New Jersey Mobile Acoustic Bat Survey
Instructions for Volunteers

INTRO

New Jersey is home to 9 bat species. Most are facing the new and unprecedented threats of White-Nose Syndrome and/or wind energy development in addition to gradual habitat loss. We can measure some of the impacts through Summer Bat Counts and census counts at winter dens, but both methods are limited. One major shortcoming is that our 3 migratory "tree bat" species (the red, silver-haired, and hoary bats) aren't captured by either. These bats are probably not affected by White-Nose Syndrome but are the most common bats to be killed by wind turbines. We also know that some cave hibernating species are hit harder by White-Nose Syndrome than others but haven't had an easy way to monitor them all individually in summer *or* winter.

Acoustic monitoring will fill in a lot of these data gaps. It's a simple and time-efficient way to get information about bat presence and species and to track population trends over time – all without having to trap, handle, or even *see* the animals. By mounting detectors on vehicles, we can cover great distances and a range of habitats. Your help with this survey will allow us to collect data all across the state, providing important information that we simply could not get any other way!

SURVEY ROUTES

Each volunteer/team is assigned at least one 10-30 mile long mobile survey transect to survey with a bat detector. The routes pass through forest, forested wetland, and riparian habitats where bats are most likely to be active. We try to follow low-traffic roadways since the transects must be driven slowly (~15 mph).

Surveys along each route should be repeated across the season if possible; 1-3 runs is a realistic goal. Most sampling should be done while bats are in their summer/maternity ranges (June 1-July 15 is the core of summer activity and excludes migrating bats). Surveys *can* be done from mid-late April through early October to include some migration info, too, but for now this project will focus on the summer range.

As routes are surveyed in successive years, we can get an idea of population trends for the various bat species. For consistency, it's important to use the same type of bat detector each time a transect is sampled, to drive the transect in the same direction each time, and to survey each individual transect within the same 7-day window(s) each year.

CONDUCTING YOUR MOBILE ACOUSTIC BAT SURVEY

Timing & Conditions

Acoustic surveys should ONLY be done on nights that are suitable for bat activity. This means:

- Temperature must be 55°F or higher at the beginning of your survey;
- ***NO rain!!*** Bats don't mind a little drizzle, but the AnaBat microphone will be destroyed by moisture! Please avoid even foggy nights (humid nights are ok);
- Air should be calm or lightly breezy. Avoid nights with steady winds over 15 mph, when the leaves & small twigs on trees are in constant motion. Bats are not active on high-wind nights.

Very important! Follow the weather forecast prior to your survey to be sure the conditions are right! We don't want you wasting your time for bad information, and we don't want our expensive equipment hurt.

Your survey will begin 30 minutes after local sunset, approximately 8:30 to 9:30 PM (depending on the exact day and your location in the state). Please don't approximate the start time or look for the sun dropping below the horizon. These methods are not accurate enough for this study. You can easily calculate the start time for any given evening by adding 30 minutes to a published sunset time, e.g., from your local newspaper, local TV weather reports, or by looking at web sites like: http://www.sunrisesunset.com/USA/New_Jersey.asp

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Remember to add 30 minutes to the sunset time in order to determine your start time! If you leave too early the bats will not be flying. Too late and you will miss the peak of activity. Please try to be punctual. NOTE: It will not be fully dark 30 minutes after sunset. That's fine. It will be dark enough for the bats.

Have a Partner

We've found that successfully running a new route is a two-person job. The passenger watches the map, keeps the driver on course, records notes, and makes sure everything is working properly. The driver concentrates on driving *only*. SAFETY – for you as well as other people on the road – is paramount!

Equipment & Prep

On survey day, make sure you have all the necessary equipment & materials ready to go! Follow this checklist:

1) Got your partner? Know where you're going? You should be familiar with your starting point, driving route, and end point – it helps to do a day-time practice run ahead of time to scope it out. Confusion on survey night may force you to repeat the survey another time!
2) Double-check the weather forecast to make sure there's no rain coming and that temperature & wind conditions will be suitable for a survey.
3) Double-check the local sunset time (http://www.sunrisesunset.com/USA/New_Jersey.asp) and add 30 minutes to determine your survey start time. Write it on your data sheet as a reminder.
4) Batteries! Remove the four AA rechargeable batteries from the detector and charge them for at least a few hours in the charger provided. You will need to detach the detector from the wooden car mount base to access them. Please *do not over-charge* the batteries (like by leaving them in the charger for days at a time), as this can impact their long-term performance.
5) After charging, put the batteries back in the detector (pay attention to +/- ends).
6) To save any potential hassle later on, turn on the detector to make sure it's working properly. (Read through steps 3-7 under the next section, "Ready to Start!")
7) ***Requires a screwdriver!*** Re-attach the wooden car mount base to the bottom of the detector using the 2 screws. It only fits one way. Make sure the foam & plastic "COMPACT FLASH CARD ACCESS" cover is in place between the detector and the wooden 2x4.
8) If it's not already attached to the car mount, make sure you have a strap to secure the detector & car mount to your vehicle! (But don't attach it until you're at/near the survey starting point…)
9) Make sure you pack:
    - Map(s) of your route
    - Data sheet
    - Authorization letter
    - Timesheet
    - These instructions!
10) Grab a couple pencils/pens for the road…that screwdriver might also come in handy.
11) Bring the "WILDLIFE SURVEY – FREQUENT STOPS" window cling sign if one was provided.
12) Bring a cell phone for recording *exact satellite times* on the data sheet (a watch or car stereo that's set *accurately* is also ok).

Ready to Start!

Arrive at your starting point well before the designated start time, giving yourself wiggle-room to set up and make sure everything is working properly. If you can't park at your starting point, then a nearby parking lot or safe pull-off shouldn't be hard to find (also a good thing to scout ahead for).

Now you're ready to attach the car mount and start your survey. Another reason for that 2nd person:

1) Place the bat detector upright on your vehicle's roof so the microphone faces straight upward and the side ports (for headphones, serial, USB, etc.) face the back. The exact placement of the bat detector isn't critical, but it works well to position it approximately above the passenger's head.
2) Secure the detector & car mount to your vehicle with the nylon strap. Run the strap across the roof, though both the driver's and passenger's side doors, and ratchet it tight inside the cab until there is no slack. (To state the obvious, don't strap your car doors shut!)
3) Turn on the detector by pushing the POWER button.
4) After a few seconds, it will settle into record mode. The red LED lights that should be lit are circled with black permanent marker. They are:
    - RECORD
    - STATUS
    - AUDIO DIV 16
    - DATA DIV 8
    - The DATA button will also flash whenever ultrasonic sounds are detected…in addition to bat calls this can include car brakes, the hum of power lines, "S"s, and fingers rubbing together. Try rubbing your fingers together in front of the microphone to make sure it registers.

5) *Very important!* If the RECORD button is *not* lit, the detector will not store bat calls. Press the RECORD/STANDBY button once and it should come on.
6) *Also very important!* If the AUTO DIV or DATA DIV selections are incorrect, press the appropriate button to scroll through until AUTO DIV is on 16 and DATA DIV is on 8.
7) The ERROR light may be on if the compact flash card is missing. Without the compact flash card, no data can be stored. ***DO NOT*** *insert or remove the flash card while the detector is on!* Turn the detector OFF and unscrew the car mount to check it. If the flash card is installed and the ERROR light is still on, call your contact person. We may or may not be able to find a solution.
8) When all is as it should be, adjust the detector's sensitivity dial to the point where an occasional "crackle" sounds from the speaker. If the sensitivity is too low you may miss some quieter or more distant bat calls. But you don't want constant static because this will fill the data card with extraneous sound files. Usually the perfect spot is around 6 or 7 on the sensitivity dial.
9) If you have spare time before the start time, practice (visually) navigating the route on the map. Also fill out the top part of your data sheet and the "Start Survey" information.
10) Begin surveying from your starting point at 30 minutes past local sunset. Record the exact start time (not necessarily the same as when the detector gets turned on). This is an important reference for us when reviewing your data. It's possible that some bat calls will come in before the start of your route if you set things up from a distance away.
11) *Navigation*: The passenger is in charge of keeping the vehicle on track and recording notes. The passenger should be aware of each next turn and give the driver advance warning. The driver's job is to focus on the road and travel speed (should be ~15 mph). Don't be *too* overly concerned about the exact speed – slower is better, but short bursts up to 20 mph are ok. Occasionally you'll be overtaken by vehicles moving faster than you. When you see a vehicle approaching from behind, simply turn on your emergency flashers and pull over as far as you can

until the vehicle passes. Turn off your flashers and resume. Keep track of the number of times this happens on your data sheet. NOTE: People who see you driving with an object on your roof may think you left it there by mistake and try to flag you down. While this can be the start of an interesting conversation, please be aware of time and don't get off track!
Some stretches of road along your route might be too busy to safely survey. Just drive normally until you get to the next turn (and record a note about the survey "break" on your data sheet). *Do not exceed 50 mph while the detector is on your roof!* (If traffic is a real problem throughout your route, contact us.)

12) Record any other important notes about the route or your survey as they come up.
13) When you reach your end point, record the exact time. Pull over as soon as there's a safe place to do so, turn off the detector (POWER button), and remove the roof mount and window cling (if provided). Store these somewhere safe, stable, and dry for the ride home.
14) Fill out the rest of the data sheet/report while everything is still fresh in your memory.

What If…?

What if I arrive late to the start of the route? Missing the start time by a few minutes is no big deal. If you are more than 10 minutes late, though, you must perform the survey on another day.
Can I reverse the route, starting at the planned finish location? Yes (especially if it's the first survey ever done for that route), but preferably no. It's best to run the survey in the same direction each time, so make a note if you reverse the directions.
What if I miss a turn? Unless you end up driving for 5 minutes before you realize the error, missing a turn or two is no problem. Turn around and get back on the route, preferably at the point where you made the error. Describe what happened on the trip report and what you did to get back on track.
What if it starts to rain while we're out on the road? You must terminate the survey. Pull over immediately and remove the bat detector from the roof. Turn off the detector and note what happened on the trip report. Plan to resume the trip from the beginning at a later date.
What if it is necessary to take a long stop during the survey? Short stops are ok; please describe any stop longer than a minute in the trip report. If you're delayed more than 10 minutes (cumulative) then it may be necessary to repeat the route at a later date.
What if there are portions of my assigned route that cannot be surveyed (road closures, etc.)? Brief deviations that still allow you to cover 75% or more of the planned route are no great problem. Note them on the trip report as precisely as possible. In most cases, the best thing is to drive at the normal traffic speed until you're able to return to the planned route. DO NOT attempt to drive at survey speed (12-15 mph) on highways, roads with a posted minimum speed, or any road where it's unsafe to do so.
What if I start a survey but am unable to finish for some reason? Please attempt to survey the complete route on another evening. If this is not possible, then we'll take the data you did collect. Make note of your deviation from the planned route on the trip report. Be specific about where you stopped surveying.

After the Survey

When you get home, make sure the data sheet is complete. Place it in the "Completed Data Sheets" envelope. If you made any changes to your route, please include a revised map in the envelope, too (or very good notes about the change).

Enter the night's survey details onto your volunteer timesheet. You can use both sides – one for each person. Put this in the envelope with your data sheet unless you know you'll be surveying again soon.

Check the AnaBat Schedule sheet to see who the detector is going to next (or contact us if uncertain). Call/email the next person and arrange with them to transfer the equipment. Let us know your status. Every so often we'll intercept the detector to download data and make sure all's working well.