Fish population survey report

Bristol Avon 2016

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

Originating team	Environmental Monitoring Team
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Date	23/03/2017
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Sign-off date	6th April 2016

Summary

- 5 sites on the Bristol Avon were surveyed by electric fishing between August and September 2016;
- 13 species of fish were recorded (excluding minor species) and a total of 2,213 fish were captured;
- Roach and chub were the most widespread species, being recorded at all sites;
- An average total density estimate of 43.6 fish per 100m^2 and biomass estimate of 3,135.9 grams per 100m^2 were recorded across all sites;
- Roach were the most numerous species caught with chub having the highest biomass.

Site locations

Survey results

Great Somerford

The survey site for 2016 was extended from the usual 77m to 119m to compensate for the changing nature of the site where erosion and deposition have reduced the number of refuge areas available to fish. Consequently, the additional survey length resulted in a larger catch but this is normalised when the fish density calculations (numbers of fish per 100m²) are taken into consideration.

Of the 11 fish species recorded (excluding minor species such as minnows and sticklebacks) chub were most numerous (85 individuals), with sizes ranging from 92mm to 476mm (mean 205mm). Chub also provided the highest biomass at 19.46kgs representing 46.45% of the overall catch. Gudgeon (80) and dace (37) were the next most common species respectively. Juvenile barbel also featured highly in the catch this year.

This reach of the Avon is stocked annually with adult triploid (sterile) brown and rainbow trout for angling interest and both featured highly in the overall catch. Brown trout (32) and rainbow trout (8) exceeded previous catches and combined, they provided 40% of the total catch weight.

Great Somerford ST9687683300 24/08/2016	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]	80	420	298	32	11.47	13557.71	32.36
Barbel [Barbus barbus]	64	225	181	19	6.81	1410.78	3.37
Chub [Leuciscus cephalus]	92	476	205	85	30.47	19462.27	46.45
Dace [Leuciscus leuciscus]	60	210	144	37	13.26	1764.61	4.21
Bleak [Alburnus alburnus]	84	113	99	9	3.23	84.44	0.2
Roach [Rutilus rutilus]	121	144	133	2	0.72	68.95	0.16
Pike [Esox lucius]	453	453	453	1	0.36	716.54	1.71
Rainbow trout [Oncorhynchus mykiss]	317	430	353	8	2.87	3215.27	7.67
Gudgeon [Gobio gobio]	71	123	102	80	28.67	1017.39	2.43
Perch [Perca fluviatilis]	218	218	218	1	0.36	158.29	0.38
European eels > elvers [Anguilla anguilla]	130	440	318	5	1.79	445.26	1.06

All weights estimated and calculated in grams.

Christian Malford

Nine fish species (excluding minors) were encountered at Christian Malford in a survey carried out over a distance of approximately 100m. Of the 484 fish sampled, the majority were roach (317), this figure nearly doubles the best of the previous 4 surveys. In order, dace (55), bleak (34), and chub (32) were the next most frequent species recorded. Standing crop data reveals a lower size range for most species on this occasion.

Roach represented over 65% of the catch by number and 48% by weight with chub providing only 6.6% of the total number and 30% of the total weight.

Dace (55) and bleak (34) both featured in greater numbers when compared to the previous 4 year average of 29 and 7.75 respectively. Predator species such as perch and pike were fewer than normal. Juvenile barbel were also recorded but in low numbers; as part of the Bristol Avon restocking programme, 2,000 juvenile barbel were stocked near this site in 2014 to boost the population.

Christian Malford ST9575078900 01/09/2016	Minimum Length (IF)	Maximum Length (IF)	Mean Length (IF)	Numbers Caught	% of Catch by Number	Weight Caught	% of Catch by Weight
Barbel [Barbus barbus]	123	164	146	4	0.83	136.98	0.88
Chub [Leuciscus cephalus]	54	434	183	32	6.61	4716.9	30.32
Dace [Leuciscus leuciscus]	42	165	102	55	11.36	883.73	5.68
Bleak [Alburnus alburnus]	51	105	81	34	7.02	168.86	1.09
Roach [Rutilus rutilus]	21	229	103	317	65.5	7478.99	48.07
Pike [Esox lucius]	384	415	400	2	0.41	975.96	6.27
Gudgeon [Gobio gobio]	41	124	87	30	6.2	270.23	1.74
Perch [Perca fluviatilis]	136	246	172	9	1.86	791.8	5.09
European eels > elvers [Anguilla anguilla]	420	420	420	1	0.21	135.49	0.87

All weights estimated and calculated in grams.

Chippenham

The survey was conducted over a distance of approximately 90m, at a time when flow rates on the upper Bristol Avon were lower than normal. Cover was less dense than on previous surveys due in part to the removal of a fallen willow tree which restricted flow yet provided good refuge for fish.

Roach were again the most numerous species at this survey site with chub once again providing the greatest biomass. Roach (572) represented 65% of the catch by number and almost 27% of the biomass. Chub numbered 112 and 12.8% of the total catch and provided 46% of the total weight at 22.6kgs.

A good balance in year classes for both species was noted with roach ranging in size from 32mm to 243mm (mean 106mm) and chub 54mm to 495mm (mean 175mm). Also prominent in the results were perch (33) with an average length of 191mm and 4 pike with a combined weight of 6.5kgs. Dace were less frequent than usual at 19, compared to the previous 4 year average of 39. Juvenile barbel were also recorded but in low number.

Chippenham ST9191872873 06/09/2016	Minimum Length (IF)	Maximum Length (IF)	Mean Length (IF)	Numbers Caught	% of Catch by Number	Weight Caught	% of Catch by Weight
Barbel [Barbus barbus]	98	452	207	4	0.46	1067.28	2.2
Chub [Leuciscus cephalus]	54	495	175	112	12.84	22599.67	46.6
Dace [Leuciscus leuciscus]	45	147	78	19	2.18	176.01	0.36
Bleak [Alburnus alburnus]	24	143	87	56	6.42	415.44	0.86
Roach [Rutilus rutilus]	32	243	106	572	65.6	13092.26	26.99
Pike [Esox lucius]	532	636	582	4	0.46	6540.13	13.48
Common bream [Abramis brama]	98	98	98	1	0.11	12.83	0.03
Gudgeon [Gobio gobio]	51	130	95	69	7.91	791.74	1.63
Silver bream [Abramis bjoerkna]	142	142	142	1	0.11	46.08	0.1
Perch [Perca fluviatilis]	118	249	191	33	3.78	3721.81	7.67
European eels > elvers [Anguilla anguilla]	280	280	280	1	0.11	38.66	0.08

All weights estimated and calculated in grams.

Lacock

A below average catch was recorded at Lacock in 2016. This is a relatively short site with quite different characteristics from other survey sites on the Bristol Avon programme. A wide, shallow gravel run dominates the upper end of the site ahead of long glide which has proven to be a valuable habitat for juvenile barbel. To a lesser extent marginal overhang provides cover for other species such as roach, chub and pike.

Of the catch, roach (65) were the dominant species however, numbers were down on the recent average of 111 for this site. It's not uncommon for fluctuations in the roach population at this location where flows are relatively high and cover is largely restricted to the margins.

Pike (6) provided the highest species biomass at just under 8kgs representing 40% of the total catch by weight whilst chub at 7.2kgs provided 37% of the total catch. Chub were fewer in number than in recent surveys with only 16 fish recorded, this was also the case with dace (11) and perch (3). Barbel numbers were just above the average for this site, with the highest number (34) being recorded in 2014 (the lowest number caught (1) was in 2013).

Lacock ST9230068030 23/08/2016	Minimum Length (IF)	Maximum Length (IF)	Mean Length (IF)	Numbers Caught	% of Catch by Number	Weight Caught	% of Catch by Weight
Barbel [Barbus barbus]	88	303	132	14	9.93	581.37	2.95
Chub [Leuciscus cephalus]	87	438	257	16	11.35	7248.98	36.78
Dace [Leuciscus leuciscus]	50	178	125	11	7.8	310.05	1.57
Bleak [Alburnus alburnus]	96	96	96	1	0.71	8.31	0.04
Roach [Rutilus rutilus]	44	186	106	65	46.1	1467.08	7.44
Pike [Esox lucius]	472	601	547	6	4.26	8048.96	40.84
Gudgeon [Gobio gobio]	75	128	111	21	14.89	350.61	1.78
Perch [Perca fluviatilis]	178	227	204	3	2.13	401.04	2.03
European eels > elvers [Anguilla anguilla]	500	590	554	4	2.84	1291.34	6.55

All weights estimated and calculated in grams.

Melksham

This is a new survey site for the Core Fish Monitoring Programme as of 2016 with no historic survey data to compare catches. It is a site with mixed characteristics comprising deep glides, marginal and in river macrophyte cover and shallow gravel runs to the head of the site.

As with most Bristol Avon fish survey sites, roach were the most common species encountered where 246 fish between 21mm to 263mm provided 56% of the catch by numbers and 31.8% by weight.

Chub were the second most predominant species with 51 individuals caught, representing 33% of the catch by weight. Barbel were again caught in low numbers at this site. As part of the Bristol Avon restocking programme, 2000 juvenile barbel were released at 2 locations in the vicinity of the site during early 2015 and therefore, it is likely they were included in the survey catch.

Melksham ST8982163674 31/08/2016	Minimum Length (IF)	Maximum Length (IF)	Mean Length (IF)	Numbers Caught	% of Catch by Number	Weight Caught	% of Catch by Weight
Barbel [Barbus barbus]	193	293	233	6	1.37	896.35	3.58
Chub [Leuciscus cephalus]	50	426	182	51	11.67	8262.65	33
Dace [Leuciscus leuciscus]	35	178	117	40	9.15	1015.5	4.06
Bleak [Alburnus alburnus]	52	123	93	47	10.76	385.2	1.54
Roach [Rutilus rutilus]	21	263	107	246	56.29	7970.4	31.83
Pike [Esox lucius]	575	670	623	2	0.46	4064.92	16.23
Gudgeon [Gobio gobio]	36	127	97	37	8.47	462.11	1.85
Silver bream [Abramis bjoerkna]	117	117	117	1	0.23	24.41	0.1
Perch [Perca fluviatilis]	150	335	223	5	1.14	1143.99	4.57
European eels > elvers [Anguilla anguilla]	530	655	593	2	0.46	815.69	3.26

All weights estimated and calculated in grams.

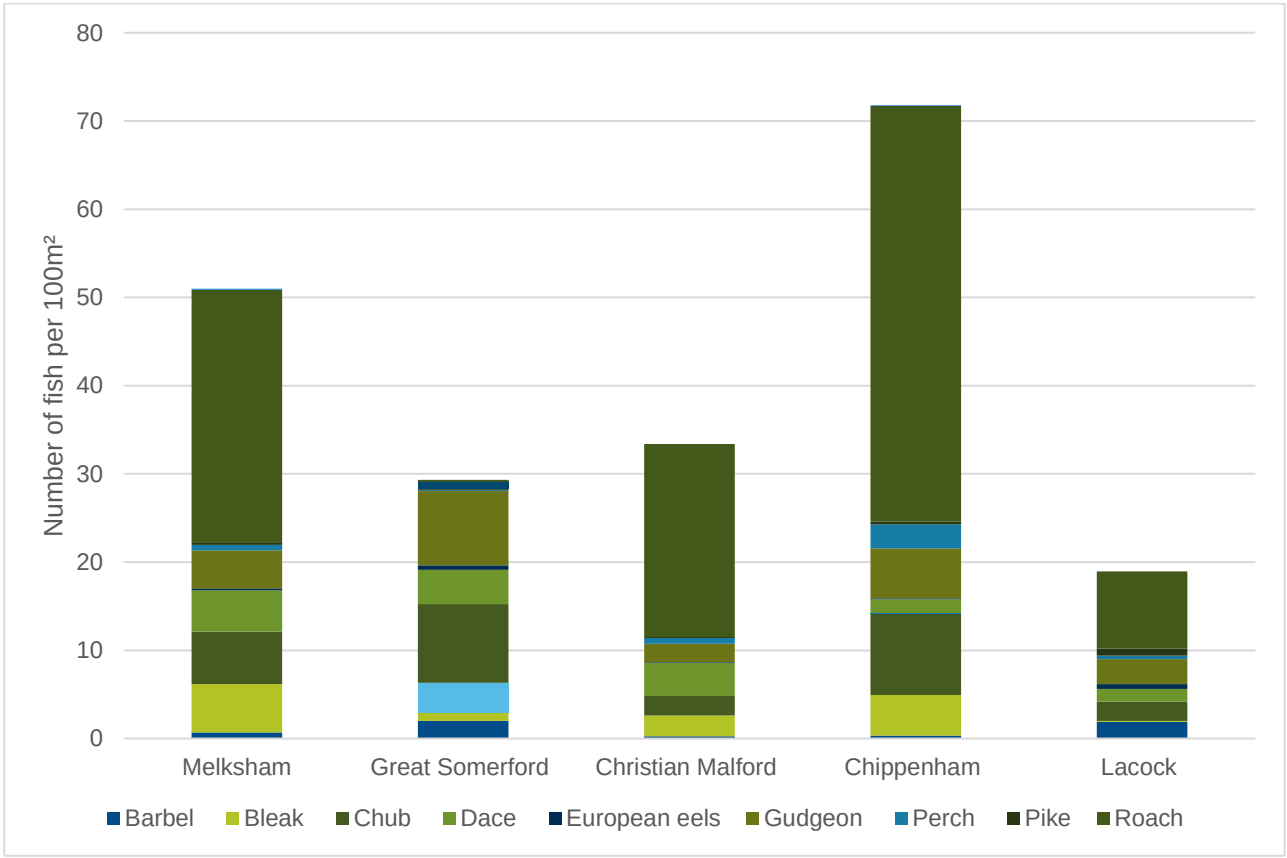
Population density estimates (number of fish per 100m^2) and size range (min – max, mm) recorded during the survey for key species.

		Great Somerford	Christian Malford	Chippenham	Lacock	Melksham
Barbel	Density	**1.996**	**0.276**	**0.329**	**1.882**	**0.7**
	Size range	**64 - 225**	**123 - 164**	**98 - 452**	**88 - 303**	**193 - 293**
Chub	Density	**8.929**	**2.207**	**9.218**	**2.151**	**5.952**
	Size range	**92 - 476**	**54 - 434**	**54 - 495**	**87 - 438**	**50 - 426**
Dace	Density	**3.887**	**3.793**	**1.564**	**1.478**	**4.669**
	Size range	**60 – 210**	**42 - 165**	**45 - 147**	**50 - 178**	**35 - 178**
Bleak	Density	**0.945**	**2.345**	**4.609**	**0.134**	**5.486**
	Size range	**84 - 113**	**51 - 105**	**24 - 143**	**96 - 96**	**52 - 123**
Gudgeon	Density	**8.403**	**2.069**	**5.679**	**2.823**	**4.318**
	Size range	**71 - 123**	**41 - 124**	**51 - 130**	**75 - 128**	**36 - 127**
Roach	Density	**0.21**	**21.862**	**47.078**	**8.737**	**28.711**
	Size range	**121 - 144**	**21 - 229**	**32 - 243**	**178 - 227**	**21 - 263**
Perch	Density	**0.105**	**0.621**	**2.716**	**0.403**	**0.584**
	Size range	**218 - 218**	**136 - 246**	**118 - 249**	**178 - 227**	**150 - 335**
Pike	Density	**0.105**	**0.138**	**0.329**	**0.806**	**0.233**
	Size range	**453 - 453**	**384 - 415**	**532 - 636**	**472 - 601**	**575 - 670**
Eels	Density	**0.525**	**0.069**	**0.082**	**0.538**	**0.233**
	Size range	**130 - 440**	**420 - 420**	**280 - 280**	**500 - 590**	**530 - 655**
Brown Trout	Density	**3.361**				
	Size range	**80 - 420**				
Rainbow Trout	Density	**0.84**				
	Size range	**317 - 430**				

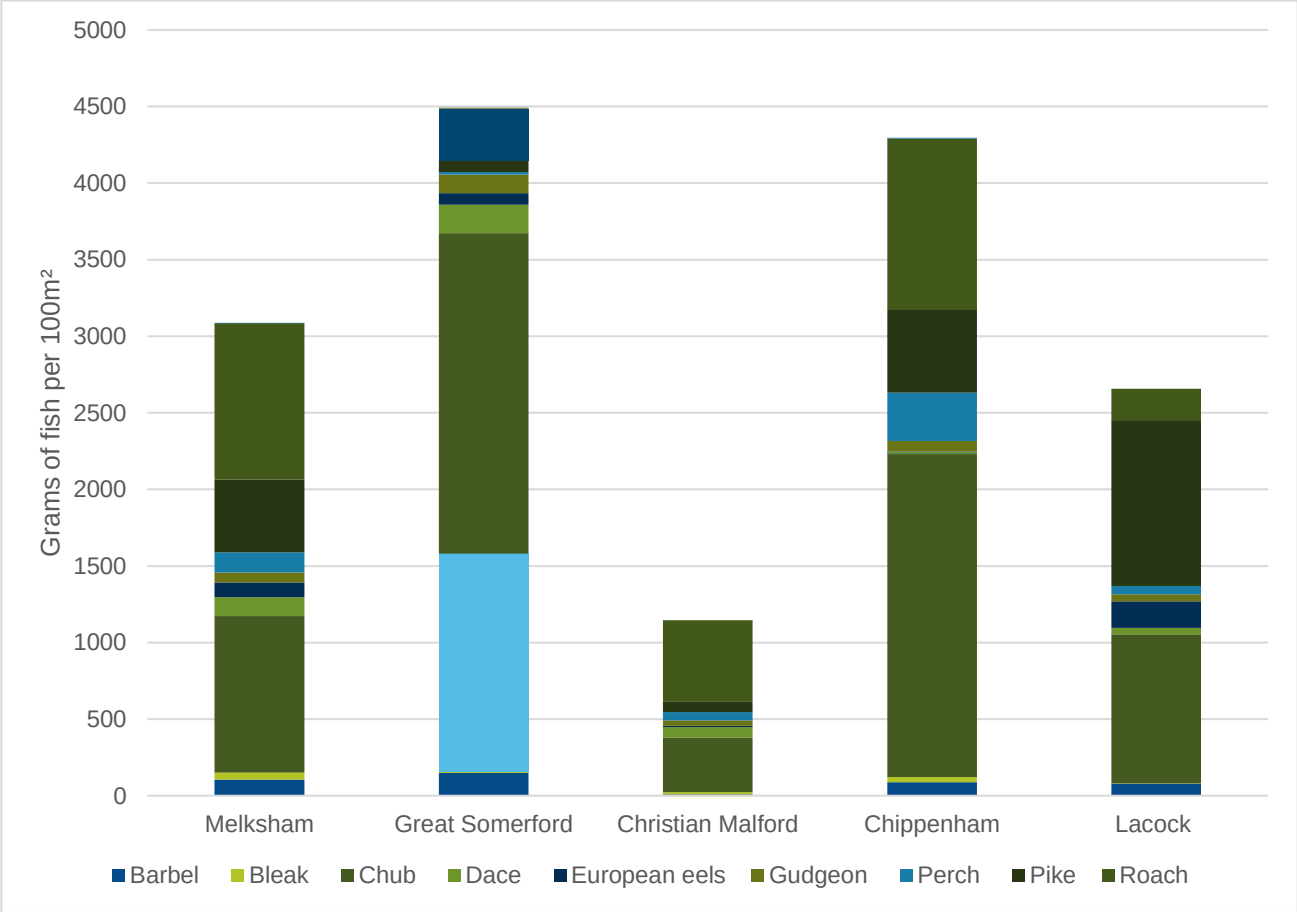
Minor species (log abundance)						
		Great Somerford	Christian Malford	Chippenham	Lacock	Melksham
Bullhead	Numbers	**100 - 999**	**1 - 9**	**10 - 99**	**100 - 999**	**Present**
Minnow	Numbers	**100 - 999**	**1000 - 9999**	**100 - 999**	**100 - 999**	**1000 - 9999**
Stone Loach	Numbers	**10 - 99**	**1 - 9**	**10 - 99**	**100 - 999**	**1 - 9**
3-Spined Stickleback	Numbers	**10 - 99**	**10 - 99**	**Present**	**1 - 9**	**Present**

Charts

Population density estimates (number of fish per 100m^2) across all survey sites.



Population biomass estimates (grams of fish per 100m^2) across all survey sites.



Health of fish population

Great Somerford

A general decline in the barbel populations throughout the middle reaches of the Bristol Avon has been a point of concern in recent years. Despite the many reasons put forward (including predation) there appears to be no definitive reason for the decline. Survey data however, does appear to confirm a lower barbel count since 2010 at some sites and in particular, fewer larger specimen fish have been found in survey catches.

Since 2013 the Environment Agency has embarked on a stocking programme throughout the middle Avon with the hope of returning the species to historical levels. Between 2012 and 2016, a total of 23,400 juvenile barbel (18 month old fish; known as 1+ fish) have been stocked between Claverton near Bath and Malmesbury, some of which will be represented in the survey data.

A local angling club have recently undertaken some habitat improvements near this site, which has included the construction of embayments to provide fry and juvenile fish refuge areas, and created marginal refuge areas using brushwood and willow that will also help to stabilise the banks, reducing erosion. These improvements should benefit the fish populations through this stretch in future years by improving recruitment success and replacing the cover that has been previously lost.

Historical survey data

Name	Great Somerford (Te)				
Date	29/07/2010	30/08/2011	28/08/2013	10/09/2014	24/08/2016
Length	77	77	75	77	119
Width	6.73	7.5	7.1	7.1	8
NGR	ST9684083318	ST9687683300			
Species					
Barbel [Barbus barbus]	4	2	1	6	19
Bleak [Alburnus alburnus]	0	7	0	1	9
Brown / sea trout [Salmo trutta]	0	7	5	13	32
Chub [Leuciscus cephalus]	34	40	25	40	85
Dace [Leuciscus leuciscus]	16	53	44	69	37
European eels > elvers	1	0	0	0	5
Gudgeon [Gobio gobio]	27	52	15	31	80
Lamprey sp. > ammocoete	0	0	1	0	0
Perch [Perca fluviatilis]	0	2	0	0	1
Pike [Esox lucius]	2	1	0	0	1
Rainbow trout [Oncorhynchus mykiss]	2	2	0	0	8
Roach [Rutilus rutilus]	8	12	6	14	2
Numbers caught	**94**	**178**	**97**	**174**	**279**
Estimated Density (/100m²)	**22.964**	**34.286**	**18.216**	**33.656**	**30.987**
Estimated Weight (grams)	**27224.7**	**27640.69**	**19179.01**	**29584.59**	**42766.48**
Estimated Standing Crop (grams/100m²)	**5253.604**	**4786.267**	**3601.692**	**5411.485**	**4492.277**

Christian Malford

This is a typical mid Avon site with a good balance of fish species for a river of this type. However, recent minor changes in habitat and flow conditions have impacted on species distribution. Reed beds are no longer a feature of the middle section of the survey site where once they provided glides and runs for chub and barbel. Chub are more often found at the top end of the site where cover is most prolific. The more open aspect to the middle to lower end of the reach favours juvenile roach and dace where the greatest numbers were recorded.

Historical survey data

Name	Christian Malford (Te)				
Date	11/08/2010	19/07/2011	28/08/2013	19/08/2014	01/09/2016
Length	91	100	100	60	100
Width	13.5	14.5			
NGR	ST9575078900				
Species					
Barbel [Barbus barbus]	0	0	1	4	4
Bleak [Alburnus alburnus]	4	9	3	15	34
Brook lamprey ammocoetes	0	1	0	0	0
Chub [Leuciscus cephalus]	23	25	23	12	32
Dace [Leuciscus leuciscus]	3	42	41	31	55
European eels > elvers	1	1	0	0	1
Gudgeon [Gobio gobio]	0	8	16	12	30
Perch [Perca fluviatilis]	10	28	17	33	9
Pike [Esox lucius]	7	5	1	4	2
Roach [Rutilus rutilus]	56	172	174	121	317
Numbers caught	**104**	**291**	**276**	**232**	**484**
Estimated Density (/100m²)	**8.628**	**21.586**	**20.621**	**28.851**	**36.897**
Estimated Weight (grams)	**23854.53**	**17845.69**	**15321.1**	**8872.01**	**16612.64**
Estimated Standing Crop (grams/100m²)	**1941.761**	**1230.737**	**1056.628**	**1019.771**	**1145.699**

Chippenham

This urban site consistently returns good catch results for most coarse fish species and has recently been added to the Environment Agency's sites for chemical analysis in fish. The Environmental Quality Standards Directive (EQSD) is a "daughter directive "of the WFD (Water Framework Directive) which sets EQSs for a list of Priority Substances and Priority Hazardous Substances. A small number of fish roach are tested on an annual basis to ascertain the good health status of fish populations. Results of these tests have yet to be reported on.

Historical survey data

Name	Chippenham (Te)					
Date	01/09/2010	31/08/2011	11/09/2013	02/09/2014	15/09/2015	06/09/2016
Length	89	90	90	60	90	90
Width	13.8	13.5				
NGR	ST9191872873					
Species						
Barbel [Barbus barbus]	6	0	3	0	2	4
Bleak [Alburnus alburnus]	55	35	64	57	77	56
Brook lamprey ammocoetes	1	0	0	0	0	0
Brown / sea trout [Salmo trutta]	1	0	2	0	1	0
Chub [Leuciscus cephalus]	43	77	72	25	110	112
Common bream [Abramis brama]	0	0	0	0	4	1
Dace [Leuciscus leuciscus]	29	27	70	37	25	19
European eels > elvers	4	1	0	0	2	1
Gudgeon [Gobio gobio]	26	36	37	58	50	69
Lamprey sp. ammocoetes	0	0	0	0	3	0
Perch [Perca fluviatilis]	31	22	63	24	38	33
Pike [Esox lucius]	9	3	5	4	3	4
Roach [Rutilus rutilus]	159	198	419	137	403	572
Silver bream [Abramis bjoerkna]	0	0	0	0	0	1
Numbers caught	**364**	**399**	**735**	**342**	**718**	**872**
Estimated Density (/100m²)	**30.37**	**43.868**	**113.827**	**45.185**	**62.305**	**75.144**
Estimated Weight (grams)	**63770.64**	**64614.25**	**83991.12**	**17576.83**	**51184.32**	**52190.82**
Estimated Standing Crop (grams/100m²)	**5192.203**	**5318.046**	**6912.849**	**2169.979**	**4212.702**	**4295.541**

Lacock

Although this is the most difficult of our Bristol Avon sites to survey it is a good indicator site for barbel populations regarded to be in decline at other locations. Catches of other species have remained consistent with historical catches with roach populations fluctuating as previously mentioned.

Historical survey data

Name	Lacock (Te)					
Date	28/07/2010	21/07/2011	27/08/2013	09/09/2014	09/09/2015	23/08/2016
Length	69	70				62
Width	12.3	12				
NGR	ST9230068030					
Species						
Barbel [Barbus barbus]	6	28	1	34	13	14
Bleak [Alburnus alburnus]	1	11	1	16	1	1
Brook lamprey [Lampetra planeri]	0	0	0	3	0	0
Brown / sea trout [Salmo trutta]	2	3	0	0	0	0
Chub [Leuciscus cephalus]	30	35	5	44	19	16
Common bream [Abramis brama]	0	0	0	0	0	0
Dace [Leuciscus leuciscus]	32	56	27	74	28	11
European eel [Anguilla anguilla]	0	0	7	0	0	0
European eels > elvers	9	4	0	5	0	4
Gudgeon [Gobio gobio]	21	47	6	87	27	21
Lamprey sp. ammocoetes	0	2	0	0	0	0
Perch [Perca fluviatilis]	4	8	4	15	2	3
Pike [Esox lucius]	0	3	1	4	1	6
Roach [Rutilus rutilus]	35	125	32	258	40	65
Numbers caught	**140**	**322**	**84**	**540**	**131**	**141**
Estimated Density (/100m²)	**25.804**	**50.357**	**10**	**108.81**	**17.381**	**19.355**
Estimated Weight (grams)	**19329.14**	**35514.44**	**7228.58**	**28979.28**	**8796.74**	**19775.46**
Estimated Standing Crop (grams/100m²)	**2277.5**	**4227.909**	**860.545**	**3449.915**	**1047.231**	**2657.992**

Melksham

This is the lowest site in the catchment and new to the Core Fish Monitoring Programme. It is intended to become a regular site in the programme and initial indications show the site to have healthy populations of all species found at other sites on the Avon.

WFD Classification

WFD Classification		
Site Name	Waterbody	Fish
	Moderate	**High**

Planned actions

- Despite the recent stockings of barbel throughout the Bristol Avon, evidence suggests that the natural population has declined with fewer mature fish being caught during surveys. Assessment of the river is needed to understand the pressures on the population and therefore the reasons for a decline. This should focus on barriers to fish migration, of which there are several throughout the catchment, and habitat availability for all life stages (including refuge from predators). Project opportunities could be developed as part of this assessment, in particular developing partnership projects with local angling clubs, land owners and other interested organisations. Future monitoring of the fish stocks throughout the reach will also help to understand the survival of stocked barbel.
- Due to the strong angling interest on the river, opportunities for project development should be considered in order to restore and/or maintain good fisheries habitat. The Fisheries Improvement Fund, which is managed by the Environment Agency, could be a good opportunity to develop partnership projects in the area.

Next survey

Summer 2017.

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

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

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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/.