GRASSLAND MONITORING TEAM
FIELD PROTOCOL

Version 7

FIELD PROTOCOL – OPTION C

Equipment needed:

- Compass
- GPS
- VOR pole
- meter stick
- rebar/stakes
- 25 meter tape
- map and list of azimuths/coordinates
- datasheets (with extra) or mobile data recorder (if available)
- scratch paper
- pencils
- personal gear
- photo guide and camera if doing photopoints

Typical series of events at a transect:

1. Use GPS to navigate to the transect starting point.

   If a new transect, make sure the transect falls within the following criteria:
   - Each point should be at least 25-m from the edge of the management unit and at least 50-m from another point.
   - Exclude areas that are obviously in a wetland or heavily wooded area, are more than 75% non-vegetated (e.g., rock pile), or that cross between systems (i.e., upland grassland, lowland grassland, and wet meadow, see below for descriptions of system types).

   If the transect needs to be moved, see protocol below.

2. Use a compass and the randomly assigned bearing to run out a 25-m cloth tape, staking it at both ends to prevent shifting during data collection.

3. OPTIONAL: Take photo points oriented towards the transect center from both ends of the transect.

4. Collect VOR readings.
   - At the center-point of the transect (12.5 m), take a set of VOR readings from the four cardinal directions (N, E, S, W) using a VOR (Robel) pole.
   - The observer will take VORs at a height of 1 m and a distance of 4 m from the pole.
   - **Record the lowest half-decimeter mark visible on the pole** (i.e., not completely obscured by vegetation).
   - It is recommended that you record VOR before doing anything else that may disturb the vegetation structure (e.g., running the transect).

5. Starting at the beginning of the transect **record a plant code (see dichotomous tree) for each 0.1 m by 0.5 m quadrat** centered around the transect tape. The plant codes represent a hierarchical tree, which functions as a dichotomous key.

   Some general tips about assigning plant groups:

- Use foliar, as opposed to canopy cover, to make plant code determinations. *Foliar cover* "subtracts out" the "blank" spaces while *canopy cover* "fills in the gaps" between leaves, branches, etc.
- Assign 900 code ("Other," for bare ground, animal mounds, rock pile, etc.) if >75% of the quadrat is unvegetated.
- If >25% of the quadrat is vegetated, use relative percentages within the vegetated portion of the quadrat to make plant code determinations.
- To distinguish between low and tall shrub, use current height not the potential height of the species.
- In determining native/invasive composition, use the list of Tier 1 and 2 invasive species provided (Appendix 5). Note that some of these invasive species are actually native to parts of the region.
- Remember that the four classes (native/invasive; all native (invasive)/mostly native (invasive); herbaceous/low shrub/tall shrub; grass/grass-forb/forb) are independent decisions. Therefore, you should include woody species when making the native/invasive decision. The only exception is that grass/forb ignores woody components.
- Include dwarf shrubs (e.g., prairie rose, lead plant) with the Low Shrub category.

6. At the 0.1 m X 0.5 m quadrat level, **record all species present in that quadrat** and assign into one of three cover classes (<10 %, 10-50%, 51-100%).

7. Using a meter stick, or other suitable measuring device, **record litter depth to the nearest cm** at 5-m intervals along the transect (5, 10, 15, 20, 25 m).
    - Measure litter depth from the soil surface to the top of the lying horizontal litter layer.
    - Exclude litter that is leaning, standing, etc.

8. After completing the 50 quadrats, walk slowly along either side of the tape looking for the indicator species within the wider transect buffer.
    - The buffer is 1.5 m (a Robel pole length) on both sides of the standard belt transect, making it 25 m X 3 m.
    - Record all indicator species (Tier 1 and Tier 2 Quality, Tier 1 and Tier 2 Invasive, and Disturbance Increaser Indicators).
    - Record indicator species even if they were already recorded in the quadrats.

9. Collect gear and navigate to the next transect.

Procedures for Moving a Transect

1. Flip the bearing of the transect 180 degrees. For example, if the initial transect bearing was 85 degrees, try running the transect 265 degrees. If the transect is still not within the target community after shifting the transect bearing 180 degrees, try the +90 degree bearing, then the +270 degree bearing.

2. If the 4 directions (in step 1) do not work, move the transect starting point 25 m from the initial starting point along the original bearing assignment. For example, if the 355 degree bearing (from the +270 degree adjustment) still falls in a non-target community, move the starting point 25 m in the 85 degree direction.

3. If step 2 is still unsuccessful, repeat step 1 at 25 m from the initial point (180 degree flip, +90, +270). For example, if 25 m from the initial starting point along the 85 degree bearing is within a non-target community, try moving 25 m out in a 85+180 = 265 degree bearing, then 85+90 = 175 degree bearing, then a 85+270 = 355 degree bearing.

4. If moving 25 m along the 4 bearings still falls within a non-target community, repeat step 3, but move 50 m.

5. If still unsuccessful after trying to move the starting point 50 m. Use a new random location from the extra coordinates created in the office or contact the project manager.

Notes on target communities:

While GMT monitoring targets upland grasslands, lowland grasslands, and wet meadows, many of the areas are naturally heterogeneous and will contain wetter depressions. Only move the transect if the area clearly crosses from one target community to another, or is in a non-target plant community. Do not move the transect if it includes areas that have shrubs as a result of lack of management (woody encroachment). Shrub swamps should be considered a different community and warrants moving the transect. Forested areas with >50% cover should be considered a different community and warrant moving the transect. Individual trees should not warrant moving the transect.

Native Plant System Level Descriptions

(Excerpts from Minnesota Department of Natural Resources MNDNR. 2005. Field guide to the native plant communities of Minnesota: the Prairie Parkland and Tallgrass Aspen Parklands Provinces. Ecological Land Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. MNDNR St. Paul, MN.)

Upland Grass

*Upland Prairie (UP) communities are herbaceous plant communities dominated by graminoid species, with a species-rich forb component that can approach codominance with the graminoids. The tall grass big bluestem (*Andropogon gerardii*) and the midheight grasses prairie dropseed (*Sporobolus heterolepis*) and little bluestem (*Schizachyrium scoparium*) are the most important graminoids. Indian grass (*Sorghastrum nutans*), a tall grass, and porcupine grass (*Stipa spartea*) and side-oats grama (*Bouteloua curtipendula*), both midheight grasses, are the most important associated graminoids. Sedges (*Carex *spp.) are sometimes common in UP communities but are typically a minor graminoid component. The most common and widespread woody species are the low semi-shrubs leadplant (*Amorpha canescens*) and prairie rose (*Rosa arkansana*), and the tall shrub wolfberry (*Symphoricarpos occidentalis*). Purple prairie clover (*Dalea purpurea*), heath aster (*Aster ericoides*) and stiff goldenrod (*Solidago rigida*) are common forbs. The main vegetation layer in UP communities is usually less than 40in (1m) high, although some forbs and the flowering stalks of the tall grasses exceed this height as the growing season progresses.*

Lowland Grass

<u>Northern Wet Prairie</u>: Grass-dominated but forb-rich herbaceous communities, often with a strong shrub component, on somewhat poorly drained to very poorly drained loam soils formed in glaciolacustrine sediments, unsorted glacial till, or less frequently outwash deposits. Present primarily on level to very gently sloping sites. Flooded for brief periods at most; upper part of rooting zone is not saturated for most of growing season. Drought stress is infrequent, usually brief, and not severe. Fires were very frequent historically.
<u>Southern Wet Prairie</u>: Grass-dominated but forb-rich herbaceous communities on poorly drained to very poorly drained loam soils formed in lacustrine sediments, unsorted glacial till, or less frequently outwash deposits. Typically in slight depressions, sometimes on very gentle slopes. Flooded for brief periods at most; upper part of rooting zone is not saturated for most of growing season, but saturation usually persists in lower zone for much of season.

Wet Meadow

<u>Northern Wet Meadow/Carr</u>: Open wetlands dominated by dense cover of broad-leaved graminoids or tall shrubs. Present on mineral to sapric peat soils in basins and along streams.
<u>Southern Basin Wet Meadow/Carr</u>: Open wetlands dominated by dense cover of broad-leaved sedges. Typically present in small, closed, shallow basins isolated from groundwater inputs.
<u>Prairie Wet Meadow/Carr</u>: Open wetlands dominated by a dense cover of graminoids. Present in small, shallow depressions in the western and southern parts of the state.