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Wetland Buffer Characterization and Public Outreach in North Hampton

By: Dave Kellam, Project Manager, New Hampshire Estuaries Project

12/4/05

Abstract:

This report includes a characterization of wetland buffers and buffer protection in North Hampton and a community outreach newsletter that focuses on the protection of the North Hampton wetland buffers. Consultants from Vanasse Hangen Brustlin, Inc conducted field examinations of key North Hampton wetland buffer areas and issued a technical memorandum that characterize wetland buffer areas in the town and discusses of the value of these areas in terms of public interest and property values. Much of the information presented in the technical memo was communicated in an eight-page newsletter produced at Fosters Daily Democrat. Fosters produced 3,000 copies and UNH Mailing Services sent them using saturation mailing rates that delivered one to every household in North Hampton (1925 residences), The newsletter highlights community wetland resources, functions and values of wetland buffers in North Hampton, and actions citizens can take to protect wetland buffers in the community. An electronic version of the newsletter is posted on the Town of North Hampton website.

Introduction:

The Town of North Hampton Conservation Commission submitted an application to the New Hampshire Estuaries Project (NHEP) Community Technical Assistance Program (CTAP) to receive technical assistance to curb the continued rapid deterioration of the Town's critically important wetlands buffers and asked for an assessment of the pattern of buffer encroachments, conduct interviews and visit some of the key areas where buffers have been encroached upon, and develop an action plan with specific recommendations and action items to mitigate buffer encroachment. This will also require assistance in implementing an effective Town-wide public awareness program as described below.

The North Hampton Conservation Commission stated goals were to:

1. To **better educate the members of other Town boards** on the vital importance in the protection of wetland buffers.
2. To **influence those Town Boards and Staff** which have a direct role in approving encroachments into wetlands to be more aware of the ramifications of their decisions and to be more active in the enforcement of the 100 foot wetlands setback.
3. To bring **increased public awareness of the importance of buffers** into focus to stimulate increased public pressure on Town Boards to enforce the wetlands buffer ordinance.

Technical Assistance

CTAP provider Vanasse Hangen Brustlin, Inc was assigned the task of producing a technical memorandum that utilizes existing data to describe the importance of the 100 foot wetlands buffer setback as established by the

North Hampton Wetland Ordinance with respect to public interests and property values. The project involved researching relevant scientific literature, consultation with the Conservation Commission, site visits to critical buffer areas and summarizing relevant findings in a technical memorandum that will be presented to the Conservation Commission at one of their public meetings. On April 24, 2008, representatives from VHB, Inc., NH Estuaries Project, and the North Hampton Conservation Commission reviewed important wetlands and buffers in town. A VHB representative presented a draft of the technical memorandum at a North Hampton Conservation Commission meeting and submitted a final memo in June, 2008. The document was posted shortly after on the Town of North Hampton website.

The public outreach component of the project was initiated shortly after the completion of the technical memorandum and managed by the NHEP. NHEP interviewed Conservation Commission Chair and attended a Conservation Commission meeting to determine the content of a public outreach piece. Representatives from the Planning Board, Zoning Board of Adjustments, and other town departments were also asked to provide and review content for the newsletter. Content included a summary of the VHB technical memorandum, description of critical water and other natural resources in North Hampton, description of impervious surfaces in North Hampton, a map of town wetlands, aquifers, and conservation lands, homeowner recommendations for landscaping BMPs to protect wetland buffers, a letter from the Conservation Commission, and a survey to garner feedback on the outreach effort. The amount of desired content warranted the use of a tabloid newspaper format, which was produced at Fosters Daily Democrat in Dover NH (on stock containing 30% post consumer stock). The NHEP established a wiki to manage content which gave the multiple reviewers the ability to submit and edit content. NHEP designed the publication using Adobe InDesign and provided final files to Fosters printing department who produced 3,000 copies of the newsletter. NHEP then coordinated with UNH Mailing Services to send the newsletter using saturation mailing which delivers one newsletter per household in North Hampton (1925 households). The newsletters were delivered on November 8, which was strategically timed to arrive after the busy November 4 election.

Conclusions

The North Hampton Conservation Commission indicated that the project met their expectations. Most significantly, they felt the technical memorandum provided a much needed scientific justification for protecting North Hampton wetlands and it was a valuable reference that could be used when faced with planning or zoning decisions. They also felt the outreach piece was effective and they planned to use the publication to generate news stories and to be a central part of a outreach campaign at the public library that will promote buffer protection and the activities of the Conservation Commission. Production and delivery of the newsletter was especially efficient due to the economy of newsprint and saturation mailing.

Appendix A

Transportation

Land Development



Vanasse Hangen Brustlin, Inc.

Six Bedford Farms Drive, Suite 607
Bedford, New Hampshire 03110-6532
Telephone 603 644-0888
Fax 603 644-2385
www.vhb.com

Memorandum

To: Chris Ganotis, Chairman, North
Hampton Conservation
Commission

Date: June 9, 2008

Project 51963.00

N

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From: Lenny Lord, Ph.D., Certified
Wetland Scientist and Bill
Arcieri, Senior Water
Quality Specialist

Re: North Hampton Conservation
Commission: Review of the Scientific
Literature Regarding the Importance of
Wetland Buffer Analysis

The following is a summary of recent research findings with regard to the value and role that wetland buffers – undeveloped uplands adjacent to wetlands – have in enhancing the effectiveness of adjoining wetland areas to perform ecosystem functions that serve the public interest. These findings highlight the importance of the 100 foot wetland buffer setback as established by North Hampton Zoning Regulations (Article 4, §409.9).

It is generally well understood that wetland buffers are valuable with respect to wildlife habitat and other ecosystem functions that benefit society and the human environment. With the focus primarily on wetlands themselves, however, public education has often been lacking in the essential role that wetland buffers play in these processes. The discussion below focuses on describing the importance of wetland buffers with respect to protecting public interests and property values in developing communities.

BUFFERS AND WETLAND FUNCTIONS

Wetlands provide a number of functions and values important to society. These include enhancing surface and groundwater quality through sediment trapping and pollutant removal, providing for groundwater recharge, mitigating and attenuating peak flood flow during storm and snowmelt events, supporting fish and wildlife habitat, as well as enhancing community aesthetics and providing recreational opportunities (USACOE, 1999). However, the ability of wetlands to provide these functions depends in large part on their position in the landscape and their relationships to adjacent undeveloped uplands. These vegetated upland transition

zones enhance the functions of wetlands and buffer the sensitive aquatic environment from the impacts of human activities. Furthermore, preventing development in these upland areas precludes them from being an additional source of wetland degradation. Indeed, most wetland scientists consider the presence of significant intact buffers as a key element in determining the ecological integrity and healthy functioning of wetland systems (e.g., USACOE 1999; Ammann & Stone 1991).

Buffers enhance wetland functions and help prevent them being overloaded with human related inputs in a number of ways. They typically provide additional sediment trapping and pollutant removal for enhanced water quality protection. Buffers slow runoff velocity and provide for infiltration for enhanced floodflow protection and stream channel stabilization. They provide multiple habitat types, food sources, screening, and shading important for healthy and diverse fish and wildlife habitats. And they provide aesthetic screening between areas such as open marshes with sweeping vistas and developed areas, thereby increasing the value of wetlands as a component of community character.

Buffers enhance flood attenuation when excess runoff generated from developed impervious surfaces flows into wetlands. Dense vegetation in the buffer can slow sheetflow and increase infiltration within the upland. Depending on the size of the storm and degree of development within the watershed, the runoff volume may exceed the storage capacity of the wetland such that the excess water may overflow into the adjacent areas surrounding the wetland. Depending on the slope of the adjacent land and whether or not there are any obstructions to flow, this added flood storage may be significant. Where surrounding wetland buffers have been altered or contain structures that impede flow or eliminate natural flood storage, then the excess flow that would otherwise be stored is conveyed downstream, which increases the potential for flooding and property damage downstream. Given the predicted effects of global climate change on precipitation levels (e.g., McElfish et al. 2008), the steady increases in impervious surfaces (e.g., Complex Systems 2006) contributing to increased stormwater runoff, and the major flood events that have occurred in recent years (i.e., 2006 and 2007), many communities have become more concerned about the need for controlling floodwaters, which can have a direct adverse impact on property values in flood prone areas.

Similarly, with regard to water quality enhancement functions, wetland buffers help to provide initial pretreatment as sheet flow travels across the land surface towards low-lying wetlands. They also help to reduce runoff volumes by allowing runoff to infiltrate into the groundwater, which ultimately reduces the potential pollutant load to the receiving water body. Well-established vegetation along riparian and wetland corridors provides for nutrient uptake and maintains lower water temperatures essential to fish habitat in streams due to the shading. Based on recent findings of a USGS study conducted in the NH Seacoast Region, there was a strong negative correlation between the percentage of urban land within the 25 meter (83 foot) buffer adjacent to a stream and the water quality and biological habitat conditions within the stream. In other words, there was a general decline in the water quality and biological conditions within the stream as the percentage of urban land increased within the 25 meter buffer. The most dramatic differences were observed in stream buffers that had less than 10 percent urban land as compared to those with more than 20 percent urban land coverage in the 25 meter buffer (Deacon, J.R., S. Soule, and T. Smith, 2005). The impact of a decline in water quality depends on the quality, size and designated uses of the water body.

The effectiveness of buffers in enhancing wetland functions depends on a number of factors including the buffer width, the intensity of development in the uplands, the sensitivity of the wetlands, the size and character of the watershed above the buffer, buffer slope, soil type, and the specific function in question. In general, wider buffers provide more protection for all

functions and are more critical around sensitive wetlands and sensitive wildlife habitat. Densely vegetated and more gently sloping buffers have increased abilities to slow runoff velocity, provide increased water quality renovation, and provide increased runoff infiltration. Dense vegetation also provides better screening for wildlife and aesthetics. Mixed vegetation types in the buffer can enhance wildlife diversity and provide for more effective uptake of nutrients and pollutants in runoff (McElfish et al. 2008). Although some towns provide for variable buffer widths, a review of recommended buffers conducted by Chase et al. (1997) found a 100 foot buffer width to be an effective minimum in most cases to ensure water quality and provide a minimum level of wildlife screening. Particularly sensitive wetlands and wildlife habitats, as well as water supply areas may require wider buffers.

WETLAND BUFFERS AND THE PUBLIC INTEREST

While wetland buffers may enhance wetland functions at the scale of the individual property, the greatest benefits and need for buffer regulations are at the community and watershed level. Typically surface runoff and wetlands encompass multiple parcels in a watershed so that actions along one portion of the wetland may affect the entire community further downstream. These functions affect the health, safety, and well being of the entire community.

For example, the cumulative effect of incremental losses in flood storage areas with increasing imperviousness associated with land development within a watershed can result in a measurable increase the frequency and magnitude of flooding downstream. The significance of flood-prone areas on property damage and property values has been clearly demonstrated in the recent flood events that occurred in May 2006 and April 2007. The financial impact associated with increased flooding frequency and intensity are not only borne by affected property owners, but by local governments as well in terms of repairing bridges, roads and other infrastructure.

Wetlands associated with public water supplies are extremely important to the public interest, and protecting the buffer areas around water supplies is essential. A recent USGS study projects water usage to increase by 50 % in Seacoast by 2025 (Horn et al. 2008). Many communities are looking to augment their ground water supplies through artificial recharge using water pumped from nearby rivers. This is a much costlier and less reliable approach than allowing natural infiltration of precipitation on permeable soils before it reaches the river.

Surface water quality issues also affect public recreation and tourism. Maintenance of healthy streams and rivers is essential to support high quality fisheries, recreational boating, and swimming, all of which are important in preserving public interest.

NORTH HAMPTON BUFFERS

On April 24, 2008, representatives from VHB, Inc., NH Estuaries Project, and the North Hampton Conservation Commission reviewed important wetlands and buffers in town. The relative extent and development of upland buffers town was also evaluated by using the GRANIT Data Mapper (<http://mapper.granit.unh.edu>) to generate an overlay of hydric soils with 2003 aerial photography (Attachment 1). Development impacts along first and second order streams in these areas were also reviewed utilizing the NH GRANIT Buffer Characterization Study for North Hampton (Complex Systems Research Center 2006). In addition to impacts buffers, the GRANIT Buffer Characterization study revealed that impervious surfaces in town increased from 7.3% of the town in 1990 to 12.4% in 2005. This is considerable considering only approximately half the town lies on upland soils. Such increases in impervious surfaces are likely to continue until all lands precluded from development by regulation have been built out, increasing the effects of stormwater related flooding and pollution on our riparian systems.

The two main watershed areas in town are those of the Winnicut River and the Little River. The Winnicut flows to the north and the Little River to the southeast, with the watershed divide between these systems roughly following along Rt. 1 from the south then along Birch Road and Highlander Road to the north. Development to the west of this divide affects the Winnicut and to the east it affects the Little River.

The headwaters of the Winnicut River occur in Line Swamp, in the southwest corner of town, from which the river flows north. In fact, much of the land in town to the west of I-95 is a large wetland complex associated with the river. This watershed appears to have significant capacity to detain flood waters, provide water quality renovation, and has significant wildlife value. Only the upper portion of the Winnicut River watershed lies within North Hampton, meaning that the community of Greenland, in the lower portion of the watershed to the north, will be significantly impacted by the way North Hampton regulates the development of buffers in town.

Buffers along the Winnicut River and its tributaries west of I-95 have undergone relatively little residential development, with more intensive development occurring between Rt. 1 and I-95 in the center of town. Highway crossings particularly those of I-95 and Rt. 111 have also had a significant impact on the watershed and buffers. Another area of past impact to stream buffers is in the northwestern portion of town, where Cornelius Brook, a tributary to the Winnicut, passes through the Sagamore-Hampton Golf Club and then through a culvert beneath I-95 and into a ditch for approximately 1,100 feet along the western edge of the highway. Runoff from roadways and golf courses often contain high levels of nutrients, which are likely to affect water quality in the brook.

One area of recent buffer impact that was noted in this watershed was the construction of a new house directly adjacent to an expansive marsh near the point where the Winnicut River crosses Lovering Road. Another home at that location across Lovering Road also appeared to be located very near the wetland boundary, but seemed to be sited many years ago. This impact of both of these properties is relatively small, with the primary effect being to the character and aesthetics of the area. Additional impacts to water quality and wildlife habitat are likely, though diluted given the size of the wetland. Such impacts would be rapidly compounded, however, if additional homes were built in similar proximity to the marsh. These homeowners and others sited near the river should be encouraged to routinely inspect and pump out their septic systems, since failure of these systems would have significant impact on the river. Furthermore, lawn care practices in these areas should minimize fertilizer and pesticide use.

One important component of the Winnicut River watershed is the inclusion of the town water supply wells off Winnicut Road. Implementation of wetland buffers is particularly important to protect groundwater quality and infiltration in this area. It appears that the recent subdivision to the north of Winnicut Road, across the street from the town wells, has included wetland buffers and conservation lands, which will help protect groundwater resources (Photos 2 and 3).

Given the relatively large wetlands in the Winnicut River watershed and limited development of wetland buffers, this is a relatively healthy wetland system. The system appears to have a significant capacity for flood storage/attenuation, water quality renovation, and wildlife habitat, while also providing scenic vistas and recreational opportunities for the community. It is likely to retain these functions for the public good provided the North Hampton wetland buffer ordinance is retained and enforced. Cumulative impacts to these functions could result in increased flooding damage, reduced water quality, and reduced ecological integrity of the wetland system, resulting in increased costs to mitigate these effects and overall reduced

property values associated with the erosion of aesthetics and rural character associated with this area of town. Such effects would not only influence North Hampton residents, but would impact the community of Greenland as well.

The second major watershed in town is that of the Little River. Unlike the Winnicut River, the Little River originates and runs its entire length through North Hampton. The headwaters of the river lie in the northern end of town, north of North Road and east of Highlander road. From here the river flows southeastward to its mouth along North Hampton State Park. Existing buffer impacts to this watershed are primarily associated with commercial development along Rt. 1, and due to residential development in the lower watershed between the Mill Pond Dam Rt. 111.

No recent impacts to buffers were noted during our site review of the Little River, however two adjoining parcels were noted to be at particularly at risk in a sensitive area. This land is located at the southwest corner of US Route 1 and North Road, and at least one of the parcels is currently for sale (Photo 4). This area is important because it has buffers that are relatively undeveloped, it is in a commercial area, and it is located high in the watershed. Buffers between areas of high potential impact and upper portions of a watershed are important for ensuring water quality and other critical functions further downstream in the watershed.

Due to their position in the watershed, the residential areas in the lower portion of the watershed and the Little River Tidal Marsh will be subject to the greatest impacts associated with increased impervious surfaces and buffer impacts associated with development over time (Photo 5). A significant amount of algae was observed in the Little River in this area along Rt. 111 during our review (Photo 6). Excess algae typically indicates high nutrient inputs to a waterbody (e.g., Caduto 1990). Development is often associated with high nutrient inputs that can be due to factors such as fertilizers, pet wastes, and silt. Degradation of water quality could affect property values along the river as well as the health and integrity of the Little River Marsh, directly downstream. North Hampton and other public agencies have made a significant financial investment in restoring the Little River Marsh as it is important to the health of the ecosystem and character of the town. Nutrient inputs from upstream may also encourage growth of invasive species such as common reed (*Phragmites australis*) and contribute to degradation of the marsh, which would clearly not be in the public interest. Such impacts could result in increased expenditures to restore the marsh and to treat stormwater inputs upstream, as well as having a negative effect on property values along the marsh if it were to become significantly degraded.

CONCLUSIONS

Failure to recognize the of wetland functions and buffers can result in significant costs to the community, including costly property and road damage due to flooding, pollution of surface waters, pollution of groundwater and wells, loss of valued native plant and animal species often followed by the invasion of nuisance species, and loss of community aesthetics and character. Once buffers have been lost to development, their benefits are essentially lost for good, often requiring costly engineered solutions to replace these lost functions and mitigate impacts. Several areas of irreversible buffer impact have occurred in North Hampton, particularly along Rt. 1 and I-95, but existing regulations should provide for the protection of remaining undeveloped buffers and their associated wetlands into the future.

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PHOTOGRAPHS



Photo 1. Subdivision along Winnicut Road near town wells (4/28/2008).



Photo 2. Conservation land along Winnicut Road near town wells (4/28/2008)



Photo 3. Parcel for sale along Rt. 1 in upper portion of Little River watershed (4/24/2008).

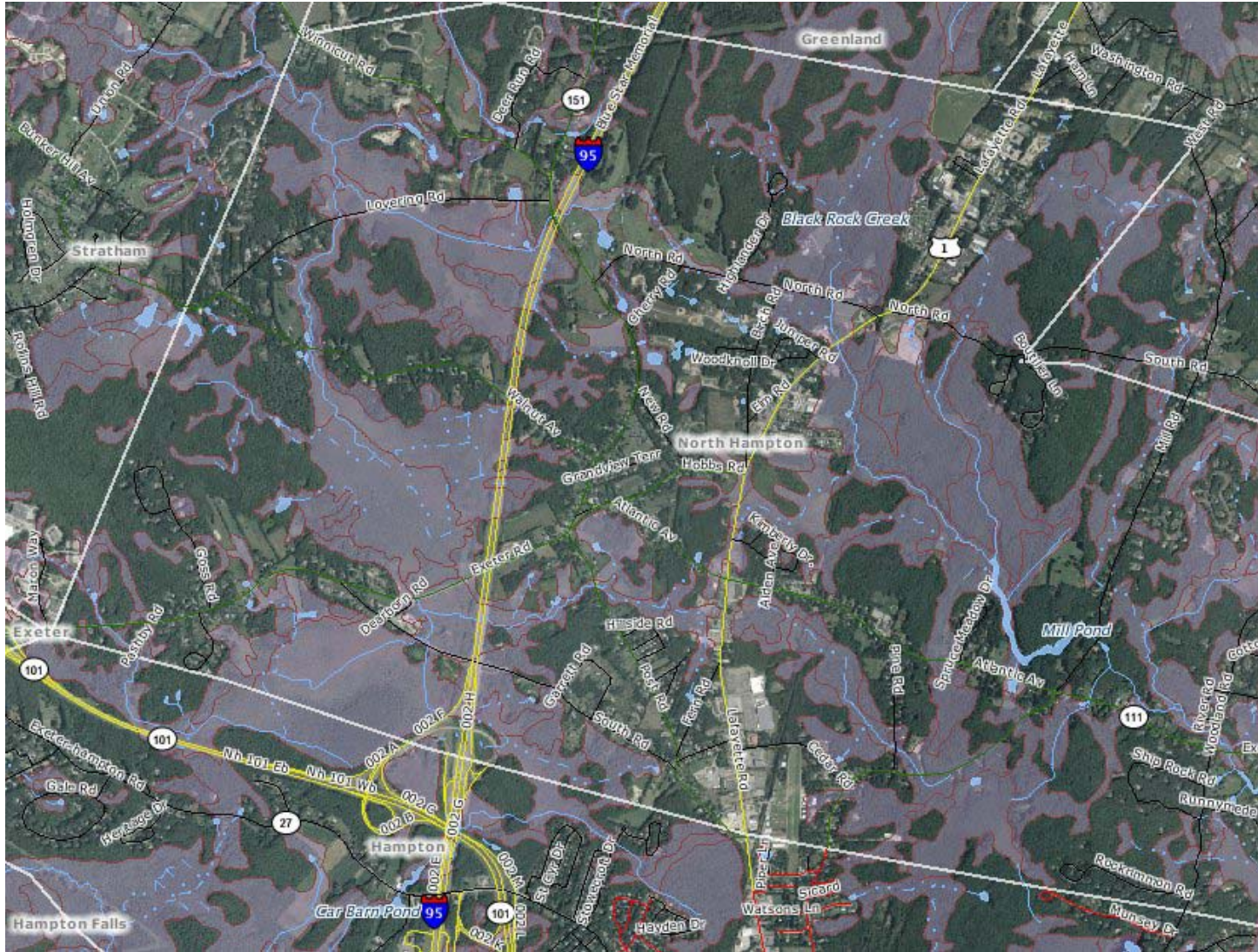


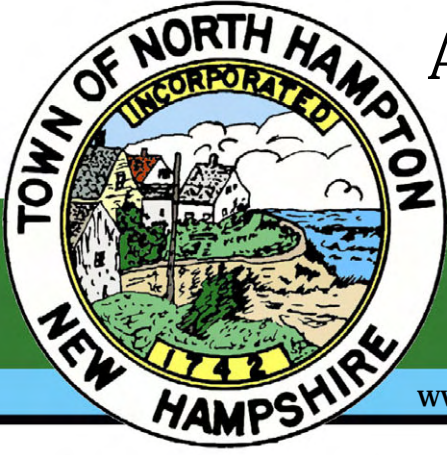
Photo 4. Residential development in buffer of Little River viewed from Woodland Rd (4/24/2008).



Photo 5. Algae in the Little River along Rt. 111 (4/24/2008).

ATTACHMENT 1: NORTH HAMPTON UPLAND BUFFERS





A Citizen's Guide to Protecting North Hampton's Wetlands and Water Resources

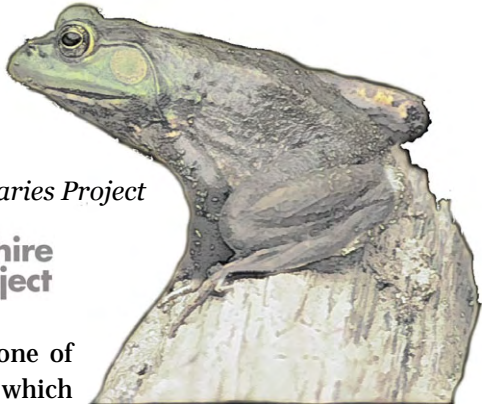
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www.northhampton-nh.gov

Fall 2008

From dismal swamp to respectable wetland

By Dave Kellam,
New Hampshire Estuaries Project



If you had to define one of the following words, which one would you pick: fen, morass, or wetland?

You might choose "wetland" and guess that it is earth that squishes beneath your feet. But really you could not lose, because all three words fit that definition.

In general, "wetland" is a term that describes many specific types of watery habitats, such as marshes, bogs, and swamps. The legal definition from the U.S. Environmental Protection Agency is "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." Or, in plain English – wet land.

Surprisingly, the word "wetland" has not been with us for very long. The first official governmental use of "wetland" appeared in a U.S. Fish and Wildlife Service report in 1956. Before the term "wetland," people just used any name for damp real estate, such as marshland, mire, muskeg, quagmire, slough or swampland.

Ironically, when English settlers arrived in North America, they did not have a word for the forested wetlands they encountered, because those types of habitats had long been destroyed in their native England. Since they had no experience with these ecologically important habitats, the settlers simply referred to them as swamps or sometimes "dismal swamps." Proof of this historic name is evidenced by the Great Dismal Swamp National Wildlife Refuge, in southeastern Virginia.

Attitudes toward wetlands remained dismal until Henry David Thoreau fell in love with swamps in the mid 1800s. On June 15, 1840, after spending many hours up to his nose in a Concord, Massachusetts, swamp "soaking up the juices of a marsh," he wrote down his thoughts on wetlands: "When I would recreate myself, I seek the darkest wood, the thickest and most interminable, and to the citizen, most dismal swamp. I enter the swamp as a sacred place - a sanctum sanctorum. There, is the strength, the marrow of nature." Respect for wetlands has increased ever since.

Continued on page 8

How do wetlands and wetland buffers protect property values?



New document details North Hampton's wetland resources and highlights the value to the community.

Story on page 3

Wetlands sustain North Hampton's beautiful and diverse wildlife



Wikimedia



Wisconsin DNR

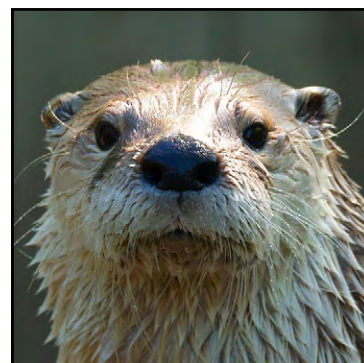


NHEP

Unlike the bustling urban landscape of Boston, North Hampton residents can still be inspired by daily wildlife sightings. Early in the morning great blue herons and snowy egrets fish in the Little River salt marsh, colorful dragonflies dance across the blue sky, and river otters play in secluded ponds. Some of the best natural beauty that northern New England has to offer still thrives in North Hampton.

Some of the wild flora and fauna in North Hampton are quite rare. The spotted turtle is a beautiful but seldom seen reptile found only in large undisturbed blocks of diverse wetland habitats. The rare redfin pickerel is a small freshwater fish found in North Hampton's weedy pools and streams. The rarest plant documented in the town is the slender blue flag iris. Found in salt marshes, this species is threatened in New Hampshire and has only been recorded in 10 other communities in the last 20 years. The native flower is at the northern limit of its range and has disappeared from many places because of habitat loss.

One reason wildlife flourishes in North Hampton is the amount of wetlands in the town. Approximately, one third of the town is classified as wetlands and these habitats are critical to a variety of plant and animal species. Some wildlife require expansive tracts of undisturbed wetlands, like those found at the headwaters of the Winnicut River. This is just one reason why protecting these areas through conservation easements and maintaining wetland buffers is so important.



Eric Bégin



Kathy Davis



Robert H. Mohlenbeck, USDA NRCS

North Hampton's wild plants and animals include the great blue heron (left/top), redfin pickerel (left/middle), cherry-faced meadowhawk (left/bottom), river otter (right/top), spotted turtle (right/middle), and slender blue flag iris (right/bottom).

Purpose

The purpose of this newsletter is to provide public information, including technical facts, to North Hampton residents about the importance of protecting wetlands, wetlands buffers and drinking water aquifers. It also serves to inform readers of the wetlands protection regulations and provide suggestions about how homeowners can protect these critically valuable resources.

Lawn care tips to protect water quality on page 7.

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What is a wetland buffer (and how is it like a sponge)?

A wetland buffer is simply the vegetated area directly adjacent to wetlands. It may be along the wooded shoreline of a pond, the grassy border of a freshwater marsh, or the shrubby land along a flowing stream. Regardless of the kind of wetland, a wetland buffer has lush plant growth and it is this plant growth that makes a wetland buffer act like a sponge.

The roots of plants create tiny spaces in the soil that look like the holes in a sponge. These spaces enable wetland buffers to absorb water very well. As rainwater flows toward a wetland, the porous soil grabs the water. Plant roots absorb some of it, but the rest seeps deeper and eventually enters the groundwater that North Hampton residents rely on for drinking water. And like any good sponge, a wetland buffer cleans the water it absorbs. Rainwater and stormwater runoff that is laden with pollutants is purified when it flows through a well-vegetated wetland buffer.

Because the spongy soil of a buffer soaks up water, wetland buffers are also good at lessening the impact of flooding. A watershed (the land drained by rivers) that has wide vegetated buffers will flood less often than one that is covered in roads, buildings, parking lots, and other structures that prevent water from soaking in the ground. These areas that prevent

Wetland buffers are Nature's water treatment plants. They clean surface water of pollutants, like nitrogen and sediments, before they enter a wetland and even the groundwater that provides North Hampton's drinking water.

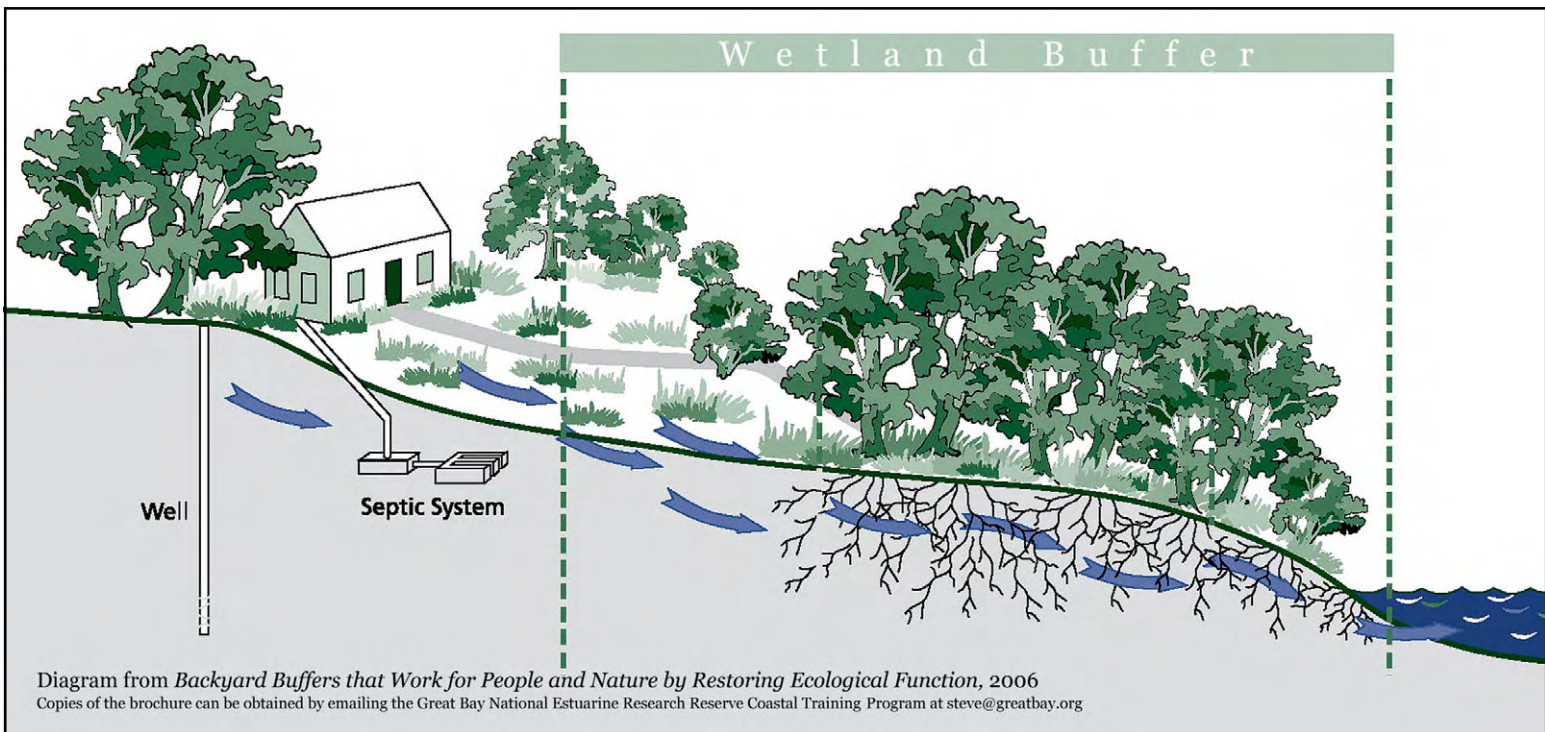
infiltration of water are known as impervious surfaces (read "Impervious Surfaces" to learn more on page 4).

It is clear that wetland buffers cannot contain buildings, roads, swimming pools, or other structures that do not absorb water. This is why in 2003, the Town of North Hampton restricted the building of structures within a 100-foot buffer of all town wetlands. The town's goal is to maintain healthy buffers because of the great benefits they provide all North Hampton residents.

Beyond adhering to the town land use ordinance (see page 5), careful stewardship of buffers is an important role individual landowners can play. Do not store vehicles in a wetland buffer because oil seeping from engines can easily pollute our water. Keep landscaping to a minimum near wetlands and only plant native plants to benefit wildlife (see page 7 for landscaping tips near wetlands). Consider maintaining a buffer larger than 100 feet which will better protect wetlands and attract more beautiful wildlife. Encourage a stable wetland buffer by not mowing it or applying chemical fertilizers, pesticides or herbicides.



Protecting the headwaters of the Little River (above), the river's lower portions (below left) and the Winnicut River headwaters (below right) are vital for the protection of water quality.



Protect Buffers: Don't Mow to the Edge of Wetlands

Mowing to the edge of a wetland damages the ability of the plants to filter runoff and stabilize the wetland shore to prevent erosion. Letting a lawn grow wild next to a stream or marsh not only improves wildlife habitat and the health of the wetland, but it saves time and money on lawn care around the house.

Healthy landscaping makes for a healthy watershed

By Barbara McMillan
NH Department of Environmental Services

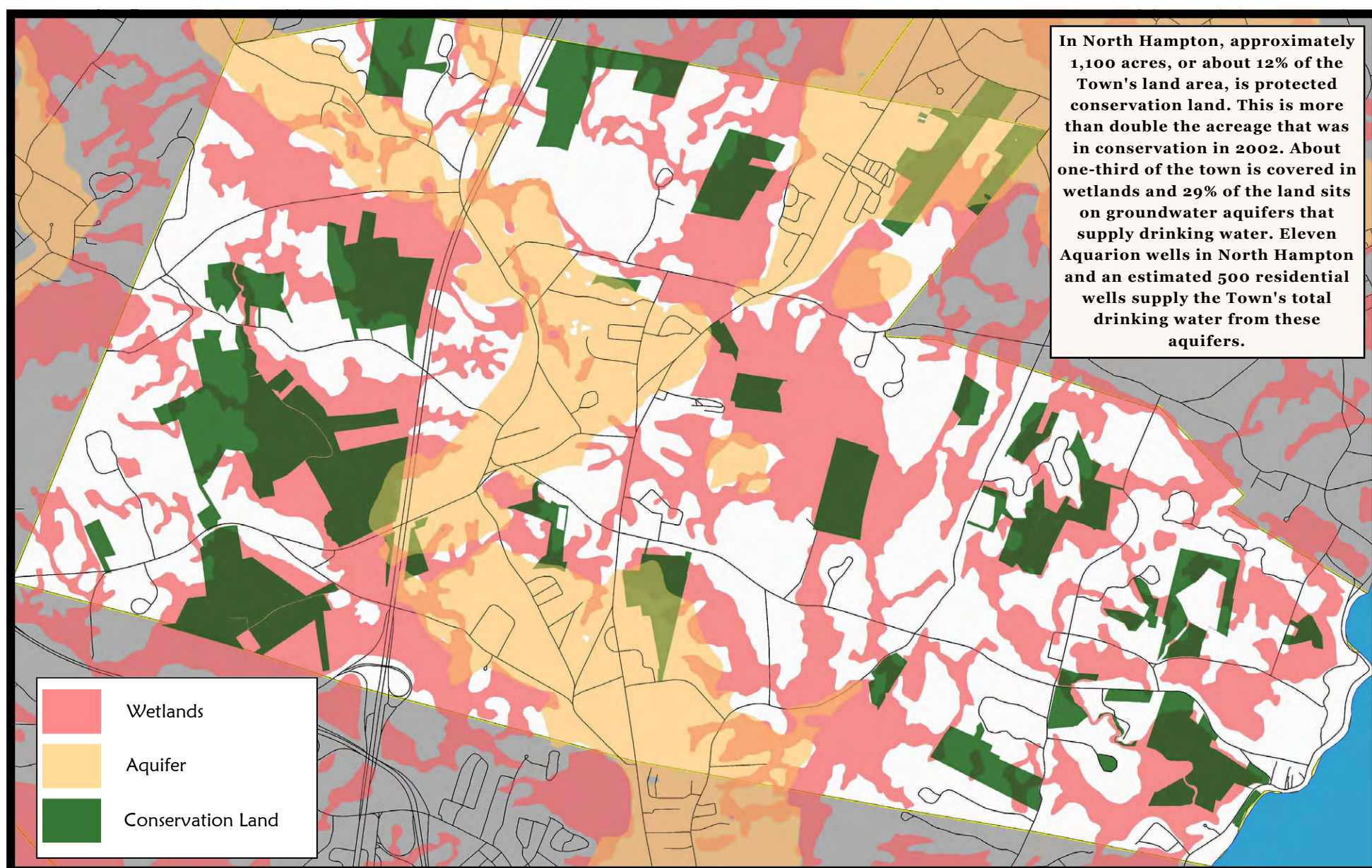


No matter where you live, you are in a watershed. Within that watershed, rain and snow falling on homes, lawns, and driveways eventually find their way to the lowest point in a river, lake, pond, stream, or ocean. Often, without realizing it, homeowners add pollutants, including lawn chemicals, fertilizers, silt, and sand to surface waters. However, with a few minor changes to your garden and lawn care routine, you can begin playing an active role in improving water quality in your watershed, while saving yourself both time and money.

Start by examining your landscaping and look for ways it might be contributing polluted runoff. First, ask yourself if you need all that lawn. Reducing the size of your lawn will save you time and money

Continued on page 8

North Hampton wetlands, aquifers, and conservation lands



This map is intended for reference purposes only. Consult appropriate maps at the North Hampton Town Office or a wetlands scientist to determine boundaries.

Document characterizes North Hampton wetland buffers and describes connections to public interest and property values

A 2008 publication commissioned by the New Hampshire Estuaries Project and North Hampton Conservation Commission summarizes the role North Hampton wetland buffers play in providing flood control, water purification and other functions that benefit the public.

Dr. Leonard Lord, wetland scientist for Vanasse Hangen Brustlin, studied town wetlands in April 2008 and drafted a technical memorandum that highlighted the importance of the 100 foot wetland buffer setback as established by North Hampton Zoning Regulations.

During his evaluation, Dr. Lord identified the headwaters of the Winnicut River and its tributaries west of I-95 as beginning a high-value, well functioning wetland with relatively little residential development. He did note however that the I-95 and Rt. 111 crossings have had a significant impact on the watershed and buffers.

A particularly sensitive area identified during the review was along Lovering Road. The area is characterized by an expansive marsh near the road crossing of the Winnicut River. A few homes at that site are located very near the wetland boundary and have the potential to negatively impact the marsh. Lord recommends that, "these homeowners and others sited near the river should be encouraged to routinely inspect and maintain their septic systems, since failure of these systems would have significant impact on the river." As well as, "lawn care practices in these areas should minimize fertilizer and pesticide use."

The technical memorandum also examines the Little River, which originates and runs its entire length through North Hampton. Lord identified commercial development along Rt. 1 as the most significant impact on the wetland buffer and noted that land protection activities should focus on headwater reaches to have the most ecological value for the watershed.

Septic systems should be inspected annually and pumped out every three to five years.

Lord noted, "due to their position in the watershed, the residential areas in the lower portion of the watershed and the Little River Tidal Marsh will be subject to the greatest impacts associated with increased impervious surfaces and buffer impacts associated with development over time." These impacts include poor water quality and flooding.

During the field review a significant amount of algae was observed floating in the Little River in the area along Rt. 111. Lord cautions that, "excess algae typically indicates high nutrient inputs to a waterbody" and is often the result of fertilizers, pet wastes, and/or silt.

"Protecting water quality in the Little River is especially important since North Hampton and other public agencies have invested a great deal of time and money to restore the Little River Marsh, which is key to the health of the ecosystem and character of the town," Lord said.

To read Dr. Lord's full analysis of North Hampton's wetland buffers, go to www.northhampton-nh.gov. In a collaborative effort with The Nature Conservancy, the Commission has initiated a water quality sampling and testing program along the Winnicut River to safeguard the watershed and identify and remedy by enforcement, sources of potential contamination.



What Are Impervious Surfaces?

Impervious surfaces are areas covered by material that prevents the infiltration of water into the soil. Examples of impervious surfaces are buildings, pavement, concrete, and severely compacted soils.



Roofs, roads, and parking lots are impervious surfaces.



How do impervious surfaces affect water resources?

Increase Flooding

Curbs, gutters, and storm drain pipes are typically designed to move water very quickly from buildings to the nearest river or stream. This is much faster than the way water naturally flows through a watershed. Before land is developed, rainwater slowly moves through wetlands and either seeps into the soil or gradually flows to the sea. Impervious surfaces increase the amount and speed of stormwater flowing into streams and thus increases flooding.



Flooding in 2006 and 2007 damaged property and closed several roads in North Hampton, including Mill Road at the Little River crossing pictured above.

Cause Stream Temperatures to Rise

The heat of the sun warms roads, roof tops, and parking lots. When rain water flows over warmed impervious surfaces, the heat is transferred to the water and into drainage streams. Increased temperatures lower the

amount of oxygen in the water and often kills aquatic creatures.

Increase Water Pollution

Impervious surfaces accelerate the delivery of pollutants, such as bacteria and nitrogen, to rivers, lakes, and estuaries. Bacteria can make people and animals sick and nitrogen can cause algae blooms that block sunlight, deplete dissolved oxygen, and kill many forms of aquatic life. Other pollutants of concern are heavy metals and oil from vehicles.

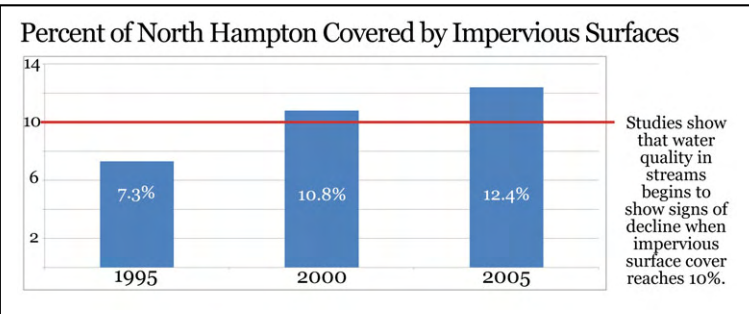


Impervious surfaces, such as roads and parking lots, collect toxic contaminants from cars, trucks, and even the air. When it rains or when snow melts, the flowing water washes the concentrated contaminants off and funnels them to rivers or streams. Reducing the amount of impervious surfaces and managing the runoff greatly improves water quality of surface and groundwater.

How much is too much?

Various studies from around the country show that stream ecosystems and water quality become degraded as impervious surfaces increase. Damage to streams often occurs when more than 10% of the land within a watershed is covered with impervious surfaces. When the percentage of impervious cover exceeds 25%, most watersheds experience severe habitat and water quality degradation. In 2005, a study in New Hampshire demonstrated that the percent of impervious surface and its proximity to streams can be used as indicators of stream quality.

North Hampton Exceeds Impervious Surface Threshold for Water Quality



Since North Hampton already exceeds the 10% threshold for impervious surface, great care must be taken when planning for new development to minimize the addition and impacts of more impervious surfaces.

What can North Hampton do to reduce the impacts of impervious surfaces?

North Hampton has accomplished many tasks to reduce the impacts of impervious surfaces. The Town has:

- Targeted land conservation efforts to protect areas near water bodies where impervious surfaces have the greatest impact on water quality.
- Implemented a wetland buffer ordinance that prevents impervious surfaces within 100 feet of wetlands.
- Encouraged conservation design alternatives that minimize the amount of land disturbed, maintain significant ecological areas in a natural state, and reduce the amount of impervious surface created.

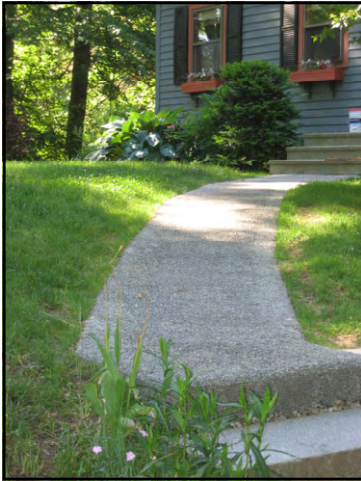
The Town will continue to seek out opportunities to protect sensitive areas from development and to adopt land use ordinances that protect community water resources, but stewardship of water resources and wetland buffers falls mainly on individual landowners.



Since 2002, the Town acquired over 560 acres of land to help protect water quality of the Winnicut and Litter River watersheds and the North Hampton drinking water supply.

Homeowners Can Reduce the Impact of Impervious Surfaces

To help protect the quality of North Hampton's water and to minimize the damaging effects of flooding and pollution, homeowners can do a variety of things that collectively will make a big difference. Homeowners can:

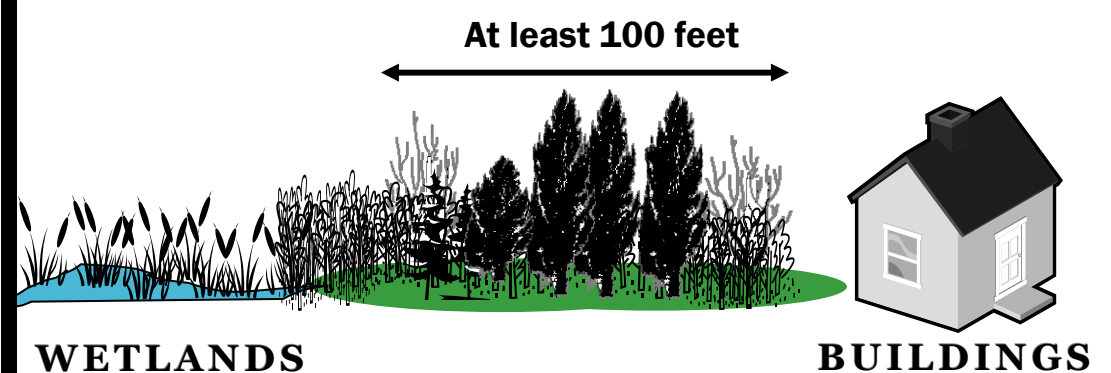


Using pervious pavement to create walkways will encourage groundwater recharge and slow the migration of pollutants to streams and rivers.

- Minimize lawn areas by planting shrubs, ground covers, and trees at the border of the property. Lawns are less efficient than planted landscaped areas at recharging groundwater and maintaining water quality.
- Limit the amount of impervious surface on their properties, such as sidewalks, roofs, driveways, patios and even swimming pools.
- Direct rainwater runoff from gutter drains to areas that are landscaped. Known as rain gardens, these areas increase groundwater recharge.
- Sweep driveways and walkways instead of hosing them down, thus slowing the rate at which pollutants enter local waters.
- Support Town efforts to protect water quality and enhance the quality of life in North Hampton.

GIVE WETLANDS SOME ELBOW ROOM

Wetlands need undisturbed space around them to purify rainwater and to lessen the impacts of flooding.





From North Hampton's Conservation Commission

Much of North Hampton is comprised of critically important environmental ecosystems. About one-third of the Town's land area is wetlands, hosting two major river watersheds, the Winnicut and the Little River and two significant salt water estuaries, the Little River and the Bass Beach Salt Marshes. Moreover, the Town depends solely on indigenous groundwater aquifers for drinking water supply.

These ecosystems are being threatened from several fronts. First, the Town's impervious surface area is 12.4% of the Town's land area, thereby causing surface water runoff to exceed the 10% surface area guideline at which level wetlands deterioration begins. Second, North Hampton has already experienced contamination of part of its drinking water supply from the Coakley Landfill Superfund site, with underground chemical leaching into residential wells and with the closure of a water company well which could have been contaminated by the chemicals. In addition, while Town voters passed an ordinance for a 100-foot wetland buffer in 2003, it has also continued to routinely allow variance approvals to develop structures within those buffers. Finally, with growing pressures for continued development, the few remaining marginal lands are being developed in areas dangerously close to important wetlands resources and continued abuses such as filling wetlands and storing hazardous materials on the land continue, since regulatory enforcement resources are overburdened.

North Hampton can ill-afford the accelerated continued deterioration of its wetlands resources. The stakes are very high, particularly with the threat to losing valuable drinking water aquifers. It is with this heightened level of concern that we bring you this informational newsletter.

We welcome any feedback you may have on this newsletter by dropping off the comment form in the library or sending an e-mail to northhamptonconservation@comcast.net.

North Hampton Conservation Commission

We would like to hear from you

The Conservation Commission welcomes your thoughts about this publication or any other natural resource issue concerning North Hampton. There are two ways to share your thoughts:

1. Email comments to northhamptonconservation@comcast.net
2. Fill out the form below and either mail it to the town or drop it off at the library.

Your name _____

Preferred way to respond to you:

Phone number _____

Email address _____

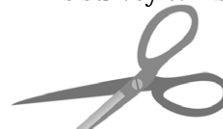
Mailing address _____

Question or Comment:

Did you find this newsletter useful?

- Very Useful Somewhat Useful Not Useful

This survey can be mailed to:



Town of North Hampton
Conservation Commission
237 Atlantic Avenue—2nd floor
North Hampton NH 03862

Article IV—District Regulations Complete listing www.northhampton-nh.gov/

Public_Documents/NorthHamptonNH_PZDept/regsTOC

Section 409 Wetland Conservation Areas

409.1 PURPOSE: IN THE INTEREST OF PUBLIC HEALTH, CONVENIENCE, SAFETY AND WELFARE, THE REGULATIONS OF THIS DISTRICT ARE INTENDED TO GUIDE THE USE OF AREAS OF LAND WITH EXTENDED PERIODS OF HIGH WATER TABLES, AND TO ACCOMPLISH THE FOLLOWING PURPOSES:

- To control the development of structures and land uses on naturally occurring wetlands which would contribute to pollution of surface and groundwater by any means.
- To prevent the destruction of natural wetlands which provide flood protection, recharge the groundwater supply, and the augmentation of stream flow during dry periods.
- To prevent unnecessary or excessive expense to the Town related to the provision and maintenance of essential services and utilities which arise because of unwise use of wetlands.
- To encourage those uses that can appropriately and safely be located in wetland areas.
- To preserve wetlands for ecological reasons including, but not limited to, those cited in RSA 482-A.
- To preserve and enhance those aesthetic values associated with the Wetlands of this Town.
- To provide a single and consistent approach for identifying and delineating wetlands based on the most advanced professional standards and scientific analysis.

Section 414 Water Resources Protection

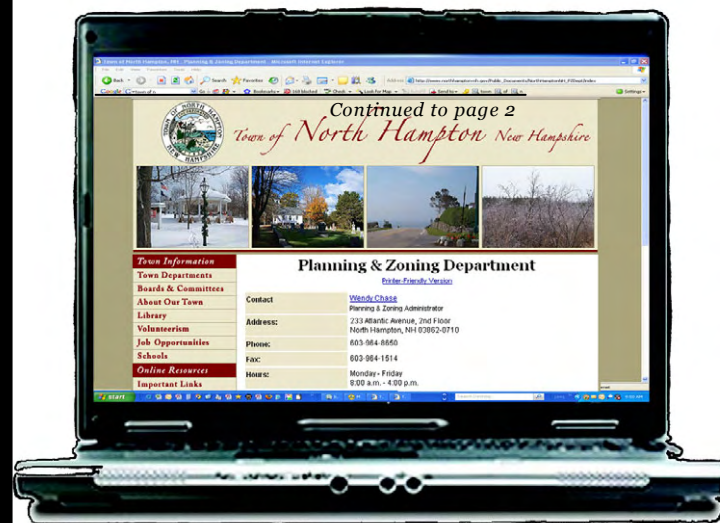
414.5 AQUIFER PROTECTION DISTRICT ORDINANCE

414.5-A AUTHORITY AND PURPOSE

Pursuant to RSA 674:16-21, the Town of North Hampton adopts an Aquifer Protection District and accompanying regulations in order to protect, preserve, and maintain potential groundwater supplies and related groundwater recharge areas identified by the Town. The objectives of the Aquifer Protection District are:

- To protect the public health and general welfare of the citizens of North Hampton.
- To prevent development and land use practices that would contaminate or reduce the recharge to the identified aquifers and all inter-related waters in town.
- To assure the availability of public and private water supplies for the present and the future growth of the Town in accordance with the Master Plan.
- To encourage uses that can appropriately and safely be located in the aquifer recharge areas.
- To heighten awareness of the need for annual review of the Coakley Site monitoring wells and the testing of residential wells.

**Read the complete North
Hampton Planning and Zoning
Ordinances and Regulations
On-line at the Planning and
Zoning Department Page on
www.northhampton-nh.gov**



Learn about:

- Permitted land uses
- Restricted land uses
- Maximum impervious surface cover
- Septic system setbacks
- And more

Bringing back tidal flow helped salt marsh and provided flood relief

By Cathy Coletti, NH Coastal Program



For 50 years, a culvert under Route 1A in North Hampton behaved like a clogged bathtub drain. The single, small culvert could handle neither the tidal flow from the ocean nor the rain draining off the land. The salt marsh across the street, where tides are essential for life, was slowly and steadily dying.

To make matters worse, the wide-open 200-acre marsh has its limits to how much water it can hold, especially when so many manmade structures are nearby, like seawalls and pavement, causing water to get trapped and spill over into roads and basements. This is especially pronounced during coastal storms when water running off the land meets the high tides with nowhere to go.

During a storm in October 1996, over six feet of water covered Little River Marsh, flooding nearby residences and causing a public outcry for the town and state and federal agencies to take action.

In 2000, after three years of project planning, a partnership of agencies, coordinated by Ted Diers from the New Hampshire Coastal Program at the New Hampshire Department of Environmental Services and Alan Ammann from the Natural Resource Conservation Service, replaced the undersized culvert with twin 6 foot by 12 foot box culverts. Diers said that the experience showed how to build and sustain partnerships around restoration projects.

In this same spirit of partnership, NHDES continues its investment in the Little River Salt Marsh with Phase II of the restoration work currently being planned. The goal is to bring more tidal flow to the upper reaches of the salt marsh, where standing water collects and mosquitoes make their breeding pools. More



The shores of the Little River in North Hampton

tidal flow will move the water and bring in hungry fish to these stagnant pools to have dinner on the insects they will find there.

Restoration is a key aspect of conservation in New Hampshire. Our coast was the first part of the state to be developed, making it fitting that it leads the way in restoration activities. As this project demonstrates, restoring natural function to our ecosystems helps humans at the same time it rebuilds ecological integrity.

For more information on the Coastal Program's Restoration Program, please visit www.des.nh.gov/coastal/restoration or call 603-559-1500.

The headwaters of the Winnicut River are special and worth protecting

By Dr. Ray Konisky, New Hampshire Chapter of the Nature Conservancy



The Winnicut River flows through expansive swamps in the northwestern part of the town.



The headwaters of the Winnicut River that create a peaceful open landscape in the northwest corner of North Hampton are an important resource for water quality and wildlife resources. The area was identified as an important conservation area in the Land Conservation Plan for New Hampshire's Coastal Watersheds due to its expanse of undisturbed open space, influence on town aquifers, and impact on the environmental health of Great Bay.

The headwaters of the Winnicut River begin in Line Swamp, in the southwest corner of town. The river continues north into Greenland and eventually ends in Great Bay. This watershed has significant capacity to detain flood waters, provide water quality restoration, and has significant wildlife value. During heavy rains, the marsh will absorb the excess surface water much like a sponge and slowly release it into the Winnicut River. This slowing of the water helps keep flood waters within the banks of the river. As the water flows through the marsh it is cleaned and rid of harmful pollutants. This is especially important since the major aquifer

that supplies the drinking water for the town is very near this wetland. The open, largely undisturbed marsh land is home to a variety of animals and plants that need this type of habitat to survive. There are heron rookeries located throughout the area and numerous sightings of deer, beaver, and muskrat.

In addition, the Winnicut's direct connection to Great Bay makes it an important watershed for migratory fish species like alewife, eel, shad, and smelt. The current dam at the head-of-tide near Route 33 now prevents these threatened species from passing from the estuary into upstream fish habitat. New Hampshire Fish and Game is now leading an effort to remove this obstruction and re-open as many as 40 miles of habitat to migratory fish. Once above the dam site, however, fish will still face a dense network of road crossings and culverts that limit migrations. To address this, The Nature Conservancy of New Hampshire is completing an inventory of the more than 40 watershed culverts and assessing each for fish passage potential and possible improvements.

To protect the Winnicut River, care must be taken to keep the headwater marshland open and well vegetated. The vegetated land along the Winnicut River and its tributaries west of I-95 have undergone relatively little residential development, with the most intensive development occurring between Rt. 1 and I-95 in the center of town. Highway crossings, particularly those of I-95 and Rt. 111, have significant impact on the watershed and buffers. In addition to the obvious threat to wildlife, the roads negate the flood protection qualities of the marsh and enable pollutants from automobiles to quickly wash into the water, thus diminishing water quality. Continued protection by the town and abutting residents is critical to maintain the many benefits provided by the Winnicut River.

Editorial note: Your Conservation Commission is working in a collaborative effort with The Nature Conservancy to test and monitor water quality along the Winnicut River. Test results showing contamination will be referred to regulatory officials for enforcement.

Will the Sharp-tailed Salt Marsh Sparrow Return to North Hampton?



Re-establishment of sharp-tailed salt marsh sparrows is one of the main goals for the New Hampshire Audubon's Little River Salt Marsh Wildlife Sanctuary. Habitat restoration is the most important activity that will enable the raspy trilling call of this sparrow to be heard again.



Removal of Greenland dam will restore migratory fish to the Winnicut River

The Winnicut Dam in Greenland will be removed in 2009 to restore migratory fish habitat in the Great Bay tributary. The restoration of the river is important for rainbow smelt populations, as well as river herring and American eels.

The dam is owned by the New Hampshire Fish and Game Department and is the only human-made barrier to upstream fish movement along the main stem of the river. The water below the dam is influenced by the tides. The dam



Smelt are just one species of fish that will benefit from the increased spawning habitat made available in the Winnicut River.

currently restricts fish movement within the Winnicut River, which in turn affects other ecological systems that are dependent upon the fish populations for dispersal within the ecosystem.

Although a fish ladder was incorporated into the dam when it was built in 1957, its design has proven to be inefficient in enabling fish to pass.

Homeowners Guide to Protecting Buffers and Water Quality

Top 10 ways to improve and protect water quality around the house

When it comes to keeping North Hampton's water clean, it is often the individual homeowner who can make the biggest contributions. The following are 10 activities that individuals can take on their properties to maintain healthy water quality.

#10 Plant Rain Gardens
Direct downspouts and sump pump discharges to areas planted with water-loving plants.



#9 Landscape with Native Plants
Planting native plants reduces need for chemical pesticides and fertilizers and provide food and habitat for many wildlife species.

#8 Mow High
Mowing your lawn higher than 3 inches will produce a lush turf that holds water, is weed-resistant, and requires less fertilizer.



#7 Minimize Erosion
Maintain lush plant growth in areas with steep slopes to hold soil in place. Minimize soil loss on seeded areas by using straw mulch.

#6 Manage Stormwater Runoff
Slope driveways and patios to direct rainwater to vegetated areas that recharge groundwater.

#5 Prevent Chemical Spills
Secure stored oil, gasoline, fertilizer, and pesticides in leak-proof containers and never near wetlands.



#4 Maintain Your Septic System
NH Department of Environmental Services recommends that septic systems be inspected annually and pumped every three to five years.

#3 Minimize Impervious Surfaces
Build the smallest buildings, patios, and driveways as possible and use water-permeable materials.

#2 Reduce Fertilizer Use
Grow and maintain plants that require no fertilization. Reduce lawn area and use only slow release fertilizers.

#1 Maintain Healthy Buffers to Wetlands
Maintaining 100 feet of lush, vegetated areas adjacent to wetlands will filter stormwater runoff, reduce erosion, lesson impacts of flooding, and provide adequate habitat for many wildlife species.

Reduce Landscaping Chemical Use

Fertilizers, insecticides, and herbicides are damaging to our water supply. Where fertilizers are a must, choose organic, slow release ones. For pesticides and herbicides, choose those with the shortest lives, and those which affect only the targeted species of pests or weeds. Better yet, use none.

More Information

Slow-Release Fertilizers for Home Gardens and Landscapes (<http://extension.unh.edu/Pubs/HGpubs/slowfert.pdf>) - UNH Cooperative Extension factsheet that defines slow release fertilizers and offers options.

Landscaping at the Water's Edge: An Ecological Approach (cost \$20, call 603-679-5616) - UNH Cooperative Extension manual for NH landowners and landscapers that describes ecologically-based design and low impact maintenance practices.

Proper Lawn Care In the Protected Shoreland - The Comprehensive Shoreland Protection Act - (<http://des.nh.gov/organization/commissioner/pip/factsheets/sp/documents/sp-2.pdf>) - NHDES factsheet for homeowners.

Backyard buffers that work for people and nature by restoring ecological function

In 2006 the City of Portsmouth and several conservation organizations worked together to create a brochure to increase awareness about wetland buffers in the community and provide property owners with landscaping designs for healthy buffers.

The brochure includes three detailed landscaping plans. The first is called the "Wildlife Enhancement" plan that suggests packing the 50-foot buffer with fruit bearing plants like highbush blueberry, bearberry, and winterberry to provide food and habitat for resting or nesting. The second landscaping

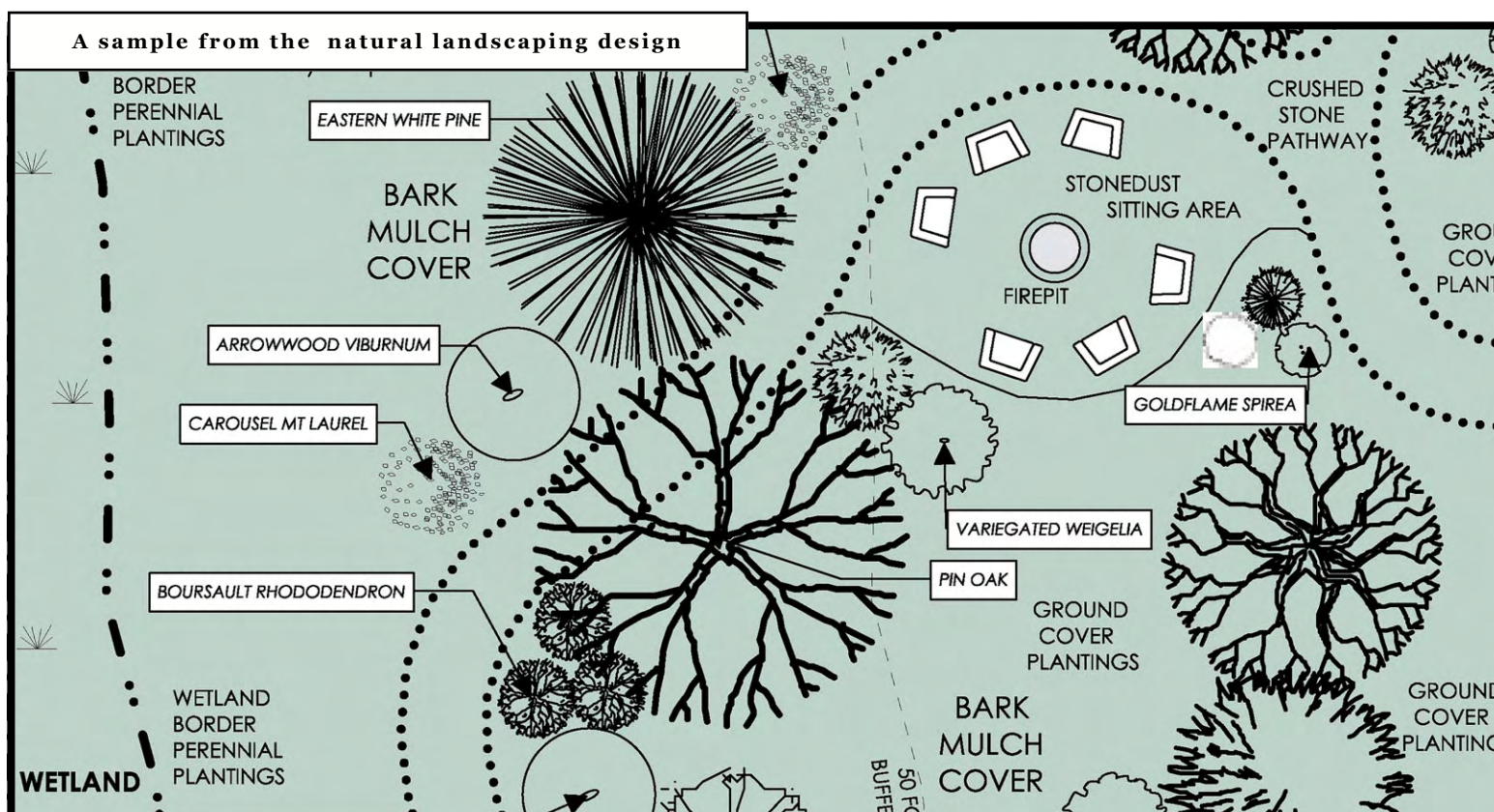
plan is called the "Stylish Gardener" and introduces exciting plant color and texture into the buffer to enhance the visual landscape, with plants like purple beech, shamrock inkberry, and wetland iris. The final landscaping design offered in the brochure called "Natural Design" uses Northeast native plant varieties that require low maintenance and provide a mix of evergreen, deciduous and coniferous plants.

Each plan also includes recommendations for maintaining the design and suggested plant lists.

What are the benefits of healthy wetland buffers?
Wetland buffers provide a long list of benefits to society and the buffer landowner.

Here is a partial list:

- Provide erosion and flood control
- Prevent water damage to homes and buildings
- Filter sediments and debris
- Absorb and transform nutrients that would pollute surface waters
- Regulate stream flows
- Moderate stream water temperatures
- Stabilize the banks of waterways
- Protect in-water habitats
- Enhance wildlife habitats and corridors
- Provide recreation
- Enhance the aesthetics of the landscape



Copies of this brochure are available from the City of Portsmouth by contacting Portsmouth Environmental Planner Peter Britz at plbritz@ch.cityofportsmouth.com to request copies.

North Hampton's aquifers

An aquifer is any formation in bedrock or sand and gravel that can yield a useable amount of water. In addition to bedrock aquifers, North Hampton is fortunate in having three major aquifers in sand and gravel that are utilized for water. North Hampton sand and gravel aquifers are shallow, some only 50 to 60 feet beneath the surface, while our bedrock aquifers are hundreds of feet deep. The majority of residential wells in town tap into bedrock aquifers.

Sand and gravel aquifers are more susceptible to contamination

Aquarion Water Company has eleven bedrock and gravel packed wells in North Hampton located primarily in the southeastern and northwestern parts of Town. The shallow sand and gravel aquifer wells yield markedly higher volumes than the bedrock wells. However, our sand and gravel aquifers are more susceptible to contamination because of their shallow depth.

This was confirmed in the late 1980s, when some residential wells in North Hampton in the LaFayette Terrace and North Road areas were found to be contaminated by the Coakley Landfill Superfund site. The DES indicated in 1986 that, "1,1 dichloroethane is the predominant contaminant found to date in the overburden water supply wells in North Hampton, most of which were found on the west side of Rt 1 off Birch Road. This fact, combined with the contamination found in the groundwater, surface waters and Little River tributaries near the Birch Road area leads us to conclude Birch Road is a high risk area for contamination of private water supply wells."

Subsequently, the water company's Hobbs well, located in the general vicinity of Birch Road, was closed as a result of concerns with its potential contamination. While we are not aware of any indications of further contamination, to safeguard our groundwater aquifers, we must be continually diligent in monitoring ground water and in maintaining drinking water protection areas near our wells.

Healthy landscaping

Continued from page 2

and save your watershed from pollutants like fertilizers, pesticides, and other backyard chemicals. Instead of lawn, plant groundcovers, trees, flowers, and shrubs that encourage water infiltration. Before you spread fertilizer test your soil to see if you need it. If you must fertilize, select a slow release fertilizer or organic fertilizer to avoid excess nutrients running into the water. Most importantly maintain a fertilizer-free buffer around wetlands.

How much lawn do you need?

Where you need to have a lawn, plant a mixture of grasses, clover, and legumes because a mix of the different species requires less nitrogen fertilizer and water and is more resistant to diseases and pests. Consider planting native plant species instead of non-native plants.

Native plants generally require much less water, pesticides, fertilizers, or trimming.

Professional landscapers and gardeners suggest top dressing lawns with compost. Compost reduces the need for fertilizers and water by supplying nutrients and helping the soil retain moisture. For more information on how your backyard can help water quality, contact Barbara McMillan, Outreach Coordinator, N.H. Department of Environmental Services, (603) 271-7889.

For information about your garden or lawn, soil testing, native plants, composting, and more, contact UNH Cooperative Extension Family Home & Garden Education Center Info-Line (877) 398-4769.

Dismal swamp

Continued from page 1

Today we know that wetlands have many benefits and offer great recreational opportunities including hiking, kayaking and wildlife viewing. They are an important part of the hydrologic cycle, positively affecting water quality and water supply.

Wetlands provide valuable flood storage, sedimentation control, and natural water filtration. And wetlands are vital wildlife habitats, home to some of the most endangered animals in New Hampshire, including the sedge wren, the marbled salamander and the ringed bog haunter dragonfly.

Across the United States, roughly half of the wetlands have been lost in the last 200 years. But not all states are the same in terms of wetland loss.

New Hampshire has lost the least amount in the Northeast, just about 9 percent of its original wetlands. We are much better off than California, which has lost 91 percent of its historic wetlands. However, New Hampshire has experienced decreases in water quality and some wildlife populations, especially in the southeastern portion of the state.

To curb these downward trends, in 1969 New Hampshire enacted law RSA 482:A, which states "no person shall excavate, remove, fill, dredge or construct a structure in surface water, bank or a wetland without a permit from the Department of Environmental Services." Passage of this law was significant because it showed that people understood that a wetland has great public value, even if it exists entirely on private land.

Given that we now better understand the services wetlands provide to wildlife, the environment and humanity; it seems they may be due for another name change. Perhaps, it would be more appropriate to rename them "lifelands" - something to consider.

New rule changes for landowners adjacent to tidal portions of the Little River

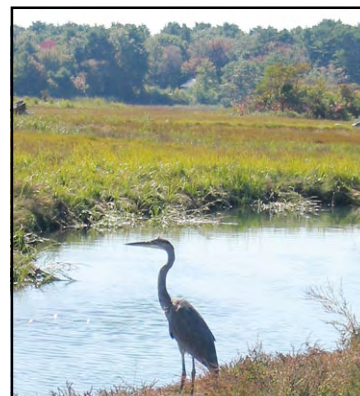
On July 1, 2008, changes to the NH Comprehensive Shoreland Protection Act (CSPA) were adopted and some North Hampton landowners were affected by the new regulations. The act states that all coastal waters subject to the ebb and flow of the tide are under the jurisdiction of the CSPA.

The act establishes restrictions within a 250-foot buffer zone of protected waters. The reference line for coastal waters is the highest observable tide line, which means a line defining the furthest landward limit of tidal flow. This does not include storm events.

The protected shoreland begins at the reference line and extends 250-foot landward. The 250-foot mark is not a setback. It is the jurisdictional limit of the CSPA. However, within the jurisdictional limit, there are setbacks from the reference line. Activities prohibited or restricted at varying degrees within 250 feet of the reference line include construction of impervious surfaces, land clearing, tree cutting, and installation of septic systems. Learn all of the details of the CSPA at <http://des.nh.gov/organization/divisions/water/wetlands/cspa/index.htm>

In addition, Wetland, Subsurface (including subdivision) or Alteration of Terrain permits require supplemental information about the property if any part of the proposed project falls within the protected shoreland.

Questions regarding the CSPA may be directed to shoreland@des.nh.gov



New invasive plant threatens seacoast



Pepperweed is an invasive species that threatens Seacoast habitats. The plant can grow four feet tall and produces white flowers at the top of its smooth, fleshy stem.

Populations of pepperweed have been located in Hampton and Rye. The NH Coastal Program seeks volunteers to find new infestations. For more information contact the Coastal Program at 603-559-1500.

Town of North Hampton
Town Offices
237 Atlantic Avenue—2nd floor
North Hampton NH 03862
Phone: 603-964-8087
Hours: M-F 8:00AM - 4:00 PM
www.northhampton-nh.gov

Land Use Boards
Contact:
Wendy Chase, Planning and Zoning Administrator
wchase@northhampton-nh.gov
603-964-8650

Special thanks to the committee of town officials that reviewed this document:

Emily Creighton
(Select Board Chair)

Phil Wilson
(Planning Board, Chair)

Tim Harned
(Water Commissioner)

Chris Ganotis
(Conservation Commission Chair)

Lisa Wilson
(Conservation Commissioner)

Lee Brooks
(Conservation Commissioner)

Phil Thayer
(Conservation Commissioner)

Richard Stanton
(Zoning Board of Adjustments, Chair)

This publication was produced by the New Hampshire Estuaries Project, which is a U.S. EPA-funded program at the University of New Hampshire with the mission to protect, enhance, and monitor the environmental health of the region's estuaries.

 **New Hampshire Estuaries Project**
www.nhep.unh.edu