

CACIWC's 41st Annual Meeting & Environmental Conference: Managing for a Changing Climate

The CACIWC Board of Directors extends their appreciation to the many members and guests who were able to attend our **41st Annual Meeting and Environmental Conference**. The conference was held on Saturday, November 17, 2018 at the Red Lion Hotel Cromwell. This expansive facility again provided an excellent setting for our conference with its twelve scheduled workshops and extensive display areas. The CACIWC Board of Directors and its Annual Meeting Committee worked throughout 2018 to bring attendees a wide variety of informative workshops and exhibitors, while coordinating with our venue to provide you with a revised display and refreshment layout.



David Vallee gives keynote presentation. Photo by Jeff Mills.

Keynote Speaker

CACIWC welcomed **David Vallee**, Hydrologist-in-Charge at the National Oceanic and Atmospheric Administration (NOAA)/ National Weather Service (NWS) Northwest River Forecast Center in Norton Massachusetts as our 2018 keynote speaker who presented on: *“Examining Climate Trends in the Northeast and their Impacts on Riverine and Coastal Flood Behavior.”* The CACIWC Board of Directors was pleased to recruit our 2018 keynote speaker as he is uniquely qualified to discuss the ongoing climate change trends and their impact on river and coastal flooding in Connecticut and throughout the Northeast.

For his presentation, David described how much of New England has been experiencing an increasing trend in annual average temperature, annual average precipitation, and the number of heavy rainfall events over the past several decades. During this same time period, the region had also experienced an increasing number of moderate to major flood episodes. These episodes have been associated with a variety of storm types and have affected the region at different times of the year. These events included the record floods of March 2010, the spring snowmelt floods which sent Lake Champlain to record elevations, the catastrophic flooding

associated with the passage of Tropical Storm Irene in western New England, and the remarkable thirteen inch rainstorm that struck Long Island, New York in the summer of 2014. His presentation illustrated how the common threads in each episode were a persistent storm track with the ability of each storm system to

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www.caciwc.org

CACIWC News

As the article and photos in the issue of *The Habitat* illustrate, our 41st Annual Meeting may have been one of our best efforts, as characterized by the many comments from our attendees. Our attendance was high, and we received numerous specific complements on our speakers, workshops, displays, networking opportunities and our choice of venue.

In addition to our keynote presentation, many workshops emphasized the conference theme of “Preparing for a Changing Climate.” An article summarizing one of our key climate-related workshops is also included in this issue.

While many current members of our board worked very hard to ensure the success of this conference, we are also indebted to many former board members who helped strengthen CACIWC through the years.

No one individual contributed more to strengthening the foundation of CACIWC than our first president and co-founder, Tom ODell. This issue also highlights the immense contributions that Tom made to CACIWC and Connecticut conservation issues before his untimely passing during the summer of 2018. To honor his many accomplishments, we dedicated our 41st Annual Meeting and Environmental Conference in Tom’s memory.

One former board member and co-executive director who continues to support CACIWC as Associate Editor of *The Habitat* is Ann Letendre. Always modest in describing her accomplishments, I want to share two recent honors given to Ann in this issue. Ann was recognized by both the Governor’s Greenway Council and the Connecticut Recreation & Parks Association (see article and photo). I know I speak for the entire board in extending our congratulations to Ann for these well-deserved recognitions. Thanks you Ann for all that you do!

In other news:

1. The CACIWC Annual Meeting Committee has been reviewing the many comments and suggestions submitted on the survey distributed at our **41st Annual Meeting and Environmental Conference** on Saturday, November 17, 2018 at the Red Lion Hotel Cromwell. If you did not have an opportunity to complete the 2018 meeting survey, please

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Journey to the Legal Horizon

by Attorney Janet Brooks

NOVs vs Orders:

“You mean there’s a difference?”

Last year I took a phone call from someone who recently moved to Connecticut. He was panicked as he explained that the municipal wetlands agent informed him by telephone that a Notice of Violation (“NOV”) was in the mail to him that required him to perform a variety of activities and then appear at a wetlands commission meeting to explain how he complied. I responded with a question – what is the date for the hearing on the order? He explained it wasn’t called an order, it was called a Notice of Violation and no hearing was scheduled. Also, he was told that the next regular monthly meeting was cancelled due to an already known lack of a quorum and that he should appear at the following meeting over six weeks in the future. Once the “NOV” arrived in the mail, I learned it contained the following:

it “notified” the property-owner “to commence the following actions”: “1. Immediately cease and desist all regulated activities upon the site . . .”; “2. Have a certified soil scientist determine and demarcate the wetland boundary. The wetlands should then be delineated on a survey of the property. . .”; “4. Appear before the [town wetlands commission] . . . Report progress to date . . . An opportunity will be provided to the applicant to be heard and show cause why this order shall not remain in effect. At this time, any additional regulated activities completed at the site will be a continuance of this violation and may subject you to additional enforcement actions . . .”

(Underlining added by author.)

Obviously someone considered this an order (by the use of the word “order” in paragraph 4) but slapped the caption “Notice of Violation” thinking it relieved the commission of holding the statutorily-required hearing within 10 days of issuance of an order. The context: the newly-arrived family to Connecticut experienced within the first two weeks of their move a tree crashing through their roof in the middle of the night. Thereafter, the homeowner, after inquiry at town hall, spoke to the wetlands agent about removing other trees to eliminate any future threat of trees falling on the house. As it turned out, the trees were removed from the upland review area.

Why was this an order? The language in the “Notice” referred to the letter as an order and considered it an enforcement action. The letter set forth actions to be undertaken: cease and desist regulated activities; delineate the wetlands; have the property surveyed, including the wetlands delineation.

What the statute says about orders: If the agency or its agent finds that any person is conducting an activity or maintaining a condition not in accordance with the statute or the municipal regulations, the agency or agent is authorized to issue a written order, by certified mail, to the person conducting such activities “to cease immediately such activity or to correct such . . . condition.”² The agency is required to hold a hearing within ten days of issuing the order. Within ten days of completing the hearing, the agency must act to affirm, dissolve or modify the order. The statute explicitly states that the “original” order is in effect upon its issuance. The protection afforded to the recipient of the order is the speed at which the agency must act by holding a hearing, within 10 days, and the amount of time it may take deliberating at the close of the hearing, 10 days. The agency’s authority is extensive, *but not unlimited*.

In contrast, the statute does not mention “Notices of Violation.” As I addressed in a CACIWC column a few *legal, continued on page 11*

Ann Letendre Receives Recognition Awards

By Alan J. Siniscalchi

One of the benefits of serving on the CACIWC board is the opportunity to work with people dedicated to promoting conservation issues in Connecticut. One notable example is Ann Letendre, our Associate Editor of *The Habitat* who also served CACIWC many years as a board member and co-executive director. Ann has been the Chairman of the Vernon Open Space Task Force since its formation in 1988 and prepared the Vernon Open Space Plan. Ann also served on the Vernon Conservation Commission for 19 years, five as its Chair. During this past year Ann received two major recognition awards.



Ann Letendre and Bruce Donald.


The first occurred in last June when Ann received the **Connecticut Greenways Council's Unsung Hero Award** for her two decades of work writing and managing over 24 grant projects for the Friends of Hockanum River Linear Park of Vernon, Valley Falls Park and Farm, and ongoing efforts for the protection of Tankerhoosen watershed.

Ann Letendre was presented her award by Bruce Donald, Chair of the CT Greenways Council, and Tri-State Coordinator for the East Coast Greenway Alliance (*see photo*) who also stated: "Trails reinvigorate our souls. They strengthen our bodies. They build our communities in myriad ways we didn't comprehend even ten years ago. They are a part of the fabric of Connecticut." The Governor's Greenway Council awards ceremony held at the Nathan Lester House in Ledyard also announced the dedication of three new greenways: the Great Oak Greenway in Ledyard, the Captain John Bissell Trail in South Windsor and the South Meadows Greenway at Goodwin College.

A few days after our 2018 CACIWC Annual Meeting & Environmental Conference, Ann received another major recognition on November 20, 2018 at the

Connecticut Recreation & Parks Association (CRPA) awards luncheon at the Mohegan Sun Hotel and Conference Center. At this luncheon, Ann received the **CRPA *Above and Beyond the Call of Duty* (ABCD) Award** for her many years of service on the Hockanum River Linear Park (HRLP) including organizing Friends of HRLP, writing and managing numerous grants for HRLP, Valley Falls Park and supporting other important park & recreation projects throughout Vernon.

I join the entire CACIWC Board of Directors in congratulating Ann for her well-deserved recognition awards and thank her for her service to Connecticut conservation efforts. 🍁



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Remembering Tom ODell

While working on our 2018 conference this past summer we were saddened to learn of the passing of CACIWC co-founder **Tom ODell**. In addition to serving as our President and Executive Director, Tom's long service as Editor of this publication has perhaps influenced more CACIWC members during its 44 year run than any other aspect of our education and outreach efforts. While many people have served on the CACIWC Board of Directors or worked on publication of *The Habitat* during the last four plus decades, no one person has contributed more to its long-term success than Tom ODell.

Thomas M. ODell was born on July 27, 1934 in Port Washington, New York and graduated from Glastonbury High School and the University of Connecticut, where he majored in Forest Entomology. After fighting western forest fires, serving as a Army National Guard medic and a forty plus year career studying biological control of insect pests with the USDA Forest Service in Hamden, Tom retired to spend more time on state and local conservation efforts.

To truly understand Tom's many contributions to our state's conservation efforts requires a brief review of the history of conservation and inland wetlands commissions in Connecticut and the formation of CACIWC. Many of our members are aware of the long history of land conservation and habitat protection by their fellow conservation and inland wetlands commissioners and staff throughout Connecticut. Following the enabling legislation of 1961 and legislation to expand their role in 1963, conservation commissions began to form in towns throughout our state. In 1964, the Connecticut Association of Conservation Commissions (CACC) was organized to help educate the expanding number of conservation commissioners volunteering to serve their towns. CACC provided literature and

other information to help these new commissioners investigate and protect local habitats.

Tom's early efforts as editor began in 1970 when, as a new member of the Westbrook Conservation Commission, he volunteered to assist in researching and developing content for the CACC newsletter, entitled *Connecticut's Environment*. This CACC newsletter was first printed by the State of Connecticut Department of Agriculture and Natural

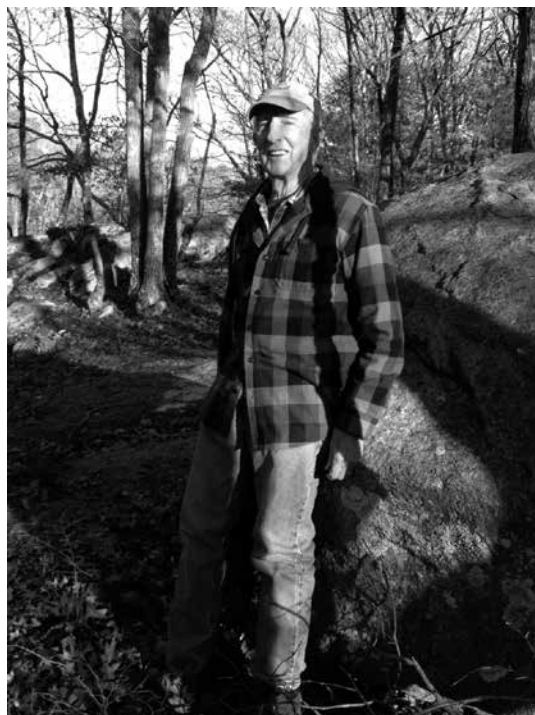
Resources for distribution throughout the state. In 1971, when most state conservation and environmental protection activities were transferred to the newly formed Department of Environmental Protection (DEP), CACC and its newsletter continued to be supported along with publication of the first Handbook for Conservation Commissions.

Major changes occurred with the passage of the 1972 Inland Wetlands and Watercourse Act creating a new municipal government function, followed by Public Act 73-293, which increased the size of conservation commissions.

Following the passages of these

acts and within four years of the first Earth Day, the **Connecticut Association of Conservation and Inland Wetlands Commissions (CACIWC)** was organized in to help support the major expansion of municipal land use roles and responsibilities. CACIWC published the first issue of *The Habitat* in 1974 with Tom as its Interim Editor. *The Habitat* received financial support from the DEP until 1993 with several others periodically helping out as supporting and interim editors. In 1994, Tom again accepted the position as Editor following his retirement from the USDA Forest Service.

For the next 22 years Editor Tom, and Associate Editor Ann Letendre, expanded and strengthened *The ODell*, continued on page 12



Tom ODell enjoying time in the woods.

Climate Impacts on Eastern Hemlock Sustainability

By Carole Cheah

Eastern or Canadian Hemlock, *Tsuga canadensis* (L.) Carriere, is the second most common native conifer in Connecticut, with an extensive range in eastern North America. Though not considered a valuable timber species, hemlocks play a vital and important ecological role in our forests and wetlands. Hemlocks occur from eastern Canada and Maine down through the mid-Atlantic Appalachian Mountains to its southernmost limits in northern Alabama, and westwards through Ohio, Michigan and Wisconsin to its northwestern fringe in eastern Minnesota. Our Connecticut hemlock resources are concentrated in the northwest corner, but large stands of hemlock also occur in the northeast and southeast. Hemlocks are shallow-rooted species which require moist, cool conditions and grow well where there is 29 - 50 inches of precipitation. In its northernmost distribution, hemlocks can grow in pure or mixed stands at sea level, but hemlock sites gradually increase in elevation to 5,000 ft in its southern range and are more restricted to north or east facing cooler slopes or deep valleys. Natural hemlock sites can be quite varied as hemlocks can grow on different soil types and are abundant on mesophytic sites but can also be found on more xerophytic slopes. They are also dominant in saturated hemlock swamps (*Figure 1*) in acidic forested wetlands. Being the most shade-tolerant species which can live for several hundred years, eastern hemlock is considered by ecologists as a foundation species. Communities of animals and plants have uniquely adapted to the structure, microclimate and ecological processes of the eastern hemlock ecosystem. The towering evergreen crowns of hemlocks cast deep shade which are critical for the thermoregulation of cold, clean stream waters

for native brook trout and rare salamanders. In Connecticut, the northern spring salamander, a threatened species, requires steep rocky hemlock habitat. Many other species of wildlife call hemlock groves and swamps home, from obligate birds such as certain warblers and thrushes which are strongly associated with hemlock forests for breeding, to ruffed grouse, red squirrel, northern flying squirrel, porcupine, deer, black bear, bobcat, and many more that rely on eastern hemlocks for cover, forage and habitat.

Our climate is undeniably warming, with serious implications to the health, diversity and sustainability of tree species and forest ecosystems in the Northeast and beyond. Abiotic stressors such as drought and excessive heat alone, for example, have severe impacts on tree health. Connecticut has recently experienced the second most extreme and prolonged drought from 2016 to 2017 since the epic exceptional/extreme drought of the mid-1960s, which lasted from 24-27 months in the three climate divisions of Connecticut (data from the Northeast Regional Climate Center). In 2016-2017, Connecticut streams ran dry, well and reservoir levels were severely reduced in some areas. This recent extreme drought lasted 11 months in northwest Connecticut (Division 1), 13 months in Central Connecticut (Division 2) and a staggering 22 months in coastal Connecticut (Division 3). Abnormally dry conditions were actually in effect for even longer and the resulting stress on trees was significant. Concurrently, 2016 was the second hottest year in Connecticut since 1895. Such extreme drought and heat were detrimental to hemlocks and other species. For shallow-rooted hemlocks, drought can be the silent



Figure 1. A hemlock swamp in New Hartford, Connecticut. Photo by Carole Cheah.

and overlooked major abiotic cause of tree decline and death, creating the conditions that allowed outbreaks of the native hemlock borer,

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Phaenops (formerly *Melanophila*) *fulvoguttata* Harris to overwhelm and kill trees already weakened and



Figure 2. Elongate hemlock scale.
Photo by C. Cheah

stressed by non-native major insect pests such as the elongate hemlock scale, *Fiorinia externa* Ferris or EHS (Figure 2) or the more widely-blamed hemlock woolly adelgid, *Adelges tsugae* Annand or HWA (Figure 3), which are both native

to Japan. In 2016 and 2017, several hemlock borer outbreaks in Connecticut were observed on some ridgetop sites with the thinnest soils where drought effects were extreme, resulting in heavy decline, needle loss and tree mortality.

Prior to the accidental introduction of exotic hemlock pests, the greatest insect threats to hemlocks were native and infrequent: the hemlock borer and a native defoliator, the hemlock looper, *Lambdina fiscellaria fiscellaria* Guenée.

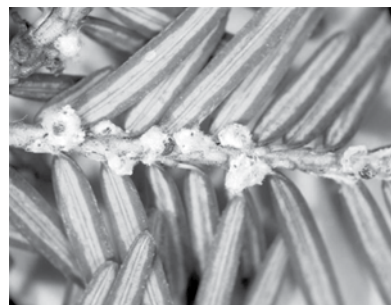


Figure 3. Hemlock woolly adelgid
Photo by C. Cheah

In Connecticut, the exotic EHS, an armored scale which feeds on the needles of many conifer species, actually preceded HWA, arriving in Connecticut in the 1970s, then spreading quickly in Fairfield

County to kill weakened hemlock survivors of the historic 1960s drought. The scale generally has one generation in the Northeast and mostly overwinters as female adults or eggs and the lack of effective natural enemies has allowed the slow spread of EHS infestations east of the Connecticut River in the last decade. Hemlocks in Connecticut, especially west of the Connecticut River, have been attacked by both EHS and HWA for many years. Needles become chlorotic from heavy EHS feeding and premature hemlock needle drop weaken and kill trees, often

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tap a tropical moisture source which resulted in very heavy rainfall on an already saturated ground.

David emphasized why the vulnerability of our coastline to tropical cyclones has never been greater. He reviewed the impact of Tropical Storm Irene and Hurricane Sandy on the region during the late summer and early fall of 2011 and 2012 respectively. These shoreline impacts were devastating and provide an ever present reminder of the tremendous costs that these types of storms can bring in the face of rising sea levels and a retreating coastline.

We continue to receive positive your feedback on David Vallee's presentation, which put into perspective the damage from these recent and in some cases record breaking events with respect to our changing climate and its impact on storm behavior, rainfall intensity and changes in flood frequency.

Workshops & Displays

Four newly revised workshop tracks were organized for the 2018 annual conference with topics on conservation biology & our changing ecosystem, legal and regulatory updates & issues, climate adaptation & water management, and strengthening and enhancing our commission tools. Individual workshops focused on strategies for preserving municipal open space, planning for flood resistant stream crossings, wetlands law for new commissioners, the giant hogweed and other invasive plants in Connecticut, important efforts of landscape architects, tackling aquatic invasive plants, wetlands law & regulation updates, climate impacts on the hemlock woolly adelgid, encouraging local conservation with student power, wetlands application site plan review, understanding your P&Z and ZBA, and Connecticut breeding and migratory bird populations.

One workshop, entitled "Strategies, Challenges, & Opportunities in Protecting Municipal Open Space," was provided by Attorney Amy Blaymore Paterson, Executive Director of the Connecticut Land Conservation Council (CLCC). This workshop examined some of the tools and legal mechanisms available to protect municipal open space, discussing some of the strengths and challenges associated with each, and exploring opportunities to work with your local land trust to help achieve your town's

conservation goals. She also discussed current and proposed funding options for acquiring and managing municipal open space at the local and state level.

Another workshop, entitled "Invasive Aquatic Plants in Connecticut Lakes and Ponds," was provided by Gregory J. Bugbee, Associate Scientist, Department of Environmental

Sciences, Connecticut Agricultural Experiment Station (CAES). This workshop reviewed the results of recent surveys conducted in Connecticut lakes that document the persistence and distribution of various invasive plant species. Methods for controlling these species with minimum impacts on the aquatic ecosystem and human populations were emphasized along with the importance of proper seasonal timing of control methods, as well as the use of physical control methods and biological control agents.

A summary of another key workshop, entitled "Climate Impacts on Eastern Hemlock Sustainability" by Carole Cheah, PhD, Research Entomologist, Valley Laboratory, The Connecticut Agricultural Experiment Station (CAES) is included in this issue.

Our conference venue supported layout of informative displays in an arrangement adjacent to our workshop rooms. The responses from our conference survey
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New England Wetland Plants, Inc. display.

annual meeting, continued from page 8 revealed a strong appreciation for the networking opportunity provided by these adjacent display and break areas.

Our conference attendees witnessed a special workshop in the main ballroom following lunch when Marc Langley, Owner of Airborne Works, demonstrated the unique perspectives which an unmanned aerial vehicle (UAV) or drone can provide. His demonstration provided recent advances on the use of thermography for environmental monitoring.

We again thank the conference attendees and all those responsible for organizing our **41st Annual Meeting and Environmental Conference**. The CACIWC Board of Directors has already been reviewing the evaluations forms submitted

by participants of this conference. In addition to informing us of their opinions of the educational sessions, the participants also provided valuable suggestions for workshop topics for next year's conference. To allow all of our members the opportunity to submit ideas for workshop topics and other suggestions, the CACIWC Annual Meeting Committee has decided to again maintain the AnnualMtg@caciwc.org email throughout the year. Please keep forwarding your suggestions to us. The board of directors extends its most sincere appreciation to our 2018 conference sponsors and looks forward to seeing all of you at our 2019 Annual Meeting and Environmental Conference, now scheduled for Saturday, November 23, 2019, when we will return to the Red Lion Hotel Cromwell. 🌿



Amy Blaymore Paterson and Lori Brown.
Photo by Jeff Mills.

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contact us with your comments and suggestions for our next conference at AnnualMtg@caciwc.org.

2. We are specifically requesting suggestions for workshop topics and speakers that you would like us to recruit for our **42nd Annual Meeting and Environmental Conference**, which we have already scheduled for Saturday, November 23, 2013. We are also pleased to announce that, based on your positive feedback, we are returning to Red Lion Hotel Cromwell for our 2019 conference. Please contact us with at AnnualMtg@caciwc.org with all of your suggestions. Watch for additional conference news in upcoming issues of *The Habitat* and on our www.caciwc.org website.

3. The Board of Directors appreciated the large number of commissions who renewed their 2018-19 CACIWC membership prior to our annual meeting as these early payments help fund our conference. We will shortly be sending notices regarding our **2019-20 membership dues**. The CACIWC board of directors

recently voted to maintain the dues at the 2018-19 levels. A copy of the current renewal form and additional information can be found on our website: www.caciwc.org.

4. Membership dues payments provide a critical source of revenue to help us fund *The Habitat* and our annual conference, which has unfortunately become increasingly expensive to operate. Would you or your company like to provide additional support to CACIWC? The website also provides a description of additional individual and business membership categories as well as our dedicated **Annual Conference sponsorships**. Please consider making an additional contribution to support our conference and other CACIWC education and outreach efforts.

5. We thank everyone who has provided us with updated email addresses and other contact information to help us **expand our ability to communicate with member commissions and staff**. Our Membership Coordinator & Database Manager Janice Fournier and your regional board representatives will be in touch with you to confirm contact information and discuss suggestions for workshops, articles, and other topics of interest to you. We continue to seek new topics for articles to be published in *The Habitat* along with additional feedback from our members, which you can email to us directly at TheHabitat@caciwc.org.

We look forward to another productive fiscal year in support of all of you, the dedicated members and staff of Connecticut's conservation and inland wetlands commissions. Please do not hesitate to contact us at board@caciwc.org if you have questions or comments on any of the above items or have suggestions for your board of directors.


We thank our members for all of your ongoing efforts and wish you a safe, healthy, and fun summer!

Alan J. Siniscalchi, President 🌿

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years ago, spring 2017 [see: www.caciwc.org/library/habitat/Habitat%20V29%20N2%202017%20Spring.pdf] only the formal enforcement actions which are mentioned in the statute constitute legally enforceable agency actions: revocation or suspension of a permit or final order after notice and opportunity for a hearing. There is value in these informal approaches: a telephone call by the municipal staff or letter inviting/urging the person to attend a meeting to explain the circumstances, transmittal of a letter asking for the person to appear before the agency and explain the circumstances. These informal procedures may be effective at enlightening the agency of the all facts and may bring the person into compliance, if s/he was out of compliance.

Once the immediate impact on the family was addressed, I wondered how many other towns were confusing NOV's with orders. I thought it would be the topic for my sometimes-annual fall survey of municipal wetlands regulations. However, I was stopped before I started when I consulted the 2006 version of the DEP Inland Wetlands and Watercourses Model Municipal Regulations. In § 14.4.b. of the Regulations agencies are informed they may issue a "notice of violation" . . . "prescribing the necessary action and steps to correct the violation including, without limitation, halting work in wetlands or watercourses." (Emphasis added by the author.) The use of the word "prescribing" is clearly inconsistent with the statute. If agencies wish to prescribe the necessary actions to correct a violation, they must do so in accordance with the statute, that is, with notice and opportunity to the "violator" to be heard within 10 days of issuing any order. Not wishing to ambush DEEP at the CACIWC annual meeting and conference in 2018, I notified Darcy Winther, DEEP wetlands official, that I would be presenting this view during one of the legal workshops. She informed me that she had already identified this section of the Model Regulations as one, shall we say, ripe for reconsideration and revision.

The take-home message: Agencies are empowered to issue orders seeking compliance with the law and correction of violations *as long as they do so by providing a hearing within 10 days of the issuance of such orders.* Similarly, agencies may utilize informal methods to accomplish the same goals. A telephone call, a letter or a Notice of Violation may be enough information to the person to bring about compliance or a more complete understanding of the circumstanc-

es. Take care to separate out prescribed requirements from phone messages, letters and Notices of Violation. When necessary, use the order format accompanied with notice of a timely hearing date.

Janet P. Brooks practices law in East Berlin. You can read her blog at: www.ctwetlandslaw.com and access prior training materials and articles at: www.attorneyjanetbrooks.com.

(Endnotes)

¹Arial font (as well as quotation marks) is used for direct quotations from the original Notice of Violation.

²General Statutes § 22a-44 (a). 🌿



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Habitat. In 2006, the CACIWC Board of Directors supported the further expansion of newsletter, with stable advertising revenue support organized by Jeff Mills of JM Communications. *The Habitat* is now a major tool of the CACIWC education and outreach triad, along with our annual conference and our www.caciwc.org website. In 2007 Tom stepped down as President to focus on his role as Editor of *The Habitat*. That fall he was awarded the **2007 Special Recognition Award** to acknowledge his many years of contributions to CACIWC and our members.

On Thursday, October 13, 2016, Tom ODell was honored for his statewide work and 46 years as Westport Conservation Commission Chairman at special ceremony held at Westport’s Water’s Edge Resort & Spa (see photo). CACIWC President Alan Siniscalchi presented Tom with his **2016 Lifetime Achievement** award at this ceremony for his for his many decades of service to the Conservation and Inland Wetland Commissions of Connecticut as the CACIWC



Tom ODell, center, is honored at the Oct 13, 2016 Westport celebration of his life. Photo by Kit Bishop

President, Executive Director, and Editor of *The Habitat* along with his tireless advocacy work for open space conservation as one of the lead environmental champions in Connecticut. Other announcements made during this event include the recent designation by the Town of Westbrook of the “Tom ODell Wildlife and Conservation Area” for an area of Long Island Sound including the three barrier islands known as Salt, Menunketesuck, and Duck.

We all again extend our most sincere sympathy to Tom’s wife Carol ODell, daughter Carrie ODell, son Patrick ODell and other members of extended family and friends. His many decades of service in support of CACIWC, the Westbrook Conservation Commission, and land conservation efforts throughout

Connecticut will be his lasting legacy that will not be forgotten. In honor of his decades of support to conservation, CACIWC dedicated this **41st CACIWC Annual Meeting and Environmental Conference** to his lasting memory. 🍂

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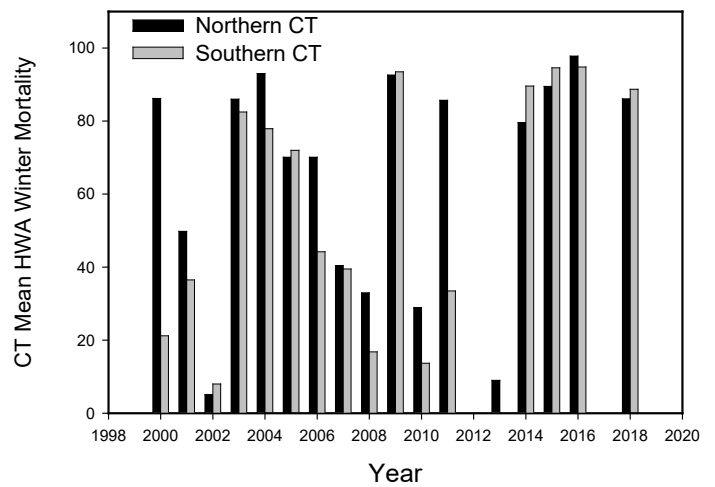
hemlock, continued from page 7

exacerbated by concurrent drought. Tree decline and mortality resulting from EHS and/or hemlock borer attacks, and drought are often misdiagnosed and attributed to HWA without careful tree inspection of the true primary casual agents.

Native eastern and Carolina hemlocks, *Tsuga caroliniana* Engelmann, are susceptible to HWA attack and damage. Hemlock woolly adelgid was first reported to the Connecticut Agricultural Experiment Station in New Haven in 1985 and quickly spread to all 169 Connecticut towns by the late 1990s during a period of warming winters. Severe drought was also recorded in 1995 and 1999 in coastal division 3 and peak damage from HWA was observed in the Connecticut River Valley and near the shoreline. All HWA are females and there are two generations which facilitate rapid population explosions on healthy hemlocks. The sistens or winter HWA generation consists of nymphs which break dormancy in the fall to feed and develop through the winter, becoming adults which lay many eggs in early spring. These hatch into nymphs which develop as the shorter progrediens generation in late spring and early summer, and generation size is dependent on the survivors of the winter generation. Adelgids do best on the newest most nutritious hemlock growth and feed along the stem on storage cells. At high densities, HWA feeding damage results in needle loss, lack of new growth and tip dieback. Hemlock woolly adelgid populations also subsequently crash due to a negative density-dependent feedback loop. Unchecked populations of HWA can build up to cause severe hemlock decline and even tree mortality, particularly under other stressful environmental conditions.

Over 18 years of research in Connecticut has shown that while warmer winters result in high survival of HWA, cold winters, particularly in the Northeast, can periodically reduce HWA sistens populations, which are actively feeding in winter. In Connecticut, there has been severe winter kill of HWA (80-97% statewide) in the consecutive winters of 2014, 2015, 2016 and 2018 (Figure 4), resulting in the historic current decimation of HWA populations on Connecticut hemlocks throughout the state. Data from Connecticut is contrary to current hypotheses and projections of continued HWA range expansion and hemlock extinction with climate change and warmer winters.

Figure 4. Mean winter mortality of HWA in northern and southern Connecticut from 2000-2018. (C. Cheah 2018)



Conventional predictions of global warming and milder winters with northward expansion of invasive species present an apparent paradox to these findings, except this is really not a contradiction at all. A deeper understanding of changing climate processes and the specific biology of HWA and its host reveals clues to a more hopeful future perpetuation of eastern hemlocks. Recent and ongoing climate research point to a rapidly warming Arctic as one of the primary drivers of the recent weak polar vortex events that have resulted in winter incursions of bitter Arctic cold into the lower latitudes. As the Arctic is warming at more than twice the rate of the rest of the Earth, apparent in the ever decreasing Arctic sea ice cover each winter, this destabilizes the jet stream, which forms the boundary between the cold polar vortex of Arctic winds and the warmer winds to the south. A wavy jet stream brings more arctic air south in unpredictable magnitudes which can kill high percentages of HWA. Connecticut research continues to document how frequently these arctic air incursions are impacting HWA winter after winter (Figure 4).

Recent analyses of patterns of HWA winter mortality in Connecticut indicates the close relationship to weak polar vortex events and how cold adaptation of HWA is related to climate divisions in Connecticut. Populations of HWA in the coastal division appear to be less cold-hardy than HWA in northwest and central divisions. Analyses showed that the absolute minimum daily winter temperature was the best predictor for the extent of HWA mortality in the different climate divisions. Adelgid mortality could also be predicted by the number of subzero days (below 0 °F) and cumulative subzero cold

hemlock, continued on page 14

hemlock, continued from page 13

called negative day degrees during a meteorological winter. Connecticut predictions were validated in the winter of 2016, which was the warmest winter for the state since 1895, and yet resulted in the highest ever recorded HWA winter mortality for the state at 97% since the start of data collection in 2000. An extreme cold outbreak from a split polar vortex which lasted only a few hours before dawn on February 14, 2016 plunged the state to minimums we have not experienced in decades. This brief but extreme cold from -20 °F to -25 °F in interior Connecticut to -10 °F along the coast was sufficient to kill 95-99% of HWA statewide. However, snow cover is also protective of HWA leading to higher winter survival. But there are management tools such as biological control of HWA that can be implemented to target any HWA resurgence in the forest. Releases of the HWA predatory ladybeetle, *Sasajiscymnus* (formerly *Pseudoscymnus*) *tsugae*, native to Japan, have been the major strategy in Connecticut where >178,000 have been released throughout the state since 1995. This species is also the only one reared commercially and available to the public through a company in Pennsylvania (<https://tree-savers.com/>).

So the tables have turned and hemlocks are now experiencing an extended reprieve from HWA, although EHS remains a challenge and continues to impact hemlock health on stressed sites as the latter are not as susceptible to winter extremes. Another surprising outcome of our changing and unpredictable climate has been the effects of the heavy precipitation that ended the recent extended drought. I am currently documenting the rapid recovery and resilience of hemlocks in previous decline in response to the return of heavy rains in 2017 and the above normal precipitation of 2018. For eastern hemlocks, more frequent polar vortex fueled arctic outbreaks and increased precipitation in a changing climate may yet prove to be critical to the future sustainability of eastern hemlock in the Northeast.

Carole Cheah, PhD is a Research Entomologist at the Valley Laboratory of The Connecticut Agricultural Experiment Station (CAES). The author thanks the many cooperators and technicians who have helped on this project and the USDA National Institute of Food and Agriculture and the USDA Forest Service for funding. 🍂



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Help Shape the 2020 Connecticut Forest Action Plan

Let your voice be heard – click on the link below to provide input on the 2020 Forest Action Plan. This is your opportunity to help shape the health and future of our forests and woodlands across the rural, suburban, and urban landscapes of Connecticut - your input is a critical component of the Forest Action Plan. Forests and woodlands are crucial to the health, well-being, and economy of Connecticut. To keep your forests and woodlands healthy requires well thought out strategies, policies, and plans that should consider input from Connecticut residents like you who care about forests and woodlands for all sorts of reasons.

This is not an academic exercise! That is why the Connecticut Forest & Park Association (the state’s oldest nonprofit conservation group) was contracted to work with partners and solicit public input that would help guide the policy, management, and financial decisions of the Connecticut Division of Forestry, the USDA Natural Resources Conservation Service, and the U.S.


Forest Service over the next 10 years. The plan is also used by Connecticut’s many and varied conservation and working lands organizations as a guide to how their work fits with the overall direction for the future of our forests and woodlands.

It all starts with you doing two things right now:

1. Take the Connecticut Forest Action Plan 2020 Survey by clicking on the link below. The survey should take 10 - 15 minutes.
2. Sign up to attend a public roundtable discussion to help shape the strategies and actions to conserve and manage forests in Connecticut. The roundtables will be 2-4 hours long, and will be held on June 11, June 13 and June 25 in different parts of the state. You can register for a roundtable discussion by following the link below and at the end of the survey, or by sending an email to ekrabet@ctwoodlands.org.

Thank you for taking the time to provide your input!

Take the CT Forest Action Plan Survey at www.surveymonkey.com/r/CTFAP2020

For more information about the Connecticut Forest Action Plan, please go to www.ct.gov/deep/cwp/view.asp?a=2697&q=454164&deepNav_GID=1631. Roundtable information and registration can be found at www.ctwoodlands.org/FAP2020. 



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We hope to see you there!