May/June 2011

Connecticut Wildlife

CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF NATURAL RESOURCES
DIVISIONS OF WILDLIFE, INLAND & MARINE FISHERIES, AND FORESTRY

From the Director's Desk

What does it mean to celebrate diversity? TheFreeDictionary.com defines celebrate as "to praise publicly," and diversity as "the state or quality of being different or varied." These definitions comport with the interpretation of an African-American friend of mine whose car carried the slogan as a bumper sticker. To him, it meant that we should revel in our racial and ethnic differences. For others, the focus shifts to rejoicing a world rich in the diverse array of natural resources our wonderful state has to offer. To me, it means all of those and more.

We are a community bound by an affection for wild things. Yet, those passionate about our shared natural resources bring remarkably diverse and often disparate perceptions to the role of humans in our natural world. For some, watching wildlife is a fulfilling experience and the notion of taking a wild animal, whether for food, fur, or wildlife management action, is untenable. For others, harvesting wild animals is the highest and most sensible use of a publicly held renewable natural resource. Paradoxically, these perspectives come from a deep, heart-felt connection with our natural world.

There is remarkable strength in that connection and, if we choose to use that strength, we can accomplish great things, including conserving wild places, and fostering restoration of natural habitats and a resurgence of our native flora and fauna. If we choose to squander it, we will fail, regardless of the parochial battles won. It is with that in mind, as we debate the various actions we take, each of us is encouraged to celebrate our diversity, as in it lies our strength.

Rick Jacobson

"What we have to do... is to find a way to celebrate our diversity and debate our differences without fracturing our communities."

Hillary Clinton

Cover:

The Eastern box turtle is of conservation concern in all of the states at its northeastern range limit, including Connecticut. See page 19 to learn more about the box turtle.

Photo courtesy of Paul J. Fusco

"Connecticut Wildlife" Can Now Be Ordered Online

Thinking about ordering a subscription to Connecticut Wildlife for a friend or family member? The magazine can now be ordered online with a credit card through the DEP Store (www.ctdepstore.com). While you are visiting the DEP Store Web page, take some time to explore the great selection of books and other environmental items that are available through the store.

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The Federal Aid in Wildlife Restoration Program was initiated by sportsmen and conservationists to provide states with funding for wildlife management and research programs, habitat acquisition, wildlife management area development, and hunter education programs. Connecticut Wildlife *contains articles reporting on Wildlife Division projects funded entirely or in part with federal aid monies.*

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Children's Art Contest and More Planned for the Year of the Turtle

P. J. FUSCO

The Northern diamondback terrapin is the only species of turtle in North America, including Connecticut, that spends its life in brackish water (water that is less salty than sea water). Diamondback terrapins are most abundant in tidal estuaries west of the Connecticut River.

The DEP Wildlife Division and the Friends of Sessions Woods, as part of the Year of the Turtle awareness campaign with Partners in Amphibian and Reptile Conservation (PARC), are sponsoring a turtle art contest for children in kindergarten through fifth grade. Children entering the contest should draw, paint, or sketch a turtle species native to Connecticut. Entries will be judged in three age groups: K-1st grade, 2nd-3rd grade, and 4th-5th grade. First, second, third, and honorable mention prizes will be awarded in each age group. The Connecticut Science Center, in Hartford, has graciously donated a Family Pass package for each first place winner. The Friends of Sessions Woods Paul Petersen Memorial Fund has donated various turtle-related prizes, such as ribbons and books, for the winning pieces of artwork (first through honorable mention). First place winners also will have their artwork published in *Connecticut Wildlife* magazine.

All of the artwork will be on display at the Wildlife Division's Sessions Woods Conservation Education Center, in Burlington, at a special "**Year of the Turtle Day**," scheduled for Sunday, June 26, from 1:00-4:00 PM. Award winners also will be announced to the public during Turtle Day. Educational programs on turtles, live turtles, and kid's crafts are all planned for Turtle Day. More information about the event will be on the DEP's Year of the Turtle Web page at www.ct.gov/dep/yearofturtle as it becomes available.

An entry form, art contest guidelines, and the list of native turtles that can be illustrated are available on the DEP's Year of the Turtle Web page at www.ct.gov/dep/yearofturtle. This information also can be obtained by contacting the DEP Wildlife Division's Sessions Woods office at P.O. Box 1550, Burlington, CT 06013; 860-675-8130 (Mon-Fri, 8:30 AM-4:30 PM). All entries must be postmarked by June 8, 2011. The native turtles that can be illustrated for this contest include the bog turtle, Eastern box turtle, common musk turtle, common snapping turtle, painted turtle, spotted turtle, wood turtle, Northern diamondback terrapin, Atlantic ridley sea turtle, Atlantic green sea turtle, loggerhead sea turtle, and leatherback sea turtle.

*Attend **Year of the Turtle Day** at Sessions Woods WMA on June 26, from 1:00-4:00 PM. Visit www.ct.gov/dep/yearofturtle or call 860-675-8130 to learn more!*

What You Can Do to Help Turtles

- **Leave turtles in the wild. They should never be kept as pets. Whether collected singly or for the pet trade, turtles that are removed from the wild are no longer able to be a reproducing member of a population. Every turtle removed reduces the ability of the population to maintain itself.**
- **Never release a captive turtle into the wild. It probably would not survive, may not be native to the area, and could introduce diseases to wild populations.**
- **Do not disturb turtles nesting in yards or gardens.**
- **As you drive, watch out for turtles crossing the road. Turtles found crossing roads in June and July are often pregnant females and they should be helped on their way and not collected. Without creating a traffic hazard or compromising safety, drivers are encouraged to avoid running over turtles that are crossing roads. Also, still keeping safety precautions in mind, you may elect to pick up turtles from the road and move them onto the side they are headed. Never relocate a turtle to another area that is far from where you found it.**
- **Do not litter. Turtles and other wildlife may accidentally ingest or become entangled in garbage (especially plastic garbage) and die.**
- **Learn more about turtles and their conservation concerns. Spread the word to others on how they can help Connecticut's box turtle population.**

The Conservation of Tidal Marsh Birds:

Guiding action at the intersection of our changing land and seascapes

Written by Min T. Huang, DEP Wildlife Division, and Chris Elphick, Associate Professor, University of Connecticut

Connecticut, along with several other state partners from Maine to Virginia, is about to embark on a multi-year study to better identify critical areas for tidal marsh bird conservation and identify which tidal marshes and species in the Northeast/Mid-Atlantic are the most sensitive to land and seascape change. This is a wide-ranging and ambitious project, bringing together a diversity of partners, all with a common goal. The partners in this project include state and federal agencies, five major research universities, and many non-governmental conservation groups.

P. J. FUSCO (4)

The clapper rail is a secretive marsh bird that nests exclusively in salt marshes. Its close relative, the king rail, is a freshwater marsh nester.

Importance of Tidal Marshes

Tidal marshes are critically important ecosystems that form the dominant transition zone between terrestrial and marine communities throughout eastern North America. In fact, the eastern North American shoreline possesses the highest level of vertebrate biodiversity of any tidal marsh region in the world. Eastern tidal marshes are home to 83 breeding vertebrate species, 22% of which occur only in tidal marshes, or possess subspecies found only in tidal marshes. However, our tidal marshes also are under some of the greatest environmental stress of any ecosystem in the world.

There are a myriad of factors that negatively impact these sensitive areas, including continued development infringement; nitrification; contamination by heavy metals; spread of invasive plant

From left to right are the saltmarsh sparrow, seaside sparrow, and Nelson's sparrow. Connecticut may harbor 15-20% of the world's breeding population of saltmarsh sparrows.

P. J. FUSCO

Willets readily use salt pannes for foraging in salt marshes. Wetland restoration efforts that restore tidal flow also create/improve salt panne habitat.

and animal species; increases in avian nest predators; widespread ditching and other hydrologic alterations for insect management; and increases in salinity due to the retention of river flows for human use. The single greatest threat to our tidal marshes, however, is likely climate change and associated sea level rise. Apart from altering the vegetative structure and composition of salt marshes, climate change also may impact the unique bird assemblage of the tidal marsh by increasing the frequency and intensity of flooding. Periodicity of flooding and the resulting water levels in the marsh are strong determinants of avian nesting success and productivity, and thus, long-term population viability.

It is estimated that over 50% of Connecticut's original tidal marshes have been lost. Remaining marshes are in various states of degradation due to past alteration (grid ditching), development, and other factors. The situation is similar throughout the northeastern United States. It is unlikely that we could ever substantially increase the amount of functional tidal marsh to benefit the many obligate marsh species that are at high risk. Therefore, it is critical that the relative importance of tidal marshes throughout the region be assessed so that the limited resources that are available to conservation can be best put to use.

Study Will Provide Answers

The new, multi-year study aims to assess avian species and tidal marsh sensitivity to various stressors, and determine the regional importance of each area. To accomplish these goals, the project will estimate the distribution and relative geographic abundance of bird species breeding in tidal high marshes from Maine to Virginia using a combination of passive and broadcast surveys designed by the North American Secretive Marsh Bird Monitoring Program. The majority of effort will be concentrated on five high marsh obligate species (saltmarsh sparrow, Nelson's sparrow, seaside sparrow, willet, and clapper rail). Efforts also will be made to assess abundance of the American black duck and black rail. Additionally, surveys will be conducted for a third suite of species that includes wading birds, Virginia rails, and some of the high marsh fringe songbirds, such as yellow warblers.

Understanding distribution and abundance, however, is only a small part of actually being able to determine vulnerability to climatic change. Management histories of each marsh, where available, will be used to examine current species distribution and abundance relative to past and current management actions. We will then assess nesting density, nesting success, and adult survival of the marsh sparrows. These data will help in the development of population models that will be used in conjunction with regional habitat loss scenarios (e.g., sea level rise) to conduct population viability analyses across the study area. The resulting products will inform managers across the study area about the importance, from a regional and local perspective, of tidal marshes in their states and their regional contribution to the overall persistence of the species being studied. A standardized survey protocol also will be established to provide a platform for long-term monitoring and assessment.

Ultimately, this study will enhance our understanding of the current extinction risk faced by tidal marsh bird species and identify potential ways to minimize risk at local, state, and regional scales. The resulting information will allow immediate actions to be taken where they are most likely to guarantee success, and will quantitatively show both what success should look like and how best to manage local tradeoffs with economic, development, and conservation concerns. More information about the study can be found at www.tidalmarshbirds.org.

This project is funded, in part, through the competitive State Wildlife Grants Program.

State Wildlife Grants

Prescribed Burning on State Lands in Connecticut

Written by Emery Gluck, DEP Division of Forestry

J. STOCKER, UCONN EXTENSION

Prescribed fire, in combination with a harvest of white pine, is used to help restore a pitch pine/scrub oak forest in Hopeville Pond State Park Natural Area, in Griswold.

Historically, fire has had a profound impact on Connecticut's landscape. Periodic fires were once integral to sustaining eastern grasslands, oak savannas, much of the oak forest, and pitch pine/scrub oak forests. The elimination of fire in recent times has led to instability in these ecosystems. Without fire or mowing, woody vegetation quickly reclaims grasslands. Grassland habitat has diminished so much in New England that some butterflies (e.g., fritillaries) and grassland birds (e.g., eastern meadowlark) have experienced sharp population declines.

Grasslands were once created in a variety of ways. Native Americans purposely created extensive grasslands in southern New England by setting frequent fires. The natives also used fire in abandoned agricultural fields to provide habitat for game animals. Numerous smaller inland meadows were created naturally through the work of beavers. These "beaver meadows" appeared after beavers abandoned their dams and the water behind the dams was able to drain out.

After a long period of fire suppression on state land, the DEP Division of Forestry has reintroduced prescribed fires to Connecticut state forests, wildlife management areas, and state parks as an ecological management measure. Repeated prescribed burns are currently being done to maintain little bluestem and other native warm season grasses along the Connecticut coast and Connecticut River, where eastern grasslands historically occurred.

P. J. FUSCO

Prescribed burns create early successional habitat, which benefits many species, including the prairie warbler.

Creating an Oak Savanna

In addition to coastal grasslands, other fields are burned repeatedly to offset the loss of early successional habitat to development and forest succession. Prescribed burns are currently being applied at a site in Nehantic State Forest, in Lyme, to simulate an oak savanna. Oak savannas (open, grassy woodlands) were probably common around Native American villages in southern New England, as the natives frequently burned forests. The forest was burned to improve habitat for game animals, increase berry production, facilitate gathering of firewood and acorns, ease travel, drive game, and eliminate cover that potentially concealed their enemies. Oak savannas have disappeared in Connecticut primarily because of fire exclusion.

After several burns at the Nehantic

After a long period of fire suppression on state land, the DEP Division of Forestry has reintroduced prescribed fires to Connecticut state forests, wildlife management areas, and state parks as an ecological management measure.

E. GLUCK, DEP FORESTRY DIVISION

According to historical accounts, oak forests near Native American populations had open grassy understories. This grassy understory (above) developed after a regeneration harvest and prescribed burn at Nehantic State Forest.

State Forest site, the thin-barked trees (e.g., maples and birches) have succumbed or been weakened by fire injury, while the thick-barked oaks are surviving. The affects from the fire are stimulating the growth of herbaceous vegetation while eliminating or suppressing the woody understory vegetation.

Perpetuating Oak Forests

Prescribed fire also is being applied to help perpetuate oak forests. Except on the driest sites, oak forests are not currently sustaining themselves. Old growth forests on mesic (well-balanced supply of moisture) sites depend on frequent fires and other disturbances to allow new generations of oak to develop and grow into overstory trees. Fire and/or other disturbances are needed to allow adequate sunlight to reach oak seedlings and reduce the competitiveness of shade-tolerant tree and shrub species in the understory. Connecticut's existing oak forests have formed after widespread clearcutting, fires, the abandonment of farmland, and the chestnut blight that occurred near the beginning of the twentieth century. Noticeably under-represented in the present forest are the vigorous, young understory oaks and substantial patches of young oak forest. This can be traced to a precipitous decline in the amount of forest fires, clearcuts, and abandoned farmland in recent years.

An adequate amount of disturbance is needed to sustain oak forests because dense shrubs (e.g., mountain laurel, pepperbush, or hophornbeam) and shade-tolerant understory trees (e.g., American beech) likely prevent oak seedlings from graduating to the overstory. Prescribed fire often top-kills the understory vegetation, only providing a short window for oaks to develop vigorously in the understory. Disturbance in the upper canopy that creates a gap in the overstory is necessary for understory oaks to succeed to the overstory. Historically, canopy disturbances in southern New England have been caused by windthrow from severe storms or mortality from insect and/or disease infestations.

A supervised commercial harvest can mimic the disturbance needed in the overstory. Prescribed burns have been performed in conjunction with commercial harvests to promote the development of even-aged, two-aged, and multiple-aged patches in oak forests. These treatments should help sustain the oak community as part of the forested landscape.

Restoring Pitch Pine/Scrub Oak Ecosystems

The pitch pine/scrub oak sand plain forest is one of 13 imperiled ecosystems in Connecticut. Pitch pine is also known as "candlewood" or "torch pine" because the early settlers and Native Americans used pitch pine staves and pine knots as torches and candles. Candlewood Hill, Candlewood Mountain, and the several Candlewood Roads around the state are so named because of the tree that populates these locales. Prior to the American Revolution, the pines were tapped for turpentine and burned in dirt covered kilns to produce tar and pitch. The numerous Tarkiln Roads and two Tarkiln villages in southern New England are witness to local pineries from the past. Historically, pitch pine ecosystems were more prevalent in the pre-settlement forest because they were sustained by the relatively frequent fires. An estimated 95% of the pitch pine/scrub oak forest has been developed for gravel pits and commercial or residential housing. The remaining pitch pine forests are losing out to succession. Pitch pines are often shaded over by more common and taller trees, such as white pine. Summer fires historically consumed the thick pine litter layer, creating a good seed bed for pitch pine seeds and providing adequate sunlight by killing a substantial number of trees.

DEP is currently using a combination of harvests and prescribed burns to sustain the pitch pine/scrub oak ecosystem. Commercial harvests remove the overtopping white pine and other trees. The harvest increases the chance that the ecosystem can be restored with fire because the logging slash provides an adequate amount of fuel and the openings allow the fuel to dry out.

The land use history of the past 300 plus years and elimination of fire have altered the historic disturbance regime that maintained Connecticut's forest ecosystems. With a combination of well-planned land use practices, such as mowing, the judicious harvest of trees, and the application and management of prescribed fire, there will be a greater likelihood of success in sustaining a diverse landscape on Connecticut's public lands.

Meet the Waterwolf

Written by Ed Machowski, DEP Inland Fisheries Division

The northern pike (*Esox lucius*) (a.k.a. waterwolf, snake, northern, "the luce") is the largest predatory freshwater fish in Connecticut. It also is one of the most popular gamefish across North America and elsewhere around the globe. The pike's sleek body, fin placement, low-slung jaw, and razor-sharp teeth make it a fast, efficient predator. It is this voracity, plus its fighting ability, that endear this fish to so many anglers worldwide.

It may be the fish's behavior, or possibly its appearance, that seem to create a shroud of mystery surrounding the pike. Present day stories from anglers, as well as tall tales in folklore and mythology, abound. The "Mannheim Pike," for example, supposedly lurked in the moat surrounding a medieval German castle and was purported to have lived for 267 years while growing to a shocking 550 pounds (don't go for a swim in that moat!). But, the pike's place in mythology is only half the story. There also are accounts of alchemists using pike hearts and galls to cure pleurisy, pike ashes to treat burns, and pike bones as talismans against witchcraft.

Mythological accounts and folklore aside, pike are capable of growing to incredible sizes for a freshwater fish species (World Record–55 lbs; North American Record–46 lbs; CT State Record–29 lbs). While pike are considered a "cool water" species, they are adaptable to a wide range of environmental and water quality conditions. This adaptability allows northern pike to be the most circumpolar species of the five-member Esocidae family (the other members are redfin pickerel, chain pickerel, muskellunge, and amur pike). The only two environments where pike seldom grow well or survive are lakes that are extremely cold and oligotrophic (poor in nutrients and plant life, but rich in oxygen) and shallow waters that mostly remain very warm. Anything in between these two extremes is suitable for pike survival.

In Connecticut, historic records indicate that pike were introduced into the Connecticut River in the mid-1800s. However, the first waterbody actively managed for pike was Bantam Lake, in Litchfield and Morris, beginning in 1970. Adult pike were procured from Minnesota and stocked into Bantam Lake to help control an out-of-balance (stunted) perch population. This management strategy worked and, at the same time, created an exciting pike fishery. As the pike's popularity soared, the DEP Inland Fisheries Division expanded the program to meet demand. Five more lakes, plus the Connecticut River, were destined to become pike fisheries. Lakes were selected based on a need for a top predator, habitat suitability, geographic location, and forage fish abundance. Today, northern pike provide anglers with more than 20,000 hours of fishing fun in Connecticut, with much of this occurring during ice-fishing season.

DEP INLAND FISHERIES DIVISION

Inland Fisheries Division biologist Ed Machowski releases an adult female pike into a managed spawning marsh.

Although pike can spawn naturally in Connecticut, two elements severely limit natural reproduction: 1) many marshes where pike could spawn have been "cut off" by road crossings and development; and 2) water levels in most marshes drop precipitously following spring freshets, causing unhatched eggs to desiccate and die. Without help from Inland Fisheries Division biologists, there would be very few pike around. Rather than purchasing juvenile pike "fingerlings" from out-of-state sources, biologists use Connecticut marshes to help pike boost their own populations. As a result, nearly 55 acres of managed marshes in Litchfield, Kent, Haddam, and Mansfield allow adult pike to produce an average of 15,000 homegrown progeny annually.

How It Works

Pike spawning coincides with ice-out conditions, snow melt, and spring rains. Marshes and backwater locations in rivers become warm sooner than surrounding deep-water habitats. This temperature difference helps guide pike to their spawning grounds. Emergent grasses, hummock

grass, and submerged brushy vegetation found in shallower marsh areas are necessary for successful spawning. Pike do not create a nest like trout or bass. Instead, females broadcast small eggs into the water over submerged vegetation where males fertilize them. The eggs "stick" to the vegetation, keeping them in oxygen-rich water and out of the mucky, marsh sediment.

Each spring, biologists collect adult pike in nets and traps to stock them directly into the managed marshes. The total number of spawning pike needed is based on the size of females captured and the size of each marsh. Biologists generally stock 10–20 pounds of female pike per acre in each location, while also adding two males for each female. They also monitor conditions and return the adults to the lake/river where captured once the spawning activity ceases.

The speed at which the eggs hatch is dependent on water temperature. The warmer the water, the quicker they hatch. Generally, this process takes about two to three weeks. Newly-hatched pike are fascinating in that they are born with a sucker disc-like mouth. This is another adaptation which keeps the non-swimming young pike attached to vegetation and out of the bottom mud. They begin to swim and actively feed on zooplankton only after the yolk sac is absorbed. The fingerling pike grow to approximately four to five inches long by late June. At this time, the water in each marsh is slowly released through a trap at the marsh's outlet. Biologists capture, count, and measure the fingerlings, stocking them in vegetated areas outside the marsh. Stocking densities are predetermined for each lake and range from two to 15 fingerlings per acre.

While the managed marshes have proven successful in producing fingerling pike, there is a tremendous amount of year-to-year variability in annual production. Many environmental and biological factors (e.g., fertilization success, pH changes, temperature changes, and flooding) ultimately control fingerling production on a yearly basis. The Inland Fisheries Division is currently investigating more efficient ways of managing our marshes and developing methods to reduce annual variations in production. In addition, the Division will be monitoring natural pike reproduction in Mansfield Hollow Reservoir (and possibly Winchester Lake) to determine if natural reproduction alone can support recreational fisheries at those locations.

Trophy Fish Award Program

Written by Bill Gerrish, DEP Inland Fisheries Division

The DEP Inland Fisheries Division has maintained the Trophy Fish Award Program for more than 46 years. Three years ago the Annual Trophy Fish Award Ceremony was established to honor these exceptional anglers. The Award Ceremony recognizes anglers for catching the largest fish in several categories. Those categories include marine and inland species of fish.

The catches have become more impressive each year. Several individuals stood out from the crowd during the Annual Fish Award Ceremony, held on January 19, 2011.

- Daniel E. S. Kornegay III, of East Hampton was recognized as the Angler of the Year. Mr. Kornegay III also received an award for catching and releasing the largest walleye (30.0 inches) and the largest rock bass (11.75 inches).
- Harry C. Barber, of Middlefield, was presented with an award for receiving the most Trophy Fish Awards in one year. Mr. Barber earned nine awards for his skill in harvesting channel catfish in 2010. He also was given the first Lifetime Achievement Award ever issued by the DEP for being the recipient of 74 Trophy Fish Awards. Since 1983, Mr. Barber has earned awards for winter flounder (1), white catfish (1), largemouth bass (3), northern pike (5), brown trout (11), and channel catfish (53).
- Nathan Dean, of Wallingford, was presented with an award for harvesting the largest tiger trout (5 pounds, 0 ounces; 24.0 inches) of any youth in 2010. A tiger trout is a brown trout/brook trout hybrid.

The rules and application form for entering the Trophy Fish Award Program can be found in the 2011 Angler's Guide and at www.ct.gov/dep/fishing.

Inland Fisheries Division Director Peter Aarrestad (left) poses with Daniel E. S. Kornegay III, of East Hampton.

Bill Gerrish (left) of the Inland Fisheries Division poses with Harry C. Barber, of Middlefield.

Inland Fisheries Division Director Peter Aarrestad (left) poses with Nathan Dean, of Wallingford.

PHOTOS PROVIDED BY DEP INLAND FISHERIES DIVISION

Open House at Rainbow Dam Fishway in Windsor

Visit the Rainbow Dam Fishway, in Windsor, on June 4, 2011, from 10:00 AM-3:30 PM. Visitors will be allowed into the counting house to watch migrating fish through the viewing window. Take I-91 to exit 40; go west on Rt. 20 to the Hamilton Road South exit; turn left, then right onto Rainbow Road; the area is 1/4-mile on the left (look for signs).

What's the Buzz About Native Solitary Bees?

Written by Laura Saucier and photography by Nelson DeBarros, DEP Wildlife Division

Scientists have estimated that approximately 4,000 bee species are found in North America. Many people are surprised by this fact as the image of a European honey bee or a bumble bee is what typically comes to mind. In actuality, bees vary in size, coloration, and habits, much like birds do. There are sweat bees that can be bright green in color and measure less than a quarter of an inch long to bumble bees that are yellow and black and well over an inch long. There are bees that only specialize on particular types of flowers, and those that do not create nests at all but lay their eggs in other bee nests. The differences are amazing, but the common thread is that they all drink nectar for sustenance and females use a nest and provision it with pollen and nectar (for the offspring to eat) that they gather from flowers.

Native bees are thought to be responsible for more than 90% of the pollination of North American wildflowers. These plants, in turn, provide food and cover for a multitude of wildlife species. Having such an important role in nature is why bees are considered to be keystone species — that is, a species that helps to support an ecosystem of which they are a part.

What makes a bee a bee? Although related to wasps and ants, bees differ from their close insect relatives in that they have branched hairs all over their bodies, giving them a fuzzy appearance (sometimes only seen under a microscope). These branched hairs are responsible for making bees such great pollinators. Bees fly from bloom to bloom, collecting pollen for their nests and drinking nectar for energy, all the while carrying excess pollen on their furry bodies. This excess pollen is what pollinates the next few flowers the bee visits. It is an ingenious system of plants providing a reward, in the form of nectar, to lure bees to visit them. The bees, subsequently, transport pollen to other plants, ensuring gene exchange among individual plants.

Bee Life History

There are social bees and solitary bees. Most bee species in North America are solitary creatures, meaning that they do not live socially like the European honey bee does. European honey bees (*Apis mellifera*) are domestic bees that live in a hive within a highly-ordered social system that benefits the hive as a whole. Female solitary bees – by themselves – will make a nest, provision that nest with food for their larvae after hatching, and sometimes guard nests from predators and parasites like cuckoo bees. In good nesting habitat, solitary bees may nest in close proximity to one another, giving the appearance of social behavior. However, this aggregation is not social behavior but merely taking advantage of prime real estate.

Approximately 70% of solitary bee species nest in the ground. The other 30% nest in wood, hollow plant stems, or the abandoned nests of other animals, such as small mammals and beetles. Often, the nest is merely a hollowed out chamber in which the female constructs a gallery of compartments. An egg is laid in each compartment, typically on top of a ball of pollen, sometimes call "bee bread," that she has collected. Once an egg hatches, the larva eats the bee bread as it develops into an adult bee.

Based on recent research, scientists believe that approximately 324 species of bees are found in Connecticut. Following are descriptions of a few groups of solitary bees that can be found in your backyard, some noticeable and some less so!

Large Carpenter Bees (Genus Xylocopa)

Only one species represents this group in Connecticut, *Xylocopa virginica*. This carpenter bee is large, with a shiny black abdomen. It sometimes is considered a nuisance to homeowners when it chooses to excavate a nest in a structure. Females excavate nest tunnels in soft or rotten wood and typically will not reuse old nest tunnels. The female will create multiple egg chambers (cells) in a row within the tunnel. Males are protective of the nest that their mate has created and will aggressively defend it, often frightening people by buzzing by them. This behavior is purely for show because male carpenter bees cannot sting (only female bees can sting and carpenter bees rarely sting). Carpenter bees have a habit of "robbing" nectar from flowers that they cannot fit their body into. Because the bee does not enter the bloom but instead cuts a hole at the base of it to gain access to nectar, the flower does not get pollinated.

Squash Bees (Genus Peponapsis)

Squash bees are the best pollinators for our native cucumbers, melons, pumpkins, and squashes. These medium-sized, golden yellow bees are ground nesters that emerge in late summer when squash blossoms begin to appear. Unlike other bees that prefer the warmth of late morning, females forage for pollen and nectar in the early mornings. Males can often be found sleeping in squash flowers in the afternoon.

Mason Bees (Genus Osmia)

Mason bees are small to medium-sized, typically metallic or iridescent, and green to blue in color. They nest in cavities in plant stems or wood. These bees have readily adapted to nesting in blocks of wood with man-made holes drilled in them (called bee blocks). Mason bees construct their nests inside these holes with various materials, such as pieces of leaves and mud. Mason bees are efficient pollinators, especially of orchard crops, such as apples.

Mining Bees (Genus Andrena)

Andrena bees are called mining bees because they are ground nesters. These medium-sized bees are typically green or black. Andrenids are interesting in that they are partial to certain types of plants, unlike most bees that are generalist pollinators. Some species will only collect pollen from a limited range of plants, some only one species of plant.

Green Sweat Bees (Genus Agapostemon)

Green sweat bees are small (around one-third inch in length) and can be entirely bright green or green on the upper body with a yellow and black abdomen. They are ground-nesters that are known to pollinate many different flowers, including strawberry plants. Sweat bees are often attracted to human perspiration, and will land on our skin to collect the salts that are excreted when we sweat.

Leaf-cutter Bees (Genus Megachile)

Leaf-cutter bees are medium-sized and typically have dark

abdomens with light-colored bands. These bees may nest in hollow stems or in the ground, but what unifies this group is that the female will chew off pieces of leaves to use in the construction of a nest. Males are often territorial and will guard a particular patch of flowers, muscling other males away from "their" flowers. Leaf-cutter bees also can be found nesting in man-made bee blocks.

Cuckoo Bees (multiple genuses)

Cuckoo bees are a fascinating group in that they are cleptoparasites. Cleptoparasites lay their eggs in nests of other bee species (like cuckoo birds do to other birds) so that their offspring will hatch and consume provisions left by the host bee. This earns them the name "clepto" as they are stealing the resources of the host larva. Cuckoo bees in the genus *Nomada* specialize in parasitizing the nests of *Adrena* species. Female Nomadids can be seen flying low to the ground searching for *Andrena* nests to parasitize. Cuckoo bees lack the typical fuzzy bee appearance and can vary widely in coloration, from a reddish brown to yellow and black-striped.

(Left) Bees, like this metallic green sweat bee come in many colors and patterns -- not just yellow and black-striped. (Right) Seventy percent of bee species nest in the ground. Leaving sunny areas of your yard free of mulch will benefit bees like this mining bee.

Bee Conservation

Since the 1990s, scientists have detected a decline in bee species that were once quite common. The spread of foreign diseases to our native bumble bees has been implicated in some declines. The reason for the decline in other bee species is still unclear. Native bees, like most wildlife species, are susceptible to habitat fragmentation and degradation by pollution, pesticides, and other environmental stressors. These stressors all take their toll on a species' ability to adapt to its changing environment.

(Left) Green sweat bees are often attracted to human sweat and will land on us to drink it for the salt content. (Right) Squash bees are specialists on the flowers of the squash family (Cucurbitaceae). Mating actually occurs inside the cucurbit flowers.

You Can Help Native Bees

- Avoid pesticides around your home and garden. Pesticides kill more than just pests – they kill many other beneficial insects. Learn about organic lawn care and gardening, and put those techniques into practice.
- If pesticides are necessary, apply them when the plants are not in flower to reduce bee exposure. If the plant is in flower, apply pesticides in the evening when bees are not actively foraging. Use the minimum amount of chemical needed for effectiveness.
- Provide food for bees by planting a variety of native wildflowers that will bloom throughout the growing season.
- Provide nesting habitat in your yard by leaving bare patches of soil (free of mulch) that receive sun. This will provide nesting opportunities for the 70% of bees that nest in the ground. Also, leaving "wild" (unmanicured) areas in your yard will provide dead, woody stems that many other bees use for nesting.

Will attracting bees to your yard mean more opportunities for getting stung? Bees get a bad reputation for causing painful stings, yet wasps, yellow jackets, and hornets are the more likely culprit. For the most part, solitary bees are not aggressive because they do not defend a hive like wasps or social bees do. Also, only female solitary bees sting; males do not have the same ability.

To learn more about native pollinators, visit the Xerces Society Web site at www.xerces.org.

State Wildlife Grants

The Bird with the Bubbly Song - The Bobolink

Article and photography by Paul Fusco, DEP Wildlife Division

The bubbly, plinking song of the male bobolink brightens a spring meadow as the bird perches, singing from the taller weeds that rise above the grass. The bobolink song is a long series of bubbling notes rising in pitch. When one male begins his song, others answer with their own version. At times they will take to the air, hovering in flight like a helicopter, as they sing from an elevated height above the thick grasses of their territories.

Description

Bobolinks are small members of the blackbird family. They are slightly larger than a house sparrow. Their short tail has stiff, pointed feathers, and they have pointed wings. Bobolinks are sometimes also known as reed birds or rice birds.

Male bobolinks have an elegant and unique look during the breeding season. Their plumage is black below and mostly white above, and they have a buffy nape. They are the only North American songbird whose plumage is dark below and light above. Females are quite different and suggestive of a large, buff-colored sparrow with dark streaking on the back and flanks and crown stripes. Females have a large, pinkish bill, while males have a black bill. Males have a similar appearance to females after the breeding season. Immature birds are similar to adult females, but are more yellow with less streaking on the flanks.

In mid- to late summer, bobolinks gather into flocks that may gradually become very large as the birds get ready for the fall migration. At this time, they can be heard giving their typical flight call, a metallic "*pink*."

During the breeding season, male bobolinks are unique in that they are the only songbirds that are light on top and dark on the underside.

Behavior

During the breeding season, bobolinks are found in extensive open grassland habitat, usually wet meadows and hayfields with thick vegetation. They will use agricultural fields and weedy fields with grasses during fall migration. Their fall migration takes them as far south as Argentina, where they spend the winter. Amazingly, their round trip journey is 11,000 miles, the longest of any North American songbird.

Bobolinks are insectivorous during spring and summer, switching to grass seeds, weed seeds, and grain in fall. In fact, large migratory flocks of bobolinks have a history of being destructive to unharvested grain, including rice. Although they have a reputation for causing damage to grain crops, bobolinks provide an incalculable benefit by consuming large amounts of harmful insects and noxious weed seeds.

Breeding

Males arrive at their grassland breeding areas in early May, about a week or two before females. Nesting begins shortly after the females arrive. Simple, open-topped nests are constructed of grass and built on the ground next to

Female bobolinks are slightly larger than a sparrow. They have dark crown stripes, streaking on the back and flanks, and a pinkish bill.

clumps of thick grass or other vegetation. The nests are well concealed.

Bobolinks are polyandrous, meaning that nests may contain eggs that were sired by different males. The normal clutch size is four to seven eggs. Incubation takes about 12 days. Young are fed by both adults and they leave the nest after about 10 days. Young tend to wander around in the grass for a few more days before learning to fly. At this stage, the young birds are extremely vulnerable.

Conservation

Unfortunately, the bubbly song of the bobolink has been disappearing from Connecticut's landscape as the bird has experienced a widespread decline in the Northeast. The bobolink is listed as a Connecticut Species of Special Concern.

In the early twentieth century, before migratory bird protection laws were enacted, bobolinks were shot in large numbers in the southern states during fall migration. Farmers would kill the birds by the thousands when they stopped to feed on grain and rice crops before the crops could be harvested. It was common practice for farmers to wait until the birds had the chance to fatten up before killing them so that they would fetch a higher price at market.

Although those days are long gone, bobolinks have never recovered their former numbers in our region. They now are facing new threats from early haying practices that impede their breeding success and habitat loss due to succession and development. Bobolink populations also are affected by pesticide use and heavy hunting on their South American wintering grounds, where they are still considered agricultural pests.

When hayfields are mowed can make the difference between sustaining a bobolink colony or losing it. Bobolinks have high site fidelity, meaning that birds from successful breeding colonies return to the same site year after year. Sites with birds that are unsuccessful in breeding and raising young will die out. Farmers who have bird conservation in mind know that the proper time to mow a bobolink field is two weeks after young have fledged the nest, which in Connecticut is in early to mid-July. This time frame gives the young birds time to build their flight muscles and gain strength. Of course, the insects that bobolinks depend on for food are also affected by mowing.

The Wildlife Division has been, and is currently, monitoring grassland bird populations. The DEP began a statewide Grassland Habitat Initiative in 2006 with funding from the federal State Wildlife Grants Program. By partnering with other state agencies, agricultural groups, and non-governmental organizations, a working committee was tasked with establishing grassland conservation goals. Ongoing field surveys, mapping, data collection, and land use assessments have allowed staff to assign conservation priorities.

Maintaining and managing healthy grassland habitat is a top priority that will benefit all of Connecticut's grassland species. The bobolink's future in our state depends on the stewardship of declining grassland habitat and ensuring that field mowing schedules are enabling the birds to raise their young successfully.

Zebra Mussels in Western Connecticut

A well-known aquatic invader expands its range in New England

Article and Photography by Barb St. John White, Research Biologist, Biodrawversity LLC

Zebra mussels (*Dreissena polymorpha*) are small bivalve mollusks native to drainages of the Black and Caspian Seas in Russia and Eastern Europe. They were first introduced to the United States during the late 1980s in the ballast of ships passing through the St. Lawrence Seaway, and are now one of the most ecologically significant invasive species in North America.

This zebra mussel was one of several discovered in the Housatonic River impoundments of Lake Zoar and Lake Lillinonah in southwest Connecticut during fall 2010.

The Invasion

The first records of zebra mussels outside their native range are from the late eighteenth and early nineteenth centuries, when they spread through canal systems across Western Europe. Zebra mussels were first found in North America in Lake St. Clair, between Lake Erie and Lake Huron, in 1988. By the mid-1990s, they were documented throughout the Great Lakes region and in 20 states in the United States, having moved as far east as the Hudson River in New York, Lake Champlain in Vermont, and East Twin Lake in northwestern Connecticut.

In the Northeast, zebra mussels remained primarily within the Hudson and Lake Champlain watersheds until 2009, when they were discovered in Laurel Lake in the Housatonic River in Massachusetts. Most recently, during fall 2010, limited numbers of mostly young animals (less than 20 millimeters in length) were found at several locations in the impoundments of Lake Lillinonah and Lake Zoar in the lower Housatonic River in southwest Connecticut. It is likely these animals were only just introduced, and while they may have come from an upstream source or been transported by recreational boaters, their exact origin is unknown.

Adult zebra mussels rarely reach more than 50 millimeters in length. Their black-and-white striped shells consist of two valves joined by a hinge, the same as other bivalve clams and mussels. The ventral side, or bottom, is flat, and the mussels attach to rocks or other hard substrates by fibers called byssal threads. Zebra mussels can inhabit both lakes and rivers, although they prefer lake habitats or areas of slow-moving water. They may occur sparsely or in high densities, completely covering the surfaces they colonize. They feed by filtering algae, small zooplankton, bacteria, and other particulate matter from the water. A single adult can filter approximately one liter of water per day.

As veligers, or larvae, zebra mussels are no more than 200 thousandths of a millimeter in size, invisible without a microscope. In one season, a single female mussel releases several hundred thousand veligers directly into the water. The microscopic larvae float freely and are dispersed by currents, easily moving more than 50 miles downstream in a river before settling in new locations. Adult zebra mussels have few natural predators of significance in North America, although some fish and aquatic birds are known to consume them in moderate quantities.

While zebra mussels seem to spread easily, research tells us they are not likely to become established in waterbodies with a pH below 7.4 and calcium levels less than 12.0 mg/liter. Streams and lakes with calcareous underlying geology, including those in the Western New England Marble Valleys of the upper Housatonic River in Massachusetts and northwest Connecticut, are highly susceptible to colonization. Lake Zoar and Lake Lillinonah, further downstream, are less alkaline and at lower risk. In both impoundments, pH is near 7.5, just over the minimum zebra mussels require. Calcium concentrations in Lake Zoar are approximately 17.0 mg/L, and 23.0 mg/L in Lake Lillinonah, making them moderately susceptible. Continued monitoring of the populations in the impoundments and vigilance on the part of local residents and visitors will be important in preventing further colonization.

Ecological Impacts

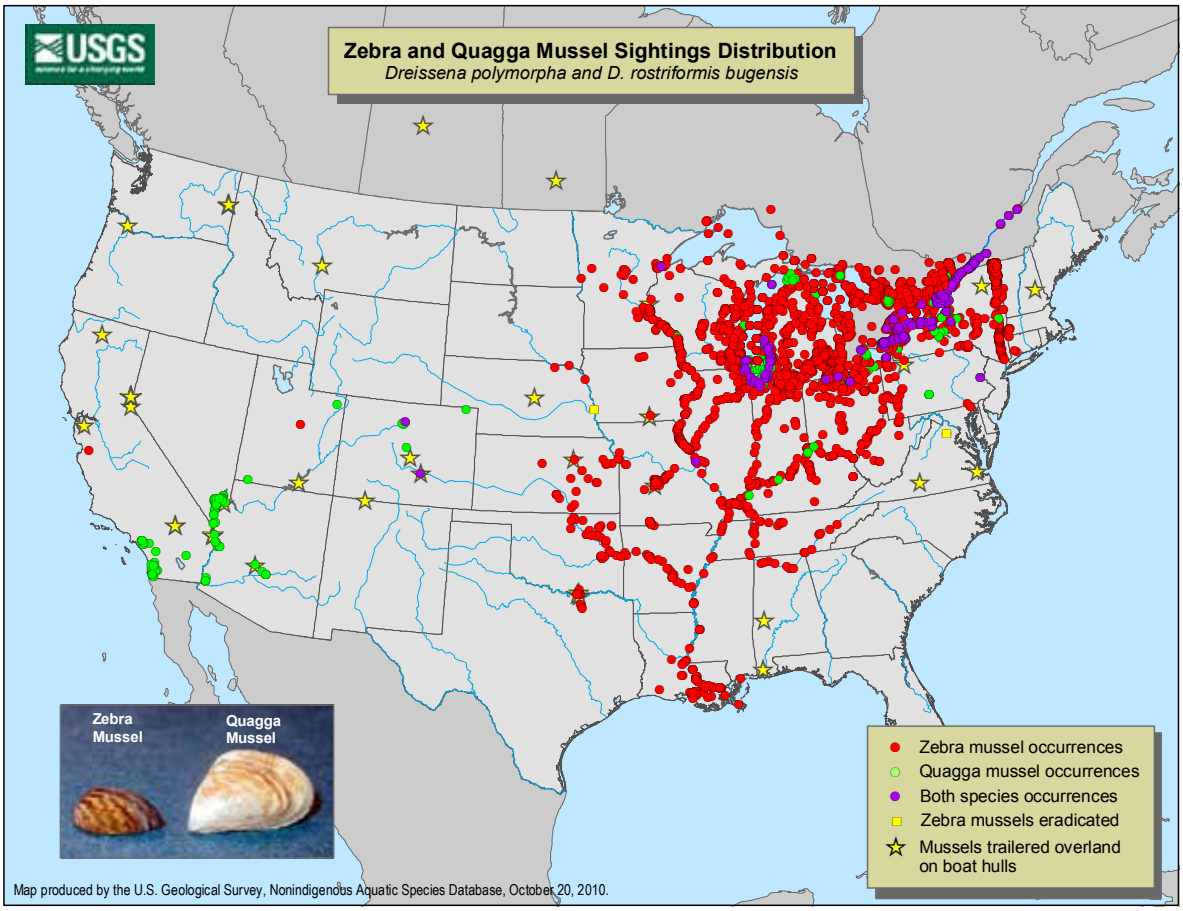
Zebra mussels can have significant ecological impacts. They will attach to any hard underwater surfaces, including rocky substrates, boats, dock installations, water intake pipes, and even native freshwater mussels. They may occur at densities as high as several thousand adult mussels per square meter, and can severely alter availability and quality of habitat of the benthos (bottom) of streams and lakes.

Aside from physical changes that are easily seen, zebra mussels also transform ecosystems in drastic ways that may not be noticed by the casual observer. Because zebra mussels filter vast quantities of suspended material from the water and digest and deposit this material on the bottom as pseudofaeces, food sources for bacteria and invertebrates and ultimately other organisms are depleted

and transferred to lake or stream bottoms. This shift in resources effectively alters basic properties of food webs and destabilizes important established processes of many aquatic ecosystems.

Closely tied to the ecological impacts of zebra mussels are their direct economic costs, which are estimated to be in the billions of dollars in the United States alone. These costs are associated with a variety of damages, including loss of function in industrial facilities whose operations are impeded by biofouling, damage to ships and ports, and the loss of native sport fisheries.

In the United States, approximately 50,000 alien and invasive species like the zebra mussel continue to disrupt long-established steady states of ecosystems they inhabit, generating unprecedented ecological damages and economic costs. People and their activities are intricately linked to ongoing introductions and the spread of these species. Through our own preventive actions we have the ability to slow or put a stop to further introductions.



How to Help

In the case of zebra mussels, vigilance and precautionary measures on the part of local residents, anglers, boaters, and anyone else in close contact with streams and lakes is critical. Bilge water, live wells, and engine cooling water of boats should be discarded before leaving a boat launch, and boats and equipment should be rinsed with a bleach solution, if possible. Bait buckets should never be emptied into a lake or stream. It also is important that fish, crayfish, or plants never be transported among waterbodies.

The DEP is monitoring for the presence of zebra mussels at Lake Zoar, Lake Lillinonah, and other locations throughout the state. Possible sightings of zebra mussels should be reported to the DEP's Inland Fisheries Division at 860-424-3474.

Learn More About Zebra Mussels

More information on zebra mussels and other aquatic nuisance species can be found on the DEP website (www.ct.gov/dep).

Other sources of information include:

- **Rhode Island Sea Grant Fact Sheet: Zebra Mussel: An Unwelcome Visitor (http://seagrant.gso.uri.edu/factsheets/zebra_mussel.html)**
- **USGS Zebra and Quagga Mussel Information Resource Page (http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/)**
- **Information Crossfile -- Lessons from the mollusk that made headlines, ParkScience (www.nature.nps.gov/ParkScience/index.cfm?ArticleID=389).**

Tips for Preventing the Spread of Aquatic Nuisance Species

- **Avoid boating through dense beds of aquatic plants.**
- **Inspect your boat and trailer, removing all visible aquatic organisms (zebra mussels and any aquatic plants) from boat, propeller, anchor, lines, and trailer before leaving any body of water. Discard vegetation in trash away from water and the shore.**
- **Drain your boat motor, wet well, and bilge on land before leaving the waterbody to remove larval stages.**
- **Flush engine cooling system, bilge areas, and live wells with tap water.**
- **Dry out your boat for at least two days (five is best) or wash down hull with tap water on land before launching again.**
- **Do not throw purchased bait or vegetative packing material from bait into the water when you are done fishing. Small organisms can live on the plant material used to keep the bait moist.**

Connecticut State Parks – Adventure is Waiting for You

Written by Diane Joy, DEP Division of State Parks & Public Outreach

With an area of just a little over 5,000 square miles, Connecticut has 107 state parks and 32 state forests, quite remarkable for the third smallest state in the nation and the fourth most densely populated. Within 10 minutes of most people's homes is the opportunity to visit one of these fabulous locations. Wildlife viewing is just one of the many activities you can do in Connecticut State Parks and Forests. Whether you are looking for a marsh wren or a little blue heron – Sherwood Island State Park in Westport is the place to go. Stop by the Sherwood Island Nature Center to see the exhibits and also take some time to appreciate the beautiful bird photographs on display by A.J. Hand.

S. BATTISTINI, DEP STATE PARKS LIFEGUARD PROGRAM

A beautiful summer day at Rocky Neck State Park in East Lyme.

You can enjoy the sun and surf at Rocky Neck State Park in East Lyme; catch a trout at Southford Falls in Southbury; paddle a canoe or kayak in Mashapaug Pond at Bigelow Hollow in Union; or enjoy a picnic lunch and hike to the tower at Sleeping Giant in Hamden. Perhaps you prefer bicycling or horseback riding on the Air Line Trail, which travels along an old railroad route for over 50 miles in eastern Connecticut, from Salmon River State Park in East Hampton all the way to the Massachusetts border just past Quaddick State Park in Thompson.

Are you a history buff? Take a step back in time as you visit Putnam Memorial State Park in Redding, the site of the 1779 Continental Army's winter encampment. Love dinosaurs? Then travel back 200 million years to the Jurassic Period when dinosaurs roamed the earth and left their tracks at Dinosaur State Park in Rocky Hill.

Whether you prefer waking up to the smell of salt air at Hammonasset Beach State Park (Madison), located on Long Island Sound, or hearing the roar of the Farmington River as you camp at the Austin F. Hawes Memorial Campground (Barkhamsted), the opportunities are endless. There are campgrounds at 11 state parks and two state forests. Reservations can be made at www.ReserveAmerica.com or by calling toll free at 1-877-668-CAMP (2267). Find out more information about camping at www.ct.gov/dep/camping.

C. FURBUSH, DEP COMMUNICATIONS & PUBLICATIONS

Trying out fishing during the No Child Left Inside®: The Great Park Pursuit, at Squantz Pond State Park, in New Fairfield.

The DEP's No Child Left Inside® (NCLI®) program has teamed up with the Connecticut Library Consortium to provide **State Park Day Passes** for each of the 169 town main libraries. Similar to checking out a book, you can check out a State Park Day Pass. Show your Day Pass at the ticket booth and it will allow you to park for free at the sites where there is a parking fee or obtain access for a limited number of people to Dinosaur, Fort Trumbull, or Gillette Castle State Parks.

No Child Left Inside® has been actively engaging families in the pursuit of outdoor adventures for the past five years. This year there is a slightly new twist to the NCLI® Great Park Pursuit — it is the Great Park Pursuit Outdoor Recreation Challenge. A booklet has been created that will serve as your family's passport to the challenge. Within the booklet is a list of 10 or more state park and forest locations that have been determined by DEP staff to be "the best" for fishing, swimming, hiking, biking, camping, letterboxing, boating, birding, picnicking, winter activities, and historic sites. A box containing a stamp will be at each of the locations so you can keep track of all your visits. To download a copy of the "Great Park Pursuit: Outdoor Recreation Challenge" passport or for additional information on Family Days associated with the challenge, go to www.NoChildLeftInside.org. Whether you want a challenge or a walk in the park – Connecticut state parks and forests are wonderful places waiting to be discovered.

Purchase a Season Pass for State Parks

Many of the state parks and forests do not charge a parking fee and others charge only on weekends and holidays. The frequent park visitor can purchase a "Season Pass" for only $67 (CT residents), which allows unlimited vehicle access. Purchase the pass online at the DEP Store (www.ctdepstore.com) and affix it to the window of your vehicle. Connecticut residents 65 years of age or older can get a free Charter Oak Pass, which allows unlimited access to state Parks and forests.

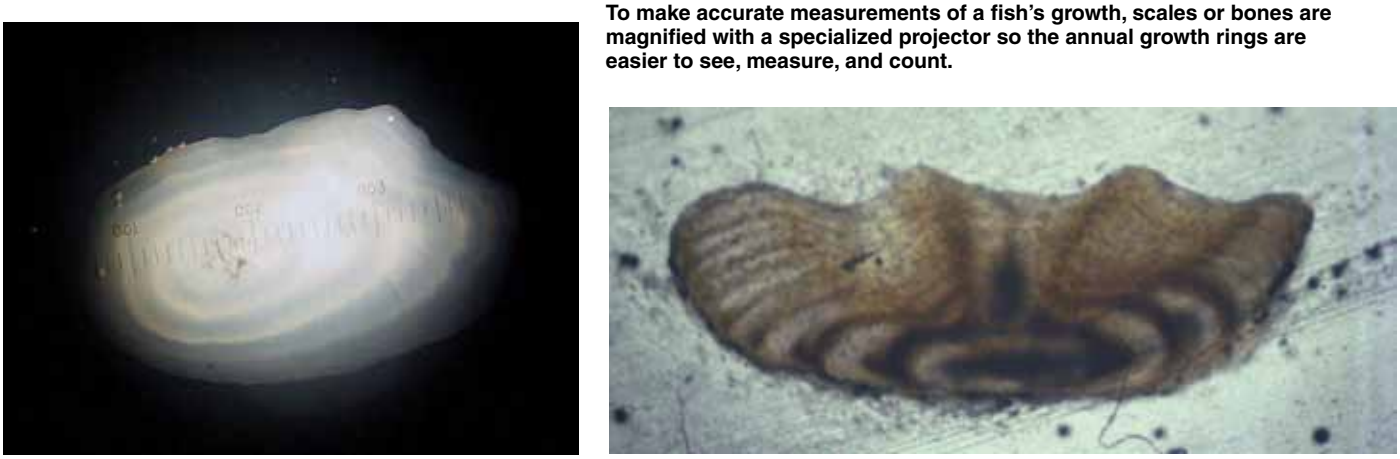
How Old Is this Fish?

Written by Penny Howell,
DEP Marine Fisheries Division: Photos provided bt DEP Marine Fisheries Division

DEP marine biologists use several techniques to age different species of fish so their rate of growth and reproduction can be tracked. Fish grow faster when the water is warm, but grow slower, or not at all, when it is cold. Various growth periods show up differently on the fish's scales, bones, or other 'hard parts.' During fast growth periods, the scale or bone is laid down thinly with little color, while a slow growth period leaves a thicker, dark ring.

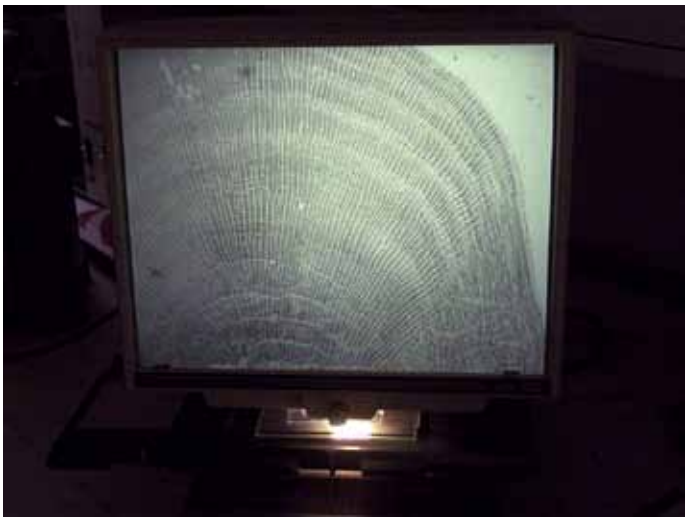
Often, these rings can be seen by holding a cleaned fish scale in front of a bright light. A more accurate count requires magnification and, if the fish is old, sometimes the thicker bones may need to be cross-sectioned with a specially designed diamond-blade cutter.

To make accurate measurements of a fish's growth, scales or bones are magnified with a specialized projector so the annual growth rings are easier to see, measure, and count.



The growth rings on a six-year-old winter flounder otolith (ear bone) are fairly clear (right) when magnified whole under a microscope. But, the otolith from a 10-year-old required cross-sectioning (left) to reveal clearer thick and thin rings. The image is more highly magnified in a microfiche reader with a built-in measurement scale.

Bones, like these operculars (gill covers) from a tautog, show large growth rings at the base when the fish was young. Smaller rings can be seen on the edge when the fish was older and its growth slowed. A large bone is needed to age tautog because they can live to be 20 to 30 years old.



This magnified image of a summer flounder scale shows very clear annual growth rings. The image is a negative of the actual scale so the light lines mark every fall when growth stops, and the darker areas represent fast summer growth.

Injured Golden Eagle Rehabilitated and Released in CT

In late March 2011, Audubon Sharon, the DEP Wildlife Division, and rehabilitators from Tufts University released a golden eagle at Mohawk State Forest in Cornwall. The eagle had been found by snowmobilers in early February in Amenia, New York, near the New York/Connecticut border. The bird had sustained multiple puncture wounds on its leg (possibly from an animal it was trying to capture). It was transported over the border by the people who found it and taken to the Sharon Audubon Center in Sharon, Connecticut. The nature center staff took it to Kensington Animal Hospital for examination and then to rehabilitator Mary Beth Kaeser in Ashford, who then transferred it to the Tufts Wildlife Clinic and Center for Conservation Medicine in North Grafton, Massachusetts. The bird was cared for by the medical staff at Tufts for over a month, eventually making a complete recovery and regaining full mobility of its injured leg and foot. The eagle was fitted with a leg band and GPS-GSM telemetry by Dr. Todd Katzner, a professor at West Virginia University. Dr. Katzner has fitted about 25 golden eagles with telemetry gear since 2006 for the purpose of studying the eastern population of North America's golden eagles. This population is small, geographically separate, and potentially genetically distinct from western populations. Eagles from the eastern population breed in northeastern Canada and winter in the southern Appalachians, so it is only possible to find this species in Connecticut during migration or in the winter.

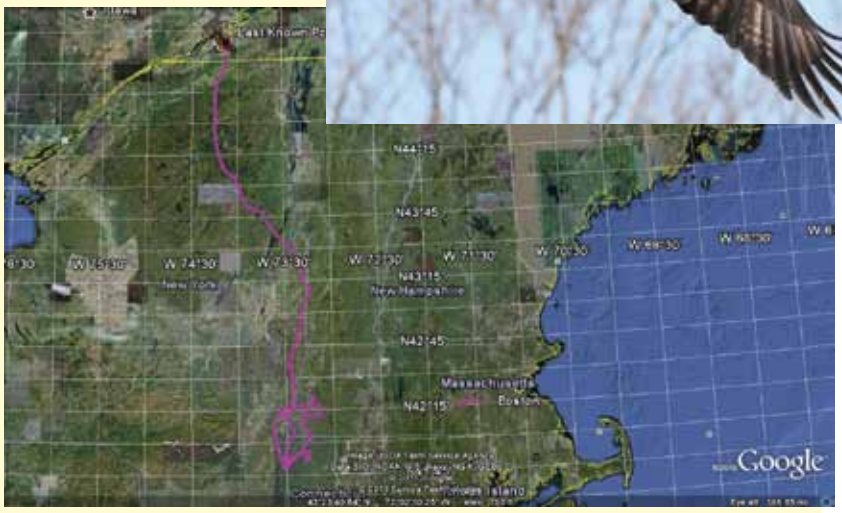
P. J. FUSCO (2)

Dr. Todd Katzner and Emily Christianson from Tufts Wildlife Clinic prepare to release the eagle at Mohawk State Forest.

This successful release was a team effort that included volunteers at Sharon Audubon Center who cared for the bird, Connecticut veterinarians who donated their time and efforts, the rehabilitator who transported the bird to Tufts University, the veterinarians at Tufts, Dr. Katzner, and the DEP.

Solar Powered Satellite Transmitter Used in Eagle Release

The solar powered transmitter was attached to the bird's back with a harness (seen in photo at right). It records GPS location points from satellites and transmits those data points through cell phone technology. The map shows the eagle's movements over the three weeks following its release. After remaining in the area for a while, the bird traveled north, up the Hudson River Valley, over the Adirondack Mountains in upstate New York, and on into southern Quebec.



Eastern Box Turtle

State Species of Special Concern

Terrapene carolina carolina

P. J. FUSCO

Description

The eastern box turtle is probably the most familiar turtle found in Connecticut. It has a high-domed carapace (top shell) with irregular yellow or orange blotches on a brown to black background that mimic sunlight dappling on the forest floor. The plastron (bottom shell) may be brown or black and have an irregular pattern of cream or yellow. The length of the carapace usually ranges from 4.5 to 6.5 inches, but can measure up to eight inches long. The shell is made up of a combination of scales and bones, and it includes the ribs and much of the backbone.

Each individual turtle has distinctive head markings. Males usually have red eyes and a concave plastron, while females have brown eyes and a flat plastron. Box turtles also have a horny beak, stout limbs, and feet that are webbed at the base. This turtle gets its name from its ability to completely withdraw into its shell, closing itself in with a hinged plastron.

Habitat and Diet

This terrestrial turtle lives in a variety of habitats, including woodlands, field edges, thickets, marshes, bogs, and stream banks. It is typically found in well-drained forest bottomlands and open deciduous forests. Wetland areas also are used. During the hottest part of a summer day, box turtles will find springs and seepages where they can burrow into the moist soil. Activity is restricted to mornings and evenings during summer, with little to no nighttime activity, except for egg-laying females. Box turtles have a limited home range where they spend their entire life, ranging from 0.5 to 10 acres (usually less than 2 acres).

Box turtles are omnivorous and will feed on a variety of food items, including earthworms, slugs, snails, insects, frogs, toads, small snakes, carrion, leaves, grass, berries, fruits, and fungi.

Life History

From October to April, box turtles hibernate by burrowing into loose soil, decaying vegetation, and mud. They tend to hibernate in woodlands, on the edge of woodlands, and sometimes near closed canopy wetlands in the forest. Box turtles may return to the same place to hibernate year after year. As soon as they come out of hibernation, the turtles begin feeding and searching for mates.

The breeding season begins in April and may continue through fall. Box turtles usually do not breed until they are about 10 years old. They have a long lifespan, which can range up to 50 to even over 100 years of age. Females do not have to mate every year to lay eggs as they can store sperm for up to four years. In mid-May to late June, females will travel from a few feet to more than a mile within their home range to find a location to dig a nest and lay their eggs. The three to eight eggs are covered with soil and left to be warmed by the sun. During this vulnerable time, skunks, foxes, snakes, crows, and raccoons often raid nests, sometimes destroying the entire nest.

Eggs hatch in late summer to early fall (about 2 months after being laid). If they hatch in fall, the young turtles may spend the winter in the nest and come out the following spring. As soon as the young turtles hatch, they are on their own and receive no care from the adults. This is a dangerous time for young box turtles because they do not develop the hinge for closing into their shell until they are about four to five years old. Until then, they cannot entirely retreat into their shells. Raccoons, skunks, foxes, dogs, and some birds will prey on young turtles.

Conservation Concerns

The box turtle was once common throughout the state, mostly in the central Connecticut lowlands. However, its distribution is now spotty, although where found, turtles may be locally abundant. Because of the population decline, the box turtle was added to Connecticut's List of Endangered and Threatened Species as a species of special concern when the list was revised in 1998. The box turtle also is protected from international trade by the 1994 Convention on International Trade in Endangered Species (CITES) treaty. It is of conservation concern in all the states at its northeastern range limit, which includes southern New England and southeastern New York.

Many states, including Connecticut, have laws that protect box turtles and prohibit their collection from the wild. State regulations provide some protection, but not enough to combat the even bigger threats these animals face, such as loss and fragmentation of habitat due to deforestation and suburban development; vehicle strikes on the busy roads that bisect the landscape; and indiscriminate and illegal collection of individuals for pets. Loss of habitat for shelter, feeding, hibernation, and nesting is probably the greatest threat of all to turtles. As remaining habitat is fragmented into smaller pieces, turtle populations can become small and isolated.

Adult box turtles are relatively free from predators due to their unique, hard shells. However, the shell is not hard enough to protect turtles that are run over by vehicles. Most vehicle fatalities are pregnant females searching for nest sites.

Wood Turtle

Glyptemys insculpta

State Species of Special Concern

P. J. FUSCO

Background and Range

Wood turtles may be found throughout Connecticut, but they have become increasingly rare due to their complex habitat needs. Wood turtles also have become more scarce in Fairfield County due to the fragmentation of suitable habitat by urban development.

Wood turtles can be found across the northeastern United States into parts of Canada. They range from Nova Scotia through New England, south into northern Virginia, and west through the Great Lakes region into Minnesota.

Description

The scientific name of the wood turtle, *Glyptemys insculpta*, refers to the deeply sculptured or chiseled pattern found on the carapace (top shell). This part of the shell is dark brown or black and may have an array of faint yellow lines radiating from the center of each chiseled, pyramid-like segment due to tannins and minerals accumulating between ridges. These segments of the carapace, as well as those of the plastron (bottom shell), are called scutes. The carapace also is keeled, with a noticeable ridge running from front to back. The plastron is yellow with large dark blotches in the outer corners of each scute. The black or dark brown head and upper limbs are contrasted by brighter pigments ranging from red and orange to a pale yellow on the throat and limb undersides. Orange hues are most typical for New England's wood turtles. The hind feet are only slightly webbed, and the tail is long and thick at the base. Adults weigh approximately 1.5 to 2.5 pounds and reach a length of five to nine inches.

Habitat and Diet

Wood turtles use aquatic and terrestrial habitats at different times of the year. Their habitats include rivers and large streams, riparian forests (adjacent to rivers), wetlands, hayfields, and other early successional habitats. Terrestrial habitat that is usually within 1,000 feet of a suitable stream or river is most likely used. Preferred stream conditions include moderate flow, sandy or gravelly bottoms, and muddy banks.

Wood turtles are omnivorous and opportunistic. They are not picky eaters and will readily consume slugs, worms, tadpoles, insects, algae, wild fruits, leaves, grass, moss, and carrion.

Life History

From late spring to early fall, wood turtles can be found roaming their aquatic or terrestrial habitats. However, once temperatures drop in autumn, the turtles retreat to rivers and large streams for hibernation. The winter is spent underwater, often tucked away below undercut riverbanks within exposed tree roots. Dissolved oxygen is extracted from the water, allowing the turtle to remain submerged entirely until the arrival of spring. Once warmer weather sets in, the turtles will become increasingly more active, eventually leaving the water to begin foraging for food and searching for mates. Travel up or down stream is most likely, as turtles seldom stray very far from their riparian habitats.

Females nest in spring to early summer, depositing anywhere from four to 12 eggs into a nest dug out of soft soil, typically in sandy deposits along stream banks or other areas of loose soil. The eggs hatch in late summer or fall and the young turtles may either emerge or remain in the nest for winter hibernation. As soon as the young turtles hatch, they are on their own and receive no care from the adults.

Turtle eggs and hatchlings are heavily preyed upon by a wide variety of predators, ranging from raccoons to birds and snakes. High rates of nest predation and hatchling mortality, paired with the lengthy amount of time it takes for wood turtles to reach sexual maturity, present a challenge to maintaining sustainable populations. Wood turtles live upwards of 40 to 60 years, possibly more.

Conservation Concerns

Loss and fragmentation of habitat are the greatest threats to wood turtles. Many remaining populations in Connecticut are low in numbers and isolated from one another by human-dominated landscapes. Turtles forced to venture farther and farther from appropriate habitat to find mates and nesting sites are more likely to be run over by cars, attacked by predators, or collected by people as pets. Other sources of mortality include entanglements in litter and debris left behind by people, as well as strikes from mowing equipment used to maintain hayfields and other early successional habitats.

The wood turtle is imperiled throughout a large portion of its range and was placed under international trade regulatory protection through the Convention on International Trade in Endangered Species (CITES) in 1992. Wood turtles also have been included on the International Union for Conservation of Nature's (IUCN) Red List as a vulnerable species since 1996. They are listed as a species of special concern in Connecticut and protected by the Connecticut Endangered Species Act.

Results for the 2010 Fall Wild Turkey Hunting Seasons

Written by Michael Gregonis, DEP Wildlife Division

Hunters have many choices regarding which game species they would prefer to hunt during the fall period. Based on permit issuance and overall harvest, fall wild turkey hunting often takes a back seat to deer and small game hunting. However, for those individuals looking for a challenge, Connecticut's fall archery and firearms seasons offer that.

Fall Archery Season

Many bowhunters purchase a fall archery turkey permit hoping for a chance encounter with a turkey while deer hunting. The archery turkey and deer seasons run concurrently, extending to the end of January in some areas of the state. A total of 1,862 permits were issued during 2010 and 50 birds were harvested. Forty-seven hunters harvested at least one turkey for a 2.5% statewide success rate. The fall archery harvest consisted of 40% adult females, 28% adult males, 23% juvenile females, and nine percent juvenile males. Harvest increased by 22% from 2009 and permit issuance dropped by 26%. Only three archers were successful in harvesting two birds. At least one bird was harvested from 38 of Connecticut's 169 towns. Newtown (5 birds) and Thompson (3 birds) recorded the highest harvest. On a regional basis, wild turkey management zones 11 (16 birds), 5 (8 birds), and 1 (5 birds) recorded the highest harvest.

Fall Firearms Season

The fall firearms turkey season continues to be the more popular of the fall turkey seasons. A total of 2,444 permits were issued in 2010 and 64 turkeys were harvested, resulting in a statewide success rate of two percent. Private land hunters harvested seven times more birds than state land hunters (56 birds versus 8 birds). Harvest did not change from 2009; however, permit issuance declined by 26%. The harvest included 36% adult females, 22% juvenile females, 22% juvenile males, and 20% adult males. Turkeys were harvested from 35 towns with Stafford and Willington (both 4 birds) reporting the highest harvest.

Turkey management zones 4A (11 birds), 2 (8 birds), and 5 (8 birds) recorded the highest harvest.

Connecticut continues to have liberal fall turkey hunting seasons and bag limits. A fall hunter could potentially harvest two birds with archery equipment, and one bird on state land and two birds on private land with a shotgun. The fall archery season length in some areas of Connecticut can run for over 120 days and the firearms season runs from the first Saturday in October to the end of the month. Besides the challenge of fall turkey hunting, the rewards of enjoying the fall foliage and fine table fare are also outstanding.

P.J. FUSCO

Report Turkey Brood Sightings

The Wildlife Division conducts the annual Wild Turkey Brood Survey to estimate the average number of turkey poults (young-of-the-year) per hen statewide and to assess annual fluctuations in the turkey population. This index allows the Division to gauge reproductive success each year and to evaluate recruitment of new birds into the fall population. Weather, predation, and habitat conditions during the breeding and brood-rearing seasons can all significantly impact nest success, hen survival, and poult survival.

What's involved? From June 1 to August 31, volunteers and Department staff record all of the hens and poults observed during normal travel. Each observation is categorized by total number of hens observed, total poults, and total number of hens with poults. Observations of male (tom) turkeys are not requested for this survey. If you would like to participate, download a DEP Wild Turkey Observation Form to record your observations (www.ct.gov/dep/wildlife; click on "Volunteer Opportunities" under the Featured Links box on the right). Instructions are on the data sheet. This is a great way to partner with the Wildlife Division to help monitor the state's wild turkey population.

FROM THE FIELD

Call for Help

Do you have a bat house/colony on your property, or enjoy watching bats emerge in the early evening to forage? If so, please consider being a bat citizen scientist for the Wildlife Division! Assistance is needed with summer maternity roost counts and the Division is asking for your help. Please contact Jen Pacelli at the Sessions Woods office (860-675-8130) to express your interest in volunteering or to report your bat colony.

In addition, if you find a dead bat, please let us know as we may want to collect the specimen for additional research. We also are interested in collecting other specimens, such as small mammals, weasels, and owl pellets.

The Wildlife Division appreciates any help citizen scientists can provide as we continue to gather knowledge about Connecticut's bats and other small mammals.

Jen Pacelli, DEP Wildlife Division

Wildlife Division Welcomes Nelson DeBarros

The Wildlife Division is pleased to welcome a new plant ecologist to the Natural Diversity Data Base program. Nelson DeBarros joined the Division in mid-January. A graduate of Providence College and Pennsylvania State University, Nelson brings a diverse knowledge of plant ecology and conservation. He has worked with the New England Wildflower Society on rare and state and federally listed plant conservation, and the Association to Preserve Cape Cod to identify and monitor the flora and fauna of tidal-restricted coastal saltmarshes. Nelson also has taught plant identification at both the undergraduate and graduate levels.

An expert in the flora resource provisioning of wild bees, he has published technical papers and general outreach materials on bee conservation, habitat enhancements for pollinator conservation, and landscaping for beneficial insects. Among his many activities, Nelson has helped design and establish a community garden and does technical illustrations of plants. Despite his short time on the job, Nelson has already provided assistance in completing environmental reviews for state-listed plants and rare ecological communities and has started to make headway on the numerous plant conservation projects that were put on hold when Ken Metzler retired from the Division in 2009. Other wildlife staff are looking forward to the 2011 field season and the ability to have a plant ecologist aid in the management and conservation of wildlife habitats.

Jenny Dickson, DEP Wildlife Division

P. J. FUSCO

Peregrine Watch at the Travelers Tower

Birders, students, and any others interested in the peregrine falcon have an opportunity to once again monitor the progress of a nesting pair of falcons on the Travelers Tower in Hartford. The *Peregrine Watch at the Travelers Tower* web cam is up and running, providing constant views of the nesting platform. As of March 29, the female was tending to four eggs in the nest. The web cam can be accessed at www.falconcam.travelers.com. You also can visit the DEP Web site to learn more about peregrine falcons (www.ct.gov/dep/wildlife; click on "Learn About CT's Wildlife") The peregrine web cam is possible through a partnership among The Children's Museum, Travelers Insurance, and the DEP.

Junior Naturalist Series at the Belding Wildlife Management Area

The Junior Naturalist programs at Belding WMA in Vernon are for children of all ages. There is no fee to participate and children can sign up for one or more programs. Registration is required; please call 860-306-5418. Programs start at 9:00 AM and end by 12:00 noon. Parking for Belding WMA is on Bread and Milk Road in Vernon.

June 30 – Birds. What makes a bird a bird? Where do birds live? What kinds of homes do they make? See and hear a variety of birds, look at bird homes, and play a bird game or two.

July 7 – Butterflies, Dragonflies, Ladybugs, Beetles! How many different kinds of butterflies are there? What do dragonflies eat? Can you make a hoverfly land on your finger? Walk the wildflower meadow looking for all kinds of fascinating insects.

July 14 – Plants. Take a walk around the fields, forest, and wetlands to see where different plants grow and learn how to identify them. Learn about native plants vs. ALIENS! After the walk, use certain plants to make plant artwork.

July 21 – Stream Life. The streams at Belding WMA are full of creatures — you just have to know how to find them. Get your hands wet looking for stream-dwelling animals.

July 28 – Signs of Wildlife. Animals are all around, but many avoid being seen by humans. Look for evidence of wildlife and learn to identify the signs that different animals leave when they pass through. Go on a wildlife scavenger hunt.

August 4 – Nature Photography. Photography is a great way to learn about nature. Learn some basics of nature photography and then head out into the wildflower meadow for some great shots. Return after lunch for a viewing of everyone's photos.

Calendar of Events

May-August..... Respect fenced and posted shorebird nesting areas when visiting Connecticut beaches, and also when viewing fireworks displays near these areas. Keep dogs and cats off shoreline beaches to avoid disturbing nesting birds. Herons and egrets are nesting on offshore islands in Long Island Sound. Refrain from visiting these areas during the nesting season.

..... Dispose of fishing line in covered trash containers or specifically marked recycling receptacles. Improperly discarded fishing line is a hazard for wildlife. A list of recycling receptacle locations is available at www.ct.gov/dep/whatdoidowith.

June 4..... **National Trails Day**, sponsored by the Connecticut Forest and Park Association (CFPA). Hikes and other events will be held throughout the state. To learn more, visit the CFPA Web site (www.ctwoodlands.org) or call 860-346-2372.

June 4..... **Rainbow Dam Fishway Open House** in Windsor, from 10:00 AM-3:30 PM (see page 9 for more information).

June 25..... **Pollinator Walk**, at the Wildlife Division's Belding WMA, in Vernon, starting at 9:00 AM. Take a walk to find various pollinators during Pollinator Week. Parking is on Bread and Milk Road in Vernon. Call 860-306-5418 for more information.

June 26-July 2 ..... **National Mosquito Awareness Week** – go to www.mosquito.org for more information. Visit Connecticut's mosquito Web page at www.ct.gov/mosquito to learn more about mosquitoes and West Nile Virus.

Programs at the Sessions Woods Conservation Education Center

Programs are a cooperative venture between the Wildlife Division and the Friends of Sessions Woods. Please pre-register by calling 860-675-8130 (Mon.-Fri., 8:30 AM-4:30 PM). Programs are free unless noted. An adult must accompany children under 12 years old. No pets allowed! Sessions Woods is located at 341 Milford St. (Route 69) in Burlington.

May 14..... **Charcoal to Iron: An Interpretive Hike**, starting at 1:30 PM. Join Master Wildlife Conservationist Shirley Sutton for a hiking talk, featuring Sessions Woods and the importance of the charcoal industry. Shirley is an avid educator about the history of Connecticut's past land use. She has presented programs on the "Leatherman" and "Native Americans in Northwest Connecticut." This program will include a slide presentation indoors and an outdoors hike to view signs of past land use.

May 25..... **Plants and their Wildlife Value**, from 10:00 AM-12:00 PM. Join Jack Hamill on an interpretive walk to identify plants and shrubs and their use to wildlife as food or shelter. A mile or so in length, this program will traverse mild terrain. Please wear appropriate outdoor gear and meet in the exhibit room.

June 4..... **Trails Day Educational Walk at Sessions Woods**, starting at 1:30 PM. Sessions Woods will be participating in National Trails Day with an educational walk to learn about wildlife and wildlife habitat on a one-mile hike to the beaver marsh. Participants can return the same way or continue on their own to complete a three-mile loop of the property. Meet leader Laura Rogers-Castro at the flagpole in front of the Conservation Education Center.

June 26..... **Year of the Turtle Day**, from 1:00-4:00 PM. View artwork submitted for the Turtle Art Contest for Kids. Also planned for the event are educational programs on turtles, a display of live turtles, and crafts for kids. More information about the event will be on the DEP's Year of the Turtle Web page at www.ct.gov/dep/yearofturtle.

July 9 ..... **Butterflies of Sessions Woods**, starting at 10:00 AM. Visit the flowers and fields at Sessions Woods to identify the local butterfly fauna with Wildlife Division Natural Resources Educator Laura Rogers-Castro. Participants will learn the basics to butterfly identification, including tips on distinguishing the various butterfly families.

Sept. 24 ..... **Connecticut Hunting & Fishing Day**. Save the date! Stay tuned to the Web page at www.ct.gov/huntfishday to find out more details about this fun, free, family event.

Hunting and Fishing Season Dates

April 27-May 28 ..... **Spring Turkey Hunting Season.** Consult the 2011 Connecticut Hunting and Trapping Guide for specific season dates and details. Printed guides are available at more than 350 locations statewide -- including town halls, bait and tackle shops, DEP facilities, and commercial marinas and campgrounds. The guide also is available on the DEP Web site (www.ct.gov/dep/hunting). Go to www.ct.gov/dep/sportsmenlicensing to purchase Connecticut hunting, trapping, and fishing licenses. The system accepts payment by VISA or MasterCard.

Connecticut Wildlife

PERIODICALS
POSTAGE PAID AT
BURLINGTON, CT,
AND ADDITIONAL
OFFICES

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

P. J. FUSCO

A female gray fox usually gives birth to a litter of four to five pups in spring. Gray fox dens are typically located in dense brush, cavities in stumps and trees, rock crevices, or under out-buildings, such as barns and sheds. The pups stay in the den until they are about four to five weeks of age, after which they emerge and begin to play outside the den entrance. At about 12 weeks of age, the pups are weaned and join the adults on hunting forays, learning to catch food for themselves.