

Fish Stock Survey of Transitional Waters in the South Western River Basin District – Bandon Lower

2016

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Fish Stock Survey of Transitional Waters in the South Western River Basin District – Bandon Lower 2016

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1. Introduction

A fish stock survey was conducted on the Lower Bandon Estuary in the South Western River Basin District (SWRBD) as part of the programme of fish monitoring for the Water Framework Directive (WFD), between the 17th and 19th of October 2016 by staff from Inland Fisheries Ireland.

The main objectives of the current survey are:

- To measure the ecological status of fish populations in the estuary complex as per the requirements of the European Water Framework Directive (WFD; 2000/60/EC).
- To inform on the role of this waterbody in relation to important marine recreational fish species.
- To provide scientific advice to support any potential fish conservation measures within the estuary.

According to the WFD, ecological status of waterbodies must be assessed by both a number of physical and chemical characteristics and a range of biological indicators. Fish populations are one of the key biological indicators of ecological status in transitional waters. Essentially they are assessed by comparing data collected from monitoring against reference (natural) conditions. This information will assist in identifying the objectives that must be set in the individual River Basin Management Plans. The Estuarine Multimetric Fish Index (EMFI) (Harrison and Kelly, 2013) has been developed for the island of Ireland (Ecoregion 1) using IFI and Northern Ireland Environment Agency (NIEA) data to assess fish populations in transitional waters. 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).

Site characteristics

The Lower Bandon Estuary covers an area of 679km² and is situated on Ireland's south-west coast, with the mouth of the estuary located directly south-east of Kinsale town, Co. Cork (Fig. 1.1). This section of the estuary extends inland for approximately 15km and the harbour area around Kinsale is a traditional commercial port.

The Bandon is an important recreational salmon angling fishery which also supports good populations of sea trout. In terms of accessible salmon habitat, it ranks at No. 15 of 173 salmon catchments in Ireland (Mc Ginnity et al, 2003) with an estimated 165.2 ha of lotic wetted area habitat.

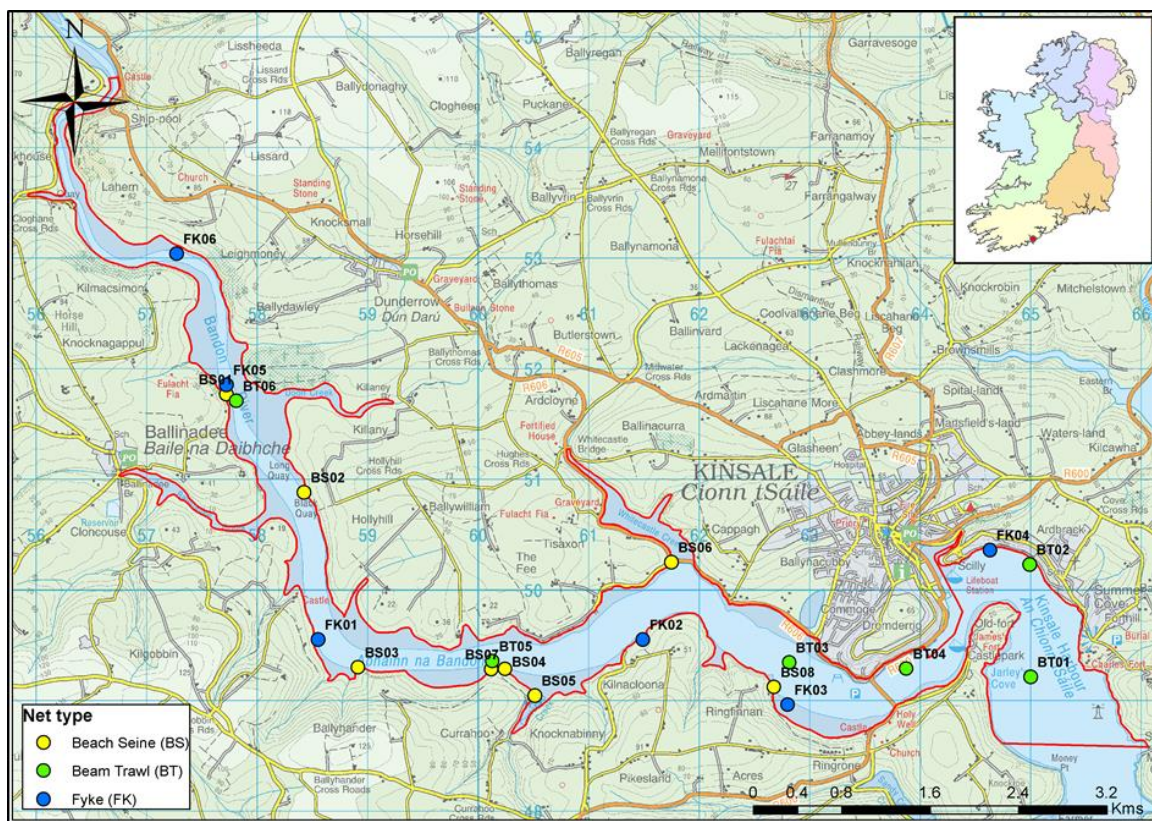


Fig 1.1: Location map of The Lower Bandon Estuary showing sampling sites.

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 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 (Fig. 1.2). 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.



Fig.1.2: Hauling a beach seine in the Bandon Estuary, October 2016.

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 eight beach seines, six fyke nets and six beam trawls were deployed in the Lower Bandon Estuary in September 2016 (Fig 1.1).

Fish status was assessed using the estuarine multi-metric fish index (EMFI) (Harrison and Kelly, 2013) to derive ecological status. As the Bandon estuary is subject to repeat surveys every three years as part of a surveillance monitoring programme, any change in fish population structure, and its derived EQR (Ecological Quality Rating) over time, will be evident.

3. Results

A total of 18 fish species were recorded in the Lower Bandon Estuary in October 2016 compared to the 28 which were recorded in 2013. A total of 1947 fish were recorded. Table 3.1 compares fish community composition between the two surveys.

Several species of note, such as thin-lipped grey mullet and conger eel were newly recorded in 2016. However, there was a large disparity in population composition between surveys as 18 species present in 2009 were not recorded in 2016.

Salinity values taken at beach seine sites ranged from 30ppt close to the mouth of the estuary to 0.1ppt at the upper end of the transitional water body.

The Lower Bandon Estuary has been assigned an EMFI ecological status classification of “good” (EQR=0.66) based on the fish populations present (Table 3.1).

Table 4.1. EMFI quality ratings for the lower bandon estuary.

Name	Year	EMFI	EQR	Intercal Class
Lower Bandon	2009	63	0.88	Good
Lower Bandon	2016	51	0.66	Good

4. Summary

A total of 18 fish species were among 1947 fish recorded during the Lower Bandon Estuary survey in October 2016. The waterbody has a range of habitats throughout its length as it changes from brackish to marine in character over its course. The range of species captured during the survey reflects this.

The 'good' ecological classification assigned to the Lower Bandon signals a maintenance of the status quo since it was previously surveyed in 2009. However, a reduction in species richness since the survey in 2009 has resulted in a reduction in the EQR score from 0.88 (borderline high status) to 0.66 (borderline moderate status) (Table 4.1).

Species richness was reduced by 10 since the 2009 survey which is concerning. However, a number of those missing from the current survey are marine migrants which may only spend a limited amount of time in the estuary. One notable exception is the lack of salmon recorded in the current survey. In 2009, four salmon parr were captured in the uppermost section of the waterbody. It is possible that the current survey did not encounter juvenile salmon because sampling was not carried out close enough to the freshwater/tidal section of the waterbody and so was out of the range of salmon parr.

Table 3.1: Number of each fish species captured by each gear type in The Lower Bandon Estuary, October 2016 and comparison with the previous survey in 2009.

Species scientific	Species common	Beach Seine		Beam Trawl		Fyke net		Total	
		2016(8)	2009(13)	2016(6)	2009(10)	2016(6)	2009(6)	2016	2009
<i>Labrus bergyllta</i>	Ballan wrasse	1	0	0	0	0	0	1	0
<i>Trisopterus luscus</i>	Bib	0	0	0	0	0	2	0	2
<i>Gobius niger</i>	Black goby	2	0	0	0	2	0	4	0
<i>Pollachius virens</i>	Coalfish (Saithe)	1	0	0	0	2	0	3	0
<i>Gadus morhua</i>	Cod	0	0	0	3	0	8	0	11
<i>Pomatoschistus microps</i>	Common goby	244	0	7	0	0	0	251	0
<i>Conger conger</i>	Conger eel	0	0	0	0	2	0	2	0
<i>Limanda limanda</i>	Dab	0	2	2	27	0	0	2	29
<i>Syngnathus typhle</i>	Deep snouted pipefish	0	0	0	2	0	0	0	2
<i>Callionymus sp.</i>	Dragonet sp.	0	0	0	15	0	0	0	15
<i>Anguilla anguilla</i>	European eel	0	0	0	0	6	2	6	2
<i>Spinachia spinachia</i>	Fifteen-spined stickleback	9	5	1	4	0	0	10	9
<i>Ciliata mustela</i>	Five-bearded rockling	0	2	0	0	24	3	24	5
<i>Platichthys flesus</i>	Flounder	78	98	3	98	7	7	88	203
<i>Syngnathus acus</i>	Greater pipefish	0	3	0	5	0	0	0	8
<i>Pholis gunnellus</i>	Gunnel	0	2	0	0	0	0	0	2
<i>Ammodytes tobianus</i>	Lesser sandeel	0	20	0	0	0	0	0	20
<i>Taurulus bubalis</i>	Long spined sea scorpion	0	9	0	3	0	0	0	12
<i>Syngnathus rostellatus</i>	Nilsson's pipefish	17	0	3	0	0	0	20	0
<i>Pomatoschistus pictus</i>	Painted goby	0	8	0	0	0	0	0	8
<i>Pleuronectes platessa</i>	Plaice	0	2	4	27	0	0	4	29
<i>Agonus cataphractus</i>	Pogge	0	0	0	15	0	0	0	15
<i>Pollachius pollachius</i>	Pollack	7	0	0	0	14	0	21	0
<i>Aspitrigla cuculus</i>	Red gurnard	0	0	0	1	0	0	0	1
<i>Gobius paganellus</i>	Rock goby	0	2	0	7	0	0	0	9
<i>Salmo salar</i>	Salmon	0	2	0	2	0	0	0	4
<i>Pomatoschistus minutus</i>	Sand goby	1225	318	10	51	0	0	1235	369
<i>Atherina presbyter</i>	Sand smelt	3	18	0	0	0	0	3	18
<i>Myoxocephalus scorpius</i>	Short spined sea scorpion	0	1	0	2	0	0	0	3
<i>Entelurus aequoreus</i>	Snake pipefish	0	0	0	6	0	0	0	6
<i>Sprattus sprattus</i>	Sprat	252	14	1	0	0	0	253	14
<i>Liza ramada</i>	Thin-lipped grey mullet	1	0	0	0	0	0	1	0
<i>Chelon labrosus</i>	Thick lipped grey mullet	0	199	0	0	0	0	0	199
<i>Gasterosteus aculeatus</i>	Three-spined stickleback	0	2	0	0	0	0	0	2
<i>Gobiusculus flavescens</i>	Two-spotted goby	0	16	0	2	0	0	0	18
<i>Merlangius merlangus</i>	Whiting	4	0	6	2	9	4	19	6

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 Kelly, F.L. (2013). Development of an estuarine multi-metric fish index and its application to Irish transitional waters. *Ecological Indicators*, 34, 494-506.

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.

McGinnity, P., Gargan, P., Roche, W., Mills, P. & McGarrigle, M. 2003. Quantification of the Freshwater Salmon Habitat Asset in Ireland using data interpreted in a GIS platform. *Irish Freshwater Fisheries, Ecology and Management Series: Number 3*, Central Fisheries Board, Dublin, Ireland.