

Monitoring a Novel Landscape Restoration Project along the Vermilion River using Unoccupied Aerial Vehicles (UAVs)





Project Scope: Monitoring a Novel Landscape Restoration Project along the Vermilion River with Unoccupied Aerial Vehicles (UAVs)

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Project Overview

This project will monitor a novel approach in landscape restoration using Unoccupied Aerial Vehicles (UAVs). The study area, known as the Kamen Parcel, is a lowland ecosystem bordering the Vermillion River. Prior to any restoration work the Kamen Parcel was dominated by Reed Canary Grass, a perennial grass which grows predominantly in wetlands. In 2021 Friends of the Mississippi River and the Minnesota Department of Natural Resources conducted controlled burns at the Kamen Parcel to combat Reed Canary Grass. These controlled burns were followed up by precision seeding in 2023. The novel approach aimed to discover if minimal seeding of specific native flora in existing pockets of desired flora could effectively compete in a Reed Canary Grass dominated ecosystem. To monitor this approach a UAV equipped with a Near Infrared (NIR) camera will collect NIR imagery. The NIR imagery will allow for the production of a Normalized Difference Vegetation Index (NDVI). A NDVI is a measurement of vegetation health and density. Taking advantage of Reed Canary Grass's unique phenological growing period, NIR imagery must be collected during the early spring each year when Reed Canary Grass will be the primary vegetation. The NDVI will provide information regarding the abundance and distribution of Reed Canary Grass and insight into the success or failure of the novel landscape restoration.

Project Goal

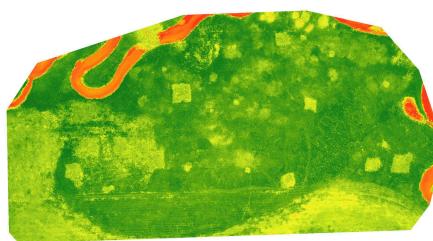
This project aims to monitor the distribution of Reed Canary Grass at the Kamen Parcel and give insight into the success or failure of the novel landscape restoration implemented at the Kamen Parcel.

Partners

- Friends of the Mississippi River
- The Kamen Family
- Minnesota's Department of Natural Resources
- The University of St. Thomas Geography Dept. and Geology Dept.

Deliverables

- A NDVI map of the Kamen Parcel (Left)
- A RGB map of the Kamen Parcel (Right)



Constraints and Limitations

- Annual execution of this project must be authorized by Friends of the Mississippi or Minnesota Department of Natural Resources.
- Adherence to regulation governing UAV operations and UAV operations on DNR property.
- Suitable weather conditions for UAV flights.
- Access to equipment and technology for data collection and analysis.

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