Stormwater capture via green infrastructure in the Plaster Creek Watershed

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Introduction

Calvin College's campus is situated within the Plaster Creek watershed which stretches from Caledonia to the Grand River near downtown Grand Rapids. All of the water within the watershed drains into Plaster Creek, which, after many years of neglect and mistreatment, has become one of the most polluted waterways in Michigan.

Plaster Creek Stewards (PCS) aims to restore the local watershed by focusing on education, research and on the ground restoration. stormwater runoff containing high amounts of sediment, chemicals, and other pollutants. A variety of practices and tools are used to accomplish this goal.

Objectives

Third Year Efforts

Our objectives were to continue, expand, refine, and promote the work done in years before.

- Plan and install raingardens in the Alger Heights and expand and promote the rain gardens in the Oakdale neighborhood.
- Add sediment traps to previous curb cut rain gardens, as well as newly installed gardens to reduce sediment in the gardens.
- Improve overall health of the watershed with native plantings to improve the ecological health and community outreach to increase awareness.
- Represent Calvin College in a respectful and responsible way.

Methods

Rain Gardens

Plaster Creek Stewards use rain gardens to capture stormwater runoff and encourage a slow percolation of water into the ground. PCS focuses on the curb-cut rain garden. Stormwater runoff flows off of the streets and into the rock channel of a garden. Here, the rain water seeps into the garden and the plants and evaportranspirate the stormwater.

Fig. 1: A curb-cut rain garden installed by Plaster Creek Stewards. The rain garden consists of a rock channel with plantings around it

Native Plants

Native plants are used in all of our plantings and rain gardens because they are the best adapted to the Michigan climate and provide habitat for native wildlife. Plaster Creek Stewards collect seeds, propagate and grow as many native plants to populate our gardens and plantings.

Fig. 2: A seedling of a native plant grown in the greenhouse. The roots of of many native plant species are extensive and help with the drainage of stormwater in the rain garden.

Sediment Traps

A new feature of curb-cut rain gardens this year are sediment traps. Sediment traps are placed in the inlet of each rain garden and collect sediment from street runoff. As water flows into the basin of the sediment trap and slows down, sediment that is suspended in the water is deposited into the traps instead of into the rock channel. These sediment traps help with the maintenance of the raingardens and make disposal of polluted sediment easier.

Fig. 3: A sediment trap in a rain garden filled with sediment. The sediment was deposited by stormwater moving through the trap

Native Plantings

Plaster Creek Stewards will also do native plantings when requested. Plantings are often installed near Plaster Creek or its tributaries and which helps control erosion and sediment deposition into the creek. These plantings also help restore the natural biodiversity and previous landscape promoting native insects and mammals in the areas.

Fig. 4: A native planting occurring along a creek in the plaster creek watershed.

Figure 5: The cut curb of a mature rain garden in the Alger Heights neighborhood

Results

The Plaster Creek Watershed has been neglected for over 100 years, it will take many years of hard work to keep it from getting worse. eventually stabilize and begin to recover.

There are still many small improvements that can be seen. The sediment traps have been observed with trapped sediment. Many community members have expressed interest in having their own rain gardens installed. Some native plantings have reached full maturity and provide habitat for local fauna.

The work on the Plaster Creek watershed is ongoing but its future is promising.

References

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