

Field and Data Recording Protocols for Point Counts of Breeding Landbirds in the Sierra Nevada Foothills

1. The first point count at each sample location begins at official sunrise for the specific calendar date of the count and the general area for the sample. Additional point counts conducted at other sample locations can be started at any other time in the morning so long as additional counts end within 3 hours of official sunrise. Observers can occasionally begin the first point count within a 15-20 minute time window around official sunrise should travel conditions dictate that observers arrive earlier or later to the location. Observers must have adequate ambient daylight to observe birds in order to begin the counts. Additional sample locations can be surveyed during the same day as the first location if additional points can be completely surveyed within 3 hours of official sunrise.
2. Observers must bring the following items with them for the point counts:
 1. Binoculars
 2. A watch with a countdown timer that beeps; fresh batteries should be recently installed
 3. A spare watch in case the watch with a countdown timer is lost
 4. A clipboard with taped code sheets for species codes and weather
 5. 6 copies of data sheets for each sample location; data sheets shall be initially completed at much as possible prior to the counts; 3 are needed for the three points at each point with the others as backups; additional copies (50-100) should be kept in the truck for other point counts.
 6. A bird field guide
 7. Bird song identification tapes or cd's
 8. 3-4 pencils that are sharp and/or fully stocked with lead
 9. Mosquito headnet, insect repellent, gaiters, etc.
 10. Extra flagging
 11. GPS unit if needed to locate each point
 12. Laser rangefinder
 13. Field vest (optional)
 14. Field notebook
 15. Summary Sheet for point counts or Dell handheld computer with summary sheet form
3. Counts of breeding birds will begin the last week of March and end in mid- to late-June; each sample location will be counted three times with one count done between early March and April (Replicate 1), the second count done between April and May (Replicate 2), and the third count done between May and June (Replicate 3); a count schedule will be developed where observers are randomly assigned which sample location to count during the three count periods.
4. A minimum of one study stand (with three point counts) shall be done per day by each observer. When study stands are in close enough proximity to each other

to allow for 2-3 study stands to be completely counted on a single day within 3 hours after official sunrise, observers shall completely survey these additional stands in a single day. Generally, adjacent stands <5 driving miles should allow observers to survey two-three stands on a single day. Observers should plan to conduct point counts on 4-5 days per week between March and June.

5. Data sheets shall be fully completed prior to and after each count. The pages shall be numbered in order from 1 to 3 to coincide with the order that the three points were counted (e.g., 1 of 3, 2 of 3, and 3 of 3). Study area refers to Tehama or Yuba County study areas. Sample # refers to the original sample location number from the GIS work. On the GPS, point count locations use alpha codes such that 1=x, 2=y, and 3=z. Replicate (1, 2, or 3) refers to the first, second, or third count done at a sample location (see Number 3 above). Date is the date of the count using the MM/DD/YYYY format. Observer is the two or three letter code for the observer doing the count. Weather represents the temperature (°F), sky and wind conditions at the end of the count. Indicate weather changes during the 10-minute period on the weather line only if a substantial change occurs during the count period. Time indicates the starting and ending time (e.g., 0720-0730) for the 10-minute count period.
6. A total of three 100-m radius point counts will be done at each sample location during each replicate. The first of the three replicate counts at each location will be done at Point #1, and successive replicate counts will be done at Point #2 and Point #3 in succession. The subsequent points shall be counted in numerical order after that (e.g., Replicate #1 - 1, 2, and 3; Replicate #2 - 2, 3, and 1; Replicate #3 - 3, 1, and 2). Some studies will use only one 100-m radius station per sample point, and this station will always be Plot #1.
7. The duration of each point count is 10 minutes; the starting and ending times shall coincide with actual watch time (e.g., start = 0720:00; end = 0729:59); watch time is used to record bird observations on the data sheets and recorded initially to the whole minute (e.g., 0720); subsequent observations of birds during the same whole minute are listed sequentially after the first observation during that minute without listing the minute time of observation; observations made during different minutes are similarly listed except that the two-digit minutes for the first observation made during that minute are listed except when there is an hour change (e.g., 0759 then 0800).
8. Observers shall move as quickly and safely as possible to the next point count in the sequence. Generally, it should take no more than 15 minutes to travel the 250 m horizontal distance to the next point regardless of terrain. With three 10-minute counts per stand, there will be a total counting time of 30 minutes, and an approximate total travel time between points of 30 minutes. Point counts at each sample location should take approximately 1 hour to complete.

9. A watch with a countdown timer is needed for the point counts; counting begins with the pressing of the start button and the second the timer begins counting down, and counting ends with the sounding of the alarm; no birds seen or heard before or after the 10 minute count period are included in the point count totals; additional bird species observed outside of the counting period and while traveling throughout the stand can be noted on the data sheet, however, to add to the knowledge about the bird community at the site.
10. There should be at least a 1 minute rest period prior to starting each point count; longer rest periods are acceptable. This time can be used to organize data sheets and field equipment, clear leaves and twigs from the point count locations, and clearing the countdown timer. If the observer is winded from a strenuous hike to a point, the resting period should be lengthened so that normal breathing resumes before the count begins.
11. Most observations of single birds shall be listed singly on the data sheets (i.e., one line per bird). Exceptions to this rule include: (1) enumerating groups of ≥ 2 birds of the same species during the same minute and within the same distance belt on the same line (e.g., 2 OATI at 0720 within the ≤ 50 m belt as "2"; and (2) listing observations of ≥ 2 birds of the same species during the same minute and within different distance belts on the same line and enumerating the number of individuals per distance belt. Listing observations of ≥ 2 individuals of the same species during the same minute is particularly helpful with flocking species that are foraging, perched, and/or flyovers such as LEGO, TUVU, or AMCO. Observers may record two different observations within the same row of the data sheet if many birds are being counted as this might allow a single data sheet to be used during the count instead of two pages for a single count if desired but additional pages can be used if desired. Observers should write legibly on each data sheet.
12. Data sheets must include total individuals for each observations in integer values (e.g., 1, 2, 3, etc.). Tally marks can be used as necessary during the counts but finalized data sheets shall include integer values.
13. Bird observations are listed by three distance belts: ≤ 50 m, 51-100 m, and flyovers so precise distances of bird observations are not needed. It is of paramount importance, however, that birds be accurately placed within each belt. Laser rangefinders or flagging will be used as needed and possible at each point to indicate 50 m and 100 m boundaries. Laser rangefinders shall be used to verify distances of observations, but observers should use their best judgment to estimate distances for each observation. Rangefinders generally should not used during the 10-minute point count but can be used as needed before or after counts are done unless absolutely necessary. Distance calibration should be repeatedly done during field season using rangefinders. Birds beyond 100 m are listed as off the stand (see Number 17 below).

14. The following flagging pattern shall be used at each site: The center point shall be flagged with two strands of double strand flagging (2 individual doubled loops), the outside points shall be flagged with a single set of double strand flagging, and 50-m and 100-m distance belts, if flagged, shall be flagged with a single set of single strand flagging.
15. Bird observations are also listed by three time periods: 1-3 minutes, 4-5 minutes, 6-10 minutes. These time periods coincide with observations made during the first 3 minutes, middle 2 minutes, and last 5 minutes of the 10-minute count period. Observations by minute shall be accurately placed within the column of the appropriate time period on the data sheet. Accurately recording the observation minute is more important than placing the observation in the appropriate column. Errors in column placement should not be erased and correctly transcribed during the actual counting period as that takes time away from the count. Observers must be careful to not make unnecessary and unwarranted counts of birds in the last 6-10 minute period as most birds in an area are detected in the first 5 minutes of the count.
16. Observers shall refrain from all activities that interfere with counting birds during the 10-minute count period. Drinking water, adjusting clothing, putting on insect repellent, etc. shall be done outside of the 10-minute count periods.
17. Birds flushed within the boundary of the point count location as the observer approaches or leaves a point shall be counted as being at the point at the beginning minute or ending minute, respectively, if no other individual of these species are seen during the 10-minute count period. The observer must determine if flushed birds would have been detected during the count if they had not been flushed by the observer. Flushed birds shall be identified with the annotation "flush" on the data sheet.
18. All observations of birds heard or seen, flying or not, shall be enumerated, identified to species, and recorded on the data sheets. All observations, both independent (first time observed) or duplicative (second and or later time observed), shall be recorded on the data sheets. Observations of duplicative and flying birds shall be deleted for analysis of habitat relationships but they can be used for analysis of point count efficiency. Individuals observed beyond the 100-m radius shall be annotated as "Off" on the data sheet in 51-100 m column. Observers should estimate distances of these "OFF" species as this will help determine duplicate and observations.
19. Individual birds counted by visual detections, even though they're vocalizing or not, shall be annotated with a "V" next to the tally mark for the observation. If visual detections are made of a subset of birds in a greater-numbered group, the visual subset is annotated as follows: "5 (V3)" to indicate 3 birds were visually detected from an estimated group of 5 birds, therefore 2 birds were heard and not seen.

20. Observers shall be fairly conservative regarding the determination of whether an observation of a particular individual is a duplicate observation. Any and all factors influencing the observer's determination of a duplicate observation shall be considered including species and its home range size, timing of first and subsequent observation, the bird's behavior (e.g., singing, foraging, gathering nest materials, etc.), distance carrying ability of the vocalization, and distances between locations of first and subsequent observations. Larger bodied birds with large home ranges and loud vocalizations are more likely to have duplicate observations than small bodied birds with small home ranges and relatively quiet vocalizations. Observations of duplicate birds shall be annotated with an "X" and the number representing the point where the first and independent observation was made (e.g., "X1" for duplicate observation from Point #1). Birds that move throughout the stand during the entire count period and are subsequently observed at new locations in the stand are still duplicate observations.
21. Bird observations are recorded for the initial distance belt when and where they were first observed during the 10-minute count period. If birds move closer or farther from the observer into a different distance belt during the same count, the subsequent observations are not recorded on the data sheets. Birds "off" the point and moving into the 100-m radius around each point are treated differently (See Number 21 below).
22. Birds that were observed off the study stand and/or outside the 100-m radius of an individual point that move into the study stand and inside the 100-m radius become independent observations and can be recorded as such. Observers, however, shall annotate the original "Off" observation as a duplicate observation using the "X point number" notation if the second "on" observation is made during a subsequent point. If the "OFF" bird moves into the 100-m radius belt during the same 10-minute point count in which it was first observed, the observer shall record the second observation during the appropriate minute and distance belt the second observation was made and then circle the "OFF" observation and draw an arrow to the second observation to connect the two observations.
23. Point counts will include pockets of different habitats even though our emphasis is surveying for birds in oak woodland habitats. Of particular importance are birds found in riparian and freshwater wetland habitats. Observers are to use their best judgment if a detected individual was using riparian and wetland habitats during their 10-minute counts in addition to the likely oak woodland, annual grassland, and shrubland habitats. Birds occurring in riparian habitats and systems are to be annotated with an "R" next to their tally on the count data sheets, while birds found in wetland habitats and systems are to be annotated with a "W" next to their tally.
24. Observers shall stand during the entire 10-minute count period. Observers shall census birds over the entire 360° area. Observers shall turn around during the

- entire count period as needed so that all areas of the survey area receive equal survey intensity. Observers shall clear the immediate area where they're standing and rotating of all leaves and twigs to bare dirt to minimize noise while counting. Observers shall continuously and variously scan all heights in the immediate field of view.
25. Observers shall wear dark or muted colored clothing made of soft fibers (e.g., cotton, fleece, wool, etc.) while counting to minimize noise. Exceptions shall be blaze orange field vests if needed to carry equipment and for safety reasons (e.g., in areas with hunters) or necessary rain gear. Observers shall, however, minimize movement and rubbing of synthetic rain gear or other clothing to minimize noise while counting. Hats, beanies, and gloves can be worn so long as they do not interfere with the observer's ability to hear or see birds and quickly record field observations. Sunglasses cannot be worn at any time. Handheld radios shall be turned off during point counts.
 26. When counting birds where turkey hunters occur, observers should be cognizant of the presence of vehicles and hearing turkey calls from hunters. Observers should be extremely cautious and note locations of turkey calls, and proceed with point counts depending on the location of hunters. Turkey hunters will generally be camouflaged and sitting next to trees, rocks, and logs. Observers should listen carefully and generally avoid them whenever possible. Observers can survey points in different order than previously scheduled if the presence of a hunter affects the outcome of the count. Observers can also survey another sample location that morning and return later when the hunter is more likely to have left. When a turkey hunter is actively calling and a turkey is responding, the observer should vacate the area immediately. Generally speaking the turkey hunter will be done when active shooting is heard and then stopped.
 27. Point counts must be done alone; other people or dogs are not allowed in the study stand during the point count period. If a hunter or other human is encountered during the point count, the observer shall immediately stop the count and wait for the individual to pass outside the 100-m radius count circle, or the observer shall ask them to voluntarily leave the area for the remainder of the count period. Exceptions will include domestic animals if the observer can still hear birds singing and camouflaged hunters sitting quietly by a tree or rock such that it appears that bird behavior is not impacted to any appreciable degree.
 28. "Pishing" of birds **shall not** be done at all during the 10-minute point count. Pishing can be done to identify previously unidentified species after the 10-minute count is completed but observers shall not spend too much time doing this and it cannot be done within the 100-m radius of adjacent points.
 29. All species seen or heard in the study stand shall be recorded regardless of whether they occur within 100-m radius of the point count location. Species shall also be recorded on the data sheets that are outside the study stand and in adjacent

- habitats that are very similar to the predominant habitats in the study stand. These observations are annotated as “Off, diff hab” on the data sheets. Species seen or heard outside the study stand but in distinctly different habitats such as lakes, vineyards, etc. are not listed on the data sheets. These latter observations can, however, be written as ancillary observations on the data sheets.
30. The correct four-letter code for each species observed shall be used for each observation. Observers shall keep a copy of the correct codes with them during point counts. When unsure of the correct code, write the full or abbreviated name of the bird species where the code should be so that another person can correctly determine the species and correct code. Write the correct code for the species after that count is over if one exists or keep the full common name on the data sheet if a code doesn't exist on the study list. Unidentified species shall be coded as “UNID”; unidentified species can be identified to species group if possible but must still have the prefix “UNID” (e.g., unidentified warbler = “UNID warb,” unidentified woodpecker = “UNID wood”). Drumming or drilling unidentified woodpeckers shall be coded as “UNID wood drill” or “UNID wood drum”. Drilling is active foraging, while drumming is a territorial announcement. Singing or calling unidentified birds shall be coded as “UNID song” or “UNID call”.
 31. Observers can try to track down and identify previously unidentified birds after the particular 10-minute count in which the bird was detected is done, but no more than 15 minutes can be spent searching for the bird while other points remain to be counted. Observers can search as long as possible to identify these unidentified species after all four point counts are done at each sample location.
 32. Point counts must be done during rainless days with mild winds and no fog. Skies may be partially cloudy or overcast, and counts can be done at winds of 3-4 on the Beaufort scale if the observers can confidently hear birds vocalizing at higher frequencies such as bushtits and blue-gray gnatcatchers, etc. Whenever winds or rains adversely affect point counts, observers shall immediately cease counting and wait for the strong winds or rain to cease. The countdown timer shall be paused and the observer shall wait to complete counting no more than 30 minutes after initially stopping. The remaining duration of the individual 10-minute count shall be completed if <5 minutes remain when weather improves. The count should be started anew if ≥ 5 minutes remain. If adverse weather continues, the observer should walk to the vehicle and wait no more than 60 minutes for weather to improve. If weather doesn't improve after 60 minutes, the count shall cease and be done the next possible day. The observer shall finish the counts the next possible day beginning with the first unfinished point. Counts shall be started the approximate time the revisited point would have been done the previous day. Observers shall follow rules of independent and duplicate observations for the resumed points by recognizing birds counted from the points previously surveyed.

33. Finally, observers should be extremely careful with identification errors. A misidentification of a species is a double error because errors are made for species missed and the species incorrectly tallied. It is better to list a bird as “UNID” if the observer is not completely confident in their identification than it is to guess incorrectly. The same logic applies to errors in counting individuals. Be certain of the number of individuals counted and the species identification – don’t guess.
34. Observers shall complete their field notebooks as necessary with notes about access problems to each study stand and other information items associated with each study stand so that other observers can use this information in subsequent visits.

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