Broad Lough

Sampling Fish for the Water Framework Directive - Transitional Waters 2008

The Central and Regional Fisheries Boards

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INTRODUCTION

A fish stock survey was carried out at sites on the Broad Lough Estuary, as part of the programme of monitoring for the Water Framework Directive (WFD), between the 1st to the 3rd of September 2008 by staff from the Central Fisheries Board (CFB) and the Eastern Regional Fisheries Board (ERFB).

Broad Lough Estuary is situated just north of Wicklow town, on Ireland's east coast approximately 35 kilometres south of Dublin. The estuary is formed by the Vartry River and is separated from the open sea by a long grassy spit of land called the Murrough (Plate 1). The estuary covers an area of 0.80km², and is divided by a causeway and narrow bridge, built to carry the Dublin-Wexford railway line. The upper section (above the railroad line) is relatively shallow and free of anthropogenic changes and consists of a partly tidal salt marsh, with intertidal flats exposed at low tide. It is extremely shallow and access was limited even at high tide. The lower section has been modified to accommodate small and large boat traffic (Plate 1). The large boats are restricted primarily to the harbour area.

Plate 1: Ariel photos of Broad Lough estuary. The upper estuary looking south towards Wicklow (top) and the lower estuary with large boat traffic (bottom). (Photo courtesy of CFB and No. 3 Operational Wing, Irish Air Corps [Aer Chór na hÉireann])

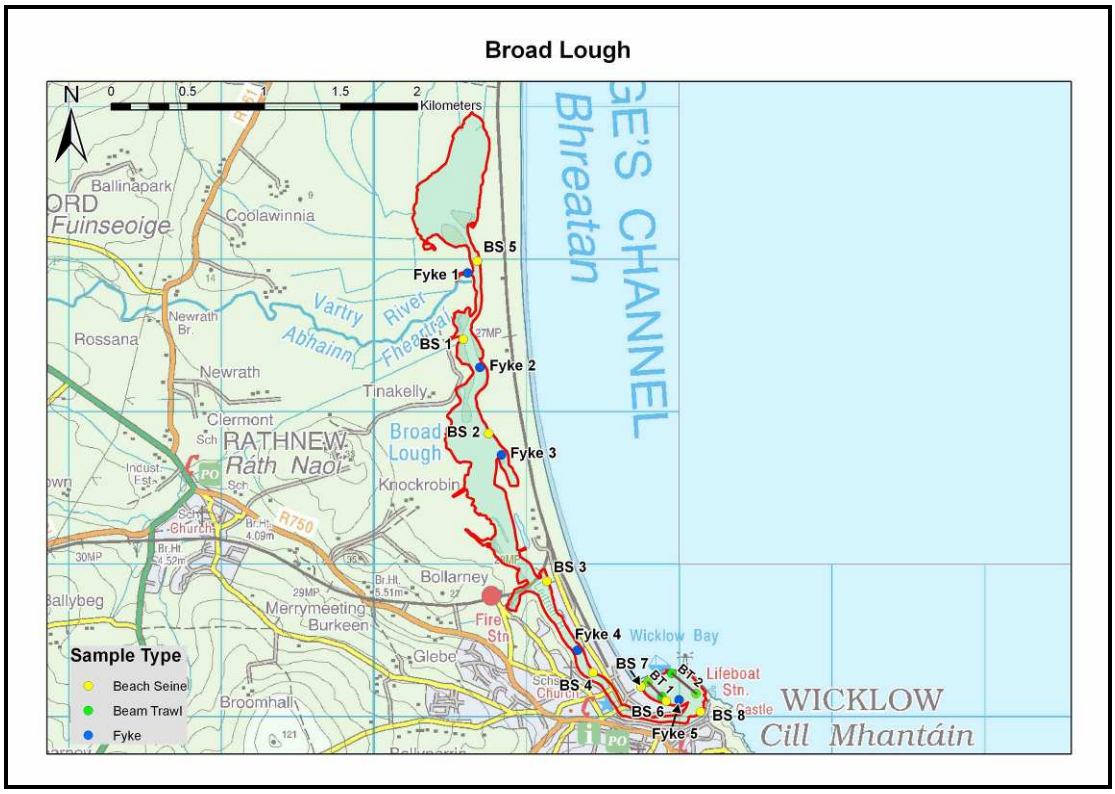

Fig. 1: Location map of Broad Lough Estuary indicating sampling sites, 2008

METHODS

Current work in the UK indicates the need for a multi-method netting approach (seine nets, fyke nets and beam trawls) to sampling for fish in estuaries and these procedures are now the standard CFB methodology for fish stock surveys in transitional waters for the WFD monitoring programme. Three sampling methods were used during the Broad Lough survey (i.e. beach seines and fyke nets), however due to a lack of depth, even at high water, sampling of the upper areas of the estuary was limited to fyke nets and beach seining. The beam trawl was utilized in the harbour portion of the lower estuary with little success due to the soft mud substrate. Portable GPS instruments were used to mark the precise location of each sampling site (Fig. 1).

RESULTS

A total of eight beach seine sites were selected encompassing the majority of geographical and where possible, habitat ranges of the estuary. Lesser sand eels and sand smelt were captured in high numbers at seine net sites in the lower estuary (Table 1). Common goby were widespread in the upper estuary (Table 1). Flounder and thick-lipped grey mullet were present in both the upper and lower estuary. There were several age classes of thick-lipped grey mullet captured during the survey (Fig. 2). The most significant find of the survey was the capture of a juvenile gilt-head bream. This species is common in the Mediterranean but is also found off the coast of northern France and the south coast of

England. Preliminary observations suggest that gilt head bream are beginning to colonise the Irish coast line and have been recorded off the south coast of Ireland mainly by anglers (Dr. Willie Roche, CFB, pers. comm.). The presence of the species off the east coast of Ireland suggests that it's spreading quite rapidly. This is the furthest north they have been documented on the east coast of Ireland (Plate 2).

Salinity values taken at beach seine sites ranged from 10.15ppt in the upper channel to 32.90ppt in the lower estuary at high water.

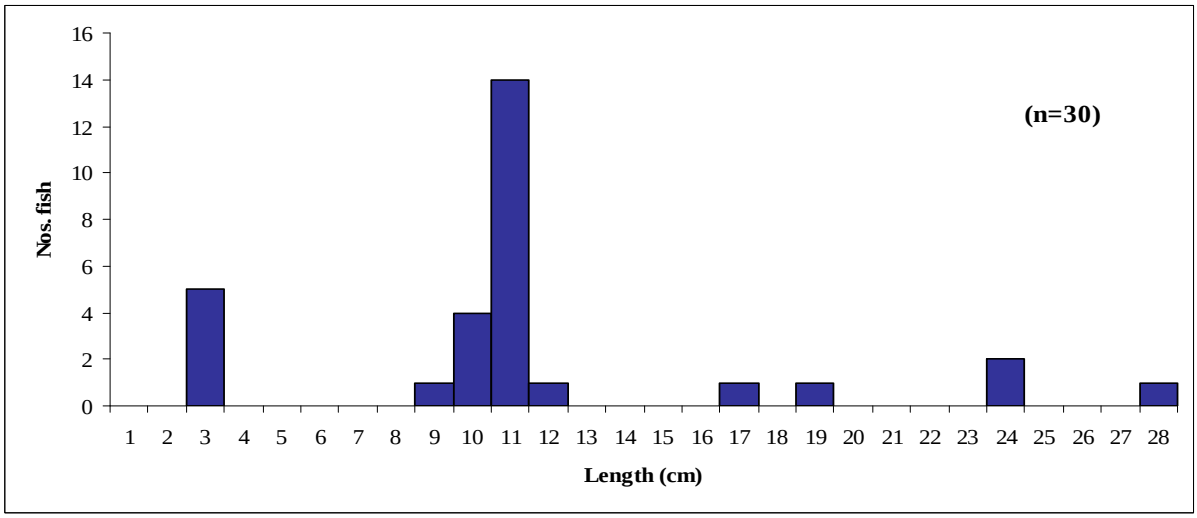

Fig. 2: Length frequency distribution of thick-lipped grey mullet captured on Broad Lough Estuary September 2008

Table 1: List of fish species and abundances in Broad Lough Estuary, September 2008

		Broad Lough Estuary		
Scientific name	**Common Name**	**Beach seine (8)**	**Fyke net (5)**	**Beam trawl (2)**
Chelon labrosus	Thick Lipped Grey Mullet	30	-	-
Platichthys flesus	Flounder	21	8	1
Dicentrarchus labrax	Sea bass	1	-	-
Sprattus sprattus	Sprat	30	-	-
Pomatoschistus microps	Common Goby	417	-	-
Pleuronectes platessa	Plaice	8	-	1
Ammodytes tobianus	Lesser Sandeel	110	-	-
Entelrus aequoreus	Snake Pipefish	1	-	-
Anguilla anguilla	Eel	1	2	-
Taurulus bubalis	Long-Spined Sea-Scorpion	1	-	-
Pholis gunnellus	Gunnel (Butterfish)	1	-	-
Gobius niger	Black Goby	3	-	-
Atherina prebyter	Sand Smelt	140	-	-
Pomatoschistus minutus	Sand Goby	57	-	-
Hyperoplus lanceolatus	Greater Sandeel	1	-	-
Sparus aurata	Gilt-Head Bream	1	-	-
Ciliata mustela	5-Bearded Rockling	-	4	-
Limanda limanda	Dab	-	-	1

Plate 2: Juvenile Gilt-head bream caught in Broad Lough Estuary, September 2008

DISCUSSION

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.

The EPA have assigned the Broad Lough Estuary an interim draft classification of "Moderate" status, i.e. must be improved to "Good" status by 2015, based on general physico-chemical elements, phytoplankton and macroalgal growths (ERBD, 2008).

A new WFD fish classification tool, Transitional Fish Classification Index or TFCI, has been developed for the island of Ireland (Ecoregion 1) using 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 Broad Lough Estuary has been classed as "Good" (EQR = 0.70) (i.e. must prevent deterioration from "Good" status) using the fish classification tool.

A final overall classification will be assigned to the estuary in December 2009 after the RBD consultation and review period has been completed.

REFERENCES

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