

FIRE MANAGEMENT

Buffelgrass Removal, Fire, and Climate Adaptation at Saguaro National Park



Buffelgrass (*Cenchrus ciliaris*) is a warm-season, non-native, invasive perennial grass that was introduced to the Southwestern U.S. for livestock grazing and to help reduce soil erosion. Buffelgrass poses a serious threat to native Sonoran Desert ecosystems by crowding areas of naturally sparse vegetation and by creating a highly flammable fuel source for disastrous wildfires. The native plant and animal species of the Sonoran Desert do not have the adaptations to withstand fire. Saguaro National Park (SNP) seeks to remove invasive buffelgrass from the desert ecosystems in the park to reduce the risk of high-severity wildfires and restore native landscapes.



KEY ISSUES ADDRESSED

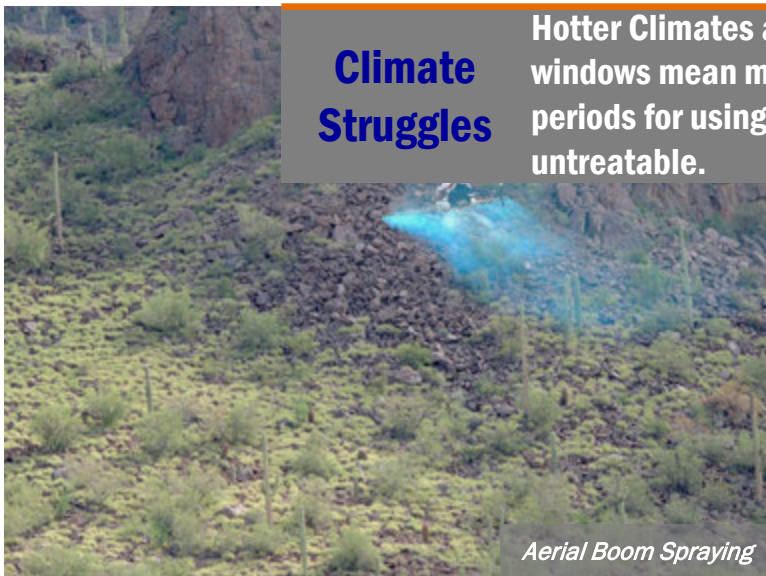
Buffelgrass decreases native plant diversity by competing for resources and creating large colonies that can spread across hundreds of acres of undisturbed desert. Seed dispersal via wind, animals, and humans allows buffelgrass to establish new colonies at great distances from mother plants and convert the native low-desert ecosystem to a scrub-desert grassland. Buffelgrass increases the risk of high-intensity wildfires that can spread across biomes and threaten native plants in both higher elevation forests and low-elevation desert ecosystems, where fire-susceptible saguaros live. Furthermore, warmer winters and hotter summers create additional buffelgrass germination periods, increase the risk of frequent, high-intensity fires and prolong fire seasons. Because of increased fire risk in the low-desert, private landowners who reside near SNP face threats of damage by wildfire and post-fire flooding.

PROJECT GOALS

- Reduce fire threats caused by buffelgrass
- Reduce buffelgrass presence and restore native desert ecosystems in Saguaro National Park
- Educate and involve the public in restoration efforts

Climate Struggles

Hotter climates and more frequent, shorter annual green-up windows mean more seedling germination events, but shorter time periods for using herbicides before buffelgrass dries up and is untreatable.



Aerial Boom Spraying

PROJECT HIGHLIGHTS

Chemical Treatment: Trained staff and volunteers at SNP spray large patches of green buffelgrass with glyphosate-based herbicides during summer months. Staff and volunteers use backpack sprayers. Aerial boom spraying is used when buffelgrass covers 50% or more of an acre, and aerial spot spraying is used on smaller, denser patches. Due to neighbors along park borders, aerial spraying is kept ¼-mile from inhabited private land. This causes buffelgrass buildup along park boundaries.

Community Buffelgrass Pulls: Volunteer buffelgrass pulls run from fall to spring, especially during the community-wide Save Our Saguaros Month in February. Involving the public through long-term volunteer programs such as Adopt an Area and Weed Free Trails let SNP focus efforts on other high-risk areas. Long-term volunteers are invaluable to the work at SNP.

Buffelgrass Mapping: Treatment mapping and systematic ground mapping are used to track infestations as well as treatment of buffelgrass and other invasive plants that create hazardous fuel loads.

Increasing Public Awareness: SNP uses social media posts, the official SNP website, and frequent outreach events to spread awareness and information about the threats of buffelgrass to native plant and animal communities, as well as to recruit more volunteers.

Collaborators

- Saguaro National Park
- NPS Southwest Invasive Plant Management Team

CART Author: Alexandra Gerber, University of Arizona, November 2023.

Photos courtesy of National Park Service
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Visit CART:



LESSONS LEARNED

Herbicides can effectively treat large areas invaded by buffelgrass, but can damage or kill native plants that are sensitive to herbicides and green-up when buffelgrass does. Active restoration may be required if there is low plant density and the native seed bank is depleted in buffelgrass colonies exceeding 100 acres. Helicopter usage for chemical spraying is limited by wind speeds, summer heat, amount of daylight, and costs. Additionally, SNP's herbicide application does not fit clearly within existing regulations, and a variety of state and federal rules and regulations must be followed before chemical spraying treatments can be prescribed. Due to these conditions, SNP is interested in exploring uncrewed aircraft systems (UAS), such as drones, to help navigate the park's rugged terrain. SNP may leverage projected future conditions of increased temperatures and water scarcity to passively manage remote buffelgrass colonies. During the record dry year of 2020, the extremely hot and dry conditions weakened buffelgrass. SNP strategically used chemical and manual efforts to restore natural fuel conditions that act as fuel breaks to stop fire from spreading across the landscape.

NEXT STEPS

- Removal additional species of invasive plants
- Develop strategies to remove buffelgrass in areas that are remote and difficult to access
- Revisit remote sensing capabilities to detect, map, and monitor buffelgrass accurately
- Assess use of UAS for aerial herbicide treatment
- Continue collaboration efforts with community groups and the public

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SNP Crew Spraying Dense Buffelgrass