Gweebarra Estuary

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 the Gweebarra Estuary as part of the fish monitoring programme for the Water Framework Directive (WFD), between the 6th and the 8th of October 2009 by staff from the Central Fisheries Board (CFB) and the Northern Regional Fisheries Board (NRFB).

The Gweebarra Estuary covers an area of 8.26km^2 and is situated on Ireland's north coast in Co. Donegal (Figs. 1.1 and 1.2, Plate 1.1). The estuary begins at the small village of Doochary and extends in a south-westerly direction for approximately 15km (Fig. 1.1).

This water body 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).

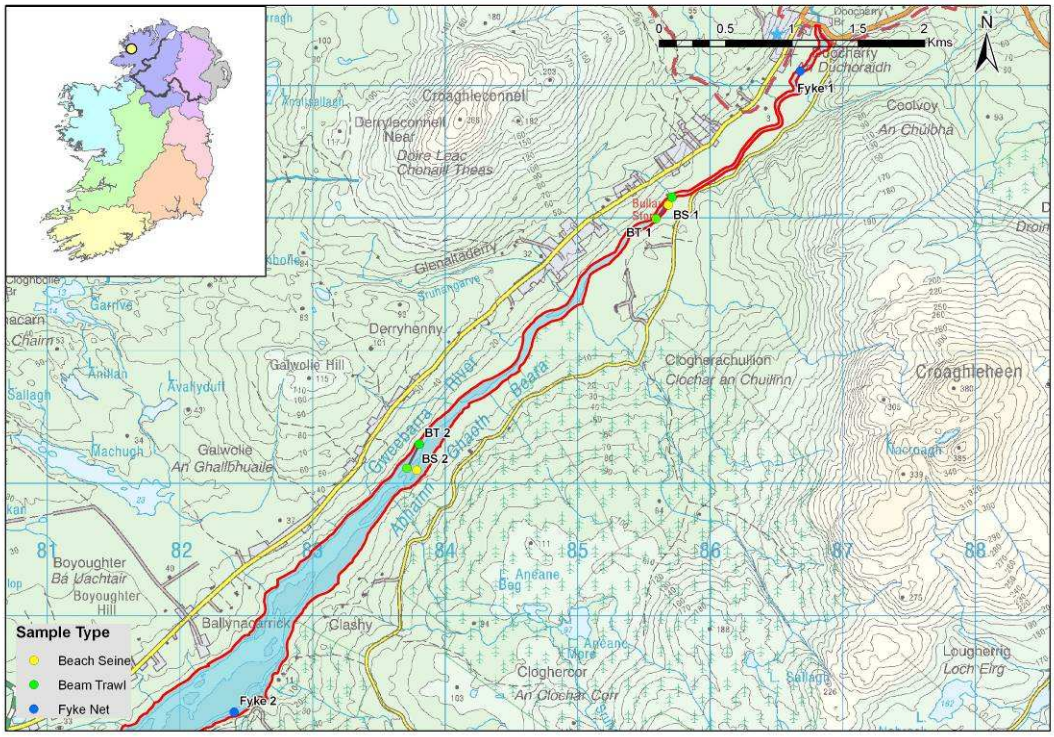

Fig 1.1. Location map of upper Gweebarra Estuary indicating sampling sites, October 2009

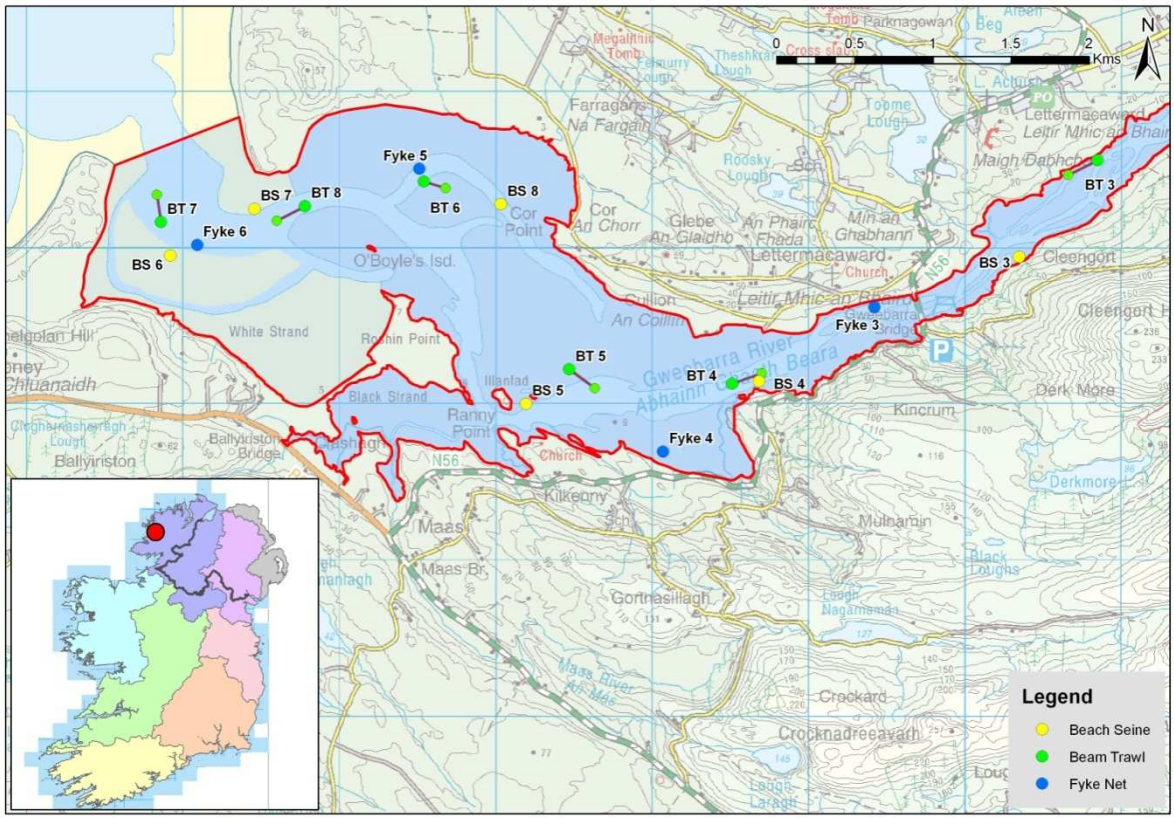

Fig 1.2. Location map of lower Gweebarra Estuary indicating sampling sites, October 2009

Plate 1.1. Beach seining in the Gweebarra Estuary, October 2009

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 eight beach seines, eight beam trawls and eight fyke nets were deployed in the Gweebarra Estuary in October 2009.

3. RESULTS

A total of 16 fish species were recorded in the Gweebarra Estuary in October 2009 (Table 3.1). Lesser sandeel was the most abundant species captured, followed by sand goby, flounder, cod, Pollack and plaice (Table 3.1).

The length frequency distribution of gadoids captured in the survey indicates that the population was composed predominantly of juvenile fish, indicating that these species utilise the Gweebarra Estuary as a nursery area (Fig. 3.1).

Salinity values taken at each beach seine site ranged from 0.174ppt in the upper estuary to 24.5ppt in the lower estuary.

Table 3.1. Number of each species captured by each gear type in the Gweebarra Estuary, October 2009

Scientific Name	Common Name	Beach seine (8)	Fyke net (6)	Beam trawl (8)	Total
Ammodytes tobianus	Lesser sandeel	467	-	-	467
Pomatoschistus minutus	Sand goby	100	-	19	119
Platichthys flesus	Flounder	24	3	75	102
Gadus morhua	Cod	-	41	-	41
Pollachius pollachius	Pollack	-	36	-	36
Pleuronectes platessa	Plaice	7	-	10	17
Ciliata mustela	Five-bearded rockling	-	16	-	16
Pollachius virens	Coalfish (Saithe)	-	6	-	6
Anguilla anguilla	Eel	-	5	-	5
Scophthalmus rhombus	Brill	1	-	1	2
Spinachia spinachia	Fifteen-spined stickleback	-	2	-	2
Taurulus bubalis	Long-spined sea scorpion	-	2	-	2
Trisopterus luscus	Bib	-	2	-	2
Myoxocephalus scorpius	Short-spined sea scorpion	-	2	-	2
Pholis gunnellus	Gunnel (Butterfish)	-	1	-	1
Syngnathus acus	Greater pipefish	-	-	1	1

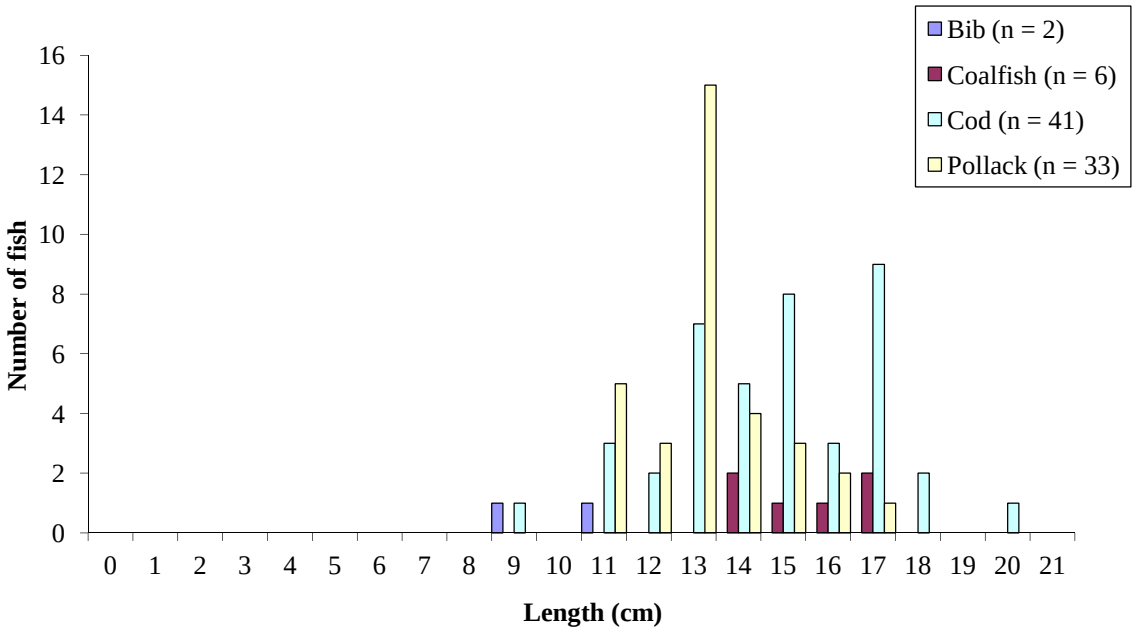

Fig. 3.1. Length frequency distribution of gadoids captured in the Gweebarra Estuary, October 2009

4. SUMMARY

A total of 16 fish species were recorded in the Gweebarra Estuary, which is similar to other transitional water bodies surveyed in the NRFB during 2009. Juveniles of a number of commercially important species were present, including cod, plaice, pollack and coalfish, as well as other species of angling importance, such as flounder. 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, the Gweebarra Estuary has been assigned a draft ecological status classification of “Good” status based on the fish populations present.

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

5. REFERENCES

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