



RUNOFF PROCESSES IN CONNECTICUT LANDSCAPES

by Glenn S. Warner, Ph.D., Department of Natural Resources Management and Engineering, University of Connecticut

Editor's Note: To assist Inland Wetland Commissions and Conservation Commissions (in a research and advisory role) in assessing whether or not a regulated activity outside wetlands or watercourses are likely to impact or affect the physical and biological characteristics of a wetland or watercourse, CACIWC has asked experts to provide information on how human intervention in the uplands can alter natural processes and potentially contribute to impacts to wetlands and watercourses. Dr. Warner's "Runoff Processes in Connecticut Landscapes" continues this series.

Wetlands and watercourses are features of Connecticut's landscape whose occurrence and characteristics are dependent upon the local terrain, soil characteristics, and hydrology. Because of the integral relationship between upland areas as the contributing watersheds of wetlands and watercourses, it is important to understand how changes in runoff processes naturally occur and how human intervention can negatively impact those processes. The purpose of Dr. Warner's article is to provide commissioners with a basic understanding of runoff processes so questions can be asked and answers requested from applicants and "third party" consultants.

General Water Balance in CT
Runoff averages about 22 to 26 inches per year, as measured by the United States Geologic Service (USGS) in streams in CT. The average precipitation in CT is about 44 to 48 inches across the state. The difference in precipitation and runoff is attributed to evapotranspiration (ET). Evapotranspiration is the combination of evaporation (from water surfaces or bare soil) and transpiration (water loss through plant stomata). Average ET in CT is then about 22 to 24 inches per year, or roughly half of the annual water budget.

depleted during early summer through early fall when ET usually exceeds precipitation. The soil water content increases during fall, winter and early spring when ET is lower.

"Changes in land use can change the dominant runoff process."

Managing Runoff

Since the amount and rate of runoff is the key to a number of water resource problems including: floods, droughts, erosion, pollution in streams, water supply and availability for in-stream biological uses, there is often a need to manage runoff. The generally accepted management goals are to: 1) reduce peak flows to prevent flooding, and 2) maintain adequate base flow during non-rainfall periods.

Seasonal Runoff Variations

Runoff varies greatly by season of the year even for uniform rainfall due to the high ET in summer and low ET in winter. It often lags precipitation due to the need to buildup soil moisture and ground water levels before significant runoff occurs. Surface storage in lakes and wetlands also may be important. Peak times for runoff are in late fall through late spring due to the low ET during those periods, except when an area is hit by extremely large storms such as a tropical storm. The ET comes primarily from soil in a vegetated watershed and therefore, the soil water is

The two general approaches to controlling runoff are a **structural approach** and a **non-structural approach**. In the structural approach we attempt to control flow rate to streams using reservoirs or detention ponds, or we try to infiltrate excess water using dry wells or other subsurface infiltration chambers. In the non-structural approach we try to maintain (or even increase) the natural infiltration capacity of a soil. Any excess rainfall above the infiltration

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Save the Date!!



CACIWC's Annual Meeting &
Environmental Conference
November 5, 2005



Gina McCarthy,

newly-appointed CT DEP Commissioner



will be our Keynote Speaker.

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capacity becomes runoff that then determines the erosion potential and amount of non-point pollution from surface sources.

Factors Controlling Infiltration

A number of factors affect the infiltration rate: the inherent soil texture, the amount and type of vegetation as well as how wet the soil is, i.e. the soil water content, at the time of the storm.

Vegetation increases infiltration capacity by: 1) intercepting rain and preventing surface sealing from rain drops, 2) helping maintain a healthy soil structure, 3) drying the soil through ET, and 4) enhancing the development of macropores. Macropores are the relatively larger pores in the soil and may be biological in nature such as earthworm/ant/beetle channels or may be physical cracks from wetting/drying processes.

The disturbance of soil can greatly affect the infiltration capacity by reducing or completely removing the vegetation. Compaction of the soil by machinery, animals and human foot traffic also greatly reduces the inherent infiltration capacity and usually results in increased runoff. As further described below, the presence of a high water table will also impact the infiltration.

Understanding Runoff Processes

The previous section deals with runoff generated by *infiltration excess runoff*. The second type of surface runoff process on a landscape is known as *saturation excess* or *saturation source runoff*. This type of runoff occurs where the soil is saturated, either from a perched or general high water table.

In this process, infiltrated water percolates to a water table and raises the water to the surface of the soil. It occurs where there is a high inherent infiltration capacity and a shallow water table. An undisturbed, vegetated soil in a humid climate such as CT often experiences this type of runoff.

Saturation excess is a very frequent, if not dominant, type of runoff in CT for forest or grass land covers. The saturated areas producing the runoff are not necessarily permanent water bodies or even classified as wetlands soils. These areas are only saturated after significant amounts of rainfall, and may remain saturated for fairly short time periods following a rainfall. Typical locations are converging areas in the landscape such as at the toe of a long slope where the topography flattens and in swales or small valleys that drain adjoining upland areas.

Changing Runoff Processes

Changes in land use can change the dominant runoff process. The most common occurrence is when a vegetated area is converted to a residential or commercial use area with significant amounts of impervious surface. The change from predominantly **saturated source runoff** to **infiltration excess** due to this land use change results in increased runoff rates, higher peak discharges, greater total runoff during a storm and lower base flow after the storm has ended. The large amount of disturbance during construction also may play a large role due to the compaction of exposed sub-soils that limit their infiltration capacity even after spreading of top soil and reseeding.

Managing Non-Point Pollution from Saturated Source Areas

Where **saturation source area runoff** dominates the potential for runoff containing pollutants is much greater. The challenge is to determine where the runoff zones are in the landscape so pollutants can be managed using BMPs. The converging areas of the landscape are keys, but it is sometimes hard to identify all these areas and the frequency and duration that they are subject to saturation. One technique is to mark saturated areas during wet periods and take note of these areas when applying chemicals or manures. If potential pollutants are applied during times when the areas are likely to become saturated, e.g. early spring, the chemicals or other pollutants are easily carried off the site. The likelihood that fertilizers, pesticides or manures will be lost due to runoff is much lower if they are applied in late spring or early summer.

Other Resources

Runoff values for particular gauged watersheds in the state can be found at <http://waterdata.usgs.gov/ct/nwis/sw>.

“Precipitation in Connecticut,” published by the Connecticut Institute of Water Resources and available electronically at <http://www.ctiwr.uconn.edu/Special%20Reports.htm>.

Assessing Impacts of Upland Development Activities to Wetlands and Watercourses: Resources for Inland Wetland Agencies and Conservation Commissions; Go to www.caciwc.org, click on Assessing Impacts of Upland Development. 🍁

CACIWC's Legislative Priorities ~ 2005

Increase Funding for Open Space and Watershed Matching Grants Program and the Recreation and Natural Heritage Trust Program ~ Connecticut has made important progress over the past six years in preserving the natural lands which protect our water quality, wildlife and scenic character. Since 1998 the Matching Grants Program has awarded 248 grants enabling municipalities and non-profits to conserve over 4,092 acres. At the last grant round in 2004 the matching grants program funded less than 50% of the requests. In 1998 Connecticut set a goal of conserving 21% of the state's land as open space. To achieve that goal we need to sustain our efforts while natural lands are still available. *CACIWC supports the Land Coalition of Connecticut's (LCCC) 2005 legislative agenda to request that the state commit to a five-year initiative of \$35 million in bonding each year -\$15 million annually for the Open Space Matching Grants Program and \$20 million annually for the Recreation and Natural Heritage Trust Fund.*

Increase Funding for Farm Preservation Programs ~ Connecticut must support the PDR (Purchase of Development Rights) Program. Connecticut has made very little progress in protecting farm land. Working farm lands are a significant part of the states economy, ensuring good local food, jobs, and an attractive landscape that enhances tourism and our quality of life. The state's long term goal is to protect 130,000 acres of farmland. Although Connecticut's PDR program was one of the first (1978) in the country, we have only protected 29,875 acres—a total of 210 farms. *CACIWC supports increased funding for the PDR program that includes \$10 million in bonding per year for the next five years.*

Cash-Based State or Municipal Support for Preserving Open Space and Farm Land ~ There is a significant need for a reliable revenue stream to increase the capability of towns and the state to acquire land for open space and farmland before costs escalate or the land is lost to develop-

ment. Particularly at a time when the state is cutting the assistance it gives to our municipalities, towns must be given tools they can choose to utilize in order to raise their own revenues for critical land preservation initiatives. Enabling towns to decide whether to impose a deed recording surcharge, an increase in the real estate conveyance tax, or some other mechanism to fund open space and farm land preservation would provide towns with a critical and fair means of protecting natural resources and preserving some of the natural features which keep our communities attractive places in which to live and work. Alternatively, instead of borrowing (bonding) to pay for conserving land, a dedicated small increase in the sales tax could generate new revenue to support local and state land conservation programs. *CACIWC will support land conservation legislation that provides towns and the state with reliable funding options as alternatives to the inconsistency of state or municipal bonding.*

All-Terrain Vehicles (ATVs) ~ *CACIWC firmly supports the need for registration and the establishment of a means of identification for ATVs. There is no issue that is more emotional to our members than the destruction of open space and farm fields by ATV users. We will support legislation that enables increased enforcement of trespass and vandalism by the ATVs. Finding a compromise that protects community and private open space and farm land, while finding places for this form of recreation is critical.*

Protecting Conservation Easements ~ Conservation Easements or Restrictions, in which a landowner maintains ownership of land but donates or sells restrictions on developing that land in the future, are an effective tool for preserving land at lower cost to a community, while keeping land on municipal tax rolls. The state, municipalities and land trusts have used this tool effectively to protect land—for example the farm land PDR program uses conservation
Legislation, continued on page 5

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restrictions to preserve farm land. However, for conservation restrictions to work those who donate or sell these restrictions must have complete confidence that they will be enforced. *CACIWC will support legislation that ensures that municipalities, agencies or land trusts which acquire these restrictions are notified of any applications to change the use of these lands, and that increases the possible penalties for violating the restrictions.*

Protecting the Forests That Protect Our Water

Supply ~ The Endangered Lands Coalition (ELC), with Connecticut Fund for the Environment, have worked hard to draft and pass laws protecting more than 100,000 acres of water company land that surround Connecticut's reservoirs. But another quarter of a million acres of privately owned, undeveloped and unprotected forestland that purify these streams, rivers and reservoirs are increasingly threatened by development. *CACIWC, as a member of ELC, will work actively with the Coalition and CFE to develop enabling legislation that supports protection of forest buffers within public drinking water watersheds that is compatible with the municipal land use regulatory process.*

Connecticut Environmental Protection Act (CEPA) ~

CACIWC will continue to actively work with the CEPA Working Group to strengthen the Act and prevent

legislation that would weaken the ability of municipalities, and the private sector from intervening in land use court actions.

Department of Environmental Protection (DEP)

Support ~ While all state agencies suffered staff losses during the past year, DEP has lost staff consistently over the past 15 years. DEP is CT's regulatory watchdog and enforcer for clean water, air and land use, and manager of our state parks and forests. Ongoing reductions in budget and staffing have been more costly to our state's well being than is generally understood. The natural resources that the DEP is charged with protecting are too often neglected. Connecticut has invested millions of dollars to clean up our rivers, lakes, and Long Island Sound, and to preserve forests, fields and shorelines. Restoring critical staff to DEP programs must be a priority to protect Connecticut's environmental investments. *CACIWC will support increases in DEP funding and oppose DEP budget cuts.*

Strengthening Wetlands Protection ~ *CACIWC will support legislation that strengthens commissions' ability to carry out their administrative and regulatory responsibilities.* 🍁

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The Working Lands Alliance Seeks Conservation Commission Support

by Ken Goldsmith, WLA Outreach Director

The Working Lands Alliance is a broad-based coalition of citizens, farmers, businesses, conservation organizations, local government associations and others working together to increase the state's commitment to farmland preservation. WLA is committed to educating the public and our state lawmakers about the importance of farmland preservation to our agricultural future and quality of life.

Connecticut Farmland... An Investment that Grows

Land stability is vital for long-term farm viability. Connecticut is losing 9,000 acres of farmland every year. In just *five years*, between 1997 and 2002, Connecticut lost 12% of its existing agricultural land, the largest percentage loss of any state in the nation. Farmland preservation programs help to ensure that current and future generations of Connecticut farmers have access to land at affordable prices. In addition to the substantial economic returns to local communities, there are numerous environmental and aesthetic benefits to keeping prime farmland in active agricultural use.

How You Can Help

WLA is optimistic that 2005 will be a landmark year for our efforts to strengthen farmland preservation programs at the state and local level. WLA goals include an increase in state funding to \$10 million per year for farmland preservation, lump sum funding authority for the Department of Agriculture, a mitigation policy in the event of state development of farmland, and increased resources for transitioning farmers. Of course, it is very important to be able to demonstrate the depth of our support to our elected leaders. There are many ways that you can help:

◆ As a Conservation Commission you can formally endorse our efforts. CACIWC has been an active Supporter of WLA since its inception and several Conservation Commissions are listed among our current Supporters.

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◆ If you are leader in another interested organization or own a farm or business you can join more than 140 other Supporters of WLA.

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◆ Finally, WLA always welcomes your tax-deductible donation. Please visit our web site, <http://www.workinglandsalliance.org>, for additional information.

Invite the WLA to Your Town

A member of the WLA staff would be happy to speak for a few minutes to your Conservation Commission or at a public forum in your community on agriculture or smart growth issues. We can also provide brochures and other written materials to distribute to your members. Please contact Ken Goldsmith, WLA Outreach Director, at (860) 296-9325 or by email, ken@workinglandsalliance.org, if you would like to become a Supporter, arrange a speaker or discuss our work. 🍁

NEW CACIWC WEBSITE FOCUS

Assessment of Impacts of Upland Development Activities to Wetlands and Watercourses

The increasing complexity of technical information needed by municipal inland wetlands agencies to assess development impacts on wetlands and watercourses prompted us to ask experts to address this issue. We have collected five significant articles (see below) on upland development impacts to wetlands and watercourses into a single location on caciwc.org. Click on “Assessing Upland Impact Resource Page” lower left of the home page to view the articles. We will continue to add pertinent material to this website location in the future. Check it out!

Background

Inland Wetlands Agencies (IWA) have traditionally regulated activities within mapped inland wetlands, determined by presence of “wetland” soils and within water bodies as defined by the Connecticut General Statutes. The 1995 revisions to the Inland Wetlands and Watercourses Act specifically enabled the IWA to regulate upland activities that would likely impact wetlands or watercourses. Beginning with *Queach Corporation vs. Branford Inland Wetlands* in 2001 and then in 2003 with *AvalonBay Communities, Inc. vs. Inland Wetlands Commission of the Town of Wilton*, Connecticut’s Supreme Court reaffirmed this authority (if the municipal regulations so specify). For analysis of these decisions visit www.CACIWC.org; click on Inland Wetlands Commissions, then Legal Issues, and scroll to Queach Information Page and the Public Act 04-209 Information Page.

The Court’s clarification of IWA authority to regulate upland areas has generated considerable interest in how to assess activity in upland areas with respect to impacts they may have on wetlands or watercourses. In the AvalonBay decision the Court provided some guidance by limiting jurisdiction for assessing activity in upland areas to potential impacts to the physical characteristics of wetlands and watercourses.

The 2004 Public Act 04–209, An Act Concerning Jurisdiction of Municipal Inland Wetlands Commissions, codified the Court’s “physical characteristic” limit by amending section 22a-41 of Connecticut’s Inland Wetlands and Watercourses Act with the addition of new subsections (c) and (d) to read as follows:

(c) For purposes of this section, (1) “wetlands or watercourses” includes aquatic, plant or animal life and habitats in wetlands or watercourses, and (2) “habitats” means areas or environments in which an organism or biological population normally lives or occurs.

(d) A municipal inland wetlands agency shall not deny or condition an application for a regulated activity in an area outside wetlands or watercourses on the basis of an impact or effect on aquatic, plant, or animal life **unless such activity will likely impact or affect the physical characteristics of such wetlands or watercourses.**

Resource Articles

- ◆ *Inland Wetlands and Watercourse Review Areas*. James G. MacBroom, P.E., Milone & MacBroom, Inc., *The Habitat*, Special Edition, January 2003.
- ◆ *The Relationship Between the Properties and Features of Wetland Soils and the Adjacent Uplands*. USDA Natural Resource Conservation Service, Connecticut staff, *The Habitat*, Fall 2003.
- ◆ *Assessing the Impacts: Evaluating the Potential Changes to Wetlands and Watercourses from Upland Development*. Dr. Glenn Warner, PhD, University of Connecticut and Kipen J. Kolesinskas, State Soil Scientist, USDA-Natural Resource Conservation Service. Workshop powerpoint presentation and check list, CACIWC’s 27th Annual Meeting and Environmental Conference, November 13, 2004.
- ◆ *Vegetative Buffer Regulations to Protect Water Quality*. Robert Jontos, PWS, CPESC, Land Tech Consultants. Workshop powerpoint presentation, CACIWC’s 27th Annual Meeting and Environmental Conference, November 13, 2004.
- ◆ *Riparian Buffer Fact Sheet* - Delaware River Keeper Network, an American Littoral Society affiliate. E-mail: drkn@delawareriverkeeper.org. 

The Economic Benefits of Open Space Protection ~ Westbrook's Investment in Open Space

by Tom Odell, Chairman, Westbrook Conservation Commission

Editor's Note: "Westbrook's Investment in Open Space", published 2002 in Westbrook Events, a town newsletter, was written to provide residents with a sense of place and purpose for preserving open space and protecting natural resources. The Conservation Commission's continuous flow of information and programming on the benefits of open space protection has been a primary reason for the success of Westbrook Connecticut's Open Space Program. The majority of the general information in the article was found on the Trust for Public Lands' web site, tpl.org. We recommend www.tpl.org as a source for land conservation information.

Evidence indicates that open space conservation is not an expense but an investment that produces important economic benefits. Some of this evidence comes from academic studies and economic analysis. Other evidence is from the firsthand experience of community leaders and government officials who have found that open space protection does not "cost" but "pays."

Clean Water:

- ◆ Communities nationwide face billions of dollars in expenses to treat polluted drinking water and polluted watercourses. Connecticut is spending millions to reduce polluted run off from reaching Long Island Sound.
- ◆ Development can cover large areas (sprawl) with impervious surfaces (such as rooftops, driveways and roads) which shunt storm water runoff away from drinking water aquifers, into culverts and streams, and into Long Island Sound. Impervious surface in watersheds brings pollution from septic and sewer systems, from lawn and garden chemicals, and from highway runoff to water resources we use for swimming and fishing.

Currently, 36 million Americans drink water from sources that violate EPA contaminant standards, and the agency has estimated that \$140 billion will be needed over the next 20 years to make drinking water safe.

- ◆ More and more communities are realizing that keeping water clean is almost always cheaper than cleaning it up.
- ◆ A 1991 study by the American Water Works Research Foundation concluded that the most effective way to ensure the long-term protection of water supplies is through land ownership.

Westbrook's Open Space Program is focused on protecting key watershed forests, wetlands, wooded buffers and estuaries. These natural systems absorb storm and flood water, and reduce pollutant and sediment loads in watershed runoff. These are all services the community would have to pay for otherwise. Natural open space provides these services for free. The result is clean water along our beaches, to swim in, to fish in—and to drink, now and for the next generation.

Quality of Life

- ◆ For a 1995 poll, researchers from the Regional Plan Association and the Quinnipac College Polling Institute in Connecticut queried nearly 2,000 people from around the country about quality of life. The major elements cited as crucial for a satisfactory quality of life were low crime with safe streets and access to greenery and open space.
- ◆ As we move toward a mixed economy based on services, light industry, consumer goods, and new technologies, businesses and their employees are no longer tied to traditional industrial centers. Today, businesses are free to shop for an appealing location, and they clearly prefer communities with a high quality of life, including an abundance of open space, nearby recreation, and pedestrian-friendly neighborhoods.

Westbrook's Open Space Program clearly includes enhancement of quality of life opportunities for all residents. Forests, farms and wetland buffers all contribute to the rural—seaside character of the town. Hiking greenways, canoeing or kayaking, bird watching and nature study, or just finding a quiet green place are part of the plan. All contribute to a beautiful community to live, play and work in.

Economic Vitality

- ◆ Protected open space is increasingly recognized as vital to the quality of life that fuels economic health.

Benefits, continued on page 9

Governor's 2006-07 Budget Contains \$35 Million in State Funding for Open Space and Farm Land Protection

It is time to say, "THANK YOU, Governor Rell."

Your letters emails and phone calls asking Governor Rell to support increased funding for open space and farm land preservation worked. In her proposed FY2006-2007 budget, she recommended \$5 million in new bonding authorizations in each of the next two years for the Recreation and Natural Heritage Trust (RNHT) program, \$5 million in new bonding authorizations in each of the next two years for the Open Space Matching Grants program, and \$5 million in new bonding authorizations in each of the next two years for the Department of Agriculture's Purchase of Development Rights (PDR) program.

Governor Rell's budget support for preserving open space and farm preservation exceeded expectations considering the fiscal position of the state. PLEASE THANK HER by letter, card, or email. Email: Governor.Rell@po.state.ct.us; Address: Governor M. Jodi Rell, Executive Office of the Governor, State Capitol, 210 Capitol Avenue, Hartford, Connecticut, 06106

Matching Grant Funds Available in 2005

The current FY2005 budget, which was passed last year, had authorized \$1.5 million for the Matching Grants program, a loss (rescission) of \$2.5 million in the RNHT, and \$2 million for the PDR program. The \$5.5 million for the Matching Grants program, which was released for expenditure by the Bond Commission in early February 2005, was from funds authorized in the FY05 and previous budgets. These recently released funds for the DEP's Municipal and Watershed Matching Grants Program are likely to be available sometime in April. Conservation Commissions, Open Space Committees and Land Trusts are urged NOW to gather the appropriate information needed if you intend to apply for grants. For information about the grant program log onto: <http://dep.state.ct.us/rec/openspace/acquisition.htm>.

Legislation—Next Steps

The proposed bonding (Capital) budget will now go to the Bonding Subcommittee of the General Assembly's Finance, Revenue and Bonding Committee, which will hold a public hearing at some point in March. The subcommittee and the full committee will issue their recommendations for changes to the Governor's proposal, and the full House and Senate will then negotiate the final package with the Governor.

Benefits, continued from page 8

- ◆ Protected Open Space requires less tax-supported infrastructure such as roads and less tax-supported town services such as police, fire and schools.
- ◆ In the long term, economic advantage will go to communities that are able to guide growth through land conservation. In some instances a community's bond rating may actually rise after it has shown it can control growth by purchasing open space.
- ◆ Instead of costing money, conserving open space as a smart growth strategy can save communities money. A study in Woodbridge, Connecticut, revealed that taxpayers would be better off buying a 292-acre tract than permitting it to be developed.
- ◆ As the nation moves toward a mixed economy based on services, light industry, consumer goods, and new technologies, businesses and their employees are no longer tied to traditional industrial centers. Today, businesses are free to shop for an appealing location, and they clearly prefer communities with a high quality of life, including an abundance of open space, nearby recreation, and pedestrian-friendly neighborhoods.

Westbrook's Open Space Program seeks to strike a balance between environmental protection and economic growth. In the last 5 years residents have recognized and supported this concept by approving 2.2 million in open space funding (86% voted yes in referendum) and by voting overwhelmingly to purchase the Horse Hill Woods, Chapman Mill Pond, Horse Hill Gorge, and Salt Island Overlook properties, totaling 160 acres. They recognize that protection of clean water and the rural character of this seaside community are value-added investments worth supporting. An open space management stewardship program has been initiated to provide residents with an opportunity to manage the use of their investment.

Online Registration Now Available for DEP Training Program 2005

Online registration is now available for DEP's Municipal Inland Wetlands Commissioners' Training Program directly through UConn's College of Continuing Studies! Log on to <http://www.continuingstudies.uconn.edu/professional/wetlands.html> - or access the site directly from DEP's website which provides a link to UConn.

DEP is required by Statute to allow one person from each town to attend the training program at no cost. Vouchers have been mailed to each CT IW agency. There are two choices for use of the voucher: it can be mailed along with a registration form to UConn, or the voucher's code number can be entered online.

Here's a snapshot of the 2005 schedule. For more information, go to the website above, or check with your local land use office for the mailed information. If you have questions, contact Darcy Winther at DEP, 860.424.3019.

Segment I

"CT's Inland Wetlands and Watercourses: An Introduction to Principles and Practices"

March 22 and 24 – Derby April 2 – Old Lyme
 April 4 and 6 – Storrs April 9 – Burlington

Segment II

"CT's Inland Wetlands and Watercourses: Legal Issues, Resource Management and Related Disciplines"

May 21 – Derby May 25 – Old Lyme
 June 2 – Burlington June 4 – Storrs June 10 – West Hartford



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U.S. Patent No. 5,087,151, U.S. Patent No. 5,419,808, U.S. Patent No. 6,129,482 U.S. Patent No. 6,322,288 B1, Other U.S. and Foreign patents. Other U.S. patents pending. RECHARGER[®], CONDUCTOR[™], HVLV[™] and STORMFILTER[®] are trade names of CULTEC, Inc. Copyright © 2004 CULTEC, Inc. All rights reserved.

URGENT! State Open Space Matching Grants Deadline ~ May 20, 2005

\$ 5.5 million is available for matching grants. For more information and an application for the Open Space & Watershed Land Acquisition Grant Program go on line to: <http://www.dep.state.ct.us/rec/openspace/opensp31.htm>. In an effort to distribute announcements regarding the funding levels and the acceptance of grant proposals for the Open Space and Watershed Land Acquisition Grant Program, DEP has established an e-mail subscription program.

To Subscribe to the Listserv:

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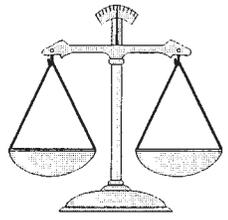
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ALERT! Sudden Oak Death Found in Connecticut

PATHOGEN FOUND ON RHODODENDRONS SHIPPED FROM OREGON

The United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) has confirmed the presence of sudden oak death, *Phytophthora ramorum* (Pr), on 5 of 14 samples sent to their Maryland labs by the Connecticut Agricultural Experiment Station (CAES) for confirmation. Sudden oak death is now confirmed to have been imported into Connecticut on infected nursery stock, sold and planted in the environment.

What is Known:

Shipments of over 10,000 rhododendron plants came into Connecticut over the past year from a nursery in Oregon. APHIS notified CAES in late October that they had traced infected plants forward from that nursery to 53 outlets in Connecticut. CAES set about the process of visiting the outlets and taking samples for testing for sudden oak death. Pathologist Sharon Douglas of the CAES conducted DNA analysis of pathogens found on numerous plants at numerous outlets. She reported multiple positive results. 14 samples of those positive tissues were sent to APHIS labs for confirmation. On November 22, 2004, APHIS informed the CAES that five of the samples were confirmed positive for sudden oak death. The five positive samples came from three sites in Connecticut. Plant stock of host species at each of the three sites has been incinerated to prevent contamination. APHIS and CAES are coordinating the response to this situation.

What is the Immediate Impact on the Forests of Connecticut?

None - yet.

State Forester Donald H. Smith Jr. said that there is no immediate impact on the forests of Connecticut. "What has happened is that the pathogen has been introduced into the Connecticut environment. What we all feared has happened and we now must wait and watch closely to see what happens", he said in a letter to foresters. "It is simply a matter of time before we are able to determine whether the climate, environment and local species favor the survival of the pathogen in our state. The best we can hope for is that the pathogen cannot survive here and dies out."

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What Can You Do?

Those who purchased rhododendron plants within the past year should examine their plants, looking for circular fungal lesions on the leaves. They should report any suspicious leaf conditions to the CAES (see below). Do not discard the plants without consulting the CAES, first. Foresters, arborists, tree wardens and loggers should be aware of the condition of oak foliage in and around residential areas with rhododendron plantings. Conservation Commissions should keep a look out for signs of the disease in town open space—particularly those near new residential development. Unusual foliage lesions or sudden wilting and dying of oak

Sudden, continued on page 13



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should be immediately reported to the CAES (see below). Suspect trees should NOT be cut and transported, as doing so may spread the pathogen to new areas.

Some Background on Sudden Oak Death

Since 1995, large numbers of oaks and tanoaks have been dying in the coastal counties of California. Since then, many other types of plants have been found to be infected or associated with this disease, referred to as Sudden Oak Death, *Phytophthora ramorum* (Pr). *Phytophthora ramorum* was first seen in 1995 in Mill Valley (Marin County) on tanoak. Since that time, the disease has been confirmed in 12 coastal California counties and in a localized area of Oregon. There is no known practicable control in the forest.

The nation has known other *Phytophthora* species (root rot and potato blight) for a while. With those species, the means of spread has been through rain splash or other mechanical means. This species seems much more dangerous because it can be airborne. That means that spread can be accelerated via severe weather events that may coincide with spore production. Several tree species are vulnerable to this disease – most notably many red and black oaks - especially northern red oak. Many shrubs species such as rhododendron, laurel, and viburnum are also hosts to this disease.

On oak trees, it seems the infected tree may appear healthy to the casual observer and suddenly wilt and die within two to four weeks. In actuality, infected trees will show evidence of infection that is observable by inspection, (cankers, seeping, etc.) for a year or two before the final collapse.

Identification

For more information about sudden oak death, visit the APHIS web site for this disease, <http://www.aphis.usda.gov/ppq/ispmp/sod>, and become familiar with identification of it. A web search for Sudden Oak Death will yield much information - most of it from the west coast. Conservation Commissions could research this information and make it available to residents and local plant nurseries and landscape outlets to ensure their plants do not have signs of sudden oak death.

To contact the Connecticut Agriculture Experiment Station in New Haven, call 203-974-8510.

Editors Note: Further information on sudden oak death will be available in the spring. 🍀

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◆ **Protecting and Restoring Our Environment**, Connecticut Department of Environmental Protection 2003 Annual Report. Link to the report: <http://www.dep.state.ct.us/enf/rpt/2003rpt.pdf>.

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As of Feb. 8, 2005, the following town commissions have supported CACIWC through membership dues for the 2004-2005 fiscal year (July 1, 2004 – June 30, 2005). THANK YOU! If you do not see your commission on the list, please encourage your commission to join (call 860.399.1807 for a membership form). If we are in error we apologize and would appreciate knowing. Member commissions receive a copy of *The Habitat* for each commissioner if dues have been paid.

CC = Conservation Commission
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Winter 2005

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