

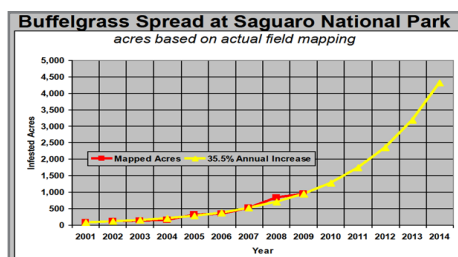


Buffelgrass Management

Saguaro National Park is located in the scenic southwest Sonoran Desert. Visitors from around the world are drawn to the park's iconic southwestern landscape, characterized by a wide diversity of plants and animals including the giant saguaro cactus. Today, this desert is becoming increasingly threatened by buffelgrass (*Pennisetum ciliare*), a perennial grass native to Africa.

Background

Buffelgrass was introduced for cattle forage and erosion control beginning in the 1940's with plantings occurring throughout the state. It is spreading rapidly across the Sonoran Desert and poses an immediate threat to this ecosystem. Invasive buffelgrass alters natural ecological processes, competes with and excludes native plants, alters wildlife habitat, and increases the frequency of wildfires. Buffelgrass and the ensuing threat of fire are a major concern for the Park and for many other public land management agencies. There are an estimated 2,000 acres of buffelgrass in the Park, and it is spreading at a rate of up to 35% annually. Over time, infestations grow in size and density. Many scientists think that with continued buffelgrass expansion, local extinctions of saguaros and many other native species may occur, changing the Sonoran Desert and wildlife forever.



Estimated annual spread of buffelgrass in southern Arizona

Buffelgrass and Fire



Buffelgrass

Fires have historically been infrequent in the Sonoran Desert, burning about once every 250 years. Many native plants and animals are not adapted to fire and can be killed by fire. Buffelgrass has the potential to introduce frequent and intense fire into the desert, with potentially catastrophic consequences. Such fires also pose a threat to public safety, homes, and infrastructure.

The perfect storm, a buffelgrass fueled fire

The following buffelgrass fire behavior information is based on a cooperative research project with the University of Arizona, Saguaro National Park, and the City of Tucson. In 2008, 160 acres of buffelgrass were subjected to a prescribed burn. The results tell us that a buffelgrass fire will result in unprecedented fire behavior in the Sonoran Desert.

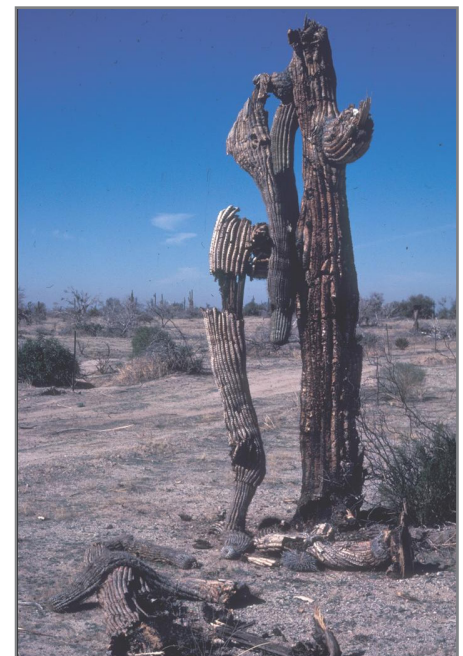
- Buffelgrass fuel loads in the Sonoran Desert can range from 1 to 4 tons per acre. This is 2 to 4,000 times greater than historic levels. Because of its heavier fuel load, it can burn under a wider range of weather conditions.
- Peak fire temperatures in the experimental burn were between 1,300-1,600°F; hot enough to melt aluminum. These temperatures are 2-8 times hotter than fire temperatures of earlier fires that were fueled by annual plants.
- Flame lengths were 12-18 feet under relatively mild conditions. Under more extreme conditions, flame lengths will exceed 25 feet. A buffelgrass fire's flame lengths are predicted to be 4-9 times taller than observed in previous desert fires.
- Rate of fire spread in buffelgrass has been measured at about 2-3 miles per hour under moderate conditions, which is about 10 times faster than predicted for usual desert fuels.



Experimental buffelgrass burn with fire temperatures between 1,300-1,600°F - hot enough to melt aluminum.

Consequences

Previous desert fires have resulted in 20-80% mortality to saguaros and cause the death of many other cactus species, paloverde, and other fire-sensitive plants. Mortality of native plants from buffelgrass fires is expected to be much higher than historic fires because of high flame temperatures and prolonged residual burning. Taller flame lengths mean wider fuel breaks are needed to stop a fire, and firefighters will not be able to fight the fire with hand tools and backpack pumps. Buffelgrass can reduce property values in infested and increasingly fire-prone areas.



Fire damaged saguaro cacti

Tourism revenues, which are a vital part of the economy in southern Arizona, may be severely impacted because the unique and iconic saguaro dominated landscape may be lost.

Invasive plant control and firefighting costs for government agencies are already increasing, and are likely to reach unprecedented levels.

Research

Buffelgrass research at the Park began in 2000. The first research project was designed to evaluate the effectiveness and costs of different control methods (hand pulling, mowing, and herbicides). Since then, the Park has written numerous grants and received funding to conduct research on topics such as different types and rates of herbicides, timing of herbicide application, and the effect of herbicides on native vegetation. Other research includes modeling to predict buffelgrass spread, use of satellite data and aerial photography to detect and monitor buffelgrass, biomass and fuel load, and buffelgrass fire behavior. Current research projects include the effect of buffelgrass on desert tortoise, spot herbicide application using a helicopter, and techniques for restoring native vegetation after a fire or after buffelgrass removal.

Treatment History

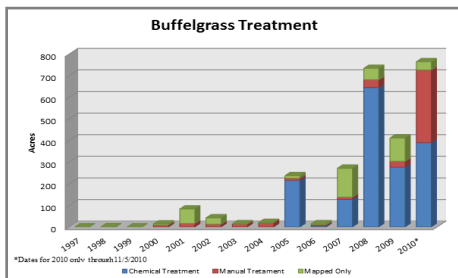
Buffelgrass was first recorded in Saguaro National Park in 1989, but it was not recognized as a threat until the early 1990s. In 1993, staff and volunteers began pulling buffelgrass by hand. Manual removal of the grass is very laborious, and its rate of spread outpaces the Park's ability to control it by hand pulling or using backpack sprayers for herbicide application.

In 2002, the Park evaluated the cost and efficacy of different control techniques, which led to the development of an Environmental Assessment and Exotic Plant Management Plan (2004). The plan embraced integrated pest management applications, including the use of herbicides. Herbicides with the active ingredient glyphosate are highly effective at killing buffelgrass. Unfortunately the only time that this herbicide is effective is when the plant is green--usually during the summer monsoons and sometimes in late winter or early spring. When the grass is dormant, park staff and volunteers remove it by hand.

Successes

After numerous years of treatment, the Park is seeing signs of success! In order to be successful, treatments need to occur year-round for at least three to five years because viable seed remains in the soil. Previously treated areas need to be monitored regularly to ensure new plants have not established.

Despite the challenges of buffelgrass control, Saguaro National Park is encouraged by the progress and success over the past several years. Community support, awareness, education and outreach, and a strong volunteer effort have contributed to the successes.



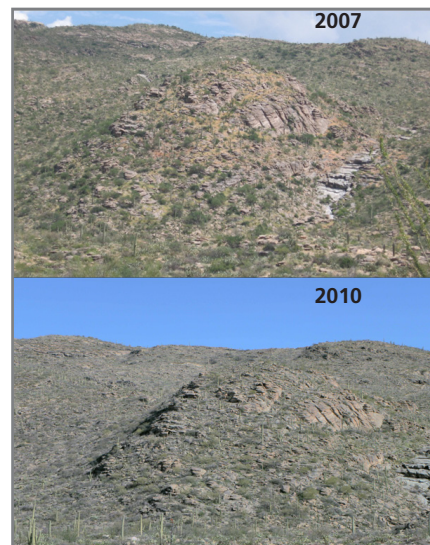
Buffelgrass treatments over time. Chemical treatments depend upon precipitation and staffing, and therefore drought years are reflected above as a lower number of acres treated.



Manual removal of buffelgrass



Herbicide application with a backpack sprayer



Javalina Hill was once covered in buffelgrass (golden color, top photo). By 2010, only a few individuals remained.



www.buffelgrass.org

More Information

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