Slaney Estuary and North Slob Channels

Sampling Fish for the Water Framework Directive - Transitional Waters 2009

The Central and Regional Fisheries Boards

ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help and co-operation of the CEO Mr. Pat Doherty, the Assistant CEO Mr. William Walsh and the staff of the Eastern 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.

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 (CFB) and No. 3 Operational Wing, Irish Air Corps (Aer Chór na hÉireann) for the aerial photographs.

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The authors would also like to acknowledge the funding provided for the project from the Department of Communications Energy and Natural Resources for 2009.

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1. INTRODUCTION

Fish stock surveys were conducted on the Slaney Estuary and North Slob Channels as part of the programme of fish monitoring for the Water Framework Directive (WFD), between the 10th and the 17th of September 2009 by staff from the Central Fisheries Board (CFB) and the Eastern Regional Fisheries Board (ERFB) (Table 1.1, Fig. 1.1).

The Slaney is one of the largest river systems on Ireland's east coast. Its estuary starts in Enniscorthy and continues south into Wexford Harbour. For the purposes of WFD monitoring and reporting, this estuary system has been split into three separate water bodies (Table 1.1), further details of which are given in each individual results section.

Table 1.1. Transitional water bodies surveyed for the WFD fish surveillance monitoring programme, September 2009 (L=lagoon, FT=freshwater tidal, TW=transitional)

Transitional Water body	MS Code	Easting	Northing	Type	Area (km^2)
Slaney Estuary, Upper	SE_040_0300	297785	135653	FT	0.80
Slaney Estuary, Lower	SE_040_0200	303790	124978	TW	18.35
North Slob Channels	SE_040_0100	307472	124835	L	0.37

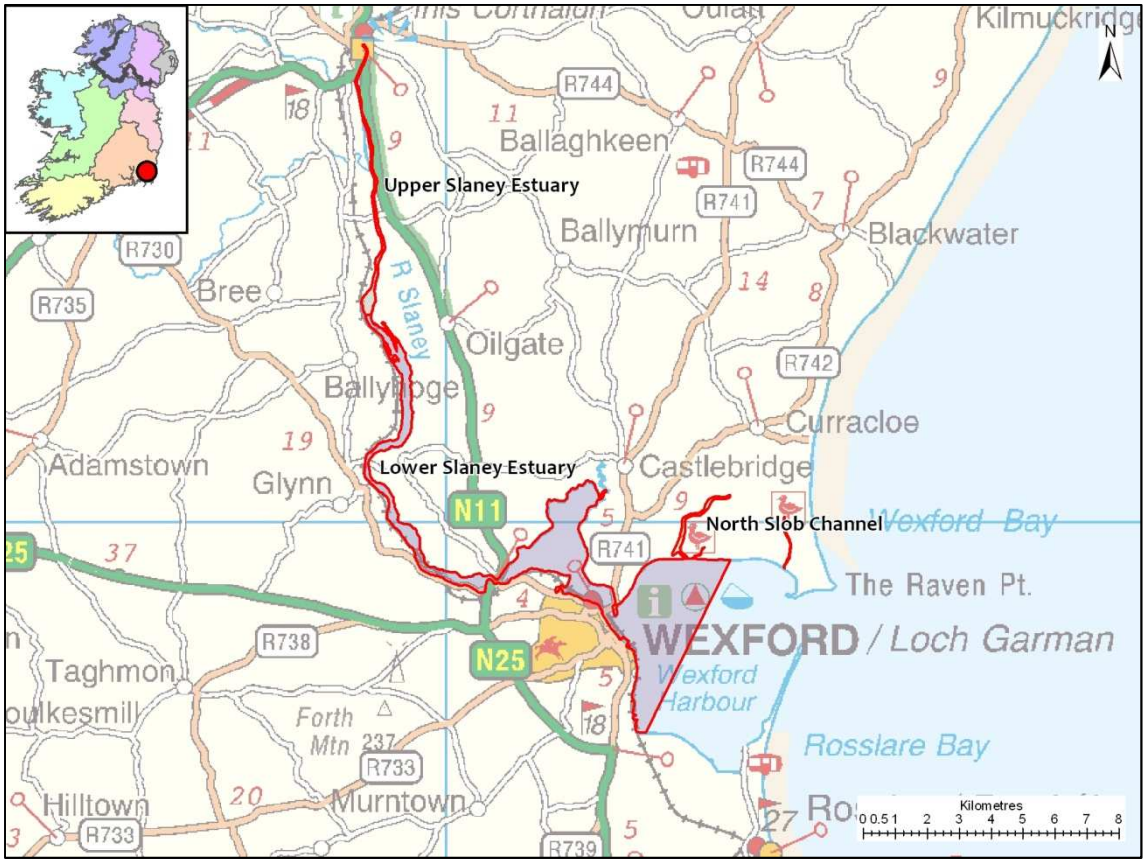

Fig. 1.1. Location map of the three transitional water bodies in the Slaney Estuary system surveyed for WFD fish monitoring, September 2009

2. METHODS

Current work in the UK and ROI 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 CFB methodology for fish stock surveys in transitional waters for the WFD monitoring program.

Beach seining (Plate 1.1) 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. 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.

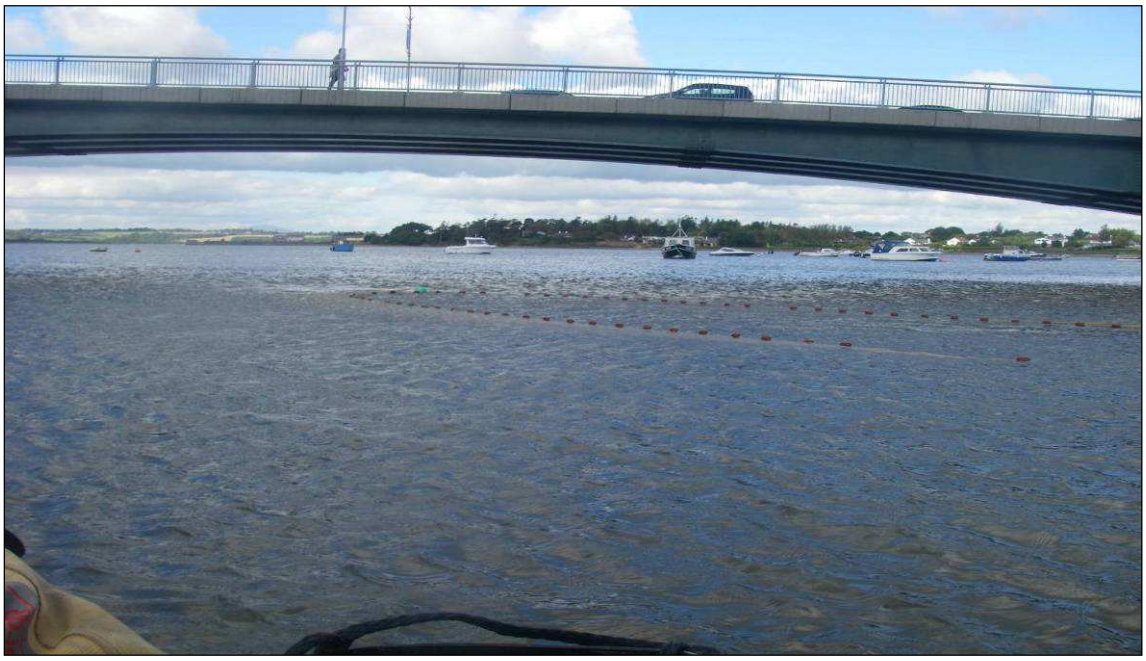

Plate 1.1. Beach seining under Wexford town bridge

3. RESULTS

3.1 The Upper Slaney Estuary

The Upper Slaney Estuary waterbody covers an area of 0.81km² (Figs. 3.1, 3.2 and Plate 3.1). It starts in Enniscorthy town and extends downstream to the southern tip of King's Island where it meets the Lower Slaney Estuary (Figs. 3.1 and 3.2). The upper estuary has a definite riverine character and is heavily influenced by the River Slaney. The bank slopes are steep and dominated by a gravel-mud substrate. Tree lined banks contribute large woody debris to the shore and make seining difficult in places.

This water body is situated within the Slaney River Valley SAC, important for its alluvial wet woodlands, which is a habitat listed in Annex I of the EU Habitats Directive. Annex II listed species present include lamprey, salmon, freshwater pearl mussel, twaite shad and otter (NPWS, 2006).

A total of three beach seines and four fyke nets were deployed in the Upper Slaney Estuary in September 2009.

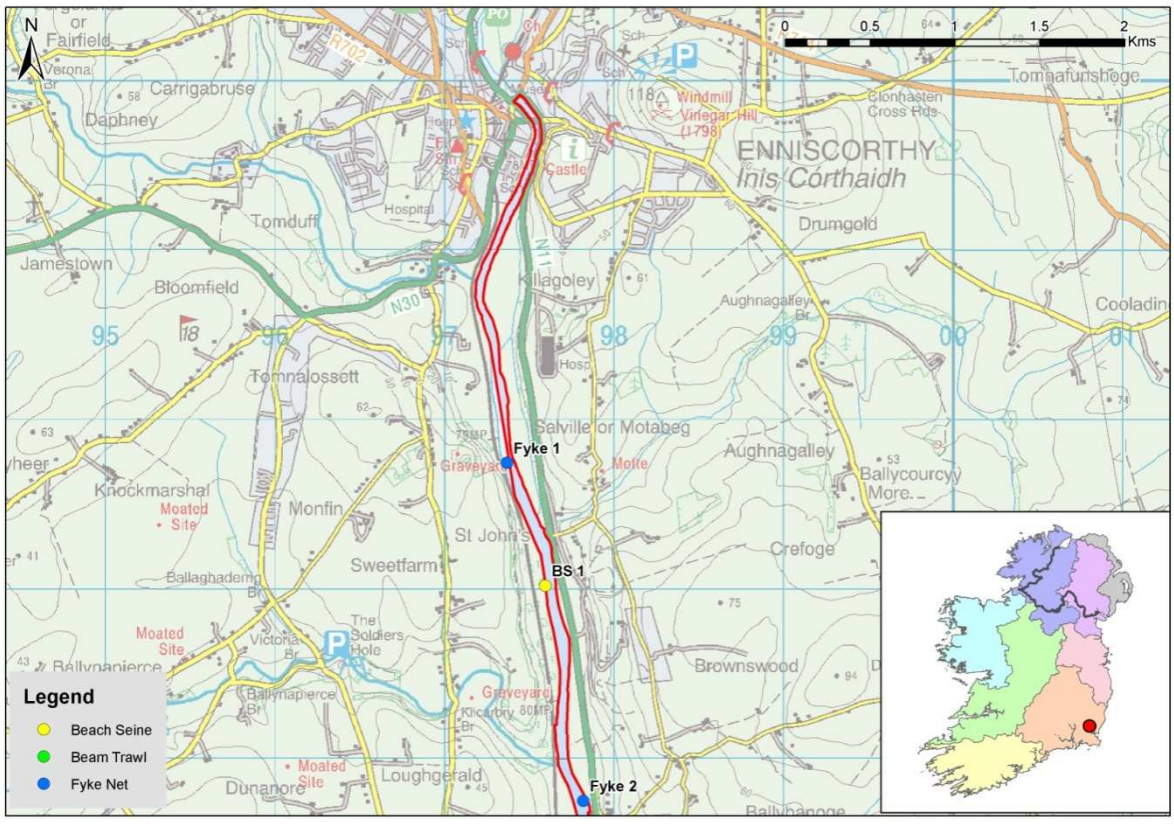

Fig 3.1. Location map of the northern section of the Upper Slaney Estuary indicating sampling sites, September 2009

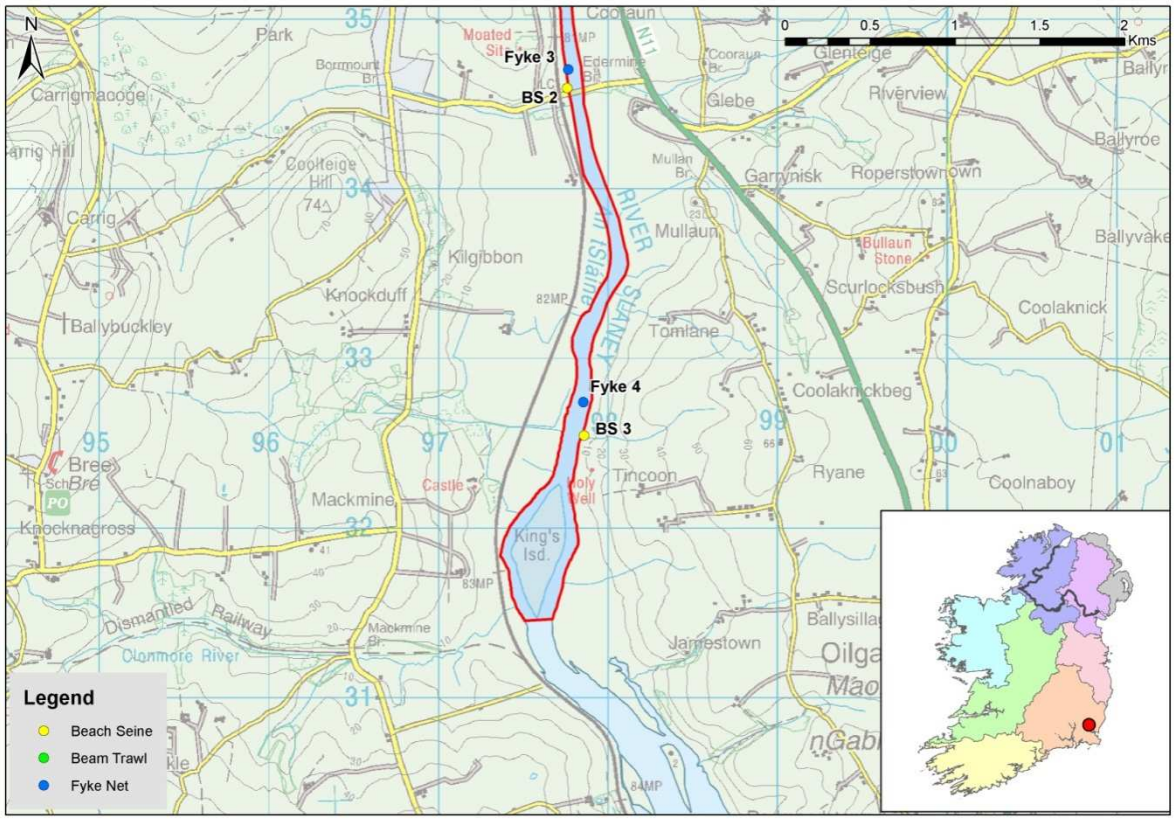

Fig 3.2. Location map of the southern section of the Upper Slaney Estuary indicating sampling sites, September 2009

Plate 3.1. Aerial photo of the Upper Slaney Estuary at Enniscorthy (Photo courtesy of CFB and No. 3 Operational Wing, Irish Air Corps [Aer Chór na hÉireann])

A total of seven fish species were recorded in the Upper Slaney Estuary in September 2009 (Table 3.1). Three-spined stickleback was the most abundant species, followed by minnow and flounder (Table 3.1). River/brook lamprey and salmon, both of which are listed on Annex II and V of the EU Habitats Directive (92/43/EEC) and also listed in the Irish Red Data List (King *et al*., 2011) were captured in the beach seines and fyke nets. Furthermore, the estuary was the only WFD transitional water body surveyed in 2009 in which river/brook lamprey were recorded. Brown trout, three-spined stickleback, eels and flounder were also present. The dominance of freshwater species recorded in the Upper Slaney Estuary, especially minnow, reflects the riverine nature of this water body.

Flounder ranged in length from 3.9cm to 19.7cm, and their length frequency distribution indicates that the sample was composed predominantly of a cohort of juvenile individuals (Fig. 3.3).

Salinity values taken at each beach seine site ranged from 0.315ppt to 0.334ppt.

Table 3.1. Number of each species captured by each gear type in the Upper Slaney Estuary, September 2009

Scientific name	Common Name	Beach seine (3)	Fyke net (4)	Beam trawl (0)	Total
Gasterosteus aculeatus	Three-spined stickleback	169	1	-	170
Phoxinus phoxinus	Minnow	150	-	-	150
Platichthys flesus	Flounder	14	42	-	56
Anguilla anguilla	Eel	1	3	-	4
Salmo trutta	Brown trout	-	2	-	2
Salmo salar	Salmon	1	1	-	2
Lampetra sp	River/Brook lamprey	1	-	-	1

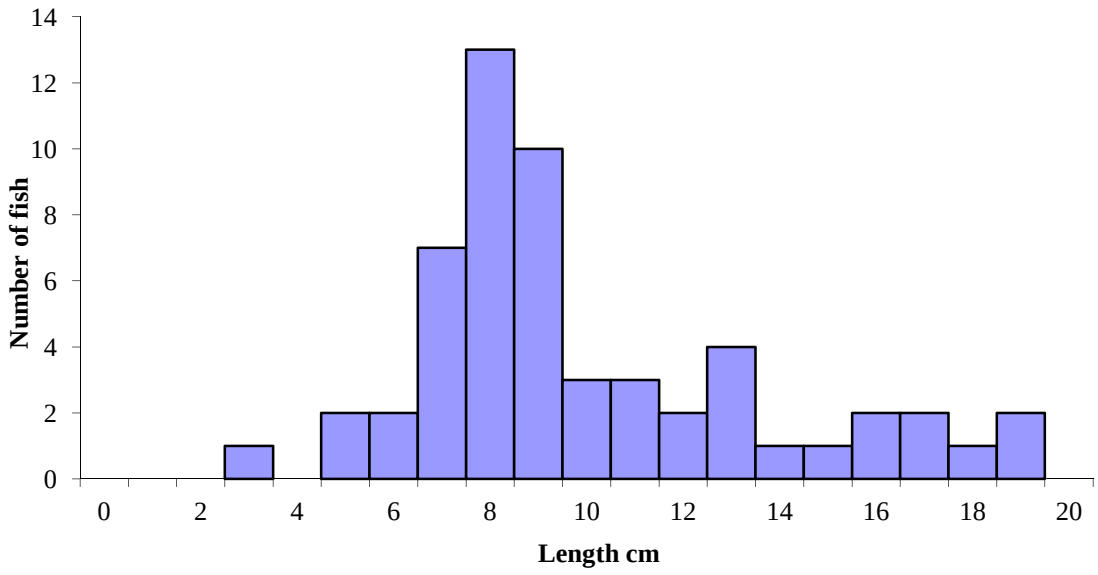

Fig. 3.3. Length frequency distribution of flounder captured in the Upper Slaney Estuary, September 2009 (n = 56)

3.2 The Lower Slaney Estuary

The Lower Slaney Estuary waterbody covers an area of 18.35 km² (Figs. 3.4, 3.5 and Plate 3.2). It begins west of the village of Oilgate and extends south-eastwards, through Wexford Town, to join the sea at Wexford Harbour. The estuary exhibits anthropogenic impacts in terms of channelisation, urban and shipping pressures. Wexford Harbour is an extensive, shallow estuary which dries out considerably at low tide exposing large expanses of mudflats and sandflats.

This water body is situated within the Slaney River Valley SAC, which is described in Section 3.1.

A total of nine beach seines, eleven fyke nets and eleven beam trawls were deployed in the Lower Slaney Estuary in September 2009.

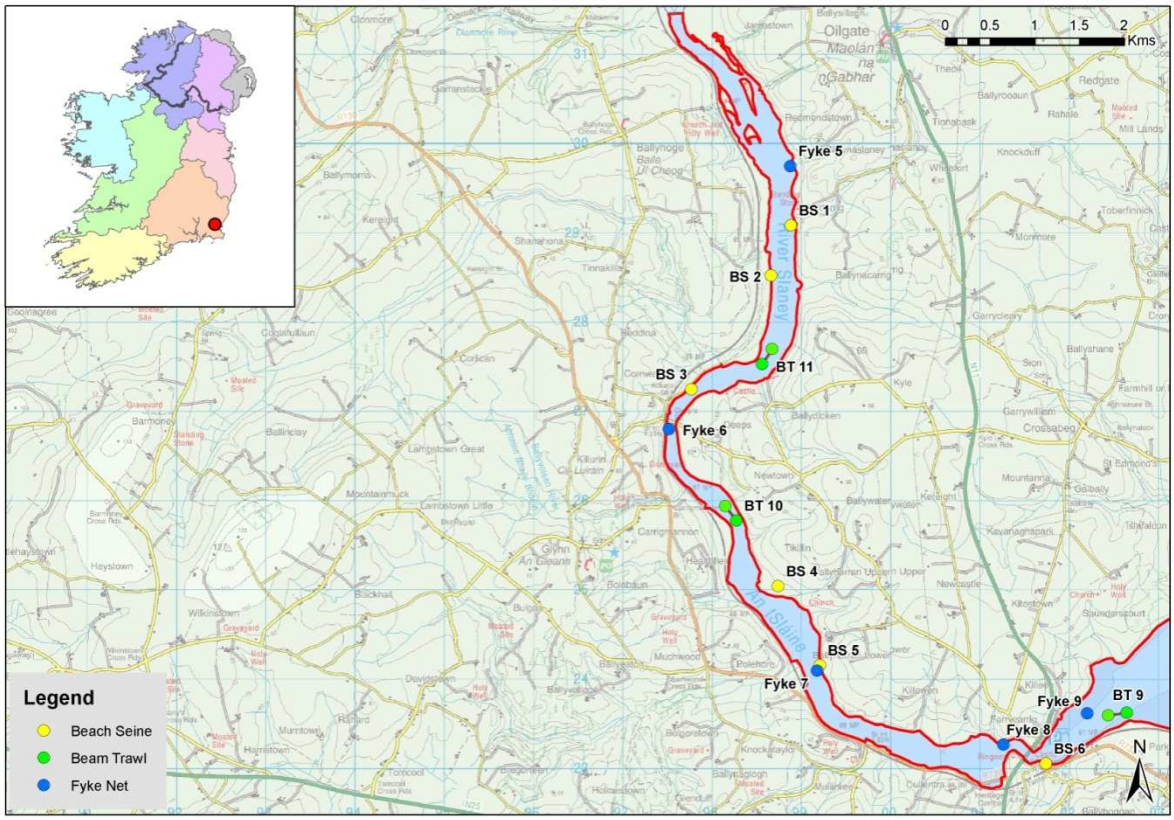

Fig 3.4. Location map of the western section of the Lower Slaney Estuary indicating sampling sites, September 2009

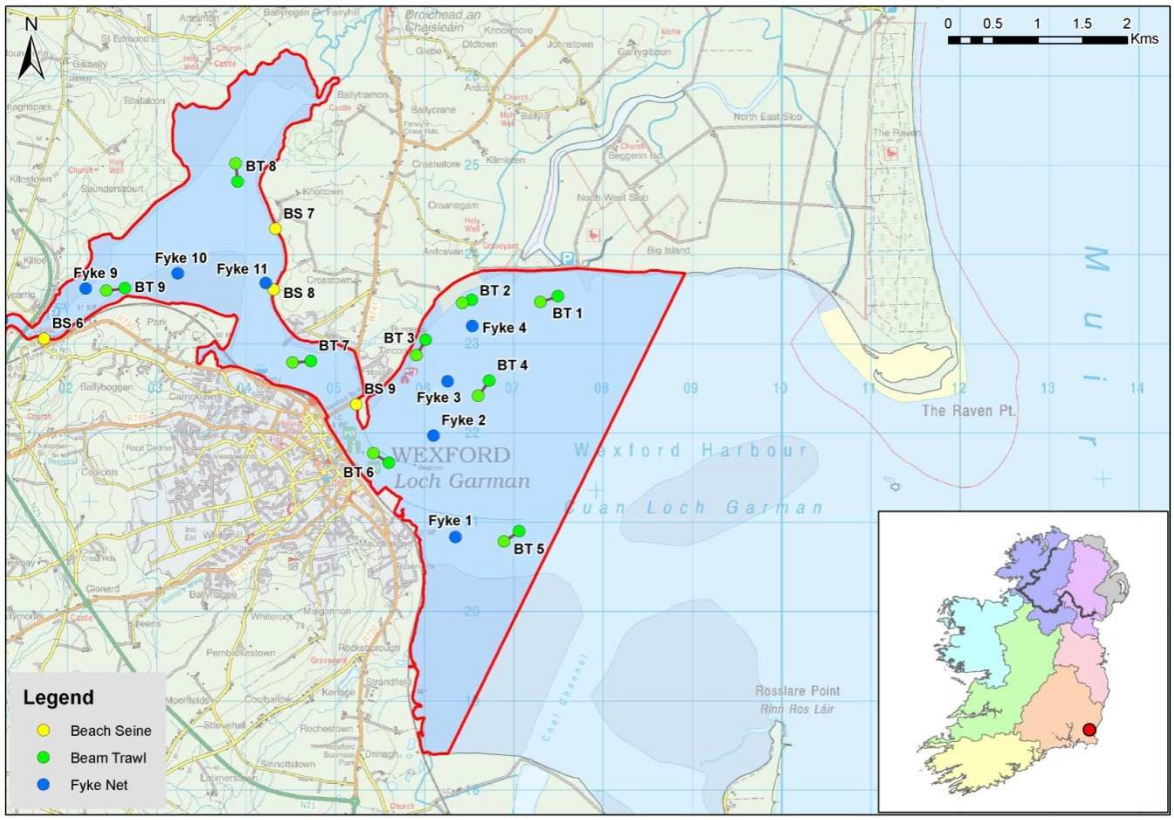

Fig 3.5. Location map of the eastern section of the Lower Slaney Estuary indicating sampling sites, September 2009

Plate 3.22 Aerial photo of the Lower Slaney Estuary at Wexford Harbour (Photo courtesy of CFB and No. 3 Operational Wing, Irish Air Corps [Aer Chór na hÉireann])

A total of 15 fish species were recorded in the Lower Slaney Estuary in September 2009 (Table 3.2). Sand goby was the most abundant species captured, followed by flounder, three-spined stickleback and thick-lipped grey mullet (Table 3.2).

Flounder ranged in length from 2.3cm to 30.1cm, and their length frequency distribution indicates that the sample was composed predominantly of juveniles (Figure 3.6).

Salinity values taken at beach seine sites ranged from 0.321ppt to 19.2ppt.

Table 3.2. Number of each species captured by each gear type in the Lower Slaney Estuary, September 2009

Scientific name	Common Name	Beach seine (9)	Fyke net (11)	Beam trawl (11)	Total
Pomatoschistus minutus	Sand goby	361	-	152	513
Platichthys flesus	Flounder	171	164	112	447
Gasterosteus aculeatus	Three-spined stickleback	346	-	-	346
Chelon labrosus	Thick-lipped grey mullet	127	-	-	127
Pleuronectes platessa	Plaice	1	2	86	89
Gadus morhua	Cod	-	26	1	27
Anguilla anguilla	Eel	2	13	-	15
Ciliata mustela	Five-bearded rockling	-	14	-	14
Pollachius pollachius	Pollack	-	11	1	12
Sprattus sprattus	Sprat	10	-	-	10
Gobius paganellus	Rock goby	-	-	6	6
Taurulus bubalis	Long-spined sea scorpion	-	-	3	3
Merlangius merlangus	Whiting	-	1	-	1
Salmo trutta	Brown trout	-	1	-	1
Clupea harengus	Herring	-	-	1	1

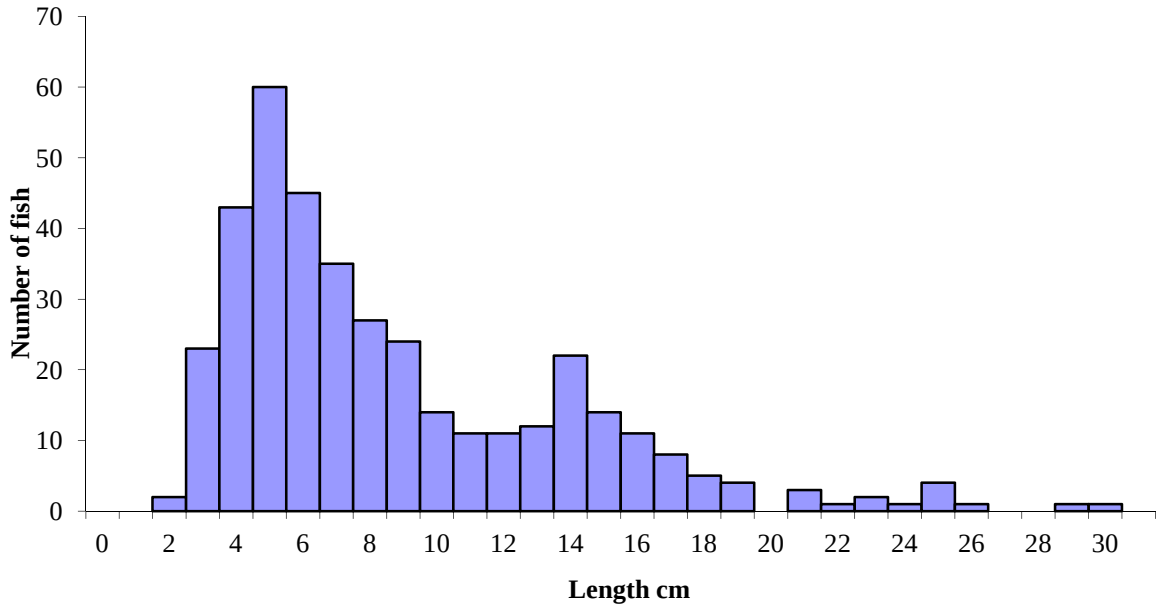

Fig. 3.6. Length frequency distribution of a sub-sample of flounder captured in the Lower Slaney Estuary, September 2009 (n = 385)

3.3 The North Slob Channels

The North Slob Channels cover an area of 0.37km and are located on Ireland's south-east coast, just a few kilometres north-east of Wexford Town (Fig. 3.7, Plate 3.3). These channels drain large areas of reclaimed land that are used for farmland (NPWS, 2007).

This water body is situated within the Wexford Harbour and Slobs SPA, important for a number of habitats such as salt marsh and tidal flat that provide home to many different species of birds (NPWS, 2007).

A total of one fyke net and two beam trawls were deployed in the North Slob Channels in September 2009.

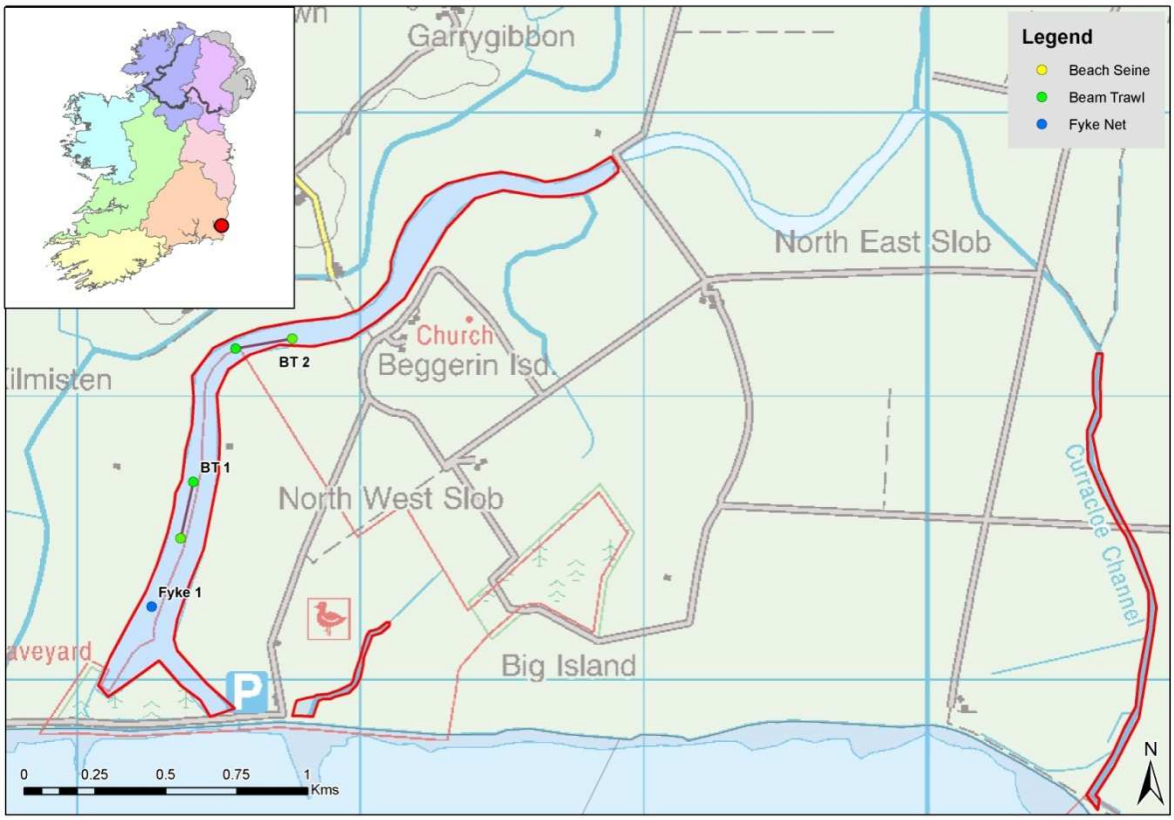

Fig 3.7. Location map of the North Slob Channels indicating sampling sites, September 2009

Plate 3.3. Aerial photo of the North Slob Channel (looking south eastwards) as it enters Wexford Harbour (Photo courtesy of CFB and No. 3 Operational Wing, Irish Air Corps [Aer Chór na hÉireann])

A total of five species were recorded in the North Slob Channels in September 2009 (Table 3.3). Three-spined stickleback was the most abundant species captured, followed by rudd, eels, sand goby and flounder (Table 3.3). The presence of rudd suggests a strong influence from freshwater on this system.

Table 3.3. List of fish species and abundance of each species by net type in the North Slob Channels, September 2009

Scientific name	Common Name	Beach seine (0)	Fyke net (1)	Beam trawl (2)	Total
Gasterosteus aculeatus	Three-spined stickleback	-	-	84	84
Scardinius erythrophthalmus	Rudd	-	23	-	23
Anguilla anguilla	Eel	-	13	-	13
Pomatoschistus minutus	Sand goby	-	-	5	5
Platichthys flesus	Flounder	-	1	-	1

4. SUMMARY

A total of 15 fish species were recorded in the Lower Slaney Estuary, which is similar to other transitional water bodies surveyed in the ERFB during 2009. Only seven and five species were recorded in the Upper Slaney Estuary and the North Slob Channels, respectively, which is relatively low. The high proportions of freshwater species in each of these latter two water bodies reflect the more riverine conditions present at these sites, especially in the Upper Slaney Estuary. Juveniles of a number of species of angling importance were present, such as cod, brown trout, flounder and thick-lipped grey mullet. Species richness and distribution among all transitional water bodies surveyed during 2009 can be seen in the 2009 WFD summary report (Kelly *et al*., 2010).

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 Northern Ireland Environment Agency (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 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 Lower Slaney Estuary has been assigned a draft ecological status classification of “Good”, and both the Upper Slaney Estuary and the North Slob Channels have been assigned draft ecological status classifications of “Moderate” based on the fish populations present.

The EPA have assigned both the Upper and Lower Slaney Estuaries an overall interim draft classification of “Moderate” status, based on general physico-chemical elements, phytoplankton and macroalgal growths.

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