

CONNECTICUT

# Wildlife



# From the Director

*There is no shortage of challenges facing resource conservation, but there are also many successes to celebrate. This issue shares a mixture of both.*

*The creation of the new Western District*

*Headquarters office, a LEEDS Platinum certified building, at Black Rock State Park is a highlight. Not only does it showcase energy conservation and efficiency, but it also celebrates the stewardship of our state forests, the amazing diversity of tree species they contain, and the range of economically important wood products they produce.*

*Connecting young people with nature and conservation through art is another accomplishment. Not only do students from across the state showcase their artistic talent in the Connecticut Junior Duck Stamp Competition, but they also learn about wildlife and habitat conservation, contribute to funding that work through the creation and sale of the Connecticut Duck Stamp, and showcase our waterfowl diversity nationally through their artwork.*

*One of Connecticut's biggest conservation success stories is the return of nesting bald eagles to our state. Those efforts had no bigger champion than Don Hopkins, founder of the Bald Eagle Study Group. I cherish the memories of working with Don to restore our eagle population and still remember the excitement of finding that "first nest" after a decades-long absence.*

*There are new challenges ahead and the frequency and intensity of storm and extreme weather events was near the top of the list in 2024. From thousand-year floods to a historic number of wildfires, a changing climate has presented new uncertainties we will continue to face.*

*One of the less well-known, but critically important, challenges we face centers around the concept of One Health. Simply put, it is the interconnection between human health, plant and food health, and wildlife and ecosystem health. As we learn more about these connections and continue to expand global travel, it is imperative that we examine these relationships and work collaboratively to address emerging issues. To that end, Connecticut Wildlife is beginning a series of stories that take a closer look at One Health and how public health, agriculture, and natural resources conservation work together to meet this growing challenge.*

*Take inspiration from the successes in this issue and spend some time in nature. It has an amazing ability to refresh and inspire us.*

– Jenny Dickson, Director, Wildlife Division



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Two male wood ducks take advantage of a plentiful supply of acorns, a favored fall and winter food. Photo courtesy of Matthew Balnis

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*Cover: CT DEEP Fisheries Division biologist Andrew Miano holding a smallmouth bass on Wangum Lake, Canaan, that was collected as part of a project to stock the fish into Wyassup Lake in North Stonington. See article starting on page 12.*

*Photo by James Murtagh/DEEP Fisheries Division*

# From the Fifth National Climate Assessment

## *CT's wildlife and residents are feeling the impacts of climate change*

Written by Dr. Aaron Grade, National Climate Assessment Staff Scientist, U.S. Global Change Research Program, Contractor with the consulting firm ICF

Rigorous scientific assessments like the Fifth National Climate Assessment - or NCA5 - are critical to understanding how climate change impacts the environment and how communities are acting to reduce greenhouse gas emissions and adapt to changing conditions. From my perspective as a Connecticut resident, a wildlife biologist, and a NCA5 contributor, I will describe the Assessment's key takeaways and how they relate to wildlife in Connecticut.

### ***What are the main findings of NCA5?***

Nationally, our emissions have fallen in the U.S. since 2007, even with a growing population and GDP. In every U.S. region, and particularly at the state, local, and Tribal levels, people are taking action right now to mitigate (reduce net emissions) and adapt to (adjust to new conditions) climate change. Connecticut emerges as a national leader in climate mitigation and adaptation, as does New England at large. Climate action is taking place at the state, Tribal, city, and local levels, with agencies, non-profits, and the private sector all playing roles in combating climate change.

Despite current efforts, global emissions are continuing



**Saltmarsh sparrows nest in saltmarsh grasses. Climate change and sea level rise not only decrease the amount of salt marsh habitat available, but also result in more flooding and failure of saltmarsh sparrow nests due to high tides and storm surges. The saltmarsh sparrow was listed as endangered by the IUCN Red List of Threatened Species 2020 ([www.iucnredlist.org](http://www.iucnredlist.org)). Photo by Paul J. Fusco**

to increase, and mitigation is not going far enough to counter the effects of warming. The warming and extreme events we are experiencing now are unprecedented over thousands of years. For example, as recently as the 1980s, the U.S. experienced about three “billion-dollar” disasters a year (adjusted for inflation). Now, we experience one climate-related disaster every three weeks on average. For example, in February 2024, a strong winter storm across the Northeast caused \$1.8 billion in damages (according to the National Oceanic and Atmospheric Administration’s National Centers for Environmental Information: <https://www.ncei.noaa.gov/>). NCA5 also found that the people most impacted by these disasters are underserved and overburdened communities, such as low-income neighborhoods. To limit the worst im-

pacts of climate change, the report finds that we would need to accelerate mitigation efforts on a transformational scale to reach net-zero emissions by 2050, all while addressing the root causes of climate vulnerability to ensure all communities are included in climate solutions.

### ***How will climate change affect Connecticut and its fish and wildlife?***

I am proud to live in a state that has scenic hills and valleys, expansive forests, and the picturesque coast of Long Island Sound. Birding, hiking, biking, and eating delicious seafood are all pastimes that are threatened by climate change. For example, extreme heat days and air quality issues, such as the Canadian wildfire smoke event in 2023, are impacting outdoor recreation.

In addition to presenting health concerns for people, warmer air temperatures and extreme heat will create challenges for wildlife. Moose are particularly vulnerable to heat stress and are expected to be adversely impacted by warmer weather. According to Audubon’s “Survival by Degrees: 389

Species on the Brink” Report for Connecticut, 37% of our state’s 227 bird species are vulnerable to climate change across seasons. A rapidly changing climate could lead to population declines and local extinctions if species are not able to adapt. Disruptions in food and nesting resources will further compound vulnerabilities to climate change.

Sea level rise and powerful storms are degrading important wildlife habitats, such as coastal dunes, forests, and wetlands, further threatening coastal species like the salt-marsh sparrow and diamondback terrapin. Ocean warming and increases in marine heat waves are shifting the range and populations of species that are important fisheries, such as Atlantic salmon, American lobsters, oysters, and scallops. There is also the ever-present danger of tick-borne illnesses, such as Lyme disease. These, along with other issues like airborne allergens, are expected to increase in Connecticut with future warming.

### ***How is Connecticut addressing climate change?***

As a national leader on climate action, Connecticut is al-



**Wading birds, such as great and snowy egrets, will lose important foraging habitat as sea level rise inundates salt marshes. Both egret species are listed as threatened under Connecticut’s Endangered and Threatened Species Act. Photo by Roger Wolfe/DEEP Wildlife Division**

# Fifth National Climate Assessment



Scan the above QR Code to read the Fifth National Climate Assessment, or NCA5.

ready taking steps to combat climate change. The state conducts the Physical Climate Assessment report and publishes a climate action plan. Additionally, the state passed a series of laws aimed at reducing emissions by 80% by 2050. As the insurance capital of the world, our state passed a first-in-the-nation climate risk provision requiring the insurance commissioner to submit reports on addressing climate impacts on insurance.

CT DEEP is implementing various climate-focused management strategies aimed at mitigating carbon emissions and adapting to impacts of climate change. For example, DEEP's Urban Forestry Program works to increase tree cover in urban areas, which helps reduce dangerous hot weather exacerbated by the combined impacts of climate change. Urban trees also provide a host of additional benefits from absorbing stormwater to reducing pollution and improving health outcomes in residents. At the same time, these trees mitigate further climate change by absorbing and storing carbon from the atmosphere as trees grow. The Fisheries Division

is working to mitigate potential impacts from Connecticut's changing climate on fish communities through actions in their plan to conserve and manage wild trout, improve/restore stream connectivity, study and improve thermal refuge use on key fisheries, modify stocking allocations, and revise recreational sportfish regulations. The Wildlife Division is working with partner organizations to test and implement various management techniques to facilitate the inland migration of salt marshes and improve their resiliency to sea level rise. Coastal salt marshes are critical breeding habitats for saltmarsh sparrows, diamondback terrapins, and many other species.

## *What are communities doing to address climate change?*

Coastal regions are already feeling the effects of flooding associated with sea level rise. NCA5 found many examples of individuals and communities taking steps to adapt to climate change. One example is in Norfolk, Virginia, where

high tide flooding occurs 10-15 times annually, and by 2050 they can experience 85-100 of these floods per year (see <https://nca2023.globalchange.gov/chapter/9/>). To address this issue, the community and partners are using federal grants to implement a “resilience park”, a green/blue-space that includes a restored tidal creek, flood berm, and wetlands. This project, along with infrastructure improvements, ensures that the community has access to non-flooded roads during high tide floods, and also restores natural function to an important watershed. Learn more about Connecticut and sea level rise at <https://circa.uconn.edu/sea-level-rise/>.



The price and availability of local seafood may change with future warming.

Combating climate change sometimes feels daunting. The latest National Climate Assessment demonstrates that communities have a toolbox of proven solutions to address this crisis head-on. Many of these solutions, like DEEP’s Urban Forestry Program, are win-win-win: they can reduce net greenhouse gas emissions, protect shorelines and urban communities from extreme events, and enhance natural envi-

ronments. These “nature-based solutions” to climate change adaptation will benefit us now and far into the future. To learn more, read the Fifth National Climate Assessment at <https://nca2023.globalchange.gov/>.



PAUL J. FUSCO

The diamondback terrapin is the only turtle species in North America that specializes in brackish water habitats. Females nest on land near the water’s edge, and salt marshes are critical for the development of juvenile terrapins. Both of these habitats are threatened by sea level rise. The diamondback terrapin has been designated a species of greatest conservation need under Connecticut’s State Wildlife Action Plan and is listed as a species of special concern under Connecticut’s Threatened and Endangered Species Act.

# Benefits of Supporting Biodiversity at Home

Written by Tyler Mahard, CT DEEP Wildlife Division

Transforming outdoor spaces in a way that helps wildlife, by providing habitat and supporting biodiversity, can also benefit us. These benefits can be direct for those who use the outdoor space, and at the same time, help mitigate global environmental issues that impact everyone. Most of us modify outdoor spaces where we live. These spaces may be as small as a balcony on an apartment building or as large as a several-acre lot. Regardless, it is possible to foster a space that simultaneously serves you, supports biodiversity, and enhances the health of our planet. This can be accomplished by allowing or supporting the growth of native plants, which can be useful to both wildlife and people.

Biodiversity refers to the variety of all forms of life in an area: plants, animals, microorganisms, and all other living things. For example, in a yard consisting of mowed lawn, you might see a robin pulling earthworms from the soil, or a cottontail rabbit grazing. In terms of species present, biodiversity in this space is relatively low. Now envision the same yard but transformed over time to support more biodiversity. Sections of it have been deliberately mowed less often. In these areas, vegetation has grown tall and begun to flower, attracting various bees, caterpillars, and other insects. Now, bats are seen after dusk as they hunt moths supported by the new vegetation. Common winterberry (*Ilex verticillata*), a native shrub, has been allowed to grow in another part of the yard. A few species of birds are in the winterberry, eat-

ing fruits that are retained into winter and early spring. Leaf litter has accumulated at the bases of shrubs, trapping moisture and providing habitat for invertebrates and amphibians. Some small mammals are also present and have cached seeds collected from the neighboring properties. Seeds that are not eaten in winter may germinate in spring, adding diversity to vegetation in the yard. With the presence of smaller birds and mammals, you will occasionally glimpse some predators, perhaps a bobcat or a hawk.

If you do not have access to a yard and are limited to smaller spaces, such as a balcony or rooftop, do not be discouraged! Potted native plants are useful for a variety of insects and birds. Hummingbirds and butterflies are attracted to container-grown native perennials, including trumpet honeysuckle (*Lonicera sempervirens*) or common milkweed (*Asclepias syriaca*).

## Direct Benefits

In addition to their biological value, all these living things also have aesthetic value. Time spent observing wild animals, plants, and other organisms can be relaxing, exciting, interesting, or inspiring, and ultimately have a positive influence on our wellbeing. There is a growing body of research that links mental health benefits to biodiversity and time spent with nature. Whether you are stopping to smell a flower, watching birds through a window, or walking around



Milkweed leaf beetles (*Labidomera clivicollis*; left) use a small number of plant species, mostly milkweeds (*Asclepias* spp.; right), to feed and reproduce. In addition to producing attractive flowers, milkweeds support a variety of insects and are the required host plant for monarch butterflies. This specimen was photographed at Belding Wildlife Management Area in Vernon, CT. The photo on the right happens to include a colorful but nonnative ailanthus webworm (*Atteva aurea*). Photos by Tyler Mahard/DEEP Wildlife Division

outside and noticing all the various forms of life around you, taking time to appreciate biodiversity can reduce stress and make us happier. Part of this is because nature is a multi-sensory experience. You can smell fallen leaves, touch the bark of a tree, hear the calls of spring peepers, and see colors on a butterfly. This engagement of senses and connection with nature regulates our nervous systems in a way that leaves us feeling refreshed, restored, and grounded. So, why not cultivate a biologically diverse habitat that we can enjoy in our backyards?

In addition to aesthetic benefits and relaxation, local biodiversity can also provide us with food. Hunters and anglers are well-aware of this, and harvested fish and game rely on biodiverse ecosystems for habitat and nourishment. While helping to keep our ecosystems in balance, Connecticut's deer hunters enjoy lean, locally-sourced and climate-friendly venison. Many of Connecticut's plants that provide food and cover for wildlife also have nutritional value for us. Among wild plants, maple trees may be the most widely used for food in our state; Connecticut has an abundance of maple syrup producers, both retailers and hobbyists. Several other native trees produce edible parts, including the nuts of hickory and beech, the small fruits and seeds of hackberry, the leaf buds and flowers of American basswood, and, if properly leached and prepared, acorns from oak trees. Additionally, a tea rich in vi-



T. MAHARD / DEEP WILDLIFE

**Trumpet honeysuckle (*Lonicera sempervirens*), also known as coral honeysuckle, is a Connecticut native plant whose flowers attract and provide nectar for ruby throated hummingbirds, as well as insect pollinators. It is easily transplanted, prefers well-drained soils, and can be grown in a container.**



**Ruby throated hummingbirds, like the female pictured here, are a fun and welcome visitor to our outdoor spaces. Consequently, hummingbird feeders are common in many backyards. While these feeders attract hummingbirds, they also attract bears! A variety of native flowering plants also attract hummingbirds, providing them with a more natural food source, allowing them to fulfill their ecological role as pollinators, and adding beauty to outdoor landscapes. Photo by Joshua Rimany/CT DEEP**

tamin C can be made by steeping the needles of white pine or Eastern hemlock trees. Highbush blueberry (*Vaccinium corymbosum*), a shrub that grows well near wet areas or in well-drained soils, produces delicious berries. Its flowers support pollinators and the berries are food for a variety of birds and mammals, people included. Many other native shrubs and vines also have edible fruits. Fruits from staghorn sumac (*Rhus typhina*) are food for numerous bird species and can also be used to make a tart lemonade-like beverage. If you do not have space for trees or larger shrubs, many smaller herbaceous (non-woody) native plants are edible. Some of these include jewelweed (*Impatiens capensis*), which produces seeds that taste like walnuts, as well as wild bergamot (*Monarda fistulosa*) and sweet goldenrod (*Solidago odora*), which can be used to make tea, and wild leek (*Allium tricoccum*), which has edible leaves. (A note to prospective foragers: only harvest plants where you have permission, be mindful of overharvesting, and be certain the food you are obtaining is safe to eat. Careful research is critical for the proper identification of plants. Vegetation cannot be collected from any state property, including state parks, forests, and wildlife management areas. Most nature preserves and land trust properties also do not permit the collection of plants.)

### **Mitigating Global Issues**

Think globally, act locally. What happens in our back-

yards impacts the rest of the world, and the rest of the world impacts what happens in our backyards. The abnormally heavy rainfall and devastating flooding that Connecticut experienced this past summer is a perfect example. According to the Intergovernmental Panel on Climate Change, human-caused climate change is resulting in extreme weather and climate shifts worldwide, with widespread adverse impacts on people and the natural world. We see evidence of this in the news quite often: fires, floods, severe storms, temperature extremes, melting arctic ice, and rising sea levels. Climate change is driven by greenhouse gas (GHG) emissions from human activities, like the burning of fossil-fuels, with carbon dioxide being the primary culprit. As plants grow, they absorb and assimilate carbon dioxide into their biomass. Therefore, allowing the growth of plant biomass in a yard, especially as trees and shrubs, helps reduce net carbon emissions. The reduced need for mowing and other management activities also helps lessen GHG emissions, as the combustion of gasoline that occurs in most mowers produces GHGs. (As an added benefit of less mowing, there is less noise pollution to interfere with bird communication or neighbors trying to telework or enjoy a quiet afternoon.) Increasing the carbon storage for one yard may seem insignificant, but a substantial amount of the earth's surface is covered by human-dominated spaces, and many small actions can make a big difference.



Leaving leaf litter on the ground, perhaps near the edges of a yard or around the base of trees, allows the formation of a duff layer. This layer of decaying organic material is critical for various invertebrates and species like the red-backed salamander (*Plethodon cinereus*). This individual, found at Sessions Woods Wildlife Management Area in Burlington, CT, is a lead-back color morph and lacks the characteristic red stripe. *Photo by Sarah Wall/DEEP Wildlife Division*

Related to climate change, but less publicized, is the issue of global biodiversity loss. The World Wildlife Fund's Living Planet Report 2022 cites a 69% average decline in global wildlife abundance since 1970. Scientific publications from around the world describe similar trends: animals, plants, and other lifeforms declining in abundance and number of species. The Convention on Biological Diversity and numerous scientific publications estimate current rates of species loss at hundreds of times greater than those prior to human influence. It is abundantly clear that human activities are driving biodiversity loss. There is consensus in the scientific community that rapid loss of biodiversity is not stopping and urgent action is needed to safeguard nature and the resources it provides. A 2019 study found a 25.2% average loss in flora species throughout New England and New York when comparing historical and modern plant survey data from numerous sources. Increasing plant diversity in an area, such as a backyard, supports a wealth of other lifeforms: wildlife, fungi, and microorganisms that interact with the plants. This also has an impact beyond the immediate area. For example, migratory birds might stop to forage at a shrub in your yard, acquiring calories needed on their journey to tropical ecosystems that they support in turn. At a more local level, seeds carried by wind or wildlife from your property might help a plant species colonize another nearby area, helping sustain regional biodiversity into the future.

It is worth noting that a choice to consume local and sustainably harvested food, instead of imported food, helps mitigate climate change and global biodiversity loss. According to the U.S. Environmental Protection Agency's 2021 breakdown of GHG emissions by economic sector, agriculture accounted for 10% of U.S. emissions, while transportation accounted for 28%, and industry accounted for 23%. Much of the food we find in our grocery stores is produced well beyond Connecticut's borders. Industrial agriculture provides us with incredible quantities of food, but at the same time is detrimental to biodiversity and a driver of climate change. Imported food requires transportation to our state, which primarily happens by way of trucks that emit GHGs as they burn fossil fuels. Further, the industry needed to produce the packaging that most imported food is delivered in also produces GHGs that drive climate change and results in pollution that negatively impacts biodiversity. Reducing our dependency on industrial agriculture, food transported from afar, and product packaging helps support biodiversity and reduce carbon emissions across multiple economic sectors.

In addition to climate change and global biodiversity loss, our planet also faces a global plastic pollution crisis. We see this impacting Connecticut's wildlife – bears that ingest plastic food packaging from people's trash, a fox with its head stuck in a plastic container, and wetlands degraded with plastic and other litter. Locally-produced foods, like vegetables from a farm stand, are less likely to be packaged



T. MAHARD / DEEP WILDLIFE

**The fuzzy fruits of a staghorn sumac (*Rhus typhina*) growing near the Naugatuck River in Thomaston, CT.**

in plastic. By reducing the amount of plastic packaging we buy, we lessen the demand for its production and can reduce the amount that ends up in our natural environments. Given the massive challenges climate change, biodiversity loss, and plastic pollution present for people and wildlife in Connecticut and worldwide, food that is produced locally and sustainably is an attractive option.

This article describes a few ways we can benefit from enhancing native vegetation, wildlife habitat, and overall biodiversity in our outdoor spaces at home. Although it focuses on privately-owned outdoor spaces, keep in mind that these concepts apply everywhere. Community-managed public greenspaces also have the potential to bring these benefits to people in urban areas, where yard space can be limited or nonexistent for many. There is much more to be said, learned, and done regarding links between biodiversity at home and human wellbeing, nutrition, climate change, and global biodiversity loss. How can the outdoor spaces where you live better serve you while also supporting the health of our planet and its ecosystems?



# Saving Smallmouth Bass

## *New stocking effort at Wyassup Lake*

Article written by Andrew Bade, CT DEEP Fisheries Division

Largemouth and smallmouth bass, collectively referred to as black bass, are Connecticut's most popular freshwater fish with over two million fishing days spent each year trying to catch them. Despite their similarities, largemouth and smallmouth bass are different in many ways. Relative to largemouth, smallmouth bass prefer clearer, cooler waterbodies with less aquatic vegetation. Smallmouth bass also have higher catchability, lower fecundity (fertility), prefer more fusiform (i.e., torpedo-shaped) prey, and appear to be more vulnerable to environmental stressors, including eutrophication, warming, pollution, and disease, than their larger-mouthed cousins. Another important difference is that while largemouth bass continue to be abundant throughout Connecticut, smallmouth bass have become extirpated (i.e., locally extinct) or dramatically reduced in abundance in several Connecticut lakes and ponds since the 1980s.

Wyassup Lake in North Stonington is one such lake where smallmouth bass have disappeared. Wyassup Lake has supported a smallmouth bass fishery since at least 1925, when 21 adult smallmouth bass were released by what was then the Connecticut Board of Fisheries and Game. This was just one year after the Board initiated the sale of inland fishing licenses. Smallmouth bass continued to be abundant in Wyassup Lake until the early 2000s when their catch-per-hour during standardized surveys dropped to about one quarter of the historical norm. Smallmouth bass continued to hang on at a reduced abundance until 2011, after which they no longer appeared in any surveys.

Where did the smallmouth bass go? Multiple factors are likely at play, with the story of smallmouth bass in Wyassup Lake looking a lot like the story of lacustrine (i.e., lake-dwelling) smallmouth bass throughout eastern Connecticut and much of the eastern United States. Eutrophication and the introduction of invasive variable milfoil considerably changed the character of Wyassup Lake over time. In addition to the direct habitat changes, decomposition of the milfoil also accelerates eutrophication and the buildup of detritus on the lake bottom, gradually covering the rock and sand substrates that smallmouth bass rely on. Landlocked



Smallmouth bass caught via angling en route to the boat launch for processing at Wangum Lake, Canaan. Photo by James Murtagh/DEEP Fisheries Division

alewives, a preferred forage fish for smallmouth bass, have also likely become extirpated in Wyassup Lake. The alewives were introduced to the lake during the 1960s and 1970s, but have not been observed in standardized surveys since 2011. Additionally, a seven-foot water level drawdown for dam repair took place from January 2012 to March 2013. Coincidentally or otherwise, smallmouth bass were no longer observed in surveys from 2013 on.

Unsurprisingly, largemouth bass abundance exploded during the same period that smallmouth bass collapsed. (Largemouth bass were introduced to Wyassup Lake in 1910.)

Smallmouth and largemouth bass have well-documented competitive interactions, and the eutrophication, increasing submerged aquatic vegetation, and climate warming that are harming smallmouth bass have only improved the recruitment (population growth) of largemouth bass. While smallmouth bass are resilient to individual stressors, the suite of environmental changes in Wyassup Lake has created conditions that are more and more favorable for largemouth bass, resulting in their displacement of smallmouth bass.

Where do we go from here? Sonar mapping and snorkel surveys indicate that Wyassup Lake continues to have suitable smallmouth bass habitat, especially in the shallow waters around its islands and in rocky areas along the eastern shore. Angler surveys also indicate near unanimous public support for reintroducing smallmouth bass to the lake. Wyassup Lake anglers and homeowners have strong memories of catching smallmouth bass there for generations and miss the unique angling experience they offer. Fish pathology testing also shows that the resident fish community does not harbor any diseases that would likely harm smallmouth bass. For these reasons, the CT DEEP Fisheries Division selected Wyassup Lake as the first lake to undergo attempted smallmouth bass reintroduction through stocking and habitat enhancement.

To identify suitable source locations of smallmouth bass for transplanting into Wyassup Lake, historically strong smallmouth bass populations were reassessed using night boat electrofishing surveys. During these surveys, which use electricity to temporarily stun fish so they can be sampled, up to 30 specimens of bluegill, largemouth bass, and smallmouth bass were retained for



**A passive integrated transponder (PIT) tag is shown being injected into the dorsal musculature of a smallmouth bass. Each PIT tag number is recorded prior to implantation to ensure functionality. The injector and PIT tags are sterilized in alcohol and rinsed in distilled water between each individual. Photo by James Murtagh/DEEP Fisheries Division**



**A female smallmouth bass being sexed using a probe commonly used to sex snakes and other reptiles. The angle and depth of penetration from the urogenital opening is a strong indicator of sex in largemouth bass (Benz and Jacobs 1984). Photo by James Murtagh/DEEP Fisheries Division**

fish pathology analysis. Wangum Lake in Canaan, operated by the Aquarion Water Company, had the highest catch per hour (60+) of adult smallmouth bass and tested negative for all pathogens at the U.S. Fish and Wildlife Service Lamar Fish Health Center. As a drinking water reservoir that is closed to fishing, Wangum Lake is a desirable source for



JOE CASSONE, CT DEEP

**DEEP Fisheries Division Biologist, Andrew Bade, posing with a boat full of half-logs that are ready to be deployed in Wyassup Lake, North Stonington.**

smallmouth bass translocation because there would be no impact to sportfishing. Lastly, the lack of largemouth bass at Wangum Lake likely improves the recruitment of smallmouth bass and makes the smallmouth bass population more resilient to the removal of adults. For these reasons, Wangum Lake has been selected as the first source location.

Smallmouth bass (a total of 160) were caught from Wangum Lake via angling on two occasions in April 2024. The transplanted fish averaged 15.6 inches and 1.7 pounds. Fisheries Division and Aquarion Water Company staff angled from two small aluminum boats fitted with large plastic tubs to transport smallmouth bass back to the launch where an oxygenated tank was positioned. Boats and equipment were decontaminated using a bleach solution and power washer prior to launching. Fisheries staff sexed, measured, weighed, took scale samples for ageing, and injected passive integrated transponder (PIT) tags into the dorsal musculature before stocking the fish at Wyassup Lake, North Stonington. Smallmouth bass were transported in an oxygenated tank in the bed of a Fisheries Division truck. No mortalities were observed among transplanted individuals, and all appeared to be in good condition at the time of stocking. Snorkel surveys and anecdotal reports from anglers indicate that the smallmouth bass in Wyassup Lake remain in good condition.

To-date, the Fisheries Division has also deployed 21 half-logs and two nest boxes in the lake. Half-logs are logs split lengthwise that are 8 to 10 feet long and are both anchored and propped up on either end by 10- to 12-inch concrete blocks.

These habitat structures, when placed in good spawning substrate, have been shown in the literature to attract spawning smallmouth bass and significantly increase production of juvenile fish. Indeed, spring-time snorkel surveys indicated that both smallmouth and largemouth bass created nests on a majority of the logs within one week of deployment. The nest boxes are three-feet by three-feet, 12 inches high, and filled with a gravel mix of one- to three-inch stones. These habitat structures work well where there is good cover for spawning (e.g., large boulders or woody debris), but no suitable substrate for egg deposition. Several additional nest boxes will be deployed in the winter of 2024-2025.

Night electrofishing will occur in fall 2024 to look for smallmouth bass born in spring 2024 and determine if the spawn was successful. Any recaptured adults will be assessed for growth and condition. In addition to deploying more nest boxes, the Fisheries Division plans to stock additional adult smallmouth bass in the springs of 2025 and 2026. Because all the stocked smallmouth bass have uniquely coded PIT tags, standard surveys will be able to determine if any fish caught in future years were stocked or originated from within the lake. Evaluating this program will help inform future management at Wyassup Lake and throughout eastern Connecticut where smallmouth bass are declining or extirpated. While the future of smallmouth bass in Wyassup Lake remains uncertain, one thing is clear – we can no longer take our smallmouth bass fisheries for granted.



# The New Western District Headquarters

## *More than just office space*

*Written by Elizabeth Bernard, CT DEEP Forestry Division*

Wood, sunlight, and stone. These three features of Connecticut's environment are visible upon entering the new Western District Headquarters building at Black Rock State Park in Watertown. The building blends modern technology with locally sourced materials, resulting in a LEED (Leadership in Energy and Environmental Design) Platinum certified building that achieves Net Zero Energy standards.

### ***Consolidating Offices***

This is a fitting location for DEEP's Western Connecticut program staff. The building houses staff from the Forestry, Fisheries, and Environmental Conservation Police Divisions. It is also an accessible visitor's center, where the public can connect with the Department and learn about Connecticut's environmental resources.

DEEP employees stationed at this new headquarters were previously located at 11 different buildings located in five different towns on the western side of the state. Many of those buildings were in disrepair. The merging of offices

improves inter-agency and public communications, saves energy, and reduces resource use.

### ***LEED Certification***

The new Western District Headquarters building supports the State's goals to help mitigate the effects of climate change by reducing energy use through design, and by using locally grown, renewable building materials. Construction of this new building, designed by TLB Architecture, LLC, from Chester, followed the LEED Platinum certification guidelines. According to the U.S. Green Building Council, LEED certification provides a framework for healthy, highly efficient, and cost-saving green buildings, which offer environmental, social, and governance benefits. The building uses a geothermal heating system, a photovoltaic solar array, and other features that result in a 30-40% decrease in energy usage as compared to a similar building designed using current building codes.



**A view from above of the new Western District Headquarters building at Black Rock State Park in Watertown. The roof features solar panels to help reduce energy use.**

## Locally-sourced Wood from State Forests

Wood used at the Western District Headquarters was acquired from Connecticut's State Forests, including the Meshomasic, James L. Goodwin, and Salmon River State Forests. This means that the light-colored maple paneling and the rich oak wainscoting were sourced less than 65 miles away. Logs were driven from the harvest sites to the DEEP Sawmill in Portland, where they were milled and transformed into paneling, wainscoting, base board, signs, and more. Once finished, the wood was trucked directly to Black Rock State Park and used in construction.

Over 18,000 board feet of Connecticut wood was used in the building. This wood was part of previously planned and site-specific forest management plans that were designed to promote forest health and resilience in our forested landscape. A forest management plan is a tool that uses site-specific information about a forest to establish short and long-term goals for that forest and details the methods to achieve those goals. Multiple goals can be achieved simultaneously through management. They include supporting wildlife, improving forest health, timber production, increasing carbon storage, and even helping the forest become more resilient in the face of climate change.

Foresters create management plans that consider each forest's unique needs and resources. Plans are reviewed by Wildlife and Fisheries biologists and other professionals. Management plans for Connecticut's state forests are available on the CT DEEP Forestry Division website at <https://portal.ct.gov/deep/forestry/management-on-state-lands/forest-management-on-state-lands>.

Wood is a climate-friendly choice. According to the Durable Wood Calculator from the Securing Northeast Forest Carbon Program, the local wood used on this building stores the carbon equivalent of 47.5 metric tons of carbon dioxide. According to the EPA's Greenhouse Gas Equivalencies Calculator, this equals the amount of CO<sup>2</sup> emitted into the atmosphere from 122,737 miles driven by the average gasoline-powered passenger vehicle.

Wood used for long-lasting structures, such as buildings, can store carbon on a long-term basis and, when harvested



(Above) The entrance to the new Western District Headquarters contains a large lobby and two conference rooms. (Below) A "Connecticut Grown" seal on wood procured from local forests.





(Left) Office space at the new Western District Headquarters. (Right) Service Forester David Irvin using a work station at the new Headquarters.

with sustainable forestry practices, creates forest conditions that allow more trees to grow and therefore store additional carbon.

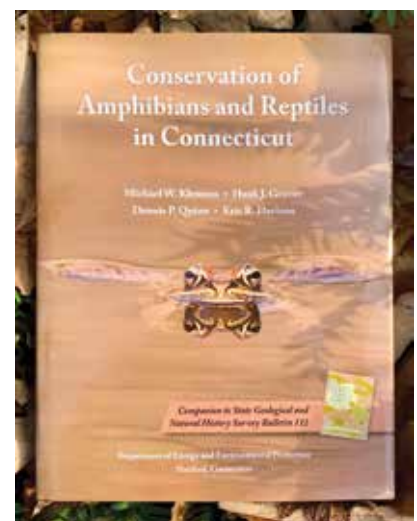
Connecticut wood products are a vital part of our state's economy. According to the 2017 CT DEEP Forest Products Economic Report, Connecticut's Forest Products industry directly employed over 7,700 people and contributed \$2.4

million to the state's economy. The top forest products in Connecticut include wood cabinets and countertops, paperboard containers, paper bags, and custom architectural wood products.

This collaborative project has resulted in a reduced carbon footprint, improved forest health, enhanced wildlife habitat, and a humble brag for Connecticut wood products.

## *Conservation of Amphibians and Reptiles in Connecticut*

Published by the CT DEEP, this 305-page book includes detailed text, 131 color photos, species account maps, and conservation solutions for the complex challenges faced by Connecticut's amphibians and reptiles. The book authors, Michael W. Klomens, Hank J. Gruner, Dennis P. Quinn, and Eric R. Davison, seek to help the reader understand the conservation challenges faced by amphibian and reptile species and also create better approaches to conservation in the future. All proceeds go toward the conservation of Connecticut's reptiles and amphibians. The book is available for purchase (by check or cash only) for \$58.44 (this price includes \$3.94 in state taxes) at the CT DEEP Wildlife Division's Sessions Woods Wildlife Management Area, 341 Milford Street (Route 69), in Burlington, CT. Office hours are Monday through Friday, 8:30 AM to 4:00 PM (860-424-3011). The book can also be purchased online with a credit card at the CT DEEP Bookstore (<https://ctdeepstore.com/>).



# One Health

## *Balancing the health of people, animals, and the environment*

Each year around the world, it is estimated that zoonotic diseases, or zoonoses (zoo-huh-noh-seez), shared between people and animals, cause 2.5 billion cases of sickness and 2.7 million deaths. Over half of all infections that people may get can be spread by animals. Examples of common zoonoses include rabies, Salmonella, and West Nile virus. The health of humans, animals, plants, and ecosystems are closely linked



PAUL J. FUSCO

**Rabies is a fatal viral disease primarily found in wild carnivores, such as raccoons, skunks, and foxes. It can also infect unvaccinated cats, dogs, livestock, and other mammals, like bats, woodchucks, and deer.**

to one another and to environmental conditions. Environmental health can affect human and animal health through contamination, pollution, and even natural conditions that can lead to new infectious agents. Acknowledging this interconnectedness, the “One Health” approach is a collaborative effort of multiple health and science professions (veterinarians, physicians, public health officials, epidemiologists, ecologists, toxicologists, and others) – working locally, nationally, and globally – to attain optimal health for people, domestic farm and food animals, wildlife, plants, and our environment. The One Health approach embraces the idea that problems impacting the health of humans, animals, and the environment are best solved through communication, cooperation, and collaboration across disciplines and institutions.

Zoonoses can cause substantial harm to a region’s economic and social well-being. One Health focuses on preventing these infectious diseases and limiting their spread from animals to humans with the understanding that these efforts benefit the environment and the economy. The emergence

and reemergence of many diseases impacting people and animals results from increasing contact between animals and humans, as well as environmental changes, international movements, and a global economy.

In addition, toxic chemicals can also cause serious health problems that affect both humans and animals. Such health problems include cancer, endocrine disruption, birth defects, reproductive failure, as well as immunologic, respiratory, and neurologic disorders.

Zoonotic pathogens (disease-causing agents) can evolve and move from one organism to another, either directly or through the environment. Sometimes, they mutate or evolve into more virulent strains, and can develop resistance to countermeasures, such as antibiotics, other bacteria or viruses, and other challenges. The advancement of scientific knowledge surrounding the ecologies of zoonoses is imperative for determining how to address these pathogens and the health issues they cause for people, animals, and entire ecosystems.

## One Health and Wildlife

Today, the fate of North American wildlife is again at a crossroads. However, this time it is not due to overharvesting as it was in the 1800s and 1900s. Instead, human-driven habitat loss and degradation, as well as a changing climate and disease, have emerged as primary threats to terrestrial biodiversity. At the same time, as humans have continued to occupy and manipulate greater expanses of wildlife habitat, the risk of infection from zoonotic diseases has greatly increased, as illustrated by the recent outbreaks of COVID-19, SARS, and Monkeypox. These highly disruptive diseases have proven significant motivators for a new and more inclusive view of nature's future, including human beings as an integral and interdependent component. Growing numbers of international institutions and conventions now embrace the One Health vision.

One Health is not a new concept but has gained significant popularity over the past two decades, especially due to recent zoonotic epidemics and pandemics. One Health was initially focused largely on zoonoses, antimicrobial resistance, and food safety, but has expanded its scope to include the health of wildlife and ecosystems, as well as human well-being and overall quality of life. Today, significant national and international institutions focus on building collaboration among diverse research areas to foster the One Health approach.

### Examples of Zoonoses Through History

Humans have evolved with zoonotic diseases and there is evidence of this throughout history. One of the oldest known

diseases in history is “mad dog” disease – rabies – with cases dating back to 4,000 years ago. For most of human history, a bite from a rabid animal was fatal, until the development of a vaccine in 1885. Over time, as more diseases became prevalent, physicians and scientists, like Hippocrates, began to make connections, defining these zoonoses as “Epidemi-on” or epidemics, noting that “the cause of diseases are in the environment”. These diseases were known as plagues and typhus, spreading far by louse, mice, biting flies, and mosquitos, and killing thousands of people. Soldiers in war would often fall victim to these diseases.

One zoonosis you may have heard of is yellow fever, which was first documented in 1493 in Haiti and many other times throughout history. More recently, the 2009 H1N1 (swine flu) outbreak caused 17,843 human deaths and spread to 213 countries . The recent COVID-19 pandemic is suspected to be zoonotic in origin, although investigation of the source of the outbreak is ongoing.

*Subsequent issues of “Connecticut Wildlife” will explore the topic of One Health and its implications for people and wildlife in Connecticut. A variety of zoonotic diseases and the efforts by scientists to learn more and prevent the further spread of these diseases will be covered.*

*Some of the information for this article came from the Centers for Disease Control and Prevention, where you can also learn more about One Health:*

*<https://www.cdc.gov/one-health/about/>*

## Testing for Avian Influenza

Since 2006, the Wildlife Division's Migratory Bird Program has been conducting targeted surveillance for avian influenza. Biologists test a sample of waterfowl in the summer and then again in winter during normal banding and research projects. They also follow up and test mortality events of birds if it seems like the deaths may have been due to avian influenza. Surveillance is typically targeted for areas that are in the vicinity of major poultry production operations, as the economic impact of avian influenza getting into one of those facilities would be devastating. Unfortunately, once avian influenza is found in wild birds, there isn't much biologists can do to contain the spread of the virus in the wild, but once detected, there are ways to prevent the virus from affecting poultry. Learn more on the DEEP website at <https://portal.ct.gov/deep/wildlife/avian-influenza>.



PAUL BENJUNAS/DEEP WILDLIFE

**Wildlife Division Resource Assistant Beth Amendola (left) and Migratory Bird Program Biologist Min Huang take a sample from a black duck to test for avian influenza.**

# 2024 Connecticut Junior Duck Stamp Art Contest Winner

Written by Kathy Herz, CT DEEP Wildlife Division

A beautiful acrylic painting of a northern shoveler created by Storrs resident, Alice Han (age 14), was selected as the “Best in Show” for the 2024 Connecticut Junior Duck Stamp Art Competition. It also won first place in the 7th-9th grade age category. Alice’s painting will be featured on the 2025 Connecticut Migratory Bird Conservation (Duck) Stamp. It also represented Connecticut in the Federal Junior Duck Stamp Contest, where Alice placed in the top 25 in the nation!

The annual Junior Duck Stamp Art Competition is coordinated by the Connecticut Waterfowl Association, in cooperation with the CT DEEP Wildlife Division. The judges reviewed entries submitted by students in grades K-12 from a number of public/private/magnet school classrooms, private art studios, and individual family entries. The participants put forth a great amount of time and effort to produce some amazing artwork (and conservation messages). Each entry must include a note about how the entrant feels about the species they are depicting and conservation of nature. Entries were divided into four age groups spanning from kindergarten through high school. Winners in each age group were then judged against each other to determine the overall state winner. The contest is open to all students, K-12, who are Connecticut residents. To enter, students create and submit a drawing or painting featuring native waterfowl (ducks or geese). There is no cost to participate.

Alice Han, the “Best of Show” artist, is a grade 9 student who works with the Lin Lin Art Studio in Glastonbury. From a young age, she displayed an innate interest and talent for



This painting by Alice Han of a northern shoveler was selected as the “Best in Show” for the 2024 Connecticut Junior Duck Stamp Art Competition.

art. From watercolor to acrylic, pencil to charcoal, Alice explored different styles and techniques under the guidance of her mentors. She then began participating in many different competitions and stumbled upon the Connecticut Junior Federal Duck Stamp competition—an opportunity to not only showcase her talent but also advocate for the preservation of nature. She spent a month vigorously working on her painting, hoping to be part of this incredible project that is aimed to inspire others to appreciate the world around them. Alice is honored and grateful to have received this award, and extends her appreciation to the Connecticut Waterfowl Association for giving her and many others this opportunity.

Visit the Connecticut Migratory Bird Conservation Stamp webpage to view more of the winning artwork and also learn how to purchase a stamp: <https://portal.ct.gov/CT-Migratory-Bird-Conservation-Stamp>

*Do your part for conservation. Buy a Migratory Bird Conservation stamp and contribute to habitat protection and restoration.*

# Dedication for Don Hopkins

## *An advocate for CT's bald eagles*

Written by Kathy Herz, CT DEEP Wildlife Division

In early June 2024, family, friends, and DEEP staff gathered at the Peoples State Forest Nature Museum in Barkhamsted to honor Don Hopkins, a tireless advocate for bald eagle conservation in Connecticut. Don passed away in August 2018 at the age of 92, but his legacy lives on forever and now his memory has been dedicated with a beautifully carved statue depicting a bald eagle pair and nestling in a tree-top nest. The carving, created by local woodcarver Ben Faraci, and a memorial plaque are now on display at the Nature Museum.

Don wasn't just an active birder with an interest in bald eagles. He founded the New England Hawk Watch in 1971 and the Bald Eagle Study Group in 1975. Since their founding, Bald Eagle Study Group volunteers have spent countless hours locating and observing bald eagle



(From left to right) Wildlife Division biologist (now Director) Jenny Dickson, Don Hopkins, and Wildlife Division biologist Julie Victoria (retired) watch as a bald eagle chick is lowered to the ground from its nest so that it could be weighed, measured, sexed, and banded. Photo by Paul J. Fusco

nests in Connecticut and sharing that information with DEEP Wildlife Division biologists. Don took meticulous notes and wrote articles about his eagle observations. He greatly contributed to our knowledge about the species as it recovered from severe population declines and local extinctions due to widespread use of DDT.

Don is credited with documenting the return of bald eagle nesting to Connecticut. In 1992, he located a nest in Barkhamsted, not far from Peoples State Forest, which was the first documented eagle nest in the state in over 40 years. He spent numerous hours observing the bald eagle pair and development of their offspring. Everything Don did in his quest to conserve eagles, he shared with the DEEP Wildlife Division. Don's invaluable contributions to the conservation of bald eagles and other raptors in our state continue to be carried on by members of the Bald Eagle Study Group, many of whom attended the dedication. You can learn more about Don and his efforts to conserve bald eagles in *Connecticut Wildlife Magazine* (July/August 2014 and July/August 2018; <https://portal.ct.gov/DEEP-CT-Wildlife-Magazine>).



This wood carving, created by local woodcarver Ben Faraci, is on display in honor of Don Hopkins at the Peoples State Forest Nature Museum in Barkhamsted.



## *Cats and Birds: A Bad Combination*

Outdoor domestic cats are a recognized threat to global biodiversity. Cats have contributed to the extinction of 63 species of birds, mammals, and reptiles in the wild and continue to adversely impact a wide variety of other species, including those at risk, such as the piping plover.

The ecological dangers are so critical that the International Union for Conservation of Nature (IUCN) lists domestic cats as one of the world's worst non-native invasive species.

### *Cats #1 Threat to Birds*

Predation by domestic cats is the number-one direct, human-caused threat to birds in the United States and Canada.

In the United States alone, outdoor cats kill approximately 2.4 billion birds every year. Although this number may seem unbelievable, it represents the combined impact of tens of millions of outdoor cats. Each outdoor cat plays a part.

### *Instinctive Predators of Wildlife*

Even well-fed cats will hunt and kill. Upon reflection, most cat owners will have observed this behavior. When a cat plays with a feather toy or laser, it is practicing predatory behaviors. When these behaviors continue outdoors, the results are deadly for birds and other wildlife.

Unfortunately, the mere presence of cats outdoors is enough to cause significant impacts to birds. Because cats are recognizable predators, their presence near nesting birds has been shown to reduce the health of nestlings and decrease nest success.

### *“Happy” Cats?*

Although more cat owners are seeing the benefits of having an indoor only cat, there are still owners who believe that allowing their cats to roam freely outdoors makes them healthier and happier. But is this belief of a “happier” cat worth the toll these animals take on native wildlife populations. Learning about the potential dangers and wildlife impacts of allowing cats to roam outside may help cat owners realize that pet cats live longer and healthier lives indoors.

### *Indoor Cats Are Healthier*

The average lifespan of an outdoor cat is drastically less than that of an indoor cat. Roaming cats typically live less than five years, whereas cats kept exclusively indoors often live to 17 or more years of age. Outdoor cats, particularly those not current on their vaccinations, are highly susceptible to contracting diseases. Some of these diseases can also be transmitted to other cats and animals, and even people. Cat diseases include feline leukemia, rabies, feline immunodeficiency virus, feline infectious peritonitis, toxoplasmosis, distemper, and roundworm. In populated areas, there is also a heightened danger of being hit by cars and infections from fights with other animals.



**These indoor cats are safely watching a bobcat in their backyard through a patio window. The outcome might have been different if they had been roaming outside. Photo by Jenna Lopardo/DEEP Wildlife Division.**

A common occurrence in Connecticut includes free-roaming cats being killed by coyotes, bobcats, and other wild predators. Many pet owners are unaware of the threat wild predators may pose to outdoor cats, only to learn the hard way after their pet is seriously injured or killed. The best way to ensure the safety and well-being of pet cats is to keep them indoors! A resulting benefit is the safety and well-being of wildlife. Help protect wildlife and cats – keep cats indoors!

Visit the American Bird Conservancy website for more detailed information about keeping cats indoors to protect wildlife. Some of the information in this article came from the American Bird Conservancy website.

(<https://abcbirds.org/program/cats-indoors/>)

## Welcome New Wildlife Division Staff

The CT DEEP Wildlife Division welcomed three more new staff members over the past several months:

**Craig Mira** was hired in December 2023 as the new secretary based out of the Division's Franklin Swamp WMA office in North Franklin. Before joining DEEP, he worked for 10 years as a real estate paralegal in his hometown of West Hartford, until deciding it was time to focus on his passion for the great outdoors. After leaving the corporate world behind, he worked for a while at Wickham Park in Manchester on the maintenance crew, assisting with the upkeep of the gardens, hiking trails, and event spaces. In his spare time, Craig enjoys watching nature documentaries, hiking, gardening, traveling, and music.

**Anna Toledo** joined DEEP's Natural Diversity Data Base (NDDB) as a wildlife biologist in February 2024. Anna was a seasonal employee for the Wildlife Division from 2017-2022, and, just before being hired by DEEP, was a contractor to the Wildlife Management Institute, working alongside the Wildlife Division to monitor and restore the New England cottontail. In her free time, she enjoys baking, riding her motorcycle, and supporting the local music scene.

**Maydiel Cañizares** joined the Wildlife Division in April 2024 as a wildlife biologist to coordinate the R3 (hunter retention, recruitment, and reactivation) Program. Maydiel is a Cuban biologist that came to the U.S. in 2018. In Cuba, Maydiel worked as a wildlife biologist and nature-based tour guide at Zapata Swamp National Park, a UNESCO Biosphere Reserve and largest wetland in the Caribbean. There, his work ranged from captive breeding of the endangered Cuban crocodile, to avian ecology and sustainable use of natural resources. Upon transitioning to the U.S., Maydiel maintained robust ties with non-profit conservation organizations while forging his own path within the American hunting community. His experience in environmental research, passion for hunting, and natural ability to connect with people from different backgrounds provide a strong set of skills for his new role.



### Attention Connecticut Wildlife Subscribers

As we continue to catch up on production and also assess the future course of the magazine, we are not taking any new or renewal orders. Stay tuned to our website at <https://portal.ct.gov/deep/wildlife/connecticut-wildlife-magazine> for any future updates.

Top photo (from left to right): Craig Mira and Maydiel Cañizares. Photo by Sydnee Foster/DEEP Wildlife Division. Bottom photo: Anna Toledo helping with the Wildlife Division's annual goose banding project. Photo by Kailyn Lundeberg/CT DEEP.

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Bureau of Natural Resources / Wildlife Division  
Sessions Woods Wildlife Management Area  
P.O. Box 1550  
Burlington, CT 06013-1550



Allowing sections of your lawn to grow without frequent mowing, minimizing your use of pesticides and fertilizers, and adding native plants are just a few ways to invite wildlife to your backyard, including amphibians like this pickerel frog. *Photo by Paul Benjunas/DEEP Wildlife Division.*