

Maigue Estuary



Sampling Fish for the Water Framework Directive - Transitional Waters 2008



The Central and Regional
Fisheries Boards

ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help and co-operation of the CEO Mr. Eamon Cusack, the assistant CEO Mr. Sean Ryan and the staff of the Shannon Regional Fisheries Board. The authors would also like to gratefully acknowledge the help and cooperation from all their colleagues in the Central Fisheries Board and especially Dr. Jimmy King for his guidance with the transitional waters surveys. Staff from the CFBs Large Patrol Vessel, An Cosantóir Brádan, provided support during the Maigue Estuary surveys and their help is gratefully acknowledged.

We would also like to thank Dr. Martin O' Grady (CFB) and No. 3 Operational Wing, Irish Air Corps (Aer Chór na hÉireann) for the aerial photographs.

The authors would also like to acknowledge the funding provided for the project from the Department of Communications Energy and Natural Resources for 2008.

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INTRODUCTION

A fish stock survey was carried out at sites on the Maigue Estuary, as part of the programme of monitoring for the Water Framework Directive (WFD), between the 3rd and the 4th of November 2008 by staff from the Central Fisheries Board (CFB) and the Shannon Regional Fisheries Board (ShRFB). Staff from the CFBs large protection vessel, An Cosantóir Bradán provided support during the survey.

The Maigue Estuary is located just north of Adare village, approximately ten kilometres west of Limerick city. The estuary begins in Adare and continues downstream for approximately 20 kilometres to where it meets the Upper Shannon Estuary (Fig. 1) and estuary covers an area of 3.21km². It is a very long and narrow estuary with steep muddy banks for most of its length. The banks and shores are lined with heavy tree cover in the upper reaches and tall stands of *Phragmites* reed in the middle to lower reaches (Plate 1). The estuary is less than 100 metres wide for most of its length but widens in the last two kilometres to become approximately two kilometres wide at the mouth. Large exposed mud flats can be seen at the mouth of the estuary during low tide.

The estuary receives the waters from the River Maigue which drains a large area of prime agricultural land known as the Golden Vale. The river suffers from agricultural run-off and was once a prime trout and salmon river until the 1970's when it was drained by the Office of Public Works as part of their arterial drainage scheme. The Maigue catchment has very high nutrient export rates, as it drains intensively cultivated agricultural land, and contributes significantly to the nutrient budget of the Shannon Estuary and to phosphorous inputs in particular (Marine Institute, 1999).



Plate 1: Maigue estuary; (A) tree lined upper estuary and (B) reed covered banks of the mid to lower estuary, October 2008

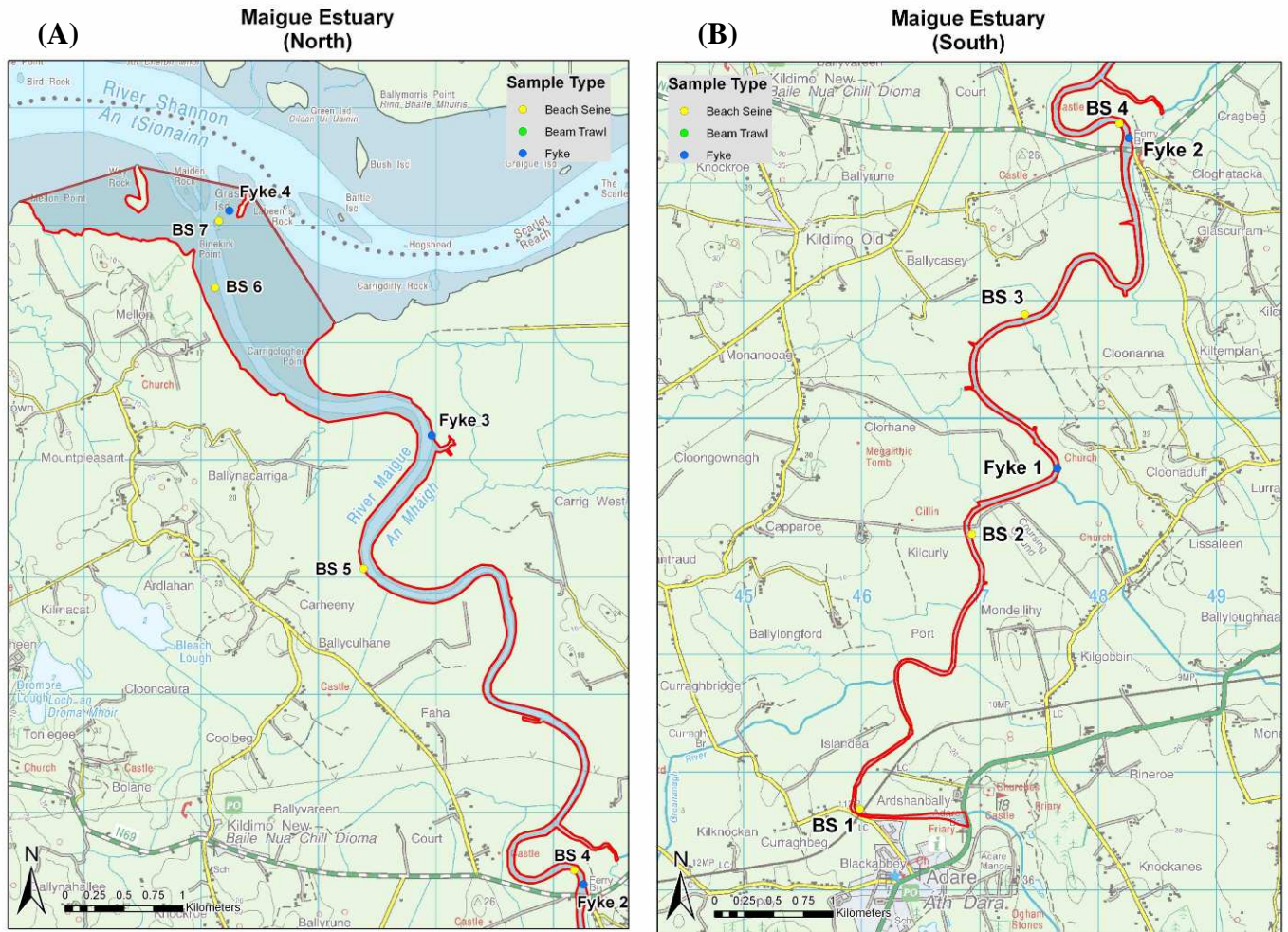


Fig. 1: Location maps of the (A) lower and (B) upper Maigue Estuary indicating sampling sites, November 2008

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 Maigue Estuary survey (i.e. beach seines and fyke nets). Beam trawling was not attempted due to the soft mud substrate present throughout most of the estuary. Portable GPS instruments were used to mark the precise location of each sampling site (Fig. 1).

A total of seven beach seine sites and four fyke net sites were selected encompassing the majority of geographical and, where possible, habitat ranges of the estuary. The steep muddy banks combined with vegetated bank slopes made sampling difficult.

RESULTS

A total of 11 fish species were captured using the beach seine. Three-spined stickleback was the most commonly encountered fish species recorded in the seine nets. The most abundant fish species captured using the beach seine was common goby (230) followed by flounder (83) and sprat (73) (Table 1).

Five fish species were recorded in the fyke nets. Flounder, brown trout and dace were the most abundant fish species and were captured in three of the four sites while flounder was the most abundant species with 43 specimens captured (Table 1).

A total of thirteen fish species were captured using both sampling techniques. Smelt, dace and flounder were captured utilizing both techniques. Dace are an invasive species in Ireland and were first recorded in the River Maigue in 1990 (Caffrey *et. al.* 2007) (Plate 2). A number of smelt (*Osmerus eperlanus*) were also captured which is important as they are a listed species in the Irish Red Data Book. Another notable species that was captured were several river lamprey that are listed in Annex II of the EU Habitats Directive.

Salinity values taken at beach seine sites ranged from 0.20ppt in the upper channel to 1.90ppt in the lower estuary.

Table 1: List of fish species and abundances of each species by net type in the Maigue Estuary, October - November 2008

Scientific name	Common Name	Maigue	
		Beach seine (7)	Fyke net (4)
<i>Chelon labrosus</i>	Thick Lipped Grey Mullet	86	43
<i>Dicentrarchus labrax</i>	Sea Bass	2	-
<i>Sprattus sprattus</i>	Sprat	73	-
<i>Pomatoschistus microps</i>	Common Goby	230	-
<i>Anguilla anguilla</i>	Eel	1	-
<i>Salmo trutta</i>	Brown Trout	-	9
<i>Gasterosteus aculeatus</i>	3-Spined Stickleback	35	-
<i>Perca fluviatilis</i>	Perch	1	-
<i>Lampetra fluviatilis</i>	River Lamprey	-	3
<i>Phoxinus phoxinus</i>	Minnnow	15	-
<i>Osmerus eperlanus</i>	Smelt	6	2
<i>Syngnathus acus</i>	Greater Pipefish	1	-
<i>Leuciscus leuciscus</i>	Dace	5	5



Plate 2: Juvenile dace (*Leuciscus leuciscus*) captured on the Maigue Estuary, October-November, 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.

Eutrophication has been identified in the Maigue estuary (ShIRBD 2008). The EPA have assigned the Maigue 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 (ShIRBD 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 Maigue Estuary has been assigned a draft classification of “Moderate” status (EQR=0.55) using the fish classification tool which agrees with the classification assigned to the estuary by the EPA (ShIRBD 2008).

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

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