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Sampling Fish for the Water Framework Directive

Transitional Waters 2012

North Western International River Basin District

Iascach Intíre Éireann
Inland Fisheries Ireland

Water Framework Directive Fish Stock Survey of Transitional Waters in the North Western International River Basin District – Gweebarra Estuary

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Cover photo: Lynda beam trawling © Inland Fisheries Ireland

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1. INTRODUCTION

A fish stock survey was conducted on the Gweebarra Estuary in the North Western International River Basin District (NWIRBD) as part of the programme of fish monitoring for the Water Framework Directive (WFD), between the 10th and the 12th of October 2012. This estuary was previously surveyed in 2009. The survey was carried out jointly by Inland Fisheries Ireland and the Northern Ireland Environment Agency (NIEA) with the objective of developing harmonised sampling protocols for fish in transitional waters for the island of Ireland.

The Gweebarra Estuary covers an area of 8.26km^2 and is situated on Ireland's north coast in Co. Donegal (Fig. 1.1). The estuary begins at the small village of Doochary and extends in a south-westerly direction for approximately 15km (Fig. 1.1 and Plate 1.1).

This waterbody lies within the West of Ardara/Mass Road SAC, which is important for many habitats listed in Annex I of the EU Habitats Directive, including large shallow inlets and bays, tidal mud flats and estuaries. Annex II listed species present include the common seal and Atlantic salmon (NPWS, 2005).

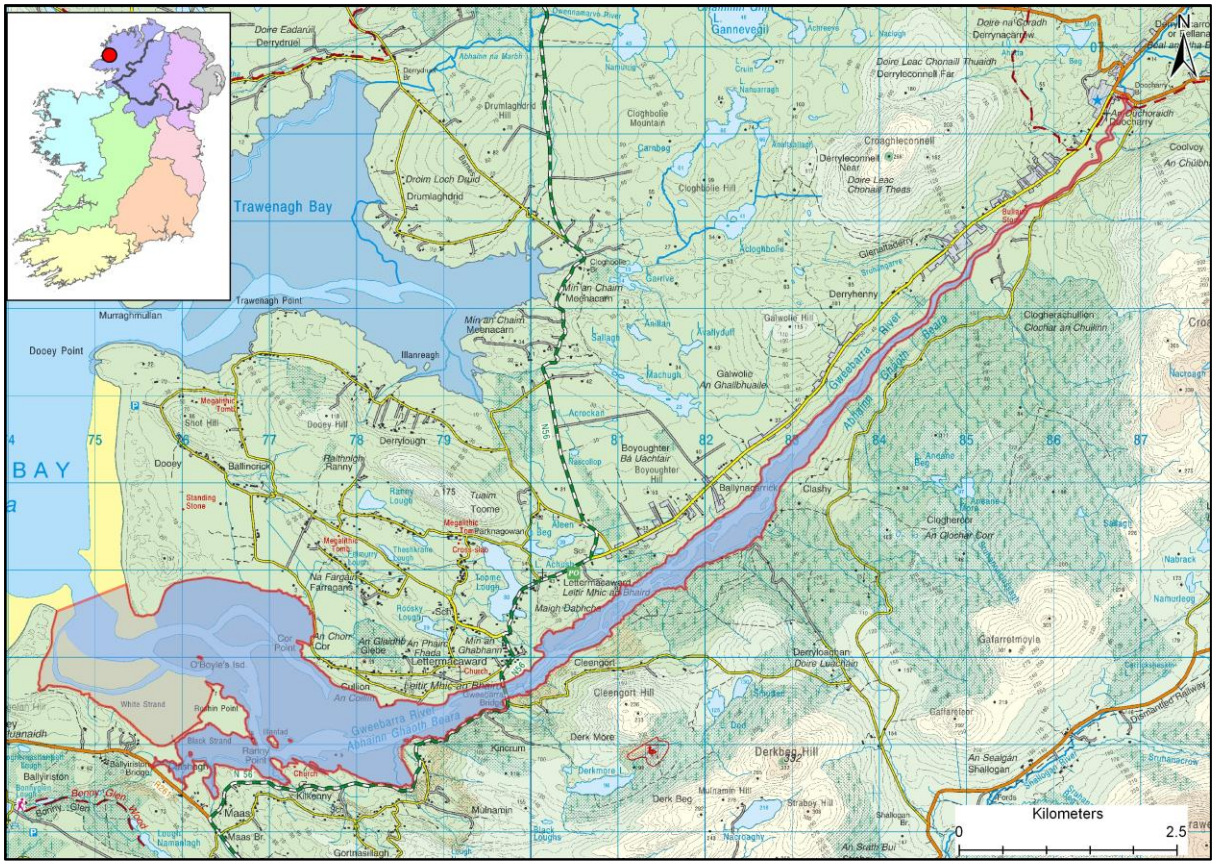

Fig. 1.1. Location map of the Gweebarra Estuary, Co. Donegal, October 2012

Plate 1.1. The lower Gweebarra Estuary, looking upstream to Gweebarra Bridge

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 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 (Plate 2.1). 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 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, 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 19 beach seines, ten beam trawls and seven fyke nets were deployed in the Gweebarra Estuary in October 2012 (Fig. 2.1).

Plate 2.1. Beach seining on the Gweebarra Estuary

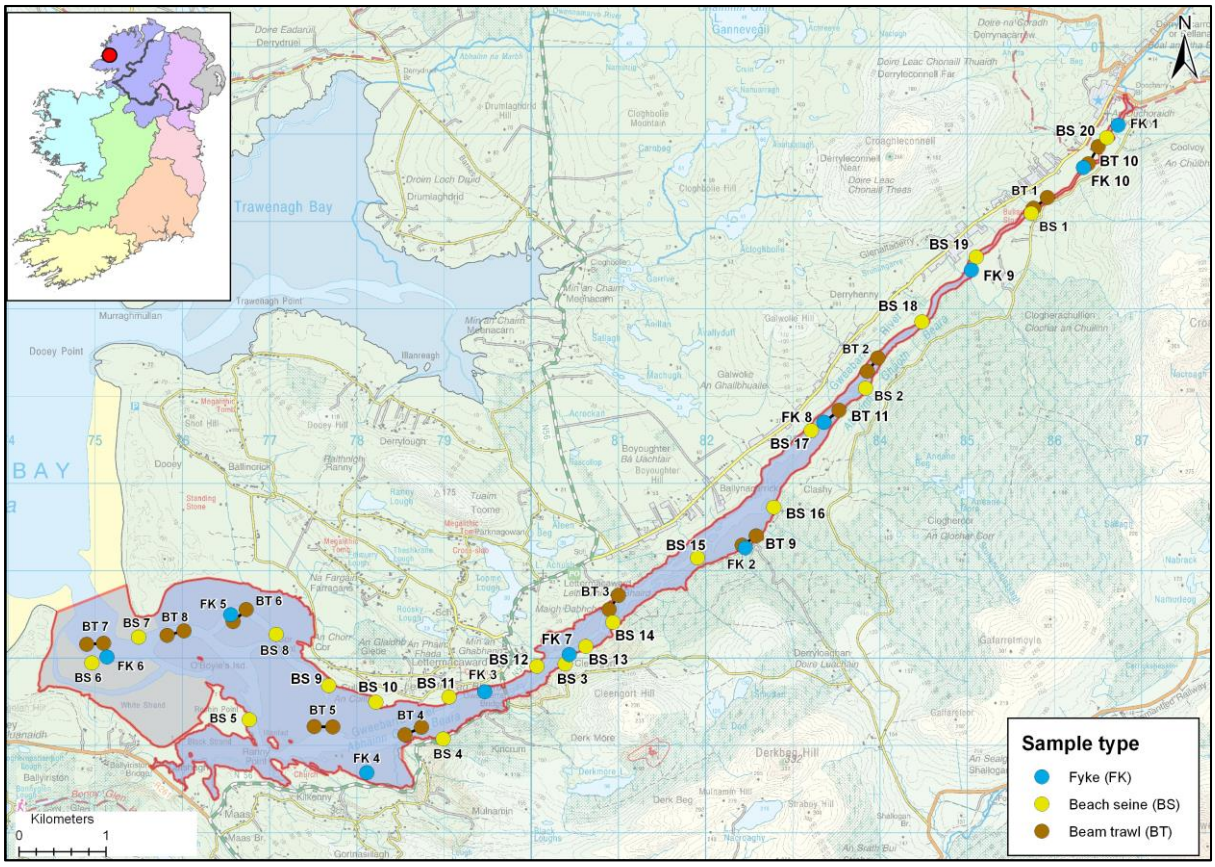

Fig. 2.1. Location map of the Gweebarra Estuary, indicating sample sites, October 2012

3. RESULTS

Fourteen fish species were recorded in the Gweebarra Estuary in October 2012 (Table 3.1). Sand goby was the most abundant species, followed by flounder and European eel. Flounder was the only species captured using all three netting methods, while sand gobies and plaice were recorded in both beach seines and beam trawls. Brown trout were captured using both beach seines and fyke nets. All other species were recorded using only one method each, indicating the effectiveness of each method's ability to target different species.

Flounder captured during the 2012 survey ranged in length from 2.7cm to 25.5cm (mean = 6.4cm) (Fig. 3.1). Flounder captured during the 2009 survey ranged in length from 2.7cm to 20cm (mean = 5.5cm) (Fig 3.1).

Salinity values taken at beach seine sites ranged from 0.02ppt to 27.6ppt.

Table 3.1. Number of each species captured by each gear type in the Gweebarra Estuary, October 2012

Scientific name	Common name	Beach seine (19)	Fyke net (7)	Beam trawl (10)	Total fish
Pomatoschistus minutus	Sand goby	371	-	102	473
Platichthys flesus	Flounder	19	10	61	90
Anguilla anguilla	European eel	-	17	-	17
Pleuronectes platessa	Plaice	5	-	8	13
Salmo trutta	Brown trout	2	3	-	5
Spinachia spinachia	Fifteen-spined stickleback	3	-	-	3
Ciliata mustela	Five-bearded rockling	-	3	-	3
Ammodytes tobianus	Lesser sandeel	2	-	-	2
Gobiusculus flavescens	Two-spotted goby	2	-	-	2
Syngnathus acus	Greater pipefish	-	-	2	2
Taurulus bubalis	Long-spined sea scorpion	1	-	-	1
Gasterosteus aculeatus	Three-spined stickleback	1	-	-	1
Psetta maxima	Turbot	1	-	-	1
Pollachius pollachius	Pollack	-	1	-	1

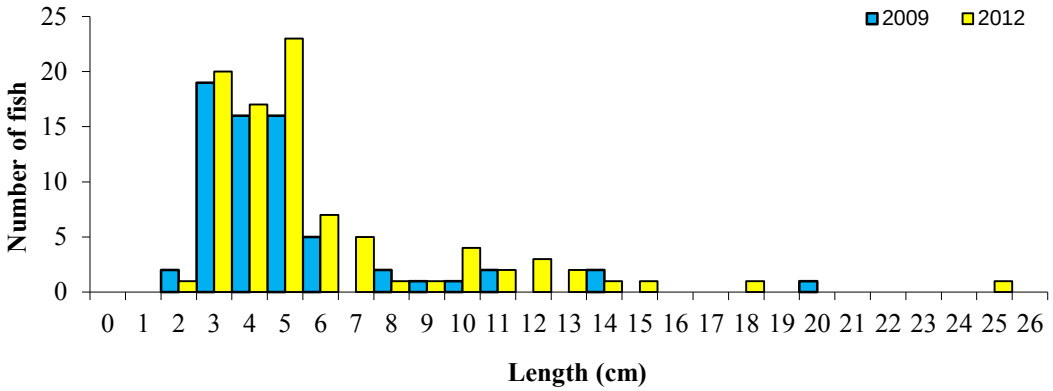

Fig. 3.1. Length frequency distribution of flounder in the Gweebarra Estuary, October 2009 (sub-sample, n=67) and October 2012 (n=90)

4. SUMMARY

A total of fourteen fish species were recorded in the Gweebarra Estuary during the 2012 survey. This is relatively low when compared with other estuaries of this type surveyed throughout the country over the past few years. The high ratio of saltwater to freshwater species, indicates the stronger influence of saltwater than freshwater on this system. In the previous survey in 2009, 16 species were recorded, with only six species common to both years, eels, fifteen-spined stickleback, flounder, long-spined sea scorpion, plaice and sand goby. Species richness and distribution of selected fish species among all transitional water bodies surveyed during 2012 can be seen in the 2012 WFD summary report (Kelly *et al*., 2013).

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 new 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 been successfully intercalibrated in a Europe-wide exercise; however it is undergoing further development to account for differences in typologies, 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, the Gweebarra Estuary has been assigned a draft ecological status classification of "Moderate" based on the fish populations present. In 2009, this waterbody was classed as 'Good'.

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

5. REFERENCES

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