COMBINED FIELD SURVEY TECHNIQUES FOR BATS WORKSHOP
Sample Agenda – Exact Times/Lectures/Demonstrations/Field Trips Vary According to Venue
*Included Meals: **Breakfast** (unless otherwise noted), **Lunch and Break, Dinner**; Times Vary According to Venue*

DAY 1: INTRODUCTION TO PHYSICAL CAPTURE TECHNIQUES FOR BATS
1:00—Welcome, Staff and Participant Introductions, Workshop Format, and Goals
1:30—Lecture/Discussion: Capture Techniques: Mist Nets, Harp Traps and Other Methods
3:30—Lecture/Discussion: Morphological Identification of Regional U.S. Bat Species
Dinner (provided)
6:30-11:30—Field Survey: Setting nets, traps, Bat Processing, WNS Protocols & Hand Releases
Midnight—Optional Geek Session, 1-on-1 with Instructors, Student Independent Study

DAY 2: INTRODUCTION TO DATA COLLECTION AND ACOUSTIC RECORDING TECHNIQUES FOR BATS
8:00—Review: Previous Night's Survey Efforts, Results, and Discussion
8:30—Lecture/Discussion: Introduction to Bats, Natural History, Local Species and Habitats
9:30—Lecture/Discussion: Introduction to Bat Survey Basics – Capture vs. Acoustic Survey Considerations and Introduction to Echolocation
  • Bat Survey Goals and Objectives; Assumptions and Realities; Applications and Limitations
  • Survey Type Considerations: Capture, Roost Survey, Acoustic Surveys: Active Recording, Passive Monitoring, and Mobile-transects
  • Overview of Existing Bat Survey: BCT-National Bat Monitoring Programme, NA Bat Monitoring Program, BatAMP, USF&WS Guidelines
Lunch (provided)
1:00—Lecture/Demonstration: Overview of Bat Detector Makes, Models and Appropriate Use
  • Types of Acoustic Data Usually Collected
  • Pros, Cons and Must-knows Regarding Zero-crossing vs. Full-spectrum
  • Microphone Placement and Weatherproofing Issues
2:00—Lecture/Discussion: Acoustic Survey Design, Detector Deployment Considerations, Siting, Placement & Species-specific Considerations
  • Answering Questions about Occurrence, Activity Levels, and Abundance
  • Nomenclature for Directories, Folders, and Filenames
  • Using Acoustic Inventory Data Forms to Capture Deployment Details
3:00—Demo: Participant's Choice Getting Detector Gear Ready for Deployment
6:30-11:00—Field Survey: Netting and Trapping, Bat Processing & Hand Releases, Detector Deployment
Midnight—Optional Geek Session, 1-on-1 with Instructors, Student Independent Study

DAY 3: POST PROCESSING AND BEGINNING ACOUSTIC ID
8:00—Review: Previous Night's Survey Efforts, Results, and Discussion
8:30—Hands-on Demonstration: Workflow for Off-loading Data and Post-processing
  • Organizing Acoustic Files Directory Structure, Archiving Data and Associated Files, Creating a Post-processing Workflow
  • Attributing Acoustic Files: Using the SonoBat DataWizard to Optimize Data Organization
  • Rename Original Files, Copy, Embed Text-header Information, Customize GUANO Fields, Scrub Noise, and Prepare to Auto-classify
9:30— Lecture/Discussion/Guided Demo: Introduction to KaleidoscopePRO and SonoBat: Basic Operations
  • Setting Preferences, Displaying Bat Calls, Adjusting Views
  • Comparing Un-known Files with Reference Views
  • Classifying Individual Calls vs. Entire Sequences vs. KaPRO Batch Output and SonoBatch
Lunch (provided)
1:30—Lecture/Discussion: Review of Echolocation Call Characteristics and Recognizing Bat- vs. Non-bat Calls and Assessing Call Quality
  • Recognizing Call Plasticity, Vocal Repertoires, and When NOT to Make the Call
  • Identifying Multiple Bats in a Recording, Echoes, Harmonics, Social Calls, and Directives
  • Student Assessment: Reviewing Sample Calls in Viewer of Choice and Completing Worksheet
3:30—Demo: Participant's Choice Getting Detector Gear Ready for Deployment
Dinner (provided)
6:30-11:00—Field Survey: Mist netting, Harp Trapping, Detector Deployment, Hand Release, Video Recording
Midnight—Optional Geek Session, 1-on-1 with Instructors, Student Independent Study

DAY 4: VETTING AUTOMATED SURVEY RESULTS
8:00—Review: Previous Night's Survey Efforts, Results, and Discussion
8:30—One-on-One With Students: Assist with Off-loading Acoustic Data and Post-processing
  • Capturing Meta-data and Recording File Notes
  • Reviewing File-naming Conventions, Directory Structure, and Data Organization
9:00— Lecture Discussion: Identifying High-frequency, Non-myotis Regional Bat Species
  • Qualitative Echolocation Call Characteristics and Quantitative Metrics to Identify Archetypical Species Recordings
  • Student Assessment: Reviewing Sample Calls and Identifying High-frequency Non-Myotis
10:30—Lecture Discussion: Identifying Low-frequency, Non-myotis Regional Bat Species
  • Qualitative Echolocation Call Characteristics and Quantitative Metrics to Identify Archetypical Species Recordings
  • Student Assessment: Reviewing Sample Calls and Identifying Low-frequency Non-Myotis
Lunch (provided)

Note: Daily activities may vary due to weather, local road conditions, water levels, and/or any special interests of the group

DAY 4: VETTING AUTOMATED SURVEY RESULTS (CONTINUED)

1:30—Lecture Discussion: Identifying Regional Myotis Bats
- Qualitative Echolocation Call Characteristics and Quantitative Metrics to Identify Archetypical Myotis Recordings
- Student Assessment: Reviewing Sample Calls and Identifying Myotis

3:00—Student Exercise: Viewing and Identifying Sample Files, Manual ID Practice – All Regional Bat Species
- Students Receive Collections of Recordings and Use their Preferred Viewer(s) to Make Manual ID Decisions
- Instructors Review Student Decisions in Classroom Round-robin Exercise

5:30—Hands-on Demonstration: Setting Nets and/or Getting Detectors Ready for Monitoring

Dinner (provided)

6:30-11:30— Field Survey: Mist-netting, Harp-trapping, Bat-handling and ID, Detector Deployment, Active Recording, Hand-releases

Midnight—Optional Geek Session, 1-on-1 with Instructors, Student Independent Study

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DAY 5: CATCH UP DAY

8:00—Review: Previous Night's Survey Efforts, Results, and Discussion
8:30—One-on-One With Students: Manual Vetting Exercises on Student-collected Data
9:30—Begin of Student Free-time / Day-off / No Formal Activities Planned

---no lunch or dinner provided this day---

4:00-11:30—*(OPTIONAL)* Demo: Participant's Choice Getting Detector Gear Ready for Deployment and Field Survey: Mist netting

Midnight—Optional Geek Session, 1-on-1 with Instructors, Student Independent Study

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DAY 6: PUTTING IT ALL TOGETHER: COMBINING SURVEY METHODS

8:00—Review: Previous Night's Survey Efforts, Results, and Discussion
8:30—One-on-One With Students: Assist with Off-loading Data, Post-processing, Manual Vetting
9:30— Lecture/Discussion/Guided Demo: After the AutoID: Now What? Using the SonoBat Vetting Table
- In KaPRO or SonoVet: Loading a Batch, Viewing Summary, Formatting the Vetting Table, Settings: Save Layout
- In KaPRO or SonoBat Viewer: Configure and Save Manual ID Buttons and Using Manual ID Buttons
- In KaPRO or SonoVet: Sort for Vetting and Begin Manual ID Process

10:30—Guided Demo: Manual Vetting Exercise Using KaRPO and SonoBat
- Updating Vetting Table: Confirming, Rejecting, Editing Auto-ID Results
- Exporting Table to use in Excel

Lunch (provided)

1:30—Lecture/Discussion: The Power of MS Excel – Sorting, Filters and Pivot Table Designs for Summarizing Data and Interpreting Results
- Sample Workflow for Importing ID Results, Formatting in Excel, Sorting, Filtering, and Viewing Relevant Results
- Pivoting, Charting, Graphing, and Summarizing Manually Vetted Auto-classifier Outputs

3:30—Hands-on Demonstration: Setting Nets and/or Getting Detectors Ready for Monitoring

Dinner (provided)

Participant Choice:

6:30-11:00pm—Field Survey: Active/Passive Monitoring and/or Mobile Transects –or– Netting/Trapping, Bat-handling, Identification

Midnight—Optional Geek Session, 1-on-1 with Instructors, Student Independent Study

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DAY 7: ADDITIONAL SURVEY AND ANALYSIS TOOLS

8:00—Review: Previous Night's Survey Efforts, Results, and Discussion
8:30—One-on-One With Students: Assist with Off-loading Data and Post-processing, Start SonoBatch'ing, Vetting Results
10:00—Lecture/Discussion: Using Video, Night-Vision and Thermal Cameras to Record Bats and Analyze Behavior/Occupancy
- Overview of Video Recording Options, Power-management, Data Review and Analysis
- Applications for Bats and Case Studies

Lunch (provided)

1:30—Field Trip: Viewing Local Roosts and/or Bat Management Efforts *(options vary according to venue)*
- Discuss Site-specific Inventory and Monitoring Efforts, Management, and Conservation
- Instructors Review Student Decisions in Classroom Round-robin Exercise

3:00—Lecture/Discussion: Other Survey Methods – Radio-tracking, Videorecording, Automated Roost Counters, Mobile Acoustic Transects
- Technology and Equipment Suitable for These Types of Bat Surveys
- Case Studies Documenting Foraging Areas, Roost Identification, and Migratory Routes

4:30—Hands-on Demonstration: Setting Nets and/or Rigging Transect Vehicle(s) and/or Getting Detectors Ready for Final Night of Monitoring

Dinner (provided)

Participant Choice:

6:30-11:00pm—Field Survey: Active/Passive Monitoring and/or Mobile Transects in Local Habitat –or– Netting/Trapping, Bat-handling, Identification
6:30-11:00pm—Classroom Work: Data Analysis, Vetting Results, Preparing Reports, Designing Survey Plans

Midnight—Optional Geek Session, 1-on-1 with Instructors, Student Independent Study

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DAY 8: SUMMING IT ALL UP. WHAT HAVE WE LEARNED?

8:00—One-on-One With Students: Assist with Off-loading Data and Post-processing and Sharing Files from the Week
10:00—Lecture/Discussion: Summary of this Week's Efforts and Comparisons with Previous Years
11:30—Wrap-up: Data Sharing, Resource Distribution and Evaluations

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