Beaver Lake Improvement Association

2013 Stream Team Update

Stream Condition of the Beaver Lake Watershed

By Mallory Bedard and the Stream Teams

Purpose of the Project

The purpose of the Stream Teams project is twofold. It aims to educate and cultivate interest in students at Pinkerton Academy in environmental and biological sciences and it also aims to provide data on the relative stream health for the watershed. It is important to monitor stream health to make sure Beaver Lake maintains a healthy ecosystem for both animals and humans. Stream Teams has been monitoring the watershed since 2006, and it is now possible for us to see basic trends in stream health. This will allow us to see whether the watershed's health is remaining constant, diminishing, or improving in a basic way.

About the Beaver Lake Watershed

The Beaver Lake Watershed (see Figure 1) in Rockingham County is a large watershed that incorporates multiple towns in Rockingham County, including Auburn, Chester, and Derry in southeastern New Hampshire. Within the watershed, there are three large bodies of water: Beaver Lake (Derry), Harantis Lake (Chester), and Adams Pond (Derry). For the summer 2013 Stream Teams, we focused on eleven stream reaches that gave readings throughout the watershed. All of the tributaries that are included in the Beaver Lake Watershed will affect the water quality of Beaver Lake, so it is important that all of the streams are in good condition in order to maintain a productive ecosystem in Beaver Lake.

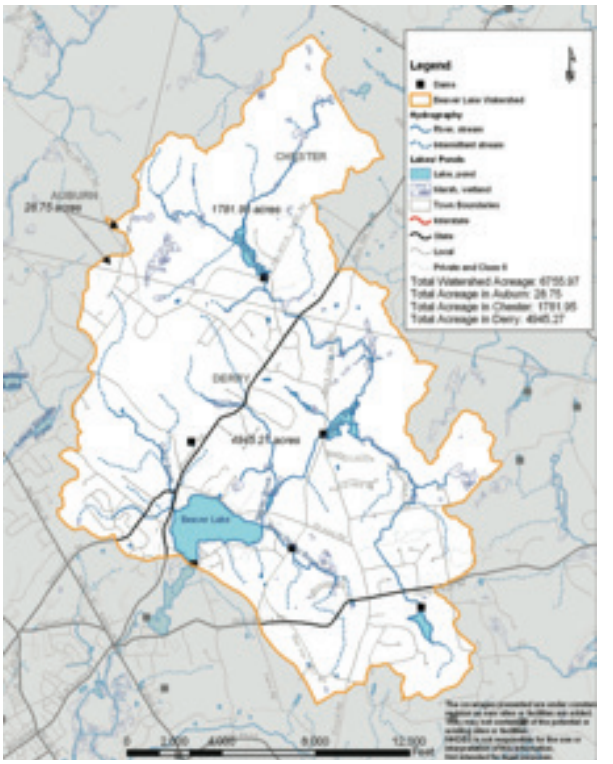

Figure 1. Beaver Lake Watershed

Results

This was a productive summer in which we were able to test eleven reaches. The NHRSAT ranking system utilizes biological indicators through macro-invertebrate sampling and basic chemical and physical indicators such as temperature, stream flow, and erosion. Stream Teams was able to test in Jenny-Dickey Brook, Partridge Brook, Manter Brook, Cat O' Brook and Cat O' Brook Tributary. Within Jenny-Dickey Brook and Partridge Brook, the water quality was listed between "fair" and "good" and demonstrated good macro-invertebrate scores. The reach we measured in Jenny-Dickey Brook led directly into Beaver Lake and was free of pollutants and garbage. The only concern for this reach is that planting a vegetative buffer along the riverbank would reduce erosion during peak flow periods. Partridge Brook also demonstrated good health as it was located further back in the woods and wasn't running directly through any lawns. There was a small amount of litter in the PBR-1 reach, which consisted mostly of old wiring, appliance parts and a broken down old shed. All three of the Manter Brook reaches scored well with the NHRSAT; however, the MAB-3 reach had a distinctly smaller amount of macro-invertebrates than the other two. This was also the reach that we found a Northern Water Snake in and a

large amount sizable crayfish. Cat O' Brook scored decently, however there were a couple reaches within Cat O' Brook that only scored "fair". There was also a distinct lack of macro-invertebrates throughout Cat O' Brook. The only zone that had a strong macro-invertebrate count was the outlet of Harantis Lake. Cat O' Brook Tributary also scored low for the macro-invertebrate count, but ultimately scored "good" with the NHRSAT. It was noted however, that there was a lot of litter along the banks of the Cat O' Brook Tributary along with close proximity to the road and driveways with steep banks leading down to the stream. We also found many Dusky Salamanders living in the streams that we sampled. Overall, stream quality was decent. Looking back on data from previous years also shows that there is a decrease in higher NHRSAT scores.

Significance

Even though this year's study has demonstrated low macro-invertebrate counts, the weather we have been experiencing can account for this. Rainfall has a tendency to dislodge macro-invertebrates and wash them downstream. Rainfall can also attribute to the erosion indicators found in the majority of the streams tested. However, the litter found along the Cat O' Brook Tributary off Beaver Road cannot be attributed to weather conditions. This is a problem to be addressed by the community; however, this seemed to be the only area that contained a significant amount of litter. The finding of many Dusky Salamanders, Green Frogs, and the Northern Water Snake is a promising discovery, as reptiles and amphibians unable to live in highly polluted zones because they absorb pollutants through their skin. This indicates that even though water quality in the streams is not the best it can be, there are still signs that it is doing well and the ecosystem is healthy.

Suggestions

While working with Stream Teams, I noticed several points that could use change. First, as suggested by the 2012 Stream Teams intern, I believe that setting up a marking system for reaches that need to be tested would be exceedingly beneficial. Since 2006, the GPS coordinates have not been working to create consistent testing of the same reaches. Implementing a system that utilizes physical markers at reach locations will ensure consistent testing of the same reaches, especially areas of concern. Second, I suggest the use of a dissolved oxygen probe and a pH testing system to retrieve more exact chemical data along with the biological macro-invertebrate testing. Having both chemical and biological readings will work to better teach the students what kind of conditions macro-invertebrates need to live and also to give better indications about stream health.

Submitted by: Mallory Bedard on August 10, 2013