

WATERSHED

A Newsletter of the Wood-Pawcatuck Watershed Association

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Road salt accumulation in waters could lead to unpalatable toxicity

To most of us the obvious consequences of salt application to roads are reflected by our cars, usually coated with a whitish film and later by corrosion of metal parts, especially the rocker panels and exposed surfaces. There are other effects caused by excessive road salts which are not quite as obvious. We will try to put road salting into some general perspective and list some consequences of road salting with particular reference to effects on streams and ground water in our watershed area. This material will be followed by our own investigation of salt effects on some of our streams which will be reported in a future study.

Recent reports published in the Proceeding of the National Academy of Sciences (PNAS) indicated that about 18 million metric tons of salt are used annually in the United States for de-icing purposes. This quantity is utilized almost exclu-

sively states in which snow and icy condition persist during the winter. Salt application rates are determined by factors such as pavement temperature and weather condition. Examples of weather factors are air tem-



Danielle Aube deploys data loggers above and below the Ruute 95 overpass on Switch Road, where runoff enters the Wood River directly.

perature, wet snow, dry snow, and freezing rain. At times a mixture of about 50 percent sand and 50 percent salt is applied. The following is an estimate

of the number of pounds of pure salt per two-lane highway mile based on Minnesota data. This quantity ranges from about 200 to 600 pounds of salt per two lane highway. The highest values apply to wet snow and cold pavement temperature conditions.

Most de-icing chemicals are technically salts that work by lowering the freezing point of water below 32 degrees Fahrenheit. The lowest effective temperature for common road

salt is about 15 degrees Fahrenheit. Once the salt dissolves it enters into our streams or soil and its fate is soon forgotten. However, these PNAS studies clearly indicate that there has been a continuing increase in chloride concentrations in northeastern US streams during the last several decades. Additionally, a study in Toronto, Canada indicates that only about 45 percent of the dissolved salt flows away in the streams and that the remaining portion is absorbed in shallow aquifers below the surface. Predictions from these studies indicate that continued yearly outputs of road salts at present levels will lead to salt accumulation greater than 250 mg per liter during this century. The value stated above is the accepted cutoff for potable water. This is also the level at which chronic toxicity occurs for many freshwater species.

It should also be recognized that once groundwater becomes salty, it may take decades to centuries for the salt to disappear even

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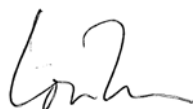
From the Executive Director

Infrastructure Collaborative hopes to empower non-profits with "back office" support systems

For nine months, WPWA has been part of a learning network referred to as the Infrastructure Collaborative. This idea of building shared back office support services for understaffed non-profits was initially funded by a grant to the RI Rivers Council and RI Land Trusts Council from Third Sector New England, a foundation that aims to build capacity in the non-profit sector. The Collaborative includes two watershed councils, two land trusts, and the two state organizations, as well as the Association for Fund-Raising Professionals.

Being invited to join in this learning network was a stroke of luck for WPWA. Aside of the direct benefits of being part of the pilot group to utilize shared donor tracking and volunteer management services, the networking among Collaborative members has led to invaluable information sharing. The process of building consensus among members, each representing a different set of experiences and levels of organizational capacity, is enlightening.

The Collaborative was recently awarded a \$30,000 grant from the RI Foundation to continue its work. As a mentoring watershed council, WPWA looks forward to sharing knowledge with others in the coming months and years. Many thanks to the RI Rivers Council for allowing us to be part of this effort.



Road Salt *(from previous page)*

when road salting has ended. Another important result of reported PNAS studies is the finding of a logarithmic relationship between the proportion of paved area in the watershed and the chloride concentration in streams. Above 15% impervious cover will produce chloride concentrations strong enough to damage some plants. Impervious cover at about 40% will cause streams to have chloride values above the threshold of 250 mg per liter.

Are there alternatives to using common salt (NaCl) for de-icing? The answer is yes but there is a significant increase in price for those that have been used to date. Some of the alternatives for common salt include calcium chloride and calcium magnesium acetate. Road salt is relatively cheap and is very effective. In addition environmental concerns seem limited because the more serious effects of road salts are not immediate.

Let us now consider other things that may be caused by excessive road salt use. They include:

a- increased metal toxicity. High concentrations of salts can increase the availability and toxicity of some metals

b- increased corrosion of concrete and metal. Pavement, bridges, and culverts are all vulnerable

c- pond stratification. A high salt content runoff into ponds and small lakes can form a dense layer of salty water over this bottom. This induces a condition known as meromixis in small ponds and lakes. This salty water near the bottom contains little or no dissolved oxygen and it is unsuitable for most forms of life there

d- dust. Excess dust from road

salt and sand can cause some air pollution problems under certain conditions.

Are there any simple solutions to the road salting problem in our watershed? It seems clear that there are not and therefore we plan to learn more by monitoring and assessing conditions at our watershed level. This work will involve the use of data loggers to compare conductivity values above and below sources of melt water from highway runoff to local streams.

Annual spring Earth Day cleanup needs your help!!

On Saturday, April 22, from 9am to noon, WPWA is hosting its 20th annual Earth Day Clean-Up at public access sites along our watersheds rivers and ponds.

There are 26 sites throughout the watershed to choose from, so you can pick one closer to home if you prefer. Bags and gloves, and bottled water, are available for pickup at the WPWA office. Call us and let us know when you'll be stopping in.

Bagged wastes may be brought to the WPWA campus for disposal following the cleanup, or volunteers may properly dispose of the collected waste at a location more convenient to them.

WE NEED VOLUNTEERS! Please lend a hand and help keep our river areas free from unsightly debris. We welcome individuals, families, and community groups. Call Danielle Aube at 401-539-9017, or email Danielle@wpwa.org.



Coalition for Water Security appears before KCWA legislative study commission

Testimony of Harold R. Ward before the Joint Legislative Commission to Study All Aspects of the Kent County Water Authority, 1/11/2006

I represent a newly-formed coalition of groups that are focused on water supply and water use issues in our state. The Coalition for Water Security currently includes such organizations as Aquidneck Island Land Trust, Audubon Society of Rhode Island, Clean Water Action, Conservation Law Foundation, Rhode Island Public Interest Research Group, Save the Bay, Sierra Club of Rhode Island, Trust for Public Land and the Wood-Pawcatuck Watershed Association. We anticipate the Coalition will grow as more groups become aware of the implications of this topic. Economic planners and strategists also recognize that water supply is an essential dimension of economic development and will be working on this issue in cooperation with the Coalition.

Coalition members understand that our state's environmental, economic and public health securities are directly tied to having sufficient clean water.

We commend the legislature for forming this commission and for focusing attention on the critical water issues emerging in Kent County. While this is an important first step, we believe the Kent County issues are best viewed in a broader, statewide context..

General:

Clean water is critical to the health and well being of our state.

Our people need clean water to drink, and sufficient clean water in our streams and lakes to support healthy ecosystems on which we depend. And we need water to further economic development. None of these can be sacrificed to support the others; all three are essential for our water security.

Initial discussions among Coalition members indicate there is general agreement that the state needs to develop an integrated water supply strategy that

- Protects our health security by guaranteeing enough clean water to drink and sufficient water for fighting fires
- Protects our environmental security by assuring that there is enough clean water for our rivers and streams, especially in the critical summer months
- Protects our economic security by conserving water for future economic and residential development by directing new development toward areas with adequate water supplies

Our coalition is new and will be expanding on these concepts in the coming months. Today we have some preliminary comments that we hope will assist the commission in its inquiry.

Statewide Concerns:

Environmental Security

1. Adequate streamflows:

Federal and state laws require the maintenance of a healthy aquatic eco-system, which necessarily requires an adequate *quantity* of water and sufficient flows in our streams. Streamflows are naturally variable by season, and aquatic ecosystems depend on

this variability, so protective streamflow standards will need to be similarly variable. RIDEM has begun but not completed the process of establishing streamflow standards that can guide the state in determining how much water can be removed from the watershed without harming natural ecosystems.

2. Planning for dry years:

We know that we will have some years with less precipitation than normal and some with more. Adequate water supply security requires planning for the predictable range of water availability. You don't size your furnace to heat only for the average winter, because you know your house will be cold at least half the time. We shouldn't plan development based on the water available during an *average* year, because we would routinely have to sacrifice one of our critical water securities. It only makes sense to plan ahead for the dry years.

3. Protection of estuarine areas

We all understand that we need water in the rivers to protect river ecosystems. But we also depend on rivers to support life in our estuaries and in the Bay. The Bay and neighboring areas that mix salt and fresh water require naturally variable flows from rivers.

Economic Security

1. Planning for new development:

A dependable water supply is essential for maintaining existing development and attracting new development. We need to make sure we save water for use in existing and future economic development, including agriculture. Development should be steered

(Cont'd page 5)

Stump dump impacts emerge in earnest

Denise J. Poyer

Richmond's infamous stump dump, a privately-owned disposal facility between Routes 3 and 95, has the town and neighboring property owners up in arms over cockroaches, pesticides, truck traffic, and now wetland violations to the adjacent Canob Brook, a tributary to the Wood River.

Recently Lt. Governor Charles Fogarty visited the site, and is now pushing for a bill that will regulate tree stump disposal.

Meantime, RIDEM Division of Freshwater Wetlands has taken notice, thanks to persistent abutting property owners, of potential violations associated with the construction of a new road access.

WPWA officials also walked the perimeter of the site with local property owners, to confirm the potential violations of wetland regulations. Also noted during the site visit was a pile of asphalt waste that appeared to be headed for onsite burial. At least two fairly large abandoned commercial vehicles were also present on the site. Without regulations governing stump dumps, however, the state apparently does not have the right to inspect the property.

Certainly the stump dump is not a new revelation. A couple of years back the site began to burn, and still continues to smolder. Residents and officials complained about the amount of water needed to douse the fire, in the midst of then drought conditions. Debates raged as to the owner's

responsibility for compensating the town for the cost of the water.

Most recently, neighbors have demanded remediation of cockroach infestations in their homes, as well as the state police barracks, that they believe are coming from the site. So as if the truck traffic, stump fire, and resulting smell, smoke and potential danger



Canob Brook in Wyoming

was not enough, now there are cockroaches. Approximately eight houses in the area are up for sale. Roger LeBrun, professor of Entomology (study of insects) at University of Rhode Island was contracted by the town to evaluate the situation and present recommendations for treatment. The town approved his plan, and treatment was intended to begin in January. To our knowledge that treatment is still pending, as warmer conditions are said to be preferable.

RIDEM Division of Wetlands has determined that the proximity to Canob Brook of a new road access that has been cut in from Nooseneck Hill Road is enough to require application for a wetlands permit before any additional work is undertaken. The new road is being installed in response to a restriction by the town that the existing access off Skunk Hill Road be used only between the hours of 7am and 6pm. Complaints of neighbors that trucks were using the road for access during overnight hours prompted the Town Council to act to restrict it. According to an article in the Providence Journal in January, the new road matter is a pending en-

forcement issue, and no citation of violation has been issued. The article also cites previous wetland violations issued to the owner by RIDEM in 1988 and 1990 that are currently under appeal.

WPWA has a variety of concerns relative to the local resources in the area. Naturally the wetland encroachment and the potential adverse impacts to Canob Brook and the Wood River are of primary concern. WPWA intends to follow up in writing to RIDEM urging them to enforce the regulations to protect the surface waters.

Also of great concern is the potential movement of groundwater from the site to the stream, and how this could carry any toxins from the decaying wastes, and of course any pesticide runoff that may also impact the groundwater and surface waters. There is also a similar concern associated with the homeowners ongoing use of pesticides in the treatment of cockroaches. Ongoing, we understand, because it is difficult or impossible to completely eradicate the insects.

WPWA will deploy YSI dataloggers upstream and downstream of the site to measure differences in dissolved oxygen, pH and specific conductivity of the surface waters. Results will be reported on our website at a later time. We are also evaluating the probable direction of groundwater flow, and the pest management plan is under review by the association.

Interested parties may visit our website, www.wpwa.org, to see a powerpoint of time-series orthos that show the changes to the site since 1988.

Coalition (Cont'd from Page 3)

toward areas of adequate water availability. The revision of the RI Land Use Law should direct the location of growth centers to such areas.

2. Use existing sources efficiently:

Water from new supplies is more expensive than water from existing sources. A first step in responsible management is to ensure existing water supplies are being used most effectively, by:

Matching the quality of water to the intended use - Treated wastewater can be used for industrial cooling, watering golf-courses and lawns. Why would we pour clean drinking water on our lawns?

Reducing nonessential uses - The demand for water often *doubles* in the summer months, largely because of outdoor uses of water.

We need some creative thinking about how to address the increased demands for water in the summer, just at the time when our water supplies are generally at their lowest.

Treating water as a resource - The price of water does not reflect its true cost, in demands on the environment and in cost of maintaining infrastructure to minimize waste. The artificially low cost of water prevents us from recognizing water as the critical resource that it is. The result is shortchanging our environmental, economic and health security.

Health Security

1. Prioritizing uses

Water to protect human health and safety (consumption, sanitary

uses, fire-fighting) is a top priority. Potable water should be designated first for consumption and sanitary uses.

2. Upgrading infrastructure

Periodic contamination of water supplies in towns and cities around the state is becoming a more frequent problem as local water delivery infrastructure become antiquated and problems caused by stormwater runoff/wastewater seepage become more prevalent. The state needs to develop a means of assisting communities with identifying potential threats to water supply systems before they occur, and with meeting the costs of replacing infrastructure and managing runoff.

3. Protecting water quality

New water supplies should be planned to protect high quality water from accidental or deliberate contamination. The most effective way to protect the quality of water is to limit the use of land surrounding surface supplies and in groundwater recharge zones, through acquisition of development rights or outright purchase.

Concerns Specific to Kent County:

Water from the Big River basin

RIDEM Director Sullivan has pointed out that *construction of a reservoir in the Big River area fails all of the preceding requirements.* The cost of construction and loss by evaporation leads to economic inefficiencies. Flooding streams and wetlands would impose a heavy environmental cost, and a surface supply crossed by an interstate highway is unacceptably

vulnerable to contamination.

Water can be withdrawn from wells in the Big River but lower volumes are available in the summer than the remainder of the year. Withdrawals from Big River wells should be integrated with use of water from the Scituate reservoir, drawing more from the Scituate during the summer. In some circumstances, treated water from Big River wells might be "banked" by storage in the Scituate reservoir.

Commitment of the Coalition

Member groups of the Coalition for Water Security are committed to working cooperatively on water supply issues.

- Collectively we intend to pull together pertinent information, develop policy recommendations, monitor the activities of state agencies with responsibilities in this area (RI DEM, RI Water Resources Board, Statewide Planning, Department of Health), and communicate our findings and recommendations to the general public and government officials. We will draw heavily on the data and analysis of the Water Allocation Project - an extensive stakeholder process that produced numerous recommendations, many of which have not been implemented.

- We will research the underlying issues of water supply management and based on our findings we will develop and advocate policies that protect aquatic habitat, require efficient use of potable water and reuse of wastewater, minimize non-essential uses and, through thoughtful land use planning, direct development toward

(Cont'd page 7)

Our state's environmental, economic and public health security are directly tied to having sufficient clean water

TNC and Alden Labs release Parke Pond Feasibility Study

The Parke Pond Feasibility Study is now available at Alden Research Laboratory website. The report is in a final draft form, pending comments from the public.

The purpose of the report is to study and analyze three-four alternatives for fish passage at the Parke Pond dam on the Shunock River in North Stonington, Connecticut. The analysis considers dam repair, sediment mitigation, historic resource conservation, and fish passage and provides designs and cost estimates for each alternative. The report was commissioned based on suggestions from the community to collect more information about the site and the alternatives before proceeding with an alternative.

Alden and The Nature Conservancy (TNC) held a public meeting in North Stonington January 18 to discuss the report, the purpose of which was to hear a presentation by the consultant about their report findings, ask questions, and to briefly discuss next steps.

Final comments to The Nature Conservancy on Alden's final draft report are due to the Conservancy within 60 days of the public meeting (March 18th, 2006). A final report will be issued after that date.

To download the report, go to www.aldenlab.com, select "Projects" (upper right on web page), then select "Parke Pond" (upper left on web page), or follow this link: http://www.aldenlab.com/index.cfm/Projects/Parke_Pond

Three versions of the report are available in pdf format: the full document with or without the appendix, an executive summary, and a separate appendix is also available.

To see a paper copy of the report check with Wheeler Public Library in North Stonington for availability. Paper copies will be sent to all known abutters of the Parke Pond site as well.

For questions or additional information contact Kevin Essington, Director, TNC Pawcatuck Borderlands Program, at 860-535-1355 or kessington@tnc.org.

TNC Pawcatuck Borderlands initiative outlines next steps

On November 29, 2005, a group of 40 individuals—planning professionals and regional stakeholders-- gathered to discuss potential next steps stemming from the May 2005 Regional Collaboration Clinic. The May clinic, facilitated by the Lincoln Institute of Land Policy, focused on regional land use trends in the Borderlands and began a process of a collaborative approach to these issues. Following a summary presentation on the Clinic, participants broke into three groups to consider the following issues, which were highlighted as potential areas for action at the clinic: 1) further exploration of the definition of the region; 2) ways to improve land use decisions to protect the unique nature of the region, and 3) ways to foster a vibrant place-based economy. Based on the discussion and feedback at the meeting, the following outlines the next steps:

December 2005 – January 2006

The Policy Council and TNC

will develop a series of maps and a related narrative describing key characteristics of the Borderlands. These maps will consider this "region" from the small scale, the unfragmented forest region of 136,000 acres, to the large scale, the greater rural area that extends north into southern Massachusetts. Please send any suggestions on map-related resources we may want to consider. In addition to this background, a menu of regional visions and related propositions that speak to potential actions will be developed.

January – February 2006

TNC will solicit feedback on these different regional visions and propositions, enabling this web-based discussion to be accessed from the Borderlands website. In addition, TNC will provide other ways for feedback via email and post mail. Although consensus may not be reached on the region during this timeframe, the hope is to encourage others to share their thoughts and make headway towards this aim.

February – March 2006

A series of topic-specific meetings will be held based on the land use and economic development ideas that came out of our meeting. These meetings will also be framed by the feedback we receive on the region, and where the areas of strong interest are, i.e. how to revitalize existing villages while protecting critical natural areas. The purpose of these meetings will be to flesh out ideas on concrete projects for discussion at the next full group meeting.

March – April 2006

A larger group meeting will be held to present and discuss the
(*Con'd from previous page*)

WPWA CANOE AND HIKING GUIDES

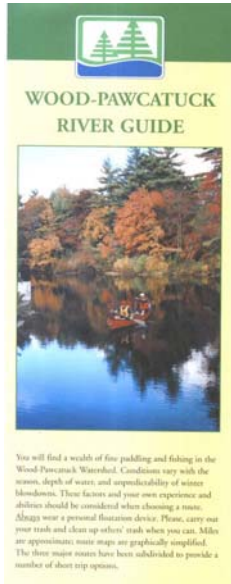
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By Charlie Hickox and Elly Heyder

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Navigate the Wood and Pawcatuck Rivers from source to sea with this colorful folded map.

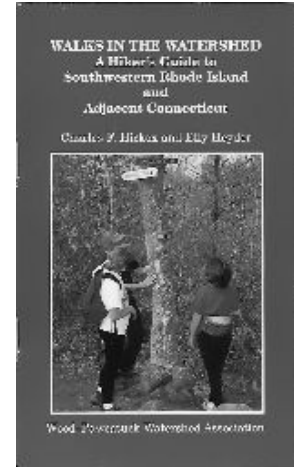


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feedback on the region/vision(s) as well as the suggestions from the smaller topic-focused meetings. At this meeting, the aim will be to reach some consensus on the region and its related vision/proposition as well as identify a few critical projects for collaborative action.

A more detailed preliminary report entitled "Regional Land Use in the Pawcatuck Borderlands," Summary and Preliminary Action Plan and all materials from the Clinic are available at www.ripolicy.org/pawcatuck.

Further thoughts on these upcoming activities may be addressed to Ariana McBride, Economic Development Planner, Rhode Island Economic Policy Council, (401) 521-3120 Ext. 101.

areas with adequate water supplies.

Expectations for Elected Officials:

It is our hope that this legislative Commission will:

- o fully evaluate all the potential impacts of water supply options in Kent County;
- o expand its scope of inquiry to include water supply issues on a statewide level;
- o conduct appropriate oversight of all state agencies with statutory responsibilities regarding water supply and management of water resources, ensuring timely progress and coordination;
- o make recommendations to the full General Assembly on necessary legislative actions. At this stage of our investigations, it appears that legislative action will be necessary to:

- ensure a timely adoption of interim statewide streamflow standards (as the CT legislature has required);
- minimize non-essential uses
- require the more efficient use of water, and
- ensure integrated management of surface and ground water systems, to protect the health of the aquatic environment while providing for essential human and economic needs.

It is also our hope that the Governor will recognize the importance of water supply issues to both our state's economy and natural environment, and will provide the necessary leadership to executive branch agencies working in this area.

Application for Membership

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Wood-Pawcatuck Watershed Association



Laura Wildman from American Rivers and Jim Turek from NOAA on site visit to Lower Shannock Falls.

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