



2010

East Kingston Buffer Outreach, CTAP Program

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Rockingham Planning Commission

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**Town of East Kingston Buffer Outreach
PREP Community Technical Assistance Program
Final Project Report – April 2010**

Summary

Rockingham Planning Commission worked with the East Kingston Conservation Commission to identify buffer areas on the Pheasant Run conservation property, install buffer boundary markers and interpretive signage for entrances, buffers and wetlands on the Pheasant Run conservation property, develop and distribute brochures about the Pheasant Run conservation property, develop an outreach program about buffers at the East Kingston library, and develop a newspaper about protecting wetlands and water resources, including water quality protection measures, buffer planting and maintenance, functions and values of buffers, and wildlife and aquatic habitat.

Overview

In 2009, the Town of Brentwood's Conservation Commission applied for assistance through Round 3 of the Piscataqua Region Estuaries Partnership (PREP's) Community Technical Assistance Program. Rockingham Planning Commission (RPC) was selected as the technical assistance provider for the project. Upon consultation with the Conservation Commission, it was agreed that RPC would work with the Conservation Commission and subcontractors to develop/create signs, an outreach program, and an educational brochure. RPC worked with PREP to design, print, and mail a buffer education newspaper to every household.

Outputs

- Community buffer education newspapers, quantity: 1900, 1293 mailed to each household
- Evaluations, quantity: 1293, mailed to each household
- Evaluation Report
- Shoreland Solutions workshop (PowerPoint) – 10 attendees
- Conservation Property Signs, quantity: 2, installed
- Pheasant Run Brochure: quantity 320

This project was supported through PREP's Community Technical Assistance Program, with funding from the Otto Haas Charitable Trust 2 Fund of the NH Charitable Foundation.



A Citizen's Guide to Protecting East Kingston's Water Resources

This publication is brought to you by the East Kingston Conservation Commission with a grant from the Piscataqua Region Estuaries Partnership

www.eastkingstonnh.org

2010



Our Natural Gem

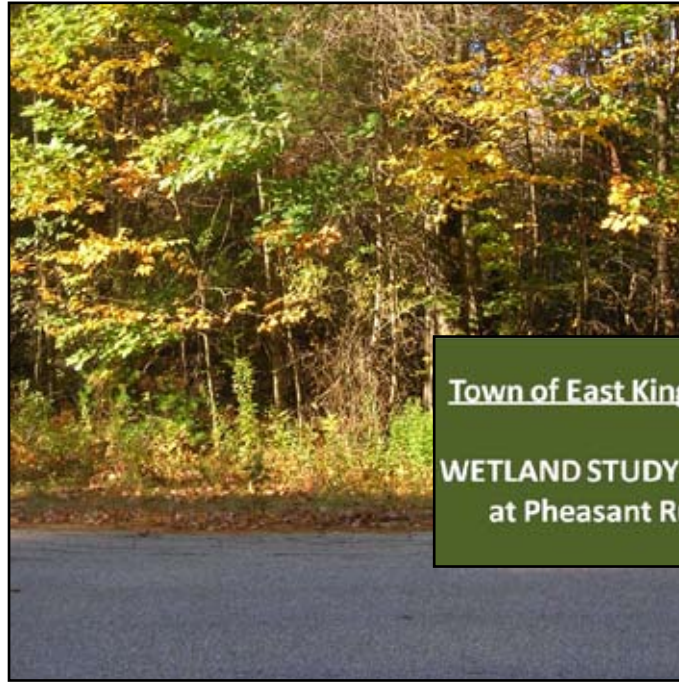
Pheasant Run Wetland Study Area is a place for people to reconnect to nature in East Kingston

by Julie LaBranche, Rockingham Planning Commission

East Kingston is fortunate to still have much of the rural charm that makes living in New Hampshire so special. The ability to take relaxing walks through beautiful natural areas just minutes from your back door is one of the reasons residents love this town. Many of these open natural areas in town are on conservation land and one small parcel is getting extra attention by the East Kingston Conservation Commission to make it even more accessible to residents.

The Pheasant Run Wetland Study Area is a 5-acre wooded property that contains an interesting wetland with a small pool and stream. Access to the property is off of Pheasant Run Road and will be marked this year with signs bought with a grant from the Piscataqua Region Estuaries Partnership and the Otto Haas Charitable Trust 2 Fund of the New Hampshire Charitable Foundation.

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Pheasant Run Wetland Study Area is open year around during daylight hours. To visit the area park on the side of the road on Pheasant Run Lane (image above). This year the area will be marked with signs that mark the boundaries of the property.

Protection of buffers and water quality is the responsibility of all who live, work, and visit East Kingston



Learn More on Page 2.

Being A Steward Of Your Land

Taking care of your property is vitally important to protect the natural resources of East Kingston. Every land owner can do their part to keep our environment healthy for all citizens.

Your land is connected to your water. This is a simple rule to keep in mind while working around the house.

Every time you apply fertilizer or weed killer to the ground there is a good chance that a portion of these chemicals will be washed away by rain and end up in a nearby stream or in a neighboring well. That is why it is so important that homeowners do the best they can to minimize pollution on their property and maximize the ability of the land to absorb and clean stormwater.

There are ways to have a beautiful landscape around your home and be environmentally friendly. The following are some practical suggestions from the Piscataqua Region Estuaries Partnership at the University of New Hampshire that will help protect East Kingston's natural resources.



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Thirsty?

East Kingston's streams and wetlands are directly connected to the region's water supply, making it even more important to work to protect these water resources with buffers.

East Kingston is very important when it comes to water quality in the region because the town contains the headwaters of rivers that supply Exeter, New Hampshire and Amesbury, Massachusetts with drinking water.

About 65% of East Kingston land drains into Great Brook and the Little River which both flow to the Exeter River and the Town of Exeter. The remaining 35% of East Kingston directs water to the Powwow River that flows through Amesbury on its way to the Merrimack River.

But the protection of our rivers and streams does not only benefit neighboring communities. The condi-



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Read page 5



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Buffers: What Are They and What Do They Do?

From Clean Drinking Water To Flood Protection, Buffers Provide Many Services To East Kingston

by Dave Kellam, Piscataqua Region Estuaries Partnership

A buffer is simply the lush, vegetated area next to a body of water or a wetland. The best ones contain only native plants and are not mowed, cut, or sprayed with herbicides. They certainly do not contain roads, parking lots, or buildings.

The word "buffer" is defined as something that reduces shock or damage due to an impact or disturbance. In the case of a wetland and shoreland buffer, the impacts being reduced are from development and other activities that remove trees and vegetation or disturb soil.

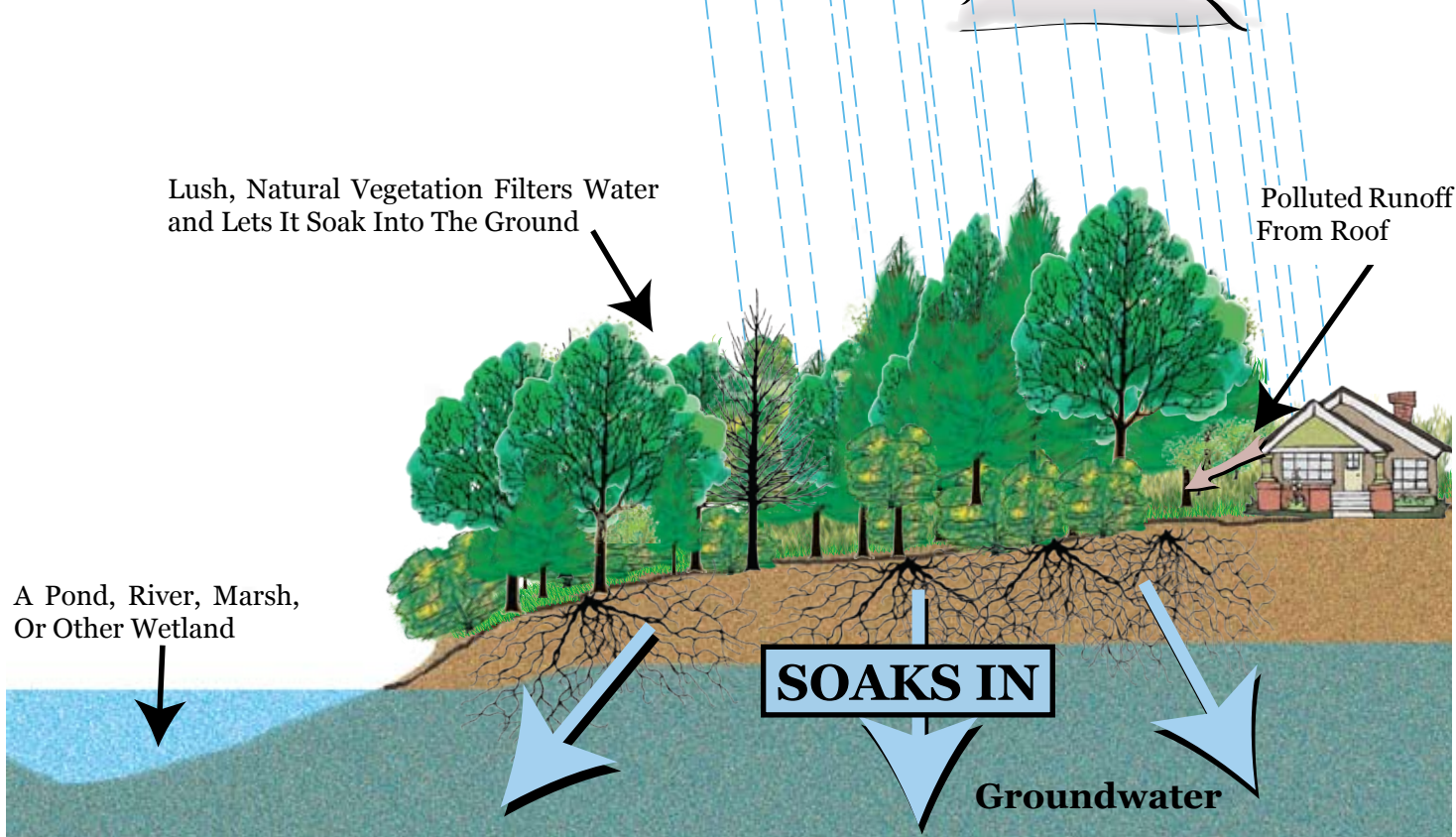
Built structures, like roads and buildings, inevitably reduce the land's ability to perform its natural functions, like filter pollutants from stormwater, transport surface water to groundwater areas, or provide habitat for wildlife. The closer the structures are to waterways, the greater the negative

impacts. For all of these reasons, buffers are important.

But what are buffers able to do? The list of benefits to us is long, but here are a few:

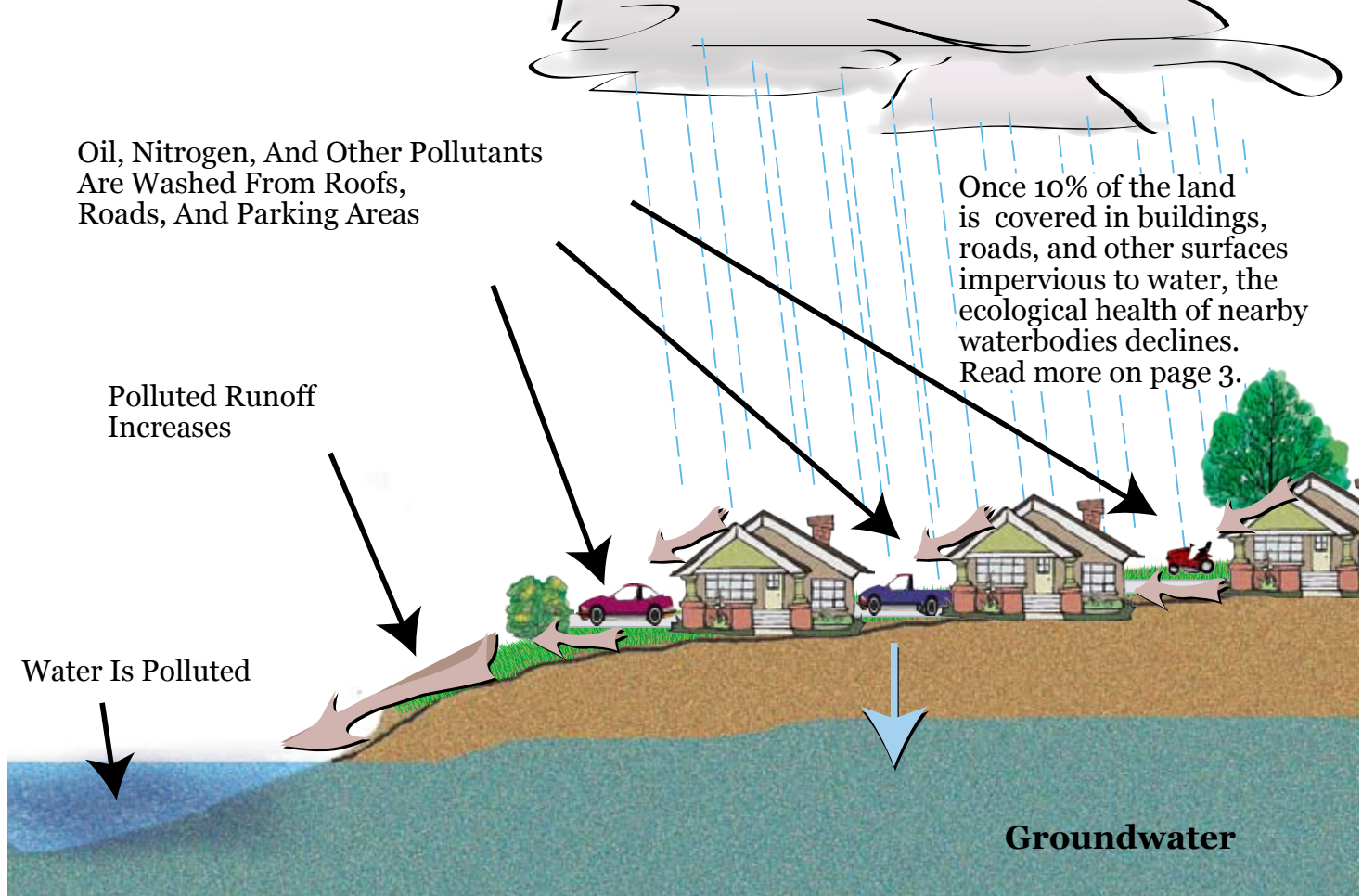
Natural Buffers Clean Water

Buffers remove pollutants from rainwater, reduce erosion, and help recharge groundwater.



No Buffers = Polluted Waters

When buffers are removed, pollutants are washed into local waters.



Pollutant Removal

Buffers clean rainwater and melting snow of pollutants such as nitrogen, bacteria, and pesticides. Natural chemical reactions occurring in the soil and plant roots neutralize many harmful contaminants. In fact, expensive water filtering systems actually mimic what buffers do naturally and for free.

Water pollution, especially dissolved nitrogen, is a significant problem in Great Bay, which is fed in part by the Exeter River that flows through East Kingston. According to the State of the Estuaries Report published in 2009, nitrogen levels have increased by 44% in the last 28 years - due primarily to increased development. Buffers throughout the watershed will help reduce nitrogen and reverse this troubling trend.

Groundwater Recharge

Since nearly everyone in East Kingston relies on well water in their homes, the benefits of buffers to groundwater quality is very important.

When stormwater is slowed by buffers, the water is allowed to soak into the soil where then much of it enters the groundwater. According to U.S. EPA studies, one acre of buffer can absorb up to 1.5 million gallons of water!

The ability of buffers to pull water into groundwater, coupled with the filtering properties of buffers, shows why lush buffers are so important to maintaining sustainable drinking water for East Kingston residents.

Flood Control

Buffers not only protect rivers and streams from buildings and roads, but they also protect these structures from the damage caused by flooding.

Buffers act very much like a shock absorber during times of heavy rain. Research shows that damage from spring flooding is greatly reduced when buildings and roads are kept 200 feet or more from waterways.

Banks Stabilization

The thick, deep root layer of a lush buffer holds soil in place and prevents it from being washed downstream. Buffers prevent the loss of land due to erosion. The mud that is stopped by buffers on land prevents aquatic animals from being suffocated by heavy sediment and pollution.

Temperature Control

Trees along streams and rivers play a very important role in keeping water

Continued on page 3

It All Adds Up

Many of the harmful pollutants that damage water resources come from stormwater that washes over streets, parking lots, and homes. Any one spot may not add much pollution to our waters, but together the impacts are far-reaching

Many of the harmful pollutants that damage water resources come from stormwater that washes over streets, parking lots, and homes. Any one spot may not add much pollution to our waters, but together the impacts are far-reaching.

April showers may bring May flowers, but it can also bring harmful pollutants into streams and rivers.

Collectively called stormwater runoff, rainwater and snow melt that washes over pavement, rooftops, and other impervious surfaces usually carries along with it pollutants that degrade water quality for public drinking water supplies, fish populations, wetlands, and aquatic habitat. Polluted stormwater runoff can also enter the groundwater table and then seep into surface waters.

Common pollutants found in stormwater are motor oil, salt and sand from roadways, pesticides and herbicides from farmland, sediments from construction sites, and fertilizer from suburban areas.

The good news is that these pollutants can be greatly minimized if stormwater runoff is allowed to filter through undisturbed vegetated areas before entering surface waters and wetlands. Plants and soil are the simplest, cheapest, and most effective cleaners of polluted stormwater.

There are three major factors that affect the amount of damage stormwater will do the environment: the amount of precipitation, the percent of land covered by impervious surfaces, and the proximity of impervious surfaces to water bodies and wetlands. There is little we can do to control how much rain falls, but we can do something about the amount and location of impervious surfaces.

In general, scientists believe that water quality begins to decline once 10 percent of a watershed is covered by impervious surfaces and is seriously degraded after 25 percent is covered. A local study in 2005 called Effects of Urbanization on Stream Quality at Selected Sites in the Seacoast Region in New Hampshire, 2001-03 found areas with reduced water quality with between eight and 14 percent impervious surface coverage.

Examples of impervious surfaces are roads, parking lots, sidewalks, roofs, concrete patios, and tennis courts.

The proximity of impervious surfaces to water bodies is important. If impervious surfaces are not separated from streams and wetlands by an undistributed vegetated buffer, then

pollutants are not filtered. Research suggests that a 150 foot vegetated buffer is generally what is needed to filter pollutants from stormwater.

How is East Kingston Doing?

To determine the amount of impervious surface coverage in East Kingston, University of New Hampshire researchers analyzed high resolution aerial photographs using a computer to calculate what percent of the land is covered by impervious surfaces. Photos were examined from 1990, 2000, and 2005. Here are the results:

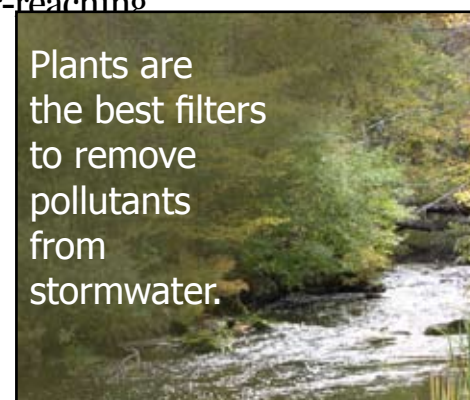
Impervious Surface Cover (%) in East Kingston

	1990	2000	2005
% of Town Area	3.5	5.3	7.0
Acres	223	338	447

Currently, East Kingston has approximately 7 percent or 447 acres of impervious surfaces. This is below both the general threshold of 10% impervious surface coverage and the local findings between eight percent and 14 percent.

No town-wide study of the proximity of impervious surface to streams has been done, however, in general the town has fairly good shoreland buffers.

Plants are the best filters to remove pollutants from stormwater.



It is important to note that the trend for adding impervious surfaces in East Kingston is increasing at roughly .34 percent per year, or 108.5 acres per year. If development trends continue, East Kingston can expect to have more than 10% impervious surface coverage by the year 2015.

What You Can Do

East Kingston citizens can do several things to minimize the damage caused by stormwater runoff. People can vote for protective measures to keep impervious surface coverage below 10% and direct construction projects away from water resources. Homeowners can maintain buffers near surface waters and direct runoff to rain gardens and other areas to clean the water naturally on site (see page 6 & 7).

How Wide Should A Buffer Be?

The best width of a buffer is determined by what you want to protect and the specific conditions on site.

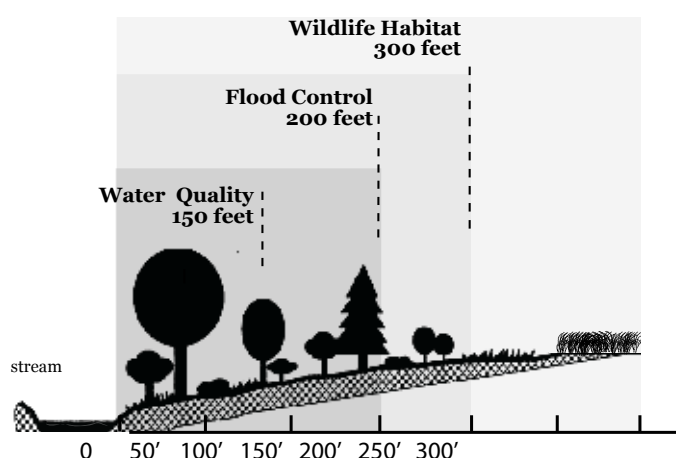
To protect water quality from sediment and nutrients, research suggests that a buffer needs to be at least 150 feet wide around a stream. To lessen the impact of flooding, a typical stream buffer needs to be at least 200 feet wide. Research also indicates that most wildlife needs at least a 300 foot riparian buffer to thrive.

The town's zoning ordinance requires setbacks to wetlands for septic systems, building and roads, but does not require an undisturbed buffer from wetlands, streams, rivers and ponds. Consider voluntarily maintaining a buffer wider than 200 feet to protect water quality and your property from flood damage.



Spring flooding causes millions of dollars in damage each year. Where streams and wetlands are adequately buffered from development, flood damage is reduced.

Typical Buffer Widths And The Functions They Provide



Buffers: What Are They . . .

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cool. The plants shade the hot rays of the sun from the streambed, but also buffers do not get as hot as roads or parking lots do on summer days. When it rains and water flows over hot pavement, it heats up and also warms the stream. In many places, the heating caused by the loss of buffers has damaged the plants and animals living in the water.

Wildlife Habitat

Rivers, streams, ponds, and wetlands are home to a variety of aquatic animals and plants, but these creatures also rely on the habitat that surrounds these aquatic environments to survive. For example, amphibians, such as wood frogs and spotted salamanders, breed in the spring in shallow wetlands called vernal pools, but spend most of the year in the surrounding forest, often more than 300 feet away from the pool. Animals like otters feed in water but use forested areas as "highways" to move from place to place.

The actual amount of buffer (distance from a water body) needed to provide suitable habitat for wildlife is dependent on many factors, such as proximity of large tracks of forest, slope, plants present, and the type of water body that is being buffered. General

research suggests 300 feet serves most wildlife needs in most areas.

Landowners wishing to optimize wildlife habitat in their area can contact New Hampshire Fish and Game Department biologists and/or UNH Cooperative Extension staff who are available to advise landowners on suitable buffer widths. For more information, contact Matt Tarr at 862-3594 or matt.tarr@unh.edu.

East Kingston Library Program



Shoreland Solutions:

Helpful tips for homeowners to maximize the benefits of buffers next to wetlands, ponds, rivers, and streams.

**Wednesday, March 31
from 7:00 p.m. - 9:00 p.m.**

Experts will discuss the value of buffers and land owner actions that will protect water quality, improve wildlife habitat, and lessen flood damage.

Pheasant Run...

continued from page 1

In addition to the access signs, the grant will also pay for the Rockingham Planning Commission to conduct education and outreach about the property. A brochure will be created that will explain the unique features of the area and a two hour program about the property and buffers around town is scheduled to begin at 7:00 p.m., on March 31 at the East Kingston Public Library.

One of the fascinating creatures that can be found in the Pheasant Run Wildlife Study Area is the wood frog, which is a small brown amphibian with a black stripe across its eye that makes it look like Zorro of the woods. These frogs live far away from water during most of the year and almost freeze solid during the winter in the soil.

But it is the spring when wood frogs thaw out, that they become most apparent to people. In shallow waters of vernal pool, these frogs congregate on rainy spring nights to find mates. The males make an odd duck-like quack to attract females. After they lay clusters of eggs, they retreat to the dry woods around the wetland for the rest of the year.



Wood frogs need both vernal pools and upland forest habitat to survive.

Wood frogs are just one of the creatures that can be seen in the Pheasant Run Wetland Study Area. Many birds, such as barred owls, Eastern wood-peewees, and broad-winged hawks, live in this habitat. Marsh marigolds, swamp asters, and other wildflowers bloom in the wet soil. All year long animals such as deer, raccoons, and fishers traverse the property regularly.

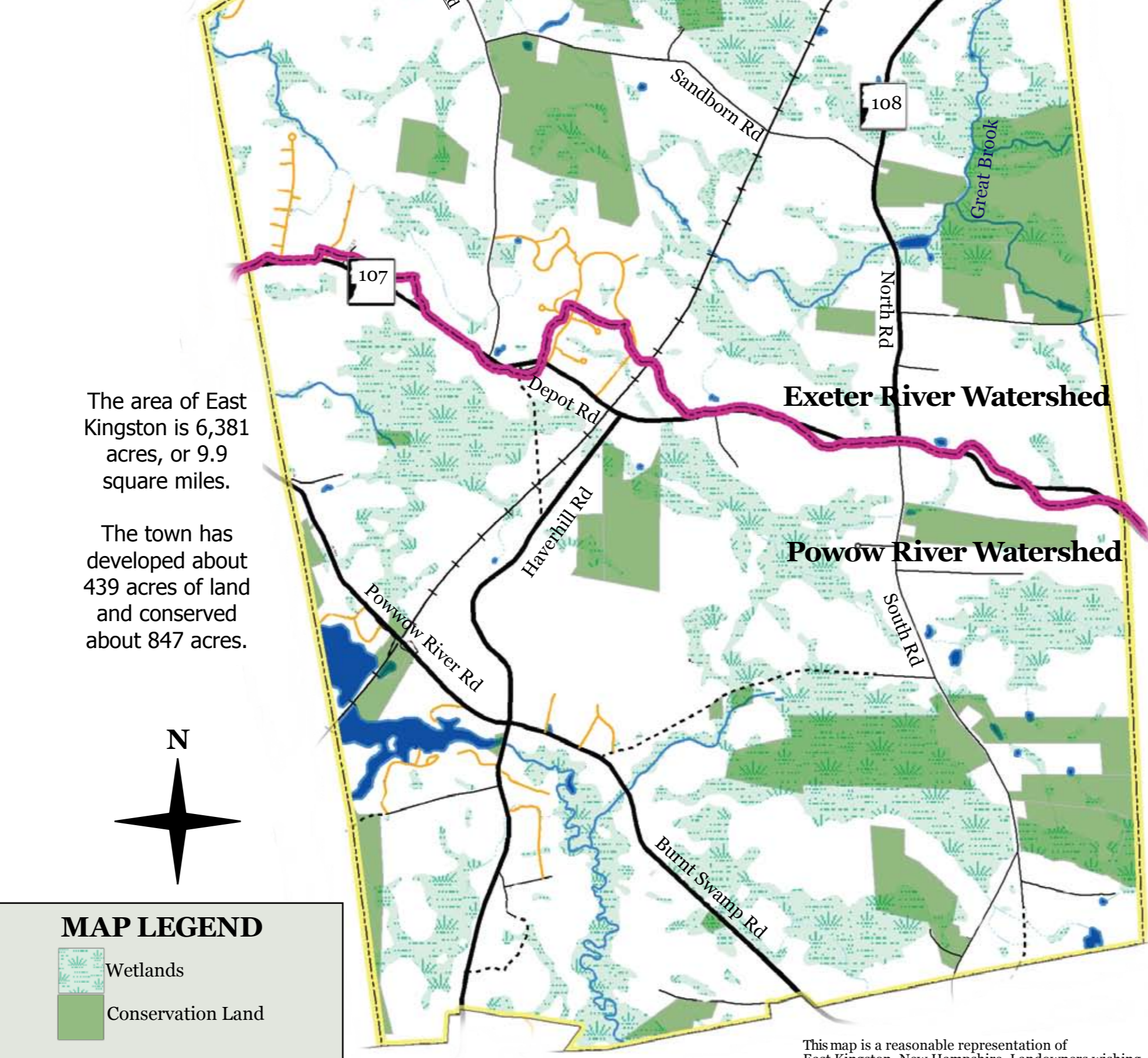
How can such a small area contain so many wild animals? The answer to this question can be found by looking beyond the borders of the property. The greatest asset to wildlife at Pheasant Run is a wooded wetland corridor that stretches about two miles to the West to Rt 125 in Kingston that is only crossed once by Willow Road. There is also a cluster of conservation easements just to the southeast of Pheasant Run, most notably the Red Gate Conservation Area that includes a large open wetland. The proximity of such prime habitat and the largely unbroken connections between them create a habitat complex that can support a wide range of plants and animals.

We all need to be good land stewards

Even though Pheasant Run Wildlife Study Area is a natural place, it must be maintained. A dedicated group of volunteers are needed to pick up trash, remove invasive species, and keep an eye out for vandalism. If you are interested in becoming a steward volunteer, contact the Dennis Quintal, Chair of the Conservation Commission, at 642-8406.

East Kingston Conservation Lands and Surface Water Resources

Pheasant Run Wetland Study Area

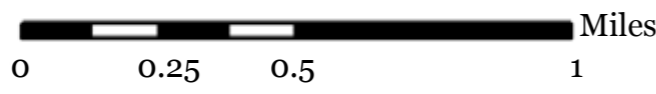


The area of East Kingston is 6,381 acres, or 9.9 square miles.

The town has developed about 439 acres of land and conserved about 847 acres.

MAP LEGEND

- Wetlands
- Conservation Land



This map is a reasonable representation of East Kingston, New Hampshire. Landowners wishing to build on their property must hire a certified wetlands or soil scientist to determine ordinance compliance.

Base map graphics provide courtesy of the Rockingham Planning Commission in conjunction with NH GRANIT.

Thirsty...

continued from page 1

tion of East Kingston's surface waters is connected to the groundwater which is the source of drinking water for the entire Town of East Kingston.

What Effects the Quality of Drinking Water?

During the summer months, when precipitation and ground water levels drop, rivers become slow moving and vulnerable to pollution. The loss of vegetated buffers which help remove harmful pollutants increases the risk of water quality impairment. When pollution in surface water is more concentrated, it becomes harmful to aquatic life and more difficult to treat. This causes water quality to occasionally have excessive algal growth from nutrients entering the water from septic systems, fertilizers, and surface runoff.

Pollution problems are categorized in general terms as originating from either "point" or "non-point" sources. Point sources are discharges from pipes, such as those leading from sewage treatment plants, industrial facilities, and stormwater culverts. A nonpoint source is any site from which polluted runoff can occur, such as a construction site, parking lot, pasture, or heavily fertilized lawn. Non-

point pollution is difficult to locate and correct and is recognized as the greatest threat to water quality both locally and nationally.

How Best Can We Protect Water Quality?

The protection of water quality and other natural resources cannot be accomplished without addressing issues of land use and development. How land is used in the watershed has a great influence on its overall health. Throughout the watershed, proper management of runoff from land used for farming, timber operations or development is very important. Much land use still involves clearing to the edge of wetlands and water bodies, and installing culverts that empty into surface waters. The best long-term measures to ensure high water quality are the protection of adequate shoreline and wetland buffers. These upland buffers can protect water bodies and wetlands from the impacts of adjacent development, thereby protecting the water quality for all users downstream.

Rivers Run Through Us

East Kingston is fortunate to have a diversity of rivers, streams, and wetlands that provide valuable services to the community. Each of these resources has unique characteristics and differing levels of protection.

There are two major watersheds in East Kingston. The water in the northern part of town drains to the Exeter River watershed, either through the Little River that flows through Kingston and Brentwood or the more extensive Great Brook system. The headwaters of Great Brook are located north of Depot road and west of North Road. Great Brook flows north and east through several large forested wetlands and east into Kensington just south of the East Kingston and Exeter border. Both of these streams flow into the Exeter River which turns into the Squamscott River in Exeter and then flows to Great Bay.



Powwow Pond

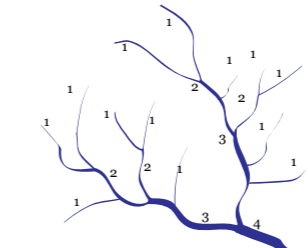
In the fall of 2000, the Merrimack River Watershed Council (MRWC) began a Watershed Assessment of the Powwow watershed to increase public awareness, document watershed status, and develop an action plan to address water resource problems. Below are some highlights from the assessment:

The other major watershed is the Powow River watershed. The Powow River exits Powow Pond in the southwest corner of East Kingston and flows southeast through the Trickling Falls Dam in East Kingston at Route 108, then flows through a large wooded wetland and floodplain area to the South Hampton border.

Regulations that stipulate what kinds of building and other land use activities may occur next to these waterways are designed to protect water quality of these systems and provide other functions, such as flood control. However, different regulations apply to different sizes of streams, noted by stream order (see diagram below),

The New Hampshire Comprehensive Shoreland Protection Act (CSPA) is applied to 4th order streams or higher, large ponds and lakes, and tidal waters. East Kingston water bodies regulated by the CSPA are the Powwow Pond, Powwow River, and the Great Brook downstream from the juncture of York Brook.

Stream Orders



Stream order is a classification system used to define stream size. First order streams are the smallest size and found at the headwaters. The Mississippi River is classified as 10th order stream. The largest streams in East Kingston are 4th order and those are covered by New Hampshire's Comprehensive Shoreland Protection Act.

- The Powwow watershed from 1953 to 1982 lost significant amounts of agricultural acres (with the exception of E. Kingston), forested acres, and gained developed acres.
- About 11 percent of the land in the watershed is covered in impervious surfaces, such as roads or buildings. This amount exceeds the threshold of 10 percent recommended to prevent water quality impairment.
- All nine watershed communities are dependent on the watershed's groundwater and surface water resources for their public and private water supply.
- The regional aquifers support over 82 public water supply sources and an estimated roughly 5,000 private wells in NH, and 7 public water supply sources in MA.
- Because the Powwow River has very few specific pollution discharges, nonpoint source pollution mainly from stormwater runoff is likely to be the major factor contributing to water quality impairment.
- There is little or no coordination with land planning on a watershed basis between watershed towns.

Caring For The Land

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Reduce The Fertilizer

Lawns that are fertilized pose a threat to our environment because nutrients that are not used by the grass are washed into rivers and end up in an estuary. This is a problem in East Kingston because a primary nutrient in fertilizer is nitrogen and the New Hampshire Department of Environmental Services has determined that the Great Bay Estuary is experiencing signs of nitrogen pollution. Homeowners should first try to reduce the need for fertilizer by leaving grass clippings on the lawn and maintaining a smaller lawn area. Most people put on more fertilizer than is needed. Experiment by applying half as much fertilizer than you normally do and see if you are happy with the results. Lawns can only use so much fertilizer and any extra is just money and pollution down the drain.

Mow High, Mow Less

Another way to reduce the amount of nutrients polluting our estuaries is to cut your grass no shorter than 3 inches. Research has shown that this is the optimal height for grass health while still providing a nice, usable lawn.



Think Smaller

Reducing the size of your lawn reduces the need for fertilizers, pesticides, and other landscape chemicals. Instead of lawn, plant ground covers, trees, flowers, and shrubs that encourage water infiltration. Where you need to have a lawn, plant fescue, a type of grass that requires about half as much fertilizer.

Buffer The Waters

It is best to leave the trees and shrubs alone in a buffer, which is the area of land next to a marsh, stream, river, or pond. A wide patch of lush vegetation absorbs a great deal of nitrogen and other pollutants. Try to maintain at least a 50 foot wide, natural buffer.



Down With Dumping

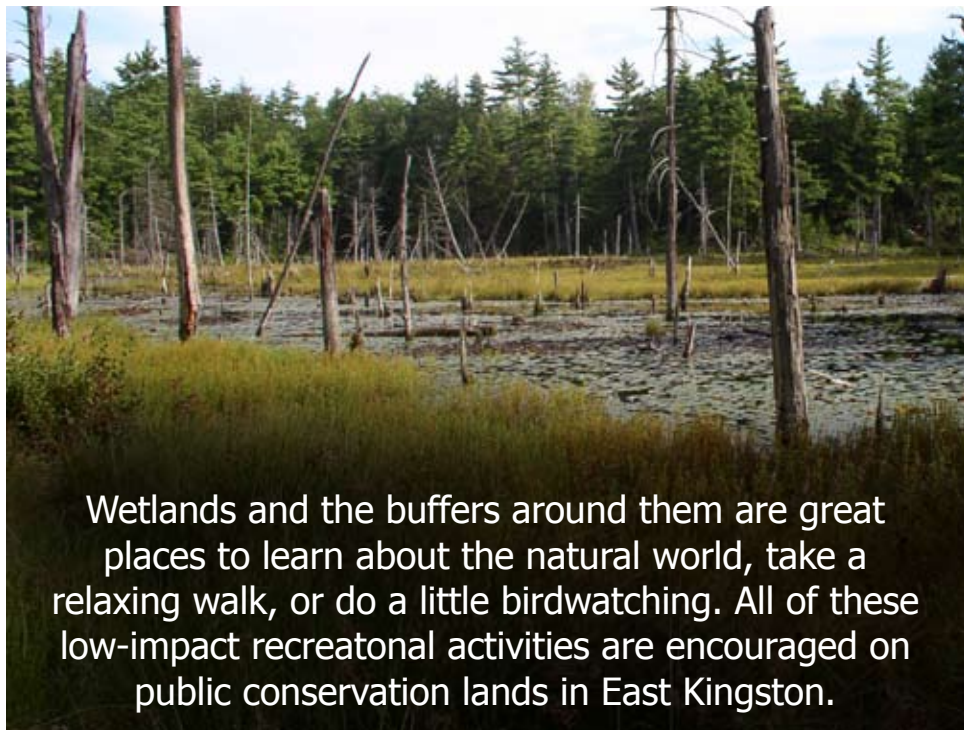
A common feature of many old homesteads is a miniature private dump in the woods in the back of the property that are often full of materials that can cause pollution of water and soil. In the past, the common way to dispose of materials was to burn it or simply leave it outside until it disappeared. But times have changed and we now know that waste doesn't disappear but endures in our soil and water. Now more than ever it is important to properly store or dispose of household waste especially those considered hazardous, like motor oil, bleach, and gasoline. Some materials can be disposed of for free at your local Transfer Station. Remember, one quart of oil can contaminate up to two million gallons of drinking water!

Rockin' The Landscape

Hard surfaces - such as paved driveways, walkways, and patios - don't allow water to seep into the soil where it can be cleansed and recharge the groundwater. Instead use gravel or other water permeable materials.

Think About the Sump Pump Dump

It is important to direct sump pump discharges to areas that absorb water, instead of drains or ditches that route the water directly into a nearby stream. Simply pipe sump pump water to flower gardens so it can seep into the soil or be used by the plants. This is also a good solution for roof downspouts.



Wetlands and the buffers around them are great places to learn about the natural world, take a relaxing walk, or do a little birdwatching. All of these low-impact recreational activities are encouraged on public conservation lands in East Kingston.

Landscape Chemical Responsibility

East Kingston residents need to know that improper application and handling of pesticides and herbicides threatens water resources, wildlife, and human health.



For many East Kingston homeowners, using bug or weed killer is a common landscaping practice. But few people realize the dangers of misusing pesticides or herbicides. The following are some steps that every homeowner should take to learn how to use landscape chemicals safely and to protect their environment, family, and community when using pesticides and herbicides.

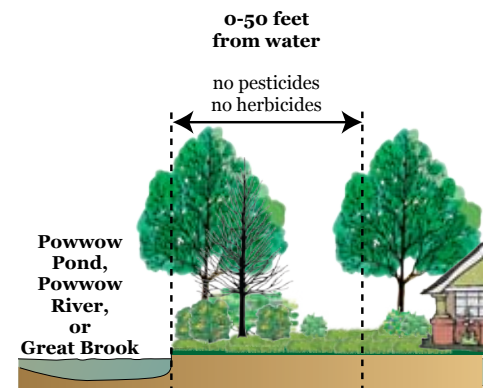
Read And Follow Label Directions

Labels on pesticides and herbicides clearly spell out application, storage, and disposal procedures. They also describe the environment risks, such as water contamination. For example carbaryl, a common active ingredient in many pesticides, carries this environmental warning: "This pesticide is extremely toxic to aquatic and estuarine invertebrates. Do not apply directly to water. Do not contaminate water when disposing of equipment washwater." Follow the label instructions - it is a federal law!

Know The Regulations

The New Hampshire Comprehensive Shoreland Protection Act regulates activities on the shores of the Powwow Pond, the Powwow River flowing out of the pond, and Great Brook, downstream from the juncture of York Brook. Within 50 feet of these water bodies, no chemicals, pesticides or herbicides are permitted. Fertilizers are also banned within 25 feet of the water and only low phosphorous, slow release nitrogen fertilizer may be used in the area that is from 25 feet to 50 feet back from the shoreline.

NH Comprehensive Shoreland Protection Act Prohibits Use of Chemicals Near Protected Waters



Think Twice About Using Pesticides and Herbicides

Handling, storing, and disposing of pesticides and herbicides is a significant responsibility undertaken by a homeowner. Applications should be well planned to avoid rain storms that will wash chemicals into drinking water supplies. Overspray and wind direction should be considered when spraying chemicals. Pets and children should not enter treated areas and places where chemicals are stored. **Never apply or dump pesticides or herbicides in or around streams, storm drains, wetlands, or ponds.**

Given all of the potential risks associated with landscape chemicals, consider living with some pests and weeds in your yard. Properties with a healthy balance of plants and animals suppress weeds and pests naturally. Homeowners should use plants that are hardy, disease resistant, and require little fertilizer.

Gardening for Stormwater

Rain gardens are a straightforward solution to dealing with stormwater runoff around the home

by Jean Eno, Greenland Conservation Commission

Every town in the Seacoast is working to address stormwater runoff issues to reduce flooding or improve water quality. Homeowners can do their part by installing a rain garden that encourages water to naturally be processed on site.

Building A Rain Garden

The first step in creating a rain garden is to pick a good spot. Choose a low area near a downspout, drainage tile, or sump pump discharge. Check your soil drainage, because your rain garden should drain well. To test this, simply make a 10-12" hole, fill it with water, and see if it drains in about an hour. The second step is to prepare the soil for the garden. Mix in compost and moderately fine pine bark to prepare the soil. The last step is to choose plants that tolerate bouts of heavy water. To maximize wildlife habitat for butterflies, frogs or beneficial insects, choose a diversity of native flowers. Focus on perennials, but mix in annuals if you like.



Locate rain gardens in areas that focus stormwater runoff, like a downspout.

For More Information

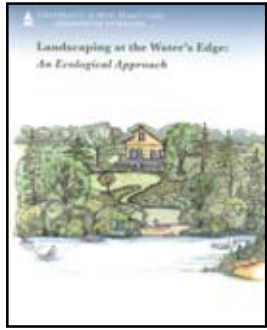
It may not be an Oscar contender, but a great video to learn how to deal with stormwater around the home is "Reduce Runoff: Slow It Down, Spread It Out, Soak It In" from U.S. Environmental Protection Agency and the U.S. Botanic Garden. It can be seen at www.epa.gov/owow/nps/lid/video.html

How Can We Protect Water Quality?

The protection of water quality and other natural resources cannot be accomplished without addressing issues of land use and development. How land is used in the watershed has a great influence on its overall health. Throughout the watershed, proper management of runoff from land used for farming, timber operations or development is very important. Much land use still involves clearing to the edge of wetlands and water bodies, and installing culverts that empty into those wetlands and water bodies. The best long-term measures are the protection of adequate shoreline and wetland buffers. These upland buffers can protect water bodies and wetlands from the impacts of adjacent development thereby protecting the water quality for all users downstream.



The Landscape Design Process



Information for this article was excerpted by permission from "Landscaping at the Water's Edge: An Ecological Approach" by the UNH Cooperative Extension Service, 2007. Copies of this 92-page guide for \$20 may be ordered at extension.unh.edu or by calling 603-862-1564.

Living along a shoreline provides homeowners with many benefits, like beautiful views, fishing access, good birdwatching, and peaceful areas to relax. But living next to water brings with it a responsibility to protect it. After all, it is a valuable asset on your property.

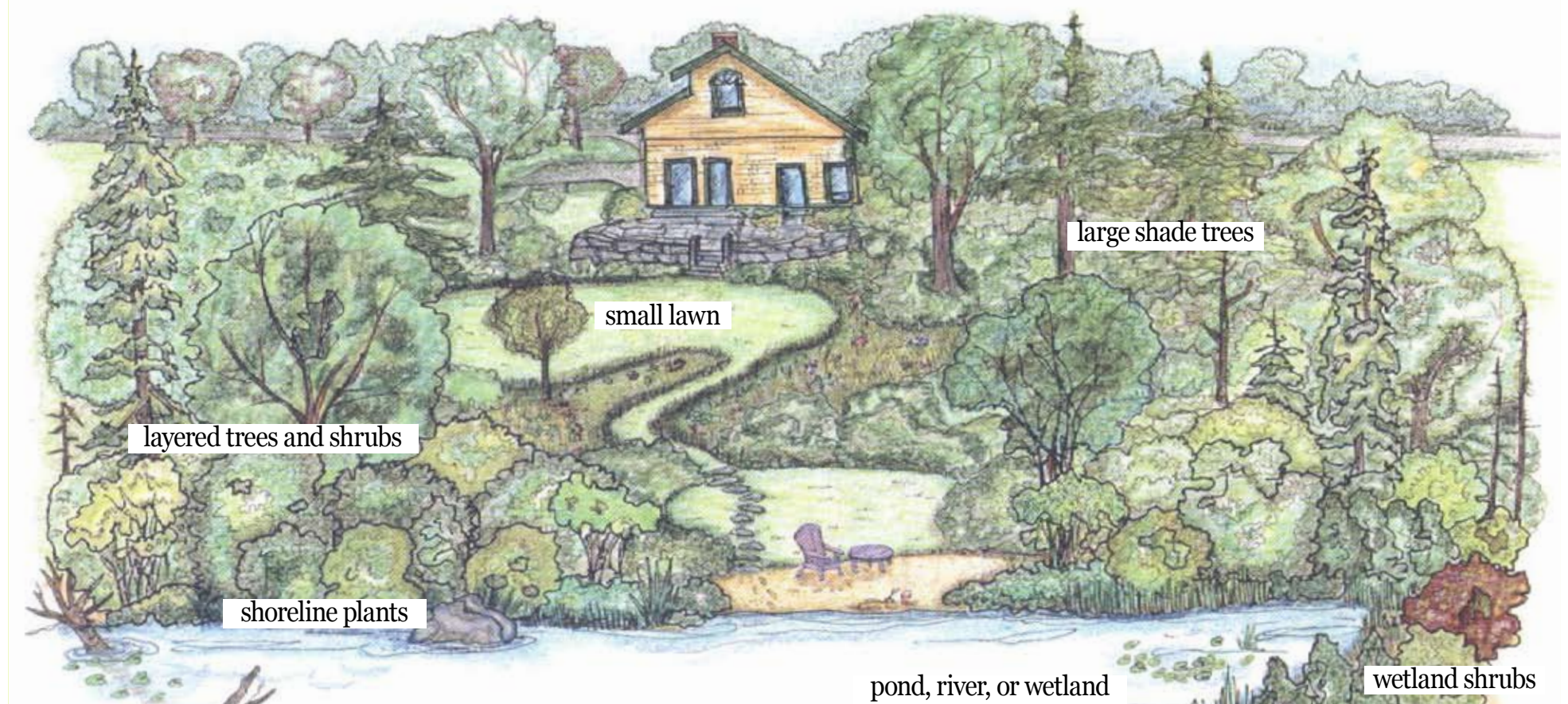
It is important to remember that your land is part of a larger watershed, meaning that water flows through your property on the way to other communities and eventually the ocean.

Before making any landscape changes, make sure you understand East Kingston's regulations regarding shoreland protection, in addition to those within New Hampshire's Comprehensive Shoreland Protection Act.

Shoreline properties should have areas of aquatic, shoreline, lowland transition and upland buffers. All these areas work together to filter and slow water movement from rain storms, irrigation and snowmelt, helping protect the quality of the water.

The first thing to consider in designing a landscape is how to protect the valuable features you already have, then move on to making improvements. For example, you may have a significant cluster of alders and winterberry shrubs along the bank of a pond and a large lawn that extends from the shoreline to your backdoor. You could shrink the size of your lawn by increasing the size of an existing shrub border, which in turn would increase woody plants, while decreasing the labor and cost of maintaining a large lawn.

A Well Planned Buffer



The key to having effective buffers next to ponds, streams, rivers, and wetlands is to maximize diversity of plant types, vertical layers, and habitats. Build a landscape that slows and cleanses rainwater that flows from roofs and driveways.

Ten design principles to help protect and improve your shoreland property

Protect and Improve Soil - Improve poor soil with compost, and keep soil covered with plants or mulches to reduce compaction and erosion.

Maximize Layers. Keep buffers diverse with plants of varying heights. Diversify soil layers by keeping leaf litter and allowing seedlings to grow. Promote diverse root types that build a thick, deep mat of roots.

Pick the Right Plant - Install plants for East Kingston's climate (hardiness zone Zone 4). Native plants provide wildlife habitat and may resist pests and diseases. For non-native plants, choose disease- and insect-resistant varieties. Match a plant's mature size to the landscape, to keep views open without pruning. Consider using plants to help block severe winds.



Think Rainwater Speed Bumps - Plants reduce the force and speed of rainwater flowing over land, especially on steep slopes. Densely layered plantings retain water, releasing it slowly, which conserves soil by reducing erosion. Plants between a stream and impervious surfaces, such as a driveway, slow down rainwater and reduce downstream flooding.

Buddy-up Buffers - Maximize the benefit of a buffer by connecting yours with your neighbor's buffer.

Limit Impervious Surfaces - Replace existing asphalt or cement driveways and walkways with water-penetrating materials such as stone dust, brick, or pavers. This helps increase the amount of water soaking into the soil (plus they look great).

Rethink Your Lawn - Instead of all grass, consider using ground covers and vertical layers of plants. These rougher surfaces slow rainfall and help remove pollution.

Minimize Chemicals - Instead of spraying pesticides, prune and throw away infected plant parts. This will improve air circulation and reduce mold.

Strive for the Lazy Man's Landscape - Design choices, like keeping lawns small or using native plants, reduce the time and money needed to maintain a landscape. Low-maintenance landscapes limit the need for chemicals, which is also better for the environment.

Remember, "Your Land Matters" - Your actions on your land directly affect the ponds, streams, rivers, wetlands, and groundwater in East Kingston. Detergents used in car washing, chemicals used in lawn treatments, gas and oil leaks from mowers may end up contaminating well water or wildlife. Some simple things, like using sand as a deicer or choosing not to use fertilizer will improve the quality of our water resources.

A Word From The East Kingston Conservation Commission and Planning Board



The East Kingston Conservation Commission is pleased to co-sponsor with the Planning Board a Buffer Outreach and Education Project funded by the Piscataqua Region Estuaries Partnership (PREP). The project, which includes

production of this newsletter, focuses on raising awareness of the importance of buffers in maintaining water quality and the health of wetlands, streams and rivers throughout the town. Protection of water resources and other natural resources including wildlife habitat is a primary goal of the Conservation Commission in its service to the town which includes review and comment on development projects and monitoring of conservation easements. The Conservation Commission is also the caretaker of the town's natural resource library, largely compiled by Larry Smith - Conservation Commission Chair from the mid-1980's to 2008.

Although portions of Powow Pond, Powow River and Great Brook are regulated by the state's Comprehensive Shoreland Protection Act (RSA 483-B), East Kingston does not regulate buffers or most activities near its wetlands, streams or rivers. However, the town's zoning ordinance does have standards that restrict the location of some structures, land disturbance and placement of hazardous materials within poorly drained and very poorly drained soils (or wet soils). Therefore, it is the responsibility of land owners to be stewards of the town's water resources and buffers near these resources to protect them against degradation and maintain their values as wildlife habitat and areas of scenic beauty.

A highlight of the Buffer Outreach and Education Project is selection of the Pheasant Run property as a buffer demonstration area, where residents and visitors may explore a natural landscape. The property includes a stream, wetlands, and the surrounding buffer areas which are composed of a mixed hardwood and conifer forest and understory vegetation. This property exhibits a typical upland and wetland boundary that is transitional in nature, following the somewhat irregular changes in topography, vegetation and soils that help identify the location of the wetland edge. For more information, please refer to the Pheasant Run: Buffer Demonstration Area brochure which is available at the East Kingston Town Hall.

The East Kingston Conservation Commission supports the goals of the Buffer Outreach and Education Project and urges residents to join them in protecting natural resources for the enjoyment of future generations.

Sincerely,

East Kingston Conservation Commission: Dennis Quintal (Chairperson), Ron Morales, Marilyn Bott, and Scott Urwick

East Kingston Planning Board: David Sullivan (Chairperson), Ed Warren (Vice-Chairperson) Ron Morales, Robert Marston, David Pendell (Selectmen's Representative), Robert Forrest, Joe Cacciatore, Peter C. Gilligan

ACKNOWLEDGEMENTS

This publication was developed by a subcommittee of the East Kingston Conservation Commission with the support of the Community Technical Assistance Program of the Piscataqua Region Estuaries Partnership (PREP).

Special thanks to:

Dennis Quintal, Chair of the Conservation Commission

Julie LaBranche, Rockingham Planning Commission

This publication was produced by the Piscataqua Region Estuaries Partnership (PREP) with funding from the Otto Haas Charitable Trust 2 Fund of the NH Charitable Foundation. PREP is a collaborative program of the U.S. Environmental Protection Agency administered through an agreement with the University of New Hampshire.



Recommendations To Improve Protection of East Kingston Natural Resources

In 2009, the Piscataqua Region Estuaries Partnership (PREP) conducted an extensive assessment of regulatory and non-regulatory approaches to managing natural resources in 52 municipalities in the Seacoast region.* PREP enlisted the help of four regional planning commissions and municipal planning officials from every town to provide data on 70 natural resource management parameters. More than 900 hours were spent by PREP staff, professional planners, and local planning officials to compile and analyze the data. With this information, PREP is able determine the strengths and weaknesses of management efforts across the entire coastal watershed. After close examination, PREP has developed the following recommendations for East Kingston to better manage and protect both local and Exeter River watershed resources.

1. Take Inventory of the Town's Natural Resources

In order to protect valuable natural resources in East Kingston, they must first be documented. PREP recommends that East Kingston join many other Seacoast communities in completing a comprehensive Natural Resources Inventory to help locate and protect sensitive areas.

2. Help Developers Steer Clear of Wildlife Habitat

Discussing ways to protect wildlife habitat with a developer before a permit is submitted is an effective way to prevent damaging rare habitats. PREP recommends that on-site, pre-application meet-

ings between developers, municipal officials, and natural resource specialists become a standard part of the development process in town.

3. Extend Protection to Vernal Pools

Vernal pools are areas that flood during part of the year, usually in the spring. These pools are home to many unique species, such as spotted salamanders, wood frogs, and fairy shrimp (see article below). Vernal pools are frequently overlooked by landowners and developers because they are not mapped or were not full of water during a site review. To protect vernal pools and associated wildlife, PREP recommends that the Town map their vernal pools

and explicitly protect them in the Town's wetlands regulations.

4. Identify and Protect East Kingston's Prime Wetlands

A Prime Wetland is a designation recognized by the New Hampshire Department of Environmental Services that indicates a wetland is of exceptional value to the community and is provided extra protection from development. Prime Wetlands provide many vital services, such as flood control, water purification, wildlife habitat, and scenic beauty. PREP recommends that East Kingston identify and designation Prime Wetlands to better protect valuable community resources.

* Funding for the Piscataqua Region Environmental Planning Assessment was provided by a grant to PREP from the Barbara K. & Cyrus B. Sweet III Fund of the New Hampshire Charitable Foundation - Piscataqua Region.

Citizen Letter

Fingers positioned above the keyboard, my mind searches for an appropriate word to indicate the need for open space. The word VITAL comes to mind so I use it but consider it to be rather inadequate. I then search for a word that describes the loss of open space. Yes, I have the word - DISASTER.

Though we now consider East Kingston's immediate predicament, we must also include in our concerns the state of New Hampshire, the United States of America and indeed this entire planet.

What are the driving forces that result in loss of open space? My answer is: (a) monetary greed and (b) the continuous onslaught of humanity, simply put, "over population". Past efforts to stem the tide have failed worldwide and are failing in the USA but perhaps, just perhaps, we could have some success in East Kingston. When I was a lad growing up in town, late 30's - early 40's, the population was about 400. There were 32 active farms, some small, some quite large, and plenty of open space. What is the population now, nearing 2,500 or more with all the new developments? Between 2000 and 2005 East Kingston was the fastest growing town in the entire state with a 25.1% increase to 2,231. Like our nation itself, the population expansion of East Kingston did not occur from within but from without, meaning outsiders moving in. And this is our problem. Developers come in, buy large tracts of land, build houses, make money, then move on. The result is a vastly increased population, vastly increased strain on our small town budget and tremendous loss of open space.

As a town, East Kingston contributed mightily to the food supply for ourselves and for others, including acres of potatoes, apples, blueberries and turkeys. As the farms have gone, everywhere we look, we see houses popping up on once productive land. We see forests, fauna and flora ripped up and killed or discarded. Increased populations destroy hundreds of thousands of acres of tillable land each year, with meaningful loss of decent water as well.

What can we do? Speaking only for myself I have been a very strong supporter of the Open Space organization for many years. Do I have my land in a conservation easement? Certainly I do. Do I speak to others who have acreage? Certainly I do, encouraging them to put land in a conservation easement. Yes, whenever I have the opportunity. Any results? Not much, mostly apathy or reluctance to see the critical need to preserve open space unless there is monetary gain.

With the passing in 2008 of Mr. Lawrence "Larry" Smith, East Kingston lost a dedicated force for conservation. Has a replacement been found for him?

Thank you,

Herb Woodworth

The Pheasant Run Wetland Study Area

The *Pheasant Run Wetland Study Area* is a 5-acre wooded property that contains an interesting wetland with a small pool and stream. Access to the property is off of Pheasant Run Road and will be marked in 2010 with new signs bought with a grant from the Piscataqua Region Estuaries Partnership (PREP).



A Public Access Recreational Area

The *Pheasant Run Wetland Study Area* is open to the public during daylight hours, 365 days of the year. Public access is provided from Pheasant Run Lane. Parking is available along the gravel shoulder at and across from the property entrance. The property frontage begins from a culvert on the north side (right facing the property) approximately 475 feet south (left facing the property) to the edge of a stone wall that extends to the forest edge at the road.

The Town of East Kingdon acquired the Pheasant Run Property as a donation to the town as part of subdivision of the old Red Gate Farm. The 5-acre property contains mostly a full canopy forest with sparse understory, a stream and a wetland.

The wetland has patches of standing water in some of the higher areas and a permanent pool and stream on the lower end of the property.

What Is a Wetland?

Wetlands are identified based upon the presence of three key features:

- 1) plants adapted to survive in water or wet soil conditions,
- 2) water at or near the surface for more than two weeks during the growing season, and
- 3) hydric soils (water-saturated, poorly drained).

Wetland Functions

Wetlands are valuable resources and worthy of protection from disturbance or inappropriate uses. Wetlands on the Pheasant Run property provide critical ecological functions and benefits to the community including:

- ✓ Flood water and stormwater storage,
- ✓ Removal/storage of silt and other sediments,
- ✓ Removal and uptake of nutrients and pollutants from runoff and surface waters, and
- ✓ Habitat and reproductive areas for plants, fish and wildlife.



Production of this brochure was funded by a grant from the Piscataqua Region Estuaries Partnership and the Otto Haas

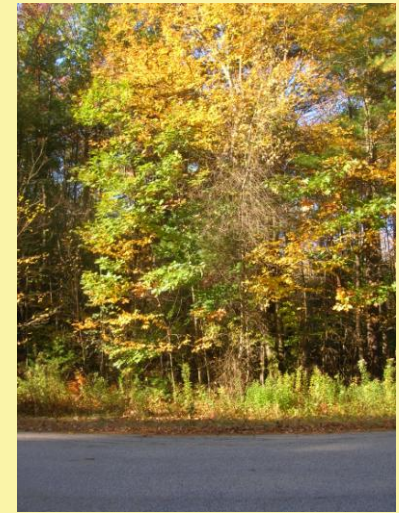
Charitable Trust 2 Fund of the NH Charitable Foundation.

PHEASANT RUN WETLAND STUDY AREA

TOWN OF EAST KINGSTON
NEW HAMPSHIRE

Our Natural Gem

Pheasant Run Wetland Study Area is a place for people to reconnect with nature in East Kingdon





Pheasant Run Wetland Study Area is open year around during daylight hours. To visit the property, park on the gravel shoulder on Pheasant Run Lane (above).

East Kingdon is fortunate to still have much of the rural charm that makes living in New Hampshire so special. The ability to take relaxing walks through beautiful natural areas just minutes from your back door is one of the reasons residents love this town. Many of these open natural areas in town are on town-owned and conservation lands. The Pheasant Run – a town owned property - is getting extra attention to make it even more accessible to residents.

Guided Tour of Natural Features

Beginning from the Pheasant Run Lane entrance, follow the markers located on trees to observe the following features.

- Forest Canopy:** the crowns of trees form a continuous covering over the forest, letting in sunlight in small patches. Lack of sunlight prevents growth of thick understory plants.
- Wetland:** areas of hummocks and depressions – some depressions are filled with water or feel “spongy” when stepped upon – and an open water area through which a small stream flows. 
- Stream:** a defined channel with flowing water most months of the year. The stream winds its way through the wetlands which serve as storage areas for flood waters during storms. The stream exists the property through a culvert beneath Pheasant Run road.
- Vernal Pool:** a depression in the landscape where water ponds for several months during the year and supports specific species including frogs, fairy shrimp, salamanders and turtles. Water stains at the base of trees and tree roots above the soil indicates a high water table or standing water during certain periods.
- Nurse Log:** fallen trees and stumps on the forest floor serve as a nursery providing nutrients and shelter from which new trees and other vegetation grow. 
- Buffer:** the area of natural vegetation that extends outward from the wetland and is part of the surrounding forest. Buffers contain the transitional areas between the wetlands and surrounding upland. These transition areas are identified by the presence of hummocky topography, moss covered rocks and logs, water stains on leaves and trees, raised tree roots (high water table), and ferns.

Buffers Provide Valuable Functions

Buffers from wetlands, streams, rivers and ponds serve many functions that are valuable to the community, wildlife and the health of the region’s watersheds and estuaries. Buffers:

- ✓ Remove pollutants and contaminants from stormwater runoff
- ✓ Reduce erosion by slowing runoff
- ✓ Recharge groundwater
- ✓ Store flood waters and runoff
- ✓ Stabilize stream banks and shorelands
- ✓ Moderate water temperature in streams
- ✓ Provide wildlife habitat

What Is the Forest Made Of?



The forest contains a combination of both upland and wetland species of trees, plants and understory vegetation.

Although some species can occur in both wetland and upland areas, their distribution here is typical of species found primarily in either wet soils or dry soils, which should provide a rough estimation of the wetland/upland boundary.

Refer to the table below for a list of these species.

Buffer Layer	Upland/Transitional Species	Wetland Species
Trees	White Pine White Birch Ash, Oak Hemlock, Cedar	Red Maple Shagbark Hickory Ironwood
Shrubs	Winterberry Serviceberry Elder	Highbush Blueberry
Groundcover	New York Fern Trifol Golden Thread	Partridge Berry Skunk Cabbage Royal Fern Cinnamon Fern Swamp Aster

What Lives In the Forests and Wetlands?

The Pheasant Run Conservation Area is home to many fascinating creatures – reptiles, amphibians, mammals and birds. Wood frogs are particularly abundant, living in the wetlands and uplands during different times of the year.



The Pheasant Run Conservation Area has many species of birds - such as Green Herons, Barred Owls, Eastern Wood-pewees, and Broad-winged Hawks - that can be seen or heard around the property. During the summer and fall animals such as deer, raccoons, and fishers traverse the property. The winter snows and spring mud capture the tracks of these roaming animals and make for a fun afternoon of deciphering the signs of wildlife.

Being Good Stewards of the Land

Even though Pheasant Run Conservation Area is a wild natural place, it must be maintained. A dedicated group of volunteers are needed to pick up trash, remove invasive species, and keep an eye out for vandalism.

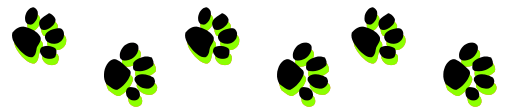
Keeping Our Land

The Pheasant Run Conservation Area is maintained by volunteers. *If you are interested in becoming a steward volunteer, contact Dennis Quintal, Chair of the Conservation Commission, at 642-8406.*

Please make every effort to keep the study area free of litter and do not disturb the plants and forested areas.



SHORELAND



SOLUTIONS:



*Helpful tips for homeowners
to maximize the benefits of
buffers from wetlands, ponds,
streams and rivers*



*A discussion of the value of buffers and land owner actions that
protect water quality, improve wildlife habitat, and lessen flood damage
with presentations by:*

Julie LaBranche

*Rockingham Planning Commission
Senior Planner*

Phil Auger

*UNH Cooperative Extension
Educator*

EAST KINGSTON LIBRARY

Wednesday - March 31, 2010

7:00 to 9:00pm



*This presentation was funded by a grant from the Piscataqua Region Estuaries Partnership and the
Otto Haas Charitable Trust 2 Fund of the New Hampshire Charitable Foundation*



Preserving Wetland Shoreland and Riparian Buffers

East Kingston Public Library

March 31, 2010

7:00 - 9:00 pm

Presented by



Julie LaBranche

Phil Auger



UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION



Workshop Overview

Julie LaBranche

- Introductions and Overview
- Buffer Functions and Values
- Buffers in East Kingston

Phil Auger

- Regulatory vs. Voluntary Protection
- Land Protection and Conservation



This presentation was funded by a grant from the Piscataqua Region Estuaries Partnership and the Otto Haas Charitable Trust 2 Fund of the NH



Focus on Buffers

An overview of the functions and values of buffers and the rationale for protection

What Are Buffers?

A buffer is a naturally vegetated area next to surface waters and wetlands that acts as a transition between them and adjacent uplands [*ecological*]

A buffer is a naturally vegetated area along a shoreline, wetland, stream or river where development or disturbance is restricted or prohibited [*regulatory*]

Vegetated Buffers

- All buffers are important – riparian, wetland, and shoreland
- Buffers provide a defense against the impacts of impervious surfaces, nutrients, and erosion
- Critical in all areas, including developed areas



Buffer Benefits and Services

- Remove nitrogen, sediments and other pollutants
- Stabilize stream banks
- Maintain stream ecology and aquatic habitat
- Shade streams
- Provide flood control and storage
- Protect drinking water supplies
- Provide wildlife habitat and corridors



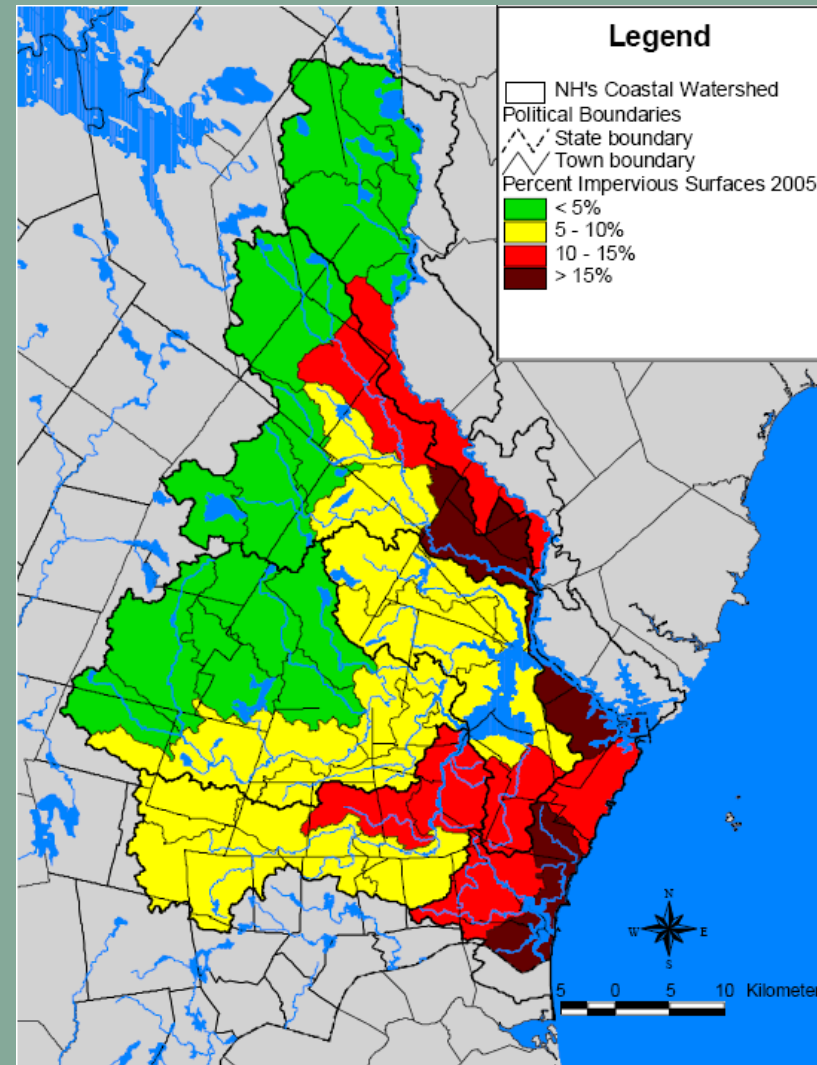
Buffer Benefits and Services

- Protect infrastructure (roads, crossings, structures)
- Provide recreational opportunities
- Improve aesthetics: urban and rural scenic views
- Increase property values (open space, water access)



Why Buffers Are Necessary

- Increasing population and development
- Increasing impervious surfaces
- Decreasing water quality
- Increasing need for flood control and stormwater management

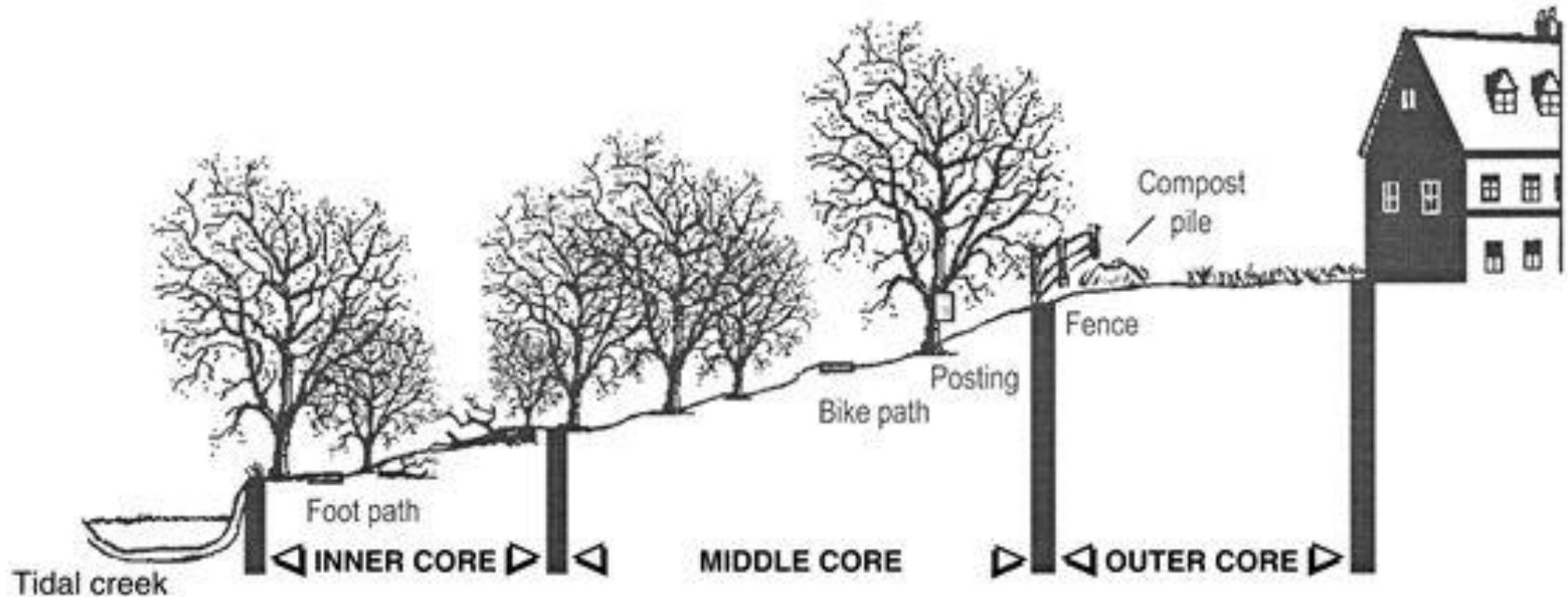


What Are Buffers Made of?

- Tree and shrub layer
- Ground cover and leaf litter
- Subsurface – roots, soil, rock



Buffer Zones



WATER SOURCE
water quality &
aquatic habitat
enhanced.

CREEKSIDE ZONE
25 ft. wide;
mature forest;
very restricted uses.

MIDDLE ZONE
50+ ft. wide;
managed forest;
restricted uses.

OUTER ZONE
25+ ft. wide;
forest or turf;
few restrictions.

Source: Schueler, WPT 2/94, p.19 (Graphic Courtesy of the Center for Watershed Protection)

How wide should a Buffer be?

Width should be determined by:

- Resource to be protected
- Desired function(s) of the buffer
- Adjacent land use and land cover
- Soils, slopes, and vegetation within the buffer

Minimum Buffer Widths by Function

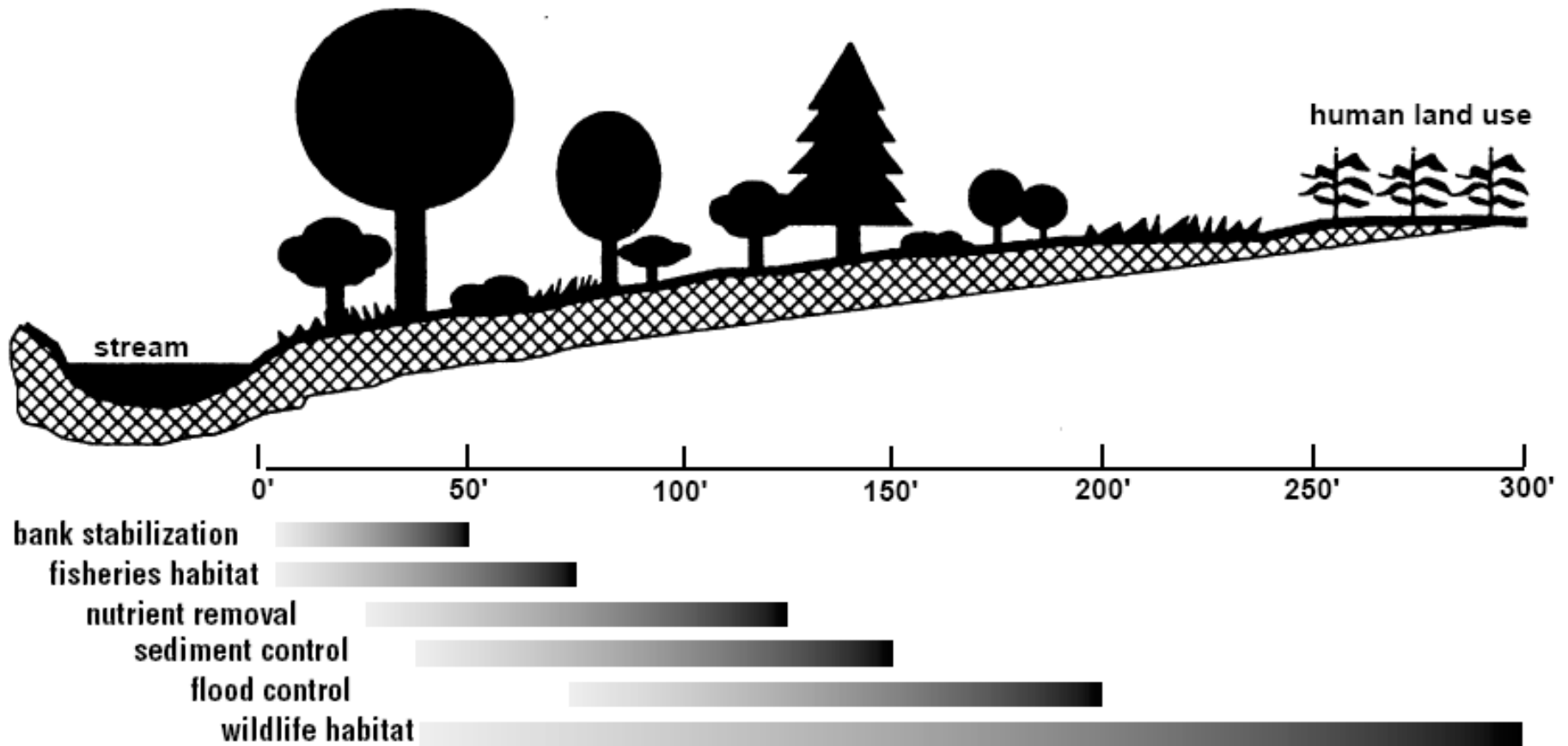
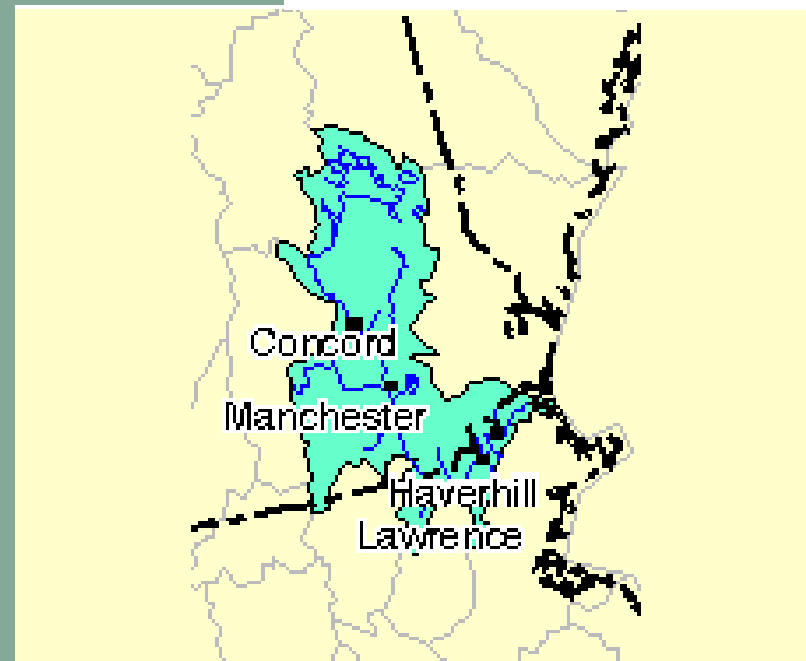
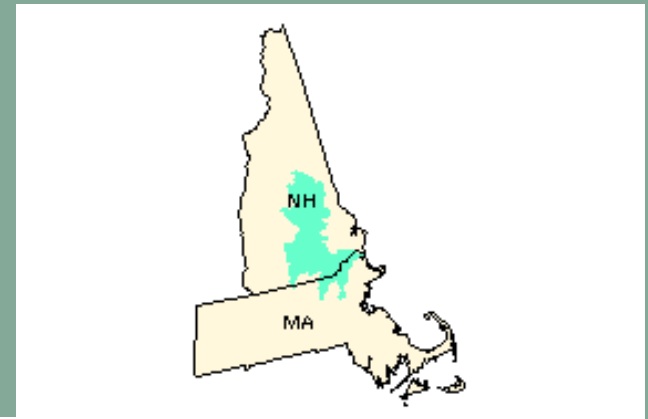
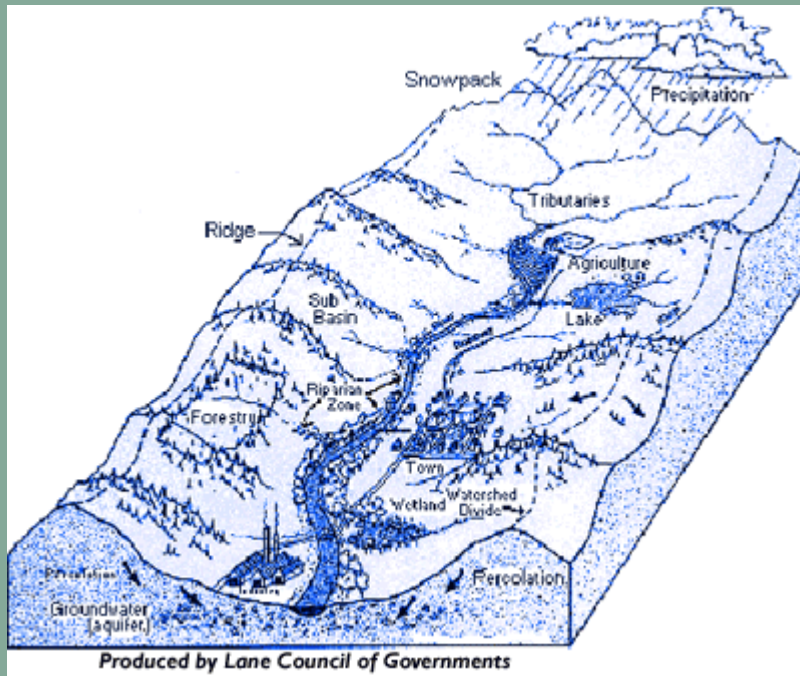


Figure source: Connecticut River Joint Commissions Factsheet on Riparian Buffers

Know Your Watershed

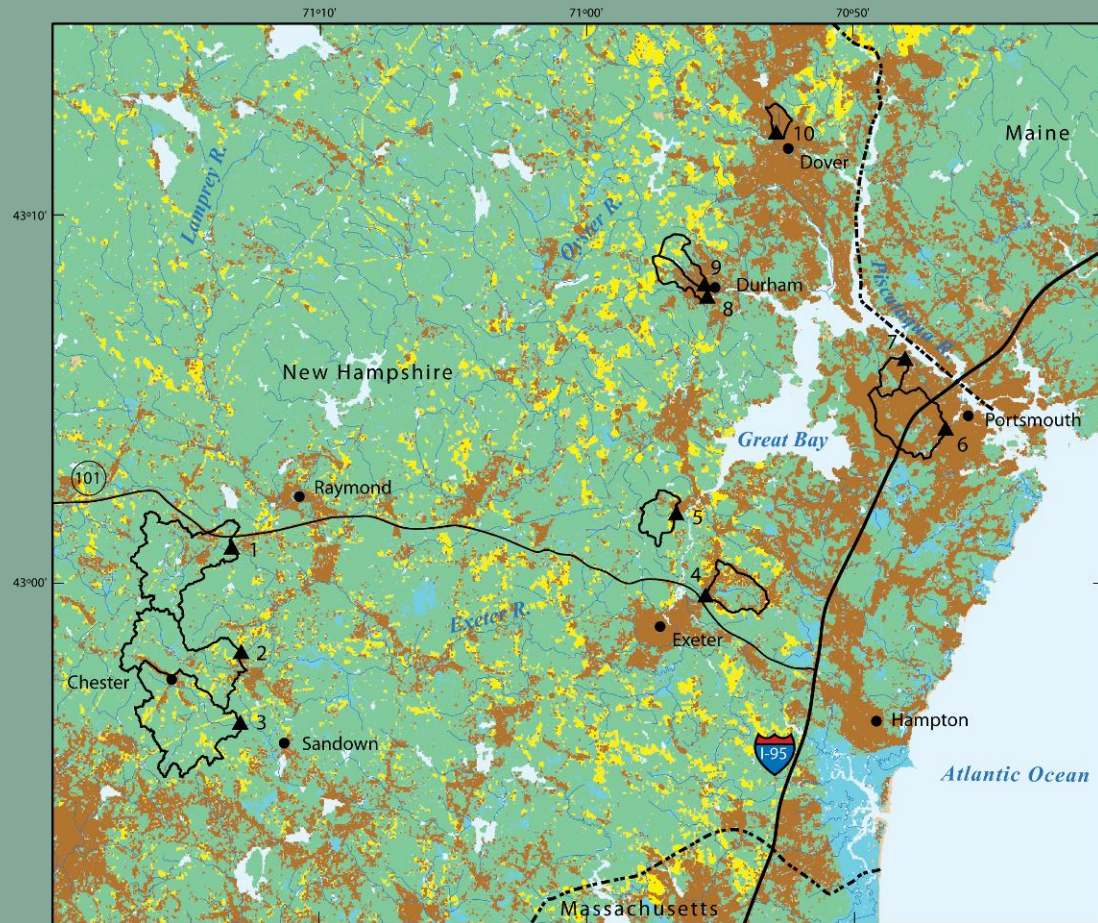
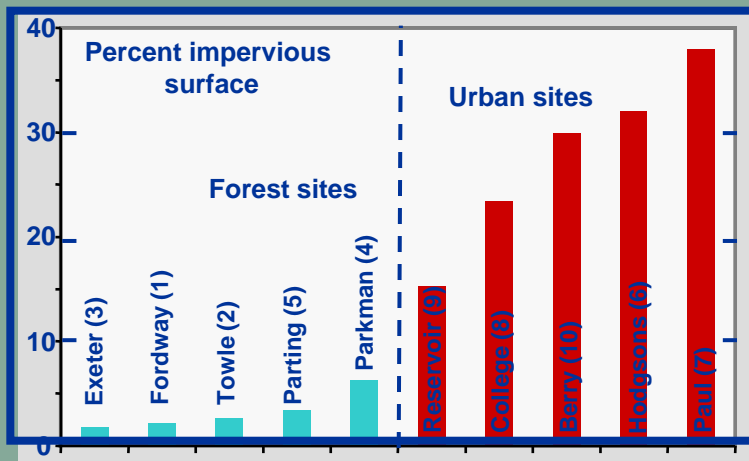


Powow River -
Merrimack River
Watershed

Effects of Development on Small Streams

Study Objectives

- Assess how water quality of small streams varies as a result of land use
- Relate water quality to forest and urban watershed characteristics



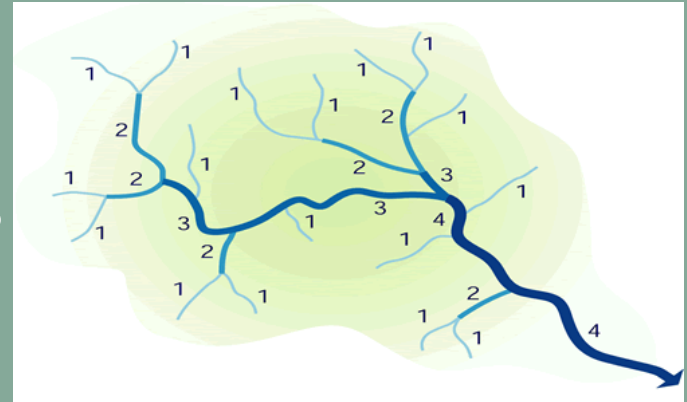
Stream Study Results

- Chemical concentrations increased with increasing levels of impervious surfaces and urban land near streams
- Aquatic insect communities were adversely affected at sites with higher levels of impervious surfaces and urban land near the stream
- Results show that buffers play a key role in maintaining the physical, chemical, and biological integrity of streams

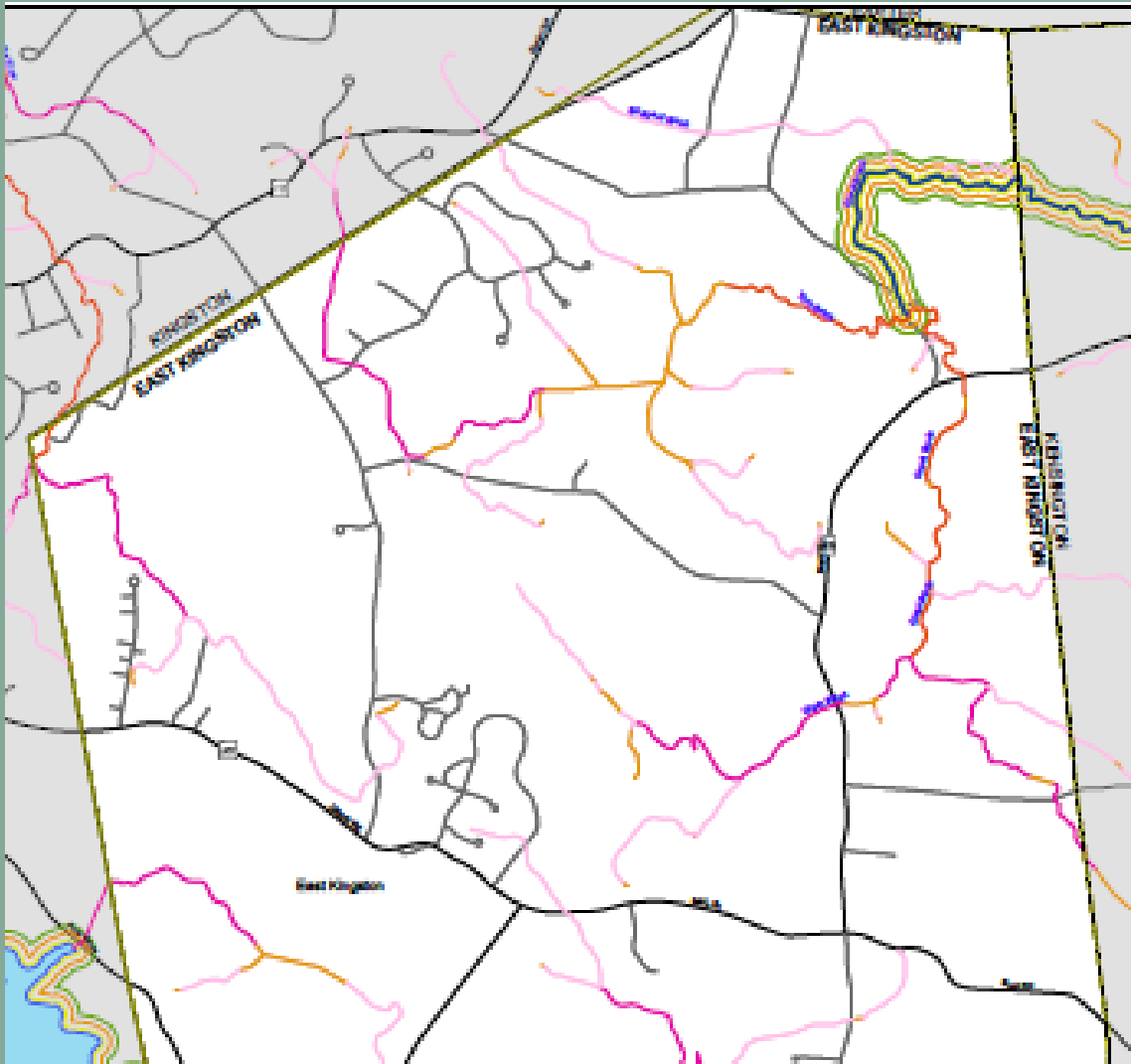


Importance of Headwater Streams

- Most vulnerable to development impacts
- Likely to have the least protection
- Provide important ecological habitat connections
- Provide storage and groundwater recharge capacity
- Improve water quality
- Nationwide headwater streams comprise 53-59% of stream network (EPA estimate)



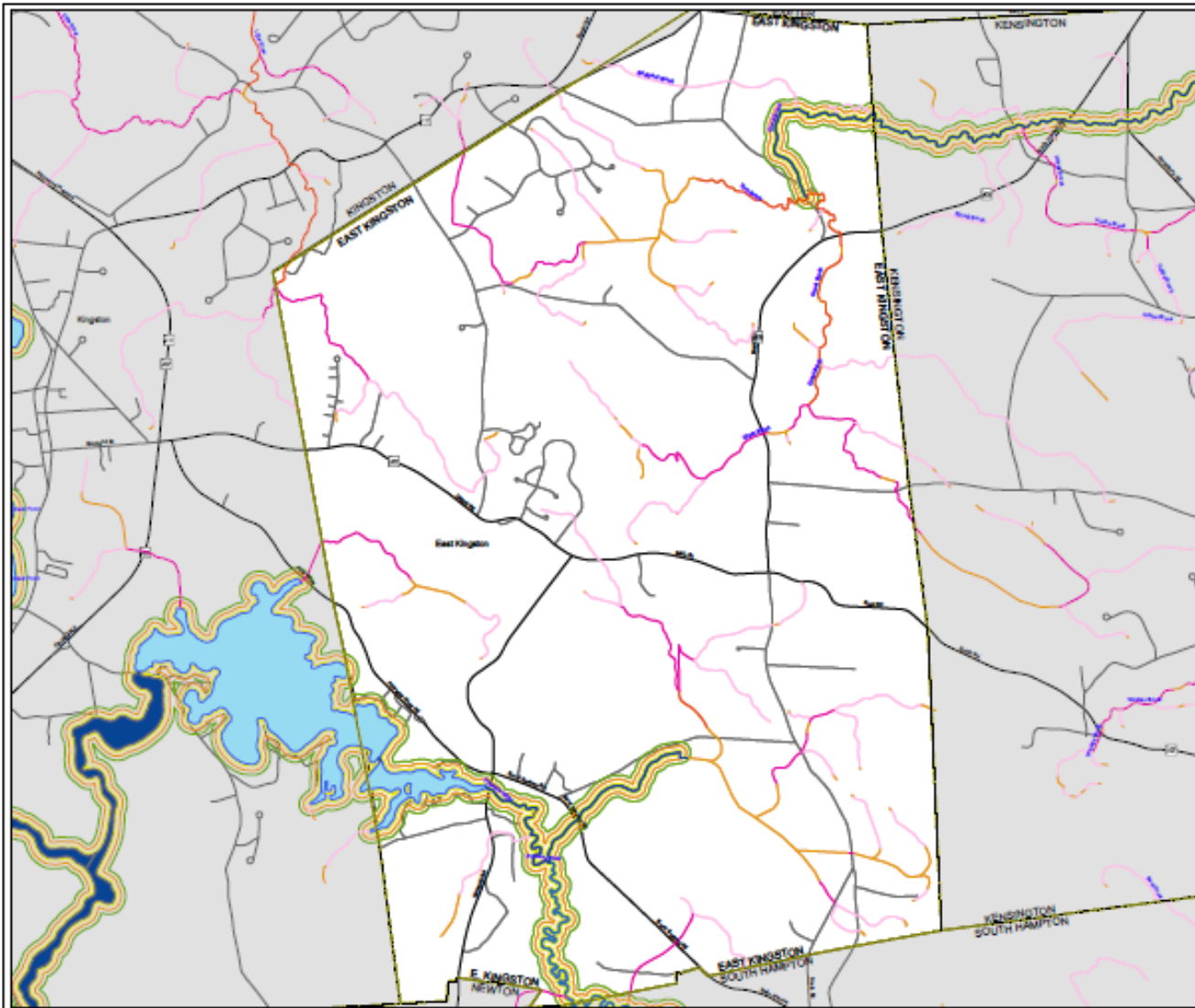
Where are headwater streams?



4th Order and higher streams = lower reach of Great Brook

All others are headwater streams

Comprehensive Shoreland Protection Act (CSPA in East Kingston



Rockingham Planning Commission Standard Map Set - August 2008

Comprehensive Shoreland Protection Act Map

NH RSA 483-B

East Kingston

New Hampshire

Stream Order

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Buffer

- 50' Primary Building Setback and Waterford Buffer
- 150' Natural Woodland Buffer
- 250' Protected Shoreland

Other

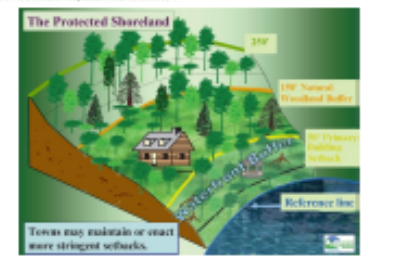
- Blue in stream order data to be corrected
- Comprehensive Shoreland Protection Act - Lakes, Ponds, Rivers and Tidal Waters

New Hampshire RSA Chapter 483-B Comprehensive Shoreland Protection Act

This Comprehensive Shoreland Protection Act (CSPA) is a state law that requires a local planning commission to create a local shoreland protection plan for the town's water bodies. The plan must include a map of the town's water bodies and a list of the town's water bodies. The plan must also include a list of the town's water bodies that are subject to the CSPA. The plan must also include a list of the town's water bodies that are not subject to the CSPA.

For Planning Purposes Only

While every effort has been made to verify all data on this map, there may be data errors. This map is for planning and guidance purposes only. Any questions about the CSPA should be brought to the attention of the CSPA. Please visit the NH CSPA website <http://www.nh.gov/governor/officeofenvironmentalaffairs/cspa.htm>. Data on this map were verified by www.nh.gov/governor/officeofenvironmentalaffairs/cspa.htm.



Data Sources

Water features are derived from the New Hampshire Hydrography Dataset (NHHD) is a feature-based database that automatically and uniquely identifies the stream segments or reaches that make up the state's surface water drainage system. The NHHD, developed at 1:24,000 scale, is an extract from the High-resolution National Hydrography Dataset (NH2D) housed at the US Geological Survey.

The road data is the NHDOT Statewide dataset containing the location of state, local and selected private roads and their associated attributes, including road names. For attribute data dictionary, see the NH Road DOT Code Description file.

Funding for this map was provided in part by the NH Department of Environmental Services (DES).

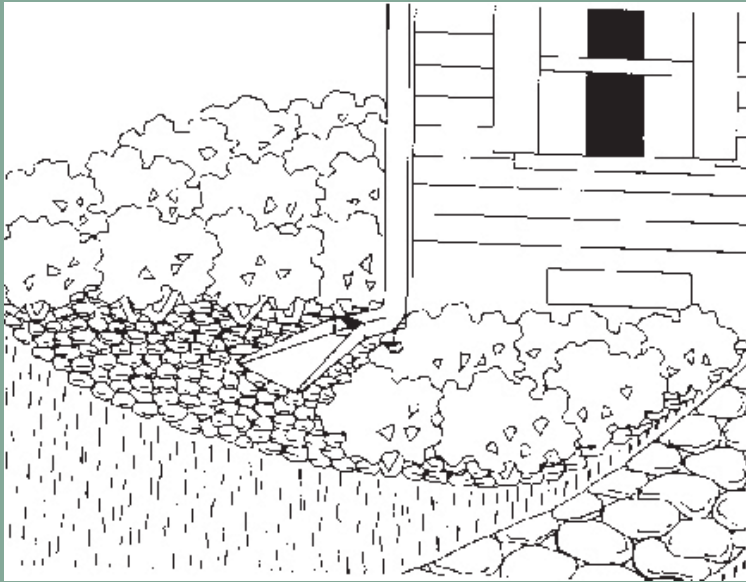
ROCKINGHAM PLANNING COMMISSION

Natural Vegetated Buffers



**Buffers are low-tech,
high-performance options
for stormwater management
and resource protection.**

Shoreland and Buffer Solutions

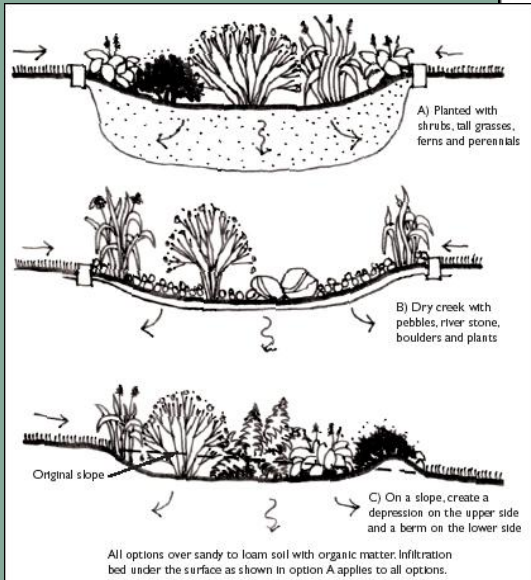


Manage Stormwater

Shoreland and Buffer Solutions



Shoreland and Buffer Solutions



Rain Gardens

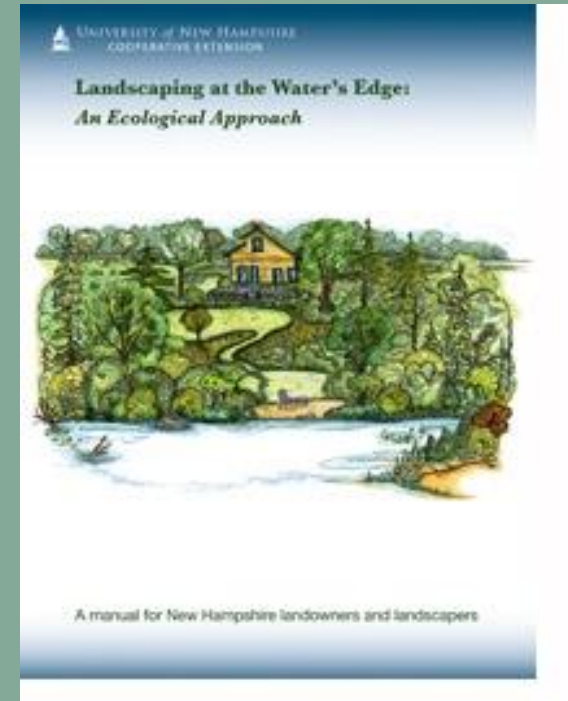
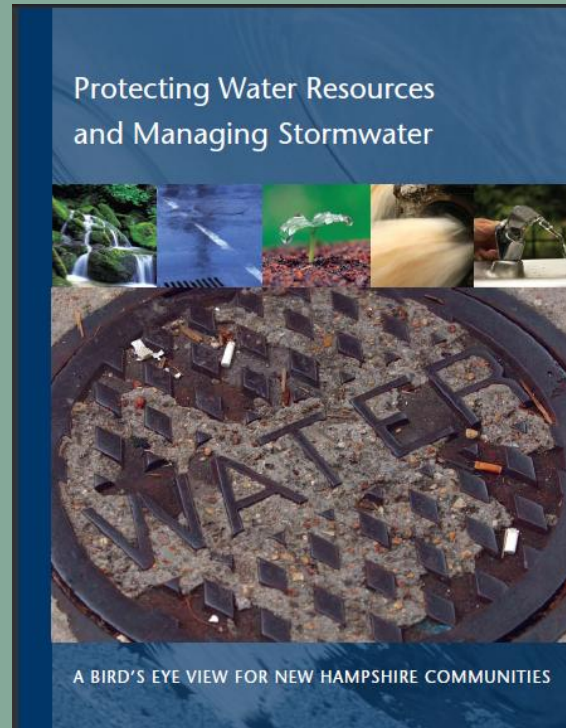
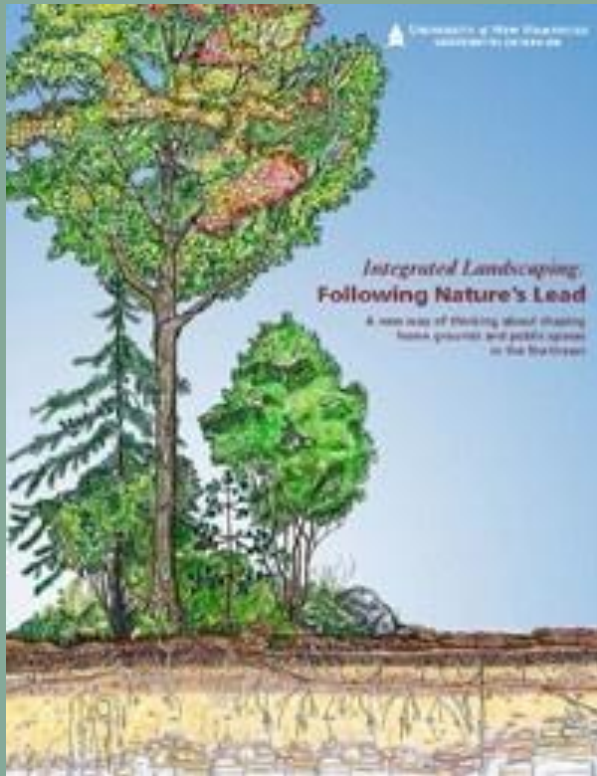
Shoreland and Buffer Solutions



Shoreland and Buffer Solutions

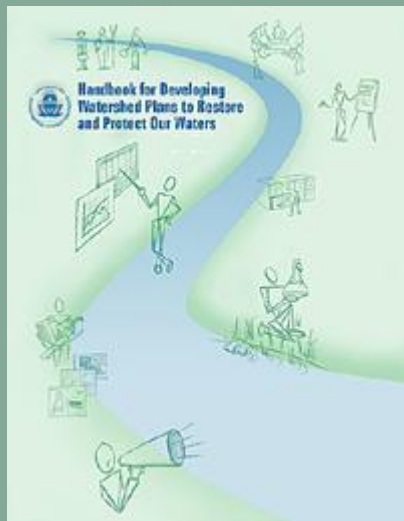


Landscaping Resources



Other Resources

Handbook for Developing Watershed Plans to Restore and Protect Our Waters



VIDEO →

<http://www.epa.gov/weatherchannel/stormwater.html>

or Play Online at
<http://www.clu-in.org/search/t.focus/id/602/>



http://www.epa.gov/owow/nps/watershed_handbook/#contents

EPA - Office of Wetlands, Oceans & Watersheds
www.epa.gov



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IN THE
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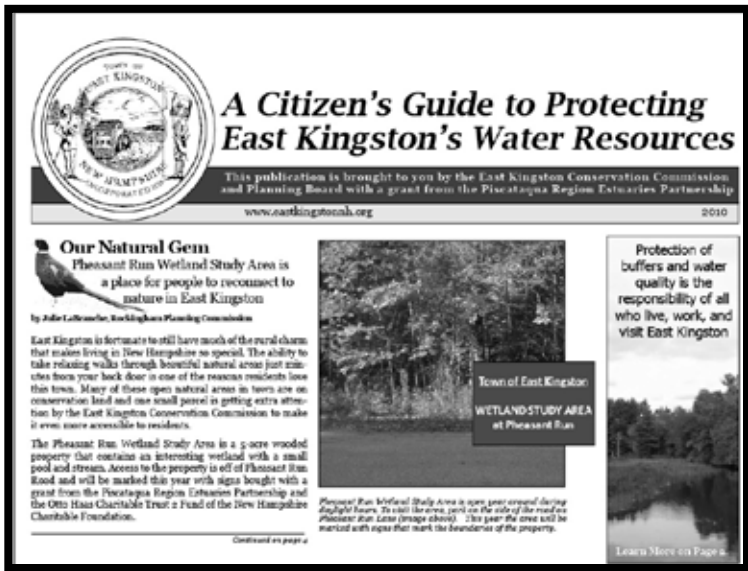
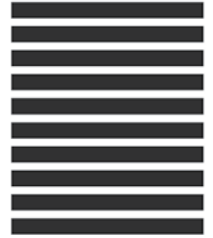
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BUSINESS REPLY MAIL

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UNIVERSITY OF NEW HAMPSHIRE
PISCATAQUA REGION ESTUARIES PARTNERSHIP
123 NESMITH HALL
DURHAM, NH 03824-9987



WHAT DO YOU THINK
OF THE LATEST
PUBLICATION FROM THE
EAST KINGSTON
CONSERVATION
COMMISSION AND PLANNING
BOARD?

*11 EASY QUESTIONS INSIDE
(takes only 5 minutes to complete)*

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East Kingston, NH 03827

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123 Nesmith Hall
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Questionnaire for *A Citizen's Guide to Protecting East Kingston's Water Resources.*

On March 19, the East Kingston Conservation Commission and Planning Board sent every household in town a newspaper called *A Citizen's Guide to Protecting East Kingston's Water Resources*. The newspaper was put together by the Town boards and the Rockingham Planning Commission, but the printing and mailing was paid for by a grant from the Otto Haas Charitable Trust 2 Fund of the NH Charitable Foundation through the Piscataqua Region Estuaries Partnership (PREP). PREP wants to know what you thought of the newspaper. If citizens find this kind of publication useful when making decisions about local water resources, then the service will be offered to more towns in the region.



————— Please answer the following questions —————

1. Did you receive this newspaper in the mail? (circle one) YES NO
2. Did you see it at a location around town? Where? (i.e. Town Hall, Library, etc. . .) _____
3. How much of the newspaper did you read? (circle one) 100% 75% 50% 25% 0% did not read
4. Did you think the information in the newspaper was accurate? (circle one) YES NO
5. Do you feel you learned something new about East Kingston's water resources? (circle one) YES NO
6. How useful do you think the newspaper is? (circle one) Very Useful Somewhat Useful Not Useful
7. After reading this newspaper, do you think you will change the way you maintain your property this year to help protect water resources? (such as maintaining a larger wetland/shoreland buffer, reducing or eliminating the amount of fertilizer you use, directing stormwater to vegetated areas on your property) YES NO
What changes do you think you will make? _____
8. What water resource issue would you like to know more about in East Kingston? _____

9. Do you think we should produce more newspapers like this one in East Kingston and in other towns?
Please explain _____

10. How long have you lived in East Kingston? _____ YEARS
11. Does your property border a stream, river, or a wetland? (circle one) YES NO

-----**Thank you for completing this questionnaire, please mail back to PREP**-----

Simply refold this sheet so that the Business Reply address appears on the outside. **You must tape the sheet closed.** You may complete this questionnaire online instead at www.prep.unh.edu/east_kingston.htm (survey ends April 9th).

East Kingston Buffer Newspaper Evaluation Summary

TOTAL RETURNED SURVEYS	44	
Read more than 50% of the paper	80%	35 out of 44 replied 75% or 100%
Thought the paper was accurate	89%	5 out of 44 did not answer
Learned Something	88%	37 out of 42 learned something
Thought it was VERY useful	57%	24 out of 42 replied VERY 17 out of 42 reolied
Thought it was SOMEWHAT useful	40%	SOMEWHAT
Will Make Changes	54%	23 out of 42 replied Yes
Change fertilizer Use	43%	10 out of 23
Address buffers and increase on property	21%	5 out of 23
Address Stormwater control on property	13%	3 out of 23
Address impervious pavement	5%	1 out of 23
Will NOT make changes	43%	18 out of 42 replied NO
Already Practicing these habits	28%	5 out of 18
Live in Condo, cannot do these things	23%	4 out of 18
Create more for other towns - YES	83%	24 out of 29 replied YES
Abutter to water resource	77%	33 out of 43 replied YES