PENNSYLVANIA GAME COMMISSION
Bureau of Wildlife Management
Wildlife Diversity Division

2001 Elmerton Avenue, Harrisburg, PA 17110-9797

DATE: June 28, 2018

SUBJECT: Surveys of Summer Bat Roosts

TO: Cooperators in the Pennsylvania Appalachian Bat Count

FROM: Greg Tuner, Wildlife Biologist

Thank you for participating in the Appalachian Bat Count! Your work is critical in helping the Game Commission monitor population trends in summer bat colonies. As many of you are aware by now, white-nose syndrome (WNS) has devastated Pennsylvania's populations of hibernating bats since it was first detected in the state during the 2008-2009 winter, approaching nearly a decade now. This disease continues to spread westward across the continent, and recent news finds it in South Dakota, Kansas, and Wyoming. Two years ago a large jump occurred and WNS found its way to Washington State, and this winter we saw continued presence and localized spread from this new epicenter in the west.

Your surveys will be used to measure the impacts of WNS and to document the location and size of surviving colonies. This is something we could not do without your help! Big brown bat colonies have appeared rather stable over the past several years, and the species seems to be only minorly impacted overall. A new study points to the presence of free fatty acids on the skin of big brown bats, that have some effective anti-microbial activity that may be warding off the fugal agent responsible for WNS. Unfortunately, the same cannot be said for little brown bats and several other species. For those of you out there lucky enough to have surviving colonies of little brown bats, we are keenly watching to see the trends at your colonies and accumulated counts state-wide to see if our trends have finally stabilized or show any indication of recovery. One thing we do know is that 100% of surviving little brown bats get exposed and infected each winter season. We suspect for little brown juveniles that survival is low that first winter, but we are starting to document a few juveniles that have survived their first winter, and hopefully enough are now doing this keep colonies stable or even increasing. If anyone has an active little brown bat colony and have needs for a bat box, please contact me directly. We have a limited supply of our aluminum shell boxes and want to prioritize these toward active colonies of little brown bats. We hope to report to you next year some general findings on some overall ABC trends in Pennsylvania. For more information on WNS, you can always check out the U.S. Fish and Wildlife Service website at: **http://whitenosesyndrome.org/.** You can find more information about bats, including bat box plans and research reports, on the PA Game Commission website, **www.pgc.pa.gov**.

Finally, I would also like to apologize for the significant delays in getting the forms out to everyone this season! I am sure many of you were wondering if they would show at all. We have lost multiple positions within our section over the past several years. Most recently our statewide coordinator for the ABC, Nate Zalik, recently moved into a new position and can no longer lead this program. We thank Nate for a great job and wish him well in coordinating all our agencies grants! The transfer of this project to our limited staff caused some minor delays in data entry this year and got us a bit behind. Fortunately, we are now caught up and rolling again.

Continued…

I am placing new site information forms, as fillable pdfs or word versions, on our website and found here in this packet as well. Or you can contact me directly and I will be happy to email you forms as needed. For new sites, it is important that we have clear, complete site information. Please take the time to describe the structure, provide detailed directions to the site from the nearest town or major road intersection, and provide latitude and longitude coordinates if known. If needed, I can send you a map on which you can mark the site. Please continue to submit information even if a colony disappears. These "zero counts" are valuable data, and it is possible that bats will return. We have also seen a number of little brown colonies turn into big brown colonies as this happens. Should you become aware of any unusual circumstances or issues regarding sites that you count, feel free to give me a call or email.

I've enclosed here: SUMMER BAT ROOST REGISTRATION FORMS (Instructions; Surveyor, Site/Landowner, and Emergence Count forms) for registering **new** sites. A database printout form is also enclosed for your surveys already in the system. Please check the information, make any corrections and use the space provided to enter this year's data. There is space to record up to three counts on the database printout. Some printouts have notes/maps attached asking for additional information.

Species **-** Determining the species being counted is extremely helpful and is requested on the "Site and Landowner" data form. If you don't know, please circle unknown. **If you have any doubts about the species using your site, please send me a picture of the guano with a ruler in the frame for a size reference.** For bats in structures we are primarily dealing with little brown bats and big brown bats. Little browns are being impacted severely by WNS with hibernacula declines in excess of 99%. Big brown declines have been less severe. Identifying little brown (and other *Myotis* species) survivor summer colonies is now a high priority.

Some helpful hints for identification:

>When flying, little browns are about the size of sparrows; big browns are about the size of a cardinal.

>The droppings, or guano, of little browns are about the size of grains of uncooked rice; big brown guano is slightly larger.

>If you have access to the dry guano - when crushed with a stick or pencil you will notice shiny chunks of insect exoskeleton that reflect light.

Little brown guano has exoskeleton pieces that are small (fine sand) and similar in size to sparkles/glitter that are used in facial accents.

Big brown guano has larger chunks of insect exoskeleton with some approaching ~½ mm in size. They have larger teeth needed to forage on beetles with thick exoskeletons.

***If conducting only one count for a site, try to do the count between July 4 and July 20. Most pups will be flying (volant) by then. You will have the best chance of getting a high count.** After July 20th, many colonies begin to disperse. ***Please return the enclosed survey forms by August 31 to:**

ATTN: Greg Turner
Bureau of Wildlife Management
PA Game Commission
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
(717) 433-5497
grturner@pa.gov (please identify yourself as a **bat volunteer** in subject line)

Commonwealth of Pennsylvania
Pennsylvania Game Commission

Appalachian Bat Count

Summer Bat Roost Registration Forms

Please Use to Register New Bat Roosts

For Previously Registered Roosts Use

Database Printout to Record Changes.

Thank you for your participation.

Pennsylvania Appalachian Bat Count
Summer Maternity Roost Monitoring - Emergence Counts

INTRODUCTION

The methods used in this survey will be used to: Identify and evaluate the approximate size of bat maternity roosts by conducting general emergence counts; evaluate emergence variances between bat pup pre-volant and post-volant counts using more extensive count surveys at some locations; compare the number of reproductive versus non-reproductive females and evaluate their general health by capturing animals; and provide opportunities for collecting biological samples at maternity roosts as needed by WNS researchers.

The Goals of the survey are to: Gather base line information on summer colonies; evaluate the impact of WNS on summer colonies; and correlate long term trends with the spread of WNS.

This survey is primarily geared toward little brown bats (*Myotis lucifugus*) and big brown bats (*Eptesicus fuscus*), the two species most often found using buildings and bat boxes during the summer. While both of these species have been impacted by WNS in the northeast US, little brown bats declines have been much more severe.

COMMITMENT LEVEL

Protocols will vary depending on the surveyor's commitment and expertise. It is hoped that surveyors will commit to conducting surveys over the next several years or longer once you find out how enjoyable bat counting is. The initial commitment is a volunteer or researcher who locates at least one roost and conducts a minimum of one emergence count of that site a year. Locating and conducting a base line emergence count is one of the most important aspects of this study. You may be contacted by researchers to use your site in a more extensive study. Once you have participated with an initial commitment and learn how much fun counting bats is, you may want to increase your effort. Listed below are different levels that can be used in this study.

LEVEL 1- Find and conduct at least one emergence count of a roost **between May 15th and August 1st**. Additional roosts can also be located and additional counts conducted. Base line information on many roosts is extremely valuable. If conducting one count try to conduct in **mid-July** (late lactation for females) when the colony should be most stable.

LEVEL 2-Find and conduct at least one (preferably 2) or more emergence counts of a roost before most pups begin flying (pre-volant).

Pre-Volant: Conduct between Last Week in May and 3rd Week in June.

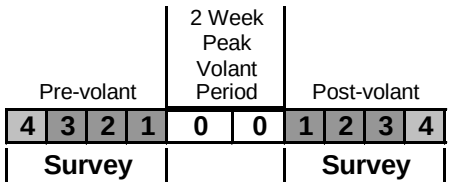
And at least one (preferably 2) or more emergence counts after most pups begin flying (post-volant). Again, target <u>mid-July</u>.

Post-Volant: Conduct between July 4th and July 20th (July 31st the latest).

LEVEL 3- conduct at least one emergence count of a roost at least every 2 weeks (preferably every week) starting the:

Last Week of May through July 31

Researchers use Level 3's high commitment because some roosts begin to disperse soon after pups begin flying. Maternity roosts can be very dynamic and it is often difficult to pick out the best dates for sampling the pre-volant and post-volant periods. For intensive research purposes, it is also recommended that you conduct at least 2 or more counts on consecutive evenings to obtain error parameters.



General guidance for conducting emergence surveys for states planning to initiate emergence surveys.
From VA north the 2-week peak Volant period is the ~ last week of June and 1st week of July.
Weeks 1, 2, and 3 are preferred weeks for emergence counts.

Another aspect of this study involves researchers with the appropriate state and federal permits. You may be contacted for permission to use your site in these studies. Proposed work includes netting during the pre-volant period to capture females and evaluate reproductive condition, gathering weight data, banding, and collecting samples for lab studies such as skin and blood samples.

Continued…

Pennsylvania Appalachian Bat Count
Summer Maternity Roost Monitoring - Emergence Counts

PROTOCOL

Finding colonies of bats: Country churches and other old structures provide the best opportunities for finding bat roosts. The largest colonies are usually located along major rivers or other large bodies of water and other colonies can be found most everywhere near forests and water. Buildings such as old houses, country churches, and barns are likely candidates. Usually you can just ask some local people about buildings with bats. Generally bat roosts are locally known. If you're lucky, someone will know of artificial roosts created just for bats. The bat species will usually be little brown (*Myotis lucifugus*) and big brown (*Eptesicus fuscus*) bats where females congregate in spring through summer to give birth and rear their young.

Data Forms- The information you collect will be maintained in a database used to research WNS. A database provides uniform formatting and storage of your data so it can be compared with other surveys. This requires the use of standardized reporting forms. Please use them.

1. Surveyor Information Data Form: This is used to register you within the program. Please print legibly so that your contact information is entered correctly. You only need to complete this form once, unless changes are needed.
2. Site and Landowner Data Form: It's important to make contact with the landowners and get their approval. Location information is important. Please record the state and county. If you have a GPS unit, please record the latitude, longitude and datum the unit is set on. If you do not know the datum, write unknown. If you have no access to a GPS, please copy a map with the site circled and return with the form so a general location can be recorded. Otherwise, provide general directions from a town, major road intersection, or other recognizable feature on a map. Record the species using the roost if known, otherwise circle unknown. The last portion of the form collects the landowner's contact information. You only need to complete this form once unless addresses, or other information changes.
3. Emergence Count Data Form: Use this form for recording the actual bat count. Be sure to indicate the site name and you as the surveyor. Record the date, sky and wind codes (codes are on bottom of form), start temperature, start & end time, total bats counted and technique used, which will usually be visual. Please make a note of other surveyors in comments. Also note any unusual observations. The form page has space for 2 counts. If you conduct more than 2, please copy more forms.

The Survey- It's best to do some scouting beforehand to determine where bats are exiting. You may find that you need help in covering all the exits (front and back of a structure). Please try to survey when starting temperatures are above 60ºF and wind and sky codes are 3 or less. Bring a thermometer, paper and pencil and the emergence form. Arrive ½ hour before sunset. Locate where the bats are exiting the structure and count them as they exit. Some may re-enter, especially when there are pups inside. Try to keep track of this. If you find that you have a mega-colony that numbers in the thousands, you may need to tally them by the 10's as they exit. Position both yourself and helpers for easy viewing of bats exiting. It is best to be in position to have the bats silhouetted against the sky for easier viewing. When more than one surveyor is needed, it's a good idea to turn the count into an evening social, with dinner or an ice cream parlor visit afterwards. Please remember to ask permission of the landowner and enjoy the experience.

Roosting Estimate- If time does not permit an emergence count and the roosting bats can be counted, a roost estimate may be recorded in comments. This is most useful for surveying multiple bat boxes (artificial roosts) where a light can be shined up into the bat box and roosting bats counted. This can also be used if you have access to an attic with roosting bats. **Record the total bats for the count, record "other" in technique and note roost estimate and counting method in comments.** This type of count is generally a minimal estimate since many bats may not be seen but it does record a roost.

Upon the completion of any re-survey, landowner and surveyor information should be checked and updated if necessary. Thank you again for participating in this important survey of your wildlife resource.

Return Survey Data by **AUGUST 31** to: ATTN: Greg Turner, Bureau of Wildlife Management, PA Game Commission, 2001 Elmerton Avenue, Harrisburg, PA 17110-9797

Pennsylvania Appalachian Bat Count
Summer Maternity Roost Monitoring-**SURVEYOR INFORMATION** Data Form

Please complete for new surveyor

SURVEYOR INFORMATION (CONFIDENTIAL):

NAME: _____

ADDRESS: _____

_____

CITY: _____ STATE:_____ ZIP:_____

PHONE:_____

EMAIL:_____

SURVEYOR TYPE (circle what best describes you):

Landowner -You are surveying a roost on your own property (use this even if also surveying other sites you do not own).

Volunteer -You are surveying as a volunteer and have limited expertise in both bat identification and ecology.

Student -You are a student studying bats with a basic expertise in both bat identification and ecology.

Researcher -You are actively involved in bat research on an academic and/or professional level.

COMMENTS: (Bat experience etc.)

_____

_____

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_____

_____

Pennsylvania Appalachian Bat Count
Summer Maternity Roost Monitoring-**SITE and LANDOWNER** Data Form

Please complete for a new site or landowner

Sitename or Number:_____ **2 Digit State abrev.:_____** **County**:_____

LAT:_____º - _____' _____" (N) **LON**:_____º - _____' - _____" (W) DATUM (circle): WGS84 (preferred) – NAD83 – NAD27
(or send a map)

Lat/Lon Precision (circle): GPS – From Map – County Resolution – Not Mapped – Other (specify)_____
(circle- "GPS" if GPS unit used; "From Map" if plotted from map; "County Resolution" if coordinates are only County specific)

Roost Structure is: barn – church – occupied house – unoccupied house – utility building – bat box – bat condo – bridge – tree –

cave – mine – unknown – other structure (describe):_____

Primary Species within Roost: _____or Unknown (circle if unknown)
(list only 1 if known., and make comments on others)

COMMENTS (include directions to site, where bats are exiting, how many surveyors needed at site, other species roosting, landowner's plans for the bat colony, history of site regarding bats, etc. attach more sheets if needed):

_____

_____

_____

_____

_____

_____

_____

LANDOWNER INFORMATION (CONFIDENTIAL):

NAME: _____

ADDRESS: _____

_____

CITY: _____ STATE:_____ ZIP:_____

PHONE:_____

EMAIL:_____

RESPONSIBLE SURVEYOR NAME:_____

Pennsylvania Appalachian Bat Count
Summer Maternity Roost Monitoring-**EMERGENCE COUNT** Data Form

SITE NAME or No.:_____ **SURVEYOR:**_____
(a SITE/LANDOWNER data form needs to be completed at least once) (Lead Surveyor who is responsible for reporting and has completed a SURVEYOR Info data form)

DATE	SKY CODE NO	WIND CODE NO	START TEMP ºF	START TIME (24 hr)	END TIME (24 hr)	TOTAL BATS COUNTED	TECHNIQUE USED enter VISUAL or VIDEO

Other Surveyors:
Other
COMMENTS:

SITE NAME or No.:_____ **SURVEYOR:**_____
(a SITE/LANDOWNER data form needs to be completed at least once) (Lead Surveyor who is responsible for reporting and has completed a SURVEYOR Info data form)

DATE	SKY CODE NO	WIND CODE NO	START TEMP ºF	START TIME (24 hr)	END TIME (24 hr)	TOTAL BATS COUNTED	TECHNIQUE USED enter VISUAL or VIDEO

Other Surveyors:
Other
COMMENTS:

SKY

CODE	DESCRIPTION
1	Clear-Clear to a few clouds
2	Partly Cloudy-Clouds but variable sky conditions
3	Cloudy-Mostly cloudy or overcast
4	Drizzle-Light intermittent rain
5	Showers-Steady soaking rain
6	Thunderstorms-Rain with thunderstorms
7	Not Recorded-Not Recorded

WIND

CODE	DESCRIPTION	~Speed
1	Calm-Leaves Still	0 MPH
2	Slight Breeze-Leaves slightly Rustling	1-7 MPH
3	Gentle Breeze-Leaves and twigs in motion	8-12 MPH
4	Mod. Breeze-Small branches begin to move	13-18 MPH
5	Windy-Small Trees or more in canopy sway	19-24+ MPH
6	Not Recorded-	Not Recorded

Sky and wind codes of 1 – 3 are best. Code of 4 is marginal. Avoid surveying if code is higher than 4.

Little Browns

Note the small nose and short, uniformly dark brown fur on the back.

Big Browns

Note the larger nose and long, silky fur of big brown bats.

Guano comparison: Little brown (left) vs. Big brown (right)