

Invertebrate investigation in the Cross Hill Burn, Kells, Co Antrim

1. Background

On 22nd of November 2025, a local volunteer conducted a Riverfly Monitoring Initiative (RMI) assessment on the Cross Hill Burn in Kells, Co. Antrim. The assessment returned a very low RMI score, indicating a potential deterioration in water quality. A repeat RMI sample was taken on 23rd of November 2025. This confirmed the low score and trigger level breach. Subsequently, on 24th of November 2025, the angling club reported the findings to the Freshwater Investigation (FI) team and the pollution hotline, as per the agreed protocol.

In response, the Water Pollution Response and Enforcement Team (WPRET) requested a formal invertebrate survey of the Cross Hill Burn. The purpose of this survey was to verify the low RMI score and assist in identifying the source and extent of the suspected pollution incident.

2. Method

On the 26th of November 2025, FI Team Ecologists [REDACTED] and [REDACTED] met [REDACTED], Water Quality inspector (WQI), in Kells town. [REDACTED] accompanied the FI team to the RMI site on the Cross Hill Burn.

Invertebrate samples were collected at three locations along the river stretch to try and narrow the investigative area and help to identify the source of pollution. Sites were selected at the [REDACTED] site in Kells town (site 3), [REDACTED] (site 2) and [REDACTED] (Site 1). The three sites (Figure 1) were sampled for invertebrates in line with procedure M0056 by [REDACTED]. Samples are subject to full biological classification (M0057) and ARMI methods for comparison.

[REDACTED]

[REDACTED]

[REDACTED]

Invertebrate investigation on the Cross Hill Burn in Kells, Co Antrim – November 2025

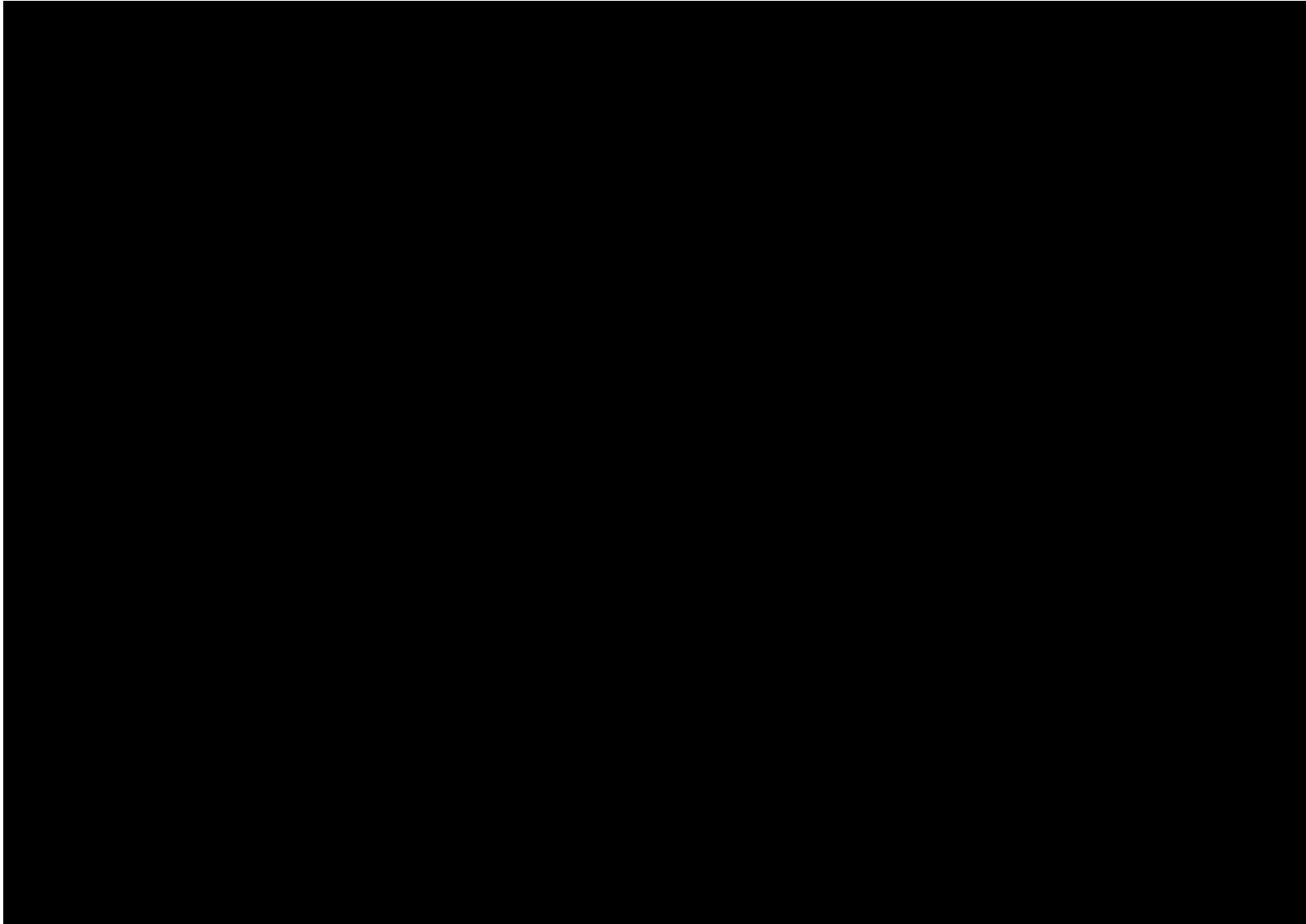


Figure 1: Map showing the location of the three Investigative sites visited on the 26th of November 2025 in the Cross Hill Burn.

3. Results

The samples were analysed on the 26th/27th of November 2025 in accordance with procedure M0057, using the Walley, Hawkes, Paisley, Trigg (WHPT) method that uses families of macro-invertebrates as biological indicators. The sites were then classified using the invertebrate classification tool RICT3. The results and status assessments are provided in Table 1. The boundary values for the classes for each site and the observed Ecological Quality Ratios (EQR's) are provided in Figure 2.

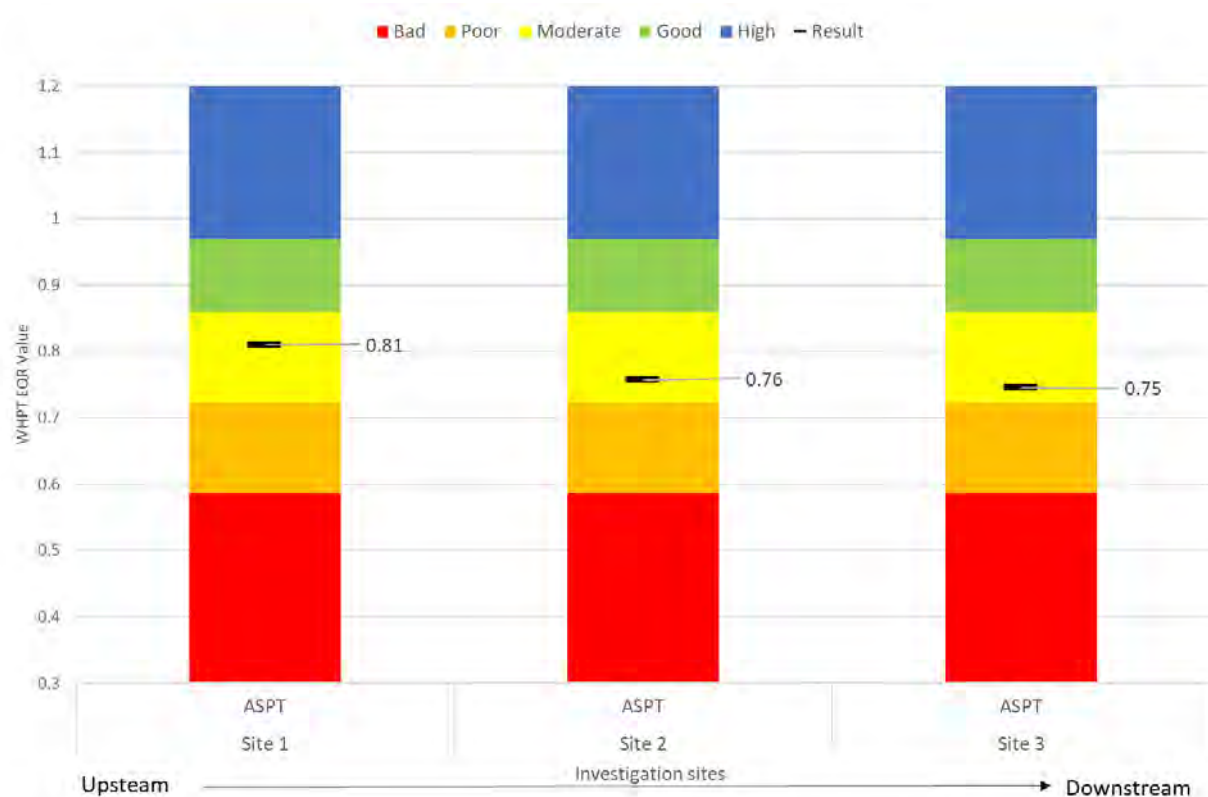


Figure 2: Boundary graph showing the EQR values for sites 1, 2 and 3 during the invertebrate investigation on the Cross Hill Burn.

Note on Figure 2

RICT produces a classification by producing two separate classes; one is based on the WHPT Average Score Per Taxon (ASPT) result and another on the number of taxa found in the sample (NTaxa). Whichever has the lower EQR value between both criteria is the single classification that is then used.

A site that classifies low via ASPT may indicate impacts from organic pollution along with nutrient and low flow issues, where dissolved oxygen levels are lower than expected. A site that classifies low via NTaxa can potentially indicate impacts from morphology issues or toxic pollution e.g. acidification, metals or chemicals such as cypermethrin. All sites classified as “MODERATE” under ASPT.

Table of results

Site No.	Location	IGR	No. of Taxa	Biotic Score	ASPT	Field Notes	Autumn 2025 (Single season classification)	ARMI Score
Site 1			21	105.4	5.02	5 – 30% sewage fungus above and below stones. Poaching on left hand bank looking upstream. Clay banks showing signs of erosion. Paucity of invertebrates.	MODERATE	3
Site 2			16	74.7	4.67	<5% sewage fungus above and below stones. Poaching on left hand bank looking downstream. Paucity of invertebrates.	MODERATE	2
Site 3			17	77.9	4.58	<5% sewage fungus above and below stones. <5% diatomaceous algae Paucity of invertebrates. Pipe located 10 metres upstream with sewage fungus below.	MODERATE	2

Table 1: Table showing WHPT and ARMI scores, field notes and classification results for invertebrate investigation on the Cross Hill Burn, November 2025.

4. Discussion

On the 24th of November 2025, a [REDACTED] [REDACTED] reported a low RMI score in the Cross Hill Burn to the FI team and pollution hotline. In response, the FI team collected an invertebrate sample at the RMI site as well as two additional sites upstream.

Site 1 was selected to represent upstream conditions and provide insight into the wider catchment. This site serves as a control for comparing invertebrate scores and pollution indicators recorded at the sites located further downstream. Based on single season survey results, site 1 classified MODERATE using ASPT, with 21 taxa, a biotic score of 105.4 and ASPT of 5.02. This site recorded the highest scores in this investigation. However, 5 – 30% sewage fungus was observed above and below the stones in the sample area, and overall invertebrate abundance was low. An RMI score of 2 was recorded.

Site 2, located [REDACTED] was classified as MODERATE based on ASPT with 16 taxa, a biotic score of 74.7 and an ASPT of 4.67. The biotic score at this site was 29% lower than site 1, indicating a decline in water quality. Less than 5% sewage fungus was observed above and below the stones, and there was evidence of soil poaching and erosion. An RMI score of 2 was recorded with low numbers of invertebrates.

Site 3, located [REDACTED] was classified as MODERATE, based on ASPT, with 17 taxa, biotic score of 77.9 and ASPT of 4.58. Less than 5% sewage fungus was recorded above and below stones in the sample area. A discharge pipe was located 10m upstream on the left-hand bank with traces of sewage fungus below.

A [REDACTED] recorded an RMI score of 2, at site 3, on the 22nd of November 2025. The FI team repeated the RMI assessment on the 24th of November 2025, recording a score of 3, however very low numbers of key species were observed, with only two specimens of *Gammarus* captured. For comparison, RMI sampling conducted by the FI team in August 2025 recorded a score of 9, with over 200 *Gammarus* captured, indicating a significant decline in ecological quality since late summer.

5. Conclusion

The investigation of the Cross Hill Burn following the reported low RMI score has confirmed a significant decline in ecological quality compared to previous assessments. All three sampling sites were classified as MODERATE based on ASPT, with reduced taxa richness and biotic scores relative to expected conditions. The most notable deterioration occurred at Site 3, where RMI scores dropped from 9 in August 2025 to 3 in November 2025, accompanied by a marked reduction in *Gammarus* abundance (from over 200 individuals to only two specimens).

This investigation revealed no specific point source pressure between site 1 and 3, however results revealed that a pollution pressure originating upstream of site 1 was likely to be the cause of the ecological issues recorded throughout the catchment. Further investigation upstream of Site 1 was recommended by the FI team.

6. Addendum

Following the classification of samples from the initial three sites, it was determined that further upstream investigation was necessary to help identify the source of the pollution. On the 3rd of December 2025, the FI team conducted five additional RMI assessments upstream of Site 1. The locations of all RMI sites and their respective scores are shown in Figure 3.

Jar 1 and Jar 3 presented good habitat conditions and recorded RMI scores of 10 and 12, respectively, indicating healthy macroinvertebrate communities.

A small feeder stream was identified joining the burn downstream of Jar 3. However, due to its limited size and amount of organic matter, only minimal sampling was conducted at this site (Jar 4). It was unclear at the time of sampling if the organic matter was of natural origin or had come from the nearby farm. The sample contained only *Oligochaeta* worms and *Chironomidae* midge larvae, which are tolerant taxa often associated with degraded water quality.

Jars 5 and 2 show extremely suppressed invertebrate communities despite the presence of suitable habitat. It appears that this incident has impacted at least 3 km of the Cross Hill Burn and has had a severe effect on the freshwater ecology of the stream.

There were no obvious visible signs of pollution recorded at any of the upstream sites, and it is unclear whether the incident was organic or toxic in nature. This may be due to recent weather events and high flows.

Upstream invertebrate investigation on the Cross Hill Burn in Kells, Co Antrim – December 2025

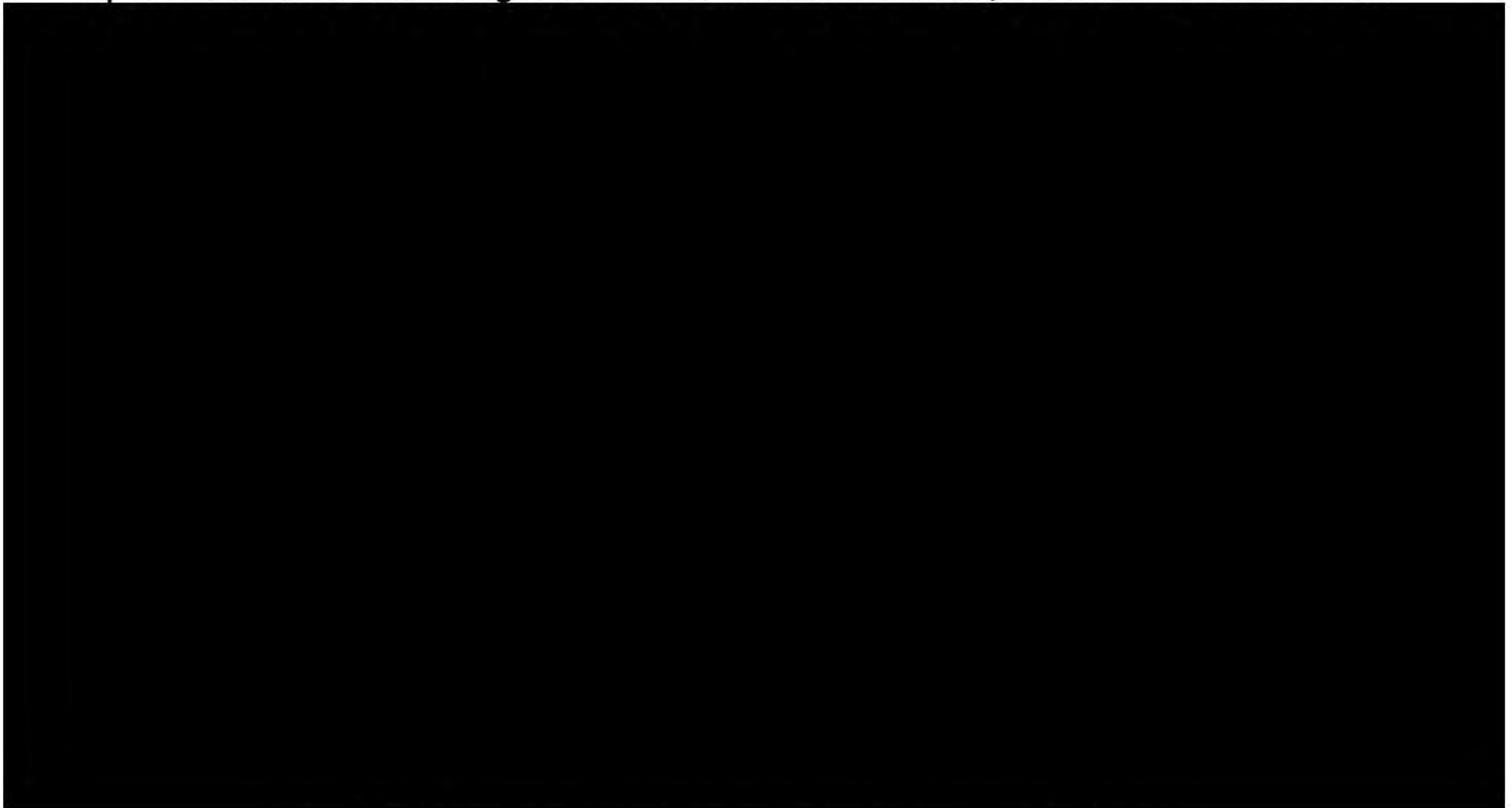


Figure 2 showing a map of sites surveyed along the Cross Hill Burn along with ARMI scores.

7. Recommendations

- Further investigation is required by the WQI to identify the pollution pressure between Jar 3 and Jar 5. It is recommended that a detailed river walk in this area may reveal a point source pollution that is responsible for the decimation of the invertebrate community downstream of this location.
- Immediate remediation and mitigation are required to prevent further damage and loss to the ecological environment.
- WQIs should keep FMA FI and local stakeholders updated on the progress and remediation efforts.