



Monitoring Invasive Glossy Buckthorn (*Frangula alnus*) Management in Acadia National Park

Shannon O'Brien, Schoodic Institute at Acadia National Park



Introduction

Glossy buckthorn (*Frangula alnus*) is an invasive shrub native to Eurasia. *Frangula* is not new to Acadia; it was introduced in the 19th century as a hedge landscape species. It competes against native species for resources and has been managed in the past. *Frangula* grows up to 20 feet and propagation happens through red berries that develop in late spring. Distribution is thought to be driven by birds, small mammals, and waterways.

The goal of this project is to monitor the plant management treatments of *Frangula* at Bass Harbor Marsh. The two treatments being used are foliar spraying of Rodeo and cutting down larger individuals.

Methods

- Three 40-meter transect lines were established. Each consists of 5 stakes at 10-meter intervals.
- A quarter meter quadrat was laid 4 times around the stake making a 1-meter square.
- At each quadrat an aerial photograph is taken and presence/absence of *Frangula* is noted as well as total stem count and cover percentage.
- This process was repeated from July through September.

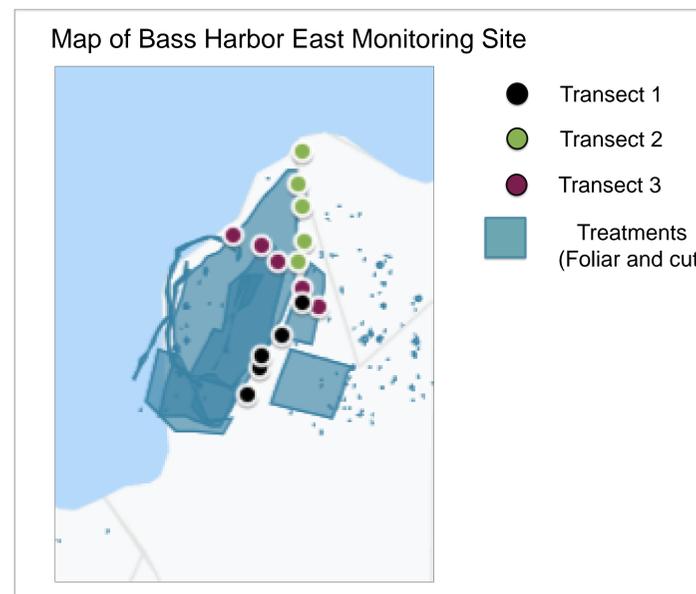
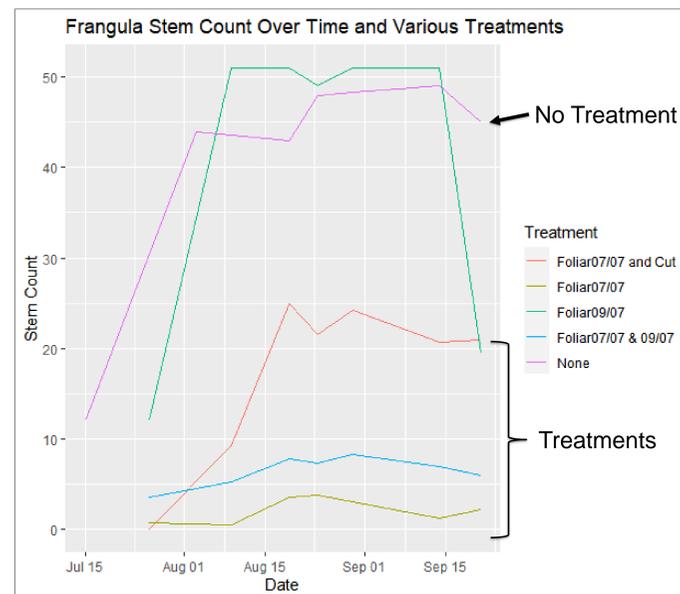
Literature cited

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Maine Natural Areas Program, Invasive Plants, Glossy Buckthorn, 2019

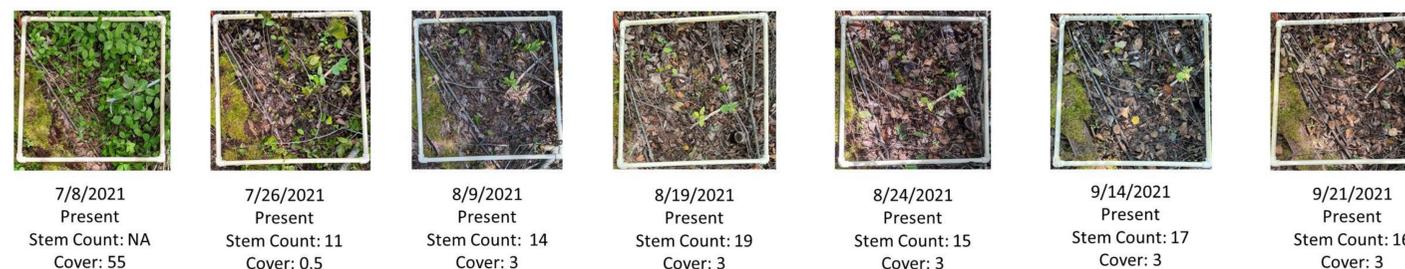
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Results



Looking at the different treatments over time using stem count shows how each method of management impacts the abundance of *Frangula*. The earlier treatments worked to stop growth before the growing season began. The absence of treatment allowed for a higher number or recruitment throughout the study. Percent cover of *Frangula* was also recorded and produced a similar graph (not shown).

This map shows the Bass Harbor East field site. The 3 different transects are shown as colored dots whereas the treatments are shown as blue polygons. The plant management crew worked independently but often crossed our transects. Another site (Bass Harbor West) has not been analyzed as there was little interaction of the monitoring sites and management areas.



These photographs show a quadrat and data over the course of the monitoring period. This plot was treated with Rodeo on 7/7 and 9/7. The first treatment occurred a day before the first photograph (taken on 7/8). Having photographs of the surveyed location helps ensure consistency and allows for better understanding about the timing of die-off post treatment. There is a time lag of about two weeks between application of foliar spray and actual die off (reference pictures 7/8 and 7/26). With multiple observers working on the project the data can vary slightly each visit. This could lead to monitoring inaccuracies over time.

Conclusions

Monitoring *Frangula* at Bass Harbor Marsh helps the park better understand how the species reacts to different treatments. The treatments that were applied this year appear to be successful at slowing the spread of *Frangula*. There is a statistically significant difference between stem count when comparing treated and untreated quadrats at the end of the monitoring season. This indicates that all treatments work however, according to the graph and field observations the earlier foliar treatment is most effective at reducing abundance overall.

This year we established monitoring methods including permanent stakes that allow for monitoring over time of the same area. Additionally, we created an initial protocol that can be a basis for future monitoring efforts.

Going forward this project could benefit from more open communication between the monitoring and management crews. Coordinating before field season to determine when and where to work would allow for more useful data to be collected. There was also some inaccuracy in quadrat placement due to multiple observers being involved. A more precise standard of placement will strengthen the data next year.

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