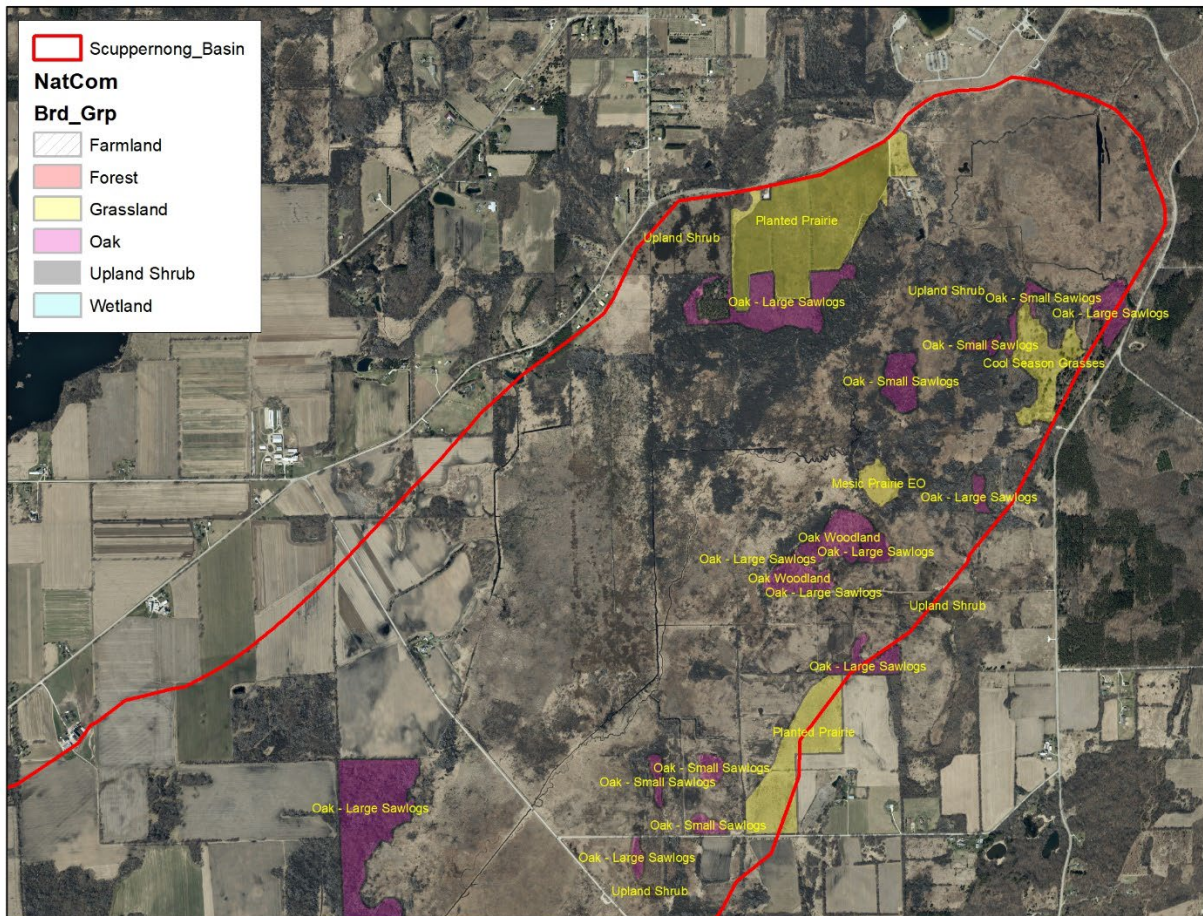
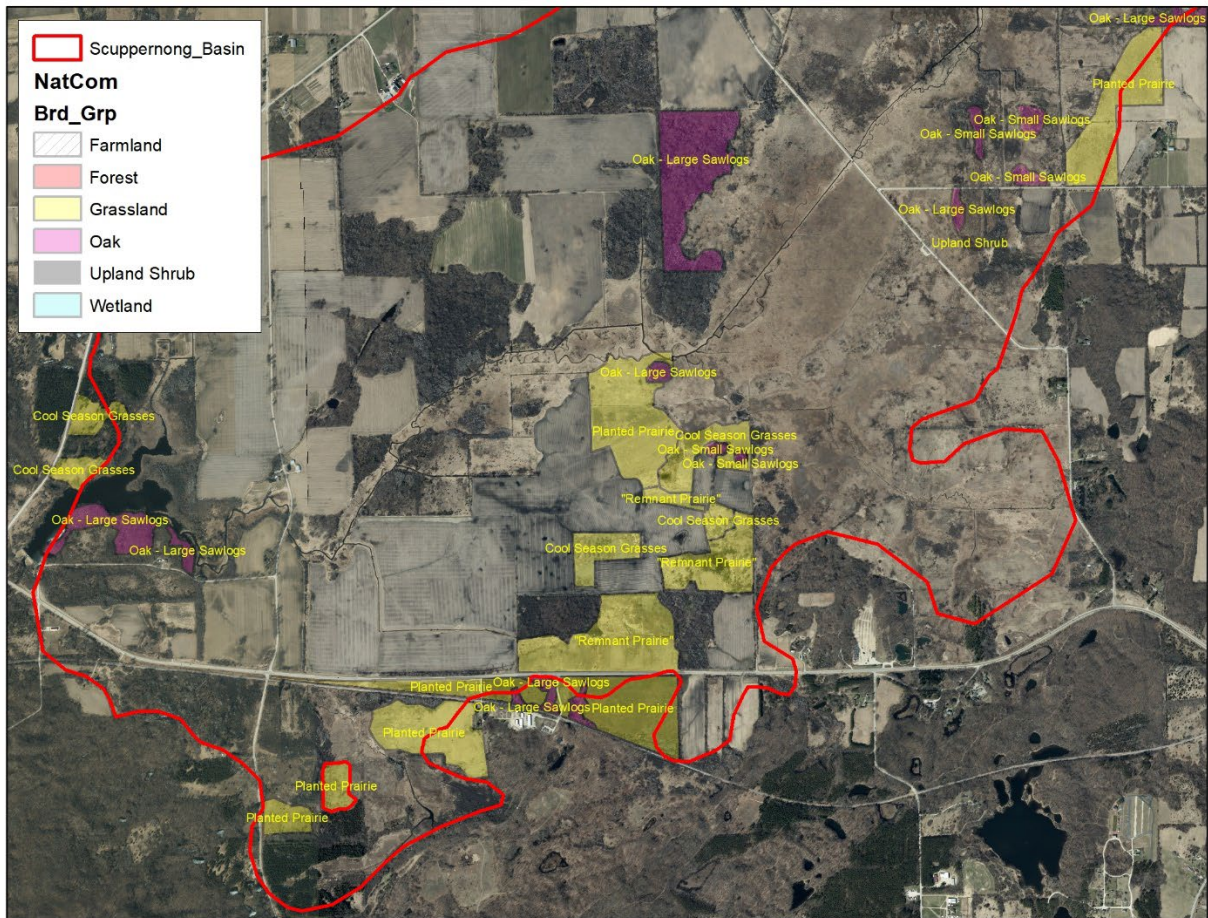


Addressing Climate Change in Scuppernong Basin Grasslands and Savannas

Within the Scuppernong Basin, grasslands occupy over 1,300 acres on DNR-owned lands, including remnant Dry-mesic Prairie, Mesic Prairie, and Wet-mesic Prairie, as well as surrogate grasslands (non-native cool-season grasses and prairie plantings). Combined with open wetlands, the area provides important habitat for grassland birds, a suite of species experiencing significant declines. Scattered upland blocks support oak savanna (Oak Opening, Oak Woodland), some having undergone restoration over recent decades, some remaining in a more degraded state due to fire suppression, past grazing, and overgrowth by shade-loving trees, brush and non-native invasives. Remnant prairies and savannas provide important habitat for diverse and rare birds, invertebrates and plants. All 'Oak' stands included in maps below, though some may be forest rather than savanna. Maps divided into northeast and southwest parts of project area.





CLIMATE IMPACTS: CHANGES IN THE APPLICATION OF PRESCRIBED FIRE AND INCREASING NON-NATIVE INVASIVES

Wisconsin’s native grasslands and savannas are fire-dependent natural communities. While the deep-rooted prairie and savanna species are well-adapted to drought and extreme heat, their fate is threatened by increasing challenges in conducting prescribed burns. Burning in spring is getting more difficult due to more unusually wet springs and early green-up. Managers are thus unable to do as many burns, or are forced to burn in non-traditional seasons such as fall or winter. Even if conditions support burning, sometimes drought or extreme heat may make it difficult to burn safely, or may disallow it altogether. If brush invades open habitats, herbs that carry fire are suppressed and the microclimate under them becomes cool and moist, making them difficult to burn. This issue is on the rise as increasing levels of atmospheric CO₂ give woody species an advantage.

The threat of non-native invasives is increasing with climate change for a variety of reasons: 1) Floodwaters provide opportunities for dispersal; 2) Increased sediment and nutrient runoff enhance conditions for germination and growth; and 3) Longer growing seasons give them more time to grow in the spring and fall; many native plants don't track environmental changes as readily.

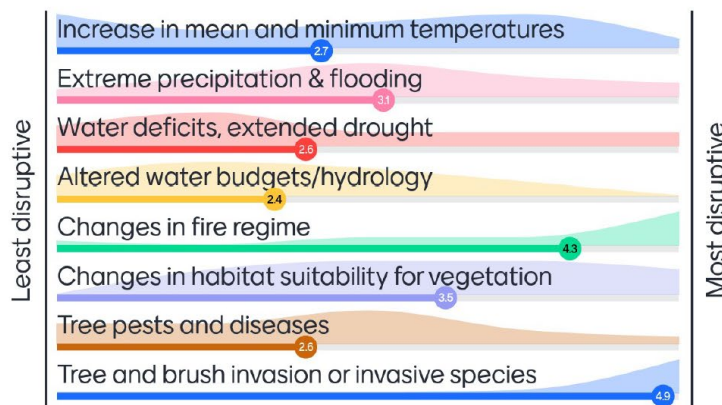
Native grasslands and savannas will fare best in places like the southern Kettle Moraine, where they occur in large landscapes secured by a matrix of fire-dependent ecosystems, allowing species to shift to sites with a more suitable microclimate. Small, isolated blocks, however, will have fewer options for shifting, and will be more vulnerable to detrimental external forces such as wind throw, invasive species, etc.

During the Scuppernong Basin Adaptation Workshop, participants ranked relative disruptiveness of the following impacts (faint colored graphics show distribution of responses, circled numbers show the means, number in lower right indicates total number of responses)::

CONSIDER WATERSHED CHARACTERISTICS (SLOPE, SOILS, HYDROLOGY, VEGETATION)

Mentimeter

How much will the following climate impacts affect conditions for GRASSLANDS, SAVANNAS?



16

POSSIBLE ADAPTATION ACTIONS

Project participants used the [Non-forested Wetland Adaptation Menu](#) to identify adaptation actions for this project. Some examples follow. This does not include benefits and drawbacks identified during the workshop, and represents early discussions and ideas that may be explored as part of a larger [master planning process](#) for Kettle Moraine State Forest-Southern Unit in the future.

Prescribed fire

The application of prescribed fire to this site's natural communities and challenges therein represent the top priority for discussion in the grasslands and savannas breakout group. In the Scuppernong Basin, burning regimes vary from regular and frequent to less so.

(Pertinent Wetland Adaptation Menu approaches: 3.1: Maintain and restore [grassland and savanna] structure; 3.2: Maintain and enhance diversity of plant species and their life histories, ecological niches, morphologies, and phenologies; 3.3: Promote fire in fire-adapted [habitats]; 3.4: Prevent invasive species establishment and limit their impacts where they already occur.)

- Apply prescribed fire in two-year return intervals and experiment with more frequent burning in some areas.
- Identify core areas that will hit two-year fire return interval (FRI) goal, and strive for similar FRI elsewhere (recognizing it is an ambitious goal).
- Consider fire surrogates to supplement burning and/or for areas that burn ineffectively.
- Explore ways to improve access for burning. If fire breaks are easy to maintain this makes everything easier.
- Assess fuel characteristics of sites to identify threats, opportunities, and negative feedback loops (e.g., excess leaf litter affecting burn conditions in grasslands, excess fuel build up in savanna increasing fire residence/intensity and causing overstory damage). Adjust prescribed fire methods (e.g., ignition) to meet goals.
- Conduct research on the effects of high frequency burns on grassland and savanna communities and the wildlife that rely on them (particularly invertebrates).

Adjust management methods

Climate change introduces emerging constraints to business as usual for natural area managers, forcing them to seek out new methods to meet their goals. Sometimes, new opportunities arise with climate change, allowing for new approaches that historically could not have been executed.

- Employ 'Regional Admixture Provenancing' by bringing seed from other remnant sites nearby to diversify gene pool and build resilience. Because the Scuppernong Basin is so large and ecologically diverse, various sites within the Basin may serve this purpose. *(Pertinent Wetland Adaptation Menu approach: 4.2: Increase genetic diversity of seed mixes within appropriate seed transfer zones)*
- Prioritize new sites for oak savanna restoration that have good landscape context and connectivity, rather than small, isolated islands.

ADAPTATION MONITORING

Project participants identified monitoring items that could help inform future management, including:

- Continue to use existing Wisconsin DNR Fire Effects Evaluation Form.
- Employ WDNR Coarse Level Metrics for Oak Opening and Oak Woodland (still in draft phase, likely available for use in 2023).