FAUNTLEROY CREEK BENTHIC STUDY

OUR LADY OF GUADALUPE SCHOOL, OCT. 18, 2013 Nathan Franck, teacher

OBJECTIVES

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

- executing an established scientific protocol
- making site observations
- documenting the project
- 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

With their teacher and a watershed volunteer, the students followed informal scientific protocol to collect macroinvertebrates using a Surber sampler. After one sample to get acquainted with the equipment and procedure, the collection team took two official samples, in riffles in the upper creek (Fenton Glen) and in the lower creek (above the fish ladder). The sorting team separated sample elements onto Styrofoam trays, then the identification team using illustrations to identify and record the macroinvertebrates. The site-description team observed site and weather conditions. And the documentation team took photos.

For their analysis, the students hypothesized: "If the lower creek is healthier than the upper creek, then there would be more benthic macroinvertebrates that are intolerant to pollution found in the lower stream." Location was the study's manipulated variable, procedure was the controlled variable, and macroinvertebrate population was the responding variable.

FINDINGS

BMIs	2013	
	Upper Creek	**Lower Creek**
Stonefly larvae	1	1
Mayfly larvae		
Caddis fly larvae		
Worms		1
Black fly larvae		
Midge fly larvae		
Too small to ID or unable to ID		3
Total	**1**	**5**

STUDY CONCLUSION

The presence of stonefly larva indicates that Fauntleroy Creek is low in pollution. Benthic abundance indicates that the lower creek is healthier than the upper creek.

OUTSTANDING QUESTIONS

- Why are benthic numbers so low in both locations?
- With so few BMIs, how clean is the water really? What else can be used to indicate water quality?
- Could water depth have affected the number of BMIs? Or predation?

NEXT TIME

- Decrease human error with more training.
- Do less-aggressive digging to reduce the amount of rock and sand debris.
- Take a bigger sample (better of two samples from each location)
- Be more careful about disposal.
- Use more trays to do sorting more efficiently.

For continuity, following are benthic data collected for nine years by students at Arbor Heights Elementary:

MACROINVERTEBRATES IN UPPER CREEK

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Stonefly larvae	4 (>1.5 cm)	3 (>.5 cm)	3 (>1.5 cm)	2	3	1	6	3	1 (>1 cm)
Mayfly larvae	6 (>1 cm)	2 (>.5 cm)	2 (>1 cm)	0	0	5 (>.25 cm)	0	7	0
Caddis fly larvae	1	1	1	3	0	2	2	0	0
Worms	1	1	1	4	4	1	3	2	0
Black fly larvae	0	2 (>.5 cm)	0	0	0	0	0	1	0
Midge fly larvae	0	2 (>.5 cm)	0	0	0	0	0	0	0
Too small to ID or unable to ID					4	0	1	0	0
Total count	12	11	7	9	11	9	12	13	1

HABITAT CONDITIONS IN UPPER CREEK

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Dissolved oxygen	8 ppm	8 ppm	-----	8-10 ppm	-----	4 ppm	8 ppm		Data not provided by school
Nitrite	0 ppm	0 ppm	-----	-----	-----	5 ppm	5 ppm		
pH	-----	-----	-----	-----	7.8	8	8		
Phosphates						>1 ppm	0		
Water temp.	52F/11C	50F/10C	55F/18C	59F/15C	57F/14C	55F/13C	50F/10C	56F/24C	
Water depth	6 cm	4-7 cm	8 cm	5-1/4 cm	?	17 cm	11 cm	15.2 cm	
Channel width	.76 m	1 m	1.25 m	1.12 m	?	.72 m	1.5 m	.9 m*	

*Estimate