

Blackwater (Munster) 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 Blackwater (Munster) Estuary, as part of the programme of monitoring for the Water Framework Directive (WFD), between the 6th and 9th of October 2008 by staff from the Central Fisheries Board (CFB) and the Southern Regional Fisheries Board (SRFB).

The Blackwater (Munster) Estuary is located in counties Cork and Waterford. The estuary is separated into two waterbodies, the upper and lower estuaries, for WFD sampling and reporting purposes. The Upper Blackwater waterbody (Fig. 1) covers an area of 0.70 km² and the Lower Blackwater waterbody (Fig. 2) covers an area of 12.07 km². The predominant bed type in the Upper Blackwater Estuary is gravel with muddy bank slopes while the Lower Blackwater Estuary is mostly mud with some areas of gravel and stones intermixed below the main road bridge (N25). The estuary receives the waters of the River Blackwater which drains a major part of Co. Cork and five mountain ranges. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour.

The Blackwater Estuary appears to be relatively pristine. Much of the estuary was historically under the ownership of English landlords. The banks are lined with mature native woodlands and dotted with estate homes and castles (Plate 1). The only urban influences are from the town of Cappoquin in the upper estuary and the town of Youghal in the lower estuary. The River Blackwater is renowned for its salmon fishing and the fishing rights in the estuary are owned by the Duke of Devonshire.

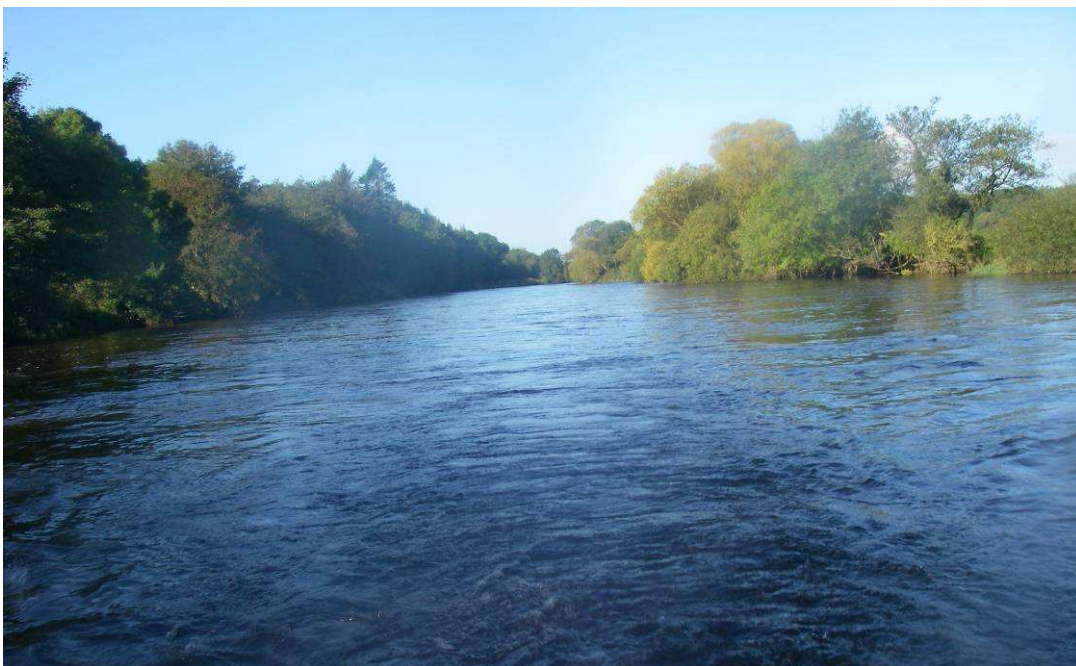


Plate 1: The Upper Blackwater Estuary

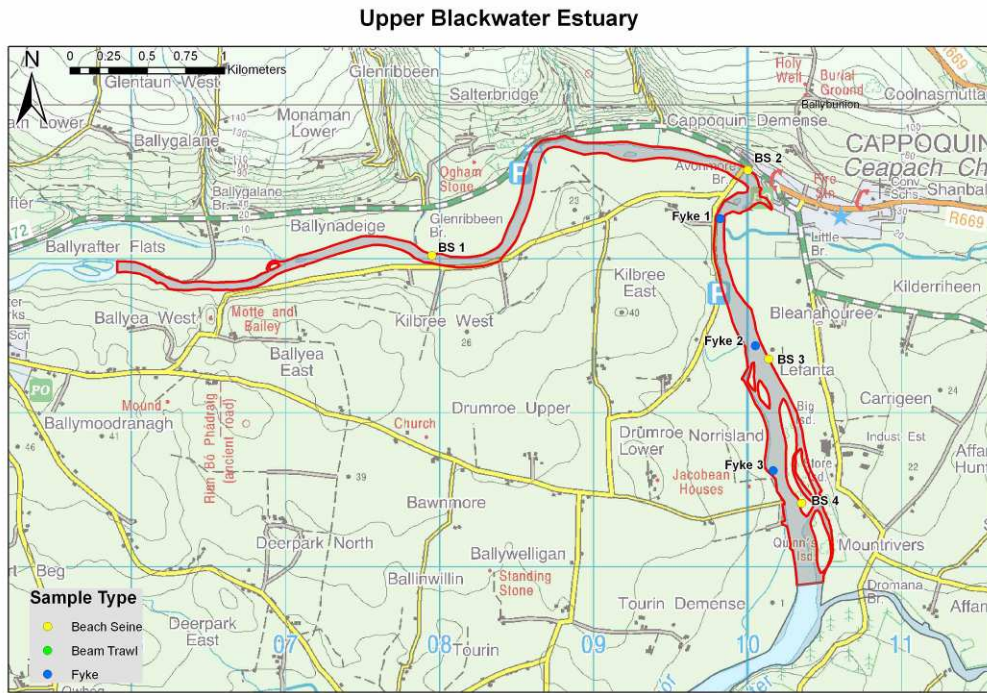


Fig. 1: Location map of the Upper Blackwater waterbody indicating sampling sites, October 2008

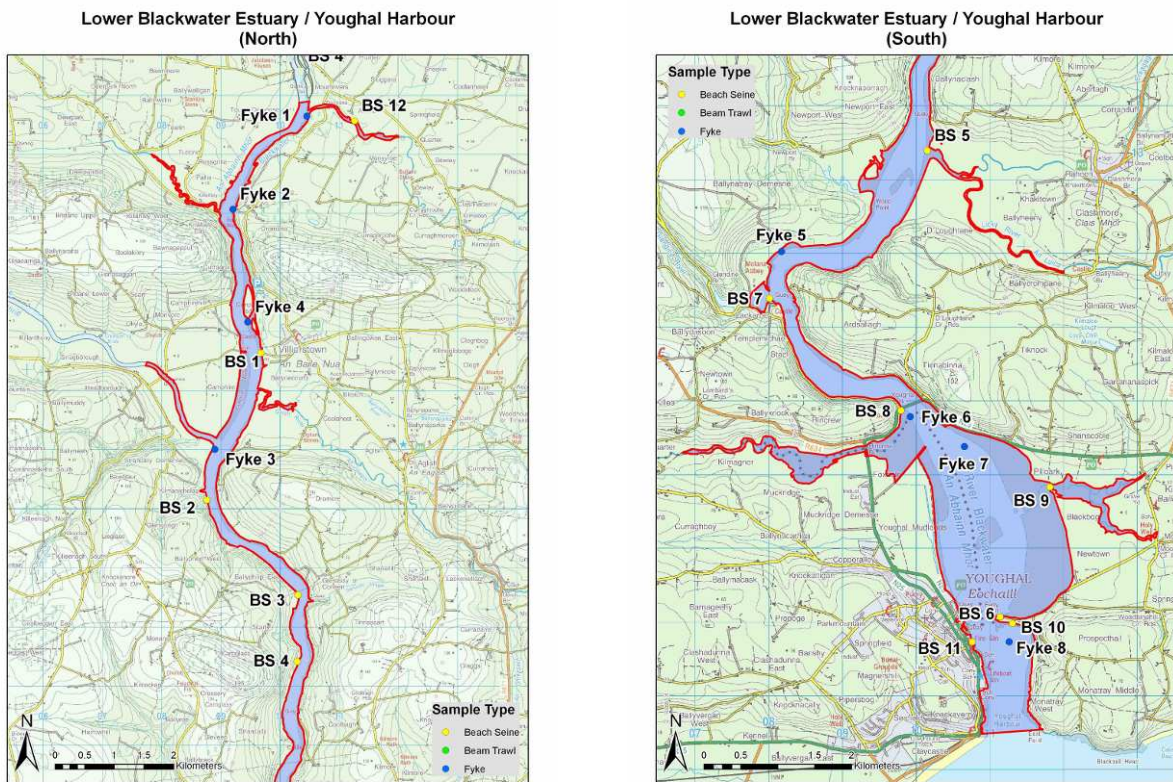


Fig. 2: Map of the Lower Blackwater waterbody indicating sampling sites, October 2008

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 Blackwater Estuary survey (i.e. beach seines and fyke nets). Beach seine and fyke net sites were chosen that encompassed the majority of geographical and, where possible, habitat ranges of the estuary. Portable GPS instruments were used to mark the precise location of each sampling site (Figs. 1 and 2).

RESULTS

Sixteen fish species were captured at a total of twelve beach seine sites in the Lower Blackwater waterbody. The most commonly occurring species were common goby (11 sites) and flounder (8sites). The most abundant species were also common goby (1,096) followed by sprat (748), flounder (115) and smelt (43) (Table 1).

Twelve fish species were captured at a total of eight fyke net sites. The most common species identified were eel and flounder which were captured in all sites. The most abundant species was flounder (304) followed by dace (39), eel (39) and 5-bearded rockling (35) (Table 1). Dace, sea trout and brown trout were associated with the sites higher in the estuary which had more of a freshwater character while whiting and 5-bearded rockling were found in the lower reaches that have more of a marine influence.

Overall a total of 23 fish species and sea trout were captured in the Lower Blackwater waterbody. The most common species captured using both methods were flounder (Table 1). The estuary provides important feeding habitat to flounder and several age classes were present (Fig. 3). Two notable fish were captured during the survey, dace and smelt. Dace are an invasive species in Ireland and were first recorded in the River Blackwater in 1889 (Caffrey *et. al.* 2007). Forty three smelt (*Osmerus eperlanus*) were captured which is important as they are a listed species in the Irish Red Data Book. In addition, one golden-grey mullet was captured (Plate 2). Salinity values taken at beach seine sites ranged from 0.00ppt to 23.95ppt in the Lower Blackwater waterbody.

Eight fish species were captured at beach seine sites (four) in the Upper Blackwater waterbody. Three-spined stickleback (16) and flounder (11) were the most common and abundant species captured (3 sites) (Table 1).

Five fish species were captured at four fyke net sites in the Upper Blackwater Estuary. The most common and abundant species were eel (28) and flounder (28) which were captured in all sites.

Freshwater fish dominated most of the catches which is not surprising as salinity was 0.00ppt at all beach seine sites.

Overall in the Upper Blackwater Estuary a total of nine fish species and sea trout were captured. The most commonly recorded and abundant species was flounder. Dace were present also in the Upper Blackwater.

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

Scientific name	Common Name	Lower Blackwater		Upper Blackwater	
		Beach seine (12)	Fyke net (8)	Beach seine (4)	Fyke net (3)
<i>Chelon labrosus</i>	Thick Lipped Grey Mullet	32	5	-	-
<i>Platichthys flesus</i>	Flounder	115	304	11	28
<i>Dicentrarchus labrax</i>	Sea Bass	5	-	-	-
<i>Sprattus sprattus</i>	Sprat	748	-	-	-
<i>Pomatoschistus microps</i>	Common Goby	1,096	1	2	-
<i>Pleuronectes platessa</i>	Plaice	7	-	-	-
<i>Ammodytes tobianus</i>	Lesser Sandeel	2	-	-	-
<i>Anguilla anguilla</i>	Eel	-	39	1	28
<i>Ciliata mustela</i>	5-Bearded Rockling	-	35	-	-
<i>Limanda limanda</i>	Dab	1	-	-	-
<i>Salmo trutta</i>	Brown Trout	1	6	-	1
<i>Salmo trutta</i>	Sea Trout*	-	4	-	2
<i>Salmo salar</i>	Salmon	1	-	1	-
<i>Gasterosteus aculeatus</i>	3-Spined Stickleback	4	-	16	-
<i>Merlangus merlangus</i>	Whiting	-	5	-	-
<i>Rutilus rutilus</i>	Roach	-	2	-	-
<i>Gadus morhua</i>	Cod	-	1	-	-
<i>Pollachius pollachius</i>	Pollock	-	7	-	-
<i>Phoxinus phoxinus</i>	Minnnow	-	-	1	-
<i>Gobiusculus flavescens</i>	2-Spotted Goby	7	-	-	-
<i>Syngnathus acus</i>	Greater Pipefish	1	-	-	-
<i>Osmerus eperlanus</i>	Smelt	43	-	-	-
<i>Leuciscus leuciscus</i>	Dace	9	39	1	1
<i>Liza aurata</i>	Golden-Grey Mullet	1	-	-	-
<i>Pollachius virens</i>	Saithe (Coalfish)	-	1	-	-
<i>Gobio gobio</i>	Gudgeon	-	-	1	-

*sea trout are included as a separate "variety" of trout



Plate 2: Golden-grey mullet captured in the Lower Blackwater Estuary, October 2008

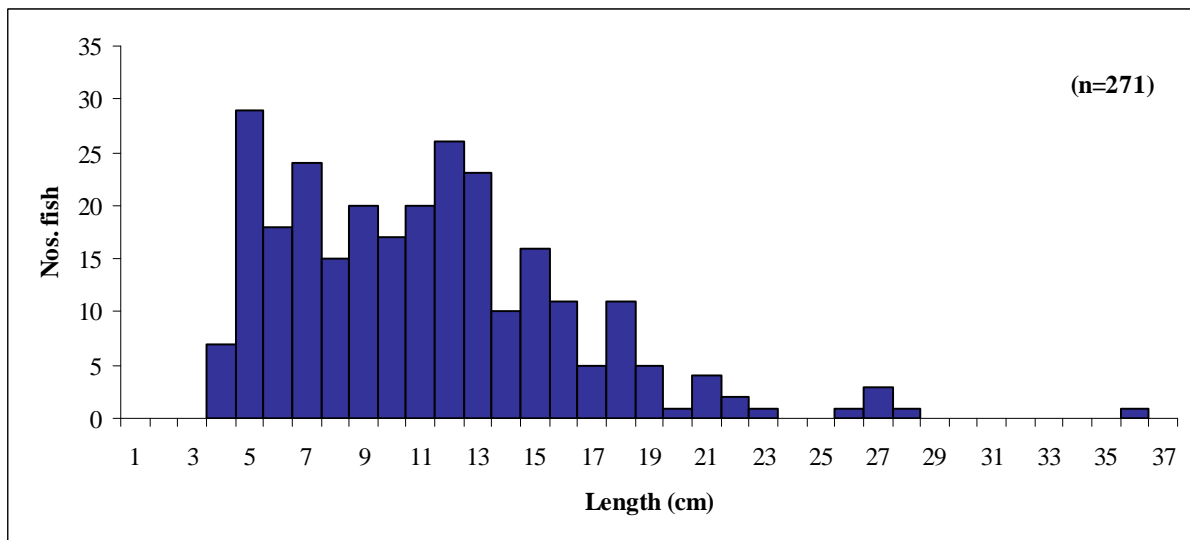


Fig. 3: Length frequency distribution of flounder, Lower Blackwater Estuary October 2008

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 Upper and Lower Blackwater 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 (SWRBD 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). Both the Upper (EQR=0.725) and Lower Blackwater Estuaries (EQR=0.725) have been classed as “Good” (i.e. must prevent deterioration from “Good” status) using the fish classification tool.

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

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**The Central Fisheries Board
Swords Business Campus,
Swords,
Co. Dublin,
Ireland.**

**Web: www.wfdfish.ie
www.cfb.ie
Email: info@cfb.ie
Tel: +353 1 8842600
Fax: +353 1 8360060**



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