

Tide Mills Small Fish Survey

5th October 2017

Introduction

Tide Mills is situated between Newhaven and Seaford. Mill Creek is a historic section of the River Ouse which is now an intertidal creek with water flow controlled by a flood gate in Newhaven Port (Figure 1).



Figure 1: The location of Mill Creek (Google maps).

Estuaries and sheltered coastal areas are important habitats for a range of small fish species. Some of these are adapted to the specific near-shore conditions and spend their whole life cycles here. Other species use the coastal zone for specific life stages such as nursery areas for juveniles of larger, often commercially important species. Most of the lower reaches of the Ouse have solid man-made structures at their margins. This is unsuitable habitat for small fish. Mill Creek is an area with intertidal mud flats and some salt marsh margin which is ideal for many fish species, as well as marine invertebrates and coastal birds.

Sussex Inshore Fisheries and Conservation Authority (IFCA), with the support of Sussex Wildlife Trust, conducted a one-off fish survey in Mill Creek on 5th October 2017 to investigate the utilisation of the Creek by fish.

Method

A fyke net was used at the eastern end of Mill Creek (Figure 2). The net was set at high tide, facing east, on the western side of the concrete bridge on which once stood a mill (Figure 1). Only the middle culvert was open, the other two being fully blocked. As the tide ebbed, fish leaving the pool to the east of the bridge were caught in the net. The net was collected after 3 hours.

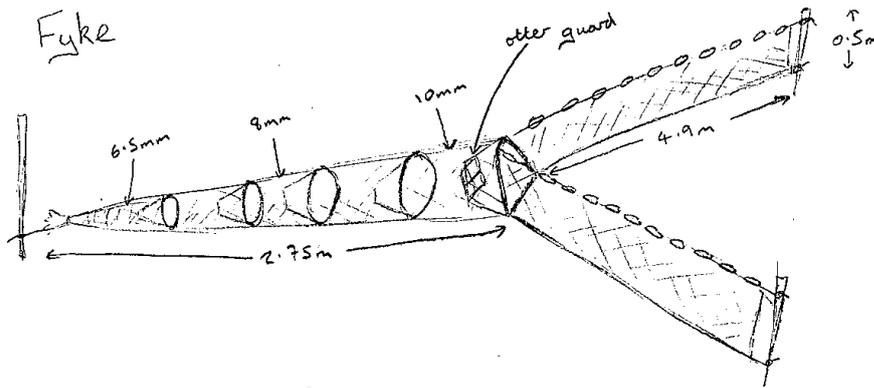


Figure 2: Top: diagram of the fyke net. Bottom left: the mill bridge at low tide. Arrow indicates location of fyke net sampling. Bottom right: setting the fyke net at high tide.

A 22m seine net was used in a small embayment on the north side of Mill Creek (Figure 3), approximately 400m to the west of the fyke net (Figure 1). Two hauls of the seine net were conducted in close succession (as recommended in the IFCA sampling guidelines). Sampling was conducted at high water.



Figure 3: Top: diagram of the seine net. Bottom: conducting the seine netting by wading.

All fish were identified to species level and the first fifty of each species in each sample were measured (total length, nose to tail tip), the rest counted. Conspicuous non-fish species were identified to the highest taxonomical level possible in the field. All samples were returned alive to the creek.

Results

The weather was sunny and warm with a south westerly wind force 4. The water temperature was 16.5°C, dissolved oxygen 9.1mg/l, pH 8.2 and the salinity 34.1psu.

In total, 620 fish were caught but only three species. Bass made up 94.2% of the relative abundance, common goby 5.6% and only one three-spined stickleback was caught (Figure 4).

Common shrimps and shore crabs were also caught. Some of the crabs were soft shelled, having recently moulted. Two of the crabs were engaged in mating behaviour.

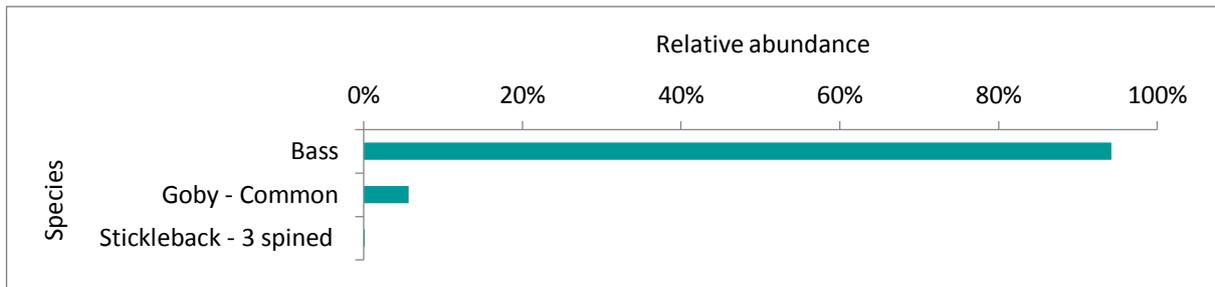


Figure 4: Relative abundance of the three species caught in Mill Creek.

Bass

There are concerns about the stock of bass (*Dicentrarchus labrax*) in European waters and there have been strict restrictions on bass fishing for both commercial and recreational fishers in recent years. Bass spend the first two to three years of their lives in inshore sheltered nursery areas and then a further one to five years in coastal waters before they reach maturity at 4-7 years for males and 5-8 years for females. Some areas around the coast of England are designated Bass Nursery Areas, where fishing activity is restricted to protect juvenile bass.



Bass in Mill Creek were between 42mm and 85mm long, considered to be age group 0, spawned in the spring of 2017 (Figure 5). There were 584 bass, 68% of them caught in the fyke net.

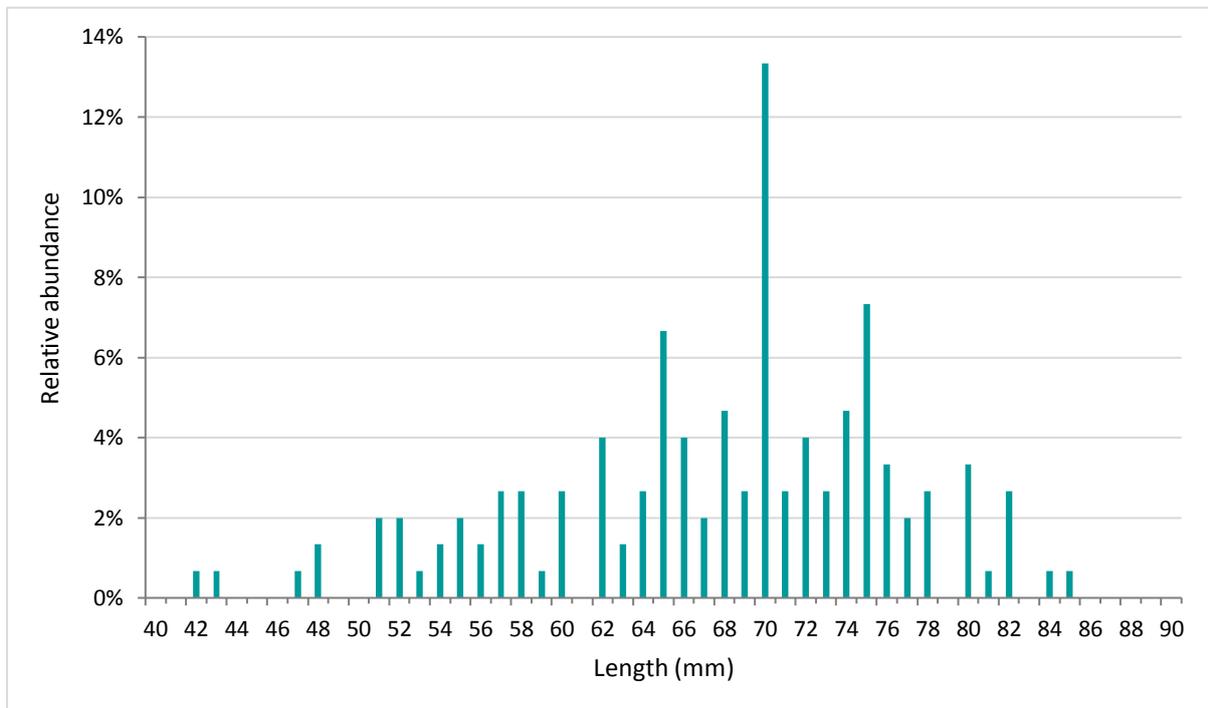


Figure 5: The relative abundance of bass in each size class.

Common goby

Common gobies (*Pomatoschistus microps*) are abundant in coastal and estuarine waters and are tolerant of reduced salinity. They reach a maximum size of 70mm and live for up to two years. They breed between April and August, laying eggs in nests between stones or algae which the male will guard.



There were 35 common gobies caught in Mill Creek, 80% in the seine net. They were between 35mm and 56mm long.

Three-spined stickleback

Three-spined stickleback (*Gasterosteus aculeatus*) can be found in fresh, brackish and salt water. They are named for the three spines on their back. They grow to a maximum length of 100mm.



There was just one caught in Mill Creek and it was 42mm long.

Discussion

Sussex IFCA conducted a one-off survey to ascertain if fish used Mill Creek as habitat and a nursery ground. 94% of the catch was juvenile bass, suggesting that this area is being used as a nursery for early life stage bass. These are a commercially important species with international concern about stock levels. It was positive to see that this area was supporting the next generation of this iconic species. Sussex IFCA has also found juvenile bass on other fish surveys in Chichester Harbour, Pagham Harbour, Medmerry managed realignment site near Selsey, Cuckmere estuary and Rye Harbour beach. It is clear that Sussex coastal waters are important for juvenile bass, as well as many other fish species; over 70 have been found in IFCA fish surveys since 2010. However, a lot of the coast, estuaries and harbours are heavily modified and provide unsuitable habitat. Areas like Mill Creek provide essential habitat for fish and other marine species and should therefore be protected.

This was only a single snapshot of the fish population in Mill Creek and it is unlikely that this was a representative sample of all species which use the Creek. However, this single survey has provided evidence that the Creek is an important habitat.

