

Assessment of *Phragmites australis* treatment at Point au Sable Natural Area using aerial imagery

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Introduction

This project assesses the management strategies used at Point au Sable Natural Area to remove invasive *Phragmites australis*, also known as common reed grass. *Phragmites australis* invades wetland habitats and can establish an area quickly due to extensive rhizomes. This plant can drastically alter wetland function. In 2010 the Cofrin Center for Biodiversity at UW – Green Bay started developing a management plan to manage and restore the coastal wetlands at Point au Sable Natural Area, which have been dominated by *Phragmites*. Through the years they have implemented many different techniques to remove the invasive reed grass. Understanding which form of management works best is crucial to preserving natural areas and wetlands.

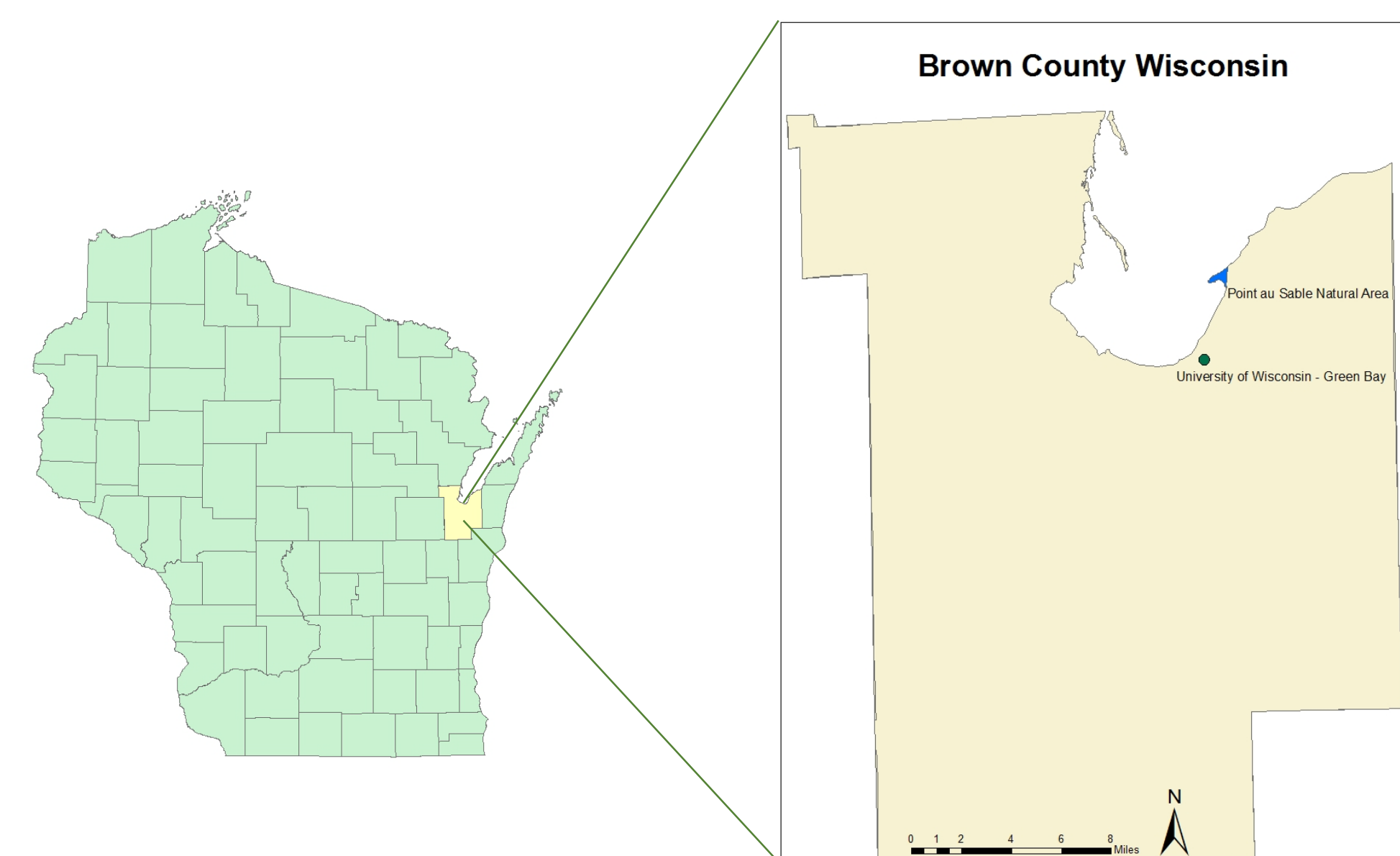


FIGURE 1: Location of Point au Sable in relation to University of Wisconsin – Green Bay campus.



Oblique image of Point au Sable Natural Area

Materials & Methods

ArcGIS 10.3 was used for all parts of this project. Spatial data on *Phragmites* treatment were collected from 2012 to 2015 by the Cofrin Center for Biodiversity, including treatments from three consultants: Skyline-Helicopters Inc., Endeavor Environmental and Applied Ecological Services. Polygons were created to represent treatment data to allow for measuring area covered by each technique used.

A 10 meter grid system was provided by the Cofrin Center for Biodiversity and overlaid on aerial orthophoto images of Point au Sable in 2010 and 2015, respectively. I analyzed aerial images of Point au Sable Natural Area and scored each grid cell representing the amount of *Phragmites* present, giving each cell a score of none, less than 50 percent, or greater than 50 percent. The treatment data layers and oblique images supplied by the Cofrin Center for Biodiversity were used as references to assist in scoring when aerial imagery was difficult to interpret.

Results

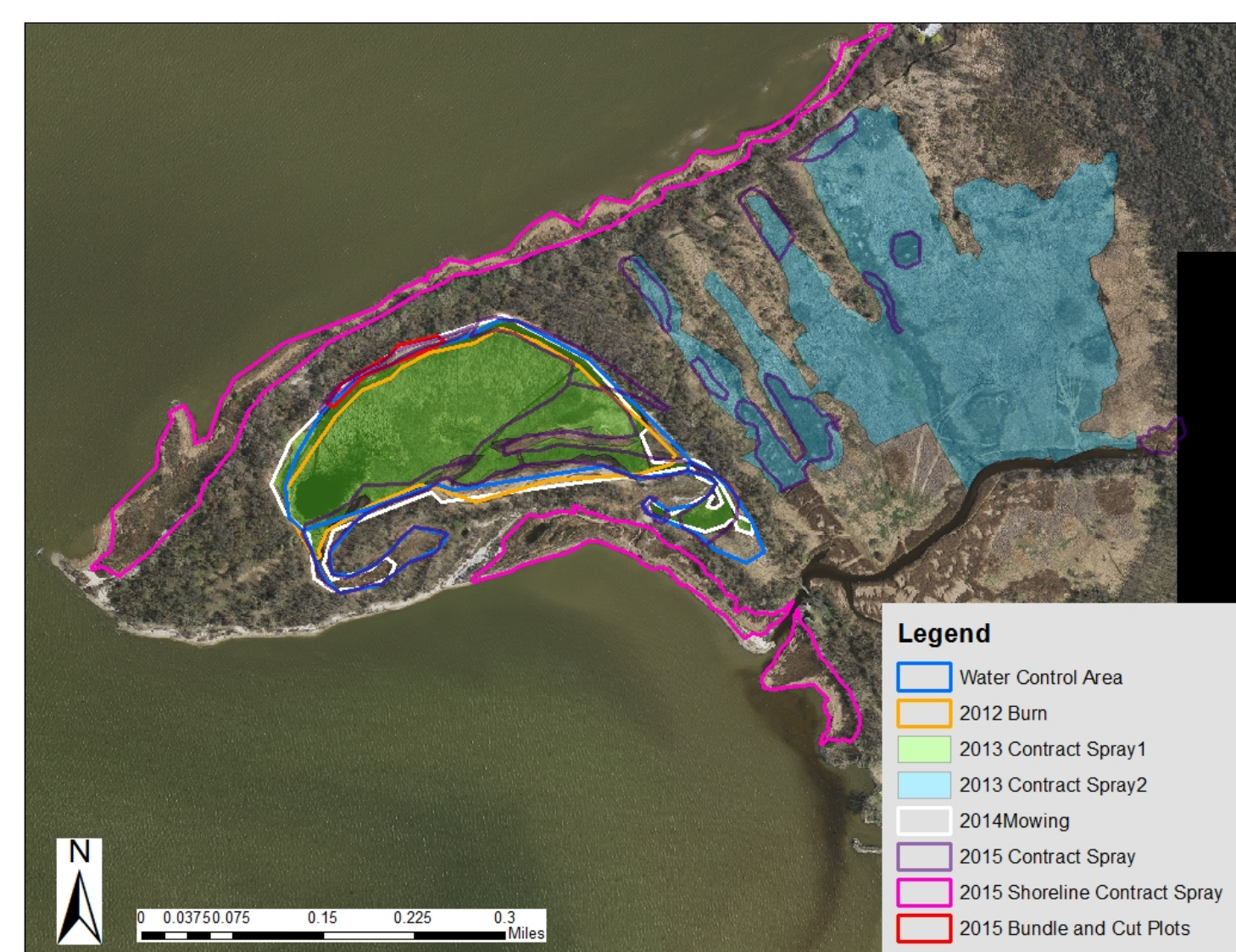
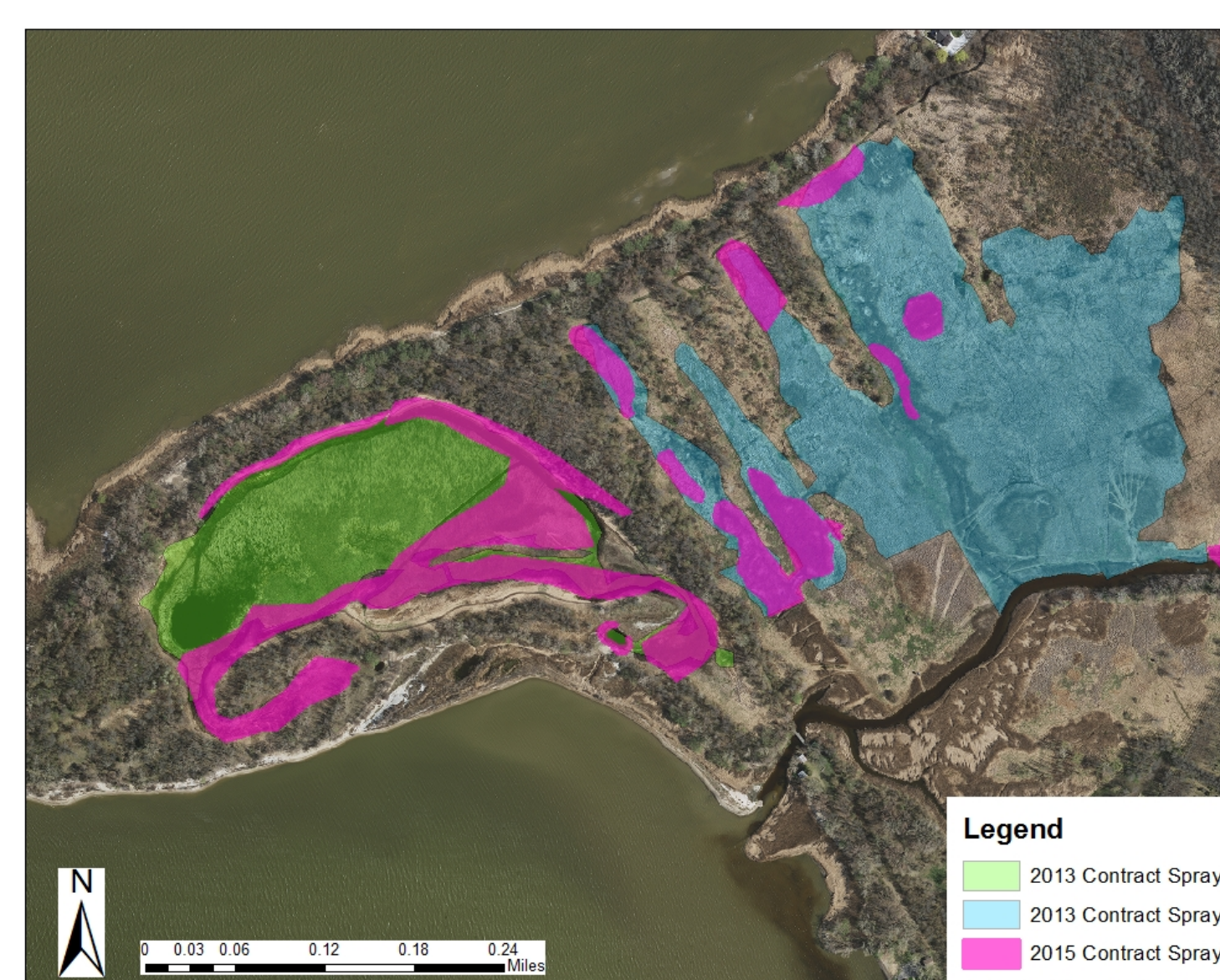


FIGURE 2: *Phragmites* treatments from 2012 – 2015 at Point au Sable



FIGURES 4 and 5 display the differences between 2013 and 2015 sprays. The area controlled was measured in square meters. There was a difference of about 199,037 m² (49.2 acres). The estuary, shown in blue on FIGURE 4, had the biggest decrease in *Phragmites australis* area needing control.

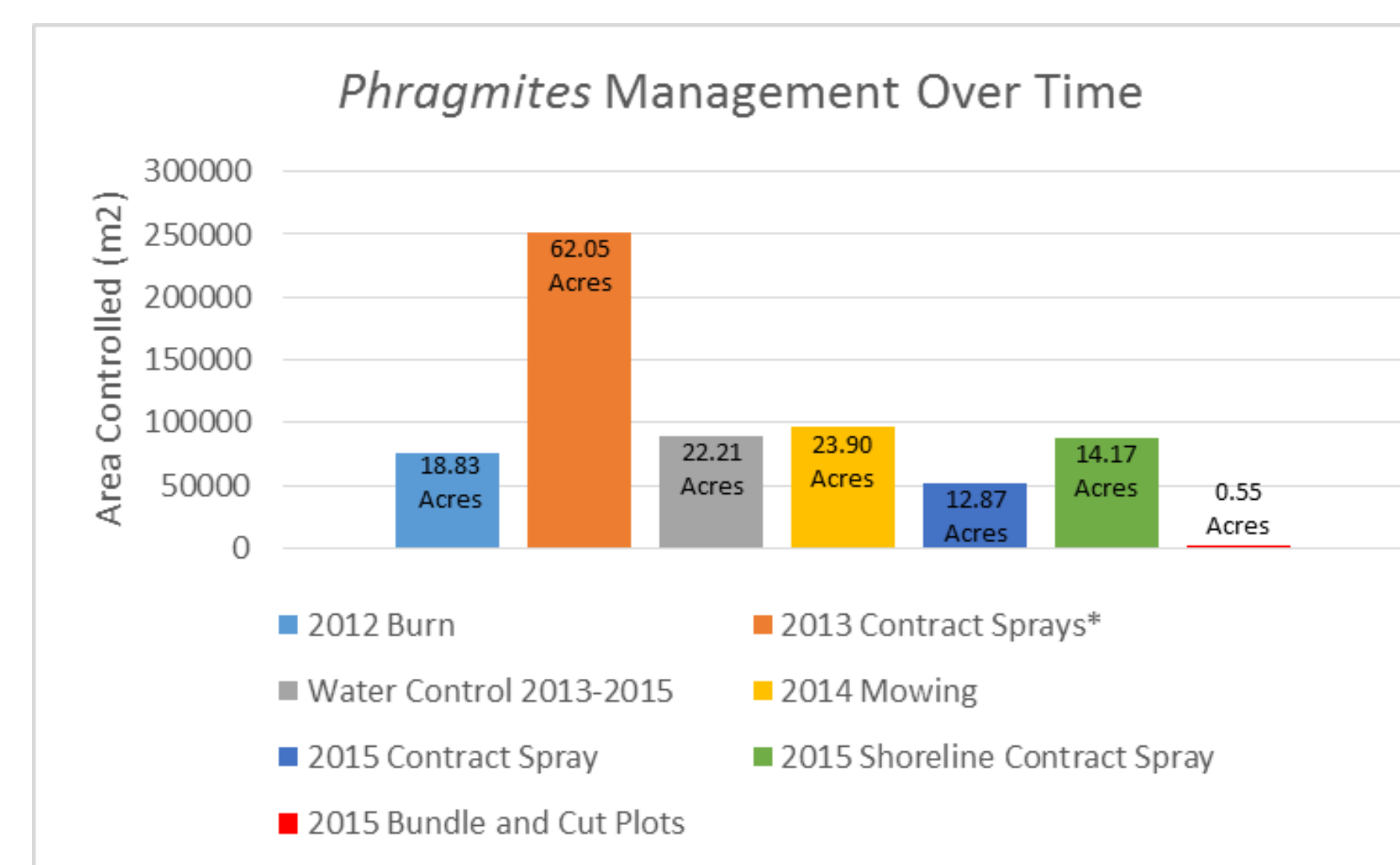
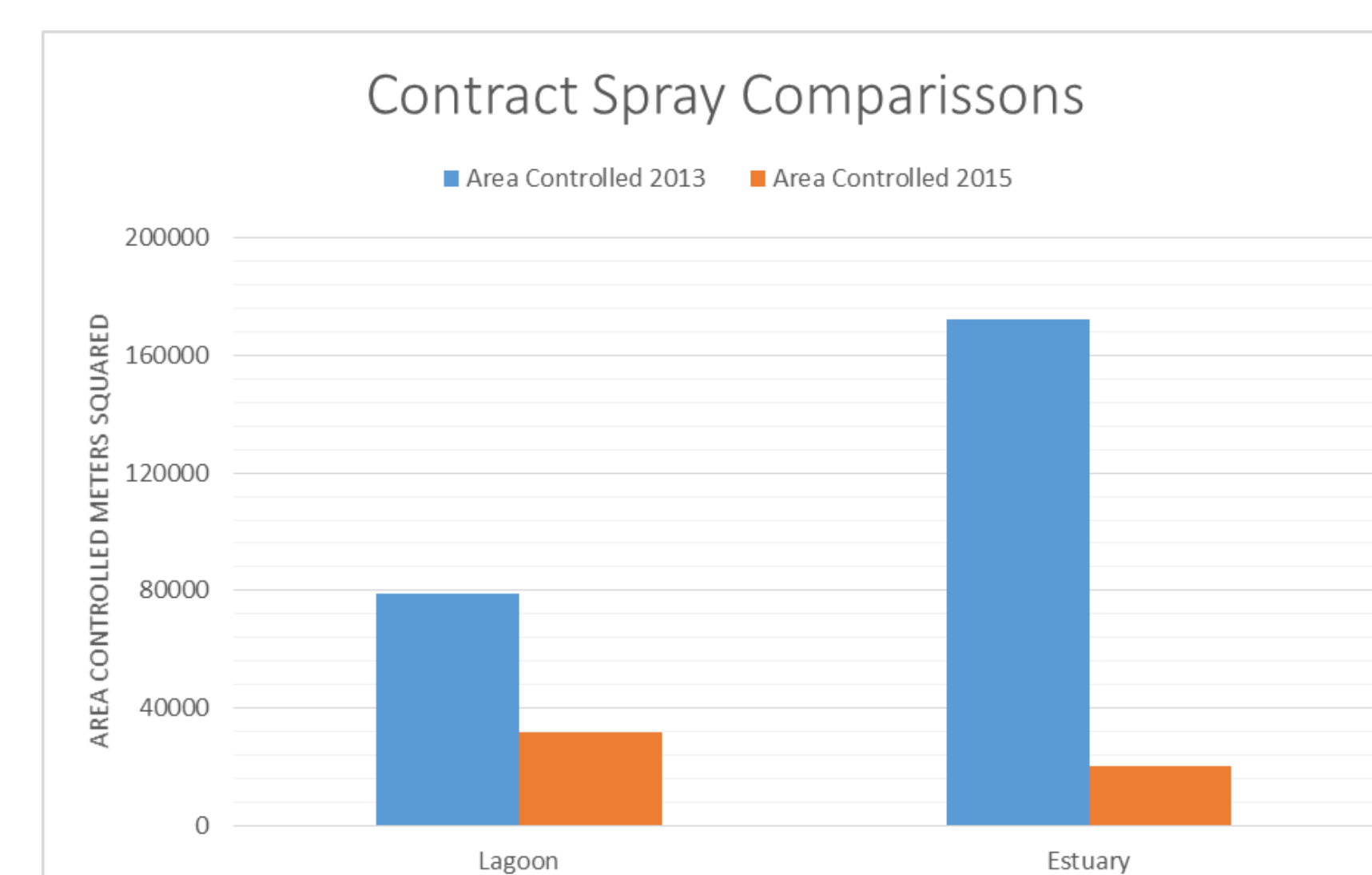
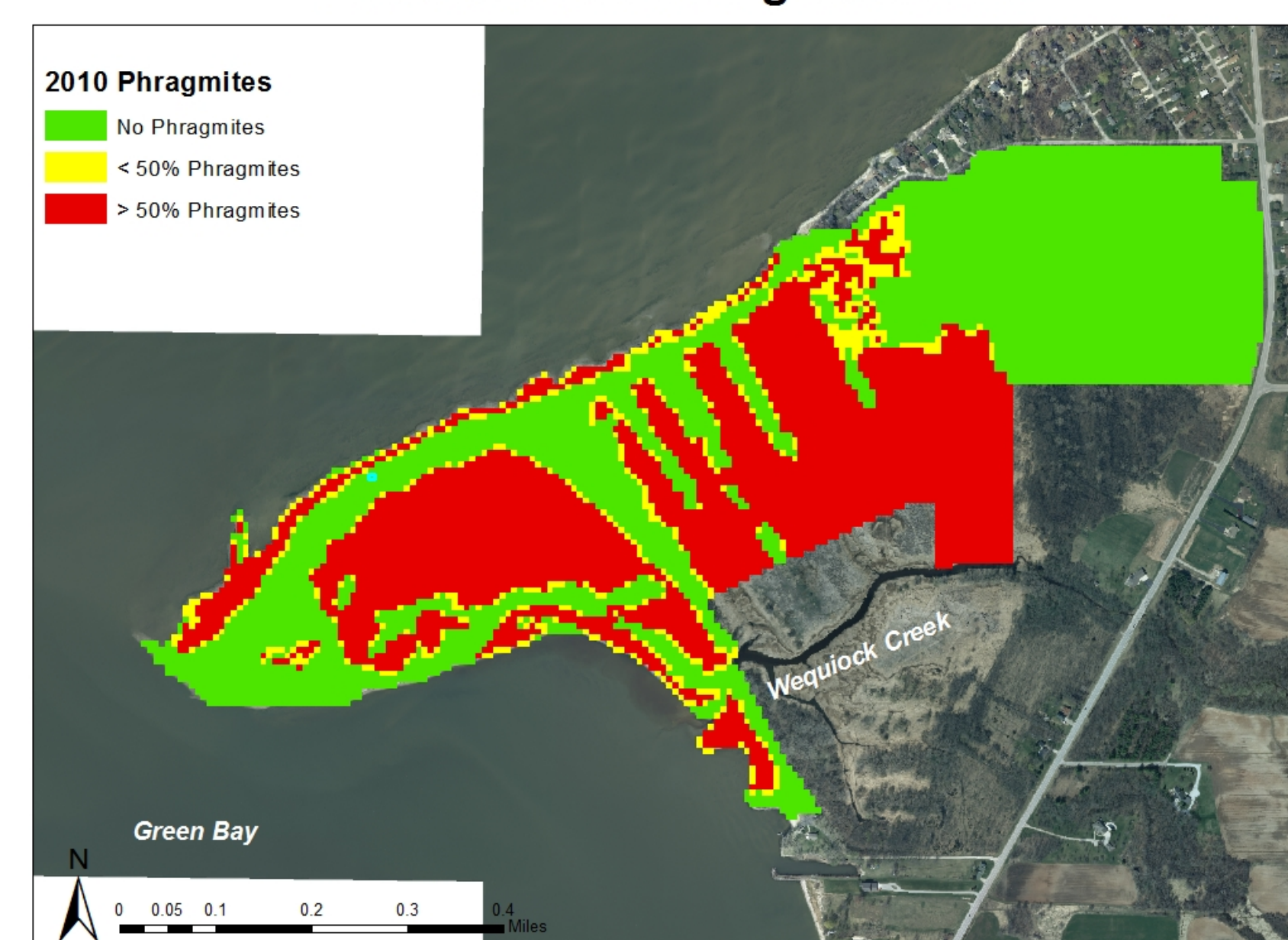


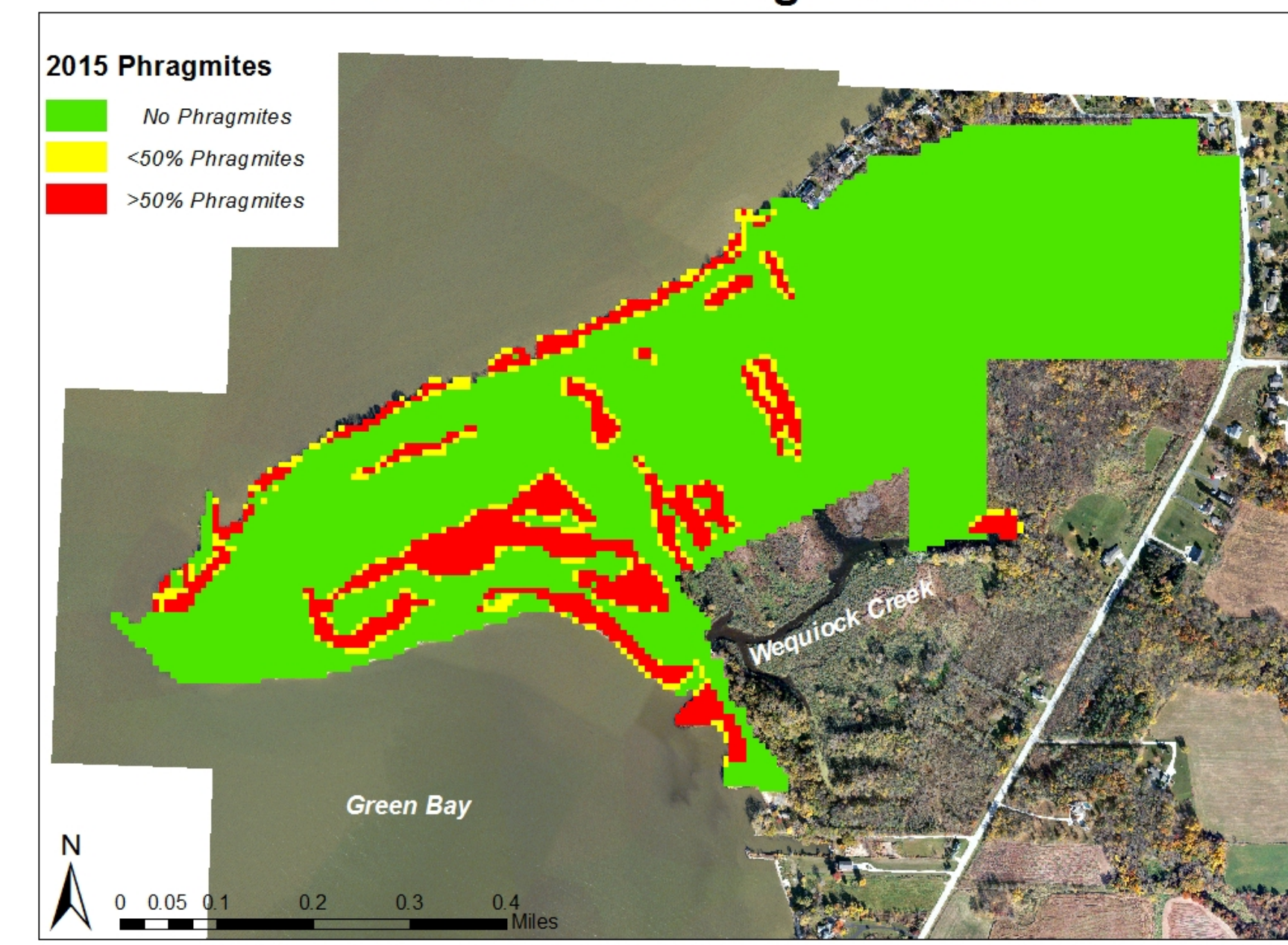
FIGURE 3: Management techniques analyzed by area controlled measured in square meters. The overall trend shows a decrease in m²
*Shoreline not treated in 2013



Point au Sable *Phragmites* 2010



Point au Sable *Phragmites* 2015



FIGURES 6 and 7 display the progress of the management of *Phragmites* at Point au Sable Natural Area. Using a grid system, each grid cell was analyzed in ArcGIS and assigned a score (X = No *Phragmites*, P = less than 50% *Phragmites*, and PP = more than 50% *Phragmites*). In 2010 *Phragmites australis* dominated Point au Sable with 355,200 m² (87.8 acres) of monotypic stands. However, thanks to the extensive work in the last few years, that number dropped down to 100,800 m² (24.9 acres) of *Phragmites* stands in 2015.

Discussion

After reviewing my findings, I conclude that the Cofrin Center for Biodiversity has made strides in the process of removing *Phragmites australis* from Point au Sable Natural Area. In the last three years, hundreds of thousands of square meters have already been managed. While the data collected are not enough to establish which management techniques are the best for eradicating *Phragmites*, the techniques used have proven to be effective. It was observed that after the burn, the *Phragmites* only came back with a vengeance; however, it came back all green at the same time. This made the spray the next year even more effective. Being a member of the natural areas crew for the Cofrin Center for Biodiversity, I have worked with the removal of this invasive plant and know just how difficult and extensive the invasion of Point au Sable is. Hopefully after this year's contract spray, we will see even more results next summer. We may find that using a combination of treatments may be the most effective.

These data are highly important for future management practices of *Phragmites australis*. Once we have more data on which treatments or combinations of treatments work best, we can begin to narrow down the best management plan. While the "complete eradication" of this invasive plant may not be achievable, it is possible to maintain the amount of *Phragmites* at numbers that will still allow for the regeneration of native wetland plant communities. Our hope is to return the wetland of Point au Sable to its natural state. By preserving the natural wetland of Point au Sable, we will be bringing back the diverse bird communities, plant communities and other unique functions of the area wetlands.



Before bundles were cut



During the process of cutting bundles



After cutting and treating bundles

Cofrin Center for Biodiversity natural areas crew members cutting bundles of *Phragmites* so that herbicide can be applied to the stems.

Acknowledgements

I would like to thank Bobbie Webster and Mike Stiefvater of the Cofrin Center for Biodiversity for helping me gather data and creating the grid system I used in my project.

*Photos taken by Roberta Reif

