

WILDLINES

New Hampshire Fish and Game's quarterly newsletter of the Nongame and Endangered Wildlife Program



TERNS TAKE BACK THE ISLANDS

From the outside, it looks like chaos—a little scary, even. Within the Isles of Shoals, off New Hampshire's coast, a rowdy and rambunctious settlement pops up every spring. It's not vacationers or tourists, but a group of noisy seabirds, some just finishing a 10,000-mile round trip journey. This migration from New Hampshire to places such as Argentina and back again is among the longest ever documented in the world of animals. Arctic terns are known to travel the farthest, and in fact hold the record for longest-distance migration at around 60,000 miles.

In May, terns begin courting by zig-zagging through the air and performing a slow, sophisticated dance on land. A male tern will offer fish to his female of choice, and the two will remain together until the breeding season's end in August. The pair will take turns incubating up to four speckled eggs, and if successful, will spend about a month teaching their young how to fly and plunge for fish before they leave together for their wintering grounds.

White and Seavey Islands in the Isles of Shoals, owned by New Hampshire's Department of Natural and Cultural Resources, host the largest tern breeding colony in New Hampshire. The Isles of Shoals was once the summer home for more than 2,000 pairs of common terns (state threatened), 60 pairs of roseate terns



Arctic terns are known to travel the farthest, and in fact hold the record for longest-distance migration at around 60,000 miles.

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(federally endangered), and 30 pairs of arctic terns, which are rare in the state because New Hampshire is the southern-most edge of their range. But by 1955, this once-booming colony was abandoned. Tern numbers had decreased worldwide due to their popularity in the fashionable hat trade. The abandonment in New Hampshire resulted when people left the islands, which coincided with a population boom of herring gulls and great black-backed gulls, both predators of young terns.

In 1997, biologists started deterring predators with pyrotechnics and by walking the islands to discourage gulls from nesting there. At the same time, biologists deployed wooden tern decoys and played recordings of tern calls to entice passing birds to stop and

investigate this potential breeding spot. By the next summer, six pairs of common terns formed a small colony to successfully raise six young on Seavey Island. Since then, all three tern species arrived to breed and have continued to return each year.

The tern restoration project has had many dedicated partners over the years. Most recently, tern monitoring and management have been coordinated by the Shoals Marine Laboratory, which is operated by the University of New Hampshire (UNH) and Cornell University, through a contract from the NH Fish and Game Department. Elizabeth Craig of UNH leads the tern research team, while continuing to monitor

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terns each summer and deter predators from the islands. During the summer months, when terns are extremely aggressive and protective of their young, researchers dress in long raincoats and straw hats packed with socks to cushion the blow of a diving tern attempting to drive them off the island. Biologists weigh and inspect the chicks, and also keep track of what the birds are eating. This can provide important data about ocean cycles and overall productivity, which is shared with fisheries managers and other biologists in the region.

The three tern species nesting on the Isles of Shoals maintain a unique balance because they depend on each other for protection, but compete for space and food. “Common terns, which are the most prevalent on the islands, are also the most aggressive,” said Craig. “You won’t find roseate terns nesting without common terns,” she explained. “Although roseate terns will defend their chicks when necessary, they take advantage of the common terns as an umbrella of protection. When a predator is nearby—usually a gull, sometimes an owl or a falcon—all the common terns will rise up in defense of the colony.”

Craig initiated a type of nursery for tern chicks in order to track their growth rates, which is the best indicator of whether they are being sufficiently fed. “The last three years have been quite poor, when looking at growth rate and overall survival,” said Craig. “This year has been a bumper year for New Hampshire, a really good fish year for us.” A really good fish year means a steady supply of herring and sand lance and different sized fish, which is essential. “Terns feed their chicks whole fish, they don’t chew and regurgitate like some other birds,” said Craig. When chicks are tiny the adults must find tiny fish, and continue on the scale of appropriate sizes until the chicks can begin foraging on their own. “A lot of things need to line up for terns to be successful; it’s a bit of right place at the right time,” said Craig.



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Terns will incubate up to four eggs. When the eggs hatch, biologists observe and check the eating habits of the tern chicks as well as monitor their weight. Roseate terns (bottom right) exploit the aggressive nature of common terns (bottom left) for their own protection from gulls and other predators.

“A few bad years are to be expected, but it’s concerning when we start to see multiple bad years in a row.”

“There are lots of implications to studying the seabird diet,” said Craig. “The fish they’re eating are important to the lobster fishery and other marine animals, too.” Craig believes this research is possibly the most critical to long-term persistence of tern colonies in New Hampshire and elsewhere. “We can protect them from predators, we can make the habitat suitable, we can do all these things year after year, but if they don’t have enough to eat they will starve and that’s a much bigger issue to tackle,” said Craig. Noting the possible increases in water temperature related to climate change, if important baitfish relocate during the months when terns are foraging it would be disastrous to the colony.

Maintaining biological staff on the islands has been critical to the recovery program. “It would take just a few years for complete abandonment of this colony to reoccur,” said Craig, if gulls were allowed to take over as “top bird” once again. Nongame Program Supervisor Mike Marchand assisted with research on the islands this summer and saw first-hand the incredible dynamic that exists there. “They are a management-reliant species,” said Marchand. “Without a stable funding source, it is one of the species I’m most concerned about long term.”

To date, it’s been an incredible recovery. Nearly 3,000 common tern nests were established on White and Seavey Islands during 2019, making it the largest breeding population of common terns in the Gulf of Maine. Craig’s team will be formulating a habitat management plan to maintain adequate nesting areas for the three species, and will also analyze fecal samples collected over the summer for the presence of micro-plastics. The tern colony is at the forefront of many large and far-reaching conservation topics. “A number of groups rallied together to get terns back to their nesting spots in the state,” said Marchand. “It’s a good example of how a species can recover, sometimes fairly quickly, when the right conservation actions are supported.”



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The common tern colony on White and Seavey Islands is the largest in the Gulf of Maine.

THE FUTURE OF RARE TURTLE CONSERVATION

Biologists conclude a second season of surveying for the spotted turtle.

Surveys for this state-threatened reptile occurred throughout southern New Hampshire by live-trapping turtles in shrubby, vegetated shallow wetlands. "Spotted turtles were caught at about 80% of the survey sites this summer," estimates Nongame Program Biologist Josh Megyesy. The team will continue to survey until turtles become inactive in response to colder temperatures. "I'm hopeful the weather will allow us to get to a few more peripheral sites such as Keene or Ossipee, which have just a few verified records," said Megyesy. The data collected from this project will be analyzed this winter and fed into a regional conservation plan for rare turtles from Maine to Florida.

From June to July, spotted turtles move across land to find sunny open meadows, fields, or other areas with exposed dirt in which to deposit the next generation of turtles. Up to eight eggs are laid, carefully covered over with sand, and then left on their own to develop. But even before that point, the female spotted turtle must embark on a hazardous journey that leads it across roads and through backyards, bringing the

turtle into contact with both cars and people. While mortality from cars on roadways has been identified as the largest threat to most turtle species in the state, collection of turtles from the wild is an emerging threat gaining worldwide attention.

Megyesy and regional partners track cases of confiscated illegal turtles across the country. A single case in New York last year uncovered almost 300 wild animals, including 184 spotted turtles. In New Hampshire, turtle poaching and casual collection have been documented. "It's a growing problem with the potential to wipe out entire local populations here in New Hampshire," said Megyesy. Because the demand is largely foreign, biologists are struggling with how to best tackle this threat. Complications with how law enforcement can investigate across state lines, and the expense of genetically testing every confiscated turtle to help determine where it came from also contribute to the problem.

"All the information collected thus far for spotted, Blanding's, and wood turtles will culminate in a multipartner project to



protect habitat in the highest priority areas," said Megyesy. Working Lands for Wildlife, fueled by the Natural Resources Conservation Service (NRCS), is seeking out landowners who may be interested in initiating on-the-ground actions that would help protect turtles and provide quality habitat. NH Fish and Game biologists will collaborate with the Southeast Land Trust, The Nature Conservancy, and Bear-Paw Regional Greenways to direct protection efforts to the most critical areas in the state. If you are a landowner interested in turtle conservation on your property, contact Josh Megyesy at (603) 271-1125 or your nearest USDA-NRCS field office. 🐢

IMPORTANT WILDLIFE CONSERVATION FUNDING PROPOSAL

A new bill introduced to Congress aims to "recover America's wildlife." The need is not new—a coalition of wildlife advocates has spent decades seeking a unified solution to the extensive loss of habitat and declining wildlife populations. Successful dedicated federal funding programs have been in place for some wildlife, game species and sport fish in particular, and more recently State Wildlife Grants have become critical to the development of state Wildlife Action Plans and implementing select priority conservation measures. But to date, there hasn't been an adequate dedicated funding source for states to take necessary conservation actions for the full array of wildlife. Although the need is not new, some threats to wildlife populations continue to intensify, and the urgency has become widely known. Currently, there are more than 12,000 Species of Greatest Conservation Need identified in Wildlife Action Plans nationwide. New Hampshire's Wildlife Action Plan alone identifies more than 900 important conservation actions for wildlife and their habitats.

The unified solution arrived this year in the form of the Recovering America's Wildlife Act (HR3742). The bill proposes the redirection of \$1.3



billion in existing revenue to state fish and wildlife agencies for implementing state Wildlife Action Plans. The Recovering America's Wildlife Act would provide critical funding for both the recovery of currently imperiled wildlife species and also the proactive conservation of the full spectrum of wildlife that exist in each state.

"This funding will enable future wildlife success stories like those we currently celebrate such as the bald eagle's return from the brink of extinction," said Mike Marchand, Nongame Program Supervisor. "The proactive conservation implemented through this funding will also help maintain

those wildlife species that we may presently take for granted because of their abundance but that may otherwise decline in the future," Marchand added.

The maintenance of healthy and diverse wildlife populations and their habitats, coupled with broad public education about our diverse wildlife resources, is a significant goal of the NH Fish and Game Department. The proposal continues to gain support among members of Congress, businesses, organizations, scientists, educational groups, landowners and land managers, and other U.S. citizens. To learn more, visit OurNatureUSA.com. 🐢

SANDERLING (*Calidris alba*)



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By October, most sanderlings have begun their journey south for the winter, but each year a few remain in New Hampshire for the cold months instead of migrating. On beaches, they feed by chasing after retreating waves that may have deposited invertebrates in the sand.

Habitat: Sanderlings are most common on coastal beaches, but also forage on mudflats and rocky shorelines. They will use salt marsh, estuarine habitat, coastal islands, and dunes.

Threats: Recreational activity on beaches that cause repeated disturbance and habitat changes related to climate change.

Conservation Actions:

- Incorporate important shorebird habitat and stopover sites into land-use planning, to ensure that human activities in response to climate change do not negatively impact these areas.
- During peak migration, avoid disturbance to shorebirds by managing important sections of beaches and requiring dogs to be leashed.

A BUTTERFLY

It's evident that Nongame and Endangered Wildlife Program Biological Aide Samantha Derrenbacher is invested in the flora and fauna of the White Mountains. "I call myself a butterfly momma, and right now I'm a momma to 66 butterfly eggs," she said at her summer base on Mount Washington. The eggs she is collecting are those of the state-endangered White Mountain fritillary, endemic to New Hampshire. Endemic species are those that are found in just one location on the planet. This uniqueness makes endemic wildlife very special, but often coincides with extreme natural rarity. One of two endemic butterflies in New Hampshire, the White Mountain fritillary has been the topic of a NH Fish and Game Nongame and Endangered Wildlife Program research project in the White Mountain National Forest for the past two years.



Male White Mountain fritillary (actual size)

This delicate, mostly orange butterfly exists only in the alpine zone of New Hampshire's Presidential Range, which is similar in land-size to the town of Winchester, NH. Within that space, the butterfly prefers wet meadows and stream-side habitats, especially where snowbanks exist late into the spring. Some research has suggested that this habitat is beginning to shrink in overall size, and predictions related to climate change estimate timing and community shifts for these high-altitude regions. In order to protect the species that

live here, much more needs to be learned about what allows for them to survive.

Derrenbacher has been tasked with studying the fritillary, including what plants it eats and how it behaves over its 2-year life cycle, which is extraordinarily long for a butterfly. Last summer, fritillary eggs were brought back to the Department's butterfly laboratory in Concord to observe the behavior of the tiny caterpillars, called the first instar.

"Depending on the species, caterpillars typically go through three to five instars where they eat a lot and then shed their skin to continue growing, initiating the next instar," explained Derrenbacher. The number of instars that this particular butterfly completes is still unknown. "In the lab we observed that once hatched, the tiny caterpillars do not eat right away, but instead go right into a form of hibernation for the winter," commented Derrenbacher. Biologists will be looking at the next phase of the life cycle this year, determining how and when fritillaries hibernate over their second winter.

In order for such a small, delicate animal to persist in the harsh conditions of the



First instar



A stunning view of the Presidential Range from Black Cap Mountain.

Y Found Only in New Hampshire

alpine zone, which includes a truncated growing season, researchers believed this butterfly would have unique habits to help it survive. Derrenbacher has documented adult fritillaries feeding on nectar plants such as goldenrod, alpine meadowsweet, asters, and rattlesnake root. However, the preferred host plant for the caterpillars remains a mystery. “We’ve seen the butterflies using these small pockets in the landscape where snow collects,” said Derrenbacher. “They take advantage of areas that seem to be protected from wind gusts, allowing for a bit more soil to accumulate when compared with other areas of the alpine zone.” These pockets are called snowbank communities and they make up less than 1%

of the entire alpine zone, but are favored by these butterflies for the unique plants they’re able to support. The research team is uncovering a world of intricacies that exist within this tiny space.

The future of the project involves looking at the population size, identifying the most important plants for survival, and assessing the possibility of captive-rearing fritillaries if deemed necessary. “Any threat to the alpine zone community that could change its species composition is something we will be keeping an eye on,” said Derrenbacher. Since



Female White Mountain fritillary

there is heavy, year-round tourism in the White Mountains, biologists educate hikers about the critical importance of staying on marked trails and minimizing recreational impacts. “The two things everyone can do to help the White Mountain fritillary is to obey posted signs and support funding for the Nongame Program,” she advised. 🐦

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caterpillar



Sam Derrenbacher conducts White Mountain fritillary research.



Snowbank habitat populated with Cutler's goldenrod.

LOCATING BATS

In the Midst of White-Nose Syndrome

A research study launched earlier in 2019 is using hands-on methods to better understand the repercussions of continued disease spread through the Northeast bat population. A decade has passed since white-nose syndrome was officially documented in New Hampshire's bats. Since then, four of the five bat species that hibernate in New Hampshire have been deemed endangered at the state level, and one is also protected as a federally threatened species. Biologists across the Northeast have continued to investigate this devastating disease.

In New Hampshire and surrounding states, biologists have focused heavily on finding areas where bats are surviving and successfully reproducing. "We monitor these areas and continue to track how many bats are in maternity colonies," explained Nongame Program Biologist Sandi Houghton. "Until the last few years, we had limited knowledge of the distribution of bats that had survived white-nose syndrome, and very few roost sites had been found," said Houghton.

"We want to know more about the habitats the surviving bats are using, how far bats will travel from the forest to find a roost



A red bat


site, and how often they're using manmade structures," said Houghton. In the summer, typical roosting sites include barns, garages, church steeples, abandoned buildings, cavities in trees, rock crevices, and well-placed bat houses. Researchers hope to locate the areas where female bats congregate to give birth and rear their young, called maternity colonies. Protecting these areas is perhaps the most critical action to conserve bats for years to come. To gather this information and develop the next steps in a recovery plan, NH Fish and Game biologists (supported by the NH Wildlife Heritage Foundation) partnered with experienced bat researchers to conduct mist-net surveys.

A mist-net survey helps determine the

presence (or possibly an absence) of certain bat species in an area by attempting to gently capture them during flight with a net. The net is made of polyester and is suspended from two poles in the forest or near a wetland—like a volleyball net with a smaller mesh size. Biologists began surveying with mist nets in June and will continue until early August. They are specifically looking for the federally threatened northern long-eared bat and the three state-endangered species: tricolored bats, small-footed bats, and little brown bats.

On warm nights, the nets are put up 30 minutes before the sun sets.

Biologists stay nearby to check for captures every ten minutes for about five hours. Any bats captured are removed from the net and given a careful examination. Biologists record weight, sex, species, and length of the forearm. They also check for signs of white-nose syndrome by inspecting the wings for damage.

"To date, we have caught several state-endangered Eastern small-footed bats, several state-endangered little brown bats, and a red bat" said Houghton. She was happy to report that several of the small-footed bats were breeding females, a critical component of the population that biologists were hoping to find. 



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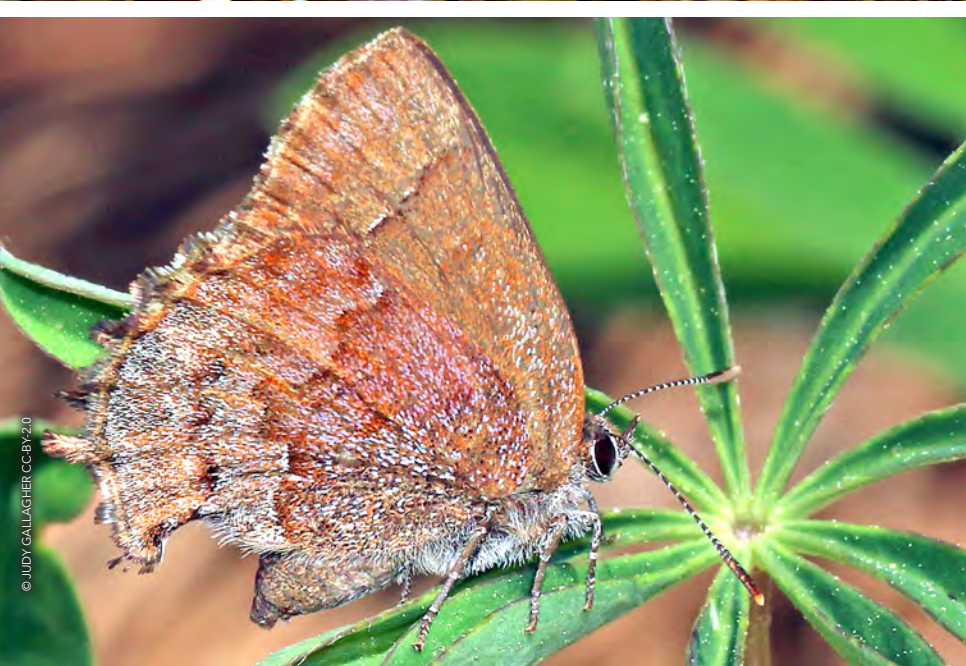
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UPDATES FROM OUR FIELD SEASON

Projects implemented and funded by the Nongame and Endangered Wildlife Program



◀ It was a record-breaking year for federally threatened *piping plovers* in the Northeast. New Hampshire documented 11 pairs of nesting plovers, beating last year's record of nine pairs. The busy plovers successfully raised 20 chicks from Hampton and Seabrook beaches.

• NH Audubon documented the return of state-endangered *common nighthawks* to 11 breeding territories in 2019. These sites were all active in 2018, and there were no new nesting sites found. Most sites were in the areas of Ossipee and Concord, both associated with pine barrens.

• A second season of surveys for the state-threatened *cerulean warbler* were conducted this year. Audubon biologists and volunteers documented a singing male at one site. The rarity of this bird coupled with low detectability makes surveys challenging.

• Audubon biologists conducted surveys for *cliff swallows* and their recognizable mud nests in May through July. Most known sites were found to be supporting colonies again this year. Observers are encouraged to report any cliff swallow (state-threatened) sighting to www.ebird.org.

◀ To date this season, eight young *New England cottontails* have been captured out of the 10-acre breeding pen at the Great Bay Wildlife Refuge and will be released into the wild. Biologists will continue to monitor and release state-endangered rabbits from the pen into New Hampshire's best shrubby habitats supporting cottontail populations.

• Two pairs of state-endangered *least terns* nested on Hampton Beach this year, fledging four chicks. Five pairs returned to Seabrook Beach but struggled to hatch any chicks this season, mostly due to predation.

◀ Biologists continued another season of captive-rearing *frosted elfin butterflies* (state endangered) in the Concord laboratory this year, resulting in the successful release of hundreds of the tiny brown-gray butterflies this summer.

• Thirteen state-endangered *upland sandpiper* chicks fledged from Pease airfield in Newington this year. The airfield typically supports 5 to 7 pairs of adult sandpipers, and 10 to 15 chicks usually fledge each year. NH Fish and Game continues to work with airport management and maintenance staff to conserve the state's only breeding site for upland sandpipers while continuing to maintain airfield safety. 🐦



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OCTOBER

• As autumn colors reach full peak, so does the migration of yellow-rumped warblers. Their winter plumage dulls, but the bright yellow rump remains.

NOVEMBER

• Squirrels, blue jays, and cottontails are still benefiting from acorns dropped by red oak trees, eating these protein-dense nuts and sometimes storing them for later.

DECEMBER

• The common loon (state threatened) that spent the summer on a New Hampshire lake can now be found in open coastal waters for the winter.



The federally endangered Karner blue butterflies had a great first brood in captivity, with excellent survival rates in 2019. For the first time since the beginning of the project, biologists did not need to conduct a second round of captive rearing. This freed up time and manpower to survey a larger section of pine barrens for wild Karner blue butterflies, conduct a habitat assessment, and implement habitat management projects. 🦋



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