Algodones Project 25.13

Pre-Treatment Monitoring Report – 2025

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for the ***Greater Rio Grande Watershed Alliance*** and the ***Coronado Soil & Water Conservation District***

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Acronyms and Abbreviations

Acronym, Abbreviation, or Term	Explanation or Definition as used by NMFWRI
BEMP	Bosque Ecosystem Monitoring Program, small rectangular plot types
CSE	Common Stand Exam
CSWCD	Coronado Soil and Conservation District
GIS	Geographic Information Systems
GRGWA	Greater Rio Grande Watershed Alliance
NMFWRI	New Mexico Forest and Watershed Restoration Institute
NMHU	New Mexico Highlands University
NMRAM	New Mexico Rapid Assessment Method, version 2.0
NRCS	Natural Resource Conservation Service
QMD	Quadratic Mean Diameter
PC	Plot center
SWCD	Soil and Water Conservation District
TPA	Trees Per Acre
USDA	United States Department of Agriculture

1 Purpose of Report

This report covers high-intensity pre-treatment vegetation monitoring assessments performed on the Algodones non-native phreatophyte removal project submitted on behalf of private landowners by the Coronado SWCD (CSWCD) to the Greater Rio Grande Watershed Alliance in 2025. Following a discussion of the ecological context, and our monitoring methods, we present pertinent background, observations, and assessment results for the project.

2 Ecological Context of Bosque Restoration

Neither the challenges nor the importance of working in the bosque and other riparian areas in New Mexico today should be underestimated. According to the New Mexico Department of Game and Fish Conservation Services Division, wetlands and riparian areas comprise approximately 0.6% of all land in New Mexico (2012).

Despite this small percentage, it is estimated that an average of 55% of New Mexican vertebrate species (can be higher for certain taxa) depend on wetland and riparian habitat for their survival (New Mexico Department of Game and Fish Conservation Services Division, 2012). For example, the relatively few miles of riparian habitat of the San Juan and Gila river valleys helped support up to 17% of the avian species of the entirety of North America in the past, due to their use as feeding grounds for migrating birds (Hubbard, 1971). 62% of 117 vertebrate species in the Middle Rio Grande sampled in a RMRS study were found to be vulnerable to changes in their habitat (Friggens, M. et al, 2013). These areas also provide flood mitigation, filtration of sediment and pollutants, and water for a variety of purposes including groundwater recharge (Patten, 1998). In addition, native vegetation, such as cottonwood forests, holds cultural significance to many communities. As much as these areas are disproportionately important to ecosystems and human communities, they are equally disproportionately impacted by disturbance. Anthropogenic impacts with major consequences for our riparian areas include dams, reservoirs, levees, channelization, acequias and ditches, jetty jacks, riprap and Gabion baskets, urbanization, removal of native phreatophytes, grazing by domestic livestock, excessive grazing pressure by native ungulate populations absent natural predation cycles, beaver removal, logging, mining, recreation, transportation, introduction and spread of invasive exotic species, groundwater extraction, altered fire and flood regimes drought and climate change. (Committee on Riparian Zone Functioning and Strategies for Management, et al., 2002). Approximately 39% of our remaining perennial stream miles are impaired (New Mexico Department of Game and Fish Conservation Services Division, 2012).

New Mexico is fortunate enough to have the Middle Rio Grande Bosque, the largest remaining bosque in the Southwest (USDA USFS, 1996). However, over the past two decades, the number of fires in the bosque has been increasing. Historically, the primary disturbance regime in the bosque has been flooding, not fire, which means the system is not fire-adapted. In fact, native species like cottonwood resprout from their roots after floods and need wet soils to germinate from seed. Flooding also promotes decomposition of organic material and keeps the soil moist, which reduces the likelihood of fire. Today, overbank flow is uncommon in many areas of the Rio Grande due to the heavy alteration of the channel and flow regimes (two obvious examples are the structures defining the upper and lower extent of the Middle Rio Grande: Cochiti Dam and Elephant Butte Reservoir). This has led to low fuel moisture content and high fuel loads, as well as increased human presence in the riparian area. As a result, bosque fires are more common and more severe: they kill cottonwoods and other native species, creating spaces which are filled by non-native species such as salt cedar, Russian olive, Siberian elm, and Tree-of-Heaven.

Efforts geared toward the removal of these nonnative species can help to reduce fire risk, preserve native vegetation, and be part of a larger effort to restore the bosque and the watershed to a more natural and functional ecosystem. The Greater Rio Grande Watershed Alliance (GRGWA) has been working on these issues with a variety of collaborating organizations and agencies within the Rio Grande basin for several years. Since 2013, the New Mexico Forest and Watershed Restoration Institute (NMFWRI) has been working with GRGWA and the Claunch-Pinto Soil and Water Conservation District (SWCD) to begin construction of a geodatabase for all of GRGWA's non-native phreatophyte removal projects as well as to perform the formal pre- and post-treatment monitoring, utilizing the field methods explained below as well as LIDAR analysis where appropriate and available.

3 Monitoring and Field Methods

3.1 High-intensity Field Methods – CSE Plots

For post-treatment monitoring, we added additional riparian-adapted Common Stand Exams (CSE). CSE plot locations are synonymous with pre-treatment photo point locations where possible; in some cases, additional plots are established to reach the target sampling density. Once the plot location was determined, a 1/100- and 1/10-acre radius plot was established by placing pin-flags at 11' 9" and 37' 3" from the plot center in each cardinal direction. Photos were taken from plot center in each cardinal direction and from 75' north of plot center toward plot center. Ocular estimates were made of understory aerial and ground cover within the 1/10-acre plot. Overstory canopy cover was estimated using a concave spherical densiometer, with measurements made in four cardinal directions, at the edge of the 1/100-acre plot. This method provides an estimate of canopy cover for a 1/10-acre area centered on the plot. A Hink & Ohmart and modified Hink & Ohmart structure class was determined for the $1/10^{th}$ acre plot (see Appendix I). Finally, all plant species observed within the $1/10^{th-}$acre area with over 1% cover were recorded, as were other comments regarding conditions at the plot.

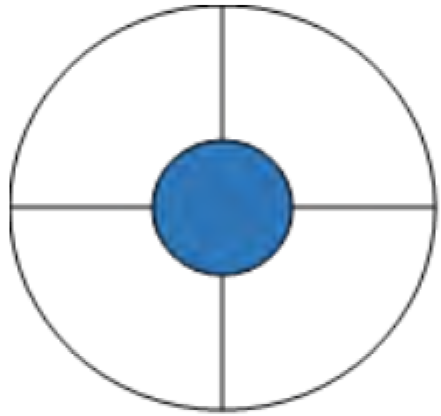


Figure 1: Example of CSE plot layout. The outer circle represents the 1/10-acre plot and the blue circle is the 1/100-acre plot.

3.2 Disclaimer

NMFWRI provides this report and the data collected with the disclaimer that the information contained in these data is dynamic and may change over time. The data are not better than the original sources from which they were derived. It is the responsibility of the data user to use the data appropriately and within the limitations of monitoring data in general, and these data in particular. NMFWRI gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. These data and related graphics are not legal documents and are not intended to be used as such. This includes but is not limited to using these data as the primary basis for the development of thinning prescriptions or timber sales. NMFWRI shall not be held liable for improper or incorrect use of the data described and/or contained in this report.

Analysis was also done according to our standard protocols. Note that the values reported in the tables are expressed on a per acre basis but represent only areas sampled. We do not scale up these values to calculate volume of wood over the project area and warn readers of this report that they are not intended for that purpose. The accompanying tables show summaries of our data, and some differences are discussed below; however, differences that seem apparent here may not stand up to rigorous statistical tests. For some estimates, the standard deviation exceeds the mean (i.e., the coefficient of variation is greater than 100 percent), and sampling errors for some estimates exceed 100 percent. Therefore, data should be used and results interpreted with appropriate caution.

3.3 Personnel Involved

2025 New Mexico Forest and Watershed Restoration Institute Monitoring & GIS Work:

- Abigail Han, Monitoring & GIS Specialist
- Jax Gaglianese-Woody, Ecological Monitoring Technician
- Clay Goetsch, Riparian Crew Lead

- Vincent Vispo, Assistant Crew Lead
- Emily Yannayon, Monitoring Specialist
- Kathryn Mahan, Monitoring Program Manager
- Corey Beinhart, Data Manager

Other persons contacted:

- Dierdre Tarr, District Manager for Claunch-Pinto SWCD, Greater Rio Grande Watershed Alliance
- Todd Haines, Field Coordinator, Greater Rio Grande Watershed Alliance
- Miriam Gagne, Coronado SWCD

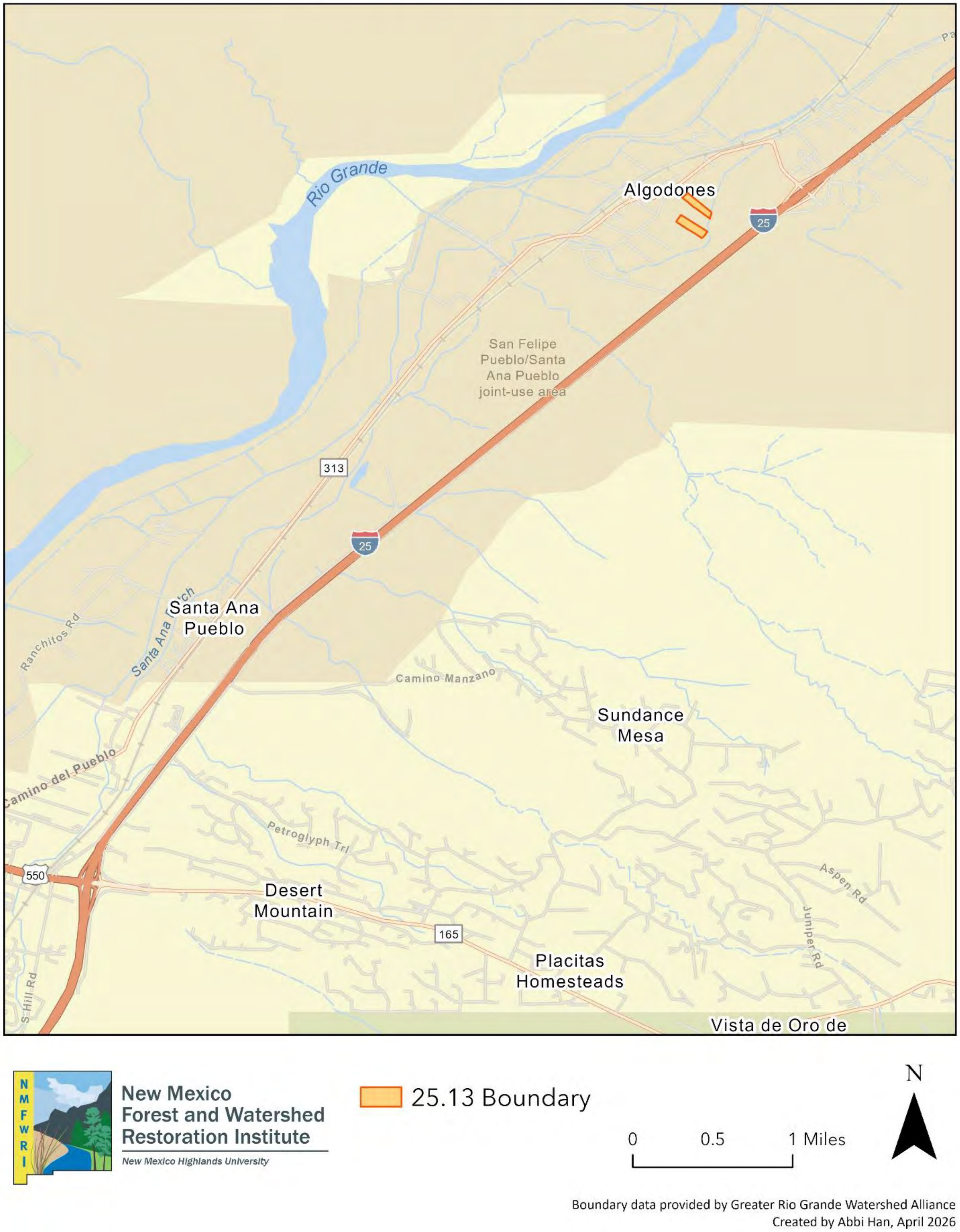
4 Algodones 25.13: Ecological Context and Project Background

The climate in Algodones ranges from an average high temperature during the summer of 93°F to an average low of 38°F. The town averages 12 inches of rain and 11 inches of snow per year, as compared to the US averages of 38 and 28 (*Algodones, NM Climate*, n.d.).

The 25.13 is on a site that is approximately 50% Jocity clay loam, 38% Gilco loam, and 12% Aga silty clay loam. It is in the "Bottomland, Cool Desert Grassland" ecological site (R042BE057NM) (USDA NRCS, n.d.). This site type was historically dominated by giant sacaton (*Sporobolus wrightii*) or alkali sacaton (*Sporobolus airoides*). Other common plants once included vine mesquite (*Panicum obstusum*) and sideoats grama (*Bouteloua curtipendula*). Woody species are typically limited to main streambeds. This historic plant community is highly suitable for domestic animal forage and is therefore often over-grazed, which leads to a succession in the plant community to one dominated by galleta, burrograss, and mat muhly. Animal species associated with this community include racoon, striped skunk, roadrunner, northern harrier, western diamondback rattlesnake, and fence lizard. Trees, when present, are important nesting habitat for mourning doves (USDA NRCS, USDA ARS, & NMSU, n.d.).

The Algodones 25.13 project area is old agricultural land next to the Algodones ditch, near the community of Algodones, NM. Treatment will be removal of mature Siberian elm trees growing along the field boundaries. It should be noted that the project boundaries presented in the following maps are based on in-the-field observations conducted by the monitoring team when visiting the site with Miriam Gagne. Official project boundaries were not yet established at the time of writing, and thus these maps may not represent the exact locations of phreatophyte removal subsequently negotiated with a contractor.

Project 25.13 Location



Map 1: 25.13 project location.

Map 2: Project 25.13 monitoring locations.

5 Monitoring Results

This site has two riparian-adapted CSE plots. The data from these plots is adapted and summarized below. There were no mature trees or regeneration on the randomly selected plots, as they fell within the agricultural fields. The tree rows surrounding these fields, where the phreatophyte removal will occur, were very similar in structure and species composition.

5.1 Regeneration

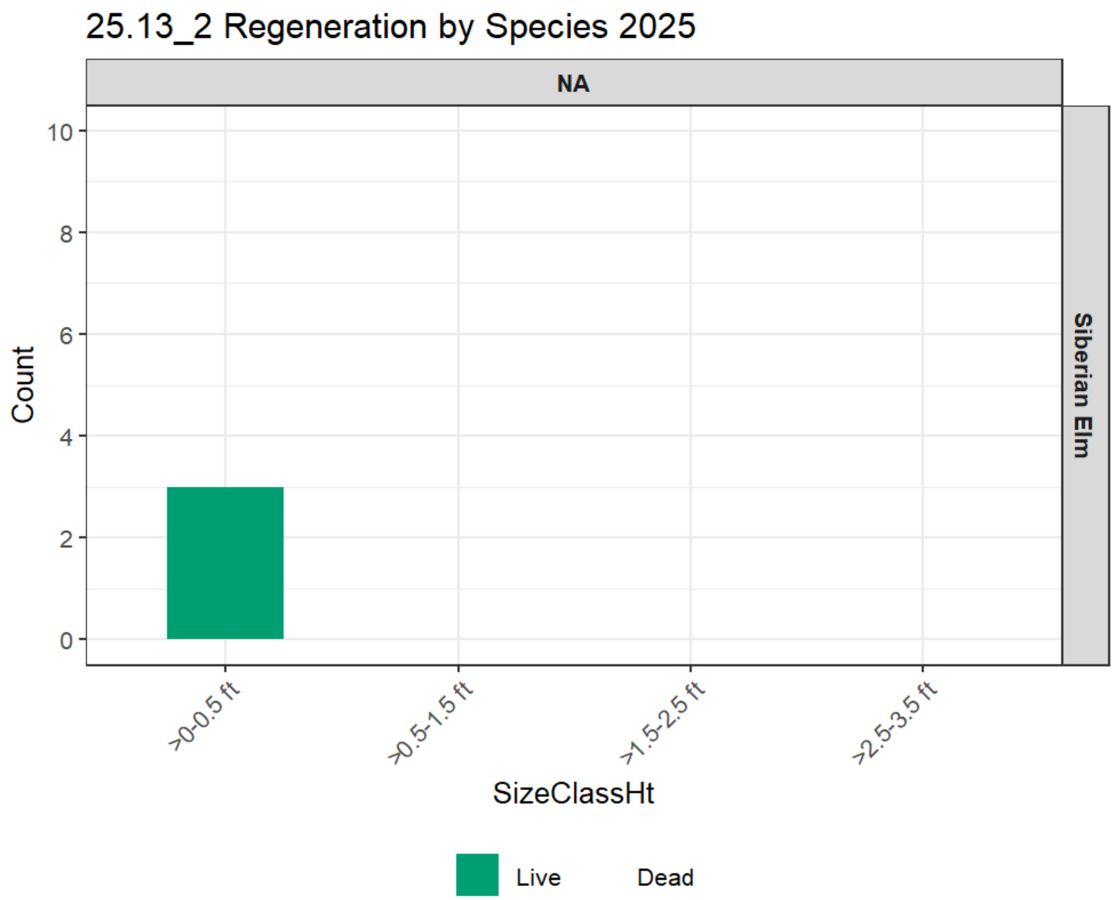
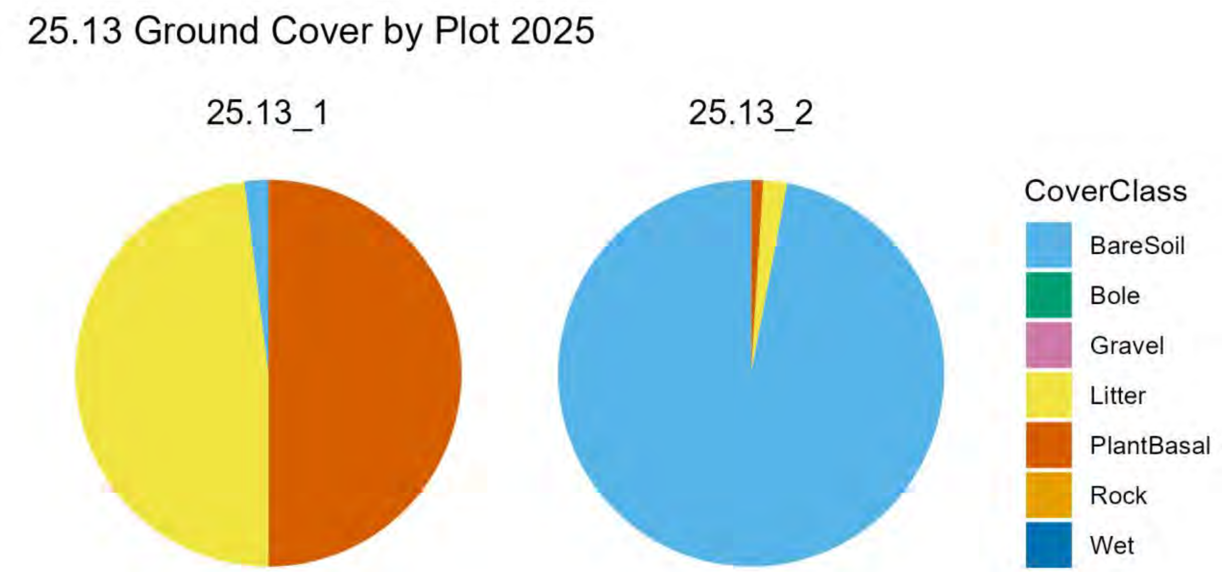


Figure 2: Tree regeneration count for plot 25.13_2.

Three Siberian Elm seedlings were counted in the 25.13_2 plot. No other seedlings or saplings were recorded in the project area.

5.2 Ground Cover



Project	Plot ID	Cover Class	% Cover
25.13	25.13_1	Wet	0
25.13	25.13_1	PlantBasal	50
25.13	25.13_1	Bole	0
25.13	25.13_1	Litter	48
25.13	25.13_1	BareSoil	2
25.13	25.13_1	Rock	0
25.13	25.13_1	Gravel	0

Project ID	Plot ID	Cover Class	% Cover
25.13	25.13_2	Wet	0
25.13	25.13_2	PlantBasal	1
25.13	25.13_2	Bole	0
25.13	25.13_2	Litter	2
25.13	25.13_2	BareSoil	97
25.13	25.13_2	Rock	0
25.13	25.13_2	Gravel	0

Figure 3: Ground cover by plot for the 25.13 project area.

These graphs, which appear to show that the monitoring plots were nothing alike, in fact mask a very fundamental similarity: they are both agricultural fields. Thus, the current plot conditions are due far more to divergent management of the land than to any difference in the biotic conditions surrounding the plots. Plot 1 is on a pasture which appears to be managed for grazing or fodder, and as such it has a high amount of plant basal area from grasses at 50%, with almost the entirety of the remaining half of cover coming from litter and the last fraction being bare. In contrast, plot 2 is in a field that is currently fallow and the plot was 97% bare.

5.3 Aerial Cover

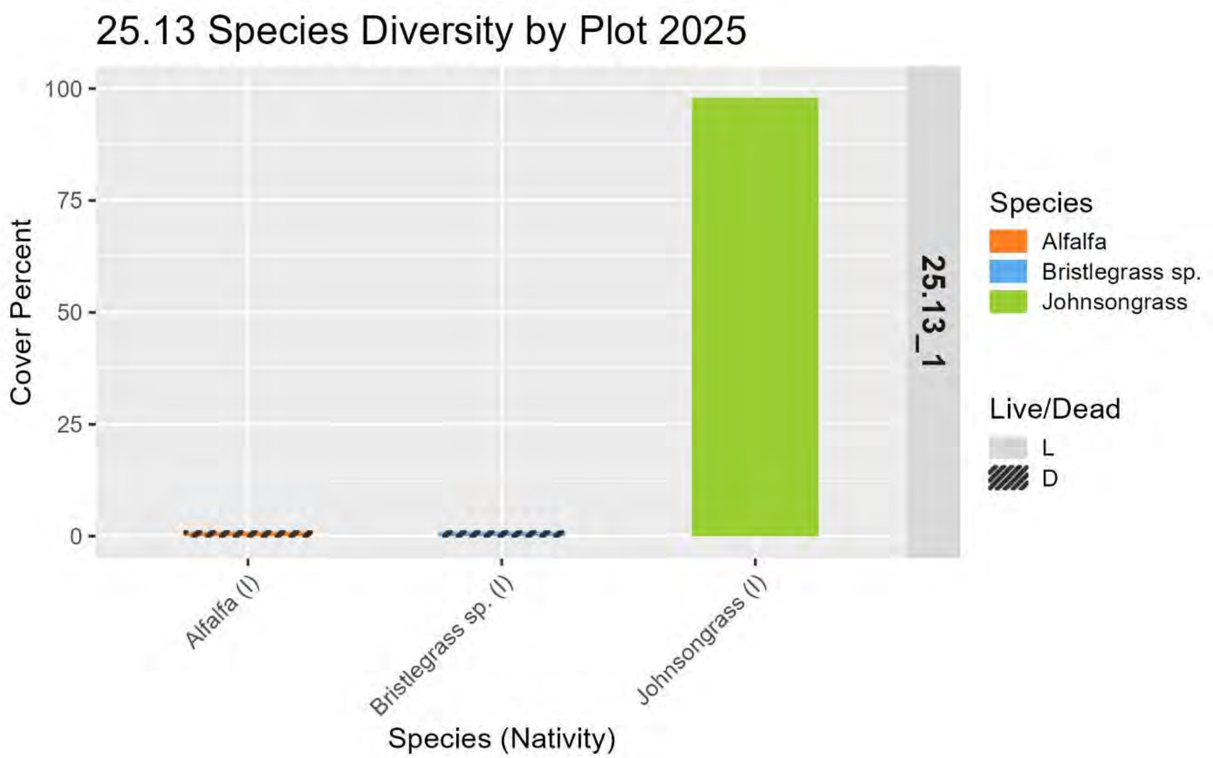


Figure 4: Aerial cover species on plot 1 in the 25.13 project area.

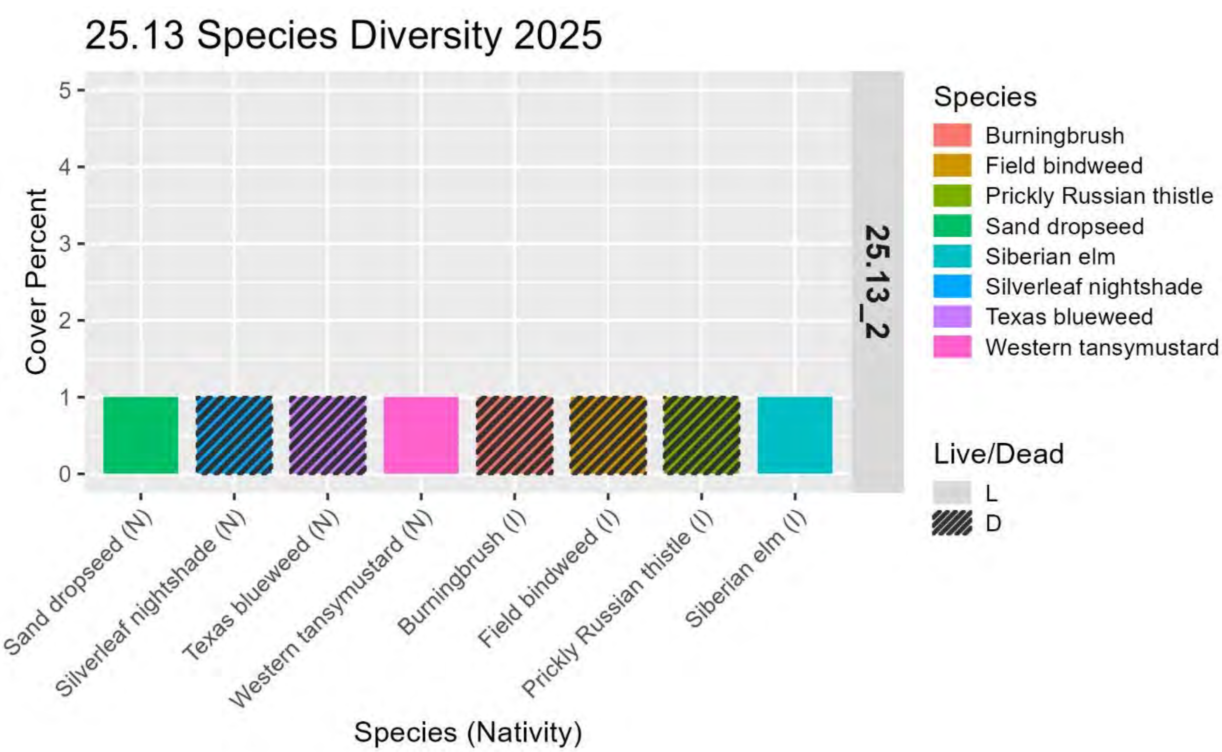


Figure 5: Aerial cover species on plot 2 in the 25.13 project area

Aerial cover on the two monitoring plots was also determined by the differences in their management. Plot 1 was dominated by Johnsongrass (*Sorghum halepense*) along with trace amounts of alfalfa (*Medicago sativa*) and bristlegrass (*Setaria sp.*). These are all non-native species. Johnsongrass, although originally introduced in the early 1800s as a forage species, has earned itself a reputation as a persistent and pernicious weed. One vegetation survey found it to be the most common herbaceous cover in cottonwood and willow communities along the Rio Grande in Texas (Howard, 2004).

Plot 2 had a smattering of native and non-native species in various stages of senescence. None were common, as the field was mostly bare, but natives included sand dropseed (*Sporobolus cryptandrus*), silverleaf nightshade (*Solanum elaeagnifolium*), Texas blueweed (*Helianthus cilaris*), and western tansymustard (*Descurainia pinnata*). The non-natives present were kochia or burningbush (*Bassia scoparia*), field bindweed (*Convolvulus arvensis*), Russian thistle (*Salsola tragus*), and Siberian elm (*Ulmus pumila*).

5.4 Soils

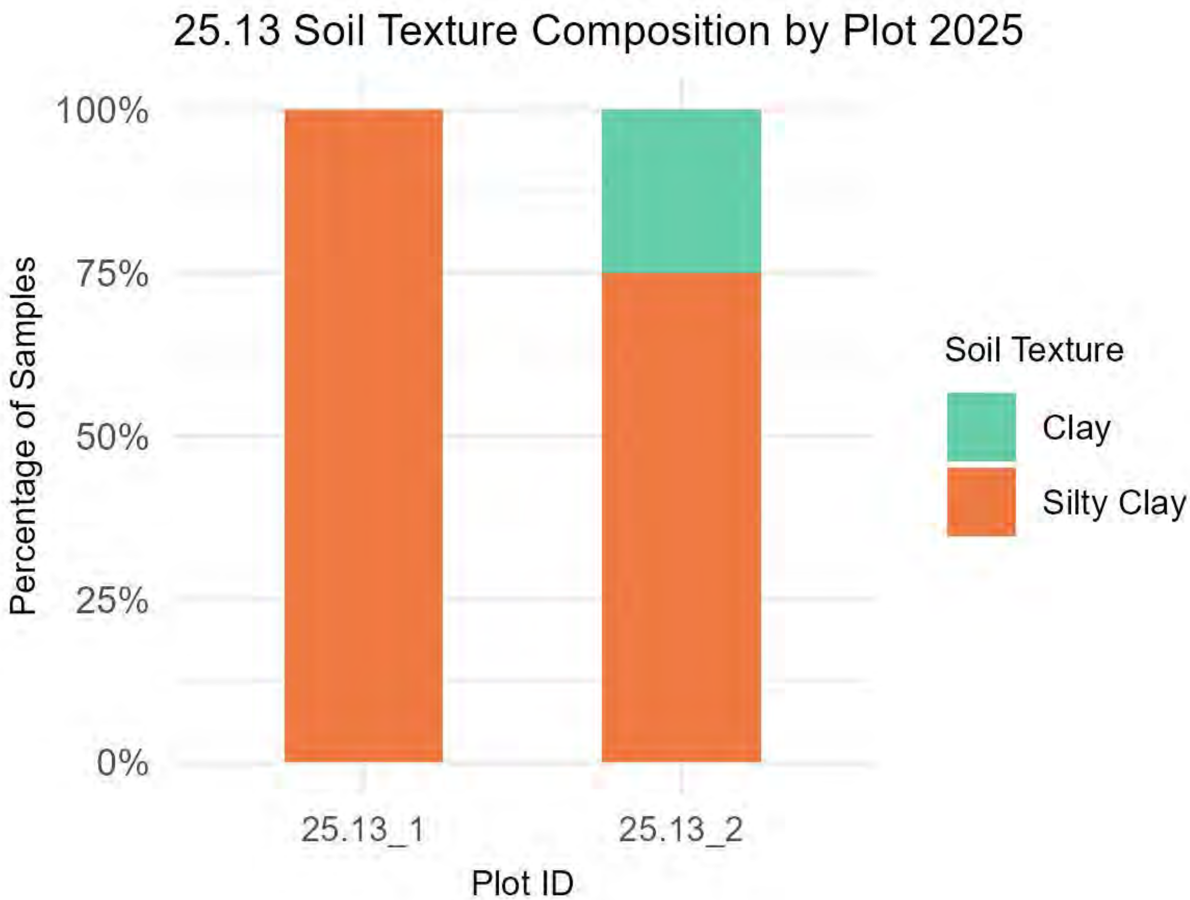


Figure 5: Soil texture by plot in the 25.13 project area.

Soil Texture Frequency:			
ProjectID	**Plot ID**	**Soil Texture**	**Frequency**
25.13	25.13_1	Silty Clay	4
25.13	25.13_2	Clay	1
25.13		Silty Clay	3

Table 1: Soil texture frequency by plot in the 25.13 project area.

Almost all soils tested in the project area were clay, with one instance of silty clay. Soil texture is a balance between particles of different sizes: sand (0.05-2mm), silt (0.002-0.05mm), and clay (<0.002mm) (Berry et al., 2007). Soils in this project area primarily consist of extremely fine particles, meaning that while they may contain important nutrients they are also susceptible to compaction and wind erosion and may suffer from issues with water percolation and aeration.

5.5 Surface Fuels

25.13 Fuel Density by Plot 2025

Summary of Estimated Downed Woody Debris in Tons Per Acre

		Tons Per Acre			
		FWD			CWD
Project ID	Plot ID	1-hr	10-hr	100-hr	1000-hr
25.13	25.13_1	0.00	0.00	0.00	0.00
25.13	25.13_2	0.06	0.00	0.00	0.00

Note: FWD = Fine Woody Debris; CWD = Coarse Woody Debris.

Table 2: Fuels by plot in the 25.13 project area.

There were effectively no fuels on the monitoring plots in this project area. However, plot 1 has dense grass that could carry a flashy fire under the right conditions, and both fields are hemmed by tree rows that contain some dead and down wood.

6 Data Summary

The 25.13 project area in Algodones is characterized by historical agricultural land use and is bordered by windrows consisting of primarily Siberian elm (*Ulmus pumila*). Monitoring plots did not capture the windrow stands except in the background of photopoints taken on plot (see Appendix II). Pre-treatment monitoring indicates an absence of trees, with only three Siberian elm seedlings recorded on plot 25.13_2. Understory diversity is low, with plot 25.13_1 being dominated by johnsongrass (*Sorghum halepense*), while plot 25.13_2 consists primarily of bare soil and few grasses and forbs.

Fuels on this project are negligible, consisting only of trace fine woody fuels on plot 25.13_2 and an absence of woody debris on plot 25.13_1. However, the presence of dense johnsongrass on plot 25.13_1 constitutes a high-load, fine-fuel environment that may present a risk for rapid-spread fire behavior.

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Appendix I - Modified Hink and Ohmart categories

The following are examples of the modified Hink & Ohmart Vegetation Vertical Structure Type Definitions categories with text from (Muldavin E. , 2021). All photos credit NMFWRI.

Multiple-Story Communities (Woodlands/Forests)

Type 1- High Structure Forest with a well-developed understory. Trees (>6 m) with a canopy covering >25% of the area of the community polygon and woody understory layer of tall shrubs or short trees (1.5-6 m) covering >25% of the area of the community (polygon). Substantial foliage is in all height layers.

Type 2 -Low Structure Forest with little or no understory. Trees (>6 m) with canopy covering >25% of the area of the community polygon and minimal woody understory layer (1.5-6 m) covering <25% of the area of the community (polygon). Majority of foliage is over 7 m above the ground.

Single-story Communities (Shrublands, Herbaceous and Bare Ground)

Type 5 -Tall Shrubland. Young tree and shrub layer (1.5-6 m) covering >25% of the area of the community polygon. Stands dominated by tall shrubs and young trees, may include herbaceous vegetation underneath the woody vegetation.

Type 6S- Short Shrubland. Short stature shrubs or very young trees (>1.5 m) covering >25% of the area of the community (polygon). Stands dominated by short woody vegetation, may include herbaceous vegetation among the woody vegetation.


Type 6W- Herbaceous Wetland. Herbaceous wetland vegetation covering >10% of the area of the community polygon. Stands dominated by obligate wetland herbaceous species. Woody species absent, or <25% cover.


Type 6H- Herbaceous vegetation. Herbaceous vegetation covering >10% of the area of the community polygon. Stands dominated by herbaceous vegetation of any type except obligate wetland species. Woody species absent or <25% cover.


Type 7-Sparse Vegetation, Bare Ground. Bare ground, may include sparse woody or herbaceous vegetation, but total vegetation cover <10%. May be natural disturbance in origin (e.g., cobble bars) or anthropogenic (e.g., roads).

Appendix II – 25.13 Algodones Plot Photos

Plot 25.13_1


25.13_1_C


25.13_1_N


25.13_1_E


25.13_1_S


25.13_1_W


25.13_1_BR100


25.13_1_BR216

Plot 25.13_2


25.13_2_C


25.13_2_N


25.13_2_E


25.13_2_S


25.13_2_W


25.13_2_BR108


25.13_2_BR314