2010 Summer Bat Count Results

Bat Counters Leona & George get ready for their barn bats' nightly exodus. Photo by MacKenzie Hall

BACKGROUND: Since 2003, the Summer Bat Count project has enlisted volunteers across NJ to monitor bat populations at known summer roost sites, including attics, barns, bat houses, churches, and other structures where female bats congregate and raise their young. This volunteer project was created by the Conserve Wildlife Foundation and the state's Endangered and Nongame Species Program (ENSP) to gain a better understanding of how NJ's bats are distributed across the state, what conditions they select for roosting, and how populations may be changing over time.

Since White-nose Syndrome (WNS) hit NJ in January 2009, information from the Summer Bat Count is more critical than ever, helping biologists to measure the impact of this devastating disease. As of Spring 2010, WNS had spread to more than a dozen US states from New Hampshire to Oklahoma and into the Canadian Provinces of Ontario and Quebec.

2010 SUMMARY:

Participation

We received data or useful observations from fifty-seven (57) bat roost sites in 2010. Sixteen counties were represented: Bergen, Burlington, Camden, Essex, Gloucester, Hunterdon, Mercer, Middlesex, Morris, Ocean, Passaic, Salem, Somerset, Sussex, Union, and Warren. A majority of the data came from northern and central NJ counties.

Overall Trends

We had data to compare "pre-White-nose Syndrome" bat counts (2008 or earlier) with 2010 bat counts at forty-nine (n=49) roost sites. This comparison gives us an idea of how badly White-nose Syndrome has impacted NJ's bats since it struck two winters ago (WNS affects bats as they hibernate). At those 49 sites, ***bat colonies have dropped an average 41% in size***, and half of them have decreased by 75-100%.

A hibernating little brown bat with WNS. Photo by NJDFW

Trends by Species

Big brown bats (*Eptesicus fuscus*) and little brown bats (*Myotis lucifugus*) are the two most common "house bat" species in the northeast. That is, they readily use artificial roost structures like attics, barns, and bat houses (other bats typically roost in the forest and go virtually unnoticed). Thus, Summer Bat Count colonies almost always consist of either big or little brown bats, or some combination of the two.

Big brown bat. Photo by M. Hall

Last year, we noticed that many *stable* summer bat colonies were made up of big brown bats. It turns out that big browns are less vulnerable to the fungus that causes White-nose Syndrome – in large part because of their unique hibernation habits. At Summer Bat Count sites ***where the bat species has been identified***:

- ***Little brown bat colonies have decreased 80%*** on average since pre-WNS counts (n=10);
- ***Big brown bat colonies have increased 41%*** on average since pre-WNS counts (n=9).

Reproduction
At 21 roost sites, bat counts were reported from both the ***pre-volant*** (before June 21st) and ***post-volant*** (after July 5th) periods. During the pre-volant period, bat pups (babies) cannot fly and are nursed by their mothers in the roost. Mother bats exit the roost at dusk to feed on insects and to drink. In the post-volant period, bat pups are flying and foraging for themselves, so they can be counted exiting the roost at dusk along with their mothers. The difference between pre-volant and post-volant counts equals (roughly) the number of young bats produced at a given roost that summer.

At these 21 sites, ***bat colonies increased an average of 70% from the pre-volant to post-volant counts***. While we don't have enough pre-White-nose Syndrome data to know what is "normal," the numbers do show that the ***surviving bats are still successfully producing & rearing young***. Big brown bat colonies grew the most, with an 88% average post-volant increase (n=5). This is not surprising, since female big brown bats often bear twins while little brown bats have just one pup per year.

2010 Maternity Colony Surveys


Mick Valent sets up a harp trap in the window of a barn. Photo by M. Hall

Under guidance of the US Fish and Wildlife Service and the national White Nose Syndrome Maternity Colony Monitoring Task Group, New Jersey biologists participated in a second year of maternity colony surveys. ENSP zoologist Mick Valent led the effort. CWF coordinated and assisted with most surveys.

Goals

- Assess bats for signs of WNS exposure – like wing scars, rips, or holes caused by the fungus;
- Record each bat's weight, sex, and age status;
- Determine whether adult female bats had nursed young this season;
- Band bats with a metal ID tag for future observation;
- Take fur, blood, and fecal samples for genetic analysis.

Studying the Bats
To collect this information, we had to physically capture bats at each study site. We chose sites where bats were reasonably easy to get to and where at least a couple dozen individuals remained. Many Summer Bat Count sites served a double purpose again this year, and we thank everyone who invited us into their homes, barns, and bat houses to study their bats.

The study focused on little brown bats because of their high vulnerability to White-nose Syndrome. We visited just one big brown bat colony this year. Bats were captured a little differently at each site depending on the situation. Sometimes, bats could be scooped into a simple butterfly net, or even grabbed by hand. At other sites, bats were unreachable by day and had to be caught with a harp trap as they exited their roosts at dusk.


The worn area around this bat's mammary gland shows that she has been nursing a pup. Photo by M. Hall

Eight bat roosts were studied between late July and early August 2010. The timing is important – entering a roost when pups are too young can cause their frightened mothers to drop or abandon them, while by mid-August the bats may have left (and it's much harder to tell the adults from their young).

Results

Around 250 bats were caught, processed, and released at the maternity roosts. In this second year since White-nose Syndrome hit NJ, we again saw very little evidence of physical damage or reproductive impacts. ***Most of the bats' wings were free of scars, their weights were healthy, and there were many young pups in every colony***. The bats who develop wing tears and other advanced signs of WNS must simply not survive to summertime – at least not in large enough numbers to turn up in this study.

Back-lighting helps us analyze the bats' wings and to tell the adults from the pups.

Although four of the study sites were "repeats" from the previous year, virtually none of 2009's banded bats were captured again (likely because of the small percentage of each colony with bands).

THANK YOU to all of our Summer Bat Count volunteers and partners! If you know of a summer bat roost and would like to participate next year, please contact us at Info@ConserveWildlifeNJ.org.

The Bigger Picture

In the handful of years since its discovery, researchers have answered a lot of questions about White-nose Syndrome, but ***many questions linger***: Can bats who survive WNS ever rid themselves of the fungus that causes the deadly disease, or can the fungus reside in the bats' tissues until the following winter? Can fumigation rid hibernation caves of this fungus? Can treatments inside the caves help bats to survive through winter? And the big one…Will bats develop a resistance?

With many eastern US bat populations already nearly gone, biologists are learning as much as they can from the affected bats and hibernation caves in hopes of helping the rest of the country. To get the most information possible out of the banding/recapture effort here in NJ, another 250+ bats were caught and banded at Hibernia Mine (Rockaway, Morris County) between September and November 2010. About twenty bats were placed in a ~250 ft² ***enclosure within the mine*** in order to track their progress over winter. Some of these bats nearly died from WNS last winter and had been in rehabilitation since April. Will they be just as vulnerable this winter?

Under UV light, the WNS fungus shows up as orange spots on a bat's wings. Photo by Mitzi Kaiura and John Gumbs

Bat researchers John Gumbs and Mitzi Kaiura are investigating the use of long-wave ***Ultraviolet light*** to detect White-nose Syndrome outbreaks before the tell-tale fungal bloom is visible on the bats' muzzles. They've found that tiny yellow-orange spots on the bats' wings – the fungal hyphae, visible under UV light only – confirm the early stages of WNS. These spots expand to cover more and more of the wing as the winter goes on. Gumbs and Kaiura are photo-documenting the progression under UV light at Hibernia this winter.

In Pennsylvania, the Game Commission has partnered with laboratory scientists to test whether ***antifungal treatments*** can fight White-nose Syndrome in hibernating bats. They're also looking at whether rehabilitated bats (WNS survivors) can hibernate in a "clean" environment without re-growing the deadly fungus. On the flip-side, Vermont is looking at whether unexposed bats from the Midwest will contract WNS from a cave where all of the previous occupants have already died and bat-to-bat transmission is not possible.

For the most up-to-date information on White-nose Syndrome, please visit:
www.fws.gov/whitenosesyndrome/