ABSTRACT
Freshwater is one of the major necessities for life. Consequently, it is important to assess water quality over ample years to identify areas in need of management, especially in areas with increasing human activity and disturbance. One way to assess water quality is by surveying macroinvertebrate bioindicators (Fig. 1) using the Rapid Bioassessment by Volunteer (RBV) approach. The objective of this project was to use RBV to see how water quality in rivers in Salem, East Haddam and Lyme had changed over multiple years. During this study, we tested the water quality of three different sites within the RBV method. We then compared macroinvertebrate data from three sites over a five year period. Our main findings showed that water quality was more or less consistent through time. These findings show that the water quality was consistent in the Eightmile River and its tributaries over a five year period.

INTRODUCTION
The Eightmile River is an incredible ecosystem. Freshwater systems like this are irreplaceable and essential for different and rare forms of life. Accordingly, for my project I wanted to explore how water quality in rivers in Salem, East Haddam and Lyme varied over time to identify areas in need of management. A useful approach to evaluate water quality is by monitoring the presence of macroinvertebrates that are sensitive or tolerant to the freshwater conditions in which they live. The Rapid Bioassessment by Volunteers (RBV) approach is one way to monitor water quality by using macroinvertebrates as biological indicators. The Eightmile River Watershed contained many outstanding resources and was designated as Wild and Scenic in 2006. After the Study bill was passed by Congress, a local Wild and Scenic Study Committee was formed, charged with carrying out the Wild and Scenic Study and developing a river management plan.

The main objective of this study was to test the water quality of rivers using the RBV approach and compare it to older data from the same rivers to look at variation in quality over time. The main question we were trying to answer was: will quality of certain rivers decrease over time due to natural causes? We hypothesized that the water quality stayed fairly consistent, due to the protection of that area.

RESULTS

Most Wanted Species
- Eight Mile River increased
- Harriss Brook decreased
- Pleasant Valley was more or less consistent
- Overall was more or less consistent suggesting little variation in water quality

Moderately Wanted Species
- Eight Mile increased
- Harriss Brook increased
- Pleasant Valley Brook increased
- All streams increased showing consistency

Least Wanted Species
- Eight Mile River increased slightly
- Harriss Brook decreased at first but grew back
- Pleasant Valley Brook increased overall
- Overall was more or less consistent

CONCLUSIONS
To conclude, our hypothesis that the water quality would decrease was not observed. This is shown because overall there was more or less consistent amount of “most wanted” species. Although all rivers in 2013 did decrease significantly in the number of “most wanted” species, indicating a decrease in water quality. This shows that the water quality may have been affected by human activities such as poor farming practices or could have been because of drought, but made a quick recovery. The hypothesis was also wrong by the increase in the amount of moderately wanted species of macroinvertebrates. The increase shows that there is a more diverse population for each stream which may indicate better quality. The study also indicated that there was a decrease in the amount of least wanted species of macroinvertebrates. This shows an increase in water quality because those species can live anywhere, and a lack of them means they have been less common and it shows a bigger variety of the species we want to see more of.

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REFERENCES
- http://eightmileriver.org/wild-scenic-program-overview/