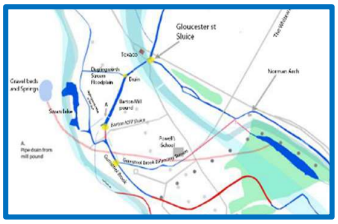
Citizen Monitoring Report March 2025



Friends of Gumstool Brook is a group of local people interested in Cirencester's Gumstool Brook and its associated streams. Visit our website at https://gumstool.org.uk

Summary

- The total March rainfall was just below 8mm in the Churn catchment and almost 8.5mm in the Frome catchment to the west. These equate to around 13% of their monthly averages, making it an exceptionally dry month and the driest March in the 40 year rainfall record available.
- As a result of the dry weather, groundwater in the Cotswold limestone aquifers fell progressively from exceptionally high levels at the start of the month but remained normal for the time of year at the end of March. Notably, however, these are the lowest end of March levels for 10 years. Similar groundwater level trends occurred in the shallow Gravel aquifer.
- At the end of March, the River Churn flow measured at the Environment Agency (EA) Cirencester gauging station was 77 million litres per day (Ml/day). This is below normal for the time of year and is the lowest end March flow for 10 years.
- All three sluice gates on the Churn at Gloucester Street remained fully open during March.
- The water level in the Barton Mill Pound has reduced, as has the flow from the River Churn into the Mill Pound.
- The Daglingworth Stream is flowing at a low level all the way from Duntisbourne Abbots to Barton Mill and is providing a small flow into the Gumstool Brook within Cirencester.
- Riverfly monitoring has yet to re-commence in 2025. Water quality monitoring has continued, showing significant fluctuations in phosphate concentrations in the Churn and Gumstool Brook in 2025 to date, while other nutrient concentrations increased slightly. The trends in river health will continue to be monitored and investigated.
- The water courses remain healthy when there is good flow but, working with the Cirencester Wildlife Group and other stakeholders, further ecological consideration is being given to how the health of the river, streams and lake can be enhanced through working in partnership.

If you would like to go straight to any of the following detailed topics, just Click on a heading

1. Weather Update & Water Situation Prognosis
2. Groundwater Situation
3. Daglingworth Stream & Gumstool Brook Flows
4. River Churn Flow
5. River Health
6. Stream Monitoring Photographic Record
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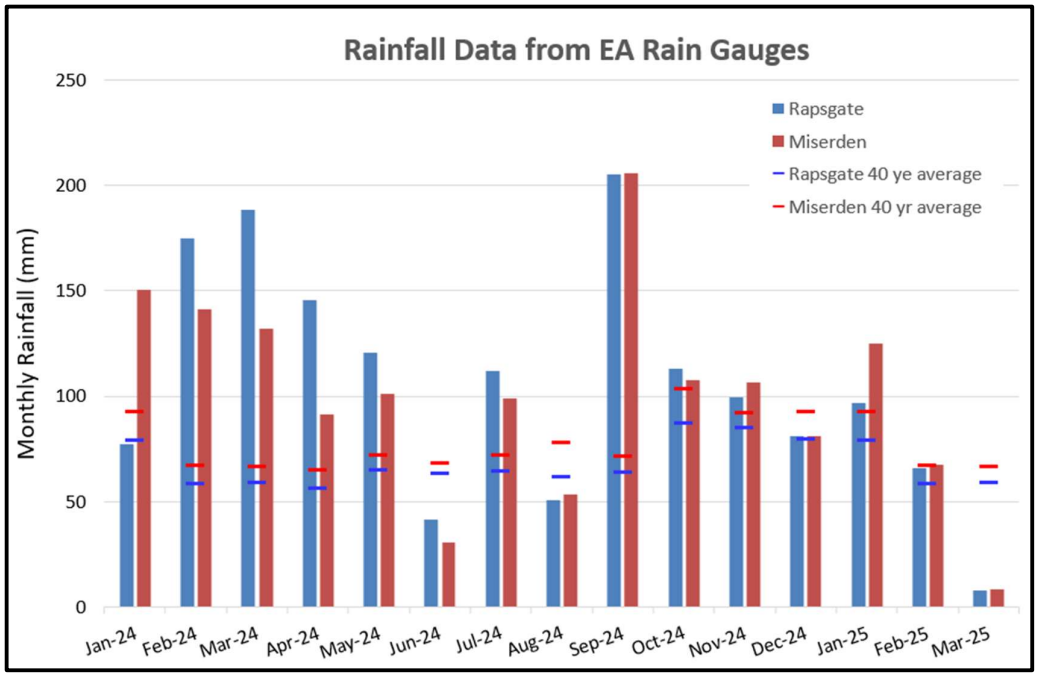
8. Details of the stream monitoring locations

1. Weather Update & Water Situation Prognosis

From October 2024 to February 2025, monthly rainfall totals in the upper Churn and Daglingworth Stream catchments were largely above averages, as can be seen on the graph below. In contrast, the data from both the Churn catchment (Rapsgate rain gauge) and the Frome catchment to the west (Miserden rain gauge) illustrates that March 2025 rainfall totals are well below their monthly averages. At Rapsgate 7.9mm of rainfall was recorded and 8.4mm at Miserden, both equating to approximately 13% of their monthly averages, making March 2025 an exceptionally dry month and, in fact, the driest March in the 40 year rainfall record available.



With the exceptionally dry weather, soils have dried progressively during the month. As a result, it is now much more likely that the soils and plants will absorb rain that falls, rather than aquifers being recharged.

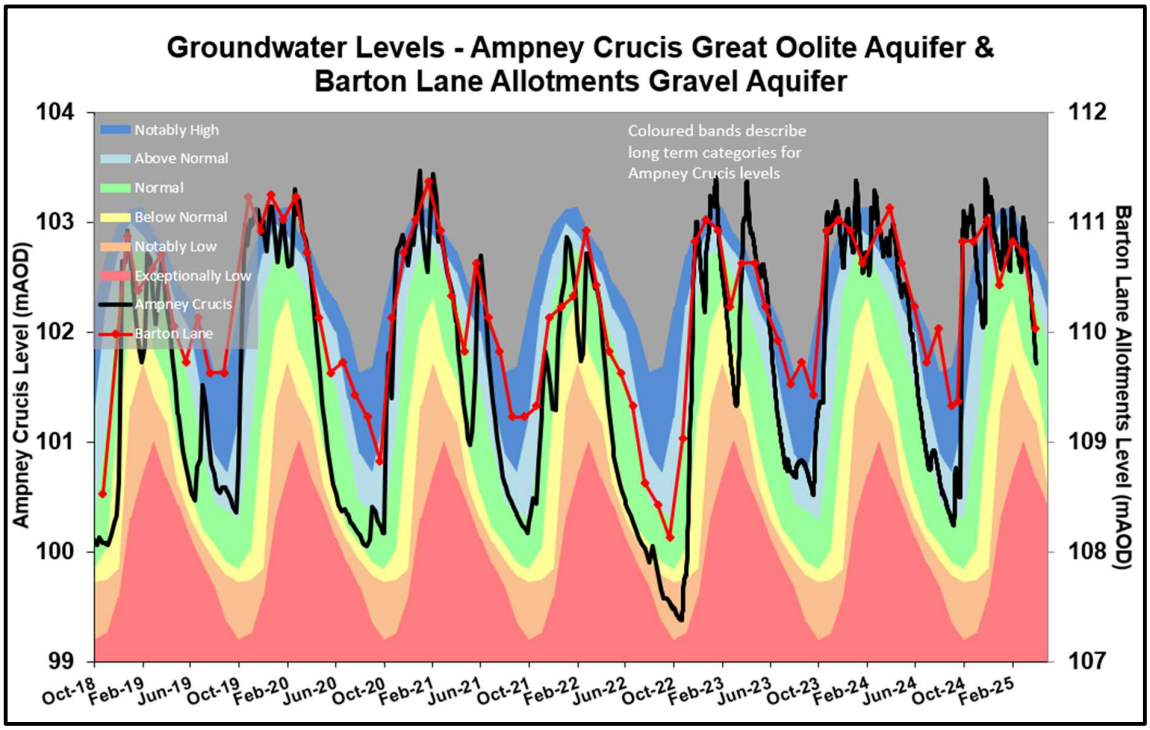
Looking ahead at the weather, the Met Office 3 month outlook from April to June 2025 for the whole UK is that there continues to be an equal chance of a wet or dry Spring and early Summer. For April, however, there is a higher chance of it being a dry month for the UK as a whole, but with increased chances of wetter spells across the southern UK. The Met Office outlook also indicates that the chance of a warm Spring and early Summer is higher than normal, leading to an increased chance of heatwaves in early Summer.

With the health of Cirencester's waterways always being influenced by the weather, groundwater levels and river flows have fallen progressively during March. At the end of March, although groundwater levels remain normal for the time of year, flow in the Churn is below normal and at the lowest end of March flow since 2015. With the outlook for wet or dry weather being uncertain but soils across the catchment now being dry, it is likely that groundwater levels and river flows will decline further in Spring and into early Summer. As there is an increased chance of a warmer than normal weather, the prognosis of lower groundwater levels and river flows in Spring and early Summer is more likely.

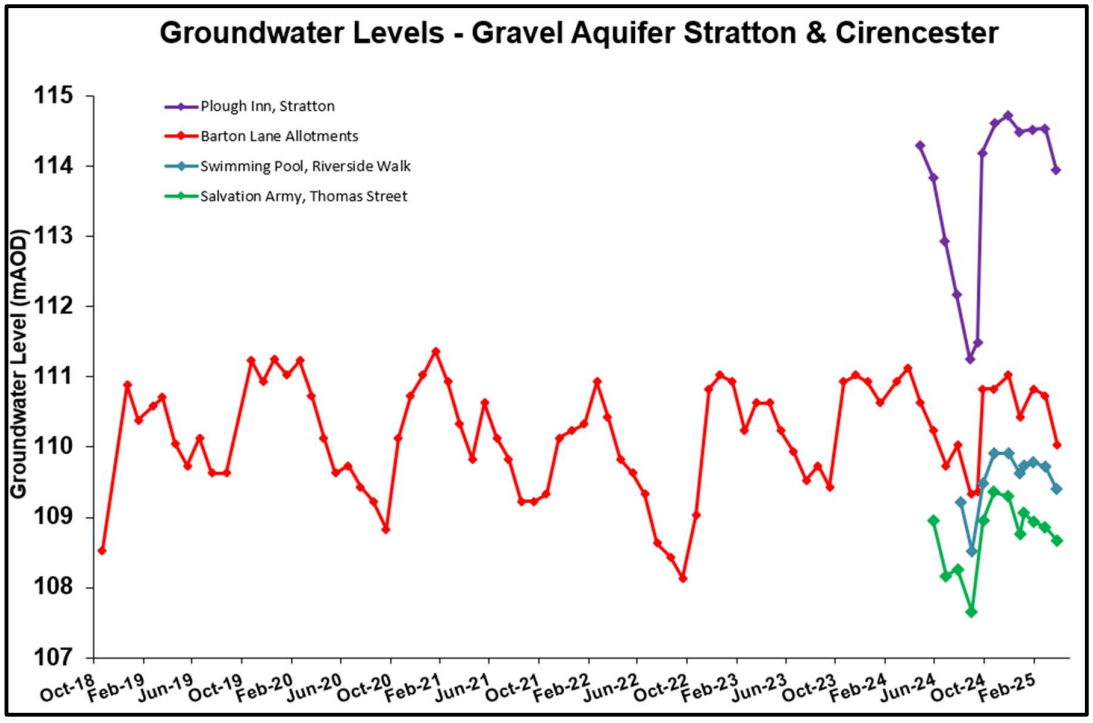
2. Groundwater Situation

During January and February 2025, groundwater in the Great Oolite limestone aquifer fluctuated between normal and exceptionally high levels in response to the variable pattern of rainfall that occurred. As shown on the graph below, although groundwater levels at the start of March were exceptionally high for the time of year, they declined progressively throughout the month in response to the exceptionally dry weather. Despite the dry weather, groundwater levels at the end of March remained within the normal range for the time of year, although they remain on a

declining trend. It is notable, however, that the end of month Great Oolite groundwater levels are the lowest end of March levels experienced since 2015. This decline in groundwater levels in the Great Oolite aquifer during March is a good example of how quickly levels can fall when drier weather occurs and result in the reduction in groundwater flow from the aquifer into the rivers and streams.



The graph above includes groundwater levels measured in the shallow Gravel aquifer at Barton Lane Allotments. Although these levels are measured only once a month, the decline between the end of February 2025 and the end of March is clear, and consistent with the trend seen in the Great Oolite aquifer. As shown on the graph below, there are similar declining groundwater level trends in Gravel aquifer measured in the shallow wells at the Swimming Pool, the Salvation Army and the Plough Inn. It is noticeable that the decline in the groundwater levels is larger at the



Plough Inn and Barton Lane Allotment wells, again suggesting that subtle differences exist in the groundwater level responses to rainfall, or the lack of it. The significance of these differences is, as yet, unclear.

3. Daglingworth Stream & Gumstool Brook Flows

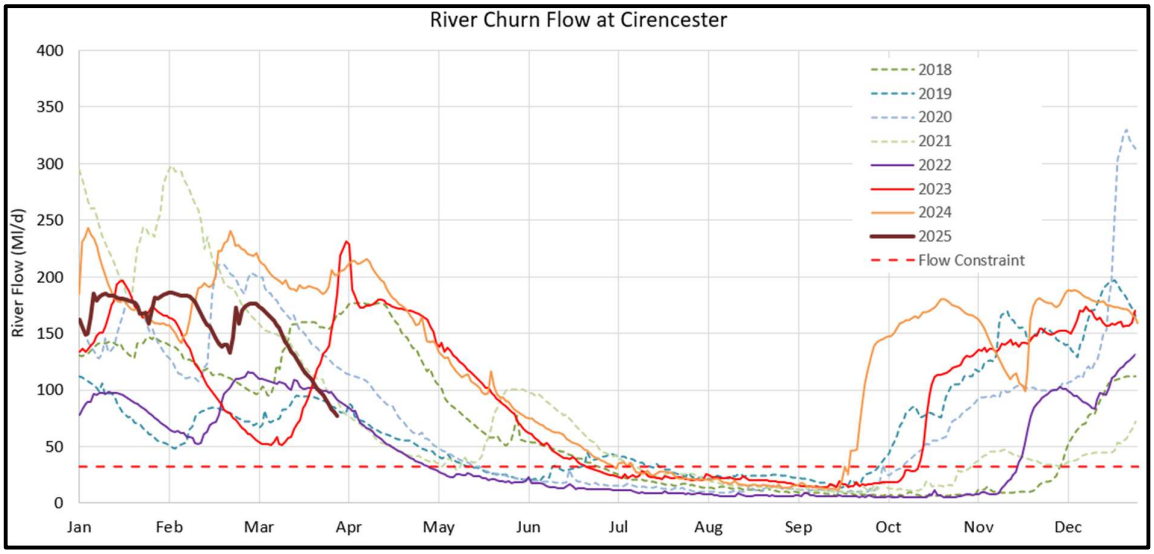
The citizen science observational monitoring of flow in the Daglingworth Stream between Daglingworth and Stratton is continuing, as is the analysis of the flow relationships with fluctuating groundwater levels in the Great Oolite aquifer.

At the end of March low stream flows continued between Daglingworth and Stratton, including where the stream is crossed by Barn Way and School Hill in Stratton. The analysis shows that the Daglingworth Stream dried up at Barn Way during May 2024, which is notable because the end of March 2025 groundwater levels were lower, but stream flow continued. Significant rainfall events resulting in runoff and increases in flow could potentially explain this difference, but March 2025 experienced exceptionally low rainfall and no significant intense rainfall events. As noted in the February 2025 report, other factors that may influence fluctuations in stream flows are being considered. These factors include riparian management, soil and sediment runoff and the impact on the permeability of stream bed sediments. It is of potential significance therefore, that the Daglingworth Stream channel upstream of Wellhill Copse was cleared in February 2025. Previously, the fields through which the stream flows have been subject to flooding but now the stream is flowing within its cleared channel. In addition, the water in the Daglingworth Stream at Barn Way and School Hill at the end March is described as “slightly muddy” and further upstream at Daglingworth Place as “muddy”. It is possible that muddy sediment on the stream bed is of sufficiently low permeability to limit the amount of stream flow seeping into the Great Oolite aquifer that underlies much of the stream in this area,

Monitoring of water levels in watercourses adjacent to wells in the shallow Gravel aquifer in South Stratton and in Cirencester around the Barton Mill Pound and Gumstool Brook has also continued. The observations made to date may also help understand the relationships between stream flow and groundwater levels. Specifically, during March it was apparent that groundwater levels in the Gravel aquifer fell below the level of the Daglingworth Stream bed adjacent to the Plough Inn and below the bed of the Gumstool Brook. This illustrates the potential for flow in the stream to seep downwards into the underlying aquifer. As noted above, the extent of seepage will, however, depend on the permeability of the stream bed sediments.

4. River Churn Flow

Flow in the River Churn, as measured at the EA Cirencester gauging station, declined progressively during March in response to the exceptionally dry weather and declining groundwater levels. As shown on the graph below, at the end of March the flow in the River Churn declined from 175 Ml/d at the end of February to 77 Ml/d at the end of March. This is the lowest end of March flow since 2015, consistent with observations made in Section 2 on groundwater levels in the Great Oolite aquifer and the groundwater level trend in the Gravel aquifer.



Although the rainfall outlook for Spring and early Summer currently remains unclear, the below normal river flows with a continued declining trend and dry soils suggest that river flows may well continue to decline into early Summer, perhaps as was experienced in 2020 and 2022. Despite the progressive decline in flows in the River Churn in March, the flow at the end of the month remained well above 32 Ml/d, as expected at this time of year. The 32 Ml/d flow is the trigger above which groundwater abstraction by Thames Water at Baunton can operate. Nevertheless, with the declining trend in river flows, dry soils and an uncertain rainfall outlook for Spring and early Summer, it is possible that this trigger will be crossed earlier than normal this year, similar to 2022 which was a notable dry year. As river flows continue to exceed the 32 Ml/d trigger, it is likely that Baunton is currently abstracting groundwater for public water supply.

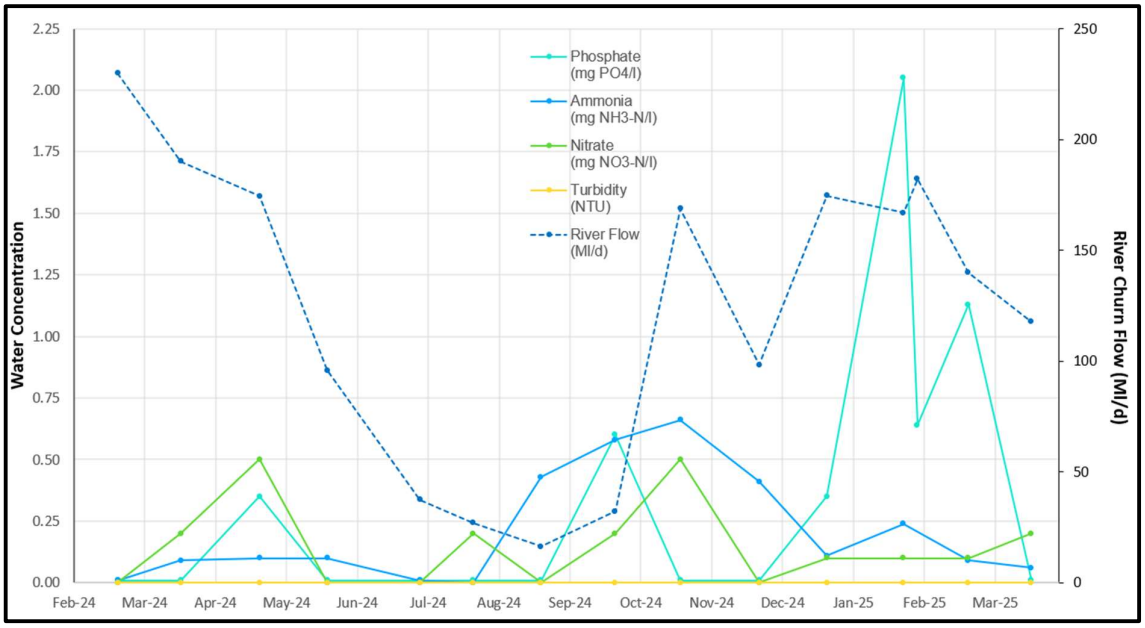
5. River Health

The health of the River Churn and Daglingworth Stream is being monitored via measurement of water quality and riverfly numbers. This is being done on the River Churn at Gooseacre Lane, just downstream of the Gloucester St sluices, and on the Gumstool Brook (Daglingworth Stream) along Riverside Walk. The aim is to carry this out monthly when river flow conditions allow monitoring to be carried out safely. In addition, it is planned that environmental observations in and around the water courses will be recorded in future, including wildlife and plant growth.

a) River water quality

Monitoring of river water quality covers the nutrients, ammonia, nitrate and phosphate, and turbidity, a measure of how clear the water is. As during 2024, when intermittent phosphate and nitrate concentration spikes were detected in the Churn and Gumstool Brook, these spikes have continued in 2025, as shown by the graph below for the Churn. The phosphate spikes in concentration have been more apparent in December 2024 to February 2025, with concentrations exceeding 1 mg PO_4/l in the Churn and Gumstool Brook. In March, phosphate concentrations decreased to be below detection limits, which may reflect the exceptionally dry weather. In contrast, nitrate and ammonia concentrations have tended to increase.

Although there are clearly spikes in nutrient concentrations, particularly phosphate, which may relate to rainfall intensity and river flow, the background concentrations appear relatively low. Monitoring will continue to investigate these trends, with appropriate nutrient concentrations reflecting good quality to be defined accounting for standards set by the UK Technical Advisory Group on the Water Framework Directive (UKTAG)



b) Riverfly health

Monitoring of riverflies collected from the riverbed, via kick sampling within the watercourses, focusses on stoneflies, caddisflies, mayflies and other species, which are recognised as good indicators of water quality. No monitoring has been possible since September 2024 largely owing to high river flow/level creating an unacceptable risk to citizen scientists undertaking the in-river sampling.

Previous results from June to September 2024 have been presented graphically for the River Churn, comparing the riverfly data, expressed as an ARMI (Anglers Riverfly Monitoring Initiative) score, with a provisional ARMI trigger. The data collected from 2024 shows most results above the trigger suggesting that both the River Churn and the Gumstool Brook are healthy and are sustaining a riverfly population. When monitoring can be re-commenced, the data will be presented in updated graphics.

c) Environmental observations

The Cirencester Wildlife Group (CWG) November 2024 environmental survey of the waterways within Cirencester, with recommendations for environmental improvement, has been shared with other stakeholders. The recommendations are in the process of being prioritized to promote further discussion and to assist in agreeing actions, roles and responsibilities.

FoGB volunteers continue to clear vegetation from the banks of the Barton Mill pound and the Gumstool Brook along Riverside Walk, as recommended by the CWG report to reduce shading of the stream, increase natural lighting and encourage water plant growth.

6. Stream Monitoring Photographic Record

The set of monitoring pictures of the River Churn in the Cirencester area was collected on the 27th and 28th March, and of the Daglingworth Stream on the 30th March 2025. From these photographs, the following visual assessments have been made.

- The Daglingworth Stream in the Duntisbourne valley down to Daglingworth village has decreased and is at a low flow level.

- The two woody debris leaky dams upstream of Daglingworth village are now being actively monitored, and are in good condition.

- The flow in the Daglingworth Stream south of the Daglingworth area has decreased and is at a low flow level and has a slightly muddy appearance.

- The River Churn flow fell progressively during March. The EA measured daily average flow was 77 Ml/d on the 31st March.

- All of the sluice gates at the Gloucester Street weir have remained fully open during March.

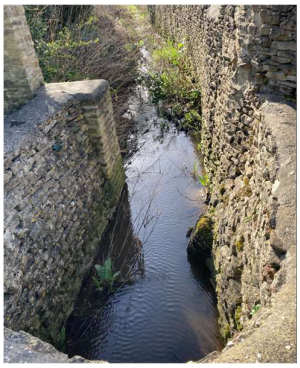
- The water level in the Barton Mill Pound has dropped, with lower flow from the River Churn into the Mill Pound. There is still flow from the new overflow and some flow at the old overflow into the adjacent field, but the flow through the Barton Mill sluices is observed to be very low.

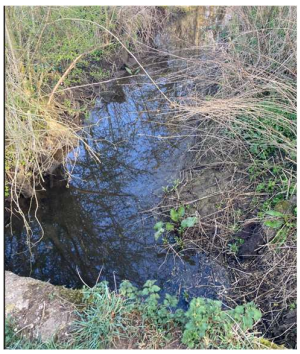
- The River Churn and Gumstool Brook flows through the town have reduced since last month but are still at a healthy level. The level of river vegetation is increasing, and noticeably more than usual in the Barton Mill Pound where tree shading has been reduced.

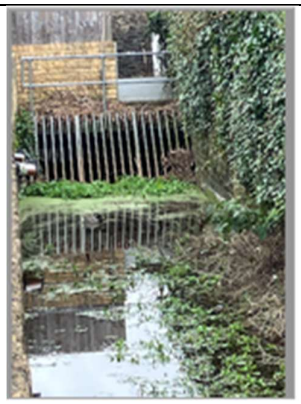
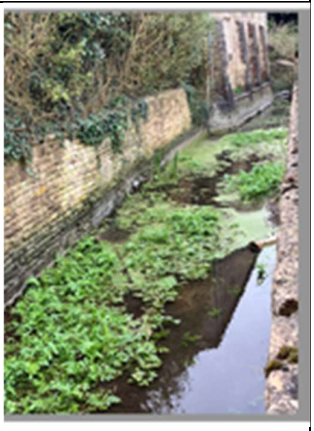
- There is a healthy flow of water into the Abbey lake from the River Churn.

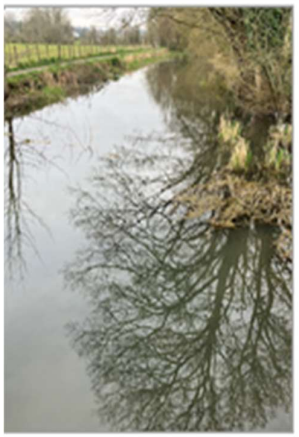
- The River Churn is flowing within its banks at the Cricklade Road area.

1a. Daglingworth Stream upper source north of Duntisbourne Abbots. The stream channel upstream and downstream of the road is dry.		1b. Duntisbourne Abbots village spring. There is a gentle flow of very clear water in the spring.	
2. Duntisbourne Abbots Daglingworth Stream downstream of inferred confluence of spring sources. There is a low flow of clear water in the channel.		3. Duntisbourne Leer ford, Daglingworth Stream. There is a low flow across the ford that extends to within 7 bricks of the cobbled area.	
4. Middle Duntisbourne ford, Daglingworth Stream. A low flow is observed that extends to within 10 bricks of the cobbled area of the south-west channel edge.		5. Duntisbourne Rouse ford, Daglingworth Stream. A low flow is observed, which is approx 0.5 metres inside of the SW boundary cobbles.	
6a. Daglingworth Stream – Leaky Dam #1, upstream of Grove Hill Lane. The woody debris dam is in good condition and at the present low flow condition it is holding back a very small amount of water.	 	6b. Daglingworth Stream Leaky Dam #2, upstream of Grove Hill Lane. The woody debris dam is covered in vegetation and in the present low flow condition is holding back a small amount of water and there is no diverted water.	 

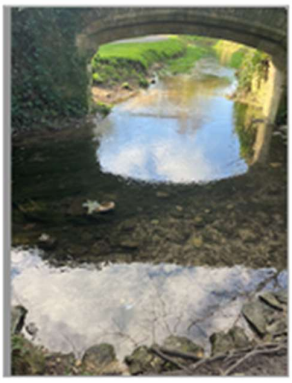
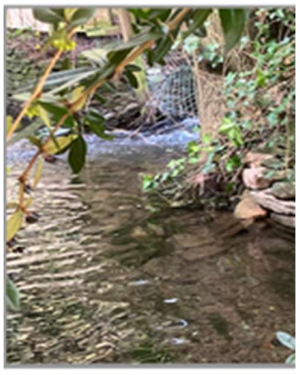
6c. Daglingworth Stream Grove Hill bridge. A low flow is observed that fills over one half of the channel in the field upstream of the Grove Hill bridge. Downstream of the road, the stream is flowing up to a approx. 20 cm from the underside of the private stone footbridge.	 	7. Daglingworth Stream at Lower End road bridge. A low flow of clear water is observed in the upstream garden, and the walled channel downstream of the bridge.	 
8. Wellhill Copse, Daglingworth Stream. In the fields upstream of Wellhill Copse, the stream has been cleared and is now flowing within its banks.		9. Daglingworth Place ford, Daglingworth Stream. A low flow of muddy water is observed at the ford and over the pebble weir.	 
10. Grange Farm bridge, Daglingworth Stream. There is a low flow of slightly muddy water into the farm channel.		11. School Hill bridge, Daglingworth Stream. The stream has a low flow of slightly muddy water.	

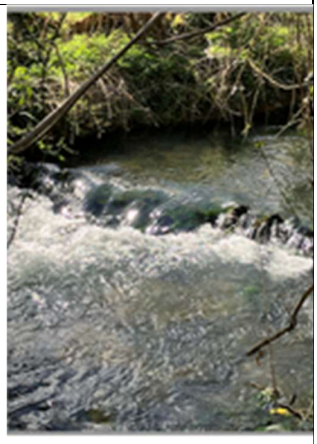
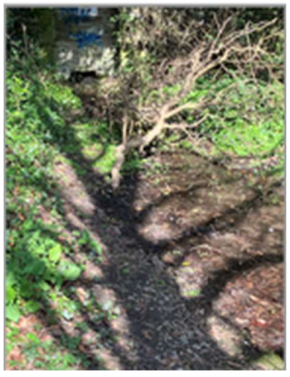
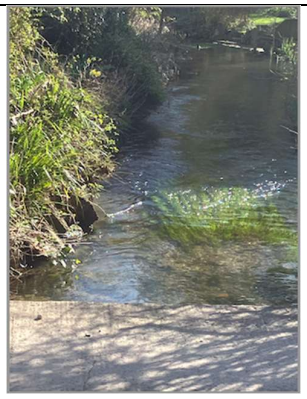
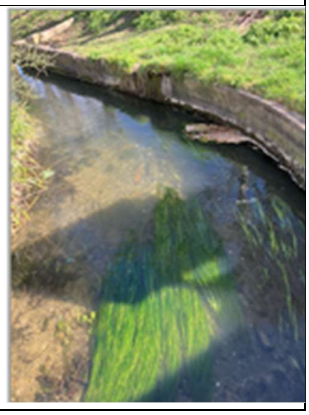
12. Stratton End (private road), Daglingworth Stream. The pool downstream of the bridge has a low flow of slightly muddy water.		13. Barn Way bridge, Daglingworth Stream. There is a low flow of slightly muddy water in the channel.	
15. Footpath at Lower Stratton. The stream is flowing at a low rate. The stream level at this location is still high due to debris downstream of the footbridge.		16a. Daglingworth Stream at Barton Lane upstream of Bathurst Estate boundary wall A steady flow of clear water is observed.	No access either outside or inside estate due to building work
16b. Daglingworth stream at Barton Lane downstream of Bathurst Estate boundary wall.		17. Gumstool Brook balancing stream at sluice gate.	
18. Gumstool Brook alongside Swimming pool on the Riverside Walk.		20. Gumstool Brook at Thomas Street culvert trash screen.	

22a. Gumstool Brook Balancing Stream behind Salvation Army.		22b. Gumstool Brook Balancing Stream at Powell's School	
22c. Gumstool Brook Balancing Stream at Powell's School trash screen (closeup)		22d. Gumstool Brook Balancing Stream from Powell's School, upstream to Salvation Army	
23a. River Churn at Gloucester Street bridge upstream of sluices		23b. River Churn at Gloucester Street bridge sluices	
23c. River Churn downstream from Gloucester Street sluices		24a. River Churn at the gauge board on Gloucester Street bridge. The gauge reading is around 1.0 (0.1m).	

24b. View to Gloucester Street bridge with River Churn flow into the Barton Mill Pound		24c. Barton Mill Pound looking downstream from Gloucester Street bridge.	
25. Barton Mill Pound Overflow (New)		26. Barton Mill Pound Overflow (Old)	
26b. Barton Mill Pound gauge board. The gauge reading is around 1.2 (0.12m)		27a. Barton Mill Pound upstream of footbridge	
27b. Barton Mill Pound downstream of footbridge.		34. River Churn upstream from Gooseacre Lane bridge	

34a. River Churn downstream from Gooseacre Lane bridge		35b. River Churn upstream of Spitalgate lane bridge	
35c. River Churn downstream towards Spitalgate Lane bridge (North side)		35c. River Churn downstream from Spitalgate Lane bridge (South side)	
36a. River Churn at Hereward Road trash screen.		36b. River Churn upstream side of Hereward Road bridge	
36b. River Churn downstream side of Hereward Road trash screen		37. Stream flowing into Abbey Lake	

38a. Weir at stream outlet from Abbey Lake		38b. Footbridge at stream outlet from Abbey Lake - downstream	
39 Abbey Lake outlet stream at Corinium Gate bridge		40. Gumstool Brook culvert outlet in Abbey Grounds	
41a. Gumstool Brook – Downstream from Abbey Grounds towards Waterloo		41b. Gumstool Brook - Upstream from Waterloo	
41c. Gumstool Brook confluence with River Churn (West) outflow from Abbey Lake at Waterloo car park		42. River Churn (West) on downstream side of London Road bridge	

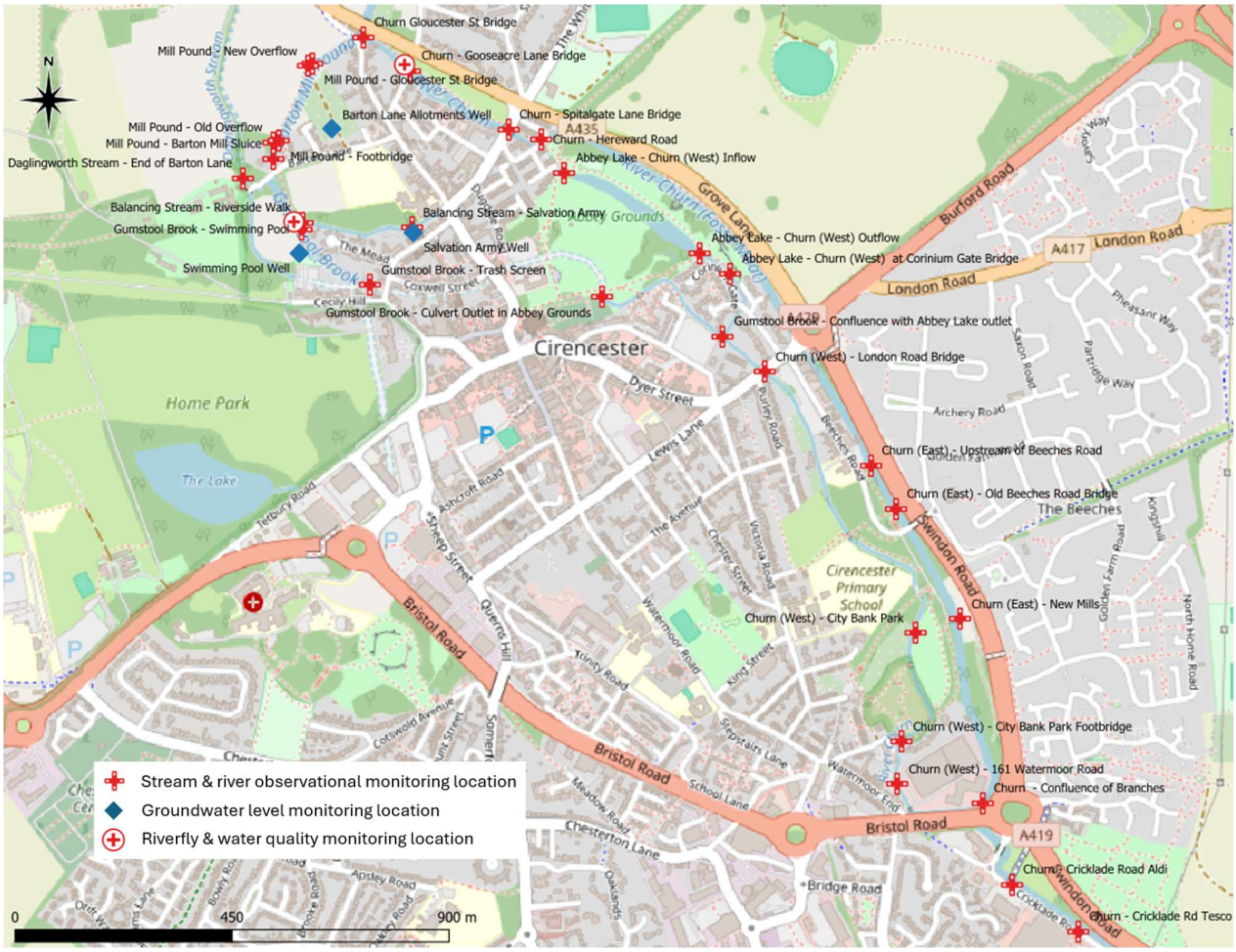
42a. River Churn (West) on downstream side of London Road bridge		43. River Churn (East) upstream of Old Beeches Road bridge	
44. River Churn (East) at Old Beeches Road Bridge A shopping trolley has been thrown into the river.		45. River Churn (West) at New Mills, City bank glade - weir	
46. River Churn (West) at City Bank Park (Furness Hole) There is no flow at this location.		46a. New Mills Overflow, River Churn (East)	
47. Gumstool Brook at City Bank Park footbridge		48. River Churn (West) at Watermoor Point car park	

49 River Churn at Cricklade Road (opposite Aldi)		50 River Churn at Cricklade Road (opposite Tesco)	

7. Monitoring location maps

Map 1: All monitoring locations, showing area covered in more detail by Map 2

Map 2: Detail of monitoring locations in Cirencester



8. Details of the stream monitoring locations

No.	Location Name	Grid Reference	What3Words Link
1	Daglingworth Stream - Duntisbourne Abbots Upper Source	SO 97036 08089	https://w3w.co/winners.lamenting.energetic
2	Daglingworth Stream - Duntisbourne Abbots Springs	SO 97163 07783	https://w3w.co/league.teaching.adhesive
3	Daglingworth Stream - Duntisbourne Leer Ford	SO 97544 07599	https://w3w.co/thatched.northward.enclosing
4	Daglingworth Stream - Middle Duntisbourne Ford	SO 98134 06527	https://w3w.co/reporters.slower.axed
5	Daglingworth stream - Duntisbourne Rouse Ford	SO 98621 05995	https://w3w.co/flamenco.spines.openings
6	Daglingworth Stream - Grove Hill Bridge	SO 99117 05367	https://w3w.co/processes.swipes.grouping
7	Daglingworth stream - Lower End Bridge	SO 99662 04835	https://w3w.co/objective.verbs.shoving
8	Daglingworth stream - Wellhill Copse Stile	SP 00277 04034	https://w3w.co/automate.servicing.objecting
9	Daglingworth stream - Daglingworth Place Ford	SP 00529 04013	https://w3w.co/posed.emerald.bandstand
10	Daglingworth Stream - Grange Farm	SP 00890 03931	https://w3w.co/episodes.champions.keyboards
11	Daglingworth Stream - School Hill	SP 01102 03770	https://w3w.co/undercuts.winks.retiring
12	Daglingworth Stream - Stratton End	SP 01236 03714	https://w3w.co/nursery.jacuzzi.unearthly
13	Daglingworth Stream - Barn Way	SP 01427 03440	https://w3w.co/requiring.handfuls.powers
14	Daglingworth stream - Plough Inn Channel	SP 01468 03385	https://w3w.co/flap.grafted.cuts
15	Daglingworth Stream - South Stratton	SP 01657 03072	https://w3w.co/commutes.boom.narrates
16	Daglingworth Stream - End of Barton Lane	SP 01712 02392	https://w3w.co/hydrant.paces.underway
17	Balancing Stream - Riverside Walk Sluice	SP 01835 02300	https://w3w.co/oasis.eclipses.pythons
18	Gumstool Brook - Swimming Pool Entrance	SP 01832 02287	https://w3w.co/monks.factored.blazers
19	Gumstool Brook - Private Bridge	SP 02067 02394	https://w3w.co/catapult.prepared.watching
20	Gumstool Brook - Trash Screen	SP 01975 02171	https://w3w.co/unicorns.carbonate.ruling
21	Balancing Stream - Powells School	SP 02085 02301	https://w3w.co/marshes.batches.spectacle
22	Balancing Stream - Salvation Army	SP 02061 02290	https://w3w.co/conquests.cried.fewest
23	River Churn - Glos St Sluices	SP 01960 02684	https://w3w.co/stooping.height.palms
24	Mill Pound - Glos St Bridge	SP 01856 02630	https://w3w.co/unguarded.thousands.gifted
25	Mill Pound - New Overflow	SP 01847 02625	https://w3w.co/arrives.headings.crisis
26	Mill Pound - Old Overflow	SP 01775 02466	https://w3w.co/sample.fuzzy.composts
27	Mill Pound - Footbridge	SP 01785 02470	https://w3w.co/sharpness.heightens.assembles
28	Mill Pound - Barton Mill Sluice	SP 01773 02433	https://w3w.co/yummy.rail.swan
29	Well - Barton Lane Allotments	SP 01896 02515	https://w3w.co/toasters.resettle.factoring
30	Well - The Plough Inn	SP 01469 03394	https://w3w.co/dote.teams.twitchy
31	Well - Salvation Army	SP 02070 02268	https://w3w.co/fine.unwraps.cowboys
32	Well - Open Air Swimming Pool	SP 01827 02237	https://w3w.co/veered.expansion.goad
33	Churn - Upstream of Gooseacre Lane	SP 02040 02633	https://w3w.co/idea.compacts.smashes
34	Churn - Gooseacre Lane Bridge	SP 02058 02615	https://w3w.co/moving.snaps.dentures
35	Churn - Spitalgate Lane Bridge	SP 02261 02493	https://w3w.co/vibrates.treetop.quirky
36	Churn - Hereward Road	SP 02329 02473	https://w3w.co/subject.enjoys.shackles
37	Abbey Lake - Stream Inlet	SP 02377 02404	https://w3w.co/silly.hairstyle.streak
38	Abbey Lake - Stream Outlet	SP 02658 02237	https://w3w.co/boater.rankings.scribble
39	Abbey Lake - Stream at Corinium Gate Bridge	SP 02721 02194	https://w3w.co/essay.goes.waltzed
40	Gumstool Brook - Culvert Outlet in Abbey Grounds	SP 02456 02147	https://w3w.co/agency.mascots.warping
41	Daglingworth Stream - Confluence with Abbey Lake outlet (Waterloo carpark)	SP 02706 02064	https://w3w.co/trinkets.inviting.dinosaur
42	Churn (West branch) - London Road bridge	SP 02792 01991	https://w3w.co/ranks.uncouth.perfected
43	Churn (East) - Upstream of Beeches Road	SP 03012 01797	https://w3w.co/blank.sheep.springing
44	Churn (East) - Old Beeches Road Bridge	SP 03064 01707	https://w3w.co/that.rephrase.necks
45	Churn (East) - New Mills	SP 03198 01478	https://w3w.co/stolen.recovery.sensible
46	Churn (West branch) - City Bank Park Weir	SP 03116 01480	https://w3w.co/roadblock.cloth.blaze
47	Churn (West branch) - City Bank Park Footbridge	SP 03077 01222	https://w3w.co/feelers.corrects.lucky
48	Churn (West branch) - 161 Watermoor Road	SP 03068 01134	https://w3w.co/tabs.wing.scout
49	Churn - Cricklade Road Aldi	SP 03305 00926	https://w3w.co/bucked.duck.mailboxes
50	Churn - Cricklade Rd Tesco	SP 03442 00829	https://w3w.co/drag.aimed.look