Program: Conservation Enhancements for a Living Landscape

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2010 Conservation Activities
E.L. Rose Conservancy

2010 Overview

In 2010, cooperative conservation and monitoring efforts involving the Cornell Conservation Education Program and E.L. Rose Conservancy members and volunteers focused on a critical wildlife conservation issue. Beginning in winter 2006/2007, scientists in New York, Vermont, Connecticut and Massachusetts began observing bats flying outside during the day in the winter, clustered near cave entrances, or dead or dying inside their winter hibernacula. Because many of these animals had a mysterious white fungus on their nose, or on the tail, wings, or ears, the affliction was termed "white nose syndrome". The fungus, thought to have originated in Europe and spread to the United States on the clothing of spelunkers, has been identified as the direct cause of bat mortality. From four known sites in one state (NY) in 2007, the fungus rapidly spread to 15 states and Canada by 2010. Over a million bats from at least 10 different species have died as a result of the fungus. In many caves, the mortality rate has been greater than 90% since the disease was first detected. The declining number of bats could mean the loss of entire local populations, and have far-reaching effects on our forest ecosystems.

In 2010, E.L. Rose Conservancy members joined with citizens from the local community, Rockwell Collins employees, and the Cornell Conservation Education Program to address bat conservation in the area. The focus was increasing awareness of the issue, locating and monitoring summer maternity roosts, and installing bat boxes in an effort to enhance habitat for these important predators of night-flying insects.

Bat Monitoring and Community Involvement

Project Objectives

The objectives of the bat monitoring project were to 1) inform the public about declining bat numbers and white nose syndrome; 2) engage the local community in bat monitoring efforts; 3) collect baseline maternity colony information for the area, and contribute that data to the "Appalachian Bat Count" project led by the Pennsylvania Game Commission; and 4) provide guidelines for bat box placement in the region.

Public Outreach and Training

Several outreach events were held to inform the public about bats and white nose syndrome, teach people how to conduct bat emergence counts (counting bats as they emerge from their roost sites at dusk), and solicit input on potential bat roost locations. Outreach efforts began with a presentation to Conservancy members and the public at the Wilkerson's barn. At that time, potential bat survey participants were recruited and we scheduled our first training and monitoring opportunity, which took place the following week at the Greenwood Barn. There, we introduced acoustic monitoring opportunities, reviewed species identification, and conducted our first emergence count. Subsequently, we conducted brief educational overviews with homeowners and other participants at each of the sites where we conducted emergence counts.

Bat Monitoring

Bat emergence counts can help establish baseline numbers of bats in a local area. By conducting annual counts at identified summer maternity roost sites, changes in bat colony size can be tracked over time. Although maternity colony size can vary for a number of reasons, a significant or prolonged decrease in one colony, or across several colonies in an area, can indicate a problem. If some colonies are declining while others remain stable, emergence counts also may provide clues about factors influencing susceptibility to white nose syndrome. In addition, the locations of maternity colonies can be correlated with habitat features in the area and as such can inform habitat enhancement efforts and bat box placement over time.

The attic of this house contains a maternity colony, as evidenced by the brown staining next to the chimney at the peak of roof.

In 2010 we surveyed eight sites from Quaker Lake south to the Greenwood property near Dimock (Figure 1). Twenty-two people participated in monitoring efforts, while five others helped us find sites and connect with landowner. Volunteers logged an impressive 50 hours of time on this effort. At most of the sites we visited, there were a small number of bats, but not enough to be considered maternity colonies. Most people indicated that the number of bats they were seeing in 2010 had substantially declined from the previous year. Although no counts were conducted in the past to support these observations with quantitative data, the reports of perceived declines were consistent across the area and therefore have merit. Two of the counts were very successful. One count on Arrowhead Lake Rd. yielded about 37 bats of two different species. At another site on Quaker Lake we counted 283 bats emerging from next to the chimney. Even at this location, though, the owner felt the number of bats was lower than in the past.

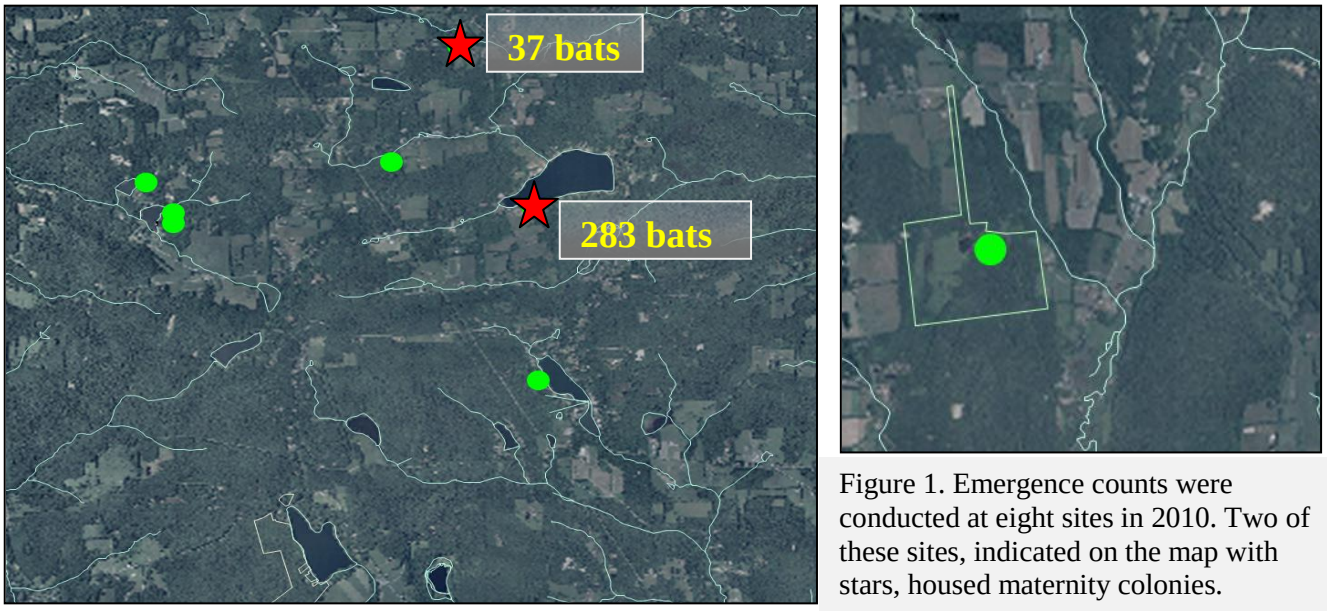

Figure 1. Emergence counts were conducted at eight sites in 2010. Two of these sites, indicated on the map with stars, housed maternity colonies.

Using GIS to Identify Ideal Bat Habitat

We used Geographic Information Systems to help identify suitable habitat for bats in the area. Based on a literature review and the results of our surveys, we considered the presence of mixed open and wooded habitat, in combination with proximity to streams, rivers and lakes > 3 acres in size. Areas of mixed habitat (Figure 2) within 300 ft of water (Figure 3) were considered as primary habitat, while areas of mixed habitat from 300-400 ft of streams was considered secondary habitat.

This house contains a maternity colony. The surrounding habitat is ideal for bats with a mix of open habitat, woodlands, and a small orchard

This information can be used in two ways. First, it can be used to identify more potential maternity roost locations to survey. Second, it can be used to inform bat box placement as a method of enhancing roosting opportunities in areas of suitable habitat.

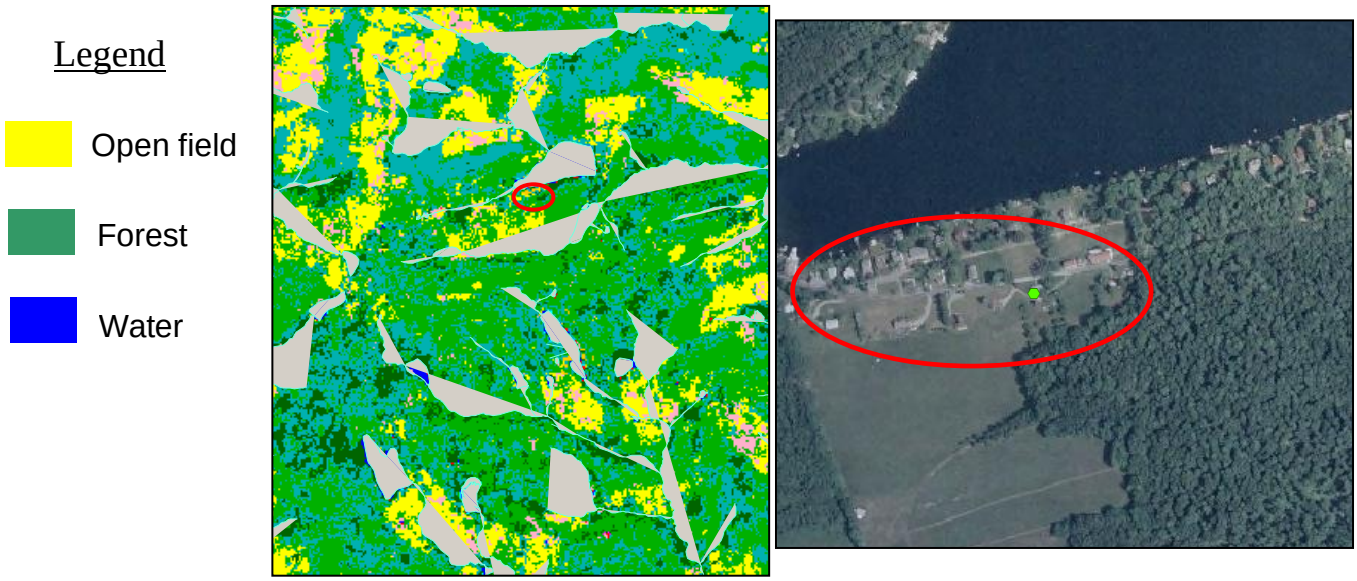

Figure 2. The area within the red circle in the picture on the left is also depicted in the aerial photo on the right. Both show the mixture of habitat types surrounding a bat maternity colony location.

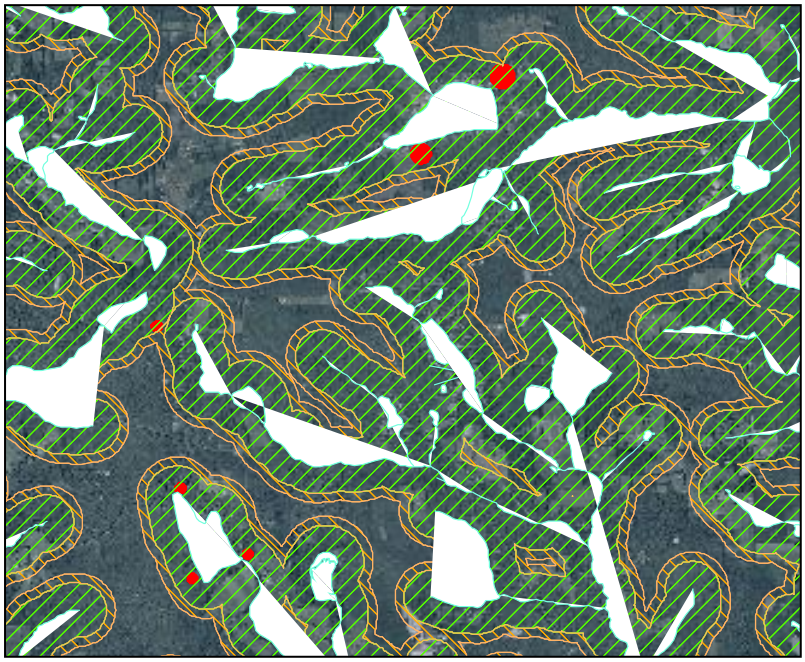

Figure 3. Areas indicated by green hatch marks are located within 300 m of water and are considered potential primary habitat where they overlap with a mix of habitat types (examples indicated with red dots). Those areas indicated by orange hatch marks are located from 300-400 m from water and are considered secondary habitat sites.

Bat Box Placement

We developed the GIS project in part to help inform bat box placement in the area. Tim Matthews, Conservancy President, secured a "Green Communities Grant" from Rockwell Collins to build and erect bat boxes in the local area. Our results can be used to guide that effort. In addition, homeowners can also use the information to choose sites for bat boxes on their own properties. Bat boxes should be erected facing southwest or southeast at a location where they will receive seven or more hours of daylight (Figure 4). Sunlight is needed to warm the box and allow young bat pups to devote more energy to growth, rather than using the energy to maintain body temperature. Once suitable habitat has been located, boxes should be erected at heights of 10 feet or higher, with 12-20 feet preferred. They should be located at sites protected from wind, and within an existing bat travel corridor. Travel corridors can be determined by visiting the site at dusk and watching the movement of bats as they feed. The travel corridor indicates regular use of the site, and placing the box nearby can help bats find, and begin using, the box sooner.

Figure 4. Image depicts potential suitable sites (yellow) for bat box placement at Greenwood based on habitat and distance from water. Bat boxes should face southeast or southwest, and should be sheltered from wind.

Summary and Future Plans

Through our collaborative efforts in 2010, we initiated a long-term monitoring program, began collecting baseline data, and raised awareness of the issue within the local community. Enthusiasm for participation is high and we plan at minimum, to monitor the two maternity sites again in 2011.

Our guidelines for bat box placement can aid landowners and homeowners in providing the best habitat possible for bats, and we will provide maps of specific areas for landowners at their request. Because bats are known to forage regularly along riparian corridors, maintaining or restoring forest cover adjacent to streams and other waterways will benefit bats in the area. Maintaining or creating snags (standing dead trees), particularly those over 14 inches in diameter, is also beneficial. The holes, or cavities, that develop in snags provide roost sites for bats. Snags are particularly beneficial when left along riparian areas, forest edges, and in regenerating stands. However, snags left in mature woodlands also provide benefits, as do living trees with cavities.