Vegetation Data for Desert Tortoise Occupancy Covariate Monitoring Project at the Boulder City Conservation Easement

Project No. 2009-KLA-811H

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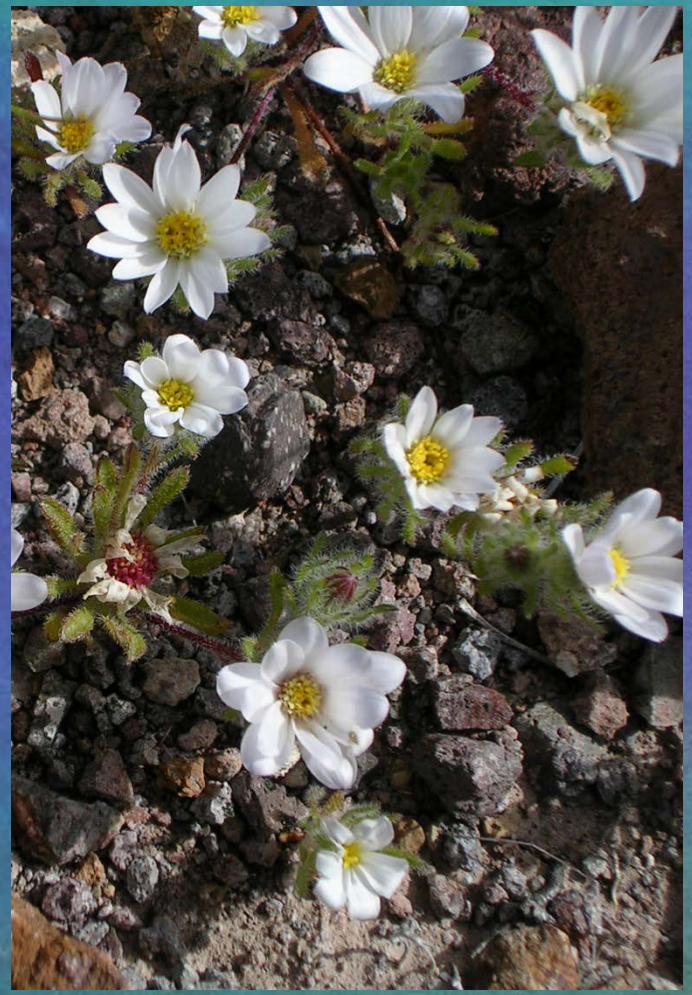
Project Overview and Background

- Funding and Agency Involvement.
  - Clark County Desert Conservation Program
  - 100% Section 10 Funding

- Vegetation as a covariate of the Desert Tortoise occupancy study
- Vegetation Uses: Shade, Food
- Types of data collected
  - Perennial and succulent cover = Shade (2014)
  - Ephemeral cover = Food (2014 and 2015)
  - Perennial and succulent species richness (2014 and 2015)
  - Ephemeral species richness (2014 and 2015)

Project Objectives for 2015



- Conduct preliminary site visit
- Align transect lines and quadrats from previous year.
- Collect ephemeral plant species richness and cover data within quadrats
- Collect species richness data in subplots
- Data verification, validation, management
- Record incidental tortoise sightings and priority plants

Project Methods

- Within the BCCE
- 80 plots, each plot covers four hectares
- Each plot contained four subplots
- Each Subplot contained four 25 m transects radiating from the center
- Each transect contained two 1m x 2m quadrats (Sampling Grids)

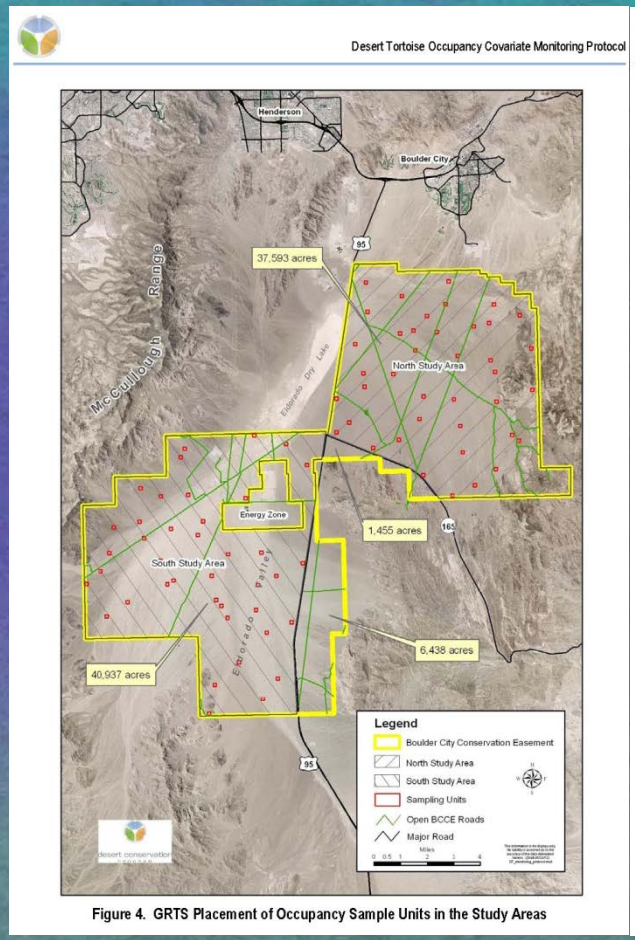


Figure 4. GRTS Placement of Occupancy Sample Units in the Study Areas

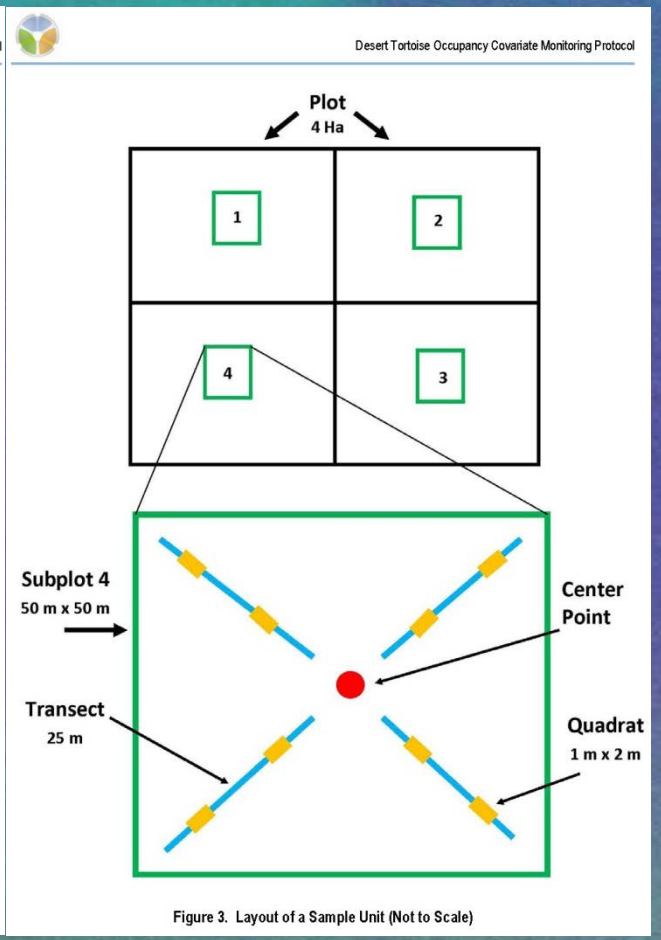


Figure 3. Layout of a Sample Unit (Not to Scale)

Project Status

- 2015 field work was completed in March during the spring wildflower bloom (March 2 – 27)
- Permanent metal cap markers were located in the center of each subplot
- Started at south end of BCCE, elev. 2450 ft; lowest elevation plots at 1800 ft.
- Many unknown annual plants in the first few days

Ephemerals in Early March: Unknown vs Known

Project Timeline

- Each of the 3 crews was able to complete 2-3 plots per day.
  - A Crew consisted of one botanist and one field assistant
- The project was broken into zones using GIS and a work plan was developed based on:
  - Plot locations in relation to other plots
  - Crew work assignments in relation to the other crews
- Due to limited roads in the area, some days required several miles of walking to reach the assigned plots.
- Fieldwork started March 2, 2015 and completed March 27, 2015
  - 19 days total, average 13 days per crew

Data Collection

- Data was collected in the field and verified after each transect
- Data was then entered into an excel table with:
  - Built in validation for logical values
  - Visual cues to identify errors
  - Formulas to help verify data and spot errors not found in the validation scheme
- Data was verified again after entry to ensure data was accurate

Vegetation Cover Varies Greatly

Plot 42

Annuals germination concept: one inch rain (Janice Beatley)

Plot 08

RESULTS

- 115 live ephemeral species observed.
- 4546 observations within 2560 quadrats.
- Ephemeral species richness averaged 4 species with range of 0 to 19.
- Ephemeral average cover 1.3% - 1.5%.
- Total species richness: 150 species observed, and 15 species to genus level.
- Most diverse plot: BC_N_008, subplot 2 with 55 species; least diverse plot: BC_S_042, subplot 4 with 4 species.

Conclusion

- Ephemeral cover was better in 2015
- A later start may have yielded even greater ephemeral cover
- Randomized sampling within study area would be better than starting in the south end of BCCE
- A repeat study of ephemeral data would benefit assessment of food resources for tortoises
- Few weedy species observed
- This is part of a larger covariate study and the data will be used as part of a fine scale predictive model for Desert Tortoise Occupancy

Questions ?

Grusonia parishii

Photo Credit:
Knight&Leavitt
Hermi Hiatt