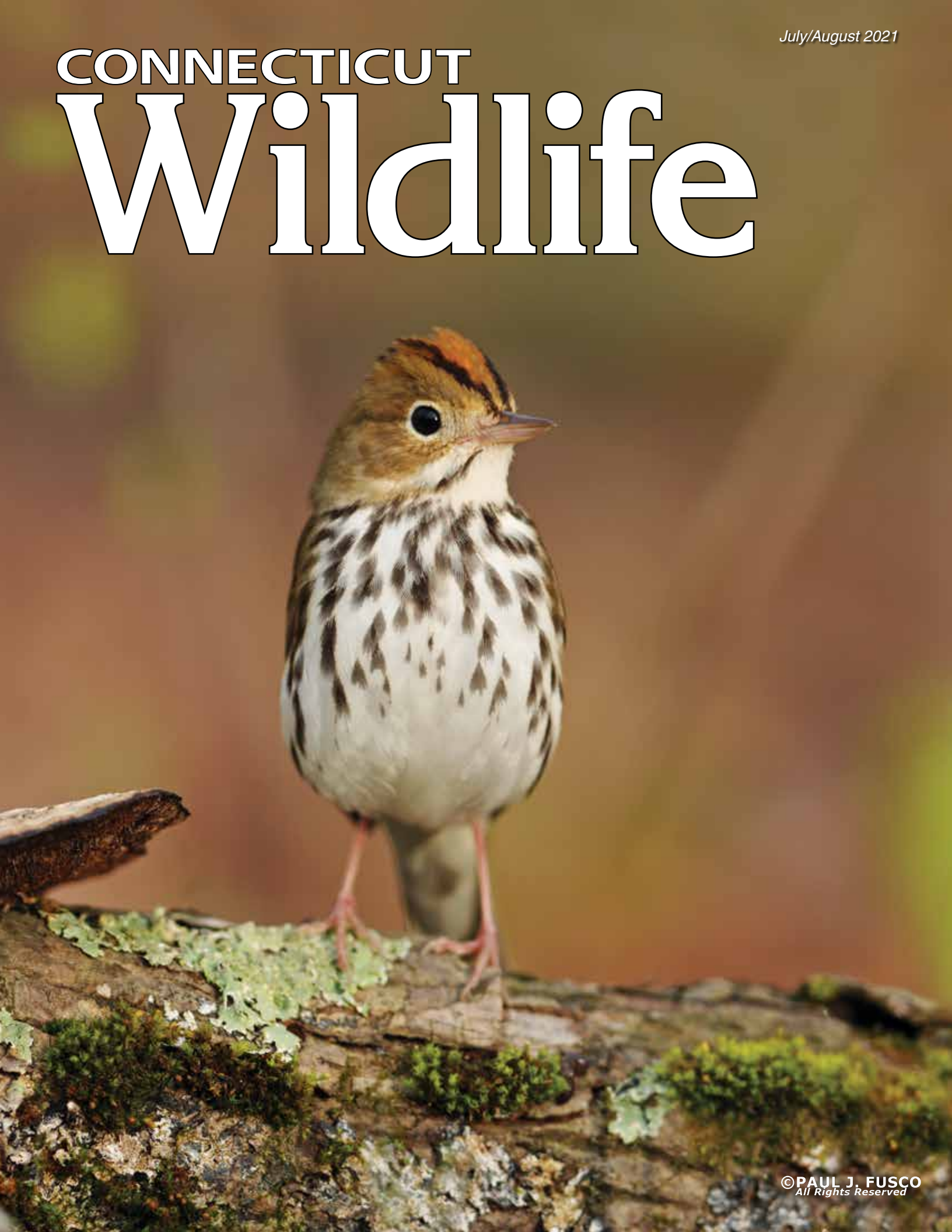
July/August 2021

CONNECTICUT Wildlife



From The Director

As I reflect on the natural world during the dog days of summer, what comes to mind for me are the number of truly amazing things happening around us if we are willing to take a moment to appreciate them. It can be things as simple as the "whiskers" on a catfish. These slender projections, called barbels, are sensory marvels that help a catfish find food. You can learn a lot more about how to catch a catfish in this issue.

Did you ever spend a few moments watching a bee seek nectar from a plant in your yard or along a trail? It is fascinating! I always marvel at how much pollen they can collect on those tiny bodies. Knowing that they can trigger plants to release pollen based on the frequency of their buzzing—just amazing!

Then, there are wood ducks. As if their striking coloration and patterns were not enough to make them unique, they nest in tree cavities and nest boxes sometimes high above the water surface, and yet those tiny ducklings manage to pop out and do what really amounts to a free-fall down to the water surface without injury. Wow! Wood ducks are also a great conservation success story and you can learn more about that journey in this issue.

How about frogs with what amounts to suction-cups on their toes? The tiny gray tree frog spends as much time in trees and shrubs as it does on the ground or in the water. Warm summer nights would not be the same without the loud trill of calling tree frogs.

How many of you knew that the United States was home to one of the world's biggest natural wonders? San Antonio is home to the world's largest bat maternity colony. Over 20 million bats call Bracken Cave home and spend the summer giving birth, raising young, and consuming insects—literally tons of them! I have had the privilege of being able to witness the emergence of bats from Bracken Cave a few times and it is truly awe-inspiring. As twilight deepens, you watch an intricate, aerial ballet and hear the hushed whisper of wingbeats as millions of bats spiral out to begin their nightly insect control. While we may not be able to offer the same sheer volume of emerging bats in Connecticut, the nighttime ballet and aerial acrobatics are still a thing of beauty if we are willing to take a moment to enjoy it.

These are but a very small sampling of the treasures we can find in nature. It is all around us wherever we may be. You do not have to trek to a remote spot or have all sorts of special gear to enjoy those wonders. Simply head outside, be still for a moment, and then allow the sights and sounds of everything around you to emerge. When you listen and look closely, you will be amazed at what nature offers each of us every day.

Jenny Dickson, DEEP Wildlife Division Director

Connecticut Wildlife

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PHOTO BY P. J. FUSCO

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Cover: *The Wildlife Division undertook a three-year study to assess the nesting success of four forest interior species with respect to forest disturbance within the core forest blocks of the state. The ovenbird was one of the focus species. Learn more from the article starting on page 6.*

Photo courtesy Paul Fusco

MOTUS:

A New Tool in Migration Research

Written by Laura Rogers-Castro and Brian Hess, DEEP Wildlife Division

Clapper rails are part of the migratory bird research being conducted by the DEEP Wildlife Division that uses Motus technology.

PHOTO BY P. J. FUSCO

A new power tool is available in the scientist tool box to answer some of the most outstanding mysteries of wildlife migration. It is called Motus and researchers are hopeful data obtained through this collaborative network may reveal secrets about large-scale animal movement ("motus" is the Latin root for "movement" or "motion"). Through this worldwide system, scientists are investigating migration stopover areas, location of wintering areas, an understanding of the timing (phenology) of migration, insight on the speed of flight, and possible risk assessment for wind energy projects.

The Motus Wildlife Tracking System is a radio telemetry-based system, coordinated by Birds Canada, consisting of a network of automated receiving stations along migratory corridors. Animals are fitted with miniature, lightweight radio-transmitters and each transmitter's unique signals are detected as they pass through arrays of receivers throughout their travels. An international coordinated network of receiving stations and researchers sharing a centrally-stored database is the core to Motus.

Before construction of the Motus network, studies of movement were limited to relatively small areas where technicians could follow animals with transmitters or to large animals capable of carrying satellite transmitters.

Motus enables tracking of small animals, including bats, birds, and large insects like monarch butterflies. The tags currently being used weigh between 0.2 to 2.6 grams (a small fraction, 0.09, of an ounce) and can be powered by battery or solar energy. Battery life ranges from about a month for the smallest tags to a few years for the larger tags. Some are solar-based and designed to remain functional on a bird for its life.

Globally, there are almost 1,000 Motus receiving stations found in 31 countries. Active efforts are underway to increase stations in Central and South America and Europe. In 2020, the U.S. Fish and Wildlife Service awarded a competitive State Wildlife Grant to create an additional network of 50 Motus Wildlife Tracking System receiver stations at inland sites across New England, including a proposed "fence" running from west to east through central Connecticut. This network compliments already established receiving stations along the Connecticut coast and a few inland in the western part of the state. By creating two east-west lines of receivers, researchers hope to understand the north-south migration of animals through Connecticut.

The 2020 State Wildlife Grant also includes funding for a study on the American kestrel in Massachusetts and monarch butterfly in New Hampshire. In Connecticut, Motus receiving stations have been used in research projects to collect

data on Canada geese, clapper rails, ovenbirds, shorebirds, terns, and others.

Motus technology has the potential to direct landscape-level conservation priorities and advance conservation science. It can document movements of species of greatest conservation need as they pass through state and national boundaries and ensure that threats to wildlife are addressed wherever they travel. This useful tool can allow public engagement by the implementation and management of new receiving stations on both private and public properties. New community science projects and job opportunities for young people are possibilities. This collaborative effort will provide useful scientific data for informed decisions in the future.

Nanotag transmitter.

A clapper rail equipped with a nanotag transmitter.

PHOTO BY MIN HUANG, DEEP WILDLIFE DIVISION

Motus receiver station operated by the CT DEEP.

P. J. FUSCO (3)

Forest Interior Birds and the CT Bird Atlas Project

Wood Thrush and Ovenbird, Compared

Written by Min Huang, DEEP Wildlife Division; photography by Paul Fusco, DEEP Wildlife Division

Currently, only six percent of Connecticut's forest is classified as young forest (early successional habitat). The DEEP Forestry and Wildlife Divisions have made concerted, cooperative efforts to increase the amount of young forest on the landscape. If young forest is to occur at higher frequencies in the state, it is critical to understand how forest interior birds respond to large disturbances. Understanding the effects, whether they be positive or negative, will better inform where and how to create young forest habitat. For forest interior birds, the Connecticut Wildlife Action Plan stresses the importance of protecting and maintaining high priority forest habitats from threats of edge effect, predation pressure, parasitism, and fragmentation. Striking the appropriate balance on the landscape, including the balancing of existing and future development, is key in the perpetuation of many of these species into the future.

The Wildlife Division's Migratory Bird Program undertook a three-year study to assess the nesting success of four forest interior species with respect to forest disturbance within the core forest blocks of the state. Biologists chose to concentrate efforts on ovenbird, wood thrush, worm-eating warbler, and black-throated blue warbler. All of these birds are species of greatest conservation need and, important for studying nest success, all nest on the ground or in the mid-canopy. Four study sites were chosen, with one undisturbed site and one disturbed site on either side of the state. Undisturbed sites were core forest, whereas disturbed sites were areas that had recently received an even-aged forest cut. Three plots were set up at each study site – one plot was placed at the edge of the cut, one at an intermediate distance (250-500 meters from the forest cut), and one within the core forest (>500 meters from any edge). Each plot was surveyed every three days. Territories were mapped and then randomly searched to find and subsequently monitor nests.

A total of 131 nests were found and followed over the study. The majority, however, were ovenbird and wood thrush nests. Only six black-throated blue warbler nests and three worm-eating warbler nests were found. Neither of these two species were found nesting in the disturbed study sites. Further, wood thrush tended to avoid disturbed areas, whereas ovenbirds nested equally in each. These results, which support most research previously conducted on many forest interior bird species, demonstrate the importance of contiguous habitat. Nesting wood thrush in Connecticut appear to be sensitive to disturbed forest blocks and may preferentially nest in blocks that are relatively undisturbed.

Recent research has shown that ovenbirds show resilience, at least for now, to current levels of disturbance and forest fragmentation in Connecticut's forests.

Nest success was greater for wood thrush in core forest, whereas disturbed sites were actually better for ovenbirds. Ovenbirds also showed differences in success between eastern and western Connecticut, with better success in the east. Overall, it was found that nesting success of ovenbirds and wood thrush in Connecticut was comparable with the published

Wood thrush that nest in Connecticut appear to favor and experience better nesting success in undisturbed areas of forest habitat.

values for the species. In interior plots, distance to an opening was a determinant in success or failure of a nest (ovenbird or wood thrush). Successful nests were found farther from an opening than failed nests.

The selection of study sites largely encompassed state-owned lands. Based on the latest analyses of core forest, publicly-owned forests in Connecticut represent some of the best vestiges of core forest in the state. Overall, it can be inferred from this study that current trends in deforestation and fragmentation of core forest will continue to cause declines in species, such as wood thrush, that require core forest to maintain population levels. Ovenbirds showed resilience, at least for now, to current levels of disturbance and forest fragmentation.

The Connecticut Bird Atlas will provide excellent data on the distribution and abundance of all forest interior breeding birds, including the four species that were targeted in this study. That information, coupled with demographic data such as from this study, will enable biologists to do a much better job of planning for and hopefully, maintaining these species on the landscape. The accompanying table presents data indicating the confirmed blocks for some of the interior breeders. Point count data collected by staff will provide relative abundance estimates across blocks.

It is clear that forest interior species have likely declined in breeding distribution over the past 30 years. In the years since data collection during the first Bird Atlas (1982-1986), Connecticut's human population has increased 13%. Every new subdivision punched into core forest results in huge impacts to the benefits of contiguous forest, at least as it pertains to forest interior birds. The CT Bird Atlas, in conjunction with current technology that allows for modeling and remote sensing, will provide the tools to effectively protect and enhance habitat for this suite of birds.

Confirmed Breeding Occurrence of Select Forest Interior Birds

Species	Confirmed 1st Atlas	Confirmed 2nd Atlas
Wood Thrush	245	126
Ovenbird	244	180
Scarlet Tanager	187	100
Black-throated Green Warbler	42	11
Black-throatd Blue Warbler	30	16
Red-eyed Vireo	264	160
Veery	168	129

Channel Catfish Prepared 3 Ways:

Catfish Management Lakes, Community Fishing Waters, and the Connecticut River

Written by Justin Wiggins and Mike Beauchene, DEEP Fisheries Division, photos provided by DEEP Fisheries Division

Regarded around the country (especially in the South!) as one of the tastiest freshwater fish, channel catfish are delicious no matter the cooking method. While it is pretty easy and convenient to go to the market and buy a few pounds, it is far more fun, exciting, and rewarding to catch your own dinner by fishing a catfish water near you. The DEEP Fisheries Division began stocking channel catfish in the early 2000s to diversify the recreational fishing opportunities. Channel catfish are predators and benefit healthy, balanced fish populations by thinning dense populations of sunfish and other panfish species.

Catfish Management Lakes

The Fisheries Division has stocked yearling (4-6 inches) fish in select Catfish Management Lakes around the state from 2007 through 2018 to develop recreational fisheries to complement Connecticut's most popular fisheries, bass and trout. Based on recent population surveys performed by the Fisheries Division in several Catfish Management Lakes, these fisheries have fully developed into high-quality opportunities to catch two- to 10-pound channel catfish. Although channel catfish are most active in the evenings and at night and are considered bottom-dwellers, they also have a reputation for taking a variety of lures, including soft plastic baits, swimming lures, and even spinner baits, while actively feeding during the day. The daily limit is six catfish per person in these waters.

The Fisheries Division performed a catfish population survey on several management lakes during 2019-2020 to determine abundance and growth of stocked catfish using "HOOP NETS".

Community Fishing Waters

No need to drive miles to find a place with high-quality fishing. Each May, the Fisheries Division stocks ready-to-harvest channel catfish into a network of ponds in state and

Cooking your Catch

If you decide to keep some catfish for the deep fryer, you should take a few easy steps to ensure the highest quality table fare.

The most important first step is to put your catfish directly into a cooler on ice after catching it. This will go a long way in ensuring the highest quality fillets.

Filleting your catfish is easy and will provide you with delicious, mild, easy-to-prepare boneless fillets. After removing skin from the fillets, be sure to cut out any red meat you find. The red you see under the skin is fat, and that fat tissue can sometimes have a "fishy" flavor.

Catfish are excellent three ways – Cajun, blackened, or fried, or no matter how you prefer to cook them! They make fantastic sandwiches and tacos. A personal favorite the family enjoys is Cajun Catfish Nuggets:

- **Fillet your catfish and cut fillets into 1- x 1-inch nuggets.**
- **Season catfish nuggets with your favorite Cajun seasoning (step optional).**
- **Soak catfish nuggets in buttermilk for at least 1 hour or up to 24 hours.**
- **Remove catfish nuggets from buttermilk and coat in fine-ground cornmeal (fish fry mix).**
- **Cook your catfish nuggets! You can either:**
  - **Pan or deep fry catfish nuggets in vegetable oil @ 375 degrees Fahrenheit.**
  - **Cook in pre-heated oven at 425 degrees Fahrenheit on a wire rack for 10 minutes (flipping half way).**

Catfish are readily accessible by both boat and shore! (Left) A beautiful adult channel catfish caught on a night-crawler on the bottom at Lake Wintergreen, a Community Fishing Water. (Right) A proud young angler hoisting his 9 lb. channel catfish caught on a live-minnow fished under a bobber in a Connecticut River cove.

municipal parks found within neighborhoods around the state. "Community Fishing Waters" are smaller ponds centered in densely-populated areas, offering convenient access within a short walk or bike ride for thousands of people. To help distribute the catch across as many people as possible, the daily limit is three catfish per person at Community Fishing Waters.

Connecticut River

The Connecticut River is home to an amazing self-sustaining population of catfish (both channel and white catfish), with trophy channel catfish over 10 pounds considered common! The Fisheries Division does not stock the Connecticut River. Connecticut River catfish are readily caught from shore-based locations using boilies (meatball like balls used to fish for common carp), chicken livers, chunks of mackerel, bluegill, nightcrawlers, or one-inch sections of eel on a size 1/0 circle hook. All you need is a stout rod equipped with a medium-sized reel and 15-20 pound test line. Catfish are bottom feeders, and keeping your bait on the bottom can be challenging with the tidal and current influences from the river. Two of the best options for holding bottom is a sliding "fish finder rig" with a flat weight or a sliding "egg sinker" in ½ oz. – 2 oz., depending on the tide and flow conditions of the river. Just make sure to keep your drag loose if placing the rod down – these catfish hit hard! Best times for fishing are in the evening just before and after sunset. Find a location where there is a "deep hole" adjacent to some shallow flats. Catfish prefer to be in the deep water by day and move up to feed in the shallows by night.

Scan these QR codes (right) to watch our videos offering tips and pointers for catfishing the Connecticut River.

Learn More Here ...

Scan these QR codes to view videos about: catfish hoop netting and ...

... our management program

Learn more about catfish and our Community Fishing Waters

CARE tips on how to fish for catfish in the Connecticut River

Native Bees Are VIPs in Gardens

Some Plants Give Special Access to Very Important Pollinators

Article and photography by Kyle Testerman, Wildlife Management Institute

Flowering plants have evolved different strategies for reproducing through pollination, although the result is the same; male pollen grains reaching the flower's ovary. Some plants produce copious amounts of small and lightweight pollen grains, which get thrown to the wind, casting so much pollen that nearby female flower parts are bound to get a coating, not to mention our respiratory systems (think ragweed pollen). Other plants go a different route, producing larger and stickier pollen grains, and depend on insects, particularly female bees, to move pollen to the right places.

Some plants go a step further by making it harder for certain insects, who may be less-effective pollinators, to access their pollen. Culinary favorites like blueberries, tomatoes, and peppers are among the six percent of flowering plants that store pollen in uniquely shaped tube-like structures, which hold pollen until specially adapted bees come along and buzz at the right frequency. The right type of vibrations from the bee frees up pollen to fall out of the tubes. Much of the pollen gets stuck on the bee's hairy body and some is transferred to the female plant parts where fertilization occurs.

Small carpenter bees are solitary and pollinate a variety of flowers. Females collect pollen to store in their nests, often within the base of hollow plant stems like raspberry bushes.

Bumble bees are effective pollinators of many fruits and vegetables that require buzz pollination. This coneflower does not need buzz pollination where pollen is left accessible on the tips of its anthers.

Bumble bees and several other groups of bees can perform this "buzz pollination" and get VIP access to pollen from these types of plants. One notable exception is the domesticated European honey bee, which cannot vibrate its wings in the necessary way. Plants that are buzz-

pollinated contain both male and female parts in the same flower. Technically, pollination is possible without the help of insects. If the flower is bumped in the right way or blown around in the wind, some pollen could shake loose and end up on the female parts. However, many varieties of fruits, vegetables, even nuts and seeds, including those that depend on buzz pollination, have higher yield and improved quality when cross-pollinated with other varieties of the same species grown nearby. For cross pollination to occur on a large scale, bees are needed to make repeated visits to a plant and its neighbors. Several studies have found that wild native bees often make more frequent visits to flowers compared to domesticated honey bees. Therefore, the presence of healthy native bee populations often improves the success of cross-pollinated plants, resulting in increased economic benefits for growers.

Next time you are tending your garden, get in close to the flowers and watch how pollinators get the job done. Listen for the high-pitched buzzing that buzz pollinators use once they get into position on your tomatoes this summer. Do not worry, these gentle bees will be too busy to even notice you are watching.

Tomatoes need buzz pollination to release pollen from their flowers. This tiny dark sweat bee is capable of creating the right vibrations for buzz pollination, as are bumble bees, sweat bees, and others. Non-native honey bees are not able to buzz pollinate.

Many male bees, like this bicolored sweat bee, do not collect pollen and, therefore, are not as hairy as females. Nevertheless, frequent nectaring visits to this patch of watermelon can still transfer enough pollen from male to female flowers for fertilization.

The Story of the Wood Duck

A Dramatic Duck in All Respects

Article and photography by Paul Fusco, DEEP Wildlife Division

The male wood duck – with its boldly patterned plumage of green, purple, bronze, and white, noticeable crest, and bright red eyes – is among the most ornate and beautiful of waterfowl. The female is rather drab in comparison, but still beautiful in grays and light browns. Look for the white teardrop-shaped eye ring on the female. This medium-sized dabbling duck is most often found in Connecticut from March through November.

Wood ducks were historically plentiful in Connecticut and throughout the eastern United States, thriving in or near freshwater wetlands with an abundance of snags (standing dead trees) that provided natural nesting cavities. Times changed and, by the early 1900s, wood ducks were thought to be on the brink of extinction, primarily due to unregulated shooting and habitat destruction. Wood ducks were not alone with their fast declining population levels. Many other migratory birds of all types had their populations driven to very low numbers due to the same circumstances.

As wildlife populations across the continent continued to drop precipitously, a conservation awakening took place leading into the 20th century. People realized protections were needed as large numbers of birds and other wildlife were killed during this time. If America's wildlife heritage, and wood ducks, were to survive into the future, the take would have to be limited and sustainable, as well as regulated with provisions allowing for recovery to happen. Far-reaching and ground-breaking changes had to be made.

Legislative protections were established and recovery began with the passage of regulatory conservation laws, including the Lacey Act of 1900, the Weeks-McLean Act of 1913, and most importantly, the Migratory Bird Treaty Act of 1918.

After these new laws took effect, it was determined that funding sources needed to be implemented that would allow for protections of wild lands and management of wildlife populations. Funding sources were enacted with the federal Migratory Bird Hunting and Conservation Stamp (Duck Stamp) Act in 1934 that allowed for the purchase of waterfowl habitat and management of waterfowl hunting seasons. In 1938, the Federal Aid in Wildlife Restoration (Pittman-Robertson) Act followed, creating a stable funding source in the form of an excise tax on the purchase of guns and ammunition. The excise tax provides funding to the states for the management of all game species and their habitat, and for the restoration of diminished populations of game species. The Pittman-Robertson Act has been, and still is, one of the most successful pieces of legislation in conservation history.

Nest Boxes

Regulation of hunting seasons for wood ducks and other waterfowl resulted in harvest levels that became sustainable. Early waterfowl managers realized that something was still holding back population gains for wood ducks. It was noted that there was a widespread shortage of suitable nesting cavities. The shortage was primarily due to habitat loss. The birds needed additional help, and a recovery project was undertaken that ultimately became a huge success.

Strong legislative protections, together with the widespread construction and placement of nest boxes during the last 80 years, have resulted in the dramatic comeback of wood duck populations – a bird that was once considered at the edge of extinction and is now one the most common breeding waterfowl species in the eastern United States.

Conservation Continues

The wood duck restoration effort is one of this country's most successful wildlife recovery stories. While continued work to protect wetland habitat is, and always will be critical, the wood duck nest box program has also been instru-

Connecticut's Historic Connection

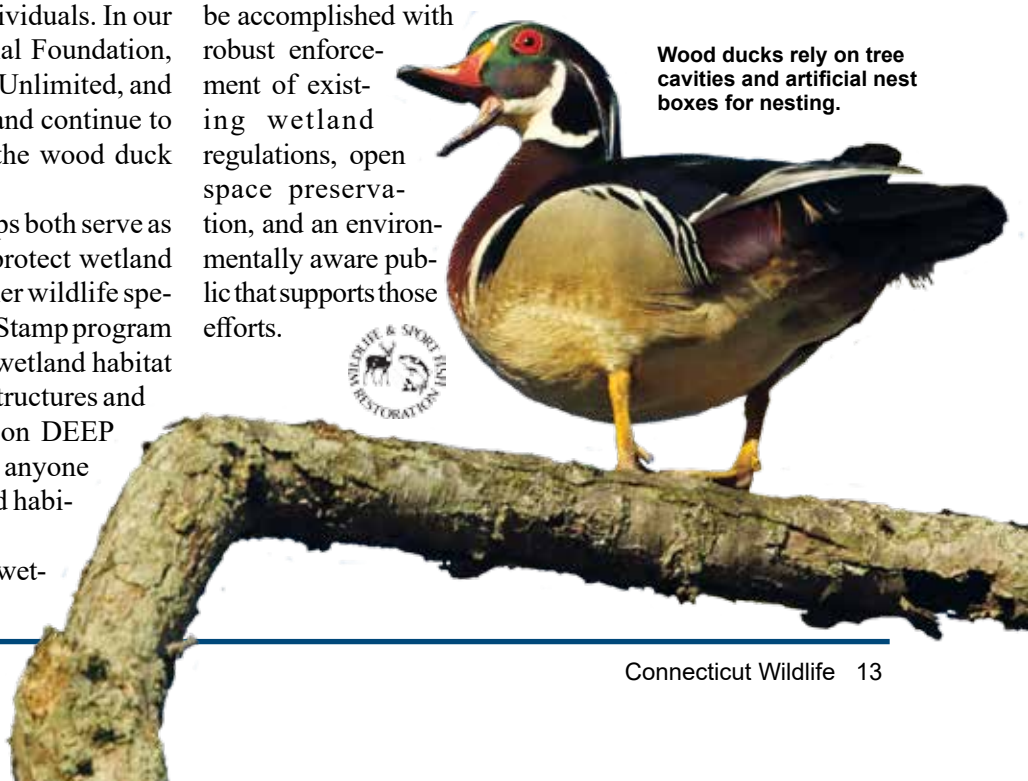
The Weeks–McLean Act (1913) legislation was sponsored by Representative John W. Weeks (R) of Massachusetts and Senator George P. McLean (R) of Connecticut. The Act prohibited the spring hunting and marketing of migratory birds, including waterfowl, and the importation of wild bird feathers for women's fashion, ending the millinery slaughter. It gave the Secretary of Agriculture the power to set hunting seasons nationwide, making it the first U.S. law ever passed to regulate the shooting of migratory birds. The Weeks-McLean Act was ultimately absorbed into the Migratory Bird Treaty Act of 1918.

Generally secretive and reclusive, the wood duck is a common breeder in Connecticut's freshwater wooded marshes. Males have a drawn out squealy "jeeee, jeeee" whistling call that rises in pitch, while females have a loud "oo-eek, oo-eek" alarm call when taking flight.

mental. Initiated in 1953, Connecticut's wood duck nest box program has placed over 3,000 nest boxes in suitable habitat throughout the state. As with any successful conservation effort, the restoration of wood ducks was accomplished through the efforts of many partners and individuals. In our state, organizations like the White Memorial Foundation, Connecticut Waterfowl Association, Ducks Unlimited, and Delta Waterfowl, to just name a few, were and continue to be invaluable in the continued growth of the wood duck population in Connecticut.

The Federal and Connecticut Duck Stamps both serve as conservation tools that help purchase and protect wetland habitat to benefit ducks, along with many other wildlife species. Since the start of the Connecticut Duck Stamp program in 1993, funds have been raised for critical wetland habitat projects, including replacing water control structures and repairing dikes at wildlife impoundments on DEEP properties. Stamps are not just for hunters – anyone interested in supporting wildlife and wetland habitat conservation should buy a stamp.

Wood ducks prefer good quality inland wetland habitat with a quiet atmosphere and minimal human disturbance. Connecticut has had heavy development pressures over the years, so strong inland wetland protections are more important than ever. Wetland habitat protection can only be accomplished with robust enforcement of existing wetland regulations, open space preservation, and an environmentally aware public that supports those efforts.



Wood ducks rely on tree cavities and artificial nest boxes for nesting.

Bats

Bats can be seen foraging wherever there are flying insects

Written by Brian Hess and Devaughn Fraser, DEEP Wildlife Division

When we think about backyard wildlife, there are some usual suspects. We love watching the birds at our feeders and in our yards. Robins, blue jays, goldfinches, song sparrows, and bluebirds bring pops of color and movement to our landscapes. Additionally, we think of backyard mammals that share our spaces, like squirrels, chipmunks, woodchucks, and the occasional fox or bobcat. We may even look closer to see butterflies and bees visiting our flowers. But, as the sun dips down and night rolls in, a whole new suite of wildlife uses the space in and around our backyards – bats. These backyard animals are immensely fun to watch, if you know where to look.

Understanding Bats

To watch bats, we must first understand what they are doing. The bats in Connecticut are all nocturnal insectivores. They have evolved to hunt dur-

P. J. FUSCO

DEEP Wildlife Division biologist Brian Hess places an acoustic monitoring device to the top of a vehicle as he prepares for an evening bat survey. Bat calls are recorded along a predetermined transect, allowing biologists to gather long-term data to better understand Connecticut's bat populations.

P. J. FUSCO

Two big brown bats huddle together in their daytime roost, the eaves of an attic.

ing the night when prey is more plentiful and airborne predators pose less of a threat. As darkness approaches, bats leave their roosts and head out into the night sky, looking for insects. To help them navigate and pursue their prey, bats send out ultrasonic calls and listen for the returning echoes. Bats will forage wherever there are insects, but different species are adapted to different environments. Big brown bats produce lower, longer calls that are most effective in open areas like meadows, while little brown bats produce shorter, higher calls that work well in cluttered forest environments. Bats of all species forage over water bodies like rivers, ponds, and vernal pools.

After eating several thousand insects throughout the night, bats will return to their roosts. Males and non-reproductive females usually roost by themselves in "bachelor roosts", while females of the same species give birth and raise their young together in "maternity roosts". These roosts need to be dark, protected, and very warm to promote heathy development of the pups. Different species prefer different types of roosts, but in general, bats will use a variety of spaces for roosts, including tree cavities, loose bark, wooden siding on buildings, shutters, attics, barns, or specially made bat boxes.

Where to Look for Bats

Bats can be seen in most places where there is an abundance of insects. Gardens, meadows, and ponds are perfect for bat viewing, both because they attract bats and also because the open evening sky makes an easier backdrop than a dark, forested area. Look for the silhouette of a bat against the night sky. You may also see swallows or swifts chasing insects, but bats have a distinctive angular look. As you track the bats around the sky, you will notice how fast and maneuverable they really are. Our bats usually travel around 20 mph, but the Mexican free-tailed bat is the fastest mammal, able to achieve speeds of 100 mph in level flight.

In addition to looking for bats in their foraging areas, you can look for them as they emerge from their daytime roosts. If you know that a house or barn has a colony of bats, look for an obvious entry and exit point. As bats leave their roosts for the evening, they will often release any urine or guano; so, guano streaks are a clue that a hole is an active entry point. Start watching that point about a half hour before sunset, and as the sun dips down, you will begin to see bats emerge. If you have a known maternity colony, bats should be present from late May (as pregnant bats prepare to give birth) through late July, after the pups have learned to fly.

Tips and Tools for Watching Bats

Watching bats is a relaxing activity. Important equipment includes a comfortable chair and a refreshing beverage. Insect spray is also strongly recommended, as you are "food" for many of the same insects that the bats are consuming. If you are watching bats emerge from a roost, a clicker counter is a handy tool to keep track of the bats you have seen. A second set of eyes is also helpful, as spotting things in the dim light can be challenging. Comparing notes between multiple observers can yield a more accurate count.

Beyond a chair, not much is necessary for watching bats, but there are some cool "toys" that can enhance the experience. Scientists have developed ultrasonic microphones and sophisticated software that can record and analyze bat calls to help with bat identification and behavior. While most of these products are prohibitively complex and expensive, products like the Echo Meter Touch 2 simply plug into an iPhone or iPad and can be purchased for under $200. While they may not be able to accurately identify every bat, they come close.

Bat activity can be extremely varied, depending on the weather. The best nights are those when lots of insects are also out. Choose a dry, warm night (ideally 60 degrees F or above) with little

or no wind. Winds less than 12 mph (leaves and twigs in constant motion) are best. If possible, avoid nights with a full moon. The bright night sky makes bats more visible to predators like owls and causes them to change their foraging patterns, making the bats harder to see. Starting a half hour before sunset allows your eyes to gradually adjust to the dusk and ensures that you will be present when the emergence begins.

You should be able to see bats regularly between May and September, but to count maternity colonies, there are some important time windows to consider. Pregnant bats give birth around the beginning of June and, until early July, the pups are too young to fly. Counting bat emergence between May 20 and July 1 will give a good idea of how many adult females might be in the colony. After the beginning of July, pups will begin to emerge and fly with the females, learning to catch insects at night and returning to the maternity roost during the day. A second count during the month of July will give some idea as to how many total bats are in the colony. This July count is actually the more important of the two periods, and if you can only do one survey, this is the window to aim for.

K> TESTERMAN

A maternity colony of big brown bats occupying the eaves of a barn. The females and their young huddle together for warmth during the day in summer months before emerging at dusk to forage on insects.

Bat maternity colony survey protocols and data submission forms are available on the DEEP website at *https://portal.ct.gov/DEEP/Wildlife/Learn-About-Wildlife/Bats-in-Connecticut*.

Attracting and Helping Your Backyard Bats

Globally, bats are in trouble. In addition, bat populations are threatened by habitat development, human disturbance, pesticide use, a decrease in prey availability, and a fungal disease called white-nose syndrome (WNS) that has ravaged bat species during hibernation. Connecticut has lost most of our "cave bats", and the Wildlife Division is working hard to minimize the threats to the survivors. Fortunately, providing bats with food, water, shelter, and safety is something that everyone can do to help bats.

The easiest thing that everyone can do is less yardwork. This helps grow and attract more bat food (insects). Do not apply pesticides, allow sections of your lawn to grow longer, and leave those leaves where they fell in the fall. Additionally, grow some native flowers and shrubs as a pollinator garden.

Provide some water. Bats usually drink water as they fly by, so while they have been known to sip from birdbaths, they prefer long stretches of calm water. A wildlife pond with clear airspace and at least 10 feet of shallow water is perfect for a bat.

Bats need shelter during the day, and a bat box is one of the best options for a bat roost. It is an open-bottomed structure on a post or building. A well-designed bat house should be black or dark brown in color to absorb as much heat as possible. The house should face to the south and have a well-sealed roof so heat can accumulate inside. Also important are ventilation holes on the front or sides. These allow bats to move up or down inside the box as they need to warm up or cool off. Finally, a landing pad of roughed-up wood is preferable to wire or plastic mesh. Metal or plastic can be a hazard to young bats.

Some simple steps can keep bats safe from predators. First, keep your cats inside unless they are leashed or contained in a "catio". Cats are extremely good at catching and killing bats. Second, do not feed wildlife as this may attract raccoons and other predators.

Bats are fun and relaxing to watch. It is delightful to watch them swoop across the sky, knowing they are "mowing down" thousands of insect pests. Hopefully, this will be a great summer for bat viewing. You are encouraged to report your bat observations as part of the Wildlife Division's community science efforts. Visit *https://portal.ct.gov/DEEP/Wildlife/Learn-About-Wildlife/Bats-in-Connecticut* to find out how to report your sightings.

P. J. FUSCO (3)

Three types of "tree roosting" bats (l to r): Eastern red bat, silver-haired bat, and hoary bat. These bats are solitary and will roost in tree hollows or beneath peeling bark. They migrate long distances to hibernate during winter. Although they are seemingly unaffected by white nose syndrome, their migratory behavior has left them vulnerable to high mortality at wind farms. Scientists are working diligently to discover solutions to keep bats safe from this important renewable energy source.

Bat Watching

While bat watching may not be on your radar yet, it is a very popular activity in many places. Texas offers some great bat viewing opportunities and the nightly emergence of Mexican free-tailed bats (*Tadarida brasiliensis*) at Bracken Cave is truly one of the world's most amazing natural wonders. Purchased almost 30 years ago by Bat Conservation International (BCI) to protect the bat colony, the education and conservation messages highlighted through this amazing spectacle have led to the establishment of the 1,458-acre Bracken Cave Preserve. In cooperation with The Nature Conservancy, BCI has now protected 3,462 contiguous acres of Texas Hill Country essential to this unique ecosystem.

On summer evenings, people from all over the world come to enjoy the tornado of emerging bats—20 million or more—as they head out for an evening of insect hunting. The swirl of bats overhead is formed by the world's largest maternity colony of bats and one of the largest concentrations of mammals on earth. In the hushed silence, you can hear the whoosh of wingbeats as they circle in an undulating cloud moving in waves across the landscape. While Connecticut may not have the same size emergence, our state still offers the same opportunities to view maternity colonies as they emerge on summer nights. Whether it is 10 bats or millions, watching their skilled flight in the evening sky is one of nature's marvels.

J. DICKSON (2)

Above: Visitors anxiously await the full emergence of a maternity colony of Mexican free-tailed bats from Bracken Cave in Texas.

Left: The exodus of tens of millions of bats creates clouds of swirling wings that darken the sky as they head into the twilight in search of food.

DEEP Foresters Protect Hemlocks Using Biocontrols

Article and photography by Jerry Milne, DEEP Forestry Division

Foresters within the DEEP play many roles as stewards of the land. Sometimes they help protect trees threatened by exotic invasive insects, such as the hemlock woolly adelgid (HWA).

Hemlock woolly adelgid (*Adelges tsugae*) is a tiny aphid-like insect that damages hemlocks by inserting its mouthparts (called stylets) into the base of the needles, essentially sucking out the tree's nutrients. This feeding causes the needles to drop off, drains the tree's storage reserves, slows overall growth, and often leads to the death of the tree. The insect also secretes a white, waxy covering that resembles "wool", which repels water and protects it from predators. It is also the easiest way to identify an infestation.

(Left) DEEP Forester Jill Humphreys examines a hemlock branch for hemlock woolly adelgid. (Right) CAES entomologist Carole Cheah applies *S. tsugae* ladybeetles with a brush.

HWA is native to Japan and was first reported in the eastern United States near Richmond, Virginia in the early 1950s. It was discovered in Connecticut in 1985, and has spread northward throughout New England and into Nova Scotia. When the insect was first identified in Connecticut, it was predicted that hemlocks would be extirpated from the state, as there were no natural controls of HWA.

Hemlocks are very important ecologically. They are found in most of our forests, are the seventh most common tree species in Connecticut, and the second most abundant conifer (after white pine). Hemlocks often grow in valleys and on north-facing slopes where their shade keeps streams cool for fish and other aquatic life. They also provide winter cover for wildlife and nesting sites for birds. While not an especially valuable timber species, the wood is often used to build barns, the pulp is used to make paper, and the bark is used to make landscape mulch.

Soon after HWA was found in Connecticut, scientists from the Connecticut Agricultural Experiment Station (CAES) traveled to Japan and found a tiny ladybeetle (*Sasajiscymnus tsugae*) which naturally keeps HWA in check in that country. The beetle underwent extensive testing and quarantining in the United States. Since 1995, tens of thousands of these ladybeetles have been released in Connecticut. Revenues from DEEP timber harvests were used to buy some of the lady beetles that were distributed on DEEP land.

DEEP Foresters identify state forests

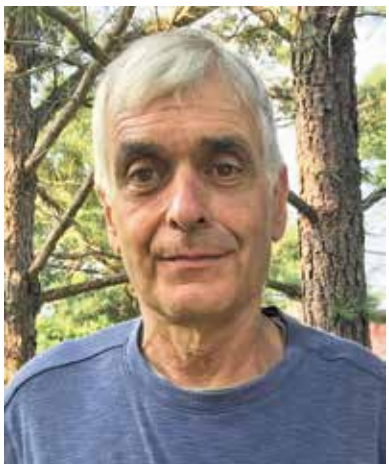
(Left) Ladybeetles on the lid of a container about to be brushed onto a hemlock twig. (Right) Containers of hemlock sprigs with ladybeetles to be tied to hemlock branches.

Hemlock woolly adelgid is a tiny aphid-like insect that damages hemlocks by inserting its mouthparts (called stylets) into the base of the needles, essentially sucking out the tree's nutrients. The white, waxy covering resembles "wool", which repels water and protects the adelgid from predators.

where HWA is prevalent. They work with Carole Cheah, a CAES entomologist, to release the ladybeetles and monitor the health of the hemlocks. The program has been a success; after almost 30 years of being infested by HWA, there are still hemlocks in our forests.

Private landowners interested in trying to control HWA in their woodlands can buy these ladybeetles from the only commercial producer, Tree-Savers, at *www.tree-savers.com*.

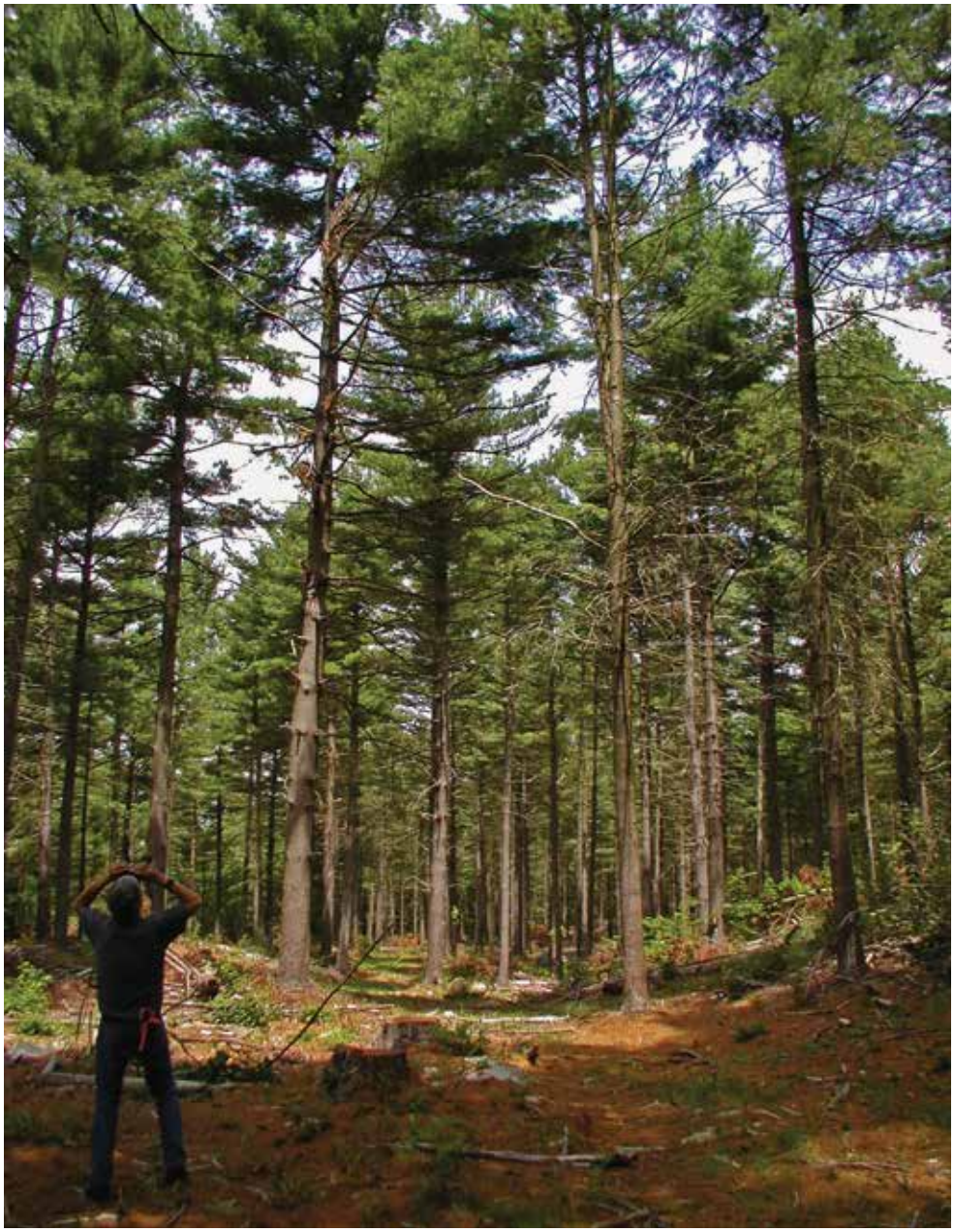
Long-time DEEP Forester Emery Gluck Retires



PHOTOS PROVIDED BY DEEP FORESTRY (2)

State Lands Forester Emery Gluck retired in June 2021 from the DEEP Forestry Division. Emery's 40 plus year career is filled with significant milestones that have greatly enhanced Connecticut's forest resources and informed the public of the important work required to keep our forests healthy and habitats vibrant.

For the majority of his career, Emery cared for and tended Cockaponset (Haddam/Chester) and Nehantic (Lyme) State Forests but was always ready to lend a hand to his colleagues managing eastern Connecticut wildlife management areas and volunteering at Connecticut Forest and Park Association's (CFPA) Whitney Forest in Lebanon. Emery served many years as a member of Connecticut's Interstate Fire Crew (CIFC) and strongly supported in-state wildfire suppression, responding to calls on any day and at any hour. The CIFC protects the people and property in Connecticut through the suppression and management of local forest fires and works with government agencies across the nation to protect lives, personal property, and natural resources threatened by wildfire. Throughout his career, Emery, applied prescribed fire as a treatment to enhance forest and wildlife habitats across Connecticut. Numerous grasslands managed for early successional birds have been maintained using fire with Emery's assistance, ranging from burn plan author to project "Burn Boss".



DEEP Forester Emery Gluck surveying the canopy of an eastern white pine, assessing cone development in anticipation of a future seed year.

Emery has written several informative articles that were published in the *Center for Northern Woodlands Education, Forest Stewardship* magazine (*https://northernwoodlands.org/*) and the CFPA's *Connecticut Woodlands* magazine, covering topics from prescribed fire to historic and current importance of pitch pine forests.

Emery's colleagues at the DEEP Bureau of Natural Resources and various conservation partners wish him well in his retirement.

Connecticut's Canopy-dwelling Amphibian

The Gray Tree Frog

Article by Paul Benjunas, DEEP Wildlife Division

P. BENJUNAS (2)

Large toe pads covered in mucous allow the gray tree frog to spend a majority of its life high in the forest canopy.

The gray tree frog is a true master of camouflage. Relying on its mottled greenish-gray color with dark blotches, this small frog (up to two inches in size) hides from would-be predators, like birds of prey and small mammals. Its coloration closely matches the color of lichens found growing on trees, making it very difficult for a wildlife observer to spot. The gray tree frog has a white underside, and despite its camouflage back, part of its thighs showcase a bright yellow-orange patch (especially as it hops away). It is thought that this coloration serves as a warning to potential predators. The gray tree frog also has the ability to change its color (to a degree) based on its surroundings and other environmental factors, including temperature. It appears darker in color when exposed to cooler temperatures and lighter (silver-gray) when exposed to warmer temperatures.

Like all tree frogs, the gray tree frog is able to scale vertical surfaces (natural and man-made) with ease through the help of its large toe pads that produce a mucous, providing it with excellent gripping ability. It is not unusual to find the gray tree frog at night along the side of a house near an outdoor light where it will patiently wait for unsuspecting insects drawn to the light.

Juvenile gray tree frogs are more green in appearance but will more closely match the color of a lichen as an adult.

Gray tree frogs are often found in moist deciduous woodlands and shrub swamps. When the breeding season begins in May, male tree frogs will actively defend their territory from trees and shrubs near pools of standing water, calling loudly with the hopes of attracting a mate. After mating, the female will lay up to 2,000 eggs that are often attached to submerged or partially submerged vegetation. Within a week, the eggs will hatch into aquatic larvae (tadpoles) and undergo metamorphosis, transforming into miniature versions of the adults.

Tree frogs spend most of the day resting high up in the trees, pressed against a trunk or safely tucked under loose bark where they remain relatively inactive (with the exception of some calling). Once night falls, this species becomes quite active and will either forage among the branches and leaves for insects or descend to the forest floor to chorus and/or breed. Your best bet for seeing a tree frog is on warm, humid nights. Be sure to bring a headlamp or flashlight and listen for its powerful trill!

Interestingly, the gray tree frog is not the only tree frog in Connecticut that belongs to the genus *Hylya*. The Cope's tree frog is essentially identical in appearance, and their ranges overlap extensively. The two species cannot be distinguished in the field, but the Cope's tree frog has half the number of chromosomes of the gray tree frog and has a slightly faster call.

Easy to Hear, Hard to Spot

The hearty, resonating trill of the gray tree frog is hard not to hear during the late spring and summer months, especially on warm humid days and nights. Many people unknowingly mistake its loud call for that of a bird, similar to how the call of a wood frog is often mistaken for quacking ducks.

2020 Deer Hunting Season Highlights

Harvest Total	**10,881**
Archery Harvest	5,803
Shotgun/Rifle Harvest	3,429
Archery Permits	16,997
Shotgun/Rifle Permits	17,223
Success Rates	
Archery	34.1%
Shotgun/Rifle	19.9%
Muzzleloader	8.7%
Sex Ratio	
Males per Female	1.1:1
Top Harvest Towns	
Newtown	264
East Haddam	217
Ridgefield	207
Lebanon	193
Top Archery Harvest Zone	
Zone 11	1,175
Reported Roadkill	372
Crop Damage	239

An adult 9-point buck on the search for a doe in heat during a cool fall morning in Connecticut.

PHOTO BY P. J. FUSCO

The annual Connecticut Deer Program Summary, with more specific details for the 2020 deer hunting season, will be published on the DEEP website in late summer/early fall of 2021.

In Memoriam

The Wildlife Division's Migratory Bird Program lost a friend and the conservation community lost a tireless contributor when John "Big Boy" Bario passed away at the age of 79 in April 2021. John spent over 20 years assisting the Migratory Bird Program banding Canada geese and ducks, trapping shorebirds, trapping and surveying of woodcock, and trapping and banding of raptors. An Air Force veteran, John always had new ideas for improving equipment, and provided many hours implementing innovative improvements to our goose rig and duck crates. John was a life-long Ducks Unlimited member and left most of his estate to the organization for conservation purposes. He knew how to make people laugh, baked a killer apple pie, and was always thinking of others. He will be missed.

John Bario was affectionately called "Pen Boy" (and also Big Boy) because he was usually the one inside the pen with trapped geese, handing them to the volunteers for banding during the DEEP Wildlife Division's annual efforts to trap and band Canada geese.

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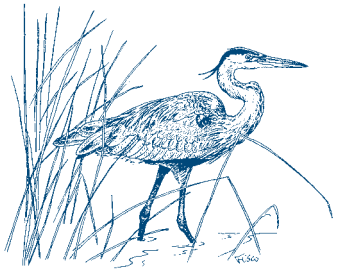

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Help fund projects that benefit songbirds, threatened and endangered species, reptiles, amphibians, bats, and other wildlife species.

Order on-line with a credit card through the DEEP Store at: https://portal.ct.gov/DEEP-CT-Wildlife-Magazine

Conservation Calendar

2021 Hunting Season Dates

Sept. 15 ..... Opening of the Fall Archery Deer and Turkey Season

Oct. 2 AND Nov. 6 .. Junior Waterfowl Hunter Training Days. Learn more at https://*portal.ct.gov/DEEP-Junior-Hunting*.

Oct. 9 ..... Junior Pheasant Hunter Training Day

Oct. 16 ..... Opening Day of the Small Game and Pheasant Hunting Season. Learn more details about pheasant hunting and stocking at *https://portal.ct.gov/DEEP/Hunting/Pheasant-Hunting*.

Nov. 6-13 ..... Junior Deer Hunter Training Days (excluding Sunday). Learn more at https://*portal.ct.gov/DEEP-Junior-Hunting*.

Nov. 17 ..... Opening Day of the Firearms Deer Hunting Season on state and private land.

Dec. 8 ..... Opening Day of the Muzzleloader Deer Hunting Season on state and private land.

*Consult the 2021 Connecticut Hunting and Trapping Guide, 2021-2022 Migratory Bird Hunting Guide, and 2021 Connecticut Fishing Guide for specific season dates and details. Guides are available at town halls and outdoor equipment stores, and also on the DEEP website (***portal.ct.gov/DEEPHunting; portal.ct.gov/DEEPFishing***). Go to* **https://portal.ct.gov/CTOutdoorLicenses** *to purchase Connecticut hunting, trapping, and fishing licenses, as well as required permits and stamps. The system accepts payment by VISA or MasterCard.*

Hunter Safety Education Classes

Firearms and Bowhunting Safety Classes are still being held as a combination of online learning and a mandatory modified field day. Students are required to complete all online prerequisites **PRIOR** to registering for a modified field day event. The modified field day meets safety requirements of social distancing and all participants must wear a mask. For registration details and prerequisites, visit *https://portal.ct.gov/DEEP/Hunting/CEFS/Hunter-Education-Modified-Field-Days-COVID-19*.

Connecticut Aquatic Education Classes

The DEEP Fisheries Division has developed a schedule of the very popular "Introduction to Fishing" courses, starting with online ZOOM sessions. Zoom participants are invited and encouraged to attend a Fishing Field Trip where you can put your new skills to the test with some help! All fishing equipment, bait, and expert instruction will be provided for use during the fishing field trip. For more details and to register, visit *https://portal.ct.gov/DEEP/Fishing/CARE/Introduction-to-Fishing-Courses*.

Sign up to receive Wildlife Highlights, a free, electronic newsletter for anyone interested in Connecticut's wildlife and the outdoors! portal.ct.gov/DEEP-Wildlife-Highlights

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P. J. FUSCO

CT DEEP Commissioner Katie Dykes was joined by U. S. Senator Chris Murphy, and conservation partners from the U.S. Fish and Wildlife Service, Housatonic Valley Association, Town of Goshen, Goshen Land Trust, and more to celebrate the recent acquisition of the Beech Hill property in Goshen. This 627-acre acquisition was made possible under the Highlands Conservation Act (HCA). This new acquisition, when combined with the 967-acre Goshen Wildlife Management Area, and embedded in a landscape of other large protected lands, creates a block of undeveloped, protected land which will provide habitat for many species of greatest conservation need. This represents the true power of partnerships and collaboration and shows what can be done when federal, state, and local governments and private organizations bring their talent and resources together. Potential exists for even greater conservation success with passage of the Recovering America's Wildlife Act (RAWA). This landmark federal legislation would not only help us manage and conserve the diversity of fish and wildlife in Goshen, it would also make conservation successes like this one possible across Connecticut and our country. Both are proof that when we work together, amazing things can happen and the natural heritage we love can be secured for future generations to continue to enjoy. #RecoverWildlife