Bridgetown Estuary

Sampling Fish for the Water Framework Directive - Transitional Waters 2009

The Central and Regional Fisheries Boards

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1. INTRODUCTION

A fish stock survey was conducted on Bridgetown Estuary, as part of the fish monitoring programme for the Water Framework Directive (WFD), between the 23rd and the 24th of September 2009 by staff from the Central Fisheries Board (CFB) and the Eastern Regional Fisheries Board (ERFB).

Bridgetown Estuary covers an area of 2.03km² and is located immediately south of Duncormick Village in Co. Wexford (Fig. 1.1, Plate 1.1). 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 a number of 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).

Fig 1.1. Location map of Bridgetown Estuary indicating sample sites, September 2009

Plate 1.1. Beach seining in Bridgetown Estuary

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 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.

A total of seven beach seines, six beam trawls and four fyke nets were deployed in Bridgetown Estuary in September 2009.

3. RESULTS

A total of 17 fish species (sea trout are included as a separate 'variety' of trout) were recorded in Bridgetown Estuary in September 2009 (Table 3.1). Sand goby was the most abundant species captured, followed by sand smelt, plaice and lesser sandeel (Table 3.1). Sea trout, eels (listed as critically endangered in the Irish Red Data Book (King *et al*., 2011)) and flounder were also recorded. All of the flounder, plaice, five-bearded rockling, cod and pollack were juveniles, indicating their utilisation of this water body as a nursery area.

Plaice ranged in length from 4.5cm to 11.5cm in length, and their length frequency distribution indicates that two age classes were present in the sampled population (Fig. 3.1). Similarly, sand gobies ranged in length from 2.0cm to 8.8cm in length, and their length frequency distribution also indicates that the sampled population was composed of two age classes (Fig. 3.2).

Salinity values taken at beach seine sites ranged from 17.5ppt to 27.7ppt.

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

Scientific name	Common Name	Beach seine (7)	Fyke net (4)	Beam trawl (6)	Total
Pomatoschistus minutus	Sand goby	157	-	14	171
Atherina presbyter	Sand smelt	86	-	-	86
Pleuronectes platessa	Plaice	6	-	25	31
Ammodytes tobianus	Lesser sandeel	20	-	5	25
Platichthys flesus	Flounder	2	-	5	7
Anguilla anguilla	Eel	-	7	-	7
Chelon labrosus	Thick-lipped grey mullet	2	-	-	2
Sprattus sprattus	Sprat	2	-	-	2
Taurulus bubalis	Long-spined sea scorpion	2	-	-	2
Pollachius pollachius	Pollack	1	1	-	2
Scophthalmus rhombus	Brill	-	-	2	2
Gobiusculus flavescens	Two-spotted goby	2	-	-	2
Salmo trutta	Sea trout	1	-	-	1
Gadus morhua	Cod	-	1	-	1
Myoxocephalus scorpius	Short-spined sea scorpion	-	1	-	1
Spinachia spinachia	Fifteen-spined stickleback	1	-	-	1
Ciliata mustela	Five-bearded rockling	-	1	-	1

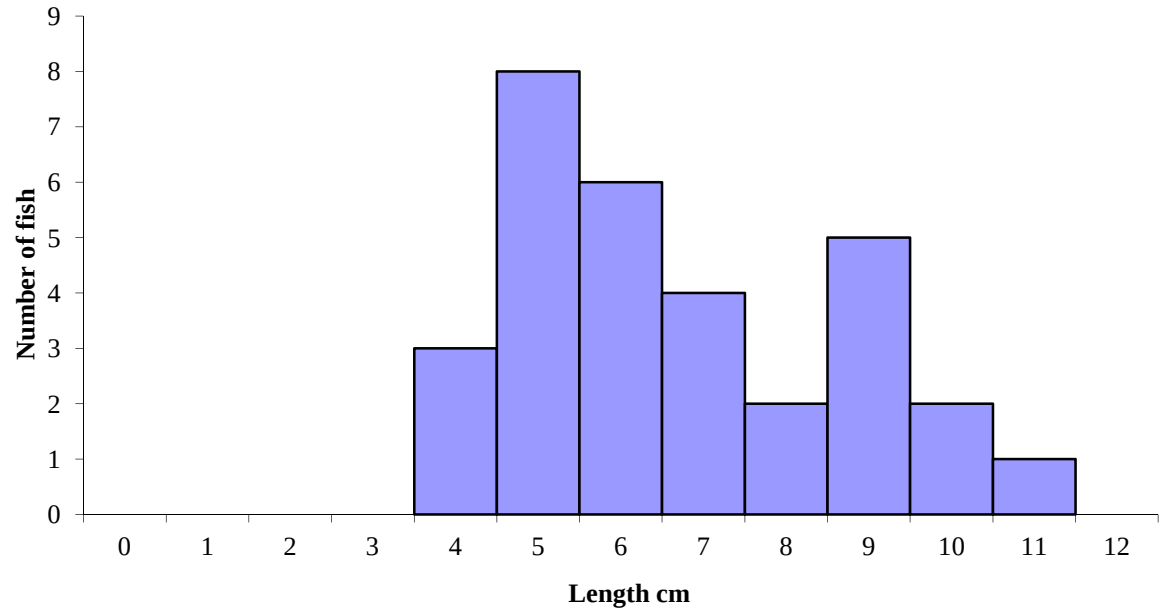

Fig. 3.1. Length frequency distribution of plaice captured in the Bridgetown Estuary, October 2009 (n = 31)

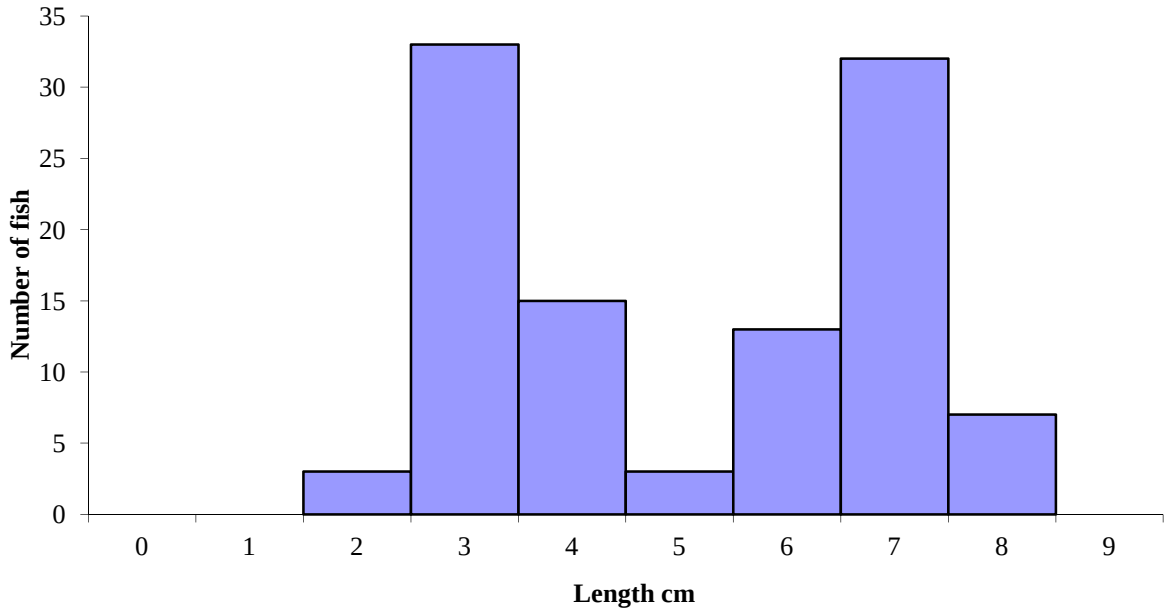

Fig. 3.1. Length frequency distribution of a sub-sample of sand gobies captured in the Bridgetown Estuary, October 2009 (n = 106)

4. SUMMARY

A total of 17 fish species (sea trout are included as a separate 'variety' of trout) were recorded in Bridgetown Estuary, which is second highest species richness of all WFD transitional water bodies surveyed in the ERFB during 2009. Juveniles of a number of species of angling importance were present, including flounder, thick-lipped grey mullet, Pollack, cod and plaice. Species richness and distribution among all transitional water bodies surveyed during 2009 can be found 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, Bridgetown Estuary has been assigned a draft ecological status classification of "Good" based on the fish populations present.

The EPA have assigned Bridgetown Estuary an overall interim draft classification of "Moderate" status, based on general physico-chemical elements, phytoplankton and macroalgal growths.

5. REFERENCES

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