NATIVE GRASSLAND STEWARDSHIP: AN ARCHETYPE FOR SUSTAINABLE MANAGEMENT

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INTRODUCTION

Fort Worth, Texas, is home to two significant tallgrass prairie ecosystems: the Blackland Prairie and the lesser-studied Fort Worth Prairie. Due to urban expansion, unsustainable agricultural practices, and the growth of the energy sector, less than 1% of these prairies remain (Robison et al., 1995). With over 93% of Texas land under private ownership, conservation strategies must actively engage stakeholders, particularly land managers (Texas Parks and Wildlife, 2025).

This study focuses on developing a management plan for the native prairie at the Botanical Research Institute of Texas (BRIT) within the Fort Worth Botanic Garden (Image 1). The plan is designed as a model for regeneratively managed prairies and ranches, integrating ecological restoration with sustainable land stewardship.

OBJECTIVES

This study evaluates plant composition and forage availability at the BRIT native prairie to guide a sustainable management plan. Specifically, it aims to:

- Assess species diversity and plant succession through a vegetation survey.
- Measure forage production to determine grazing potential.
- Develop a targeted grazing strategy using small ruminants to control invasive species and improve prairie health.

FIELD METHODOLOGY

The field methodology for this study involved several key steps to assess plant composition and forage availability. To document plant species and their distribution, four transect lines, each 40–50 meters long, were established across the prairie, with plant species recorded at 10-meter intervals (Image 2). For forage assessment, biomass samples were collected from 1m² plots at two representative locations to estimate forage production. In addition, soil composition, tree cover, and the presence of invasive species were observed and recorded to provide context for the management strategies. These data helped inform a comprehensive approach to prairie restoration and sustainable land stewardship.

Image 1.: BRIT Native Prairie, Source: *Google Earth*

RESULTS

The soil profile of the BRIT native prairie is primarily comprised of Frio Urban (FoUA) complex (~98.5%) and Sunev-Urban land complex (SvC)(~1.5%) soil types (Image 3). However, the introduction of off-site topsoil may have altered the original soil profile, potentially influencing plant growth and forage availability.

Eight plant species were identified, with ragweed (Ambrosia psilostachya, 32%) and Indiangrass (Sorghastrum nutans, 26%) being the most dominant (Table 1). Forage production was estimated at 8,030 lbs. of dry matter per acre, with 4,015 lbs. available for grazing under a 50% utilization protocol (Table 2). KR Bluestem (Bothriochloa ischaemum), an invasive species, was encroaching on the prairie, indicating the need for targeted control methods.

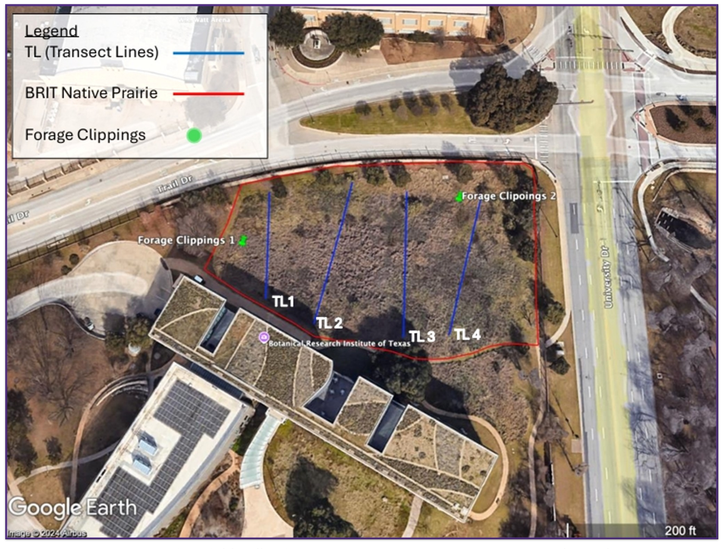

Image 2.: BRIT Native Prairie Field Collection Map via Transect Lines, Source: *Google Earth*

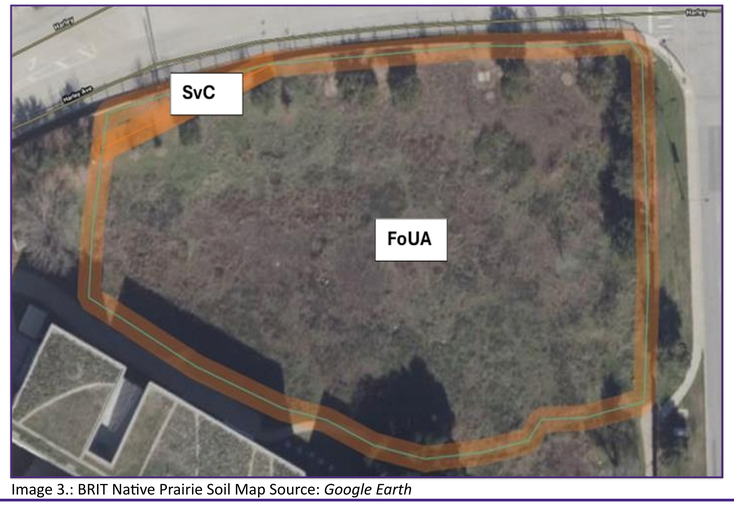

Image 3.: BRIT Native Prairie Soil Map Source: *Google Earth*

Plant Identified	Frequency	Percentage
Indian Grass	5	26%
Silver Bluestem	2	11%
Ragweed	6	32%
Aster	1	5%
KR Bluestem	2	11%
Goldenrod	1	5%
Jonson Grass	1	5%
Tievine	1	5%
TOTAL	**19**	**100%**

Table 1.: Identified Plant Species

Category	Species Composition	Weight (kg)	Moisture (%)	Actual Weight (kg)
FC1	98% Indian Grass, 1% Johnson Grass, 1% Ragweed	1.4	20%	1.12
FC2	75% KR Bluestem, 23% Johnson Grass, 1% Ragweed, 1% Goldenrod	0.82	20%	0.68

Table 2.: Forage Clipping Calculations

Forage Weight & Grazing Utilization Calculations

Average Weight/Acre =

Average Weight of Forage Clippings (oz) × m²/acre

Grazing Utilization =

Average Weight/Acre

RECOMMENDATIONS

- **KR Bluestem Encroachment:** Mechanical removal of grasses along prairie boundaries may be increasing KR Bluestem spread. Alternative management strategies should be explored to maintain plant diversity.
- **Tree Cover Benefits:** The trees along the prairie edge provide shade, wildlife habitat, carbon sequestration, and soil retention. Long-term monitoring and management are needed to preserve these ecological benefits.
- **Grazing Strategy:** Small ruminants, specifically goats, are recommended for rotational grazing over the next 2–3 years to control invasive species and improve soil health through hoof action.
- **Stocking Rates:** To utilize 4,015 lbs. of available forage, the prairie can support either 16 goats for 50 days or 30 goats for 27 days. These rates should be reassessed biannually based on prairie conditions.
- **Why Goats?** Goats are effective at consuming invasive plants like Ragweed and KR Bluestem while contributing to soil enrichment through organic matter deposition.

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