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Campus Life: In Perkins Arboretum there are birds of all feathers, trees that tell a story, and even romance (especially if you're a frog)

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Campus Life



1. Scarlet Tanager
(*Piranga olivacea*)

In Perkins Arboretum there are birds of all feathers, trees that tell a story, and even romance (especially if you're a frog)

Story by Gerry Boyle '78



Illustrations by Carlyn Iverson

A wall of trees where the athletic fields end. A shadowy forest seen from the running and ski trails. A leafy backdrop for Mayflower Hill's manicured lawns. A patch of Maine's famous woods right on campus.

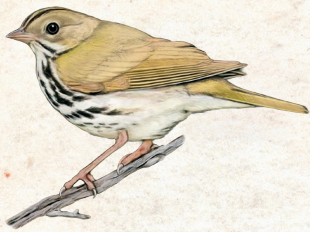
"To the novice," said Associate Professor Judy Stone, resident botanist, "it's all sort of green out there."

Ah, but for the initiated the fields, ponds, and woodlands of the Colby campus, especially the Perkins Arboretum and Bird Sanctuary and surrounding woods and fields, are teeming with life, from tiny plants to towering white pines, from peeping frogs to hooting owls.

For those who take advantage of the offerings of Colby's biggest classroom, Mayflower Hill becomes a window to the natural world, a living laboratory for hands-on study. Or it can be just a place to clear your head. ➤



5. Red-bellied woodpecker
(*Melanerpes carolinus*)



6. Ovenbird
(*Seiurus aurocapillus*)



7. Indigo bunting
(*Passerina cyanea*)



8. Tufted titmouse
(*Baeolophus bicolor*)



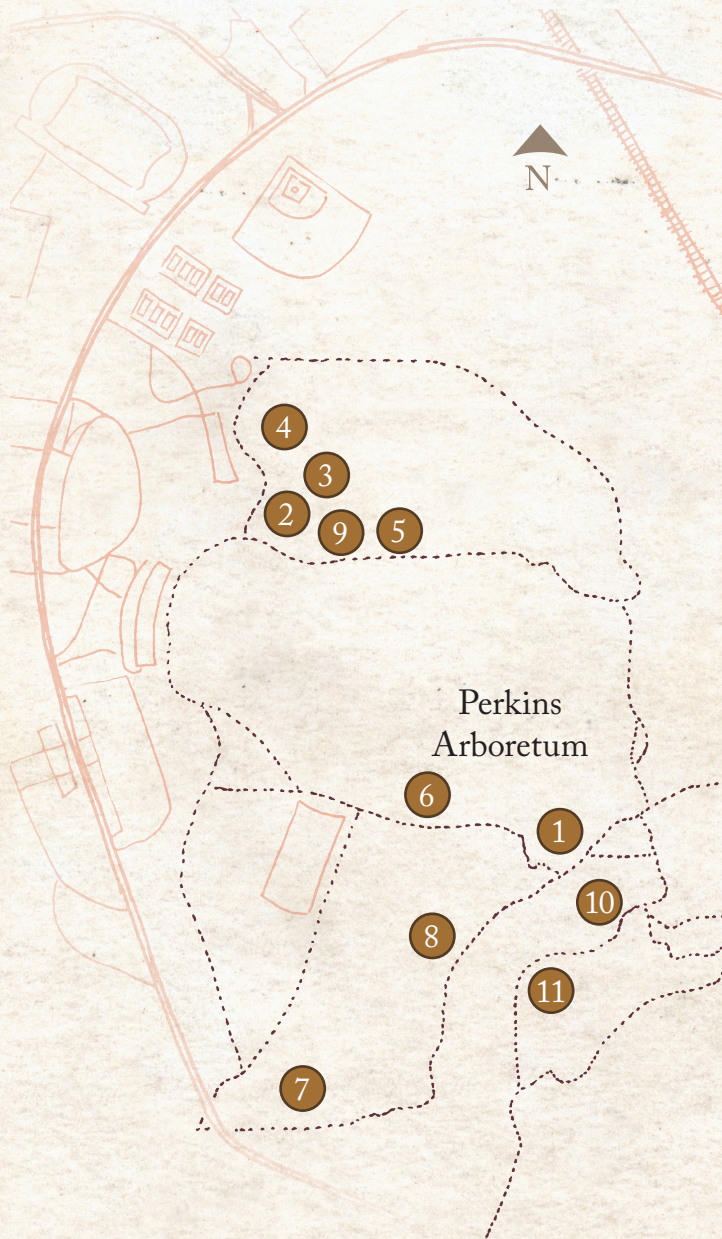
4. Bullfrog
(*Lithobates catesbeianus*)



3. Gray tree frog
(*Hyla versicolor*)



2. Green frog
(*Rana clamitans*)



9. White ash
(*Fraxinus americana*)



10. White pine
(*Pinus strobus*)



11. Witch hazel
(*Hamamelis virginiana*)



Colby recently toured the arboretum with three faculty members: Stone, botanist and associate professor of biology; Catherine Bevier, herpetologist and associate professor of biology; and Herb Wilson, ornithologist and Lesley Brainerd Arey Professor of the Biosciences.

The three raised the curtain to reveal myriad species of flora and fauna (a few unwanted), a surprising back story (Runnals Hill was once a peninsula jutting into the sea), and an intense dating scene (frogs are always on the make).

And it was all a short walk from the always impeccable Miller Library quadrangle.

"I don't think there's another college of our caliber with such an access to the natural environment," Stone said.



Stone arrived at Colby in 1999 with a Ph.D. from a university on Long Island where the native plants on campus had almost all been overtaken by invasive species. She set out to explore the Colby arboretum and was delighted to be in real woods with real local flora.

And that wasn't all.

Stone learned that the 700-acre campus sits on a boundary where, 13,000 years ago, Runnals Hill was at the edge of the sea. Runoff from glaciers dumped silt into the ocean here. The result: sandy loam on the higher elevations of campus, and fine soil on the lower parts, including much of the arboretum.

"It holds more water and it holds more nutrients, and you get a whole different set of species moving in," Stone said. "So it's a great teaching environment."

➤ *Witch hazel, a small shrub whose name is most often associated with the medicine extracted from its bark and leaves. An uncommon plant, it can be found growing in Perkins Arboretum. The name comes from an Old English word for pliant or bendable.*

"This is all very young forest, and this is what I expect my students to be able to talk about. They should be able to walk in here with an educated eye and tell me what they see."

— Judy Stone, Associate Professor

On a trail behind Lunder House, she crouched and dug up some soil, let it sift through her hands. This was the loam that is home to oaks and beeches. In minutes she had left that habitat behind. Along the way she pointed out white oaks, at the very northern end of their range. Soon Stone led the way into the arboretum, picking up a pinch of the silty soil, and she pointed to the densely packed trees all around.

"This is all very young forest, and this is what I expect my students to be able to talk about," she said. "They should be able to walk in here with an educated eye and tell me what they see."

So what *does* the educated eye see?

At the edge of the arboretum were sections of aspen, an indication that the land was open field just 30 or 40 years ago. There were apple trees, remnants of the time when Mayflower Hill was farmland, and then there was a stream, which Stone assumes was a barrier for farmers. On the far side was more-mature forest, with sugar maples and red oaks.

Stone leads her students to spots in the forest. Staring up at the trees, they answer exam questions about the age and type of the trees, the history of the land. For most students, she said, all of this is entirely new.

"People really have lost touch," Stone said. "A lot of people can't identify any plants."

For that reason her classes (or even a single guided tour of the woods) are an eye-opening experience.





On a ridge top she pointed out majestic white pines and hemlocks, the pines dropping limbs as they become shaded, the hemlocks thriving even in low light. What grows best under a hemlock? More hemlocks, she said.

Below a ridge, along a stream, she showed basswood trees, thriving in a flood plain. Some live to be hundreds of years old. In the same microhabitat were yellow birch and black ash, the tree that supplies Native American basket makers. “Here’s black cherry,” Stone said. “And oh, there’s a really big mountain ash. I don’t recall seeing that before.”

She keeps tabs on the trees and shrubs, both good and bad. In recent years invasives including honeysuckle have infiltrated the arboretum, and Stone works to keep them at bay. Her Colby students gladly assist, she said, and she has even enlisted Advanced Placement science students from nearby Waterville High School. “We went on a rampage,” Stone said. “Nick Margitza, who’s one of [the high school’s] best shotput throwers—he can bench press like three-hundred pounds and he was having the best time pulling out honeysuckle.”

Her students learn that runaway ornamental plants like honeysuckle and garlic mustard—a particularly virulent invasive now lurking in a backyard on Mayflower Hill Drive—drive out the native plants on the forest floor.

They also learn that red maple filled the vacuum left when American chestnuts fell to an imported blight in the early 20th century. Another disease that strikes beech will keep the trees stunted in coming years. White oak will be a winner in the warming trend of climate change; sugar maple may be a loser.

All of this was explained along the trail, with interruptions to point out unusual plants like witch hazel and muscledwood. After a stroll with Stone, the woods seem like more than, well, just woods.

“This is what I want students to think about,” she said. “To differentiate. It’s not just all green. There’s a reason.”



The sound—a resonant “plonk” like someone plucking a banjo string—was coming from the pond behind the Schair-Swenson-Watson Alumni Center. A frog? Sure. But not just any frog.

The caller, said Associate Professor Catherine Bevier, was a green frog. A male, it was warning other male green frogs to stay away from the meter-wide territory it had staked out in the shallow, weedy waters—and an invitation for females to stop by to check him out.

It’s all part of the nonstop courtship going on in and around the ponds, with everything from bullfrogs to salamanders trolling for a hot date. The spotted salamander, for example, is busily procreat-



The green frog, common in small ponds at the edge of Perkins Arboretum. From its meter-wide territory, the male frog calls to nearby females, hoping its “plonk-plonk” call will be more attractive than that of other males.

“Males place spermatophores on the floor of the pond. They do a little bit of a dance, a little bit of a courtship, and try to attract a female to their own spermatophore and try to guide her over that.

That’s how they fertilize an egg.”

— Catherine Bevier, Associate Professor

ing beneath the placid surface of the water. “Males place spermatophores on the floor of the pond,” Bevier explained. “They do a little bit of a dance, a little bit of a courtship, and try to attract a female to their own spermatophore and try to guide her over that. She’ll take it up in her cloaca. That’s how they fertilize an egg.”

Too much information? Not for Bevier, who uses the catchment ponds in the woods off of Colby Green as living laboratories. An expert on amphibians, she introduces students to the variety of spe-



cies that thrive on campus. Green frogs, gray treefrogs, wood frogs, spring peepers, and bullfrogs: they swim in the shallow water, call from the trees, and creep through the woods.

"The peepers and wood frogs start the season off," Bevier said. "As soon as the ice is gone—the first nice, warm, rainy night—the peepers and wood frogs will come down to the ponds."

Bevier and her students come down to the ponds, too. They study the calling behavior of the frogs, and have monitored their coming and going by setting out driftnets and pitfall traps to count the numbers of frogs arriving at the ponds for breeding season and the number leaving after the season ends. Bevier and her students have injected dye in frogs to tag them and have put beaded belts on frogs to distinguish one from another as they bobbed in the water.

Every spring semester she holds "Peepers and Pie," leading comparative anatomy students into the woods at night to listen to the blaring, 110-decibel peep-frog chorus. With pie for dessert. Last summer she had two student researchers—one from Colby and one from Bowdoin—working in her lab and in the field. "They could just go across the street and do the work," Bevier said.

It's one thing to read about frogs and even dissect them in the



White pine was cut extensively in Maine for masts for the English navy's sailing ships. In Perkins Arboretum majestic white pines and hemlocks flourish on ridgetops, creating a habitat best suited to themselves.

"I think just about everything that could occur here does."

—Catherine Bevier, Associate Professor

lab. It's another to study them in their natural habitat, watching their entire life cycle, from egg to tadpole to adult.

Just as Stone's woods become more than just trees, Bevier's frogs become more than just an invisible something that croaks at night.

She explained that bullfrogs require a big territory, so one or two might inhabit a small catchment pond like those at Colby. Some of the bullfrogs and green frogs will never leave the ponds, wintering deep in the mud, under the ice. If they survive to adulthood—predators include water bugs that insert a proboscis into the tadpole and suck it dry—many frogs will migrate to new territory as population density increases. Gray treefrogs actually make their way from the woods back to the ponds every night, slowly descending and then hopping across the ground to the water's edge.

Some of the research is self-contained (Bevier studies physiological ecology); some is far-reaching. She and her biology students are assisting in a Yale University study of a fungus that is causing

amphibians to decline. Their assignment: find 100 green frogs and test them for the fungus. "We've been out here grabbing frogs and rubbing a toothpick over them," Bevier said. "And that scrapes enough skin off of them so that if the fungus is on them, it will get on the toothpick."

She looked down at the water and added, "There's one right there."

Wading into the water in her rubber boots, she netted a frog and held him up for inspection. "This is a nice male," Bevier said. "They get this yellow coloration."

The males are distinguished from females by larger eardrums, used as a resonator for all that calling. Males also have more muscular forearms, she said, for holding the female in place.

Who knew? Bevier and her students, of course, who went to the ponds again this spring, moving from one classroom to another. "I think just about everything that could occur here does," she said as she let the green frog go.



Walking along a ridge top at the center of Perkins Arboretum, Professor Herb Wilson notes that very few of his incoming ornithology students have much knowledge of birds. But, Wilson said as he peered into the canopy of hemlocks and white pines (great pine-warbler habitat), once students get started, "they just get hooked."

This was halfway through a bird tour of the arboretum with Colby's resident ornithologist, and it was easy to see how a few turns



around the 200-acre refuge would transform students into birders.

The walk began behind the Schair-Swenson-Watson Alumni Center, where the common yellowthroat (a type of warbler) is, aptly, common.

"There's one chipping right there," Wilson said, "and there can be swamp sparrows as well."

Going on a bird walk in the arboretum with Wilson is like sitting with a translator at the United Nations. Cacophony becomes information.

In a little more than an hour he identified, mostly through songs culled from the chatter of bird noise, the yellowthroat, black-throated green warbler, red-bellied woodpecker, ovenbird, veery, pewee, goldfinch, red-eyed vireo, yellow-bellied sapsucker, brown creeper, northern parula warbler, scarlet tanager, white-breasted nuthatch, tufted titmouse, song sparrow, pileated woodpecker, red-start, chestnut-sided warbler, and great crested flycatcher.

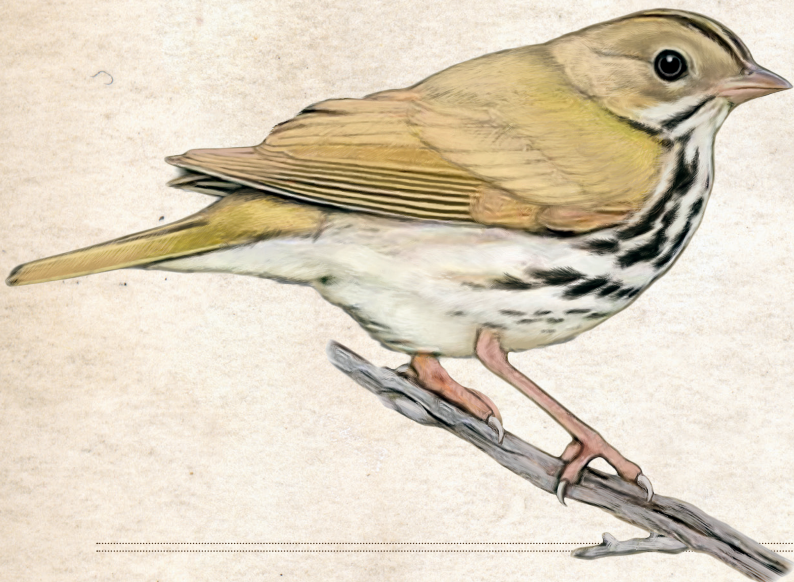
We would have had better luck, Wilson said, if we'd set out earlier. In fact, the list of birds commonly seen in the arboretum—but no-shows that morning—went on nearly as long. Notables included a pair of nesting broad-winged hawks and a barred owl.

For Wilson the hike is more than a chance to add to a writer's bird list. It's a way of explaining the forces of nature that have shaped the habitat and its bird life. He led the way through young second-growth forest along a stream (often "thick with chestnut-sided warblers") to older forest with hemlock stands on the south side of a ridge, favorite haunt of scarlet tanagers. ("He's not talking now, of course," Wilson said.)

Just as Stone identified species of trees and shrubs associated



The ovenbird is one of the most common birds in Perkins Arboretum. The small drab warbler-like bird keeps close to the forest floor, and while it may be hard to spot, it's not hard to pick out its distinctive call, "Teacher, teacher, teacher."



"Not only do we take students to parts of the arboretum where they've never been, but occasionally we get students who have never been in the arboretum."

—Herb Wilson,

Leslie Brainerd Arey Professor of Biosciences

with particular habitats, so Wilson pointed to birds.

Water thrushes and least flycatchers nest along a stream in the heart of the plot. Barred owls nest in hollow trees near Mayflower Hill Drive. Wetlands at the east side of the preserve have been home to colorful wood ducks. The grassland on Runnals Hill is home to bluebirds, bobolinks, a pair of indigo buntings. "It was the first time I'd seen them nesting here," Wilson said of the bunting sighting last spring. "They were clearly territorial."

The wooded tract lures uncommon species—Wilson notes that a cerulean warbler was spotted in the arboretum a few years ago—but it also offers Wilson and his students opportunities to conduct research on populations of common birds.

One group of students recorded the incessant calls of the red-eyed vireo to see whether there was a pattern to the relatively monotonous song. With the aid of computer analysis and graphics, they found that some birds had an extensive repertoire, up to 35 variations on their tune. "We also found that there was a higher probability of song order," Wilson said.

Colby students and Wilson discovered that, like a DJ, the red-eyed vireo has a set list.

Wilson and his students also have studied chickadees' feeding patterns, catching and banding the birds, then watching to see how often individual birds visit a feeder set up near an observation post in the woods. "I've got about a hundred chickadees that I know personally there," he said.

The conclusion? Everybody eats, but older, dominant birds get to hit the feeder more often.

For the students, it's an opportunity for discovery—in more ways than one.

"It's interesting," Wilson said, walking a trail deep in the woods. "Not only do we take students to parts of the arboretum where they've never been, but occasionally we get students who have never been in the arboretum.

"They say, 'I didn't know this was here.'" 