

CP33- Habitat Buffers for Upland Birds Monitoring Protocol

Prepared by:

Southeast Quail Study Group, Research Committee
and
Southeast Partners in Flight

L. Wes Burger, Department of Wildlife & Fisheries, Box 9690, Mississippi State University, Mississippi State, MS 39762, wburger@cfr.msstate.edu

Mark D. Smith, Department of Wildlife & Fisheries, Box 9690, Mississippi State University, Mississippi State, MS 39762, msmith@cfr.msstate.edu

Rick Hamrick, Department of Wildlife & Fisheries, Box 9690, Mississippi State University, Mississippi State, MS 39762, rhamrick@cfr.msstate.edu

Bill Palmer, Tall Timbers Research Station, 13093 Henry Beadel Dr., Tallahassee, FL 32312-0918, bill@ttrs.org

Shane Wellendorf, Tall Timbers Research Station, 13093 Henry Beadel Dr., Tallahassee, FL 32312-0918, Shane@ttrs.org

INTRODUCTION

USDA-FSA Notice CRP-479 provides policy for CRP continuous signup practice CP-33, Habitat Buffers for Upland Wildlife. Notice CRP-479 specifies that:

“A monitoring and evaluation plan must be developed in consultation with the state technical committee, including the U.S Fish and Wildlife Service, State Fish and Game Agencies, and other interested quail parties. The plan must provide the ability to establish baseline data on quail populations and estimate increasing quail populations and impact on other upland bird populations as a result of practice CP-33, Habitat Buffers for Upland Birds, including the following:

- verification that suitable Northern Bobwhite quail cover is established
- verification that appropriate cover management practices are implemented on a timely basis
- states must control acreage within their allocation
- implementing a statewide sampling process that will provide reliable estimates of the number of quail per acre (or some other appropriate measure):
 - before practice CP-33, Habitat Buffers for Upland Birds, is implemented (baseline)
 - resulting from the established CRP cover.”

The Research Committee of the Southeast Quail Study Group has been charged with developing a suggested national protocol for monitoring northern bobwhite response to CP-33 that can be deployed through a combined effort of State Offices of USDA-FSA/NRCS and state resource management agencies in such a manner to: 1) provide statistically valid estimates of northern bobwhite density (or some other appropriate measure) on fields enrolled in CP-33 at state, regional (BCR), and national levels and 2) provide a measure of the relative effect size of the CP-33 practice. This document outlines a suggested multi-stage sampling framework for monitoring CP-33 to insure consistency in data collection among states and to facilitate statistically valid measures of the effectiveness of CP-33, regionally and nationally.

This document provides a suggested framework for determining:

- which states to sample
- which measures of population response to monitor

- sampling intensity (i.e., number of contracts and fields to sample) required to achieve monitoring objectives
- how to draw a representative and random sample of contracts and fields for monitoring at state and national levels
- specific monitoring protocols for fall covey counts of northern bobwhite and breeding season call counts of northern bobwhite and select songbirds

Which States to Monitor

FSA Notice CRP-479 requires that state level monitoring be conducted within each state that received an allocation of CP-33 acres ($n = 35$). However, acreage allocation varied substantially among states in relation to number of acres of row crop, rate of bobwhite decline, and core range of the bobwhite. FSA recognizes that monitoring intensity may vary among states in relation to these factors. Additionally, discussions with FSA suggest that they would be receptive to a 2-tier monitoring program in which detailed population data is collected at the state level for a core group of states that received the primary CP-33 allocation and are within the core bobwhite range. For the remainder of states some reduced intensity of sampling, producer survey, or extrapolation of CP-33 effects from intensively monitored states may suffice.

Of the total CP-33 allocation of 250,000 acres, 78% (194,700 ac) occurs in just 13 states and 95% (235,700 ac) occurs in 20 states (Table 1). The remaining 5% of the acreage is distributed among 15 states that are outside of the core range of the bobwhite. Intensive monitoring in the 20 states that received 95% of the CP-33 allocation would largely characterize the national impact of CP-33 on northern bobwhite populations. The Research Committee of the SEQSG recommends that field-level monitoring of northern bobwhite and select grassland birds be conducted in the 20 states receiving the majority of the acreage and relative population responses of these species be extrapolated to the remaining states, proportional to allocation. Additionally, a producer survey of these states might provide a subjective assessment of wildlife benefits.

Which Population Metrics

Bobwhite abundance has been estimated or indexed during the breeding season using calling male surveys and during the fall using a myriad of methods including flush counts, line transect, capture-recapture, and fall covey counts. Population goals in the Northern Bobwhite Conservation Initiative are stated in terms of coveys added to the fall population. Previous research in Mississippi and North Carolina indicate that fall populations are more responsive to field border practices than breeding season populations. Therefore, the Research Committee recommends that state-level monitoring programs primarily focus on estimating fall density using fall covey counts and point-transect distance sampling methodology and monitor breeding season relative abundance using call counts or male density using call count point-transects, as resources permit.

In addition to monitoring bobwhite, the Research Committee recommends that broader conservation benefits of CP-33 be identified by monitoring relative abundance/density of grassland/shrub songbirds during the breeding season. The Research Committee recommends that bobwhite breeding season monitoring be accompanied by point-transect monitoring of a select suite of early successional farmland birds likely to respond to CP-33 (e.g., Dickcissel, Indigo Bunting, Common Yellowthroat, Eastern/Western Meadowlark, Grasshopper Sparrow, Song Sparrow, Eastern Bluebird, Loggerhead Shrike). The specific suite of songbirds might vary among BCRs and should be selected with input from NABCI, PIF, and non-game cooperators.

Sampling Intensity

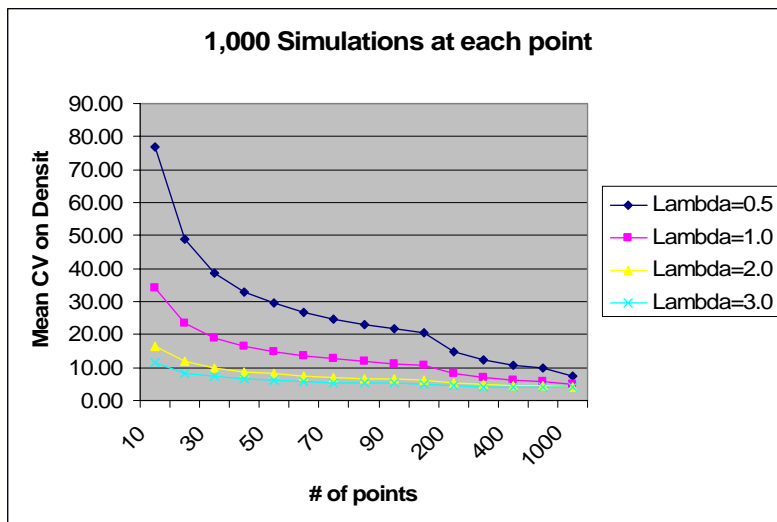
CRP-479 requires a "statewide sampling process that will provide reliable estimates of the number of quail per acre." Relative to adequate sampling, 2 questions are germane, 1) what is the fundamental sampling unit and 2) how many sampling units must be measured to produce reliable population

estimates at the state level? Although CP-33 state allocations were expressed in terms of acres of buffer, the experimental unit to which these acres will be applied on the ground is the field. As such, the field is a logical sampling unit for monitoring.

For fall sampling, either covey density or bird density is a logical population metric. We recommend estimating fall covey density, using distance sampling methodology in a point-transect context applied to fall covey counts adjusted for calling probability (Wellendorf et al. 2002, 2004, Seiler et al. 2002). This approach requires estimation of a detection function, which is then applied to observed detections to generate a density estimate. With regard to sampling intensity, 2 questions are relevant 1) how many points are required to estimate the detection function and 2) how many points must be sampled at the state level to generate density estimates with an acceptable level of precision? Literature recommendations suggest that estimation of the detection function in a point-transect context generally requires 75-100 observations. However, analysis of empirical point distance information from the Georgia BQI project (Hamrick 2002) suggests that, at the expected bobwhite density in agricultural landscapes, as many as 170 points may be needed to generate sufficient detections to adequately estimate the detection function. Clearly, most states will not be able to sample intensively enough to estimate state-specific detection functions. We suggest that detection functions be estimated at BCR or regional levels by pooling observations across states with similar landscape composition and topography and bobwhite density. These landscape-specific global detection functions could then be applied to observed detections at the state level to generate state-level density estimates. Given that reliable detection functions could be estimated at the BCR or state-level, sufficient fields must be sampled within each state to produce state-level density estimates with acceptable precision.

To determine the expected effect of number of points (fields) on precision of density estimates, we used observed bobwhite detections from 701 point mornings from BQI monitoring in GA (Hamrick 2002) to estimate a global detection function (best fit function was a Uniform with cosine adjustment) and determine the expected number of detections per point (~ 1 covey/point). We then used simulation models to determine the expected Coefficient of Variation (CV) on density in relation to number of points sampled. We *a priori* set a CV of 15% as an acceptable level of precision. We generated 1000 sets of random samples in increments of 10 at each sample size of 10 – 100 and in increments of 100 from 100 – 1000. At each sample size (number of points surveyed; 10, 20, 30 and so on) we generated the respective number of observations from a Poisson distribution with a mean of 0.5 - 3 and computed the density and associated statistics using the global detection function from Hamrick (2002). We then calculated the expected (mean) CV on *covey density* at each sample size.

Figure 1. Relationship between sample size (number of points) and CV over a range of expected detection rates.



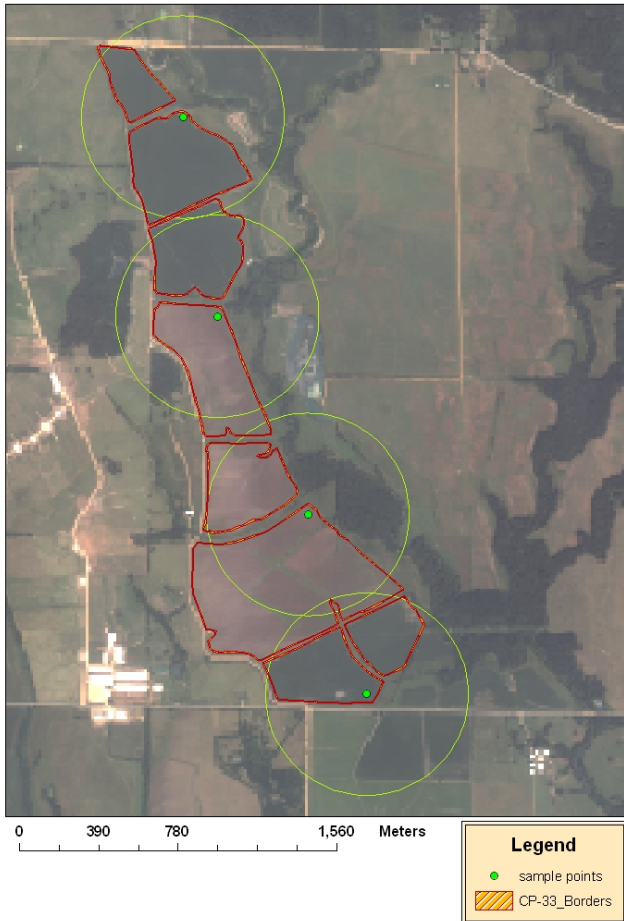
This simulation suggests that at a sample of 40 points we can expect a CV of 16.39 and at 50 points a CV of 14.69. The Research Committee believes that this is sufficiently precise to meet the language in CRP-479 *at the state level* and will produce CVs on regional and national data in the 5-6% range. If fields enrolled in CP-33 were paired with un-enrolled control fields in the vicinity of each contract we could estimate the effect size of the CP-33 practice (number of quail/ac added to the landscape as a result of CP-33) and extrapolate that to the national enrollment to produce a defensible estimate of the national effect of CP-33 on bobwhite and select songbirds. Insofar as detections of calling males during the breeding season are typically higher than fall coveys, sampling at an intensity sufficient to estimate fall density with an acceptable level of precision would likely yield acceptable breeding season density estimates. The Research Committee suggests that sampling intensity should vary in relation to the number of acres enrolled in the state (i. e., proportional stratified sampling). Under this scheme, states would monitor from 40 – 141 fields and costs would range from \$8550 - \$27,556/state/yr (Table 2). These cost estimates assume labor at \$7.50/hour + fringe (25%) for 6 weeks during the fall and 2 weeks during the breeding season. The total cost of labor for national monitoring under this scenario would be approximately \$340,885/yr. Cost estimates **do not** reflect the cost of vehicles, gas, lodging, or per diem which would likely equal or exceed labor costs.

As an alternative, the committee offers that 40 points per state represents an absolute minimum sampling intensity sufficient to produce state-level density estimates. Projected labor costs (\$8550/year/state) associated with monitoring at the minimum of 40 contracts per state are illustrated in Table 3. These cost estimates assume labor at \$7.50/hour + fringe (25%) for 6 weeks during the fall and 4 weeks during the breeding season. The total cost of labor for national monitoring under this scenario would be approximately \$171,000/year. Cost estimates **do not** reflect the cost of vehicles, gas, lodging, or per diem which would likely equal or exceed labor costs.

Drawing a Representative Sample

Selection of a random and representative sample of experimental units from the population to which inference is to be made (target population) requires a sampling frame. Ideally, the target population and the sampled population should be identical. Under the suggested protocol, we recognize that the sampled population actually represents 95% of the target population. Furthermore, the experimental unit to which CP-33 is applied (the field) is not subject to direct sampling because the available sampling frame (FSA CRP contract database) treats the contract as the observational unit. A given contract will consist of ≥ 1 fields consisting of a variable number of acres of field border. An important sampling issue relates to whether to sample a single field/contract or multiple fields/contract. In implementing a sampling design, there exists a tradeoff between sampling efficiency and independence. A multistage sampling scheme (randomly select contract, then randomly select multiple points/fields within contracts) enhances efficiency because it reduces total number of landowner contacts required and travel time. However, points within contracts must still be reasonably independent (not sample the same area). During fall sampling, the effective audible range of calling coveys is approximately 500 m. During the breeding season, Hansen and Guthery (2001) assumed that the radius of audibility was 400 m. A 500-m radius circle has an area of approximately 194 acres. A pure cluster sampling (randomly select contracts, then sample all fields within contracts) approach would not be feasible because multiple fields within contracts would likely overlap in the radius of audibility, and as such would result in double-counting and lack of independence. The Research Committee recommends a multistage sampling approach in which contracts are randomly selected, then a field within the contract is randomly selected. Additional fields within the contract may be sampled, up to a total of 3 fields, if the property is large enough and fields distributed such that 500-m radii around sample points do not overlap (Figure 2). For each bordered field in the sample, a non-bordered field within the same landscape ($1000 \text{ m} < \text{distance from bordered field} < 3000 \text{ m}$) must also be sampled. Non-bordered fields should be paired with bordered fields under the management of the same producer if possible.

Figure 2. Farm level GIS illustrating selection of independent points (fields) within contract for sampling. Sampled fields should be selected such that 500-m radii of audibility do not overlap.



Selection of Contracts within States

Drawing a random sample of contracts, stratified by state, will require access to the FSA CRP contract database. A random sample of contracts, stratified by state will be drawn from the national database. This sample will contain 20% more contracts than needed to serve as replacements if the landowner cannot be located or refuses access. This database will contain information about contract number, date of enrollment, state and county FIPS, and total acreage. However, it is likely that the individual county offices will need to be visited to secure information regarding number of fields, individual field size, landowner contact information, and spatial data. From county-level data landowners can be contacted, permission secured, and field-level spatial databases (GIS) developed (Figure 3). Selection of individual fields and determination of the number of fields/contract to be sampled will have to be made at the county level.

To characterize temporal change in vegetation structure and bobwhite population response over the life of the contract, the initial sample of contracts should be followed over time for at least 5 years. As such, the same fields and contracts should be sampled each year. However, to quantify temporal change in program implementation, it may be desirable to add contracts to the sample in future years as programmatic guidelines evolve (i.e., 2007 Farm Bill).

Monitoring should begin when a state has a sufficient number of contracts ($n > 50$) enrolled in CP-33 combined with the appropriate resources to carry out the monitoring. As of 11/30/05, 16 states have sufficient numbers of contracts from which to draw a sample and therefore should consider sampling during the 2006 growing season. The remaining ($n = 4$) states will begin sampling whenever CP-33 enrollment reaches >50 contracts.

Selection of Fields within Contracts

Multiple fields may be sampled within each contract. An initial field should be randomly selected from those within the contract and then up to 2 additional fields with non-overlapping 500-m radii may be selected. Fields enrolled in CP-33 selected for sampling will be paired with a non-enrolled field in the same landscape to make inferences regarding effect size of the CP-33 practice. Control fields should be located greater than 1 km and less than 3 km from the fields sampled in the contract. Control fields should be of the same crop type (soybean, corn, cotton, etc.) and growth stage as the crop within the bordered fields. Care should be taken to not select fields where noise from adjacent highways, urban areas, livestock, processing facilities, etc. will be a problem. For example, if all CP-33 fields within a contract are located next to a highway, randomly select another contract from the list.

Selection of Sampling Points within Fields

The sampling point should be positioned at a point along the field border that provides the “best” place to listen for birds (e.g., a hill top). The point should be located along the field edge for sampling and accessibility reasons and to avoid crop disturbance. Preferably, the point should be located along the midpoint of the longest axis of the field; however, this is subject to change based on access, topography, and vegetation. We encourage observers to fine tune the location of the sampling point based on infield conditions (i.e., away from major roads, on a hill top, fairly open vegetation). Points should be selected, located in the field, and flagged **before** monitoring begins (i.e., pre-scout the area before sampling). Points for control (non-bordered) fields **must** be selected using the same criteria as those used for treatment (bordered) fields. Furthermore, to maintain consistency in point location criteria, it is preferable that only 1-2 people select point locations for all contracts. The sample point should be geo-referenced with a differentially corrected GPS and collected in Decimal Degrees, WGS84 datum. The same sampling points should be used during fall and breeding season sampling.

FIELD-LEVEL MONITORING PROTOCOL

Sampling protocol for breeding and fall monitoring will be based on point-transect methodology (Buckland et al. 2001). Number of uniquely identifiable coveys (fall) and number of uniquely identifiable **calling male** northern bobwhite and **male** songbirds (breeding season) within concentric distance bands from the call station will be recorded and used to estimate detection functions and subsequently density. During the breeding season counts, both northern bobwhite and songbirds should be recorded simultaneously. **Do not conduct these counts separately as noted in previous versions of this protocol.** For songbirds during the breeding season counts, the number of **male** songbirds visually or aurally (heard) detected should be recorded. Furthermore, only a select group of songbirds will be monitored within each Bird Conservation Region **BCR** (not state). **Each state has the flexibility to select additional species of concern so that CP-33 monitoring may be compatible with other monitoring programs within their state/BCR.** Please see Appendix A of species to monitor within each state/BCR. Below are the protocols for the fall bobwhite covey counts and the breeding season bobwhite and songbird counts.

Fall Bobwhite Covey Counts

The following guidelines have been developed to assist individuals conducting early morning covey call counts to estimate northern bobwhite fall density. Recent research has determined optimal timing, conditions, and analysis for conducting surveys (see Wellendorf 2000, Seiler 2001, Hamrick 2002, Seiler et al. 2002, Wellendorf et al. 2004).

- Prior to conducting covey call counts, observers should receive training that consists of testing of accuracy of estimation of calling distance, and a minimum of 3 mornings of field monitoring of wild covey calling. Distance testing may be accomplished using electronic callers, pen-reared birds, or radio-marked wild birds.
- Consistency among years in observers is critical for accurate evaluation and can be maximized by thorough training and/or having the same observers at the same points year after year.
- Surveys can be conducted between the last week of September and the second week of November with the optimal time usually being the last 2 weeks of October, and the latest measurement occurring before hunting (usually firearms season) commences on sample fields. These periods are general guidelines. Each state should determine the peak calling periods for their state.
- Pilot monitoring should be conducted from mid-Sept – early October to determine beginning of calling activities and to determine seasonal trends in peak calling activity.
- The effective listening radius under most conditions will be out to 500 m from the survey point, which gives an inference area of 194 acres. This may be increased in open, flat landscapes. Adjacent survey points should be spaced at least 1000 m apart to ensure independence.
- In heterogeneous landscapes it is necessary to locate points to incorporate representative portions of each landscape feature that are considered potentially usable by coveys.
- Paired sites (i.e., treatment field with a buffer and control field without a buffer) must be sampled **on the same morning** to avoid bias arising from temporal variation in covey calling rates.

Procedure for Early Morning Fall Covey Call Point Counts

1. Make sure all points have been clearly marked prior to the survey (flagging, pole, location coordinates) and observers understand directions to the point. It is very helpful to place a metal pole (or t-post) with a light-reflecting sign (e.g., slow moving vehicle sign) at the sampling location during the preceding afternoon. Remember, the observer will be arriving at the sampling point well before sunrise.
2. Have maps and field sheets ready for observers. Field sheets should have an air-photo of the point and surrounding landscape. See Figure 3 for an example data sheet.
3. Do not conduct the survey if there are high winds (> 6.5 km/hr), cloud cover (>75% cloud cover), rain, or a dramatic drop in barometric pressure (> 0.05 in/Hg).
4. Observers should arrive at the point **45 minutes before sunrise** and remain at the survey point until all covey calling has ceased, approximately 5 minutes before sunrise. Disturbance should be kept to a minimum while at the point.
5. Before calling begins, orient the field sheet/map in the appropriate direction and be prepared to record data.
6. Record each calling covey once on the field sheet by placing a small point/dot (•) on the map where you believe the covey to be located based on sound. Uniquely number each covey. See Figure 4 for examples on how to properly mark covey locations.
7. During the calling period rotate to face all cardinal directions to assist in hearing coveys from all directions.
8. Use mapped covey locations to determine if subsequent calling coveys have already been detected. Add new coveys only if it is possible to verify they are unique.
9. It is recommended that some effort be made to flush detected coveys to verify perceived locations.
10. At the end of the survey visually estimate cloud cover and measure or estimate wind speed (use an anemometer if available). Count the total number of calling coveys and complete the datasheet.

After returning to the office collect barometric pressure (in/Hg) observations for 1 am and 7 am to calculate the change. This information will be used for calculating the predicted call rate.

- In the office, measure the distance of each covey from the sampling point. A geographic information system (GIS) software package such as ArcView or ArcGIS will be very helpful. If you do not have access to these programs or are unfamiliar with their use, send copies of all data sheets to Mark Smith, Department of Wildlife and Fisheries, Mississippi State University.

Figure 3. Example data sheet to be used for fall covey sampling. The red circle (500m radius) is used only to give the observer a distance reference and is centered on the sampling point. The field border (CP-33) for the sampled field is highlighted.

Example of CP-33 Fall Covey Count data sheet

Date: _____ County: _____ Landowner name: _____

Observer: _____ Farm #: _____ Tract #: _____ Contract #: _____

GPS Latitude: _____ GPS Longitude: _____ Field #: _____

DIRECTIONS: Arrive at the point approximately 45 minutes before sunrise and begin listening for calling coveys in all directions. Mark COVEY location(s) on the map using a small "." where you best estimate the covey location. DO NOT place an "X" or draw a circle to mark the location. Make sure the "." is clearly legible and note the location (e.g., Covey 1) on the map. Note the time that each covey BEGAN calling in the spaces provided. Continue listening for calling coveys until all covey calling has ceased, approximately 5 minutes before sunrise. After the count, write the total number of coveys heard on the appropriate space below.

****For the first year of sampling, please clearly mark with a small "x" and note the exact location of where you conducted the count

Total number of COVEYS heard: _____ Cloud cover (%): _____


Covey #1 Time: _____ Covey #4 Time: _____ Bar. Press. (in/Hg) 1:00am: _____


Covey #2 Time: _____ Covey #5 Time: _____ Bar. Press. (in/Hg) 7:00am: _____

Covey #3 Time: _____ Covey #6 Time: _____

2,000 Meters

N

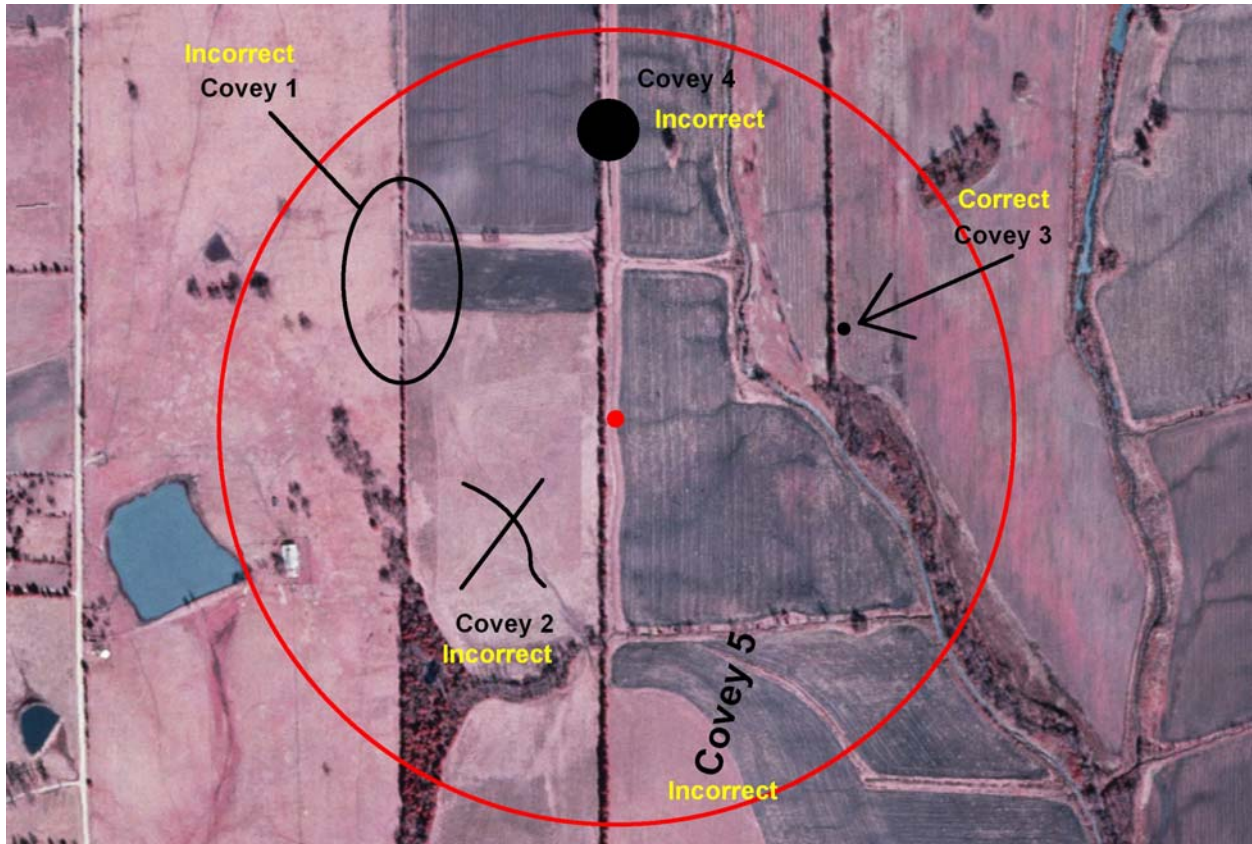




2,000 Meters

Note: Red circle is for distance reference and is 1,000m diameter

Figure 4. Correct (covey #3) and incorrect (coveys #1, 2, 4, and 5) methods for marking covey locations on fall sampling data sheets. Place only a small dot (•) to mark the covey location and then label appropriately. Do not use circles, crosses, large dots, or the covey name to mark the location.



Breeding Season Call Counts (northern bobwhite and songbirds)

Breeding season call counts for northern bobwhite and selected BCR-specific songbirds should be conducted using the same contracts, fields, and points used during the fall covey counts. ***It is critically important that you sample the appropriate songbird species for the BCR-state combination in which the sample field is located.*** Songbirds to be sampled for each state-BCR are listed in Appendix A. For example, if your sampling field is located in the Tall Grass Prairie BCR, you should record at least those songbirds listed under TGPR in Appendix A. You may include additional species to those listed in Appendix A. Please note that most states will have 2-4 BCRs within the state. Therefore, it is likely that you will have to learn several songbird species.

- Prior to conducting breeding season counts, observers should receive training that consists of a minimum of 3 mornings of monitoring calling activity.
- Furthermore, all observers must be familiar with identifying songbirds by sight and sound prior to beginning the survey. Contact your state Partners in Flight (PIF) coordinator to receive proper training.
- Surveys should be conducted during the daily and seasonal peak periods of calling activity (Hansen and Guthery 2001). This generally occurs between sunrise and 2 hours after sunrise during the period from the last week of May to the 2nd week of July. Daily and seasonal phenology should be locally determined using pilot monitoring starting in late May.

- Replicate sampling of individual points (3 mornings/point preferred) will reduce effects of daily and seasonal variation in calling activity.
- The effective listening radius under most conditions will be out to 500 m from the survey point. This may be greater in open, flat landscapes.
- Paired sites (i.e., treatment field with a buffer and control field without a buffer) must be sampled **on the same morning** to avoid bias arising from temporal variation in calling rates.

Procedure for Breeding Season Songbird and Calling Male Bobwhite Counts

1. Make sure all points have been clearly marked prior to the survey (flagging, pole, location coordinates) and observers understand directions to the point.
2. Have data recording (Figure 5) and distance reference (Figure 6) sheets ready for observers. The distance reference sheet can be easily created in a GIS software program such as ArcGIS.
3. Do not conduct the survey if there are high winds (> 6.5 km/hr or sustained 4 or greater on Beaufort Scale), cloud cover (>75% cloud cover), rain, or a dramatic drop in barometric pressure (> 0.05 in/Hg). If these conditions are encountered, cancel the sampling for the day and reschedule.
4. Multiple points/per morning can be surveyed by a single observer as long as observers complete counts within 2 hour after sunrise.
5. All observers should arrive at the first point of the morning approximately 15 minutes before sunrise. Disturbance should be kept to a minimum while at the point.
6. Before calling begins orient the distance reference sheet in the appropriate direction and be prepared to record data.
7. Call counts will consist a 10-minute observation period in which the number of uniquely identifiable male songbirds and calling male bobwhite detected will be recorded within each of 6 distance bands (0-25, 25-50, 50-100, 100-250, 250-500, > 500). Use a watch to keep track of time.
8. Record each uniquely identifiable calling male once by placing a unique number in the appropriate line and distance category on the data recording sheet (Figure 5). Use standard coding symbols [4 letter species alpha codes can be found in Appendix C of Hamel et al. (1996)]. Additionally, it is advisable to the distance reference map (Figure 6) readily available to help judge distances to objects.
9. The recorded distance band should be based on the estimated distance between the sampling point and the location at which the bird was first detected. For species that occur in flocks, record the flock (e.g., species) and flock size in the appropriate distance band. There is no need to record each bird in a flock individually.
10. **Record data for different time intervals (0-3 minutes, 4-5 minutes, and 6-10 minutes) of the count in different ways.** Some people like to use different color pens; alternatively, detections can be underlined or double underlined to indicate the different time periods. Be sure to record a legend of the chosen coding scheme on the data sheet for future reference.
11. During the calling period, rotate to face all cardinal directions to assist in hearing and observing calling male bobwhite and songbirds from all directions.
12. Determine if subsequent calling birds have already been detected. Add new birds only if it is possible to verify they are unique.
13. At the end of 10 minutes, stop recording bird observations. Do not record any new birds seen or

heard either before or after the 10 minute listening period. Birds detected outside of the listening period may be noted in the comments section of the data sheet.

- At the end of the survey visually estimate cloud cover and measure or estimate wind speed (use an anemometer if available). Count the total number of songbirds and calling male bobwhite for each distance category. Complete the datasheet. After returning to the office, collect barometric pressure (in/Hg) observations for 1 am and 7 am to calculate the change.

Figure 5. Example data sheet for breeding season bobwhite and songbird monitoring.

Example of Data Recording Sheet for Breeding Season Counts

Observer: _____ Date: _____ County: _____ BCR: _____
 Contract #: _____ Field #: _____ Landowner: _____
 Start time: _____
 Point type: CP-33 / control (circle one) Long: _____ Lat: _____

Weather measurements

Cloud cover (%) _____ Wind speed (mph): _____
 Barometric pressure (inHg) 1:00 am _____
 Barometric pressure (inHg) 7:00 am _____

Fog score _____ (0 = no fog, clear; 1 = slight fog, visibility impaired only in low areas; 2 = foggy, visibility impaired in all areas)

Species	Distance Bands					
	0-25m	25-50m	50-100m	100-250m	250-500m	500+

Other notes:

****Record data for different time intervals using some form of coding scheme. Note the coding scheme on this data sheet.

****(XXXX, XXXX,XXXX,XXXX) Songbirds to monitor in this BCR.

Figure 6. Example of a reference map depicting distances on an air-photo. This map should be used to identify landmarks and to help measure distances to objects (and subsequently birds) while in the field collecting data. Once the correct distance band is determined for a bird, record the species and distance on the sample data sheet.

Distance Reference Map for Breeding Season Songbird and Northern Bobwhite Counts

Use the distance bands on this sheet to identify landmarks (i.e., trees, field edges, etc.) in order to more accurately place observations into appropriate distance bands.

Circle the correct distance band on the data recording form.



PROCEDURE FOR FIELD-LEVEL MONITORING OF VEGETATIVE COVER

The following information will be recorded for each CP-33 field where birds are sampled. Vegetation measurements should be taken only once for each field during the 2nd or 3rd growing season (i.e., after vegetation becomes established). A simple data sheet should be constructed similar to the one in Figure 7.

1. Contract width/actual width (measured at 10 points systematically distributed at equal intervals around the field boundary).
2. Is the contracted cover established?
3. Ocular estimate of percentage (5% increments) of border in NWSG, broad-leaved forbs, legumes, and exotic forage grasses. (these estimates should be recorded along the 10 transects used to measure border width).
4. Dominant taxa (e.g., contract species, tall fescue, perennial and annual weeds)
5. Percentage in trees and shrubs.
6. Percentage of field border in invasive exotic forage grasses (fescue, bermuda, cogon, etc).
7. Percentage of field border disturbed by non-compliance and type (mowing, turning, cultivation, parking of equipment, herbicide drift, grazing, etc).
8. Midcontract management activities (if applicable; percentage of the border treated and type of treatment: disking, prescribed fire, herbicide, etc).

Figure 7. Example data sheet for vegetation monitoring.

Example of Vegetation Data Recording Sheet

Observer: _____ Date: _____ State: _____ County: _____

FSA Contract #: _____ FSA Field #: _____ Landowner: _____

CP-33 Contract Width (ft.): _____ Contract Cover: NWSG/Nat. Regen (circle one)

Is contracted cover established: Yes / No (circle one)

Type of exotic forage grasses present in border (Bermuda, Fescue, Bahia, Brome, Cogon, Other)

Percentage of border in shrubs: _____ Percentage in trees: _____

Percentage of border disturbed by non-compliance (mowing, turn-row, cultivation, equipment parking, herbicide drift, grazing, etc.) _____

Briefly describe non-compliance disturbance.

Percentage of border in mid-contract management activities (disking, prescribed fire, herbicide, etc.): _____

CP-33 Width Measurements (in ft.)---measured at 10 points systematically distributed at equal intervals around the field boundary:

Percent cover of NWSG, forbs, legumes, and exotic forage grasses ocularly estimated along same 10 transects at which border width is measured.

Transect	Border Width	% NWSG	% Forb	% Legume	% Exotic
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Other Comments:

Table 1. Distribution of CP33 acres by state sorted by acreage allocation, estimated number of contracts, estimated number of fields, cumulative acres of total CP33 allocation, cumulative % of total allocation, and cumulative % of allocation to states with 95% of total allocation.

State	Acres	Est. No. Cont.	Est. No. Flds	Cumulative Acres	%Total	Cumulative %	% of 235700
Illinois	20000	2500	10000	20000	0.08	0.08	0.085
Indiana	20000	2500	10000	40000	0.08	0.16	0.085
Iowa	20000	2500	10000	60000	0.08	0.24	0.085
Kansas	20000	2500	10000	80000	0.08	0.32	0.085
Missouri	20000	2500	10000	100000	0.08	0.4	0.085
Texas	20000	2500	10000	120000	0.08	0.48	0.085
Ohio	14200	1775	7100	134200	0.0568	0.5368	0.060
Arkansas	12000	1500	6000	146200	0.048	0.5848	0.051
NorthCarolina	11300	1412.5	5650	157500	0.0452	0.63	0.048
Oklahoma	9500	1187.5	4750	167000	0.038	0.668	0.040
Mississippi	9400	1175	4700	176400	0.0376	0.7056	0.040
Tennessee	9300	1162.5	4650	185700	0.0372	0.7428	0.039
Kentucky	9000	1125	4500	194700	0.036	0.7788	0.038
Louisiana	8900	1112.5	4450	203600	0.0356	0.8144	0.038
Georgia	8600	1075	4300	212200	0.0344	0.8488	0.036
Alabama	6100	762.5	3050	218300	0.0244	0.8732	0.026
Nebraska	6000	750	3000	224300	0.024	0.8972	0.025
SouthCarolina	5000	625	2500	229300	0.02	0.9172	0.021
Virginia	3600	450	1800	232900	0.0144	0.9316	0.015
Florida	2800	350	1400	235700	0.0112	0.9428	0.012
Michigan	2400	300	1200	238100	0.0096	0.9524	
Pennsylvania	2200	275	1100	240300	0.0088	0.9612	
Maryland	2100	262.5	1050	242400	0.0084	0.9696	
Wisconsin	1500	187.5	750	243900	0.006	0.9756	
Delaware	900	112.5	450	244800	0.0036	0.9792	
Colorado	600	75	300	245400	0.0024	0.9816	
NewJersey	600	75	300	246000	0.0024	0.984	
Connecticut	500	62.5	250	246500	0.002	0.986	
Maine	500	62.5	250	247000	0.002	0.988	
Minnesota	500	62.5	250	247500	0.002	0.99	
NewMexico	500	62.5	250	248000	0.002	0.992	
NewYork	500	62.5	250	248500	0.002	0.994	
Rhodelsland	500	62.5	250	249000	0.002	0.996	
SouthDakota	500	62.5	250	249500	0.002	0.998	
WestVirginia	500	62.5	250	250000	0.002	1	
Total	250000				1		

Table 2. Labor estimates based on proportional stratified sampling, proportional to acreage allocation.

State	Acres	Est. No. Cont.	Est. No. Flds	Sample Size	Fall Surveys			Spring Surveys			Total Costs
					Mandays	Bodies	Labor Cost	Mandays	Bodies	Labor Cost	
Illinois	20000	2500	10000	141	296.85	14	\$22,263.41	70.71	4	\$5,303.35	\$27,566.76
Indiana	20000	2500	10000	141	296.85	14	\$22,263.41	70.71	4	\$5,303.35	\$27,566.76
Iowa	20000	2500	10000	141	296.85	14	\$22,263.41	70.71	4	\$5,303.35	\$27,566.76
Kansas	20000	2500	10000	141	296.85	14	\$22,263.41	70.71	4	\$5,303.35	\$27,566.76
Missouri	20000	2500	10000	141	296.85	14	\$22,263.41	70.71	4	\$5,303.35	\$27,566.76
Texas	20000	2500	10000	141	296.85	14	\$22,263.41	70.71	4	\$5,303.35	\$27,566.76
Ohio	14200	1775	7100	100	214.82	10	\$16,111.52	50.21	3	\$3,765.38	\$19,876.90
Arkansas	12000	1500	6000	85	183.71	8	\$13,778.04	42.43	2	\$3,182.01	\$16,960.06
NorthCarolina	11300	1413	5650	80	173.81	8	\$13,035.57	39.95	2	\$2,996.39	\$16,031.97
Oklahoma	9500	1188	4750	67	148.35	7	\$11,126.37	33.59	2	\$2,519.09	\$13,645.46
Mississippi	9400	1175	4700	66	146.94	7	\$11,020.30	33.23	2	\$2,492.58	\$13,512.88
Tennessee	9300	1163	4650	66	145.52	7	\$10,914.23	32.88	2	\$2,466.06	\$13,380.29
Kentucky	9000	1125	4500	64	141.28	6	\$10,596.03	31.82	2	\$2,386.51	\$12,982.54
Louisiana	8900	1113	4450	63	139.87	6	\$10,489.97	31.47	2	\$2,359.99	\$12,849.96
Georgia	8600	1075	4300	61	135.62	6	\$10,171.76	30.41	2	\$2,280.44	\$12,452.21
Alabama	6100	763	3050	43	100.27	4	\$7,520.09	21.57	1	\$1,617.52	\$9,137.61
Nebraska	6000	750	3000	42	98.85	4	\$7,414.02	21.21	1	\$1,591.01	\$9,005.03
SouthCarolina	5000	625	2500	40	94.00	4	\$7,050.00	20.00	1	\$1,500.00	\$8,550.00
Virginia	3600	450	1800	40	94.00	4	\$7,050.00	20.00	1	\$1,500.00	\$8,550.00
Florida	2800	350	1400	40	94.00	4	\$7,050.00	20.00	1	\$1,500.00	\$8,550.00
Total				1706	3692.11	171	\$276,908.36	853.0	42.65	\$63,977.09	\$340,885.45

Table 3. Labor estimates based on fixed sampling level within each state at minimum sampling intensity.

All States Sample at the Minimum Level											
State	Acres	Est. No. Cont.	Est. No. Flds	Sample Size	Fall Surveys			Spring Surveys			Total Costs
					Mandays	Bodies	Labor Cost	Mandays	Bodies	Labor Cost	
Illinois	20000	2500	10000	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Indiana	20000	2500	10000	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Iowa	20000	2500	10000	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Kansas	20000	2500	10000	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Missouri	20000	2500	10000	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Texas	20000	2500	10000	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Ohio	14200	1775	7100	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Arkansas	12000	1500	6000	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
NorthCarolina	11300	1413	5650	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Oklahoma	9500	1188	4750	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Mississippi	9400	1175	4700	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Tennessee	9300	1163	4650	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Kentucky	9000	1125	4500	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Louisiana	8900	1113	4450	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Georgia	8600	1075	4300	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Alabama	6100	763	3050	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Nebraska	6000	750	3000	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
SouthCarolina	5000	625	2500	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Virginia	3600	450	1800	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Florida	2800	350	1400	40	94	4	\$7,050.00	20	1	\$1,500.00	\$8,550.00
Total				800	1880	94	\$141,000.00	400	20	\$30,000.00	\$171,000.00

Frequently Asked Questions

Question: Why do we mark covey locations on a map during the fall counts but put locations of songbirds and calling male bobwhite into distance bands during the breeding season counts?

Answer: It will be much easier (and likely more accurate) if we have observers place the covey location on the map especially given that they'll have an airphoto depicting infield landmarks (i.e., fence row, the next field over, access road, etc.). We will measure distances to covey locations at a later time (in the office). What we want to avoid is observer bias in placing a covey into bands (usually the next band closer to the sampling point). Therefore, in an attempt to prevent or minimize this bias, we just want observers to mark the estimated covey location on the map without references to distance bands.

We're going to use Program Distance to estimated densities for the fall coveys. In using this distance-sampling approach, we'll likely create our own distance bands when analyzing the data and will likely place coveys into one of at least 4 distance categories.

As for songbirds during the breeding season, most detections will occur <100m from the sampling point, or more appropriately, observers will likely detect most songbirds out to about 100m or so. Therefore, it will likely be much easier to "place" these observations into distance bands while in the field. Furthermore, there will likely be several more detections of songbirds and bobwhite during the 10 min breeding count than during the fall covey counts. Marking all of the locations on a map will become very cumbersome and messy.

Question: Why are songbird distance bands different from bobwhite distance bands?

Answer: They are no longer different. We combined the songbird and bobwhite breeding counts into 1 period and have combined their distance bands.

Question: I've identified (mapped) some of the 45 contracts or so from one of my counties that has good CP33 participation. I'm seeing clumping of contracts, for whatever reason, in areas. It might make it difficult to find controls within 1000-3000 meters for monitoring in some of these areas if centrally located contracts are chosen. Most of the cropland (landowners) around them now have buffers. What should we do if we can't find any control fields within 1-3km from the treatment field? Why do control fields have to be within 1-3km of the treatment field?

Answer: This distance was somewhat arbitrarily set based on our experiences and is subject to a great deal of flexibility based on "infield reality." Our intent was to make sure, as close as possible, that control fields are sampled within the same farming landscape as the treatment fields. For an extreme example, we DON'T want people to sample all of their treatment fields in, say the MS Delta, and then all of their control fields in the Black Belt Prairie region. This would obviously present some statistical/inferential problems with the results. We want to try as much as possible to keep pairs of treatment and control fields in the same farming landscape (crop type, practices, etc). However, on the flip side, we don't want to sample treatment and control

fields located next to each other because the effects of the field border on the treatment field will affect what we observe in the control field.

If you can't find a control field within 1-3km from the treatment field, don't worry. Just select the nearest control field that you can that is most similar to the treatment field. If you have to select a control field beyond 3km from the treatment field, that will be fine.

There will be much subjectivity in selection of control fields. Our goal is to minimize this subjectivity as much as possible, but at the same time we realize that things don't always work out in the field as they do on paper. Therefore, just try and do the best that you can relative to the protocol.

Question: What criteria are you using to pick monitoring locations in randomly chosen tracts? Will there be some flexibility in the field to fine tune the location of the monitoring point?

Answer: There is a great deal of flexibility here also. We've been racking our brains as to the best approach and have decided that, yes, we need to select a point along the field border that provides us the best place to listen for birds (e.g., a hill top). We are going to provide only some loose guidelines to allow observers to select the "best" place to sample based upon field conditions (i.e., access, topography, vegetation, etc.). We would like to have the sampling point located on the midway along the longest side of the field. However, this is obviously subject to change from field to field based on field conditions. Also, we suggest that the point be located along the field EDGE for sampling and accessibility reasons and also not to disturb the producer's crop (getting along with the producer reason). We encourage you to "fine tune" the location of the sampling point based on field conditions so that you have the greatest opportunity to hear birds. This obviously needs to be done for both the control and treatment fields. Again, we will need to rely upon your expertise and experience here. However, once sampling point is selected it is important that the same location be sampled in fall and breeding seasons in each year. The initially selected point will become a permanent monitoring station.

Question: Any consideration for using female separation calls to stimulate bobwhite calling?

Answer: We've considered it and it may produce additional detections, however, we run into a whole new set of problems (i.e., call types, players, how long, when, etc.). Given that this protocol will be used by folks with various professional backgrounds, with various resources (\$\$\$) available, across several states and BCRs, we feel that it is best just to use a simpler standard (w/o female calls) call count. Yes, there are some drawbacks to doing this, but we think we'll cause more confusion and introduce more sampling biases if we introduce female calls into the equation.

Question: Why are quail and songbird breeding season counts now done simultaneously?

Answer: There were/are going to be several sampling problems if we conduct them separately as previously suggested (i.e., do a quail count and then do a songbird count or vice versa).

Therefore, after much deliberation, we decided that bobwhite and songbird counts should be done simultaneously.

Question: Why don't we sample all songbirds instead of just a select group?

Answer: There were several points taken into consideration when going this route. First, we (or anyone for that matter) don't know what the experience level will be of those conducting the songbird counts. In an ideal world, we would like to have experienced birders record all species of birds and then flesh out the details later. However, we suspect that may not be the case for most states. Therefore, we decided it would be better to just focus/train individuals on a smaller subset of species that will likely be observed. Secondly, whereas it is/will be important to document field border usage by less common (rare) bird species, we likely won't have sufficient numbers of observations to make statistically valid inferences. You should include any ancillary observations of rare or uncommon bird use (or lack thereof) of CP-33. These ancillary observations can be noted on the data sheet.

Question: What about sampling songbirds during the winter?

Answer: We concur that winter sampling would be very valuable, especially for southern states, however, time, people, and funds are limited. The winter songbird protocol is still up in the air. Winter sampling will be dependent upon the availability of resources (\$, time, personnel, etc), thus will be voluntary for each state. We think that during winter, line transect distance sampling would be the most appropriate approach. However, this is open to debate.

Question: In the protocol under the section "Drawing a Representative Sample" you state that "For each bordered field in the sample, a non-bordered field within the same landscape must also be sampled." Does this mean a) bordered is synonymous with CP 33 such that the paired, non-enrolled field could have a grass border enrolled in another program or no program at all, b) that the paired, non-enrolled field should be a whole field with no border whatsoever, c) a whole crop field with no border, or d) a crop field with a non-CP 33 border of any grass kind.

Answer: The control field should be a crop field that has no herbaceous grass community intentionally established along the perimeter of the field for the benefit of wildlife (i.e. no conservation buffer). I would also rule out fields which may have any other grass border enrolled in another program. Basically, for the most part, you should be looking for control fields that are cropped in the traditional "fencerow-to-fencerow" fashion (i.e., fields that are normally cropped right up to the road edge, fencerow, access road, etc. or relative to whatever most producers do in your area). We recommend that you NOT include fields which the producer intentionally left (for various reasons) a herbaceous plant community along a field edge that would have otherwise been cropped. However, all crop fields are going to have some kind of adjacent field margin community (hedge row, turn row, mowed grass border, fencerow, etc.) We do not intend to exclude fields with this type of border.

Question: Treatment of whole field enrollment - we have just been made aware of the "51% rule" in Missouri whereby landowners that have more than that proportion in CP 33

can enroll the whole field (sounds similar to Illinois). We had originally discussed omitting these samples but in discussions with our biometricians believe that including them in our random sample will allow broader inferences across states in the same BCR who are also experiencing this effect like Illinois.

Answer: Yes, to make inferences to the population of CP-33 contracts within the state, you do need to include whole field enrollment just like any other enrollment.

Question: Can an individual CRP contract have a location in one county and be administered by an FSA office in another county? If so, do we contact the CED in the county of location or administration.

Answer: Yes, a CRP field may be physically located in one county, but the contract is administered by the FSA office in another (typically adjoining) county. This normally occurs because the landowner's property is either situated on the border of the 2 counties or the landowner has property in both counties but desires to deal with a single office. Contact the CED in the county of administration.

Question: Are we looking for the CP33 field point and control field points to be different landowners that do the farming. What about the same landowner renting out fields to different farmers? Some landowners will only let the farmer do certain things to the field. What happens if we come across a landowner that has more than one field in a contract? I believe every field has its own contract number even if it's the same landowner. But just incase we come across one.

Answer: The control field can be either owned/managed by the landowner/farmer who has the CP33 field or not. Ownership does not make a difference as long as the cropping practices are fairly similar between the control and CP33 field. We had originally suggested asking the landowner who has the CP33 field if he/she has any other non-CP33 fields (at least 1km away from CP33 fields) that we could use as controls. If they did, it would make life easier (only have to deal with 1 landowner, will likely have similar cropping practices). However, if they don't, then we have to find a control field, preferably within 1-3km of the CP33 field. If you have more than 1 field in a contract with CP33, you may sample up to 3 fields in the contract if each of the fields are greater than 1km from each other (i.e., somewhat independent---not counting the same individuals from both points).

Question: Are we counting the "bobwhite" calls that the quail give or just the whistles?

Answer: In the strictest sense, we are not interested in the number of calls or whistles but rather the number of individuals (breeding season)/coveys (fall) that we can uniquely identify from the calls/whistles. When conducting breeding season counts, count the number of INDIVIDUAL MALE BOBWHITE, regardless of the number of times they call. In the fall, count the number of INDIVIDUAL COVEYS, regardless of the number of calls made. It may be useful somewhere down the road to record the number of calls/whistles that an individual/covey emits, but not really all that important. The big thing is to identify the number of unique birds (breeding season) or coveys (fall) making the calls. For example, a covey of 12 birds at a station

may emit 23 calls while another, different, covey of 8 birds at the same station emits 14 calls--- we are only interested in the knowing that 2 different coveys called. The fact that they called 23 and 14 times, respectively, is not all that important.

Question: How do we select the best point to sample on the field?

Answer: Pick the "best" listening spot (elevated, somewhat open point) along the longest axis (side) of the field. Your point should be at the edge of the field in the field border. It is very important that we take the same approach for the control fields as well.

Question: With the buffer zones on the data sheet, we were not going to put the 50m, 100m, etc rings on the data sheet. But what about the 500m perimeter circle, do we still want this circle on the data sheet. Since it is an outside perimeter, but how much is it going to effect the observers hearing a quail and putting it inside the circle. I didn't know if this was going to be a problem with truncating data.

Answer: We will not include the individual bands on the fall data sheets, but we will include the 500m outside band as a point of reference to help observers understand the scale of the map. We don't think many coveys will be detected beyond 500 m.

Question: So, here is the situation we have encountered. In one of our samples in the 40, the farmer lives and owns one farm in Grundy county (where the pulled sample is associated with), but the actual farm with CP 33 is in Sullivan county. From what we understand, this situation might arise multiple counties as people just list all of their properties in the county where they live. So, our options are 1) use the random sample although it is located in a different county that the sample was drawn from, or 2) go to the next sample in the list.

Answer: From a sampling standpoint, it doesn't matter if the contract is administered out of Grundy county even though the actual location of the CP-33 field is in Sullivan county (county adjacent to Grundy). Contracts were selected from available contracts across the entire state of MO, not by county. I don't foresee us doing any county level analyses. We just need to make sure we go to the county FSA office that has the contract to get the info and just make a mental note that the field is actually in Sullivan county. So in the end, YES, go ahead and use this sample.

Missouri was the first state to monitor CP-33 (fall 2005). Below is a list of problems encountered while preparing for CP-33 monitoring.

Compiled by: Kim Wells, Jody Bartz, and Jill Utrup, Resource Science Division, Missouri Department of Conservation, 1110 S. College Ave, Columbia, MO 65201.
Phone: 573-882-9909, ext 3292, Kimberly.wells@mdc.mo.gov

Top Things to Be Aware of For CP 33 Sampling

Logistics and Sampling

- Finding paired, control fields can be challenging (lack of crops, most fields with crops already buffered, random point generation, landowner access, noise)
SOLUTION: Where possible, use aerial maps or work with FSA county office to determine which random points currently have crops and then request contact information for both the landowner and renter followed by site visits to screen noisy locations (near highways, farm animals etc.)
- Landowner information can be challenging to obtain because plat maps at FSA offices are often out of date or the property spans multiple counties or is administered in one county but physically in another
SOLUTION: Where possible, obtain most recent plat map for every county of interest ahead of time. If that isn't possible, ask for the date of last contact or if they know of a recent sale at each county FSA office to reduce search time. Finally, always get maps for surround portions of the plat map for cases when the property boundary overlaps counties or actual location is different than administration county.
- The constraint of sampling on days with minimal cloud cover or wind is challenging (most fall days were pretty cloudy or overcast in morning and fall in MO rarely sees enough days < 6 km/hr)
SOLUTION: Strive for optimal but decide beforehand what amount of flexibility is appropriate for your state. We relaxed wind speed and often surveyed under complete cloud cover if all other variables were within target range. We re-sampled these sites at the end of the sampling period because we had time.
- Targeting relatively constant barometric pressure wasn't feasible (we used nearest weather station data after sample was collected)
SOLUTION: Collect barometric pressure after sampling from nearest weather station if don't have the equipment or way to be out sampling 6 hours prior to sunrise and then at sunrise.

Communication/Landowner Relations

- Contacting with landowners is often challenging (not home during day, working late and on weekends during harvest and planting)

SOLUTION: Have flexible staff expectations so can contact during weekends, late evenings, or very early mornings. Also, be prepared to find farmers during planting or harvesting season – some talked to our staff while harvesting

- Landowners were concerned about conduct while on property (where walking, driving at all, when exactly surveying, hunting season etc.) and often had specific instructions (don't use this road)

SOLUTION: Have just one person be the lead on contacting a single landowner and keep a datasheet to record conversation details and instructions (we have an example we will share). Mention up front that surveys will involve only walking in buffer and no driving. Call one or two days in advance to notify landowner of exact date of visit. Be prepared for landowners with concerns about hunting season in fall (bow season was open while we were surveying but less than 5 people denied access for this reason out of 40)

- Constancy of contact with just one person was critical to avoid confusion (often requires 2+ tries in person and on phone to reach over several days)

SOLUTION: Be prepared to find landowner on phone or in person. If working long distances, may need to rely on phone contact which takes longer. Also, may need info on landowner and renting farmer from FSA. FSA is also great source of info about recent property sales or property owner locations (out of town or state) that don't appear in database or on plat map

- Need to know whether landowner will be enrolling field in CP 33 or any other buffer program during sampling period – this caused discussion within MDC because we didn't want to appear to deter landowners from participating in programs, but also didn't want to have any surprises

SOLUTION: Work closely with Private Lands staff (or equivalent) within agency or in other agencies to discuss ahead of time and avoid differing expectations or perceptual challenges

APPENDIX A**APPENDIX A****State-BCR Songbird List**

This species list was generated by 1) identifying a subset of species from a list provided by Chuck Hunter of priority species that could be affected by Farm Bill programs and that would most likely be associated with CP-33, 2) reviewing distribution and relative abundance maps for each species using BBS data from the BBS website, 3) determining which species overlap the states and BCRs in the bulk of the bobwhite range and are somewhat relatively abundant (e.g., Eastern Kingbird, Field Sparrow, Grasshopper Sparrow, Dickcissel, Eastern Meadowlark), and 4) adding in additional species needed to fill in other parts of the bobwhite range (e.g., Scissor-tailed Flycatcher, Bell's Vireo, Vesper Sparrow).

Note: This list represents the baseline species that should be monitored when conducting CP-33 breeding season counts. **Each state has the flexibility to select additional species of concern so that CP-33 monitoring may be compatible with other monitoring programs within their state/BCR.**

ALABAMA

- Central Hardwoods (BCR 24)
EAKI, FISP, EAME, INBU
- Southeastern Coastal Plain (BCR 27)
EAKI, FISP, EAME, INBU
- Appalachian Mountains (BCR 28)
EAKI, FISP, EAME, INBU
- Piedmont (BCR 29)
EAKI, FISP, EAME, INBU

ARKANSAS

- Central Hardwoods (BCR 24)
EAKI, FISP, EAME, DICK, INBU
- West Gulf Coastal Plain (BCR 25)
EAKI, EAME, DICK, INBU
- Mississippi Alluvial Valley (BCR 26)
EAKI, EAME, DICK, INBU

FLORIDA

- Southeastern Coastal Plain (BCR 27)
EAKI, EAME, INBU
- Peninsular Florida (BCR 31)
EAKI, EAME

GEORGIA

- Southeastern Coastal Plain (BCR 27)
EAKI, FISP, EAME, PABU, INBU
- Appalachian Mountains (BCR 28)
EAKI, FISP, EAME, INBU
- Piedmont (BCR 29)
EAKI, FISP, EAME, INBU

ILLINOIS

- Eastern Tallgrass Prairie (BCR 22)
EAKI, FISP, EAME, DICK, VESP, GRAS, INBU
- Prairie-Hardwood Transition (BCR 23)
EAKI, FISP, EAME, DICK, VESP, INBU
- Central Hardwoods (BCR 24)
EAKI, FISP, EAME, DICK, GRAS, INBU

INDIANA

- Eastern Tallgrass Prairie (BCR 22)
EAKI, FISP, EAME, DICK, VESP, GRAS, INBU
- Prairie-Hardwood Transition (BCR 23)
EAKI, FISP, EAME, VESP GRAS, INBU
- Central Hardwoods (BCR 24)
EAKI, FISP, EAME, DICK, GRAS, INBU

IOWA

- Prairie Potholes (BCR 11)
EAKI, DICK, VESP, INBU
- Eastern Tallgrass Prairie (BCR 22)
EAKI, FISP, EAME, DICK, VESP, GRAS, INBU
- Prairie Hardwood Transition (BCR 23)
EAKI, FISP, EAME, DICK, INBU

KANSAS

- Shortgrass Prairie (BCR 18)
EAKI, DICK, GRAS, INBU
- Central Mixed-grass Prairie (BCR 19)
EAKI, FISP, EAME, DICK, BEVI, GRAS, UPSA, SCFL, INBU
- Eastern Tallgrass Prairie (BCR 22)
EAKI, FISP, EAME, DICK, BEVI, STFL, GRAS, UPSA, INBU

KENTUCKY

- Central Hardwoods (BCR 24)
EAKI, FISP, EAME, DICK, GRAS, INBU
- Mississippi Alluvial Valley (BCR 26)
EAKI, FISP, EAME, DICK, INBU
- Southeastern Coastal Plain (BCR 27)
EAKI, FISP, EAME, INBU
- Appalachian Mountains (BCR 28)
EAKI, FISP, EAME, INBU

LOUISIANA

- West Gulf Coastal Plain (BCR 25)
EAKI, EAME, DICK, PABU, INBU
- Mississippi Alluvial Valley (BCR 26)
EAKI, EAME, PABU, INBU
- Southeastern Coastal Plain (BCR 27)
EAKI, EAME, DICK, INBU
- Gulf Coastal Prairies (BCR 37)

PABU, INBU

MISSISSIPPI

Mississippi Alluvial Valley (BCR 26)

EAKI, EAME, DICK, INBU

Southeastern Coastal Plain (BCR 27)

EAKI, EAME, DICK, INBU

MISSOURI

Eastern Tallgrass Prairie (BCR 22)

EAKI, FISP, EAME, DICK, GRASS, INBU

Central Hardwoods (BCR 24)

EAKI, FISP, EAME, DICK, INBU

Mississippi Alluvial Valley (BCR 26)

EAKI, FISP, EAME, DICK, INBU

NEBRASKA

Prairie Potholes (BCR 11)

EAKI, FISP, EAME, DICK, GRAS, UPSA

Shortgrass Prairie (BCR 18)

EAKI, EAME, GRAS, INBU

Central Mixed-grass Prairie (BCR 19)

EAKI, FISP, DICK, BEVI, GRAS, UPSA, INBU

Eastern Tallgrass Prairie (BCR 22)

EAKI, FISP, EAME, DICK, GRAS, UPSA, INBU

NORTH CAROLINA

Southeastern Coastal Plain (BCR 27)

EAKI, FISP, EAME, INBU

Appalachian Mountains (BCR 28)

EAKI, FISP, EAME, INBU

Piedmont (BCR 29)

EAKI, FISP, EAME, GRAS, INBU

OHIO

Lower Great Lakes (BCR 13)

EAKI, FISP, EAME, INBU

Eastern Tallgrass Prairie (BCR 22)

EAKI, FISP, EAME, VESP, GRAS, INBU

Central Hardwoods (BCR 24)

EAKI, FISP, EAME, INBU

Appalachian Mountains (BCR 28)

EAKI, FISP, EAME, INBU

OKLAHOMA

Shortgrass Prairie (BCR 18)

EAKI, DICK, GRAS

Central Mixed-grass Prairie (BCR 19)

EAKI, FISP, EAME, DICK, STFL, GRAS, PABU, INBU

Eastern Tallgrass Prairie (BCR 22)

EAKI, FISP, EAME, DICK, BEVI, STFL, PABU, INBU

SOUTH CAROLINA

Southeastern Coastal Plain (BCR 27)
EAKI, FISP, EAME, PABU, INBU
Piedmont (BCR 29)
EAKI, FISP, EAME, GRAS, INBU

TENNESSEE

Central Hardwoods (BCR 24)
EAKI, FISP, EAME, DICK, GRAS, INBU
Mississippi Alluvial Valley (BCR 26)
EAKI, FISP, EAME, DICK, INBU
Southeastern Coastal Plain (BCR 27)
EAKI, FISP, EAME, INBU
Appalachian Mountains (BCR 28)
EAKI, FISP, EAME, INBU

TEXAS

Shortgrass Prairie (BCR 18)
SCFL, GRAS
Central Mixed-grass Prairie (BCR 19)
STFL, GRAS, PABU
Edwards Plateau (BCR 20)
FISP, BEVI, STFL, GRAS, PABU
Oaks and Prairies (BCR 21)
EAKI, EAME, DICK, SCFL, PABU
West Gulf Coastal Plain (BCR 25)
EAKI, EAME, SCFL, PABU, INBU
Chihuahuan Desert (BCR 35)
BEVI
Tamaulipan Brushlands (BCR 36)
SCFL, PABU
Gulf Coastal Prairies (BCR 37)
EAKI, EAME, DICK, STFL, PABU

VIRGINIA

Southeastern Coastal Plain (BCR 27)
EAKI, FISP, EAME, INBU
Appalachian Mountains (BCR 28)
EAKI, FISP, EAME, INBU
Piedmont (BCR 29)
EAKI, FISP, EAME, GRAS, INBU