Lee (Cork) Estuary

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 Lee Estuary, as part of the programme of monitoring for the Water Framework Directive (WFD), between the 16th and the 21st of October 2008 by staff from the Central Fisheries Board (CFB) and the South Western Regional Fisheries Board (SWRFB).

The Lee Estuary is located in the city of Cork and divides the city in two separating the south from the north side. The Lee Estuary is separated into the upper (Fig. 1) and lower (Fig. 2) estuaries for WFD sampling and reporting purposes. The Upper Lee Estuary covers an area of 0.25 km²; the waterbody begins at the weir in Lee Fields and extends downstream to the Albert Street Bridges (N-27) (Fig. 1). The larger Lower Lee Estuary covers an area of 0.89 km²' the waterbody begins at the Albert Street Bridges (N-27) and extends downstream approximately 4.2 kilometres to the Glashaboy River. The vast majority of riverbank, shoreline and channel in these waterbodies has been modified and manipulated over time to allow for urban development (channelisation of the river, building of retaining walls, dredging, construction of piers and platform structures) (Plate 1).

The River Lee is the main river entering the estuary and primarily drains small farms and moorlands. The river rises in the mountainous region near Gougane Barra in west Cork and flows 90 kilometres due east and through the city of Cork. Two hydroelectric dams were erected on the river Lee in 1956 which interfered with the passage of salmon. Extensive areas of estuarine habitat have been reclaimed since 1950s for industrial, port-related and road projects, and further reclamation remains a threat. Water quality is variable in Cork Harbour as it is adjacent to a major urban centre and a major industrial centre, with the estuary of the River Lee being somewhat eutrophic (NPWS, 2004).

Plate 1: Seine netting on the Lower Lee Estuary, October 2008

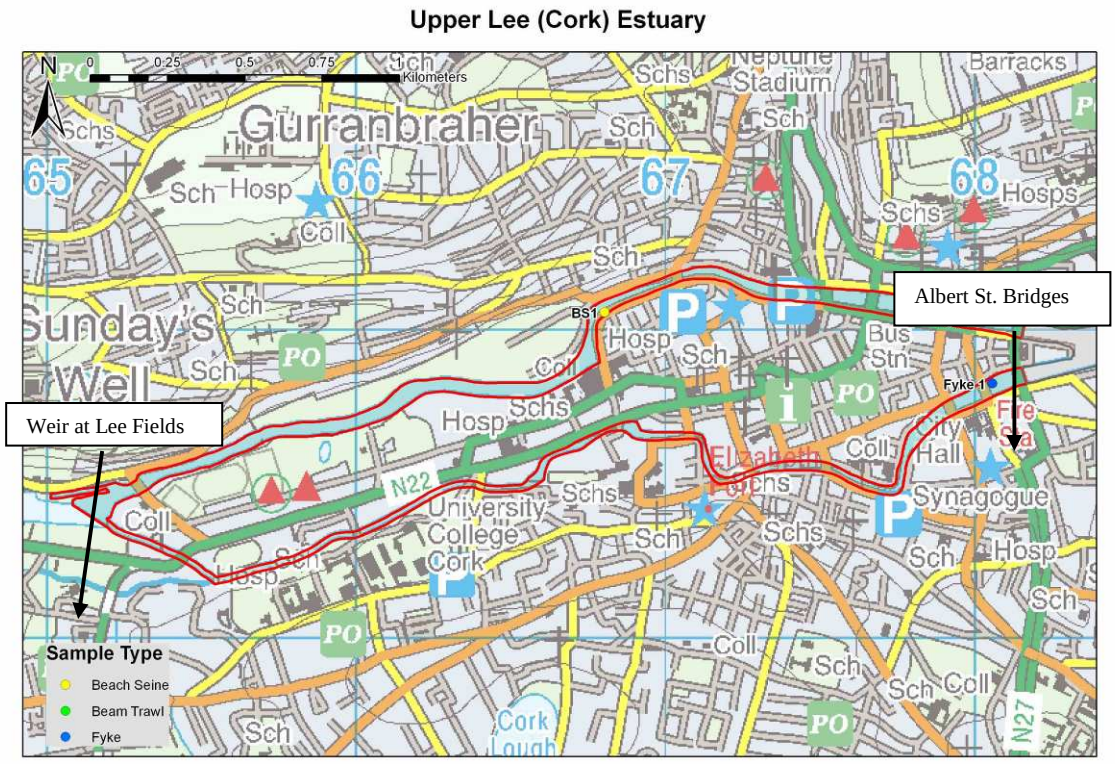

Fig. 1: Location map of the Upper Lee Estuary indicating sampling sites, October 2008

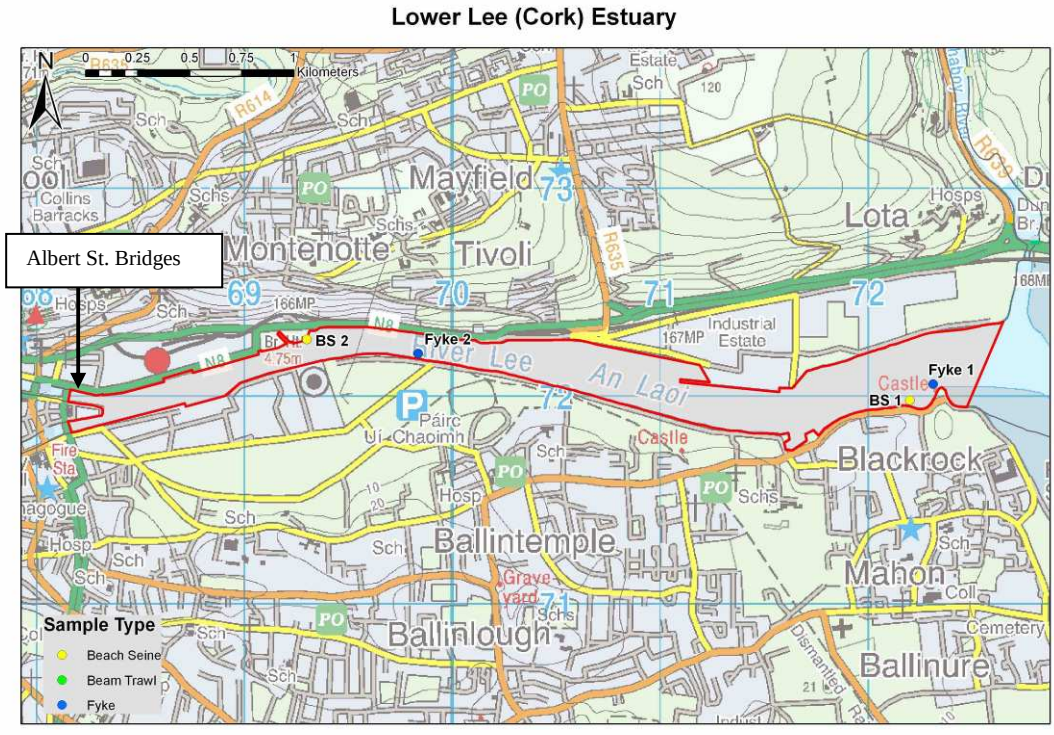

Fig. 2: Location map of the Lower Lee Estuary indicating sampling sites, October 2008

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. Two sampling methods were used during the Lee Estuary survey (i.e. beach seines and fyke nets); however, beach seining was unsuccessful due to a lack of sloped shores. Beam trawling was not attempted due to the presence of soft sediments and boat traffic. Portable GPS instruments were used to mark the precise location of each sampling site (Figs. 1 and 2).

RESULTS

A total of three fish species were captured in the Upper Lee Estuary. A single beach seine site was selected for sampling in the upper estuary due to a lack of suitable sites. The upper estuary is completely walled and a single sloped area was sampled during low tide, however the swift current collapsed the net and no fish were captured. Two fykes were set in the upper estuary with eel (9) being the most numerous species (Table 1).

A total of seven fish species were recorded in the Lower Lee Estuary. Only two beach seine sites were selected for sampling in the lower estuary due to a lack of suitable sites. Common goby (145) and flounder (3) were present in both seine hauls. Two fykes were set in the lower estuary with whiting (4), pollack (3) and five-bearded rockling (3) being the most abundant species (Table 1).

Salinity values taken at beach seine sites ranged from 4.85ppt to 7.10ppt in the Lower Lee Estuary and were 0.2ppt in the Upper Lee Estuary.

Table 1: List of fish species and abundances of each species by net type in the Upper and Lower Lee Estuary, September 2008

Scientific name	Common Name	Upper Lee		Lower Lee	
		Beach seine (1)	Fyke net (2)	Beach seine (2)	Fyke net (2)
Chelon labrosus	Thick Lipped Grey Mullet	-	-	1	-
Platichthys flesus	Flounder	-	3	3	1
Pomatoschistus microps	Common Goby	-	-	145	-
Anguilla anguilla	Eel	-	9	-	-
Ciliata mustela	5-Bearded Rockling	-	-	-	3
Merlangus merlangus	Whiting	-	4	-	4
Pollachius pollachius	Pollock	-	-	-	3
Liza aurata	Golden-Grey Mullet	-	-	1	-

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 Lee estuary (upper and lower) 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 (SWRBD 2008). Measures to address the causes of point and diffuse sources of pollution in the Lee have been identified in the draft SWRBD River Basin Management Plan as well as a plan to removed unused ports structures from the estuary.

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). Both the Upper and Lower Lee Estuaries have been classed as "Poor" (EQR=0.275 and 0.35 respectively) status using the fish classification tool.

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

REFERENCES

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