

VII. Summary

We have been managing and creating grasslands in globally rare sandplain habitats for nearly 40 years. Our review of the state of management of sandplain habitats demonstrates that while we have made good progress in the short term and have learned a great deal about these habitats, our management is currently not adequate to maintain this system over the long term. Unless we make progress with management of woody species, many species will not persist due to the incremental degradation of this community type.

In existing sandplain grasslands, we have had good success at promoting warm season grasses with aggressive mowing and burning, and moderate success at reducing unwanted species with herbicide. However, we have had less success with restricting the growth of woody plants and at maintaining plant and animal diversity. The challenges are numerous, but implementing prescribed fire in the growing season and limited success with grazing are among the most important. Both tools are expensive and logistically complicated, limiting widespread use. Due to our use of frequent mowing and infrequent burning and grazing, we are in danger of homogenizing our management approaches and increasing coordinated risk across the system.

Creating new grasslands is harder than maintaining existing grasslands and land use history is an important factor that can impact success. Although we have had some successes with clearing, disturbing soil, and planting in forested or shrubby systems, dealing with persistent woody vegetation remains a challenge. In agricultural systems, we need to improve our ability to remove existing vegetation and to deal with persistent non-native species. Additionally, access to a local seed supply remains an ongoing challenge. As with existing grasslands, we need to test very aggressive combinations of management or be prepared for the process to take a long time. We also encounter within a few years the same challenges of maintaining existing grasslands.

The challenge moving forward is not only to maintain these systems using similar methods that created them, but to test new aggressive combinations as the application of no one management practice can accomplish what we need. For example, we need to mow at different intensities within burned areas, use herbicides at different frequencies within other management areas and to spot control shrubs, or use grazing combined with other management. We also need to address the issue of woody debris left by mowing which impedes seedling germination and enriches soil.

We also need to address new threats such as new and existing invasive species, habitat fragmentation, increased nitrogen deposition, mesopredators, and climate change. The achievement of overall goals hinges on existing ecology, available seedbank and/or proximity to seed rain, management practices, important management variables, and whether they are

applied in combination. We also need to focus more on responses of individual target species as there is little known about how to manage for individual species.

We are recommending the next steps below regarding management:

Management Recommendations

Fire

Do a summer research burn and then do and compare other management techniques to see if we can find replacement for summer burning.

Grazing

1. Develop a group position paper on grazing in conservation lands
2. Do work on anthropogenic lands with animals to get conservation outcomes (Farm Institute and Bamford Preserve on Martha's Vineyard, new Dartmouth, MA land).

Combination Treatments

1. Create Truro like plots in sandplain system and test various combinations of treatments.
2. Piggy back on top of management already happening to do research. Push smaller areas within larger area harder as experiments by introducing combinations of management to the mix.
3. Work with Heritage to develop soil disturbance protocol.
4. Research different mowing/forestry equipment to see if we can find tool to break up mowing debris.
5. Implement one-acre research project on Nantucket in area where soil disturbance is not an issue to determine method for breaking up mowing debris.

Monitoring

Review monitoring chapter before writing.

New Research Needed

- 1) There is a need to test combinations of management techniques both for creating and maintaining sandplain grasslands as field experiments. These combinations could be set up as sub-plots that receive different mechanical removal techniques to test the response desirable and non-desirable species.
- 2) Further research about conversion of forest and shrubland to sandplain grassland could involve a more detailed examination of large-scale soil disturbance in land that has been deforested. Experiments might focus on comparing the response of vegetation composition over time in deforested areas that have been harrowed versus undisturbed soil.

- 3) Improve understanding of how infrequent or rare plants respond to different conversion combinations. These rarer plants are some of the major targets for sandplain grassland management and often have life histories that differ from closely-related but more common species. There is currently almost no information on how these species respond to management practices associated with conversion, whether via seedbank or seeding.
- 4) Test combinations of mechanical and chemical removal of non-desirable plant species with other management techniques such as prescribed fire, grazing, and/or mowing. These combinations should be designed and monitored as field experiments. These combinations could be set up as sub-plots that receive different mechanical removal techniques to test the response desirable and non-desirable species. Specifically, prescribed fire should be researched as a potential first step for removal of exotic, cool-season grasses.
- 5) More work is needed to determine how such a conversion or management affects the mortality and population dynamics of animals that use agricultural lands. These effects may be particularly important for less common and conservation target species that have small and dispersed populations. It is also important for higher-profile species such as birds and for more common species such as some invertebrates or meadow voles that are important prey of grassland birds.

Areas for Future Discussion

This guidance document did not address several issues that are important to managing sandplain grasslands across the range of these grasslands. These issues include:

1. Should we do a regional scale conservation plan for this habitat?
2. What is the best use of each grassland site?
3. How important is connectivity across the system and should we do anything different to facilitate connectivity?
4. What policies could be changed or created to facilitate creation and maintenance of these systems?