

**Sampling Fish for the
Water Framework
Directive**

Transitional Waters 2013

Lough Gill



Iascach Intíre Éireann
Inland Fisheries Ireland

Water Framework Directive Fish Stock Survey of Transitional Waters in the South Western River Basin District – Lough Gill

Fiona L. Kelly, Ronan Matson, John Coyne, Rory Feeney, Emma Morrissey, and Kieran Rocks

Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin

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PROJECT STAFF

Project Director/Senior Research officer:	Dr. Fiona Kelly
Project Manager:	Ms. Lynda Connor
Research Officer:	Dr. Ronan Matson
Technician	Mr. John Coyne
Technician	Mr. Rory Feeney
Technician:	Ms. Emma Morrissey
GIS Officer:	Mr. Kieran Rocks
Fisheries Assistant:	Mr. Johannes Bulfin
Fisheries Assistant:	Mr. John Finn
Fisheries Assistant:	Ms. Karen Kelly
Fisheries Assistant:	Ms. Roisin O' Callaghan
Fisheries Assistant:	Ms. Laura Walsh

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1. INTRODUCTION

A fish stock survey was conducted on Lough Gill in the South Western River Basin District (SWRBD) as part of the programme of fish monitoring for the Water Framework Directive (WFD), between the 14th and 15th of October 2013 by staff from Inland Fisheries Ireland.

Lough Gill covers an area of 1.4km² and is situated on Ireland's south-west coast, approximately 1km north-west of Castlegregory village, Co. Kerry (Fig. 1.1, Plate 1.1). The lough is classified as a large, natural sedimentary lagoon that drains into Tralee Bay through a modified outlet and sluice gate (NPWS, 2004). Lough Gill is relatively shallow (<0.5m) and has a predominately firm sand substrate. It receives the waters of the Killiney River and another unnamed stream that flows from Stradbally Mountain, located approximately 3km to the south.

Lough Gill is situated within the Tralee Bay and Magharees Peninsula, West to Cloghane SAC. This is a large SAC containing a number of important bird species, as well as coastal habitats, including lagoon and fixed dunes, both of which are listed in Annex I of the EU Habitats Directive (NPWS, 2003).

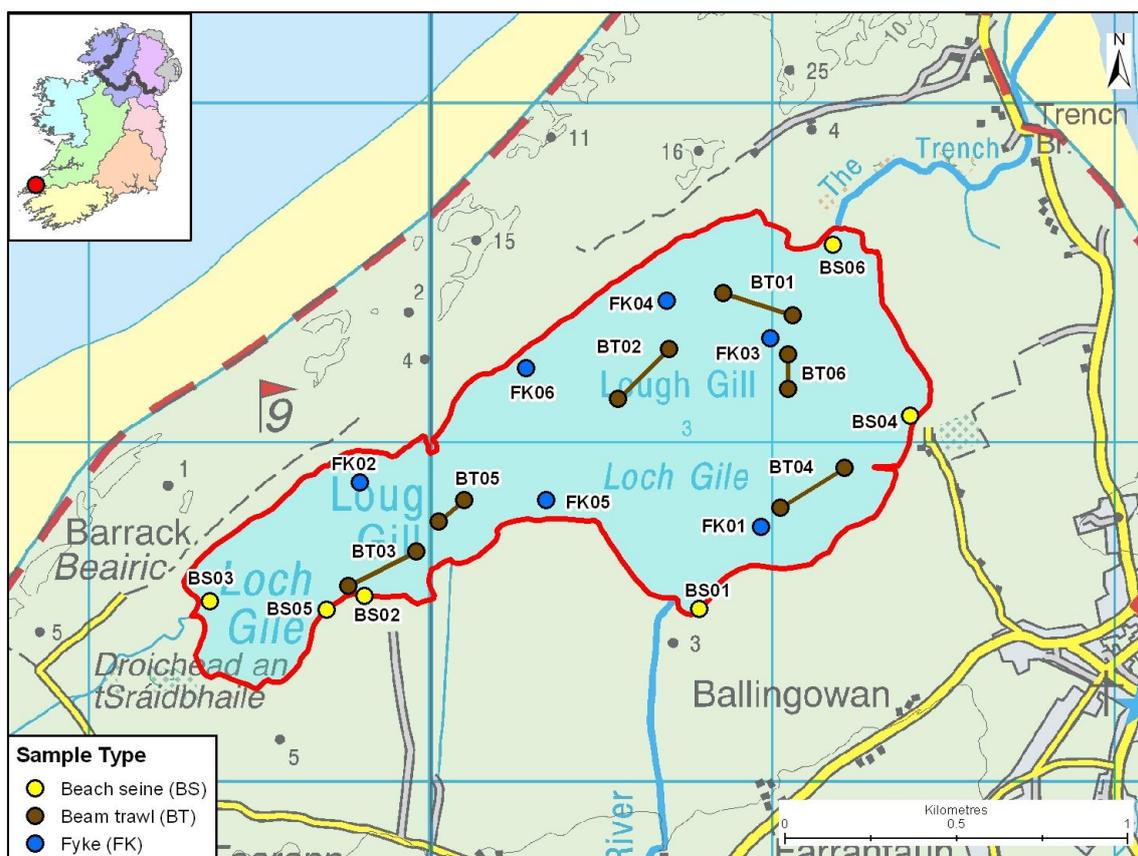


Fig. 1.1. Location map of Lough Gill indicating sample sites, October 2013



Plate 1.1. Aerial photo of Lough Gill looking north towards Brandon Bay. (Photo courtesy of IFI and No. 3 Operational Wing, Irish Air Corps [Aer Chór na hÉireann])



Plate 1.2. Emergent vegetation along the shores of Lough Gill

2. METHODS

Current work in the Republic of Ireland and United Kingdom indicates the need for a multi-method (beach seine, fyke net and beam trawl) approach to sampling fish in estuaries and these procedures are now the standard IFI methodology for fish stock surveys in transitional waters for the WFD monitoring program.

Beach seining (Plate 2.2) is conducted using a 30m x 3m net (10mm mesh size) to capture fish in littoral areas. The bottom of the net has a weighted lead line to increase sediment disturbance and catch efficiency. Fyke nets (15m in length with a 0.8m diameter front hoop, joined by an 8m leader with a 10mm square mesh) are used to sample benthic fish in the littoral areas. Beam trawls are used for sampling benthic fish in the littoral and open waters, where bed type is suitable. The beam trawl measures 1.5m x 0.5m, with a 10mm mesh bag, decreasing to 5mm mesh in the cod end. The trawl is attached to a 20m tow rope and towed by a boat. Trawls are conducted along transects of 100m in length.

Sample sites are selected to represent the range of geographical and habitat ranges within the water body, based on such factors as exposure/orientation, shoreline slope, and substrate type. A handheld GPS is used to mark the precise location of each site.

All nets were processed on-site by identifying the species present and counting the total numbers caught in each. Length measurements are recorded for each species using a representative sub-sample of 30 fish, while scales are only collected for certain species, such as salmon and sea trout. Unidentified specimens were retained for subsequent identification in the laboratory.

A total of six beach seines, six fyke nets and six beam trawls were deployed in Lough Gill in October 2013.



Plate 2.1. Deploying a fyke net in Lough Gill



Plate 2.2. Beach seine among emergent weeds in Lough Gill

3. RESULTS

A total of seven fish species were recorded in Lough Gill in October 2013. Table 3.1 shows a comparison between 2013 and the previous survey in 2010. Sand smelt, and golden grey mullet were newly recorded in 2013, while thick-lipped grey mullet were absent. Three-spined stickleback was the most abundant species, followed by sand goby, brown trout and flounder. Three-spined stickleback was the only species recorded using all three netting methods.

Eels which are listed as critically endangered in the Irish Red Data Book (King *et al.*, 2011) were recorded during this survey. Other noteworthy species included golden grey mullet and brown trout.

Salinity values taken at beach seine sites ranged from 3.40 to 12.20.ppt.

Table 3.1. Number of each species captured by each gear type in Lough Gill, October 2013

Common name	Beach seine		Fyke net		Beam trawl		Total	
	2010 (4)	2013 (6)	2010 (4)	2013 (6)	2010 (4)	2013 (6)	2010	2013
Three-spined stickleback	634	196	-	5	77	160	711	361
Sand goby	19	107	-	-	3	106	22	213
Brown trout	-	8	13	17	-	-	13	25
Flounder	1	1	12	13	-	-	13	14
European eel	4	1	5	3	1	4	10	8
Sand smelt	-	2	-	-	-	-	-	2
Golden grey mullet	-	-	-	1	-	-	-	1
Thick-lipped grey mullet	3	-	-	-	-	-	3	-

Brown trout captured during the 2013 survey ranged in length from 14.1cm to 31.4cm (mean 21.6cm) (Fig. 3.1), with the majority of those within the 1+ and 2+ age classes (Fig. 3.1). Brown trout captured during the 2010 survey ranged in size from 24.3cm to 33.2cm (mean = 28.5cm) and were mainly aged 2+.

Flounder captured during the 2013 survey ranged in length from 11.1cm to 20.3cm (mean 15.9cm) (Fig. 3.2). Flounder captured in 2010 ranged in length from 7.8cm to 23.1cm (mean = 15.4cm).

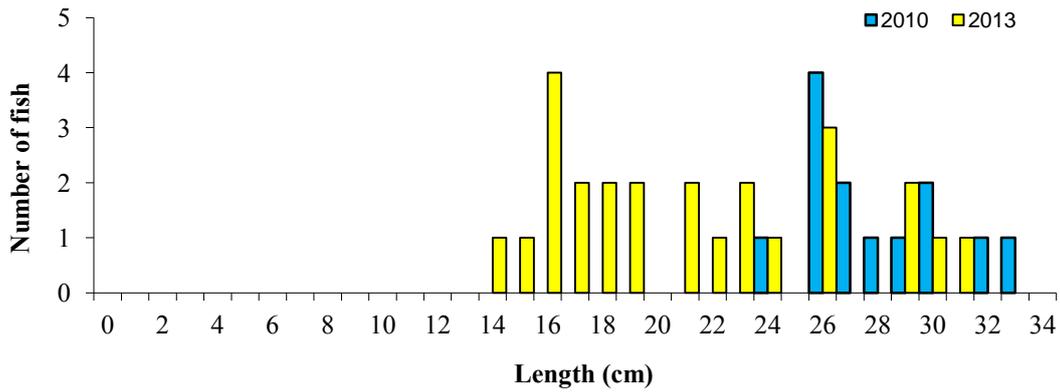


Fig. 3.1. Length frequency distribution of brown trout in Lough Gill, September 2010 (n = 13) and October 2013 (n = 25)

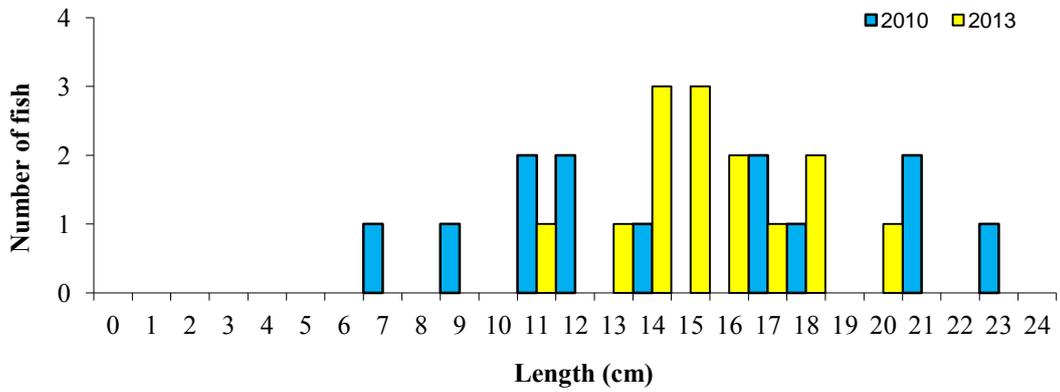


Fig. 3.2. Length frequency distribution of flounder in Lough Gill, September 2010 (n = 13) and October 2013 (n = 14)

4. SUMMARY

Seven fish species were recorded in Lough Gill during the current survey. This was a relatively low number of species when compared with other transitional water bodies surveyed around Ireland in 2013. This is likely due to it being a small shallow lagoon with limited connectivity to the sea. The low salinity levels recorded throughout this water body, suggest that freshwater influences this water body to a greater extent than salt water. Furthermore, the species present were all either freshwater species, or those tolerant of brackish conditions.

An essential step in the WFD monitoring process is the classification of the ecological status of transitional waters, which in turn will assist in identifying the objectives that must be set in the individual River Basin Management Plans.

A WFD fish classification tool, Transitional Fish Classification Index or TFCI, has been developed for the island of Ireland (Ecoregion 1) using IFI and Northern Ireland Environment Agency (NIEA) data. This is a multi-metric tool based on similar tools developed in South Africa and the UK (Harrison and Whitfield, 2004; Coates *et al.*, 2007). The TFCI has recently completed the intercalibration process, in order to make it fully WFD compliant and to account for differences in estuary typologies.

Using this approach combined with expert opinion, Lough Gill has been assigned a draft ecological status classification (TFCI) of “Good” based on the fish populations present.

5. REFERENCES

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**Inland Fisheries Ireland
Swords Business Campus,
Swords,
Co. Dublin,
Ireland.**

**Web: www.fisheriesireland.ie
Email: info@fisheriesireland.ie
Tel: +353 1 8842 600
Fax: +353 1 8360 060**