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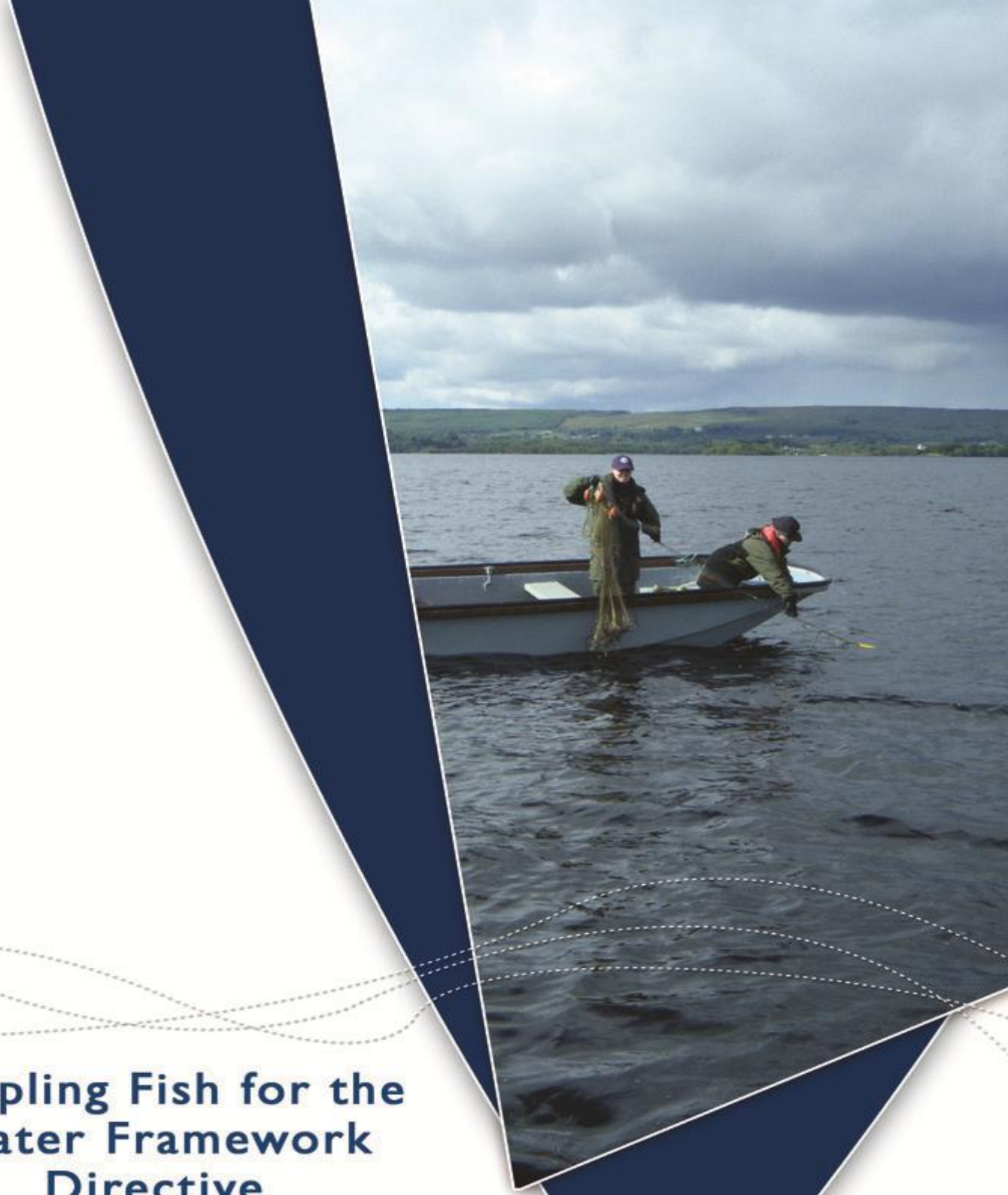

Sampling Fish for the Water Framework Directive

Lakes 2011

Kiltooris Lough

Iascach Intíre Éireann
Inland Fisheries Ireland

Water Framework Directive Fish Stock Survey of Kiltooris Lough, August 2011

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CITATION: Kelly, F.L., Connor, L., Morrissey, E., Wogerbauer, C., Matson, R., Feeney, R. and Rocks, K. (2012) Water Framework Directive Fish Stock Survey of Kiltooris Lough, August 2011. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

Cover photo: Lynda and Fiona gill netting © Inland Fisheries Ireland

ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help and co-operation of the regional director Dr. Milton Matthews and the staff from IFI, Ballyshannon. The authors would also like to gratefully acknowledge the help and cooperation of all their colleagues in IFI, Swords.

The authors would also like to acknowledge the funding provided for the project from the Department of Communications, Energy and Natural Resources for 2011.

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 $CaCO_3$). 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 0.75lb 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 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 as part of the Water Framework Directive surveillance monitoring programme (Kelly *et al*., 2009). During this 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 2011 fish stock survey carried out on the lake, as part of the Water Framework Directive surveillance monitoring programme.

Plate 1.1. Kiltooris Lough, looking south-east over the lake

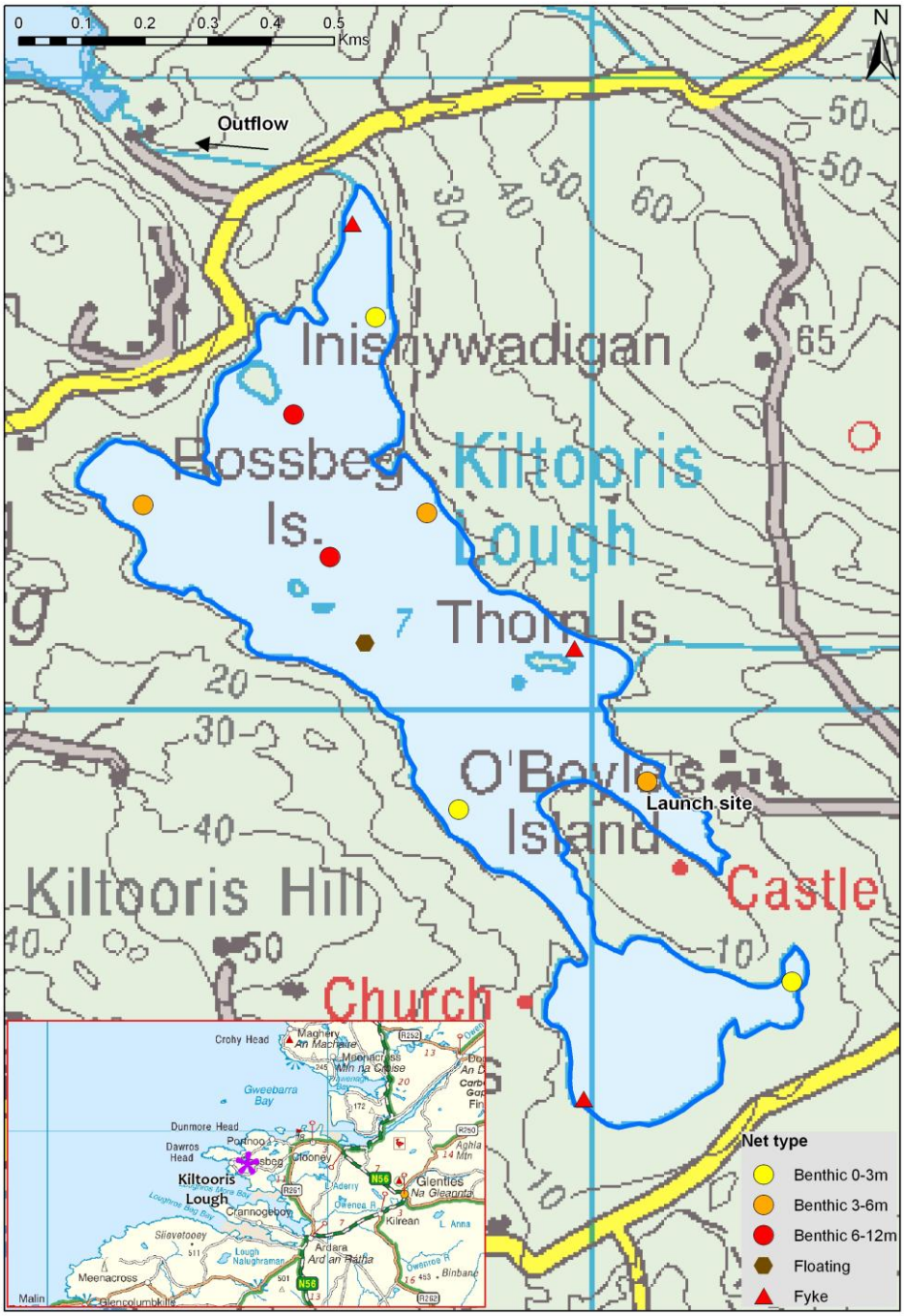

Fig. 1.1. Location map of Kiltooris Lough showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

Kiltooris Lough was surveyed over one night on the 15th of August 2011. 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 survey in 2008. 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 2011, with 55 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Brown trout was the most abundant fish species recorded, followed by three-spined stickleback and eels. During the previous survey in 2008 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 2011

Scientific name	Common name	Number of fish captured			
		Benthic mono multimesh gill nets	Surface mono multimesh gill nets	Fyke nets	Total
Salmo trutta	Brown trout	38	4	0	42
Gasterosteus aculeatus	3-spined stickleback	8	0	0	8
Anguilla anguilla	European eel	0	0	5	5

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 2008 and 2011 are summarised in Table 1.2. Mean CPUE and BPUE for all fish species is illustrated in Figures 1.2 and 1.3.

Although the mean brown trout CPUE and BPUE appeared slightly lower in 2011 than in 2008, these differences were not statistically significant (Figs. 1.2 and 1.3).

The differences in the mean brown trout CPUE and BPUE between Kiltooris Lough and two similar lakes was assessed, with no overall significant differences being found (Figs. 1.4 and 1.5).

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

Scientific name	Common name	2008	2011
		Mean CPUE	
Salmo trutta	Brown trout	0.163 (0.052)	0.116 (0.028)
Gasterosteus aculeatus	3-spined stickleback	0.005 (0.003)	0.022 (0.017)
Anguilla anguilla	European eel	0.066 (0.019)	0.027 (0.02)
		Mean BPUE	
Salmo trutta	Brown trout	21.009 (6.14)	15.912 (4.384)
Gasterosteus aculeatus	3-spined stickleback	0.011 (0.011)	0.027 (0.021)
Anguilla anguilla	European eel	5.088 (1.246)	2.416 (1.961)

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

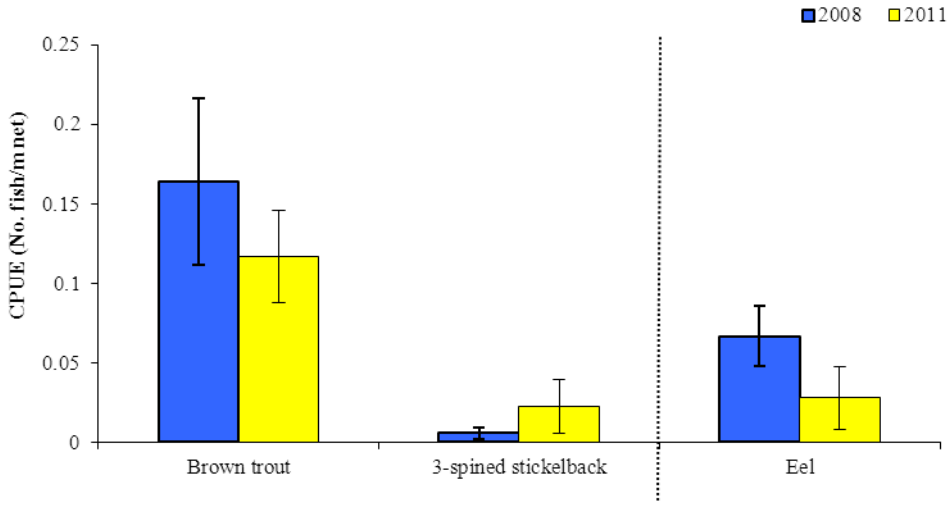

Fig. 1.2. Mean (±S.E.) CPUE for all fish species captured in Kiltooris Lough (Eel CPUE based on fyke nets only), 2008 and 2011

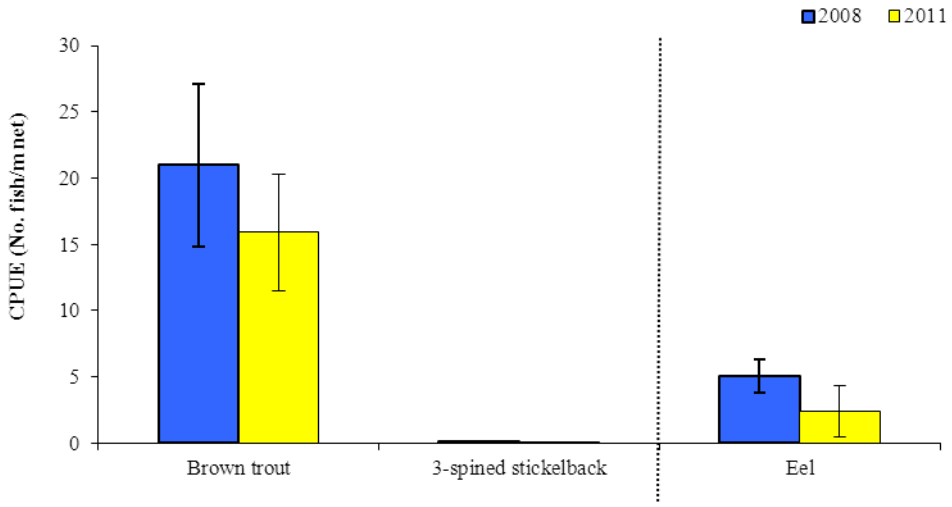

Fig. 1.3. Mean (±S.E.) BPUE for all fish species captured in Kiltooris Lough (Eel CPUE based on fyke nets only), 2008 and 2011

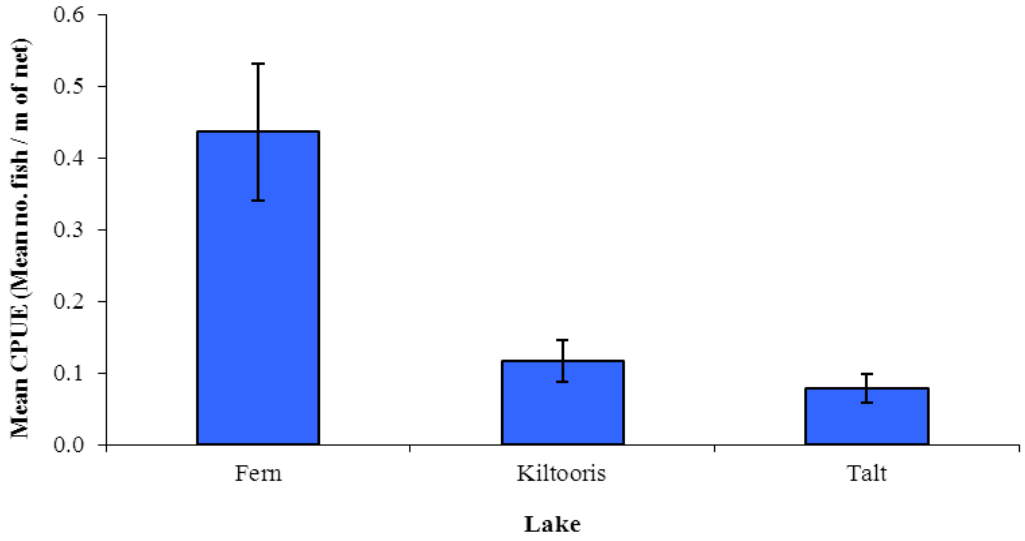

Fig. 1.4. Mean (±S.E.) brown trout CPUE in three lakes surveyed during 2011

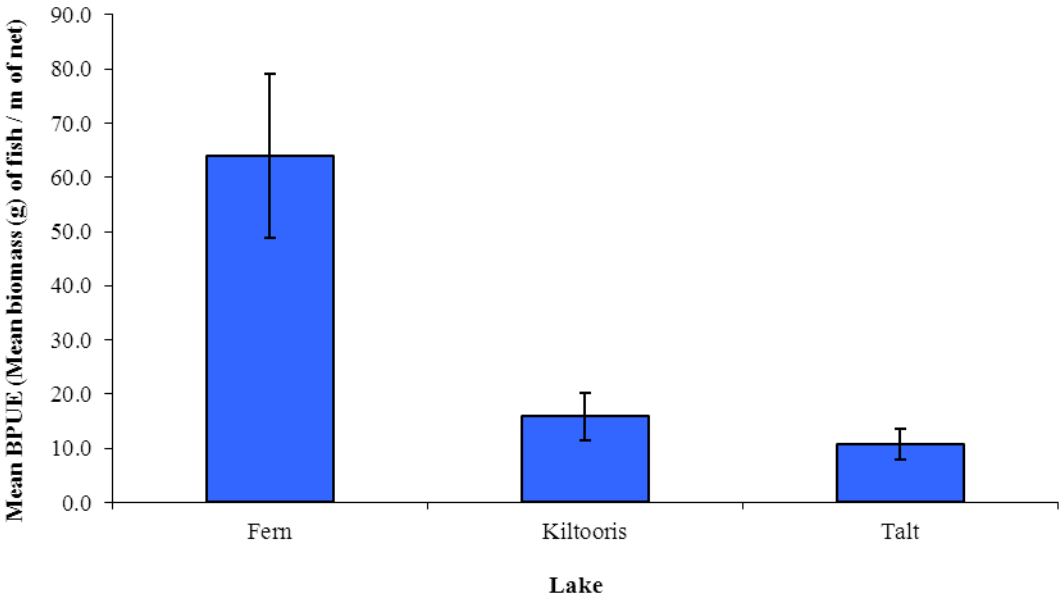

Fig. 1.5. Mean (±S.E.) brown trout BPUE in three lakes surveyed during 2011

1.3.3 Length frequency distributions

Brown trout captured during the 2011 survey ranged in length from 8.0cm to 32.0cm (mean = 21.7cm) (Fig. 1.6). Brown trout captured during the 2008 survey ranged in length from 13.4cm to 32.0cm (Fig. 1.6).

Eels captured during the 2011 survey ranged in length from 32.5cm to 43.5cm (mean = 36.7cm). Eels captured during the 2008 survey had lengths ranging from 31.5cm to 43.0cm.

Three-spined stickleback captured during the 2011 survey ranged in length from 3.5cm to 4.3cm.

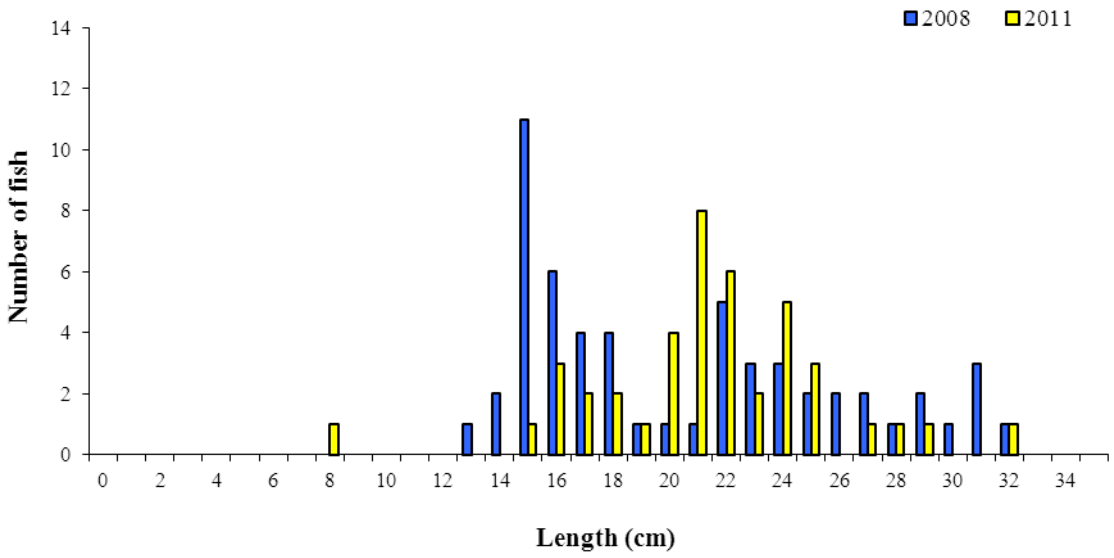

Fig. 1.6. Length frequency of brown trout captured on Kiltooris Lough

1.3.4 Fish age and growth

Five age classes of brown trout were present, ranging from 0+ to 4+, with a mean L1 of 7.7cm (Table 1.3). In the 2008 survey, brown trout ranged from 0+ to 4+ with a mean L1 of 6.4cm. Mean brown trout L4 in 2011 was 29.7cm indicating a slow rate of growth for brown trout in this lake according to the classification scheme of Kennedy and Fitzmaurice (1971).

Table 1.3. Mean (±SE) brown trout length (cm) at age for Kiltooris Lough, August 2011

	L_1	L_2	L_3	L_4
Mean	7.7 (0.2)	17.8 (0.4)	24.5 (1.0)	29.7
N	37	28	7	1
Range	5.3-11.9	14.5-23.7	22.2-29.4	29.7-29.7

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 and BPUE in Kiltooris Lough was similar to the other lakes assessed, with no statistically significant differences being found between lakes. There was also no significant difference between mean brown trout cpue and BPUE between the 2008 and 2011 surveys. Brown trout ranged in age from 0+ to 4+, indicating reproductive success in each of the previous five years. Length at age analyses revealed that brown trout in the lake exhibit a slow rate of growth according to the classification scheme of Kennedy and Fitzmaurice (1971).

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.*, 2012). Using the FIL2

classification tool, Kiltooris Lough has been assigned an ecological status of High based on the fish populations present. The ecological status assigned to the lake based on the 2008 survey data was Good.

In the 2007 to 2009 surveillance monitoring reporting period, the EPA assigned Kiltooris Lough an overall ecological status of Good, based on all monitored physico-chemical and biological elements, including fish. This status classification will be revised at the end of 2012.

1.5 References

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