IFI/2013/1-4119

Sampling Fish for the Water Framework Directive

Transitional Waters 2012

North Western International River Basin District

Iascach Intíre Éireann
Inland Fisheries Ireland

Iascach Intíre Éireann
Inland Fisheries Ireland

Water Framework Directive Fish Stock Survey of Transitional Waters in the North Western International River Basin District – Erne Estuary

Fiona L. Kelly, Lynda Connor, Ronan Matson, Emma Morrissey, Ciara Wogerbauer, Rory Feeney, and Kieran Rocks

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

CITATION: Kelly, F.L., Connor, L., Matson, R., Morrissey, E., Wogerbauer, C., Feeney, R. and Rocks, K. (2013) Water Framework Directive Fish Stock Survey of Transitional Waters in the North Western International River Basin District – Erne Estuary. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

Cover photo: Lynda beam trawling © Inland Fisheries Ireland

© Inland Fisheries Ireland 2013

ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help and co-operation of the regional director Dr. Milton Matthews and staff from IFI Ballyshannon as well as various other offices throughout the region. The authors also gratefully acknowledge the help and cooperation of colleagues in IFI Swords.

The landowners and angling clubs that granted access to their land and respective fisheries are also gratefully acknowledged.

PROJECT STAFF

Project Director/Senior Research officer:	Dr. Fiona Kelly
Project Manager:	Ms. Lynda Connor
Research Officer:	Dr. Ronan Matson
Technician:	Dr. Ciara Wögerbauer
Technician	Mr. Rory Feeney
Technician:	Ms. Emma Morrissey
GIS Officer:	Mr. Kieran Rocks

The authors would also like to acknowledge the funding provided for the project from the Department of Communications Energy and Natural Resources for 2012.

The report includes Ordnance Survey Ireland data reproduced under OSI Copyright Permit No. MP 007508.
Unauthorised reproduction infringes Ordnance Survey Ireland and Government of Ireland copyright.
© Ordnance Survey Ireland, 2012

1. INTRODUCTION

A fish stock survey was conducted on the Erne Estuary in the North Western International River Basin District (NWIRBD) as part of the programme of fish monitoring for the Water Framework Directive (WFD), between the 8th and the 12th of October 2012. This estuary was previously surveyed in 2009. The survey was carried out jointly by Inland Fisheries Ireland and the Northern Ireland Environment Agency (NIEA) with the objective of developing harmonised sampling protocols for fish in transitional waters for the island of Ireland.

The Erne Estuary covers an area of 2.57 km² and is located on Ireland's north-west coast, adjacent to the town of Ballyshannon, Co. Donegal (Fig. 1.1). It extends for approximately 4km westwards from Ballyshannon (downstream of Cathleen's Falls Dam) to Tullan Strand, with large portions draining on a low tide to expose sandy beaches. It receives waters from the River Erne and the Abbey River.

This waterbody lies within the Donegal Bay SPA which is important for the protection of a large number of birds that inhabit its wetlands (NPWS, 2010).

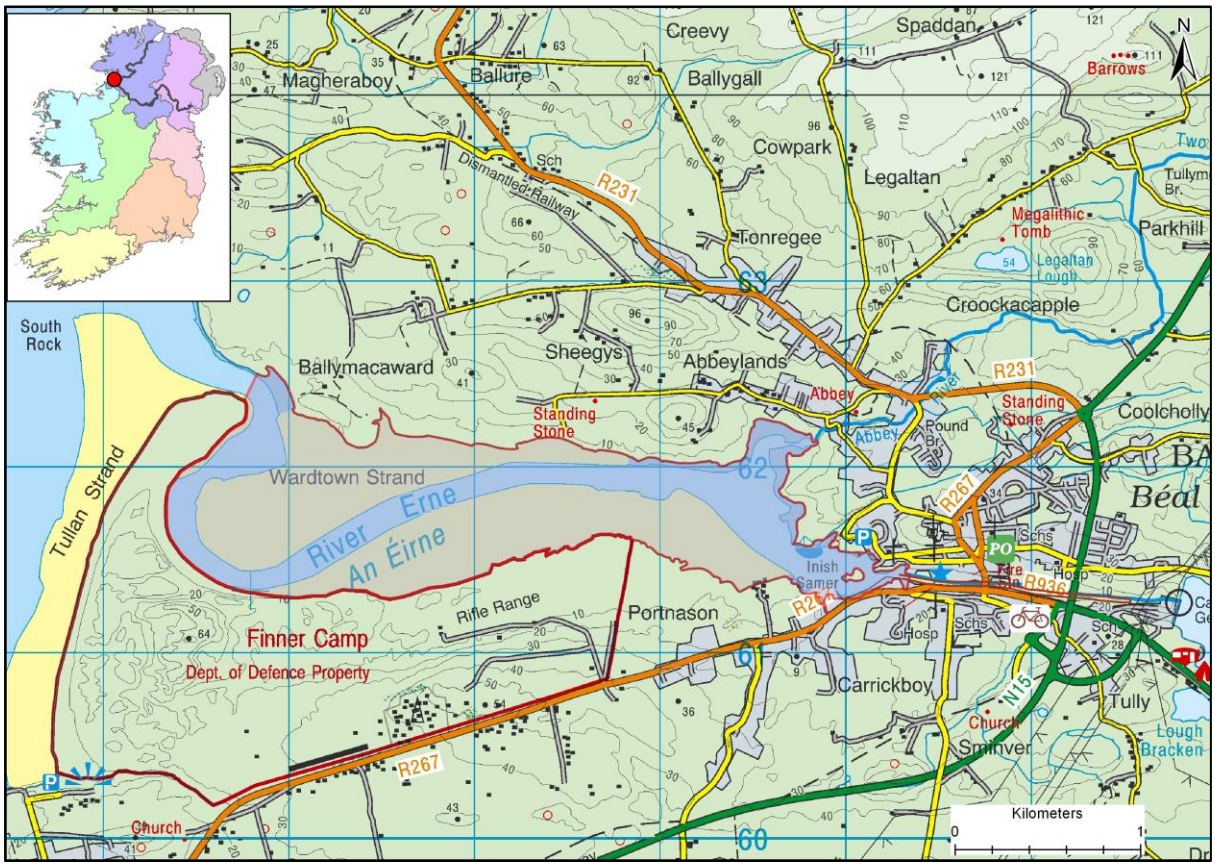

Fig. 1.1. Location map of the Erne Estuary, Co. Donegal, October 2012

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. The bottom of the net has a weighted lead line to increase sediment disturbance and catch efficiency (Plate 2.1). 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 (Plate 2.2). 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 100m 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, 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 11 beach seines, six beam trawls and six fyke nets were deployed in the Erne Estuary in October 2012 (Fig. 2.1).

Plate 2.1. Beach seining on the Erne Estuary

Plate 2.2. Retrieving a beam trawl net in the Erne Estuary

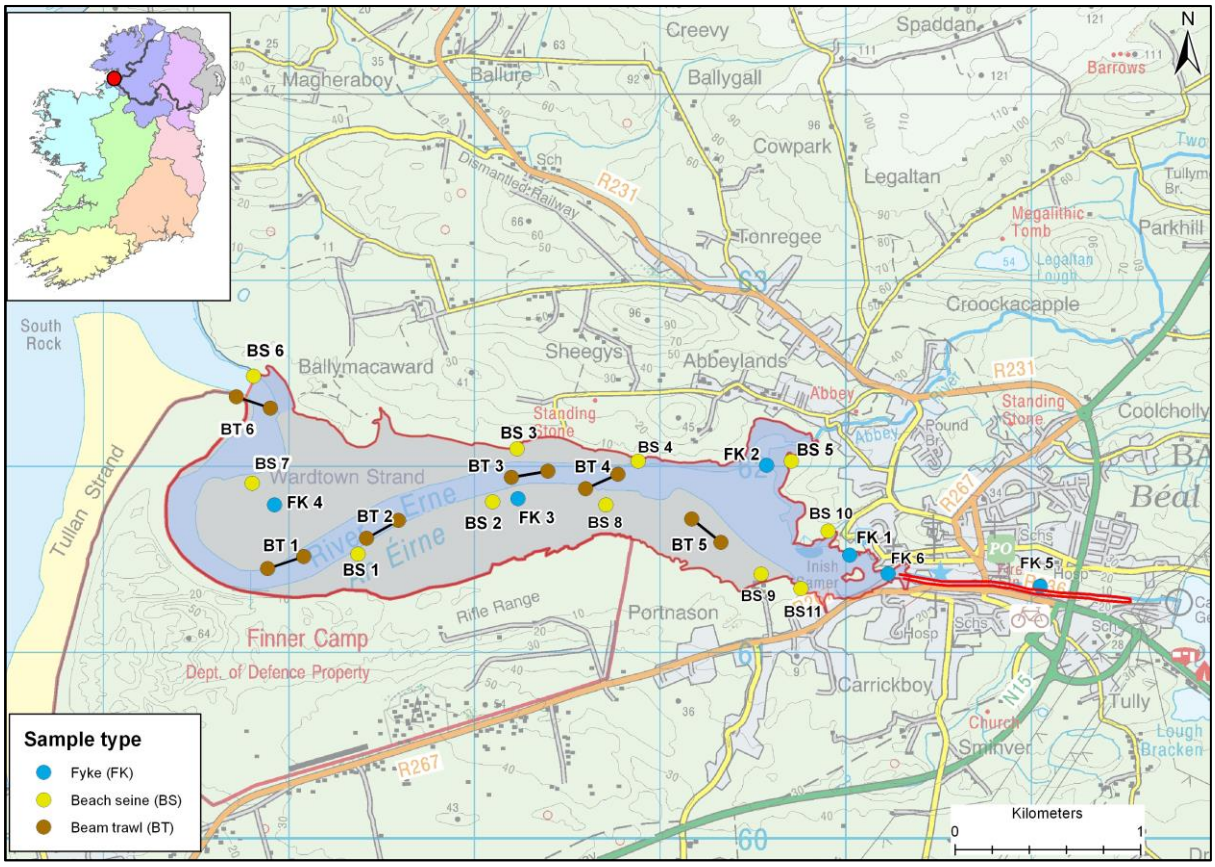

Fig. 2.1. Location map of the Erne Estuary, indicating sample sites, October 2012

3. RESULTS

Ten fish species were recorded in the Erne Estuary during October 2012 (Table 3.1). Sand goby was the most abundant species, followed by flounder and thick-lipped grey mullet. Flounder was the only species captured using all three netting methods, while sand gobies were recorded in both beach seines and beam trawls. All other species were recorded using only one method each, indicating the effectiveness of each method's ability to target different species.

Flounder captured during the 2012 survey ranged in length from 4.6cm to 42.5cm (mean = 10cm) (Fig. 3.1). Flounder captured during the 2009 survey ranged in length from 5.5cm to 27.2cm (mean = 12.8cm) (Fig 3.1).

Salinity values taken at beach seine sites ranged from 0.05ppt to 2.4ppt.

Table 3.1. Number of each species captured by each gear type in the Erne Estuary, October 2012

Scientific name	Common name	Beach seine (9)	Fyke net (5)	Beam trawl (6)	Total
Pomatoschistus minutus	Sand goby	151	-	257	408
Platichthys flesus	Flounder	5	32	31	68
Chelon labrosus	Thick-lipped grey mullet	15	-	-	15
Ammodytes tobianus	Lesser sandeel	12	-	-	12
Ciliata mustela	Five-bearded rockling	-	8	-	8
Gasterosteus aculeatus	Three-spined stickleback	6	-	-	6
Psetta maxima	Turbot	-	-	2	2
Perca fluviatilis	Perch	1	-	-	1
Agonus cataphractus	Pogge	-	-	1	1
Pollachius pollachius	Pollack	-	1	-	1

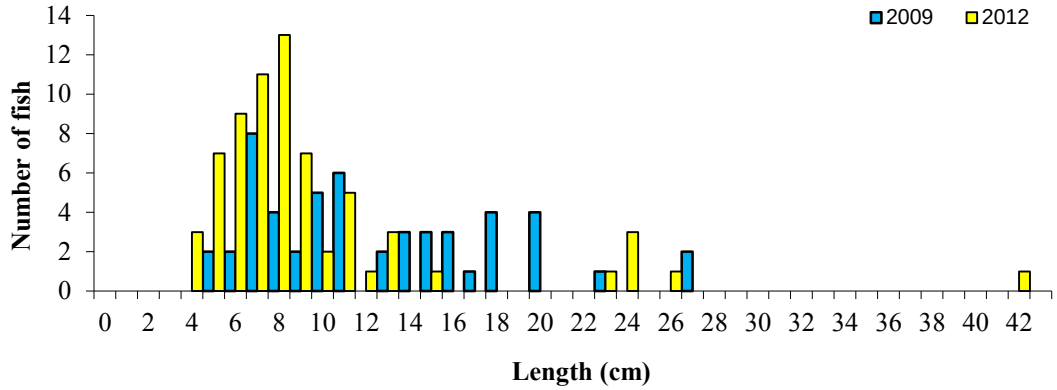

Fig. 3.1. Length frequency distribution of flounder in the Erne Estuary, September 2009 (n=52) and October 2012 (n=68)

4. SUMMARY

A total of ten fish species were recorded in the Erne Estuary during the 2012 survey. This is relatively low when compared with other estuaries of this type surveyed throughout the country over the past few years. The high ratio of saltwater to freshwater species indicates the stronger influence of saltwater than freshwater on this system. In the previous survey in 2009, 16 species were recorded, with only seven species common to both years, five-bearded rockling, flounder, lesser sandeel, perch, pogge, pollack, sand goby, thick-lipped grey mullet and three-spined stickleback. Species richness and distribution of selected fish species among all transitional water bodies surveyed during 2012 can be seen in the 2012 WFD summary report (Kelly *et al*., 2013).

An essential step in the WFD monitoring process is the classification of the ecological 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 has been successfully intercalibrated in a Europe-wide exercise; however it is undergoing further development to account for differences in typologies, 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, the Erne Estuary has been assigned a draft ecological status classification of "Moderate" based on the fish populations present. In 2009, this waterbody was classed as 'Good'.

In the 2007 to 2009 surveillance monitoring reporting period, the EPA assigned the Erne Estuary an overall ecological status of 'Moderate' based on all monitored physico-chemical and biological elements. This status classification will be revised at the end of 2012.

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., Connor, L., Matson, R., Feeney, R., Morrissey, E., Wogerbauer, C. and Rocks, K. (2013) *Sampling Fish for the Water Framework Directive – Summary Report 2012*. Inland Fisheries Ireland.

NPWS (2010) *Donegal Bay SPA. Site Synopsis, site code: 004151.* Available at: http://www.npws.ie/media/npwsie/content/images/protectedsites/sitesynopsis/SY004151.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