



Environmental Analysis Program

Pomona College
Biogeochemistry Laboratory

SOP-F315

Bird Point Count Surveys

Standard Operating Procedure

SOP Number	SOP-F315
Revision	0.1
Author(s)	Marc Los Huertos
Date	2026-06-26
Organization	EA Program, Pomona College

FOR INTERNAL USE ONLY

This document is the property of the Environmental Analysis Program at Pomona College.
Unauthorized distribution is not permitted.

Table of contents

1 Purpose	1
2 Scope	2
3 Responsibilities	2
4 Safety and Hazards	2
4.1 Required PPE	2
4.2 Permits	3
4.3 Emergency Procedures	3
5 Definitions	3
6 Required Materials	3
7 Estimated Time	4
8 Procedure	4
8.1 Survey Design	4
8.2 Survey Timing	4
8.3 Conducting a Point Count	4
8.4 Between Points	5
8.5 Repeat Visits	5
9 Quality Control	5
10 Data Management	6
11 References	6
12 Training Record	6
13 Appendix A: Point Count Field Data Sheet	7

1. Purpose

This SOP describes procedures for conducting standardized bird point count surveys. Point counts are the most widely used method for monitoring bird populations and community composition in

terrestrial habitats. An observer stands at a fixed point for a defined time period and records all birds detected by sight or sound within a specified radius. This SOP follows protocols compatible with the North American Breeding Bird Survey (BBS) and Partners in Flight (PIF) guidelines to enable comparison with regional and national datasets (Ralph et al., 1993; Ralph et al., 1995).

2. Scope

- **Applies to:** Fixed-radius and unlimited-radius bird point count surveys at all EA Program field sites, including the Bernard Field Station, Pomona College campus, restoration areas, and agricultural study sites
- **Does not apply to:** Area searches, nest monitoring, mist-netting, raptor surveys, nocturnal surveys, or aquatic bird surveys (these require separate protocols)
- **Location:** All EA Program terrestrial field sites

3. Responsibilities

Role	Responsibility
PI / Field Lead	Approve survey design; ensure permit compliance
Trained Observer	Conduct point counts; identify all species by sight and sound
Data Recorder	Record observations if a second person is available
New Students	Complete training (Section 13) before recording data independently

4. Safety and Hazards

Hazards

- **Early morning work:** Surveys begin at or before sunrise. Reduced visibility increases trip and fall risk. Use a headlamp while walking to survey points.
- **Biological:** Ticks, rattlesnakes, and stinging insects in brushy and riparian habitats. Poison oak along riparian corridors.
- **Heat:** Summer surveys in southern California can reach high temperatures by mid-morning.

4.1. Required PPE

- ☐ Closed-toe shoes or field boots
- ☐ Long pants (tick and brush protection)
- ☐ Sun protection (hat, sunscreen)
- ☐ Headlamp (for pre-dawn travel to survey points)

4.2. Permits

Bird surveys do not typically require a Scientific Collecting Permit as long as birds are not captured or handled. However, access to certain sites may require permission from landowners or managing agencies. The PI must confirm access authorization before fieldwork.

4.3. Emergency Procedures

A minimum of two people is recommended for early morning surveys. Carry a cell phone and a first aid kit. Refer to [SOP-F001 Field Safety](#).

5. Definitions

- **Point count:** A survey method in which an observer records all birds detected from a single fixed point during a standardized time period.
- **Fixed-radius point count:** Detections are recorded only within a specified distance from the observer (e.g., 50 m). Provides density estimates without distance estimation models.
- **Unlimited-radius point count:** All detections are recorded regardless of distance, with the estimated distance to each bird noted. Allows distance sampling analysis to estimate detection probability and density.
- **Detection type:** How the bird was detected: singing (S), calling (C), visual (V), flyover (F), or drumming/mechanical sound (D).
- **Breeding Bird Survey (BBS):** A long-running North American monitoring program using roadside point counts; the EA Program protocol is designed to be compatible with BBS methods.

6. Required Materials

Item	Notes
Binoculars (8x42 or 10x42)	Essential for visual identification
Field guide	<i>Sibley Guide to Birds</i> or <i>Kaufman Field Guide</i>
Rangefinder (laser)	For estimating detection distances in unlimited-radius counts
Stopwatch or timer (phone app)	For standardizing count duration
GPS unit or smartphone	For recording point locations
Bird point count data sheet	Pre-printed (see Appendix A)
Clipboard and pencils	Mechanical pencils; avoid pens that smear
Headlamp	For pre-dawn travel
Audio recorder (optional)	For later verification of song identifications; Merlin or eBird app
Compass	For recording bearing to detections (optional, for distance sampling)

7. Estimated Time

Task	Time
Travel to first point (before sunrise)	Variable
Count period per point	5 or 10 minutes (see Section 8.3)
Travel between points	5–10 minutes (minimum 150 m apart)
Full survey (10 points)	2–3 hours (must finish within 4 hours of sunrise)

8. Procedure

8.1. Survey Design

1. Establish point count locations before the first survey:
 - Points must be at least 150 m apart (250 m preferred) to minimize double-counting of the same individuals (Ralph et al., 1995)
 - Distribute points using a systematic or stratified random design within the study area
 - Permanently mark each point with a GPS waypoint and, where possible, a discreet physical marker (flagging tape, small stake)
2. Record the habitat type at each point (e.g., coastal sage scrub, riparian woodland, grassland, developed)
3. Determine whether fixed-radius (50 m) or unlimited-radius counts will be used. Fixed-radius counts are simpler and require less observer experience. Unlimited-radius counts with distance estimation allow more sophisticated density modeling.

8.2. Survey Timing

- Conduct surveys during the breeding season (mid-March through mid-June in southern California) when singing activity is highest
- Begin surveys at local sunrise and complete all counts within 4 hours of sunrise. Detection rates decline substantially after this window.
- Avoid surveying during rain, sustained wind above 20 mph, or dense fog, as these conditions reduce detectability and violate the assumption of constant detection probability across surveys
- Record weather conditions (wind speed on the Beaufort scale, cloud cover, temperature, precipitation) at the start and end of each survey

8.3. Conducting a Point Count

1. Arrive at the point quietly. Wait 1–2 minutes for birds disturbed by your approach to resume normal activity.
2. Start the timer. The standard count duration is:

- **5 minutes** for fixed-radius counts or BBS-compatible surveys
 - **10 minutes** for unlimited-radius distance sampling (often split into 0–3, 3–5, and 5–10 minute intervals to model detection over time)
3. Stand still and record every bird detected within the count period:
 - Species (use the 4-letter AOU alpha code, e.g., HOFI for House Finch, CALT for California Towhee)
 - Number of individuals
 - Detection type: Singing (S), Calling (C), Visual (V), Flyover (F), Drumming (D)
 - Distance band or estimated distance:
 - Fixed-radius: Within 50 m / Beyond 50 m
 - Unlimited-radius: Estimate distance to the nearest 5 m (or use bands: 0–25, 25–50, 50–100, 100–200, >200 m)
 - Direction (compass bearing, optional but useful for distance sampling)
 - Time interval (0–3, 3–5, 5–10 min, if splitting the count)
 4. Record flyovers separately. Birds flying over the point without landing or interacting with the habitat are recorded but flagged as flyovers and excluded from density calculations.
 5. At the end of the count period, stop recording. Do not add birds detected after the timer ends.

Identification by Sound

The majority of detections during breeding season are auditory (songs and calls). Invest time learning bird songs before the survey season. The Merlin Bird ID app (Cornell Lab of Ornithology) can assist with real-time song identification in the field, but do not rely on it exclusively.

8.4. Between Points

1. Walk to the next point. Record any notable observations along the way as incidental sightings (separate from point count data).
2. Allow a 1–2 minute settling period before starting the next count.

8.5. Repeat Visits

For occupancy modeling or trend analysis, repeat the survey at each point at least 2–3 times during the breeding season, spaced at least 10 days apart. Record the date of each visit.

9. Quality Control

- Each observer should demonstrate proficiency by passing a field identification test (greater than 90% correct identification of common species by sound and sight) before conducting surveys independently

- On 10% of surveys, a second observer independently records detections at the same point to assess inter-observer agreement
- Record the observer's name on every data sheet; observer identity is a variable in analysis
- Flag any uncertain identifications on the data sheet ("?" after the species code) for later review
- If an audio recorder is used, archive recordings for at least one season to allow verification

10. Data Management

1. Enter field data into the project spreadsheet or database within 48 hours
2. Each row represents one detection: point ID, date, time interval, species code, count, detection type, distance, flyover flag
3. Reconcile uncertain identifications using audio recordings or field notes
4. Archive field data sheets (scan if paper)
5. Version-control all analysis scripts per [SOP-L801](#)
6. For analyses requiring detection probability correction, use the **unmarked** R package (Fiske & Chandler, 2011) for distance sampling or N-mixture models

11. References

See the project-level **references.bib** for full citations. Key references: Ralph et al. (1993), Ralph et al. (1995), Bibby et al. (2000), Fiske & Chandler (2011).

- Bibby, C. J., Burgess, N. D., Hill, D. A., & Mustoe, S. H. (2000). *Bird census techniques* (2nd ed.). Academic Press.
- Fiske, I., & Chandler, R. (2011). Unmarked: An R package for fitting hierarchical models of wildlife occurrence and abundance. *Journal of Statistical Software*, 43(10), 1–23. <https://doi.org/10.18637/jss.v043.i10>
- Ralph, C. J., Geupel, G. R., Pyle, P., Martin, T. E., & DeSante, D. F. (1993). *Handbook of field methods for monitoring landbirds* (General Technical Report PSW-GTR-144). USDA Forest Service, Pacific Southwest Research Station. <https://www.fs.usda.gov/research/treesearch/5052>
- Ralph, C. J., Sauer, J. R., & Droege, S. (1995). *Monitoring bird populations by point counts* (General Technical Report PSW-GTR-149). USDA Forest Service, Pacific Southwest Research Station. <https://www.fs.usda.gov/research/treesearch/5062>

12. Training Record

Before conducting bird point counts independently, personnel must:

1. Read this SOP and [SOP-F001 Field Safety](#)
2. Demonstrate identification of at least 90% of common species (by sight and sound) at the study site during a supervised field test
3. Participate in at least two supervised point count survey sessions

4. Demonstrate proper data recording (species codes, distance estimation, detection types)
5. Be signed off by the PI or field lead

13. Appendix A: Point Count Field Data Sheet

Print and carry in the field.

Observer: _____ **Date:** _____ **Start time:** _____

Weather: Wind (Beaufort): _____ Cloud cover: _____% Temp: _____ C Precip: Y / N

Point ID	Time Start	Species Code	Count	Detection (S/C/V/F/D)	Distance (m)	Fly- over?	Notes
-------------	---------------	-----------------	-------	--------------------------	-----------------	---------------	-------