Snohomish County, Washington
Surface Water Management

- Water Quality
- Aquatic Habitat
- Drainage
- Flood Hazard Management
Diffusion of Landscape-Level Best Management Practices
<table>
<thead>
<tr>
<th>Best Management Practices for streamside landowners</th>
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**Diffusion of Landscape-Level Best Management Practices**

_Snohomish County Surface Water Management_
Social Marketing
Education helps people to know things

Social Marketing helps people to do things
Fun with Pet Waste

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Yikes!

**Everett** receives about 36 inches rain per year
Each acre receives about 1 million gallons of rain

**Monroe** receives about 53 inches of rain per year
Each acre receives about 1.5 million gallons of rain

**Index** receives about 110 inches rain per year
Each acre receives about 3 million gallons of rain
Fecal coliform bacteria machine
*Ancylostoma sp.* egg and larva

Can survive outside host 3-4 weeks in larval stage.

Puppies are a significant source of infection. Prompt removal of dog and cat feces greatly reduces risk of human infection.
Toxocara canis eggs

CDC reports 300,000 human cases annually, 90% of waterborne origin.

Survival outside a host can exceed 6 months – up to four years in soil.
**Giardia lamblia cysts**

a.k.a. *Giardia duodenalis*

a.k.a. *Giardia intestinalis*

CDC reports 2 million human cases annually, 90% of waterborne origin.

Survival outside is indeterminate. Resistant to drying, chlorination, and temperature extremes. Can survive for months in water.

10 μm
Cryptosporidium parvum cysts

CDC reports 300,000 human cases annually, 90% of waterborne origin.

Survival outside a host can exceed 6 months.
Campylobacter is one of the most common bacterial causes of diarrheal illness in the United States. About 15 cases are diagnosed annually for each 100,000 persons.
Can survive up to four months in feces.

One strain, O157:H7, causes an estimated 73,000 human cases of infection, and 61 deaths in the United States annually.

Most cases are associated with contaminated food, however infection can occur after swimming in or drinking contaminated surface water.
Diffusion of Landscape-Level Best Management Practices

Snohomish County Surface Water Management

Snohomish County Dog Population
Dogs per Acre
Based on INSOURCE 2004 Data
Not suitable for swimming or wading

Not suitable for swimming
Formative Research

1. Reviewed pet waste programs in North America, Europe, Australia, New Zealand
2. Reviewed pet waste management research
3. Inventoried pet-oriented businesses
4. Inventoried pet waste cleanup and disposal products
5. Inventoried off-leash areas
6. Conducted focus groups of County residents
7. Conducted a public opinion survey of County residents
8. Analyzed Snohomish County’s pet and human demographics
9. Identified problem areas using demographic and water quality data
37.4% of Washington households have dogs

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
1.5 dogs per dog-owning household in Washington

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management

American Veterinary Medical Association 2002 data
Estimated Countywide Dog Population

224,852  Snohomish County households

0.374  Households with dogs

$\times$ 1.5  Dogs per dog-owning household

126,141  Dogs in Snohomish County

U.S. Census Bureau 2000 data
American Veterinary Medical Association 2002 data
Estimated Countywide Pet Population

126,141 Dogs

206,773 Cats

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Estimated Waste Production

126,000 Dogs

≈

32,000 People

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management

Snohomish County 2005 data
Nearly all pet waste programs:

- Are based on primary sanitation program models (not water quality models)
- Emphasize pet waste management in public places – parks, sidewalks, parkways, etc.
Portion of Dog Waste Dropped in Yards and On Walks
Snohomish County Public Works 2004 Data

- All in yard: 38.4%
- Most in yard: 38.4%
- Half and half: 10.1%
- Most on walks: 7.4%
- All on walks: 5.5%

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Nearly all pet waste programs:

- Are based on primary sanitation program models (not water quality models)
- Emphasize pet waste management in public places – parks, sidewalks, parkways, etc.
Focus Groups
Telephone Survey
Target Audience Analysis

Desired Behavior
Pick-up regularly and dispose in trash

Partial Behavior
Pick-up regularly but do not dispose properly

Contrary Behavior
Pick-up irregularly or not at all

Frequent behavior
Reinforce behavior

Infrequent behavior
Correct behavior

Target Audience
Introduce behavior

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
<table>
<thead>
<tr>
<th>bomb</th>
<th>droppings</th>
<th>lawn sausages</th>
<th>poodle paddies</th>
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<tbody>
<tr>
<td>boo-boo</td>
<td>dump</td>
<td>lincoln logs</td>
<td>poop</td>
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<tr>
<td>brownie</td>
<td>dung</td>
<td>load</td>
<td>poopie</td>
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<tr>
<td>caca</td>
<td>effluvium</td>
<td>looloo</td>
<td>poopoo</td>
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<tr>
<td>calling card</td>
<td>evacuation</td>
<td>manure</td>
<td>presents</td>
</tr>
<tr>
<td>chocolates</td>
<td>excrement</td>
<td>mess</td>
<td>pungies</td>
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<tr>
<td>crap</td>
<td>excreta</td>
<td>muck</td>
<td>scat</td>
</tr>
<tr>
<td>crapola</td>
<td>exudation</td>
<td>mud</td>
<td>s#&amp;%</td>
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<tr>
<td>dirt</td>
<td>exuviae</td>
<td>night soil</td>
<td>soil</td>
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<tr>
<td>do-do</td>
<td>fecal matter</td>
<td>nuggets</td>
<td>souvenirs</td>
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<tr>
<td>doggy sausage</td>
<td>feces</td>
<td>number two</td>
<td>stool</td>
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<td>doo</td>
<td>feculence</td>
<td>ordure</td>
<td>stuff</td>
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<tr>
<td>doodie</td>
<td>jobbers</td>
<td>package</td>
<td>tootsie rolls</td>
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<td>doodie</td>
<td>kisses</td>
<td>pile</td>
<td>turd</td>
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*Diffusion of Landscape-Level Best Management Practices*

*Snohomish County Surface Water Management*
Safe kids
Safe pets
Clean yards
Clean shoes

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Dog Waste is Raw Sewage

Photo: Dave Ward, Snohomish County
Scoop the poop, bag it, place it in the trash
It's the American Way

Scoop the poop, bag it, and place it in the trash.

Pet waste is a leading cause of bacterial pollution in Snohomish County's streams and rivers.

Clean yards. Clean streams. (And clean shoes!)

101 REASONS TO PICK UP PET WASTE: NUMBER 85
No matter what you call it, it’s still sewage

calling card * poop * pile * package * dirt * muck * doo * dump * soil
boo-boo * excrement * crap * dookie * s#$% * bomb * caca * load
poodie paddies * doolie * lawn sausages * chocolates * poopoo * doodie
tootsie rolls * mess * ordure * souvenirs * land mines * feculence
do-do * night soil * feces * waste * kisses * exudation * poopie * scat
mud * droppings * excreta * manure * nuggets * turd * dirt * load
mine * package * evacuation * dung * night soil * ordure * doodie
number two * looloo * kisses * exudation * do-do * poopie
nuggets * land mines * crap * looloo * mess
exudation * dookie * stuff
poo * dung * droppings
exudation * poopie
poo * pile * stool
patties * kisses
pungles * doolie
feces * bomb
poop * doo
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crapola * poop
dump * poopoo
lincoln logs * crap
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souvenirs * do-do
pungles * brownie
crapola * pile * scat * doolie * doodle * crapp
dung * tootsie roll * stool
looloo * mess
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excrement * number two
dump * poo * doo
chocolates * bomb
s#$% * soil * land mines
jobbers * feces
manure * doggy sausage
lawn sausages
chocolates * poopoo
Scoop the poop, bag it, and place it in the trash.
Clean yards. Clean streams. (And clean shoes.)

More than 126,000 dogs live in Snohomish County.
That’s an entire city’s worth of untreated raw sewage sitting in our backyards.

101 REASONS TO PICK UP PET WASTE:
NUMBER 9
Some things last longer than you think

Scoop the poop, bag it, and place it in the trash

Clean yards. Clean streams. (And clean shoes!)

101 REASONS TO PICK UP PET WASTE:
NUMBER 79
IT’S OKAY!

Scoop the poop, bag it, and place it in the trash

Harmful organisms can be transmitted from dog waste to children. Some can persist for weeks in yards and streams, waiting for a host.

Roundworms, E. coli, and Giardia are just a few of the harmful organisms that can be transmitted from dog waste to people.

The solution is easy:

**Scoop the poop, bag it, and place it in the trash**

Clean yards. Clean streams. (And clean shoes!)
Proxy measures

We Scoop
Scoop the poop, bag it, and place it in the trash
www.petwaste.surfacewater.info

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
This is a BEHAVIOR CHANGE program, not an education program
Foundation

Diffusion of Innovations (Everett Rogers)

Program Design/Evaluation Hierarchy (Claude Bennett)

Social Capital (Robert Putnam)

Social Marketing (Philip Kotler, Nancy Lee)

Psycho-demographic segmentation (VALS)

Buzz Marketing (Mark Hughes)

Cause Marketing (Andy Goodman)

etc., etc., etc.

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Program Evaluation and Monitoring

Activities produce outcomes

Outcomes have impacts

Impacts are assumed to produce the desired result

MONITORING

Implementation Monitoring

Activity Measures

Was the activity implemented as designed?

Effectiveness Monitoring

Outcome Measures

Did the activity produce the desired outcome?

Validation Monitoring

Impact Measures

Did the outcome yield the desired result, i.e., was our assumption valid?

MONITORING

EVALUATION

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Communications Strategy

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Streamside Landowners

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Streamside Landowners

General Population
610,000 Individuals

Ready and Willing
to do more
320,000 Individuals

Residential Streamside Landowners
16,000 Individuals

TARGET AUDIENCE

General Population
610,000 Individuals

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Best Management Practices for streamside landowners

- Minimize impervious surfaces
- Mulch
- Install rain gardens
- Cover bare soil
- Install rain barrels
- Plant native plants
- Plant trees and shrubs
- Maintain existing native plants
- Minimize fertilizer use
- Minimize garden chemical use
- Minimize pesticide use
- Control invasive plants
- Don’t garden in protected areas
- Minimize lawn area
- Install terraces
- Install infiltration swales
- Keep pets out of streams
- Pick-up pet waste
- Keep livestock out of streams
- Control livestock waste
- Maintain vehicles
- Wash vehicles at a carwash
- Leave banks natural - No riprap or armoring
- Leave it to beavers – don’t remove beavers or dams
- Leave streams alone
- Remove trash and garbage
- Don’t dump yard waste along streams
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- Don’t allow yards to expand into protected areas
- Allow woody debris and fallen trees to remain
- Install native plant buffers along protected areas
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- Control invasive plants
- Don’t touch protected areas
- Let vegetation get messy
- No fertilizer use
- No lawn chemical use
- No pesticide use
- No yard waste dumping
- Don’t locate buildings near streams
- Replace driveways with pervious materials
- Remove buildings near streams
- Minimize use of household chemicals and soaps
- Maintain septic systems

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Top Ten Streamside Landowner BMPs

KEEP THE WONDER ALIVE

1. Plant lots of trees
2. Wash your vehicle at a car wash
3. Stop using pesticides and herbicides
4. Don’t fertilize your lawn
5. Pick up your pet waste (put it in the trash)
6. Leave your streambanks natural
7. Learn to love beavers (they’re good for salmon)
8. Keep pets and livestock out of streams
9. Plant native plants
10. Walk your stream with a Watershed Steward

LEAVING A LEGACY IS EASY. WE'RE HERE TO HELP.

Surface Water Management
425-388-3464 www.surfacewater.info

Diffusion of Landscape-Level Best Management Practices

Snohomish County Surface Water Management
Motivators

• Responsibility to future generations, children and grandchildren
• Responsibility to be good stewards
• Sense of place
• Don’t go negative – offer hope!
• What can residents do at home?
• Don’t ask for too much

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Workshops for Streamside Landowners

- Market workshops directly to streamside landowners
- Apply research findings: motivators, barriers, messages
- Bring workshops to convenient neighborhood locations
- Give assistance a friendly face
- Speak in plain English

Diffusion of Landscape-Level Best Management Practices

Snohomish County Surface Water Management
Logic Model

1. Formative research
2. Message development
3. Trial mailings
4. Workshops for Target Audience
5. Personal visits to Target Audience properties
6. Measure, evaluate and refine
7. Mailings to full Target Audience

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
Participant Response

• “It is rare these days to see such caring on the part of government.”

• “… a touch of empathy toward the many issues that can bewilder streamside landowners.”

• “It was evident that you were there to help serve as a source of information and a contact, and that you were not there to judge current individuals practices or viewpoints.”

• “The depth of information presented was surprising given the variety of topics – there was definitely something for everyone.”

• “The knowledge I gained influenced what I would do with my property. I also learned I have a whole lot more to learn before I make major decisions.”
Workshop Alumni Focus Group

Every focus group participant identified best management practices they implemented as a direct result of the workshops

Thanks Dept. of Ecology!

Thanks Puget Sound Action Team!

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
What did the program produce?

Citizens: Apply BMPs

Technical Assistance:
- BMP implementation
  - 240+ landowners

Education:
- BMP implementation
  - 40 landowners
- Solicited project implementation
  - 15 landowners
- BMP implementation
  - 15 landowners
- Solicited project implementation
  - 15 landowners

Information:
- BMP implementation
  - 40 landowners

- Marketing to target audience
  - 16,000 landowners

- Landowner workshops
  - 300 landowners

- SWM project solicitation
  - 15 landowners

- 1 on 1 on-site consultations
  - 50 landowners

- 1 on 1 on-site consultations
  - 133 landowners

- Calls for assistance
  - 358 landowners
Public Involvement Continuum

- Citizens
  - Apply BMPs
  - Technical Assistance
  - Education
  - Information

- Sustained Independent Action
  - Facilitated Action
  - Applied Learning
  - Learning
  - Awareness

CHANGE AGENT
POINT OF VIEW

CITIZEN
POINT OF VIEW

Diffusion of Landscape-Level Best Management Practices
Snohomish County Surface Water Management
BEHAVIOR CHANGE