

Cumberland Piedmont Network

National Park Service
Inventory and Monitoring Division



Standard Operating Procedure 1

Training Sampling Crew—Version 1.2

Please cite this as:

Cumberland Piedmont Network. 2023. Training sampling crew—Version 1.2. Cumberland Piedmont Network Standard Operating Procedure NPS/CUPN/SOP—1. Cumberland Piedmont Network, Mammoth Cave, Kentucky.

Summary

This standard operating procedure (SOP) discusses the training of field sampling crews. Implementation of this protocol requires an overall project leader plus one to five other persons, in most cases. The project leader, a permanent employee intimately familiar with field sites and years of experience employing sampling techniques, oversees and directs project operations, including training of personnel. Field sampling crews will normally be comprised of the project leader (or designated field crew leader[s]) and from one to five field crew members. However, even properly trained field crew members can conduct some types of field sampling alone under certain circumstances (e.g., a summer bat emergence count outside a cave entrance that has relatively few bats and is not in a remote location).

Revision Log

Revision Date	Author	Changes Made	Reason for Change	New Version #
December 2016	Steven Thomas	Minor edits following external peer review		1.1
June 2021	Steven Thomas	Minor edits--focus on training field crew leaders	Minor edits made following annual review of protocol	1.2

Contents

	Page
Training.....	3
Literature Cited	6

Training

Training sessions are necessary for all project field crew leaders, particularly crew leaders new to the project. New crew leaders must undergo training for each of the field sampling methods and office tasks in which they will participate. Training will include: (1) safety procedures; (2) orientation, which will summarize this protocol; (3) in-office demonstrations of the less intuitive field equipment (e.g., HOBO data logger data collection, video camera setup); (4) data recording; (5) data handling and processing; (6) data entry; (7) sampling dry runs; (8) pre-field sampling event briefings; and (9) White-nose Syndrome (WNS) decontamination requirements and procedures. Obviously, on the job training will also be of enormous value toward honing new crew leaders' skills at various protocol tasks. Experienced crew leaders absent from the project for a substantive amount of time, as determined by the project leader, will attend a sampling dry run and re-train at office tasks with current crew leaders. Once the project attains a critical mass of reliable field crew leaders, training sessions will be conducted as needed. For summer bat counting methods, double-sampling with trainer and trainee will be used as an evaluation tool. Table 1 below is a more detailed list of protocol tasks that field crew leaders and selected crew members need to master.

An essential component for the collection of credible, high-quality cave-roosting bat and associated meteorological data is well-trained and experienced field crew leaders. This cannot be overemphasized. Therefore, new crew leaders should be thoroughly familiar with SOP 3 *Summer Cave Roost Sampling*—Version 2.3 (CUPN 2023a), SOP 4 *Winter Cave Roost Sampling*—Version 1.2 (CUPN 2023b), and SOP 5 *Cave Meteorological Sampling*—Version 1.2 (CUPN 2023c) and will be given hands-on training by the project leader or an experienced crew leader designated by the project leader for each of the items detailed therein. A few crew leaders from among CUPN and park staff should be trained (and should participate in sampling on a regular basis) in case scheduled crew leaders are unavailable for particular sampling events. Review of SOP 2 *Pre-field Sampling and Safety*—Version 1.3 (CUPN 2023d) should serve to refresh and “recalibrate” the crew leaders' ability to prepare for sampling, locate sampling sites, and properly record the information; it also improves integrity of the data being collected. All personnel involved with the handling and processing of equipment or data (i.e., hardcopy and electronic formats) following field sampling must review SOP 6 *Post-field Sampling*—Version 2.2 (CUPN 2023e) prior to the first field sampling event each year.

Transient personnel (e.g., university interns, Student Conservation Association members, other cooperators, volunteers, short-term or temporary NPS employees) will normally only serve as project crew members (i.e., field assistants). While review of SOP's 3 (CUPN 2023a), 4 (CUPN 2023b), and 5 (CUPN 2023c) for crew members is encouraged, it is not essential because the tasks assigned to crew members can be easily taught and rehearsed in a short amount of time prior to field sampling. In the unique case of Long Cave (MACA), several highly experienced volunteers/cooperators will be used as field crew leaders to sample the exceptionally large number of gray bats in the cave that quickly become active when disturbed. Approximately one week prior to the sampling event at Long Cave (it only occurs on years ending in an odd number), the project leader will host a remote training conference call with all field crew leaders. Participants will be asked to read the field sampling SOP

(CUPN 2023b) prior to the training. One part of the training will involve assuring that all crew leaders are calibrated with respect to the reference density photos and selected categories. An evaluation will be performed using photos with known densities to compare with reference density photos.

Training will include demonstration and practice of all measurement procedures. The critical importance of careful, accurate, and steady data collection to this long-term monitoring project must be emphasized. Trainers must stress the importance of exact adherence to SOP instructions to prevent bias in measurements among years. Lack of strict adherence to protocols will inhibit our ability to detect long-term trends. The crew must never deviate from established protocols or alter the data form or database without first consulting with the project leader. Any changes in procedures must be clearly documented in the SOP revision history log and the project database.

Trainers will stress the importance of teamwork and sharing the workload among crew members. They will encourage trainees to discuss any concerns with the project leader or designated field crew leader earlier rather than later.

Training must emphasize the critical importance of careful behavior to minimize disturbance to bats and consistent adherence to the latest national decontamination guidance to minimize the risk of human-assisted transmission of the fungus which causes WNS in bats. Training will also include an overview of safety issues that may be encountered by field crews. Prior to conducting field sampling each year, all field personnel involved must **read and sign** the related Job Hazard Analysis (JHA) (Table 5 in SOP 2 [CUPN 2023d]), as well as the sections of SOP 2 (CUPN 2023d) that deal with WNS and disturbance of hibernating bats. Prior to each multi-event sampling trip (e.g., four consecutive days of sampling at Chickamauga and Chattanooga National Military Park), all participating field personnel must **review** the related JHA (Table 5 in SOP 2 [CUPN 2023d]) and agree to follow all safety guidelines during sampling. The project leader or designated field crew leader will discuss the trip plans with the field crew, with an emphasis on safety, prior to each sampling event. In addition to the JHA, all NPS staff must read the entire CUPN Safety Plan. Prior to participating in field work all NPS staff must complete NPS Operational Leadership training. Volunteers will be asked to sign an NPS Volunteer Services Agreement form and to keep track of their hours. The project leader will submit the volunteer total hours worked on each park towards the end of each fiscal year to the CUPN volunteer coordinator.

Table 1. List of protocol tasks in which selected field crew leaders and crew members may need to be proficient and their locations among project SOPs (if any).

Training	Location	Protocol Task
Field	Office	The use of updated Field Information Sheets, travel route maps, cave entrance photos, and hibernacula Cave Section Maps stored on external hard drive(s) for access by field crew members (SOP 2 <i>Pre-field Sampling and Safety</i> —Version 1.3 [CUPN 2023d]). Navigation with GPS and after dark during the summer.
Field	Office	Decontamination precautions and minimizing disturbance (SOP 3 <i>Summer Cave Roost Sampling</i> —Version 2.3 [CUPN 2023a], SOP 4 <i>Winter Cave Roost Sampling</i> —Version 1.2 [CUPN 2023b])
Field	Office	Use of field data forms (SOP 3 <i>Summer Cave Roost Sampling</i> —Version 2.3 [CUPN 2023a], SOP 4 <i>Winter Cave Roost Sampling</i> —Version 1.2 [CUPN 2023b])
Field	Office	Operation of night vision equipment, IR illuminators, and TIR video camera to count emerging bats (SOP 3 <i>Summer Cave Roost Sampling</i> —Version 2.3 [CUPN 2023a])
Field	Office	Camera operation and photographic techniques (SOP 4 <i>Winter Cave Roost Sampling</i> —Version 1.2 [CUPN 2023b])
Field	Office	Quadrat/grid sampling to estimate the total number of hibernating bats (SOP 4 <i>Winter Cave Roost Sampling</i> —Version 1.2 [CUPN 2023b])
Field	Office	Deploying and collecting data from a HOBO temp/RH data logger (Woodman et al. 2011; SOP 5 <i>Cave Meteorological Sampling</i> —Version 1.2 [CUPN 2023c])
Field	Office	Conducting opportunistic grab sampling with handheld temp/RH sensors (SOP 4 <i>Winter Cave Roost Sampling</i> —Version 1.2 [CUPN 2023b])
Field	Office	Image/video processing and analysis (SOP 6 <i>Post-field Sampling</i> —Version 2.2 [CUPN 2023e])
Field	Office	Data Entry (SOP 7 <i>Data Management</i> —Version 1.2 [CUPN 2016])
Field	Office	Proper use of the park's two-way radios or satellite communicator

Literature Cited

- Cumberland Piedmont Network (CUPN). 2023a. Summer cave roost sampling—Version 2.3. Cumberland Piedmont Network Standard Operating Procedure NPS/CUPN/SOP—3. Cumberland Piedmont Network, Mammoth Cave, Kentucky. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2291690> (last accessed January 2023).
- Cumberland Piedmont Network (CUPN). 2023b. Winter cave roost sampling—Version 1.2. Cumberland Piedmont Network Standard Operating Procedure NPS/CUPN/SOP—4. Cumberland Piedmont Network, Mammoth Cave, Kentucky. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2291691> (last accessed January 2023).
- Cumberland Piedmont Network (CUPN). 2023c. Cave meteorological sampling—Version 1.2. Cumberland Piedmont Network Standard Operating Procedure NPS/CUPN/SOP—5. Cumberland Piedmont Network, Mammoth Cave, Kentucky. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2291692> (last accessed January 2023).
- Cumberland Piedmont Network (CUPN). 2023d. Pre-field sampling and safety—Version 1.3. Cumberland Piedmont Network Standard Operating Procedure NPS/CUPN/SOP—2. Cumberland Piedmont Network, Mammoth Cave, Kentucky. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2291689> (last accessed January 2023).
- Cumberland Piedmont Network (CUPN). 2023e. Post-field sampling—Version 2.2. Cumberland Piedmont Network Standard Operating Procedure NPS/CUPN/SOP—6. Cumberland Piedmont Network, Mammoth Cave, Kentucky. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2291693> (last accessed January 2023).
- Cumberland Piedmont Network (CUPN). 2016. Data management—Version 1.2. Cumberland Piedmont Network Standard Operating Procedure NPS/CUPN/SOP—7. Cumberland Piedmont Network, Mammoth Cave, Kentucky. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2291694> (last accessed January 2023).
- Woodman, R. L., J. W. Jernigan, B. C. Carson and B. J. Moore. 2012. A protocol on sampling designs and methodologies for selective and adaptive monitoring in caves of air temperature, relative humidity, and cross-sectional air velocity throughout the Cumberland Piedmont Network. Natural Resource Report NPS/CUPN/NRR—2012/491. National Park Service, Fort Collins, Colorado. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2183494> (last accessed January 2023).