Lough Murree

Sampling Fish for the Water Framework Directive - Transitional Waters 2009

The Central and Regional Fisheries Boards

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1. INTRODUCTION

A fish stock survey was conducted on Lough Murree as part of the programme of fish monitoring for the Water Framework Directive (WFD), between the 14th and the 15th of October 2009 by staff from the Central Fisheries Board (CFB) and the Western Regional Fisheries Board (WRFB).

Lough Murree covers an area of 0.13km² and is located on the southern side of Galway Bay, approximately 4.5km north-east of Ballyvaughan, County Clare (Fig. 1.1, Plate 1.1). The lagoon has no visible freshwater input other than rainwater and the surrounding area is predominately used for agriculture.

This water body is situated within the Galway Bay Complex SAC, which is important for a number of salt marsh habitats listed in Annex I of the EU Habitats Directive. Annex II listed species present include the common seal (NPWS, 2006).

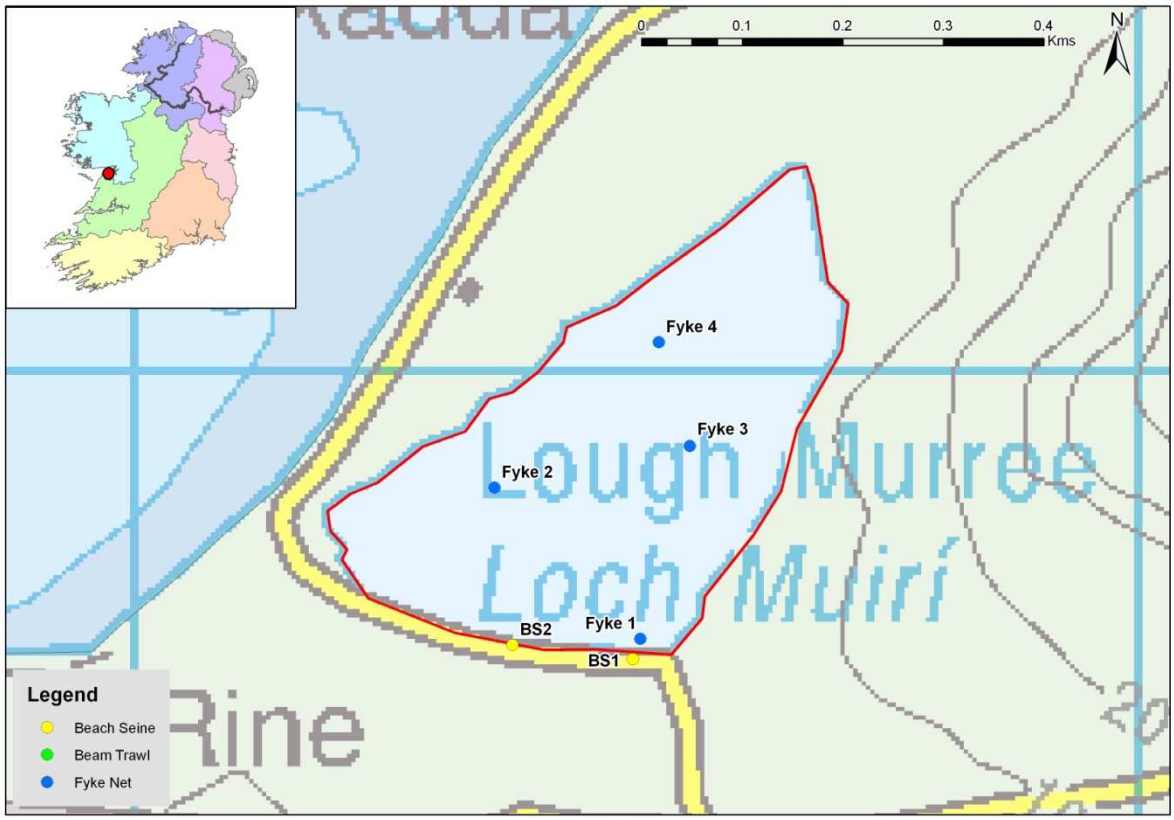

Fig 1.1. Location map of Lough Murree indicating sampling sites, October 2009

Plate 1.1. Lough Murree

2. METHODS

Current work in the UK and ROI 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 CFB methodology for fish stock surveys in transitional waters for the WFD monitoring program.

Beach seining 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 100 – 200m 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 are 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 two beach seines and four fyke nets were deployed in Lough Murree in September 2009.

3. RESULTS

Two fish species were recorded in Lough Murree (Table 3.1). Three-spined stickleback was the most abundant species, followed by eel (Table 3.1). Three-spined stickleback ranged in length from 1.6cm to 4.6cm in length (Fig. 3.1).

Salinity values taken at beach seine sites ranged from 8.23ppt to 8.25ppt.

Table 3.1. Number of each species captured by each gear type in Lough Murree, September 2009

Scientific name	Common Name	Beach seine (2)	Fyke net (4)	Beam trawl (0)	Total
Gasterosteus aculeatus	Three-spined stickleback	133	3	-	136
Anguilla anguilla	Eel	-	4	-	4

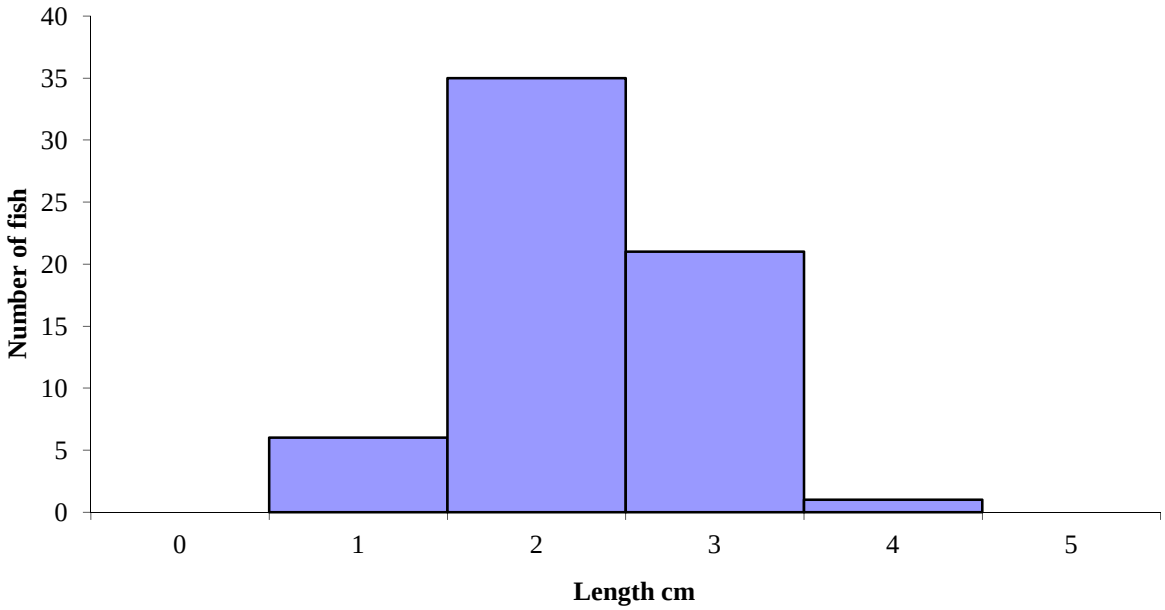

Fig. 3.1. Length frequency distribution of a sub-sample of three-spined stickleback captured in Lough Murree, October 2009 (n = 63)

4. SUMMARY

Only two fish species were recorded in Lough Murree, which is the lowest species richness of all WFD transitional water bodies surveyed in the WRFB during 2009. Both species that were recorded are tolerant of freshwater and saltwater conditions. This water body presents a number of different challenges to fish fauna and their ability to colonise it. Firstly it has no direct connection to the sea, which not only inhibits the influx of seawater to the system, but also the entry of marine species. Furthermore, this water body has no obvious source of freshwater input, except for rainwater, which rules out the recruitment of freshwater species from an upstream source. Species richness and distribution among all transitional water bodies surveyed during 2009 can be seen in the 2009 WFD summary report (Kelly *et al.*, 2010).

An essential step in the WFD monitoring process is the classification of the 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 new WFD fish classification tool, Transitional Fish Classification Index or TFCI, has been developed for the island of Ireland (Ecoregion 1) using Northern Ireland Environment Agency (NIEA) and CFB 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 is still undergoing further development in order to make it fully WFD compliant and to account for differences in estuary typologies; however, at this stage it has been used, along with expert opinion, to provide draft ecological status classifications for each transitional water body surveyed for the WFD.

Using this approach, Lough Murree has been assigned a draft ecological status classification of “Bad” based on the fish populations present.

The EPA have assigned the Lough Murree an overall interim draft classification of “Moderate” status, based on general physico-chemical elements, phytoplankton and macroalgal growths.

5. REFERENCES

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