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# Evaluation of Massie's Creek Habitat and Water Quality

Kaitlyn Sturm

Cedarville University, [kaitlynsturm@cedarville.edu](mailto:kaitlynsturm@cedarville.edu)

Amiah Warder

Cedarville University, [awarder@cedarville.edu](mailto:awarder@cedarville.edu)

Malorie Young

Cedarville University, [mryoung@cedarville.edu](mailto:mryoung@cedarville.edu)

Mark A. Gathany

Cedarville University, [mgathany@cedarville.edu](mailto:mgathany@cedarville.edu)

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# Evaluation of Massie's Creek Habitat and Water Quality

Malorie Young, Amiah Warder, Kaitlyn Sturm, & Mark Gathany

Corresponding author: [mgathany@cedarville.edu](mailto:mgathany@cedarville.edu)

## Introduction

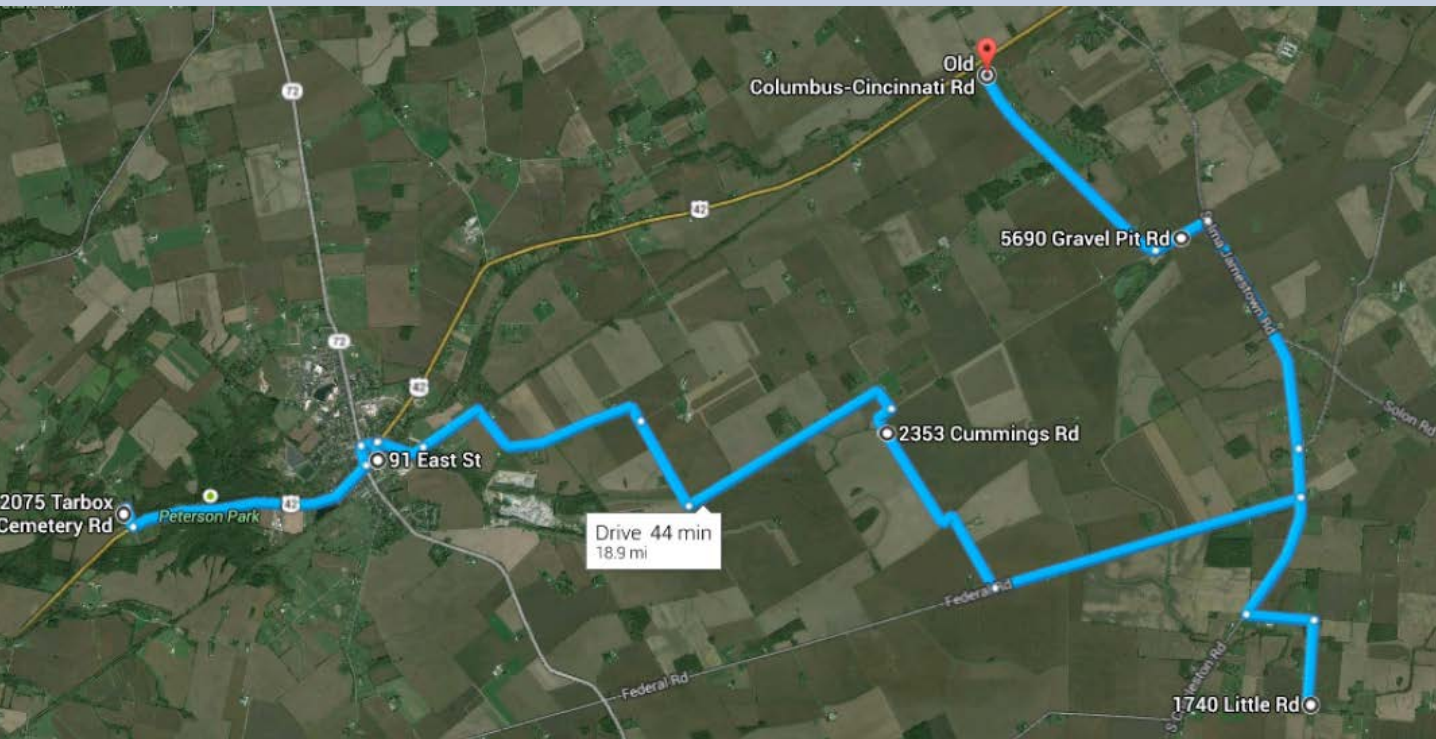
In November of 2009, the Greene County Soil and Water Conservation District completed a restoration project on the North Fork of Massie Creek. This project was designed to address "...erosion and water quality concerns, improve drainage, and restore the habitat of NFMC". The project worked to "...stabilize the stream banks, create riffle/pool habitat, and restore and enhance vegetation along a 2.2-mile long segment of the creek". The project was finalized with seeding the area in January of 2010.

The North Fork of Massie Creek feeds into Massie Creek in the town of Cedarville, Ohio. Massie Creek then flows through Cedarville and into the Indian Mound County Park, passing by many homes, businesses, and factories along the way. With the extensive use of the watershed area by humans, it is very likely that the Massie Creek watershed area needs maintenance and restoration beyond the North Fork.

In our research project we will investigate the effect of the runoff from Cedarville on the water quality of Massie Creek. Through our investigation we hope to find some major causes of water quality issues that can be addressed in the future.

## Objective

We seek to evaluate the habitat quality and environmental conditions at various locations along Massie's Creek in Greene County, Ohio.



**Figure 1:** The image above shows the approximate locations of our sample sites located in Greene County, Ohio. You may note the landscape mosaic and watershed which Massie's Creek drains.

## Acknowledgements

We would like to thank the Cedarville University Department of Science and Mathematics for providing equipment and support. We would also like to thank Aaron Reuben for providing transportation.

## Methods

We sampled six stream locations along the Massie Creek. We started 1.2 miles West of Cedarville, Ohio, working our way upriver to the East. We utilized HOBO data loggers & software and Ohio EPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheets (QHEI) to assess the stream health at each of the six locations.

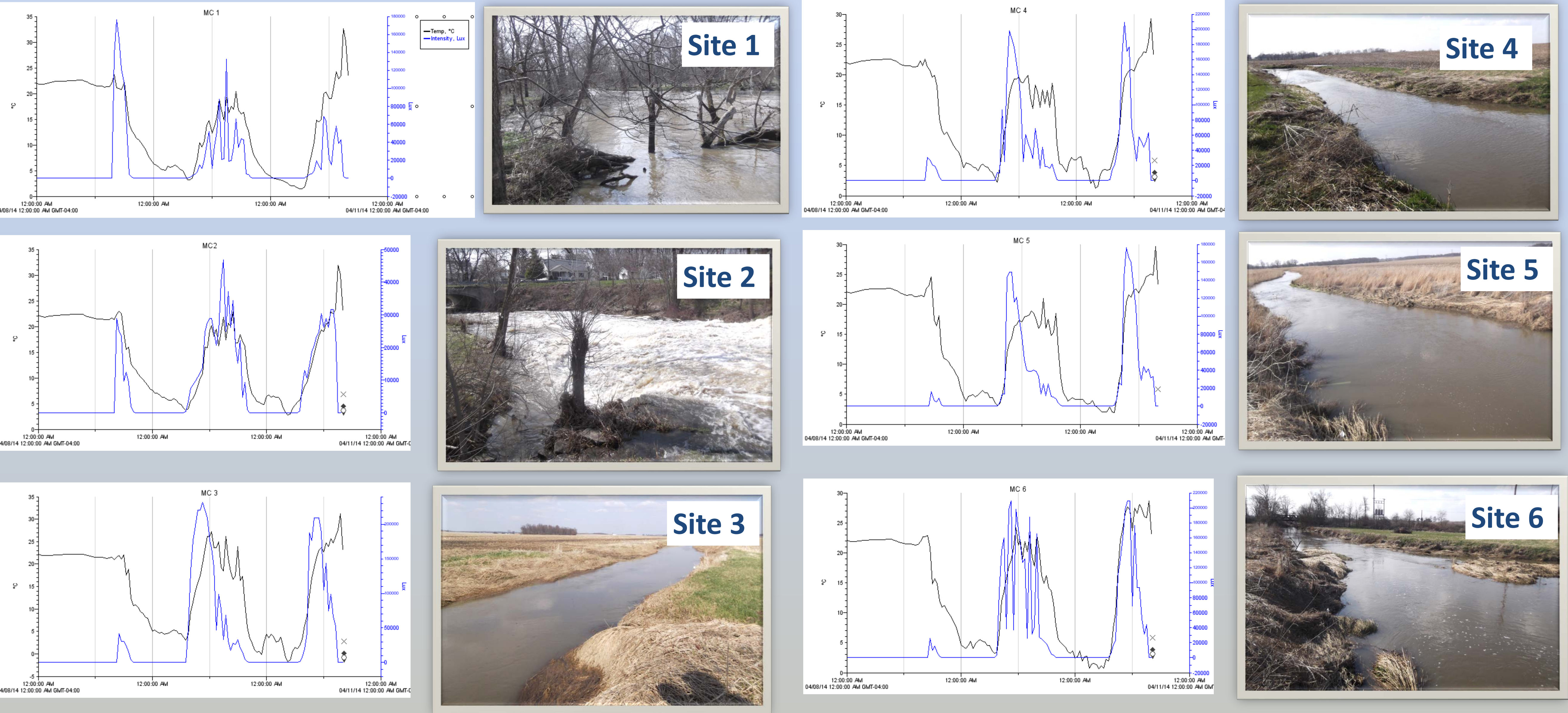
## Conclusions

We found that Massie Creek (Sites 1 & 2) and North Fork (Sites 5 & 6) had the greatest overall quality based on the QHEI assessments. This suggests that the stream restoration work done on the North Fork have had an overall positive impact on stream quality. With time we expect this to continue to improve as the vegetation establishes. This should lead to further habitat diversity and quality. Sites 3 & 4 had the lowest overall quality largely due to the poor substrate, lack of vegetation, and poor sinuosity. Efforts to improve stream quality should be directed toward the reduction of erosion and/or increasing bank stability with vegetation.

## Results

**Table 1:** This table shows the results of the QHEI testing. Each site's scoring was based on the six factors below, and then added together to derive the site's overall score. A higher total score indicates a healthier stream.

Site	Substrate (20 max)	In-stream cover (20 max)	Channel Morphology (20 max)	Bank Erosion and Riparian Zone (10 max)	Stream Structure Quality (20 max)	Gradient (10 max)	Total (100 max))
Massie Creek (1)	16	14	17	8	13	7	75
Massie Creek (2)	15	12	15	7	13	5	67
South Fork (3)	11	10	12	6	10	6	55
South Fork (4)	9	6	12	3	8	6	44
North Fork (5)	15	10	15	6	16	7	69
North Fork (6)	14	11	15	6	14	7	67



**Figure 2:** The figures above depict the HOBOT data from each site. Higher Lux values show less canopy cover which can be indicative of a poor quality stream.