Alaska Clean Water Actions Grant 23-02
River Center Rain Garden
Final Report

Kenai Peninsula Borough

Donald E. Gilman River Center

This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement number 00J84605 to the Department of Environmental Conservation through the Alaska Clean Water Actions (ACWA) program.

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Definitions

Green Infrastructure (GI): The range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters.

Low-Impact Development (LID): A management approach that can reduce runoff and pollutant loadings by managing runoff as close to its sources(s) as possible by implementing the use of natural systems for infiltration, evapotranspiration, and the harvesting and use of rainwater.

Nonpoint source pollution (NPS): Pollution that comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground and picking up natural and human-made pollutants, such as fertilizer, road salt, sediment, oil and bacteria. These pollutants are eventually deposited in our waterbodies.

Stormwater runoff; runoff: Stormwater runoff is generated from rain and snowmelt that flows over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. Runoff can pick up and deposit harmful pollutants like trash, chemicals, and dirt/sediment into streams, lakes, and groundwater.

Rain Garden: A depressed area in the landscape that collects rainwater from a roof, driveway or street. Rain gardens allow stormwater to soak into the ground and filter out pollutants

Watershed: The land area that drains to a stream, lake or river; an area of land that contributes water runoff to one specific delivery point.

Overview

This project, implemented between March 1, 2023 and February 28, 2025, installed a rain garden to capture and treat stormwater runoff at the Donald E. Gilman River Center (River Center) in Soldotna, Alaska. Because of its location at the River Center, the rain garden is highly visible and provided opportunity for the public to learn about low-impact development (LID) techniques that can be implemented at businesses or personal properties to reduce nonpoint source pollution, flooding, and negative effects of stormwater runoff to area waterways. The project included several public outreach activities highlighting the benefits of green infrastructure.

The main objective of this grant was to raise awareness about the benefits of green infrastructure and promote the implementation of LID techniques to reduce nonpoint source pollution, flooding, and negative effects of stormwater runoff within the Kenai River watershed.

Rain Garden Installation

A 60-square-foot rain garden and 50 gallon rain barrel were installed at the River Center to capture and treat stormwater runoff from the River Center facility (Appendix A). The rain garden was placed at the eastern side of the building, adjacent to a busy parking lot, where the River Center's thousands of visitors can view the rain garden and learn more from the interpretive signage installed alongside it.

A local contractor was hired to install the approximately 4-foot-wide by 15-foot-long rain garden (Appendix B). Native plants were also sourced from a local plant nursery. Planting native vegetation is a great option to support riparian habitat across the Kenai River watershed. Native plants require less maintenance because they are adapted to Alaskan soils and climate, and often need less maintenance than their non-native counterparts. In addition, they provide food and shelter for our birds, bees, and butterflies. Additional native plants were planted around the building and impervious public walkways.

Outreach Activities

1. Public events:
    a. The River Center hosted an open house on March 23, 2023 with nearly 100 individuals in attendance.
    b. On June 22, 2023 the River Center hosted a floodplain community meeting with 56 attendees.
    c. River Center staff presented at the Kenai Peninsula Realtor's Association (KPRA) general membership meeting on August 8, 2024 and February 13, 2025. In total, there were over 100 attendees.
    d. River Center and Kenai Watershed Forum staff collaborated to present to students at Kenai Central High School on January 17, 2024. There were approximately 150 students throughout the day, and we discussed the impacts that development, impervious surfaces, runoff, and erosion have within the Kenai watershed.
    e. There were between 4,464 and 8,640 visitors at the River Center between June 15 and August 15 of 2024.

2. Radio campaign:
    a. We implemented a 2.5-week-long radio campaign to a listening market of approximately 60,000 people to raise awareness about the benefits of green infrastructure and how property owners can reduce non-point source pollution. There were 36 ads that aired across six different Kenai Peninsula-area radio stations at KSRM Radio Group.
    b. During and after the radio campaign, we fielded dozens of phone calls from the public and spoke with several business customers visiting the River Center about the green infrastructure techniques they had heard on the radio.

3. Public education materials: The River Center developed and distributed outreach materials to educate the public about the benefits of green infrastructure and how they can reduce their non-point source pollution footprint.
    a. Created a page on the River Center's website dedicated to green infrastructure and the rain garden (Appendix C).
    b. Created two informational flyers about green infrastructure and erosion. Mailed over 4,400 of these flyers to property owners (Appendix D, E).
    c. Installed interpretive signage at the River Center Rain Garden site to educate visitors about the project and the benefits of green infrastructure. Signage included information about the benefits of rain gardens, how they work, and how they can be implemented on personal properties (Appendix F).

Public Response

Our target audience with this project was the general public, local businesses, community organizations, schools, and government agencies.

1. The River Center hosted an open house that had 45 attendees sign in, though there were closer to 100 individuals that filtered in/out throughout the night.
2. The River Center's floodplain community meeting had 56 attendees.
3. River Center staff presented at the Kenai Peninsula Realtor's Association (KPRA) general membership meeting, there were over 100 attendees.
4. River Center and Kenai Watershed Forum staff collaborated to present to students at Kenai Central High School. There were approximately 150 students.
5. There were between 4,464 and 8,640 visitors at the River Center between June 15 and August 15 of 2024.

To evaluate changes in public awareness of green infrastructure and rain gardens, the River Center sent approximately 3000 mailout surveys to Soldotna-area private landowners within the 50-foot Habitat Protection District and received 87 survey responses. In summary, about 25% of respondents had at least some familiarity with green infrastructure techniques; over 85% of respondents said they had not implemented green infrastructure techniques; over 90% of respondents said they would be more likely to implement green infrastructure if there were a financial incentive; approximately 50% of respondents felt that green infrastructure was beneficial to the watershed. Overall, the public's response to this project was positive.

Evaluation of Success

The outreach plan appears to have been effective in bringing more attention to green infrastructure, and the benefits it can provide to the Kenai River watershed. Daily business interactions allowed staff to converse with members of the public that would most benefit from utilizing LID techniques. This project was able to engage six (6) community organizations, (5) five business associations, and seven (7) government agencies. Moving forward, the River Center will continue to highlight the benefits of LID techniques in our outreach initiatives.

Recommendations

Outreach activities that could be implemented in the future:

1. Educational handouts on different topics (step-by-step instructions on how to build a rain garden, beneficial native plant species, etc.)
2. A pass-through grant program that would partially or wholly fund LID techniques on private property.

Appendices

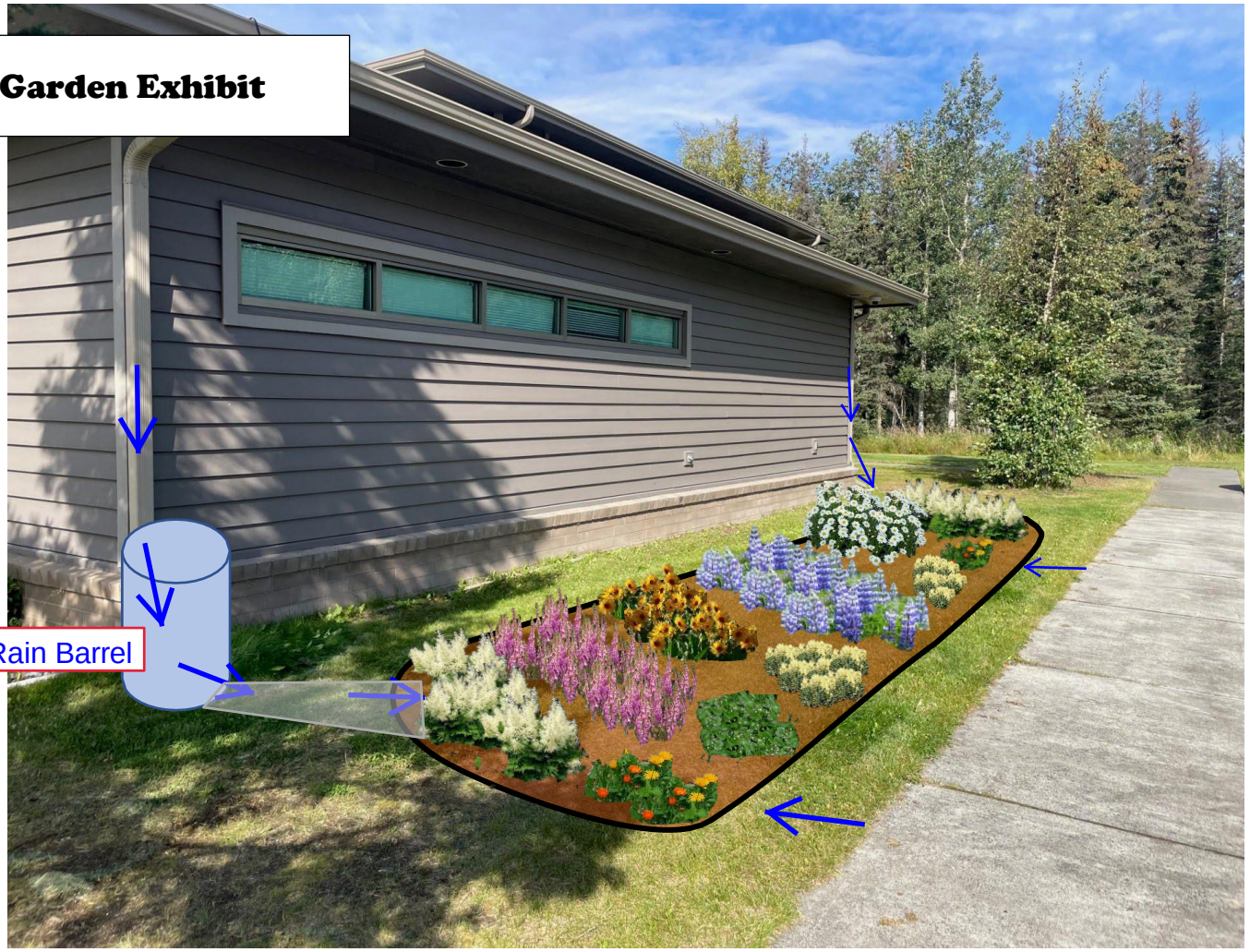
A. Final Rain Garden Design
B. Photo Log
C. Green Infrastructure Webpage
D. Erosion Flyer
E. Green Infrastructure Flyer
F. Rain Garden Interpretive Sign

Appendix A

Final Rain Garden Design

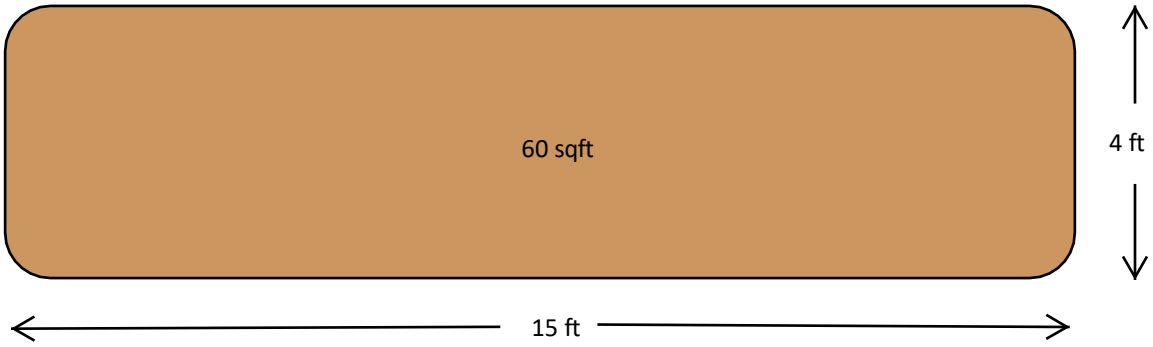

River Center

Rain Garden Exhibit

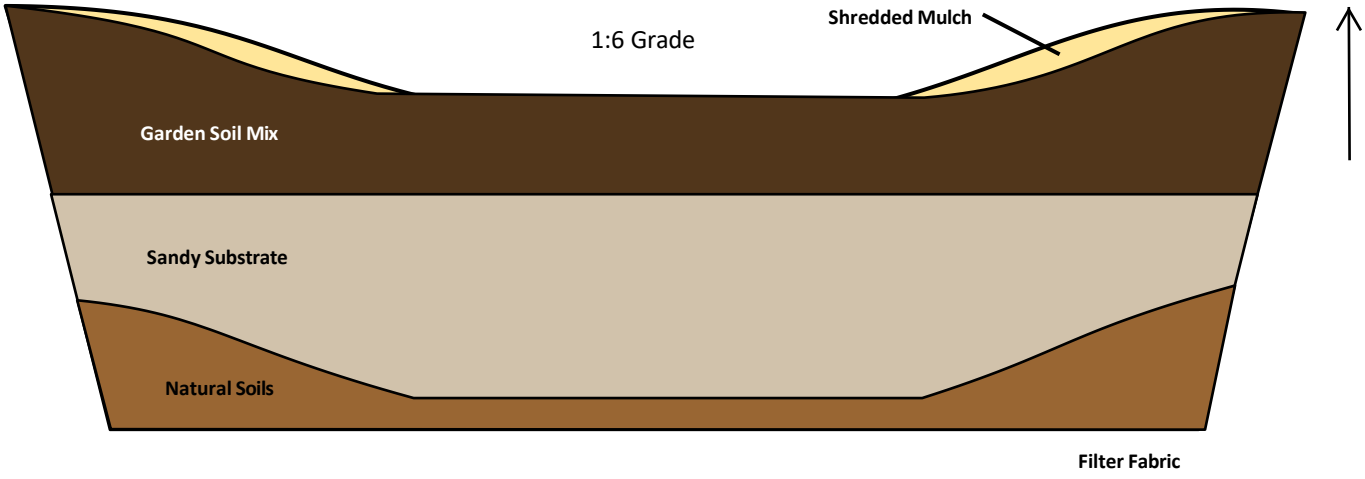


Rain Garden Exhibit
Aerial View

Sources: Rainwater, rain barrel overflow, roof & sidewalk runoff



Rain Garden Exhibit
Cross-Section
Infiltration Trench



Appendix B

Photo Log

Before Installation

During Installation

Rain Garden & Rain Barrel Installed

Rain Garden: Week One

Additional Plantings Installed

Additional Plantings Installed

Rain Garden and Plantings

Green Infrastructure Sign

Rain Garden & Sign

Appendix C

Green Infrastructure Webpage

Streams, Rivers & Lakes

The River Center works to protect and restore the rivers of the Kenai Peninsula, its watersheds, and its fish and wildlife resources.

Overview
Permits & Forms
Streambank Rehabilitation
Habitat Protection District
Floodplain Management Program
Resources
River Center
Green Infrastructure

Green Infrastructure

Water Pollution & Green Infrastructure

As the rain falls and the snow melts, that water eventually ends up in our streams, lakes, and rivers. Along the way, it can pick up pollutants from roads, parking lots, and the ground. This is called nonpoint source pollution. When these pollutants end up in our waters, it can have a major effect on our health, our water quality, and our salmon.

With water all around us, what can we do about that? Consider implementing green infrastructure! Green infrastructure techniques such as rain gardens and bioswales are designed to mimic the natural water cycle and absorb the water where it falls, soaking up water and filtering pollutants before they end up in our lakes, rivers, and streams.

From private rain gardens to major urban planning - anyone can utilize green infrastructure techniques!

Non-Point Source Pollution

Non-point source pollution is the most significant source of pollution overall in the country. Polluted runoff can make humans sick, harm aquatic life, damage aquatic habitat, and reduce the capacity of water resources to be used for drinking and recreation.

Rain Garden and signage at the River Center

What Can You Do?

There are several techniques that Alaskans are already using to reduce runoff and improve water quality in their watersheds:

Planting

Another great option to support riparian habitat across the Kenai River watershed is to plant native vegetation. Native plants require less maintenance because they are used to Alaskan soils and climate. In addition, they provide food and shelter for our birds, bees, and butterflies.

Rain Gardens

Rain gardens are beautiful and affordable solutions that anyone can use to reduce water pollution from runoff. A rain garden is a flower garden that dips toward the center, and is designed to collect and clean the water running off your roof or lawn. The water can slowly filter into the ground instead of running off of your property - keeping our rivers clean and our salmon healthy!

Bioswales

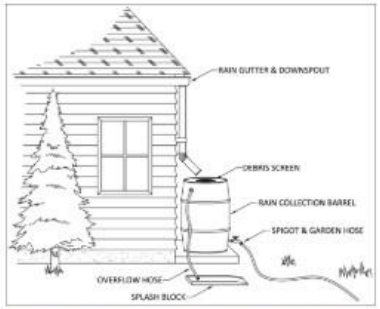
Bioswales are essentially long, narrow rain gardens that use vegetation or mulch to slow and filter runoff. While commonly used near curbs and parking lots, they can also be used in tight developments where the space between buildings is narrow.

Land Conservation

Impervious surfaces are hardened surfaces and structures that increase runoff. The most effective and affordable way to protect our waters is to preserve the natural buffers that exist—such as wetlands and riparian habitat. By conserving these areas, it ensures they can continue absorbing and filtering runoff.

Downspout Connections

This simple practice is designed to reroute water coming off your roof, and direct it into rain barrels, cisterns, gardens, or other permeable areas.



Example of downspout connection using a rain barrel.

Additional Resources

ADEC Nonpoint Source Water Pollution Prevention & Restoration ADEC Nonpoint Source Water Pollution Prevention & Restoration
EPA Green Infrastructure
Erosion Handout
Green Infrastructure Handout

Appendix D

Erosion Flyer

LEARN MORE

Scan this QR code to learn more about preventing erosion!

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Donald E. Gilman River Center
514 Funny River Road
Soldotna, AK 99669

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KenaiRivCenter@kpb.us

KEEP YOUR SOIL AT HOME

RIVER CENTER

KENAI PENINSULA BOROUGH

BELIEVE IT OR NOT, ONE OF THE BIGGEST THREATS TO OUR WATER QUALITY IS PLAIN OLD DIRT WASHING INTO OUR RIVERS, LAKES, AND STREAMS

What's Wrong with Sediment?

Sediment clouds water and can impact salmon habitat and spawning grounds. Sediment can also carry pollutants such as nutrients, oil, and grease. Excessive pollutants in the watershed can lead to big issues that not only impact our salmon, but our health and water quality, too.

Erosion Isn't Just for Rivers

Whenever soil is lost through erosion—no matter where it happens—it can become a pollutant. And you don't have to live on the river for erosion pose a problem. Other areas vulnerable to erosion can be:

- Exposed tree roots, stones & rocks
- Construction sites
- New lawns and gardens

How Do You Prevent Erosion?

The best way to prevent erosion and sediment runoff is to plant. Plant roots act like a binder, and hold the soil in place over time. Here are other options you can use to prevent erosion:

- Direct downspouts onto grass or gardens.
- Only garden on level areas of your property, and cover with mulch or leaves over winter to reduce erosion when the snow melts.
- Plant shrubs or trees to create a buffer between your property and any lake or stream. Buffers filter out pollutants!
- Working in the dirt? Set up erosion controls, like a silt fence.

Plant This, Not That

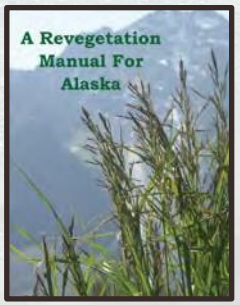
With so many options, how do you know what to plant?

fws.gov/story/alaskans-plant-not

Native plants have deeper root systems that prevent erosion. Choose native perennials, shrubs, and trees that grow well in Alaska.

Scan this QR code to see examples of Plant Alternatives for Alaskan Gardens!

The **Alaska Plant Materials Center** has a variety of resources to assist you. Visit them at plants.alaska.gov to find the right plants for your property!



Appendix E

Green Infrastructure Flyer

Water Pollution & Green Infrastructure

As the rain falls and the snow melts, that water eventually ends up in our streams, lakes, and rivers. Along the way, it can pick up pollutants from roads, parking lots, and the ground. This is called nonpoint source pollution. When these pollutants end up in our waters, it can have a major effect on our health, our water quality, and our salmon.

With water all around us, what can we do about that? Consider implementing Green infrastructure!

Green infrastructure techniques such as rain gardens and bioswales are designed to mimic the natural water cycle and absorb the water where it falls, soaking up water and filtering pollutants before they end up in our lakes, rivers, and streams.

From private rain gardens to major urban planning—anyone can utilize Green infrastructure techniques!

Have you seen green infrastructure in your community?

LEARN MORE!

Scan this QR code to learn more about green infrastructure at our website!

Photo by Devony Lehner
Homer Soil & Water Conservation District

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Green Infrastructure, Rain Gardens, and Water Quality

Rain Garden by the City of Homer

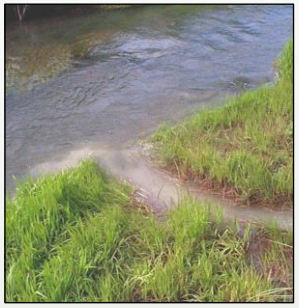
RIVER CENTER

KENAI PENINSULA BOROUGH

Working together to protect and restore the rivers of the Kenai Peninsula, its watersheds, and its fish and wildlife resources

Runoff, What's the Risk?

Nonpoint source pollution is the most significant source of pollution overall in the country. Polluted runoff can make humans sick, harm aquatic life, damage aquatic habitat, and reduce the capacity of water resources to be used for drinking and recreation



What can you do? There are several techniques that Alaskans are already using to reduce runoff and improve water quality in their watersheds!

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A rain garden is a flower garden that dips toward the center, and is designed to collect and clean the water running off your roof or lawn. The water can slowly filter into the ground instead of running off of your property - keeping our rivers clean and our salmon healthy!

Photo by Devony Lehner
Homer Soil & Water Conservation District

Land Conservation

Impervious surfaces are hardened surfaces and structures that increase runoff.

Green infrastructure can filter water runoff from impervious surfaces such as roads, roofs, and parking lots

The most effective and affordable way to protect our waters is to preserve the natural buffers that exist—such as wetlands and riparian habitat. By conserving these areas, it ensures they can continue absorbing and filtering runoff.

Planting

Another great option to support riparian habitat across the Kenai River watershed is to plant native vegetation.

Native plants require less maintenance because they are used to Alaskan soils and climate. In addition, they provide food and shelter for our birds, bees, and butterflies.

Downspout Disconnection

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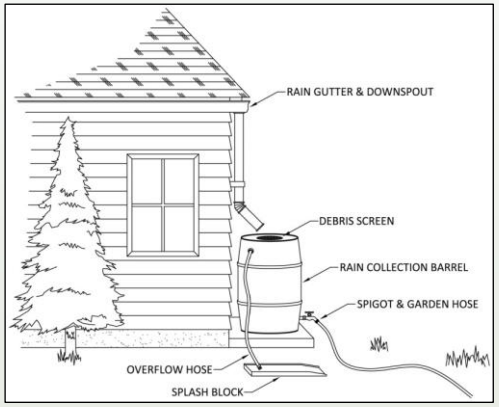

Bioswales

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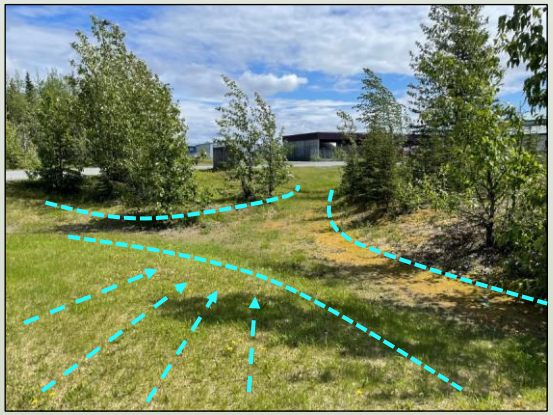

Bioswale at the Donald E. Gilman River Center

Appendix F

Rain Garden Interpretive Sign

What is Green Infrastructure?

As the rain falls and the snow melts, that water eventually ends up in our streams, lakes, and rivers. Along the way, it can pick up pollutants from roads, parking lots, and the ground. This is called nonpoint source pollution. When these pollutants end up in our waters, it can have a major effect on our health, our water quality, and our salmon. With water all around us, what can we do to help?

Green infrastructure uses techniques designed to mimic the natural water cycle by absorbing water where it falls. Water is soaked up and pollutants are contained before they end up in our lakes, rivers, and streams.

Consider implementing green infrastructure where you live! Plant a rain garden, install a rain barrel or consider leaving some areas on your land undeveloped.

Rain Barrels

Stormwater runoff can cause soil erosion and carry lawn fertilizer and other contaminants into local streams. Rain barrels collect water from your roof, slow runoff, and prevent flooding in your yard. Another benefit — free water for your landscape!

Rain Gardens

Prevent ponding and create habitat for birds and insects! Rain gardens like the ones at the River Center are depressions in the ground designed with native plants to help filter pollutants, absorb excess water, and return it to the local soil.

Bioswales

Paved areas like roads and parking lots increase surface water runoff. Road pollutants such as oil and metals from vehicle exhaust can end up in local waterways. Bioswales are low-lying areas that use vegetation or mulch to slow and filter stormwater. Re-directing water into a bioswale is a great way to collect and retain water from rain and melting snow, keeping your river clean and safe for wildlife.

Riparian Zones

A green buffer of plants and trees prevents erosion and absorbs downslope water before it can flow into the river. Riparian zones help prevent flooding. Tree roots also stabilize the river's bank and provide habitat and shelter.

Why Native Plants?

Native plants are adapted to the local soil and climate. Once established, native plants are low maintenance because they they thrive during both drought and major rain events.

Native plants do not need fertilizers or pesticides.

Native plants benefit your area birds, insects and other wildlife.

The River Center is a multi-agency permitting, outreach, and education center. There are several agencies at the River Center, all working together to protect and restore the rivers of the Kenai Peninsula, its watersheds, and its fish and wildlife resources.

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