

Quincy Bog Notes

Conserving Land, Connecting People with Nature

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A Citizen Science Bumblebee Project and Quincy Bog

Judith Saum

I became fascinated with bumblebees two years ago when I made the disturbing observation that they were missing! In fact, the normal buzzing from these charismatic bees was notably absent from my yard for several months during that hot, dry spell in early 2021. When the rain returned in mid-July, so did the bees. Although relieved, I was left with a nagging question: what can I do to support bumblebees?

In searching for an answer, I found out about Dr. Robert Gegear, a UMass Dartmouth biology professor and researcher, who created a citizen science project called "Beecology." Gegear maintains that, in order to support pollinator communities in an ecologically sound way, we need solid, evidence-based data to guide us. To collect that data, volunteers take videos of bumblebees to identify them and to document the flowering plants they feed on.

According to Gegear, it's a popular misconception that all bumblebees are in decline. While total numbers have decreased in Massachusetts by about half, a few species are thriving and increasing. The most prominent of these is the common eastern bumblebee, *Bombus impatiens*, which is outcompeting and replacing other species, thereby contributing to their decline. A 2018 UNH study (completed by Molly Jacobson and colleagues from Dr. Sandra Rehan's lab) revealed a similar pattern in New Hampshire. Gegear's comment that "just because we see lots of bees in our garden does not mean that the ecosystem is doing fine" also applies to the Granite State.

Gegear recommends broadening our perspective to recognize that the problem goes beyond just "saving the bees." Pollination systems as a whole are in decline because they have been so badly degraded. Bumblebees play a crucial role in these systems because so many other plants and animals depend on them, so elimination of just a few kinds of bees can have a cascading effect resulting in extensive loss of species diversity and ecosystem decline. (See Dr. Gegear's recent presentation on YouTube: "More Than Just the Buzz: A Guide to Plant Pollinator Systems.")

The Beecology project aims to tackle this problem by addressing the gap in knowledge about which plants support the most threatened bumblebees. Based on more than 20,000 submissions, Gegear developed and recommends a native plant list that targets three at-risk bumblebee species (also helping other wild bees

and butterflies). He's begun the second phase of the Beecology project by using these plants to restore habitat on three large experimental plots. So far, the results have been amazing: bumblebees that had been missing from these sites reappeared immediately when the planted natives started to bloom. (For the Gegear plant list see <https://gegearlab.weebly.com/plant-list.html>)



The face of a male half-black bumblebee, *Bombus vagans*. Photo from the USGS Native Bee Inventory and Monitoring Lab.

Last May, I decided to join this project myself. I started identifying the bees and plants in my own yard less than a half mile from Quincy Bog using the Beecology app. As anticipated, I found an abundance of *B. impatiens*, in addition to several other common species. I was also pleased to find some of the threatened half-black bumblebee, *Bombus vagans*, which happens to be one of the target species identified by both Dr. Gegear and Molly Jacobson. *B. vagans* has a longer tongue than most bumblebees and therefore prefers certain flowers of tubular shape, often missing in contemporary gardens. In my yard *B.*

vagans fed profusely on foxglove beard tongue (*Penstemon digitalis*), along with several other tube-shaped natives I'd planted for pollinators. For the sake of comparison, I surveyed an extensive nearby ornamental garden and found only two *B. vagans* there during the whole summer.

I routinely surveyed the Quincy Bog Natural Area last summer and was pleased to find *B. vagans* foraging on pickerelweed (*Pontederia cordata*) starting in late July, and on jewelweed (*Impatiens capensis*) until the beginning of September. Yet the relative number of these bumblebees in both my yard and at the Bog did not come close to what the 2018 UNH study found previously, when *B. vagans* made up more than a third of all bumblebees around the state. That research documented a substantial decline of *B. vagans* and suggested it be considered for conservation status.



Yellow-banded bumblebee, *Bombus terricola*, at the Bog. Photo by the author.

I was also thrilled to discover one of the threatened, yellow-banded bumblebees, *Bombus terricola*, collecting nectar on buttonbush (*Cephalanthus occidentalis*) near the Bog Nature Center. I found several more of these beauties feeding on goldenrod at the Jim Darling Natural Area in Rumney. Given that the 2018 UNH study recommended that *B. terricola* be listed as a Species of Greatest Conservation Need due to its severe decline and ecological role as the sole pollinator of several rare plants, this was a notable find.

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President's Perspective

Gino Infascelli

"We don't inherit the earth from our ancestors,
we borrow it from our children."
- Chief Seattle

As I was headed to the Bog on a recent Saturday morning, I noticed a trash bag on the opposite side of the road. A short while later I saw another one, and concluded they had fallen off the back of a truck on the way to the recycling center. Then, down the road further, some brightly colored vests appeared – worn by people picking up roadside litter and other debris. On my return trip, many more piles of collected trash had been stockpiled. It occurred to me that many of us celebrate Earth Day (April 22) in our own way. This road beautification campaign has roots in the "Keep America Beautiful" initiative of the 1950s, about the time interstate highways enabled travelers to go further and faster. When Earth Day started in the early 1970s, there were many clean-up campaigns that bolstered the thought of, and continued the overall concept of, Keep America Beautiful.

Thinking back to this last Earth Day, I realized that adjacent communities show their outward support of each other, and of all of us, through their roadside trash-collecting efforts, setting good examples for the next generations. Thank you.

One mission of Quincy Bog is to offer to the public nature-oriented opportunities for outdoor recreation, land protection, and education. The rules posted for use of this private property are intended to protect the natural area and provide a safe, enjoyable experience for our visitors.

Our many volunteers at Quincy Bog will remind visitors of these rules, as needed. Those who choose to ignore and disrespect the posted rules create great stress for these volunteers. Recently bark was stripped from paper birches, initials carved into trees, new trail signs destroyed, and fires made without permission.

Particularly problematic is when visitors fail to leash their dogs, as this creates difficulties for other guests at the Bog, including those who do leash their dogs. I encourage off-leash dog walkers to visit the nearby Quincy Pasture Forest (especially for dogs that could use more exercise than a gentle walk). I completely understand the need for dogs to run, but the Quincy Bog boardwalks are too narrow for all those who are trying to enjoy that space, and this is a nature preserve. A few years ago, the decision to require the leashing of dogs on the Bog trails was a compromise from the originally suggested alternative of banning them completely. To assist those who may have forgotten a leash, there are some leashes available to be borrowed at the main kiosk and the Nature Center. Please return them when you are done.

As summer approaches let us all be grateful for Mother Nature and enjoy what's been given to us.

Gino Infascelli is an avid motorcyclist who enjoys unobstructed views and the aromas of freshly cut wood, flowering shrubs, and wild strawberries. He tries to find any reason to be outside in nature.

Support Quincy Bog

Our strategic actions in support of local natural environments depend on the efforts of volunteers and the generosity of friends like you! Please consider sending a donation to Rumney Ecological Systems (P.O. Box 90, Rumney, NH 03266) or giving via PayPal at our website (quincybog.org). Thank you!



Strategic Planning at Quincy Bog

Paul Wilson and Mark Runquist

Any organization needs to have a carefully considered reason for its existence and a plan for how to accomplish its purposes. As a 501c3 nonprofit group, the Board members at Rumney Ecological Systems (RES) must ensure that our actions provide for the public good. RES is the registered nonprofit name for Quincy Bog. We strategically plan our efforts so that we achieve our mission of conserving land and connecting people with nature.

In 2011, the Board of Directors created a comprehensive strategic plan for RES, requiring specific action steps. We revisited it in 2016, and again in 2022. The strategic plan is a living document – it grows and changes as we do, but always steers us towards mission goals. The plan comprises the five major elements of our actions:

- ◆ Nature Center and Trails
- ◆ Organization
- ◆ Pemi-Baker Land Trust
- ◆ Resource Protection
- ◆ Communication & Public Relations



For the most recent update to our strategic plan, a dedicated team met by Zoom, from summer through the fall of 2022. We assessed specific accomplishments, and reviewed many actions that continue to be needed, such as trail maintenance. Late in 2022, the working group presented the updated plan to the Board and it was formally approved at our November meeting. We agreed that, while we would write a revised plan every 5 years, we would also meet annually to measure our progress and accomplishments. This year, the annual assessment will be done in Fall 2023.

Our strategic plan includes activities that can be considered as "keeping the lights on" as well as enhancements. As you walk around the Bog, some of the organizational tasks we do are obvious, but others are not. While there are hundreds of activities in the plan for us to care for, here are just a few items to give a sense of the scope of our work:

- ◆ Organize and train Bog Hosts
- ◆ Maintain and repair the Bog trail
- ◆ Create a new Bog overlook viewing area and trail at the Ledges
- ◆ Update trail guides and other guides and maps
- ◆ Migrate organizational records to cloud storage for easier access
- ◆ Inspect and monitor existing Pemi-Baker Land Trust conservation easements
- ◆ Work with area landowners wanting to protect their land in perpetuity
- ◆ Offer opportunities for internships to local students
- ◆ Provide conservation-related programs to the public and schools
- ◆ Maintain an active website and social media presence

You can find our strategic plan – and much more about our activities – on our newly updated website. We encourage you to pay us a visit online or in person.

In addition to serving on the working group that updated our Strategic Plan, both **Paul Wilson** and **Mark Runquist** are active in the Land Trust efforts of RES.

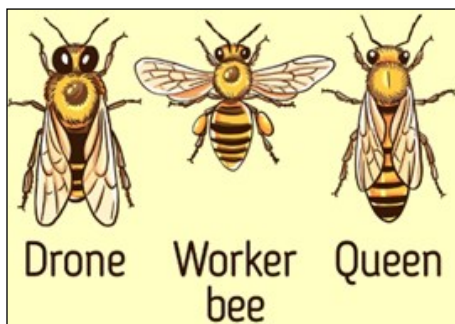
Junior Naturalist Corner

Marguerite St. Laurent-Crowell

All About Honey Bees

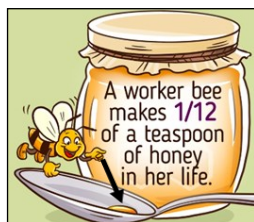
Honey bees are the only insects in the world that make food that people eat. Honey bees also pollinate plants, including many of the fruits and vegetables we enjoy.

There are three kinds of honey bees that live in a hive. Check out their size and shape! The **Queen** is the boss of the hive and makes babies. **Drones** are male and mate with the Queen. **Worker bees** are female and they build and protect the hive. They're the only ones to collect pollen and feed the baby bees.



Cool Fact – The average worker bee lives for just 5-6 weeks. Drones only live for about 3 months. Queens live for 1-2 years!

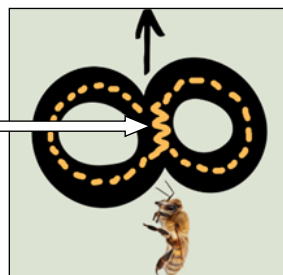
It takes a lot of bees to make honey – 12 bees per teaspoon!



Cool Fact – You can help by planting flowers and buying local honey to support beekeepers!

Workers tell other workers about the best food sources by doing a 'waggle dance'. When they return to the hive, they move in the shape of a sideways 8 and shake their bodies to show the direction of the flowers.

The length of the waggle run tells how far to the food source.



Cool Fact – The Austrian scientist who first figured out the 'waggle dance' won a Nobel Prize in 1973. More recently, researchers at Sussex University in England spent two years figuring out exactly how far and where honey bees traveled by watching their dances!

About 17 years ago, beekeepers in the U.S. noticed that some honey bees were abandoning their hives, leaving behind all their honey and their queen. Scientists discovered one reason for this odd behavior was poisoning from pesticides on the flowers they visited. As bees collected pollen from those plants, they became confused and lost their way. Parasites called Varroa mites also destroy honey bee colonies. They hitch rides on bees when they visit flowers and, once in the hive, can lay baby mites on the baby bees.



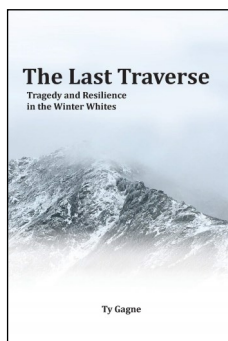
Marguerite St. Laurent-Crowell is the Vice President of the Board of Directors.

Image sources: Brightside.me (first two illustrations), Creative Commons (Varroa)

Books We're Reading at the Bog

The Last Traverse

A review submitted by Robert Bulkeley



This book (by Tyler Gagne, TMC Books 2020) is a gripping and sad account of the fate of two hikers who attempted to climb Franconia Ridge in the White Mountain National Forest on February 10, 2008. It is a cautionary tale, to say the least, and presents many facets of the rescue effort, hour-by-hour, integrated with weather reports from the Mount Washington Observatory. It explores the multi-pronged operation to discover where the climbers went and the search that eventually found them below Mt. Lincoln.

The narrative opens at Littleton Hospital where a Blackhawk helicopter delivered the climbers, one still clinging to life. It then jumps back to the discovery that they were missing and the assembly of a massive search. The terrible weather that trapped

the climbers on the ridge put the experienced rescue teams at the very limits of their abilities. In the chapter "In Extremis", Steve Larson says "Visibility was terrible. With blowing snow, the headlamps don't help much at all. You're just seeing this wall of darkness and snow." Confusion from hypothermia compounded the difficulty, brought on by a sudden temperature drop and extremely high winds. The climbers had not told others where they were going or left a note about their planned route, making the search problematic from the start.

The book also presents the history and development of the mountain rescue teams over the years, and the background and experience of the many people involved that day on the mountain and at the base of operations in Franconia Notch. It describes essential equipment for mountain rescue teams and, ultimately, how their persistence and fortitude made it possible to find the climbers. Much of the book is about decision-making, such as when to go ahead and when to turn back. Anyone planning a high-altitude hike in the mountains should read this book. Future tragedies could be avoided if more hikers read this valuable discussion of mountaineering and rescue.

Robert Bulkeley, Director Emeritus at Quincy Bog, has 70 years of hiking and trail work experience in New Hampshire.

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Quincy Bog Notes is a twice-yearly newsletter of information, announcements, and news about the Quincy Bog Natural Area and Pemi-Baker Land Trust.

Quincy Bog Natural Area, 131 Quincy Bog Road, Rumney, NH, 03266, www.quincybog.org

Quincy Bog Notes

(Continued from page 1, Saum)

For further comparison, I completed regular surveys in a large field not far from the Bog Nature Center. I found a lot of the more prevalent bumblebees, including *B. impatiens*, as well as honeybees dominating that disturbed habitat of mostly non-native red clover. Dr. Gegear notes that while honeybees are immensely important to agriculture, they have minimal ecological value, unlike bumblebees. In fact, he completed a study showing that honeybees can deter and drive native bees out when floral resources are limited. For that reason, Gegear recommends that beehives not be set up near conservation lands.



Bombus vagans at the Bog.
Photo by the author.

In one small corner of that same field by the Bog, I also found a few *B. vagans* feeding in mid-July. But by the end of the month, they had abandoned the red clover, and had possibly moved to the pickerelweed that started blooming at the Bog. This observation made me wonder if non-native flowers, like red clover, can be important to bumblebee survival when the native flowers they prefer are missing. Dr. Gegear admitted that red clover, cow vetch and comfrey have prevented a couple of bumblebee species from going locally extinct in Massachusetts.

He went on to explain that if it were simply a matter of "saving the bees," we could easily do that by presenting them with horticultural flowers known to lure bumblebees. But the big problem with these non-natives is that they may not support other kinds of wildlife in providing food, shelter, and nesting sites. Therefore, the pollinator loses its functional role in supporting species diversity and conservation.

Gegear's remarks indicate that there are important choices to be made when it comes to helping bumblebees. It's clear that dedicating and managing lands like the Quincy Bog Natural Area conserves critical habitat for an abundance of species including at-risk bees. Yet it wouldn't hurt to extend that same conservation mindset to backyard landscapes. Integrating a few native plants favored by threatened bumblebees into your garden or landscape could make a difference. Such a decision goes beyond just saving a few kinds of bees. It may also contribute to keeping ecosystems resilient and buzzing for years to come.

Judith Saum lives in Rumney and is a Natural Resource Steward volunteer through UNH Cooperative Extension.

Reference mentioned on p. 1: Jacobson, M.M., E.M. Tucker, M.E. Mathiasson, and S.M. Rehan. 2018. Decline of bumble bees in northeastern North America, with special focus on *Bombus terricola*. *Biological Conservation* 217: 437-445.



The Beecology Project logo.
To learn more about this citizen science effort, visit <https://beecology.wpi.edu/website/home>