



El Chaparral Riparian Restoration Project

A Hinkson Creek CAM Project

Annual Monitoring Report

Year 3

December 2020

Section 1. Pre-Existing Site Conditions

The former BCRSD wastewater lagoon site located on South Fork Grindstone Creek and adjacent to El Chaparral Sub-division was closed and seeded to fescue in 2008-2009. The 6.9 acre site was deeded to the City of Columbia in April 2010. The site is currently managed by Columbia Parks and Recreation.

The area of the decommissioned lagoon (where the majority of restoration effort has been focused) is approximately 2.5 acres in size with approximately 550 feet of creek bank. The lagoon footprint was dominated by fescue (*Festuca arundinacea*) turf with a few herbaceous forbs and sedges (see partial list). The site had been allowed to go fallow since Parks and Recreation took over management. The existing riparian corridor at the site was an average of 50 feet in width and was dominated by Sycamore and the invasive shrub species, bush honeysuckle and autumn olive. There were other tree species, including black walnut, but they were a small component and not significant. It was determined that the entire reach associated with the lagoon site would benefit from some native tree and shrub diversity.

Areas upstream and still on the property have older second growth timber with good diversity, including American basswood, swamp white oak, hickory spp., northern red oak, etc. The entire site has a typical problem with invasive shrubs. The lagoon site, likely due to the suppressive nature of fescue, did not have a worrisome component of invasive plants. However, it was (and still is) surrounded by woods that have a heavy component of shrub honeysuckle, Japanese honeysuckle and some autumn olive.

Section 2. Work Plan

The basic plan is to construct a stormwater treatment wetland and restore a broader riparian corridor and adjacent buffer areas. The riparian corridor will be restored by first establishing a vegetative ground cover that mimics a typical floodplain in the Grindstone watershed. This will be a mix of floodplain grasses and forbs e.g., Virginia wild rye, river oats, wingstem, cup plant, etc.

The tree and shrub component will likewise mimic nearby relatively undisturbed riparian habitat. There are areas downstream that are relatively undisturbed. The over story species are diverse, e.g. swamp white, northern red, white and chinkapin oaks, sycamore, black walnut, hackberry and basswood. The under story is still fairly interesting having a good mix of small trees and shrubs, e.g. ironwood, black haw, dogwood, buckbrush and buckeye. Although to a lesser extent than most, these areas do have a relatively troublesome presence of both bush honeysuckle and autumn olive.

- The plan to restore the El Chaparral site to a native riparian, floodplain emergent marsh, and savannah with a species mix that mimics riparian areas adjacent to the site is currently underway. This is being accomplished by using native seed mixes, containerized trees and shrubs, and minor site grading. The project should create quality habitat as well as stormwater treatment. Invasives control is also being included in the restoration work.

Section 3. Work performed in prior Reporting Periods

- Work to eliminate the existing ground cover has been completed. The primary goal of this operation was to eliminate as much of the fescue ground cover as possible. It was anticipated that the presence of a native plant seed bank would persist and be helpful in the native reconstruction of the site. This action was carried out using glyphosate herbicide and was done in three treatments. This action was completed in October 2017.
- During November 2017, all of the grown out trees and shrubs were planted at the site. We were also fortunate to have a surplus of native forb (flowering plants) container grown plants to plant at the site. This was also completed at this time.
- Seeding was done in two stages during the mid and late winter. The prairie forb mix was seeded in early January 2018 and the native grass mix was seeded in early March 2018.
- Stormwater facility construction was carried out during the second and third weeks of February and the first week of March 2018. This consisted of building a new junction box within an existing stormwater pipe in order to divert water from direct flow into South Fork Grindstone Creek to a detention swale/level spreader for wider dispersion over the riparian floodplain. Utility staff will continue to monitor the site and make adjustments as necessary.
- Ongoing invasive plant control as detailed in prior reporting period

Section 4. Work performed during current Reporting Period

The following actions were conducted at the site this past year:

- Invasives control has been an ongoing activity at the site. This has been carried out through volunteer events and utility staff spot spraying when time allows. This will continue at times when suitable for both volunteer comfort and staff availability. To date, four (4) volunteer days (2018-2019) to remove bush honeysuckle have been carried out. There were no volunteer events at the site during 2020 due to Covid-19. It is hoped that these activities can resume during 2021.
- Site monitoring

Section 5. Work planned for next Reporting Period

The following actions are expected to be completed at the site this upcoming year:

- Site Monitoring – An effort will be made to locate and better identify live trees and shrubs.
- Supplemental planting of trees and shrubs, Spring 2021
- Ongoing invasive plant control

Section 6. Summary

The site is at the end of its third growing season and is, by nature, a wet site. The soil material that remains from the lagoon closure is very tight and heavy in clay and largely hydric, meaning it is often saturated resulting in anaerobic conditions (low oxygen). Therefore, the site conditions are suitable for wet tolerant plants. The existing seed bank is proving to be just this with a good stand of typical flood plain species growing at the site. These include but are not limited to, Wingstem, Cup Plant, Tickseed Sunflower (*Bidens*, possibly two species) and native sedge species.

Rainfall was slightly above average this year. With the amount of rainfall the site has received this year, there is very good growth of plant species that were included in the native seed mixes. Some of the new plant species observed at the site include Swamp Milkweed, Blazing Star, Wild bergamot, Tickseed Coreopsis, Grey Headed Coneflower, Golden Alexander, Switchgrass, Little Bluestem, Foxglove Beardtongue and Willowleaf Sunflower to name a few. Combined with the existing seed bank, the site is developing very good plant diversity. The stormwater BMP is also developing a nice suite of emergent plants including Rose Mallow, Water Plantain, Cardinal Flower, Softstem Bulrush and several sedges. The trees and shrubs planted as part of the restoration effort have also seen a good rate of survival, including those originally planted in 2017 and those planted in 2018. Tree growth was very good this year. It is expected that this will improve with time.

Even with the current success of the seeding and planting efforts, this is a difficult site for restoration. The soils and seed bank in some regards have proven to be a challenge. One example is the high percentage of Bull Thistle/Canada Thistle (*Cirsium vulgare*/*Cirsium arvense*) seedlings and second year plants that made themselves known throughout the site. An aggressive control program has been initiated to get ahead of this infestation. There is still much Bush Honeysuckle removal to be done, and the City hopes to organize volunteer removal days as staff time allows.

Overall, the site is developing nicely, though in retrospect, an additional year of site prep (spray treatments) might have been beneficial. The City will continue to manage and monitor the site.

Section 7. Photographs



Figure 1. Aerial of Site before spraying 6/6/2018



Figure 2. Typical of ground cover prior to treatment 10/26/2016



Figure 3. Typical of Site post spray treatment 10/12/2017



Figure 4. Tree and shrub planting day 11/13/2018



Figure 5. Volunteer day, Bush honeysuckle removal 5/29/2019



Figure 6. Stormwater swale during construction 2/13/2018



Figure 7. Stormwater swale summer 2020 7/20/2020



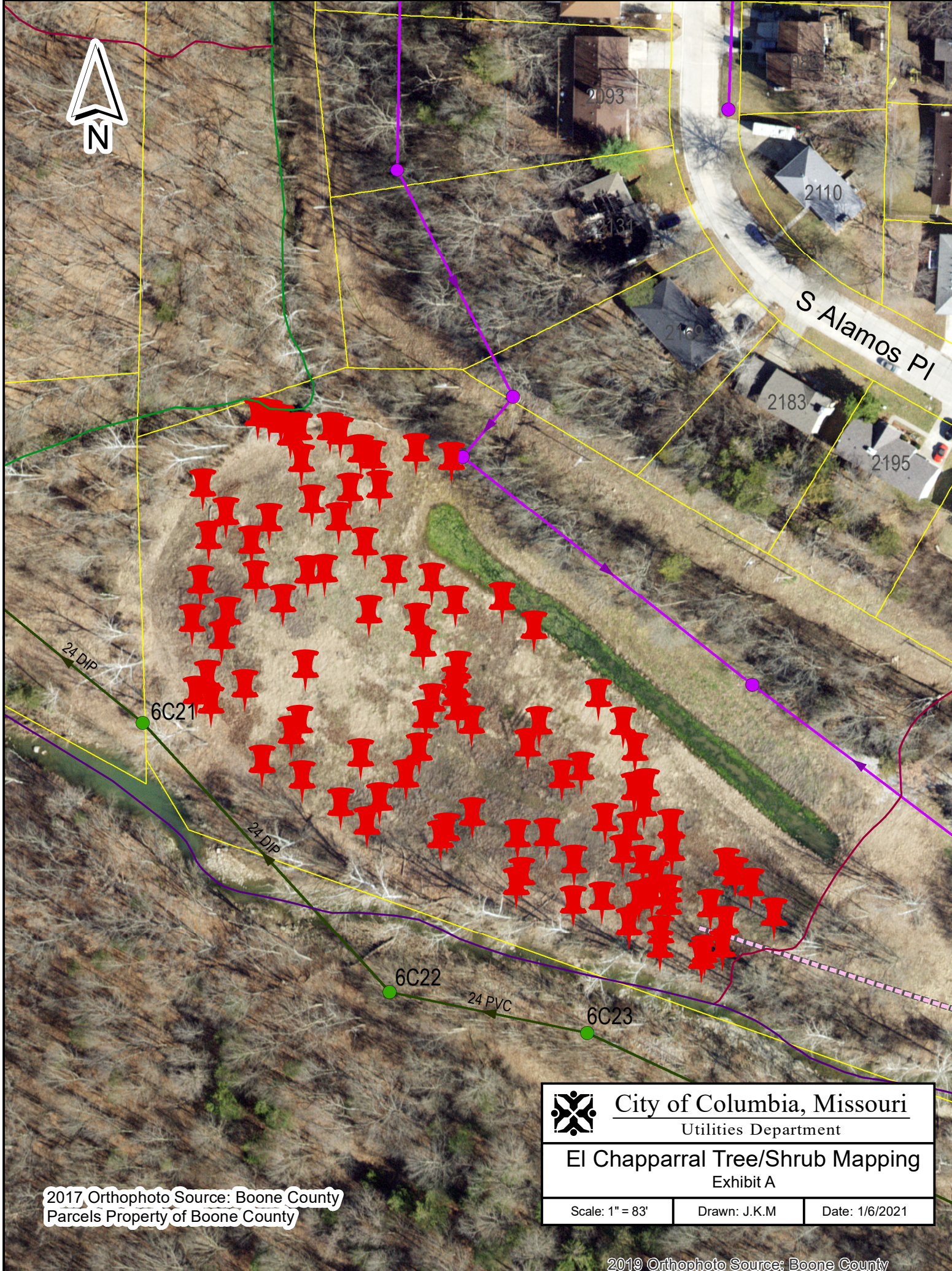
Figure 8. Flowering native plants early in third growing season 7/8/2020



Figure 9. Tree with flowering native plants and grasses. Tree planted fall 2018. 6/22/2020



Figure 10. Native flowers and grasses, Summer 2020. 7/8/2020



2093

2110

2131

2169

2183

2195

S Alamos Pl

24 DIP

6C21

24 DIP

6C22

24 PVC

6C23



City of Columbia, Missouri
Utilities Department

El Chapparral Tree/Shrub Mapping
Exhibit A

Scale: 1" = 83'

Drawn: J.K.M

Date: 1/6/2021

2017 Orthophoto Source: Boone County
Parcels Property of Boone County

2019 Orthophoto Source: Boone County