**PROJECT TITLE:** Restoration of floodplain forests along the Mississippi River

**I. PROJECT STATEMENT**

The **goal of this project** is to **assess and develop** techniques for **restoration treatments** *and* **adaptive management** of the greater Twin Cities’ urban natural forests. Mississippi Park Connection and St. Paul Parks will be planting more than a **1,000 trees across 70 acres at Crosby Farm Regional Park** through a grant ($250,000) from the Wildlife Conservation Society Climate Adaptation Fund (WCSCAF). The grant, like many restoration grants, **does not** include any money for research to assess if treatments met the intended goals of the restoration. This project will **fill that important gap** and **provide quantitative information** on the early success of the treatments. Specific objectives are to:

1. **Monitor:** 500 of the tree seedling that will be planted in spring of 2020 for detailed measurements of growth, survival, and ecological response to restoration treatments
2. **Quantify**: silver maple performance (a common planted floodplain species) with measurements of soils, water availability, and light conditions to identify the best performing forest restoration treatments (i.e., resistance, resilience, or transition)
3. **Engage**: with local organizations including non-profit, local, state, researchers, and other community partners to develop restoration recommendations

The Mississippi and Minnesota rivers have played an integral role in shaping the Twin Cities. However, multiple interacting disturbances (invasive species, climate change, extreme weather and flooding events) threaten many of the ecosystem benefits Crosby Farms provides including:

* **Wildlife:** significant stopover place for migrating songbirds and waterfowl – described as *a bird superhighway* during spring and fall migration
* **Recreation:** *500,000+ visitors* each year use the 6.7 miles of trails for hiking, biking, fishing, picnics, dog walking, cross country skiing, and many other outdoor activities
* **Ecology:** 500 acres (the largest park in the City of Saint Paul) with *diverse natural community* of plants, animals, insects, and natural ecosystem processes in the heart of a major urban area

**Restoration treatments need to be paired with quantitative research** to be able to assess if the goals of increasing healthy, resilience forests communities have been met.

**II. PROJECT ACTIVITIES AND OUTCOMES**

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| **Activity 1: Monitor planted seedlings to quantify growth and survival**  **Description:**  Seedlings will be planted in Spring of 2020 (seedling and planting costs covered by WCSCAF grant). We will monitor 500 seedlings for detailed measurements of growth and survival. We will use standard forest measurements including measures of diameter, height, and overall health to understand how individual tree species respond to various restoration treatments. We will quantify growth and survival, which is foundational data to develop forest restoration practices.  **ENRTF BUDGET: $ 70,000** |  |

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| **Outcome** | **Completion Date** |
| *1. Monitor 500 seedlings in 2020 & 2021 for important ecological variables for growth and survival* | *Fall 2021* |
| *2. Analyze data, publish results, and apply findings to Activity 3* | *Summer 2022* |

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| **Activity 2: Quantify the relationship between seedling growth and environmental conditions across a gradient of restoration treatments**  **Description:**  This activity will quantify restoration treatment impacts on plant growing environments through a) planting silver maple as a standard indicator species and b) installing microclimate monitoring equipment on a subset of plots. Silver maple seedlings will also serve as indicators of deer browse. Microclimate monitoring will quantify treatment impacts on light availability, air and soil temperature, and soil moisture, with broad implications for ecosystem services.  **ENRTF BUDGET: $99,000** |  |

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| **Outcome** | **Completion Date** |
| *1. Plant 300 silver maple seedlings* | *Summer 2020* |
| *2. Install microclimate monitoring equipment* | *Fall 2020* |
| *3. Analyze data, publish results, and apply findings to Activity 3* | *Fall 2022* |

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| **Activity 3: Engage community partners to develop restoration recommendations**  **Description:**  Urban forest management is a collaborative effort. We will bring together multiple organizations who play essential roles in forest management of urban ecosystems to discuss findings from Activity 1 & 2, to share local and expert knowledge, and to co-develop management recommendations for broader use in urban natural forests in the face of multiple threats.  **ENRTF BUDGET: $30,000** |  |

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| **Outcome** | **Completion Date** |
| *1. Gather key urban forest groups and organizations to discuss results from Activity 1 & 2 to develop management recommendations* | *Fall 2022* |
| *2. Share results through multiple media including online and in person resources* | *Fall 2022* |

**III. PROJECT PARTNERS AND COLLABORATORS:**

Project partners receiving funding including Drs. Marcella Windmuller-Campione (expertise in Forest Management – Project Coordinator), Christopher Looney (expertise in environmental monitoring of seedlings – lead for Activity 2), Rebecca Montgomery (expertise in tree physiology) from the University of Minnesota Department of Forest Resources. Project partners not receiving funding include Leslie Brandt with the US Forest Service (expertise - Climate Change), Mary Hammes with the Mississippi Park Connection (coordinating Coordinating WCSCAF grant), and Saint Paul Parks and Recreation (Land Management Organization).

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

Crosby Farm’s will be the first urban forest in the Adaptive Silviculture for Climate Change (ASCC) Network (<https://www.adaptivesilviculture.org/>). Money from LCCMR will provide valuable data on short-term assessment and development of forest restoration techniques. The long-term goal is to following through time (5 to 20 years) to be able to assess long-term success. We will continue to look for funding. After the LCCMR grant, monitoring may be done by UMN undergraduate students for experiential learning in forestry classes and continued partnership among UMN, Mississippi Park Connection, and Saint Paul Parks and Recreation Staff.

**V. SEE ADDITIONAL PROPOSAL COMPONENTS: A, B, F**