

Transect Establishment and Survey Protocol

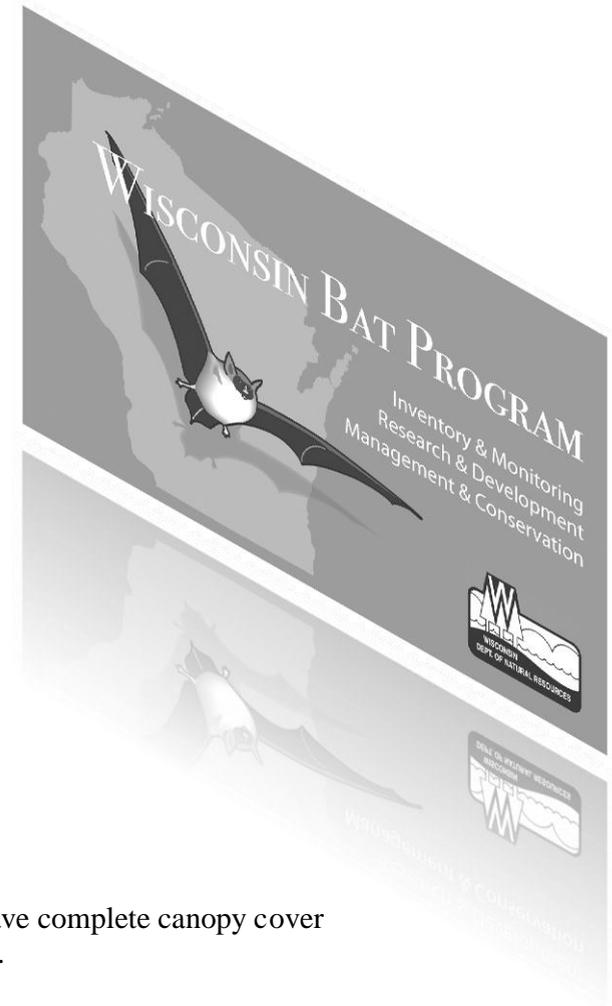
Acoustic Bat Survey Driving Transects

The following information was adapted from “Using Acoustic Surveys to Monitor Population Trends in Bats,” by Eric R. Britzke and Carl Herzog and R9 Acoustic Centers of Excellence by Brian Heeringa.

Recording echolocation calls of bats as the researcher moves along a transect (walking, driving, canoeing, etc.) is now commonly used to monitor bat populations across the country and around the world. Ultrasonic detectors are a cost effective method for monitoring multiple bat species at large spatial scales. To run a transect using a vehicle, the microphone is typically removed from the detector and mounted on the roof via an extension cable, where it is less susceptible to road noise. (**Note:** When using an AnaBat detector, the green ‘Hi’ microphone is required for this type of setup.)

Criteria the WI Bat Program used in establishing a driving transect:

1. Be approximately 30 miles long.
2. Minimize sampling the same stretches of road (one-way straight line movement).
3. Be safe to drive at speeds not exceeding 20 mph.
4. Pass through common habitat types of the area.
5. Minimize the amount of time on roads with small forested corridors that, 10 feet above the vehicle, have complete canopy cover over them. The ultimate goal is to try and give as big an area of sampling for the bat detector as possible.
6. Be easily sampled in successive years.



Sampling

Any type of bat detector that allows for recording of echolocation calls can be used (except time expansion systems). The important thing is that the same type of detector is used whenever transects are sampled, and transects are started at the same location each time.

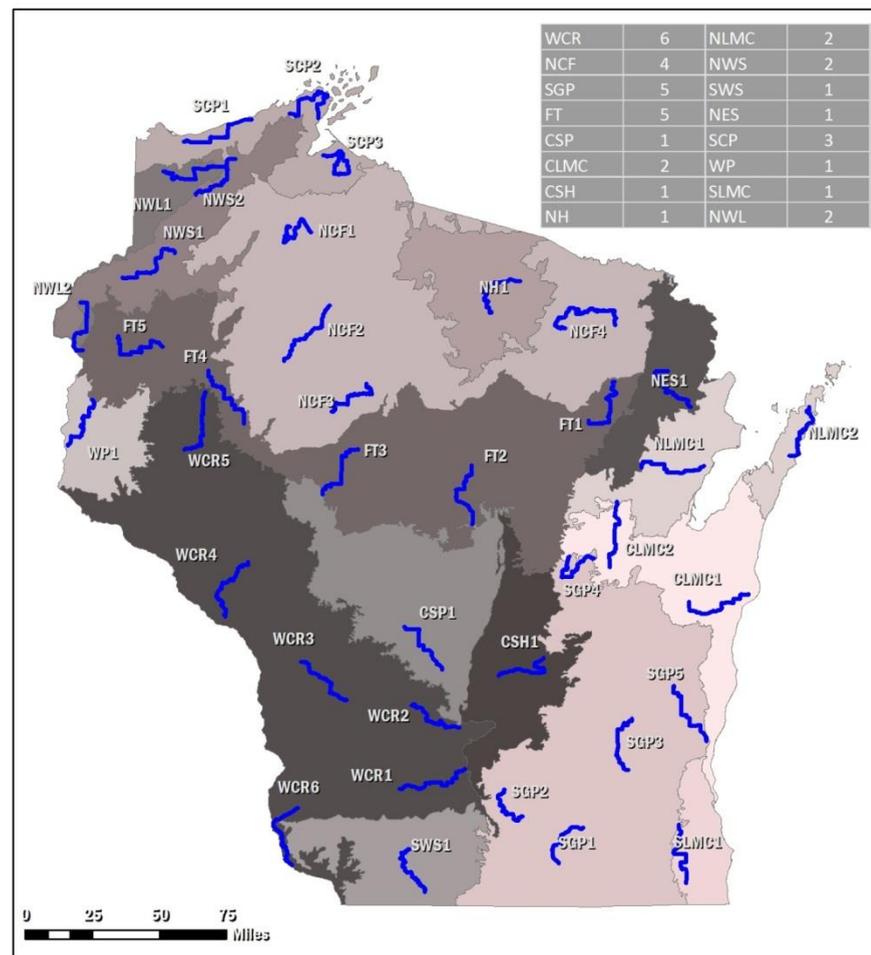
Surveys are run between **June 1 and July 15** when bats are on their maternity range. Routes should be surveyed at least twice during the maternity period. There are 3 primary survey periods, though additional surveys may be conducted.

Run 1: June 1 through June 15

Run 2: June 16 through June 30

Run 3: July 1 through July 15

1. A minimum of one survey is completed for each route during each of the established periods. There should be a minimum of 5 days between replicates of the same transect.
2. Weather conditions are generally pretty flexible. Monitoring should be conducted on nights that are suitable for bat activity.
 - a. Low wind (<30 mph)
 - b. No rain or fog (the microphone is easily damaged by moisture).
 - c. Suitable daytime temperatures (50°F or warmer)
3. Sampling will begin 30 minutes after sunset.
4. Drive each survey route at ~20 MPH.
5. Travel each route in the same direction every time.
6. Securely position the microphone assembly on top of the vehicle so as to be out of the wind stream as much as possible (i.e., towards the back of the cab of a pick-up, or in the middle of the roof of a sedan or SUV). Make sure the microphone is pointed straight up or slightly to the rear for the survey.
7. Fill out a datasheet for each survey night.
8. Rub your fingers in front of the microphone before starting and ending each transect.



**Wisconsin Bat Monitoring Program
Acoustic Bat Survey Driving Routes**

— Driving Route

ACOUSTIC BAT DRIVING TRANSECT DATASHEET

Investigator Name(s): _____ Date: _____

Transect Name (ex. SLMC 1): _____ Sunset: _____

Odometer Start: _____ Odometer End: _____

Start Time	Temp (F)	Relative Humidity (%)	Wind Speed (m/s)

End Time	Temp (F)	Relative Humidity (%)	Wind Speed (m/s)

Comments (ex. Mileage, high insect noise, traffic, break in sampling, change in sensitivity level, etc.):

Please send any map corrections/additions/comments to John.White@Wisconsin.gov

WISCONSIN CITIZEN-BASED ACOUSTIC BAT MONITORING PROJECT

DRIVING TRANSECT MANUAL



System Check

Before going into the field ensure that:

- PDA internal battery fully charged;
- Bat Detector (SD1) 4 AA batteries charged
- *Keep microphone assembly magnet away from the bat detector & PDA as damage may occur.*

Preparing the detector for the driving transect

The microphone needs to be replaced with the driving transect high-microphone system.



1 Firmly grasp the detector with one hand near the back of the detector and place one hand over the microphone.



2 *PULL* the microphone straight back to remove. **DO NOT** turn or twist microphone as damage to the sensitive pins will occur.



3 Align pins to fit by ensuring missing pin always matches the detector plug. The plug should easily insert into the detector.



4 *PUSH* the cord directly into the detector it has firmly seeded.

Preparing the detector for the driving transect

Feed the microphone assembly and cord through your open window. Be careful not to crimp the cord by rolling up your window entirely.



If possible, it is best to use a window that does not need to be open and closed, such as a passenger or rear door.



The detector should be placed in a secure position in the cab of your vehicle and be readily available so you can verify that the GPS is working properly throughout the survey.

Connect PDA-GPS-SD1



Power on SD1 and Set Values (7,16,8)



ANABAT SD1 Settings

Press "POWER" button firmly to power on SD1.

- Press "AUDIO DIV" button until 16 is illuminated
- Press "DATA DIV" until set at 8
- "SENSITIVITY" should be set at 7
- Leave "LEDS" on during a survey
- Use up and down arrows to control the "VOLUME" which has no effect on recording
- "RECORD/STANDBY", and "MIC" buttons will not be used during surveys.

*NOTE: Cord should be connected to the Detector & to the PDA. It is important to turn on Bat Detector **FIRST** then power up PDA. 6*

Instructions for using External GPS and Power-pack on a Bat survey (when PDA is not being used)

Beginning a bat survey:

Step 1: Remove 2 silver bolts that hold plastic bracket on from the back of the detector. Insert the Compact Flash data card into the back of the detector and replace the plastic bracket with bolts.



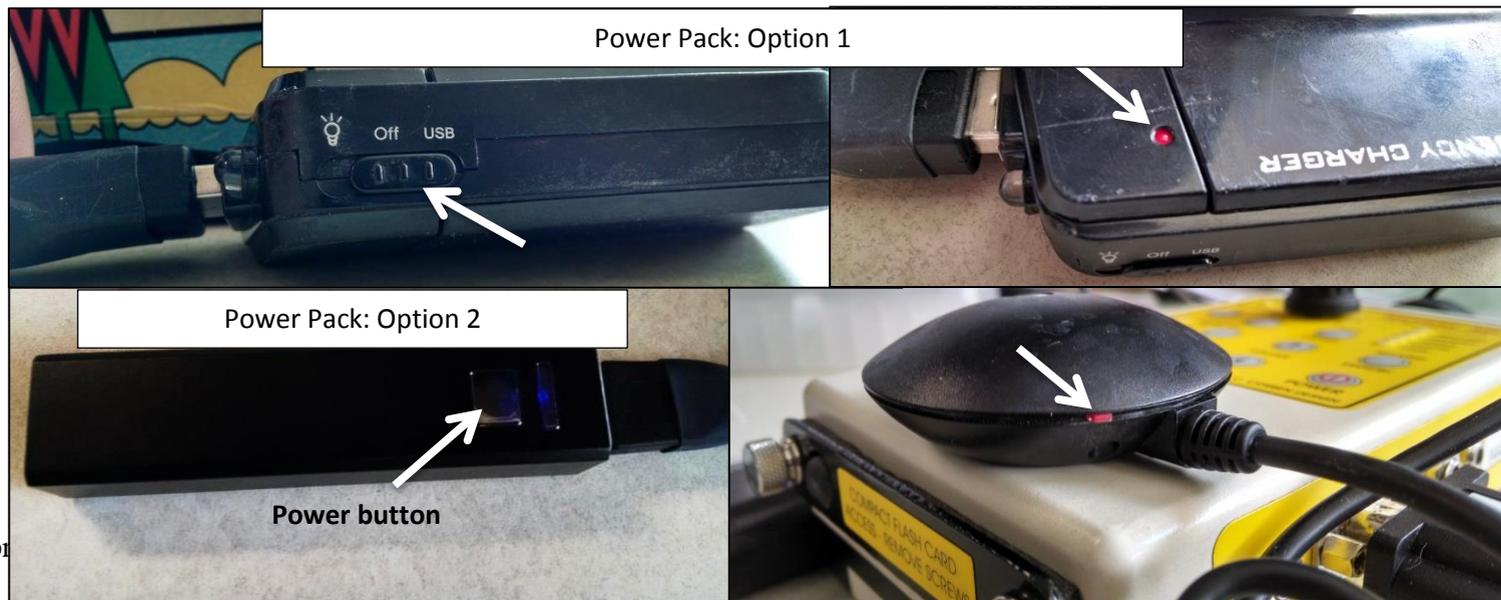
Step 2: Secure the GPS connection to the side of the detector (use two black knobbed bolts to secure cord to serial port of detector). The USB end will insert into power pack and GPS circular disc can be placed on back of the detector, secured by an internal magnet. Ensure the GPS has 2 charged AA batteries and the detector has 4 charged AA batteries.

Step 3: Turn the GPS: Two different GPS power packs are illustrated.

Option 1) Turn on by switching the black button to "USB". NOTE: Do not move button to the lightbulb symbol, this lights-up a white LED light and **DOES NOT** record GPS information.

Option 2) Press silver button to turn-on power pack, blue light indicates the power is on. GPS should be plugged in via USB.

Step 4: Let the GPS collect signal for 30 seconds to 1 minute to ensure satellites are found and a GPS fix can be established. A red light will **flash**



on the GPS disc if the GPS is working properly.

Step 5: Press “Power” button on detector. The detector should automatically begin recording (red LED next to RECORD will light-up). If the Record LED light is not on, press “Record/Standby” button once to start the recording session. The finger snap test in front of the microphone (helps to have the volume turned-up) should cause the “Data” light to flicker.

Ending a bat survey:

Step 1: To stop recording, press “Record/Standby” button once on the detector (which stops the recording session).

Step 2: Press “Power” button on the detector to power-down system.

Step 3: Shut-off GPS by moving the button on the power pack to “OFF”, which is the middle setting on the power pack.

*Many additional surveys can be conducted on the same data card; there is no chance of losing or writing-over existing data that is stored on CF data card. Data card will be sent to Madison for data offloading and analysis.

Begin Survey at Civil Twilight (Write down start time)



Safety: While surveying be courteous to other drivers and obey the rules of the road.



Contact Information

For more information please contact the
Acoustic Monitoring Coordinator

J. Paul White

Phone: 608-267-0813

Email: John.White@Wisconsin.gov

Disclaimer regarding microphone assembly magnets



K&J Magnetics, Inc.

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Thank you for purchasing magnets from K&J Magnetics, Inc. We hope you enjoy your new magnets as much as we enjoy ours. If handled properly, they will give you a lifetime of use. Because neodymium magnets are so strong, some special care is needed when handling them. Please read this paper carefully to understand all the precautions necessary when handling neodymium magnets.

Proper Care & Handling of Neodymium Rare Earth Magnets:

The neodymium magnets we sell are extremely strong, and must be handled with care to avoid personal injury and damage to the magnets. Fingers can get severely pinched between two attracting magnets. Neodymium magnets are brittle, and can peel, crack or shatter if allowed to slam together. Eye protection should be worn when handling these magnets, because shattering magnets can launch pieces at great speed.

The strong magnetic fields of these magnets can damage magnetic media such as floppy disks, credit cards, magnetic I.D. cards, cassette tapes, videotapes and similar items. They can also damage televisions, VCRs, computer and CRT monitors and other electronics. Never place neodymium magnets near any of these items.

Children should not be allowed to handle neodymium magnets, as they can be dangerous. These magnets are not toys. Small magnets pose a choking hazard and should never be swallowed or inserted into any part of the body. Swallowed magnets can stick together across intestines causing serious infections and death. Seek immediate medical attention if magnets are swallowed or inhaled.

Never allow neodymium magnets near a person with a pacemaker or similar medical device. The strong magnetic fields of the magnet can affect the operation of such devices.

Neodymium magnets are brittle and prone to chipping and cracking. They do not take kindly to machining. Neodymium magnets will lose their magnetic properties if heated above 175°F (80 C). Neodymium magnets should never be burned, as burning them will create toxic fumes.

Like any tool, neodymium magnets can be fun and useful, but must always be treated with care.

Thanks again for purchasing from K&J Magnetics, Inc. We hope to see you in the future. If you are in need of more magnets, visit us at our website or email us at contactus@kjmagnetics.com. Have a great day!

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