

# WILDLINES

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



WINTER  
2023

## FROM EGG TO BUTTERFLY

### *Under the Harshest Conditions*

In July, sudden fog, rain that lasts for days, and wind gusts well over 50 miles per hour are just a handful of the intense conditions that alpine butterflies have to contend with each year. And so do the researchers diligently trying to study them.

"Timing of surveys and successful data collection depend heavily on the weather throughout the summer," explained Heather Siart, a graduate student at the University of Massachusetts studying alpine butterflies and their vulnerability to a changing climate. It is why alpine butterflies take so long

to complete their life cycles. In the case of the White Mountain Arctic, the slow progression from egg to adulthood takes two full winters and a third summer before an adult butterfly emerges.

Siart is part of a collaboration working to uncover life history details of both the White Mountain Arctic and the White Mountain fritillary, two species that are known to exist only in the alpine zone of New Hampshire and nowhere else on earth.

Researchers have identified critical information such as host plants these

pollinators consume in their juvenile life stages. "We've learned that the fritillary is a generalist that regularly feeds on five plant species as caterpillars: two plants in the blueberry family, two plants in the willow family, and one violet," said Siart. In contrast, Arctic caterpillars are specialists, feeding on Bigelow's sedge, a state-threatened plant that grows only on alpine ridges and plateaus in the limited alpine zone of the Presidential Range, underscoring their vulnerability to habitat changes.

The research team, led by Nongame Program Biologist Heidi Holman, has documented what the White Mountain fritillary looks like as a caterpillar and as a chrysalis in captivity. "We now have pictures of the caterpillar's growth stages, called instars, and discovered that they complete five stages before transforming into a hanging chrysalis," reported Siart. Combining this information with the recently discovered host plants gives researchers a much better chance of locating them in their wild habitats.

Completing a population estimate for each species is the next major goal of the project, which has never before been completed for the Arctic butterfly. "We need another summer to get the full population



For daily survival, White Mountain Arctic butterflies depend on their ability to camouflage themselves.

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## SPRUCE GROUSE

*(Falcipennis canadensis)*



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This short, stocky bird is restricted to the northernmost three counties in New Hampshire. They're mostly deep brown with white and black spotting, and males have a bright red eyebrow. Their habitat doesn't typically overlap with the more common ruffed grouse, since they prefer bogs and dense forests with openings and plenty of low-hanging forage.

**Habitat and Distribution:** Lowland spruce-fir forest and high-elevation spruce-fir forest.

**Threats:**

- Habitat loss due to outbreaks of forest pests.
- Timber harvesting that results in an imbalanced forest composition and the loss of spruce-fir habitat.
- Disturbance from recreational activities in and around the White Mountains, including OHRV use, hiking and foot traffic, and increased forest road density.

**Conservation Actions:**

- Support initiatives to conserve spruce-fir habitat that will likely be most resilient to climate change.
- Conduct research focused on New Hampshire's spruce-fir forests.
- Learn to identify and report forest pests at [nhbugs.org](http://nhbugs.org).
- Report spruce grouse sightings on [eBird.org](http://eBird.org).

# Strategizing to Conserve Endangered NORTHERN HARRIER

A hunting harrier is an incredible sight. The sleek raptor may glide low in search of prey and hover, allowing its circularly arranged facial feathers to amplify the sound of small animals in thickets. Although related to other hawks and eagles, northern harriers occupy a distinct niche in the Northeast. They require a variety of habitats for hunting and nesting, which often includes wetland complexes, regenerating forests, and fields. They nest on the ground in these areas, rendering their young vulnerable to predators and disturbances.

NH Audubon and the NH Fish and Game Nongame and Endangered Wildlife Program recently collaborated on surveys to locate nesting sites and estimate the number of breeding pairs in the state. Unlike other raptors, such as eagles or osprey, there is relatively little information about harriers in New Hampshire. Compared with historic numbers, biologists estimate there may be less than half of the breeding population there once was.

State Wildlife Grant funding allowed NH Audubon to hire seasonal biologists to document nesting when harriers were actively calling during spring courtship and before the vegetation leafed out and impaired visibility. Biologists documented at least 10 active territories in Coos County during surveys from 2020 through 2022, ranging from just two successful nests fledging three young



A male northern harrier hovers over a field in search of prey.

A trio of juvenile harriers taking off.



Katrina Fenton of NH Audubon conducts a harrier survey.

# HARRIERS



*A female northern harrier surveys its territory as it glides low over an open field.*

in 2021 to six nests fledging 15 young in 2022. Each survey year was distinct, noting various disturbances that flushed females from their nest during incubation and potential changes in hunting success.


“These three consecutive years of surveys have allowed us to pinpoint the consistent territories for these birds in Coos County,” explained NH Audubon Biologist Chris Martin, who leads the project, “and we need to focus on these areas for any decisions to be made about habitat manipulation or other management steps.” Martin emphasized that the gathered data is an advantageous starting point for upcoming discussions about future conservation actions, which should encompass a variety of partners, including landowners in Coos County.

Learning new information often leads biologists to more questions. Have declines been linked to habitat loss, intense weather, disturbance and fragmentation, changes

in prey availability, or a combination of these?

To investigate, habitat management research may be conducted in the future. Of course, monitoring habitat experiments takes time, and that is an uncertain variable. “How long might we expect harriers to persist as a breeding species in the state without active management?” asked Martin. “We don’t know the answer.”


There are a few places where harriers have nested in the past but were absent during recent surveys, including Umbagog

National Wildlife Refuge and a few areas south of Coos County. Vacant territories are a likely sign that the population continues to decline. Biologists remain hopeful that ambitious next steps will come from discussions among wildlife managers and landowners. Visitors to the North Country are encouraged to promptly report any summer harrier sightings at [eBird.org](http://eBird.org). 

## FINDING THE NORTHERN BOG LEMMING

Northern bog lemmings prefer peatland habitats with abundant sedges and grasses to clip and eat, but there have been very few reports of these small rodents in New Hampshire over the past 100 years. They travel through moist habitats via tunnels dug just below the ground and maintain dens within their burrows in small colonies, making detecting them a difficult task. These runways allow them to maintain activity year round, even in the harsh environments of New England and Canada.

In the Northeast, there are two species of bog lemmings, northern and southern, the latter of which is more widely distributed. Both species are species of greatest conservation need in New Hampshire’s Wildlife Action plan. The northern bog lemming, however, is listed as threatened in Maine, labeled of special concern in New Hampshire, and deemed at risk by the US Fish and Wildlife Service (USFWS).

A partnership between the USFWS and researchers from the University of New England led to a survey for lemmings by collecting batches of fecal pellets, which allows DNA extraction to identify areas where the animals occur in New Hampshire and Maine. The research team selected likely habitat to survey, with an emphasis on areas with significant sphagnum moss. From this collaborative effort, the team detected northern bog lemmings at four new locations in 2021, two in each state. The New Hampshire sites included an area of Mount Eisenhower in Chandler’s Purchase and a pond near Mount Willey in Bethlehem. Identifying these sites is an important step as the USFWS considers listing the northern bog lemming as endangered or threatened in the coming year. 



*Northern bog lemmings are distinguishable from similar vole species by a stubby rounded nose, short tail, and brownish gray coat. Researchers can identify bog lemming scat by its bright green color.*



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## JANUARY

• Eastern chipmunks lack a large fat reserve and thus may be active on mild days, waking frequently to snack on seeds, nuts, and acorns that have been stored separately from their sleeping chambers in dug tunnels.

## FEBRUARY


• Pine siskins are feeding on the seeds of conifers, birches, and alders in flocks this month. Their numbers may fluctuate with the availability of cone crops.

## MARCH

• You may see more turkey vultures soaring the skies or at roadsides as one of the first migrants returns to the state. Most leave New Hampshire since they're not built for extremely cold weather but some may stay for the winter depending on weather severity.



## BUTTERFLIES *continued from page 1*

picture, given their extended life cycle," said Siart. Holman's team will use environmental chambers to mimic potential changes to snowpack in winter and an earlier start to spring to observe how this may affect the caterpillar's development and survival. There is much more to discover in this complex slice of alpine habitat. 



White Mountain fritillary

© HEATHER SIART

# MEMORIAL DONATIONS

## to New Hampshire Fish and Game's Nongame and Endangered Wildlife Program

Donating a gift to conservation in memory of a loved one is a lasting way to commemorate their life and advance the mission of protecting New Hampshire's wildlife. The NH Fish and Game Department recognizes with gratitude the following individuals, their families, and their friends, for helping to leave behind a conservation legacy for future generations:

- **Dave deRochemont** of Goffstown loved fishing and spending time at camp on Sebec Lake.
- **Bob and Dolores Broad** had ties to the Umbagog area and were the welcoming hosts of Brown Owl Camps.
- **Dorothy Pierce** shared a love of nature and spent time hiking, camping, and kayaking with her husband Brian.
- Long-time Nongame Program donor **Bill Peabody** loved to explore northern Maine, fish with friends, and was a proud veteran of the U.S. Marine Corps.
- Former NH Fish and Game employee and natural resource consultant **Edward "Ted" Spurr** left a lasting mark on the environmental community as a contributor to numerous conservation organizations.