

Sampling Fish for the Water Framework Directive

Lakes 2014

Kiltooris Lough





Water Framework Directive Fish Stock Survey of Kiltooris Lough, August 2014

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1.1 Introduction

Kiltooris Lough is located approximately eight kilometres north-west of Ardara, Co. Donegal (Fig. 1.1). The lake has a surface area of 43ha, a mean depth of <4m and a maximum depth of 13.5m. The lake is categorised as typology class 5 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), less than 50ha and moderately alkaline (20-100mg/l CaCO₃). The lake has been classed as 2a (i.e. expected to meet good status by 2015, pending further investigation) in the WFD Characterisation report (EPA, 2005). The geology of the area is predominantly schist and gneiss. Kiltooris Lough is located within the West of Ardara/Maas Road Special Area of Conservation. The site is designated as such for fulfilling a number of criteria, including blanket bog, orchid-rich calcareous grasslands, Atlantic salt meadows and tidal mudflats, etc. (NPWS, 2005).

Kiltooris Lough is reputed to be one of the best trout lakes in the Ardara area. The lake has a sandy bottom with trout averaging 0.34kg up to 0.68kg (O' Reilly, 1998). The Ardara Anglers Association has the fishing rights to the lake and has stocked it in the past with brown trout. The lake is also a public water supply. The lake was surveyed by Inland Fisheries Ireland (previously the Central Fisheries Board and the Northern Regional Fisheries Board) in 2005 as part of the NS Share Fish in Lakes project, and this survey found that brown trout followed by three-spined stickleback and eels were present in the lake (Kelly *et al.*, 2007). Kiltooris Lough was also previously surveyed in 2008 and 2011 as part of the Water Framework Directive surveillance monitoring programme (Kelly *et al.*, 2009 and Kelly *et al.*, 2012a). During the 2011 survey, brown trout were found to be the dominant species present in the lake. Three-spined stickleback and eels were also captured during the survey.

This report summarises the results of the 2014 fish stock survey carried out on the lake, as part of the Water Framework Directive surveillance monitoring programme.



Plate 1.1. Kiltooris Lough



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



1.2 Methods

Kiltooris Lough was surveyed over one night on the 11th of August 2014. 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 (3 @ 0-2.9m, 3 @ 3-5.9m and 2 @ 6-11.9m) and one floating monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill net were deployed in the lake (12 sites). Nets were deployed in the same locations as were randomly selected in the previous surveys in 2008 and 2011. 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 brown 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 retained for further analysis.

1.3 Results

1.3.1 Species Richness

A total of three fish species were recorded on Kiltooris Lough in August 2014, with 48 fish being captured (Table 1.1). Brown trout was the most abundant fish species recorded, followed by three-spined stickleback and eels. During the previous surveys in 2008 and 2011 the same species composition was recorded.

Table 1.1. Number of each fish species captured by each gear type during the survey on Kiltooris Lough, August 2014

Scientific name	Common name	Number of fish captured			
		Benthic mono multimesh gill nets	Surface mono multimesh gill nets	Fyke nets	Total
<i>Salmo trutta</i>	Brown trout	29	9	1	39
<i>Gasterosteus aculeatus</i>	3-spined stickleback	5	0	1	6
<i>Anguilla anguilla</i>	European eel	0	0	3	3



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 captured in the 2008, 2011 and 2014 surveys are summarised in Table 1.2. Mean CPUE and BPUE for all species is illustrated in Figures 1.2 and 1.3.

Brown trout was the dominant species in terms of abundance (CPUE) and biomass (BPUE) followed by three-spined stickleback. Although the mean brown trout CPUE and BPUE decreased slightly over the three sampling years, these differences were not statistically significant (Table 1.2; Fig 1.2 and 1.3).

Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Kiltooris Lough, 2008, 2011 and 2014

Scientific name	Common name	2008	2011	2014
Mean CPUE				
<i>Salmo trutta</i>	Brown trout	0.163 (0.052)	0.116 (0.028)	0.107 (0.041)
<i>Gasterosteus aculeatus</i>	3-spined stickleback	0.005 (0.003)	0.022 (0.017)	0.015 (0.008)
<i>Anguilla anguilla</i>	European eel	0.066 (0.019)	0.027 (0.02)	0.016 (0.010)
Mean BPUE				
<i>Salmo trutta</i>	Brown trout	21.009 (6.14)	15.912 (4.384)	9.527 (3.508)
<i>Gasterosteus aculeatus</i>	3-spined stickleback	0.011 (0.011)	0.027 (0.021)	0.008 (0.005)
<i>Anguilla anguilla</i>	European eel	5.088 (1.246)	2.416 (1.961)	11.011 (5.724)

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

*Eel CPUE and BPUE based on fyke nets only

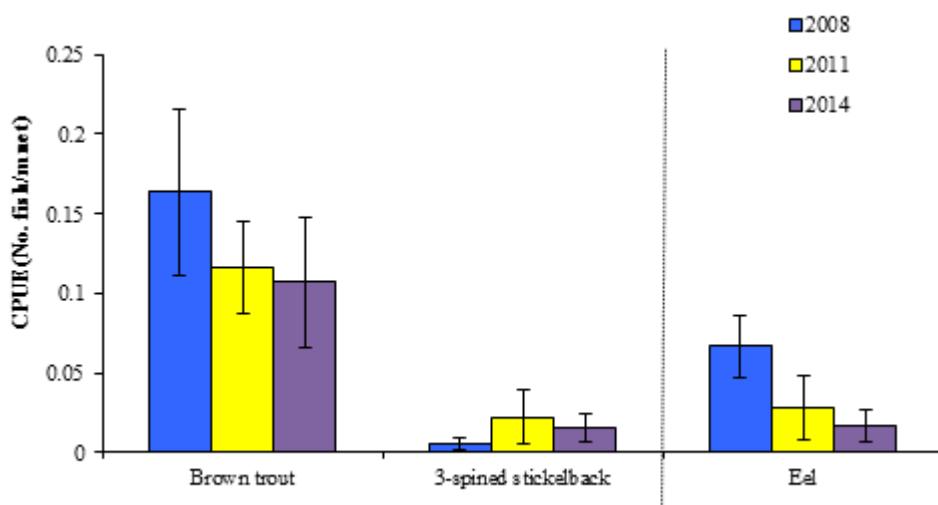


Fig. 1.2. Mean (\pm S.E.) CPUE for all fish species captured in Kiltooris Lough (Eel CPUE based on fyke nets only), 2008, 2011 and 2014

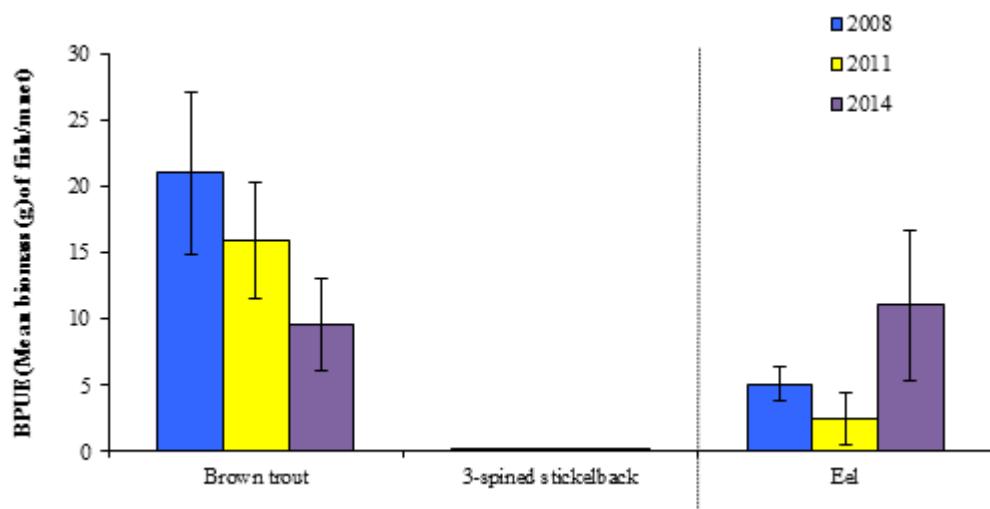


Fig. 1.3. Mean (\pm S.E.) BPUE for all fish species captured in Kiltooris Lough (Eel BPUE based on fyke nets only), 2008, 2011 and 2014



1.3.3 Length frequency distributions and growth

Brown trout captured during the 2014 survey ranged in length from 11.7cm to 26.7cm (mean = 20.1cm) (Fig. 1.4). Three age classes were present, ranging from 1+ to 3+, with a mean L₁ of 6.4cm (Table 1.3). The dominant age class was 2+ (Fig. 1.4). Brown trout captured during the 2008 and 2011 surveys had a slightly wider length range than 2014 (Fig. 1.4) and all three sampling years had a similar age range and growth rate (Fig. 1.4).

Three-spined stickleback captured during the 2014 survey ranged in length from 2.5cm to 4.0cm and eels ranged from 46.2cm to 78.5cm.

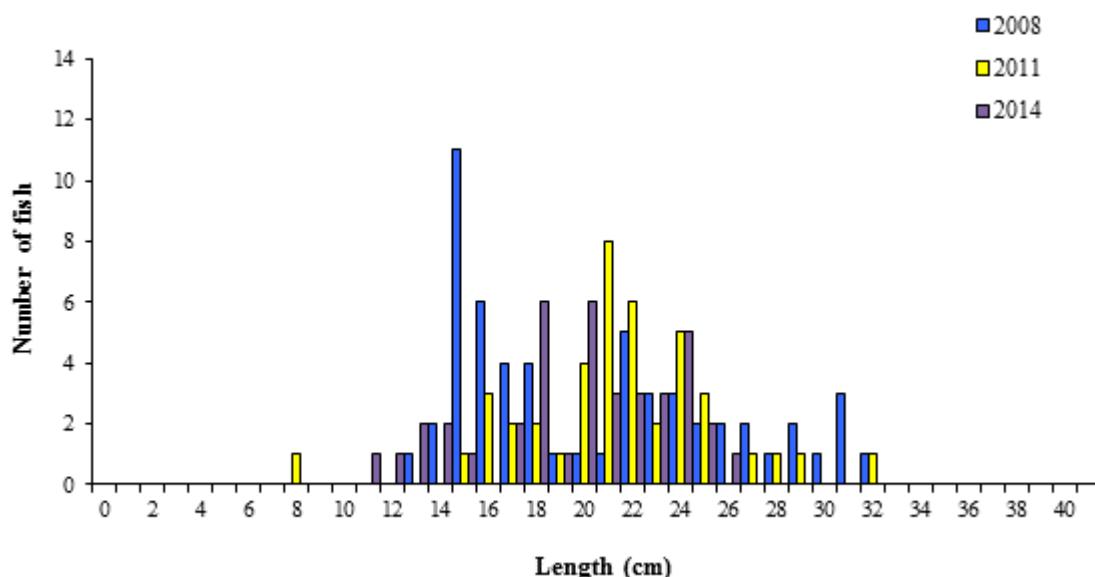


Fig. 1.4. Length frequency of brown trout captured on Kiltooris Lough, 2008, 2011 and 2014

Table 1.3. Mean (\pm SE) brown trout length (cm) at age for Kiltooris Lough, August 2014

	L ₁	L ₂	L ₃
Mean	6.4 (0.3)	15.9 (0.6)	20.8 (0.7)
N	30	23	11
Range	3.5-10.3	10.4-23.7	15.6-23.7



1.4 Summary

Brown trout was the dominant species in terms of abundance (CPUE) and eels were the dominant species in terms of biomass (BPUE) captured in the survey gill nets during the 2014 survey.

The mean brown trout CPUE and BPUE decreased slightly over the three sampling years; however, these differences were not statistically significant. Brown trout ranged in age from 1+ to 3+, indicating reproductive success in three of the previous four years. The dominant age class was 2+.

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 multimetric fish ecological classification tool (Fish in Lakes – ‘FIL’) was developed for the island of Ireland (Ecoregion 17) using IFI and Agri-Food and Biosciences Institute Northern Ireland (AFBINI) data generated during the NSSHARE Fish in Lakes project (Kelly *et al.*, 2008). This tool was further developed during 2010 (FIL2) in order to make it fully WFD compliant, including producing EQR values for each lake and associated confidence in classification (Kelly *et al.*, 2012b). Using the FIL2 classification tool, Kiltooris Lough was assigned an ecological status of Good for both 2005 and 2008 and High for both 2011 and 2014 based on the fish populations present.

In the 2010 to 2012 surveillance monitoring reporting period, the EPA assigned Kiltooris Lough an overall draft ecological status of High, based on all monitored physico-chemical and biological elements, including fish.



1.5 References

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