Fish Stock Survey of Transitional Waters in the South Eastern River Basin District 2020

Bridgetown Estuary

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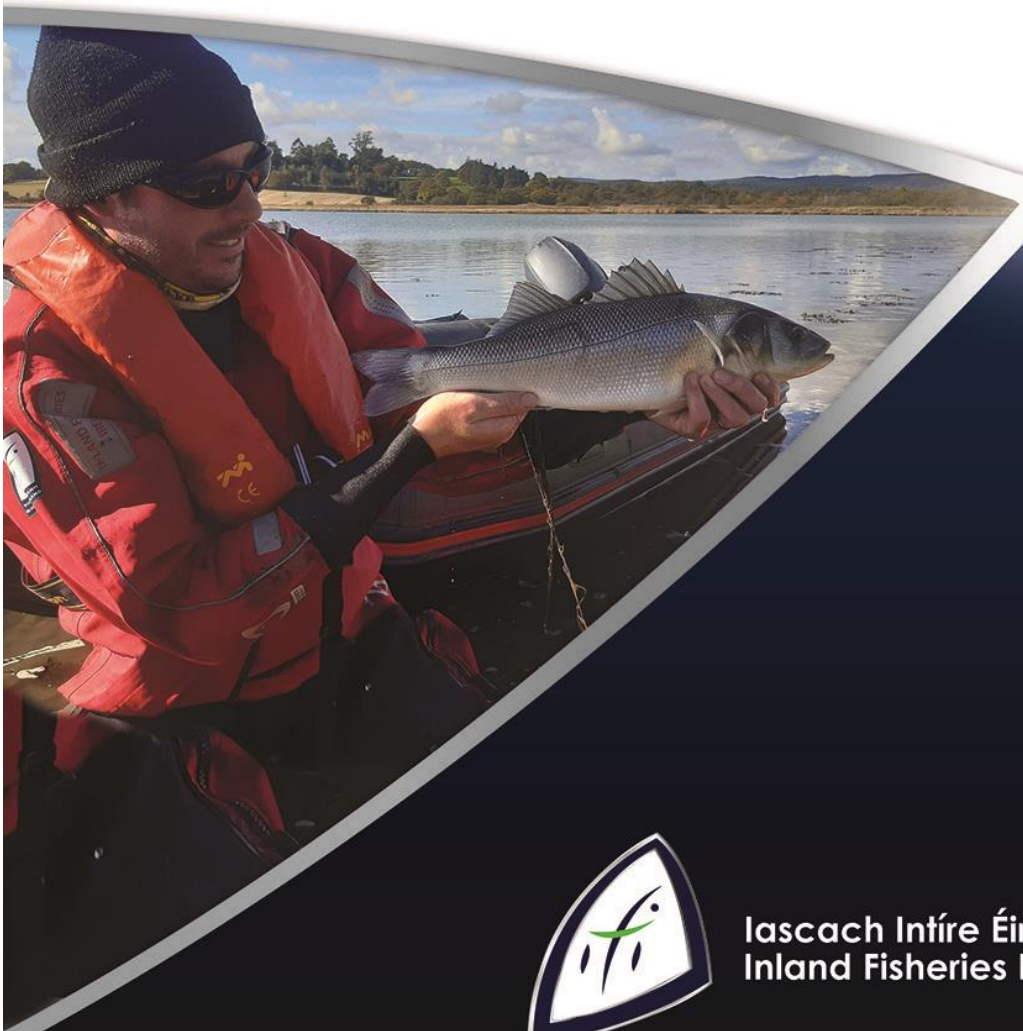

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National Research Survey Programme

Fish Stock Survey of Transitional Waters in the South Eastern River Basin District 2020– Bridgetown estuary

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Contents

1. Summary

This report presents fish capture data collected during Inland Fisheries Ireland (IFI) surveys of transitional waterbodies. This report focuses on the survey which was conducted within the Bridgetown estuary in the south east of Ireland. It was conducted primarily to designate an ecological status based on fish populations, as per the requirements of the Water Framework Directive (Directive 2000/60/EC). The populations of species of angling and conservation importance are also discussed.

A number of fish sampling methods were used to ensure that a range of habitat types were sampled, thus making it likely that all fish species present in the estuary were captured. Across the survey, a total of 17 species and 740 individual fish were captured. Current data was also compared to a previous survey in 2009 to assess how fish populations have changed in the intervening years.

2. Introduction

The Bridgetown Estuary covers an area of 2.03km² and is located immediately south of Duncormick Village in Co. Wexford (Fig. 1). The estuary is situated at the mouth of the Duncormick River and is separated from the open sea by Ballyteige Burrow, a long narrow spit of coarse gravel and sand that extends north-westwards (NPWS, 2003).

This water body lies within the Ballyteige Burrow SAC, which is important for several habitats listed in Annex I of the EU Habitats Directive, including fixed dune, dune heath and lagoon. The site also provides important habitat for many different bird species, including wintering wildfowl (NPWS, 2003).

The catchment is well regarded for angling with popular angling species like European sea bass, flounder, and sea trout present.

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 examine fish population dynamics in the estuary.
- To provide scientific advice to support conservation measures within the estuary complex.

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. Fish status was assessed using the estuarine multi-metric fish index (EMFI) (Harrison and Kelly, 2013) to derive ecological status. As the estuary was surveyed in 2009, it was possible to examine any changes in population structure in the intervening years.

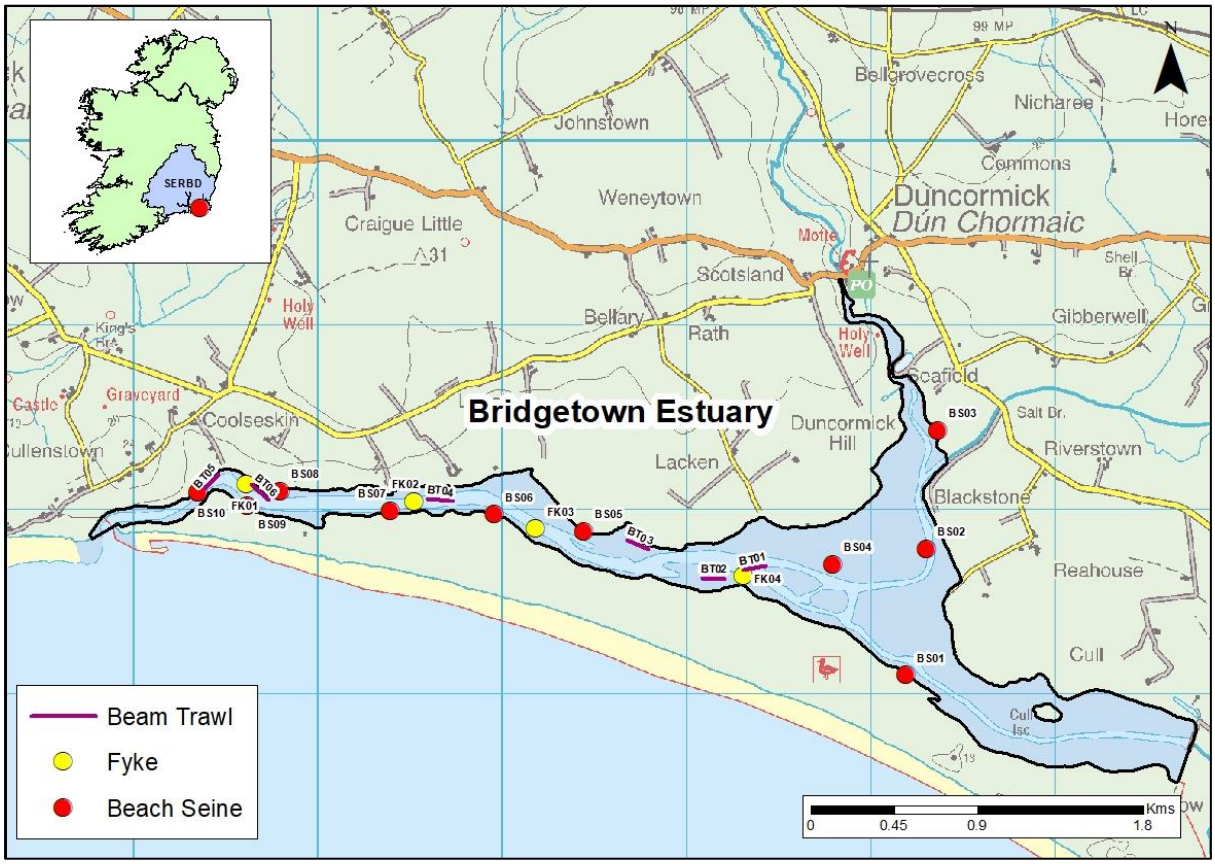

Fig. 1: Map of the Bridgetown Estuary showing all samples taken during the October 2020 survey.

3. Methods

The Bridgetown estuary covers an area of 2.03km^2. Fish stock surveys were conducted to ensure sufficient coverage of the water body so that stocks could be assessed. Sampling took place between 7th - 8th October 2020. Habitat type across the sites ranges from soft mud to hard sandy substrate and brackish to fully saline and all in between. The separate waterbodies are described in more detail in www.wfdfish.ie.

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.

In 2020, due to Covid-19 (i.e. social distancing) and manual handling considerations a lighter beach seine and reduced numbers of fykes in each fyke set were utilised. Beach seining was conducted using a 30m x 2.5m net (14mm mesh size side panels 12m x 2.5m with the middle/bunt of the net 6.5mm mesh size 6m x 2.5m) 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. Previous surveys used 3 fyke nets tied together to form a set whereas 2 fykes were tied together to form a set in 2020. 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.

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 if necessary. Unidentified fish specimens were retained for subsequent identification in the laboratory.

A handheld GPS was used to mark the precise location of each site. Physiochemical data were also collected at each beach seine site.

4. Results

4.1 Data summary – 2020 survey

A total of 20 samples were taken using three different sampling methods (10 beach seine, 4 fykes and 6 beam trawls), over the course of the sampling programme (Fig.1). Temperatures ranged from 12.3-14.4 °C (mean = 13.3°C) and salinity (PPT) ranged from 1.3 to 30.9 (mean= 21.4)

In the Bridgetown estuary, 740 individual fish were captured, counted and identified to species level prior to release. Fifteen different fish species were encountered over the course of the survey (Table 1).

Table 1: List of species captured during the 2020 WFD survey of the Bridgetown estuary

Species	Total count	Count measured	Ave length(cm)	Max length(cm)	Min length(cm)	Standard deviation (cm)	Relative abundance %
Brill	1	1	9.3	9.3	9.3	N/A	0.1
Corkwing wrasse	11	11	4.6	5.9	3.8	0.7	1.5
European eel	2	2	28.3	33.0	23.5	6.7	0.3
Fifteen-spined stickleback	4	4	8.8	10.3	7.3	1.7	0.5
Flounder	15	15	10.9	17.1	7.3	2.7	2.0
Lesser sandeel	9	9	9.2	11.5	7.1	1.5	1.2
Long-spined sea scorpion	2	2	9.4	9.9	8.9	0.7	0.3
Nilsson's pipefish	1	1	12.4	12.4	12.4	N/A	0.1
Plaice	1	1	5.2	5.2	5.2	N/A	0.1
Rock goby	3	3	4.6	5.0	4.0	0.6	0.4
Sand goby	382	236	5.8	8.6	2.2	1.6	51.6
Sand smelt	258	150	6.1	9.2	3.6	1.1	34.9
Sea trout	2	2	35.0	45.5	24.5	14.8	0.3
Sprat	3	3	9.5	10.6	8.5	1.1	0.4
Thick-lipped grey mullet	42	42	6.5	38.4	3.0	7.3	5.7
Tub gurnard	2	2	7.9	7.9	7.8	0.1	0.3
Two-spotted goby	2	2	3.9	3.9	3.8	0.1	0.3

4.2 Comparative analyses

4.2.1 Abundant species

Sand goby were by far the most abundant species within the estuary in 2020, making up over 51% of the total catch (Fig. 2). Sand smelt and thick-lipped grey mullet were also common, making up 34.9 and 5.7 % of the total catch, respectively. Thick-lipped grey mullet were present in greater numbers than recorded in the previous survey in 2009 (Fig. 2)

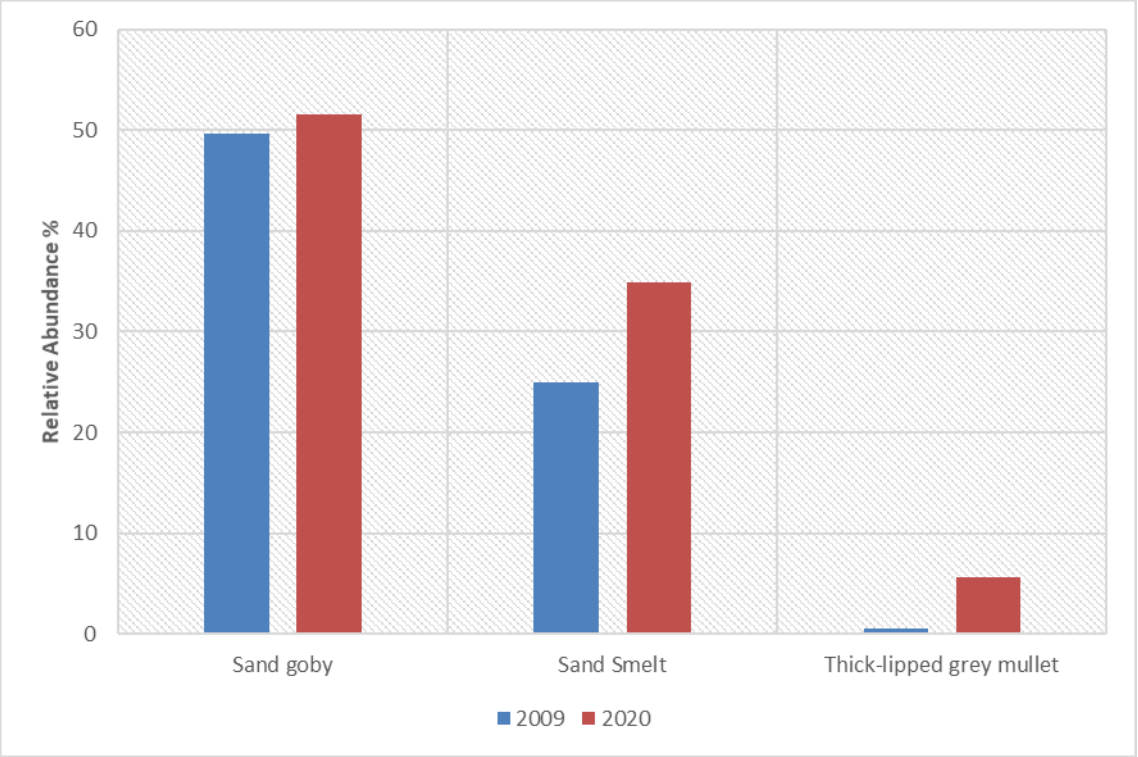

Fig 2: Relative abundance of the most abundant species captured during the 2020 WFD survey of the Bridgetown estuary and comparison with the 2009 survey.

4.2.2 Key species

Two sea trout were captured during the survey the largest fish was 45.5cm. These are a popular species with anglers (Plate 1.). Juvenile Thick lipped grey mullet made up 5.7% of the total catch respectively (Fig 2), indicating a possible nursery function for these popular angling species. The estuary is noted for bass and flounder fishing. No bass were captured during the survey while flounder comprised 2.0% of the total catch (Table 1).

Plate 1: Sea trout.

4.2.3 EMFI quality rating

The Bridgetown estuary achieved good status in 2020 which was the same status it achieved in the 2009 survey (Table 2).

Table 2. EMFI quality ratings of the Bridgetown estuary

System	Year	EMFI	EQR	Classification
Bridgetown	2020	57	0.77	Good
Bridgetown	2009	58	0.79	Good

5. Discussion

Sand goby, sand smelt, and thick lipped grey mullet made up over 92% of the catch.

As the substrate is largely sand/mud within the estuary, this is not unexpected as these species are common over this substrate. Sand goby and sand smelt are an important prey species and provide a vital food source for piscivorous fish and birds feeding within the shelter of the estuary (Faria *et al.* 2014).

Sea trout were captured in the 2009 survey previously. These are an important angling species, and their presence is welcomed by anglers.

6. References

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