**PROJECT TITLE:** Prescribed Burning for Brushland-dependent Species-Phase II

**I. PROJECT STATEMENT**

We propose to extend our Phase I project that compares the response of brushland vegetation and the bird community to prescribed burns conducted in the spring, summer, and fall to include 3 and 5 year post-fire surveys. Our Phase I project documents vegetation and bird responses 1 and 2 years after fire, and builds a nice foundation, but later post-burn surveys are needed to understand how the season of burning influences the ability to effectively maintain open brushland conditions over longer time periods. Bird and vegetation responses 3 and 5 years after burns will help understand how the response to burning changes over time and if the season of burning produces different long-term effects on the brushland ecosystem.

Brushlands cover approximately ~8.5 million acres (20% land surface) in Minnesota and provide critical habitat for over 250 wildlife species, including >80 species on the Minnesota Department of Natural Resources (DNR) list of Species of Greatest Conservation Need (SGCN) including 38 birds, 17 mammals, 12 reptiles, 2 amphibians, and 12 insects. Numerous game species also use brushland habitats including sharp-tailed grouse, American woodcock, white-tailed deer, and furbearers.

Prior to European settlement, Minnesota’s brushlands were maintained by frequent wildfires. These burns happened frequently in summer and fall due to lightning strikes and fires set by Native Americans. Today, brushlands are maintained by prescribed burns conducted primarily in the spring. Prescribed fires in spring are less hot and are easy to control. However, cooler fires may be less effective in achieving habitat goals of maintaining open conditions by preventing the conversion of brushland to forest.

Why don’t managers burn brushlands more often in summer and fall? Burning in summer and fall seasons is more challenging because conditions are less frequently suitable for burning. Thus, without science clearly illustrating the benefits of summer and fall fires, little incentive exists to take on the additional challenge of trying to accomplish burns when burn windows are less frequent. Showing benefits of a more varied burn season schedule will help justify changes to existing management, ultimately benefiting wildlife.

Prior to Phase I, we knew very little about effects of burning in different seasons on brushland vegetation. Results to date provide preliminary support for implementing burns in multiple seasons. We have recorded 105 bird species, including 26 SGCNs, and documented several new county records for plant species including 2 state threatened species. However, we are limited in the inferences we can make with data from only 1-2 years post-fire. Fall and summer fires appear to create patchiness in the vegetation due to variation in where the fire burned hotter and cooler. This patchiness supports more species. However, re-sprouting occurred 1 year after spring and fall fires.

We will compare the longer-term effects of spring, summer, and fall prescribed burns on brushland breeding birds and vegetation in 1200 acres of brushland in central and NE Minnesota. Our project will:

* provide data on the habitat benefits of spring, summer, and fall burns
* develop best management practices for maintaining healthy brushland habitat
* improve brushland habitat management to meet the needs of diverse wildlife and native plant species

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1 Title:** Assess vegetation and bird responses 3-5 year after prescribed burns on 1200 acres of brushland habitat in central/NE Minnesota

**Description:**In phase I, our DNR partners conducted prescribed burns at 4 sites in each of 3 seasons: spring, summer and fall (10 burns total). Due to weather, these burns were implemented over 3 different years (2016, 2017, 2018), limiting initial plans for multiple years of post-fire data at all sites. To date we have data for either 1 or 2 years following burning for vegetation and birds. Here, we request funding to extend both plant and bird surveys, gaining valuable information for all sites 3 and 5 years after burns. The project has been very successful to date and garnered a lot of interest and attention. What remains unknown is how long the effect of fire will be seen in plant and bird communities and how that might vary with season of fire.

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| **ENRTF BUDGET: $ 137,428** |  |

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| **Outcome** | **Completion Date** |
| *1.* 1200 acres surveyed for birds 3 and 5 years after spring, summer, & fall fires | *July 2022* |
| *2.* 1200 acres surveyed for vegetation response 3 and 5 years after spring, summer, & fall fire | *August 2022* |
| *3.* Dataset of fire effects and vegetation response compiled and analyzed | *February 2023* |

**Activity 2 Title:** Enhance manager guide for brushland habitat

**Description:**We will update the best management practices guide developed in Phase I. The goal of management of these ecosystems is to restore and maintain diverse brushland habitat for non-game and game wildlife species. Having data from 3 and 5 years post burn would provide a much stronger basis for developing new prescriptions that incorporate season. Our DNR partners currently burn at least once every 5 years. Thus, collecting data on effect of seasons 3 and 5 years post-fire would cover the entire range of post-burn conditions normally associated with current management.

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| **ENRTF BUDGET: $ 10,000** |  |

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| **Outcome** | **Completion Date** |
| *1.* Workshop with DNR staff and stakeholders to update best management practices developed in Phase I | *March 2023* |
| *2.* Updated management guidelines for using prescribed fire to maintain brushland habitat | *June 2023* |

**III. PROJECT PARTNERS AND COLLABORATORS:**

Partners receiving funding: Dr. Rebecca Montgomery (UMN-TC, Department of Forest Resources), overall management responsibility for project team and co-advise graduate student; Dr. Lee Frelich (UMN-TC, Department of Forest Resources), coordination and co-advise graduate student. Partners not receiving funding: Charlotte Roy (MN DNR) and Lindsey Shartell (MNDNR), provide expertise on habitat characteristics for wildlife.

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:** Upon completion of Phase II of the project, research sites will return to DNR fire management rotation informed by the data collected in this study. Understanding how effects vary over time will help set burn season schedules to meet desired management goals for habitat and wildlife.