



## **FLBWG Bat App**

### **Bat Emergence Count Protocol**

#### **Overview**

The Florida Bat Working Group (FLBWG) with support of the Florida Fish and Wildlife Conservation Commission and the University of Florida IFAS Extension have created the new **Bat App** as a tool for citizen scientist “surveyors” and others to help bats in Florida. This document will guide you through the use of the FLBWG Bat App for conducting bat emergence counts of bat colonies at roosts. Thank you for your assistance in helping us better understand how to protect and conserve bats in Florida.

#### **Purpose**

The purpose of this program is to gather baseline information on bats in the state and evaluate long-term trends in bat populations. A roost is where bats spend their day resting and raising their *pups* (baby bats) and are an essential component of their habitat. Bats roost in many places, including human-made ‘bat houses’, trees, caves, buildings, and bridges. A colony is a group of bats who live together; groups can be composed of just a few bats, hundreds, or even thousands. Bat colonies can move each season or change in size, so it can be challenging for wildlife managers and researchers to monitor their populations. We conduct *emergence counts* to determine if a bat colony is using a roost and estimate how many bats there are, and that is why we created the FLBWG Bat App! Our goals are to:

- Record new or unknown roosts
- Track changes in colony size and number of pups over time
- Identify the types of roosts and characteristics of those roosts that bats prefer

#### **Commitment**

We’ve created a program that will be flexible to each person’s time, interest, and expertise. We hope that surveyors will commit to conducting at least one survey at the same roost for several years, but we welcome any surveys you are able to conduct. Commitment can change across years if you want to increase or need to decrease your effort. If you want to conduct more counts within or outside of this time, please do so!

**Bat Observer** – *Minimum 1 survey per year* – Conduct at least 1 survey in maternity season (April 15 – July 15) and/or 1 winter survey (December 1 – March 1).

**Bat Spy** – *Minimum 2 surveys per year* – Conduct at least 2 surveys at the same roost; one survey before pups begin flying (pre-volancy; April 15–June 15), and one survey after pups begin flying (post volancy; July 1 – September 1).

**Bat Sleuth** – *Minimum 5 surveys per year* – Monthly surveys at the same roost during the maternity season (April 15 – September 1).

**Battastic Super Sleuth** – *Minimum 10 surveys per year* – Biweekly (preferably weekly) surveys at the same roost during the maternity season (April 15 – September 1).

## Get the FLBWG Bat App

To collect and submit data, you will use Survey123. Survey123 is a software program that can be used as an app on your phone to enter data while you are in the field **or** you can record your data on paper and enter it at a later time through Survey123 on your computer. You can either download the [Survey123 App](#) and search “FLBWG Bat Emergence Survey” or access it through the web browser format found here: <https://arcg.is/1Hoi9Lo>.

## Conducting a Survey

### Step 1: Locate a bat roost

Locate an active bat roost which you believe is currently being used by a bat colony. Bat houses on your property or near your house are great options for surveys. To determine if a roost is active, look for signs of bats including the presence of guano (bat poop), staining, odor, or the sounds of chatter. Choose a roost where you can observe the exit clearly, even in low light.

If you are unaware of a roost, they can sometimes be found in barns, old structures, bridges, and culverts. Locations near rivers and other large water bodies may increase your chances of locating a roost. Be sure to get permission from the landowner before conducting the survey! If you are unable to locate a nearby roost, you can contact [FLBWG.BatEmergenceApp@gmail.com](mailto:FLBWG.BatEmergenceApp@gmail.com) who may be able to assist in helping to locate a roost in your area.

### Step 2: Decide when to do your survey

Pick a night in the appropriate survey window for your commitment level (see above) when the temperature is >50 °F, winds <12 mph, and no rain. Cooler temperatures, wind, and rain will affect bat emergence and your emergence count will be unreliable.

### Step 3: Prepare for the survey

Plan to arrive at the roost at least 30 minutes before sunset. You may want to bring a chair and a flashlight/headlamp so you can exit the site safely upon the conclusion of the survey.

Upon arrival, record site information, roost characteristics, and weather conditions in the FLBWG Bat App. If you are surveying a roost in a culvert or tree, please bring a measuring tape to record information on roost size. It's best to record the measurements, take photos, and enter data into the app before the survey and while it is still light outside.

Select stationary observation point where you can observe the exit to the roost clearly and from >15 ft away to reduce disturbance to the bats. It can be helpful if there is lighter background/sky behind the roost from the perspective of your location. If you are surveying a building, culvert, or cave with multiple entrances you may need additional observers to help count bats at each exit point.

#### **Step 4: Begin the survey**

About 15 minutes before sunset, get settled at your stationary observation point; have your watch and counting aid (optional) ready. Record the time you begin watching the roost; you should start watching *before* any bats begin emerging. Remain quiet and turn off all lights so you do not discourage the bats from exiting the roost. It may take a while for the first bat to emerge, be patient.

#### **Step 5: Count emerging bats**

Once the bats begin exiting, you need to count continuously until, a) bats stop emerging for at least a 15-minute period, or b) until it becomes too dark to count. As each bat exits, you may want to use a manual clicker, counting app on your phone (Counter + or Tally Counter), or create tallies on a piece of paper. *You may use an infrared or thermal camera to aid in counting, but do not use white lights.* Record the time you stop watching the bat roost and end your survey.

#### **Step 6: Enter your data into the Bat App**

Enter the results of your survey into the FLBWG Bat App. Since you entered most of the information when you first arrived at your roost, you only need to enter the emergence count # afterwards and click SUBMIT. Remember, if you do not have a smart phone, you can also record all the information on a paper data sheet and enter into your computer at home.

### **Data Entry**

Below we explain some of the data that you will be asked to enter in the FLBWG Bat App. We recommend you open to app (or go to the website) to follow along as you review the instructions below. Take some time to familiarize yourself with the app before arriving at your roost. It's OK to enter some example info as you do so, just do not click "SUBMIT" at the end unless you are doing a real survey.

#### **Surveyor Data**

During each survey, enter:

- Name and E-mail
- Select which best describes you:
- Type of participant and bat experience (optional)

#### **Roost Data**

During each survey, enter:

- **Have you surveyed this roost before? Yes/No** – If you select, “No”, there will be follow-up descriptor questions to enter details about the roost characteristics.
- **County** – The **county, roost number, and location** information will be used to create a unique roost identification code that will allow us to connect surveys submitted by you from the same roost on different dates in our database.
- **Roost Number** – This is a number that YOU assign to each unique roost that YOU survey. Roost number autofills to 1. If you are surveying multiple roosts, please number each roost differently.
  - If you return to the same roost again, please use the same number.
  - If you forget the number and you have the app, you can look at your previously submitted surveys to match it up. You can also put a descriptor to remind yourself in the comments section at the end.
- **Location** – Move the map until the pin is on the location of the observation.

#### **Follow-up descriptor questions:**

Enter details about the roost characteristics specific to the type of structure you are surveying; you will only need to answer these follow-up questions the **first time** you survey at the roost. The follow-up descriptor questions are **optional** but will be very helpful for us to better understand the type of roost characteristics that bats are selecting for!

- **Roost Type** – (e.g., bat house, structure, bridge, tree, culvert, cave, other)
- **Attach a picture of roost** – Please take from 10 feet away.
- **Species** – If known. Have you seen the bats outside the box? Used an acoustic detector to identify the species? If so, here’s your spot to let us know!
- **Signs of Bat Presence** – Is their guano, smell, sound, staining, or visible bats?

#### **Bat house descriptors:**

- **Type** – What type of bat box is it? Single Chamber, Multi Chamber, Rocketbox, or Other
- **Color** – What color is your bat box? Black, brown, gray, etc.
- **Orientation** – What direction does your bat box entrance face? North, Northeast, East, etc.
- **Placement** – How is your bat box hung? Attached to a tree, pole, or building?
- **Approximate Height** – About how many feet is the bat box above the ground?

#### **Culvert descriptors:**

- **Type** – What type of culvert is it? Concrete pipe, corrugated metal pipe, concrete box culvert, other
- **Height** – How tall is the culvert at the tallest point (feet)
- **Width** – How wide is the culvert at the widest point (feet)

#### **Bridge descriptors:**

- **Signs of bat presence** – Can you tell if bats use this bridge? Is their guano, smell, sound, staining, or visible bats?
- **Type** – What type of bridge is it? Parallel box beam, prestressed concrete girders, cast in place, steel I beam, flat slab, or other. See pictures in app (can be enlarged) for more info.
- **Conditions under bridge** – What habitats are under the bridge? Bare ground, road, riprap, flowing water, etc.

*\*\*For more information on surveying bridges and identifying signs at bridge roosts, please visit our professional portal on the [FLBWG website](#).*

### **Tree descriptors:**

- **Species of tree** – What tree species is the roost located in?
- **Part of the tree** – What part of the tree are they roosting in, for example in a cavity, under loose bark, between leaves, in Spanish moss, etc.
- **Is the tree alive or dead?**
- **Tree circumference** – If you have a measuring tape, measure all the way around the tree at chest height and report in inches.

## **Emergence Count**

During each survey, enter:

- **Survey Date** – Auto-fills to the current date, so please change if you did the survey on a different day.
- **Sky Conditions** – Avoid conducting an emergence survey when it is raining.
- **Wind** – Avoid surveys when wind is greater than 13+ mph. Don't have a way to detect wind speed? Don't worry! The App can help you classify the wind. Options include Calm (0 mph), very light wind (leaves and small branches moving; 1-3 mph), etc.
- **Temperature** – Avoid surveys when below 50 °F.
- **Total Bats Emerged** – How many bats did you see emerge? Did it get dark while bats were still emerging, but you couldn't keep counting? Add a comment about it at the bottom!

Optional information:

- **Time Survey Started** – When did you start watching the roost?
- **Time First Bat Emerged** – When did things start getting more interesting?
- **Time Survey Ended** – When did you pack up and leave?
- **Number of Dead Bats Observed** – Sometimes you may find a dead bat on the ground below the roost. Please count any bats and attach a picture of the bat if you can.

## **Pup Count (optional)**

**Conduct from 1 April - 1 October only** - After most of the adults have left the roost (about an hour after sunset), use a flashlight and binoculars (if needed) to look into the bottom of the bat box. Look to see if pups are present as possible to minimize disturbance. *Please wear goggles or glasses and close your mouth while looking up into the box to protect against falling guano!*

When pups are born, they are hairless and pink but they grow quickly, and differentiating between adults and older pups may be difficult. Remember, adult bats are much smaller than people realize (3-5 inches in length).

If you can count the bats quickly (<1 min) include the number of pups in the comments.

## **Glossary of Terms:**

- **Colony:** a group of bats living together.
- **Emergence count:** when observers observe a roost from an angle so they can spot exiting bats as they are silhouetted against the setting sun.
- **Guano:** Bat poop!

- **Maternity season:** a temporary period of time when reproductive females are giving birth, nursing, and weaning pups; in Florida, maternity season occurs between April 15<sup>th</sup> and July 15<sup>th</sup>.
- **Pups:** baby bats
- **Roost:** a place where bats regularly settle or congregate to rest during the day to sleep.
- **Survey123:** a program used to record and submit emergence count data. It can be accessed as an application on your phone or through a web browser at no cost to the surveyor.
- **Volant (volancy):** capable of flying; pre-volant refers to the stage before bats are able to fly.
- **Winter:** generally defined as the time between Dec 1 and March 1 when bats may move away from maternity roosts.

## Supply List:

Most items below are optional, but might be helpful:

- Phone with FLBWG Bat App (or paper data sheet)
- Watch
- Flashlight/headlamp for safety when leaving after the survey
- Red flashlight for use during bat emergence
- infrared or thermal camera
- Clicker, counting app on phone, or pencil/paper for tally
- Measuring tape for roost description
- Goggles/glasses to prevent guano in your eyes
- Chair for comfort

## Questions or Issues?

E-mail us at Roost App Moderators @ [FLBWG.BatEmergenceApp@gmail.com](mailto:FLBWG.BatEmergenceApp@gmail.com)

The Florida Bat Working Group (FLBWG) Bat App Project was developed by the FLBWG Monitoring Committee to fulfill the FLBWG’s mission of “Conserving Florida’s bats through collaborative research, management, and education among agencies, organizations, and individuals”. For additional information about the FLBWG or the Bat App project, please contact us!

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