

TORRIDGE RIVERFLY REPORT 2019



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Acknowledgements

Volunteers The huge number of volunteers who put their time towards monitoring river health every year

*Thanks to all past, current and, in advance,
future volunteers. We can do nothing
without you*

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Background

The Riverfly Partnership is a dynamic network of organisations, representing anglers, conservationists, entomologists, scientists, water course managers and relevant authorities including the Environment Agency. It is hosted by the Freshwater Biological Association and aims to protect the water quality of our rivers, further the understanding of riverfly populations and conserve riverfly habitats.

Riverfly in the Torridge catchment was established in 2014, through a partnership with the North Devon Biosphere and Devon Wildlife Trust. It has been running now for 5 years and is one of the larger Riverfly projects in the UK, with over 40 registered sites and 23 active sites in 2019. In addition, since 2016, Riverfly volunteers have also been trained to monitor parts of the Taw catchment with 11 registered sites.

The programme is almost entirely volunteer led. It is designed to help detect pollution incidents through the identification of river invertebrates and the abundance of each group. This gives a score for each site which, if falls below the trigger level set for the site by the Environment Agency, proceeds with further action in the form of a second survey by the Catchment Coordinator or involvement of statutory bodies. By collecting data over a whole river catchment year on year the surveys can also monitor long-term changes in overall river health and act as a deterrent to polluters.

A Volunteer's View:

In these times when nature is under increasing pressure from things like intensive farming, climate change, and shrinking natural habitats, it is vitally important to monitor these habitats, so that at least we can act when things are going wrong. In this way, we can hopefully maintain what we have, and then maybe look to improve things in the future. This is why I think the Riverfly Survey is so important. It gives us the mechanism to check the state of our rivers in a consistent way, and to quickly report any issues.

Chris Baines (Dymsdale Bridge)

Riverfly National Review - From the Anglers' Riverfly Monitoring Initiative (ARMI) Project Manager

ARMI volunteers regularly monitor 1955 sites UK wide and continue to detect pollution incidents, reporting vital information to local statutory body contacts. Across the UK, strongly established ARMI hubs and groups are providing the spine to support Riverfly Plus, and other citizen science, initiatives, such as Extended Riverfly (siltation & low flows) and Outfall Safari (developed and first run by the Citizen Crane project in the Crane Valley catchment).

Thankyou to every single ARMI volunteer, coordinator, tutor and partner for your ongoing commitment to protecting and conserving our rivers across the United Kingdom. Special thanks to all rod licence paying anglers and the Environment Agency for providing funding support to ARMI in England, to SEPA for providing strategic support to ARMI in Scotland, to RP host the Freshwater Biological Association and to RP Chair, Steve Brooks.



Introduction to Riverflies.

The three groups of Riverflies that we focus on are the mayflies (Ephemeroptera), caddisflies (Trichoptera) and stoneflies (Plecoptera). They live most of their lives as larvae on the bed of rivers and still waters, emerging as short-lived adult flies mostly in spring and summer, often en masse. Riverflies are a vital part of the aquatic food web and their populations are affected by water quality and quantity, habitat diversity and habitat quality. Their limited mobility, relatively short life cycle, presence throughout the year and specific tolerances to changes in environmental conditions make them powerful biological indicators to monitor water quality, and they are commonly referred to as 'the canary of our rivers.' Of the 278 species in these groups eight have Biodiversity Action Plans and are designated by the government as priorities for conservation.

Caddisflies also need clean water with, for the cased species, suitable materials to build their protective cases. The adults are rarely seen as they fly mostly at dusk or are nocturnal.

Freshwater shrimps (*Gammarus* spp.) are more tolerant of a variety of water pollutants than the mayflies and caddisflies so may still be found after a pollution incident.



A variety of cased caddis

River Torridge Update 2019

The last Riverfly sampling for 2019 was done by the Torridge volunteers in September. During the year, 78 samples were collected from 23 active sites. The co-ordinator is Tamsin Quinn. Tamsin is a volunteer with the Devon Wildlife Trust and can be reached by email at tamsinextra@hotmail.com

The co-ordinator for the River Taw is Olivia Cresswell from Westcountry Rivers Trust Olivia@wrt.org.uk

Results

The data across the whole Torridge catchment, which in some areas has been collected for 6 years is difficult to categorise, as there is little consistency with the decline, stability or improvement in water quality across the catchment, with trends varying across the different water bodies. The most significant improving trends for water quality have been seen on the River Waldon. In contrast the strongest declining trends have been shown on Pulworthy Brook and the River Mere, based on invertebrate species and abundance. *The latest Environment Agency water quality scores (2016) are detailed to the full results document which accompanies this report.*

Three sampling sites on two different tributaries failed their trigger level. These include the Woolladen Stream (tributary to the Mere), Dolton Stream and Woolfardisworthy (Dipple Water). Those at Woolladen Stream were the result of low flow levels and it ceased flowing in July. In September there was still insufficient water to sample. One pollution event was identified and investigated at the Dolton Stream site. There were other reported trigger level breaches all of which were above their trigger levels when a second sample upstream was examined.

River Torridge results since 2014

Looking at the Riverfly programme as a whole since it began on the Torridge in 2014,

- 723 samples have been taken
- 50 sites have been sampled
- 5 catchments have suffered trigger breaches

- 33 sites are inactive at the end of 2019 so if anyone wishes to get involved in Riverfly and possibly take up one of these sites, please contact Lisa Schneidau at Devon Wildlife Trust lschneidau@devonwildlifetrust.org
- 2169 volunteer hours assuming each sample requires 3 hours of time to take and enter into the database
- The financial value of volunteer hours calculated using the HLF 'skilled labour rate' of £20/hour is £43380
- 6 catchments/parts of the Torridge catchment are without any active sites at the end of 2019 so this report cannot reflect the reality of the state of all of the River Torridge catchment.

Table 1. Catchments with no active sites in 2019

| Catchment | Part of Catchment | Sites available |
|------------------|-----------------------------|------------------------|
| Torridge | Dipple Water to Coombe Lake | Julians Farm |
| | | Haytown Bridge |
| Torridge | Coombe Lake to Lew | Sheepwash |
| | | Coham |
| | | Bradford Mill |
| | | Coombe Hill |
| | | Black Torrington |
| Cookbury Stream | | Bramble Wood |
| Whiteleigh Water | | Stadson Bridge |
| Musselbrook | | Littlecot |
| | | Upcott Barton |
| | | Musselbrook |
| Upper River Mere | | Upper Ford |
| | | Coombe Bridge |
| | | Rest-A-While |

Table 2. Active sites during 2019

| Site | Volunteer(s) | Active Since |
|---------------------------|-------------------------------|---------------------|
| Coombe Farm | Sally Vergette | 2014 |
| Copse Bank | Steve Short and Helen Barnard | 2015 |
| Dolton Stream | Marian Philips | 2018 |
| Dymsdale Wood Bridge | Chris Baines | 2017 |
| Halsdon | Kevin New | 2016 |
| Halsdon Mere | Kevin New | 2016 |
| Hatherleigh CC | Elizabeth Durrant | 2014 |
| Hayes Barton | Mike Stamp | 2014 |
| Merton Mill | Steve Martindale | 2015 |
| Quarry Bridge | Gordon Murray | 2014 |
| South Heale Yeo | Robert Reed | 2015 |
| The Mills, Monkhampton | Kevin New | 2014 |
| Torr Common | Mandi Harrison | 2014 |
| Watergate Car park | Graham Nicol | 2015 |
| Waterland Bridge | Sarah Payne and Mick Jones | 2016 |
| Woods Bank | Steve Short | 2015 |
| Woolfardisworthy | Julie Collingham | 2014 |
| Wooladen Stream | Tamsin Quinn | 2017 |
| Woolleigh Brook | Austin Philp | 2014 |

Investigations into trigger breaches in 2019

Investigation of Riverfly Monitoring Initiative (RMI) Trigger Level Breach on Dolton Stream, 7th August 2019

An RMI survey carried out by Marian Phillips on the Dolton Stream just south of the DWTHalsdon Nature Reserve possibly on 24th July 2019 identified the following:

“Water is brown, opaque, dead fish evident. Two dead (trout?) in our sample. Sampled as normal and found only 2 mayfly, 3 olives and 1 shrimp. The Mayflies and Olives very much on their last legs” (email forwarded by Tamsin Quinn, 24th July 2019). This results in an RMI Score of 3. The Trigger Level set for this site is currently 6 and, for context, the site scored 12 when sampled two months earlier. The dead fish photographed in that assessment were in fact minnows.

Reports of poor water quality, colour and odour, and dead trout, bullhead, lamprey, stone loach and minnows in the Dolton Stream had previously been phoned through to the Incident Hotline on 22nd July 2019. An Environment Officer attended on 23rd July 2019. This investigation identified a potential source of agricultural pollution to the Cudworthy Stream.

Action

On 7th August 2019, I visited the Dolton Stream with Antonia Dommett, where we collected and analysed invertebrate samples from three sites upstream of the Riverfly Monitoring site in Little Hill Wood (referred to as Halsdon NR on the Riverfly website). The routine EA monitoring site, Opposite Rock Cottage Driveway, was selected in preference to the Riverfly site because of an existing, recent baseline of family level data. The samples were sorted live, bankside, and the animals present identified to family level, and abundances estimated. Biological quality was poor at the Rock Cottage site, when compared with invertebrate samples taken there in March and September 2013, and with samples taken a little further downstream at Dolton Mills in 1991, 1992 and 1993. This is true for all three metrics; BMWP, ASPT and Number of Taxa. This represents a significant decline in water quality in this reach, still very much in evidence two weeks after the initial observation by Riverfly volunteers. The

invertebrate fauna shows signs of both chronic enrichment, in elevated numbers of detritivores, as well as likely more acute impacts that have resulted in the absence of some pollution sensitive animals.

Results

Table 3. Results from three water bodies in the River Torridge catchment

| Water Body | Cudworthy Stream | Dolton Stream | Dolton Stream |
|-----------------------|-----------------------|-----------------------|-----------------------|
| Site/Station Name | Upstream Stony Bridge | Upstream Stony Bridge | Opposite Rock Cottage |
| Site/Station ID | 198292 | 198293 | 162120 |
| Site/Station Location | SS-56026-11740 | SS-56043-11730 | SS-55822-11594 |
| Sample ID | 799574 | 799575 | 799573 |
| BMWP | 66 | 155 | 91 |
| ASPT | 6.6 | 6.74 | 5.35 |
| No. Of Taxa | 10 | 23 | 17 |
| RMI Score | 5 | 13 | 8 |

BMWP: The Biological Monitoring Working Party is a procedure for measuring water quality using families of macroinvertebrates as biological indicators. The method is based on the principle that different aquatic invertebrates have different tolerances to pollutants.

ASPT: The Average Score Per Taxon (group of invertebrates in this case)

Upstream, the Dolton Stream receives significant flow from the Cudworthy Stream at Stony Bridge. The sample taken from the lower reaches of this tributary was also poor. The fauna was sparse, with all those taxa present represented in low numbers, and many families of invertebrates were absent, suggesting a recent, fairly catastrophic decline in biological quality, consistent with that reported to the EA on 24th July 2019. There were, however, some early signs of recovery from un-impacted river further upstream.

The invertebrate fauna present upstream of Stony Bridge on the Dolton Stream, and also upstream of the discharge from Dolton WWTW, is excellent, and typical of an un-impacted stream of this type. Pollution sensitive mayflies, stoneflies

and caddis are all present in good numbers, and there is no evidence of the ongoing, low level enrichment seen downstream.

Conclusions & Recommendations

Recent, significant organic pollution in the Dolton Stream appears to be the result of poor water quality in the Cudworthy Stream, although the location of the Dolton WWTW discharge (immediately upstream of the bridge and the confluence of the two streams) means that it is not possible to rule that out as a contributing factor.

Further Riverfly monitoring, resource permitting, of Cudworthy Stream in combination with existing monitoring on the Dolton Stream, might help to better understand the relative contribution of sources identified. EA monitoring has been provisionally allocated to assess the impact of Dolton WWTW on nutrient status in 2020.

Michael Thomas, Analysis & Reporting, Devon Cornwall and Isles of Scilly Area
13th August 2019

Riverfly Trigger Level Breach at Quarry Bridge, Torridge,

2nd September 2019

A RMI score of 6 was recorded at Quarry Bridge by Gordon Murray on 2/9/19.

The levels were as follows:

Cased Caddis – 7

Caseless Caddis – 0

Mayfly – 0

Blue Winged Olive – 1

Heptageniidae – 1

Olive/Baetidae – 9

Stonefly – 18

Shrimp – 0

Taking a kick sample on a riverbed of relatively large stones has always been challenging. What was notable yesterday was the general lack of invertebrates in the kick sample. Particularly the near absence of *Heptageniidae*, Blue-winged Olive and *Baetidae* was notable. I usually find at least 20+ *Heptageniidae*. Shrimps are always rare, but again I usually have <10 Caseless Caddis. I saw no untoward signs on the river. No build-up of algae, signs of foam or any other surface pollution. Water clarity was fine.

Action

This breach of Trigger Level probably does not justify a repeat sample. RMI Scores are typically close to their Trigger Level – if this is set correctly - in agricultural catchments at the end of summer, and a score of 6 was registered for this site in September 2016. Flows are low and this in combination with warm weather and elevated nutrients is driving down dissolved oxygen levels and resulting in some stress to the invertebrate community. In some instances this has been exacerbated by heavy algal growth (see Loddiswell, Avon) but that is not the case here. Low numbers or an absence of certain mayflies is not unexpected in early September. I have looked at Torridge data this morning to confirm that mayflies belonging to both *Heptageniidae* and *Ephemerellidae* (blue winged olives) families are typically much less abundant in samples taken in late summer. This is because those taxa, although present, are apparently less abundant due to the stage of their life cycle they will typically be in at this time. It is also true to say the substrate composition, and its stability in these rivers makes sampling difficult. A lot of effort is required to disturb substrate on a well-armoured riffle, and this tends to have a negative impact on recorded abundances in this river typology.

Postscript

Dolton Stream improved after this pollution incident, returning to near normal levels by the end of the season.