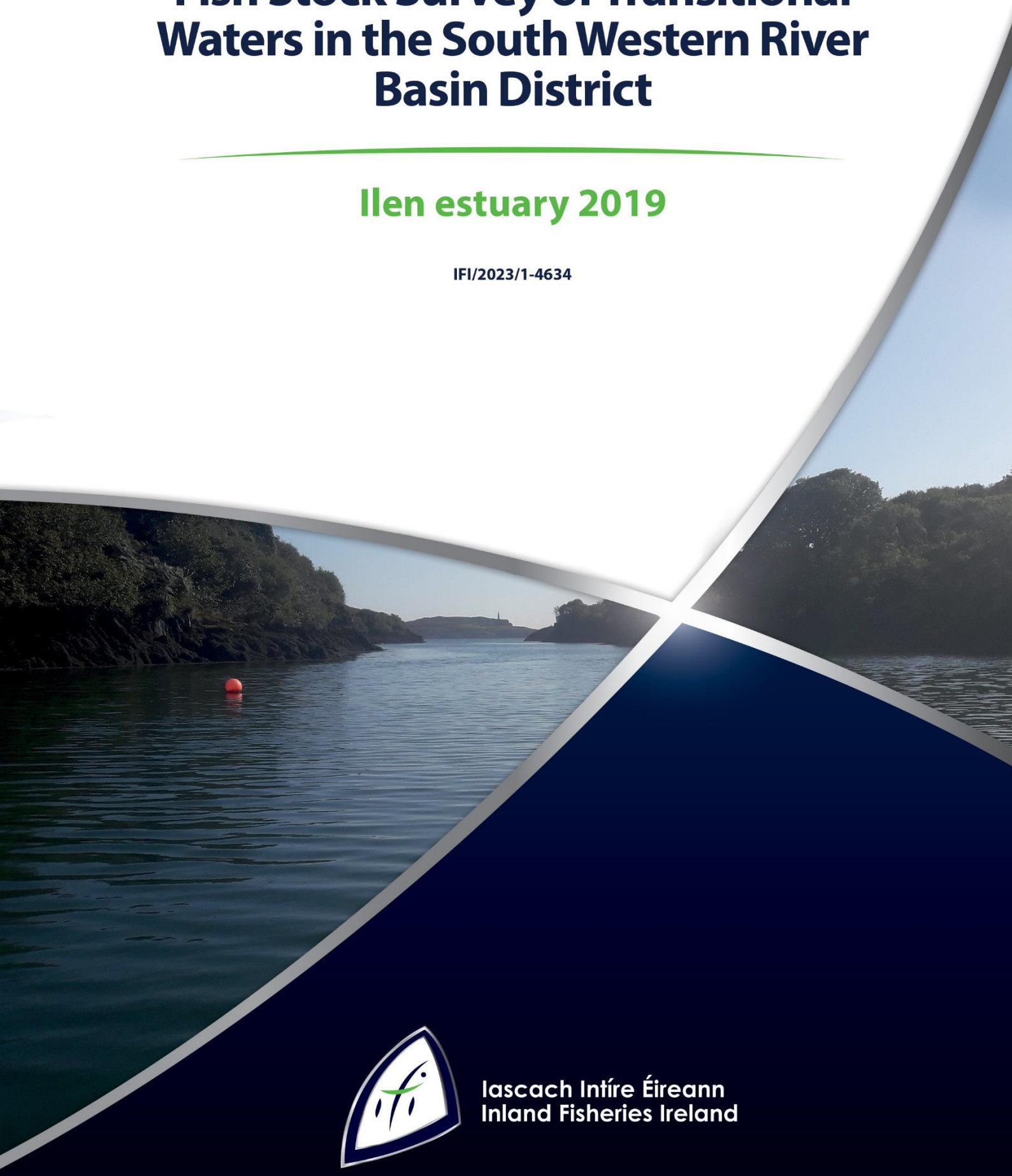
Fish Stock Survey of Transitional Waters in the South Western River Basin District

Ilen estuary 2019

IFI/2023/1-4634



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National Research Survey Programme

Fish Stock Survey of Transitional Waters in the South Western River Basin District 2019– Ilen estuary

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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 Ilen estuary in the south west 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 of 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. A total of 23 species and 1878 individual fish were captured. Current data was also compared to a previous survey in 2008 to assess how fish populations have changed in the intervening years.

2. Introduction

The Ilen Estuary is located in County Cork and is bordered by the towns of Skibbereen in the upper estuary and Baltimore close to the mouth of the estuary, on Ireland's south west coast (Fig. 1). The upper estuary, above Ringarogy Island, is shallow, has a riverine feel and the substrate is dominated by a layer of mud over gravel. The lower estuary has a strong marine influence and the shoreline is dominated by exposed jagged rock and thus finding suitable beach seine sites was challenging.

The Ilen River flows into the estuary, adjacent to Skibbereen, and is a medium sized spate river that drains an area of 303 square kilometers. The River Ilen is noted for its excellent salmon and sea trout fishing although no salmon were captured during the survey. The estuary is promoted by the South Western Fisheries Board as a good fishing venue for bass, flounder, dogfish, mullet and sea trout.

The main objectives of the current survey are:

1. 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)
2. To inform on the role of this waterbody in relation to important marine recreational fish species
3. 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. Fish status was assessed using the estuarine multi-metric fish index (EMFI) (Harrison and Kelly, 2013) to derive ecological status. As the estuary was also surveyed in

3. Methods

The Ilen estuary covers an area of 9.66km^2. Fish stock surveys were conducted to ensure sufficient coverage of the water body so that stocks could be assessed. Sampling took place between 16th and 18th of September 2019. Habitat type across the sites ranges from soft mud to hard sandy substrate and brackish to fully saline.

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 (Harrison and Kelly, 2013) for the WFD monitoring program.

Beach seining was 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 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 site.

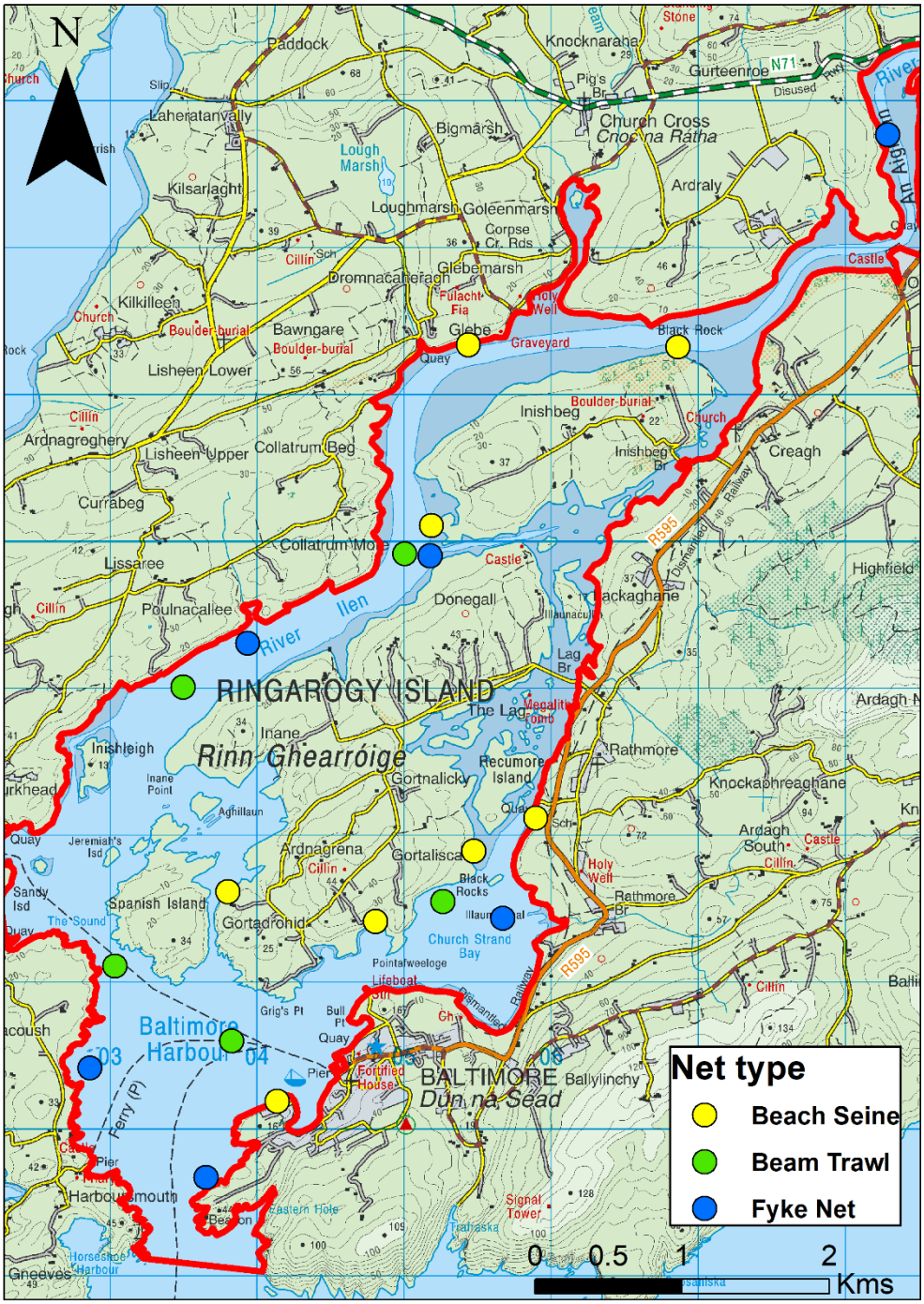

Fig. 1: Map of the Ilen Estuary showing all samples taken during the 2019 survey.

4. Results

Data summary – 2019 survey

A total of 19 samples were taken using three different sampling methods (8 beach seine, 6 fykes and 5 beam trawls), over the course of the survey (Fig.1). Temperatures ranged from 19.7-14.3 °C (mean = 16.7) and salinity ranged from 34 to 16 (mean= 30.9). 1878 individual fish were captured, counted and identified to species level prior to release. 23 different fish species were encountered over the course of the survey (Table 1).

Species *(scientific name)*	**Species (common name)**	**Total count**	**Count measured**	**Ave length(cm)**	**Max length(cm)**	**Min length(cm)**	**Standard deviation**	**Relative abundance %**
Labrus bergylta	Ballan wrasse	1	1	14.3	14.3	14.3	*NA*	0.1
Scophthalmus rhombus	Brill	1	1	14.8	14.8	14.8	*NA*	0.1
Gadus morhua	Cod	3	3	20.9	28.0	15.4	6.5	0.2
Pomatoschistus microps	Common goby	67	42	5.5	8.7	4.0	1.0	3.6
Solea solea	Common sole	1	1	6.4	6.4	6.4	*NA*	0.1
Conger conger	Conger eel	1	1	37.0	37.0	37.0	*NA*	0.1
Crenilabrus melops	Corkwing wrasse	7	7	10.1	12.6	4.0	2.9	0.4
Anguilla anguilla	European eel	1	1	34.5	34.5	34.5	*NA*	0.1
Spinachia spinachia	Fifteen spined stickleback	45	45	9.0	15.0	6.9	1.4	2.4
Ciliata mustela	Five bearded rockling	6	6	14.0	15.5	12.0	1.4	0.3
Platichthys flesus	Flounder	18	18	8.8	26.5	3.5	5.0	1.0
Chelon auratus	Golden grey mullet	29	29	13.6	15.5	12.0	0.7	1.5
Zeus faber	John dory	1	1	6.1	6.1	6.1	*NA*	0.1
Taurulus bubalis	Long spined sea scorpion	4	4	10.8	12.4	9.0	1.5	0.2
Syngnathus rostellatus	Nilssons pipefish	3	3	13.8	17.0	12.1	2.8	0.2
Pleuronectes platessa	Plaice	18	18	6.1	14.7	3.5	2.4	1.0
Pollachius pollachius	Pollack	15	15	17.4	39.6	12.0	7.2	0.8
Pomatoschistus minutus	Sand goby	1092	137	6.1	8.0	3.8	1.1	58.1
Atherina presbyter	Sand smelt	60	58	9.3	13.1	4.5	3.0	3.2
Trachurus trachurus	Scad	15	15	6.7	7.5	6.0	0.4	0.8
Sprattus sprattus	Sprat	486	81	7.8	10.5	2.5	1.3	25.9
Chelidonichthys lucerna	Tub gurnard	1	1	5.2	5.2	5.2	*NA*	0.1
Merlangius merlangus	Whiting	3	3	10.1	12.5	8.2	2.2	0.2

Table 1: List of species captured during the 2019 WFD survey of the Ilen estuary.

Comparative analyses

Abundant species

Sand goby were the most common species within the estuary in 2019, making up nearly 60% of the total catch (Table 1). Sand goby were not recorded in 2008. Sprat were common in 2019, contributing another 26% of the total catch. However, in 2008 sprat were rare. Only 2 sprat catches were recorded during the survey. Fifteen spined stickleback remained relatively common between sampling years, making up 2.4% and 2.2% of the total catch in 2019 and 2008 respectively (Fig. 2). Sand smelt were relatively abundant in the estuary in 2008, making up over 10% of the total catch (Fig. 2).

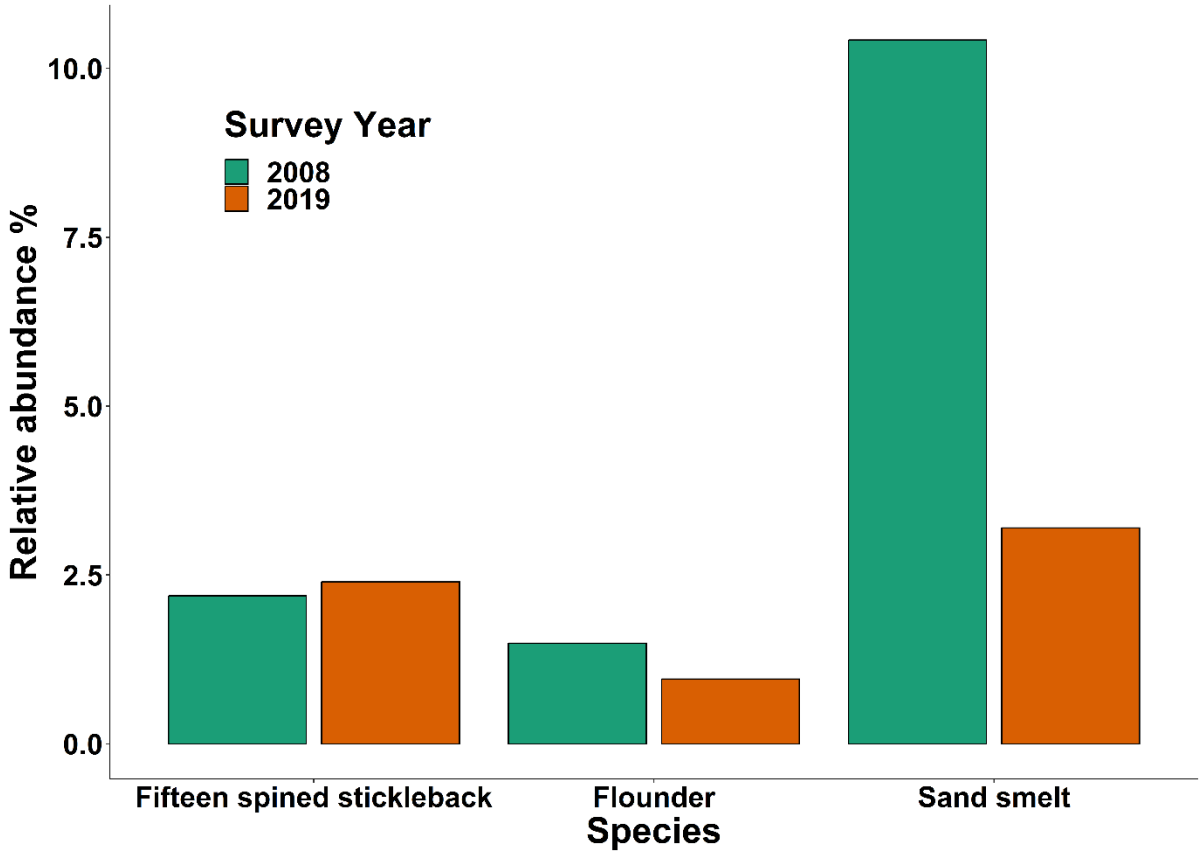

Fig 2: Relative abundance of selected common species captured during the 2019 WFD survey of the Ilen estuary and comparison with the 2008 survey.

Key species

Juvenile golden grey mullet increased from less than 0.2% of total catch in 2008 to over 1.5% of total catch, indicating a possible nursery function for this popular angling species (Fig. 3).

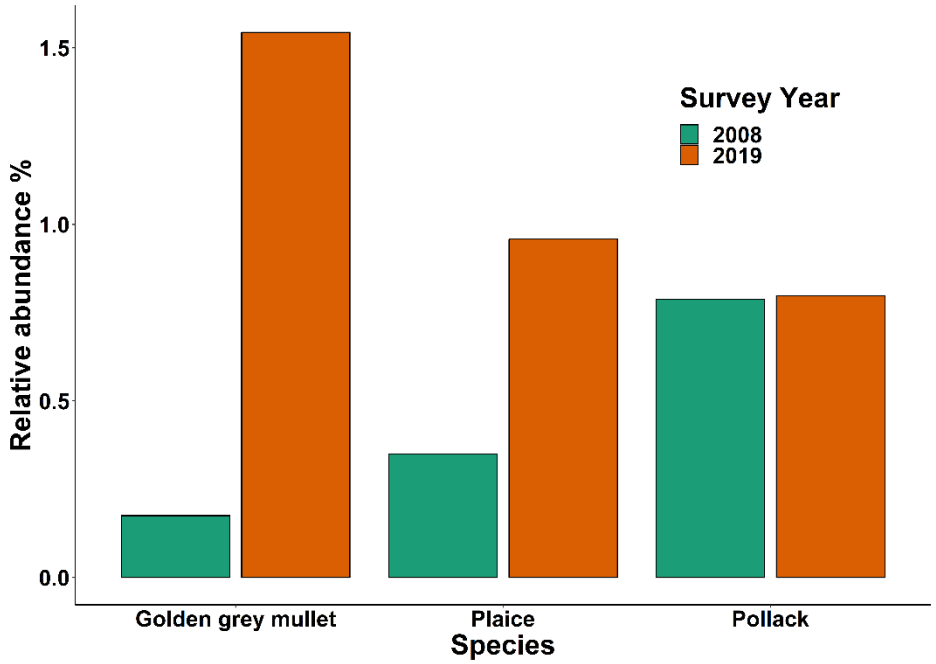

Fig 3: Relative abundance of some species of angling interest captured during the 2019 WFD survey of the Ilen estuary and comparison with the 2008 survey.

Fig 4: A juvenile john dory caught during the 2019 WFD survey of the Ilen estuary.

Relative abundance of juvenile plaice doubled from less than 0.5% of total catch to over 1% of total catch between sampling in 2008 and 2019 (Fig. 3). A single juvenile john dory was caught during the survey in 2019 (Fig. 4).

EMFI quality rating

The Argideen estuary achieved good status in 2017, an improvement on the 2008 survey (Table 2).

System	Year	EMFI	EQR	Intercal Class
Ilen Estuary	2019	59	0.80	Good
Ilen Estuary	2008	61	0.84	Good

Table 5. EMFI (Estuarine multi-metric fish index) quality ratings of the Ilen estuary in 2019 and 2008.

5. Discussion

The EMFI rating decreased slightly between 2008 and the current survey. However, the EQR did not drop below 0.80. This indicates that the system continues to have well-functioning fish populations for an estuary of this type as this value remains well above an EQR of 0.65 which denotes the moderate/good boundary.

A substantive increase in juvenile golden grey mullet was noted between surveys. All samples were measured in the field and returned alive. However, large numbers of thick lipped mullet were recorded during the survey in 2008 (37% of total catch). It is possible that some of the juveniles in this cohort were identified incorrectly. In future surveys, it may be useful to take a sub sample of juvenile mullet back to the laboratory so that they can be identified by mullet species and subsequently confirmed or otherwise that the Ilen estuary is a golden grey mullet nursery..

6. References

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