MONITORING PROTOCOLS
FOR
DPW MITIGATION PROPERTIES

Grassland Monitoring Protocols

Point-intercept methodology – used to measure species composition and structure at the peak of the annual growing season.

- At each monitoring location, establish a 100-meter transect along a randomly selected compass bearing.
- At every meter along these transect, drop a pin vertically, and record the species contacting the pin and the height of the tallest member of each growth form (grass, forb, shrub, thatch). Bare ground should be recorded when touched by the pin.
- Record any disturbance visible at each pin location (i.e., at each meter along transect), these could include gophers, ant clearings, cattle trail, etc.
- Visually estimate the grazing intensity (High, Moderate, None)
- Take a photo in each cardinal direction at the stake within each plot. Record direction, shutter speed, and F-stop for each photo.

Belt transect methodology – used to measure the species richness in each plot location.

- Record all species along a 2-m wide belt at each monitoring location
- Count all Nasella bunches within the 2-m wide belt at each location.

Vernal Pool Vegetation Monitoring Protocols

Quadrat methodology – used to measure species composition at the peak of the annual growing season (i.e., following pool drawdown). Note presence of water, animal species of interest (e.g., fairy shrimp).

- At each monitoring location, randomly establish a transect across the pool, a second transect perpendicular to the first can be established if need to increase quadrat sampling area (depending on pool size)
- Divide the pool into three zones based on pool depth: 1) center (deepest area), 2) intermediate, and 3) pool edge (upland transition). Quadrat sampling (minimum of three to five quadrats) will be conducted within each of the three zones. Quadrat locations within each zone should be randomly or haphazardly selected using the two transects.
- Record cover of all species within 10 cm x 50 cm quadrats. Record cover of bare ground or thatch as appropriate.
- Visually estimate the grazing intensity within each quadrat (High, Moderate, None).
- Record disturbances within each quadrat, such as cow hoof prints.
- List all species found in the pool, whether or not in a quadrat.
- Take a photo in each cardinal direction from the edge of every pool, such that the pool is captured in each photo. Record direction, shutter speed, and F-stop for each photo.

Riparian Vegetation Monitoring Protocols

At cross-section RT8, riparian vegetation community composition and structure will be measured using a line-intercept methodology.

Line-intercept methodology – used to measure species composition and vertical structure in the tree and shrub layers.

- At each monitoring location, establish a transect reaching from one side of the channel to the other and perpendicular to the channel.
- Measure the length along each transect that is intercepted by all species in both the shrub and tree layer.
- Take a photo of the habitat from each end of the transect and upstream and downstream from the center of the transect. Record direction, shutter speed, and F-stop for each photo.

Line-intercept methodology – used to measure species composition in the herbaceous layer.

- Every one-half meter drop a pin vertically and record the species touched by the pin.

Belt transect methodology – used to count the numbers of individual trees and shrubs at each location

- Record and categorize as seedlings or adults all species along a 2-m wide belt at each monitoring location

Santa Maria Creek Channel Geomorphology Survey Protocol

The channel geomorphology of the section of Santa Maria Creek within the property will be measured at stream cross section SG8.

- Vertical elevation-horizontal distance pairs will be measured providing the cross-sectional shape of the channel.

- GPS coordinates will be taken to provide the latitude and longitude of the benchmarks (right and left end points of the cross-sections).

- Approximate bankfull geometry for each cross-section in the Santa Maria Creek reach will be established from standard field observations and measurements.

- Standardize all cross-sections to read from river left (RL) to river right (RR) when the observer is looking downstream.

- Present channel geomorphology in real elevations (meters above mean sea level).

Hydrologic Monitoring of Vernal Pools

- Install a staff gauge in each of the study vernal pools.

- Staff gauges will be constructed of 24-inch-long sections of 1-inch diameter polyvinyl chloride (PVC) pipe, fitted over 30-inch-long sections of 1/2-inch diameter rebar. The gauge will be fitted so the PVC pipe and rebar are flush on one end, and the flush end is capped to indicate the top of the gauge. From the base of each cap, place marks at 1-inch increments to indicate depth. Place self-adhesive numbers indicating the pool's identity vertically down the gauge, opposite the side with the 1-inch hash marks.

- Drive the staff gauges into the ground so that the bottom hash mark, indicating zero inches, is flush with the ground in the deepest portion of each pool.

- Monitor water depth weekly from January to April each year. Record water depth to an accuracy of 0.25 inch for each vernal pool on each date. Average the water depth across the vernal pools within complexes.

- Monitor dissolved oxygen levels monthly in each vernal pool using a LaMotte Dissolved Oxygen Test Kit (Code 7414/5860). Record water temperatures every two weeks. In addition, collect anecdotal information on conductivity (a measure of the amount of dissolved solids, such as salts, in water).