

**McDowell Sonoran Conservancy Parsons Field Institute**

**Scope of Work #2 Invasive Plant Removal Assessment - Summary Report 2020**

Project #18-RP-009 - On-call Services for McDowell Sonoran Preserve Analysis & Assessment

**Background and Project Objectives**

Buffelgrass and fountain grass are two non-native, invasive plants of concern in the McDowell Sonoran Preserve. The Preserve is surrounded by a considerable and growing built environment, which has contributed to the influx of these two species. These bunchgrasses are highly productive and spread quickly across the landscape, creating extreme fire risk. The Sonoran Desert is not adapted to fires. Historically, ignition sources were limited, and flames were unable to spread across the landscape due to natural open spaces between vegetation. However, developed areas around the Preserve have increased the risk of fire ignition (e.g., through sparks from the road or cigarettes), and buffelgrass and fountain grass, which rapidly fill in the natural open spaces between plants, allow the flames to spread rapidly. Three major fires occurred in the Preserve in the past, damaging the landscape and endangering public safety. In 2020, a wildfire occurred just outside the boundary of the Preserve in McDowell Mountain Regional Park, and another was nearby to the north.

Buffelgrass and fountain grass also compete with native plants for light and nutrients and negatively affect local wildlife. Both species are recognized by the State of Arizona and Tonto National Forest as noxious weeds. The City of Scottsdale and other land managers actively seek to control these two plant species. Identifying where these grasses occur and the best removal techniques are essential for controlling these species.

The objectives of our SOW #2 projects are two-fold: 1) to survey, remove, and monitor buffelgrass and fountain grass across the Preserve and 2) to determine the most efficient removal options to effectively control these two invasive species on the Preserve.

**Approach**

**Project #1: Survey, remove, monitor**

To document where non-native species occur within the Preserve and to prioritize removal sites, we use ArcGIS Collector to collect data in the field regarding presence, growth stage and abundance of invasive species. This year, we upgraded app features so that we could better track our survey and removal efforts and facilitate ongoing monitoring of the same areas. We trained citizen scientists to identify these invasive plants and to use the app.

In the past year, we continued our efforts to map additional populations of non-natives, with a focus on washes in the far south area of the Preserve where we believe populations of the non-native grasses are likely to be found. We have used survey results to identify hotspots of buffelgrass and fountain grass for removal priorities (see below). Six stewards were trained and state certified as herbicide applicators, and we shifted the focus of our removal efforts from physical removal to herbicide application. We conducted 23 large-scale buffelgrass and fountain grass removal and treatment projects over the past year, as well as removal of several individual plants or small groups of plants. To date, we have removed invasives, including a

small amount of annual plants such as Sahara mustard and globe chamomile, from more than 60 acres in the Preserve. We continue to revisit these removal areas annually to survey and remove new/missed plants. Each year, fewer new plants are observed in areas where we have completed prior treatments, and we have already had numerous successes where we are not seeing new growth.

Due to the lack of monsoon rains, continued surveys and removals did not occur this fall but will resume once the Preserve received adequate precipitation.

**Project #2: Removal experiments**

To help determine the most effective removal options for fountain grass and buffelgrass, we established 25m<sup>2</sup> plots in 2018 to test different removal techniques of fountain grass in Quartz Wash and buffelgrass at Brown’s Mountain. Our goal is to determine efficacy, costs, required time commitment, and effect on the native plant community of different treatment options. Each spring, we survey the plant community within each plot so we can assess efficacy of subsequent treatments, as well as how the treatments affect both native and non-native plant species. We then conduct removal treatments, which include different combinations of pulling, cutting, and herbicide. Surveys and treatments occur annually, with some plots receiving more than one treatment per year. In 2020, we completed our plant surveys in March and applied treatments in the spring. In fall, only two fountain grass plots showed growth and received treatments. Due to lack of monsoon rains, buffelgrass did not green up, so fall treatments were not applied.

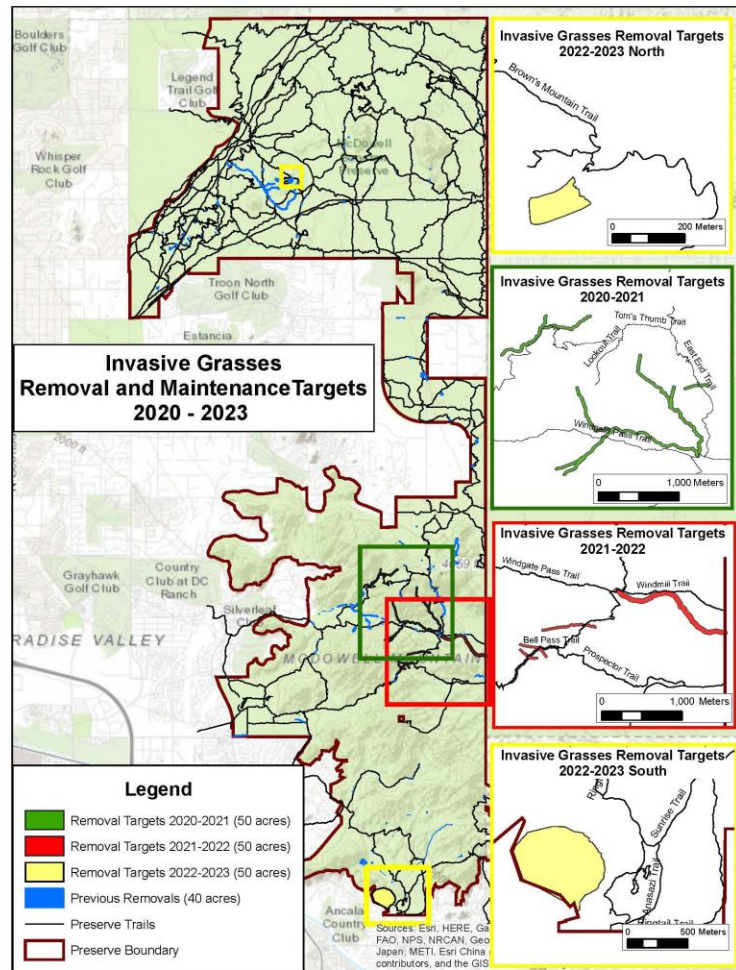


Figure 1. Map of the prioritized removal sites for the upcoming three years. Note that 40 acres of previous removals will continue to be monitored and treated over time. This number will grow as new areas are treated.

## Summary of findings

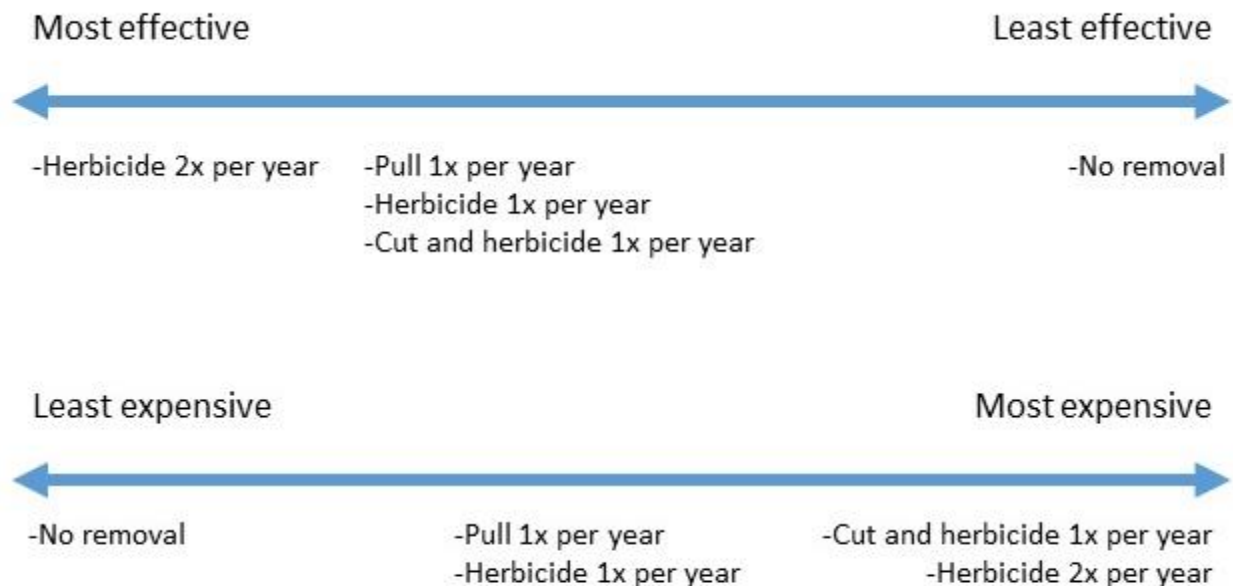
### **Project #1: Survey, remove, monitor**

Buffelgrass and fountain grass are distributed across the Preserve. We've found that the densest areas of fountain grass occur in washes in the southern section, whereas buffelgrass occurs in many different terrain types. Through this year's survey efforts, we updated our hotspot maps and prioritized removal efforts for 150 acres in the Preserve for the upcoming three years (see map).

### **Project #2: Removal experiments**

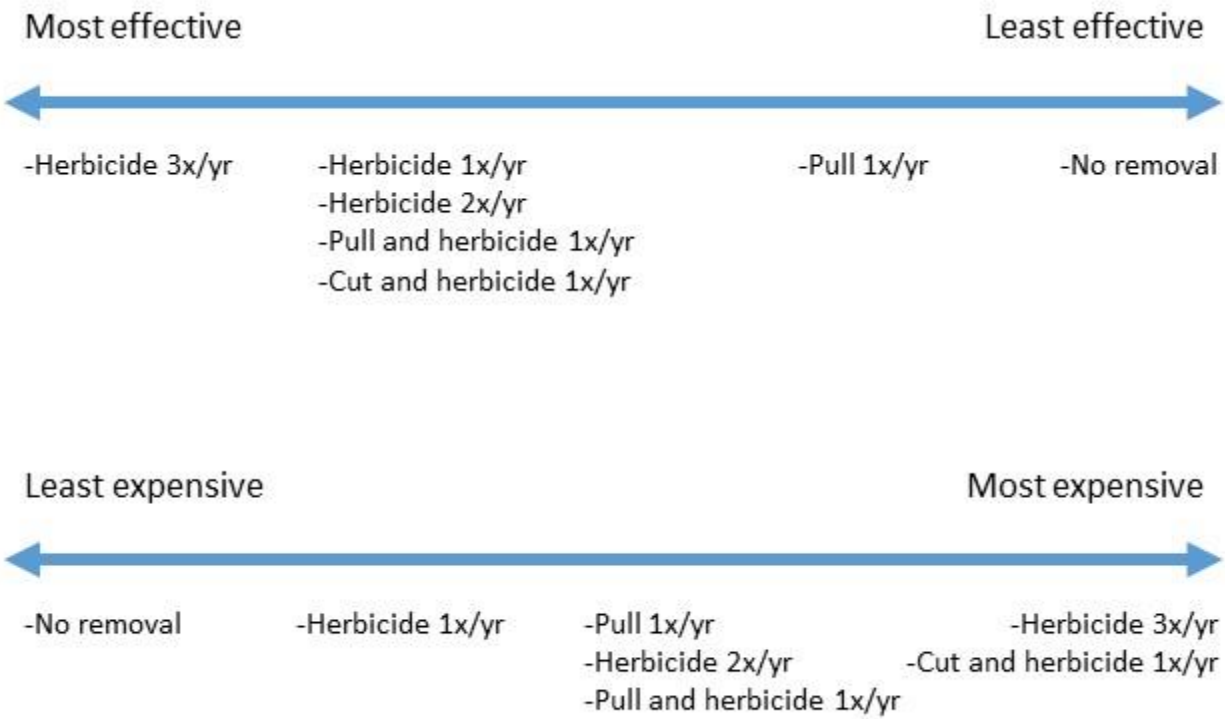
#### *Fountain grass*

At this point in the fountain grass removal experiment, we are finding that the treatments have similar effectiveness. The cost (including preparing herbicide materials, travel time for hiking, supplies, and actual removal time) is highest for the treatments requiring multiple trips per year.



#### *Buffelgrass*

In the buffelgrass experiment, applying herbicide three or more times per year has been the most effective. However, this is also the most costly treatment due to the need for multiple visits.



**Recommendations**

Project #1: For 2021, we recommend prioritizing removals within the hotspots we identified as well as continued monitoring and removals within previous large-scale removal sites. **We encourage the City to supplement our efforts with the use of contractors to remove these invasive species more quickly.** The efforts of the contractors will be towards new removals, whereas the Conservancy efforts will focus on continuing to survey trails and washes to identify presence of invasives and revisiting and retreating past large-scale removal project sites.

Project #2: This year’s results indicate that applying herbicide multiple times per year is most effective for controlling buffelgrass, although this may not be feasible in difficult-to-access areas or sites that require long-distance travel. For fountain grass, pulling and herbicide both appear to be effective; which of these treatments to use depends on terrain and travel distance. For both species, time of year is also an important consideration because herbicide is only effective when plants are at least 50% green. We recommend continued sampling and treatments within our experimental plots as the third-year data reported here reflect efficacy based on intermediate results. We cannot conclude which treatment will be most effective until we stop seeing new invasive species growth in the plots. At that time, we can also analyze our full dataset and evaluate which treatment best protects the native plant community.





Use of herbicide allowed us to conduct removals across large areas in Spring 2020, such as this population of buffelgrass in the Lost Dog area of the Preserve. Blue dye is used to ensure adequate coverage of the non-native species.