

ACOUSTIC SURVEYS FOR BATS FIELD COURSE

*Sample Agenda – Exact Times/Lecture/Demonstrations/Field Trips Vary According to Venue
Included Meals: 8am: Light Breakfast (unless otherwise noted), 12pm: Lunch & Break, 5pm: Dinner (on your own)*

DAY 1: INTRODUCTION TO BAT DETECTOR TECHNOLOGY, MANUFACTURERS, MODELS, MICROPHONES AND ACTIVE MONITORING

1:00 PM—Registration and Introductions: Welcome, Staff/Student Introductions, Workshop Format, Goals and Objectives

1:30—Lecture/Discussion: Echolocation 101

- The Physics of Sound and Basics of Bat Call Sequences: Search Phase Calls, Approach Phase, and Feeding Buzz
- Factors Affecting Call Quality and ID Potential; e.g., Recognizing Noise, Echoes, Interference, Non-bat Recordings

2:30 PM—Intro to Bat Detector Technology

- Overview of Bat Detectors: Heterodyne (HET), Frequency Division (FD), Time Expansion (TE), and Full Spectrum (FS)

6:30 PM—Evening field trip to Local Bat Hot Spot Active Recording: Anabat, EchoMeter Touch, SonoBat LIVE, etc.

DAY 2: THE PHYSICS OF ECHOLOCATION, PASSIVE ACOUSTIC MONITORING TIPS & VIEWING FULL-SPECTRUM ECHOLOCATION CALLS

8:30—Lecture/Demonstration: Use SonoBat to View Bat Calls

- SonoBat Viewer: Very Basic Operations

9:00—Lecture/Demonstration: Use KaPRO to View Bat Calls

- KaPRO Viewer: Very Basic Operations

10:00—Lecture/Discussion: Echolocation 201

- Acoustic Data Usually Collected; Considerations and Caveats for Starting Acoustic Surveys
- Exercise I: Viewing and Evaluating WAV Files to Determine Call Types, Call Quality, and Bat Presence

Lunch (provided)

1:30—Group Activity: Review and Discuss Exercise I, Using SonoBat and KaPRO Side-by-side

2:15—Lecture/Discussion: Call Morphology & Call Characteristics of Regional Bats PART 1

- Call Shapes, Call Plasticity, and Species Repertoires; and ID'ing Archetypical Calls from High-frequency Non-myotis
- Exercise II: Viewing and Evaluating WAV Files to Determine High-frequency (non-Myotis) Species

3:15—Lecture/Demonstration: Detector Siting and Placement Tips + Overview of Field Trip

- Siting and Placement Schemes, Deployment Gear, Meta-data Collection, and Documentation; Gear Tips and Tricks

4:00—Demonstration: Passive Detector Outfitting

- Need to Know Basics of Popular Passive Detector Platforms

Dinner (on your own)

6:00-8:30 Deploying Passive Detectors

- Site Selection and Detector Set-ups for Passive Monitoring; Walkabout with Active Detectors; Retrieve Passive Units

9:30-11:30 Optional Geek Session – Working with Software and Hardware; Organizing Directory Structure for Acoustic Files

DAY 3: POST-PROCESSING DATA, BASICS OF IDENTIFYING BATS FROM ECHOLOCATION CALLS & ANALYZING RESULTS

8:30—Group Activity: Review and Discuss Exercise II

9:15—Lecture/Discussion: Bat Survey Data Management and Organization

- Suggested File Management Structure; Nomenclature for Directories, Folders, Filenames; Sample Metadata Format

10:00—Guided Demonstration: Post-processing Detector Data using SonoBat

- Examine Log Files for Evidence of Proper Detector Functioning; Off-load Data to Archive Location; Create Metadata Files
- Use SonoBat Data Wizard; Attribute Recordings; Populate Working Directory; Consider File-structure; Scrub and Classify

Lunch (provided)

1:30—Lecture/Discussion: Call Morphology and Call Characteristics of Regional Bats PART 2

- Call Shapes, Call Plasticity, and Species Repertoires; and ID'ing Archetypical Calls from Low-frequency Non-myotis
- Exercise III: Viewing and Evaluating WAV Files to Determine LoF (non-Myotis) Species

2:30—Lecture/Demonstration: Intro to the SonoVet function and SonoBat Batch Output

- Viewing the SonoBat Outputs, Assigning Significance to File-level Classifications

4:00—Demonstration: Preparing Gear for Evening Survey

Dinner (on your own)

6:30-9:00 Field Trip- Passive and Active Recording at Local Natural Area; Spot-lighting Bats, Identifying Bats on the Wing

9:00-11:00 Optional Geek Session - Post Processing data/manual vetting call files upon return from fieldwork

DAY 4: INCORPORATING MOBILE TRANSECTS IN ACOUSTIC SURVEY EFFORTS – TIPS, TRICKS, AND SPECIAL CONSIDERATIONS

8:30—Group Activity: Review and Discuss Exercise III

9:30—Lecture/Discussion: Call Morphology & Call Characteristics of Regional Bats PART 3

- Call Shapes, Call Plasticity, and Species Repertoires; Dis-ambiguous Myotis vs. Cryptic Myotis
- Exercise IV: Viewing and Evaluating WAV Files to Identify Regional Myotis Species

10:30—Lecture/Demonstration: Use Kaleidoscope PRO to Generate Results of Auto-ID

- Delete/Move SonoBat Scrubbed Files and Batch Remainder for KaPRO; View Output and Assign Confidence to ID's

Lunch (provided)

1:30—Lecture/Discussion: Visualizing Mobile Transects

- Long Term Passive vs. Mobile Transect Pros and Cons, Introducing Myotissoft Transect and TransectPRO

3:00—Group Activity: Preparing Gear for Evening Survey

Dinner (on your own)

6:30-9:00 Field Trip: Deploy Passive Detectors at Transect Start/Stop Location, Run Transect, then Collect Passive Detectors

9:00-11:00 Optional Geek Session - Post Processing data/manual vetting call files upon return from fieldwork

DAY 5: INTERPRETING AUTO-CLASSIFIER OUTPUTS AND REPORTING ON ACOUSTIC SURVEYS

8:30—Group Activity: Review and Discuss Exercise IV

10:00—Lecture/Demonstration: Using Excel to Interpret and Report on Acoustic Survey Results

- Spreadsheet Formatting Tips: Inserting Helpful Columns to Aid in Data Analysis and Reporting
- Common Excel Formulae for Populating New Columns and Performing Calculations on Data, Pivot Table Designs

Lunch (provided)

1:30—Guided Demo: Mobile Transect Data Workflow

Prepare Mobile Transect Data for Post-processing: From Off-loading to Manual Vetting for Analysis

3:30—Group Activity: Preparing Gear for Evening Survey

Dinner (on your own)

6:30-9:00 Field Trip: Deploy Passive Detectors at Transect Start/Stop Location, Run Transect, then Collect Passive Detectors

9:00-11:00 Optional Geek Session - Post Processing data/manual vetting call files upon return from fieldwork

DAY 6: MANUAL VETTING PRACTICE – KNOWING WHEN NOT TO MAKE THE CALL; SUMMARY REPORTS; NABAT/BATAMP

8:30—1-on-1 Post Processing Data Offloading Assistance

9:00—Guided Demo: Transect Data Workflow using Data from Night 2 Walking Transect and Night ¾ Mobile Transect

- Prepare Mobile Transect Data for Post-processing: From Off-loading to Manual Vetting for Analysis; View in Transect

Lunch (provided)

1:30—Lecture/Demonstration: Manual ID – A Deep Dive into Interpreting Acoustic Surveys

- Survey Efforts: How Much is Enough? Species Accumulation Curves and Summarizing Long-term Acoustic Data
- When Automated Classifiers Fail, Understanding Software Pitfalls, Methods to Make Voucher Calls; Report Essentials

3:30—Group Activity: Manual ID – Distribute Exercise V: Regional Bats, All Species, Guilds, and Call Types

- Students Given Time to Complete Manual ID Exercise and/or Receive In-class 1-on-1 Help with Lingering Issues
- Sign-up for Optional Evening Activities and Prepare Equipment

Dinner (on your own)

6:30-9:00 OPTION 1: Field Trips – Active Recording using SonoBat LIVE; Passive Deployments; Spot-lighting; Emergences

6:30-9:00 OPTION 2: Classroom Work – Long Term Detector Data Analysis, Vet Results, Prepare Report, Design Survey Plans

9:00-11:00 Optional Geek Session - Post Processing data/manual vetting call files upon return from fieldwork

DAY 7: SUMMING IT ALL UP

8:30—1-on-1 Post Processing Data Offloading Assistance

9:00—Group Activity: Review and Distribute Workshop Resources

10:00—Lecture/Discussion: Review and Discuss Manual-vetting Exercise V – All Regional Bat Species and Guilds

11:00am—Workshop Wrap-up and Closure: Thank you, Evaluations, Good-bye

- Instructors Available for Additional Responses to Student Questions, Problems, and Lingering Issues