Line-Point Intercept Cover Monitoring Guide

City of Fort Collins, Environmental Planning

Monitoring Timing

Cover monitoring should occur at the peak of the growing season, which can vary depending on precipitation and climate for a given year. Typically, in Fort Collins, this is around late July or August. Adequate time should be allowed for warm season grasses and late blooming forbs to reach their peak growth.

Transect Layout

Prior to arriving on site, refer to the Landscape Plan to determine seeded areas within the Natural Habitat Buffer Zone or area of interest. Sampling is performed within seeded areas only for each of the following habitat types: mesic-grass and mixed-grass communities. Determine approximate locations of each habitat type within these seeded areas.

Measure the desired line of travel within the target habitat type. Divide the total length by the desired number of transects to obtain the linear distance between transect locations. Correlate the distance with the sampler's pace count to determine number of paces between each transect. If feasible, establish transects that follow straight lines of travel within the given habitat. If no straight lines are available, then meander as needed to stay within the appropriate habitat type. Avoid placing transect locations in aberrations (across or through two-tracks, trails, and other uncharacteristic areas). Bounce the transect off any aberration at a 90° angle if unavoidable.

Please note, it is critical to be able to identify the habitat type in the field to appropriately know where to sample. This mapping procedure takes into account qualified judgment of individual community boundaries given underlying habitat characteristics as well as manifested species composition. Implementation of this mapping methodology requires a biologist familiar with the visual appearance of the various communities given the required parameters (success standards) necessary to define those communities. Based on this knowledge, the qualified biologist circumnavigates the target community along its visually apparent boundaries as well as those ecotonal areas that present habitat requisites that would support development / expansion of this target community.

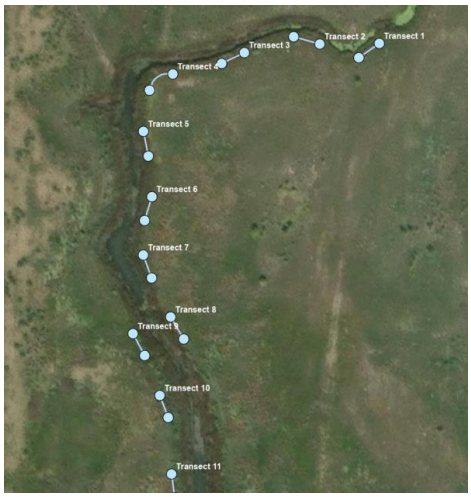

Figure 1. Example of transect layout in a mesic-grass community reference area.

Point-Intercept Method Sampling Procedure

Ground cover at each sample point is determined utilizing the point-intercept methodology (also referred to as "line-point intercept"). City of Fort Collins, Environmental Planning uses a 'laser bar' to facilitate rapid and accurate data collection (Figure 2, below). Please note, this monitoring device is not required. Traditional methods of Point-Intercept (also known as Line-Point Intercept) Method may be used and will achieve the same results.

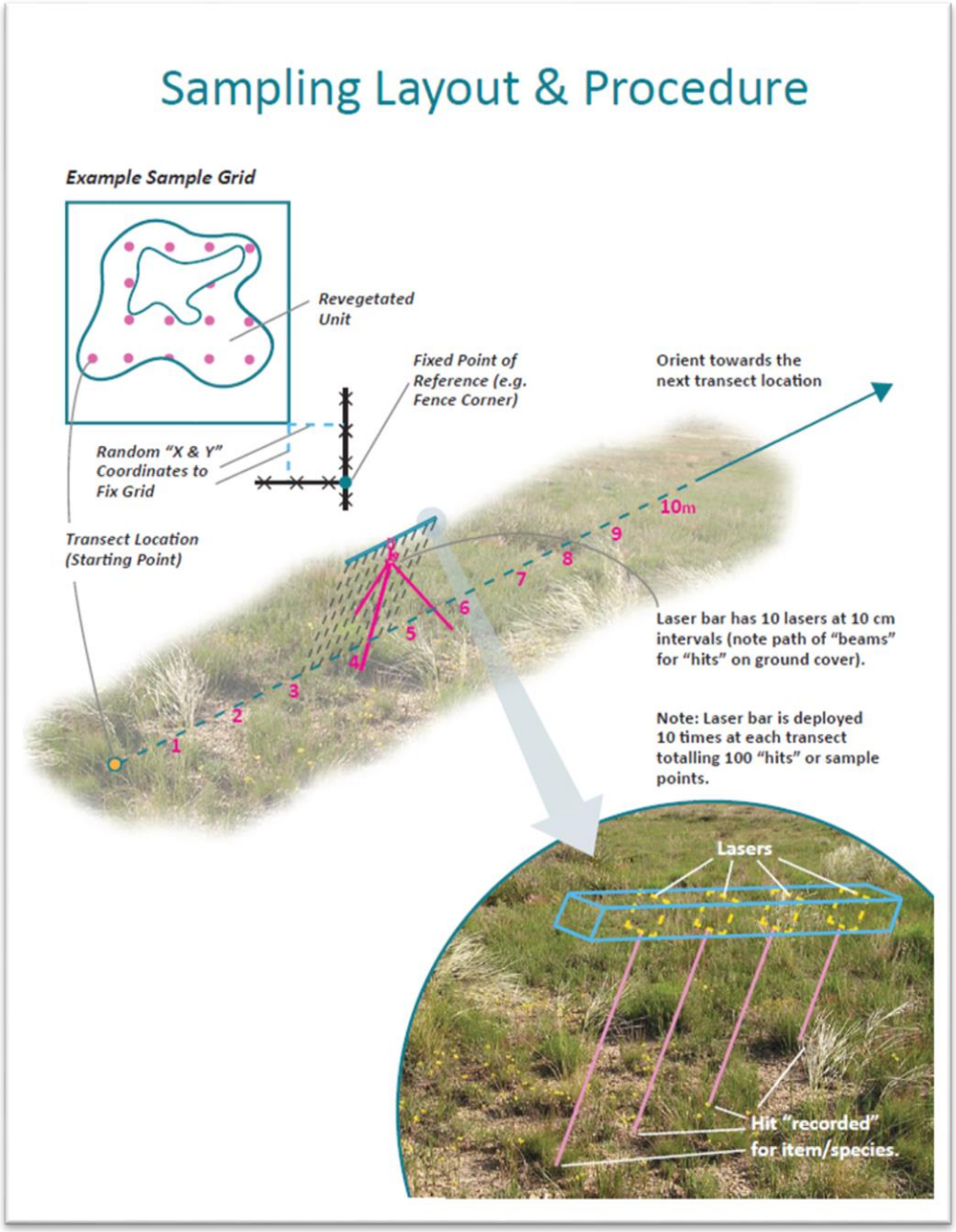

Figure 2. Sampling Layout and Procedure

Point-Intercept Method Sampling Procedure (continued)

1. Upon first arriving at a transect location within the given habitat type, take pictures of the cardinal directions.

2. From the marked center of transect start point, extend a transect 10 meters in length in the direction of the next sampling location. Make sure to always keep transects within boundaries of the given habitat type.
3. At each one-meter interval along the transect, a 'laser point bar' is situated vertically above the ground surface, and a set of 10 readings are recorded as to hits on vegetation (by species), litter, rock (>2mm), or bare ground. Hits are determined at each meter interval by activating a battery of 10 specialized lasers situated along the bar at 10 centimeter intervals and recording the variable intercepted by each of the narrow (0.02"), tightly focused beams (see Figure 1). In this manner, a total of 100 intercepts or 'hits' per transect are recorded. Each transect serves as one data point (i.e. n = 1). This methodology and instrumentation facilitates the collection of the most unbiased, repeatable, and precise ground cover data possible.
4. Record each 'hit' on a data sheet similar to the one below. Record vegetation using the species scientific name (*Genus species*) only. Do not use common names. If specific species is unknown, record using *Genus s*p. (if one unknown species) or *spp. (for multiple unknown species of the same genus*). Example: *Agropyron spp. or Agropyron sp.*

YEAR	Project:						Personnel:				
Transect #-->							Date:		Year: 1	2	3
Total Plant Cover						Incidentals:					
Rock											
Litter											
Bare Ground											
Grasses											
Forbs											
Shrubs, Sub-Shrubs, Trees, & Cacti						#Live		#Live		#Live		#Live		#Live
Comments / Live Shrubs														

5. Once ten 'hits' are recorded, move the laser bar approximately one laser bar-length over along the orientation towards the next transect location and repeat the data collection. Repeat for a total of 10 laser bar-lengths for a total of 100 laser points recorded for each transect. Record and sum up totals from datasheet and double check that the numbers add up to 100 at the end of each transect.

6. Walk to next transect start location using the predetermined number of paces calculated previously (Refer to 'Transect Layout' section above. When walking between transect locations, keep a running record of all species observed on the datasheet in the 'Incidentals' category (upper right-hand side of datasheet). This serves as a rough estimate of species richness and gives information regarding all species present on site regardless of whether or not they received a 'hit' in a given transect.
7. Repeat process until all transects are sampled. Again, each transect should total to 100 points, so if 6 transects are sampled, this equates to 600 total points or 'hits'.
8. Compile data to determine the average 'Desirable Cover' for each community type (mixed-grass or mesic grass). This is the cover value that will be compared to the desirable cover Reference Area success criteria for the given habitat type.

   'Desirable Cover' ***includes*** the following species:

   - Native annual and perennial grasses and forbs
   - Native Sub-shrubs/shrubs
   - Introduced perennial grasses and forbs (Excluding those defined as "weedy" within code section Sec. 20-41. Definitions)

   'Desirable Cover' ***excludes*** the following species:

   - Introduced Annual grasses and forbs
   - State Listed Noxious Weed Species (List A-C species)
   - Weedy species as defined by code section Sec. 20-41. Definitions