



A QUARTERLY PUBLICATION OF NEW HAMPSHIRE LAKES ASSOCIATION

## 2011 Legislative Agenda:

*Keeping it Local – Maintaining the rights of local communities to help protect New Hampshire's lakes*



*Members dedicated to protecting lakes*

Volume XX, No. 3, Fall 2010

*by Jared Teutsch, NH LAKES President*

With each passing year, the cost of protecting and maintaining New Hampshire's lakes becomes a bigger and bigger challenge for the State of New Hampshire. Local communities are asked to increase their share of the costs to help prevent, detect, and manage the threats to our lakes. NH LAKES believes that state laws designed to provide support to local towns and communities to help manage our lakes should be maintained and updated periodically to reflect changes in manufacturing and technology that impact water use.

### **Personal Watercraft (Ski Craft)**

In 1988 and 1989, the New Hampshire legislature passed several pieces of legislation regulating personal watercraft (PWCs). The bills used the term 'ski craft' to label the class of vessels commonly known as jet skis and defined them as "any motorized watercraft or private boat which is less than 13 feet in length as manufactured, is capable of exceeding a speed of 20 miles per hour, and has the capacity to carry not more than the operator and one other person while in operation. The term includes a jet ski, surf ski, fun ski or other similar device." This definition was intended to regulate all personal watercraft being used in New Hampshire at that time. In addition, the legislation: required operators to wear personal floatation devices (PFDs); set a minimum age of operation at 16 years of age; prohibited operation between sunset and sunrise; set a headway speed buffer of 300 feet from shore; prohibited ski craft operation on lakes smaller than 75 acres; and, created an administrative process for gathering input from lake users and determining the appropriateness of this class of vessels on individual water bodies.

Shortly after the passage of this legislation, the personal watercraft industry began developing larger vessels capable of carrying three and even four passengers. Although the craft appeared nearly identical to their smaller predecessors and exhibited the same design and operation characteristics, these craft did not fall under New Hampshire's definition of 'ski craft' because they were greater than 13 feet in length and had a capacity to carry more than two people. This industry development means that craft as little as nine inches longer than the average two seat 'ski craft' (but otherwise identical vessels) can operate on water bodies that are deemed inappropriate for ski craft (including lakes smaller than 75 acres), are subject to a headway speed buffer of 150 feet rather than 300 feet, and operators are not required to wear personal floatation devices. In addition, local communities have no say in the presence and impact of larger ski craft on their lakes.

The additional nine inches in length changed much more than simply adding a seat for a third person. It allowed changes in style and manufacturing to circumvent years of carefully crafted legislation and it negated a sizeable grassroots movement to give local communities a say in local lake use.

**In order to keep pace with industry developments and maintain the ski craft legislation's original intent, during the upcoming 2011 legislative session, NH LAKES proposes to update the definition of personal watercraft that was created by the Personal Watercraft Industry Association (PWIA).** This updated definition would allow New Hampshire to once again unite all personal watercrafts under a common definition that will result in: less confusion on the part of the operator and other lake users; consistent enforcement of laws pertaining to the craft; improved safety on our public waters; and the ability of lake managers to determine the appropriateness of such craft on a particular waterbody through a democratic public hearing process. The proposed definition of personal watercraft is "a vessel which uses an inboard motor powering a water jet pump as its primary source of motive power and which is designed to be operated by a person or per-

*Legislative Agenda, continued on page 3*

## LAKESIDE

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# From the President...



A community can be defined as, 'a group through which everyone takes common ownership and responsibility for a healthier quality of life.' By this definition, NH LAKES is **YOUR** community to protect and enhance the quality of your life along New Hampshire's lakes. This fall, we are taking the opportunity to re-emphasize the community aspect of our relationship with you, our members and our supporters. While we are a statewide organization that addresses statewide lake problems, we are firmly dedicated to helping local groups—individuals, associations, and municipalities—with implementing solutions to problems on the local level. Some of these solutions take form in citizen action protection or restoration programs like the NH LAKES Lake Host™ Program, Lake Conservation Corps<sup>SM</sup> Program, or Innovative Exotic Weed Control Program, while others take form in the enactment of state laws initiated through NH LAKES' efforts.

Each fall NH LAKES unveils your priorities for solutions to resolve problems through our lake advocacy efforts in the state legislature. All summer your NH LAKES staff traveled around the state

attending your association meetings to listen to what your local needs are for lake management and protection. For those of you who we didn't visit, we made sure that we heard from you through our annual Lake Issue Survey. At your meetings, we heard that exotic aquatic species, polluted runoff water, and traffic on your lake continue to be the biggest threats to your lake experience. And, through the issue survey, these three issues were validated as the top threats. Then, we shaped the 2011 Legislative Agenda by placing emphasis on exotic aquatic species, pollution sources, and recreational uses as they impact the local lake community. (See the cover page article of this issue to learn more.)

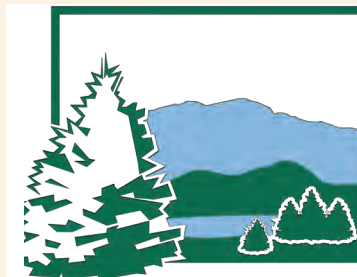
As part of the NH LAKES Community, autumn provides an important opportunity for you to strengthen your relationship with your only statewide, non-profit organization dedicated to protecting your lake and the rest of New Hampshire's 1,000 lakes. Soon you'll find our Annual Fund giving opportunity in your mailbox. Your generosity at this time of year provides critical funding which ensures that NH LAKES will be poised to continue to educate and advocate for lake protection and the high quality of life you, your family, and your friends enjoy along and on the lake.

Thank you for being a part of the NH LAKES Community and for helping to strengthen it!

Best wishes for a safe and enjoyable holiday season,

  
Jared

### NH LAKES gratefully acknowledges the support of:

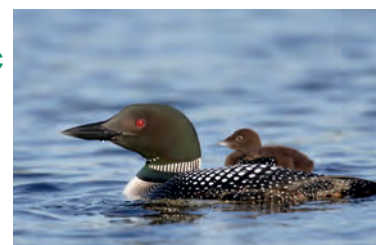


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whose generous contributions underwrite this issue of *Lakeside*.

sons sitting, standing, or kneeling on the vessel, rather than the conventional manner of sitting or standing inside the vessel.” This definition allows regulators to describe personal watercraft by the characteristics that differentiate them from other vessels (propulsion and riding method) rather than by the number of people sitting on the craft.

Passage of this legislation would apply the following requirements to all personal watercraft regardless of their capacity: 1. Operators are required wear a PFD; 2. The minimum age of operation is 16 years; 3. Operation is prohibited between sunset and sunrise; 4. Operators must maintain headway speed within 300 feet of shore on rivers and 150 feet of shore on lakes or ponds; 5. The extension of the administrative process for gathering input from lake users to determine the appropriateness of personal watercraft use on individual waterbodies.

**This legislation updates existing law to keep pace with industry developments. It does not ban PWCs from any waterbody in the state but it does prevent nine inches from silencing the public’s voice on the use of New Hampshire’s lakes.**

## Septic Systems

Currently, out-dated and undersized septic systems present unique challenges to protecting the health of New Hampshire’s lakes since they often leach pollutants into surface waters. Local communities are faced with a growing problem of managing redevelopment along the shores of lakes with limited space and limited septic designs approved by the State of New Hampshire. Many lakes with dense shoreline development have small lots that no longer meet the state requirements to install a new septic system. As part of its 2011 legislative agenda, NH LAKES is initiating a Commission to Study Septic Systems in the state. **By establishing a commission, NH LAKES hopes that many of the questions associated with replacing out-dated, undersized, and failed septic systems can be answered.**

## Exotic Aquatic Species Policy

In 2004, the Exotic Aquatic Weeds and Species Committee was created to study exotic aquatic weeds and species in the state and aid the New Hampshire Department of Environmental Services in the control and eradication of mil-

foil. Since that time, NH LAKES has worked with local communities to not only expand one of the most effective exotic aquatic species prevention programs in the country (the NH LAKES Lake Host™ Program), but has helped communities implement new management techniques for non-chemical exotic aquatic weed control. **Recognizing our experience and expertise and the communities we represent in exotic aquatic species prevention and control, NH LAKES will initiate legislation in 2011 to add a representative of NH LAKES on to the Exotic Aquatic Weeds and Species Committee and to put more emphasis on other exotic aquatic invasive species.**

**During the upcoming legislative session, NH LAKES will need your support in passing these important bills to help maintain the rights of local communities to help protect New Hampshire’s lakes.** If you have questions about these bills or other policy issues, please contact Jared Teutsch at [jteutsch@nhlakes.org](mailto:jteutsch@nhlakes.org) or (603) 226-0299.



*View of Cow Island, Lake Winnepesaukee, in autumn.*  
Photo courtesy of Bill Hemmel, [www.lakesregionaerials.com](http://www.lakesregionaerials.com).

# Student Landscapers protect lakes, ponds, rivers, and streams!

by Brett Hillman, NH LAKES Programs Coordinator

NH LAKES' 2010 Lake Conservation Corp<sup>SM</sup> (LCC) Program season has come to a close, but not before high school students from all around the state worked incredibly hard to restore a few of New Hampshire's shorelines!

The NH LAKES LCC Program is a natural resource stewardship learning program designed to actively involve youth in hands-on shoreland and watershed restoration projects. These projects reduce the amount of polluted water that flows off the landscape (formally referred to as 'stormwater runoff') in an effort to improve the health of New Hampshire's surface waters. The students who participate in this innovative and much-needed program have the unique opportunity to learn about lake ecology, build their resumes, and literally "get their hands dirty" as they do very important water quality restoration work. And, by hosting 'open houses' for the public where the finished projects are showcased, property owners have the opportunity learn how easily they can construct similar stormwater improvement projects on their own property.

The five projects completed through the NH LAKES LCC program during Summer 2010, highlighted below, were all tremendously successful—we thank all of the hardworking students and their supervisors for their efforts!

**Canaan:** Despite attending rival high schools, Mascoma High and Lebanon High students had no trouble working together on two projects designed to reduce the amount of stormwater runoff flowing into Goose Pond in



*Students planting a rain garden along Goose Pond Road in Canaan.*

Canaan. The students enjoyed constructing rain gardens and infiltration trenches on two residential properties. A rain garden is a depressed area of the ground planted with vegetation which allows runoff from impervious surfaces which do not soak up rainwater (such as roadways and driveways and roofs) the opportunity to be collected and infiltrated into the groundwater supply or returned to the atmosphere through evaporation. The students constructed open-top culverts and infiltration trenches to direct stormwater runoff from nearby driveways and Goose Pond Road into rain gardens. We thank the property owners who volunteered their property for these improvements. And, we thank the Wellborn Ecology Fund and the Byrne Foundation for their financial support of this project which was a part of NH LAKES' Summer Youth Employment Program for Lake Protection in the Upper Valley. And, we can't forget to thank the Goose Pond Lake Association for donating plants and the Town of Canaan for donating crushed stone.

**Colebrook:** There is a town-owned piece of property along the Connecticut River in Colebrook that serves as a popular access point for anglers and kayakers. Unfortunately, years of heavy use had compacted the soils and prohibited vegetation from growing, which combined to prevent rainwater from being absorbed into the

ground—instead, it ran off the landscape bringing sediment and other pollutants along for the ride into the river. To fix this problem, Colebrook Academy students constructed water bars made of timbers to direct water off

*Student Landscapers, continued on page 5*



*The Summer Youth Employment Program for Lake Protection crew in Colebrook.*



*A vegetated buffer and crushed stone water bars were installed at the Eastman Community Association's South Cove Activity Center to reduce the amount of stormwater runoff into Eastman Lake.*



the well-used path and into adjacent vegetated areas. The students also spruced up the area and made the river more accessible for recreationists by constructing an attractive footbridge. We thank the Town of Colebrook and many local businesses for supporting this project and the Tillotson Foundation which funded this project as part of NH LAKES' Summer Youth Employment Program for Lake Protection in the North Country.

**Grantham:** Students from the Eastman Community Association (ECA), in cooperation with members of the ECA's Lakes and Streams Committee, constructed a number of best management practices at the South Cove Activity Center to reduce the amount of stormwater runoff into Eastman Lake. The students, on their summer vacation from schools throughout New Hampshire, installed crushed stone dripline trenches at the base of the new "green" building to capture roof runoff and allow it to soak into the ground. They also constructed a beautiful rain garden to collect roof runoff. And, along a popular walking path that leads down to the lake, they constructed a series of crushed stone water bars reinforced with timbers and planted an extensive vegetated buffer to reduce the amount of runoff. A rain barrel was also purchased and installed on the project site to collect runoff from the roof—the collected water, instead of polluting the lake, will be used to water nearby flower gardens. We thank the Eastman Charitable Foundation for their support of this project and the Eastman Community Association for their substantial volunteer contributions to the project.

**Laconia:** Planting a few shrubs along the shore of Lake Opechee may not have seemed like a tall task, but the students from Laconia High School weren't counting on 95 degree heat and the frustrating, unyielding compacted soil and a network of tangled roots that had invaded the shoreline. But, along with help from Dale Squires of Belknap Landscape Company, Inc., the students managed to get several dozen plants into the ground. Planting a vegetated buffer strip at the water's edge works to

both stabilize the shoreline and allow runoff water to infiltrate into the soil. In addition to thanking Belknap Landscape for providing shrubs at a discounted cost and the Samuel Pardoe Foundation for funding this project as part of NH LAKES' Summer Youth Employment Program for Lake Protection in Laconia, we thank Public Service of New Hampshire for helping coordinate this project on their property used by the City of Laconia for lake access.

**Pittsburg:** Students from the Pittsburg School worked tirelessly to reduce soil erosion from a recreational trail along the upper reaches of the Connecticut River. This work, which took place on land owned by the Society for the Protection of New Hampshire Forests, involved the construction of an extensive system of boardwalks along very muddy sections of a popular hiking trail. Students hauled heavy wood several hundred yards from the trailhead which, to put it lightly, was



**The LCC crew in Pittsburg constructed an extensive boardwalk along a popular but muddy hiking trail.**

no easy task! The boardwalk prevents soil erosion and provides for safe public access. We thank the Forest Society for supporting this project. And, we thank the many local businesses that contributed the project by providing discounts on materials and donations and the Tillotson Foundation which provided funding for the project as part of NH LAKES' Summer Youth Employment Program for Lake Protection in the North Country.

**The NH LAKES Lake Conservation Corps**

**Program is a unique and collaborative effort between NH LAKES, local schools, students, community organizations, businesses, and charitable organizations**—it puts youth to work and provides examples of how property owners can construct landscaping features that improve the aesthetics of their property while improving the health of local waterbodies. If you would like to view one of these projects to get ideas for how you can fix stormwater runoff problems on your property, contact NH LAKES at [info@nhlakes.org](mailto:info@nhlakes.org) or (603) 226-0299—we may be able to arrange a tour for you! And, to learn how to construct rain gardens, infiltration trenches, waterbars, rain barrels, and other simple stormwater best management practices, visit the NH LAKES website at [www.nhlakes.org](http://www.nhlakes.org) to download "*The Shoreland Homeowner's Guide to Stormwater Management*." (Just click on the link which is found on the left-hand side of our homepage.)



**The LCC crew in Laconia planted a vegetated buffer along the shoreline of Lake Opechee.**



# Our pond has a salt problem – does yours?

by Dave Barney, Goose Pond Lake Association, President

Here's an interesting story about how local politics caused Goose Pond Road to lose its 'Low Salt' status and how it was eventually re-established five years later...

## **Goose Pond: A road runs along it.**

Goose Pond and its watershed (the land area that drains into it) is located in the towns of Canaan, Hanover, and Lyme, New Hampshire. The watershed is approximately 16 square miles in size and the pond itself is 625 acres. The pond serves as an important recreational, scenic, and ecological resource in the Mascoma River watershed. In addition to its recreational value, Goose Pond is in the headwaters of the City of Lebanon's water supply. A critical part of the topography is Goose Pond Road, a paved road which runs approximately three miles along the eastern shore of Goose Pond and leaves only a narrow vegetated strip between it and the pond. The northern one-third of a mile of the road is in Hanover, while the rest is in Canaan.

## **1989 – 2005: We initiated a water testing program to identify potential pollutants to our lake.**

In 1989, the Goose Pond Lake Association (GPLA) started a water testing program as part of the New Hampshire Lakes Lay Monitoring Program at the University of New Hampshire (UNH). From 1998 through 2000, the sampling effort was expanded to a watershed analysis by UNH to assess watershed conditions and predict the possible impacts of land development on the health of the pond. In 1999, as part of the watershed analysis with UNH, the GPLA asked the Town of Canaan whether salt was used on Goose Pond Road. The response was that salt was not used north of the dam along the shoreline of the pond. On the northern portion of the road, the Town of Hanover uses manufactured sand with a small amount of salt mixed in to keep it from freezing.

From 1999 to 2005, residents complained of salt use on Goose Pond Road north of the dam. Responses from the Town of Canaan were typically "driver error" or the need to remove ice from icy areas. During the latter part of this period it became obvious that salt

was being used regularly on the entire road—visual observations of salt on the road and tree damage were very apparent.

As part of the watershed analysis, GPLA took conductivity readings (since elevated conductivity readings usually indicate road salt use in New Hampshire) in tributary streams and at 130 points along the shoreline. We have continued this extensive monitoring since that time. The conductivity readings increased from the low 30 uMhos/cm (micromhos per centimeter) range in 1998 to approaching or exceeding the 40 uMhos/cm range in 2005.

## **2005 – 2007: We approached the town about the salt problem.**

On December 15, 2005, the GPLA sent a letter to the Canaan Selectboard identifying the salt problem on Goose Pond Road. This was followed by an inconclusive meeting with the Selectboard and Road Agent on January 3, 2006. We discovered that there was a Town of Canaan written policy that prohibited the use of salt on Goose Pond Road. The current Selectboard was not aware of the policy and decided to suspend it pending a study of the problem. At a public hearing on January 26, 2006, the Selectboard agreed to "work with Mr. Barney, the State Limnologist and the Road Agent to come to an agreed solution in the near future." Meetings and tours of the road continued and, on March 21, 2006, the Selectboard agreed to use salt only in the event of an ice storm for the rest of the season.

A Road Salt Working Group (RSWG), composed of one Canaan Selectman, the Town

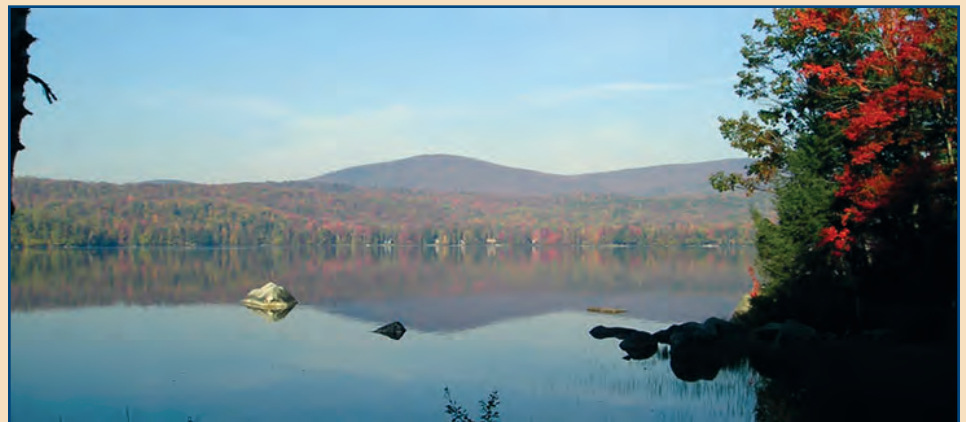
Administrator, two representatives from the GPLA, two from the New Hampshire Departments of Environmental Services (DES), and one from the Department of Transportation (DOT) was formed in May and started work on a policy for Goose Pond Road. A draft policy was developed by the RSWG in September 2006. It called for the designation of Goose Pond Road as a 'low salt (Type 5) road' with abrasives only used for winter maintenance as defined in DOT maintenance policy. It also called for repairing icy areas on the road, upgrading trucks to allow accurate measurements of materials used on the road, providing the capability to sweep up sand on the road, and incorporating additional water quality testing through the NH DES Volunteer Lake Assessment Program.

The policy was reviewed at a public hearing on November 14, 2006. At a subsequent meeting with the Selectboard, it was decided to proceed with the 'Low Salt Area.' However, the Selectboard did not, then or later, officially approve the RSWG recommended policy. Signs were posted and sand was used for the remainder of Winter 2006 - 2007.

## **2007 – 2008: Winter road conditions were very bad.**

Mother Nature gave us plenty of snow and mixed in sleet and freezing rain. As a result, much of this precipitation froze onto the road. Ice was allowed to build up on the Canaan section of Goose Pond Road and the

*Salt Problem, continued on page 7*



**Goose Pond, Hanover/Canaan.**

driving was treacherous at times. The Selectmen decided to use some salt late in the season, but it was too late to reduce the build-up. Since Canaan was on a default budget, the GPLA paid an independent contractor \$800 to sweep the Canaan section of the road along the pond in spring. The Town of Canaan provided a truck to collect 13 truck loads of sand. The Hanover section of the road was in good shape the entire winter.

### **2008 - 2009: During the summer of 2008, things took a turn for the worse.**

After using sand for two winters, the Town of Canaan decided to purchase a new product called 'Magic Salt', based on the vendor's assertion that it is environmentally safe and would reduce the amount of salt required. The Magic Salt was discussed and approved at a Selectmen's meeting without any prior notification to or consultation with the GPLA.

The GPLA did some investigation and found that Magic Salt is an "agricultural by-product of the distilling process" which contains phosphorus (the nutrient that accelerates plant and algal growth in lakes). Unfortunately, phosphorus presents an additional problem for the lake. We provided a sample of Magic Salt to DES for testing and they verified that it did in fact contain phosphorus. We also learned that salt and Magic Salt will increase the phosphorus level in the water more so than sand. Since we know that excessive phosphorus inputs into lakes can contribute to algae blooms and toxic cyanobacteria blooms, we asked the Town to discontinue the use of Magic Salt. In spite of our objections, Magic Salt was used on Goose Pond Road mixed with salt.

After a winter of using salt and Magic Salt, phosphorus testing in late-March 2009 showed the highest phosphorus levels in the streams along Goose Pond Road that we had seen in the 11 years since the testing of stream phosphorus levels began. Much to our dismay, we have also seen non-toxic algal blooms increasing over the last few years and, even more concerning, toxic cyanobacteria blooms occurring during the past two summers. Although algal blooms are a problem in many lakes and ponds, they are very sensitive to phosphorus levels and it is hard to avoid making a connection between the use of road salt and Magic Salt, the increased phosphorus levels, and toxic cyanobacteria episodes in our pond.

In November 2009, we met with the Town of Canaan Selectboard again to convince them to adopt the November 2006 recommendation of the RSWG to use abrasives only on the section of Goose Pond Road adjacent to the pond. In spite of our review of the harmful effect of road salt on aquatic life and vegetation and our explanation that the phosphorus in the salt would increase nutrient levels which could cause additional cyanobacteria blooms, they again refused to adopt the recommendation.

### **January 2010: We submitted a petitioned warrant article to designate Goose Pond Road along the pond in Canaan as a 'low salt road.'**

In order to ensure that the amount of chloride and phosphorus entering the pond was minimized, the warrant article called for the implementation of the major elements of the RSWG recommendations. An attempt to amend the warrant article to a study at the Deliberative Session was defeated and the low

salt warrant article was passed by the voters at the Town Meeting in March 2010.

### **Happy ending?**

Not yet. Work remains for the Town of Canaan, the Goose Pond Lake Association and property owners. Canaan needs to complete several of the recommendations in the RSWG plan. In February 2009, we prepared a request for stimulus funding from the Clean Water State Revolving Fund to incorporate the Goose Pond Road Low Salt Area into the Town Winter Maintenance Policy. It requested \$110,950 for repairing icy areas, upgrading trucks, initial sand sweeping, and an initial supply of manufactured sand. The request was determined to be eligible but was ranked too low to receive any of the available funding.

### **For more information:**

If you would like a copy of the warrant article the GLPA submitted for low salt designation, email [Dave.Barney@VALLEY.NET](mailto:Dave.Barney@VALLEY.NET).

### **NOTE: Since the initial writing of this article, there have been some other developments...**

At a meeting on August 30, 2010, the Canaan Town Administrator raised two concerns. One was whether the Town Meeting had the authority to direct highway operations. The other concern was a perceived need for an emergency procedure in the event that a buildup of snow and ice caused dangerous conditions. On September 1, 2010, Canaan Town Counsel Bernie Waugh rendered an opinion "that the Selectmen have the legal authority to decide to depart from compliance with Article 21 if they determine that the public interest and safety would be served by doing so." This was discussed at the Selectmen's meeting on Tuesday, September 21, 2010. No formal vote was taken but the Selectmen did agree to honor the low salt warrant article with the addition of an emergency procedure which would allow them to take appropriate action if road conditions become unsafe. The Selectmen will write the procedure. Input will be solicited from other towns with low salt roads. Although the GPLA has no authority to enter into any "agreement", I expect we will be able to discuss or comment on it.

### **Stay tuned...**



**Goose Pond Road is located along the eastern shore of Goose Pond.**

# Waterfront Septic Systems: What happens after you flush?

BY RICK KELLER, WASTEWATER ALTERNATIVES, INC.

*This is a paid advertisement intended to provide you with information about a new technology that is available to help protect and improve water quality. NH LAKES does not necessarily support or endorse any one technology, or product or company over similar products and companies.*

If you live or vacation on a New Hampshire lake, there is a very good chance you are living with an onsite septic system. This type of septic system treats your wastewater under your yard, as opposed to flushing it away to a municipal treatment plant. In fact, the Northeast has the highest concentration of residential septic systems in the country. Just how many there are in New Hampshire, or how many are overloaded or in failure, we don't know, but the U.S. Environmental Protection Agency estimates that half the systems in the country are more than 30 years old, and that 10 to 30 percent of these systems fail annually. This is not good news for New Hampshire's approximately 1,000 lakes and 17,000 miles of rivers.

**New Hampshire's lakes and rivers are a precious resource, and protecting their quality is a never-ending task.** Toward that end, the New Hampshire Legislature passed the Comprehensive Shoreland Protection Act (CSPA) in 1991, amended it in 2008, and continues to review and evaluate legislative proposals every year. Many of the new standards are aimed directly at onsite septic systems, including increased setbacks from waterbodies and the requirement for a 'Site Assessment Study' before selling developed property. The ultimate goal of the CSPA is to protect the health of New Hampshire's waterbodies.

**Why target septic systems?** Because, if the system is in failure, it can pollute drinking water with nitrates, chemicals, pathogens, and pharmaceuticals, which in turn can cause numerous health problems for people drinking the contaminated water. These include gastrointestinal illnesses and diseases such as cholera, hepatitis A, and typhoid.

**And if you live near a lake or other waterbody, runoff from a failed system can contribute to increased levels of nitrates, phosphates, and other pollutants in the water, which in turn stimulates algae and weed growth.** When the additional algae and plant material is decomposed, the amount of oxygen in the water can be reduced to the point that the waterbody can no longer support a healthy population of fish or other aquatic animals. This is when the problem finally hits home for many people—failing septic systems can cause beaches to be posted for unhealthy water quality and fishing areas can be closed.

**Conventional septic treatment is a two-step process.** First, effluent from toilets, sinks, dishwashers, showers—everything that goes down the drain—runs into a septic tank where it settles out, leaving a heavy sludge on the bottom of the tank, grease and other light substances floating on the top, and a cloudy layer of untreated effluent in the middle. The biological activity in this tank is *anaerobic* (that is, it takes place without oxygen), and treatment is only partial. Next, the middle, cloudy, layer of effluent goes to the leach field, where air is introduced through vents or through the soil, allowing aerobic (with oxygen) activity to occur. Aerobic activity creates a sludge-like layer called a 'biomat' which filters out solids and dissolved pollutants not already processed in the tank.

**Conventional, two-step septic systems have been in use for decades, and they still constitute the majority of new installations.** If properly designed and built—and *properly maintained*—they are an acceptable solution in most instances. They do, however, have limitations:

- Conventional systems require sizeable leach fields—from 540 to more than 1,000 square feet for a three or four-bedroom home, depending on soil type. This may mean cutting trees, removing earth, moving or blasting boulders and ledge, and hauling in large amounts of new stone and State-approved sand.



**Like many shoreline homes, this home is serviced by an onsite septic system.**



**An aerated system like Wastewater Alternatives' The Clean Solution permits a reduced leachfield, often as small as 75 square feet.**

- If a system is overloaded or improperly maintained, the biomat will become thicker, reducing the leach field's ability to process effluent, and the field will eventually fail. At this point, effluent will either back up inside the house, "pond" on the surface of the leach field, or break out and flow directly (and untreated) across and into the ground, where it could eventually contaminate groundwater, the nearest lake or stream, or your (or your neighbor's) well.
- Even well-maintained conventional systems are not efficient at filtering out phosphates and nitrates. If effluent runs or leaches into a nearby waterbody, it can contribute to accelerated *eutrophication*—the process described above in which excess nutrients stimulate plant and algal growth. This process can ultimately lead to the depletion of dissolved oxygen in the water so that it can no longer sustain healthy aquatic life.

**For several decades, engineers and designers have been devising systems to make wastewater treatment "greener" by improving the aerobic activity, whether in the tank or in the leach field, and by reducing the impact on the landscape.** One such system is "The Clean Solution™", designed by Wastewater Alternatives, Inc., of Concord, New Hampshire. Invented by engineer Harold Davis in the early 1990s, The Clean Solution has become a well-accepted alternative to conventional treatment throughout New England, with over 1,000 systems installed in New Hampshire alone and more than 600 along the shoreline of New Hampshire waterbodies. The Clean Solution introduces air into the wastewater, stimulating highly aerobic activity which digests the effluent. This digestion reduces the organic content and the amount of suspended solids, and reduces the amount of undigested pollutants, including nitrates and phosphates.

**Gary Spaulding, president of Wastewater Alternatives, explains the system as follows:** "Wastewater still goes into a septic tank for initial settling, just like in a conventional system. But then it flows into the 'Biocon chamber' where we introduce tiny air bubbles into the effluent through a diffuser, rather like the way you would aerate a fish tank." Much of the air from the diffuser is absorbed into the effluent as dissolved oxygen, creating an environment bacteria thrives in, and the bacteria attaches to the media in the Biocon chamber and goes to work digesting the pollutants. From the Biocon chamber, the effluent goes to a second settling chamber and finally to a dispersal field.

**"The dispersal field can be much smaller than a conventional leach field,"** says Spaulding, "because, in our system, the digestion that normally takes place in the leach field is now taking place in the Biocon chamber." In many cases, New Hampshire has permitted dispersal fields with The Clean Solution to be as small as 75 square feet—a more than 90 percent reduction in size from a conventional system. And, for sites with tight setbacks or with challenging soil characteristics, this could be a major factor in selecting a system or in deciding whether or not to even purchase a property.

**It is important to remember that any system, regardless of its design or age, requires maintenance to keep it operating properly.** "It doesn't matter what kind of system you have," Spaulding says. "If you don't maintain it, you will have problems in the future." Recommended maintenance includes regular pumping and should include an inspection by a qualified system evaluator.

**"Maintenance also includes proper use,"** adds Spaulding. "If your system was designed for a two-bedroom house and you have 20 guests for a family reunion, you might want to consider a portable toilet. Also, think about the impact on the system if you start renting the property. What will happen to the system if the weekend camp is now getting full-time use? You may want to restrict use of the washing machine and dishwasher." And, of course, don't pour bleach and other chemicals or unused pharmaceuticals down the drain, and don't clean paintbrushes in the sink—even if it's latex paint.

**For more information:**

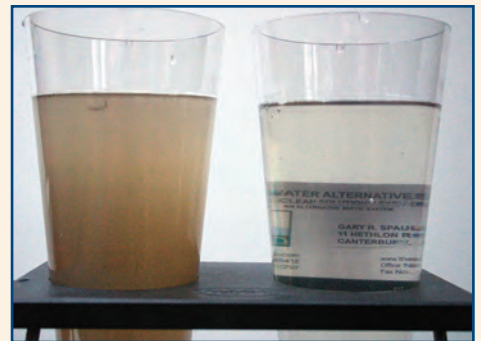
To learn more about wastewater disposal, we recommend checking out the following website links: Wastewater Alternatives, Inc at [www.thecleansolution.com](http://www.thecleansolution.com); Granite State Designers and Installers at [www.gsdia.org](http://www.gsdia.org); the New Hampshire Department of Environmental Services (DES), Subsurface Systems Bureau at [des.nh.gov/organization/divisions/water/ssb](http://des.nh.gov/organization/divisions/water/ssb); and the DES Shoreland Program at [des.nh.gov/organization/divisions/water/wetlands/cspa](http://des.nh.gov/organization/divisions/water/wetlands/cspa).



*The compressor serving the Biocon chamber uses about the same amount of electricity as an 80-watt light bulb, and it can be placed in a garage or shed, or in a crawl space under the house.*



*Bacteria attaches itself to thousands of these media in the Biocon chamber where active digestion results in reduced pollutants, including phosphates and nitrates.*



*The sample on the left is effluent from a conventional septic tank. The sample on the right is from the Biocon chamber of a Clean Solution system.*

# New NH LAKES Directors

At its annual meeting at the end of July, NH LAKES announced the election of six new directors to its board and the appointment of George Dana Bisbee of Concord as the new Chairman to its membership. And, with a bit of sadness, we honored and thanked outgoing board members and friends Ted Kramer, Shirley Green, Jeffrey Schloss, and Bill Smith.

The six elected board members, each elected to a three-year term, are: Theodore W. Braun, James F. Haney, James W. Nelson, Peter Sorlein, Robert W. Varney, and John B. Wilson.

## New Director Biographies

**Theodore W. Braun** heads the risk quality assessment team at Liberty Mutual and is a long-time resident of Merrimack, with a summer home on Silver Lake in Nelson. He is a professional member of the American Society of Safety Engineers, a member of the Human Factors and Ergonomics Society, and serves on the Ergonomics Standing Committee of the National Safety Council. He earned his Master of Arts in Business Administration from Southern New Hampshire University and his Bachelor of Science in Physics from the University of Cincinnati.

**James F. Haney, Ph.D.**, of Durham, is a professor of biological sciences at the University of New Hampshire and the former Chair of the Zoology Department at the University of New Hampshire. He received his B.A. and M.A. from Miami University, his Ph.D. from University of Toronto and his Postdoc from the Kellogg Biological Station at Michigan State University. Dr. Haney is one of a handful of preeminent experts on New Hampshire's water quality.

**James W. Nelson** is a member of Valley Creek Restoration Partnership in Pennsylvania, President of the Valley Forge Chapter of Trout Unlimited, and a current resident of Lees Pond in Moultonborough. He spent the majority of his career working for Johnson & Johnson in manufacturing, logistics, and plant engineering and maintenance. He was the Senior Vice President of Operations for American Safety Razor and the Vice President of Operations for L&F Products Division of Eastman Kodak. He received his B.A. from

Monmouth College and his M.B.A. from Indiana University.

**Peter Sorlein** began his career by founding a nonprofit arts organization in Chautauqua County, New York. He is an activist for loon preservation and serves as Second Vice-Chair of the Loon Preservation Committee. He has also served on the board of the Squam Lakes Association, chairing its Wildlife Committee and publishing Squam Wildlife Guide. He has been an accredited appraiser of art and antiques for 22 years and has served in all the offices of the Boston chapter of the American Society of Appraisers. He is a graduate of Dartmouth College where he majored in history.

**Robert W. Varney** of Bow is the Senior Vice President of Normandeau Associates and former U.S. Environmental Protection Agency (EPA) New England Administrator. He was Commissioner of the New Hampshire Department of Environmental Services for 12 years and also served as the Director of the New Hampshire Office of State Planning, Executive Director of the Nashua Regional Planning Commission, and the Executive Director of the Upper Valley-Lake Sunapee Council. Considered one of the nation's most experienced and respected environmental

leaders, in 2009 he was presented with EPA's prestigious Lifetime Achievement Environmental Merit Award. He holds a bachelor's degree in economics from the University of New Hampshire and a master's degree in urban planning from Michigan State University.

**John B. Wilson** of New London has a degree in Electrical Engineering from Cornell University and a degree in dentistry from University of Buffalo. He served as an officer in the Navy. He has been a three-term President of the Pleasant Lake Protective Association (PLPA) of New London and currently serves as the Chair of its Watershed Conservation Committee. He has been a Weed Watcher Captain and is an active member of the PLPA Wildlife Committee. He has been elected to this third term on the New London Budget Committee and has been elected as Budget Committee Chair for the past three years. John is married to Kittie Wilson, who is also actively involved in the PLPA and the Loon Preservation Committee.

**We look forward to the new ideas, perspectives, and expertise that this strong class of new directors brings to NH LAKES.**



*Horseshoe Pond in Concord, just outside of NH LAKES' new office at 14 Horseshoe Pond Lane.*

# Couple from Crystal Lake Wins Prestigious Morten Award

NH LAKES awarded the John F. Morten Memorial Award for Exemplary Lakes Stewardship to Glyn and Shirley Green on July 30 at its Annual Meeting. The award was well-deserved considering the couple's unrelenting commitment to protecting and improving the quality not only of Crystal Lake in Enfield but of all New Hampshire's lakes.

Glyn and Shirley have monitored the health of Crystal Lake through the University of New Hampshire's Lay Lakes Monitoring Program for more than 15 years. Since 2000, they have volunteered as New Hampshire Department of Environmental Services' Weed Watchers surveying sections of Crystal Lake each summer keeping an eye out for infestations of exotic plants. And, in 2002, they established the NH LAKES' Lake Host™ program at Crystal Lake to protect it from invading exotic aquatic plants. In addition to spearheading these statewide lake monitoring pro-

grams at Crystal Lake, they created and continue to publish the Crystal Lake Improvement Association newsletter and they lead the association's annual picnic and watershed cleanup. For the last 10 years, Shirley also managed to find time to serve as a dedicated member of the Board of Directors of NH LAKES, including serving as Chair of the Education Committee. Glyn has volunteered his time at many of NH LAKES' events.

**Not only is Crystal Lake in Enfield better off because of Glyn and Shirley, all of New Hampshire's approximately 1,000 lakes are better off!** NH LAKES was proud to award this prestigious honor to this wonderful couple and team.

The Morten Award was created in September 2002 in honor of the late John F. Morten (1914-1989) in recognition of his lifelong work to protect New Hampshire's lakes and ponds.



*At the NH LAKES 2010 Annual Meeting, Glyn (middle) and Shirley Green (second from right) from Crystal Lake in Enfield were presented with the John F. Morten Award.*

## Membership Matters

*New Members – June 11 through September 28, 2010*

### Individuals

Ms. Kally Abrams • Mr. and Mrs. Richard Bayles  
Mr. and Mrs. Stanley A. Clark • Mr. Dennis Fallon  
Mr. and Mrs. William H. Harman • Mr. and Mrs. David F. Moore  
Ms. Sharon Nahill • Ms. Kathryn Soave • Ms. Elizabeth Titus

### Lakes Legacy

Mr. Mark W. Begor

### Businesses

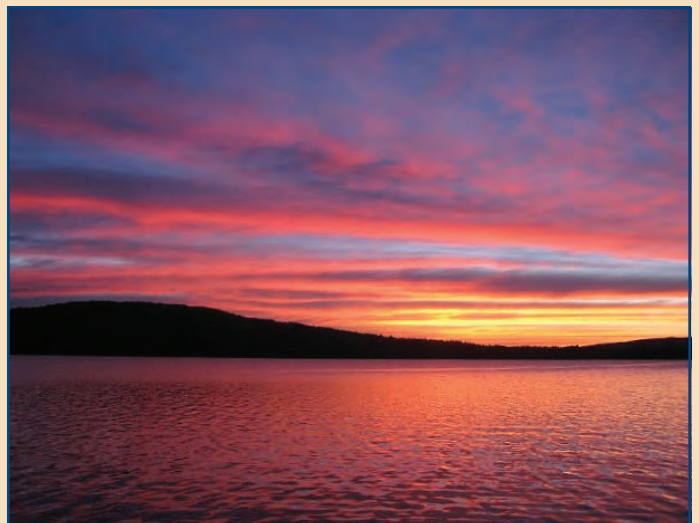
Arch Chemicals, Inc. • Camp Shaker/Shaker Road School  
Seacoast Energy Alternatives, Inc.

### Lake Associations

Town of Tuftonboro Parks & Recreation

### Grants

Jack & Dorothy Byrne Foundation



*Fall sunrise on Pleasant Lake in New London.*

Photo by Kittie Wilson.

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*Members dedicated to protecting lakes*

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Membership Matters

This issue is dedicated to: Carl Johnson (1922 – 2010)

Thanks, Brett!

Printed on stock that is 30% recycled fiber with chlorine free pulp, using timber from managed forests.

## *This issue is dedicated to:*



### *Carl Johnson (1922 – 2010).*

Former State Senator Carl Johnson passed away unexpectedly on Saturday, September 18. During his sixteen years serving in the state legislature, he made very important contributions to education, the environment, and economic development in New Hampshire. He was a true advocate for preserving and improving New Hampshire's lakes. He will be greatly missed by New Hampshire's approximately 1,000 lakes and ponds and the staff at NH LAKES.

## *Thanks, Brett!*

In mid-October, Brett Hillman, Programs Coordinator, left NH LAKES to pursue other opportunities and a masters degree at Antioch University. During the past seven months, he did a tremendous job helping run the Lake Host and Lake Conservation Corps Programs, writing grant proposals, and with planning LakeFest. Good luck, Brett!