

# Stage of invasion: How do sensitive seedlings respond to buffelgrass?

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Buffelgrass (*Pennisetum ciliare*, syn. *Cenchrus ciliare*) transforms the vegetation community in the Catalina foothills.

**Left:** Native Sonoran Uplands dominated by trees, succulents, bare ground.

**Right:** Buffelgrass fills in space between plants.

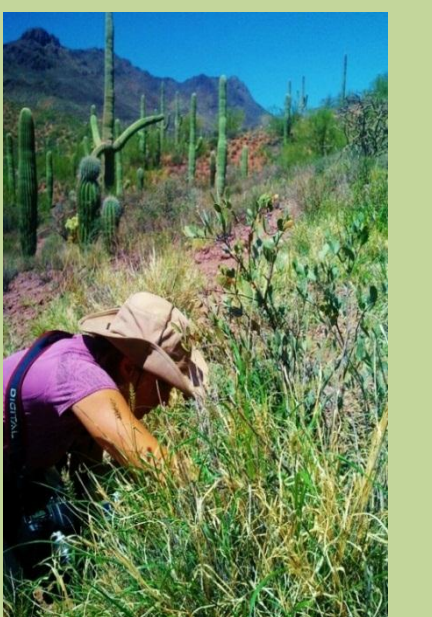
## Why study invasive species?

1. Comparison to pre-invasion dynamics to study biological diversity generally<sup>4</sup>.
2. Invasive grasses decrease biodiversity worldwide, transforming ecosystems<sup>5</sup>.

## Methods

Measured seedling germination and survival in 25, 1x1m plots between July 28 and October 15 on the University's Desert Station research preserve in the Tucson Mountains.

Eight of these plots had at least 30% buffelgrass cover, 8 had 0% buffelgrass cover, and 9 had buffelgrass removed with combination glyphosate application and mowing.



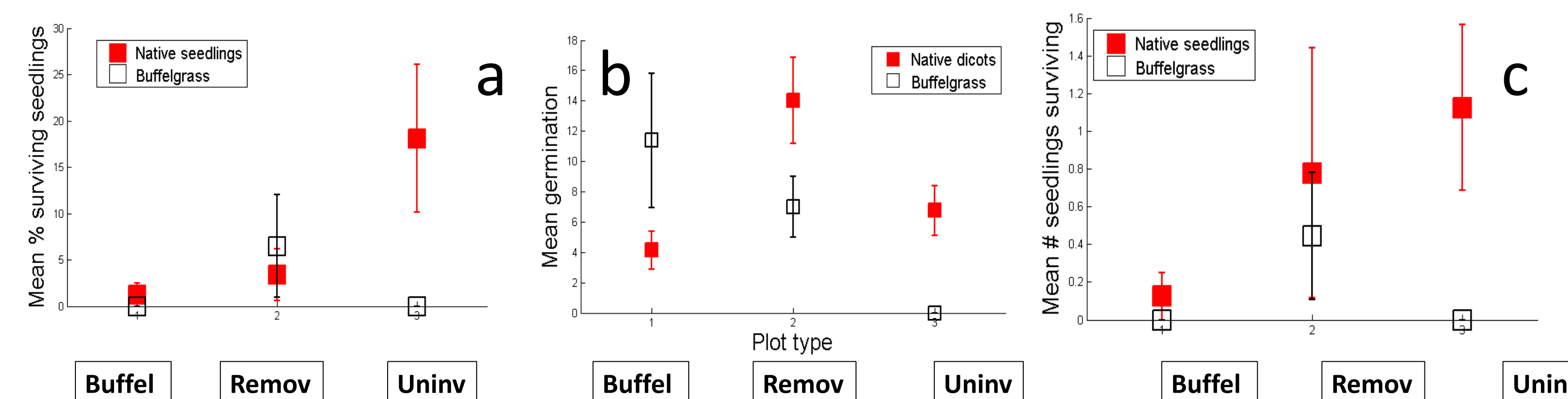
## How does buffelgrass transform the Sonoran Desert?

Long-term aerial photo analysis shows native species decline in density and diversity within 20 years of buffelgrass invades<sup>1</sup>. What is causing this decline?

**Hypothesis: Buffelgrass reduces native seedling survival.**

Seedling survival is a critical life stage for native Sonoran perennials, with high mortality from desiccation and predation<sup>2</sup>, but determines dominant species and community structure<sup>3</sup>.

## Results



Buffelgrass presence (Buffel) inhibits native seedling survival relative to removal plots (Remov) and uninvaded plots (Uninv). Percent survival for the removal plots appears low (A) because of a flush of germination in those plots (B). In the end, similar numbers of seedlings survived in uninvaded and removal plots (C).

## Conclusions

Buffelgrass presence decreases native seedling survival. Plots recently sprayed/mowed had high germination, but similar seedlings establishing.

Future work should distinguish what causes lower survival:

- Predation or resource competition?
- Remaining belowground biomass, or surrounding grass?

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