

Steele Creek Pilot Project Summary





**Non-Regulatory
Subdivision of State Government**

About KCD



**Steele Creek Watershed
Shellfish Closure**

The Project Area



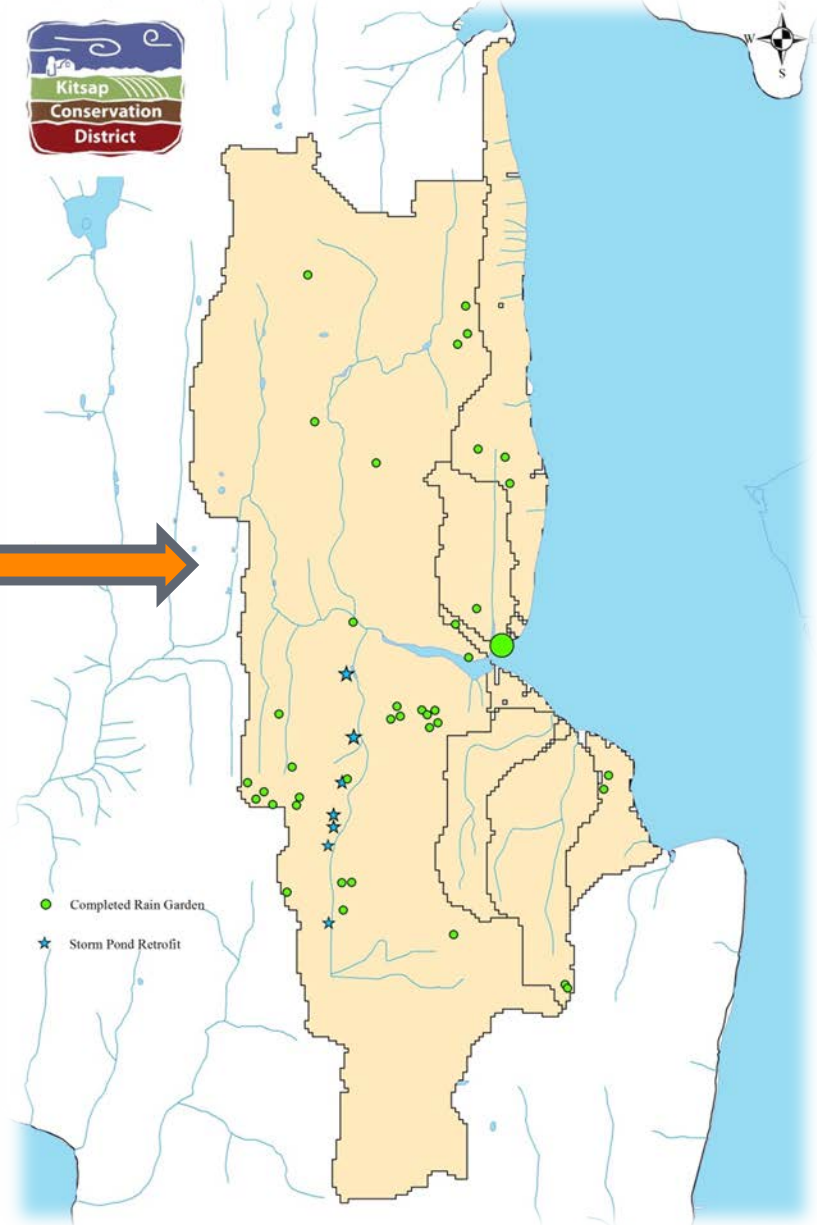
Steele Creek
Watershed



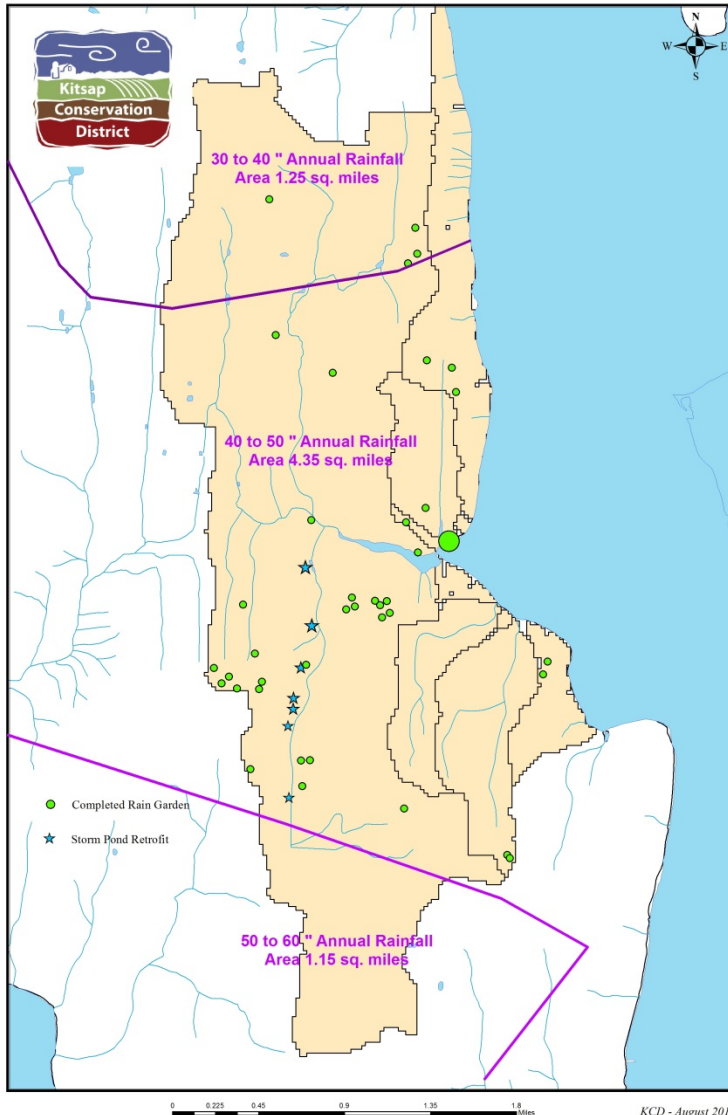
Kitsap County Map Distribution of 71 Practices



- Completed Rain Garden
- ★ Storm Pond Retrofit

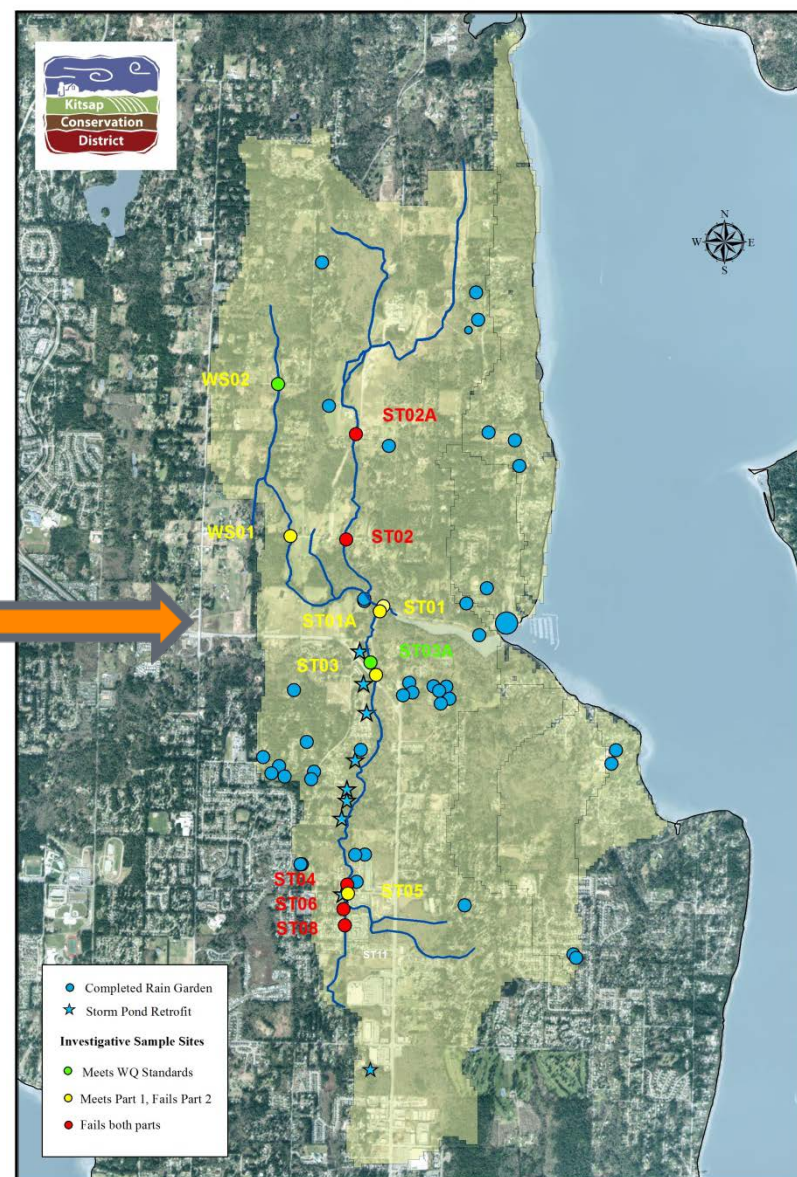
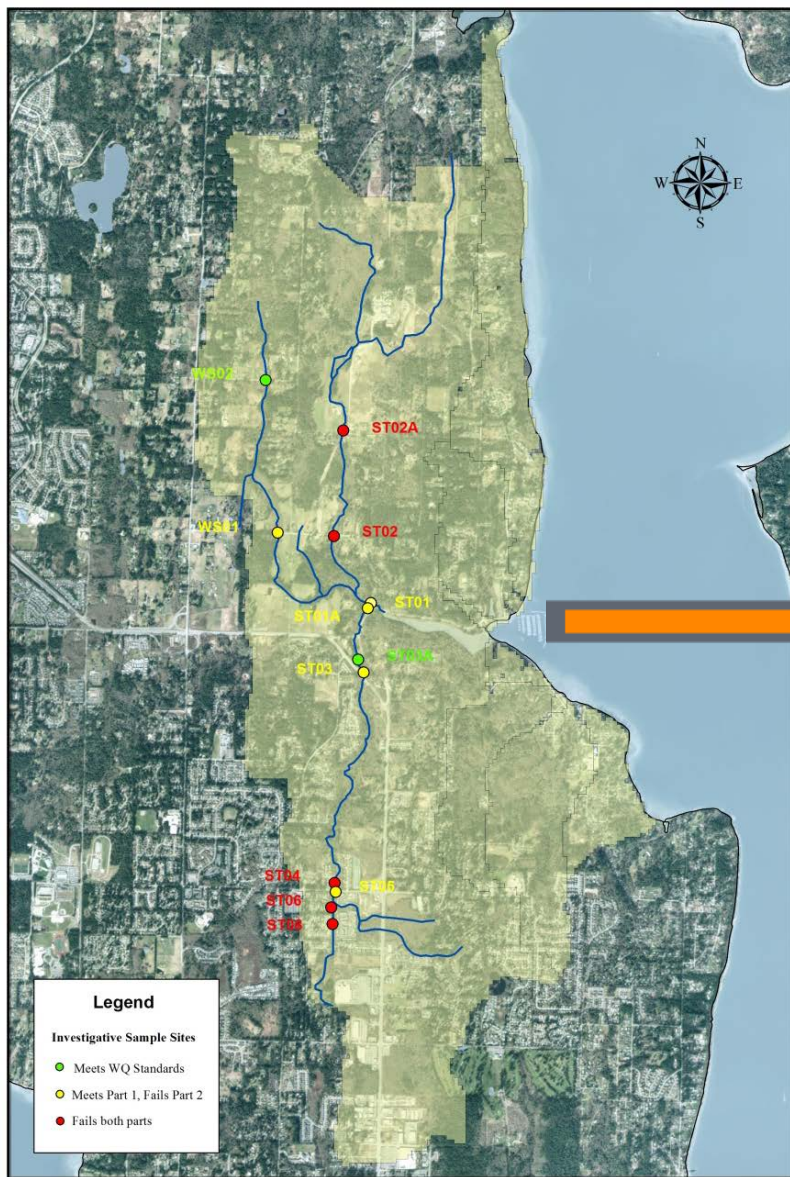


STEELE CREEK WATERSHED



Most practices lie within the 40" to 50" annual rainfall

A rainfall of 45" annually will be used to calculate amount of runoff treated (3.75 feet per year)



Water Quality Testing Sites

GSS Practice Sites

TABLE 1 Surface Water Quality

Surface Water Quality Standard/Criteria		
Parameter	Freshwater Standard-Part 1	Freshwater Standard-Part 2
Escherichia coli (E. Coli) Bacteria	≤ 126 colonies/100 mL (geomean)	$< 10\%$ of all samples > 406 colonies/100mL

U.S. EPA criterion (U.S. EPA 1986A)

**Health Department
Water Quality Part 1 & Part 2**



**New BMP's Added to
Watershed:
62**

Green Stormwater Solutions-47
Complex Underground Outlets-15

**Detention Pond
Enhancements:
9**

**Total Practices Installed
71**

In addition, 40 Rain Barrels
were Distributed

Steele Creek Summary

Existing Partnerships

KCD already had a strong Clean Water Kitsap (CWK) Green Infrastructure Program in place

- ✓ CWK supports the planning and education piece that the Terry Husseman Account (THA-Ecology) Low Impact Development (LID) and Washington State Conservation Commission (WSCC) Shellfish Grants could not cover
- ✓ KCD administration and accounting systems were already in place.

Kitsap Health Department

- ✓ Supplied the Water Quality Summaries
- ✓ Referred Clients

Washington State University Extension

- ✓ Professional Workshop & Outreach

How did KCD get Started?



Clean Water Kitsap

- funding
- referrals
- outreach materials

Health Department

- monitoring
- referrals
- shell fish closure area

Washington State
Conservation
Commission

- Funding

Department of Ecology

- Funding

WSU Extension

- outreach materials
- Referrals



Partnership Organizations

Inventory of Watershed

Planning and Estimating

- Analysis of Existing Stormwater Systems
- Evidence of runoff flow patterns
- Potential High Pollution Generators
- List of Potential Project Sites

Education and Awareness

- Targeted Mailing
- Walk About-Discussions with Business owners
- Residential Advocates-Neighborhood Green Street

Dig Day

- Excavation, Technical Assistance, Timeliness

KCD's Role



Dig Days

Summary Details	Steele Creek Watershed	Percent of Total	Green Street Sipes Ln.	Percent of Total
Total Area SQ FT	188 Million SQ FT	100%	637,052 SQ FT	3.4%
Number of Parcels	562	100%	21	3.7%
Feet of Stream	65,155 FT		300 FT	0.46%
Total Road FT*	302,870 FT		1616 FT	0.5%
Road, Roof, Driveway SQ FT**	10.6 Million SQ FT	5.6%	134,584 SQ FT	1.3%

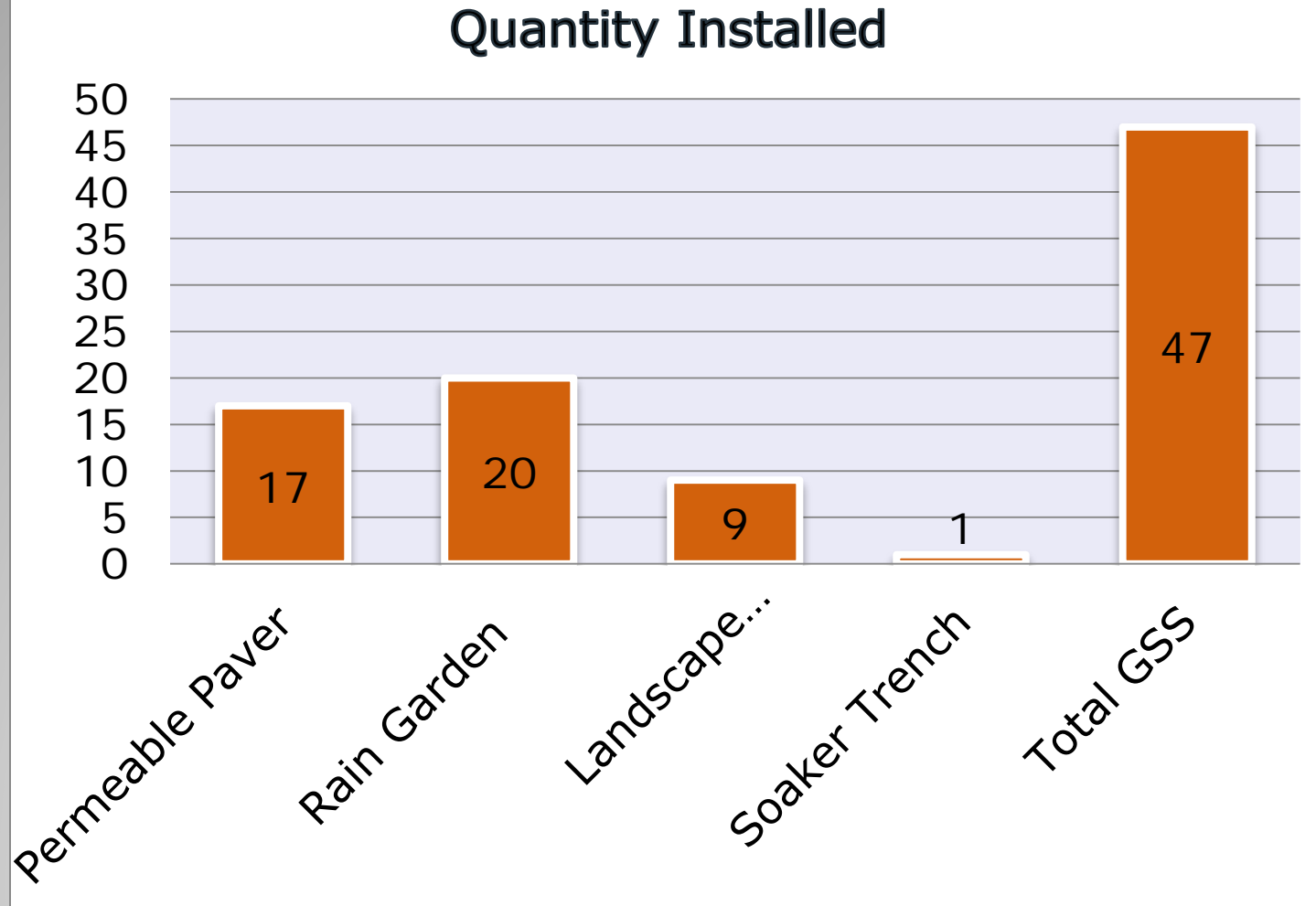
Summary Details:

Summary Details	Steele Creek Watershed	Percent of Total	Green Street Sipes Ln.	Percent of Total
# GSS Parcels	31	5.5%	5	23%
# Practices	71	100%	8	11.3%
Grant Period #Practices	43*	100%	8	18.6%
As-built Area of Practice	39,452 SQ FT	0.21%	3,383 SQ FT	8.6%
Grant Period As-built Area of Practice	36,837 SQ FT	0.20%	3,383 SQ FT	9.2%

Summary Details	Steele Creek Watershed	Percent of Total	Green Street Sipes Ln.	Percent of Total
Impervious Area Treatment	81,921 SQ FT	0.44%	8,806 SQ FT	10.7%
Grant Period Impervious Area Treatment	67,694 SQ FT	0.36%	8,806 SQ FT	13%
Impervious in Gallons*	2.3 Million Gallons	0.0004%	247,008 Gallons	10.7%
Grant Period Impervious in Gallons*	1.9 Million Gallons	0.0004%	247,008 Gallons	13%

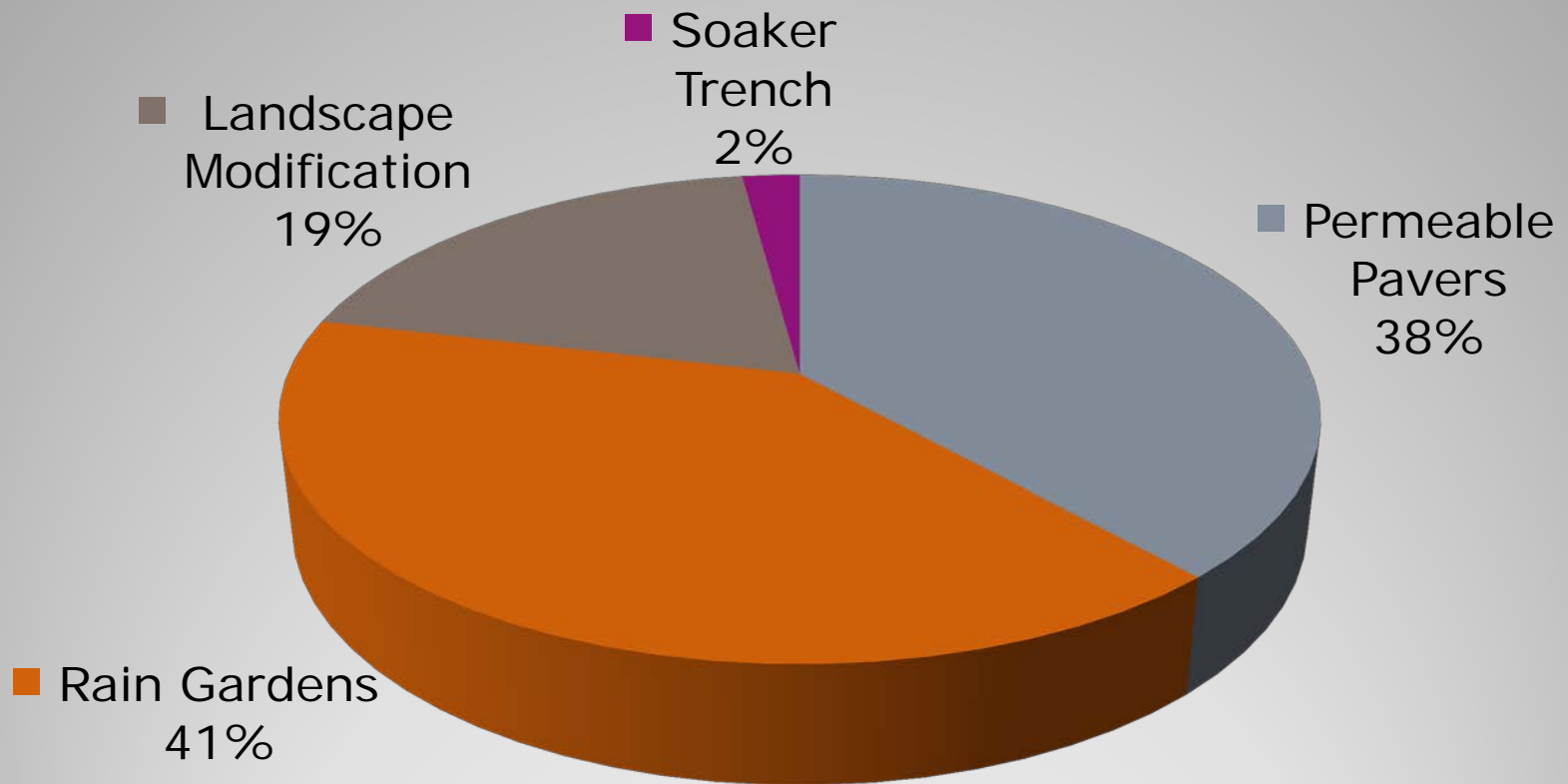
Summary Details	Funds	Percent of Total	Grant Period	AVE.
THA*	\$35,120.00	32%	Cost/Project	\$2,581
Matching CWK/KCD*	\$19,319.00	17.4%	Cost/Practice SQFT	\$3.01
WSCC*	\$50,000.00	45%	Cost/Treatment Area SQFT	\$1.64
WSCC (TA)	\$6,550.00	5.9%	Cost/Gallon Treated Run off	\$0.06
Totals	\$110,989.00	100%	Landowner Reimbursement	\$1,612

Summary of Overall Costs



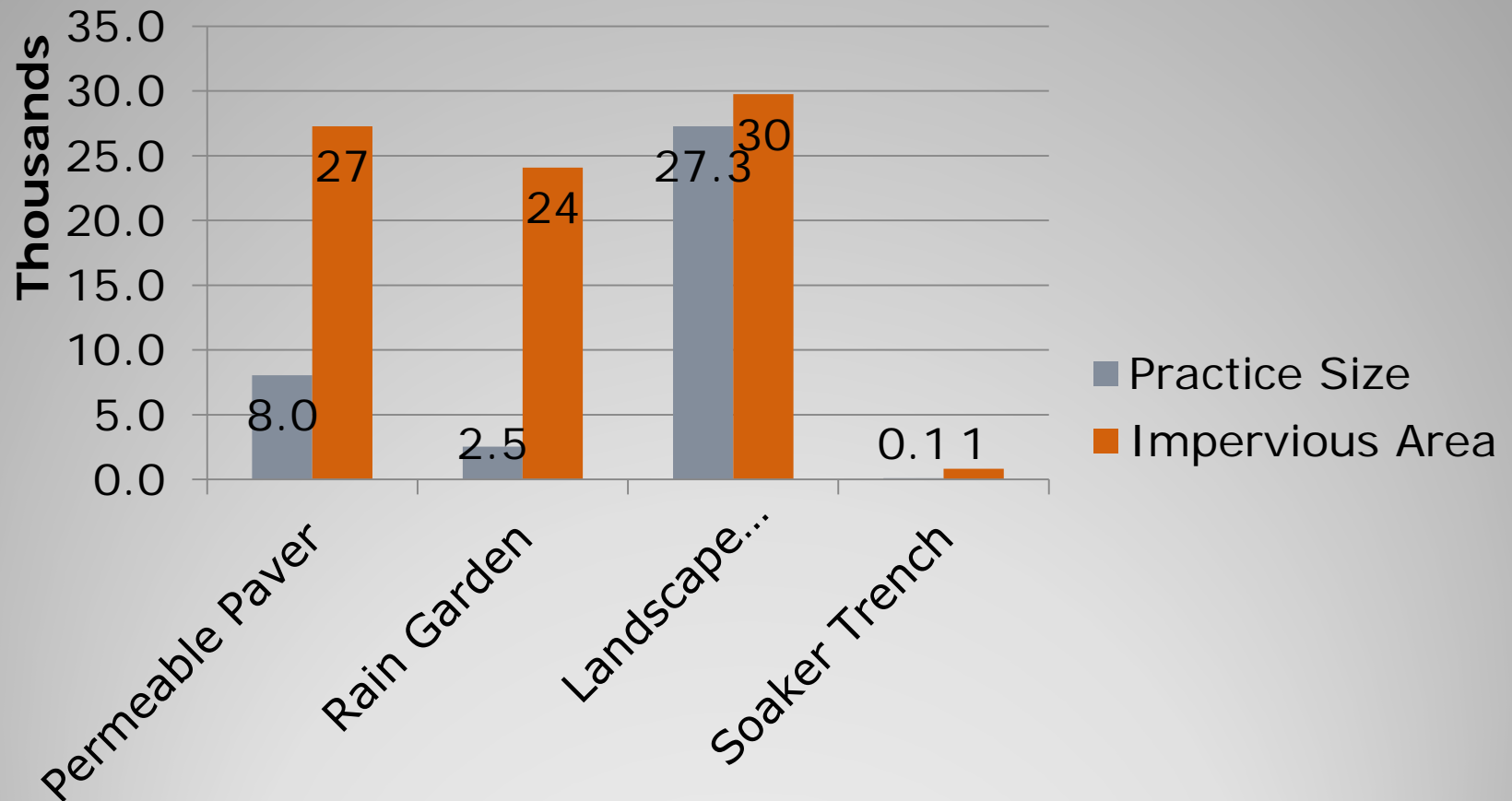
Green Stormwater Solution (GSS) Technologies Installed

*not including 17 Complex Underground Outlets



Percent Distribution

Green Stormwater Solutions



**Area of Practice & Impervious Area
Treated**

Rain Garden Average Area Practice/ Area of Impervious	Permeable Paver Average Area Practice/ Area of Impervious	Landscape Average Area Practice/Area of Impervious	Soaker Trench Average Area Practice/ Area of Impervious
10.5%	29.5%	91.7%	11.5%

**Practice Area to Impervious Area
Treated**

All GSS Practices Combined

As-built Size

36,837 SQFT

Impervious Area Treated

67,964 SQFT

Average Precipitation

45" per year

1,906,390 Gallons

Runoff

Receiving Treatment

Permeable Pavers:

Total Practice Size

- 8047 SQFT

Total Impervious Area

- 27,274 SQFT

Rain Garden/Bioretention:

Total Practice Size

- 1592 SQFT

Total Impervious Area

- 11,322 SQFT

Landscape Modification:

Total Practice Size

- 25,698 SQFT

Total Impervious Area

- 29,098 SQFT

Soaker Trench:

Total Practice Size

- 95 SQFT

Total Impervious Area

- 820 SQFT

Rain Barrel:

Total Practice Size

- 40 * 55 gallons
- 2200 gallons

Grant Period All GSS:



Approximate Area
of Watershed
188,194,570 SQFT

Installed BMP's
Treatment Area
67,964 SQ FT

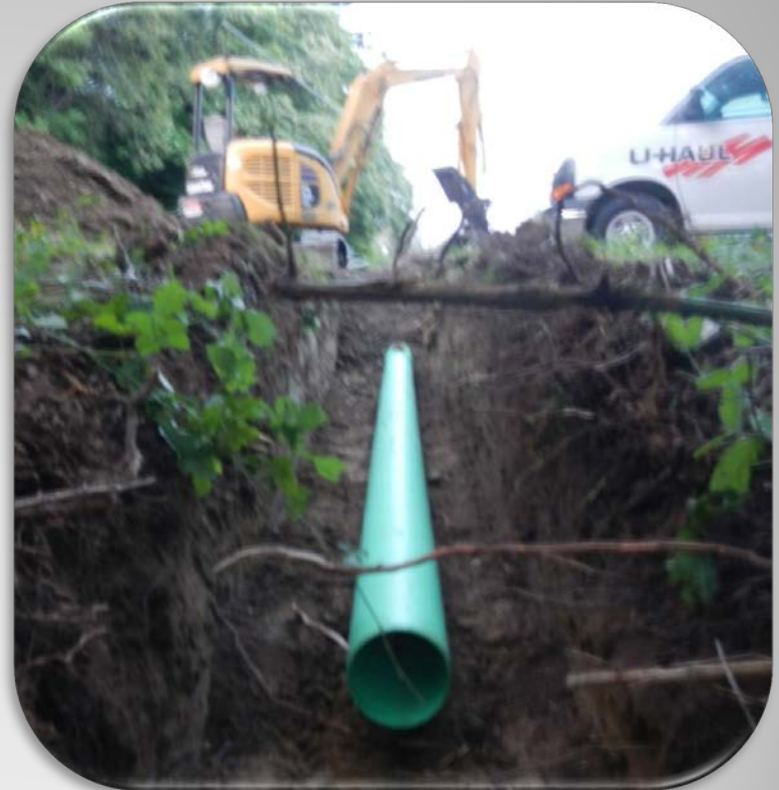
**0.36 Percent of
Watershed has
been treated
by Additional
BMP's With
CWK, WSCC &
THA Funds**
ratio 1:275

**Percentage of Watershed Receiving
Treatment With CWK, THA, WSCC Funds**

40 Rain Barrels



17 Underground Outlets



Additional BMP's Installed

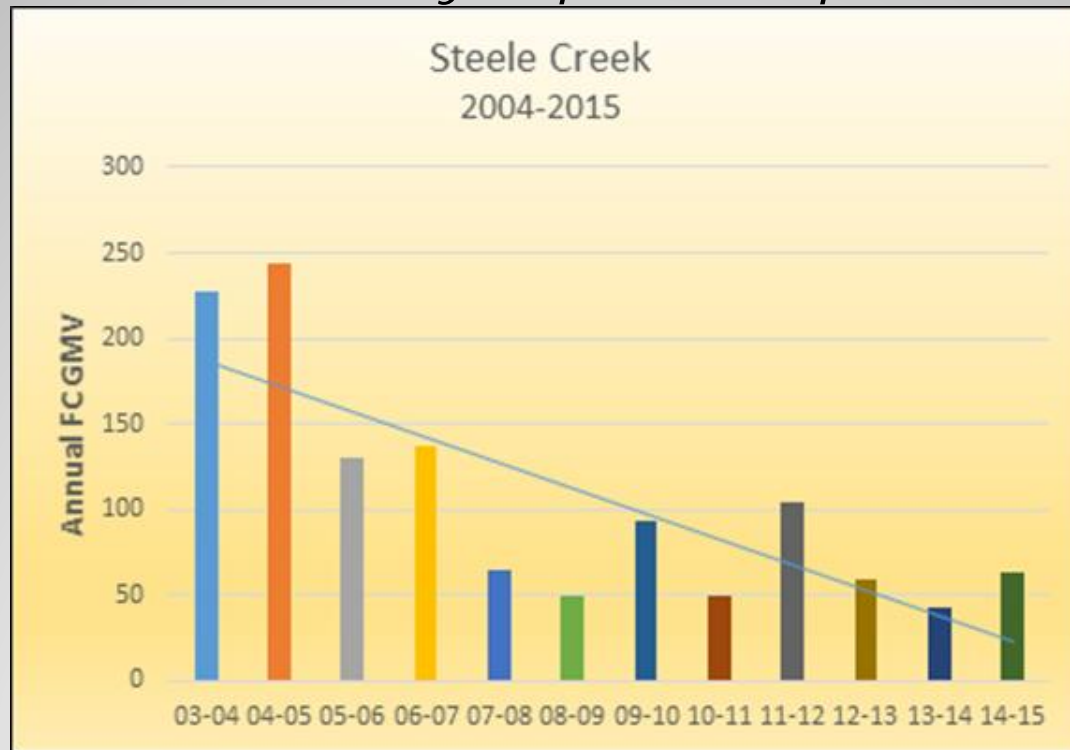
- Start with a trained crew in LID
- Work with a core group of Contractors
- Use Economies of Scale to purchase materials
- Know your audience
 - *Listen to clients-Note needs, concerns & barriers*
- Remove barriers such as providing standard drawings, scheduling excavation, offering Technical Assistance, & Reducing Costs
- Provide Incentives
 - *100% Reimbursement of cost receipts*
- Database: Collect information-for administration, reporting and evaluating program.

Recommendations

"OVERALL MARINE WATER TREND

Two of the three Port Orchard / Burke Bay marine stations show a significant improving trend. "

2014 Annual Water Quality Report Kitsap Health Department



Steele Creek Water Quality



**Interlocal agreement with
City of Poulsbo**



Permeable Grid



Rain Garden



Soaker Trench



Detention Pond

<https://www.kitsappublichealth.org/environment/files/reports/ShorelineMonitoringPlan.pdf>

<http://www.kitsappublichealth.org/environment/files/reports/2012/Intro.pdf>

http://www.kitsappublichealth.org/environment/files/reports/2014/Intro_withCover.pdf

<http://www.kitsapgov.com/sswm/pdf/7086%20-%20Managing%20Rainwater%20Booklet.pdf>

<http://kitsapcd.org/>

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Resources: