

# Fish population survey report

River Chelmer, 2016

This report provides a summary of results from recent fish population surveys on the River Chelmer between Great Dunmow and Chelmsford. The surveys were carried out to assess the health of the river and enable successful management of our principal fisheries.



Photograph of fish being released back into the River Chelmer after the Camsix Farm survey.

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<b>Date</b>	April 2017
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<b>Sign-off date</b>	April 2017

Ecology Chemistry Fish

**Analysis and Reporting**  
Analysis, Interpretation, Presentation





## Survey results

During the 2016 surveys there were a number of factors that need to be considered when reviewing the data collected from the River Chelmer. These factors include:

- Dense patches of macrophyte coverage at Chelmsford Viaduct and Little Waltham sites may have influenced fish capture success. Thick plant coverage and overhanging tree branches can obstruct the line of sight of the survey team and therefore reduce fish detection and capture efficiency. Density and biomass data collected from these sites should therefore be viewed as a guide.
- A fallen tree across the river at Croxtons prevented the survey team from accessing the historical survey site in its entirety. The site was shortened by 40m and so not all habitats within the section could be sampled.

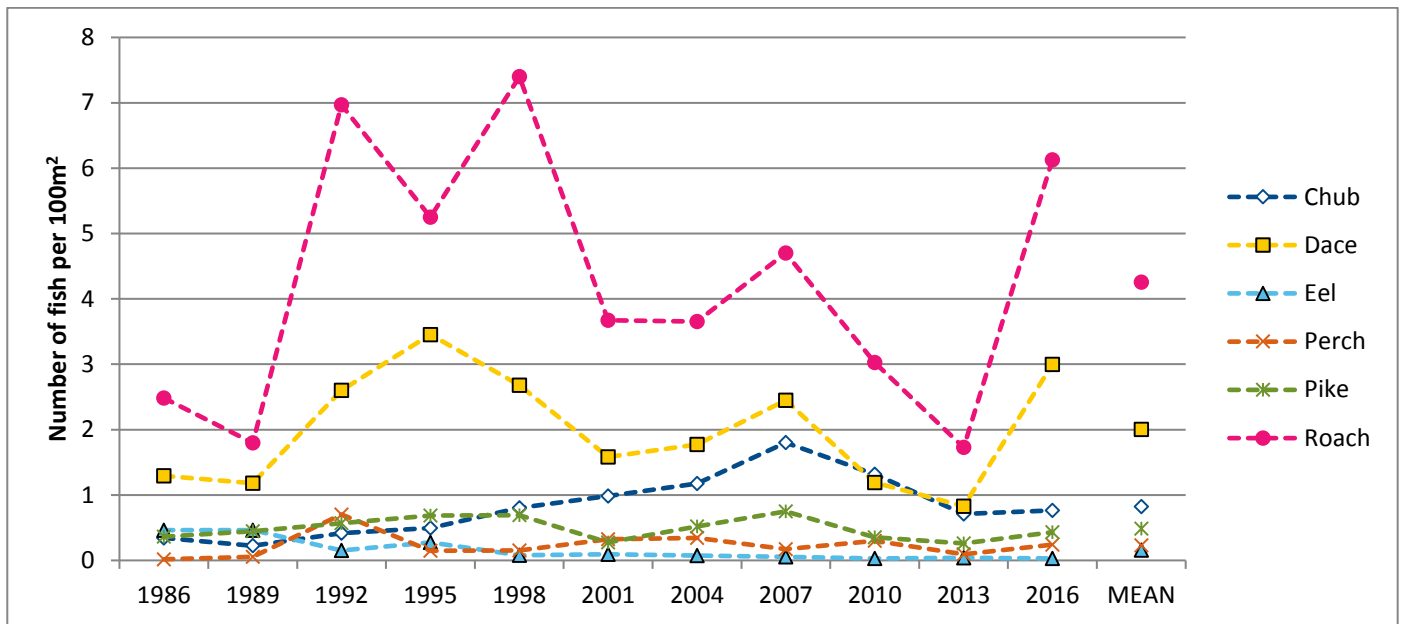
**Table 1. Population density estimates (number of fish per 100m<sup>2</sup>) and size range (min – max, mm) recorded during the survey for key species.**

	Chub		Dace		Perch		Pike		Roach	
	Density	Size range	Density	Size range	Density	Size range	Density	Size range	Density	Size range
<b>Chelmsford Viaduct</b>	0.06	135	3.0	46-122	0.8	151-266	0.9	122-385	22.1	32-269
<b>u/s Croxtons</b>	-	-	0.2	134-142	0.2	204-209	0.9	280-528	2.0	56-200
<b>Little Waltham</b>	0.4	444-502	0.1	35	0.6	205-254	0.4	350-586	4.0	88-269
<b>Warners Farm</b>	-	-	1.1	37-118	-	-	0.2	513-634	0.4	29-80
<b>Littley Park</b>	2.0	113-423	5.7	50-228	-	-	0.1	481	4.6	80-228
<b>Camsix Farm</b>	1.1	43-448	9.3	49-272	-	-	0.1	545	3.2	76-243
<b>Felstead</b>	2.5	72-434	1.6	44-211	0.3	195-230	0.9	489-629	12.4	45-306
<b>Langleys Dunmow</b>	0.1	208	2.9	40-237	-	-	-	-	0.2	180-196

Table 1 shows the population density estimates (number of fish per 100m<sup>2</sup>) and size ranges of the five most abundant fish species of angling interest recorded during the River Chelmer surveys. The largest fish from the surveys were:

- a chub measuring 502mm (3lb 8oz or 1.6kg) at Little Waltham.
- a dace measuring 272mm (9oz or 256g) at Camsix Farm.
- a perch measuring 266mm (13oz or 368g) at Chelmsford Viaduct.
- a pike measuring 634mm (5lb 1oz or 2.3kg) at Warners Farm.
- a roach measuring 306mm (1lb 5oz or 610g) at Felstead.

**Figure 2. Population density estimates (number of fish per 100m<sup>2</sup>) across all survey sites since 1986.**



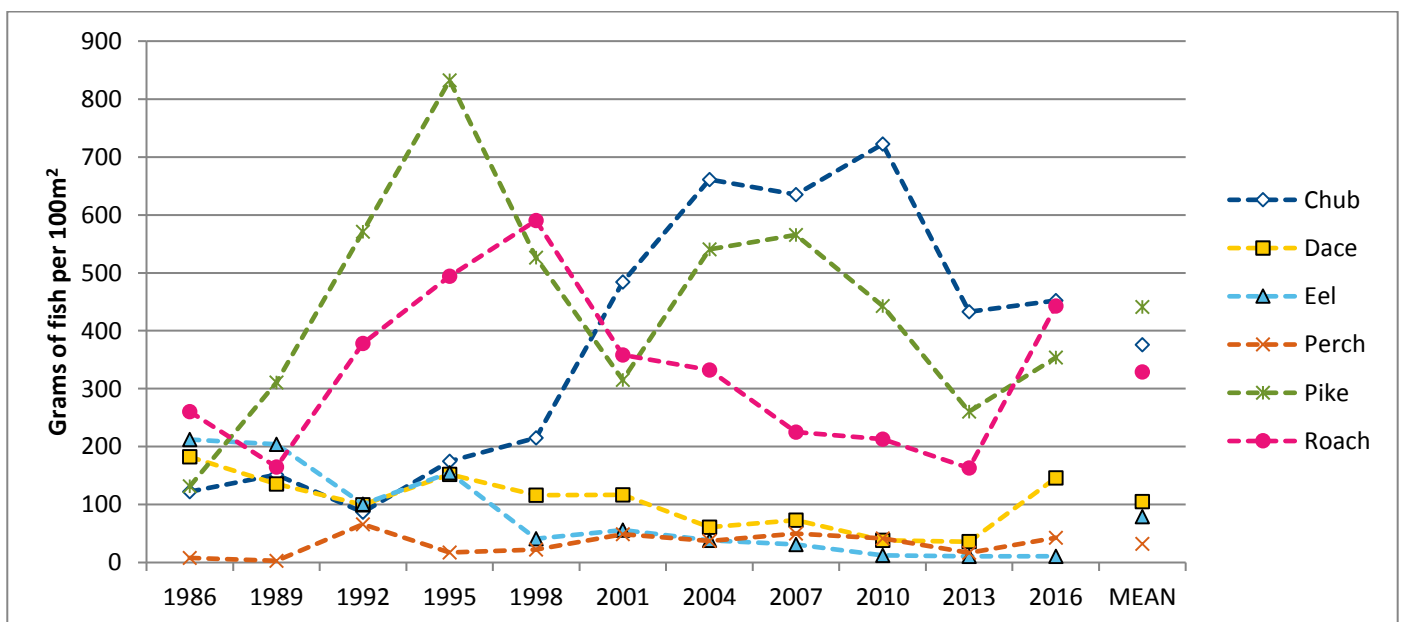
Roach numbers have improved since 2013 when the species registered an all-time density low of 1.7 fish per 100m<sup>2</sup>. The roach population density estimate is now at 6.1 fish per 100m<sup>2</sup>, which is 1.5 times higher than the species long-term density average (Figure 2).

Like roach, dace numbers have also seen a marked improvement since 2013 after they too recorded an all-time species low, 0.8 fish per 100m<sup>2</sup>. Dace population density estimate is currently 3 fish per 100m<sup>2</sup>, the species second highest population density estimate after 3.5 fish per 100m<sup>2</sup> attained in 1995.

After a species high in 2007, chub population density estimate appears to have levelled out at 0.8 fish per 100m<sup>2</sup>, in line with the species long-term sampling average.

Perch and pike species have both had small density increases since the last surveys and are currently in line with their respective long-term averages.

**Figure 3. Population biomass estimates (grams of fish per 100m<sup>2</sup>) across all survey sites since 1986.**



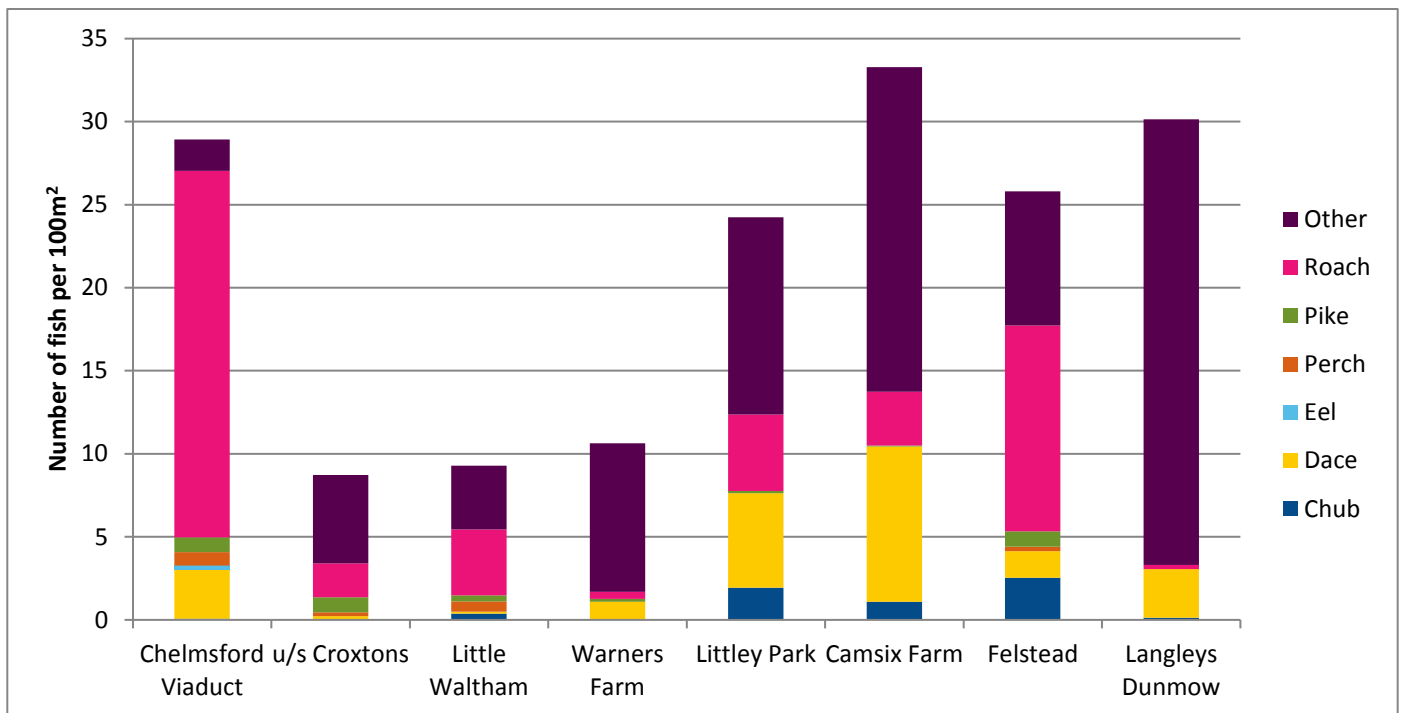
Following a small increase since 2013 chub biomass has reached 451 grams per 100m<sup>2</sup>, and is now above the species long-term average, 376 grams per 100m<sup>2</sup> (Figure 3). Chub continue to account for the greatest percentage share of total standing crop composition in the River Chelmer with 28%, closely followed by roach with a 27% share.

Unsurprisingly roach biomass has also seen a sizeable increase since 2013 given the large improvement in roach density. Roach biomass has increased from 163 grams per 100m<sup>2</sup> in 2013 to 442 grams per 100m<sup>2</sup> in 2016.

Dace attained a biomass of 146 grams per 100m<sup>2</sup>, the species' third highest biomass value on record. Again this does not seem out of the ordinary given the vast improvement in dace density since 2013.

As a result of the small density increases in both perch and pike populations, biomass estimates have risen for both species. Perch biomass is now above the species long-term average whilst pike biomass is approaching the species' long-term average estimate.

**Figure 4. Population density estimates (number of fish per 100m<sup>2</sup>) across all survey sites in 2016.**



Since 2013 there has been a marked increase in fish density across all eight of the survey sites. However fish densities at u/s Croxtons, Little Waltham and Warners Farm remain noticeably lower than the other five sites.

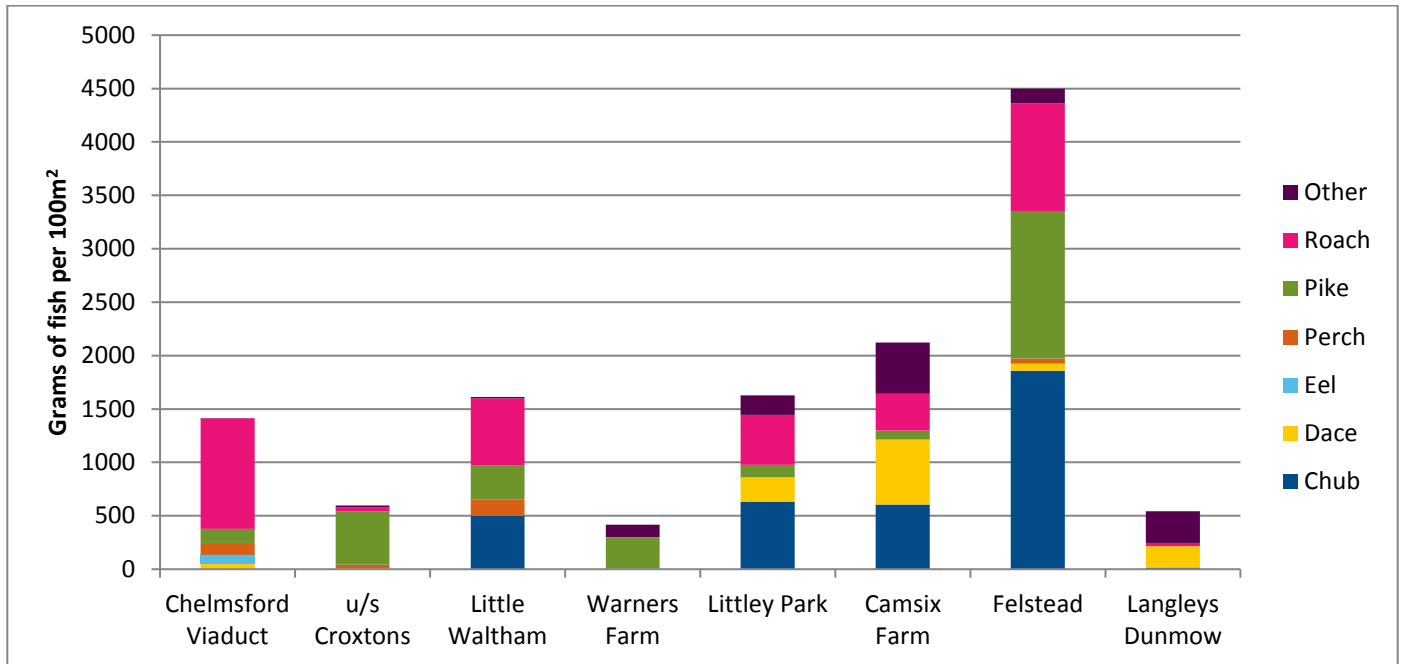
Roach numbers have increased across all survey sites since 2013, but the most substantial roach densities continue to be found at Chelmsford Viaduct and Felstead (Figure 4). Chelmsford Viaduct is predominantly a deep, wide, slow flowing site with plenty of cover from macrophytes and tree branches. Felstead although not as wide, offers similar habitat to Chelmsford Viaduct with the added benefit of being close to a sewage treatment works, a potential source of additional nutrients, ideal for good roach numbers.

Dace densities were at their greatest at Camsix Farm and Littley Park, but dace numbers have generally improved across all sites since 2013. In particular, both Camsix Farm and Littley Park have tree communities that provide a good mosaic balance between light and shaded areas, good invertebrate communities, and substrate structures which include more gravel and coarse sand; all of which are preferred by dace and would account for the higher densities at these sites.

“Other” species have also increased greatly over the past 3 years. Warners Farm and the four sites upstream have seen the largest increases in “other” species. Bullhead are the dominant “other” species at Langleys Dunmow with 19.5 fish per 100m<sup>2</sup> followed by minnow with 5.1 fish per 100m<sup>2</sup>, whilst minnow are the dominant smaller species elsewhere. Minnow are a species lower down on the food chain; with their

increased density there is potential for larger piscivorous fish species to exploit minnow as a food source and become more abundant themselves.

**Figure 5. Population biomass estimates (grams of fish per 100m<sup>2</sup>) across all survey sites in 2016.**



Total fish biomass was greatest at Felstead with 4.5kg of fish per 100m<sup>2</sup>. The majority of this weight came from chub 1.9kg per 100m<sup>2</sup> and pike with 1.3kg of fish per 100m<sup>2</sup>. Roach also contributed a notable amount with 1kg of fish per 100m<sup>2</sup> (Figure 5).

Despite catching the second highest density of fish at Langleys Dunmow, the site only achieved a total of 543 grams fish per 100m<sup>2</sup>. This was due to 82% of the catch comprising of bullhead and minnow.

Chelmsford Viaduct also attained a high density of fish but only achieved a biomass of 1.4kg fish per 100m<sup>2</sup>. The catch mostly consisted of small roach (less than 110mm in length), and therefore clarifies the relatively low biomass at the site when compared to fish density.

Croxtons, Little Waltham and Warners Farm were the bottom three sites for density of fish sampled on the River Chelmer. Regardless of this, Little Waltham performed well in terms of total fish biomass when compared to the other sites on the River Chelmer. This is mainly attributed to the large chub recorded at the site, which included the biggest chub encountered on the River Chelmer in 2016.

## WFD Classification

The purpose of the Water Framework Directive (WFD) is to protect and improve inland surface waters, estuaries, coastal waters and groundwaters, and attain good ecological status by 2027. The overall ecological status of each inland surface water/waterbody is determined by a number of ecological elements including water quality, fish, invertebrates, macrophytes and hydromorphology. Each of these elements are investigated, graded and assigned one of the five ecological classes - bad, poor, moderate, good or high. The lowest of these classes across the elements ultimately determines the overall ecological status of the river.

The 2015 ecological classification for the River Chelmer between Great Easton and Chelmsford was Moderate. While invertebrates attained a high classification and hydromorphology supports good; fish, macrophytes and water quality classifications were less than good and resulted in the overall moderate classification.

Given the improvements in both the number of species present and densities of fish at each sampling site during the 2016 surveys, it is likely the classification for fish will improve.

## Health of fish population

The River Chelmer has seen an improvement in both density and biomass estimates since the eight sites were last surveyed in 2013. Total average fish density has increased from 6.3 fish per 100m<sup>2</sup> to 21.4 fish per 100m<sup>2</sup>, a growth of 340%. While total biomass has risen from 947 grams per 100m<sup>2</sup> to 1.6kg per 100m<sup>2</sup>, an increase of 169%.

Species abundance in the River Chelmer has also improved since 2013 with seven of the eight sites having 8 or more species present. Felstead had the greatest species diversity with 14 different species. Littley Park had the lowest species diversity with 7.

There have been marked population improvements across most species in the River Chelmer, indicating the fish population as a whole is showing signs of recovery after a poor year in 2013. In particular those showing the biggest density increases, in terms of species of angling interest, are roach and dace. From a smaller species perspective, minnow have experienced the largest population expansion.

Five sites in the River Chelmer attained more than 24 fish per 100m<sup>2</sup>, however Croxtons, Little Waltham and Warners Farm recorded noticeably fewer, between 5 and 10 fish per 100m<sup>2</sup>. These sites tended to be slow moving, overly wide/deep with either too much shade leading to very little macrophyte growth, or too little shade leading to too much macrophyte growth.

Given the increases in both species diversity and abundance at most of the sites on the River Chelmer, it is likely that the results from the 2016 surveys will cause the moderate WFD fish classification to improve. However it is likely the overall WFD classification for the watercourse will remain below good ecological status owing to pressures of water quality and macrophyte growth.

## Planned actions

In a partnership between the Essex Wildlife Trust, Essex County Council and the Environment Agency, a section of river alongside Chelmer Valley Road (between the Chelmsford Viaduct and Croxtons fish survey sites), was reconnected to the surrounding floodplain. The earthworks were completed in March 2017 and included the installation of a new berm and ditch to re-join the river to the existing floodplain drainage system, and the creation of four shallow scrapes. The reconnection to the drainage ditch will alleviate flood flow whilst the shallow scrapes and berm will increase habitat and species diversity (Photograph 2). An additional fish refuge bay was also created at a point of existing bank erosion to provide an area of still water and refuge for fry and small fish (Photograph 3).

Future works on the site will include the sowing of a wild meadow seed mix and the planting of 1,700 trees. The trees will provide shade, habitat for local wildlife and bank stabilisation in times of flood.

customer service line  
03708 506 506

incident hotline  
0800 80 70 60

floodline  
0345 988 1188  
0845 988 1188



**Photograph 2: Newly constructed berm to increase flow and habitat diversity on the River Chelmer at Springfield Nature Reserve.**



**Photograph 3: The new fish refuge bay created at Springfield Nature Reserve, for fry and small fish to shelter away from the main river flow.**

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0845 988 1188



## Next survey

Summer 2019.

If you would like to discuss the information presented in this report, please contact:

- Jon Diss, Environmental Monitoring Officer, Analysis & Reporting
- 03708 506 506
- [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

If you would like to discuss future management of this fishery, please contact:

- Ben Norrington, Fisheries, Biodiversity & Geomorphology
- 03708 506 506
- [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

Before you go fishing don't forget:

- You must have a valid [Environment Agency rod licence](#) and permission from the fishery owner;
- You must comply with the [fisheries byelaws](#);
- The coarse fish close season (15th March to 15th June inclusive) applies to all rivers, streams and drains in England and Wales but not most stillwaters. Stillwater fishery owners can still have their own close season and rules, so please check with them before setting out.

Report illegal fishing:

If you see any fishing, netting or trapping you think may be illegal, please do not tackle it yourself. Call us immediately on 0800 80 70 60 and tell us:

- Exactly where the alleged offence is taking place;
- What is happening;
- How many people are involved and their descriptions;
- The registration numbers of any vehicles involved.

If you prefer to remain report an environmental crime anonymously call Crimestoppers on 0800 555 111 or <https://crimestoppers-uk.org/give-information/give-information-online/>.