

# Kiltooris Lough



## Sampling Fish for the Water Framework Directive - Lakes 2008



The Central and Regional  
Fisheries Boards

## **ACKNOWLEDGEMENTS**

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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 CaCO<sub>3</sub>). 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 area. The lake has a sandy bottom with trout averaging 0.75lb up to 1.5lb (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 the Central Fisheries Board (CFB) and the Northern Regional Fisheries Board (NRFB) 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).

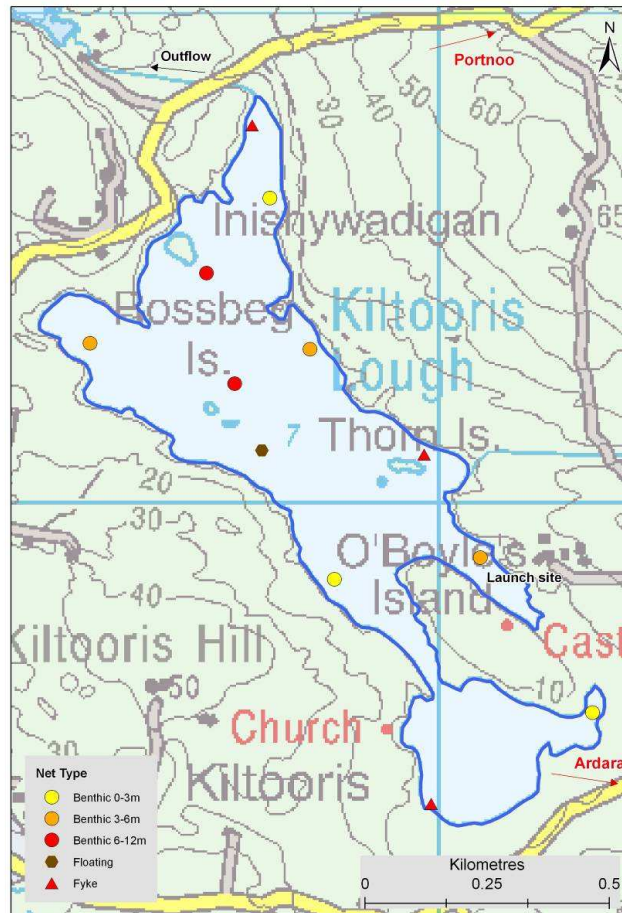


**Plate 1. Kiltooris Lough, looking south-east over the lake**

## 1.2 Methods

Kiltooris Lough was surveyed over one night on the 7th of August 2008. A total of three sets of Dutch fyke nets, eight benthic monofilament multimesh (12 panel, 5-55mm mesh size) survey gill nets (3 @ 0-2.9m, 3 @ 3-5.9m and 2 @ 6-11.9m) and one surface floating monofilament multimesh (12 panel, 5-55mm mesh size) survey gillnet were deployed randomly in the lake (12 sites) (Fig. 1.1). The netting effort and netting locations employed during the survey are similar to that undertaken during the 2005 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 and scales were removed from brown trout on site. 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.



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

### 1.3 Results

#### 1.3.1 Species richness

A total of three fish species were captured in Kiltooris Lough during the survey. The number of each species captured by each gear type is shown in Table 1.1. Brown trout were the most common fish species captured in the gill nets. Eels were the most common species captured in the fyke nets. Crayfish were also present. A previous survey conducted in 2005 showed a similar species composition (Kelly *et al.*, 2007).

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

Scientific name	Common name	Number of fish captured			Total
		Benthic mono multimesh gill nets	Surface mono multimesh gill nets	Fyke nets	
<i>Salmo trutta</i>	Brown trout	41	18	0	59
<i>Gasterosteus aculeatus</i>	3-spined stickleback	2	0	0	2
<i>Anguilla anguilla</i>	Eel	0	0	12	12

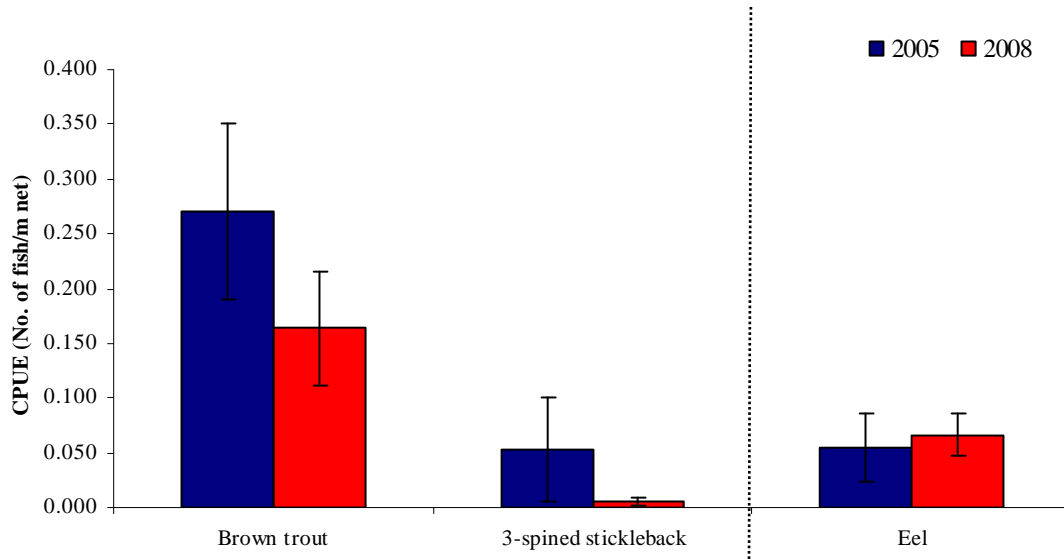
#### 1.3.2 Fish abundance

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. Mean CPUE is illustrated in Figure 1.2. For comparative purposes, 2005 data is also displayed. Mean CPUE for both brown trout and 3-spined stickleback were lower in 2008 than in 2005, however these differences were not statistically significant.

**Table 1.2. Mean CPUE and Mean BPUE on Lough Kiltooris**

Year	2005	2008
	<b>Mean CPUE (mean no. of fish per m of net)</b>	
<b>Brown trout</b>	0.271 (0.0805)	0.164 (0.0523)
<b>3-spined stickleback</b>	0.053 (0.0469)	0.006 (0.0037)
<b>Eel</b>	0.056 (0.0309)	0.067 (0.0192)
	<b>Mean BPUE (mean weight (g) of fish/m of net)*</b>	
<b>Brown trout</b>	49.539 (17.701)	21.009 (6.1402)
<b>3-spined stickleback</b>	0.027 (0.0229)	0.011 (0.0111)
<b>Eel</b>	11.522 (7.1005)	5.089 (1.2463)

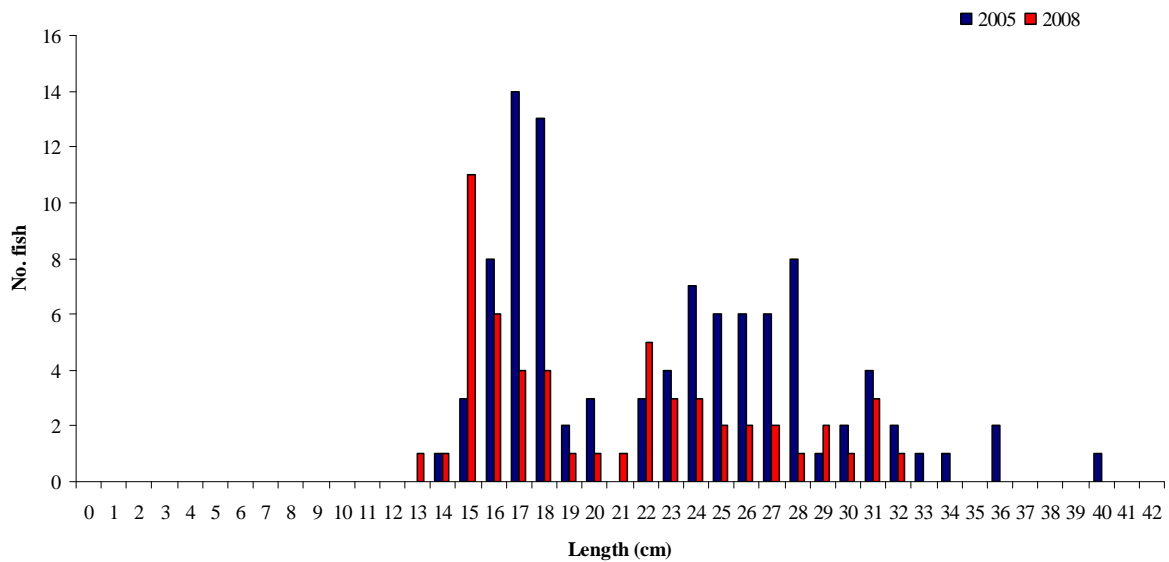
\* On the rare occasion where biomass data was unavailable for an individual fish, this was determined from a length/weight regression for that species. Standard error is displayed in brackets.



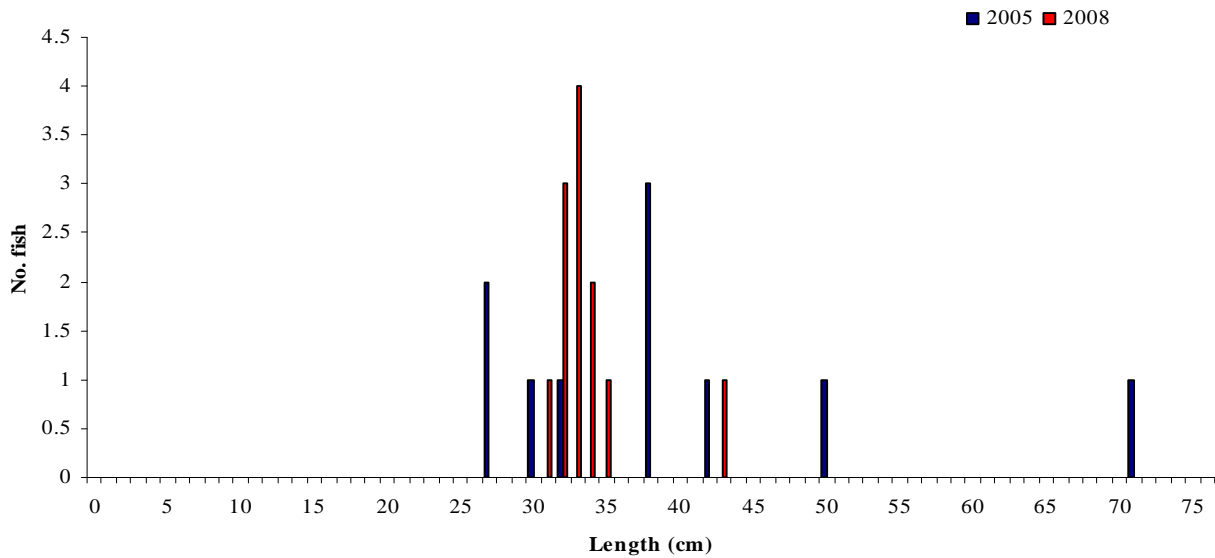
**Fig. 1.2. Mean ( $\pm$ S.E.) CPUE on Lough Kiltorris (Eel CPUE based on fyke nets only)**

### 1.3.3 Length frequency distributions

Brown trout ranged in length from 13.4cm to 32.0cm (mean = 21cm) during the 2008 survey (Fig. 1.3). Trout captured in the 2005 survey had a slightly greater mean length (23.0cm), and ranged in length from 14.0cm to 40.0cm (Fig. 1.3). Eels ranged in length from 31.5cm to 43.0cm (Fig. 1.4).



**Fig. 1.3. Length frequency of brown trout captured on Kiltorris Lough**



**Fig. 1.4. Length frequency of eels captured on Kiltorris Lough**

#### 2.3.4 Fish age and growth

Brown trout ranged in age from 0+ to 4+ in the 2008 survey. Brown trout aged 3+ accounted for the largest proportion of the populations captured in the gill nets (40.8%), followed by 2+ (34.6%), 1+ (16.3%) and 4+ (8.16%). Brown trout in the 2005 survey ranged in age from 1+ to 5+.

Mean brown trout L4 was 27.4cm in the 2008 survey indicating that the growth of brown trout in Kiltorris Lough is slow based on a classification developed by Kennedy and Fitzmaurice (1971) (Table 1.3).

**Table 1.3. Mean ( $\pm$ S.E.) brown trout length at age (cm) for Kiltorris Lough, August 2008**

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>
Mean	6.4 (0.15)	15.1 (0.34)	21.6 (0.47)	27.4 (0.32)
N	49	41	24	4
Range	4.6-9.6	11.0-19.8	18.5-27.5	26.6-28

### 1.4 Summary

Brown trout was the dominant fish species in Kiltorris Lough, followed by eels. Mean CPUE for brown trout in the lake was average when compared with other moderate alkalinity lakes, e.g. Lough Melvin and Lough Gill. In 2005, the CPUE of Kiltorris Lough brown trout was higher than all other moderate alkalinity lakes surveyed at the time. Brown trout CPUE has shown a slight decrease since this previous survey; however, this was not statistically significant.

Kiltooris Lough had a below average mean CPUE for eels when compared with other moderate alkalinity lakes. This is consistent with the 2005 survey.

Kennedy and Fitzmaurice (1971) related growth rates to alkalinity and classified the growth of lake trout generally into four different categories. This description was applied to trout from Kiltooris Lough from this survey and therefore trout in the lake were classified as slow growing. Brown trout growth was slow in comparison with some of the other moderate alkalinity lakes surveyed, e.g. Lough Fern and Lough Gill, although it was very similar to that of other moderate alkalinity lakes, e.g. Lough Melvin and Lough Leane (Kelly *et al.*, 2009). The 2005 survey also concluded that brown trout in Kiltooris Lough were slow growing when compared with other moderate alkalinity lakes surveyed at that time.

It is suggested that the fish population in Kiltooris Lough should be monitored regularly due to the current practice of water abstraction. Duration of drawdown and extent of exposure will determine the impact on macroinvertebrates, lake productivity and the availability and type of food for fish (Igoe and Hammar, 2004). Water level fluctuations are particularly detrimental to macroinvertebrate species such as *Gammarus* sp. that are an important food base for trout (Igoe, *pers. comm.*). The lowering of water levels as a consequence of water abstraction can also be detrimental to the spawning success of resident fish populations that may utilise shallow, gravelly lake margins as spawning substrate in the absence of suitable inflowing streams. In the case of Kiltooris Lough, however, this is unlikely to be a major issue, as there are several inflowing streams that may potentially be utilised by spawning fish. Assessing/monitoring spawning activity in these streams would be useful to establish the importance (if any) of the littoral lake area as spawning habitat.

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 multimetric fish classification tool has been developed for the island of Ireland (Ecoregion 17) using Agri-Food and Biosciences Institute Northern Ireland (AFBNI) and CFB data. Using this tool and expert opinion, Kiltooris Lough has been assigned a draft classification for fish of good status. After the 2005 survey was conducted, the lake was assigned high status, therefore the ecological status for fish in Kiltooris Lough has changed to good within the past three years.

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



## 1.5 References

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