

FAUNTLEROY CREEK BENTHIC STUDY

OUR LADY OF GUADALUPE SCHOOL, OCT. 26, 2016 Michael Stein-Ross, teacher

OBJECTIVES

Sixth-grade science students from Our Lady of Guadalupe School sampled sites in upper and lower Fauntleroy Creek for benthic macroinvertebrates (BMIs) and applied their findings, using the EPA-approved Biotic Index of Water Quality, to determine water quality. They gained experience in

- employing teamwork to execute an established scientific protocol
- making site observations
- documenting their work
- posing and answering questions based on their findings
- presenting a summary to watershed and city representatives
- evaluating the experience with an eye toward improvements.

METHODOLOGY

For their analysis, the students began with the research question: "What is the water quality in Fauntleroy Creek where we will be releasing our salmon?" They then hypothesized:

If evidence of BMIs indicates stream health, then testing for BMIs in two locations on Fauntleroy Creek will tell us which part of the creek is healthier.

They identified three types of variables:

- Controlled - the procedure used each time, the equipment used each time, the time of year (mid October), and the type of BMIs looked for
- Dependent variable - the number and types of BMIs found
- Independent variable - the sampling sites

With their teacher, chaperones, and a watershed volunteer, the students followed scientific protocol to collect BMIs using a Surber sampler. Collection teams took two samples in the upper creek (big bridge) and two in the lower creek (above the fish ladder). The upper-creek site was changed to the bridge because a downed tree prevented access to the prior sampling site in Fenton Glen. The bridge (where schools release salmon fry) is approximately 1/8 mile upstream of the glen; both are in the same wooded natural area. The channel at the bridge is main stem only, while the channel at the glen benefits from all creek tributaries.

One sample at each location was the official one, taken in a riffle using the Surber and stirring the gravel in the frame for one minute. The unofficial sample was for comparison, consisting of a grab sample of decaying leaves and wood taken from the creek channel; these unofficial samples are referenced here.

The sorting team separated sample elements into Styrofoam trays, then the identification team used a dichotomous key to identify and record the macroinvertebrates. The site-description team documented features of each site and weather conditions. The documentation team took photos.

Students presented a PowerPoint of their research, which included information about the historic watershed and drainage from the engineered watershed that might affect flow into the creek. Invited guests were Jonathan Frodge, PhD, stormwater scientist and limnologist with Seattle Public Utilities; Peggy Cummings, forest steward for the Fauntleroy Creek watershed; and creek advocates Judy Pickens and Phil Sweetland.

FINDINGS

SITE CONDITIONS

	Upper Creek	Lower Creek
Air temperature	15.0° C	15.0° C
Water temperature	12.0° C	11.0° C
Water depth	18.0 cm	5.0 cm
Weather conditions	Cloudy; no rain	Cloudy; no rain

MACROINVERTEBRATES - OFFICIAL SAMPLES

	2013		2014		2015		2016	
	Upper Creek	Lower Creek	Upper Creek	Lower Creek	Upper Creek	Lower Creek	Upper Creek	Lower Creek
Stonefly larvae	1	1	1	2		2		
Mayfly larvae				1	1	5		
Caddis fly larvae				1	1	19		
Aquatic worms		1	2	2	1	5	1	7
Black fly larvae			1					
Midge fly larvae								
Water penny			2					
Beetle larvae			1					
Riffle beetle			1					
Snail						4		
Too small to ID or unable to ID		3			2			
Total	1	5	8	6	3	35	1	7

Students found stonefly larvae in both unofficial samples, four in the upper creek and one in the lower creek.

STUDY CONCLUSIONS

- Changing the sampling location may have had something to do with reduced abundance and diversity of BMIs in the upper creek.
- Because aquatic worms can live in healthy or polluted water, students could not reach a conclusion about creek health based on BMIs.
- A heavy rain event prior to sampling could have washed toxins into the creek; BMIs may not have had a chance to recover.
- The unofficial samples proved that stonefly larvae were present in both upper and lower sampling sites and they require clean water.

QUESTIONS FOR FURTHER STUDY

- Should the upper sampling site move back to Fenton Glen or stay at the bridge?
- Should future studies use the same exact riffle location?
- Should we be more careful about the time of the year that we study?

SUGGESTIONS FOR NEXT YEAR

- Take two official samples per site as slightly different locations to maximize the amount of data collected.
- Change the upper sampling site to the big bridge as that is where released fry need to find food.