



# Sampling Fish for the Water Framework Directive

Transitional Waters 2010

**Tolka Estuary**



Iascach Intíre Éireann  
Inland Fisheries Ireland

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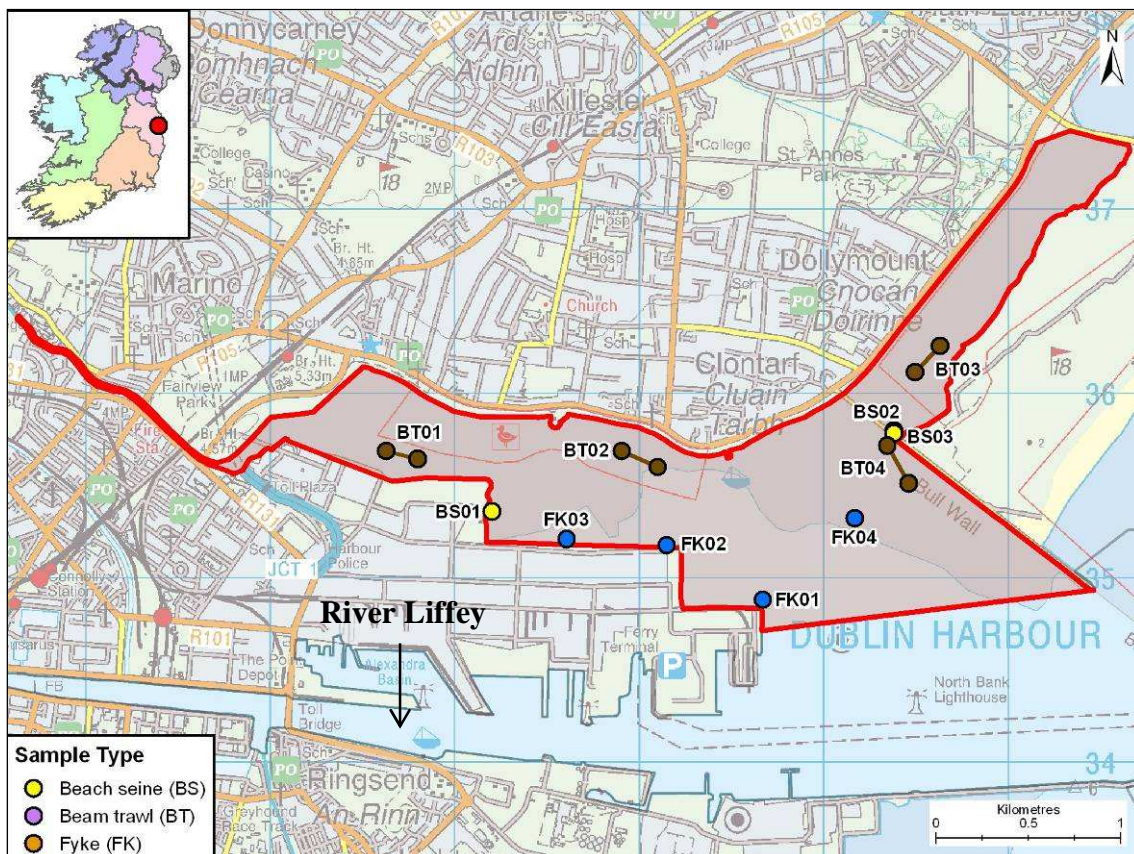
## 1. INTRODUCTION

A fish stock survey was conducted on the Tolka Estuary in the Eastern River Basin District (ERBD) as part of the programme of fish monitoring for the Water Framework Directive (WFD), between the 12<sup>th</sup> and the 15<sup>th</sup> of October 2010 by staff from Inland Fisheries Ireland.

The Tolka Estuary covers an area of 3.58km<sup>2</sup> and is located close to Dublin's City Centre, adjacent to the Lower Liffey Estuary (Fig. 1.1, Plate 1.1). This is a relatively shallow water body, with the vast majority of its banks, shoreline and channel modified and manipulated over time, to allow for urban development.

This water body is located within the South Dublin Bay and River Tolka Estuary SPA, which is an important area for its diversity of wild birds (NPWS, 2008).

The 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 the Tolka Estuary indicating sample sites, October 2010**



**Plate 1.1. Aerial photo of the Tolka Estuary. (Photo courtesy of IFI and No. 3 Operational Wing, Irish Air Corps [Aer Chór na hÉireann])**

## **2. METHODS**

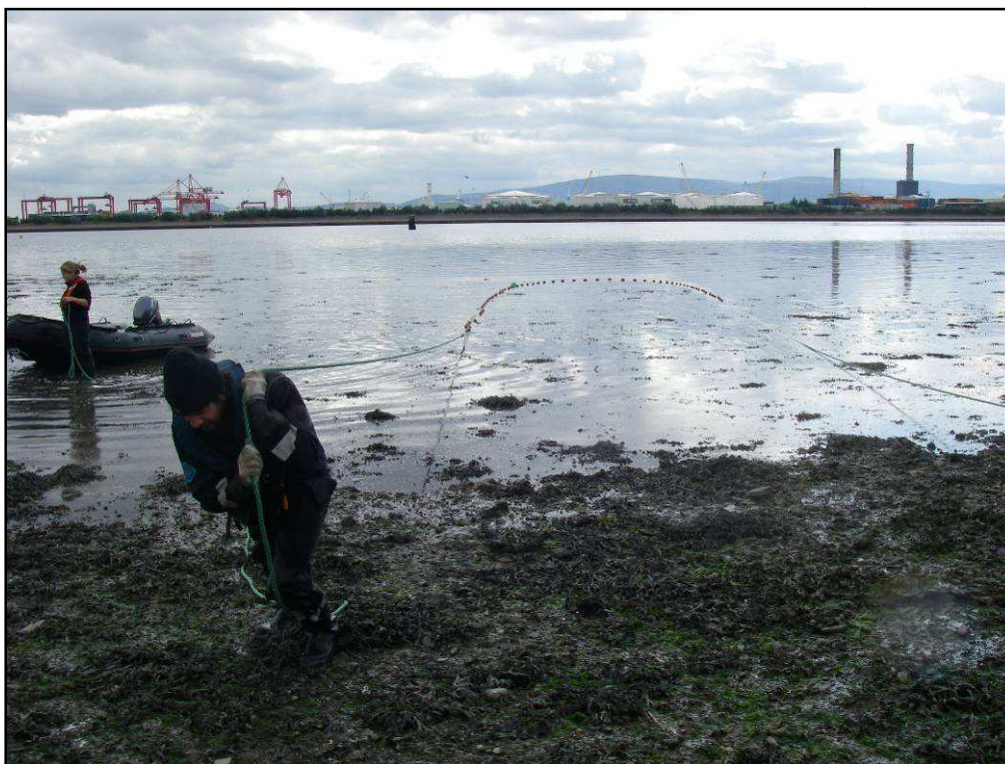
Current work in the Republic of Ireland and United Kingdom indicates the need for a multi-method (beach seine, fyke net and beam trawl) approach to sampling fish in estuaries and these procedures are now the standard IFI methodology for fish stock surveys in transitional waters for the WFD monitoring 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 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 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 three beach seines, four fyke nets and four beam trawls were deployed in the Tolka Estuary in October 2010.



**Plate 2.1. Beach seining on the Tolka Estuary**

### **3. RESULTS**

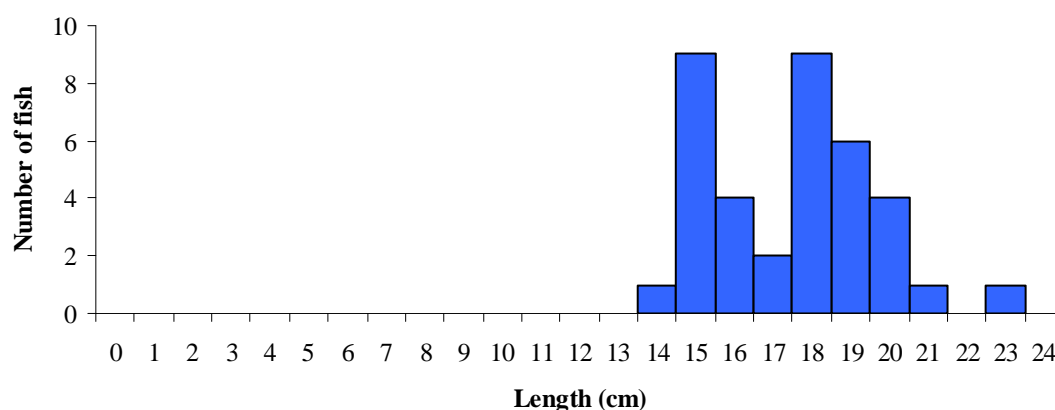
A total of 15 fish species were recorded in the Tolka Estuary in October 2010 (Table 3.1). Thick-lipped grey mullet was the most abundant species, followed by cod and sand goby. Eels were the only Red Data Book listed (King *et al.*, 2011) species encountered during this survey. Flounder were the only species caught using all three netting types. A slightly higher species diversity was recorded in 2010 than in the previous survey in 2008 (Kelly *et al.*, 2009), although on that occasion, no beam trawl nets were deployed.

Cod ranged in length from 14.6cm to 23.7cm (Figure 3.1). Thick-lipped grey mullet ranged in length from 2.2cm to 5.5cm, and their length frequency distribution indicates that only juveniles were recorded (Fig. 3.2).

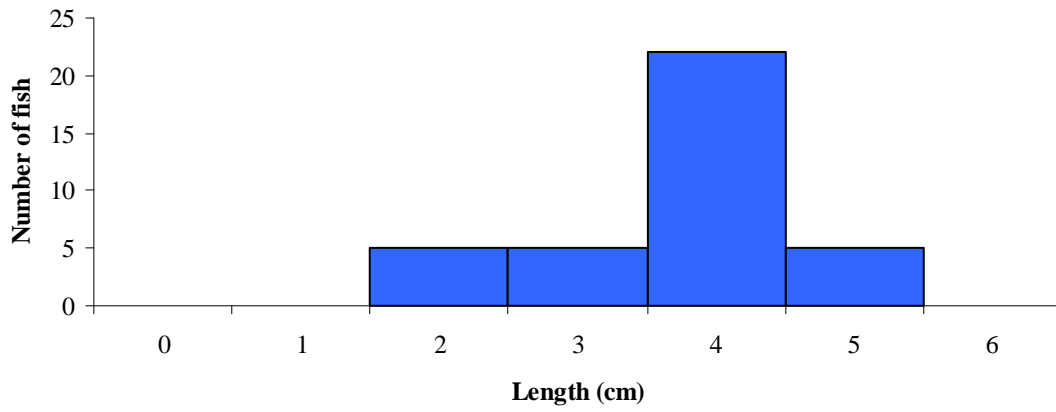
Salinity values taken at beach seine and beam trawl sites ranged from 12.2ppt to 24.4ppt.

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

Scientific name	Common name	Beach seine (3)	Fyke net (4)	Beam trawl (4)	Total fish
<i>Chelon labrosus</i>	Thick-lipped grey mullet	326	-	-	326
<i>Gadus morhua</i>	Cod	-	58	-	58
<i>Pomatoschistus minutus</i>	Sand goby	35	-	15	50
<i>Atherina presbyter</i>	Sand smelt	32	-	-	32
<i>Ciliata mustela</i>	Five-bearded rockling	-	18	-	18
<i>Platichthys flesus</i>	Flounder	1	2	4	7
<i>Sprattus sprattus</i>	Sprat	7	-	-	7
<i>Merlangius merlangus</i>	Whiting	-	5	-	5
<i>Myoxocephalus scorpius</i>	Short-spined sea scorpion	-	3	-	3
<i>Anguilla anguilla</i>	European eel	-	1	-	1
<i>Dicentrarchus labrax</i>	European seabass	-	1	-	1
<i>Pollachius pollachius</i>	Pollack	-	1	-	1
<i>Spinachia spinachia</i>	Fifteen-spined stickleback	1	-	-	1
<i>Syngnathus acus</i>	Greater pipefish	-	-	1	1
<i>Taurulus bubalis</i>	Long-spined sea scorpion	-	1	-	1



**Fig. 3.1. Length frequency distribution of a sub-sample of cod in the Tolka Estuary, October 2010 (n=37)**



**Fig. 3.3. Length frequency distribution of a sub-sample of thick-lipped grey mullet in the Tolka Estuary, October 2010 (n=37)**

#### 4. SUMMARY

A total of 15 fish species were recorded in the Tolka Estuary, which is similar to other transitional water bodies surveyed during 2010. The tidal section of the Tolka River itself, is quite short and being a relatively small river, with a large opening to the sea, is influenced more heavily by saltwater than freshwater. This is also reflected in the high salinity levels recorded during the survey. As a result, the fish fauna was composed more greatly of marine than freshwater species. 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, the Tolka Estuary has been assigned a draft ecological status classification of “Good” based on the fish populations present. This is an improvement from 2008, when this water body was assigned moderate status (Kelly *et al.*, 2009).

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

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