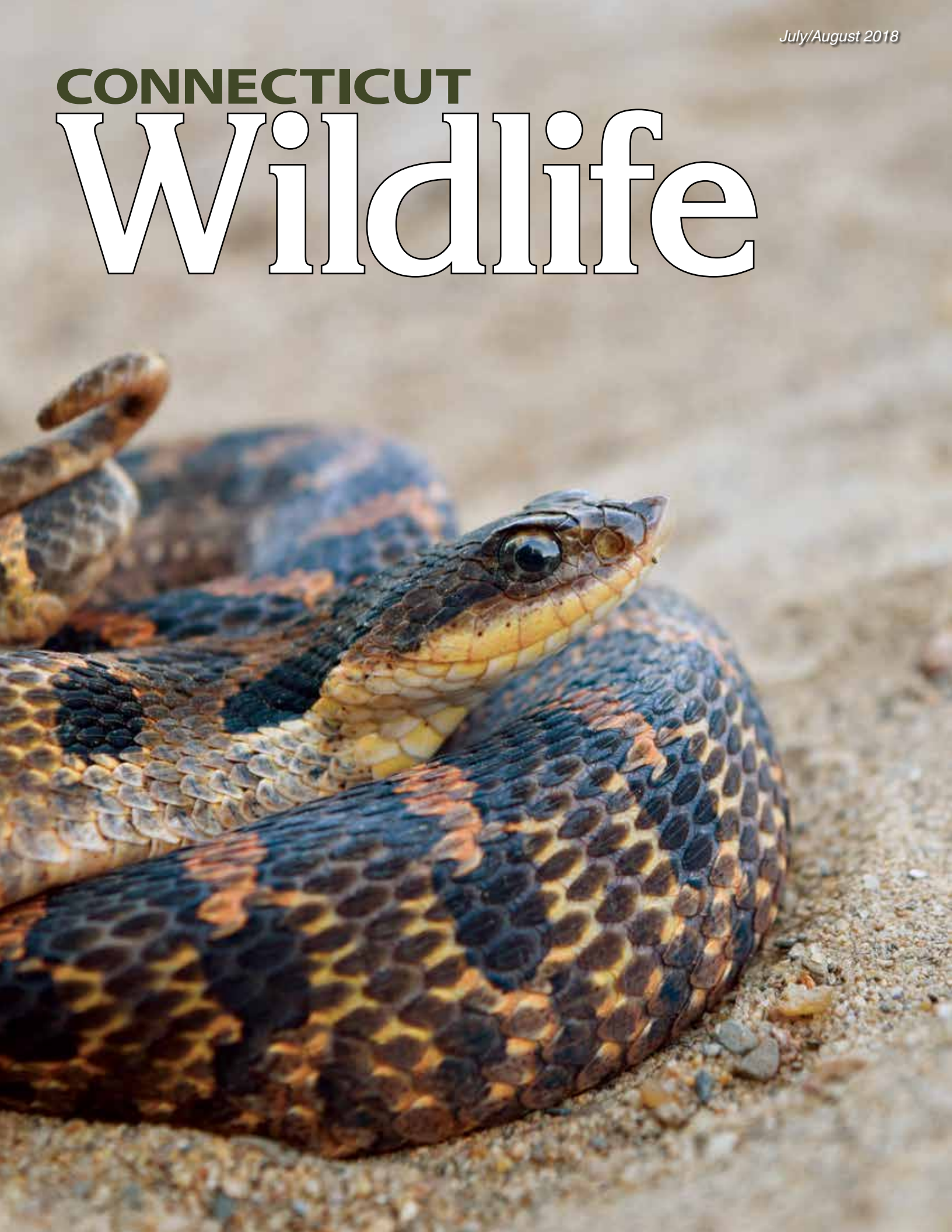
July/August 2018

CONNECTICUT Wildlife



Wild Thoughts

The adage "inquiring minds want to know" perfectly describes this issue of Connecticut Wildlife. *The species highlighted and projects described share a common theme of being a good observer when in the natural world. In an effort to learn more about the population declines of a secretive marsh bird, the clapper rail, biologists must carefully hunt for hidden nests, not only to determine nest success, but to help locate adults so their movements can be more closely tracked through migration.*

An astute angler noticed an unusual matted growth in the West Branch Farmington River and let the DEEP know. As a result of his observation skills, the first case of "rock snot" was documented in Connecticut. The keen observations of biologists and researchers studying this case led to an even more exciting find – the discovery of a new-to-science species.

If you want to seek sharks in Long Island Sound, you need to be able to tell one from the other, so observing the details that make each shark unique is not only key to learning more about these interesting animals, it is essential to making sure you do not accidentally break the law.

Are you a bird watcher? If so, your observation skills may be tested when identifying members of the tyrant flycatcher family. Do you have a keen enough eye to spot the white-banded tail or narrow red crown of the Eastern kingbird? We also need your help to find purple martins sporting colored leg bands that will help biologists monitor the survival rates of newly-fledged birds. Staff biologists also hone their observation skills each spring in a hunt for breeding waterfowl in a study that looks at population trends over time for birds such as wood and black ducks.

Being able to observe small details is very helpful for correctly identifying Connecticut's snakes. Milk snakes, Northern water snakes, and Eastern hog-nosed snakes are all beneficial, non-venomous snakes that are needlessly killed each year by folks who mistake them for other species – notably timber rattlesnakes and copperheads. Taking the time to observe color patterns, behavior, or even simply the habitat the snake is in can lead to correct identification and conservation.

If you have an interest in Connecticut's amazingly diverse array of wildlife and plants, please take a moment or two to become a student of nature. Reconnect with that sense of curiosity and wonder we had as kids and too often lose as we grow up. Wildlife viewing may become a new hobby; you may decide to take part in a citizen science project; or you might simply share what you observe with others. By feeding your inquiring mind, you will help advance conservation whether you realize it or not. The more we learn the better stewards we become of our shared natural history.

Jenny Dickson, Supervising Wildlife Biologist

Connecticut Wildlife

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The eastern hog-nosed snake has unique features and behaviors. It is a species of special concern in Connecticut. See page 16 to learn more. Photo courtesy of Paul Benjunas

Nanotags Aid in Rail Research

Written by Min Huang, DEEP Wildlife Division

Clapper rails, like many of the saltmarsh obligate bird species, are declining across their range. It is estimated that clappers are declining at annual rates of between seven to ten percent. It is imperative to determine what is causing the decline. Adult survival rates of this migratory species may be one cause. Another may be lowered nesting success due to sea level rise and increasing predation.

In 2016, the DEEP Wildlife Division partnered with the University of Connecticut and initiated a study to assess clapper rail nesting success and adult survival. Typical survival rate studies use either banded birds and recovery data of those bands to estimate annual survival rates (e.g., waterfowl) or radio-tagged animals (e.g., current CT DEEP bobcat study). Banding relies on a relatively high recovery rate of bands to sufficiently estimate survival. The recovery of bands occurs through harvest, chance observation, or finding the band on a dead animal. Radio-tagging is very labor intensive, unless remotely downloadable data can be obtained. For most bird species, this is not possible because current transmitters are still quite heavy. Birds can only wear a radio that is less than three percent of their overall body weight. Clapper rails are very rarely seen, let alone found dead, so traditional banding programs to estimate survival are not appropriate.

The current clapper rail study relies on nanotag

K. EMERY DEEP WILDLIFE

Researcher William Cassidy holds an adult clapper rail wearing a nanotag.

technology to estimate annual survival rates of adults. Nanotags are small, individually coded tags, which are placed on birds that are caught. The tags emit a unique frequency that is picked up and recorded if a bird travels near an antenna station set up specifically to detect these types of tags. Currently, towers are located along Connecticut's coastline and increasingly across the Atlantic seaboard. Nanotags are being used on a variety of bird species, such as semi-palmated sandpipers, red knots, loggerhead shrikes, various warblers, and for the Wildlife Division's study on clapper rails, to track movement patterns, assess survival, and provide insight into other research questions. New towers have been erected at Barn Island Wildlife Management Area (WMA) in Stonington, Harkness State Park in Waterford, Guilford Marina, and Sherwood Island State Park in Westport. These have complemented existing towers placed at Roger Tory Peterson WMA in Old Lyme and Hammonasset Beach State Park in Madison.

Clapper rails make use of the thick grasses within saltmarsh habitat during the breeding season.

Prior to placing tags on birds, researchers experimented with detection of nanotags and found that tags could be detected at ground level within a quarter mile of the antennas. Other studies have demonstrated a range of at least seven miles when tags are above ground on flying birds. Because rails primarily inhabit ditches and creeks, and do not fly until they migrate or are flushed, it was expected that the only times the rails would be detected was upon departure for wintering grounds and then

P. J. FUSCO (2)

W. CASSIDY DEEP WILDLIFE

Clapper rail nest in the process of hatching.

again upon arrival back to Connecticut in spring. Detections during summer and fall would be spotty, depending on luck and the birds' behavior.

Using behavior to increase capture success rates, captures are being approached in two different ways. Before the birds begin nesting, recorded calls are being used to find aggressive, territorial birds. Once aggressive birds are located, researchers use mist nets to catch them as they come to investigate the "usurper" in their territory. Rails are also being trapped off nests late in incubation. Researchers wait until the nest is about to hatch so that they do not cause abandonment of the nest through negative association. Both methods have proven effective; however, some nuances can lead to success or failure. For instance, in trapping incubating birds, if the bird is not attending the nest when you arrive, success is greatly decreased. It has been found that invariably if a bird is on the nest when researchers prepare to trap, they have very high success in catching the bird. Occasionally, researchers are too late, and the nest has hatched out or is destroyed by a predator.

The fate of clapper rail nests is being monitored to estimate nesting success rates. Finding and monitoring nests is arduous work. Clapper rails tend to nest within approximately 16 feet (5 meters) of a creek or ditch and almost exclusively in smooth cordgrass (*Spartina alterniflora)*. As the nesting season progresses from May into July, the growth of *Spartina* makes finding nests extremely difficult. This necessitates traversing the same creeks and ditches roughly every two weeks to make sure that new nests are not overlooked. Once found, nests are marked in an inconspicuous manner. When a full clutch is laid (9-12 eggs), researchers determine how far along they are in incubation. Nests are visited every three to four days until their fate can be determined (hatched, destroyed by a predator, or abandoned).

Researchers began capturing and tagging clapper rails in 2017. A total of 16 birds were caught; five at East River Marsh WMA in Guilford and Madison and 11 at Hammonasset Beach State Park. The tower at Guilford Marina picked up 15 of these birds from the middle of November through the second week of December and then no detections of rails were made through winter. Two of the birds were detected out-of-state during winter 2017; one was detected in Georgia and the other in Virginia. In April 2018, 13 of the 16 birds were detected back in Guilford and Madison. The first detection was on April 7, and the last detection of a new bird was April 18. In 2018, through the middle of July, researchers had captured 23 clapper rails.

Clapper rail nest monitoring began in 2016. Eighteen nests were monitored; nine each at East River Marsh WMA and Hammonasset Beach State Park. The daily survival rate (DSR) for nests was estimated. At East River Marsh WMA, the estimated DSR was 98.4% and overall nesting success was 72%. At Hammonasset Beach State Park, the estimated DSR was 97.5% and overall nesting success was 59%. The pooled estimate for DSR was 98%, and overall nesting success was estimated at 65.4%. This estimate is much higher than the 33% nesting success researchers estimated during a 2010 study. (The sample size in 2016 was three times greater than in 2010.)

In 2017, researchers found 49 nests; 25 at East River Marsh WMA and 24 at Hammonasset Beach State Park. At East River, the estimated DSR was 97.2% and overall nesting success was 55%. At Hammonasset, the estimated DSR was 97.5% and overall nesting success was 59%. The pooled estimate for DSR was 97.4%, and overall nesting success was estimated at 57.8%.

Through the middle of July 2018, researchers had found 54 nests; 28 at Hammonasset and 26 at East River.

The Wildlife Division hopes this work leads to a better understanding of clapper rails and enables biologists to devise conservation actions to benefit the birds.

A. HOYT DEEP WILDLIFE (2)

The fish crow on the left holds a clapper rail egg from an active nest at East River WMA.

Clapper rail nests are typically concealed with a woven roof.

Don't Get Snotty

Written by Diba Khan-Bureau, Ph.D., Professor at Three Rivers Community College and research scientist at the University of Connecticut, and Mike Beauchene, DEEP Fisheries Division

You have most likely heard "rolling stones gather no moss", but what about "gathering snot"? Well, for the rocks found on the bottom of the West Branch Farmington River, definitely. In case you have not heard of it, "rock snot" is a descriptive and collective name for several species of diatoms. The "snot" part of the name reflects the prolific growth of stalks that become thick and gooey mats. These mats are produced by each algae cell. They are an accumulation of millions of these individual strands and cells. The most infamous member of this group is also known as "didymo" which often becomes aesthetically unpleasing and can be problematic for native diatoms, the insect community, and fish.

The first confirmed observation came in 2011 when an angler called the DEEP Fisheries Division to report what he thought was "didymo" growing in the West Branch of the Farmington River in Barkhamsted. To date, through regular monitoring and observation by the authors, two different species of rock snot have been formally documented in the West Branch Farmington River. This includes the discovery of a novel, new-to-science species, *Didymosphenia hullii*. The documentation of a third species is in progress.

M. BEAUCHENE DEEP FISHERIES

Stop the Snot

The best way to prevent the inadvertent spread of any potential aquatic nuisance species is to **DRAIN, CLEAN, WASH, DRY,** specifically for rock snot, as the cells can remain alive in slightly moist conditions for several weeks. The best way to prevent the spread of rock snot to any other waters is to make sure the cells are completely dead. **DRAIN** all water on site. **CLEAN** by removing any attached strands or chunks. Before going to other waters, **WASH** anything that had contact with the water using a concentrated salt solution or a 10% bleach solution. **DRY** thoroughly for at least 48 hours before using again.

For anglers who frequent the West Branch Farmington River or rivers in other states that have rock snot diatoms, in addition to the above we recommend **FREEZING** your waders for 24 hours to kill any attached cells. We also recommend having a second pair of waders just for use in waters known to have rock snot. This way there is very little chance of inadvertently transporting live microscopic diatom cells to new places in Connecticut and around the region.

Meet the Players

Diatoms are single cell microalgae, which are unique in that the cell wall is made from silica dioxide – they live in glass houses. They are microscopic, which means the only way to see the cell wall is by using a microscope. The size, shape, and design are unique to each species and can only truly be appreciated using a scanning electron microscope. There are thought to be over 100,000 species. Connecticut's waters have hundreds of species of diatoms, the majority of which we never notice. What makes the rock snot group different and somewhat challenging from many other diatoms is their production of long thin stalks.

Didymosphenia hullii: A new species to science, this diatom was recorded in 2012 by the authors while monitoring the initial reports of *Didymosphenia geminata* and then published in the

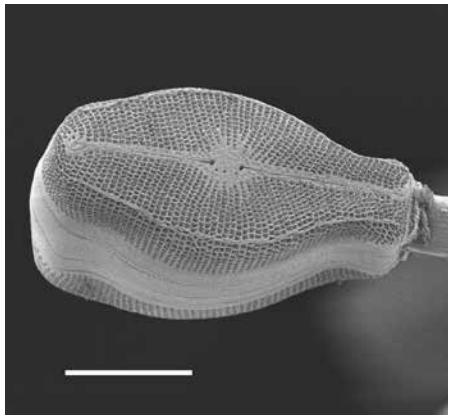
M. BEAUCHENE DEEP FISHERIES

(Left) *Didymosphenia hullii*, a type of "rock snot", can grow large quantities of mucilaginous stalks which can cause ecological issues and displace other diatoms and aquatic insects.

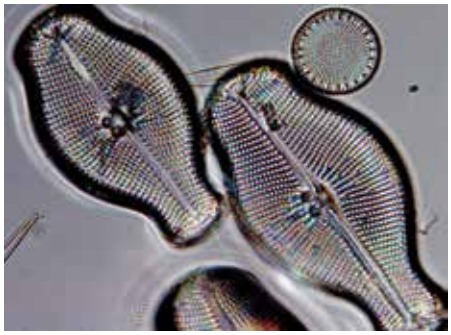
(Above) Rock snot can completely take over the bottom of the river, leading to disruption to the types algae, aquatic macroinvertebrates, and even fish. Can you find the slimy sculpin?

D. KHAN-BUREAU (3)

Scanning electron microscope image of *D. hullii* on stalks from the West Branch Farmington River showing single and bifurcated stalks with cells attached. Scale bar = 200 µm.



***Didymosphenia hullii* cell on a stalk from the West Branch Farmington River. Scale bar = 20 µm.**



Light microscope image of acid washed *D. hullii* cells. Scale bar = 10 µm.

European Journal of Phycology. There are subtle morphological differences when viewing with a microscope and in the field (the stalks) with the naked eye. *Didymosphenia hullii* is smaller, more stout, and has different markings on the cell wall than *D. geminata*. Like its close relative *D. geminata*, *D. hullii* thrives in the same cold, stable, nutrient poor conditions. As of now, *D. hullii* is only found in the West Branch Farmington River. However, with additional sampling and identification, it may be found elsewhere.

Cymbella janischii: This species was first observed in the West Branch Farmington River in July 2013 by the authors. Native to the Pacific Northwest, it has expanded its geographical range. This diatom was most likely transported to the West Branch Farmington River via angler wading boots. *Cymbella janischii* has slight visual differences. However, under the microscope, one can see a large (for a diatom) crescent shaped cell (versus the more soda bottle shape of didymo). The ability of *C. janischii* to tolerate wider conditions for temperature, flow, and nutrient levels is cause for concern. Unlike didymo with its very specific and narrow range of preferences, which limit the potential for spread, many other rivers and streams across Connecticut could have appropriate conditions for *C. janischii*.

Lastly, the authors are in the process of formally confirming the presence of *Didymosphenia geminata* as a third species of rock snot in the West Branch Farmington River in collaboration with the Louise Lewis Laboratory at UCONN and funded by CT Trout Unlimited.

Didymosphenia geminata: The most commonly reported species of didymo in North America, *D. geminata*, was the first to bring the potential problems of "rock snot" to light. The species was introduced to New Zealand where it experienced, in true invasive species style, incredible and prolific growth in some pristine and high profile trout waters. *Didymosphenia geminata* prefers very cold, stable, and nutrient free waters – the same characteristics found in many trout fisheries (especially tailwater fisheries) across North America. The introduction is suspected to be from viable cells transported on angler wading boots or equipment. *Didymosphenia geminata* has become recently established in the nearby states of New York, Vermont, and New Hampshire.

A more detailed account of rock snot in Connecticut can be found in the following publications:

Khan-Bureau et al. 2014. Observations of two nuisance stalk-forming diatoms from a river in Connecticut, Northeastern U.S.A. BioInvasions Records vol. 3, issue 3: 139-149

Khan-Bureau et al. 2016. Characterization of a new species in the genus *Didymosphenia* and of *Cymbella janischii* from Connecticut, U.S.A. European Journal of Phycology: 1-16

M. BEAUCHENE DEEP FISHERIES

It does not take much to understand the how these diatoms were nicknamed rock snot, as exemplified by *Cymbella janischii* observed in the West Branch Farmington River.

What to Do if You Catch a Shark

Written by Mike Beauchene, DEEP Fisheries Division

Several species of sharks, some common and some protected, occur in Long Island Sound and are occasionally caught by anglers. Sharks can be difficult to identify, even for experts. To make sure you do not accidentally retain a prohibited species, release any sharks you are not sure you can identify correctly.

Remember: **If you don't know, let it go**. For help with shark identification, download the Recreational Shark Identification Placard (*www.fisheries.noaa.gov/resource/outreach-and-education/shark-identification-placard*) and the Prohibited Shark Identification Placard (*www.fisheries.noaa.gov/resource/outreach-and-education/prohibited-shark-identification-placard*).

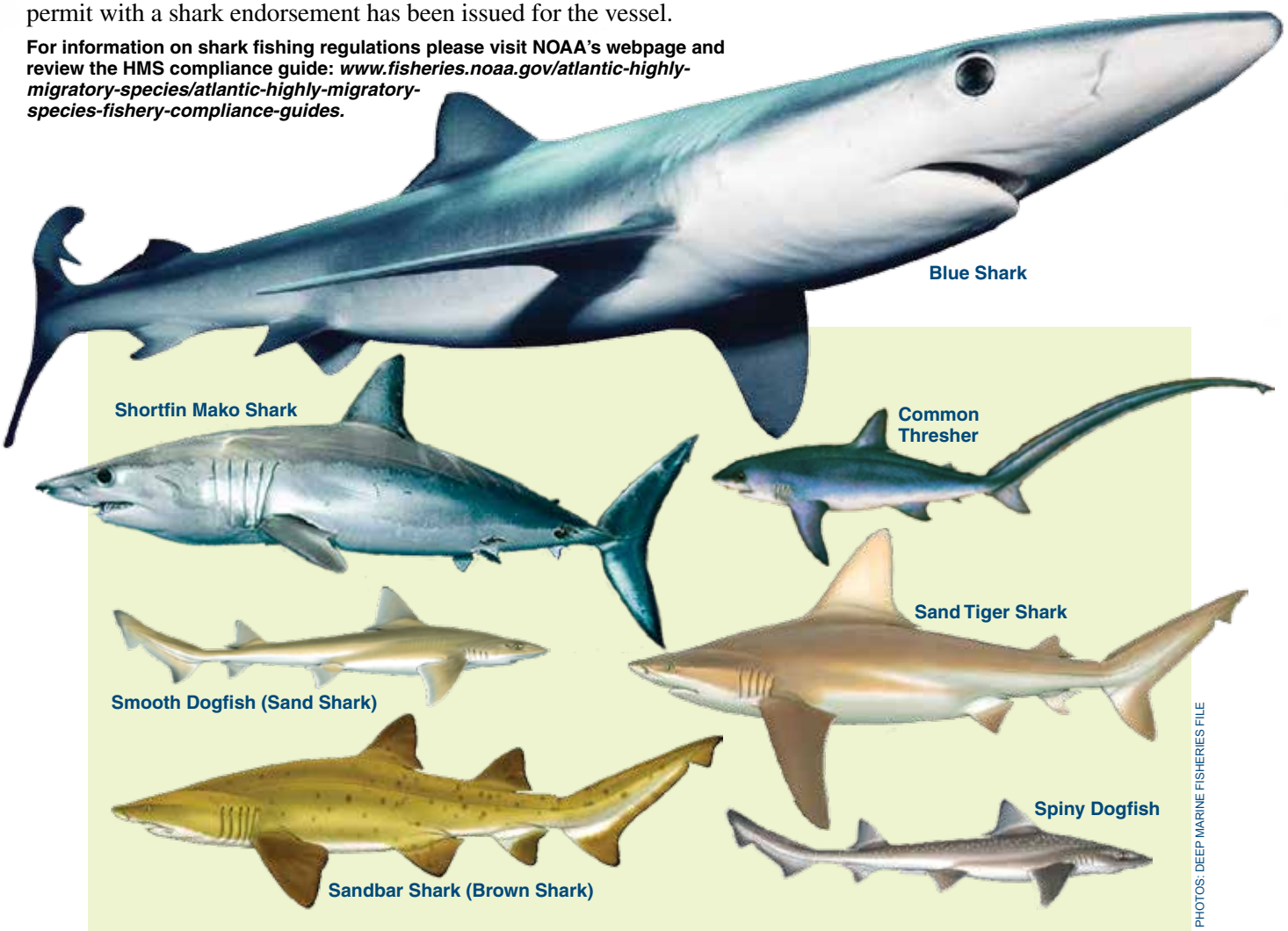
Sharks Typically Found in Long Island Sound

This list goes from most common to least common shark species. The last three are primarily found east of The Race in the Sound.

- **Smooth Dogfish (Sand Shark)** ***Mustelus canis***
- **Spiny Dogfish** ***Squalus acanthias***
- **Sandbar Shark (Brown Shark)** ***Carcharhinus plumbeus***
- **Sand Tiger Shark** ***Carcharias taurus***
- **Common Thresher** ***Alopias vulpinus***
- **Blue Shark** ***Prionace glauca***
- **Shortfin Mako Shark** ***Isurus oxyrinchus***

Sharks are classified by the National Oceanic and Atmospheric Administration (NOAA) as a Highly Migratory Species (HMS) and as such, anyone who is fishing for or is in possession of any species of shark is required to have a NOAA HMS permit with the shark endorsement. As of January 1, 2018, all HMS permit holders that recreationally fish for, retain, possess, or land sharks are required to obtain a shark endorsement on the permit, which requires completing an online shark identification and fishing regulation training course and quiz. Permit holders can take the quiz at any time during the fishing year, but the vessel(s) may not leave the dock on a trip that will include fishing for sharks unless a new or revised permit with a shark endorsement has been issued for the vessel.

For information on shark fishing regulations please visit NOAA's webpage and review the HMS compliance guide: *www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-fishery-compliance-guides.*



PHOTOS: DEEP MARINE FISHERIES FILE

Tyrant of Tyrants

Connecticut's Eastern Kingbird

Article and photography by Paul Fusco, DEEP Wildlife Division

A member of the tyrant flycatcher family, the Eastern kingbird (*Tyrannus tyrannus*) is a well-known and widespread summertime denizen of open fields, grasslands, and wetland habitats in Connecticut. Tyrant flycatchers are identified by their flattened bill, upright perching posture, and behavior of flying out from an exposed perch to snap insects out of the air. Other tyrant flycatchers include such familiar birds as the great-crested flycatcher and the Eastern phoebe.

Eastern kingbirds are found in Connecticut as migrants and breeders. They are fearless and aggressive, especially when it comes to intruders trespassing into their nesting territories. Kingbirds will often attack crows, hawks, and other larger birds perceived to be a potential threat. Observers may even witness a kingbird riding on the back of an unfortunate hawk, pecking and feather pulling as the hawk desperately tries to fly away. Their small size (slightly smaller than a robin) does not prevent them from being a bird with attitude.

Description

The Eastern kingbird's dark gray plumage is offset with a white throat, breast, and underside, giving the bird an elegant look. The best field mark is the conspicuous white band at the tip of the tail. Male and female kingbirds are similar in appearance. Kingbirds have a narrow red streak on top of the crown that is well hidden and very difficult to see. The red crown patch may be raised in times of aggression.

Kingbirds are not shy about calling attention to themselves. They frequently announce their presence by expressing a series of loud and raucous high-pitched sputtering calls. The typical calls are *tzee-tzee-tzee* and *kit, kit, kitter-kitter* delivered in rapid succession.

Kingbirds often fly with such shallow quick wingbeats that they have the appearance of quivering as they hover above the grasses of a meadow or over a wetland.

Behavior

Kingbird nests are usually built in an open tree or shrub, often near or over water. Sometimes kingbirds build their nest in a rotted stump within a wetland. The nests are bulky and composed of twigs, grasses, stems, rootlets, and animal hair.

Three to five white or cream-colored eggs that are heavily marked with dark spots and blotches are laid. Incubation lasts 14 to 17 days and young fledge after about 17 days.

Eastern kingbirds spend the winter in South America. They typically show up in Connecticut during the first half of May and depart by early September, making their stay here just long enough for the breeding season. Many neotropical migrants, such as the Eastern kingbird, are residents of the tropics and only visit our area to take advantage of the abundant insect crop that allows them to feed and raise more young than they otherwise could in the tropics.

Conservation

Although their population is widespread and they use a variety of habitats, the Eastern kingbird population has declined by an estimated 70% in Connecticut since the mid-1960s, according to breeding bird surveys by the National Audubon Society and U.S. Geological Survey. Reasons for the decline are not definitive, but main causes are thought to be habitat loss, habitat succession, and widespread use

Tyrant Flycatchers of Connecticut

Eastern Kingbird	Common breeder and migrant
Eastern Phoebe	Common breeder and migrant
Eastern Wood-Pewee	Common breeder and migrant
Great Crested Flycatcher	Common breeder and migrant
Acadian Flycatcher	Uncommon breeder and migrant
Alder Flycatcher	Uncommon breeder and migrant
Least Flycatcher	Uncommon breeder and migrant
Willow Flycatcher	Uncommon breeder and migrant
Olive-sided Flycatcher	Rare breeder and migrant
Yellow-bellied Flycatcher	Uncommon migrant
Western Kingbird	Rare migrant
Ash-throated Flycatcher	Very rare migrant
Fork-tailed Flycatcher	Very rare migrant
Gray Kingbird	Very rare migrant
Say's Phoebe	Very rare migrant
Scissor-tailed Flycatcher	Very rare migrant
Tropical Kingbird	Very rare migrant
Western Flycatcher	Very rare migrant

Above: The Eastern kingbird has been described as the tyrant of tyrants due to its bullying behavior.

Right: Kingbirds often build their nests in shrubs bordering wetlands. Note that this nest has discarded fishing line in it.

of insecticides that may contaminate the birds' food supply. Despite the losses, the Eastern kingbird is considered a low conservation concern, and the birds can be seen at most open habitats across the state. Some of the best places to find them include the shrubby edges of wetland habitat, such as around beaver marshes and along riversides and pond edges.

Mallards Dominate Annual Breeding Waterfowl Survey

Written by Kelly Kubik, DEEP Wildlife Division; photography by Paul Fusco, DEEP Wildlife Division

Staff from the Wildlife Division completed the annual breeding waterfowl survey in April. Each state in the Atlantic Flyway, from Virginia north to New Hampshire, participates in this ground-based survey. In the northern part of the Atlantic Flyway in Maine and eastern Canada, breeding waterfowl surveys are conducted aerially.

In Connecticut, 56 one-kilometer squared plots are surveyed. The plots are randomly distributed across the state, and the same plots are surveyed each year. Per survey protocol, 20% of the plots are checked at either dawn or dusk. All water bodies and any suitable terrestrial habitat where waterfowl could be found within each plot are checked.

This survey not only provides an estimate of breeding waterfowl populations, but also gives waterfowl managers an idea of current habitat conditions. Habitat conditions in Connecticut were good for breeding waterfowl this past spring. Melting snow and early spring rains recharged most of the water bodies in the state, providing ample nesting habitat.

Mallards continue to dominate the survey in Connecticut. The mallard estimate for 2018 was 13,670 pairs. This is less than a one percent increase from 2017 and a seven percent decrease from the five-year average. Mallard populations in eastern North America have declined approximately 20% since 1998. Over that same time period, mallard harvest in the United States' portion of the Atlantic Flyway has decreased by about 40%. As a result of this decline, the mallard bag limit in the Atlantic Flyway will be reduced starting in the 2019-2020 hunting season.

The Canada goose estimate for this year was 8,964 pairs. This represents an eight percent decrease from the previous year and a 10% decrease from the five-year average. Results from this survey help assess the efficacy of liberalized hunting regulations on resident Canada goose populations. While the resident population has declined slowly in the state over the last decade, resident geese still continue to cause problems, primarily in areas where hunting is limited or nonexistent.

The wood duck estimate for 2018 was 8,728 pairs. This is a 29% increase from 2017 and a 16% increase from

Wood ducks were the third most abundant breeding waterfowl species in Connecticut this year, behind the mallard and Canada goose.

Connecticut Breeding Waterfowl Pair Estimates for Major Species

Species	*2017*	*2018*	*Five-year Average*
Black Duck	51	51	278
Canada Goose	9,765	8,964	9,945
Mallard	13,640	13,670	14,771
Wood Duck	6,785	8,728	7,539

the five-year average. The Wildlife Division's Wood Duck Nest Box Program annually checks and maintains over 400 nest boxes on state properties in an effort to bolster local wood duck populations.

The breeding black duck estimate for this year was 51 pairs. There was no change from 2017 and an 82% decrease from the five-year average. Due to the low number of breeding black ducks in the state, large fluctuations are seen in annual breeding estimates for this species. For the fourth year in a row, black ducks were only detected in coastal plots. This survey helps to highlight the importance of salt marsh habitat to breeding black ducks in Connecticut.

The Canada goose estimate for the 2018 breeding waterfowl survey was 8,964 breeding pairs, which represents an eight percent decrease from 2017.

A Dedicated Actor -
The Eastern Hog-nosed Snake

Cover photo and article by Paul Benjunas, DEEP Wildlife Division; photography by Paul Fusco, DEEP Wildlife Division

Though widely distributed throughout Connecticut, the Eastern hog-nosed snake is seldom found in high densities. This harmless, non-venomous snake typically measures 21 to 32 inches in length and can be most easily identified by its upturned "nose" scale, bearing resemblance to a hog-like snout. This upturned scale serves as a shovel, allowing the hog-nosed snake to dig and search for food. Another field mark is its distinctly keeled dorsal (back) scales. Unlike smooth scales, keeled scales have a raised ridge along the center. A highly variable color pattern can make this snake difficult to identify in the field, with some individuals having alternating light and dark blotches with

The killing of any snake is strongly discouraged, and several species, including the Eastern hog-nosed snake (species of special concern), are protected by Connecticut's Endangered Species Act. Those who kill or collect such species could face fines or legal action. Notice the flattened head and cobra-like pose of this hog-nosed snake. These characteristics often cause people to mistakenly think that the hog-nosed is a venomous snake.

vivid yellows, browns, reds, and oranges, while others are unicolored, ranging from black to gray to deep brown. The snake's ventral side (stomach) can be mottled or solid in color. Due to its scarcity in Connecticut and loss of habitat, the Eastern hog-nosed snake is listed as a state species of special concern.

Range and Diet

Hog-nosed snakes can be found in the eastern half of the United States from southern Florida north to central New England, parts of the Great Lakes Region, and west through most of Kansas, Oklahoma, and eastern Texas.

These snakes prefer habitats with well-drained loose, sandy, gravely soils. They often travel underground using passages created by small burrowing mammals within fields, open grassy areas adjacent to woodlands, and forests. Given that the hog-nosed snake prefers open habitats, it is rarely found in dense wooded areas, but instead within areas with a mosaic of early to late successional habitats and habitat edges. Strictly terrestrial, this snake may enter water while moving between habitats. The hog-nosed snake is active during daylight and can often be observed basking in sunny areas. Cover may be sought under shrubs, logs, or in shallow burrows.

This snake's preferred food is toads, but it will also eat frogs, salamanders, small mammals, insects, and some birds. As a means of avoiding predation, toads fill their lungs with air and "puff" up, making them difficult to swallow. While this tactic may help save a toad from becoming dinner for a gartersnake, the hog-nosed snake has a trick up its sleeve to help overcome the toad's tactic. Located towards the back of the snake's mouth are two enlarged teeth that can be used to puncture and deflate toads, making it much easier for the snake to swallow its meal. While a toad has glands that produce toxins, the hog-nosed snake's digestive system is equipped with enzymes that neutralize these toxins.

Life History and Behavior

Shortly after emerging from their winter hibernacula, hog-nosed snakes begin searching for a mate. They are oviparous, meaning that they lay eggs. In early summer, females will lay from four to over 50 eggs in a shallow cavity in loose or sandy soil. After approximately 60 days, the young begin to hatch and are fully capable of fending for themselves. This is the case for most snake species, where there is very limited to no parental care of young.

If its upturned "nose" scale is not enough to make this snake a truly unique species, the series of complex behaviors it exhibits when threatened surely sets this snake apart from the other 13 snakes native to Connecticut. The hog-nosed snake relies on its cryptic camouflage and behavior to avoid predators. If detected, the hog-nosed snake is quick to bluff its way out of a predicament by coiling, flattening its head and neck to form a cobra-like hood, inflating its body, hissing loudly and fiercely, and falsely striking with a closed mouth. Such behaviors have given the hog-nosed snake names such as puff adder, blow snake, and hissing viper. Should these tactics fail in deterring the threat, the snake will writhe about, excrete a foul-smelling musk, and turn onto its back with mouth open, tongue hanging out, becoming completely limp and feigning death. Once danger passes, the snake will lift its head, look around, turn back over on its stomach, and proceed on its way. In addition to its coloration and pattern, these unusual behaviors often trick people into believing the snake is venomous. This misunderstanding often results in the snake's unfortunate death.

Snakes have a long history of being misunderstood, and many people view these creatures as aggressive and full of malice. In reality, the snakes of Connecticut are generally harmless and would prefer not to be bothered by people. Being able to identify and educate others about the Eastern hog-nosed snake will help conserve this unique animal. If you have a snake question, assistance can be found by calling the Wildlife Division at 860-424-3011 or visiting the DEEP website at *www.ct.gov/deep/wildlife*.

When they feel threatened, hog-nosed snakes will sometimes "play dead."

The coloration of Eastern hog-nosed snakes can be highly variable. Some may be more uniformly black or dark gray, like this black-phased individual.

FROM THE FIELD

Resident Canada Goose Banding Update

Each year, the Wildlife Division captures resident Canada geese during their annual molt in an effort to collect important data and mark the birds with identifying leg bands. Waterfowl such as Canada geese are unique because unlike other birds, they simultaneously shed their primary feathers and become temporarily flightless for approximately one month each year. Biologists take advantage of this flightless period by driving molting geese across land and/or water and corralling them into a portable net where they are aged, sexed, banded, and released. Information derived from banding is used by researchers for various purposes, including assessing distribution of harvest, productivity, population size, and survival rates.

A total of 2,180 geese were captured this past season, which included 1,326 unmarked and 854 previously marked geese. Geese were banded at 41 different sites and capture size at each location ranged from four to 195 geese. Banding sites were distributed statewide with a minimum of three sites per county.

Once again, volunteers were an integral part of the goose banding project this year. Volunteers spent over 775 hours and drove almost 9,000 miles assisting us! Without the assistance of volunteers, we would not be able to capture and band as many geese as we did. Those interested in volunteering for next year's goose banding project should contact Kelly Kubik at *kelly.kubik@ct.gov* or 860-418-5960.

Kelly Kubik, DEEP Wildlife Division

Purple Martin Banding Project

To learn more about the survival rates of purple martins, a Connecticut species of special concern, Wildlife Division biologists have been visiting colonies to place identifying leg bands on young martins before they fledge from their nest boxes or nesting gourds. Through this study, biologists can track and assess movement patterns of the birds from their hatching location to their breeding locations and future nesting sites. All of the young birds banded at each purple martin colony are given colored bands specific to that colony location. This allows the birds to be identified while in flight and also keeps track of the colony they hatched from. This year, DEEP staff banded 772 purple martin chicks from seven different colonies.

For the study to be successful, these banded birds need to be seen again – and reported. We need your help. Please watch for banded purple martins and tell us what you have seen. Observations of color-banded purple martins should be reported to the DEEP Wildlife Division at *deep.wildlife@ct.gov* or phone: 860-424-3011.

Paul Benjunas, DEEP Wildlife Division

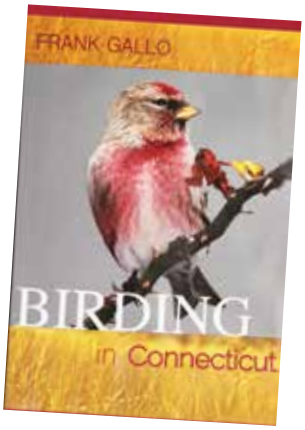
The Recovering America's Wildlife Act Introduced to U.S. Senate

The Senate version of Recovering America's Wildlife Act (S. 3223) was recently introduced by Senators Risch (R-ID), Manchin (D-WV), Alexander (R-TN), and Heitkamp (D-ND). This bipartisan legislation authorizes the redirection of $1.3 billion a year from revenues derived from federal lands and waters to help states proactively conserve fish and wildlife species and implement their State Wildlife Action Plans. The Bill compliments the House version (H.R. 4647) introduced in December 2017 by Jeff Fortenberry (R-NE) and Debbie Dingell (D-MI) which currently has over 80 co-sponsors. This much needed, stable funding would help Connecticut preserve our natural heritage and ensure that fish and wildlife are here for future generations to enjoy. More information can be found at *www.ct.gov/deep/AllianceforFishandWildlife* or *Ournatureusa.com*.

Paul Benjunas, DEEP Wildlife Division

New CT Birding Book

Birding in Connecticut
By Frank Gallo
Wesleyan University Press



Authored by long-time Connecticut Birder, Frank Gallo, *Birding in Connecticut* is the definitive guide to finding birds in the state. This colorful book is packed with valuable information for birders of all skill levels, including species accounts, locations, a first-of-a-kind cumulative list of rare bird sightings in the state, and a host of time-tested tips to help you locate and identify birds.

An important resource on the habitats and habits of Connecticut's birds, the guide includes well designed and current bar graphs presenting seasonal occurrence and population levels for every Connecticut bird species. It is the first comprehensive guide of its kind for our state. Handsomely illustrated with color photographs and maps, *Birding in Connecticut* is the perfect year-round companion for experts and novices alike! It will quickly become a "go-to" birding book for Connecticut's birding community.

Don't miss out on Discover Outdoor Connecticut Day on September 22, 2018, at Franklin Wildlife Management Area! ***www.ct.gov/deep/DiscoverOutdoorCT***

CASEBOOK

Reports from the Environmental Conservation Police

During May 2018, Connecticut State Environmental Conservation (EnCon) Officers conducted 335 boating enforcement patrols and investigated seven boating accidents. Officers logged over 825 fisheries enforcement patrols, 79 hunting enforcement patrols, 37 ATV patrols, and conducted 143 public safety assists. Officers also responded to 110 wildlife complaints with 28 of those complaints for nuisance bear and five for exotic/non-native wildlife possession. In the State Parks, Officers performed 679 park and forest patrols. Some of the cases are highlighted here. You can learn more about other interesting cases by following the EnCon Police Facebook page at www.Facebook.com/CTEnConPolice.

- During May, Western District officers responded to 21 nuisance bear complaints. Officers also responded to two motor vehicle accidents where a bear was struck, with one being a motorcycle that struck a cub. Officers also responded to a bear with an injured leg from a trap. In addition to the nuisance and injured bears, officers also responded to 15 other nuisance/sick/injured wildlife complaints. These calls consisted of four native snake calls, four raccoon calls, one skunk call, two goose calls, one fox call, one owl call, and two calls for injured or dead bald eagles.

- On May 6, 2018, an East Marine Officer conducted an offload inspection of a commercial fishing vessel. During the offload, the Officer saw several horseshoe crabs in the pen that had not been sorted. The vessel captain did not have an endorsement to possess horseshoe crabs in the trawl. The crabs were released and the individual was issued a written warning for the violation.

- On the evening of May 25, 2018, a Southwest EnCon Officer and Southbury Police Officers were dispatched for a report of a male firing a firearm at a bear in Southbury. Upon arrival, the Officer spoke to the suspect who stated he shot and killed an "aggressive" black bear while at his mother in-law's house. According to neighbors, the suspect's mother in-law called him about a bear that was feeding on birdseed and other attractants in her yard. Before leaving for his mother in-law's house, the suspect retrieved a pistol and rifle and placed them in his vehicle. Once at the house, the suspect shot several times in the direction of the bear to scare it away. The bear came back a short time later. At this point, the suspect retrieved the rifle from his vehicle and shot the bear. It was determined the suspect did not have a pistol permit. The suspect was arrested and released on a $1,000 surety bond with a court date in Waterbury for the charges of Illegal Taking of Black Bear, Unlawful Discharge of a Firearm, and Carrying a Pistol without a Permit. The bear's carcass was transferred to the DEEP Wildlife Division so that biologists could conduct a necropsy.

- Also on May 25, Southwest Officers were dispatched to Wolcott for a report of a turkey hunter who accidentally shot a hen turkey during the spring turkey season (only male turkeys can be harvested in the spring). The hunter showed officers the turkey, which was on ice in a container and not tagged. The hunter was able to provide a valid 2018 hunting license, a Resident Game Bird Conservation Stamp, and a valid written permission slip to hunt on the property. He then showed the officer where the turkey was killed and where he was sitting when he shot the turkey. It was determined that the hunter was approximately 410 feet away from the neighbor's house and only 17 yards away from the turkey when he shot it. While investigating the area, officers noticed a bare dirt spot on the ground where bird seed was spread out. The hunter admitted to putting out bird seed to keep the turkeys in the area. The accused was charged with possession of more than the seasonal limit for wild turkey, hunting within 500 feet of a building, hunting wild turkey over bait, and failure to fill out a harvest tag.

DEEP ENVIRONMENTAL CONSERVATION POLICE

After 32 years with the State Environmental Conservation Police, the last eight as the head of the Division, Colonel Kyle Overturf retired on May 30, 2018. Colonel Overturf was a tireless advocate for the men and women of the EnCon Police by consistently speaking up for the mission of the division, especially during times of limited resources in an effort to meet increased demands. He also increased the standing of the division through his leadership and professionalism.

Don Hopkins Remembered

A Long-time Advocate for CT's Bald Eagles

Written by Julie Victoria, retired DEEP Wildlife Division Biologist

If there was a bald eagle watcher Hall of Fame, Don Hopkins would be one of the first inductees. Founder of the New England Hawk Watch in 1971 (see *Connecticut Wildlife* July/August 2014) and the Bald Eagle Study Group in 1975 (see *Connecticut Wildlife* July/August 2005), it is safe to say that Don had been watching hawks and eagles for quite some time and in all seasons. The DEEP Wildlife Division has lost one of its best volunteers and the State of Connecticut has lost a long-time crusader for bald eagles with the recent passing of Donald A. Hopkins on August 8, 2018, at the age of 92.

One of the missions of the Bald Eagle Study Group was to enjoy bald eagles. And, Don truly did enjoy eagles. He enjoyed counting them, watching them, finding their nests, and, most of all, helping DEEP Wildlife Division biologists band the chicks. Measuring the eighth primary flight feather on a bald eagle chick to determine its age was Don's job and he must have measured over 100. His wry sense of humor always made for a fun day in the field and his hand-drawn cartoons about field days made us laugh all year long.

Don wasn't just an active birder with an interest in bald eagles. He was an advocate for bald eagle conservation. He took meticulous notes, wrote articles about his observations, and greatly contributed to our knowledge about a species whose numbers were once decimated and then rebounded as they pioneered their way back to areas in our state where they had been eliminated. Don is credited with documenting the return of bald eagle nesting in Connecticut in 1992 after a 40-year absence – he spent countless hours observing the bald eagle pair and determining the presence of chicks in the nest. Everything Don did in his quest to conserve eagles, he shared with the DEEP Wildlife Division.

While Don was learning about eagles, he was also a teacher. He took the time to read the literature, formulate theories, amass data, write articles about Connecticut eagles, and pass on all his information to the rest of us.

The Wildlife Division and the birding community have lost a great friend and naturalist. Although we are deeply saddened by his passing, we hope he knows how thankful we are for all his time and contributions to the conservation of bald eagles and other raptors.

P. J. FUSCO

(From left to right) Wildlife Division biologist 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.

Don was also a talented artist. He created educational cartoon booklets after each eagle banding season that highlighted the activities of the chick banding team in a fun and insightful manner, and he would often poke fun at himself.

P. J. FUSCO

The Wildlife Division and the birding community have lost a great friend and naturalist. Although we are deeply saddened by Don's passing, we are thankful for all his time and contributions to the conservation of bald eagles and other raptors in Connecticut.

Notable Accomplishments of Donald A. Hopkins

Service to His Country

- Took part in the assault and capture of Okinawa on April 1, 1945, as a member of the 4th U.S. Marine Corps Regiment, and also took part in the surrender and occupation of Japan in September 1945.

Service to Our State

- Founded the Bald Eagle Study Group in Connecticut in 1975.
- Located the first active bald eagle nest in Connecticut in the early 1990s following a 40-year absence of breeding bald eagles in the state.

Service to Conservation

- Co-founded the New England Hawk Watch Committee in 1971 and the Hawk Migration Association of North America in 1974.
- Published more than a dozen papers regarding his studies of bald eagles, and received letters of recognition from professional wildlife societies for his work.

Awards

- The Maurice Broun Award in 1993 for his work on raptor migration and the Mabel Osgood Wright Award in 1994 by the Connecticut Ornithological Association.
- Received the Watershed Protection Award from the Metropolitan District Commission (MDC) for his long-term monitoring and study of eagles on MDC land.

Eastern Spadefoot

Scaphiopus holbrookii

P. J. FUSCO (2)

Background

The Eastern spadefoot is the only member of the spadefoot family (Scaphiopodidae) east of the Mississippi River. It is among the rarest amphibians in the northeastern United States. While often referred to as a toad, the Eastern spadefoot is actually a primitive frog. Spadefoots are listed as endangered under Connecticut's Endangered Species Act and designated as a species of greatest conservation need in Connecticut's Wildlife Action Plan. Spadefoots are secretive, spending most of the year in subterranean burrows, emerging at night to feed during warm-weathered rains. This amphibian derives its name from a hard, sharp edge located on the inner surface of the hind feet. This spade-like tubercle is used in the excavation of burrows.

Range

The Eastern spadefoot occurs from southern New England, south to Florida along the Atlantic Coastal Plain and as far west as the Mississippi Valley north to Tennessee. New England populations are scattered and typically occur in low elevation river valleys with sandy, well-drained soils.

Description

The spadefoot is a medium-sized amphibian, ranging from 1.75 to 3 inches in body length. The skin is smooth and warts are very small and scattered. The spadefoot has large, bright yellow eyes with vertical pupils. The dorsal (back) coloration ranges from brown to gray with two yellowish stripes running down the back and forming a vase-shaped pattern. The venter (belly) is translucent white with a pinkish cast.

Habitat and Diet

Spadefoots require dry environments with sandy or loose soils that are sparsely vegetated. These soils are preferred because spadefoots can easily excavate burrows in them. These amphibians breed and reproduce in temporary bodies of water (e.g., vernal pools, flooded fields, etc.).

When spadefoots emerge from their burrows, they are opportunistic hunters, feeding on a variety of spiders and insects.

Life History

Spadefoots spend most of their time in underground burrows, awaiting the warmer rains of late spring, summer, and fall. They can remain dormant for months in a state of torpor. The Eastern spadefoot will dig its burrow several inches below ground but has been known to dig as deep as 8 feet. When heavy rains fall, typically of 2 or more inches, the amphibians emerge from their burrows in large numbers and explosively breed. Eggs are strewn out in irregular bands under water and attached to grass or plant stems. The eggs can hatch in as little as 24 hours with rapidly developing tadpoles that can grow into land-dwelling amphibians in as little as 14 days. Tadpoles feed opportunistically on vegetation, invertebrates, or other amphibian larvae.

Interesting Facts

Because the breeding pools used by spadefoots are ephemeral (short-lived), they do not often support larval development of other Connecticut amphibians. Therefore, spadefoots often breed alone. Spadefoot tadpoles can have cannibalistic tendencies, often eating their own siblings.

The breeding call of adult male spadefoots sounds like "caw... caw," something similar to that of a young crow.

During hibernation, spadefoots curl into a tight ball and excrete a fluid that hardens the soil around them, forming a compact chamber to retain moisture.

Conservation Concerns

Spadefoot populations in Connecticut appear to be in decline. Many localized populations have been extirpated, presumably due to urban/suburban developments impacting their breeding pools. Urbanization of early successional habitats and alteration of breeding pools, which are often not afforded wetland protection status due to their highly short-lived nature, are the greatest causes of decline. Some populations in eastern Connecticut remain relatively undisturbed but face threats from both agriculture and sand and gravel extraction. Due to their very secretive lifestyle, it can be difficult to detect the presence of spadefoots and accurately estimate population size. Eastern spadefoots are protected by the Connecticut Endangered Species Act, and collection of these amphibians is prohibited.

What You Can Do

If you find an eastern spadefoot, please take a photograph and report it to the Wildlife Division at *deep.wildlife@ct.gov* or call 860-424-3011. It is best to observe the animal(s) from a distance, and never attempt to capture an individual – it is both harmful to the animal and illegal. Additionally, you may elect to properly manage breeding pool areas if populations occur on your property, after consultation with the CT DEEP Wildlife Division. Often, education and awareness of these endangered amphibians can be a powerful conservation tool.

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Conservation Calendar

September 22 ..... **Discover Outdoor Connecticut Day**, from 10:00 AM to 4:00 PM, at DEEP's Franklin Swamp Wildlife Management Area in North Franklin (391 Route 32). Lots of fun activities for the whole family are planned for this FREE event that explores Connecticut's fish and wildlife resources and legacy of outdoor traditions. Go to *www.ct.gov/deep/DiscoverOutdoorCT* for details.

September 22 ..... **National Hunting and Fishing Day**, which is celebrated the fourth Saturday of every September, is the most effective grassroots effort ever undertaken to promote the outdoor sports and conservation. Learn more at *www.nhfday.org*.

Hunting and Fishing Season Dates

Sept. 1-29 ..... Early September Canada Goose Season in the north zone.

Sept. 15-29 ..... Early September Canada Goose Season in the south zone.

Sept. 15-Dec. 31 ..... Deer and turkey bowhunting season on private land and state land bowhunting only areas.

Sept. 29 & Oct. 27... Junior Waterfowl Hunter Training Days – Go to *www.ct.gov/deep/juniorhunter* for more information.

Oct. 13 ..... Junior Pheasant Hunter Training Day – Go to *www.ct.gov/deep/juniorhunter* to learn about special hunting events for junior pheasant hunters on October 13 and other days this fall.

Oct. 20 ..... Opening day of the small game hunting season.

Nov. 3-10 ..... Junior Deer Hunter Training Days (excluding Sunday) – Go to *www.ct.gov/deep/juniorhunter* for more information.

*Consult the 2018 Connecticut Hunting and Trapping Guide and 2018-2019 Migratory Bird Hunting Guide for specific season dates and details. The guides are available at DEEP facilities, town halls, and outdoor equipment stores, and also on the DEEP website (**www.ct.gov/deep/hunting**). Go to **www.ct.gov/deep/sportsmenlicensing** to purchase Connecticut hunting, trapping, and fishing licenses, as well as required permits and stamps. The system accepts payment by VISA or MasterCard.*

Discover Outdoor Connecticut – Saturday, September 22, 2018, from 10:00 AM to 4:00 PM, at DEEP's Franklin Swamp Wildlife Management Area, 391 Route 32, North Franklin

This fun-filled, FREE event explores Connecticut's fish and wildlife resources and legacy of outdoor traditions, with live animals, demonstrations, archery, fish casting, fly tying, outdoor skills, shooting clays, kid's activities and crafts, a photo contest, and more. Live bird presentations this year will feature ducks, hawks, and owls from the Livingston Ripley Waterfowl Conservancy and a red-tailed hawk, barred owl, American kestrel, and Cooper's hawk brought by Christine Peyreigne of Christine's Critters, who is also the youngest falconer in Connecticut. All attendees will have a chance to win a variety of great door prizes provided by generous donors. Bring a picnic lunch and stay for a few hours or the whole day! Free on-site parking. Go to www.ct.gov/deep/DiscoverOutdoorCT for details.

Sign up to receive *Wildlife Highlights*, a free, electronic newsletter for anyone interested in Connecticut's wildlife and the outdoors! *www.ct.gov/deep/WildlifeHighlights*

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P. J. FUSCO

Large insects, including dragonflies, are a main dietary staple for the Eastern kingbird in Connecticut.