

# Does Restoration Improve the Habitat for Macro Invertebrate Insect Life in Pike Creek?

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## Introduction/Background

The study site, Pike Creek, is a tributary of White Clay Creek in the Delaware Bay watershed of northern New Castle County, Delaware. In the spring of 2005 a unique restoration project began on a 5,000 foot section of Pike Creek. Prior to the restoration surveys observed that the stream was impaired by significant bank erosion, heavy sediment loads and a degraded aquatic habitat. A total budget of \$633,930.00 provided by federal, state, and county agencies plus a private landowner was spent on the restoration project. The Delaware Natural Resources and Environmental Control agency oversaw the implementation of the project. Restoration was completed in 2007. The focus of our study was to determine the long term success of the restoration effort through the collection benthic macro invertebrates.

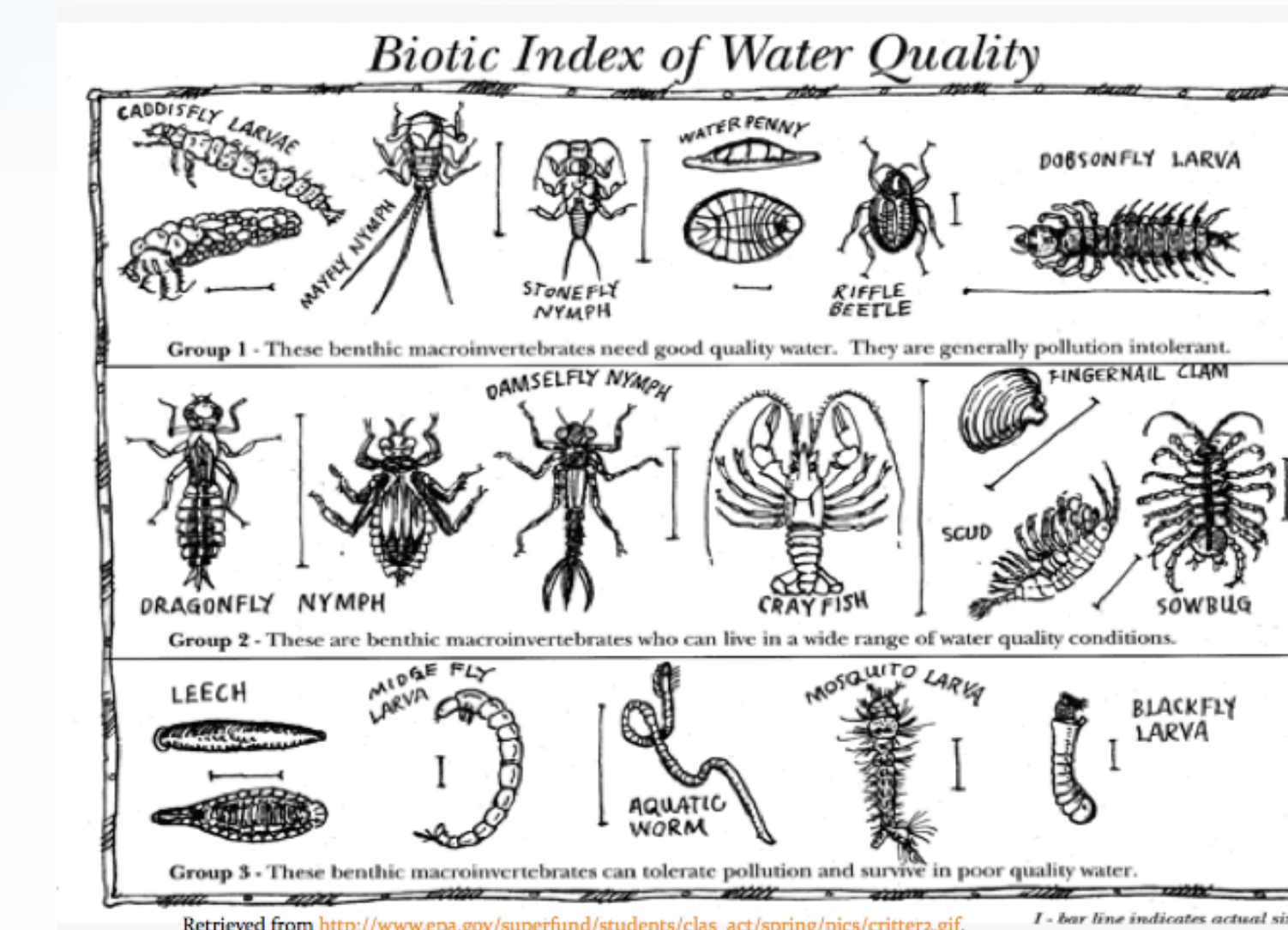
In honor of an adjacent landowner's overwhelming support of the effort, the restoration activity is referred to as the Three Little Bakers stream restoration project. The DNREC restored the stream channel and adjacent banks using a host of restoration techniques, planted approximately 5 acres of vegetation within the riparian zone, and created 3 acres of wetlands.

## Materials and Methods

Invertebrates were collected during late July of 2014 at riffle sites using the RACC (Research on Adaptation to Climate Change) Reference Manual field method protocols. Four samples were collected at two sites. One site located in a restored section of Pike Creek and the second site located downstream in an unrestored section of Pike Creek. The collected macro invertebrates were identified to the taxonomic level of order and family. Biometric comparisons were made between the two stream site locations.

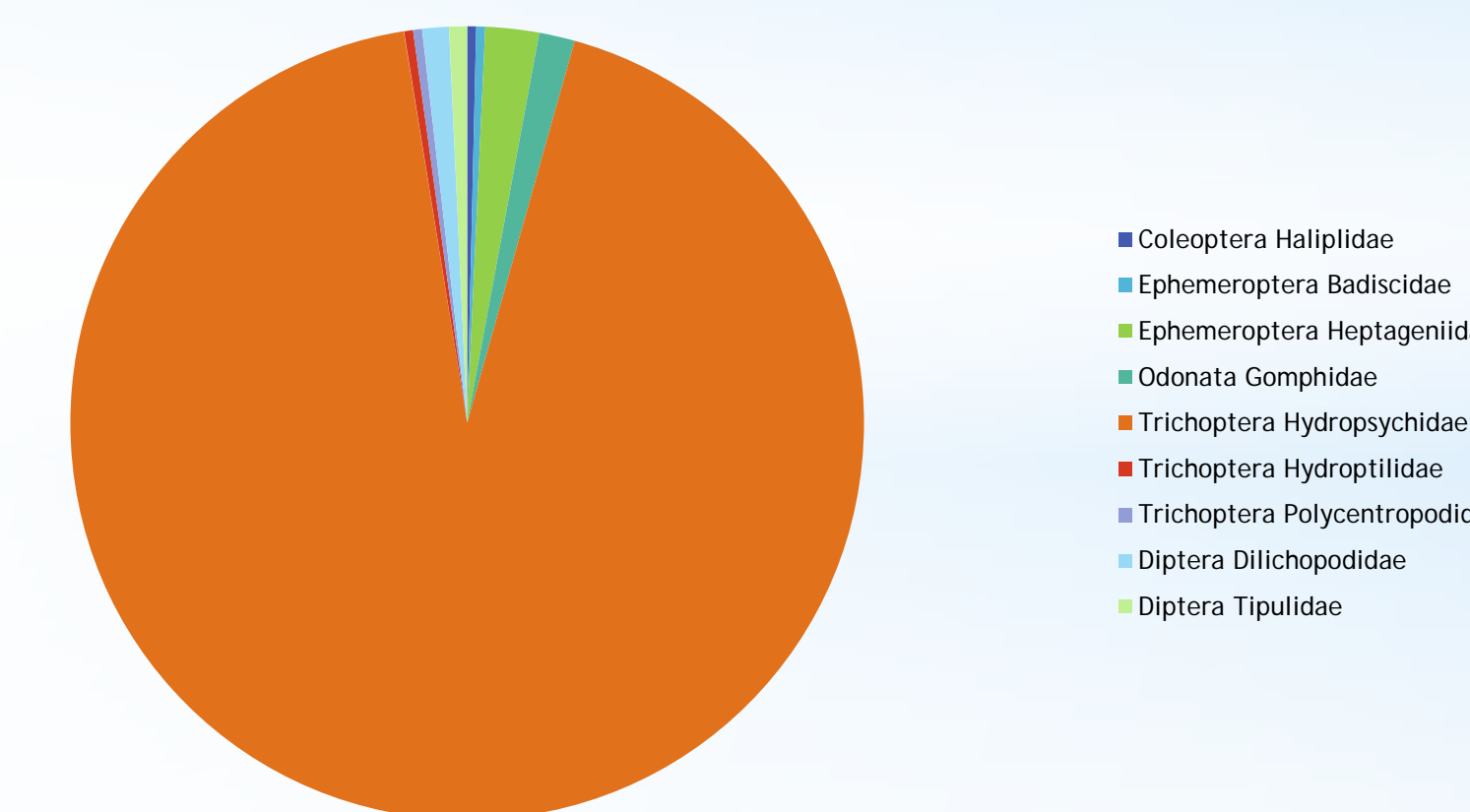


Metric	Unrestored Site wcc-PkCrk-112	Restored Site wcc-PkCrk-156
Richness	10	9
EPT Index	6	6
EPT/EPT & Chironomidae Index	6/1= 6	6/0= NA
Hilsenhoff Biotic Index	3.84	3.95

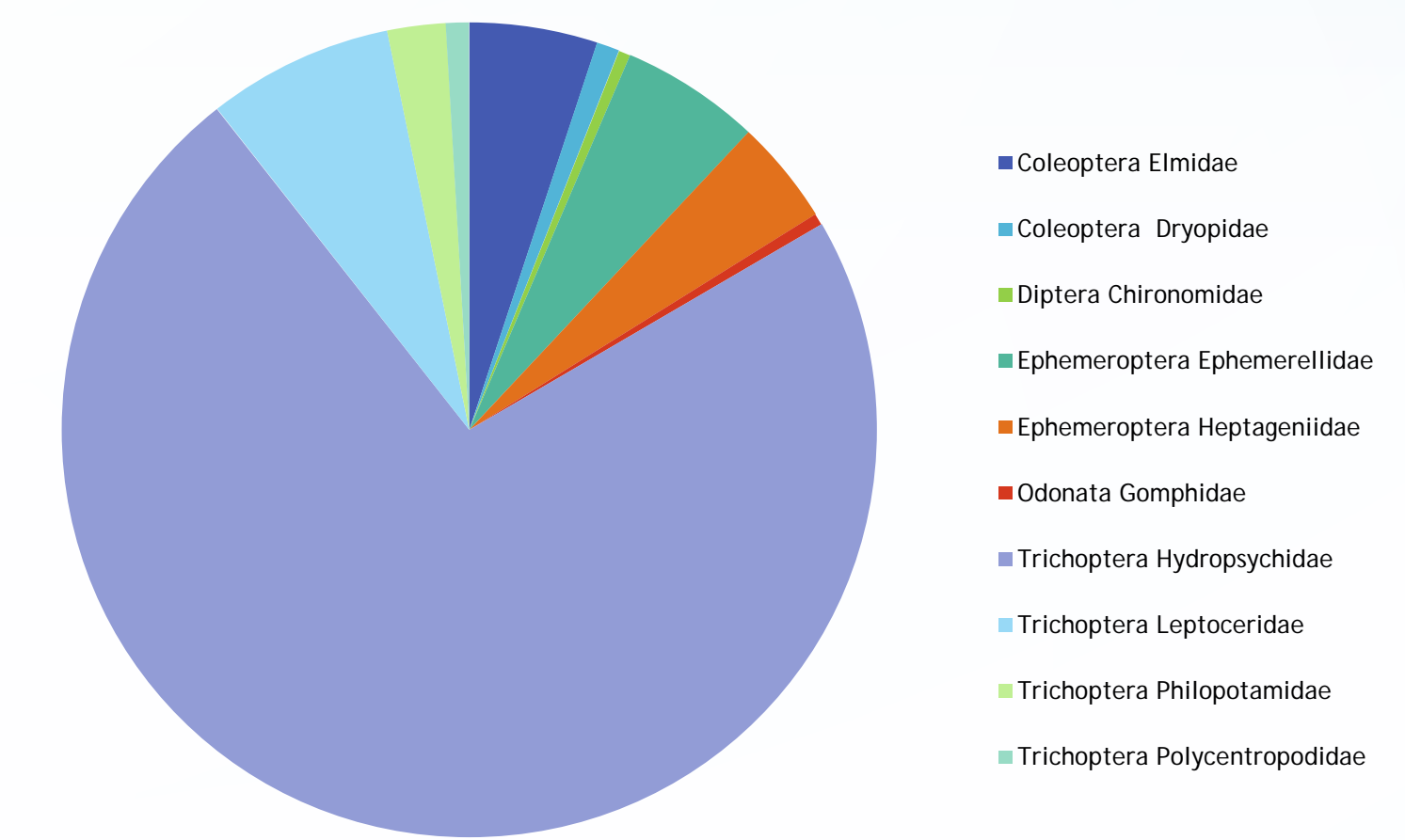


HBI Value	Water Quality	Degree of Organic Pollution
0.00-3.50	Excellent	No apparent organic pollution
3.51-4.50	Very Good	Slight organic pollution
4.51-5.50	Good	Some organic pollution
5.51-6.50	Fair	Fairly significant organic pollution
6.51-7.50	Fairly Poor	Significant organic pollution
7.51-8.50	Poor	Very significant organic pollution
8.51-10.00	Very Poor	Severe organic pollution

Macroinvertebrate Taxa Data Pike Creek- Restored Site



Macroinvertebrate Taxa Data Pike Creek- Unrestored site



## Results

Out of the two sites, the unrestored site had a higher richness than the restored site. Both sites had the same EPT Index rating. The unrestored site had an EPT/EPT & Chironomidae Index rating of 6, while the rating of the restored site was not determined. The restored site had a Hilsenhoff Biotic Index rating of 3.95, while the unrestored site had a rating of 3.84. Based on the richness, the EPT Index, the EPT/EPT & Chironomidae Index, and the Hilsenhoff Biotic Index, there are very little differences between the two sites.

## Conclusion

This project explored two different study sites along Pike Creek, one of which was restored in 2005 and the other that has not been restored. The two streams are a part of a tributary of White Clay Creek in the Delaware Bay watershed in northern New Castle County, Delaware. The project compared two sites along Pike Creek in order to judge the degree of success of restoration through the collection benthic macro invertebrates. Our initial hypothesis was that the restored creek would be the healthier creek based on the type of macro invertebrate found in that particular stream. However, our data analysis of the macro invertebrates at the two sites determined that there is very little difference between the restored and unrestored locations.

## References

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