Dunglow Lough

Sampling Fish for the Water Framework Directive - Lakes 2009

The Central and Regional Fisheries Boards

ACKNOWLEDGEMENTS

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1.1 Introduction

Dunglow Lough (Plate 1.1, Fig. 1.1) is located in the Rosses fishery, 1.3km from Dunglow town, Co. Donegal. The Rosses fishery is composed of six salmon/sea trout/brown trout systems with isolated loughs interspersed throughout the fishery. Dunglow Lough is the furthest downstream of the lakes in the system. The lake is situated at an altitude of 17m a.s.l. It has a surface area of 61ha, a mean depth of 1.3m and a maximum depth of 7.5m. The lake is categorised as typology class 2 (as designated by the EPA for the purposes of the Water Framework Directive), i.e. shallow (<4m), greater than 50ha and low alkalinity (<20mg/l CaCO3). The lake has been classed as 2b (i.e. expected to meet good status by 2015) in the WFD characterization report (EPA, 2005). The geology of the area is predominantly granite, felsite and other intrusive rocks rich in silica.

The lake holds a good stock of small, wild brown trout which has historically been augmented by regularly stocking larger brown trout into the lake. There was also additional stocking of rainbow trout up to 680g in previous years (Cooke *et al.*, 1997). In an effort to regenerate the sea trout population, the Rosses Anglers Association discontinued their stocking policy in 2006 (Gerry McCafferty NRFB, *pers. comm.*). The sea trout run into the lake starts in July (O'Reilly, 2007). Dunglow Lough was previously surveyed in 1996 (Cooke *et al*., 1997) and 2006 (Kelly *et al*, 2007). In the most recent survey in 2006, brown trout, sea trout and European eel were recorded.

Plate 1.1. Dunglow Lough (Rosses fishery)

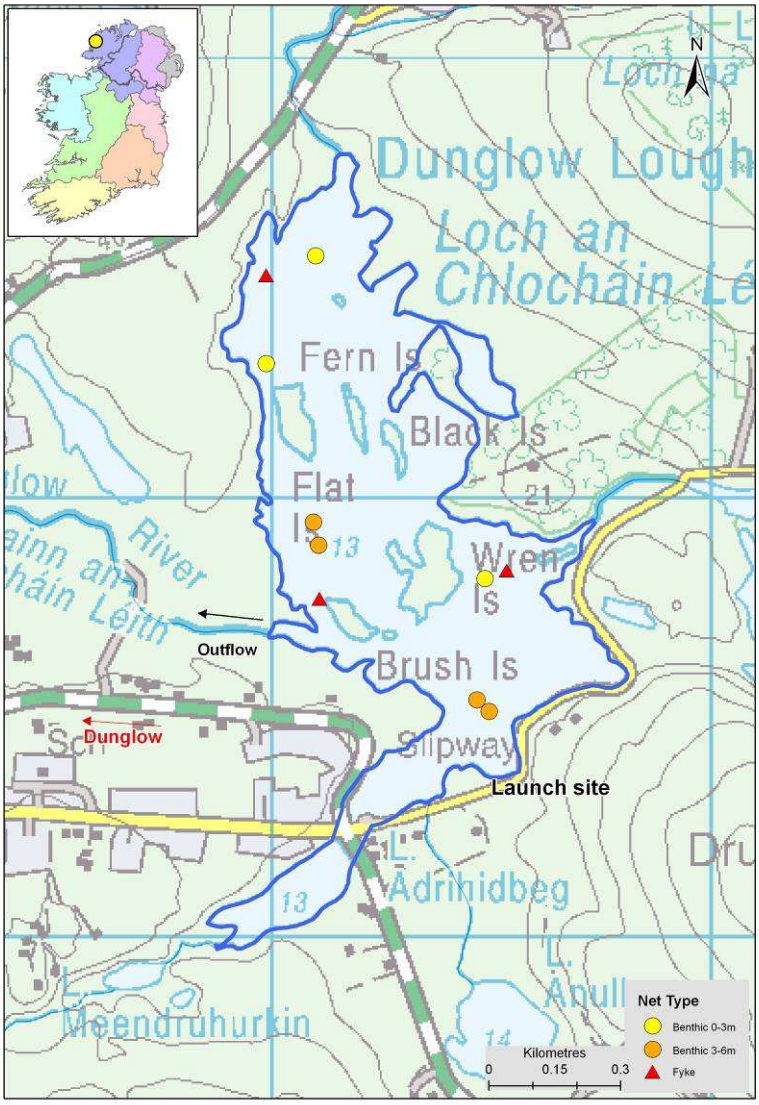

Fig. 1.1. Location map of Dunglow Lough showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

Dunglow Lough was surveyed over one night on the 6th of 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 (3 @ 0-2.9m and 4 @ 3-5.9m) were deployed in the lake (10 sites). Nets were deployed in the same locations as were randomly selected in the previous survey. 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 were measured and weighed on site and scales were removed from all trout. 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 two fish species, as well as sea trout, were recorded in Dunglow Lough in August 2009, with 64 fish being captured (Table 1.1). Brown trout was the most abundant fish species.

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

Scientific name	Common name	Number of fish captured		
		Benthic mono multimesh gill nets	Fyke nets	Total
Salmo trutta	Brown trout	38	4	42
	Sea trout	2	0	2
Anguilla anguilla	European eel	2	18	20

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 recorded during the 2006 and 2009 are summarised in Table 1.2.

Although there was a slight increase in brown trout CPUE from 2006 to 2009 (Fig. 1.2), this was not statistically significant. The differences in the mean brown trout CPUE from 2009 between Dunglow Lough and three other similar lakes were assessed and were also not statistically significant (Fig. 1.3).

Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Dunglow Lough, 2005 and 2009

Scientific name	Common name	2006	2009
		Mean CPUE (mean no. of fish per m of net)	
Salmo trutta	Brown trout	0.108 (0.035)	0.133 (0.042)
	Sea trout	0.003 (0.003)	0.007 (0.004)
Anguilla anguilla	European eel	0.089 (0.006)	0.100 (0.067)
		Mean BPUE (mean weight (g) of fish per m of net)	
Salmo trutta	Brown trout	5.212 (1.979)	4.758 (1.637)
	Sea trout	0.900 (0.900)	2.240 (1.509)
Anguilla anguilla	European eel	9.417 (1.064)	11.633 (7.619)

* 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.

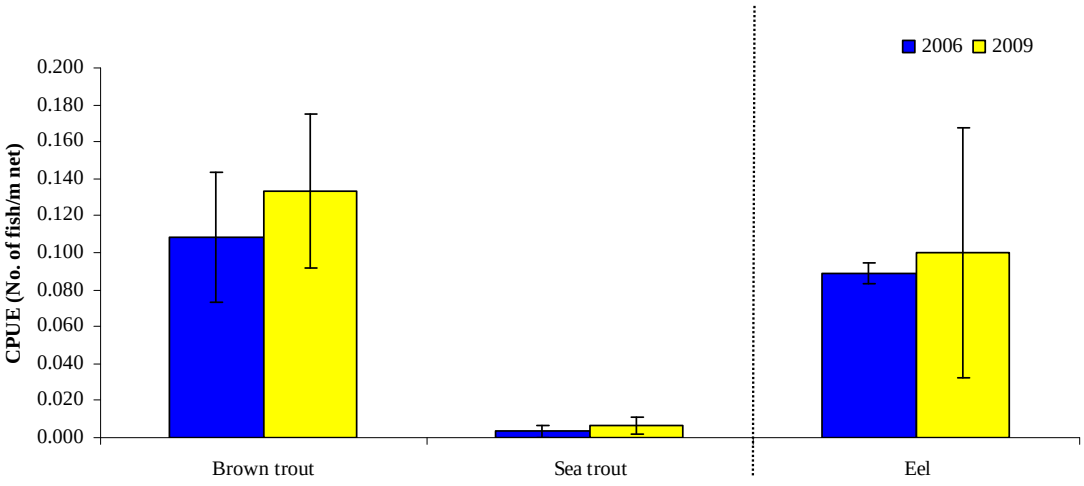

Fig. 1.2. Mean (±S.E.) CPUE on Dunglow Lough (Eel CPUE based on fyke nets only)

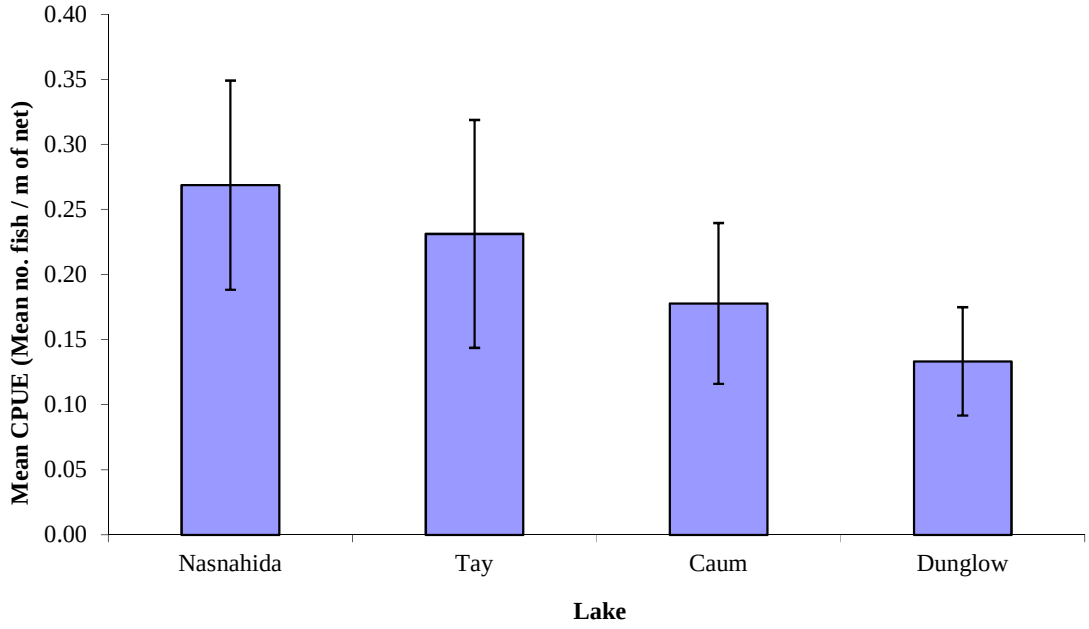

Fig. 1.3. Mean (±S.E.) brown trout CPUE in four lakes surveyed during 2009

1.3.3 Length frequency distributions

Brown trout ranged in length from 11.0cm to 23.3cm (mean = 16.0cm) (Fig 1.4). Brown trout from the 2006 survey ranged in length from 11.5cm to 21.6cm (Kelly *et al.*, 2007). Sea trout ranged in length from 29.7cm to 31.1cm (mean = 30.5cm) (Fig.1.5). Eels captured in the current survey ranged in length from 31.5cm to 52.0cm. Eels from the 2006 survey had a length range of 28.0cm to 54.0cm (Kelly *et al.*, 2007).

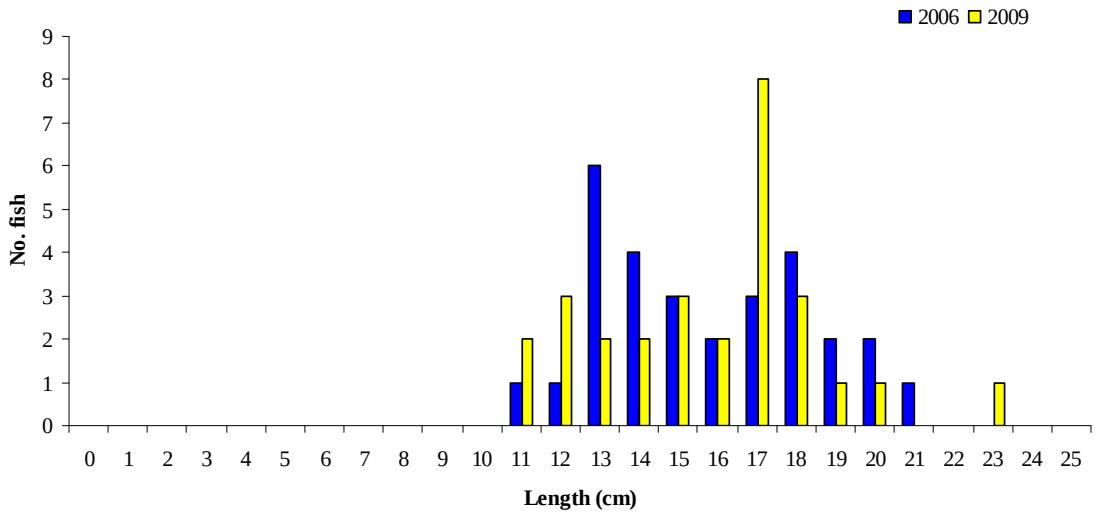

Fig. 1.4. Length frequency of brown trout captured on Dunglow Lough, 2006 and 2009

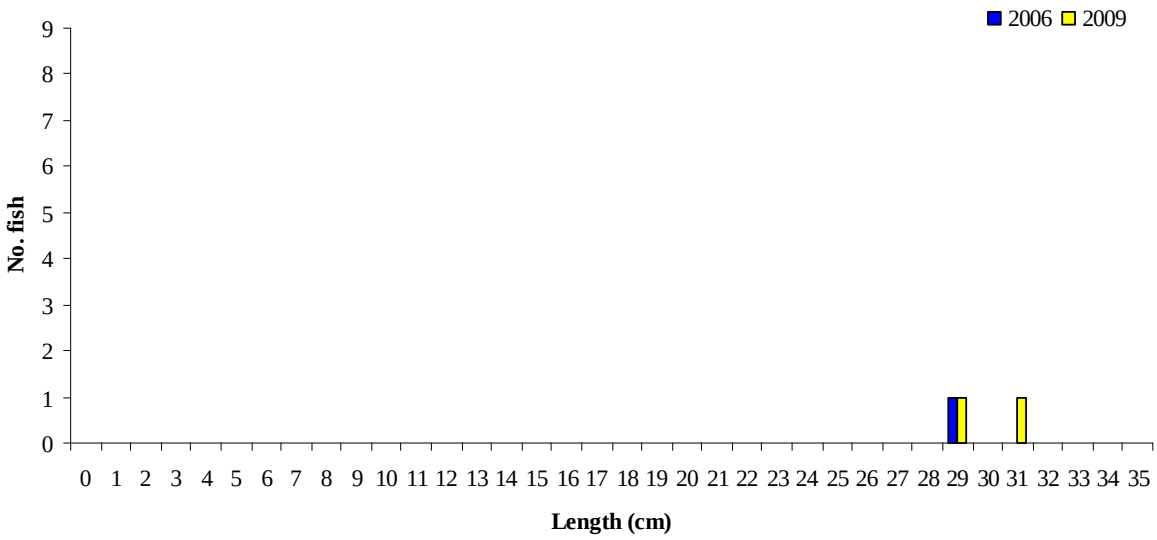

Fig. 1.5. Length frequency of sea trout captured on Dunglow Lough, 2006 and 2009

1.3.4 Fish age and growth

Two age classes of brown trout were present, ranging from 1+ to 2+, with a mean L1 of 6.5cm (Table 1.3). In 2006, brown trout ranged from 1+ to 3+, with a mean L1 of 7.3cm (Kelly *et al.*, 2007).

The dominant age class of brown trout in 2009 was 2+, corresponding to the 16cm to 19cm length class (Fig. 1.4) whereas the dominant age class of brown trout in 2006 was 1+, corresponding to the 11cm to 15cm length class (Fig. 1.4).

Both sea trout captured during the 2009 survey were aged 2.0+. In 2006, one sea trout was recorded aged 3.0+ (Kelly *et al.*, 2007).

Table 1.3. Mean (±SE) brown trout length at age for Dunglow Lough, August 2009

	L_1	L_2
Mean	6.5 (0.268)	14.1 (0.522)
N	24	11
Range	3.0-8.7	11.5-17.1

1.4 Summary

Brown trout was the dominant species in terms of abundance (CPUE) and biomass (BPUE) captured in the survey gill nets.

The mean brown trout CPUE in Dunglow Lough was lower when compared with other similar type lakes; however, this was not statistically significant. Brown trout ranged in age from 1+ to 2+ indicating reproductive success in each of the previous two 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, Dunglow Lough has been assigned an ecological status classification of Good based on the fish populations present.

The EPA has assigned an overall status of Good to Dunglow 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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