

Fish population survey report

River Chew 2016

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



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Date	23rd March 2017
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Sign-off date	6 th April 2017

Ecology Chemistry Fish

Analysis and Reporting
Analysis, Interpretation, Presentation





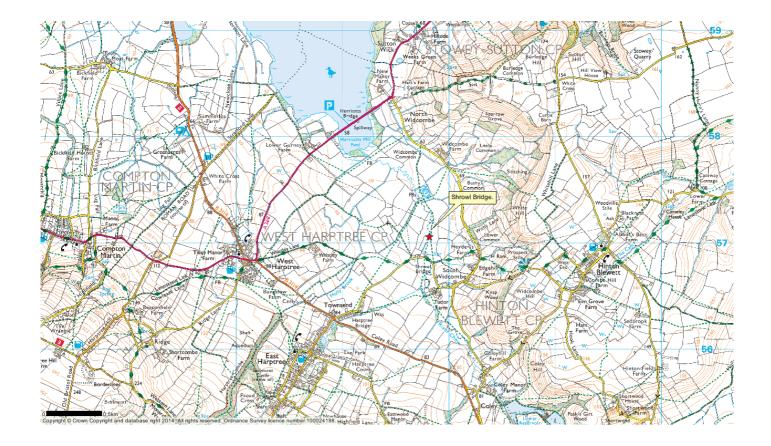


Summary

- 5 sites on the River Chew were surveyed by the Wessex Sampling and Collection Team during July 2016;
- Shrowl Bridge and Pensford survey sites were selected as part of the Core Fish Monitoring Programme to monitor and assess the health of wild brown trout populations. All other sites covered in this report are intended for the purpose of monitoring all fish populations.
- 15 species of fish were recorded and a total of 542 fish were captured;
- Brown trout were the most widespread species, being recorded at all 5 sites;
- An average total density estimate of 22.2 fish per 100m² and biomass estimate of 1589 grams per 100m² were recorded across all sites;
- Brown trout were the most numerous species and also had the highest biomass.

Site locations





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Survey results

Shrowl Bridge



Shrowl Bridge is the uppermost site surveyed on the River Chew catchment.

The survey site is 1.8km upstream of Chew Valley Lake into which the River Chew discharges close to Herriott's Bridge. Consisting riffle, pool and glide over a gravel substrate this makes for an ideal habitat for salmonid recruitment.

The survey was conducted by electric fishing a 120m length of river enclosed by stop nets to obtain an accurate account of numbers and species of fish present.

Brown trout (13 individuals) represented 27% of the catch but were surpassed by a naturally occurring rainbow trout population of 17 fish and 35% of the overall catch. Brook lampreys (18) were recorded along with bullheads and 3-spined sticklebacks.

Shrowl Bridge	ST5782057100	Minimum	Maximum	Mean	Numbers	% of Catch	Weight	% of Catch
21/07/2016		Length (IF)	Length (IF)	Length (IF)	Caught	by Number	Caught	by Weight
Brown / sea trout [Salmo trutta]		82	238	138	13	27.08	588.61	26.36
Rainbow trout [Oncorhynchus mykiss]		93	298	186	17	35.42	1644.77	73.64
Lamprey sp. ammocoe	etes [Petromyzontidae]	80	140	113	18	37.5		

All weights estimated and calculated in grams.

Stanton Drew



Approximately 5km below Chew Valley Lake the depositing nature of the river at this location has allowed for high levels of macrophyte growth. Surveying by electric fishing is often difficult in such conditions and particularly challenging when trying to extract eels from dense, submerged macrophyte cover.

Measuring approximately 112m in length and 5.5m wide the site is predominantly a straight glide with few refuge areas for fish (other than the cover provided by the dense macrophyte growth). The site is generally open with some shade provided by marginal shrubs and a high beech tree canopy.

This was a poor catch by normal standards however, it was unusually diverse in fish species for this type of habitat. Eels (27) provided the highest catch by number whilst brown trout (5) had the highest biomass at 1,126grams representing 44.7% of the overall survey weight. Aside from minor species, other key species included dace (2), gudgeon (4),tench (1) and crucian carp (1).

Stanton Drew ST5997063510	Minimum	Maximum	Mean	Numbers	% of Catch	Weight	% of Catch
19/07/2016	Length (IF)	Length (IF)	Length (IF)	Caught	by Number	Caught	by Weight
Brown / sea trout [Salmo trutta]	152	294	251	5	12.2	1126.62	44.7
Dace [Leuciscus leuciscus]	155	159	157	2	4.88	94.94	3.77
Crucian carp [Carassius carassius]	114	114	114	1	2.44	28.59	1.13
Gudgeon [Gobio gobio]	105	127	115	4	9.76	72.78	2.89
Tench [Tinca tinca]	269	269	269	1	2.44	285.32	11.32
European eels > elvers [Anguilla anguilla]	150	595	223	27	65.85	912.01	36.19
Lamprey sp. ammocoetes [Petromyzontidae]	100	100	100	1	2.44		

All weights estimated and calculated grams.

Pensford



The river at Pensford differs greatly from Stanton Drew, generally having higher flow conditions which is better suited for salmonid species. Deep and shallow glides over a cobble, gravel and substrate and with an abundance of low tree cover provides the perfect habitat for brown trout.

When combined, eel and elver catches provide the highest species count at 81 with brown trout at 78. Together both species represent over 80% of the catch by number, brown trout, alone provide nearly 80% of the catch by weight.

Pensford ST6183863832 06/07/2016	Minimum Length (IF)	Maximum Length (IF)	Mean Length (IF)	Numbers Caught	% of Catch by Number	Weight Caught	% of Catch by Weight
Brown / sea trout [Salmo trutta]	133	404	224	78	41.27	13314.93	77.89
Rainbow trout [Oncorhynchus mykiss]	364	364	364	1	0.53	417.04	2.44
Dace [Leuciscus leuciscus]	145	218	173	23	12.17	1585.65	9.28
Grayling [Thymallus thymallus]	249	249	249	1	0.53	153.41	0.9
Gudgeon [Gobio gobio]	127	131	129	2	1.06	50.82	0.3
Roach [Rutilus rutilus]	173	173	173	1	0.53	81.39	0.48
Perch [Perca fluviatilis]	129	129	129	1	0.53	28.11	0.16
European eels > elvers [Anguilla anguilla]	120	515	200	60	31.75	1462.57	8.56
European elvers [Anguilla anguilla]	100	120	111	21	11.11		
Lamprey sp. ammocoetes [Petromyzontidae]	65	65	65	1	0.53		

All weights estimated and calculated in grams.

Compton Dando



Compton Dando, is located towards the mid/lower end of the catchment and features riffles, pools and glides as its main characteristics. The survey site below the river bridge is wide and shallow at the head deepening as the site progresses downstream to the gauging station.

In recent years salmon have spawned in the River Chew and its tributaries and during 2016 survey 30 parr were recorded in the survey catch.

Brown trout (80) were at their highest levels in recent surveys, more than double the previous high catch of 38 in 2003. Dace (58) were also above the long term average of 44 for the site, however, chub were absent on this occasion. Unlike Pensford, the Grayling population has increased to 11 from a site average of 6.

Compton Dando	ST6473064690	Minimum	Maximum	Mean	Numbers	% of Catch	Weight	% of Catch
07/07/2016		Length (IF)	Length (IF)	Length (IF)	Caught	by Number	Caught	by Weight
Brown / sea trout [Sal	mo trutta]	53	320	185	80	43.01	7503.57	49.43
Atlantic salmon [Salm	o salar]	56	181	128	30	16.13	792.79	5.22
Dace [Leuciscus leuci	scus]	122	240	188	58	31.18	5212.41	34.34
Grayling [Thymallus th	nymallus]	67	300	211	11	5.91	1406.58	9.27
European eels > elver	s [Anguilla anguilla]	140	420	258	6	3.23	265.58	1.75
Lamprey sp. ammoco	etes [Petromyzontidae]	150	150	150	1	0.54		

All weights estimated and calculated in grams.

Keynsham Park

This is the lowest site surveyed in the River Chew catchment and close to the confluence with the Bristol Avon. The sedentary river characteristics are influenced by the weir below Chew Bridge approximately 250 downstream. Too deep for wading, the survey at this site is conducted by boat over a length of approximately 100m.

The river being deeper and slower through Keynsham Park is better suited for coarse fish and is reflected in the catch. Roach, gudgeon, dace and chub were the dominant species providing approximately 90% of the total by number. Roach (39) were most numerous with an average length of 169mm, whilst chub represented 36% of the catch by weight with 27 fish weighing a total of 4,544grams.

Barbel featured in the catch for the first time with three fish between 205mm and 220mm recorded. Eels (5), brown trout (3) and perch (1) made up the remainder of the total.

Keynsham Park	ST6567068190	Minimum	Maximum	Mean	Numbers	% of Catch	Weight	% of Catch
21/03/17		Length (IF)	Length (IF)	Length (IF)	Caught	by Number	Caught	by Weight
Brown / sea trout [Salm	o trutta]	183	340	266	3	2.38	865.48	7.02
Barbel [Barbus barbus]		205	220	213	3	2.38	328.19	2.66
Chub [Leuciscus cephal	us]	76	422	192	27	21.43	4544.66	36.84
Dace [Leuciscus leucisc	us]	45	217	154	22	17.46	1311.13	10.63
Gudgeon [Gobio gobio]		53	125	93	26	20.63	268.29	2.17
Roach [Rutilus rutilus]		65	270	169	39	30.95	4272.48	34.63
Perch [Perca fluviatilis]		283	283	283	1	0.79	368.61	2.99
European eels > elvers	[Anguilla anguilla]	123	410	321	5	3.97	377.93	3.06

All weights estimated and calculated in grams.

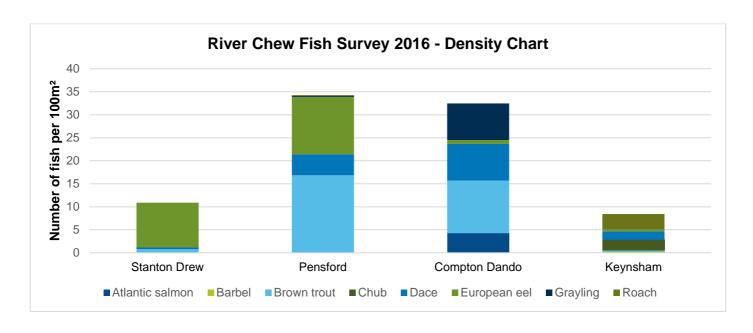
Catch Results 2016

Population density estimates (number of fish per 100m²) and size range (min – max, mm) recorded during the survey for key species.

		Shrowl Bridge	Stanton Drew	Pensford	Compton Dando	Keynsham Park
Atlantic salmon	Density	0	0	0	4.26	0
	Size range	0	0	0	56 – 181	0
Barbel	Density	0	0	0	0	0.25
	Size range	0	0	0	0	205-220
Brown trout	Density	3.026	0.81	16.84	11.42	0.25
	Size range	82 - 238	152-294	133 - 404	53 - 320	183 - 340
Rainbow trout	Density	3.958	0	0	0	0
	Size range	93 - 298	0	0	0	0
Chub	Density	0	0	0	0	2.33
	Size range	0	0	0	0	76 - 422
Dace	Density	0	0.35	4.055	7.98	1.83
	Size range	0	155 - 159	145 – 218	122 - 240	45 - 217
European eel	Density	0	9.75	16.63	0.83	0.48
	Size range	0	150 – 595	100 - 515	140 - 420	123 - 410
European elvers	Density	0	0	4.16	0	0
	Size range	0	0	100 - 120	0	0
Grayling	Density	0	0	0.20	7.98	0
	Size range	0	0	249	67 - 300	0
Roach	Density	0	0	0.20	0	3.33
	Size range	0	0	173	0	65 - 270
Crucian Carp	Density	0	0.162	0	0	0
	Size range	0	114	0	0	0
Tench	Density	0	0.162	0	0	0
	Size range	0	269	0	0	0
Brook Lamprey	Density	15.598	0.162	0.198	0.138	0
	Size range	80 - 140	100	65	150	0

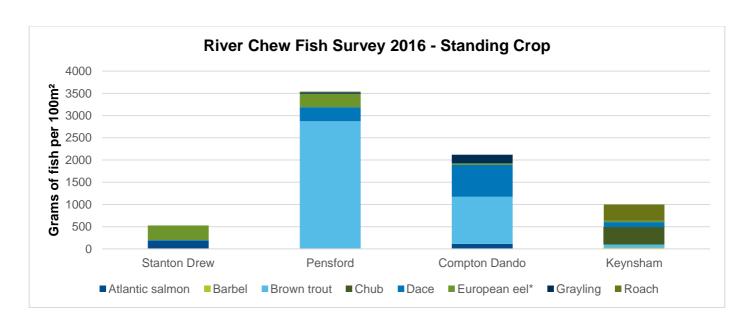
2016

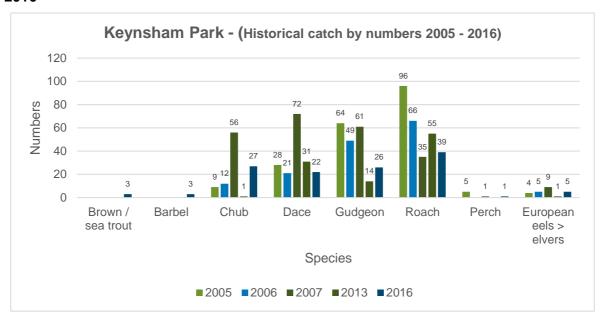
Population density estimates (number of fish per 100m²) across all survey sites (key species).



2016

Population biomass estimates (grams of fish per 100m²) across all survey sites (key species).



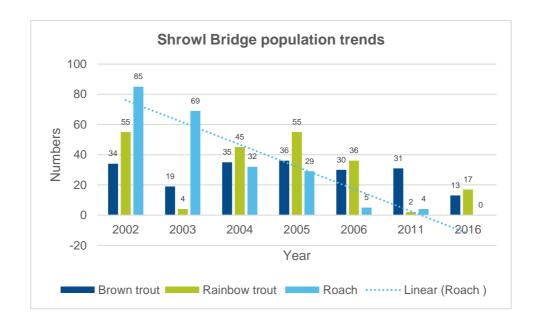


WFD Classification

WFD classification						
Site name	Waterbody	Fish				
Shrowl Bridge Moderate Good						

Health of fish population

Naturally breeding rainbow trout have been observed at **Shrowl Bridge** since surveys commenced in 2002. The origins of the population are not fully understood however, stocking by angling clubs and the close proximity to Chew Valley Lake (which is stocked with rainbow trout) may have played a part. Roach, once common at his site, have been in steady decline since the first survey, the most recent survey recorded a zero count as demonstrated on the chart below.



Historical survey data

Name		Shrowl B	ridge (Te)	
Date	07/05/2003	20/07/2004	30/06/2005	21/07/2016
Length	120	120	100	121
Width	3.7	3.7	4.9	3.55
NGR		ST5782	2057100	
Species				
Brown / sea trout [Salmo trutta]	19	35	36	13
Chub [Leuciscus cephalus]	0	0	1	0
Lamprey sp. [Petromyzontidae]	0	0	1	0
Lamprey sp. Ammocoetes	0	0	0	18
Perch [Perca fluviatilis]	1	1	0	0
Rainbow trout [Oncorhynchus mykiss]	4	45	55	17
Roach [Rutilus rutilus]	69	32	29	0
Tench [Tinca tinca]	0	0	1	0
Numbers caught	93	113	123	48
Estimated density (100m²)	122	113	129	97
Estimated biomass (grams)	27.477	25.45	26.327	22.582
Estimated standing crop (grams/100m²)	12621.11	9974	16846.94	2233.38

Eels infrequently feature as a dominant species in surveys however, **Stanton Drew** and Pensford are exceptions in 2016. Dace, roach and gudgeon were once more prolific at this location but have been in steady decline of late. The decline may partly be attributed to a site move of approximately 40m upstream due to health and safety concerns with the lower end of the site where the water is deeper.

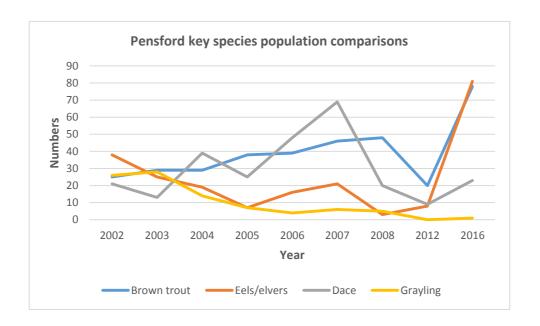
Historical survey data

Name				Stanton	Drew (Te)			
Date	10/08/2006	23/08/2007	31/07/2008	08/09/2009	15/07/2010	21/08/2012	23/07/2014	19/07/2016
Length	100	93	100	96.5	102	100	104	112
Width	6	5	6	5	5.25	6	5.8	5.5
NGR	ST5997063	3£T599366353	38					
Species								
3-spined stickleback [Gasterosteus aculeatus]	0	0	0	0	38	23	8	0
Brown / sea trout [Salmo trutta]	6	3	7	9	9	4	8	5
Bullhead [Cottus gobio]	0	0	0	0	153	203	130	0
Dace [Leuciscus leuciscus]	12	25	27	23	3	0	0	2
European eels > elvers [Anguilla anguilla]	14	13	7	25	5	40	10	27
European elvers [Anguilla anguilla]	0	0	0	0	3	1	0	0
Gudgeon [Gobio gobio]	21	34	14	18	8	11	6	4
Lampetra sp. [Lampetra]	0	0	0	0	0	2	0	0
Lamprey sp. [Petromyzontidae]	0	0	0	6	0	0	0	0
Lamprey sp. ammocoetes [Petromyzontidae]	0	0	0	0	0	0	2	1
Minnow [Phoxinus phoxinus]	0	0	0	0	34	23	104	0
Perch [Perca fluviatilis]	2	0	0	0	0	0	0	0
Rainbow trout [Oncorhynchus mykiss]	2	1	6	1	0	1	6	0
Roach [Rutilus rutilus]	7	31	13	3	0	3	2	0
Rudd [Scardinius erythrophthalmus]	0	0	0	0	0	1	0	0
Stone loach [Barbatula barbatula]	0	0	0	0	0	2	1	0
Tench [Tinca tinca]	0	0	0	0	0	0	2	1
Numbers caught	64	107	74	85	253	314	279	41
Estimated density (/100m²)	11.5	28.4	14.5	18.0	78.6	77.8	57.5	12.0
Estimated biomass (grams)	6525.6	7538.5	7714.0	7311.6	1935.2	4426.2	4995.3	3634.9
Estimated standing Crop (grams/100m²)	1087.6	1621.2	1285.7	1515.4	361.4	737.7	828.1	590.1

Eels and brown trout dominated the species count at **Pensford** in 2016 but this has not always been the case. Dace topped the head count in 2006 and 2007 but a reduction in the count coincided with the increase in brown trout and eel. Other species have also steadily declined notably grayling, where in 2003 28 were recorded in the catch only 1 was found in 2016.

The lower Chew is stocked with triploid (sterile) brown trout and rainbow trout by angling clubs to boost catches. This tradition has been on-going for many years with a switch from diploid (fertile) to triploid stocked fish in 2015 to help retain the genetic integrity of the wild trout stocks in the river. Unlike Shrowl Bridge in the upper Chew, there is no evidence of a naturally breeding rainbow trout population in the mid/lower reaches of the catchment.

Pensford



Historical survey data

Name			Pensford (Te)	
Date	09/08/2006	22/08/2007	26/08/2008	04/09/2012	06/07/2016
Length	100	100	100	100	99
Width	5.1	5.1	5.1	5.1	5.1
NGR		S	T618506398	80	
Species					
Brown / sea trout [Salmo trutta]	39	46	48	20	78
Bullhead [Cottus gobio]	0	0	0	55	0
Chub [Leuciscus cephalus]	1	0	0	0	0
Dace [Leuciscus leuciscus]	48	69	20	9	23
European eels > elvers [Anguilla anguilla]	16	20	3	8	60
European elvers [Anguilla anguilla]	0	1	0	0	21
Grayling [Thymallus thymallus]	4	6	5	0	1
Gudgeon [Gobio gobio]	7	4	2	0	2
Lamprey sp. ammocoetes [Petromyzontidae]	0	0	0	0	1
Minnow [Phoxinus phoxinus]	0	0	0	3	0
Perch [Perca fluviatilis]	0	0	0	0	1
Rainbow trout [Oncorhynchus mykiss]	0	0	1	0	1
Roach [Rutilus rutilus]	4	9	10	0	1
Total Results (No) Table for Number	119	155	89	95	189
Total Results (Cs) Table for Density (/100m²)	23.3	32.0	17.8	21.6	39.4
Total Results (Cs) Table for Weight (g)	13608.0	14793.6	12069.5	5137.2	18362.0
Total Results (Cs) Table for Standing Crop (g/100m²)	2668.2	2900.7	2366.6	1007.3	3636.8

Compton Dando has seen an increase in four key species when compared to historical records. Atlantic salmon parr were first encountered in an Environment Agency survey in 2012 and later in 2016 when 30 fish were recorded. Brown trout numbers have remained fairly constant since the first survey in 2003 however, a steep rise in 2016 saw numbers rise three fold on the previous survey in 2012. As with Pensford, the dace population peaked in 2007 however, the decline at Compton Dando has been minimal. Grayling numbers although moderate are higher than the long term average.

Historical survey data

Name		Con	npton Dando	(Te)	
Date	08/08/2006	10/08/2007	26/08/2008	21/08/2012	07/07/2016
Length	73	91	100	100	95.6
Width	7.9	7.9	7.9	7.9	7.6
NGR		S	T647306469	90	
Species					
Atlantic salmon [Salmo salar]	0	0	0	8	30
Brown / sea trout [Salmo trutta]	27	28	17	23	80
Bullhead [Cottus gobio]	0	0	0	67	0
Chub [Leuciscus cephalus]	4	5	4	3	0
Dace [Leuciscus leuciscus]	42	70	67	49	58
European eels > elvers [Anguilla anguilla]	3	0	0	1	6
European elvers [Anguilla anguilla]	0	0	0	1	0
Grayling [Thymallus thymallus]	6	7	7	0	11
Gudgeon [Gobio gobio]	8	2	2	1	0
Lamprey sp. ammocoetes [Petromyzontidae]	0	0	0	0	1
Minnow [Phoxinus phoxinus]	0	0	0	10	0
Roach [Rutilus rutilus]	1	1	0	0	0
Total Results (No) Table for Number	91	113	97	163	186
Total Results (Cs) Table for Density (/100m²)	15.8	15.7	12.5	40.0	26.3
Total Results (Cs) Table for Weight (g)	10728.9	11852.3	9914.1	16770.8	15582.5
Total Results (Cs) Table for Standing Crop (g/100m²)	1860.4	1648.7	1254.9	2122.9	2144.7

Long term trends at **Keynsham Park** shows fish populations to be fairly constant throughout with occasional spikes in dace and chub in 2007. There has been a decline in the eel population over time however, the transient nature of the species may see migration throughout the catchment where access permits. The capture of barbel for the first time at this site in 2016 could be due to the stockings of the species to the lower reaches of the River Chew between 2012 and 2014 as part of programme to boost the stocks through the wider Bristol Avon catchment.

Historical survey data

Name	Keynsham Park (Te)				
Date	05/07/2005	28/07/2006	04/09/2007	16/07/2013	12/07/2016
Length	100	100	96	100	100
Width	12	12	11	12	12
NGR	ST6567068190				
Species					
3-spined stickleback [Gasterosteus aculeatus]	0	0	0	9	0
Barbel [Barbus barbus]	0	0	0	0	3
Brown / sea trout [Salmo trutta]	0	0	0	0	3
Chub [Leuciscus cephalus]	9	12	56	1	27
Dace [Leuciscus leuciscus]	28	21	72	31	22
European eel [Anguilla anguilla]	4	5	9	1	0
European eels > elvers [Anguilla anguilla]	0	0	0	0	5
Gudgeon [Gobio gobio]	64	49	61	14	26
Minnow [Phoxinus phoxinus]	0	0	0	23	0
Perch [Perca fluviatilis]	5	0	1	0	1
Roach [Rutilus rutilus]	96	66	35	55	39
Stone loach [Barbatula barbatula]	0	0	0	6	0
Total Results (No) Table for Number	206	153	234	148	126
Total Results (Cs) Table for Density (/100m²)	19.9	12.9	31.2	12.7	10.9
Total Results (Cs) Table for Weight (g)	10114.7	3973.1	13862.3	4434.8	12645.6
Total Results (Cs) Table for Standing Crop (g/100m²)	842.9	331.1	1312.7	369.6	1053.8

Planned actions

The River Chew and its tributaries have many, large barriers to fish migration that will be impacting on fish stocks, in particular the migratory species such as European eels, Atlantic salmon and brown trout. The river also suffers from fine sediment suspension and deposition, which can impact the habitat available for fish (as well as invertebrate populations), reducing possible spawning sites for salmonid species and thus reducing recruitment of these species. In light of this, it would be important to look for project opportunities in the catchment to improve fish passage as a primary measure, whilst also looking to restore habitat in less favourable stretches. Partnership opportunities with angling clubs, local land owners and other interested groups should therefore be explored in order to develop suitable projects.

Next survey

Summer 2019

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

- Geoff Way, Sampling and Collecting Officer, Analysis and Reporting
- 03708 506 506
- enquiries@environment-agency.gov.uk

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

- Jody Armitage Fisheries, Biodiversity and Geomorphology
- 03708 506 506

enquiries@environment-agency.gov.uk

Before you go fishing don't forget:

- You must have a valid <u>Environment Agency rod licence</u> and permission from the fishery owner;
- You must comply with the <u>fisheries byelaws</u>;
- 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/.