

# Catching Rain: Low Impact Development & Green Stormwater Strategies *for* Real Estate Professionals

Spring 2013

Presented by:



Funding from:

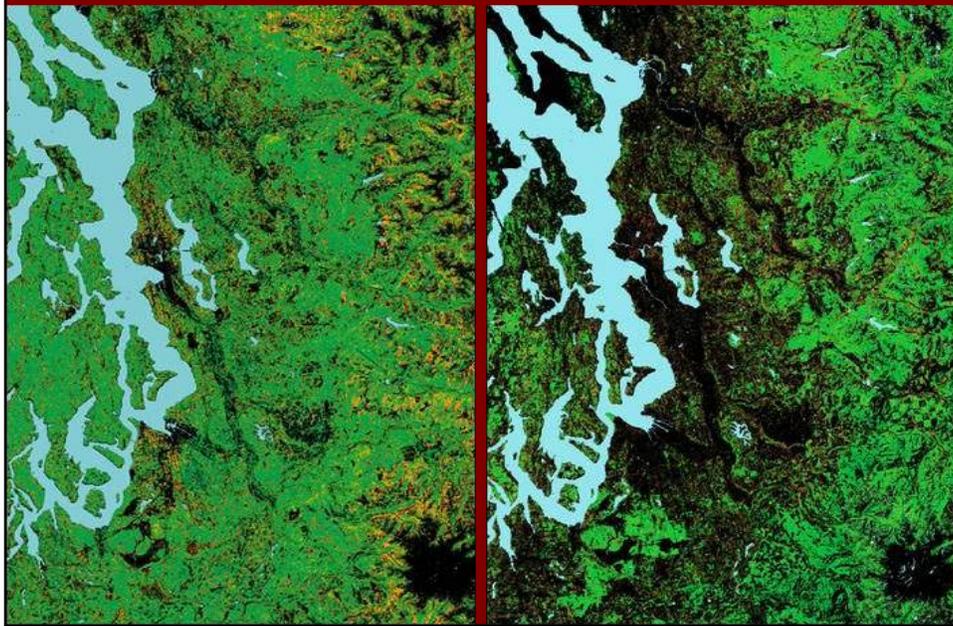


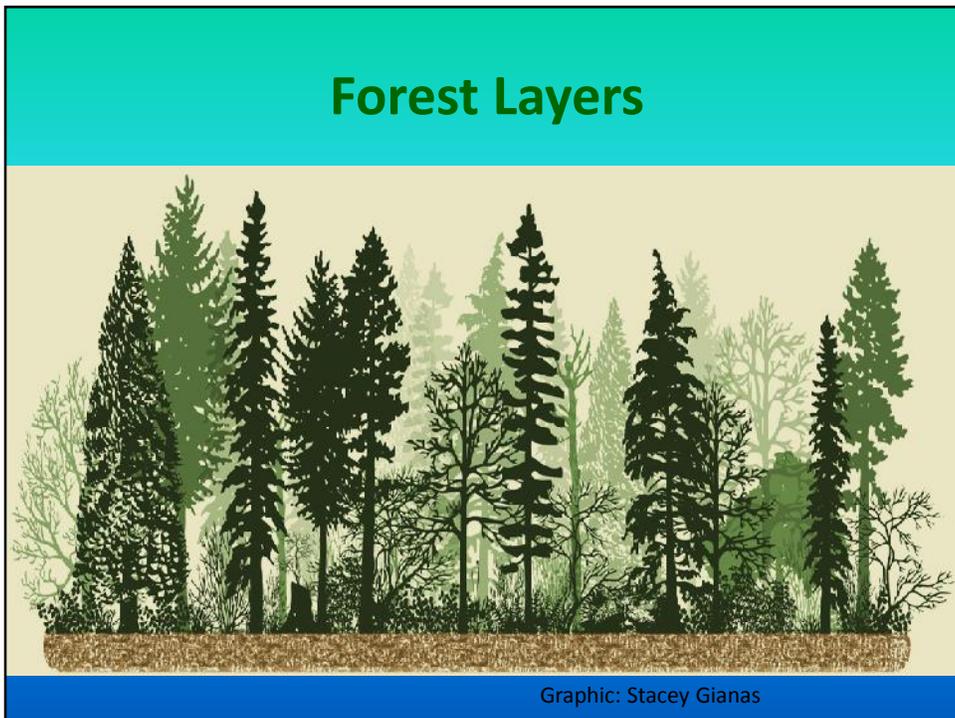
## Water Resources Overview

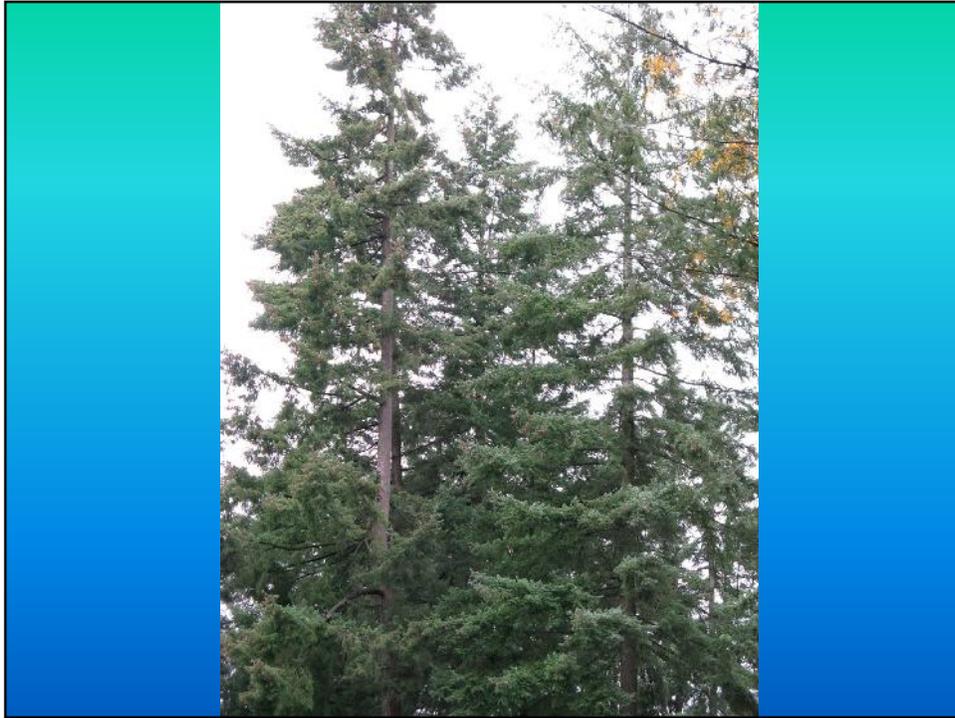


Erica Guttman, WSU Extension  
Water Resources Program

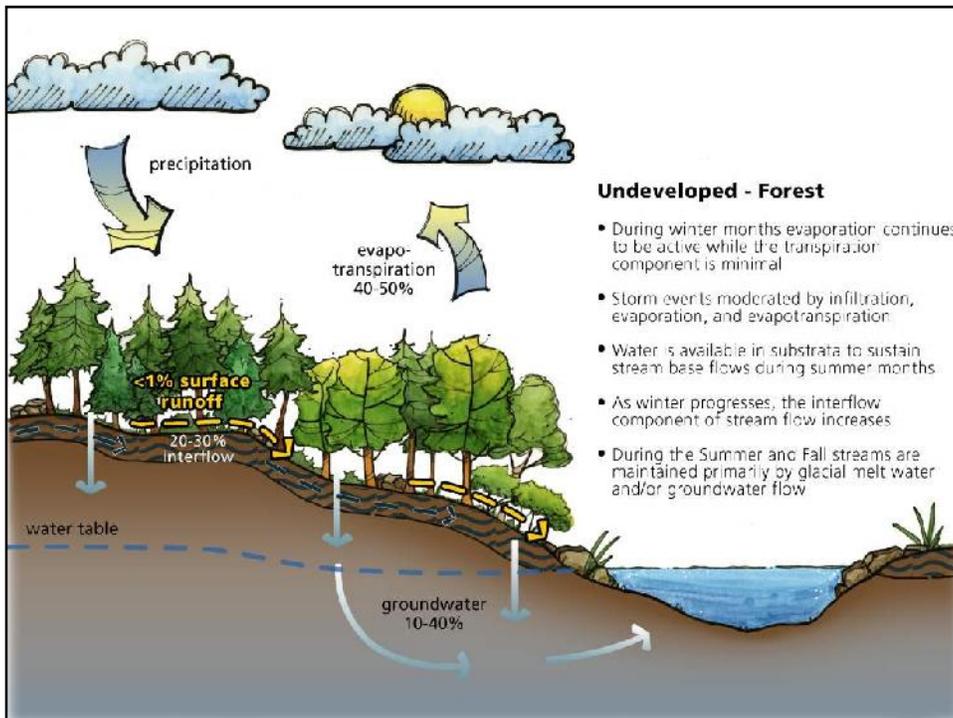
*Puget Sound Land Conversion (1972-1996)*







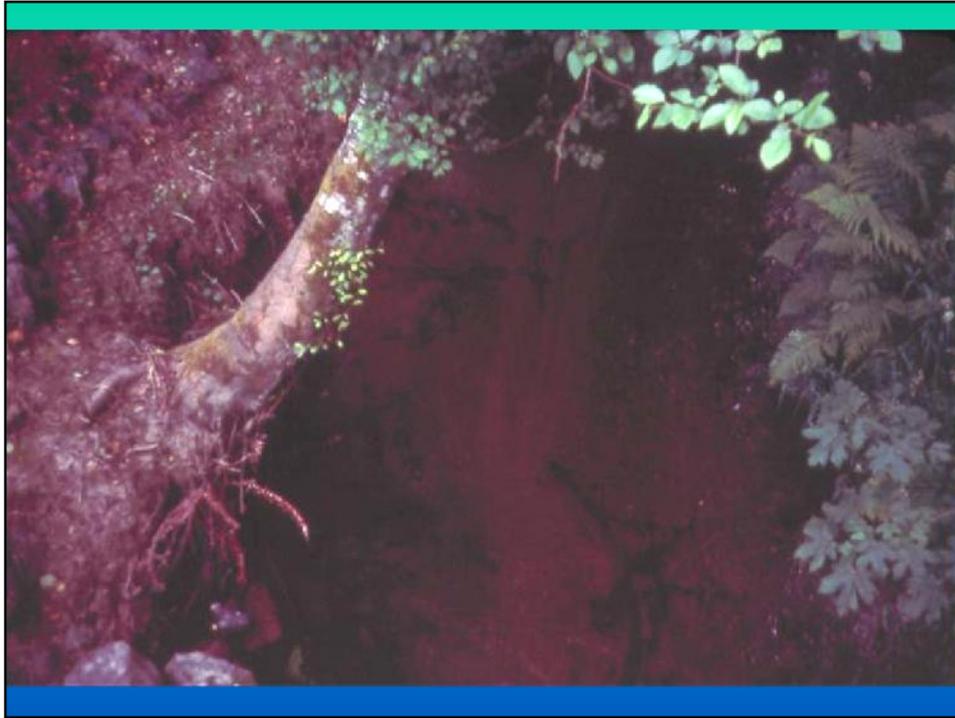








Flooding







**Majority of toxics are carried to  
our waterways by runoff**



## Contaminants of concern:

- Nutrients – (Fertilizers & Animal Wastes)
- Bacteria
- Pesticides – (Mostly home gardening products)
- Toxic chemicals
- Petroleum products



Source: Washington Dept. of Ecology, May 2011, Pub. #11-03-025

## Specific contaminants of concern:

- Dissolved copper, lead & zinc
- Dissolved copper = 61,000 - 141,000 #s/year
- Zinc = 250,000 - 300,000 #s/year

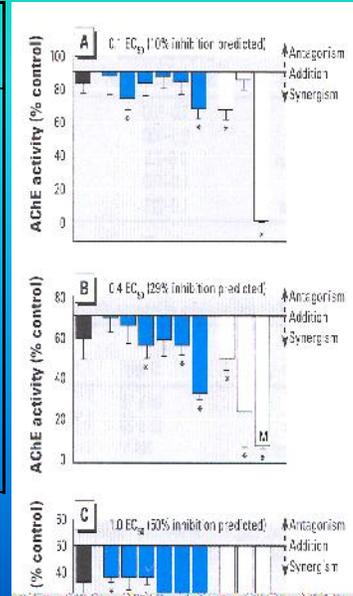


Source: Washington Dept. of Ecology, May 2011, Pub. #11-03-025

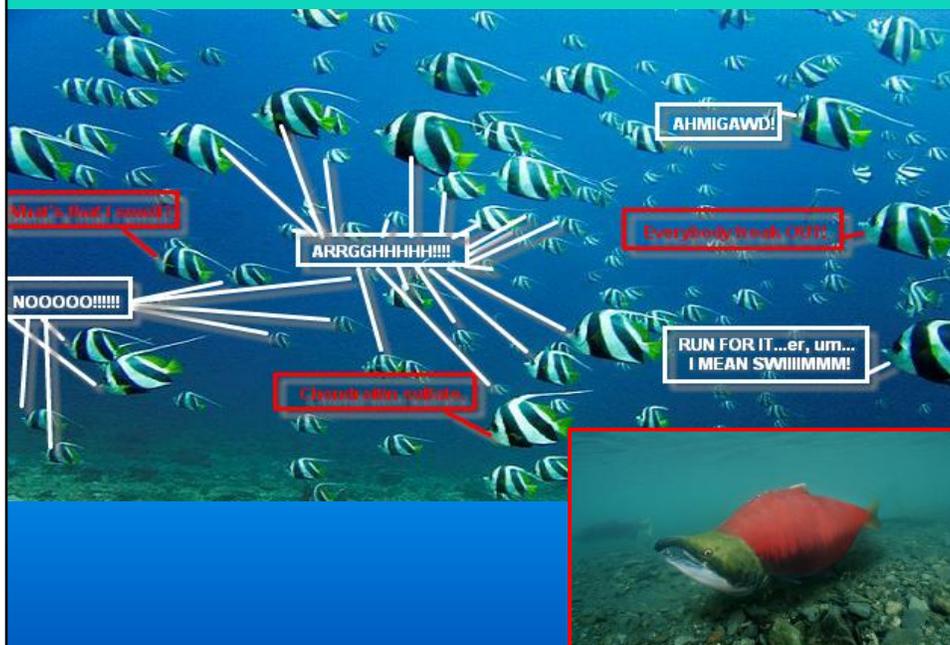
## Synergistic Effects: NOAA & WSU Research

	Cu ( $\mu\text{g/L}$ )	Diazinon and Malathion
Level of concern	5 $\mu\text{g/L}$ Loss of olfactory function and behavioral impairment (predator avoidance and navigation)	Paired diazinon (7.3 $\mu\text{g/L}$ ) and malathion (3.7 $\mu\text{g/L}$ ) produced severe (>90%) AChE inhibition and anticholinesterase poisoning => synergism. Loss of ability to avoid predators.

Acetylcholinesterase: enzyme for neurotransmission.  
Organophosphate and N-methyl carbamate insecticides designed to inhibit anticholinesterase; affects fish and humans.  
Jen McIntyre, et al.



## “Schreckstoff”



## Specific Contaminants of Concern:

•PAHs (polycyclic aromatic hydrocarbons) – byproducts of combustion

300-600 #s/year



Source: Washington Dept. of Ecology, May 2011, Pub. #11-03-025

## Urban stream impacts studied

Urban runoff is toxic to coho embryos

filtered



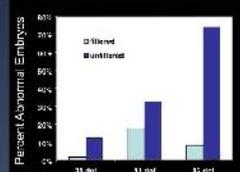
unfiltered



Longfellow Creek experimental facility, ~ 50 days of development

Coho embryo development affected in urban stream

Unfiltered stream water resulted in higher rates of developmental defects and mortality than embryos exposed to filtered stream water

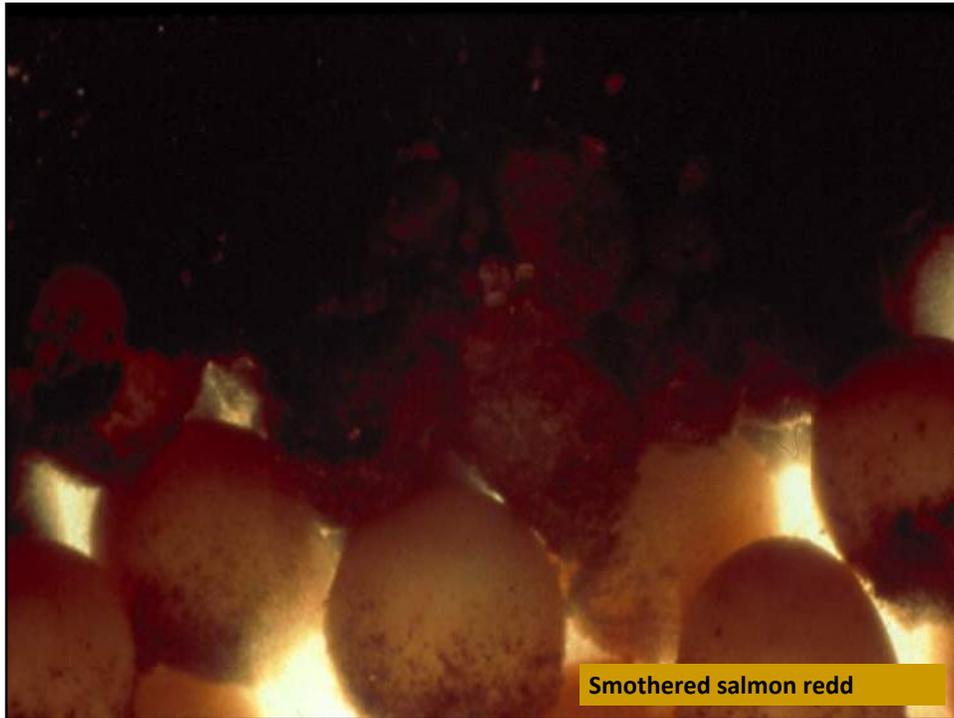


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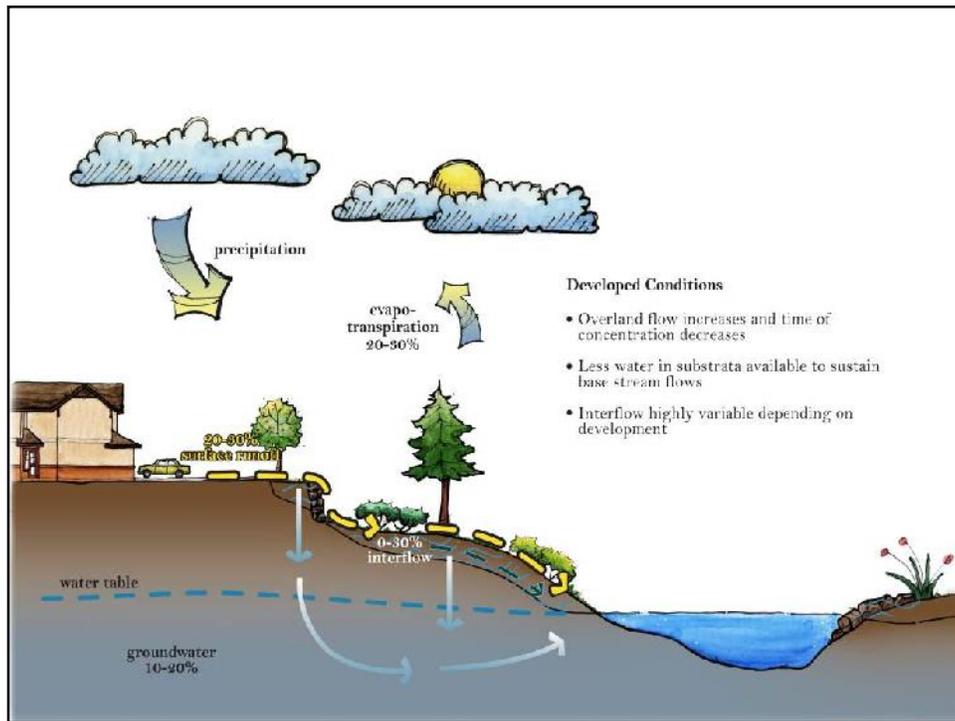
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Jen McIntyre et al.



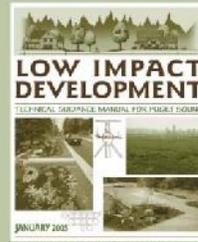






## LID or GSI Defined

“To create a hydrologically functional landscape that prevents measurable harm to streams, lakes, wetlands and other natural aquatic systems.”



## LID/GSI Principles

- Conserve and restore vegetation and soils.



## LID/GSI Principles

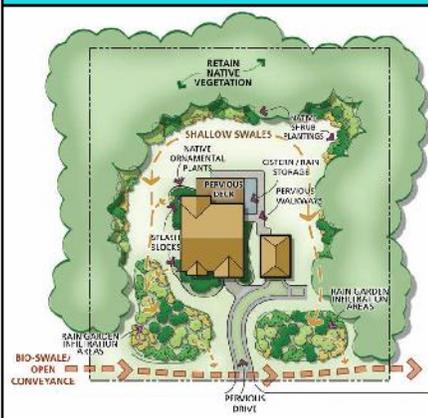
- Design site to minimize impervious surfaces.



Photos: Williams Contracting; PIN Foundations Inc.

## LID/GSI Principles

- Manage stormwater close to where rain falls.



## Intersection of LID & Real Estate Profession

- Understanding regulations (Ben)
- Valuation (Robbi)
- Guiding clients



## Intersection of LID & Real Estate Profession

- Disclose or remedy problems



## Intersection of LID & Real Estate Professionals

- Knowledge of remedy options
- Clarity on what's fixable



## Intersection of LID & Real Estate Profession

- Guidance about keeping important features (even if they're not quite perfect yet!)



## Intersection of LID & Real Estate Professionals

- Recommending maintenance and prevention strategies



## Intersection of LID & Real Estate Profession

- Explaining LID features that may be permitted & required



# Catching Rain

Low Impact Development &  
Green Stormwater Strategies  
*for* Real Estate Professionals

***New LID Regulations –  
Where did they come from and  
where are they going?***

**Ben Alexander  
Sound Native Plants, Inc.**

## What is the purpose of the stormwater rules?

- Protect lakes, rivers, streams
- Prevent water pollution
- Limit cumulative impacts to natural resources



## Point sources of pollution such as industrial discharges

- Point sources are contained in a pipe, like an industrial outfall
- Flows are unaffected by weather
- Wastewater composition is predictable & consistent



Photo by Tom Check

## Where did the new rules come from?

- Federal Clean Water Act passed in 1972
- NPDES permits created to regulate point sources



## NPDES applied to stormwater systems later

- Non-point sources dispersed across landscape
- Influenced by weather soils and geology
- Rules for municipal stormwater systems added later
- Address non-point sources with cumulative impacts



## Stormwater Regulations

Federal

- Clean Water Act – 1972
- NPDES stormwater permits created – 1987

State

- EPA grants Ecology authority to administer stormwater permits
- Phase I permits issued in 1995; Phase II permits issued in 2007
- LID added to reissued permits – 2013

Local

- Local regulations generally in place ahead of Federal and State requirements
- Phase I and II permits increased requirements, resulting in new local regulations & programs

## Phase I Cities and Counties

<p>Seattle Tacoma Snohomish County</p>	<p>King County Pierce County Clark County</p>
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## Phase II Western Washington coverage

<p><b>Phase II Cities</b></p> <p>Aberdeen Algona Anacortes Arlington Auburn Bainbridge Island Battleground Bellevue Bellingham Black Diamond Bonney Lake Bothell Bremerton Brier Buckley Burien Burlington Camas Centralia Clyde Hill</p>	<p>Covington Des Moines DuPont Duvall Edgewood Edmonds Enumclaw Everett Federal Way Ferndale Fife Fircrest Gig Harbor Granite Falls Issaquah Kelso Kenmore Kent Kirkland Lacey Lake Forest Park</p>	<p>Lake Stevens Lakewood Longview Lynnwood Maple Valley Marysville Medina Mercer Island Mill Creek Milton Monroe Mountlake Terrace Mount Vernon Mukilteo Newcastle Normandy Park Oak Harbor Olympia Orting</p>	<p>Pacific Port Angeles Port Orchard Poulsbo Puyallup Redmond Renton Sammamish SeaTac Sedro-Woolley Shoreline Snohomish Steilacoom Sumner Tukwila Tumwater University Place Vancouver Washougal Woodinville</p>	<p><b>Phase II Counties</b></p> <p>Phase II county permits apply to urban areas around permitted cities.</p> <p>Cowlitz County Kitsap County Skagit County Thurston County Whatcom County</p>
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## Phase II Eastern Washington Coverage

### Phase II Cities

Asotin	Pasco	Sunnyside
Clarkston	Pullman	Union Gap
East	Richland	Walla Walla
Wenatchee	Selah	Wenatchee
Ellensburg	Spokane	West Richland
Kennewick	Spokane Valley	Yakima
Moses Lake		

### Phase II Counties

Phase II county permits apply to urban areas around permitted cities.

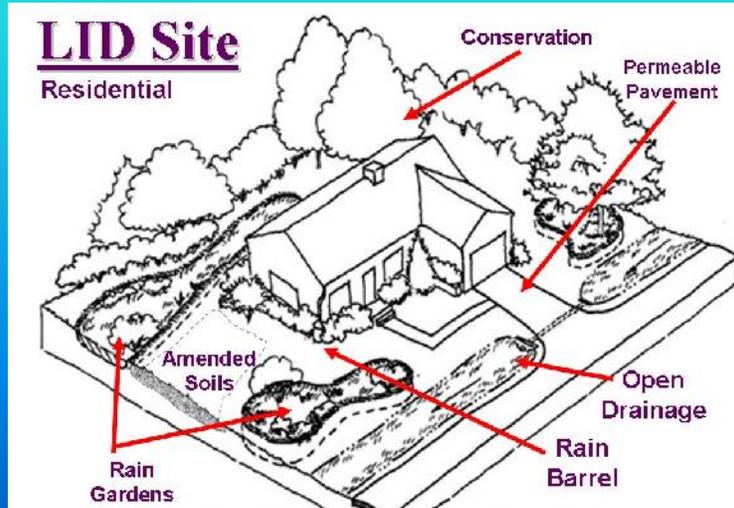
Asotin County  
 Chelan County  
 Douglas County  
 Spokane County  
 Walla Walla County  
 Yakima County

## Implementation Timeline

### Timeline for New LID Requirements in Washington State



## Local development codes will include LID design standards



## Required BMPs

- Lawns & Landscaped Areas
- Roofs
- Other hard surfaces



## Required BMPs: Lawns & Landscaped Areas



Photo by Marie Richie



Photo by Ryan Wilson



Photo by Mark Hohn

## Required BMPs: Roof runoff



Photo by Clint JCL



David Hymel



Erica Guttman



Photo by the 15th Foundation

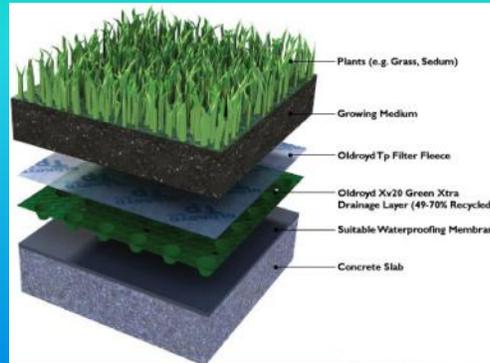
## Required BMPs: Other Hard Surfaces



## Choice: BMPs or Performance Standard

- Use Best Management Practices (BMPs), which are science-based design standards for managing stormwater on-site, OR
- Demonstrate that the project will meet the LID Performance Standard, which means that the post-construction stormwater discharges shall match the pre-developed discharges

## Optional BMPs



Green Roofs

Cisterns



## LID specs contained in companion documents

- 2012 Stormwater Management Manual for Western Washington
- Stormwater Management Manual for Eastern Washington (new draft under development)
- Low Impact Development Technical Guidance Manual for Puget Sound (WSU)
- Rain Garden Handbook for Western Washington Homeowners (WSU)

## Larger project size thresholds (W. Washington)

- Results in 5,000 square feet or greater of new plus replaced hard surface area (new development), or
- Adds 5,000 square feet or more of new hard surface area (redevelopment), or
- Converts  $\frac{3}{4}$  acres or more of vegetation to lawn or landscaped areas, or
- Converts 2.5 acres or more of native vegetation to pasture

## BMP requirements for larger projects (List #2)

### Roofs and Other Hard Surfaces:

- Rain gardens not allowed (bioretention instead)

### Other Hard Surfaces:

- Permeable pavements higher priority than bioretention - must be considered before bioretention is used

## Smaller project size thresholds (W. Washington)

- Results in 2,000 square feet or greater of new plus replaced hard surface area, or
- Has land disturbing activity of 7,000 square feet or greater

## BMP requirements for smaller projects (List #1)

### Roofs:

- Choice of rain gardens or bioretention

### Roofs and Other Hard Surfaces:

- Permeable pavement and rain gardens or bioretention same priority level – either may be used

## **Infeasibility criteria for special situations**

**Examples include:**

- **Causes downstream flooding**
- **Increases landslide or erosion hazards**
- **Could cause damage to structures**

## **Competing needs criteria**

**Examples include:**

- **Conflicts with local zoning design standards**
- **Conflicts with public health and safety standards**
- **Noncompliance with ADA requirements**
- **Conflicts with Critical Areas tree preservation requirements**

## New rules mean that site clearing practices will change

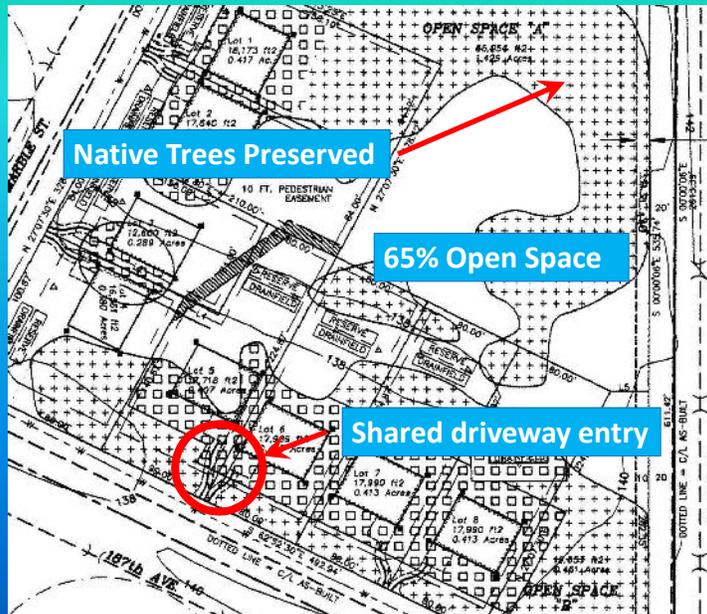


THIS



NOT THIS

## Site layout will change



Native Trees Preserved

65% Open Space

Shared driveway entry

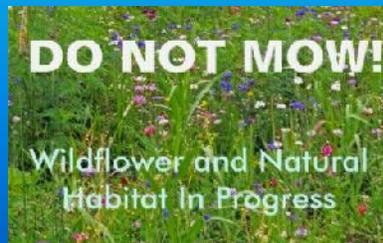
## New homes may have unfamiliar features



## Limits on structural modifications



## Maintenance requirements will differ



## The wrap-up:

- Local jurisdictions will implement & enforce the new LID codes, NOT Ecology (no new permits needed)
- Some BMPs required and other optional
- Details & start dates will differ between locations
- Some developments may be vested under old rules - deed restrictions could help determine which properties are subject to which rules

## Questions about the permits?

Island, Skagit and Whatcom Counties	Christina Maginnis	360-715-5212
Phase I Permittees (City of Seattle, Port of Seattle, King and Snohomish Counties) and Phase II permittees in Snohomish County	Rachel McCrea	425-649-7223
Kitsap County and Phase II Cities within King County and Kitsap County	Anne Dettelbach	425-649-7093
Clallam and Pierce Counties and the Port of Tacoma (Phase I and Phase II)	Deborah Cornett	360-407-7269
Clark, Cowlitz, Grays Harbor, Lewis, and Thurston Counties	Lisa Cox	360-690-7120
Benton, Chelan, Douglas, Kittitas, and Yakima Counties	Terry Wittmeier	509-574-3991
Asotin, Franklin, Grant, Spokane, Walla Walla, and Whitman Counties	Dave Duncan	509-329-3554
WSDOT Statewide Permit	Foroozan Labib	360-407-6439
Stormwater Education and Outreach, Community Based Social Marketing, Program Evaluation, and Outreach Resources	Jocelyn Jones	360-407-7529

## More questions for us?

- Ben Alexander, Sound Native Plants  
(360) 352-4122 or  
ben@soundnativeplants.com
- Erica Guttman, WSU Extension  
(360) 867-2146 or  
erica@nativeplantsalvage.org
- Robbie Currey, SEEC LLC  
(360) 561-8623  
racurrey@mccabeappraisal.com