

README FILE FOR ARS #03 ECOSYSTEM STRESS AREA (ESA) DATA

This data package was produced by researchers working on the Shortgrass Steppe Long Term Ecological Research Project. This project was supported by National Science Foundation from 1982-2014. This data package includes one or more tab-delimited data tables, tab-delimited files (named _var) that denote header definitions and data types for each column, and detailed metadata within an Ecological Metadata Language document (i.e. XML). Example image files of plots, digital datasheets, or schematics of the experimental design may also be included when applicable.

Background information on the SGS-LTER project is contained in related series of objects within the Digital Collections of Colorado and the Colorado State University archives. Together data packages and other background information, including items such as images, proposals, and reports contribute to a comprehensive SGS-LTER collection.

The data tables and associated EML documents represent components of a PASTA (Provenance Aware Synthesis and Tracking Architecture) congruent LTER data package, which may be discovered and accessed through secondary repositories serving specific ecosystem science domains (e.g. LTER Network Information System, DataONE, or The Knowledge Network for BioComplexity).

The following information and protocol was obtained from the SGS-LTER Field Crew Manual:

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Study Objectives: to conduct long-term monitoring of the vegetative characteristics of an area that was nutrient stressed during the International Biome Project.

Sampling Frequency: Long-term sampling is conducted for LTER at least once a year from 1982-1989 and every other year from 1991. Beginning in 2009, conduct sampling once a year in the two control plots (D1 and D2 on the map). All treatments and reps as well as the grub kill plots are sampled every five years (2007, 2012, 2017, 2022...).

Study Area Location and Design

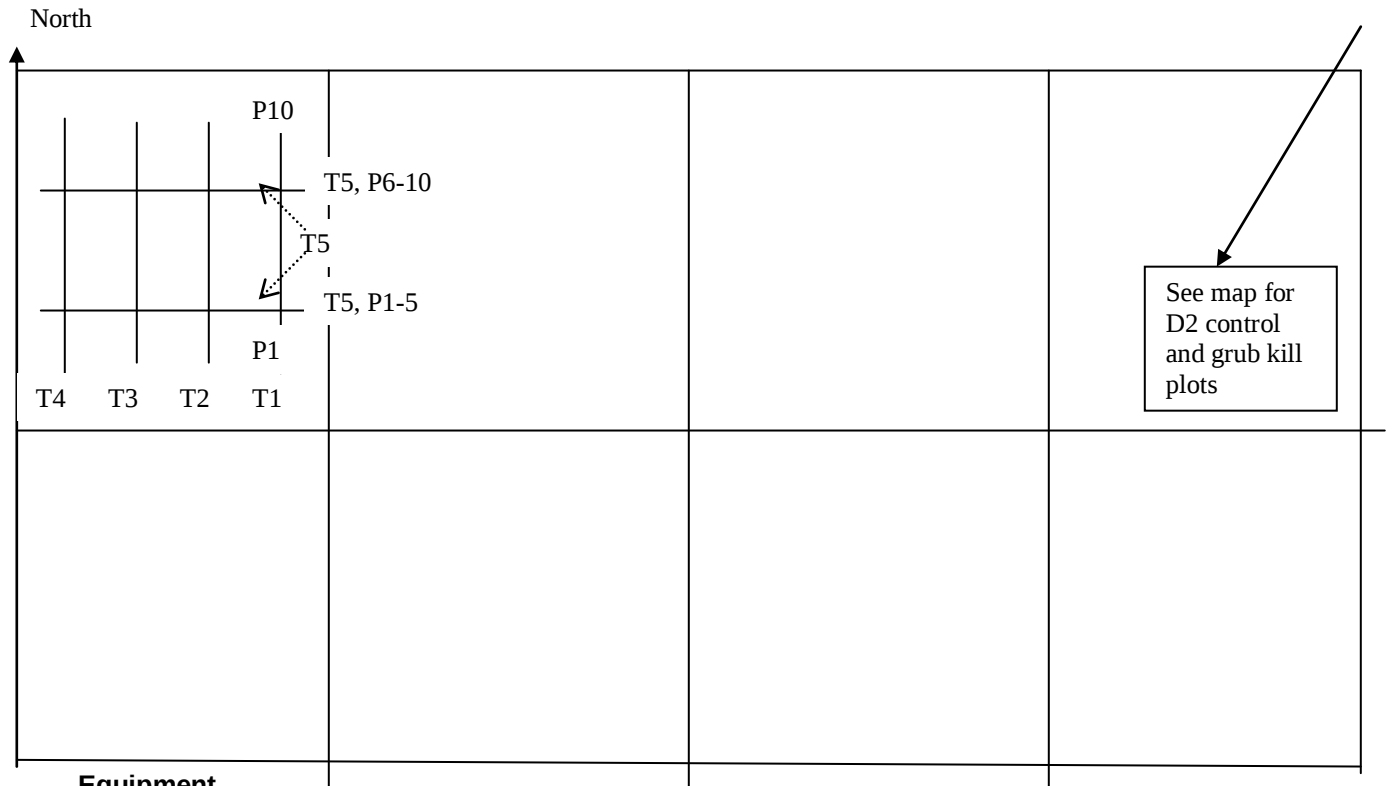
Blocks – There are 2 blocks, one to the east and one to the west. Data need to be collected in a total of 9 areas. 2 reps repeat the same treatment (D1 control, D2 control, E1 irrigation, E2 irrigation, F1 fertilization, F2 fertilization, G1 irrigation and fertilization, G2 irrigation and fertilization). In addition, there is a part of D2 that contains the grub kill. The area that contains the grub kill should be recorded as D2-G on all data sheets. The grub kill plots are marked with tent stakes rather than rebar and need to be identified with unique flagging.

Transects 1-5 – see transect lines below. The transects in the grub kill area of D2 is recorded as “G”. Plot numbers range from 1-50 in the grub kill area of D2 only. Control transects in the D2 grub kill area so no follow the standard design below. Please follow the attached map for the D2 and grub kill plots.

Plots 1-10 – see plots below. Permanent plots were established by installing transects of rebar. Each rebar has a blaze orange plastic cap. The transect and plots number need to be re-written on each cap with sharpie prior to sampling.

Important: these are permanent plots, so it is very important that plot numbers and transects are always recorded correctly.

*Please note that the Humus Experimental plots are also located within seven of the eight ESA blocks. Be careful not to tread across the Humus Plots. See Mark, Nicole, or Indy (PI) to find out how the humus plots are set up.



Equipment

Circular $\frac{1}{4}$ m² quadrat frame
 Ten point frame
 Datasheets
 Maps of ESA treatment, and grub kill area
 Check off sheet for QAQC

Density Sampling Protocol

A 0.25 m² circular quadrat with four quarter plots is placed with the cross bars in the northeast corner. Collect data starting in the northeast quarter plot (1) and work your way around clockwise to #4. Count all of the individuals of each species rooted within each quarter plot and record the data under the appropriate quarter plot number. Use the species column to record the correct species code. If a species is not found in a quarter plot, then enter a "0" in that cell on the data sheet. We do not count the number of individuals of Bogr or Buda.

Point Frame Sampling for Basal Cover Protocol

Use the ten point frame to estimate cover at each plot location. The point frame should be placed at a random angle around the rebar. This will provide a total of 10 points of contact for each plot. The categories to record are plant species code, litter (code = litt), bare ground (code = bare), and lichen (code = pach). Be very critical about what the contact really is. If the tip intercepts dead crown, record it as litter. If the tip intercepts live crown of a plant, record the species code. The accuracy of the method is determined by how carefully contacts are identified. Record only what the exact tip of the point touches at the soil surface. Ignore hits on leaves as point move through the frame to touch what occurs at the basal level.

QAQC Instructions

There are a few sampling procedures that must be followed in order to assure consistency through years, and to make certain that all plots have been sampled. These are permanent plots. It does matter how they are coded each year on the data sheet with correct block, area and treatments codes, as well as transect and plot numbers. Check to see that you have collected density and all 40 points for point-frame data from all plots from the area on which you are working. CAN OTHER PEOPLE UNDERSTAND YOUR WRITING ??? Then you may move onto the next area for sampling.

Data Sheets

Check-off Sheet

[illegible]