Southeast Coast Network

National Park Service
Inventory and Monitoring Division

Standard Operating Procedure 1.4.32

Classification of Landbird Vocalization Recordings—Version 1.1

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Summary

Automated recording devices are deployed in the field to record avian vocalizations as part of the Southeast Coast Network (SECN) landbird monitoring protocol. This standard operating procedure (SOP) outlines the process of selecting a representative subsample of avian recordings, manually interpreting and classifying the species that were recorded, and logging the data for further analyses. This SOP is intended to supplant guidance from SOP 1.4.6 *Conducting a Variable Circular Plot Point Count—Version 1.0* (Byrne 2012) and SOP 1.4.20 *Manual Evaluation of Automated Recording Device Files—Version 1.0* (Byrne 2013) regarding manual evaluation of ARD recordings of bird vocalizations.

Revision Log

Revision Date	Author	Changes Made	Reason for Change	New Version #
05/25/2023	MC Parrish	SOP 1.4.06 and SOP 1.4.20 covered manual evaluation of a subset of audio using now-obsolete software which required updates to the approaches used for processing of recordings . This document clarifies the manual classification approach using modern software and includes instruction on QA/QC and data management.	New SOP	1.0
08/05/2024	MC Parrish	Removed paragraph referring to obsolete database.	New SOP in in development to cover data management.	1.1

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Overview

Automated recording devices (ARDs) are deployed each spring at five parks (15 parks are monitored on a three-year rotating basis) in the Southeast Coast Network (SECN), where they are used to record avian vocalizations as part of the Landbird Monitoring Protocol (Byrne et al. 2014). Each ARD records sound for 12 minutes every other morning, on 38 occasions. One of the project's long-term goals is to develop an automated method for classifying sampled vocalizations, however, automated software methods of identifying avian vocalizations are not presently developed. This necessitates manual classification work performed by skilled avian technicians, who are familiar with the calls of birds in the Southeast Region.

This standard operating procedure (SOP) is intended to replace guidance from SOP 1.4.06 *Conducting a Variable Circular Plot Point Count—Version 1.0* (Byrne 2012) and 1.4.20 *Manual Evaluation of Automated Recording Device Files—Version 1.0* (Byrne 2013) regarding manual evaluation of ARD recordings of bird vocalizations. The SOP 1.4.20 acknowledges the need for manual evaluation of bird recordings and then refers to SOP 1.4.06, which adapts an existing visual point-count protocol for use in manual classification of audio recordings. This SOP (1.4.32) guides the reader through the process of selecting a representative subsample of avian recordings, manually interpreting and classifying the recorded species, and logging the data for further analyses, while maintaining a comparable approach to data analyses.

A typical SECN park contains between 15 and 30 sample locations where data are collected, although smaller parks may have fewer. The ARDs are deployed at each sample location, where one 12-minute audio clip of bird vocalizations is recorded on every second morning. In each field season, 38 or more recordings are made at each sample location, representing a minimum of 456 minutes of audio. Five parks are sampled each year, between approximately March 10 and June 1.

We estimate that a single 12-minute recording requires approximately 20 to 40 minutes to manually review. It is not possible, given current personnel constraints, to manually review all recordings. Instead, a subsample of five out of 38 recordings (60 minutes, or 13.2% of total recording time) is selected at each sample location to be manually reviewed by a technician.

Required Software and Hardware for Manual Review of Audio Field Recordings

- Microsoft Windows 10 laptop with dual monitors and sufficient memory.
- Kaleidoscope Pro software, version 5.4.2 or higher (Wildlife Acoustics, Inc. 2022).
- High-quality, noise-cancelling, over-ear headphones. Currently, the Southeast Coast Network uses Sony WH-1000XM3 Wireless Noise-Canceling Over-Ear Headphones.
- Data sheet MP-06 (one copy per sampling location).
- Landbird call and landbird natural history reference materials.

Procedure for Selecting a Subsample of Recordings

The SECN wildlife biologist is responsible for selecting a subsample of five audio recordings from each sample location. The subsample to be used for manual classification will be systematically selected from the pool of recordings on or about the following key dates: April 1, April 15, April 30, May 15, and May 30, according to the procedure below.

1. Open a candidate file in Kaleidoscope Pro 5 (Wildlife Acoustics, Inc. 2022). Scan through the 12-minute file, listening to the audio and visually examining the waveforms. Search for excessive spikes in background noise (e.g., thunderstorms, strong wind, anthropogenic noise, or droning insects). Some low-frequency noise sources (e.g., thunder) or high-frequency sources (an insect) may be either intermittent enough to ignore or may be screened out using a band-pass filter in Kaleidoscope Pro 5.

2. Using professional judgement, determine if sound quality and background noise levels are acceptable for classification work to proceed. If so, record the file name and include the recording as part of the subsample. Acceptable sound quality means that, in the judgement of the biologist, most vocalizations can be heard and identified by an attentive, trained listener without noticeable reduction of hearing due to extraneous noise. Unacceptable sound quality means there is a noticeable reduction of hearing due to the presence of disruptive noises which cannot be compensated for through modification of playback settings (e.g., band filtering).

   Notes:

   a. An acceptable sound recording may still require modification of playback settings by the technician. This is not a reason to eliminate a candidate recording from the subsample.

   b. The presence of vocalizations in a recording is not a prerequisite for it to be selected as part of the subsample. The goal of subsample selection is to choose relatively clean

recordings as close to the key dates (above) as possible. The biologist's task is not to make selections based on the presence or absence of interesting vocalizations.

3. Begin with the file recording on the key date or the preceding day. In the event the sound quality of the candidate recording is judged to be unacceptable, evaluate the recording made during the next sampling event. Likewise, if the first alternative date is poor, look backward two sampling events, then forward three events, and then backward four events, until a suitable recording is located. If no suitable recordings are located from the week preceding nor the week following the key date, stop looking and continue to the next key date.

   Example:

   The candidate recording from April 15 contains a thunderstorm and is deemed unacceptable. Next, the biologist evaluates an alternative recording from April 17. If that recording is unacceptable, the biologist considers the recording from April 13, then April 19, then April 11, etc., until an acceptable recording is located.

   If the sampling period did not cover the entire April 1 to May 30 period, it is acceptable to select files from between the key dates to obtain the needed five recordings (e.g., if sampling cut off after May 15, a subsample might be selected consisting of: April 1, April 15, April 22, May 1, and May 15).

4. Using the above process, compile a list of five audio files representing a subsample of recordings for each sample location. Provide the list of files to the audio technician, who will be responsible for classifying vocalizing species in the next procedure.

Procedure for Manual Classification of Avian Vocal Recordings

The audio technician is responsible for manual classification of the avian vocal recordings according to the procedure below.

1. The wildlife biologist will provide the technician with a copy of recordings to be classified. The primary copies of the original recordings are not directly used.

2. Obtain data sheet MP-04 (Figure A-1 in Appendix A) from the SECN network drive: S:\Monitoring\Landbird\Protocol-SOPs\Forms.

   Print this file and utilize the hard-copy paper data form for Steps 3–8 below.

3. On the paper form, record the survey year, four-letter park code, and the audio file name pertaining to the file to be examined. Ensure the file name contains the following information: park code (four letters), sample location (three or four digits), ARD unit (three digits), date (YYYYMMDD), start time of the recording (HHMMSS), and file extension

("WAV" or "WAC"). For an example, see Figure A-2 in Appendix A. It is important that the file name is correctly recorded on the data sheet.

4. Record the technician's name and the date on which the recording is being classified on the appropriate lines. A field is provided for "Detection Notes" on each row of bird observations. Detection Notes are intended to provide additional information about a single vocalization detection. A "General Comments" field is provided at the end of the form and is intended for general helpful or descriptive comments that apply to the overall sound file. Detection Notes and General Comments are optional, but strongly suggested.

5. Open the sound file in Kaleidoscope Pro 5. While listening to the recording, dynamically adjust the playback settings (dB gain, contrast, band pass filters, playback speed, and microphone channel) as needed to better view or hear vocalizations (Figure 1). If settings are applied to the entire recording, make a note in the General Comments field, but dynamic adjustments to refine individual signals need not be noted down.

   Notes: Playback volume may be adjusted by changing dB gain. Contrast adjustment can improve visual display of soundwaves. Band pass filters are used to isolate frequency bands (which is useful in screening out continuous low- or high-frequency sound sources). Modification of playback speed may occasionally be useful in breaking down complex overlapping sounds. Switching to alternate microphone channels sometimes improves playback of particular sounds. Review Kaleidoscope Pro 5's documentation (Wildlife Acoustics, Inc. 2022) for a more in-depth discussion of the above settings.

6. Analyze each 12-minute recording in four separate time segments: segment #1 (0–3 minutes), #2 (3–6 minutes), #3 (6–9 minutes), and #4 (9–12 minutes). In the main section of the data sheet, enter the time segment number in the Time Segment column. Play back the three-minute section of the recording and note each species vocalization that can be identified. Record the four-letter alpha code (USGS Bird Banding Lab 2019) for each unique species detected in the Band Code column. Each detected species is recorded on a separate row. Stop and replay clips as needed. It is acceptable to pause and consult reference sources or subject matter experts. If no vocalizations are detected during a time segment, record the time segment number on the data sheet and draw a line across that row, indicating the segment was reviewed, but no detections were made.

   If a species vocalizes in multiple time segments, record the species in each segment in which it is heard (i.e., if a NOCA sings at 1m30s and 4m30s, it is recorded in both segments #1 and #2). If a species vocalizes more than once within a single time segment, only one of the occurrences is noted for that segment. The technician may use their discretion in choosing which vocalization event is recorded for a species within a given time segment. For example, consider a species that vocalizes at 1m30s and 1m45s, with the first vocalization being difficult to discern and the second vocalization clear and loud. It is acceptable (and preferred) for the technician to note the second vocalization event at 1m45s as the record for that species during time segment #1.

Record unidentified vocalizations as “UNKN” (unknown), then flag the record in the Detection Notes column for further consultation (e.g., by reviewing reference audio or consulting with the SECN wildlife biologist). A best guess is encouraged, provided the ID is flagged in the Detection Notes column for further review. Unacknowledged guesses and incorrect IDs must be avoided, as they will trigger time-consuming QA/QC (quality assurance/quality control) reviews. If the technician indicates a vocalization event was faint or that a chip note was the basis of the ID this will be interpreted by the biologist as a request for further consultation.

Figure 1. An example screenshot of an audio file being viewed in Kaleidoscope Pro 5. The user has applied a band pass filter (white-highlighted frequency range on the left) to isolate frequencies of interest and minimize background noise. The dB gain was adjusted to play the Louisiana Waterthrush (*Parkesia motacilla*) song clearly, and the mouse is currently indicating the time offset of the first detected vocalization.

7. For each classified vocalization event, indicate the time offset value (MM:SS). Offset time is the number of minutes and seconds from the start of the audio file (not the three-minute time segment!) to the start of the identified vocalization.

8. The Detection Notes field is optional but can be used for short comments. The “Flag” field indicates that the listener requests that the wildlife biologist review the ID. An observation

flagged for later consultation will not be considered an error for the purposes of QA/QC. Faint calls or chip notes used as the basis for an ID and other uncertain identifications are reasons to flag an observation.

9. After completing the classification, return the data sheet to the wildlife biologist for review.

   In the example data sheet (see Appendix A, Figure A-2), note the following: Several species occurred in multiple time segments and were noted in each segment, per protocol. Two species were flagged for the biologist to review, one because it was unexpected, and one because the technician was uncertain as to the ID. No vocalizations occurred in time segment 3 (6–9 minutes), so a line was drawn across the row to indicate that time segment was not merely skipped but was indeed reviewed and was absent of detections.

   At the conclusion of the work, a final line was drawn across the last row and the technician indicated the work was completed. The technician wrote a few comments to the biologist related to the recording. The General Comments box may be used to indicate brief sound events (e.g., a jogger ran by or a truck backed up) that may have caused disruptions to bird behavior. If more birds had been present, the technician could have continued recording detections on the right-hand column, or on the back of the data sheet.

QA/QC of Manual Classifications and Data Management

Quality Assurance: Classification Accuracy Check

Upon receipt of original data sheets from the audio technician, the SECN wildlife biologist or their designee will make a high-quality scan to PDF of the original sheets (see section: Records Management, below). A copy of the PDF will be printed and provided to the wildlife biologist for annotation during the quality assurance procedure below.

For quality assurance, the wildlife biologist will review two three-minute segments (10% of the subsample) from each sample location, according to the procedure described below. This procedure is characterized by two levels of assurance review: a standard level (Steps 1–2 below) and an escalated review (Steps 3–8), triggered only if errors are discovered in the standard review.

1. Select two random numbers and two corresponding random letters from Appendix B. Use the two number/letter combination to randomly select two of the 20 time segments to review. Numbers range between one and five and indicate which of the five subsample recordings (in chronological order) is to be reviewed. Letters range between A and D, indicating which of the four time segments within the recording is to be reviewed. For example, 1A represents the first recording's first time segment, and 5D represents the fifth recording's fourth time segment.

2. Open the recording file in Kaleidoscope Pro 5. Reference the data sheet and advance to each vocalization detection recorded for the selected time segment, using the record's time offset. Listen to the vocalization and judge whether the classification recorded by the technician is correct or not. Check off each record reviewed on the data sheet and indicate any errors.

Correct any errors on the data sheet using a red pen. If no errors are detected in the examined time segment, end the error review. Otherwise, proceed to Step 3.

Notes: If the technician flagged a classification on the data sheet, the entry will not be considered erroneous if it is incorrect. For example, the technician may explicitly note they are not certain of an ID and request the biologist review that record, or request confirmation of a faint call ID or the ID of a chip note. This is considered normal classification procedure and is not an error, even if the biologist determines the classification should be changed.

It is not expected that all sounds are possible to identify with 100% accuracy (Table 1). The biologist may deem a flagged signal too faint or obscure to identify and omit it from later data entry.

Table 1. Measurement Quality Objectives for landbird community monitoring protocol.

Task	Measure/Quality Indicator	Quality Objective
Site Recon	Location Accuracy	Sample location within +/ 10 m of established waypoint.
Site Establishment	Location Accuracy	+/- 10 m (horizontal)
	Location Description Detail	Description provided with enough detail to assist relocation with use of GPS equipment
	Applicable SOP	SECN SOP 1.4.31
Microphone Calibration and Audio Recording	Microphone calibration	Left and right microphones pass testing with standard microphone calibrator: SongMeter 4 (pass: -35 ± 4 dB); SongMeter Mini (pass: > -16 dB).
	Applicable SOP	SECN SOP 1.4.01
Audio Recording Parameters	Channel	Stereo
	Gain (Left/Right)	16.00 db (SongMeter 4) or 18.00 dB (SongMeter Mini)
	Preamp (Left/Right)	26 dB (SongMeter 4)
	Hi Pass Filters (Left/Right)	Off (SongMeter 4)
	Sample Rate	32 kHz
	File Format	*.WAV (uncompressed)
	Applicable SOP	SECN SOP 1.4.01
Bird Audio Classification	Taxonomic Resolution	Identifications made to the species level

Task	Measure/Quality Indicator	Quality Objective
	Identification Accuracy	90% accuracy for audio observations
	Identification Completeness	90% of discernable observations identified to species level

3. If errors are detected in the selected time segment, expand the review to the full recording (i.e., review all four time segments for the entire data sheet).

4. If the classification error rate (number of errors / number of records) for the entire recording is less than 10%, end the error review. If the classification error rate for the recording is greater than 10%, randomly select one time segment from each of the other four recordings and examine them. It is acceptable if this random selection happens to include the second of the two time segments selected in Step 1.

5. If no errors are detected in the additional four segments, end the review. If errors are detected in one or more of the segments, expand the review to include the full recordings in which errors were found.

6. If the classification error rate for all evaluated records is less than 10%, end the review. If the classification error rate for evaluated records is greater than 10%, expand the review to the entire sample location (i.e., review all four time segments in all five recordings).

7. In the event a full recording subset for a sample location requires review, discuss the situation with the audio classification technician. Identify the reason for the error rate and discuss ways to mitigate the problem in future work. If more than one sample location per park requires a full review, set up a formal sit-down performance review with the technician.

   In the performance review, identify deficiencies with the process, the audio data, and/or the technician's training. Develop a plan to correct the problem (e.g., review subsample selection criteria, or provide additional bird ID training to the technician). As part of the performance review, consider issues such as audio quality at particular locations or specific difficulties in the technician's ability to identify certain groups of species.

8. After reviewing the classifications and correcting the data sheet (if required), sign off on the line for Classification Accuracy Check. Scan the marked-up data sheets into a high-quality PDF (see section: Records Management, below). Forward the marked up/corrected data sheets to a data entry technician for data transcription into a spreadsheet.

Quality Control: Datasheet Transcription Validation

Using the procedure below, a data entry technician will transcribe data from reviewed and corrected data sheets (provided by the wildlife biologist) into a Microsoft Excel spreadsheet and then validate the transcribed data (Steps 1–4). Next, the wildlife biologist will perform a second round of validation on a randomly selected subset of the data (steps 5–8).

1. The wildlife biologist will provide to the data entry technician an Excel spreadsheet to store avian vocalization detections (see section: Records Management, below). Transcribe the paper datasheets into the spreadsheets. Line items listed as UNKN (unknown ID) or indicated by the biologist to be omitted are not entered.

2. Include the date each record was transcribed under the column TranscriptionDate and include the data entry technician's initials under the column TranscriptionTech.

3. Systematically check each data entry, line-by-line, against the corresponding item on the paper data sheet. Correct any transcription errors. **Note:** this step may be performed by the original transcriptionist on a different day, or by a different person altogether.

4. After confirming each item on the data sheet was correctly transcribed, add the date and initials of the validating technician to the columns ProvisionalDate and ProvisionalTech, respectively, of the validated records. The data are now considered to be "provisional" in status.

5. Provide the spreadsheet and paper data sheets to the wildlife biologist, who will continue the validation procedure from this point forward.

6. Randomly select one sheet per sample location (use Appendix B) and perform a second round of validation to ensure the data sheet items were correctly transcribed into the spreadsheet.

7. If transcription discrepancies are detected upon the second review, validate the transcription of all five sheets for that sample location. Otherwise, proceed to the next step.

8. After completing the second round of validation, add the date and initials of the biologist to the columns AcceptedDate and AcceptedAuthority, respectively, of the validated records. Data validation is complete with this step and the data are now considered "accepted" in status.

Records Management

Original paper data sheets are organized sequentially for each park, first by sample location number, and then by date of recording.

1. Generate a high-quality (600 DPI) scan to PDF according to park.
2. Name PDFs according to the format:

   ManualAuditoryClassification_YYYY_PPPP_original.pdf

   where YYYY represents the year data were collected and PPPP is the four-letter park code.

   e.g., ManualAuditoryClassification_2017_CANA_Original.pdf (CANA is Canaveral National Seashore)
3. Store the PDF in the following folder on the SECN network drive:

   S:\Monitoring\Landbird\Data\DataSheetScans\ManualAuditoryClassification\YYYY
4. After scanning, store the original paper data sheets in the SECN data storage file cabinet area, in the drawer marked LANDBIRD AND VOCAL ANURAN MONITORING -- FILE DRAWER #1.

Marked up/corrected paper copies of data sheets used in the quality assurance process are organized sequentially for each park, first by sample location number, and then by date of recording.

1. Generate a high-quality (600 DPI) color scan to PDF according to park.
2. Name PDFs according to the format:

   ManualAuditoryClassification_YYYY_PPPP_qaqc.pdf

   where YYYY is the year data were collected and PPPP is the four-letter park code.

   e.g., ManualAuditoryClassification_2017_CANA_qaqc.pdf
3. Store original data sheet PDFs in the following folder on the SECN network drive:

   S:\Monitoring\Landbird\Data\DataSheetScans\ManualAuditoryClassification\YYYY

Spreadsheets containing transcribed and QA/QC notations are incrementally saved to prevent loss of the entire dataset in the event a file becomes corrupted.

1. Name spreadsheets according to the format:

   YYYY_Landbird_Classifications_yyyy_mmddx.xlsx

where YYYY is the year data were collected; PPPP is the four-letter park code; and yyyy_mmddx is the current date with a final letter added if incremental saves are made during the day.

For example:

If the spreadsheet containing data for Canaveral National Seashore in 2017 is opened for editing on January 13, 2020, immediately save it with the filename:

2017_Landbird_Classifications_2020_0113A.xlsx

…then, as work progresses during the day, periodically re-save the file as:

2017_Landbird_Classifications_2020_0113B.xlsx, and later…

2017_Landbird_Classifications_2020_0113C.xlsx , and later…

2017_Landbird_Classifications_2020_0113D.xlsx

…and so on, so if the file happens to be corrupted at the end of the day, only the work since the last incremental save will be lost.

2. Store spreadsheets in the following folder on the SECN network drive:

   S:\Monitoring\Landbird\Data\DatasetSpreadsheets\YYYY

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Literature Cited

Byrne, M. W., J. C. DeVivo, C. J. Wright, E. Thompson, and C. D. Jones. 2014. Protocol for monitoring landbird communities in Southeast Coast Network parks. Natural Resource Report NPS/SECN/NRR—2014/853. National Park Service, Fort Collins, Colorado. Available at: https://irma.nps.gov/DataStore/Reference/Profile/2216122 (last accessed August 2024).

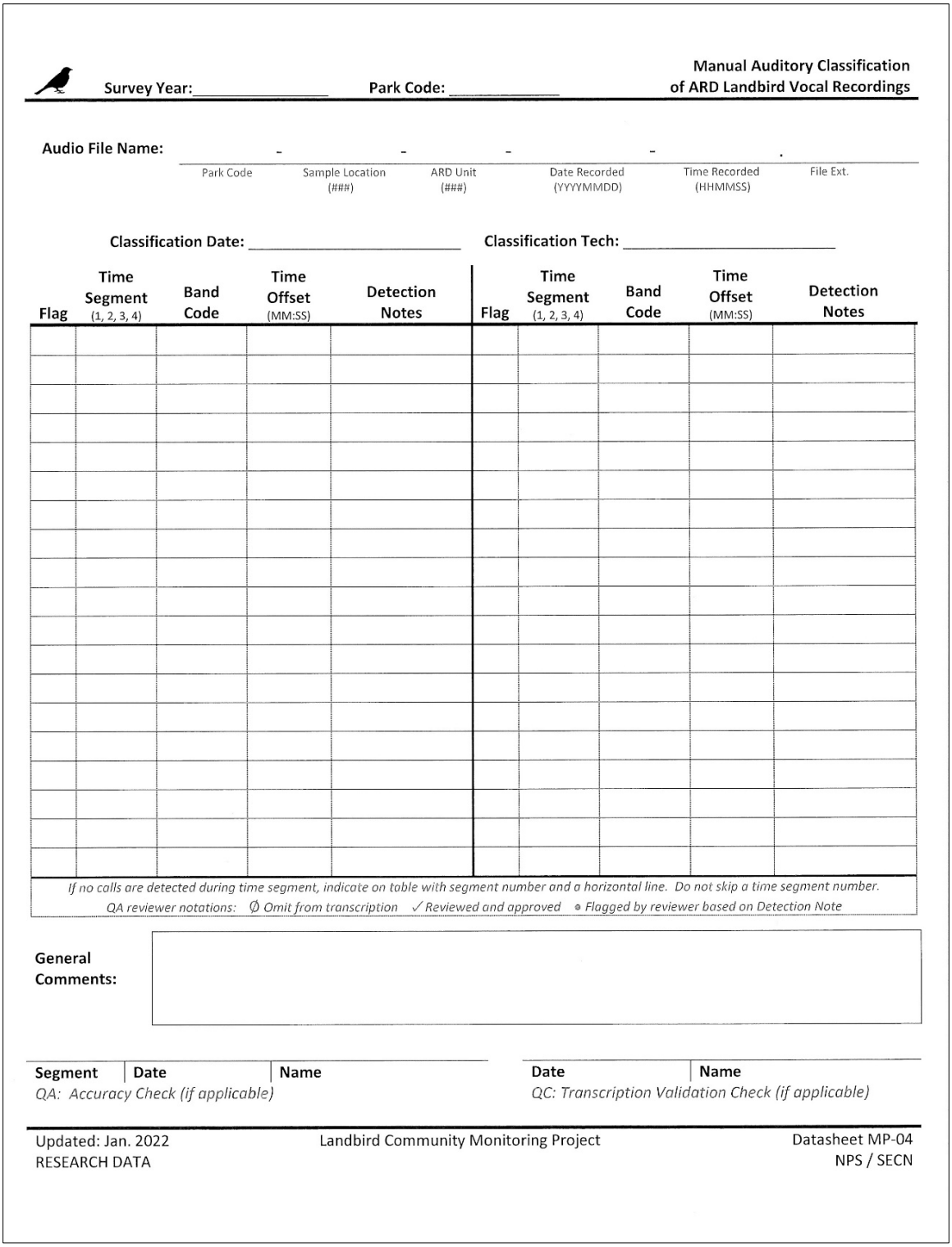
Byrne, M.W. 2013. Manual evaluation of automated recording device files. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—1.4.20. National Park Service, Athens, Georgia. Available at: https://irma.nps.gov/DataStore/Reference/Profile/2197062 (last accessed August 2024).

Byrne, M.W. 2012. Conducting a variable circular plot point count. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—1.4.06. National Park Service, Athens, Georgia. Available at: https://irma.nps.gov/DataStore/Reference/Profile/2215876 (last accessed August 2024).

USGS Bird Banding Lab. 2019. Species Table and Recommended Band Sizes. Available at: https://www.pwrc.usgs.gov/BBL/Bander_Portal/login/speclist.php (last accessed June 2023).

Wildlife Acoustics, Inc. 2022. Kaleidoscope User Guide. Available at: https://www.wildlifeacoustics.com/uploads/user-guides/Kaleidoscope-Pro-User-Guide_2022-12-22-143553_fnvg.pdf (last accessed August 2024).

Appendix A. Data Forms



Survey Year:_____ Park Code: _____ Manual Auditory Classification of ARD Landbird Vocal Recordings

Audio File Name: _ _ _ _ .

Park Code | Sample Location (###) | ARD Unit (###) | Date Recorded (YYYYMMDD) | Time Recorded (HHMMSS) | File Ext.

Classification Date: _____ Classification Tech: _____

Flag	Time Segment (1, 2, 3, 4)	Band Code	Time Offset (MM:SS)	Detection Notes	Flag	Time Segment (1, 2, 3, 4)	Band Code	Time Offset (MM:SS)	Detection Notes

If no calls are detected during time segment, indicate on table with segment number and a horizontal line. Do not skip a time segment number.

QA reviewer notations: Ø Omit from transcription ✓ Reviewed and approved ⊙ Flagged by reviewer based on Detection Note

General Comments:

Segment	Date	Name	Date	Name

QA: Accuracy Check (if applicable) *QC: Transcription Validation Check (if applicable)*

Updated: Jan. 2022 Landbird Community Monitoring Project Datasheet MP-04

RESEARCH DATA NPS / SECN

Figure A-1. Example data sheet MP-04. This sheet will be used when classifying avian vocalization recordings. This data sheet can be obtained on the network drive: S:\Monitoring\Landbirds\Protocol-SOPs\Forms

Survey Year: 2020 Park Code: CONG

Manual Auditory Classification of ARD Landbird Vocal Recordings

Audio File Name: CONG - 722 - 115 - 20200424 080000 . WAV

Park Code	Sample Location (###)	ARD Unit (###)	Date Recorded (YYYYMMDD)	Time Recorded (HHMMSS)	File Ext.
CONG	722	115	20200424	080000	WAV

Classification Date: 7/22/2020 Classification Tech: J. Aubrey

Flag	Time Segment (1, 2, 3, 4)	Band Code	Time Offset (MM:SS)	Detection Notes	Flag	Time Segment (1, 2, 3, 4)	Band Code	Time Offset (MM:SS)	Detection Notes
	1	NOPA							
	1	NOCA							
	1	MODO							
	1	CARW							
	1	GCFL							
X	1	IBWO		Ask biologist					
	2	NOCA							
	2	CACH							
	2	TUTI							
X	2	CARW							
	3	—		No detections					
X	4	NOCA							
	4	PIWO							
X	4	EASO		Faint					
	4	CACH							
—	—	—	—	Completed					

If no calls are detected during time segment, indicate on table with segment number and a horizontal line. Do not skip a time segment number.

QA reviewer notations: Ø Omit from transcription ✓ Reviewed and approved ⊛ Flagged by reviewer based on Detection Note

General Comments: Jogger passed at 06:15 – no vocal activity in segment 3. Review possible IBWO in seg. 1.

Segment	Date	Name	Date	Name
1	08/01/2020	S. Maturin		

QA: Accuracy Check (if applicable) *QC: Transcription Validation Check (if applicable)*

Figure A-2. Sample data used to fill out datasheet MP-04. Note some species (e.g., NOCA) were detected in multiple time segments. Four detections were flagged for further review. No vocalizations were noted in time segment 3.

Appendix B. Random Number Tables

Below are a table of random numbers between one and five (Table B-1) and a table of random letters between A and D (Table B-2). These random lookup tables can be used by the wildlife biologist to facilitate random selection of classified subsampled recordings during review.

For example, starting with the first entry in each table results in "3," which corresponds to the third recording out of the five (in chronological order) and "B," which corresponds to the second 3-minute time interval in the recording. The next entries are 5B, so the biologist would review the fifth recording's second 3-minute interval. This page may be printed out and so that each table entry may be crossed out as it is used.

Table B-1. This array contains 150 random numbers between one and five.

Column 1	Column 2	Column 3	Column 4	Column 5
3 5 1 3 5	3 4 3 4 3	5 4 5 4 5	4 2 4 5 5	3 5 1 5 4
1 1 1 4 1	2 1 1 4 2	4 1 2 2 2	1 5 3 5 2	3 3 3 2 1
4 1 3 4 4	4 3 2 5 2	4 5 1 5 5	3 1 4 5 1	3 3 2 2 1
4 3 1 3 1	3 5 1 3 3	4 4 4 4 3	2 1 4 2 5	2 5 1 3 4
5 1 1 1 5	5 4 3 1 4	2 4 1 3 5	1 2 3 3 3	2 2 1 5 3
1 4 1 3 5	2 3 4 5 5	5 5 4 3 2	5 3 1 4 1	3 4 5 1 2

Table B-2. This array contains 150 random letters between A and D.

Column 1	Column 2	Column 3	Column 4	Column 5
B B C A D	B B C D A	C A A B C	C D D C D	D B C A B
C D B D C	C D C A A	C A C A C	D C B A B	A B A A B
C A D D D	D A B B C	D C C C A	A D D C B	A C D D A
A D C C C	D A A C C	D D C B A	C A A B B	A C C D A
C B B A B	B A D D B	D B C A B	A A C C D	A C A C C
D B C A D	D C B B A	C D A B A	D C D B A	D C B B A