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SNOW REMOVAL BIOSWALES IN HAINES, AK



Middle School students complete the final grading at the newly constructed bioswale in the Fort Seward Parade Grounds.
Photo: TWC Staff

Final Report

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Executive Summary

During FY17 the Takshanuk Watershed Council (TWC) and the Alaska Department of Environmental Conservation (ADEC) partnered to develop and install two (2) bioswales in the Fort Seward Parade Grounds in Haines, Alaska. The bioswales were designed to treat snow melt from the adjacent Haines Borough snow storage locations. Snow melt is known to contain several pollutants including oils, sand, antifreeze, hydrocarbons, and heavy metals. In addition to the construction of two (2) approximately 700 ft² bioswales the TWC also implemented several environmental education components. Non-point source pollution lessons were taught by TWC education staff to Haines Middle and High School students. In addition, Haines High School students mapped stormdrains within the Fort Seward area. Finally, a community Rain Garden and Bioswale tour was hosted to showcase 5 green infrastructure projects within the Haines townsite.

Introduction

The goal of this project was to demonstrate the value of green infrastructure bioswales to treat contaminated stormwater runoff. This was accomplished through the construction of two (2) approximately 700 ft² bioswales designed to treat the runoff from two (2) snow storage areas, the instruction of non-point source lesson plans and stormwater mapping with Haines Middle and High School students, and hosting a community rain garden and bioswale tour.

The environmental benefits of this project included the treatment of two large snow storage areas within the Haines Borough, hands-on environmental education for Haines Middle and High School students, and increased community knowledge of the benefits of green infrastructure techniques. Snow melt is known to contain several pollutants including sand, oil, antifreeze, hydrocarbons, and heavy metals. By treating the runoff from melting snow storage areas we are able to improve adjacent water quality of streams and waterways.

Implementation

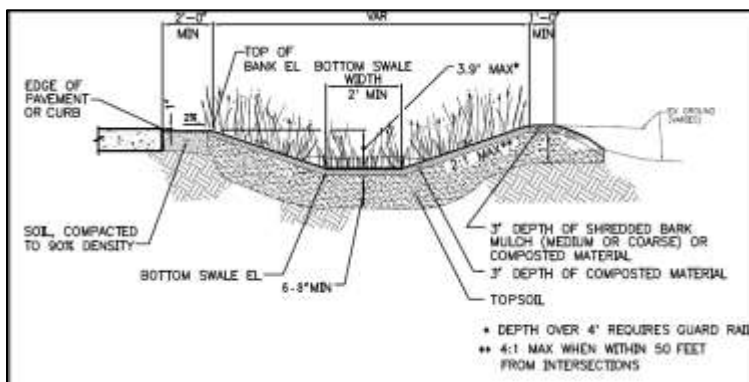
Bioswales

The locations were identified in the Haines Borough Snow Removal Plan (2015)¹ as an ideal location for the placement of a bioswale to treat the snow melt from the snow storage sites. The bioswales were

¹ Haines Borough Snow Removal Plan (July 2015). Prepared by the Southeast Alaska Watershed Coalition. Funding from ADEC ACWA grant:ACWA-15-03

designed to treat the pollutants as the snow pile melts by reducing flow and allowing for higher retention time.

The two bioswales located at the upper two corners of the Fort Seward Parade Grounds in Haines, AK were constructed in the fall of 2016. The Haines Borough provided equipment and operator time as in-kind for this project. The swales were excavated to approximately 2 feet, drain rock wrapped in geotextile fabric was then placed, and native soil was then sculpted into a swale design. The initial plan identified hardening the snow storage site itself, however, after several community meetings with neighboring residents it was determined that hardening the site would not be aesthetically pleasing and the natural vegetation at the site would suffice. In the spring of 2017 topsoil was placed on the swales and they were planted with native perennials. Plants included: wild iris, lupine, yarrow, and various groundcover perennials.



Bioswale design (Juneau, 2010)²



Installation of the bioswales. Photo: TWC staff

² Juneau, C. a. (2010). *Manual of Stormwater Best Management Practices*.



Swale lined with geotextile and filled with drain rock. Photo: TWC staff



Planting the Bioswale. Photo: TWC Staff

Environmental Education

Community and student involvement with projects such as the creation of the bioswales is an essential component of the work of the Takshanuk Watershed Council. In the fall of 2016 Haines Middle School students learned about non-point source pollution through a class demonstration activity and came to

the bioswale site to assist in some of the final grading work. In the spring of 2017 TWC education staff also taught a lesson on non-point source pollution impacts to Haines High School students. Those students then assisted in the mapping of stormdrains in the Fort Seward area (map in Appendix A). In addition, TWC's after-school gardening program, "Garden Club", assisted with community volunteers in the planting of the bioswales in the spring.

Through these education activities participants were able to learn about the benefits of green infrastructure and how to treat stormwater runoff.



Students completing the final grading. Photo: TWC staff



Students adding dye to map stormdrains. Photo: TWC staff



Students tracing the dye to the outlet at Portage Cove. Photo: TWC staff

Conclusion





The construction of the bioswales and the student and community education through this project aims to demonstrate the value of green infrastructure techniques to treat contaminated stormwater runoff from a variety of sources including snow storage locations. The TWC will continue to implement these and other green infrastructure projects and serve as a source of knowledge on green infrastructure for the community of Haines.

Appendix A

Fort Seward Snow Removal Bioswale Plan



Legend

-  Stormdrain_Mapping_Locations
-  Parade Grounds
-  Bioswale Area
-  Snow Storage Area

