

# Kitsap Conservation District

Rain Gardens and other LID's for Surface and Stormwater Management

“Treating water as a resource not a waste stream”



The goal of Rain LID is to treat stormwater at the point that it is created. In effect, having housing developments function more like natural features.



# Primary goals for LID:

- 1) no measurable impacts to receiving waters
- 2) maintain or more closely approximate pre-development surface flow volumes and durations





# Low Impact Development Objectives:



- Protect and restore native soils/vegetation.
- Reduce the development envelope.
- Reduce impervious surfaces.
- Manage Stormwater as close to its origin as possible.
- Integrate stormwater controls into the design—create a multifunctional landscape.
- Reduce concentrated surface flow, minimize stormwater contact with impervious surfaces, and increase stormwater contact with soils and vegetation.



## Why LID?

- Our population continues to grow at about 2% per year over the last 80 years

creating more and more impervious surfaces. Source: "2012 Population Trends," State of Washington Office of Financial Management Forecasting Division, September 2012; <http://www.ofm.wa.gov/pop/april1/poptrends.pdf>

- Our waters are highly polluted –

- On an average day, it's estimated that 140,000 pounds of toxic chemicals – including petroleum, copper, lead, zinc and polychlorinated biphenyls (PCBs) – enter Puget Sound. Source: "Control of Toxic Chemicals in Puget Sound," Washington State Department of Ecology, Phase 2: Development of Simple Numerical Models, 2008; [www.ecy.wa.gov/Programs/wq/pstoxics/index.html](http://www.ecy.wa.gov/Programs/wq/pstoxics/index.html)
- About 75 percent of the toxic chemicals entering the Sound are carried by stormwater runoff that flows off of paved roads and driveways, rooftops, yards and other developed land. Source: "Control of Toxic Chemicals in Puget Sound," Washington State Department of Ecology, Phase 2: Development of Simple Numerical Models, 2008; [www.ecy.wa.gov/Programs/wq/pstoxics/index.html](http://www.ecy.wa.gov/Programs/wq/pstoxics/index.html)
- 549 streams, rivers and lakes across the Puget Sound region are impaired by poor water quality. Source: "Washington State's Water Quality Assessment [303(d)]," Washington State Department of Ecology, 2008; [www.ecy.wa.gov/programs/wq/303d/](http://www.ecy.wa.gov/programs/wq/303d/)

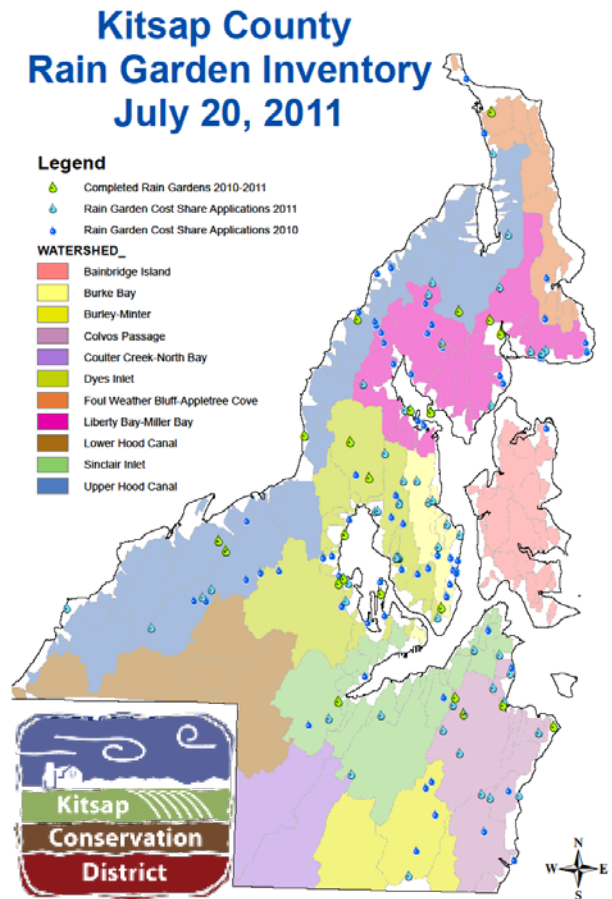
- Legislation is continuing to tighten on stormwater and water usage

- Our climate is changing - Source: "The Washington Climate Change Impact Assessment," Climate Impacts Group, 2009; [www.cses.washington.edu/cig/res/ia/waccia.shtml](http://www.cses.washington.edu/cig/res/ia/waccia.shtml)

- Wetter winters – Overall rain is not expected to increase but rain events are expected to be more intense and warming weather will cause reduced snowpack all creating more erosion.
- Dryer summers – rain garden plants, designed to be drought tolerant, will not suffer with this change and need no irrigation.

# Kitsap County Quick Facts

- Population: 251,133 - 2010 census
- 394.94 square miles
- 636 People per square mile.  
2<sup>nd</sup> most densely populated in Washington State
- One of 12 Washington counties in the Puget Sound basin





# Kitsap County's Large Constituents

- 4 cities
- Large unincorporated rural area
- 3 Native American Tribal Governments
- 3 US Naval bases



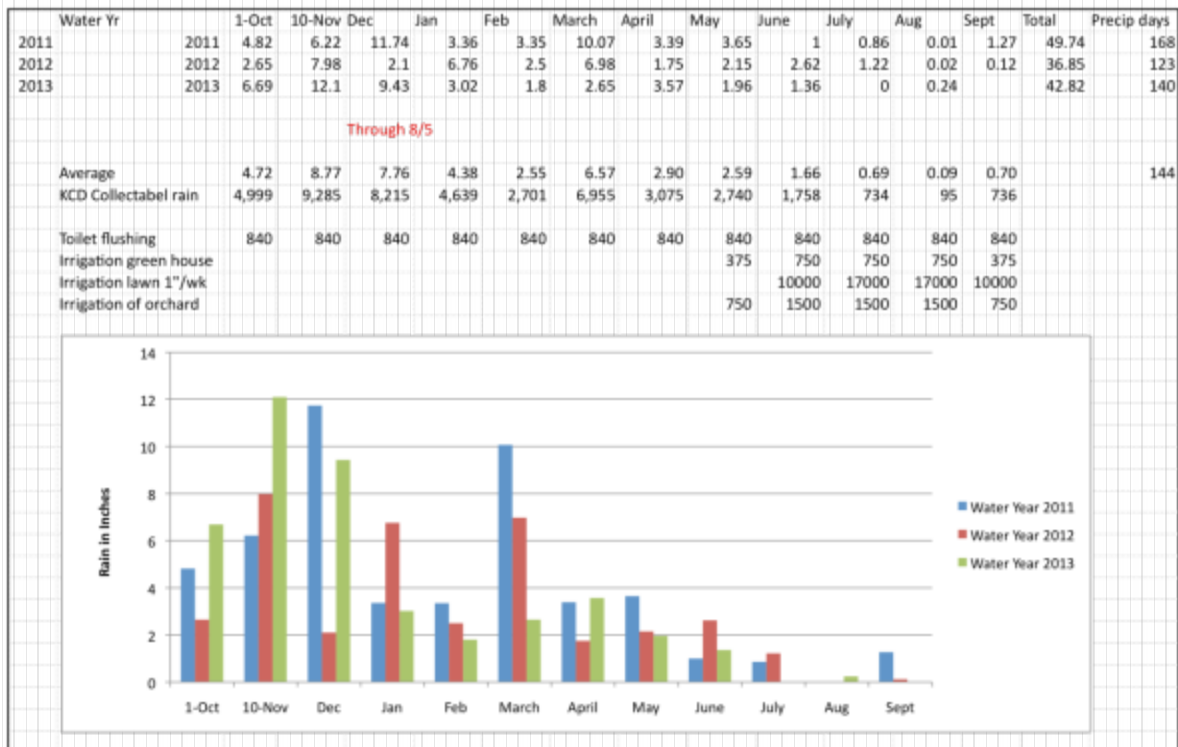
# Kitsap County's Unique Water Challenges

- No large rivers – 1,003 miles of streams (1 river, Union)
- Long marine shoreline – 228 miles of shoreline (almost an island)
- No mountains containing snow pack



# Kitsap County's Unique Water Challenges

- Medium rain fall county average 50"/yr. (varies from 26"-60") with long summer drought (3 mos. with average <0.5")
- Large but declining salmon fishery
- Large but declining shellfishery – recently seen improvements!



# A Strong foundation

- 1993 – Forward thinking county leaders created Kitsap County's Surface and Stormwater Management (SSWM) Program through Ordinance 156-1993. Kitsap SSWM is an **interagency** partnership tasked with the following goals:

[http://www.psparchives.com/publications/our\\_work/stormwater/stormwater\\_resource/stormwater\\_management/kitsap\\_manual05.pdf](http://www.psparchives.com/publications/our_work/stormwater/stormwater_resource/stormwater_management/kitsap_manual05.pdf)

- Protect public health and natural resources.
- Minimize institutional costs.
- Obtain support for the program from other municipalities, tribal governments, and county residents.
- Meet state and federal regulatory requirements.
- Provide a permanent funding source to address nonpoint source pollution. (Tax assessment)

Kitsap Surface and Stormwater Management partners:







## Anatomy of a Rain Garden

Water flowing off impervious surfaces (for example a roof or driveway) can be delivered to the rain garden through a swale lined with decorative rock or plants, through a pipe, or across a landscape area.

Selected native plants or hardy cultivars

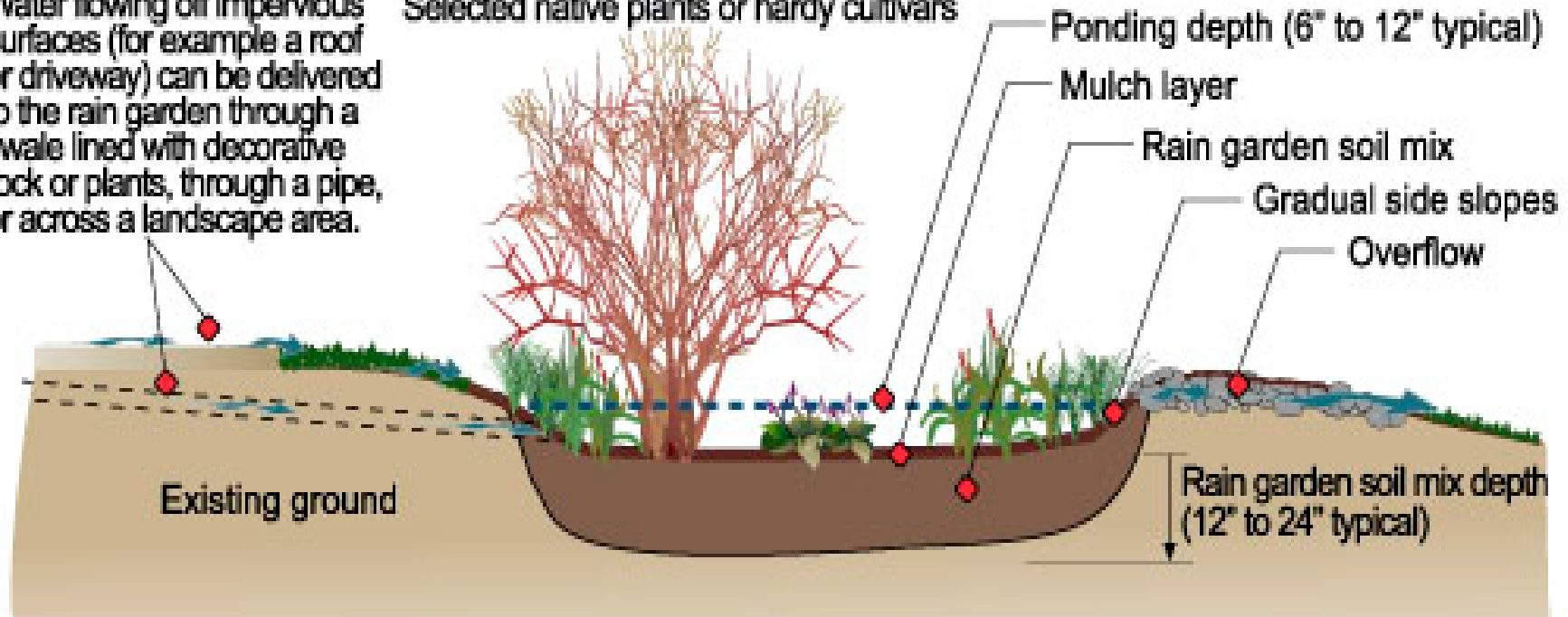
Ponding depth (6" to 12" typical)

Mulch layer

Rain garden soil mix

Gradual side slopes

Overflow



# 2010 Rain Garden Program established

- Outreach
  - Workshops
  - Festivals
  - Farmer's Market
  - Fairs
  - Colleges/schools
  - PSNS Learn at Lunch
  - Mailings
- Technical assistance
- Basic Rain Garden design
- Installation Assistance
- Cost Share – 50% up to max. \$500.00
- Installed 13 rain gardens



# Kitsap Conservation District

## Rain Garden retrofit **Cost Share** Program

- Kitsap Conservation District (KCD) administrates the implementation of the Rain Garden Cost Share Program for Surface and Storm Water management.
- The rain garden program for Kitsap County reimburses landowners/small commercial businesses of **unincorporated** Kitsap County 50% of costs for materials and contractor labor, **not to exceed \$500.00 per rain garden.**
- Each cost shared site is **evaluated for participation** in the program **prior to purchase** of materials or starting work.
- Landowners must apply for cost share with KCD prior to starting work.
- KCD contributes technical assistance, basic design, and construction assistance if necessary.
- Once the application is approved and garden is built, the landowner must **submit original receipts** for cost share reimbursement.

# 2010-2013 Rain Garden Program Matures

- 2012 added
  - Cisterns – Cost shared 3
  - Permeable Pavement - 0
- Installed 70 rain gardens
- Significant\* contacts with 380 properties

\* Communication with land owner requesting a site visit.

- Summer 2013 Added excavation service to the program
- Summer 2013 Adding option to excavate RG, provide and place bio retention soil and provide zone 1 plants with no cost share.



# Challenges Encountered

- Uninformed population – have seen significant increase
- Economic downturn – furloughs...
- Other priorities
- Trained professionals – installers and designers
- Expense
- Buy-in
- Material availability
  - Native plants
  - Bioretention Soil
- Site constraints
  - Septic Systems (OSS)
  - Steep slopes and banks
  - Poor draining native soils
  - High seasonal water table

# Looking Forward

- Increase amount of cost share \$1,500 – \$2,000?
- Increase percentage of cost share 60-40, 70-30?
- Increase BMP's
  - Native tree planting
  - Conservation Landscaping/soil amendment
  - Pavement removal
  - Permeable pavement
- Contract with a landscape installer to install LID BMP's
- Keep pressing forward! Still have a long way to go!!

Organizations and agencies to collaborate-

- City and County Public Works Departments
- Conservation Districts
- Public Utility Districts
- Educational Institutions



Rain Gardens do  
their job and will  
accentuate your  
landscape.





# Kitsap Conservation District

Teresa Brooks

[t-brooks@conserveva.net](mailto:t-brooks@conserveva.net)

360-337-7171 ext.24

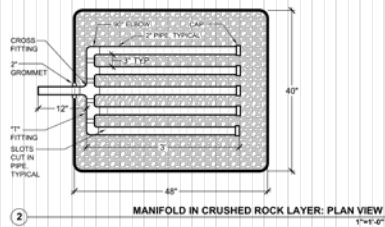
[www.kitsapcd.org](http://www.kitsapcd.org)

Mindy Fohn Kitsap SSWM Water Quality Manager

[mfohn@co.kitsap.wa.us](mailto:mfohn@co.kitsap.wa.us)

360-337-7066

**SECTION/ELEVATION**  
F14-4"



- 250 GALLON PLASTIC FOOD GRADE CONTAINER
- 2" RUBBER GROMMET
- MINIMUM 20' OF 2" SCHEDULE 40 PVC PIPE
- (2) 90 DEGREE ELBOWS
- (2) T FITTINGS
- (1) CROSS FITTING
- (5) END CAPS
- 13 CUBIC FEET CLEAN CRUSHED 3/4" - 1" ROCK
- 9 CUBIC FEET #5A GRAVEL
- 20 CUBIC FEET RAIN GARDEN SOIL
- 3 CUBIC FEET COARSE WOODY MULCH
- PIPE GLUE
- PLANTS
- SPLASH ROCK

## RAIN GARDEN IN A BOX/GRATTIX

