

County: Skagit

Grant No: G1000022

PROJECT TITLE: Northwest Straits Commission: Skagit County MRC Action Grant

DELIVERABLES FOR TASK NO: 3 - Low Impact Development Brochure

PROGRESS REPORT: [☐]

FINAL REPORT [☒]

PERIOD COVERED: 1 July 2009 to 30 June 2011

DATE SUBMITTED: 30 June 2011



This report was funded in part through a cooperative agreement with the National Oceanic and Atmospheric Administration.

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Marine Life Photos: Jim Ramaglia

About the Skagit County Marine Resources Committee

Established in 1999, the Skagit Marine Resources Committee (MRC) is one of seven citizen-based advisory committees formed under the congressionally authorized Northwest Straits Marine Conservation Initiative (NWSI). The primary goal of the MRC is to restore and protect the marine ecosystem to sustainable levels for the benefit of the people today and future generations. One of the strategies for accomplishing this goal is by promoting stewardship and understanding of Skagit County marine resources through education and outreach. The 19 MRC members represent diverse interest groups including: four local tribes, marine scientists, environmental organizations, local government, marine dependent businesses, recreational divers and fishermen, and concerned citizens. To learn more about the MRC and their accomplishments visit: www.skagitcounty.net/MRC.



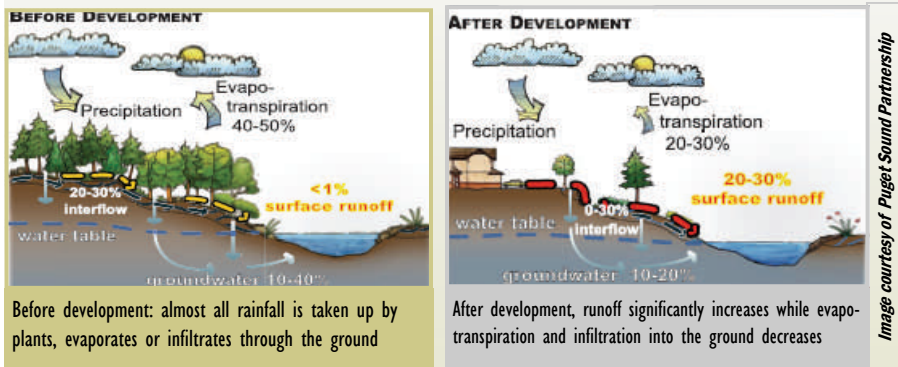
LOW IMPACT DEVELOPMENT *in Skagit County*

DEVELOPED BY THE SKAGIT COUNTY MARINE RESOURCES COMMITTEE



What Is Stormwater Runoff? Why Is It a Problem?

Stormwater runoff is unfiltered rain water and snowmelt that flows across impervious surfaces (e.g. driveways, sidewalks, rooftops, parking lots, driveways, and streets), washing harmful pollutants and bacteria, sediments, and debris into storm drains, ditches, streams, rivers, lakes and ultimately into Puget Sound. Stormwater runoff is the number one source of water pollution in the state and can result in beach closures for swimming and shellfish harvesting. It can also increase erosion and sedimentation that damage fish and wildlife habitat, cause flooding and landslides, and can result in less water for sufficient stream flow for fish and groundwater supplies. The amount of impervious surfaces increase as growth and development increase. Skagit County's population has more than doubled since 1960 and is expected to increase by another 100,000 by 2060 for an estimated population of 218,000. What can we do to accommodate growth while protecting our natural resources? Low Impact Development can help.



Reducing Runoff With Low Impact Development

Low Impact Development (LID) is an approach to managing stormwater runoff through development practices that mimics hydrology under natural conditions. LID not only manages stormwater, it makes communities greener and more beautiful. In native forests, when it rains most of the water evaporates or is absorbed into the ground and is then taken up by the roots of the plants and trees growing there. The process of allowing water to filter through the ground naturally, removes many of the pollutants in the water before it reaches our rivers, lakes, and marine waters. Examples of LID include:

- Retaining and protecting existing trees and vegetation
- Amending soils with compost improves drainage and infiltration of stormwater
- Pervious pavement reduces impervious surface areas and helps infiltrate stormwater
- Vegetated roofs and walls absorb rain water before it ever reaches the ground
- Bioretention areas help capture, absorb, and filter polluted stormwater
- Roof rainwater collection and flow control dispersal systems reduce stormwater volume and velocity.

*Primary Source: Puget Sound Partnership Website

Low Impact Development Resources

- **City of Burlington Stormwater Management Plan:** www.ci.burlington.wa.us/imageuploads/Media-2996.pdf
- **City of Anacortes Stormwater Management Program:** <http://www.cityofanacortes.org/PublicWorks/Engineering/Stormwater/stormwater.htm>
- **City of Mount Vernon Stormwater Management Program:** <http://www.ci.mount-vernon.wa.us/imageuploads/Media-4341.pdf>
- **Center for Watershed Protection:** <http://www.cwp.org/>
- **Environmental Protection Agency Low Impact Development reports and fact sheets:** www.epa.gov/owow/nps/lid/
- **Environmental Protection Agency Green Infrastructure:** www.epa.gov/greeninfrastructure
- **Low Impact Development Technical Guidance Manual for Puget Sound, Puget Sound Action Team & WSU Extension:** http://www.psp.wa.gov/downloads/LID/LID_manual2005.pdf
- **Low Impact Development Center, Inc:** <http://www.lowimpactdevelopment.org/index.html>
- **Phase I Stormwater Permit:** <http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIpermit/phaseIwwa0107/phipermitfinal.pdf>
- **Puget Sound Partnership, Stormwater & Low Impact Development:** http://www.psparchives.com/our_work/stormwater/lid.htm
- **Rain Garden Handbook for Western Washington Homeowners, WSU Extension:** http://www.pierce.wsu.edu/Lid/raingarden/raingarden_handbook.pdf
- **Urban Design Tools, Low Impact Development:** <http://www.lid-stormwater.net/index.html>
- **Skagit Conservation District Stormwater Programs:** http://www.skagitcd.org/stormwater_programs
- **Skagit County Health Department Septic Inspection Program:** <http://www.skagitcounty.net/Common/Asp/Default.asp?d=HealthEnvironmental&c=General&p=onsitesewer.htm>
- **Skagit County Health Department Shellfish Harvest Safety Information:** <http://www.skagitcounty.net/Common/Asp/Default.asp?d=HealthEnvironmental&c=General&p=shellfish.htm>
- **Skagit County Shore Stewards:** <http://www.shorestewards.wsu.edu/skagit/>
- **Skagit County Stormwater Management Plan:** <http://inside.skagit.local/PublicWorksSurfaceWaterManagement/Documents/Stormwater/Final%20SWMP%202010.pdf>, Report a Water Quality Problem: (360) 366-9400.
- **Washington Department of Ecology Water Quality Program:** www.ecy.wa.gov/programs/wq/stormwater/index.html
- **Watershed Planning:** www.ecy.wa.gov/watershed/index.html

10 Things You Can Do To Reduce Stormwater Runoff and Pollution

- 1. Maintain your car or truck.** Never dump anything down a storm drain. Always recycle used oil, antifreeze and other fluids. Get vehicle emissions checked and repaired and fix oil leaks in your vehicles
- 2. Wash your car at a commercial car wash rather than in the street or in your driveway.** The phosphates from the soap and other chemicals from the car and driveway harm fish, wildlife, plants, and water quality. Phosphate can also cause excess algae, which harms water quality and uses up oxygen in the water that fish need. If you wash your car at home, wash it on your lawn. Use phosphate free biodegradable soap and use shut off nozzles to conserve water
- 3. Borrow a carwash kit for fundraiser car washes.** The kit redirects car wash water to a grassy area or into a sewer system. Borrow a car wash kit at the following locations:
 - City of Anacortes (293-1920)
 - City of Burlington (755-9715)
 - City of Mount Vernon (336-6204)
 - City of Sedro-Woolley (855-0771)
 - Skagit Conservation District (428-4313)
 - Skagit County Public Works (336-9400, ext. 3174)
- 4. Drive less.** Combine errands and take a bus, carpool or bike to work if you can
- 5. Use less fertilizers, pesticides and herbicides.** Consider using organic fertilizers
- 6. Reduce the size of your lawn, preserve existing trees, and plant native plants.** Replace part of your lawn with native, drought-resistant plants. Preserve trees and vegetation particularly along stream banks
- 7. Maintain your septic system.** Septic systems require regular inspections, maintenance and pumping, or they will fail, costing a lot of money to fix and could pollute nearby lakes and streams. For more information contact the Skagit County Health Department :360-336-9380 or email: health@co.skagit.wa.us
- 8. Pick up after your pets and keep animals out of streams.** Scoop your dog's poop and properly dispose of it. Also, make sure fences and other structures are keeping cows, horses and other animals out of streams. Keep compost manure covered in a designated area so that it doesn't wash off into nearby waterways. Pet and livestock waste carries harmful bacteria that pollute our waterways during heavy rainstorms
- 9. Reduce impervious surfaces at home and increase the vegetated land cover of your property.** Impervious surfaces include your roof, driveway, and patios. Reduce rooftop runoff by directing your downspouts to vegetated areas, and not to the storm drain on your street. For your driveway and patios, consider putting in permeable paving or cement and brick pavers that allow water to filter through it
- 10. Support your local storm or surface water program.** Consider volunteering for stream restoration and water quality monitoring. For volunteer opportunities contact the Skagit Conservation District: www.skagitcd.org, or the Skagit Fisheries Enhancement Group: www.skagitfisheries.org. Report pollution concerns to the County: (360) 336-9400 or the Washington Department of Ecology: 1-425-649-7000



What are the Benefits of Low Impact Development?

LID Helps Protect the Environment

- Filters pollutants and helps reduce contamination of shellfish growing areas and beaches in our waterways
- Helps maintain stream flows and replenish streams and groundwater levels
- Reduces the volume and velocity of stormwater runoff to help protect stream banks from erosion, salmon spawning habitat, and shellfish growing areas
- Preserves and restores trees and other native vegetation

LID Helps Reduce Flooding and Protects Property

- Reducing impervious surfaces, increasing vegetation and infiltrating stormwater results in a reduced volume of stormwater runoff
- Helps reduce flooding and protects property

LID Helps Protect Human Health

- Filters pollutants from stormwater before reaching our local waterways. Untreated stormwater in lakes, rivers, and bays can be unsafe for people to drink, swim, or consume seafood
- Helps maintain groundwater water levels for drinking water supplies

LID Is Good for the Economy

- Can help reduce maintenance costs of stormwater facilities
- Can help protect shellfish growing businesses, water quality and marine sediment quality so that Puget Sound remains a great place to operate a business and attract employees.
- Reduces the need for expensive pollution cleanup efforts
- Provides cost-effective alternatives to systems upgrades
- Increases the appearance and aesthetics of communities to help increase property resale values



Impervious surfaces inhibit stormwater from naturally infiltrating into the ground, so pollutants are washed into our local waterways and can result in less water for sufficient stream flow for fish and replenishing groundwater supplies. Impervious surfaces can also cause an increase in stormwater velocity and volume which causes erosion and sedimentation, damages fish and wildlife habitat, and increases flooding and landslides

*Primary Source: Puget Sound Partnership Website

Low Impact Development Practices In Skagit County

Bioretention

Bioretention areas, also referred to as rain gardens or bioswales, are landscaped shallow depressions designed to function like a native forest to help slow down, soak up and filter runoff pollutants collected from rooftops, driveways, porches, lawns, and parking lots. With no bioretention areas, this polluted stormwater would drain untreated to local waterways. Additional benefits include:

- Reduced flooding, sewer overflow, and stream bank erosion
- Increased infiltration needed to recharge local groundwater
- Provide habitat for beneficial insects and birds

Rain garden workshops are occasionally offered through the Skagit Conservation District and the Washington State University Extension office. For more information about the workshops go to: www.skagitcd.org, <http://raingarden.wsuedu/classes.html>, or check out the "Rain Garden Handbook for Western Washington Homeowners" by Washington State University Extension: http://county.wsu.edu/mason/nrs/water/Documents/Raingarden_handbook.pdf.



Rain gardens at the Port of Anacortes Rope Building are designed to capture, absorb, and treat roof runoff

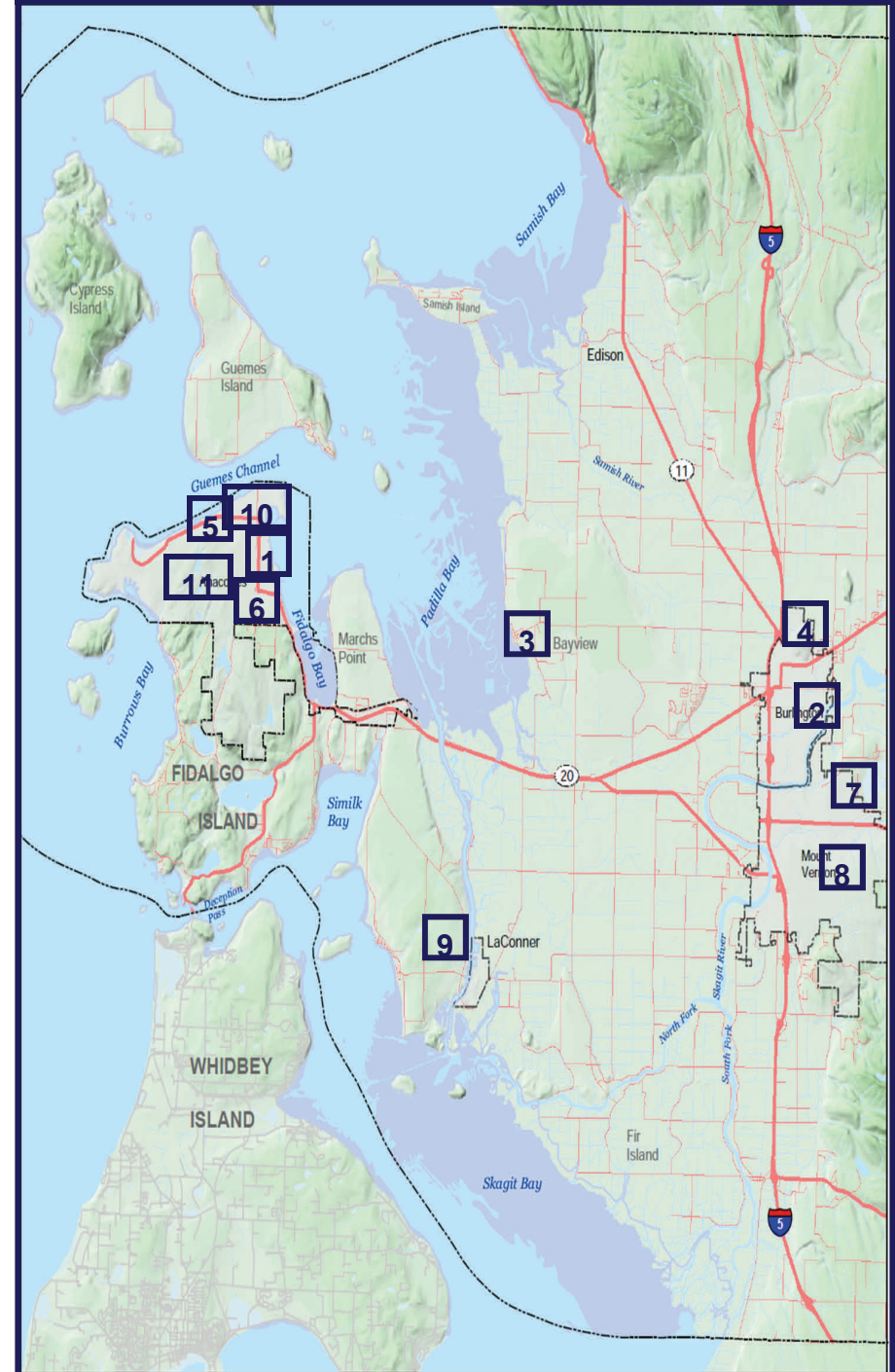


Two rain gardens at the Swinomish Planning Department capture and treat parking lot runoff



Landscaped bioswales, located at the Anthony's Restaurant parking lot at Cap Sante Marina, absorb the runoff from the parking lot and remove the pollutants left behind by vehicles

Low Impact Development Locations



Low Impact Development Practices in Skagit County

1. **Anthony's Restaurant at Cap Sante Marina** - 1207 W Avenue, Anacortes
 - Bioswales
2. **North Oak Housing Development** - North Oak Street, Burlington
 - Pervious Asphalt
3. **Padilla Bay Estuarine Research Reserve** - 10441 Bayview-Edison Road, Mount Vernon
 - Pervious Pavers
 - Pervious Asphalt
4. **Pomona Grange Park** - 5625 Old Hwy 99, Burlington
 - Vegetated or "Living" Roof
5. **Port of Anacortes Railroad Avenue Mitigation and Beach Restoration**
 - Rain Garden
 - Decorative Roof Rain Water Collection System
 - Pervious Pavers
 - Native Planting along the Shoreline
6. **Port of Anacortes Seafarers Memorial Park** - Seafarers Way, Anacortes
 - Pervious Pavers
 - Native Planting
7. **Skagit County Administration Building** - 1800 Continental Place, Mount Vernon
 - Rain Garden
 - Rain Barrels
8. **Skagit Valley Hospital** - 1415 East Kinkaid Street, Mount Vernon
 - Bioswales
9. **Swinomish Tribe Planning Building** - 11430 Moorage Way, La Conner
 - Rain Gardens
10. **Train Depot** - 611 R Avenue, Anacortes
 - Rain Garden
 - Pervious Pavers
11. **Tursi Park** - 2200 Pennsylvania Avenue, Anacortes
 - Pervious Concrete

Low Impact Development Practices In Skagit County



The rain garden at the Skagit County Administrative Building captures, absorbs, and treats roof runoff



Landscaped bioswales located in the parking lot of the Skagit Valley Hospital absorb the runoff from the parking lot and remove the pollutants left behind by vehicles

Vegetated Roofs and Walls

Vegetated "living" or "green" roofs and walls provide multiple benefits. They absorb rain water and reduce stormwater runoff; reduce air pollution; increase sound insulation; provide wildlife habitat; and provide a thicker thermal barrier that keeps heat in during the winter and out during the summer, making the building more energy efficient, which reduces heating and cooling cost.

Living Wall



Skagit County Administration Building

Green Roof



Pomona Grange Park

Low Impact Development Practices In Skagit County

Roof Rainwater Collection Systems

Roof rainwater catchment and dispersal systems reduce the volume and velocity of runoff which reduces soil erosion and flooding. Captured rainwater can be used for irrigation, drinking water, grey water or other purposes reducing the demand on groundwater supplies.



Concrete structures at the Skagit County Administration Building, capture and disperse roof rainwater to the rain garden



Decorative roof rainwater collection system at the Port's Rope Building captures and disperses roof rainwater to the rain garden



Rain barrels capture roof rainwater for irrigation at the Skagit County Administration Building

Low Impact Development Practices In Skagit County

Pervious Pavement

Pervious pavement reduces the volume and velocity of stormwater runoff which in turn reduces soil erosion and flooding, by allowing the water to filter through to the soil underneath where contaminants are removed before reaching streams, rivers, lakes, and bays.

Pervious Pavers



Pervious pavers at the Port's Seafarers Memorial Park allows stormwater to infiltrate through void spaces and gaps between the pavers and into the subgrade layers

Pervious Asphalt and Concrete



Pervious asphalt parking lot and pervious concrete sidewalk at the Padilla Bay Estuarine Research Reserve allow water to infiltrate and remove pollutants



Pervious Concrete Demonstration

Pervious Grid



Pervious concrete grid filled with grass at the Padilla Bay Estuarine Research Reserve infiltrates stormwater and provides a durable parking area for vehicles