



Bristol Frome Riverfly Monitoring Summary Report

January 2025



Version history

Revision	Date	Description	Author(s)	Reviewer(s)	Approval
1.0	Jan 2025	ISSUE	JG	SH	SH

Executive summary

The Bristol Frome is an urban river that rises in Dodington Park, South Gloucestershire, and flows approximately 20 miles south-westerly through Bristol including a 1km underground culvert, to join the river Avon in the City Centre. As with many urban rivers, the Frome has suffered from an array of various pollutions, but several stretches of river flow through parklands and nature reserves that support a range of wildlife. The Frome is home to populations of [Biodiversity Action Plan](#) species including the critically endangered European eel, brown trout as well as a diverse variety of other aquatic life and the wider ecology which it supports.

Historically, the river's energy was harnessed by many watermills, and the river mouth area was developed as shipyards by the eighteenth century. As the city of Bristol developed in the nineteenth and twentieth centuries, surface water flooding became a significant problem, remedied by the construction of storm drains and diversions. In recent years, development in North Bristol, coupled with a changing climate has increased pressures on the Bristol Frome, with more impermeable surfaces, Combined Sewer Overflow's (CSO's) and storm drains delivering surface water, and any accompanying pollutants, into the river during rainfall events.

BART is the Bristol Avon Riverfly hub for the Riverfly Monitoring Initiative (RMI). The RMI uses citizen science to get people out and about on their local river, enjoying the natural environment and sampling for riverflies. The scheme is supported by the Riverfly Partnership and more info can be found on their website: <http://www.riverflies.org/rp-riverfly-monitoring-initiative>.

Riverfly Monitoring Initiative Findings

BART volunteers have set up a total of 19 sites in the Bristol Frome catchment, although some of these have very limited or no data. There are ten active sites on the Bristol Frome - and two more sites with data that are looking for new monitors. There are two sites on the Bradley Brook. There is one site on the Stoke Brook which is looking for a new monitor. The active sites are mapped and labelled in figure 1 below. The numbering aims to order the sites and relates to the first column in table 1.

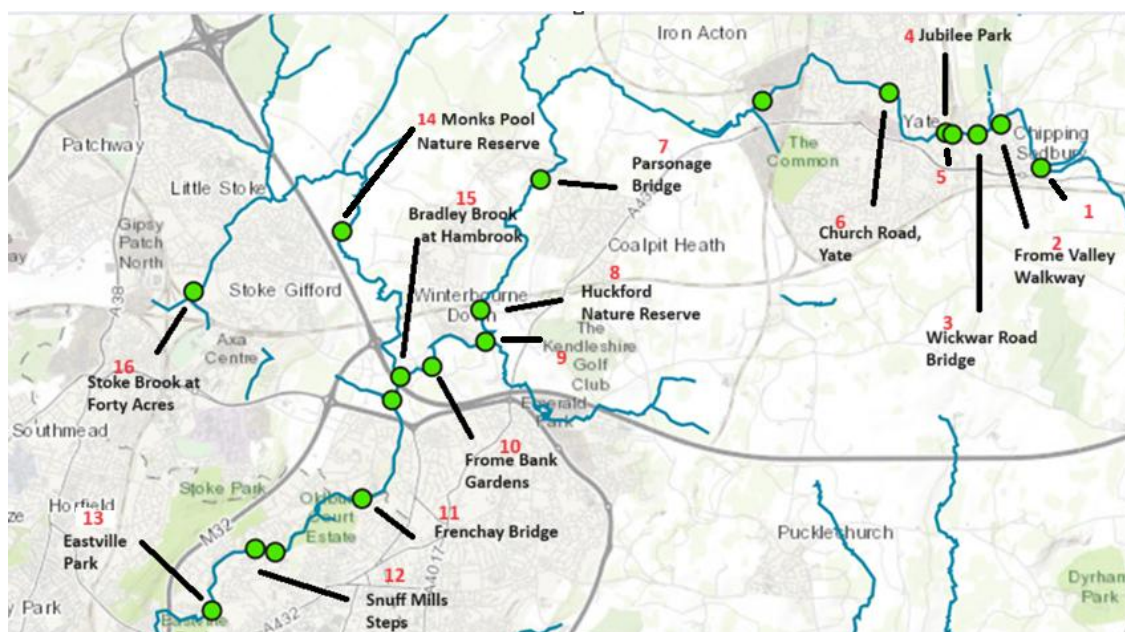


Figure 1 Map of RMI Site Locations in the Bristol Frome Catchment.

Table 1 below shows the average RMI scores, the trigger level and number of trigger level breaches for all the Bristol Frome, Bradley Brook and Stoke Brook sites with data available. Sites are listed in upstream to downstream order.

Number on Map	Site Name	Grid Reference	Average RMI Riverfly Score	Trigger Level	Trigger Level Breaches
	Bristol Frome				
1	At Wickham / Jenner Close	ST 73687 81841	7.5	6	0
2	At Frome Valley Walkway	ST 73140 82471	7	5	0
3	At Wickwar Road Bridge	ST 72793 82338	7.6	6	0
4	At Jubilee Park	ST 72352 82356	7.3	5	0
5	At Beeches Industrial Estate	ST 69750 82810	6.4	5	2
6	At Church Road, Yate	ST 71516 82920	6.2	5	1
7	At Parsonage Bridge	ST 66550 81710	8.9	6	0
8	At Huckford Nature Reserve	ST 65695 79875	10	6	0
9	At Damsons Bridge	ST 65740 47930	9	6	0
10	At Adjacent to Frome Bank Gdns	ST 65038 79406	8.2	6	0
11	At Frenchay Bridge	ST 63960 77200	3.5	3	0
12	At Snuff Mills Steps	ST 62430 76490	9.1	4	0
13	At Eastville Park	ST 61800 75600	6.9	5	0
	Bradley Brook				
14	At Monks Pool NR	ST 63700 81000	7	5	0
15	At Hambrook	ST 64524 78939	9.1	8	0
	Stoke Brook				
16	At Forty Acres, Stoke Gifford	ST 61580 80180	4.3	1	0

Table 1 – RMI Overview Table

Riverfly total scores on the Bristol Frome sites ranged between 0 and 15. The lowest score of 0 was recorded twice at the Beeches Industrial Estate site and these scores were reported to the Environment Agency. The absence of any invertebrate life was likely to be the result of a pollution event or underlying poor water quality exacerbated by low flows in late Summer / Autumn 2022.

Average riverfly scores ranged from 3.5 to 9.1 on the Bristol Frome sites. There is no clear trend in riverfly scores when comparing upstream to downstream locations. Riverfly scores are influenced by localised conditions including habitat and water quality, both of which are known to be compromised on the Bristol Frome.

The Frenchay Bridge site has the lowest average score of 3.5 – this site also has the lowest trigger level set at 3. This suggests both poor water quality and poor habitat at this site. The site registration form for this site and site photos show that this site is heavily shaded, has very slow flow and high silt cover on the channel substrate. There are also re-enforced / artificial banks. BART’s walkover surveys have recorded barriers close to the riverfly site (a large weir approximately 200m upstream and an EA gauging flume approximately 200m downstream). All of these factors are likely to be having a detrimental impact on the ecological communities present at the riverfly site.

The highest riverfly total score of 15 was recorded at the Snuff Mills Steps site. The Snuff Mills Steps site scored the highest average score of the Bristol Frome sites - 9.1. The Parsonage Bridge site and Damsons Bridge site also scored high average scores of 9 and 8.9 respectively suggesting conditions are better for macro-invertebrates at these three sites. The Huckford Nature Reserve site scores an average of 10, suggesting good conditions, but only two samples have been taken at this site.

The overall average riverfly score for all the riverfly samples on the Bristol Frome is 7.9. This can be compared to another river in the Bristol Avon catchment such as the river Chew. The river Chew has an overall average riverfly score for all surveys of 11.6. This suggests that the conditions at the river Chew sites are able to support a better macro-invertebrate population than the Bristol Frome sites.

The overall average riverfly score for all the riverfly samples under the BART riverfly hub (2784 samples) is 9.6. This average riverfly score for all BART sites is higher than the Bristol Frome average riverfly score of 7.9. This suggests that conditions at the Bristol Frome sites are not able to support as diverse macro-invertebrate communities as the wider Bristol Avon sites. Table 2 below shows a comparison of average riverfly scores.

Area	Average RMI Riverfly Score calculated from all samples
Bristol Frome River	7.9
Bradley Brook	7.8
Stoke Brook	4.3
All BART Sites (2784 samples in total)	9.6

Table 2 – Average Riverfly Score Overview Table

The taxon abundances for all the Bristol Frome surveys show that shrimps are the most abundant of the eight riverfly groups. Flat bodied mayflies and stoneflies are the least abundant of the eight groups. This is to be expected as shrimps are the least pollution sensitive of the eight groups and flat bodied mayflies and stoneflies are the most pollution sensitive of the groups.

Riverfly total scores on the Bradley Brook sites ranged between 5 and 12. The lowest score of 5 was recorded at the Monks Pool Nature Reserve site, just hitting trigger level. The highest score of 12 was

also recorded at the Monks Pool Nature Reserve site suggesting that conditions are quite variable at this site. The average riverfly score was lower at the Monks Pool site (7) than at the Hambrook site (9.1) suggesting that conditions are overall more favourable for macro-invertebrates at the Hambrook site. The overall average riverfly score for all the riverfly samples on the Bradley Brook is 7.8 – very similar to the Bristol Frome as a whole.

Riverfly total scores at the Stoke Brook at Forty Acres, Stoke Gifford site ranged between 3 and 6. The average riverfly score was 4.3. This suggests both poor water quality and poor habitat at this site. BART have carried out extensive habitat improvement works on the Stoke Brook in Autumn 2023. The river restoration works including in stream woody debris work were located downstream of the riverfly monitoring site.

Overall, the data clearly show that invertebrates are being impacted at all sites by a combination of factors, including water quality and siltation. It is recommended that further investigations be conducted to identify the sources of these impacts. These findings can then be used to develop targeted solutions that create conditions for invertebrates and the wider aquatic ecosystem to thrive.

The following recommendations are made to build upon the findings of this report:

- BART to analyse [River Detectives](#) citizen science water quality data alongside the Bristol Frome Riverfly site data to identify and pinpoint any water quality pressures;
- BART to investigate the Frenchay Bridge stretch of the Bristol Frome (the poorest scoring Riverfly site) to identify any potential opportunities for habitat and water quality improvements;
- BART to share findings of this Riverfly Monitoring report with volunteers and partners. Partners to include the Environment Agency, the Bristol Avon Catchment Partnership and River Frome Reconnected Partnership;
- BART to look for funding opportunities to undertake SmartRivers species level monitoring at the Bristol Frome RMI sites to identify the main pressures on the macro-invertebrates in these locations and, therefore, help to target improvement work in the area;
- BART to investigate funding opportunities to undertake further River Restoration works on the Stoke Brook in the location of the Forty Acres Riverfly site.

Table of Contents

Executive summary	i
1. Introduction	1
1.1 Bristol Frome Overview.....	1
1.2 Riverfly Monitoring Overview.....	1
1.3 Riverfly Monitoring Initiative (RMI) Site Locations	1
2. Methodologies	3
2.1 RMI Sampling and Analysis Methodology	3
3. Results	4
3.1 Riverfly Total Scores	4
3.2 Riverfly Total Scores and Taxon Abudances	8
4. Discussion	15
4.1 Riverfly Monitoring Initiative.....	15
5. Conclusions and Recommendations	19
6. References	21

1. Introduction

1.1 Bristol Frome Overview

The Bristol Frome is an urban river that rises in Dodington Park, South Gloucestershire, and flows approximately 20 miles south-westerly through Bristol including a 1km underground culvert, to join the river Avon in the City Centre. As with many urban rivers, the Frome has suffered from an array of various pollutions, but several stretches of river flow through parklands and nature reserves that support a range of wildlife. The Frome is home to populations of Biodiversity [Action Plan](#) species including the critically endangered European eel, brown trout as well as a diverse variety of other aquatic life and the wider ecology which it supports.

Historically, the river's power was harnessed by many watermills, and the river mouth area was developed as shipyards by the eighteenth century. As the city of Bristol developed in the nineteenth and twentieth centuries, surface water flooding became a significant problem, remedied by the construction of storm drains and diversions. In recent years, development in North Bristol, coupled with a changing climate has increased pressures on the Bristol Frome, with more impermeable surfaces, Combined Sewer Overflow's (CSO's) and storm drains delivering surface water, and any accompanying pollutants, into the river during rainfall events.

1.2 Riverfly Monitoring Overview

BART is the Bristol Avon Riverfly hub for the Riverfly Monitoring Initiative (RMI). The Riverfly Monitoring Initiative uses citizen science to get people out and about on their local river, enjoying the natural environment and sampling for riverflies. The scheme is supported by the Riverfly Partnership and more info can be found on their website here: <http://www.riverflies.org/rp-riverfly-monitoring-initiative>.

1.3 Riverfly Monitoring Initiative (RMI) Site Locations

BART volunteers have set up a total of nineteen sites in the Bristol Frome catchment, although some of these have very limited or no data. There are ten active sites on the Bristol Frome - and two more sites with data that are looking for new monitors. There are two sites on the Bradley Brook. There is one site on the Stoke Brook – at Forty Acres - which is looking for a new monitor. The active sites are mapped and labelled in figure 1 below. Numbering relates to the numbers in table 1 above.

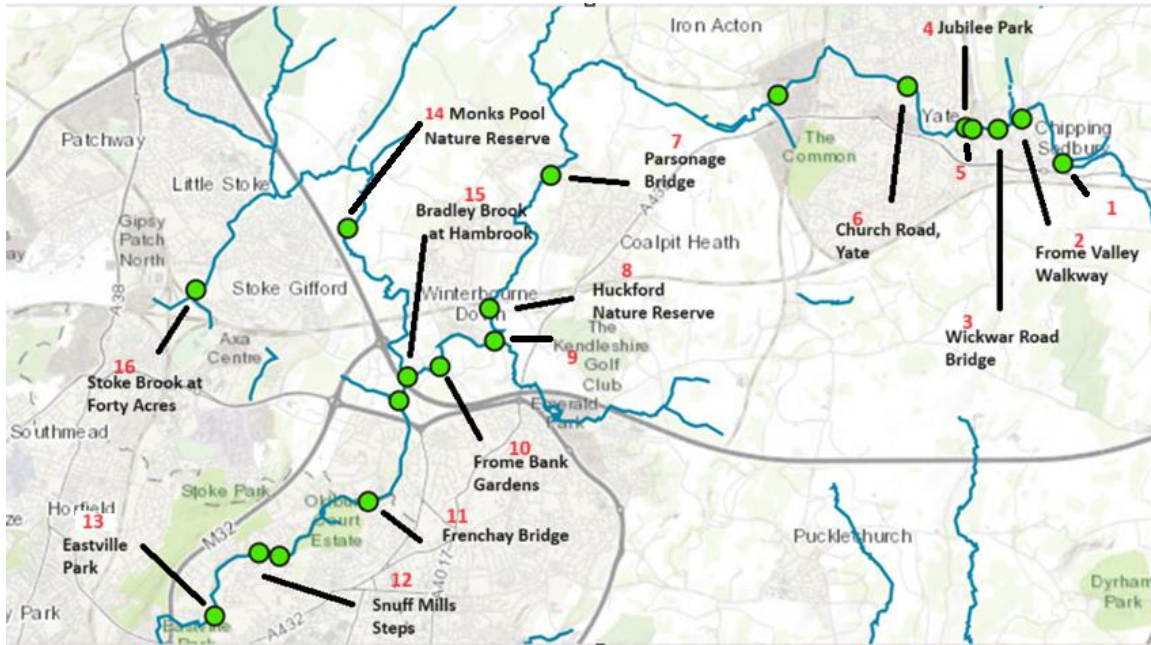


Figure 1 Map of RMI Site Locations in the Bristol Frome Catchment.

2. Methodologies

2.1 RMI Sampling and Analysis Methodology

The RMI monitoring methodology copies the standard sampling methodology outlined in section 2.1 above. The monitoring is carried out by a volunteer trained in RMI sampling. The same monitor samples the same site as regularly as possible – aiming for once a month.

Analysis is undertaken bankside following the method outlined in the RMI training. The sample is sorted in a white tray and macro-invertebrates from eight key groups are picked out and counted. The eight RMI groups are: stoneflies, burrowing mayflies, blue winged olive mayflies, olive mayflies, cased caddisflies, caseless caddisflies and shrimps.

Counts are entered by the volunteer onto the Riverfly Partnership's Cartographer database for each of the eight groups. Scores are automatically calculated for each site using the following categories:

1-9 = 1

10 - 99 = 2

100 – 999 = 3

1000+ = 4

An overall score for the sample is calculated by combining the scores for all the groups. This score is compared to a trigger level, set by the Environment Agency. Scores that fall below the trigger could be a sign that there is a pollution incident occurring and follow up is required.

3. Results

3.1 Riverfly Total Scores

The graphs below show the RMI total riverfly scores over time for each of the RMI sites in the Bristol Frome Catchment with data available, starting from the most upstream site on the Bristol Frome. The graphs are taken from BART’s Riverhub (<https://riverhub.co.uk/>).



Figure 2 Bristol Frome at Wickham / Jenner Close

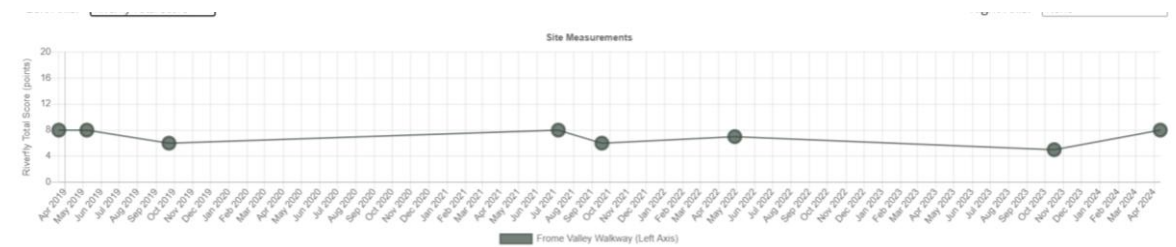


Figure 3 Bristol Frome at Frome Valley Walkway



Figure 4 Bristol Frome at Wickwar Road Bridge



Figure 5 Bristol Frome at Jubilee Park



Figure 6 Bristol Frome at Beeches Industrial Estate



Figure 7 Bristol Frome at Church Road Yate

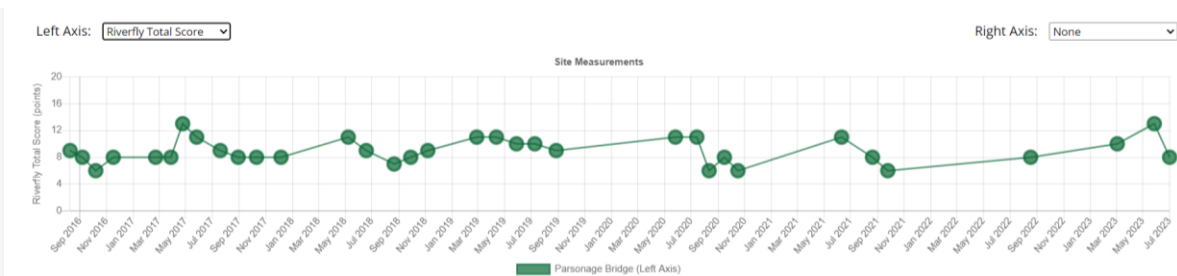


Figure 8 Bristol Frome at Parsonage Bridge. Note, the site was visited in Jan, March, April and May 2024 but the flow was too fast to take a sample.

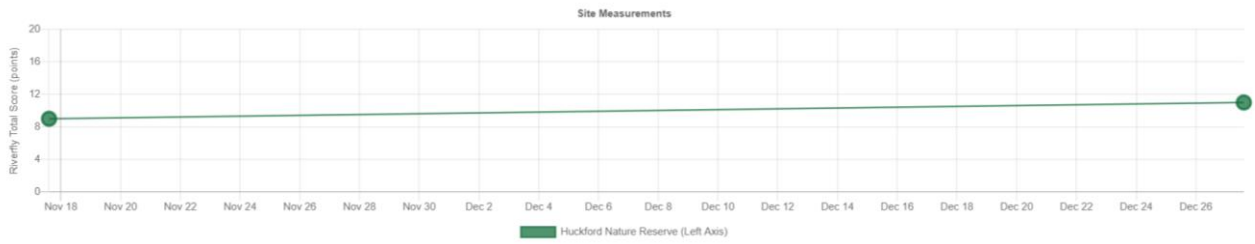


Figure 9 Bristol Frome at Huckford Nature Reserve

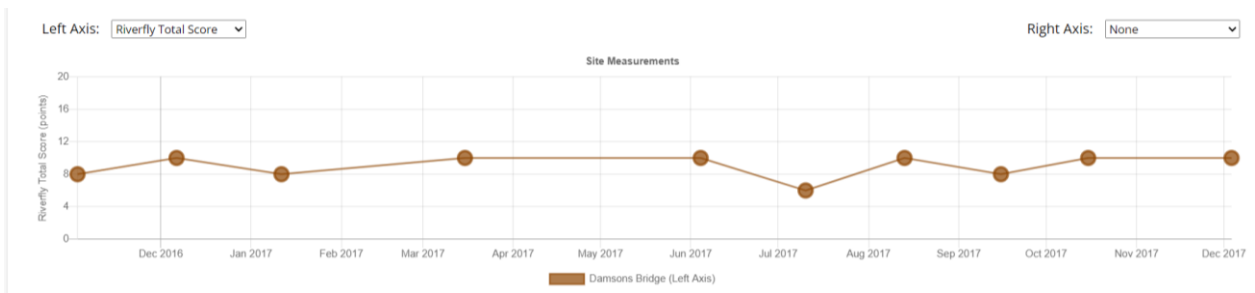


Figure 10 Bristol Frome at Damsons Bridge

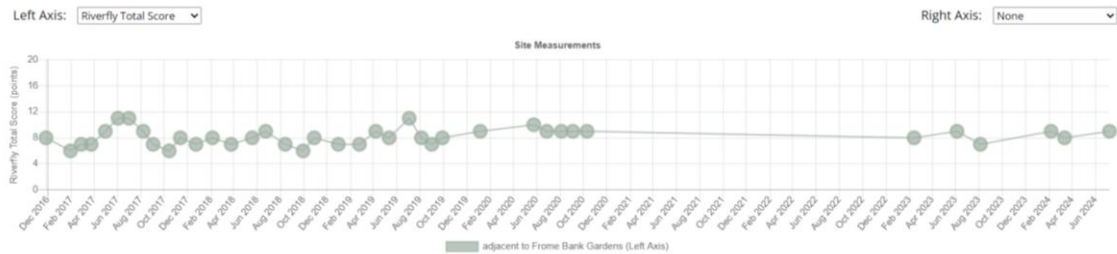


Figure 11 Bristol Frome at Adjacent to Frome Bank Gardens



Figure 12 Bristol Frome at Frenchay Bridge



Figure 13 Bristol Frome at Snuff Mills Steps



Figure 14 Bristol Frome at Eastville Park

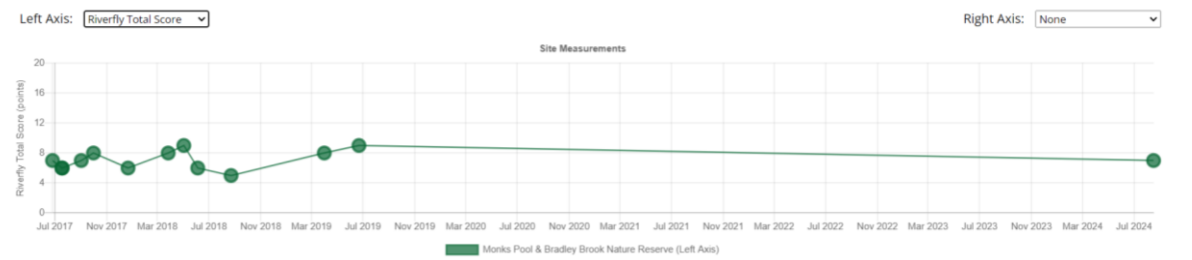


Figure 15 Bradley Brook at Monks Pool Nature Reserve

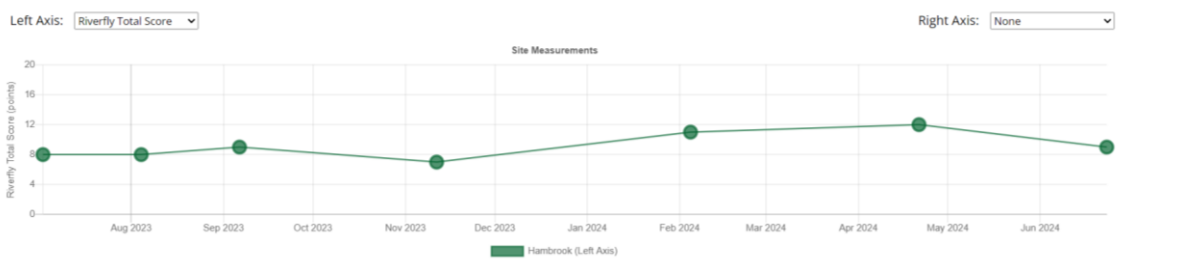


Figure 16 Bradley Brook at Hambrook



Figure 17 Stoke Brook at Forty Acres, Stoke Gifford

3.2 Riverfly Total Scores and Taxon Abundances

The graphs below show the RMI total riverfly scores over time for each of the RMI sites in the Bristol Frome catchment as well as the taxon abundances for the eight groups included in the RMI scheme. The graphs are taken from the Riverfly Partnership’s Data Platform: [Riverfly Data](#)

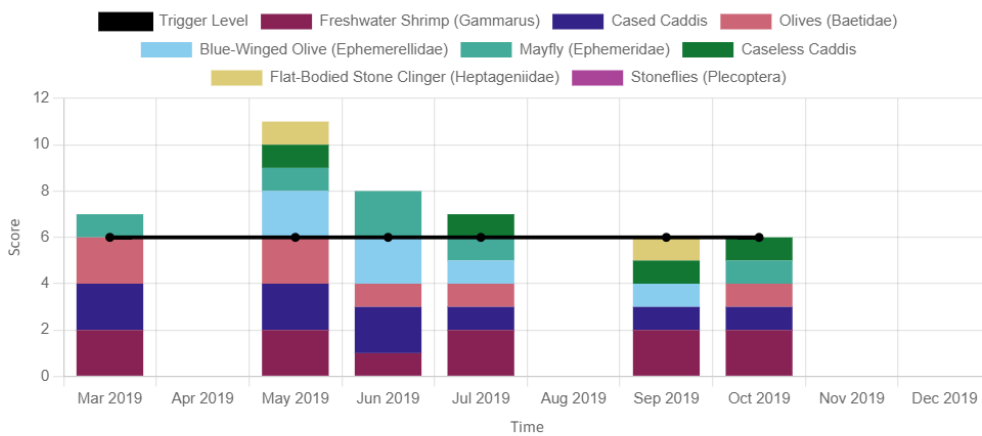


Figure 18 Bristol Frome at Wickham / Jenner Close

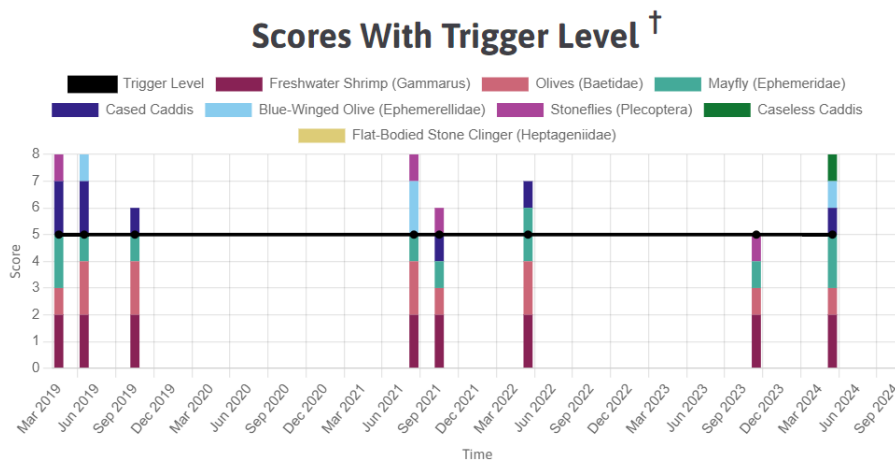


Figure 19 Bristol Frome at Frome Valley Walkway

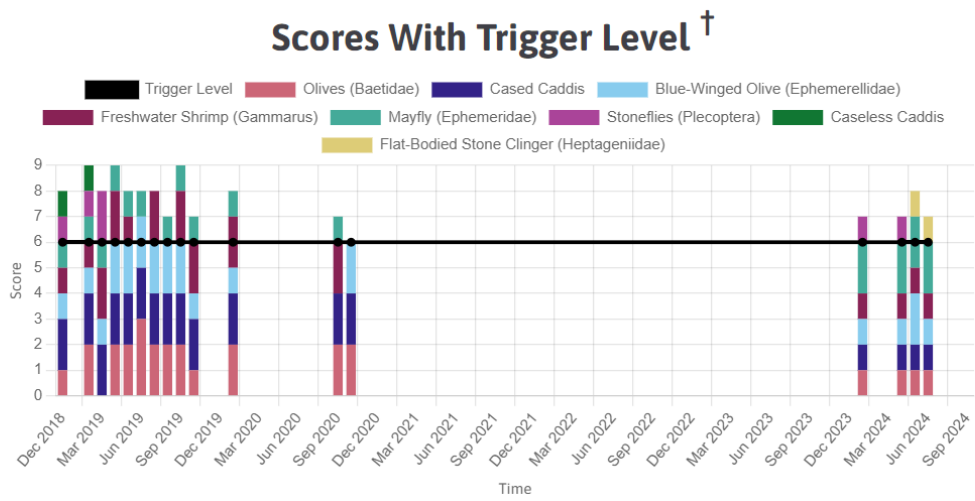


Figure 20 Bristol Frome at Wickwar Road Bridge

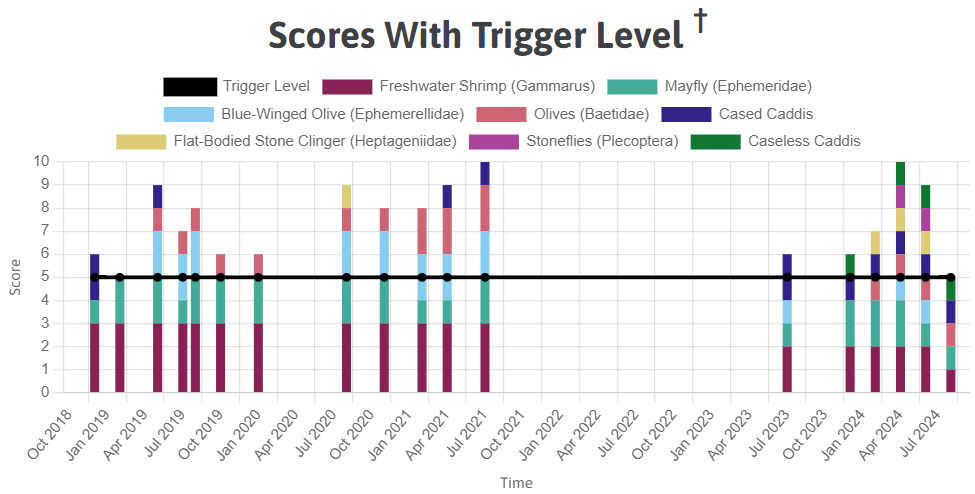


Figure 21 Bristol Frome at Jubilee Park

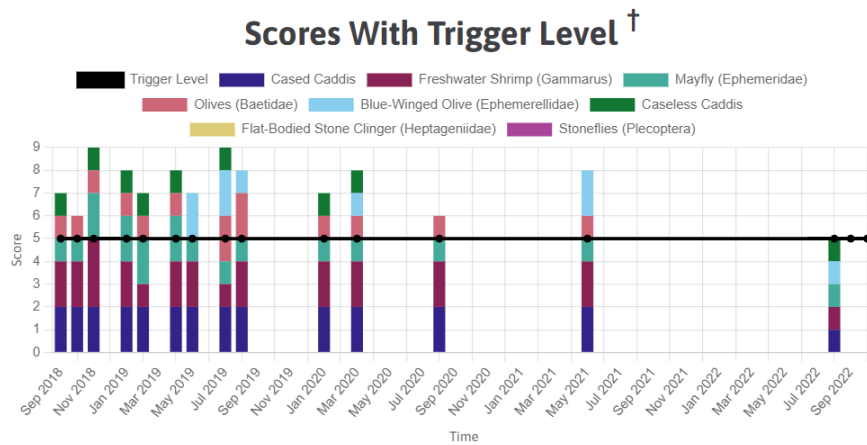


Figure 22 Bristol Frome at Beeches Industrial Estate – note that scores of “o” in Sept and Oct 2022 are marked by two dots on the trigger line.

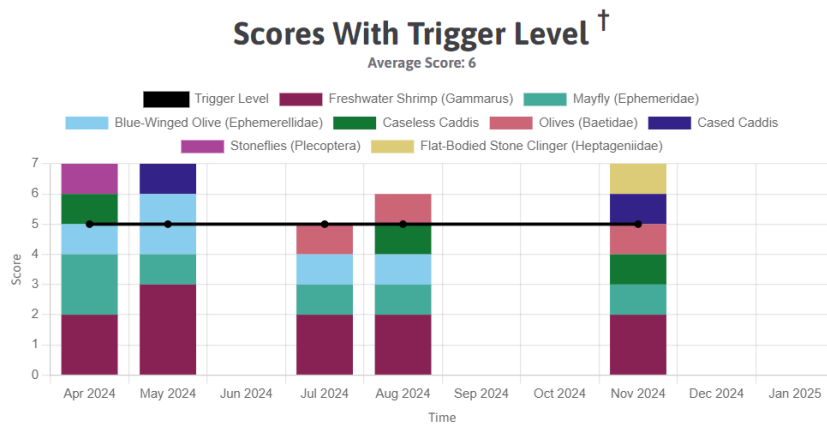


Figure 23 Bristol Frome at Church Road, Yate

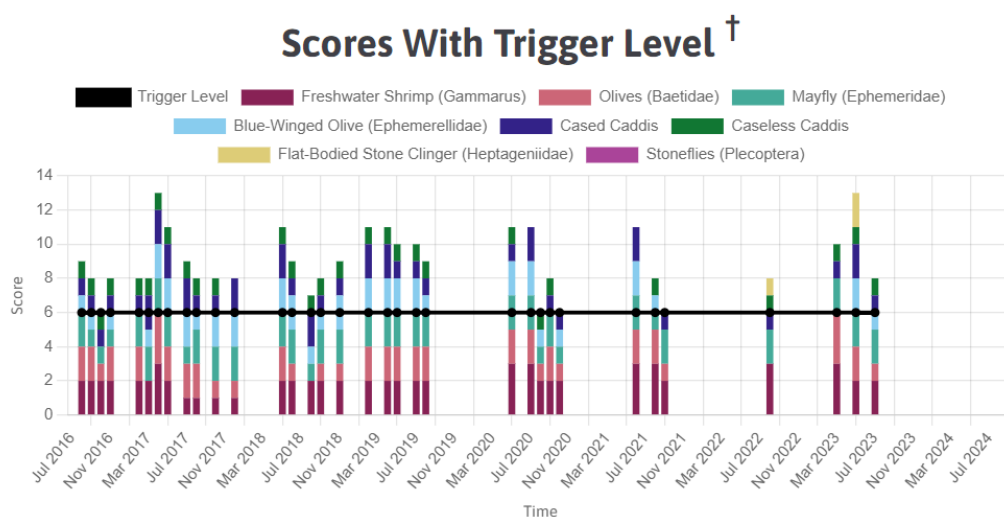


Figure 24 Bristol Frome at Parsonage Bridge

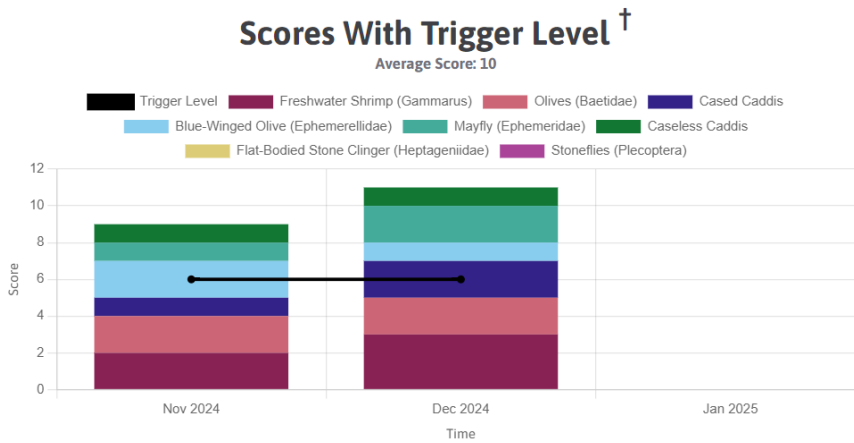


Figure 25 Bristol Frome at Huckford Nature Reserve

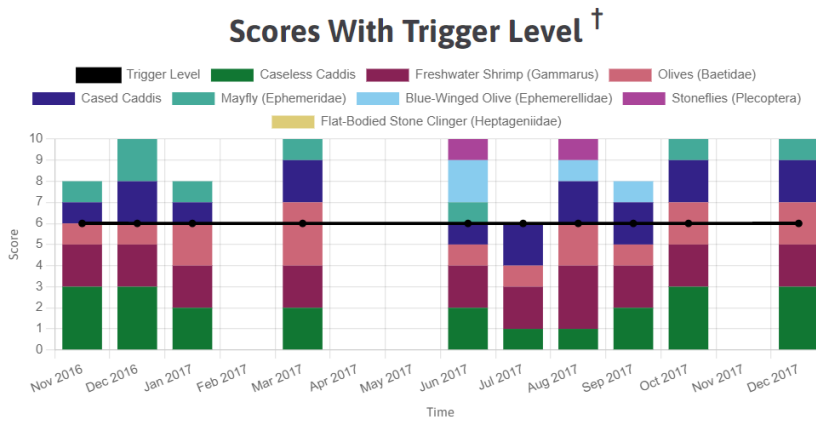


Figure 26 Bristol Frome at Damsons Bridge

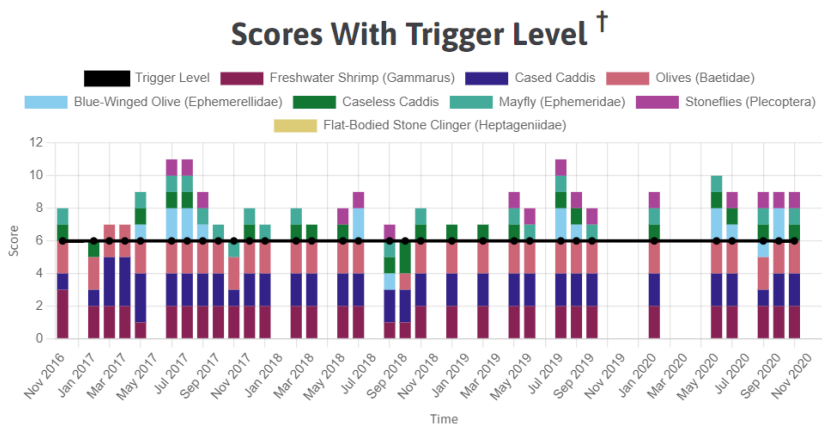


Figure 27 Bristol Frome at Adjacent to Frome Bank Gardens

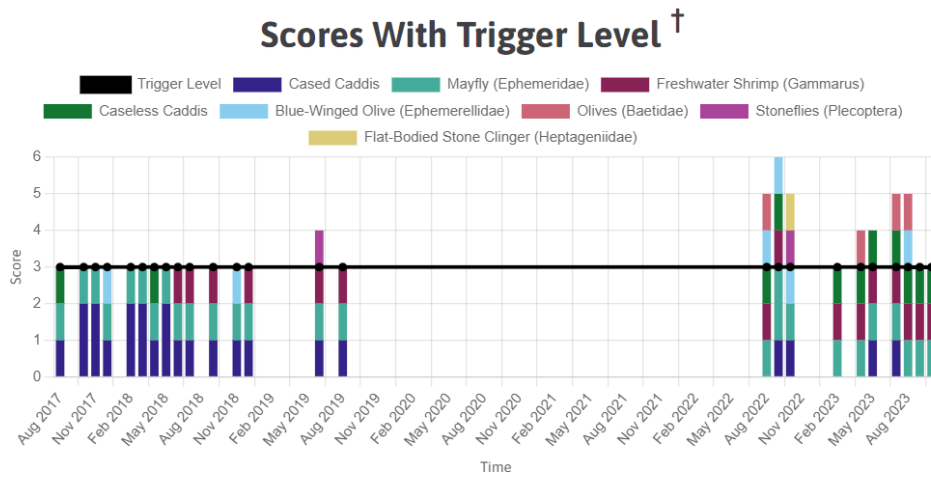


Figure 28 Bristol Frome at Adjacent to Frenchay Bridge

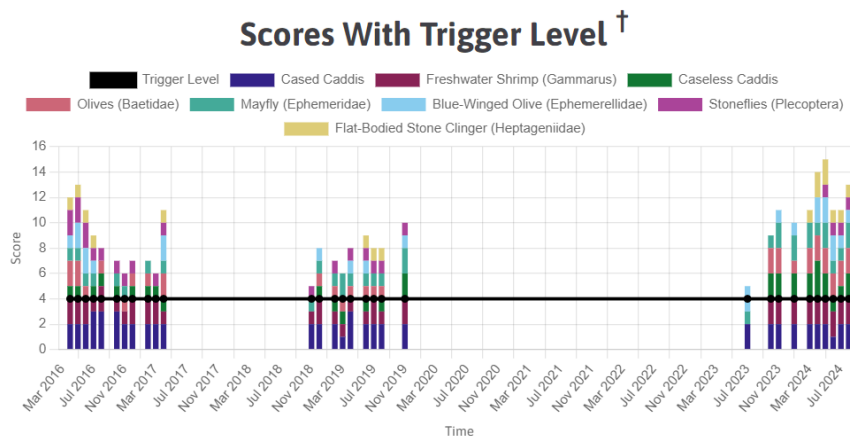


Figure 29 Bristol Frome at Snuff Mills steps

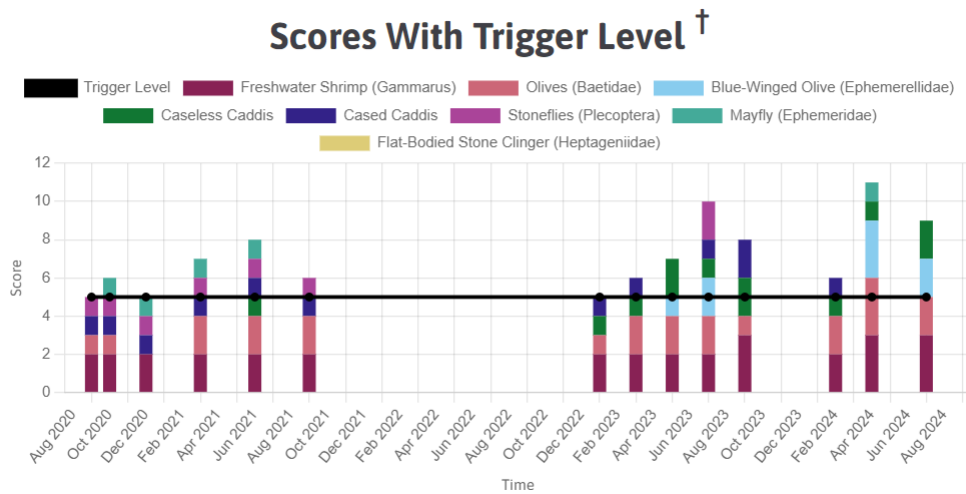


Figure 30 Bristol Frome at Eastville Park

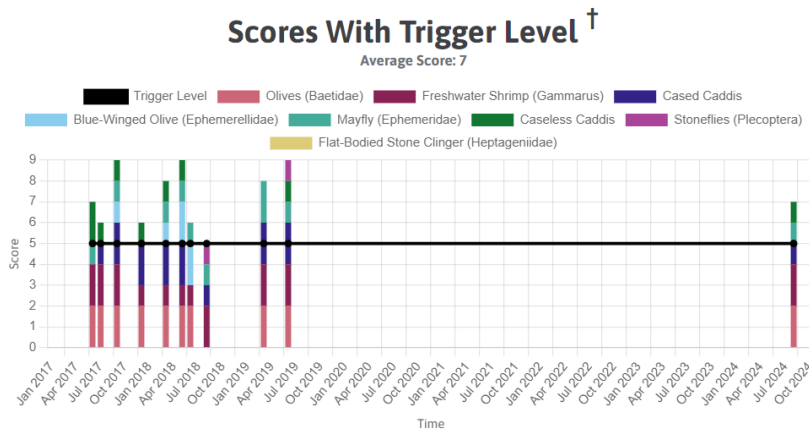


Figure 31 Bradley Brook at Monks Pool Nature Reserve

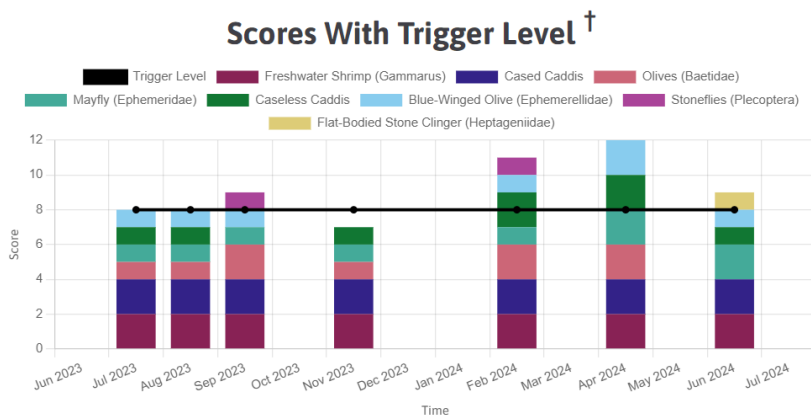


Figure 32 Bradley Brook at Hambrook

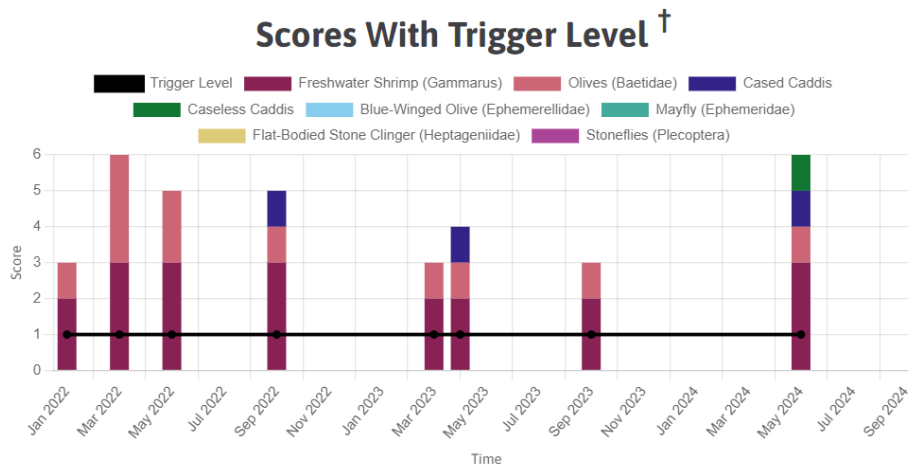


Figure 33 Stoke Brook at Forty Acres

4. Discussion

4.1 Riverfly Monitoring Initiative

Riverfly total scores at the Bristol Frome at Wickham / Jenner Close site ranged between 6 and 13. The vast majority of samples scored between 6 and 11. The site was surveyed six times between March and October 2019 when the volunteer stopped monitoring. No samples fell below the trigger level of 6.

Seven of the eight RMI groups have been recorded at the Wickham / Jenner Close site although four of the six samples had five or fewer of the RMI groups present. Freshwater Shrimp were the most abundant of the eight RMI groups. Stoneflies have not been recorded at the Wickham / Jenner Close site.

Riverfly total scores at the Bristol Frome at Frome Valley Walkway ranged between 5 and 8. The higher scores of 8 were recorded in the March to early July samples and the lower scores of 5 and 6 were recorded in September and October time. The site was surveyed eight times between March 2019 and present day. No samples fell below the trigger level of 5.

Seven of the eight RMI groups have been recorded at the Frome Valley Walkway site although cased caddisflies were not recorded until April 2024. The flat bodied stone clinger has not been recorded at this site and only six stoneflies have been recorded in total. Freshwater shrimps were the most abundant of the RMI groups, although an average abundance of 13 shows that even these were mainly recorded in low numbers.

Riverfly total scores at the Bristol Frome at Wickwar Road Bridge site ranged between 6 and 9. The lowest score of 6 was recorded in October 2020. The site was surveyed regularly between December 2018 and October 2020. The monitor then stopped surveying and a new monitor has taken the site on in January 2024 and has been sampling regularly since. No samples fell below the trigger level of 6.

All eight RMI groups have been recorded at the Wickwar Road Bridge site although flat bodied stone clingers were not recorded until May 2024 and caseless caddisflies have not been recorded since Feb 2019. Stoneflies were recorded in their highest numbers in March 2019 (40) with only five other individuals recorded in total for all other samples. Olives were the most abundant of the RMI groups, with an average of 29 per sample, although numbers of this mayfly are much lower since sampling began again in Jan 2024.

Riverfly total scores at the Bristol Frome at Jubilee Park site ranged between 5 and 10. The majority of samples scored between 7 and 9. The site was surveyed thirteen times between October 2018 and July 2021. The monitor then stopped surveying and a new monitor has taken the site on in July 2023 and has been sampling regularly since. Scores are generally higher in Spring and early Summer and lower in Autumn and Winter. No samples fell below the trigger level of 5.

All eight RMI groups have been recorded at the Jubilee Park site although caseless caddisflies were not recorded until Dec 2023 and stoneflies were not recorded until April 2024. Freshwater shrimps were the most abundant of the RMI groups, with numbers of 100 plus recorded in each of the samples pre 2023. Since sampling began again in July 2023 the shrimps have been found in fewer numbers – between 6 and 30 in each sample.

Riverfly total scores at the Bristol Frome at Beeches Industrial Estate ranged between 0 and 9. The site was surveyed fourteen times between September 2018 and August 2022 when the monitor stopped

surveying. The samples fell below the trigger level of 5 in September and October 2022 – scoring 0 on both occasions. The Environment Agency Pollution hotline was notified as well as the Analysis and Reporting Team. This was at the time of drought conditions in the catchment which may well have exacerbated poor water quality conditions. The August 2022 sample was also very low – hitting the trigger level of 5.

Six of the eight RMI groups have been recorded at the Beeches Industrial Estate site; stoneflies and flat bodied stone clingers have not been found at the site. Cased caddisflies were the most abundant of the RMI groups with an average score of 29 for this group.

The Bristol Frome at Church Road, Yate site is a new site and has been sampled five times in 2024. The site scored between 4 and 7. One sample fell below the trigger level of 5 – the site scored 4 on 17th July 2024. There were no signs of pollution. The trigger level breach protocol was followed and the site was re-sampled at the next opportunity. On the 24th July 2024 the site scored 6, above the trigger level.

All of the eight RMI groups have been recorded at the Church Road, Yate site. Freshwater shrimps were the most abundant of the RMI groups with an average score of 40 for this group.

Riverfly total scores at the Bristol Frome at Parsonage Bridge ranged between 6 and 13. The majority of samples scored between 8 and 10. The highest scores were generally recorded in the Spring and early Summer. The lowest scores were generally recorded in the Autumn. The site was surveyed regularly between August 2016 and present day, with excellent regularity between 2016 and 2019 in particular. The original monitor then stopped surveying in 2022 and a new monitor has taken over the site. The site has been visited four times in Winter / Spring of 2024 but the river levels were too high / fast for a survey to be undertaken. No samples fell below the trigger level of 6.

Seven of the eight RMI groups have been recorded at the Parsonage Bridge site; stoneflies have not been found at the site. Flat bodied stone clingers have only been recorded on two occasions – August 2022 and May 2023. Freshwater shrimps were the most abundant of the RMI groups with an average score of 62 for this group.

The Bristol Frome at Huckford Nature Reserve site is a new site and has been sampled twice- in Nov and Dec 2024. The site scored 9 and 11 respectively. No samples fell below the trigger level of 6.

Six of the eight RMI groups have been recorded at the Huckford Nature Reserve site; stoneflies and flat bodied stone clingers have not been found at the site. Freshwater shrimps were the most abundant of the RMI groups with an average score of 80 for this group.

Riverfly total scores at the Bristol Frome at Damsons Bridge ranged between 6 and 10. The majority of samples scored between 8 and 10 with only one sample scoring lower than this – a 6 in July 2017. The site was surveyed regularly between November 2016 and December 2017 but has not been sampled since. No samples fell below the trigger level of 6.

Seven of the eight RMI groups have been recorded at the Damsons Bridge site; flat bodied stone clingers have not been found at the site. Stoneflies were only recorded on two occasions and blue winged olives were only recorded on three occasions. Caseless caddisflies were the most abundant of the RMI groups with an average score of 79 for this group.

Riverfly total scores at the Bristol Frome at Adjacent to Frome Bank Gardens ranged between 6 and 11. The majority of samples scored between 7 and 9. The lowest scores of 6 were recorded in Jan 2017, Oct 2017 and Sept 2018. The high scores of 10 are recorded in the Summers of 2017 and 2019. The

site is sampled regularly from Nov 2016 to Oct 2020, then there is a gap in sampling until Sept 2023 when sampling begins again. No samples fell below the trigger level of 6.

Seven of the eight RMI groups have been recorded at the Adjacent to Frome Bank Gardens site; flat bodied stone clingers have not been found at the site. The vast majority of stoneflies are recorded during late Spring and Summer. Freshwater shrimps were the most abundant of the RMI groups with an average score of 33 for this group.

Riverfly total scores at the Bristol Frome at Frenchay Bridge site ranged between 3 and 6. From Aug 2017 to Aug 2019 the site was sampled regularly. All but one of the sixteen samples taken between Aug 2017 and Aug 2019 scored 3 (June 2019 scored a four). A new monitor took on the site in Aug 2022 and collected 10 samples, the most recent in Oct 2023. These scores were higher than previously with 7 of the 10 samples scoring 4 to 6. No samples fell below the trigger level of 3.

All of the eight RMI groups have been recorded at the Frenchay Bridge site; however all of the groups are present in very low numbers. Only one flat bodied stone clinger and three stoneflies have been found at the site. Cased caddisflies were the most abundant of the RMI groups with an average score of 5 for this group, again showing that all the taxa are present in low numbers.

Riverfly total scores at the Bristol Frome at Snuff Mills Steps site ranged between 5 and 15. The site was sampled regularly between March 2016 and April 2017. The score of 13 was recorded in May 2016 which gradually reduced to a 6 in March 2017 before increasing again to 11 in April 2017. The site was then sampled again in Nov 2018 and regularly sampled for the next year. Scores ranged from 5 to 10 in this period with no clear pattern. A new monitor took on the site again in July 2023 and has sampled regularly up to present day. After an initial low score of 5 scores have generally been higher in this period with a high score of 15 in May 2024. No samples fell below the trigger level of 4.

All of the eight RMI groups have been recorded at the Snuff Mills steps site; however this site has been monitored extensively – with 30 samples in total recorded. Flat bodied stone clingers and stoneflies have been recorded in low numbers with average scores of 2 and 4 respectively. Burrowing mayfly and blue winged olives were also recorded in low numbers (an average score of 5 for both). Cased caddisflies were the most abundant of the RMI groups with an average score of 43 for this group. The RMI data shows a mixed picture of the site, likely the result of different monitors sampling over time. Recent scores have been higher than historic scores.

Riverfly total scores at the Bristol Frome at Eastville Park site ranged between 5 and 11. The site was sampled regularly between August 2020 and September 2021 and then there was a gap until Jan 2023 when sampling was taken up again and continues to present day. The two highest scores of 10 and 11 were recorded in July 2023 and April 2024 respectively. No samples fell below the trigger level of 5.

Seven of the eight RMI groups have been recorded at the Eastville Park site. No flat bodied stone clingers have been recorded at this site. Burrowing mayflies are present in low numbers (average score of 1). Cased caddisflies, caseless caddisflies and stoneflies are also present in low numbers with average scores under 10 (3, 7 and 2 respectively). Freshwater shrimps were the most abundant of the RMI groups with an average score of 69 for this group.

Riverfly total scores at the Bradley Brook at Monks Pool Nature Reserve site ranged between 5 and 9. The site has been surveyed 13 times between June 2017 and present day. Twelve of the samples were collected between June 2017 and June 2019. No samples fell below the trigger level of 5.

Seven of the eight RMI groups have been recorded at the Bradley Brook at Monks Pool Nature Reserve site. Flat bodied stone clingers have not been recorded at the site. Olive mayflies were most abundant with an average of 257 for this group.

Riverfly total scores at the Bradley Brook at Hambrook site ranged between 7 and 12. The site has been surveyed seven times between July 2023 and present day. The highest score of 12 was recorded in April 2024. The November 2023 fell below the trigger level of 8.

All of the eight RMI groups have been recorded at the Bradley Brook at Hambrook site. Flat bodied stone clingers were not recorded at the site until June 2024. All groups apart from cased caddisflies and freshwater shrimps were found in low numbers with average scores under 10. Freshwater shrimps were most abundant with an average of 44 for this group.

Riverfly total scores at the Stoke Brook at Forty Acres, Stoke Gifford site ranged between 3 and 6. The site was sampled eight times between Jan 2022 and present day. The highest scores of 6 were recorded in March 2022 and May 2024. No samples fell below the trigger level which was set very low at 1. River restoration work was carried out by BART on the Stoke Brook, downstream of the riverfly site, in Autumn 2023.

Four of the eight RMI groups have been recorded at the Forty Acres, Stoke Gifford site. No flat bodied stone clingers, stoneflies, blue winged olives or burrowing mayflies have been recorded at this site. Freshwater shrimps were the most abundant of the RMI groups with an average score of 116 for this group. The other groups were recorded in low numbers with caseless caddisflies only recorded at this site in May 2024 (2 individuals). Unfortunately the monitor has stopped surveying this site, although it is hoped that a new monitor will be able to take the site on in 2024.

5. Conclusions and Recommendations

Riverfly total scores on the Bristol Frome sites ranged between 0 and 15. The lowest score of 0 was recorded twice at the Beeches Industrial Estate site and these scores were reported to the Environment Agency. The absence of any invertebrate life was likely to be the result of a pollution event or underlying poor water quality exacerbated by low flows in late Summer / Autumn 2022.

Average riverfly scores ranged from 3.5 to 9.1 on the Bristol Frome sites. There is no clear trend in riverfly scores when comparing upstream to downstream locations. Riverfly scores are influenced by localised conditions including habitat and water quality, both of which are known to be compromised on the Bristol Frome.

The Frenchay Bridge site has the lowest average score of 3.5 – this site also has the lowest trigger level set at 3. This suggests both poor water quality and poor habitat at this site. The site registration form for this site and site photos show that this site is heavily shaded, has very slow flow and high silt cover on the channel substrate. There are also re-enforced / artificial banks. BART’s walkover surveys have recorded barriers close to the riverfly site (a large weir approximately 200m upstream and an EA gauging flume approximately 200m downstream). All of these factors are likely to be having a detrimental impact on the ecological communities present at the riverfly site.

The highest riverfly total score of 15 was recorded at the Snuff Mills Steps site. The Snuff Mills Steps site scored the highest average score of the Bristol Frome sites - 9.1. The Parsonage Bridge site and Damsons Bridge site also scored high average scores of 9 and 8.9 respectively suggesting conditions are better for macro-invertebrates at these three sites. The Huckford Nature Reserve site scores an average of 10, suggesting good conditions, but only two samples have been taken at this site.

The overall average riverfly score for all the riverfly samples on the Bristol Frome is 7.9. This can be compared to another river in the Bristol Avon catchment such as the river Chew. The river Chew has an overall average riverfly score for all surveys of 11.6. This suggests that the conditions at the river Chew sites are able to support a better macro-invertebrate population than the Bristol Frome sites.

The overall average riverfly score for all the riverfly samples under the BART riverfly hub (2784 samples) is 9.6. This average riverfly score for all BART sites is higher than the Bristol Frome average riverfly score of 7.9. This suggests that conditions at the Bristol Frome sites are not able to support as diverse macro-invertebrate communities as the wider Bristol Avon sites. Table 2 below shows a comparison of average riverfly scores.

Area	Average RMI Riverfly Score calculated from all samples
Bristol Frome River	7.9
Bradley Brook	7.8
Stoke Brook	4.3
All BART Sites (2784 samples in total)	9.6

Table 2 – Average Riverfly Score Overview Table

The taxon abundances for all the Bristol Frome surveys show that shrimps are the most abundant of the eight riverfly groups. Flat bodied mayflies and stoneflies are the least abundant of the eight groups. This is to be expected as shrimps are the least pollution sensitive of the eight groups and flat bodied mayflies and stoneflies are the most pollution sensitive of the groups.

Riverfly total scores on the Bradley Brook sites ranged between 5 and 12. The lowest score of 5 was recorded at the Monks Pool Nature Reserve site, just hitting trigger level. The highest score of 12 was also recorded at the Monks Pool Nature Reserve site suggesting that conditions are quite variable at this site. The average riverfly score was lower at the Monks Pool site (7) than at the Hambrook site (9.1) suggesting that conditions are overall more favourable for macro-invertebrates at the Hambrook site. The overall average riverfly score for all the riverfly samples on the Bradley Brook is 7.8 – very similar to the Bristol Frome as a whole.

Riverfly total scores at the Stoke Brook at Forty Acres, Stoke Gifford site ranged between 3 and 6. The average riverfly score was 4.3. This suggests both poor water quality and poor habitat at this site. BART have carried out extensive habitat improvement works on the Stoke Brook in Autumn 2023. The river restoration works including in stream woody debris work were located downstream of the riverfly monitoring site.

Overall, the data across numerous sites clearly show that invertebrates are being impacted at all sites by a combination of factors, including water quality and siltation. It is recommended that further investigations be conducted to identify the sources of these impacts. These findings can then be used to develop targeted solutions that create conditions for invertebrates and the wider aquatic ecosystem to thrive.

The following recommendations are made to build upon the findings of this report:

- BART to analyse [River Detectives](#) water quality data alongside the Bristol Frome Riverfly site data to identify and pinpoint any water quality pressures;
- BART to investigate the Frenchay Bridge stretch of the Bristol Frome (the poorest scoring Riverfly site) to identify any potential opportunities for habitat and water quality improvements;
- BART to share findings of this Riverfly Monitoring report with volunteers and partners. Partners to include the Environment Agency, the Bristol Avon Catchment Partnership and River Frome Reconnected Partnership;
- ART to share findings of this Riverfly Monitoring report with volunteers and partners;
- BART to look for funding opportunities to undertake SmartRivers species level monitoring at the Bristol Frome RMI sites to identify the main pressures on the macro-invertebrates in these locations and, therefore, help to target improvement work in the area;
- BART to investigate funding opportunities to undertake further River Restoration works on the Stoke Brook in the location of the Forty Acres Riverfly site.

6. References

BS EN ISO 10870:2012 Water quality - Guidelines for the selection of sampling methods and devices for benthic macroinvertebrates in fresh waters

Researchgate.net (2021) https://www.researchgate.net/figure/BMWP-Classes-Scores-Categories-and-Interpretation-of-the-Result_tbl1_326649205

RiverHub Data Platform 2024: <https://riverhub.co.uk/>

Riverfly Partnership Data Platform 2024: [Riverfly Data](#)