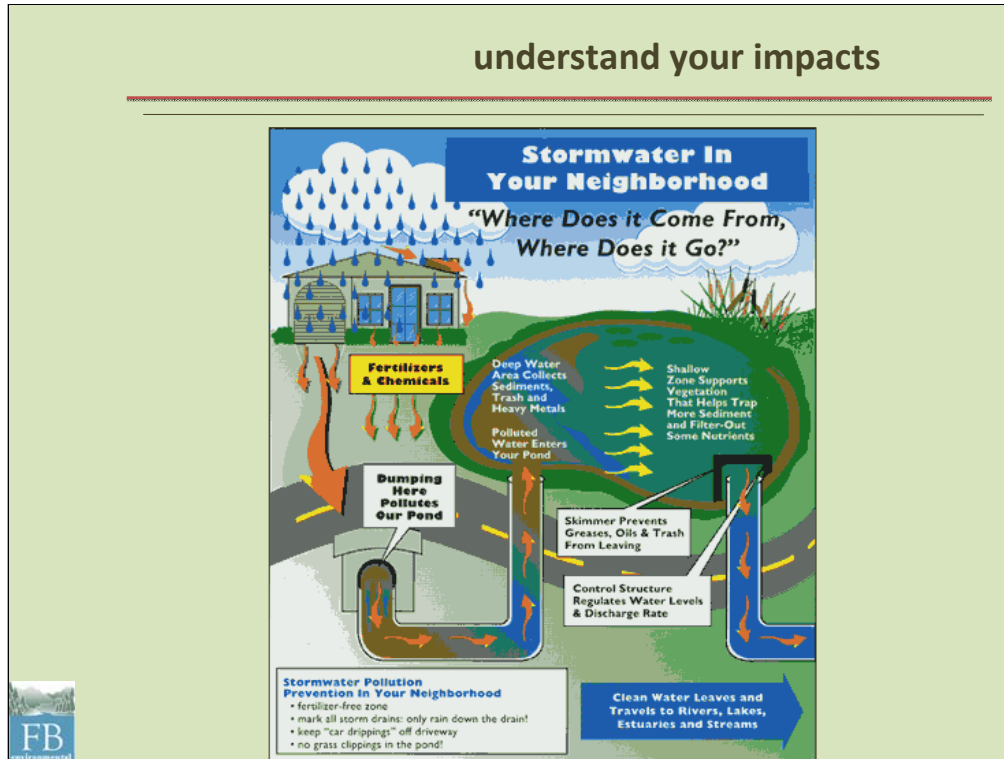


Low Impact Living In the Spruce Creek Watershed



The watershed covers **9.8 square miles** (6,112 acres) in the towns of Kittery and Eliot.

understand your impacts



Low Impact Living practices that will positively affect the WQ of Spruce Creek: increase vegetation, install buffers as last line of defense against contaminated runoff, cover and protect soil, infiltrate runoff, break up concentrated flows (ie: off roof), direct runoff to stable vegetation or somewhere it can be absorbed, decrease impervious surfaces (large driveways, large patios, etc), let areas revert to natural states,

We can all do things on our own property to reduce the CUMULATIVE IMPACT of stormwater runoff. There are a number of steps that each one of us can take to reduce this runoff.

In many ways, our home landscape design can function in an environmentally friendly way and help protect the waters of Spruce Creek.

This presentation will:

- Talk about how Low Impact Living practices can positively affect the water quality of Spruce Creek
- Go over the current major problems with water quality in the watershed
- Highlight some of the easy, low-cost things we all can do to fix these problems and make our properties more creek-friendly.

Overview of Spruce Creek Water Quality Issues

Spruce Creek has poor water quality due to:

- High bacteria levels
- High variability in dissolved oxygen (DO) levels
- Toxic contamination – heavy



“Big Picture” Spruce Creek water quality issues.

Spruce Creek is also:

- **Impaired** water body due to nonpoint source pollutant sources
- Identified as **one of 17 Nonpoint Source Priority Coastal Watersheds**
- Listed as **one of seven coastal watersheds most at risk from development**



Nonpoint sources of pollution:

- Nutrients
- Lack of vegetated buffers
- Trash and debris
- Flow restrictions
- Impervious surfaces

Other sources: septic systems, ATV trails, footpaths, pets, construction site debris, stormwater outfalls, cleared land

NPS Priority Coastal Watershed designation due to bacterial contamination , low dissolved oxygen, toxic contamination, and a compromised ability to support commercial marine fisheries. Define NPS pollution and link it back to their residential properties by example. Due to poor water quality, Spruce Creek is listed in Maine's 2006 Integrated Water Quality Monitoring and Assessment Report (303d) as impaired under Category 5-B-1: Estuarine & Marine Water Impaired by Bacteria (**TMDL** required) for **nonpoint source pollutant** sources.

Undeveloped/ Unmaintained Lots:

- Leaves and other debris filter impurities
- Roots hold soil in place
- Trees and leaves intercept rainfall



Developed/ Maintained Lots:

- Vegetation removed
- Impervious surfaces
- Land smoothed out
- Greater runoff and with different quality



DEP study found that there is 5 to 10 times the amount of **phosphorus** contained in the runoff from the developed area.



Let's start off by comparing a developed lot to an undeveloped lot. DEP study compared runoff from a forested/vegetated area to a similar area with residential development and came up with this finding. Phosphorous is a nutrient (and a)that is in part the reason for the "impaired" waterbody designation. It attaches to soil particles (sediment) which is carried to the creek by runoff from your property.

REDUCE THE AMOUNT OF IMPERVIOUS SURFACE



This is a popular Low Impact Development technique. Convert traditional concrete or asphalt to porous asphalt or pervious concrete. Install permeable pavers where possible such as in driveways to allow for increased infiltration of stormwater. Another idea is to replace long driveways with paved tire pathways and allow the other areas in between to be vegetated.

INCREASE VEGETATION

Planning Considerations

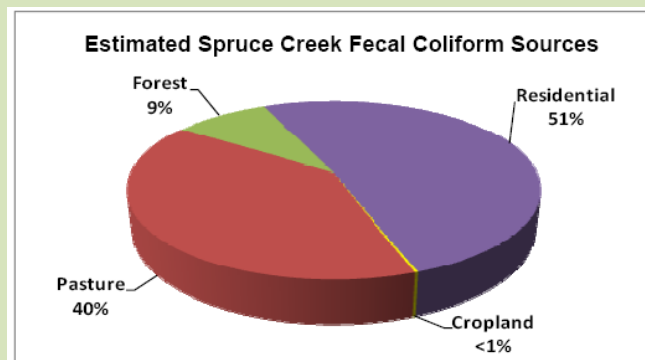
- Site Conditions- Soils, Sun/Shade
- Goals
- Natural vs. landscaped buffer
- Islands or lines?
- Covered area and phasing?
- Cost- let revert naturally or purchase plants?



Aside from installing buffers, strategic planting of trees over paved surfaces or roofs can reduce stormwater- the water gets trapped in the leaves and branches and then has a chance to evaporate before falling.

MAINTAIN YOUR SEPTIC SYSTEM

➤ Estimated human activities (including septic systems and pets) contribute the highest overall bacteria loadings in the Spruce Creek watershed.



This fact is from findings that were published in the Watershed Management Plan completed by FBE. Most of Spruce Creek is not served by municipal sewer. Although most systems are intact within the watershed, those installed before 1975 have a much higher chance of malfunctioning.

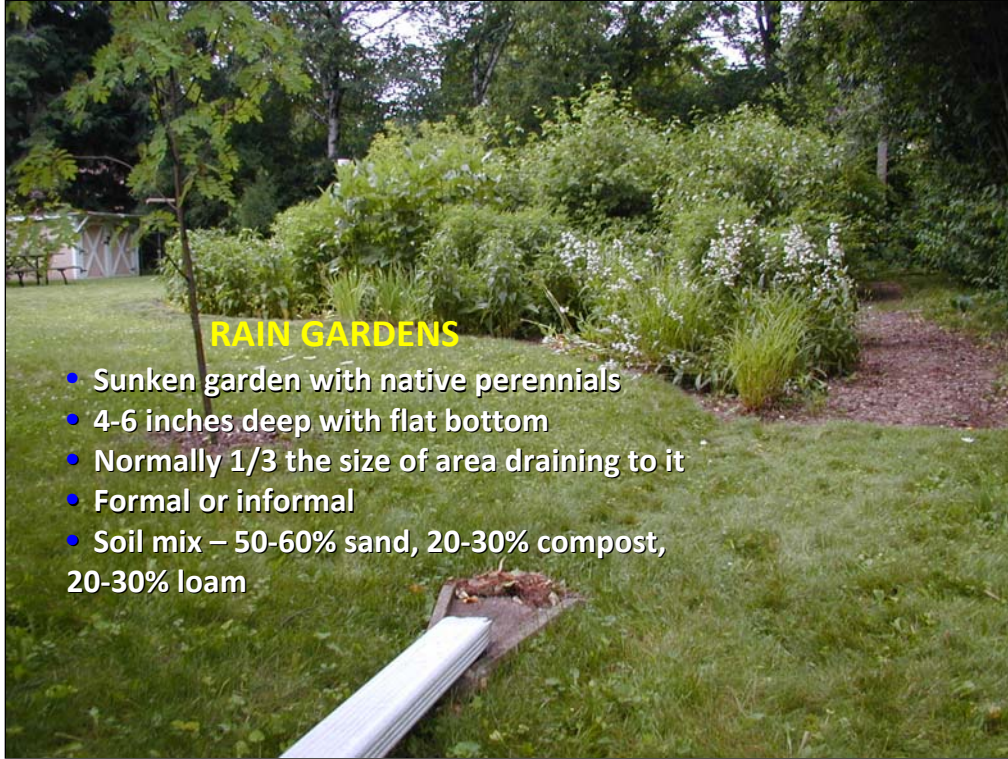
❖ Create rain gardens

Benefits of rain gardens:

- Helps to protect and restore natural hydrology
- Allows rain to soak into the ground
- Intercepts pollutants
- Aesthetically pleasing



On a 2000 sq ft house with rain gardens at each downspout, rain gardens can catch and infiltrate 32,000 gallons of water a year. (THIS FACT IS FROM WISCONSIN – NOT SURE IF THE CALCULATIONS HOLD UP FOR MAINE)



RAIN GARDENS

- Sunken garden with native perennials
- 4-6 inches deep with flat bottom
- Normally 1/3 the size of area draining to it
- Formal or informal
- Soil mix – 50-60% sand, 20-30% compost, 20-30% loam

Rain Gardens



Before

After!



Example of residential home having a rain garden installed to catch runoff from rooftop, lawn, etc.

Rain Gardens



Pre and post rain garden construction at Portland Water District

❖ Install a riparian/coastal buffer

Benefits of Buffers:

- Root networks stabilize banks
- Enhance privacy
- Provide sun and wind protection
- Provide shelter and food for wildlife
- Improve aesthetic appeal
- Protect water quality



Installing a vegetated buffer is one of the most important ways to reduce contaminated runoff from reaching Spruce Creek.

Buffers

Considerations and Limitations:

Tidally influenced area = salt tolerant plants

Shallow to Bedrock Soils

- Infiltrate only clean water
- Limited infiltration capacity
- Tall trees subject to windthrow

High Spring Water Table

- Limited infiltration in spring

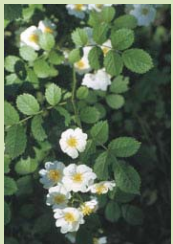


Buffers

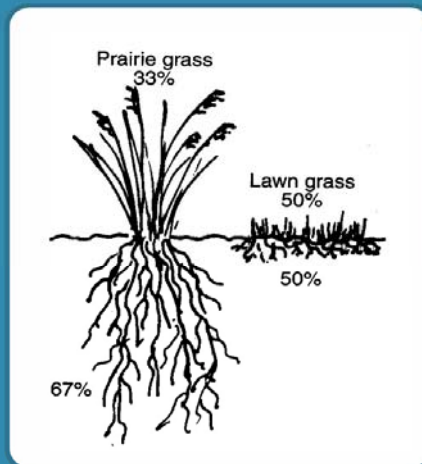


Invasives: What Not To Plant

- Purple Loosestrife
- Japanese barberry
- Oriental bittersweet
- Buckthorn
- Non-native honeysuckles
- Multiflora rose
- Common reed



Value of Using Native Plants



**Deeper roots -
absorbs more water**

Uses no fertilizer

Uses little or no pesticides

**Easy maintenance after
first year**

**Does not require watering
after establishment**

* The roots of native wildflowers & prairie grasses have deeper roots to absorb more water. If the plant is five feet tall, its root will go down an incredible ten feet. While turf grass roots only grow down the same depth as the plant leaves are allowed to grow tall-- just a few inches. Additionally each year about a third of a perennial's roots die, leaving long tubes for water to flow down.

* Native plants do not need to be fertilized or typically need any pesticides.

* Maintenance is low, about the same as for any non-native perennial garden: they need to be weeded when young and eventually the plants may need to be split – making a good gift to others who want to follow your lead.

* As water bills increase, it's nice to know that the hardy native plants do not need to be watered once they are established.

Buffers

Native Shrubs to Highlight

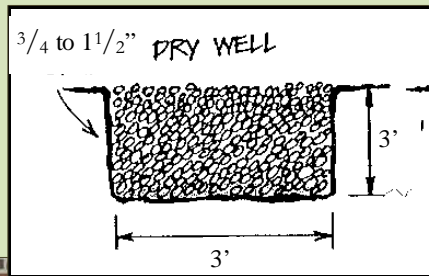
Black chokeberry
Beach Plum
Fragrant Sumac
Blueberry
Inkberry
Creeping Juniper
Bayberry
Serviceberry
Summersweet
Swamp Azalea
Lowbush cranberry
Sweet fern
Red osier dogwood



This plants are salt tolerant, hardy and beautiful!

❖ Rain barrels & Dry Wells

Houses with gutters.....



Dry wells allow water from gutters to infiltrate. Drywells can be covered with sod, or left exposed for easy access and cleanout. Drywells and infiltration trenches work best in sandy or gravelly soils.

Rain barrels collect water from downspouts that can be used to water gardens.

It's estimated that 850 gallons of water runs off of a roof (1500 sq ft) during a 1 inch rainstorm- that's a lot of water that can erode soil that will eventually end up in the creek.

Drywells can be covered with sod, or left exposed for easy access and cleanout. Drywells work best in sandy or gravelly soils.

Materials: 1/2" to 3/4" crushed stone is available from P&K Gravel (693-6765), Shaw Brothers (839-2552) and several other distributors.

❖ Infiltration trenches

Without gutters.....



Infiltration trenches collect and infiltrate water from impervious surfaces on your property such as driveways and rooftops. These trenches slow runoff from your camp when it hits the ground. More pore space holds the water and allows it to infiltrate. When used to collect water off rooftops that don't have rain gutters, they also reduce back splash and damage to your house. These systems are not good for large areas such as a large driveway due to their relatively small size. They work best in areas with well drained soils.

CLEAN UP AFTER YOUR PETS

When your pet goes
on the lawn,
remember it doesn't
just go on the lawn.



Plastic bags: Don't leave
home without one!

The images say it all. Pet waste is a threat to human health as well as to the health of the Spruce Creek watershed.

❖ Pathways/Walkways/Sitting Areas

Design:

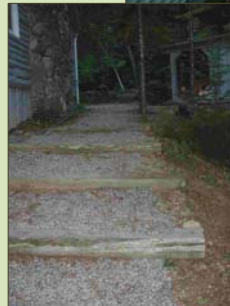
Minimize number of paths

Meandering

Make it a narrow path (<6 ft.)

Define with adjacent plantings

Install steps in steep areas



❖ Pathways/Walkways/Sitting Areas

Surface:

Wood chips

Bark mulch

Crushed stone

Permeable pavers set in crushed stone

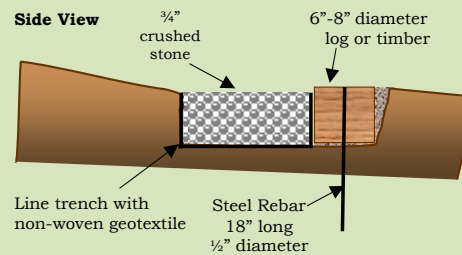


Surface of trail should be armored to protect soil from foot traffic and runoff. Also allow water to infiltrate.

❖ Pathways/Walkways/Sitting Areas

Runoff diverters:

Install waterbars across path



Install waterbar “speed bumps” to break up the slope and keep water from concentrating on a path.

Fill behind with crushed stone to help runoff soak into the ground and direct water into vegetated areas. Rot-resistant logs or pressure treated timbers can be used.

Extend past the outside edge of both sides of the path and install at a 30-degree angle. Secure the waterbar with large stones on the downhill side and/or pound in with pieces of rebar steel.

REDUCE HERBICIDE, PESTICIDE AND FERTILIZER USE

When you're fertilizing the lawn, remember you're not just fertilizing the lawn.



➤ These contaminants enter Spruce Creek via runoff from your property

Landscaping with native plants will reduce reliance on these chemicals. Transitioning your conventional lawns to a more creek friendly one will also decrease or eliminate the need for these chemicals. A blend of fescue and wild ryes can be substituted for traditional lawns. This mix is available in Maine and was created specifically for this climate.



Photo: ME DEP

Low Impact Living practices protect
Spruce Creek *and* enhance
properties!



Photo: Phyllis Ford

QUESTIONS?

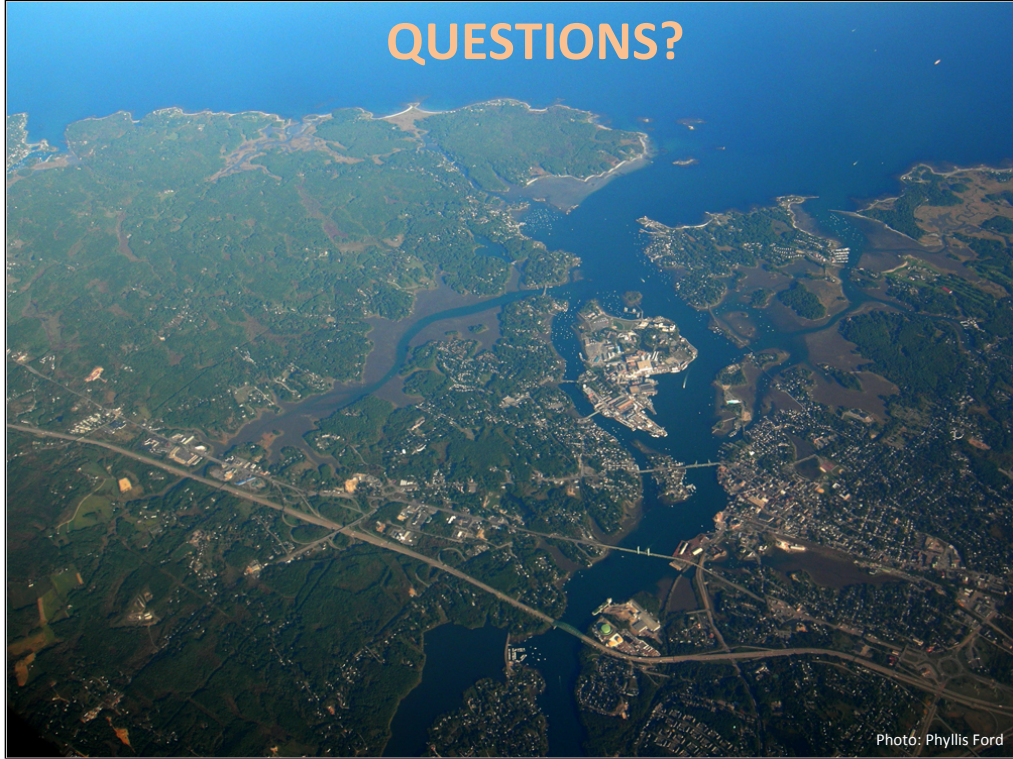


Photo: Phyllis Ford