



## Effectiveness of Native Plant Regeneration after Glossy Buckthorn Removal and Treatment in Schmeeckle Reserve

Bethany Brownfield and Shannon O'Fallon | Advisor: Dr. Michael Demchik

### Introduction

This site in Schmeeckle Reserve was historically an oak savanna with some delineated wetlands that has become a forested and has undergone invasion by glossy buckthorn. Glossy buckthorn (*Frangula alnus*) was introduced to Schmeeckle Reserve in 1986 and has since contributed a decline in native animal and plant understory species through competition and deer browse selection (1). An increase in the amount of solar radiation that reaches the forest floor and reduced competition with invasive species will help the native graminoid species successfully compete in their natural cycles and provide improved habitat for native wildlife species. Urban areas being adjacent to Schmeeckle could also contribute to the buckthorn preference due to high deer browse pressure from the natural reserve.



Figure 2. The north quadrant of the site before removal of glossy buckthorn (left) and after removal (right).

### Results

We hypothesized that quadrants with rotary seeding application would show greater native regeneration after buckthorn removal and treatment. Results will be determined by evaluating pre- and post-treatment levels of regeneration and comparing the data between the quadrants that were seeded and those that were not. Post-treatment data will be collected in spring 2021 after completion of glossy buckthorn removal and treatment.

### Methods

Initial site assessment involved the collection of data concerning basal area, regeneration, and native and invasive species richness. This data was entered into the Universal Floristic Quality Assessment Calculator, which analyzed several conservation-based metrics. Glossy buckthorn was manually removed from all four quadrants using hand loppers, hand saws, and brush saws. The basal area of the site was reduced using chainsaws. Manual rotary seeding of native graminoid species was conducted in the south and southeast quadrants, while the other quadrants were left to naturally revegetate for comparison. Garlon 3A herbicide will be applied to the cut glossy buckthorn throughout the site in the spring of 2021. Following treatment, a second site assessment will be conducted to assess the same data and determine the influence of native seeding on native species regeneration following glossy buckthorn removal and treatment.

### Discussion

Much of Schmeeckle Reserve is currently undergoing an invasion of glossy buckthorn so the results of this study could influence future invasive species management practices throughout the reserve. Results could possibly be skewed by inconsistent buckthorn establishment among the quadrants; some quadrants had thicker buckthorn than others and seeding of native graminoids was decided based on convenience of entry. Future management on the site should focus on monitoring to continuously evaluate the need for buckthorn removal, herbicide application, basal area reduction, or other practices. Observations should be conducted to assess the long-term success of native seeding following buckthorn treatment.

### References

(1) Chastain, Bob. 2000, pp. 3–101, *An Ecological and Vegetative Overview of the Schmeeckle Reserve.*

### Introduction

This site in Schmeeckle Reserve was historically an oak savanna with some delineated wetlands that has become a forested and has undergone invasion by glossy buckthorn. Glossy buckthorn (*Frangula alnus*) was introduced to Schmeeckle Reserve in 1986 and has since contributed a decline in native animal and plant understory species through competition and deer browse selection (1). An increase in the amount of solar radiation that reaches the forest floor and reduced competition with invasive species will help the native graminoid species successfully compete in their natural cycles and provide improved habitat for native wildlife species. Urban areas being adjacent to Schmeeckle could also contribute to the buckthorn preference due to high deer browse pressure from the natural reserve.

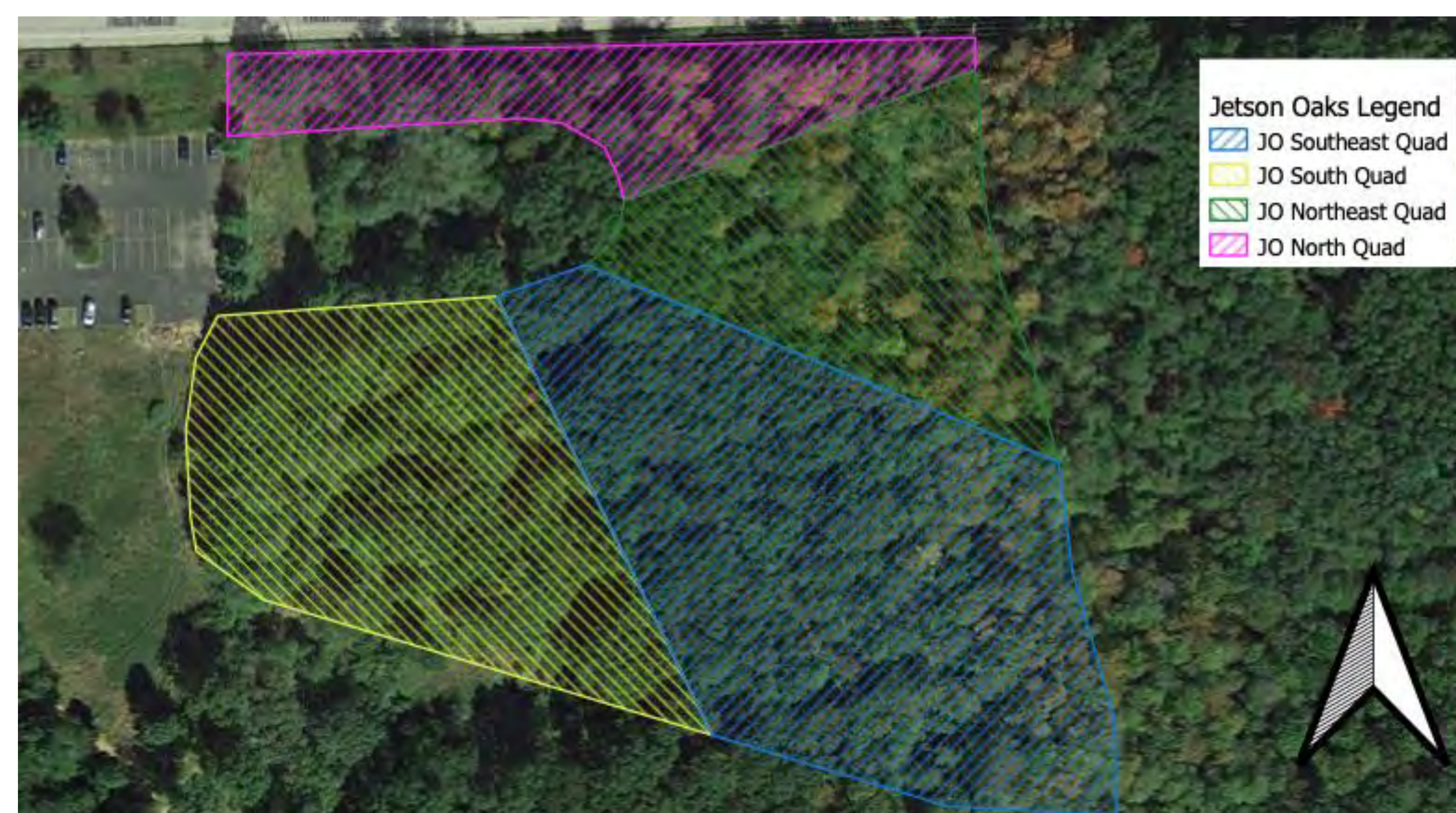


Figure 1. Delineation of the site into four quadrants allowed for each to be managed on a local scale.

