

CCS Field Sampling Protocol

This protocol provides a summary of the field sampling protocol that is outlined in the CCS User's Guide. It is intended to supplement, not replace, the User's Guide.

Pre-Field

To enhance efficiency, complete appropriate portions of the Map Unit Packet in advance.

Transect Data Collection

- 1) Upon arrival in each map unit:
 - a. Complete portions of Map Unit Packet that were not filled out in advance
- 2) Upon arrival at the transect point:
 - a. Determine the correct compass bearing that your 50m transect will follow (provided by the SETT with your transect points)
 - b. Lay out transect tape
 - i. Ensure that you thread the transect tape through vegetation, do not lay it on top of vegetation.
 1. A 1.5m long PVC pipe with a clip/carabiner on the end can help thread the tape through vegetation
 - ii. Use chaining pins to help make transect straight and taut
- 3) Once transect is laid out:
 - a. Photo document the transect starting point, and any reflections
 - i. Include identifying information in the picture (either label in the photo overlay or with a white board in the field)
 1. Project site
 2. Date
 3. Transect ID
 4. Bearing
 - b. Begin sampling:
 - i. You may begin at the 0m or 50m mark, but ensure you are collecting data on the correct side of the tape (if starting from 0m, walk on the right side, record shrubs that intercept the transect tape, and collect data within Daubenmire plots on the left side of the tape)
 - ii. NOTE: All species from Line intercept, Daubenmire plots, and general species lists, should be recorded using the following nomenclature. Species names should be recorded using full scientific name or the USDA PLANTS database species code (<http://plants.usda.gov/>).
 1. If genus can be identified, but not the species, use the PLANTS database genus code (<http://plants.usda.gov/>). ALWAYS try to define the genus portion of the code in the notes section of the transect datasheet (e.g., Artemisia species = ARTEM). In addition, note if it is annual or perennial for forbs and graminoids.
 2. DO NOT USE COMMON NAMES
 3. If genus cannot be identified, use the following codes and a short description/drawing:
 - a. AF# = Annual forb (also includes biennials)
 - b. PF# = Perennial forb
 - c. AG# = Annual graminoid
 - d. PG# = Perennial graminoid
 - e. SH# = Shrub

4) Sampling tips:

a. Shrub canopy cover:

i. Categories: Low Sagebrush, Big Sagebrush, Other

1. Acceptable Big Sagebrush Species

- a. *Artemisia cana*
- b. *Artemisia tridentata ssp. tridentata*
- c. *Artemisia tridentata ssp. vaseyana*
- d. *Artemisia tridentata ssp. wyomingensis*
- e. *Artemisia tripartita*

2. Acceptable Low Sagebrush Species

- a. *Artemisia arbuscula*
- b. *Artemisia frigida*
- c. *Artemisia longiloba*
- d. *Artemisia nova*
- e. *Artemisia papposa*

3. ENSURE YOU ARE NOT COUNTING NON-SAGEBRUSH AS SAGEBRUSH

- a. e.g., *Picrothamnus desertorum* is a “sage” species, but should not count as sagebrush and should be considered “other” shrub canopy cover
- ii. Must span line-intercept tape for at least 5cm to be considered cover
- iii. If a gap in coverage is 5cm or more, need to split up measurement
- iv. If multiple sagebrush shrubs overlap, measure start to end of first shrub, the end will be the start of the second, and so on
- v. If multiple ‘other’ shrubs overlap, they can be lumped together as one section
- vi. If multiple sagebrush shrubs overlap with ‘other’ shrubs, use process outlined in step 4, but measure multiple ‘other’ shrubs as a single section as outlined in step 5.
- vii. Dead/decadent shrubs:
 1. If rooted, still count towards cover
 - a. If completely dead, should be categorized as ‘other’, not ‘sagebrush’, even if it’s a dead sagebrush (because it doesn’t provide any forage at this point)
 - b. If just a dead branch attached to a live shrub, treat as you would a live shrub
 2. If not rooted, do not count as cover

b. Height:

i. For sagebrush, only record height once per individual shrub, even if it intersects the transect tape multiple times

1. Inflorescences do not count towards height
2. Measure the tallest point of the shrub, not just the portion that covers the line-intercept tape

ii. DO NOT RECORD HEIGHT FOR ‘OTHER’

c. Distance to nearest sagebrush cover:

- i. Measure from 30m mark of line-intercept transect
- ii. Do not go farther than 300m to find nearest sagebrush (if 300m or farther, record as 300m)

- iii. Remember, 'cover' = area of at least 30x30m, avg height of 30cm, canopy density of 10%
- d. Daubenmire Plots (forb and grass characteristics)
 - i. Collect every 10m.
 - ii. Lay long side of frame parallel to transect tape.
 - iii. Align the right edge of the frame with each 10m mark



1. E.g., if you are at 10m, the frame will span from approximately the 9.5m mark to the 10m mark
 2. If starting the transect at 0m, the frame should be on the left side of the transect tape (i.e., above the numbers)
 3. Note: If a transect reflection occurs in a manner that disrupts Daubenmire Frame placement, you may adjust the frame placement slightly so that it falls completely along the transect. Note any changes on your datasheet and take a photo.
- iv. Determine Percent Cover:
 1. **All cover inside Daubenmire frame is counted** (even if plant is not rooted within frame)
 2. Grasses: count **annual and perennial; live and residual** cover
 3. Forbs: only count **perennials and live cover**
 4. 6 cover classes:

COVER CLASS	RANGE OF COVER (%)	MID-POINT OF CLASS (%)
0	0	0
1	>0-5	2.5
2	6-25	15.0
3	26-50	37.5
4	51-75	62.5
5	76-95	85.0
6	96-100	97.5

- v. Determine Forb Species Richness: # of **live** unique **annual** and **perennial** forb species **rooted** within Daubenmire frame

5) Other Tips

- a. If transect hits a MU boundary, another boundary where treatments may differ (e.g., fence, deep/wide river that cattle cannot cross, road, etc.), or where conditions are unsafe, reflect the transect 90 degrees to the right. If right does not work, reflect left. If left does not work, select an alternative bearing (from the three provided) for the transect. If none of the three bearings work, reject the transect and select the first backup transect. Make sure to note and photograph reflections, alternative bearings, and rejections.
- b. All Species List (on datasheet): plant species encountered along transect; don't have to be intersecting transect tape, just keep a list of all species observed within 2m on each side of your transect