0.763)
Anguilla anguilla	European eel	25.833 (6.404)

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

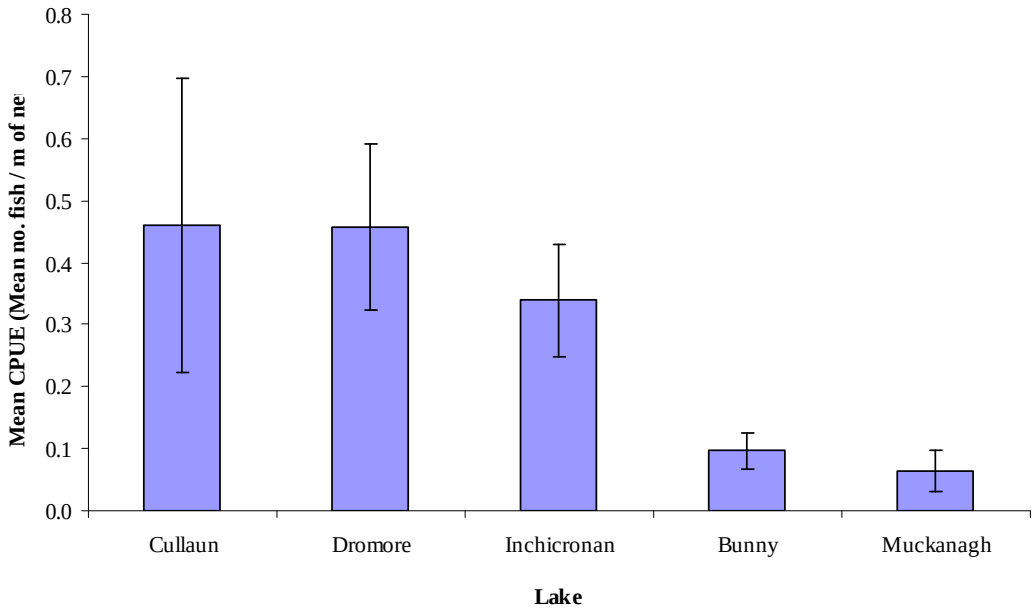

Fig. 1.2. Mean (±S.E.) perch CPUE in five lakes surveyed during 2009

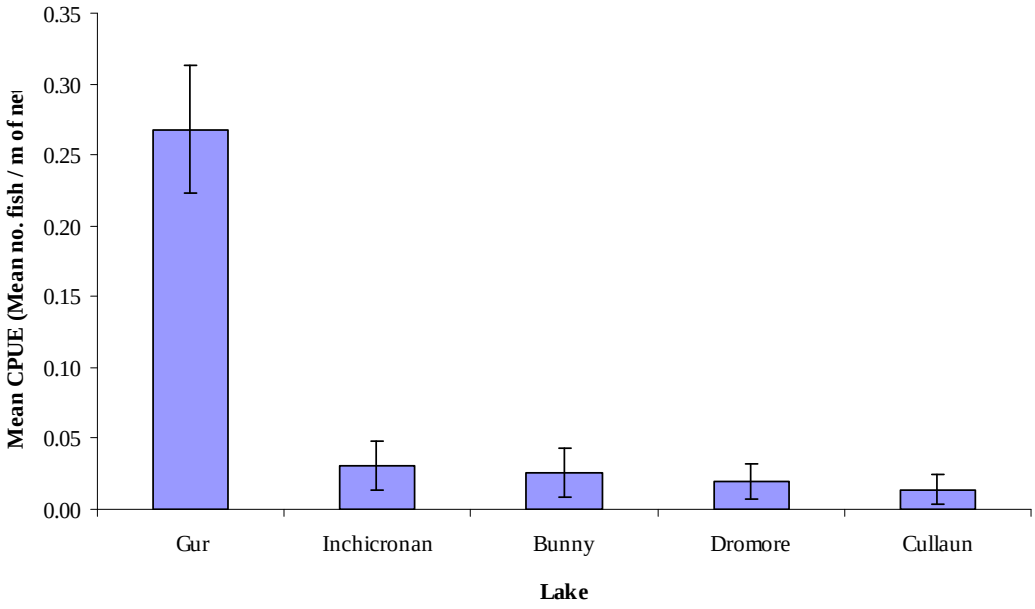

Fig. 1.3. Mean (±S.E.) rudd CPUE in five lakes surveyed during 2009

1.3.3 Length frequency distributions

Perch ranged in length from 5.6 cm to 26.5cm (mean = 15.6cm) (Fig. 1.4). Rudd ranged in length from 6.8cm to 24.8cm (mean = 12.3cm) (Fig.1.5). Pike ranged in length from 16.8cm to 72.5cm. Eels ranged in length from 36.0cm to 66.0cm.

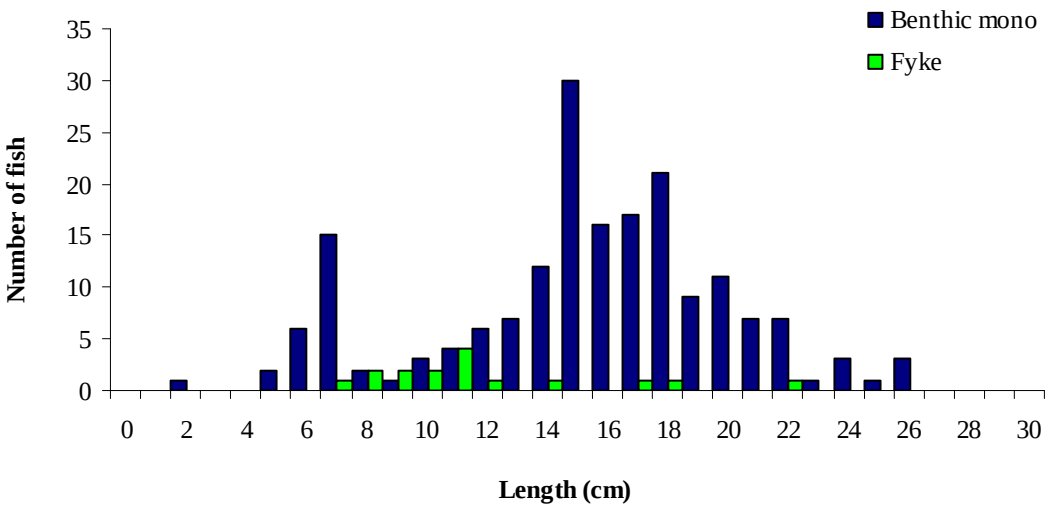

Fig. 1.4. Length frequency of perch (n=201) captured on Dromore Lough, September 2009

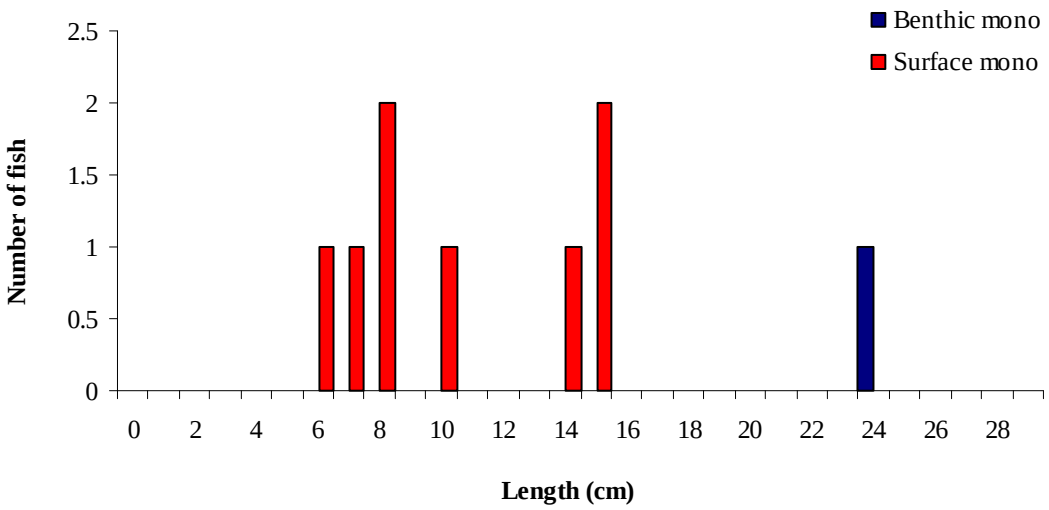

Fig. 1.5. Length frequency of rudd (n=9) captured on Dromore Lough, September 2009

1.3.4 Fish age and growth

Six age classes of perch were present, ranging from 0+ to 5+, with a mean L1 of 7.1cm (Table 1.3). Five age classes of rudd were present, ranging from 1+ to 5+, with a mean L1 of 2.8cm (Table 1.4). Three age classes of pike were present, ranging from 5+ to 8+.

Table 1.3. Mean (±SE) perch length at age in Dromore Lough, September 2009

	L_1	L_2	L_3	L_4	L_5
Mean	7.1 (0.1)	12.2 (0.2)	16.3 (0.3)	19.0 (0.4)	22.1 (0.6)
N	83	68	49	21	12
Range	5.0-9.9	9.5-15.5	12.9-20.8	16.7-22.4	18.0-25.1

Table 1.4. Mean (±SE) rudd length at age in Dromore Lough, September 2009

	L_1	L_2	L_3	L_4	L_5
Mean	2.8 (0.2)	5.5 (0.3)	9.6 (0.4)	13.5 (0.5)	20.0
N	9	5	4	3	1
Range	2.0-3.9	4.7-6.1	8.9-10.4	12.7-14.4	20.0-20.0

1.4 Summary

Perch was the dominant species in terms of both abundance (CPUE) and biomass (BPUE).

The mean perch CPUE in Dromore Lough was significantly higher than Lough Bunny and Muckanagh Lough; however, there were no other statistically significant differences between the other similar lakes assessed. Perch age classes ranged from 0+ to 5+, indicating reproductive success in each of the previous five years.

The mean rudd CPUE in Dromore Lough was significantly lower than Lough Gur but not so when compared to the other similar type lakes. Rudd ranged in age from 1+ to 5+, indicating reproductive success in each of the previous five 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, Dromore Lough has been assigned an ecological status classification of Poor/Bad based on the fish populations present.

The EPA has assigned an overall status of Poor to Dromore Lough in an 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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