River Ems fish surveys, 2021

A brief summary of methods, results and observations.

Introduction

On 12th August, 2021 the Environment Agency Solent & South Downs Area's Analysis & Reporting Team carried out two fish population surveys by single-run electric fishing, using a battery powered backpack. The first was at Mill Meadows Farm (SU7542007095), the second at Deep Springs (SU7649207976). Single-run surveys don't produce a total population estimate but instead indicate a minimum population size, in that we can be fairly sure that not all individuals of each species were captured.

The questions the surveys were designed to address were:

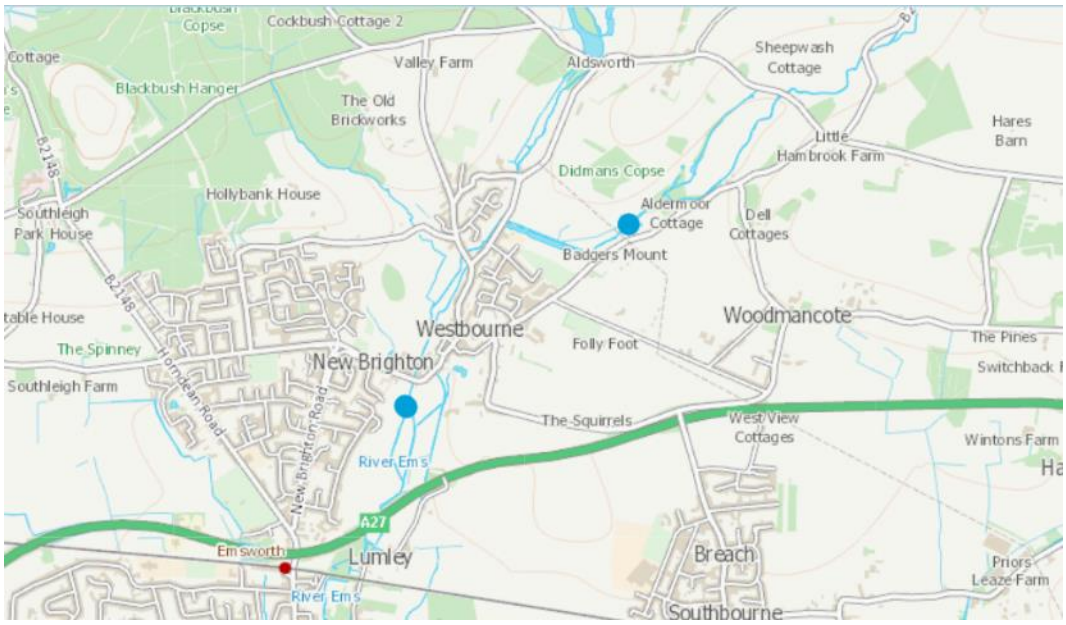
What species comprise the Ems fish community?

What general level of abundance are these species currently at?

For the main species of interest, are there several year classes present?

How do these results compare with previous surveys?

Map 1 shows the 2021 survey locations:



Map 1: 2021 R. Ems fish survey locations

Backpack electric fishing survey in progress at Deep Springs.

Long-sleeves & face visors are Covid control measures for close-proximity working.

Part of the juvenile wild brown trout *Salmon trutta* catch from Mill Meadows

Results

Table 1 gives the numbers of each species caught at the two surveys sites:

Species	Mill Meadows	Deep Springs
Brown trout	38	11
European eel	8	15
Pike	0	3
Bullhead	25	15
Ten-spined stickleback	0	2

Table 1: Survey catch by species

Table 2 gives the mean, maximum & minimum brown trout lengths (mm) at each site:

	Mill Meadows	Deep Springs
Mean length mm	133	92
Max length mm	319	103
Min length mm	60	81

Table 2: Brown trout descriptive statistics

A mature Mill Meadows European eel *Anguilla anguilla*

A young pike *Esox lucius* from Deep Springs

Figure 1 is a stacked bar chart, putting the two most recent surveys in the context of all previous River Ems fish surveys conducted by the EA. The bars represent fish density per species, that is, the number of individuals per 100m^2 (10 x 10m); this allows reasonable comparison between sites of differing length and channel width. The site name, month and year of each survey is given in the x axis labels.

Table 3 provides the grid references for each survey site.

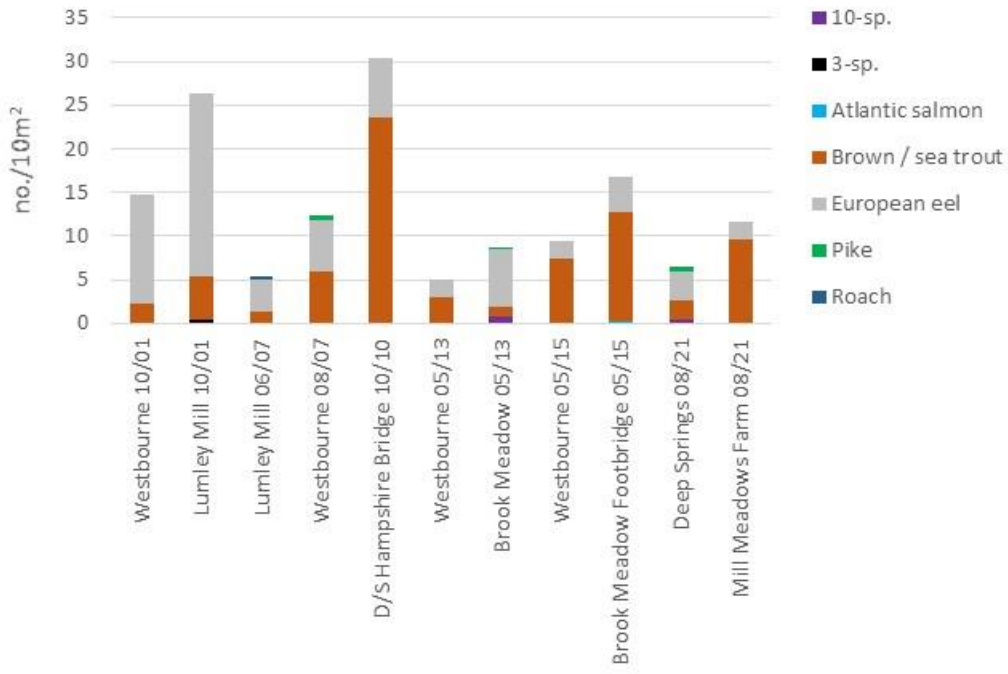


Figure 1: Fish density per species at all R. Ems survey sites.

Table 3: Site grid references:

Brook Meadow	SU7506305987
Brook Meadow Footbridge	SU7505506271
D/S Hampshire Bridge	SU7544407209
Deep Springs	SU7649207976
Lumley Mill	SU7529806491
Mill Meadows Farm	SU7542007095
Westbourne	SU7567807789

General survey observations:

- The brown trout abundance, condition and diversity of age groups recorded at Mill Meadows is comparable with some of the best quality chalkstreams elsewhere in Solent & South Downs Area. The site clearly provides the species with the range of habitats it needs to thrive, as well as a lack of disturbance, which is often underrated as an influence on fish populations.
- The abundance of one and two year old trout at Mill Meadows suggests that sea trout may be an important component of the population at this site: a proportion of these fish can be expected to smolt & migrate to sea in March / April each year.

- The aquatic habitat, the richness of the chalkstream plant community and the water quality at Deep Springs were remarkably good. However, we noted that slightly more water velocity would be preferable to improve the habitat for trout; this would require either a degree of channel narrowing, or preferably, consistently elevated flow.
- The Deep Springs catch demonstrated successful spawning and recruitment of brown trout, but adults were notable by their absence despite the presence of multiple pools providing good adult habitat. Given the apparent constraints on migratory access to this reach (sea trout), it's likely that the resident population is largely dependent on a small number of broodstock, none of which were caught on this occasion. A particular feature of such isolated populations is their increased risk of extinction as a result of unusually high mortality events, for example, drought or pollution.
- Ten-spined stickleback were recorded at Deep Springs – locally, this species is typically found in the vegetated margins of chalkstream headwaters, so it's presence in the Ems is welcome and another indication of natural habitat conditions.

A ten-spined stickleback *Pungitius pungitius* from Deep Springs - the number of spines can vary between 8 and 12 and it is often referred to as the nine-spined stickleback.

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