NEWTON CONSERVATORS
WINTER ISSUE

NEWSLETTER

Newton's land trust working to preserve open space since 1961

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An Adventurous Walk Along the Charles: Auburndale to Lower Falls

By Representative Kay Khan

On Saturday, October 17th, Dan Brody from the Newton Conservators and I met at the parking lot on Recreation Road (Exit 23 Northbound only off Route I-95/128) to lead a walk along the Charles River from the backside of Riverside to Lower Falls. We hoped our walk would spark interest in the condition of existing trails in this area of Newton.

One couple in our group was from Singapore. While visiting family in Newton, they found the announcement of the walk in a copy of the Conservators' Newsletter in the library and decided to join Dan, Jerry Reilly, Chris Steele, me, and several others interested in exploring the area on this picture-perfect fall afternoon.

Newton Conservators Charles River Walk

Our walk included two Newton bridges that were beautifully restored a few years ago—thanks to former Governor Deval Patrick's Accelerated Bridge program and my work with DCR, DOT and many advocates. The first was the old railroad bridge over the Charles in Lower Falls, officially opened in 2012, which connects Newton to Wellesley and its walking trails, and the second was an old pedestrian footbridge behind Riverside, easily accessible from Recreation Road. (A third bridge close to the Lasell College Boat House on Charles Street in Auburndale will hopefully be done soon, which will be a welcome addition for bikers.)

During the walk, we got a close-up look at both of these restored bridges and followed a proposed route of a walking trail (possibly also a bike trail) that might be completed some day in the future. The walk followed the riverbank into two areas that are not yet widely used and are very rough in spots, so hiking shoes are recommended if you decide to give it a try. Thanks to DCR, young people from Americorps helped with some of the cleanup in the area behind Riverside two summers ago including the painting of the tunnel under the commuter rail connecting to Charles Street. Soon thereafter, the graffiti artists returned it to its previous state.

Now, a little history…

In 1970, when my husband and I bought our house on St. Mary's Street in Newton Lower Falls, we discovered a train track running close to our back yard. One day shortly after moving in with two very young children,

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Restored Stringer Bridge

we were excited to greet a train, waving to the engineer as it came down the track from the Riverside Station area in Auburndale. This train would be traveling through Newton Lower Falls to Wellesley Lower Falls, delivering lumber to the Grossman's Lumber Yard, located in Wellesley Lower Falls at the time.

Grossman's was purchased in 1969, and shortly after we moved into our home, the train stopped delivering lumber. There had been a station in Wellesley Lower Falls, built in 1887, but it was razed in 1944. That station was located on the west side of the tracks, about two hundred feet north of Washington Street, long before Grossman's put up their cash-and-carry store.

The Newton Lower Falls branch of the Boston and Albany Railroad ran from Newton to Lower Falls in Wellesley. The line branched off at Riverside Station (not the present Green Line station but a main-line rail station, whose remnants still exist), and ran for a distance of approximately one mile to Lower Falls, serving the mill area at Wellesley Lower Falls and later Grossman's Lumber Yard.

Giant Puffball Mushroom

After the train line branched off from the Boston and Albany main line on the Weston side of the Charles, it crossed back over the Charles before continuing on its current course. It crossed highway ramps and Route 128 before running parallel to the Leo J. Martin golf course. It transected a residential area before crossing Concord Street and the Charles River into Wellesley. Originally, the track even extended across Route 16 after crossing the Charles River.

The tracks were removed many years ago, but most of the rail grade in Newton is still intact, while in Wellesley it has been built over. Although the tracks have been removed, the two bridges are still extant: a pair over Route 128 and the off-ramp from exit 23.

As more interest in off-road walking trails began to arise several decades ago and money slowly became available for walking and biking trails, I began to explore with DCR and the Newton Bike and Pedestrian Task Force what could be done in Lower Falls to utilize the old railroad track to improve walking in Newton and to connect Lower Falls to Wellesley trails and the Charles River Pathway system into Boston. There is a long way to go in this small section of Newton bordering on Weston and Wellesley, but there is movement.

Now that we have spent seven years focusing on getting one section of the mile-long trail converted to a walking path in Lower Falls with the Trestle Bridge restored, it would be great if neighbors would get on board so that eventually the entire network could be completed from Wellesley Lower Falls to Riverside. Many feel that would be an added amenity to the Newton Lower Falls community, which is disconnected from the rest of Newton by Rt. 128.

Teepee

Extending the Charles River Pathway from the Auburndale section of Newton near the Marriott Hotel to Charles Street in Auburndale, then following the Charles River close to the backside of Riverside Station into Lower Falls and crossing into Wellesley, would be an ideal transportation corridor for commuters who might walk to Riverside from Auburndale or Lower Falls or from Lower Falls to the Commuter rail in Auburndale. People could come from other areas by T with their cross-country skis and get right on the Weston Ski Track in the winter.

If the Riverside redevelopment project moves forward, there could be the possibility of opening the locked gate into the Riverside Station, giving Lower Falls residents direct off-road access into the station, at least from Deforest Road in Lower Falls, an idea which seems to have some support.

Sadly, the likelihood of the entire path becoming available in Lower Falls seems slim: instead, especially along the St. Mary's Street stretch, abutters are dumping trash, debris from fallen trees, piles of leaves, and chopped wood to prevent walkers from easily moving about. There are also several

lawsuits pending regarding the ownership of parts of the trail, so the idea of a beautiful off-road walking experience on public land where one could enjoy nature and wonderful wildlife—all within the neighborhood and with easy access to Riverside—will not become a reality any time soon.

It was a wonderful afternoon: all who joined us seemed to enjoy the walk as we explored the area and, hopefully, inspired more people with the beauty Lower Falls has to offer. At least for now, Newton Lower Falls has the Leo J. Martin Golf Public Course, the Weston Ski Track, and the ability to walk across the Charles to all of the amenities in Wellesley Lower Falls.

Credit for the stretch from Concord Street in Newton Lower Falls to Wellesley:

Newton Bike and Pedestrian Task Force • Bike Newton • League of Women Voters • Newton Conservators • Green Newton • Citizens of Lower Falls and Auburndale • City of Newton • Town of Wellesley • Mass Department of Conservation and Recreation (DCR) • Mass Department of Transportation (DOT) ■

Riverside Pathway: Another Voice

By Jerry Reilly

Jerry Reilly is a frequent walker and a member of the Conservators

The Riverside Pathway is a fairly simple, low-cost plan that would be a wonderful amenity for the residents of Lower Falls as well as the rest of Newton's citizens. Many people have been working on the essential pieces that are needed to construct this trail. Now is the time to focus on the entire trail as an easily achievable goal.

The Riverside Pathway

Lower Falls is effectively an island. It's cut off from the rest of Newton by Route 128. The primary links to the mainland of Newton are by two busy roads (Route 16 and Grove Street). There is an unused railroad that connects Lower Falls directly to the Riverside property. For the price of a pair of bolt cutters, the gate to that bridge could be opened, and Lower Falls would have a new pedestrian footpath to Riverside Station on the 'mainland'. The path would start at Deforest Road in Lower Falls and cross Route 128 and the 128 exit ramp. Between the railroad bridges, there's a small strip of woods that's a pleasant little surprise along the teeming highway.

Just as is, the path is certainly walkable. The railroad tracks and ties are long gone, but the surface is railroad gravel – not the best walking surface. Dumping dirt on top of the gravel and rolling it would be a simple and cheap—and a big improvement

Once inside the Riverside property, some sort of walking path would need to be included in the new Riverside development project to get pedestrians from there across the property to Riverside T station. As part of the development project, this is a relatively simple piece.

Opening up that piece of the footpath by itself would be of great benefit to Lower Falls' residents on foot, but it could also be the start of a ¾-mile long river walk that would connect to Riverside Park and extend all the way to the Lasell boathouse.

The path would run along the hillside between the Riverside property and the Charles River to the existing unused pedestrian underpass under the commuter rail tracks. At the moment, there is a very rough, little-used trail along that hillside. With little effort and expense, that existing trail could be turned into a real walking trail and be connected to Riverside.

Halfway along that hillside path there is a lovely wrought iron pedestrian bridge that has just been beautifully restored by the DCR. The bridge crosses the river to the Recreation Road Park, which is a sizable and pleasant chunk of riverfront public parkland in Weston. At the moment, that bridge is a bit of a mystery. It's a beautifully restored bridge to nowhere on the Newton side of the river since there seems to be no officially sanctioned public access.

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Continuing along, the trail would pass through the pedestrian underpass below the commuter rail. That underpass looks a bit shabby at the moment, but some trash clearing and a coat of paint would work wonders. You'd probably want to put up a fence to keep the trail separated from the commuter rail tracks.

The trail would then continue down to the Lasell boat house to another pedestrian bridge across the Charles, which I believe is already scheduled to be refurbished soon. Alongside the boathouse is another under-utilized DCR park with picnic tables and a playing field.

From here, a pedestrian can walk down quiet Charles St to Auburn St and into Auburndale.

Pedestrian Underpass Below the Commuter Rail

Over recent years, many people have been working on some of the details of this plan. In fact this plan was first laid out in detail way back in 1975 by the Newton Conservation Commission. What needs to happen next to make it a reality is to treat it as a single integrated project and to tie it in to the Riverside redevelopment project. We need the DCR, the MBTA, the City of Newton, the Riverside developer, the Conservation Commission and the neighbors to work together on this.

The entire route from Lower Falls to the Lasell Boat House is three quarters of a mile, most of it along the river front. This portion of the river has long been neglected because it's encircled by highways, ramps, and rail yards. Despite all the nearby traffic, once you get down to the riverfront, it's quite pleasant and scenic.

Back in 1898, this stretch of river was described like this: *"Within ten miles of Boston, there is a stretch of river scenery that cannot be surpassed in the United States"*. Now with 128 and the Pike in the immediate neighborhood, this section of the river will never live up to that 19th-century description, but there are still plenty of modest pleasures to be had there.

Over the last 25 years or so, the Department of Conservation and Recreation (DCR) wove together waterfront paths that stretch from Watertown to Auburndale along the river. This path system has quietly grown into one of the most treasured natural assets of the citizens of Newton. It's time to continue that work further upstream. The Riverside project presents the perfect opportunity to create a new 3+/- mile of riverfront path. Best of all, the Riverside Pathway can be done quickly and cheaply, using existing public land and infrastructure that's now being wasted. ■

If you haven't renewed your membership already, now is the time.
And consider a gift for a conservation-minded friend.

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Please make checks payable to Newton Conservators, Inc.
Visit our website at www.newtonconservators.org if you wish to renew your membership online.

Fritillary
Photo by Suzette Barbier

President's Message

At this time last year, Professor Richard Primack wrote a wonderful article on the effects of climate change on Newton. (You can refresh your memory here: *http://www.newtonconservators.org/newsletters/15_01_climate.pdf).*

His article included the following chart, which shows the areas of Boston that will be vulnerable to flooding as our region experiences more intense storms and a rise in sea level as a result of climate change.

PHOTO: THE BOSTON HARBOR ASSOCIATION

Areas vulnerable to flooding are highlighted in color in this map of the Inner Harbor of Boston; the Charles River basin is shown in the upper left.

Until recently, most of the state government's attention has focused on reducing greenhouse gas emissions in order to mitigate those effects as much as possible.

Recent reports, however, have indicated that some of the changes in weather and sea level are inevitable. We cannot abandon work to reduce our consumption, but we also must start to plan how to manage those changes that are expected. In response, a group of noted environmental groups have joined together to form the Massachusetts Climate Change Adaptation Coalition. Those groups include Mass Audubon, the Sierra Club, the Charles River Watershed Association, The Trustees of Reservations, the the Nature Conservancy Massachusetts, the Union of Concerned Scientists, and many more. The Conservators was one of the first local nonprofit organizations to join the coalition (and we've since been joined by our local partners Green Newton).

The mission of the organization is to advocate for the passage of state legislation to prepare for climate change, to educate the public about climate change and strategies for adapting to it, and to convene stakeholders to develop appropriate policies for mitigation.

The Conservators' first act was to send a letter to Rep. Brian Dempsey of the Massachusetts House Ways and Means Committee encouraging the passage of House Bill 472, which calls for the establishment of a comprehensive adaptation management plan. A similar bill (S.1979) already has passed the state Senate.

In coming months, we will bring you news from the Climate Change Coalition. If you want to learn more now, one good place to start is the Boston Harbor Association's report "Preparing for the Rising Tide" *(http://tbha.org/files/documents/preparing_for_the_rising_tide_executive_summary_final.pdf).* You also can visit the website of the Coalition: *massadapt.org.*

Beth Wilkinson

Winter Owls in Newton

As we drift toward colder temperatures and frozen precipitation, it is nice to realize that looking and listening to birds during the winter in Newton can be pretty exciting. Of course, there is a different cast of avian characters in Newton during the winter, as most of our songbirds have migrated south while some of the more arctic species have come down to our latitude. Great Horned Owls, Barred Owls and Eastern Screech-Owls stay with us throughout the year. Canadian Northern Saw-whet Owls migrate down to us for the winter, while our Northern Saw-whet Owls go farther south for the winter. We, thus, have four owl species with us each winter.

Great Horned Owl

The most commonly seen owls in Newton are the Great Horned Owls. These are predators at the top of the local food chain and are second only to the Snowy Owls in size and weight. They have distinctive "ears," which are not ears but tufts of feathers. You can see them in the photograph above, taken in Auburndale.

The actual ears are on an owl's head, behind the circular disk of facial feathers. These feathers are orange in the Great Horned Owls, as above. The feathers in these disks funnel sound into the owl's ears; their hearing is much more acute than ours. As I was taking this picture, the owl was not only looking at me, but probably listening to my breath also. The Great Horned Owls are courting around the time of our Christmas Bird Count in Newton. We see them each year by playing their courtship calls on a "bird app" attached to a speaker or on a boom box. Their calls sound like a deep "Hoo, HooHoo, Hooo, Hooo." Great Horned owls prey on small mammals up to the size of rabbits and skunks but would not stay away from a crow's nest with chicks in it.

Barred Owl

Another large owl in Newton is the Barred Owl. It has big facial disks which are light colored. These owls have dark eyes whereas the Great Horned Owl has yellow on its irises with a dark pupil in the center. The Barred owls have no ear tufts. They are not usually found around Great Horned Owls, as they could be eaten by their larger cousins. Their hooting has a cadence that is often anthropomorphized as "Who Cooks for you?" "Hoo-Hoo, Hoo, Hoooo." The Barred Owl below was taken in my back yard on Upland Road. They are seen in both Nahanton and Cold Spring Parks and along the Cochituate Aqueduct. They will also respond to their calls from a "birding app."

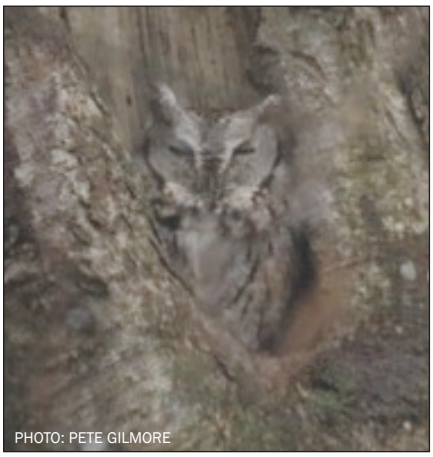
The second most commonly seen owl in Newton is the much smaller Eastern Screech-Owl. The Great Horned Owls are about 22 inches long and weigh over three pounds; the Barred Owls are about 21 inches long and weigh only 1.5 pounds. The Eastern Screech-Owls are a little over eight inches long and weigh about six ounces.

These little folks are very wary of their larger cousins. When we go out on the Christmas Bird Counts, we always call the Screech-Owls first; if we get no response only then do we call the larger owls. Calling for Screech-Owls after playing a Great Horned Owl's hoots is an invitation for the little Screech-Owl to be eaten.

The Eastern Screech-Owls come in two color phases, red and gray; both phases occur in Newton. We see these owls on almost every Christmas Bird Count. They are courting also at that time and fly close in response to their calls being broadcast. Their calls include a descending whinny and a monotone trill. Both calls can be imitated well by humans. These calls are often heard from our bedrooms during the summer nights through open windows.

Screech-Owls often roost in cavities in trees and can be found by paying attention to the mobbing behavior of flocks

of chickadees, nuthatches and titmice. These small birds gather in scolding flocks to drive Screech-Owls away, like crows will do with Red-tailed Hawks and Great Horned Owls. The photograph of the gray phase owl was taken in Cold Spring Park.



Screech Owl - Gray Phase

The photograph of the red phase Screech-Owl was taken in West Newton. The woman whose backyard was graced by this owl named her Athena, after the Greek goddess of wisdom, whose patron bird was the owl. Screech-Owls are in most wooded areas in Newton and prowl for insects and an occasional vole. We are unaware of their presence in our midst, while they are eating many small undesirable creatures. These owls are in every Newton neighborhood where there are mid-growth trees The larger stands of big trees, like white pines, are home to the larger owls and so do not attract small Screech-Owls.

The fourth owl species in Newton during the winter is seldom seen, or heard. This is the diminutive Northern Saw-whet Owl; they weigh in at just under three ounces and are only eight inches in length. They are smaller than our Eastern Screech-Owls and like conifers and wet woodlands. They have been recently heard and seen in Nahanton Park, near the Charles River and the wetlands along its bank area.

Screech Owl - Red Phase

Their call is a quiet, monotone, repeated toot, toot, toot that goes on for a while. They ordinarily toot at night when we are inside with the windows closed but will respond to a broadcast of their tooting during the beginning of their courtship season.

One of the best ways to get acquainted with Newton's owls is to walk along on our Christmas Bird Count owl walk. This takes place at 5 AM on the day of the Christmas Bird Count. Ordinary bird counting begins at 7AM, when we divide up into teams to cover Newton's green spaces. We return from the owl walk for coffee and bagels with the daytime birders. We encourage you to come and to participate in one or both of these activities; there is no time constraint, so you can leave us at any time. This is a nice wintertime walk in the woods with others who enjoy nature; the entire walk is over by noon. ■

Pete Gilmore

MISSION
Newton Conservators, Inc.

The Newton Conservators promotes the protection and preservation of natural areas, including parks, playgrounds, forests and streams, which are open or may be converted to open space for the enjoyment and benefit of the people of Newton. It further aims to disseminate information about these and other environmental matters.

A primary goal is to foster the acquisition of land, buildings and other facilities to be used for the encouragement of scientific, educational, recreational, literary and other public pursuits that will promote good citizenship and the general welfare of the people of our community.

The Newton Conservators was formed as a not-for-profit organization 54 years ago in June 1961.

The Newton Conservators Newsletter© is published four times each year by the Newton Conservators, Inc., in June, September, December, and March. Deadlines for these issues are the first Friday of each month in which an issue is scheduled to be published.

We welcome material related to our mission from any source. Send proposed articles or letters by email in MS Word or rich text format to bethwilkinson@mac.com. Digitized photographs, maps and diagrams are also welcome.

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We Must Protect the Miracle of Webster Woods

By Ken Kimmell

(Ken is a former official in Governor Patrick's Administration and now heads a national science-based advocacy group.)

Thirteen years ago, my family and I moved to Newton Centre not far from the Webster Conservation land. I can't quite describe what it was like to wake up that first morning, amid boxes and packing crates, and realize that I could walk down the block and step into woods that reminded me of rural New Hampshire—except to say that I felt both astonishment and gratitude. Two blocks in the other direction brought me to the doors of Peet's Coffee. I heard coyotes howl at night as I heard the trolley rumble back and forth on its way to Copley or Riverside. Hawks circled over my backyard as I watched a blimp float toward Fenway Park.

How could it be possible, I wondered, to live in the city and live near the woods? What sort of miracle *was* this?

PHOTO: OCTO BARNETT

A Walk in Webster Woods

As I was to discover, it was the same sort of miracle that has given Newton a swimming lake, with a bathhouse and a playground, in the middle of town. In mid-summer, swimmers wave at commuters from the middle of Crystal Lake, floating on their backs while businesspeople riding on the T gaze wistfully from the windows. It was the same sort of miracle that brings children into the villages every Halloween to paint goblins and witches on shop windows and that allows skaters to circle a cove in Auburndale as soon as the river freezes and then change back into their shoes in a warming hut. We are a city of people who value getting outside; we value the environment as part of our daily lives instead of as an abstraction; we value seeing each other. We don't simply live in our houses; we live in Newton.

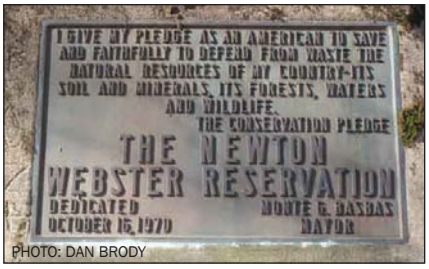

PHOTO: DAN BRODY

That first morning, as I walked along the little creek that meanders through woods, I understood my immense good fortune to live in this surprising and lovely city. And I vowed I would do everything possible to make sure everyone else in Newton would always be able to have the experience I was having: walking in the woods in the morning, listening to the birds, watching people stroll by with their dogs on the trails, smelling the leaves and hearing them rustle in the breeze.

That was thirteen years ago; I am as intensely grateful today as I was then. But I am also aware that my vow has now come due. With its pending purchase of property owned by the Mishkan Tefila temple on Hammond Pond Parkway, Boston College soon will own a large wedge of land that bisects the Webster Woods. Without swift action from the city to acquire the undeveloped section of that property, what is now a swath of forestland could turn into pockets of trees. Boston College has not divulged its plans for the property, which does not bode well for Newton residents. I was an environmental lawyer for almost twenty years before I spent seven years in state government, first as General Counsel for the Secretary of the Office of Energy and Environmental Affairs and then as the Commissioner of the Department of Environmental Protection. I have seen a heartbreaking number of cases where wooded land that once seemed protected, and that local residents cherished, turned into shopping malls, residential complexes, and high-rise institutional buildings.

We are an old city. We don't have many large undeveloped parcels left. Certainly we don't have many places where we can take a walk and feel far away from the noise, traffic and tensions of urban life—while still being right at home. The chance to spend time in a large and contiguous stand of the woods grows more precious every day. Amid the trees of Webster, the stick forts, the birds, the dog walkers, the cross-country skiers in the winter and the lady slippers in springtime, I see people laughing and talking to each other, children climbing on rocks, elderly couples admiring the changing fall leaves. And here is something I ***rarely*** see: people staring at their cell phones.

We are a city that deeply loves its marvelous, unusual, fragile natural beauty. We owe it to ourselves and our children and all future residents, to protect what has, almost miraculously, been provided for us. ■

Winter's Coming: What Should We Do About Salt?

It's almost Winter in New England. Time to step up and confront the annual dilemma: what to do about the tons of white stuff piling up on our roads... our sidewalks… the paths to our front doors.

No, we're not talking about snow. We're talking about that other white stuff. Salt.

According to the Federal Highway Administration, 70 percent of the nation's roads are located in "snowy regions", defined as those receiving more than five inches average snowfall annually, and nearly 70 percent of the U.S. population lives in these snowy regions. A 1992 Marquette University study examining the impact of road salt on highways in New York, Illinois, Minnesota and Wisconsin found that de-icing with salt reduces accidents by 88% and injuries by 85%. But that safety comes at a cost. Vehicles and highway infrastructure can suffer significant damage from the corrosive action of road salt.

Sodium Chloride

More subtle—at least at first—is the damage done to the environment.

Road salts enter the environment through losses at salt storage and snow disposal sites and through runoff and splash from roadways. A 2001 assessment report by the Canadian government concluded that high releases of road salts were having an adverse effect on freshwater ecosystems, soil, vegetation and wildlife. Three years later Canada responded by categorizing road salt as a toxin. Nothing suggests they are less toxic in the lower 48.

In North America the most common form of salt used for deicing or pre-icing is sodium chloride (NaCl). Less refined than common table salt, sodium chloride road salt can contain up to 5% trace elements, including trace metals. According to a Mass Department of Transportation report, substances potentially present include phosphorus (14-26 mg/kg), sulphur (6.78-4200 mg/kg), nitrogen (6.78-4200 mg/kg), copper (0-14 mg/kg) and zinc (0.02-0.68 mg/kg) Other inorganic salts used include calcium chloride ($CaCl_2$), magnesium chloride ($MgCl_2$) and potassium chloride (KCl), although cost and reduced effectiveness limits their use. Sodium ferrocyanide ($Na_4Fe(CN)_6 \cdot 10H_2O$), is commonly added to road salt as an anti-caking agent.

The freezing point of salty water is lower than that of pure water. Scattering salt on snow or ice accelerates the melting process. Dumped on top of packed layers of snow and ice in quantities sufficient to melt through to the pavement, salt thaws the bond between the ice and the road surface, making it easier for the plows to scrape the road clear. However regular road salt is only effective from near freezing to about 15 degrees Fahrenheit. Below that, crews mix in other deicers like magnesium chloride or calcium chloride, which can work down to well below zero Fahrenheit. Because salt's effectiveness depends on temperature—"At warm temperatures, a little salt melts a lot of ice. At low temperatures, a lot of salt only melts a little ice"—and because of the need for fast results, it is vulnerable to over-use. And that means everything it comes in contact with is vulnerable too.

When salt dissolves, it splits into sodium and chloride ions. These particles get carried away in melt runoff and are deposited in surface water (rivers, lakes and streams) and in ground water, where on occasion it can make its way into the municipal water supply. Because chloride ions are transported more easily than sodium, chloride is the greatest source of pollution. According to a 2009 study released by the US Geological Survey, forty percent of the urban streams tested across the northern United States had chloride levels that exceed federal guidelines for aquatic life. Elevated chloride inhibits plant growth, impairs reproduction and reduces the diversity of organisms in streams. High levels interfere with the way organisms regulate the uptake of salt into their bodies. This insult can be compounded by the use of anti-caking ferrocyanide salts, which, in solution, can photolyse to yield free cyanide ions, which are highly toxic to aquatic organisms.

Because salt affects water's density, elevated salt concentration reduces water circulation, preventing oxygen from reaching bottom layers of the water. Road salt also builds up in shallow soil, layering on to create what is essentially a salt bank. Dried salt crystals attract deer, moose and elk to busy highways, increasing the chances of fatal encounters for both animals and humans.

Salt can radically alter entire ecosystems. In the June 2001 issue of *Wetlands*, researchers reported that high salt concentrations in the groundwater, attributed to deicing salts, were having a significant impact on Kampoosa Bog, a 1,350-acre wetland in Berkshire County. Owned by the Marian Fathers of the Immaculate Conception, who placed the property in a conservation restriction some thirty years ago, and designated an Area of Critical Environmental Concern by the Commonwealth in 1995, the 12,000-year-

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old Kampoosa Bog (an old Indian word meaning "dangerous place") is the largest and most diverse calcareous *(calcium-rich)* fen in the state. The site is comprised of old growth forest of hemlock, beech and hickory trees, red maple swamp areas and calcareous basin fen surrounding open water area. Possibly introduced in the course of some Tennessee Gas Pipeline Company pipeline work more than twenty years ago, giant reed *(Phragmites australis)*, a salt-tolerant invasive species, established a foothold in a portion of the wetlands adjacent to the Massachusetts Turnpike. Forming dense colonies, it's continued to spread across Kampoosa.

The natural chemistry of Kampoosa has been greatly altered by road salt runoff from the Pike, and in question is whether the run-off has facilitated aggressive growth by the invasive species. The salt run-off may have compromised less tolerant native, and in many cases rare, species, allowing giant reed to easily move in.


PHOTO: Z22, WIKIMEDIA COMMONS

Roadway With Salt Residue

Before the advent of the automobile, people used ashes, sand or sawdust to keep their walkway slip-free. To improve travel in wintertime, wheels on horse carts and coaches were replaced with ski-like runners, which were better able to handle snowy conditions. Sure-footed horses made their way through the snow to Grandmother's house pulling sleighs. (No surprise that the Thanksgiving-bound horse and sleigh that made it though the wide-and-drifting snow was a literary creation of a Massachusetts native, abolitionist Lydia Maria Child.) Enterprising inventors were issued the first patents for snowplows in the 1840s, but several years passed before the plow designs were put to use. One of the first mentions of snowplow—a plow attached to a cart pulled by a team of horses through the snow-clogged streets—came from Milwaukee in 1862. Over the next several years, horse-drawn plows gained popularity and came into use in many other Northeastern cities. In a few cities salt was used to do what plows could not, but residents strongly protested salting not just because it damaged pedestrians' shoes and clothing but also because it ruined the streets for sleighing.

The invention of the automobile changed all that. By 1925, more than 17 million cars were registered, vastly increasing public demand for, and reliance on, streets that were safe and easy to navigate. Salt was first used on American roadways for snow and ice control in the 1930s, and in 1941 New Hampshire became the first state to formally adopt the process. By the late 1940s and early 1950s, highway departments were adopting a "bare pavement" policy for establishing winter roadway standards.

By the end of the decade, however, damages to salt-intolerant roadside sugar maples in New England and reports of contaminated drinking wells were beginning to raise concerns about the "more is better" approach to road salting. In the sixties research began on alternative deicing chemical use, improved operational procedures, including pavement heating, to reduce environmental salt exposure. In 1967 the Salt Institute, an Alexandria Virginia based non-profit industry trade institute, launched its Sensible Salting program. The evolving program, which continues to influence municipal planning, emphasizes storm-response planning, personal training, equipment maintenance, spreader calibration, storage and environmental awareness to minimize the harmful impact of salt on the environment.

For years now Rajib Basu Mallick, professor of civil and environmental engineering at Worcester Polytechnic Institute, has been looking at ways to harvest solar energy to clear snowy roadways. Funded in part by grants from the National Science Foundation, Mallick first looked at embedding fluid-filled tubes in the pavement to collect solar energy. He now believes that would only be practical in places like parking lots, where the collected energy could not only clear snow and ice but be diverted to nearby buildings to provide heat and lights. For roadways Mallick is now putting his money on special geotextile fabrics, which could be embedded in the pavement, collecting and dispensing energy as desired. (Mallick's work in heat spreading technologies could benefit summer pavements, too, where high surface temperatures can reduce the life of the pavement.)

While Mallick's work continues in the lab, low-tech methods endure. Salting before a storm, especially if sand or gravel is added, can keep snow from binding to the pavement. But as anyone who's had the misfortunate to travel behind a highway salt truck can testify, dry salt bounces. Irritation and car finish scratches aside, bounced salt is also wasted salt. The addition of liquid to make a brine can mitigate the "bounce effect," reducing the amount of salt needed to clear roadways. And pre-wetting the pavement with brine can reduce the amount of snow accumulating, making it easier to plow. A number of states have been experimenting with brines—in Minnesota they like sugarcane molasses; Illinois and Michigan go for beet juice; while Wisconsin is awash in cheese brine. For the most part, these agricultural by-products would be discarded and, thus, can be utilized at minimal expense. They are not without their own environmental concerns, however. For example, beet juice runoff can also deplete oxygen in waterways.

The Newton Department of Public Works is responsible for sanding and plowing more than 300 miles of streets,

15 municipal parking lots and approximately 87 miles of sidewalk each winter. After the winter of 2013-14, then-Commissioner David Turocy told the Board of Aldermen's Public Facilities Committee that while the City was "going in the direction" of using brine as a pre-storm pavement treatment, the decision had been made to wait for the state and municipalities like Lexington to "iron out" problems like establishing the optimal brine/salt ratio. (According to Turocy, Lexington, which uses both brine and a calibrated salting spreader, reduced their salting costs by forty percent.) According to a compliance report filed with the EPA this past April, Newton was still not doing any prewetting as part of roadway treatment. Ninety-six percent of Newton's winter pavement treatment is done with plain sodium chloride, while two percent is done with the additives magnesium chloride (when the temperature falls between 10 and 20 degrees) and two percent with sand (when temperatures are expected to remain below 10 degrees), applied at a rate of 200 – 400 pounds per lane mile. Low salt areas around designated bodies of water are treated with half the rate of salt used in other areas.

In the absence of specific guidance from the City, Newton residents are left on their own to consider what the eco-friendly alternatives are for their own sidewalks and paths. Safe (or safer) melts are sold in home quantities, although they typically command a premium price. Sand and kitty litter can provide extra traction, although they can also be tracked inside with predictable results. Auburndale resident Aimee Lambert remembers that her mother used to spread bird seed on her walkways, keeping them from being slippery, making them safe for pets' paws and feeding the birds all at the same time. "I grew up in Vermont where it was hard to get to bird feeders once the snow started mounting," she explains. Lambert has used birdseed on her own walks, but not on ones that are shared. "I live on a corner lot on Auburndale Ave. where there are lots of pedestrians, and I worry it wouldn't provide enough traction. So we remove snow as much as possible and put down salt as little as possible." Now she's wondering if she can do a little more by doing even less. "This discussion has made me reconsider," she says, "maybe I'll switch to sand this year."

Snow shoveling ordinances aside, sometimes it seems like doing nothing is the best choice for the environment, and for people. "I feel that leaving some snow, about 3 inches, on the curb is safer because it stays on top of the black ice that forms at night from the melting nearby high mounts," says Helena Froehlich, artistic director of CreationDance, the First Unitarian Society in Newton's Sacred Dance Company in residence. Froehlich, who is also an EMF Balancing Technique instructor, explains, "I slip less on snow than on ice." ■

Margaret Doris

New Geology Field Trip

Eric Olson
Senior Lecturer in Ecology at Brandeis University

Professor of Geology Dr. Chris Hepburn (Emeritus, Boston College) shared his knowledge of local geology on a Newton Conservators walk.

On Saturday, October 24, the car-pool tour of Newton-Needham area rocks included a stop in Webster Conservation Area near Beacon St. Here, Chris notes the contact between the Roxbury Conglomerate, which is the Commonwealth's State Rock and an ancient river channel filled with sandstone.

Other rock types seen on the tour: basaltic lava flow, welded volcanic tuff, and the Cambridge Argillite (a kind of slate). We came away with a mental picture of the setting and age of formation of this area of New England, about 585 million years ago and 60 degrees south of the equator, before the evolution of land plants. Think archipelago of volcanic islands in a cold sea, land surfaces looked like Mars, river channel sometimes carried ice.

Geologists can help make the past visible. ■

Roxbury Conglomerate Rock at Webster Conservation Area

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Clay-colored Sparrow
Photo by Haynes Miller

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