NATURAL HERITAGE HARMONIES

A publication of the Wildlife Diversity Program

Vermont Fish & Wildlife Department
Agency of Natural Resources

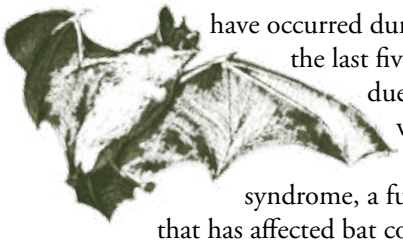
WINTER 2013

Conserving Vermont's fish, wildlife, and plants and their habitats for the people of Vermont.

Students Raise Money for Bat Conservation

By Tom Rogers

Fifth and sixth grade students at the Waitsfield Elementary School raised $700 for the Vermont Fish & Wildlife Department's Nongame Wildlife Fund to support research and conservation of Vermont's bat populations. The students were inspired to raise money for bats after wildlife technician Alyssa Bennett gave a presentation last spring on the massive die offs that threaten several of Vermont's bat species with localized extinction. The die offs have occurred during the last five years due to white-nose syndrome, a fungus that has affected bat colonies in the Northeast.



After learning about the threats facing Vermont's bats, the students were inspired to embark on a service learning project to help save them. The students built four-chambered bat boxes and sold them to raise money to donate to the Nongame Wildlife Fund. They also filmed public service announcements for their local TV station, composed a brochure on bat conservation, and created a children's book on bats for their school library.

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Inside Highlights

What is Good Quality Habitat?

Examining "Necessary Wildlife Habitat" Functions

By Paul L. Hamelin

PHOTO CREDIT: LINDA MORSE

To cope with Vermont's severe winters, deer rely on availability of special winter habitat known as deer wintering areas (DWAs), or "deer yards."

The term "necessary wildlife habitat" (NWH) seems redundant, as one would assume that all habitat components are necessary for wildlife to thrive on the landscape. However, several environmental regulatory processes and habitat conservation strategies in Vermont recognize that certain habitats or their components are essential to the perpetuation of a species. Such habitat or components are afforded special protection under Vermont law, once their "necessary" status has been recognized via regulation or case law. As applied in Act 250, Vermont's land use and development law, NWH is defined as "concentrated habitat which is identifiable and is demonstrated as being decisive to the survival of a species of wildlife at any period in its life including breeding and migratory periods." Other Vermont regulatory processes which apply the concept of NWH are the Vermont Wetland Rules, and Section 248 of Title 30 V.S.A. 203 (regulation of certain public energy utilities).

The Vermont Fish & Wildlife Department (VFWD) has been reviewing and commenting on Act 250 (and Section 248) applications since the laws were enacted. The department has successfully protected deer wintering areas, mast stands, wetlands (including bear feeding wetlands and vernal pools), wildlife road crossings, and habitat for rare and endangered species, such as heron rookeries and falcon nest cliffs.

Of course, NWH is found on private land throughout Vermont, so landowners can voluntarily protect and perpetuate these habitats at any time, outside of the regulatory processes. Let's examine some examples of NWH, and

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WHAT'S NEW

BioFinder – a New Tool for the Toolbox

The Agency of Natural Resources has launched a new mapping and database tool to help identify the distribution and richness of Vermont's biodiversity. BioFinder is a map and database identifying Vermont's lands and waters supporting high priority ecosystems, natural communities, habitats, and species.

At its core, BioFinder is 21 overlapping data sets representing terrestrial and aquatic biological, ecological, and natural heritage data at various scales and aspects. It was developed with developers, planners, scientists and educators in mind.

Learn more about this great tool at **http://biofinder.vermont.gov**

Vermont's Wildlife Action Plan Slated for Review

Plans to review and revise Vermont's Wildlife Action Plan are underway. Congress asked each state to develop a Wildlife Action Plan and stipulated the plans must be reviewed after ten years. Department staff are forming teams and starting to reach out to partners to meet the revision due date of October 1, 2015.

Although still in the very early stages, specific areas for revision have been identified, including climate change, emerging diseases, landscape habitat connectivity, pollinators, invasives, and re-evaluating high and medium priority Species of Greatest Conservation Need. Including a map generated with BioFinder is also on the list of suggested revisions.

Vermont's Wildlife Action Plan is a proactive examination of the health of Vermont's wildlife. It prescribes actions to conserve wildlife and vital habitat before they become more threatened and more costly to protect. The plan was created by pooling the knowledge of the people who know Vermont's wildlife best—the Vermont Fish & Wildlife Department and representatives of more than 60 local, state and national agencies, sportsmen and conservation groups, academics, land managers and other wildlife experts.

We will be providing opportunities for stakeholders and partners to get involved reviewing the Wildlife Action Plan and suggested revisions. We are just getting started but wanted to let you know what is coming.

Natural Heritage Harmonies is a free, annual publication of the Vermont Fish & Wildlife Department's Natural Heritage Information Project. Please acknowledge the Vermont Fish & Wildlife Department in any reprints.

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consider how they may be protected or perpetuated by private landowners in Vermont.

Deer Wintering Areas

To cope with Vermont's severe winter climate, deer rely on availability of special winter habitat known as deer wintering areas (DWAs), or "deer yards." A DWA is generally defined as an area of mature or maturing softwood cover with slopes facing toward the south, southeast, southwest, or even east or west, used by deer on a regular basis as refuge from restrictive snow depths and extreme cold temperatures. Ideally, the evergreens have a minimum of 70 percent crown closure to provide winter shelter, but there are many areas in Vermont where crown closures of less than 70 percent support wintering deer quite well. Browse should be available near enough for deer to travel through snow without expending much energy.

DWAs vary from a few acres to over a hundred acres, and provide deer essential protection from deep snow, cold temperatures and wind. Forest cover is commonly hemlock and white pine in the southern part of the state, and white cedar, spruce, and fir in the north. DWAs can be used by generations of deer over many decades if appropriate habitat conditions are maintained. Deer annually migrate, often several miles, from fall habitats to wintering areas. A single DWA often serves deer from large areas of a town and in some cases from surrounding towns as well. Residential or commercial development within or adjacent to a DWA decreases the amount of winter habitat available to deer, negatively effecting the area's deer population. Without adequate winter habitat, Vermont's deer population would be subject to extreme fluctuations due to increased winter mortality during moderate and severe winters. Only eight percent of the forested landscape of Vermont has been mapped as DWAs, so conserving it is essential to managing white-tailed deer in the state.

The department maintains a GIS database of mapped DWAs. The DWAs are included on the department's Significant Habitat Maps, available from the department and town and regional planning commissions. However, not all DWAs have been mapped. It's also important to remember that some DWAs mapped since the 1960s may no longer exist because of changes in forest cover or land use. If you suspect you own an un-mapped DWA, it's recommended you contact the department.

Mast Stands

"Hard mast" refers to nuts, available primarily from American beech and oaks in Vermont. It's widely

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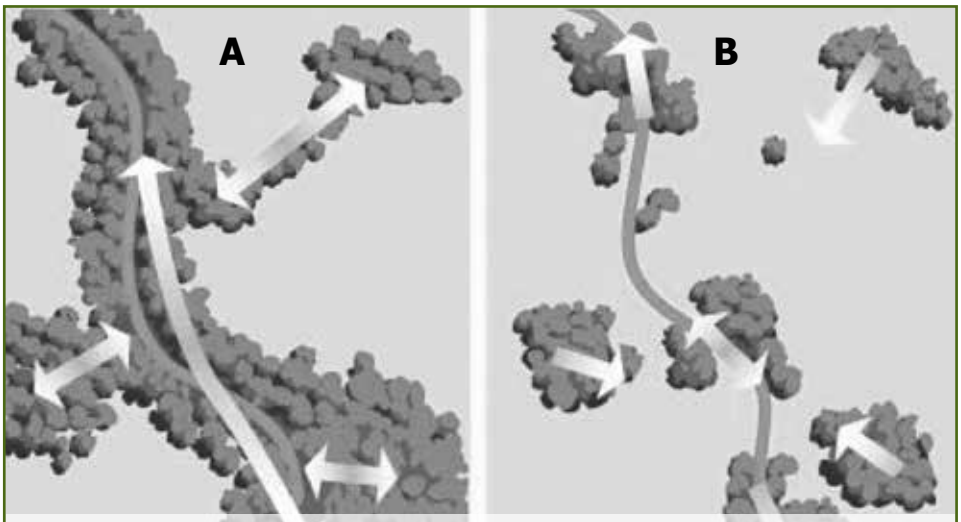
considered an important wildlife food source. The black bears' need for hard mast is so well established that the department considers areas of beech or oak with a history of bear feeding use to be NWH as defined by Act 250. Hard mast availability in the fall affects the minimum reproductive age of bears, productivity rates and cub survival. Female bears exhibit reproductive 'skips' after poor mast years, and fall weight gains are keyed to mast availability. Simply put, these stands of beech and oak used by black bears are absolutely essential for the survival and reproduction of this species in Vermont!

Similar to deer winter habitat and wetlands, significant mast stands are discrete habitat features on the landscape that can be delineated and represented as a polygon on a map. Although beech is a common tree species associated with Northern Hardwood Forest natural communities, concentrated stands of beech used by black bears are not common. These stands represent a small fraction of the overall forested landscape of the state, hence their significance for conservation planning.

Mast stands considered necessary black bear habitat exhibit some bear scarring made within the past ten years, and include at least 15 to 25 historically scarred trees within the stand. Smaller mast stands, however, also may be significant for wildlife and worth considering. Development within or even near the boundaries of a mast stand can diminish the function and use of this habitat.

Connecting Habitat (Corridors)

Connecting habitat is land that links larger patches of habitat within a landscape, allowing the migration and dispersal of animals and plants. Riparian habitat along streams and rivers, strips of forest cover between developed areas, and even hedgerows and fencerows represent potential connecting habitat. Sometimes these areas are called 'corridors' even though they are not always linear, as the term implies.



Landscapes with (A) high and (B) low degrees of connectivity. Corridors are particularly important for wide-ranging species whose habitat needs are not accommodated by a single patch of suitable habitat. (Source: Federal Interagency Stream Restoration Working Group)

While movement from one habitat patch to another is obviously important for wide-ranging animals such as bobcats and black bears, it's equally important for animals with relatively small ranges. Spotted salamanders, for example, use connecting habitat in the spring to move from their hibernation sites to breeding pools. Connecting habitat is valuable both seasonally and spatially. For example, it may allow black bears to access important food resources during a specific time of year (seasonal), or it may prevent isolation of bear populations by allowing free movement of breeding adults (spatial). Ultimately, connecting habitat can ensure that the habitat, movement, migration, and behavior requirements of most native plants and animals are conserved across a broad landscape.

"While movement from one habitat patch to another is obviously important for wide-ranging animals such as bobcats and black bears, it's equally important for animals with relatively small ranges, like spotted salamanders."

Conserving threads of plant cover within a developing landscape won't maintain an area's ecological values and biological diversity, nor will corridors alone meet the habitat needs of all plant and animal species in the area. Connecting habitat will support ecosystem functions and related public benefits only in conjunction with conserving large areas of undeveloped land with diverse habitat conditions and maintaining a sustainable working landscape.

Things You Can Do

You can help conserve necessary wildlife habitat on your property or within your town by setting out specific goals and conservation strategies. For example, a goal may be maintaining and protecting the functional integrity of all DWAs, mast stands, or connecting habitat on the property.

Some conservation strategies examples include:

- Locate existing necessary wildlife habitat throughout the property using Significant Habitat Maps at your Town Clerk's office and other wildlife-use data. Wildlife habitat consultants can also help you evaluate how much unmapped necessary wildlife habitat exists in the area of interest. The department maintains a searchable database of individuals specializing in habitat inventorying, habitat management planning, species

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Wildlife, Plants and Natural Communities News

by Lilla Lumbra

Department biologists and our partners collaborate on more than 60 projects involving nongame wildlife, plants and natural communities. The Nongame Wildlife Fund and State Wildlife Grants help support our efforts to conserve and protect Vermont's rich wildlife and plant resources. Here is an update on some of our projects.

Plants & Natural Communities

New populations of state threatened or endangered plants, as well as new populations of rare plants, were discovered thanks to the efforts of our cooperators, members of the Scientific Advisory Group on Flora (FLAG), and our dedicated New England Plant Conservation Program volunteers. Two plants species, Susquehanna sand cherry and White camas, were added to the state's Threatened and Endangered Species List in 2012. Cork or rock elm, bog arrow-grass and Pickering's bent-grass were listed as endangered in 2011. Torrey's rush, on the other hand, was removed from the list after it was found to be more common than originally thought, following inventories associated with development projects in the Champlain Valley.

Our management efforts to help regenerate the Sandplain Natural Community continue with a controlled, ecological burn at Sandbar Wildlife Management Area after which we planted pitch pine samplings into the burn area. The saplings were grown from seeds previously collected from the site. We also collected pitch pine seeds from trees at Camp Johnson in Colchester, with help from Green Mountain Power's staff and bucket truck. Seeds from these cones will be germinated and grown to produce saplings that will be planted at Camp Johnson after a controlled burn there, currently planned for 2013.

PHOTO CREDIT: BOB POPP

Green Mountain Power helped us collect pitch pine seeds in Colchester.

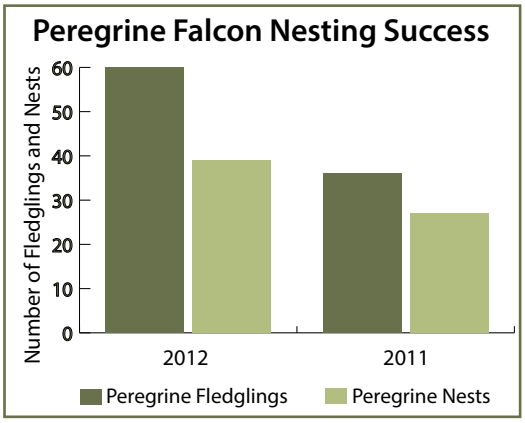
The Vernal Pool Mapping project is nearly complete, with more than 4,000 potential vernal pools mapped statewide. One objective of this project is to identify and map the location of potential vernal pools in every Vermont town using stereo, color infrared aerial photo interpretation. The first year of the project mapped pools in northern Vermont, the second in central Vermont, and the final year in southern Vermont. More than 1,400 vernal pools have been field verified by staff and trained citizen volunteers visiting the "potential" pools on the ground.

During field-verification, data were collected on amphibian and invertebrate "indicator species" present in each pool. The spotted salamander was the most commonly detected species, followed closely by the wood frog. Other species detected included the blue-spotted salamander, Jefferson salamander, fingernail clams, and fairy shrimp.

When complete, this project will produce a GIS representation of observed vernal pools throughout the state, with information on species presence, pool characteristics and conditions and surrounding upland habitat conditions. This project is made possible through a partnership with the Vermont Center for Ecostudies and Arrowwood Environmental.

A Strong Showing for Feathered Species

Peregrine falcons rebounded in 2012 from a poor nesting year in 2011. Sixty young falcons fledged from 39 nests compared to just 36 fledglings from 27 nests in 2011. This year's productivity is consistent with the strong levels of chick production this species has exhibited since it was removed from the state's endangered species list in 2005. Much of the falcon's success is due to the ban on DDT; monitoring efforts of Audubon Vermont, department staff and citizen volunteers; and the cooperation of outdoor recreationists who avoid the falcon's cliff-based nests.



Bald eagles are making a strong comeback to Vermont with increasing numbers of successful nesting pairs. In 2010, department biologists and volunteers monitored nine eagle nests, with four nests producing five fledged eaglets. Eleven nests produced 13 fledglings in 2011. During the 2012 nesting season, 15 Vermont nests successfully fledged 23 eaglets.

Bald eagles first began nesting in Vermont in 2002 after a 60-year absence. Although the bald eagle was removed from the list of endangered species at the national level in 2007, it remains listed as an endangered species in Vermont, as it does in many New England and surrounding states. The department will continue to protect and monitor the success of bald eagles as outlined in our Bald Eagle Recovery Plan. The plan is available on the department's website (**www.vtfishandwildlife.com/wildlife_nongame.cfm**).

Vermont's common terns, a state endangered species, had a successful

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Wildlife and Plants News

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nesting season in 2012. Good productivity occurred on both islands that have historically hosted tern colonies, unlike in 2011 when record high water reduced nesting habitat to a single island. A total of 225 pairs were estimated to have nested on the two islands in northern Lake Champlain.

Gull nesting and ant predation are managed and chick shelters are provided to improve survival. Predation and competition from other bird species has been deterred with fencing and overhead wire. These efforts have paid off. The fifth year of the five-year down-listing threshold for nesting productivity outlined in the recovery plan was met in 2012.

Vermont's common loon population continues to do well with observers confirming a record 72 nesting pairs in 2010. Of these pairs, 57 successfully nested, producing 70 chicks that survived through August. In 2011, despite a wet April and May and the late-arriving summer in southern VT, nesting loons had a strong year, with 71 pairs attempting to nest statewide and 51 successfully nesting. Approximately 60 loon chicks survived through August. The 2012 nesting season was a success as well, with 49 nesting pairs producing 87 chicks.

Bat Prospects Dim

Unfortunately the outlook for bats is not as bright as for our feathered species. During 2010, department wildlife biologists conducted a statewide population assessment of the state's six cave bat species to determine the effects of White Nose Syndrome on their populations.

The survey results indicated that two bat species, the little brown bat and the northern long-eared bat, are most affected by White Nose Syndrome. The little brown bat population has declined between 75 to 99 percent while northern long-eared bat numbers have been reduced 93 to 99 percent. These two species, once Vermont's most common bats, are now the state's rarest.

"What is unique and particularly challenging with the listing of the little brown bat is that it is one of two bat species found in residences, places of work and public buildings."

In response to the dramatic declines, the little brown bat and the northern long-eared bat were added to Vermont's endangered species list in 2011 and the tri-colored bat was added in 2012. Listing the little brown bat is both unique and particularly challenging because it is one of two bat species found in residences, places of work and public buildings.

Two measures to balance bat protection and human concerns were approved by the secretary of the Vermont Agency of Natural Resources. The first includes a general permit for the taking of endangered bats when a potential exposure to rabies has occurred. Citizens are allowed to kill up to four listed bats per year in order to collect the bats to be tested for rabies. If bats are killed for such purposes, they must be reported on the department website (**www.vtfishandwildlife.com/Bats_Incidental_Take_Form.cfm**) or by calling 802-241-3700 (work hours) or 802-786-0040 (anytime) within five days.

PHOTO CREDIT: TOM ROGERS

Currently, we are conducting state-wide hibernacula surveys for the first time since 2010. Results of the survey will be available in late spring 2013.

The second measure includes best management practices for excluding bats from a house or other building. The practices are available on the department's website (**www.vtfishandwildlife.com/library/Factsheets/NonGame_and_Natural_Heritage/BMP_for_bats.pdf**) and describe the methods that can be applied to remove bats from a building without harming them. Before bats can be removed, even with actions that are consistent with the best management practices, the person must first obtain a State Threatened and Endangered Species Permit. The best management practices are particularly important for contractors who conduct such work as a business.

While listing is an important step in reducing non-disease related mortality of little brown bats, these measures were put into place because citizens must be allowed to protect themselves from health concerns associated with rabies.

Got Bats? We need your help! The department is especially interested in monitoring little brown bat colonies in Vermont. If you have bats living in your attic, barn or church in the summer, please report them on the department's website at **www.anr.state.vt.us/fwd/batcolonyreporting.aspx** or call 802-786-0098. For more ways to help Vermont's bats, see **www.vtfishandwildlife.com/wildlife_bats.cfm**.

Butterfly Study Takes Wing

We have completed our 6-year effort to gather and analyze records of all of Vermont's butterfly species. Contributors submitted more than 36,000 records, accompanied by vouchers (photographs or specimens) for more than a third of these. A total of 149 people contributed records to Vermont Butterfly Survey (VBS), with 13 individuals tallying more than 1,000 records each.

VBS observers added 13 new butterflies to the Vermont list, which now stands at 103 species. The most commonly recorded species was the common ringlet, a butterfly that only recently

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became established in Vermont from the north and was first collected in 1980. Two species have apparently disappeared from Vermont, the regal fritillary and persius duskywing.

The highest butterfly diversity was observed in the Taconic Mountains biophysical region, where 89 species were reported, followed by the Southern Vermont Piedmont (88), Southern Green Mountains and Champlain Valley (84), Vermont Valley (83), Northern Vermont Piedmont and Northern Green Mountains (75), and the Northeast Highlands (70).

A complete state list of species can be found at **www.vtecostudies.org/VBS/VTstatelist.pdf**. The Fish & Wildlife Department partnered with the Vermont Center for Ecostudies to bring this project to fruition. The results will provide a baseline of information that can be used in the future to identify population trends and conservation needs.

PHOTO CREDIT: SUSAN WARNER

Wildllife biologist Doug Blodgett prepares to fit a captured rattlesnake with a transmitter to monitor its movements.

Turtles and Snakes

A new population of spotted turtles was found in west central Vermont. Several turtles were captured and fitted with radio tags to monitor their movements and habitat use. In southeast Vermont several under-rail passages were installed when a railroad line that bisects a spotted turtle wetland was upgraded. The under-rail passages will provide safer travel for the turtles as they move through the wetland.

Meet the Spotted Turtle

The spotted turtle is a small turtle with yellow spots on a dark shell. The shell is usually less than five inches long. It takes eight to ten years for a spotted turtle to reach maturity and may live as long as 50 years. Three to four eggs are laid by early June and young hatch in September. Spotted turtles hibernate underwater from November to March. Tadpoles are an important spring food, but spotted turtles also eat vegetation, fruit, and insects.

Spotted turtles live in shallow wetlands. They range primarily along the eastern seaboard states and a few lake states. It is an endangered species and recognized as a Species of Greatest Conservation Need in Vermont due to its scarcity and vulnerability to loss. It is more common in Massachusetts where it ranges to the Vermont border.

Habitat loss and alteration, isolation of populations, road mortality, increasing predator populations such as raccoons and skunks, and collection of wild turtles as pets have contributed to declining spotted turtle populations. Survival of the adult breeders is very important to maintaining this species. Survival of eggs and hatchlings is low, but over time, a long-lived adult female is hopefully able to replace herself with a surviving offspring.

Spotted turtles are a difficult species to locate and when they are few in number it is even more difficult. If you observe a spotted turtle please email Steve Parren (steve.parren@state.vt.us) or call 802-241-3700. Your sighting could lead to documenting a new population. Thank you.

Managing important communal nesting areas has helped save many hatchling turtles each year, including state-threatened spiny softshell, map, snapping, and painted turtles. Two techniques, laying wire mesh fencing over the nesting area to prevent predators digging up the nests and installing electric perimeter fence to limit predator access to the largest communal nesting area, are making a difference. Seventy-five spiny softshell hatchings were salvaged from nests in 2010 and at least 675 hatchlings successfully emerged from the nests. In 2011, 90 nests were examined and at least 591 hatchlings emerged from 51 nests. An additional 200 live hatchlings, embryos and intact eggs found in the nests were collected, cared for during the winter and released in 2012.

Work on rare snakes in Vermont continued with six male rattlesnakes implanted with transmitters in the spring of 2011. The transmitters provide valuable information on the snakes' movements. Throughout the active summer season, 105 rattlesnakes were captured in the study area, weighed, sexed, PIT-tagged and released. Three more snakes were fitted with temporary "tape on" transmitters and monitored bi-weekly. One of these animals subsequently revealed a new den portal within the larger den complex.

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Our outreach efforts to protect rattlesnakes from direct persecution seem to be working. Two rattlesnake locations were phoned in via our "rattlesnake relocation program" and the animals were safely moved from yards and driveways at the landowners' request.

Two ratsnakes were also implanted with transmitters and monitored biweekly in late summer 2011. In the fall, these telemetered ratsnakes helped us discover two new hibernacula sites.

Camera surveillance of one known racer hibernaculum failed to detect the presence of racers at this site. Specific habitat improvements are being employed and maintained for racers, but considerable efforts involving active field searches have yet to reveal a sighting of any of these animals in two years.

However, there is better news for Vermont's ribbonsnakes. Reported leads and active field searches have revealed an expansion of this snake's known range in Vermont.

This article is brief summary of the work being conducted to conserve Vermont's nongame wildlife and natural heritage. This work is made possible through your contributions to the Nongame Wildlife Fund. By giving a little, we can all make a difference. We are grateful for your support.

Thank You

Biologists, botanists, ecologists, seasonal staff, support staff, game wardens, volunteers, program partners and all Vermonters for your help in conserving Vermont's nongame and natural heritage resources.

Nongame Wildlife Fund

Good Habitat

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population inventorying, and water resources on our website at **www.vtfishandwildlife.com/information_consultants.cfm**.

- Consider the largest, highest quality DWA, mast stand, and/or connecting habitat, particularly those that overlap with other unique habitats or rare species elements, as candidates for a conservation easement.
- Develop a necessary wildlife habitat management plan. The department offers information and advice for developing such plans at: **www.vtfishandwildlife.com/conservation_assistance.cfm**.

WHO...

Will help our wildlife, if you won't?

When you contribute to the **Nongame Wildlife Fund** you are helping protect and restore Vermont's endangered wildlife like bald eagles and bats threatened by White Nose Syndrome.

It's Easy to Donate:

1. ***Line 29A on the Vermont tax return***
2. ***Purchase a Conservation License Plate***
3. ***Direct donations – use the form below or go to our website: www.vtfishandwildlife.com/support_nongame.cfm***

I'm sending $ _____ to help Vermont's wildlife.

This is a tax-deductible contribution.

Your Name: _____

Address: _____

City: _____

State/Zip: _____

Phone: _____

E-mail: _____

Please fill out the information below if paying by credit card and be sure the address above is your billing address for credit card.

Credit Card (circle one) Visa Mastercard

Card Number: _____

Expiration Date (Required): _____

Please Sign Here: _____

Send this form, along with your donation, payable to the **Nongame Wildlife Fund** *to:*

Nongame Wildlife Fund
Vermont Fish & Wildlife Department
103 South Main Street, 10 South
Waterbury, VT 05671-0501

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Thank You

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Your Support Makes a Difference!

Please donate to the Nongame Wildlife Fund on your Vermont income tax form. Look for the loon icon.

Students Raise Money

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"The beauty of this project was the organic development of student-generated projects that directly supported habitat restoration for bats in Vermont," said Waitsfield Elementary teacher Lee Van Dine. "This project engaged students, staff and community members to raise awareness and support."

Bats generate an estimated $3.7 billion a year in benefits to North American agriculture through insect pest control and crop pollination, according to the journal *Science*. Vermont is home to nine bat species. White-nose syndrome has caused a 90 percent decline in Vermont's two formerly most common bat species, the little brown bat and the northern long-eared bat, and it threatens fragile populations of the small-footed bat and Indiana bat.

Students at the Waitsfield Elementary School present Vermont Fish & Wildlife Department wildlife technician Alyssa Bennett and Wildlife Director Mark Scott with a check for $700 to the Nongame Wildlife Fund to support bat research and conservation.

PHOTO CREDIT: TOM ROGERS

According to Bennett, Vermont has been a leader in bat conservation since white-nose syndrome began to devastate the bat population. Our conservation efforts depend on the citizen reporting and community support we receive to be successful. You can find out how to build your own bat box, how to report a bat colony that you've found, and other ways you can help Vermont's bats at **www.vtfishandwildlife.com/wildlife_bats.cfm**.