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Vegetation Survey Standard Operating Procedure – Northern Bobwhite & Grassland Birds

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Across each 500x500-m grid, we will conduct **two different types of vegetation surveys**:

1. Cell-scale vegetation surveys: Fine-scale community vegetation surveys will occur in four of the 50x50-m cells.
2. Grid-scale surveys: A habitat characterization survey demarking major habitat types across the whole grid.

Survey Timing & Locations

To ensure vegetation is fully grown at the time of survey and plants are identifiable, vegetation surveys should be conducted during the late summer (late July or August). Vegetation surveys are to be conducted at all point count locations.

Cell-scale Vegetation Surveys

Materials:

Vegetation Survey Datasheets	Compass
Meter (Transect) Tape	1x1-m Quadrat
Robel Pole	

[Note: directions for building quadrats and Robel poles are forthcoming.]

Surveyors will conduct 4 cell-scale surveys per grid. Two should be conducted in cells where a bobwhite was detected during any of the 2-3 point counts conducted during the previous spring (i.e., presence cells), and two should be cells where no bobwhite were detected (i.e., pseudoabsence cells). [Note: If no bobwhite were detected during any prior point count visits, do 4 pseudoabsence cells. Similarly, if only one bobwhite was detected during the prior point count visits, do 1 presence cells and 3 pseudoabsence cells.]

Presence and pseudoabsence cells are selected randomly from the qualifying cells. Surveyors will be provided a list with the cell IDs in random order. The list will also have the central coordinates for each cell and a randomly-assigned transect direction (north-south or east-west) for each cell. Surveyors should first highlight the cell IDs where a bobwhite was detected during one or multiple point count surveys from the previous spring. To select the presence cells, proceed down the list until you reach the first two highlighted cells. Likewise, to select your pseudoabsence cells, proceed down the list until you reach the first two cells that are *not* highlighted. If either a presence or pseudoabsence cell falls outside the bounds of the property boundary, do the next available cell per the above instructions.

Cell-scale Survey Steps:

1. Once you have identified the locations for the cell-scale surveys, including two presence and two pseudoabsence cells, place your first transect. For both presence and pseudoabsence cells, the 22-m transects will be centered on the central coordinates of the cell of interest (i.e., meter mark "11" should be at the central coordinates). Transects should be oriented north-south or east-west according to the random assignment on the cell ID list. See Figure 1. It is imperative that surveyors avoid trampling vegetation during transect deployment. It is suggested that surveyors first carefully secure the center of the transect at the coordinates of interest. [Note: measurements are taken at this location, so again, please avoid trampling the vegetation.] Surveyors can then stretch one end of the transect taut while walking well outside of the projected transect line (e.g., if deploying the southern end of a north-south transect, surveyors should not walk due south, but rather head south at an angle). Once the transect line is taut, surveyors may then walk in an arch bringing the transect into line and verifying with a compass bearing. This is then repeated for the other end of the transect.

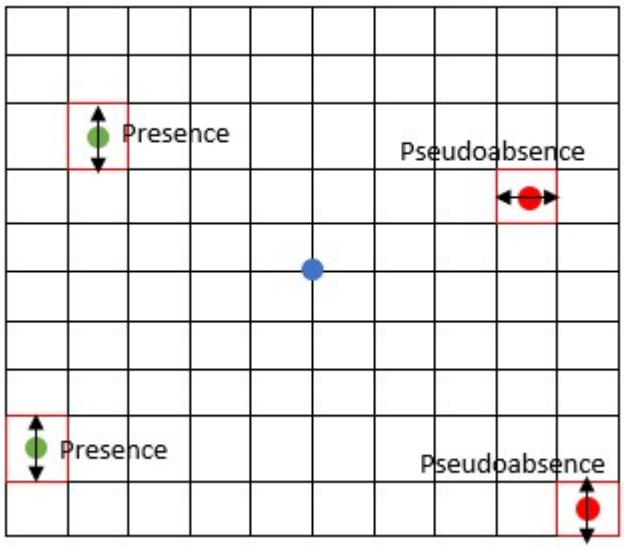

Figure 1: Presence and pseudoabsence points with randomly assigned transect directions (north-south or east-west). Notice the transects are centered on the central coordinates of the cells of interest. The blue dot represents the grid's center (where the point counts were conducted).

2. Surveyors will conduct a Daubenmire Cover Class Assessment and a Robel-pole Vegetation Structure Assessment for every 5-m interval on the transect starting at meter mark "1". In other words, both assessments will be conducted at meter marks 1, 6, 11, 16, and 21.

Quadrat Assessment

At the above-mentioned intervals, place the 1x1-m quadrat on the ground so that it is centered on the meter mark of interest. See Figure 2.

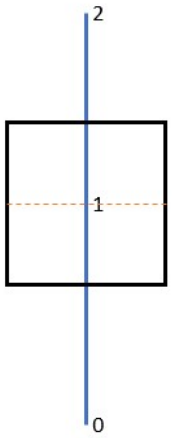

Figure 2: Example of quadrat placement at meter mark "1" on a transect. The blue line represents the southernmost end of a north-south transect, numbers represent meter marks, and the black square represents the quadrat.

Surveyors will record a Daubenmire cover value for each of the following categories: graminoid, forb, shrub, litter, and bare. [Note: you will *not* record a cover value for each individual plant *species*, only for the general categories. You will be asked to identify the dominant and codominant species of graminoid, forb, and shrub, but cover values should include all species within each category, not just the dominant species.] Additionally, surveyors will record a count of the number of saplings/seedling trees within the quadrat.

Daubenmire Cover Class Category:

Graminoid: grasses, sedges, and rushes. These should be relatively self-evident, but generally characterized by long, narrow leaves.

Forb: herbaceous (i.e., non-woody), broad-leaved plants. In general, any herbaceous plant that is not a graminoid is a forb.

Shrub: a plant that is <5m in height with woody stems and several basal shoots.

Litter: dead woody stems less than 10cm tall -or- any dead plant material (e.g., logs, sticks, leaves) that is not rooted in the ground.

Bare: ground that is devoid of plants or plant debris (litter).

Count Number Occurring in the Quadrat:

Seedling/Sapling: tree species that are <5m in height at the time of survey.

Please watch the following YouTube video on the Daubenmire Cover Class Method: https://www.youtube.com/watch?v=wKcKQzNbsds (relevant information starts at 09:51). [Note: our methods differ in three important ways from what is shown in the video. 1) We will be using 1x1-m square quadrats, not the rectangular quadrats shown in the video. 2) Cover class values are recorded for the above-mentioned categories, not parsed out into individual species. 3) we will be using smaller percent ranges across more class values (see table below).]

Surveyors will only need to record the cover class value. Midpoints and averages (termed "final value" on the datasheets) will be calculated automatically upon data entry.

Identify and record the dominant and co-dominant plant species for grasses, forbs, and shrubs. If only one species for a category is present in a quadrat, record "n/a" for the co-dominant species and likewise for the dominant species if no species for a category is present.

Robel-pole Vegetation Structure Assessment

The Robel pole consists of a 4-foot long white rod with 10cm bands of alternating colors. Bands are numbered consecutively from the bottom starting with 0. A 4-m string is attached at 1m in height on the Robel pole and the opposite end is attached to one end of a 1-meter pole (hereafter the "viewing pole").

Surveyors will insert the Robel pole into the ground using the attached tent stakes so that the bottom is flush with the ground and the pole is stable and perfectly vertical. The pole is placed at the meter mark of interest, taking care not to trample vegetation while setting it up. Measurements are taken in the 4 cardinal directions. Surveyors will pull the connecting string taut and place the bottom of the viewing pole (i.e., the side opposite the one with the connecting sting) so that it is flush with the ground and perfectly vertical. Surveyors will then squat or kneel so they can view the Robel pole by looking just above the top of the viewing pole. The actual reading consists of identifying the last band visible on the Robel pole before it disappears in the vegetation. Note: the lowest visible band must be recorded even if viewed through a hole in the vegetation and not at the top of the vegetation.

3. Once the transect measurements are gathered, surveyors should stand at the central coordinates of the cell. Surveyors will provide a count of the trees (i.e., living trees >5m in height at the time of survey) and snags (i.e., dead trees >5m in height) for the *entire* 50x50-m cell. It is understood that the exact bounds of the cell will be unknown, but surveyors should visualize the cell to the best of their ability. From the central coordinates, visualize 25-m out in the four cardinal directions and ~35-m out in the four ordinal directions. Mentally connect the dots to visualize the cells bounds.

4. Once the Daubenmire Cover Class and Robel-pole Structure Assessments have been completed for every 5 meters (1, 6, 11, 16, and 21) on the first transect and the number of trees and snags are counted for the 50x50-m cell, surveyors should repeat steps 1-3 for the remaining 3 grid cells of interest.

Grid-scale Surveys

***To be completed in a subsequent SOP version. ***

Data Entry & Data Management

***To be completed in a subsequent SOP version. ***

Please see the attached example datasheet. Please reach out if you have any questions regarding the Standard Operating Procedures.

Cell-scale Veg. Datasheet – Northern Bobwhite & Grassland Birds

EXAMPLE

Observer Name	Contract ID	Date	Point ID
D. Tilson	100000001AA	05/23/2023	10001

Grid cell ID: A2 — **Presence** / Pseudoabsence (circle one)

Grid Central Coordinates: 41.126809, -87.108645 Cell Central Coordinates: 41.12883, -87.11014

Cover Data (Daubenmire)													
Transect Distance	**Grami-noid Cover Class**	**Forb Cover Class**	**Shrub Cover Class**	**Bare Cover Class**	**Litter Cover Class**	**Seedling/ Sapling Count**	**Dominant Graminoid Species**	**Co-dominant Graminoid Species**	**Dominant Forb Species**	**Co-dominant Forb Species**	**Dominant Shrub Species**	**Co-dominant Shrub Species**
1m	8	0	1	1	1	3	Big Bluestem	Smooth Brome	n/a	n/a	Huckleberry	Sparkleberry
6m	5	1	2	1	2	12	Big Bluestem	Smooth Brome	Green Briar	n/a	Huckleberry	Sparkleberry
11m	10	1	1	1	1	1	Big Bluestem	Broom Sedge	Western Ragweed	n/a	Huckleberry	Sparkleberry
16m	6	2	3	2	2	23	Big Bluestem	Smooth Brome	Western Ragweed	Annual Lespedeza	Sparkleberry	Huckleberry
21m	5	2	4	3	2	15	Smooth Brome	Big Bluestem	Green Briar	Western Ragweed	Huckleberry	Sparkleberry
Final Value						**Notes:**						

Be sure to record the Daubenmire cover class, not your percentage estimates (see reference table below). Cover class final values will be calculated automatically on the data entry spreadsheets.
Remember: do not record a cover class for seedlings/saplings. Please record the exact number occurring in the quadrat.

Daubenmire Cover Class Reference

Class	Range (%)
0	<1
1	1-10
2	11-20
3	21-30
4	31-40
5	41-50
6	51-60
7	61-70
8	71-80
9	81-90
10	91-98
11	99-100

Cell-scale Veg. Datasheet – Northern Bobwhite & Grassland Birds

EXAMPLE

Observer Name	Contract ID	Date	Point Id
D. Tilson	100000001AA	05/23/2023	10001

Grid cell ID: A2

Presence / Pseudoabsence (circle one)

Robel Pole	
Point	**Height**
1m North	5
1m East	2
1m South	12
1m West	7
6m North	26
6m East	14
6m South	15
6m West	20
11m North	12
11m East	10
11m South	13
11m West	11
16m North	8
16m East	6
16m South	4
16m West	9
21m North	12
21m East	28
21m South	20
21m West	17

Number Occurring in the 50x50-m Grid Cell:

Trees:	**23**
Snags:	**7**

Double check that all fields on both cell-scale data sheets are complete and legible!