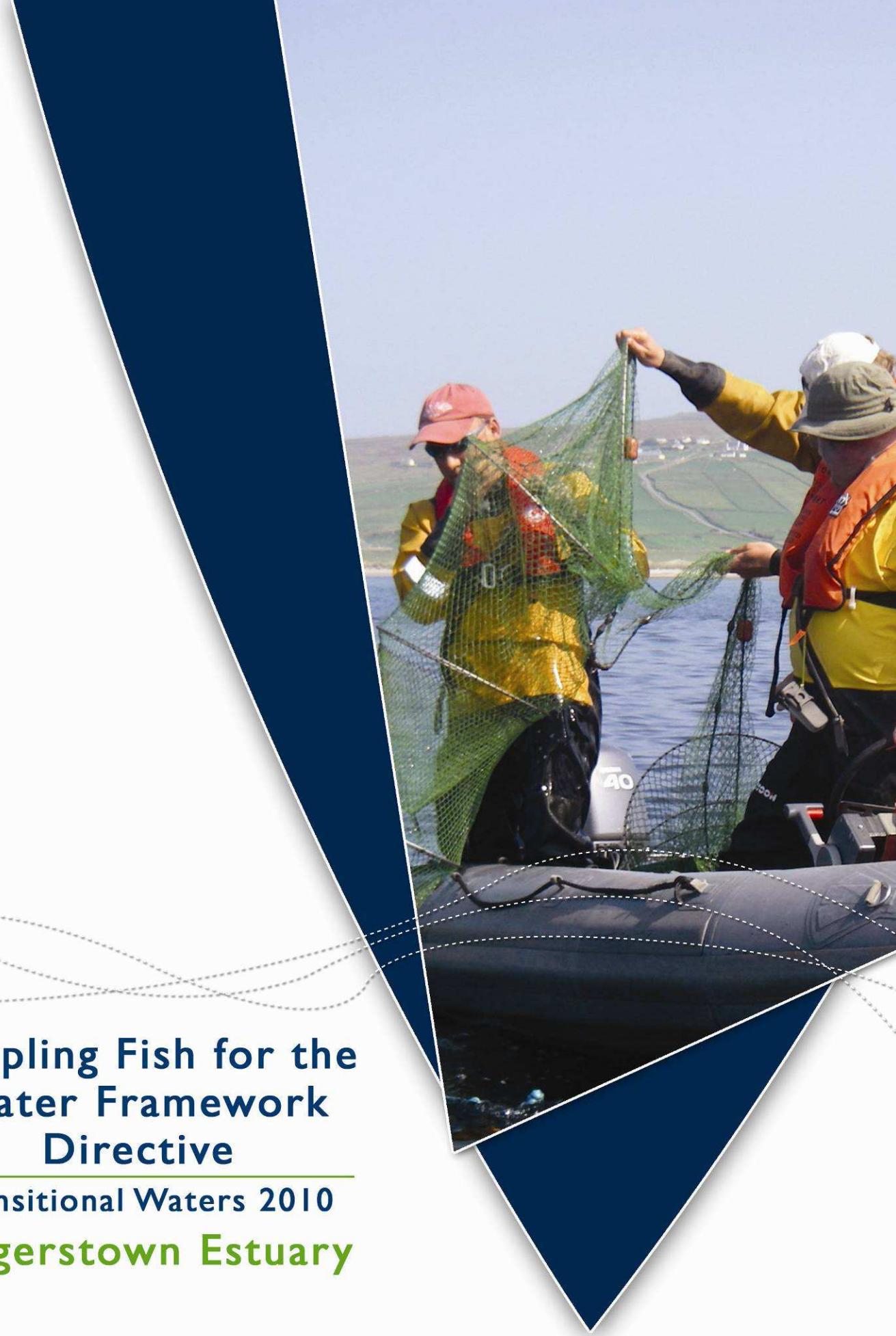

Sampling Fish for the Water Framework Directive

Transitional Waters 2010

Rogerstown Estuary

Iascach Intíre Éireann
Inland Fisheries Ireland

ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help and co-operation of the Director Mr. William Walsh and staff from IFI, Blackrock as well as various other offices throughout the region. The authors also gratefully acknowledge the help and cooperation of their colleagues in IFI, Swords.

We would like to thank the landowners and angling clubs that granted us access to their land and respective fisheries.

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

PROJECT STAFF

Project Director/Senior Research officer:	Dr. Fiona Kelly
Project Manager:	Dr. Andrew Harrison
Research Officer:	Dr. Ronan Matson
Research Officer:	Ms. Lynda Connor
Technician:	Ms. Roisín O'Callaghan
Technician	Mr. Rory Feeney
Technician:	Ms. Emma Morrissey
Technician:	Mrs. Ciara Wögerbauer
GIS Officer:	Mr. Kieran Rocks
Fisheries Assistant:	Ms. Gráinne Hanna (Oct 2010 – Dec 2010)
Fisheries Assistant:	Mr. Kevin Gallagher (Oct 2010 – Dec 2010)

The authors would also like to acknowledge the funding provided for the project from the Department of Communications Energy and Natural Resources for 2010.

1. INTRODUCTION

A fish stock survey was conducted on Rogerstown Estuary in the Eastern River Basin District (ERBD) as part of the programme of fish monitoring for the Water Framework Directive (WFD), between the 11th and the 12th of October 2010 by staff from Inland Fisheries Ireland.

Rogerstown Estuary covers an area of 3.05 km² and is located on Ireland's east coast, approximately 25km north of Dublin City (Fig.1.1, Plate 1.1). The estuary receives water from the Ballyboghil and Ballough Rivers, both of which flow through intensive agricultural catchments (NPWS, 2003). A causeway and bridge (Fig. 1.1), built during the 1840s for the Dublin-Belfast railway line, divides the estuary in two (NPWS, 2003).

This water body lies within Rogerstown Estuary SAC, which is important for several habitats listed in Annex I of the EU Habitats Directive, including salt marsh and intertidal flats. The site is also important for a number of plant and bird species (NPWS, 2000).

Rogerstown Estuary was previously surveyed by Inland Fisheries Ireland (formerly the Central and Regional Fisheries Boards) in September 2008 (Kelly *et al*., 2009).

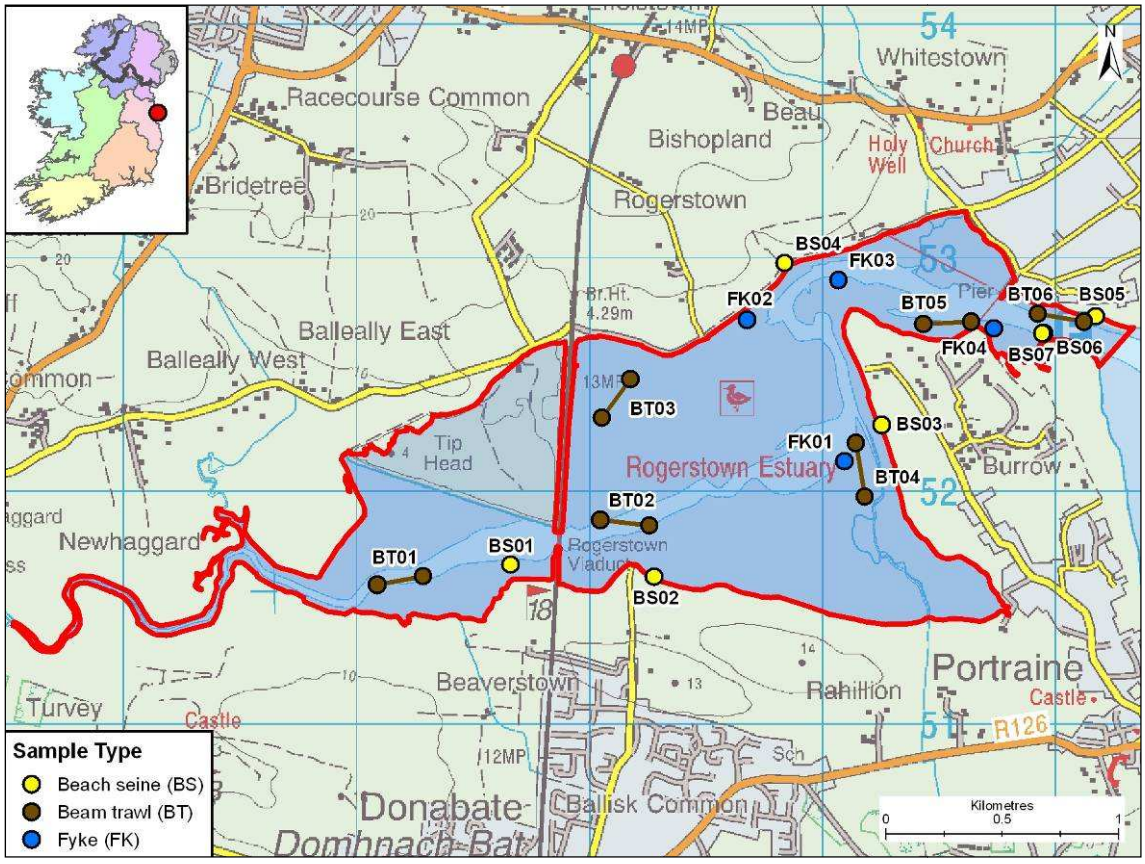

Fig. 1.1. Location map of Rogerstown Estuary indicating sample sites, October 2010

Plate 1.1. Aerial photo of Rogerstown Estuary showing the towns of Donabate (on left) and Rush (on right). (Photo courtesy of IFI and No. 3 Operational Wing, Irish Air Corps [Aer Chór na hÉireann])

2. METHODS

Current work in the Republic of Ireland and United Kingdom 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 IFI 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 (Plate 2.1). 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 seven beach seines, four fyke nets and six beam trawls were deployed in Rogerstown Estuary in October 2010.

Plate 2.1. Seine netting on Rogerstown Estuary, October 2010

3. RESULTS

A total of 18 fish species were recorded in Rogerstown Estuary in October 2010 (Table 3.1). Sand goby was the most abundant species, followed by lesser sand eel and thick-lipped grey mullet. Eels, listed as critically endangered in the Irish Red Data Book (King *et al.*, 2011) were also present. A slightly higher number of fish species were recorded in Rogerstown Estuary in 2010, than in the previous survey in 2008, however, no beam trawl nets were deployed in the latter survey.

Thick-lipped grey mullet ranged in length from 2.0cm to 53.8cm in length, and the length frequency distribution of a sub-sample of the population captured indicates that both juveniles and adults fish were present in the sample (Fig. 3.1).

Flounder were the only species captured using all three netting methods. Flounder ranged in length from 6.6cm to 21.7cm. Their length frequency distribution shown in Figure 3.2 indicates the presence of at least two to three different age classes in the sample.

Salinity values taken at beach seine and beam trawl sites ranged from 13.7ppt to 16.6ppt.

Table 3.1. Number of each species captured by each gear type in Rogerstown Estuary, October 2010

Scientific name	Common name	Beach seine (7)	Fyke net (4)	Beam trawl (6)	Total
Pomatoschistus minutus	Sand goby	923	-	27	950
Ammodytes tobianus	Lesser sandeel	87	-	-	87
Chelon labrosus	Thick-lipped grey mullet	39	1	-	40
Platichthys flesus	Flounder	15	7	9	31
Ciliata mustela	Five-bearded rockling	-	25	-	25
Sprattus sprattus	Sprat	15	-	-	15
Pleuronectes platessa	Plaice	-	-	14	14
Atherina presbyter	Sand smelt	12	-	-	12
Crenilabrus melops	Corkwing wrasse	3	-	-	3
Anguilla anguilla	European eel	-	2	-	2
Gadus morhua	Cod	-	2	-	2
Spinachia spinachia	Fifteen-spined stickleback	2	-	-	2
Merlangius merlangus	Whiting	-	1	-	1
Myoxocephalus scorpius	Short-spined sea scorpion	-	1	-	1
Pholis gunnellus	Gunnel (Butterfish)	1	-	-	1
Pollachius pollachius	Pollack	-	1	-	1
Scophthalmus rhombus	Brill	1	-	-	1
Taurulus bubalis	Long-spined sea scorpion	-	1	-	1

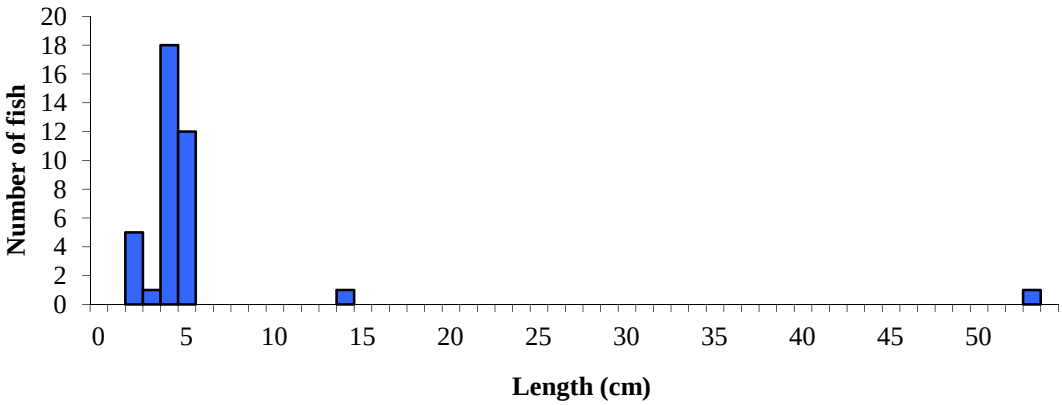

Fig. 3.1. Length frequency distribution of a sub-sample of thick-lipped grey mullet in Rogerstown Estuary, October 2010 (n=38)

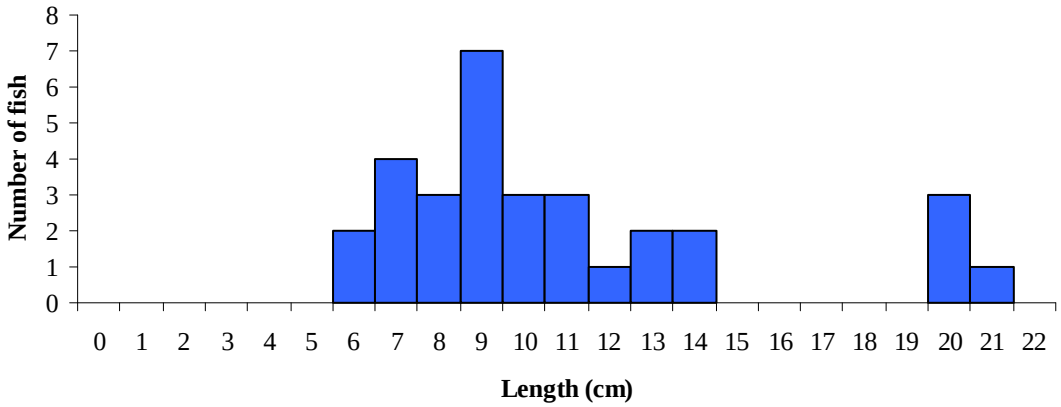

Fig. 3.2. Length frequency distribution of a sub-sample of flounder in Rogerstown Estuary, October 2010 (n=21)

4. SUMMARY

A total of 18 fish species were recorded in Rogerstown Estuary, which is similar to other transitional water bodies along the east coast surveyed during 2010. The relatively small rivers draining into this water body have only short tidal sections before opening out into the estuary. The variety of marine species present and levels of salinity recorded suggest that there is good connectivity to the sea, with a higher marine, than freshwater influence in both sections. Species richness and distribution for selected species among all transitional water bodies surveyed can be seen in the 2010 WFD summary report (Kelly *et al*., 2011).

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 IFI and Northern Ireland Environment Agency (NIEA) 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, Rogerstown Estuary has been assigned a draft ecological status classification of "Good" based on the fish populations present. This shows no change from 2008, when this water body was also assigned good status (Kelly *et al*., 2009).

The EPA have assigned Rogerstown Estuary an interim draft classification of "Moderate status", based on general physico-chemical elements, phytoplankton, fish and macroalgal growths.

5. REFERENCES

Coates, S., Waugh A., Anwar A. & Robson M. 2007. Efficacy of a multi-metric fish index as an analysis tool for the transitional fish component of the Water Framework Directive. *Marine Pollution Bulletin*, **55**, 225-240.

Harrison, T.D. and Whitfield, A.K. (2004) A multi-metric index to assess the environmental condition of estuaries. *Journal of Fish Biology*, **65**, 683-710

Kelly, F., Harrison, A., Connor, L., Matson, R., Morrissey, E., Feeney, R., Wogerbauer, C., O'Callaghan, R. and Rocks, K. (2011) *Sampling Fish for the Water Framework Directive – Summary Report 2010*. Inland Fisheries Ireland.

Kelly, F., Harrison, A., Connor, L., Wightman, G., Matson, R., Morrissey, E., O'Callaghan, R., Feeney, R., Hanna, G., Lordan, M. and Rocks, K. (2009) *Sampling Fish for the Water Framework Directive – Transitional Waters 2008 - Rogerstown Estuary*. Central and Regional Fisheries Board.

King, J.J., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., Fitzpatrick, Ú., Gargan, P.G., Kelly, F.L., O' Grady, M.F., Poole, R., Roche, W.K. and Cassidy, D. (2011) *Ireland Red List No. 5: Amphibians, Reptiles and Freshwater Fish*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2000) Rogerstown Estuary SAC. *Site synopsis, site code: 000208.* Available at: http://www.npws.ie/media/npwsie/content/images/protectedsites/sitesynopsis/SY000208.pdf

NPWS (2003) *Rogerstown Estuary SPA. Site synopsis, site code: 004015*. Available at: http://www.npws.ie/media/npwsie/content/images/protectedsites/sitesynopsis/SY004015.pdf

Inland Fisheries Ireland
Swords Business Campus,
Swords,
Co. Dublin,
Ireland.

Web: www.fisheriesireland.ie
Email: info@fisheriesireland.ie
Tel: +353 1 8842 600
Fax: +353 1 8360 060