Towards a Wild Anthropocene:

Fostering Interdisciplinary Collaboration for Habitat Restoration

Project Case Study:

Habitat restoration to sustain Sage-grouse in Canada

STUDIO

Towards a Wild Anthropocene:

Fostering Interdisciplinary Collaboration for Habitat Restoration

The Vision:

In our pursuit to restore and enhance habitats in the Anthropocene era, we recognize the indispensable need for interdisciplinary collaboration. This project aims to break new ground by integrating the expertise of landscape architects with that of ecologists and computational scientists, creating a synergistic approach to habitat restoration. By transcending traditional disciplinary boundaries, we aim to develop innovative, sustainable solutions for the ecological challenges of our time.

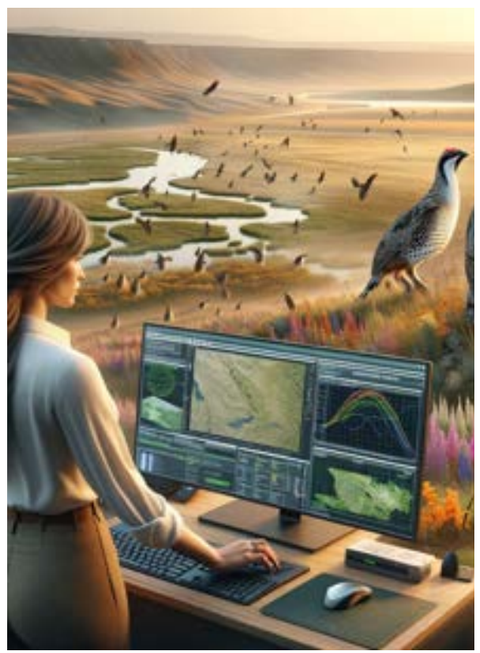
Research Project Brief:

In collaboration with the Computational Ecology Group (CEG) the project team used an integrated approach on a current habitat restoration project, with the goal to explore potential innovations and actions to support habitat restoration in the Greater-sage grouse range. The research funding went towards integrating a landscape architecture perspective which wouldn't have otherwise been integrated into the project scope. Through collaboration the integrated project team discovered project opportunities which may not have been realized, and built capacity and overlap across expertise, skills, tools.

01 | The Proposal

Creating the research grant proposal:

Exploring opportunities integrating generative artificial intelligence into proposals



AI as a support colleague:

LDA Studio is a small 1 person design practice, and as such time becomes infinitely stretched beyond practice capacity. At the time of producing the grant application in November of 2023 generative artificial intelligence (AI) was developing towards different application for content generation. As part of the physical production of the grant proposal AI was used to generated proposal imagery, proof and edit text and integrate and regenerate content based on review comments. This was an iterative and exploratory process looking at opportunities to enable additional capacity within a small design practice. The approach looked to integrate and harness generative processes as a practice support and create hybrid imagery and content. A disclaimer was provided as a component of the proposal identifying the use of these tools.

As the technology continues to develop AI enhanced workflows for both project works as well as proposal production, and office support services will undoubtedly become a significant aspect of both small and large landscape architecture practices. This will come with a range of new unknowns and industry changes but it is critical to begin understanding how these tools can be leveraged towards our mandates, successes, and contributions as practicing professionals.

02 | The Project

Project Case Study:

Habitat restoration to sustain Sage-grouse in Canada

Habitat Restoration Project Summary

- Greater Sage-grouse have been at high risk of imminent extinction in Canada for over a decade.
- A key conservation intervention has been the translocation of grouse from Montana to Alberta, which likely helped the evidenced stabilization of this small and fragile population.
- Greater sage-grouse are habitat specialists which, as the name suggests, largely depend upon sagebrush for their survival and persistence.
- The demise of sagebrush due to habitat deterioration as well as factors such as climate change and introduction of invasive species have all played a role in the imminent decline across Canada.
- Management strategies for Greater Sage Grouse need to enable habitat restoration decisions that are not only of utility in the short term but are also adaptive to changing challenges and habitats of the future.

The project proposes a comprehensive program of innovations and actions which can help to benefit habitat protection and habitat restoration immediately, while developing future-facing habitat projections that can guide land-use management and associated release site selections for the long-term.

Project Timeline

Wet Meadow Restoration Timeline

Project Start
Current / Ongoing

Restoration Intervention
June/July 2024

Project Report Creation
Sept-Nov 2024

Field Monitoring and Feedback
2024 - Ongoing

LACF Project Timeline

Big Ideas Visioning Session
Feb 2024

Collaborative Workshop
Mar/Apr 2024

Tool Explorations
Apr-Jun 2024

Project Report Creation
Nov - Jan 2025

Project Objectives

Project Funders:

صندوق محمد بن زايد
للمحافظة على
الكائنات الحية
The Mohamed bin Zayed
SPECIES CONSERVATION FUND

LACF FAPC
LANDSCAPE ARCHITECTURE CANADA FOUNDATION
FONDATION D'ARCHITECTURE DE PAYSAGE DU CANADA

Research:

To establish an undisturbed, restored safe haven for Greater sage-grouse populations to flourish again, protected from external threats.

Practice:

Habitat improvement by restoring purchased land to increase sage grouse habitat quantity and quality. Wet meadow restoration will be implemented to improve vegetation, and climate vulnerability mapping will also be completed by Computational Ecology Group to identify climate-resilient sites.

Outreach:

In addition to assessing the feasibility, protocols, and best locations for habitat restoration, Computational Ecology Group and partners aim to engage and share project learnings with a wide range of organizations working in the project area.

Cross Disciplinary Collaboration:

To explore new and innovative avenues for cross disciplinary collaboration and contributions to habitat restoration works.

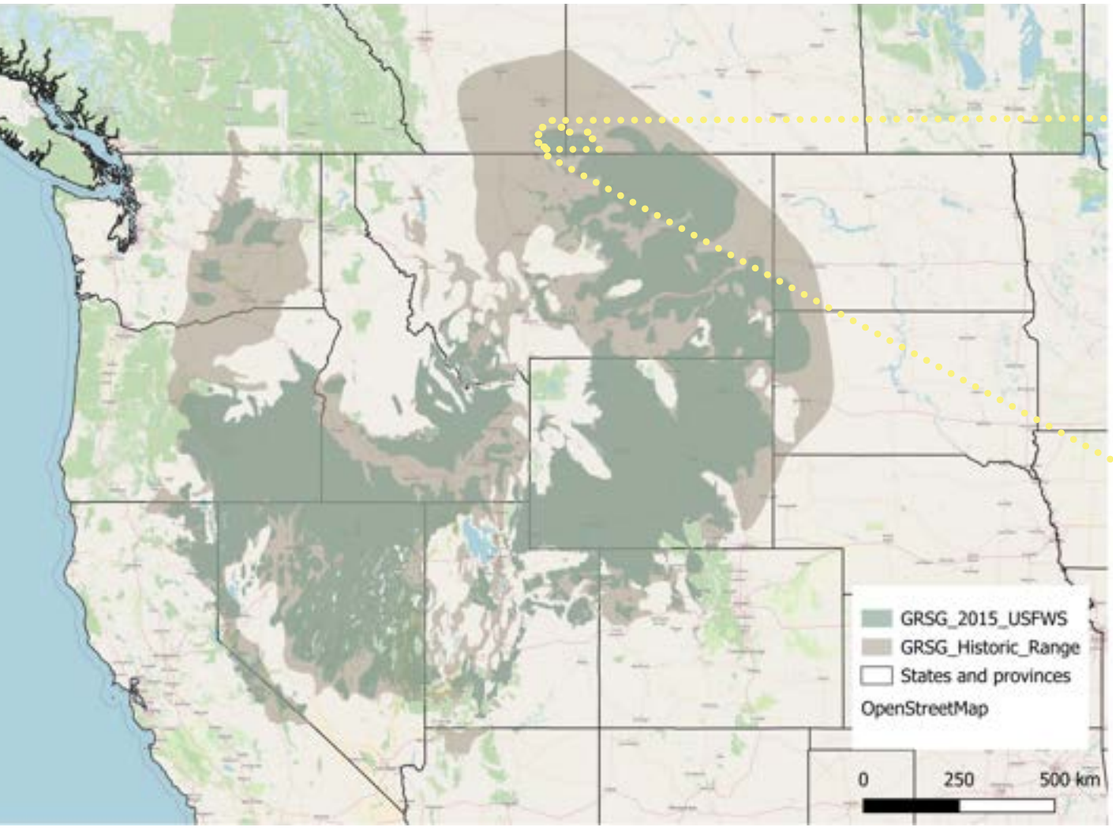
Landscape Architecture Research and Perspectives:

To explore potential value add and project involvement for professional landscape architects in species conservations and remote habitat restoration works.

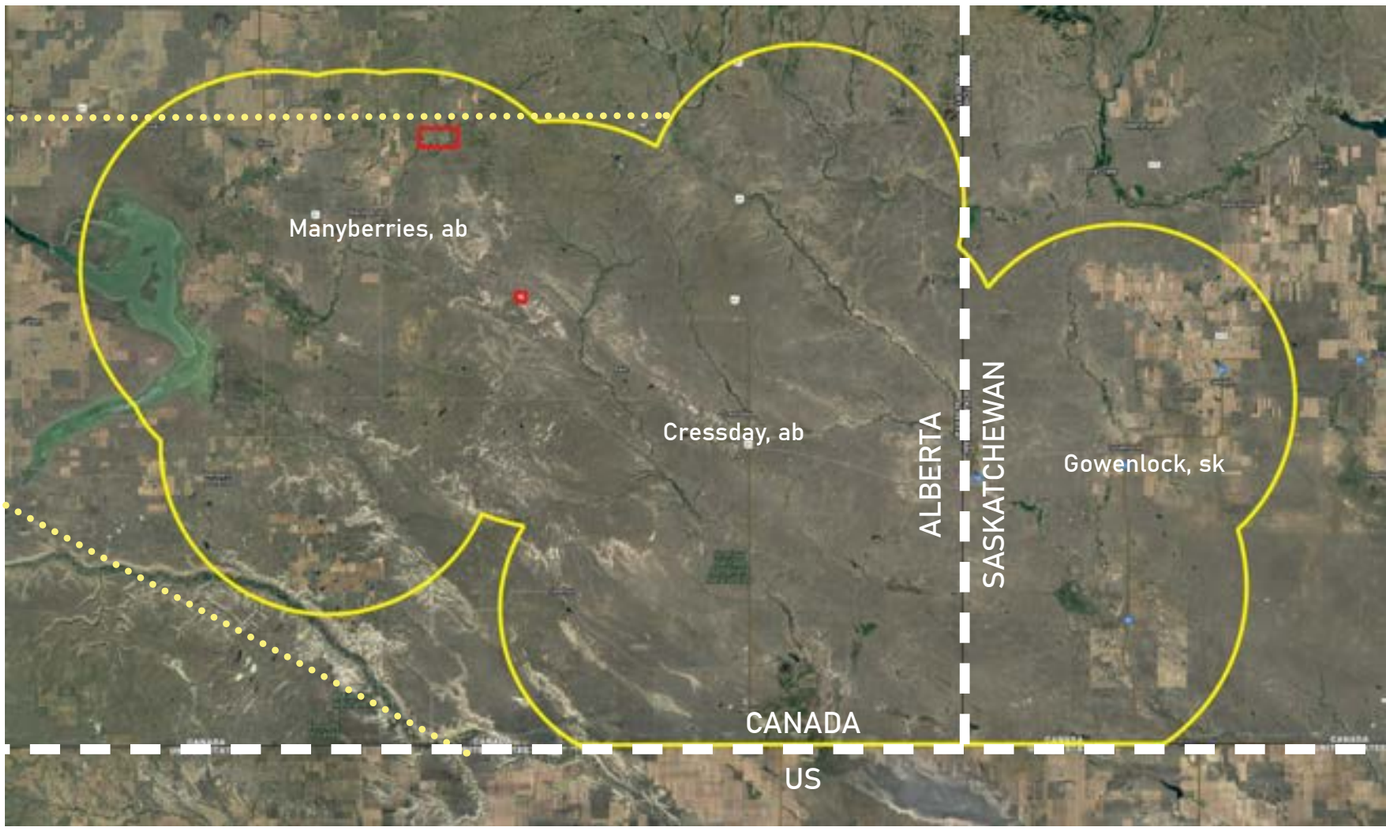
Project Context:

The location for the habitat restoration project was specific sites located in southern Alberta and Saskatchewan within the current sage-grouse range. This wider project study area has numerous landowners and stakeholders . The team collaborated with numerous agencies and stakeholders throughout the specific site selection and site intervention process.

SAGE-GROUSE RANGE



SOUTH EAST ALBERTA CONTEXT

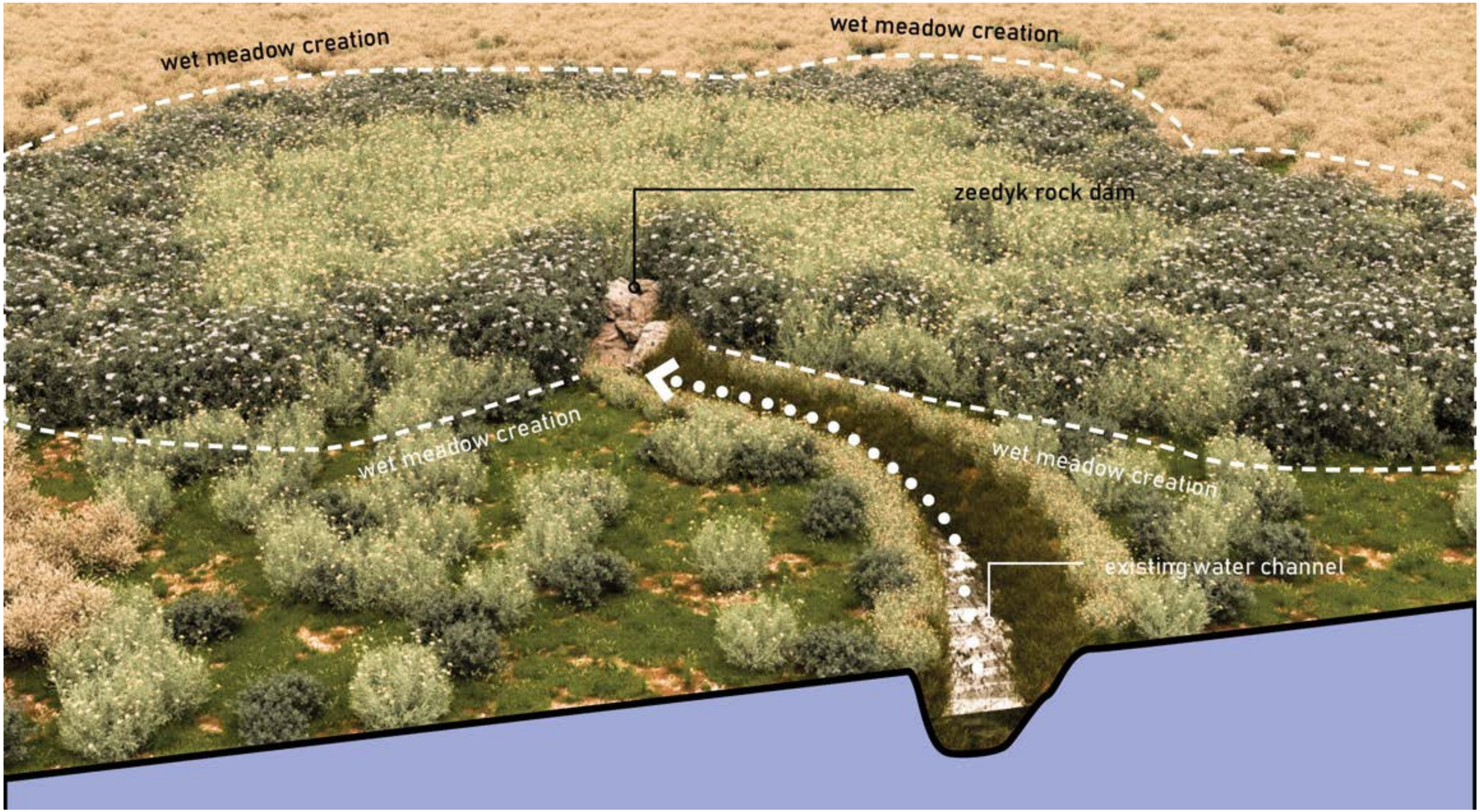


The Site Intervention:

ZEEDYKS: Structures for riparian areas and Wet Meadows

LOW TECH | SITE SPECIFIC | FIELD INSTALL

Zeedyk structures are low profile, hand-built treatments made of rock or wood intended to restore hydrologic and ecological function of wet meadows and small streams impacted by head-cutting, gully erosion, and channel incision. The structures help to slow and disperse water, dissipate energy, capture sediment, and increase soil moisture thereby promoting mesic and wetland plant species expansion that prevents further degradation and fosters channel recovery. Typical installation requires multiple structures to achieve desired effects within a reach.


wet meadow creation
wet meadow creation
zeedyk rock dam
wet meadow creation
wet meadow creation
existing water channel

03 | The Process

Collaborative Workshop:

The project team engaged with stakeholders in a online collaborative workshop to share experience, expertise and ideas the workshop featured two sessions.

Activity 1.0 | Defining success, exploring opportunities

Objective:

To have a open and collaborative brain storming session focused on defining success and highlighting potential opportunities or constraints around multiple project aspects such as implementation, vegetation (short- and long-term), sage-grouse, conservation collaboration, site design, public communication, interdisciplinary

Activity 2.0 | Site intervention consideration, limitations and constraints

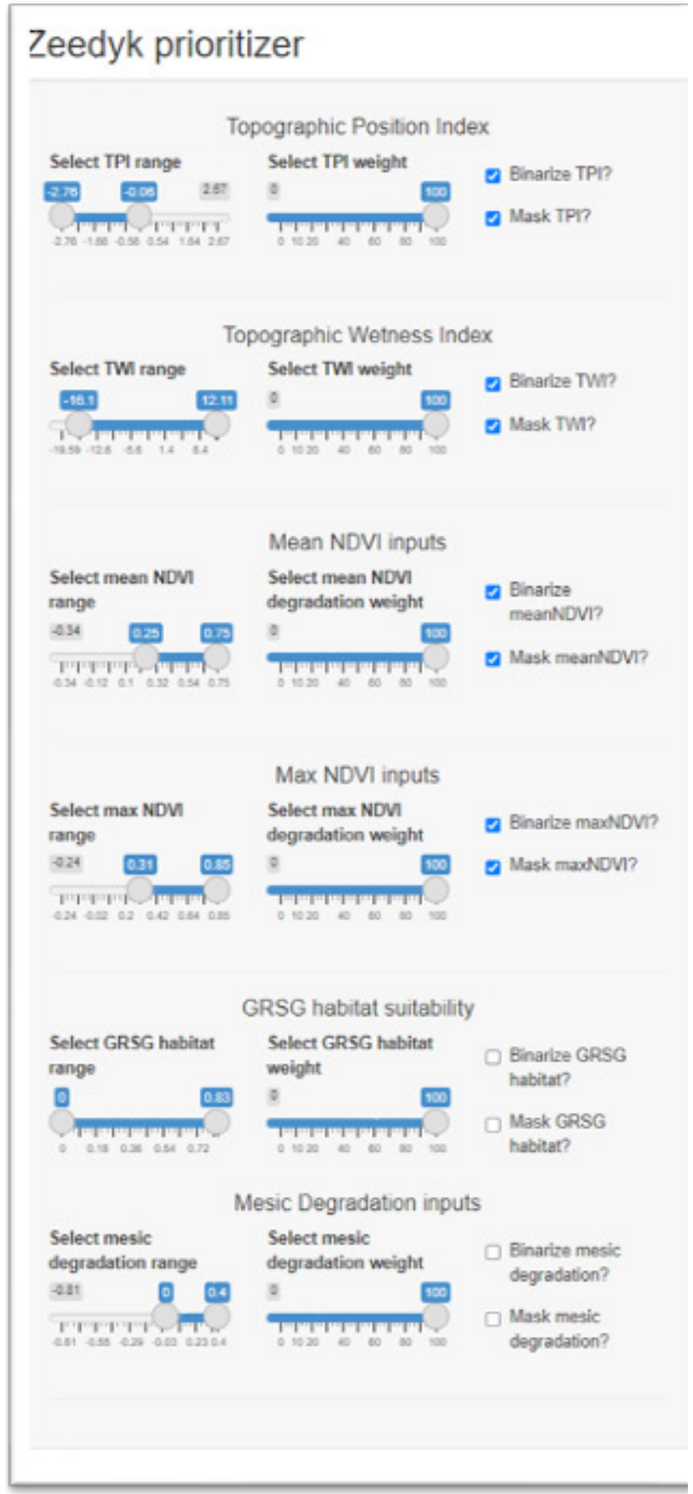
Objective:

Provide a brief background on zeedyk installation and have a discussion on the different facets of constraints: logistical implementation, vegetation, sage-grouse impact/benefits, site design, monitoring, collaboration, social/communication, interdisciplinarity.

Site Selection:

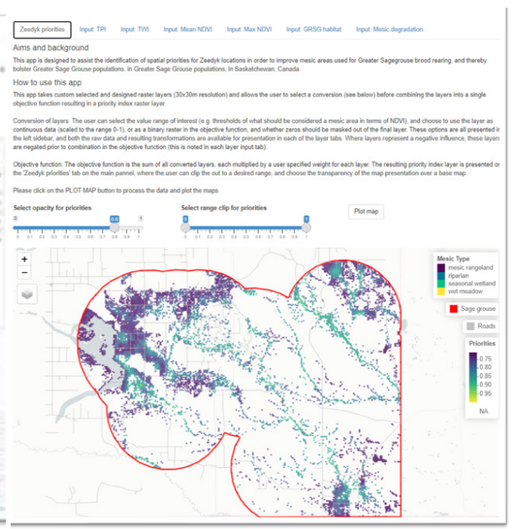
As the project lead the Computational Ecology Group (CEG) developed an app to support the refinement and selection of specific sites within the wider project context area. This app provides a user interface that allows user driven weighting and refinement to specific criteria. This tool was used to identify the specific intervention locations. The shiny app CEG developed provided new opportunities for data analysis and site selection within a spatial (30m) priorities based on:

- **Potential for mesic habitat**
- **Topographic position index**
- **Extant / historical presence of high NDVI in brood season**
- **Sage grouse benefit**
- **Within critical habitat**
- **Proximity to recently active leks**
- **Where mesic areas are limited**
- **Potential for restoration**
- **Recently degraded**



Potential Wider Application of App:

The app developed by CEG and similar analysis tools and practices in computational ecology can prove to be directly beneficial to landscape architecture projects of both regional and site specific context. With continued development and explorations, integration, design feedback, collaboration, and monitoring approaches current and future projects could benefit from the integration of these tools and expertise throughout the project process, in aims to improve ecological benefit and enhancement to habitat restoration.



Exploring Opportunities for Landscape Architecture Scope Enhancement

Big Ideas Visioning

As part of the project process the project team shared experience, skills, knowledge and prior project outcomes. Using the specific sage grouse habitat restoration the team discussed project opportunities that might be realized in future projects through enhanced collaboration and integration across expertise. Sharing professional knowledge the team looked to identify potential for future collaborative projects to enhance the outcomes of habitat restoration projects

ANALYSIS PROJECT OPPORTUNITIES

Site selection and design development:
Using design and analysis hard and soft skills to analyze topography and explore and communicate site specific design options

parametric and site analysis
3d modeling
rendering and visualization
construction documentation
project communication

DESIGN PROJECT OPPORTUNITIES

On-site Design Opportunities:
Telling stories of place through contextually sensitive design features

highlighting intervention design elements
creating opportunity for engagement
designing to limit human disturbance

ENGAGEMENT PROJECT OPPORTUNITIES

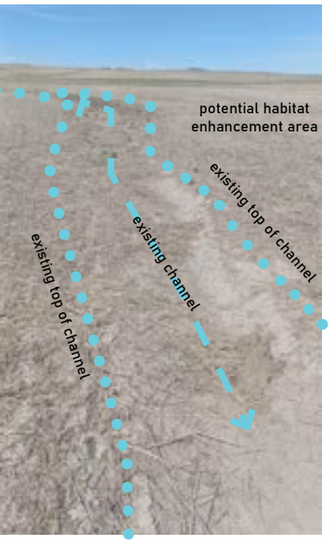
Communicating:
Building capacity and understanding with public and users

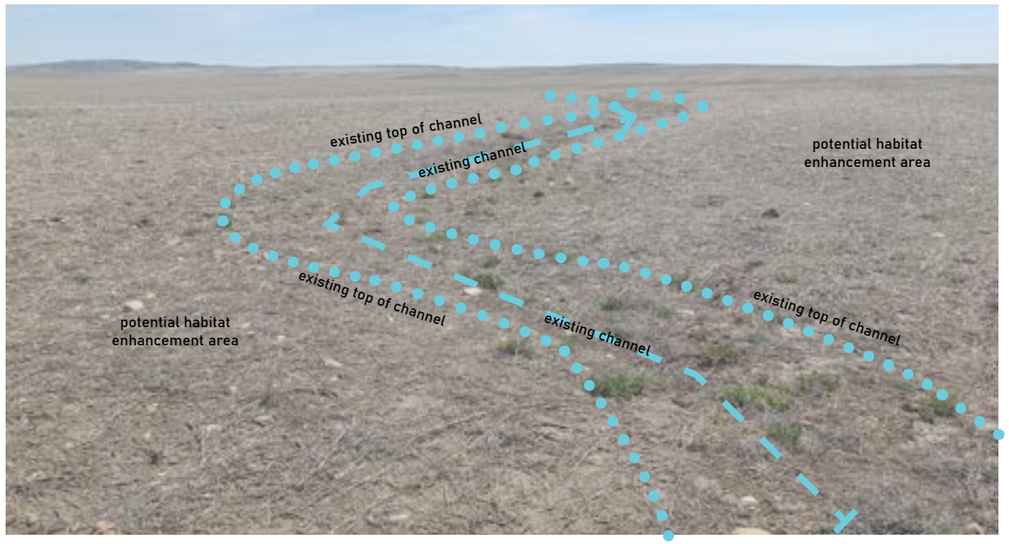
signage
graphic communication
demonstration design features
engagement

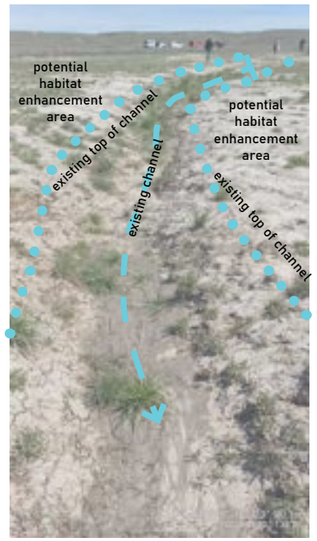
critical habitat site → demonstration site

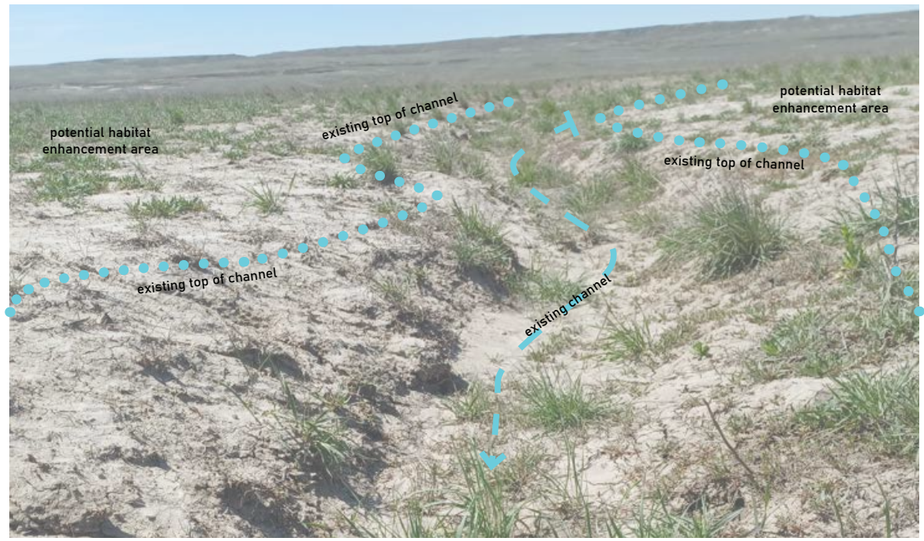
access and human engagement

04 | The Outcomes







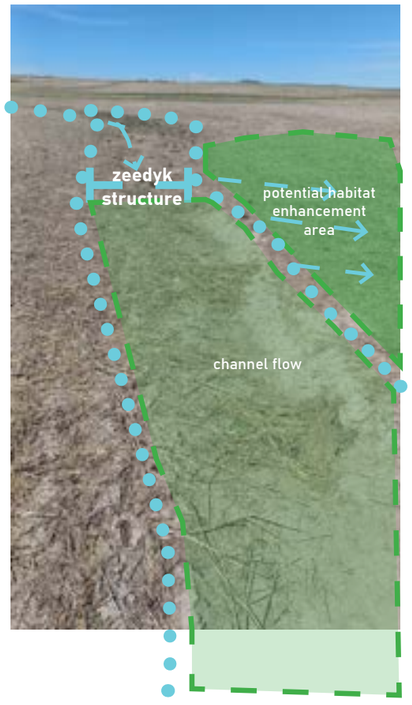


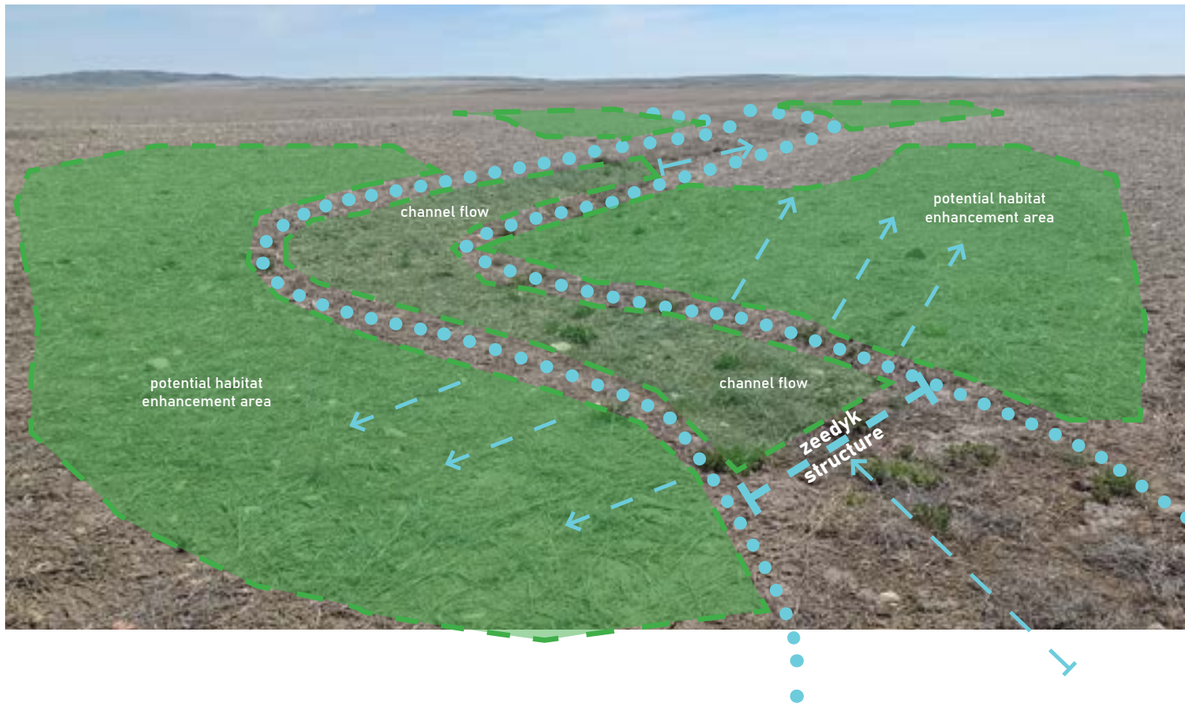
IDENTIFYING SITE OPPORTUNITIES

- Existing low points and depressions
- Evidence of surface water flow
- Natural and altered topographic features
- Potentially water limited habitat areas

POTENTIAL INTERVENTIONS

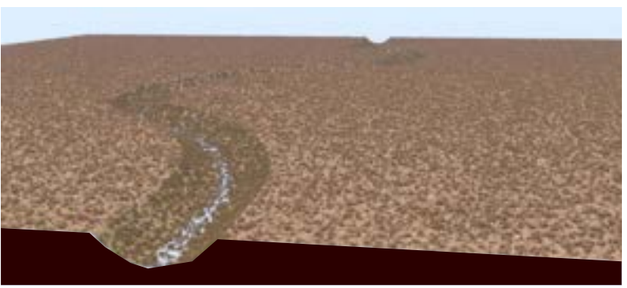
- Plug and spread structures
- Increase available soil moisture beyond channel



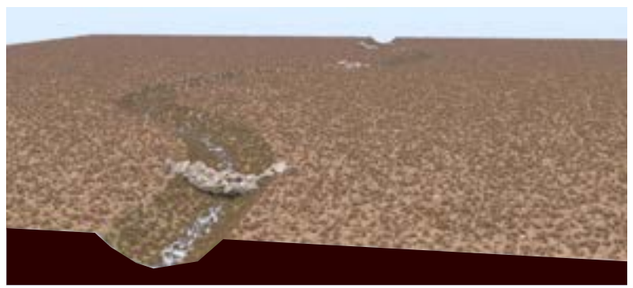


Production of process diagrams and visualizations

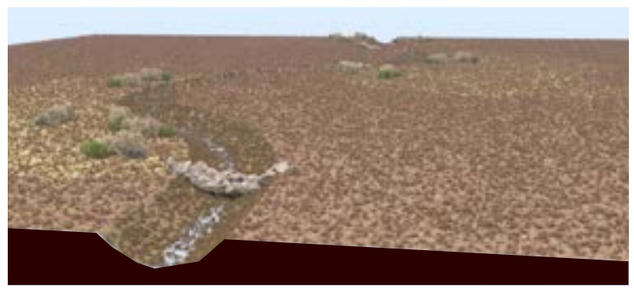
01 | EXISTING CHANNEL CONDITION



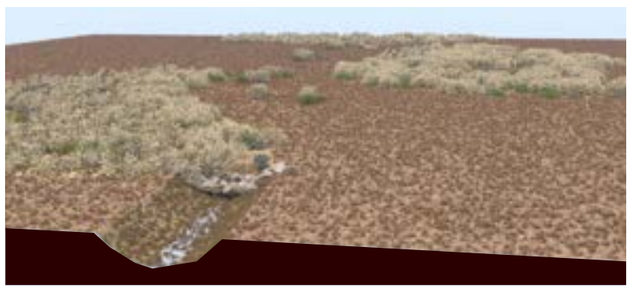
02 | ZEEDYK INSTALLATION

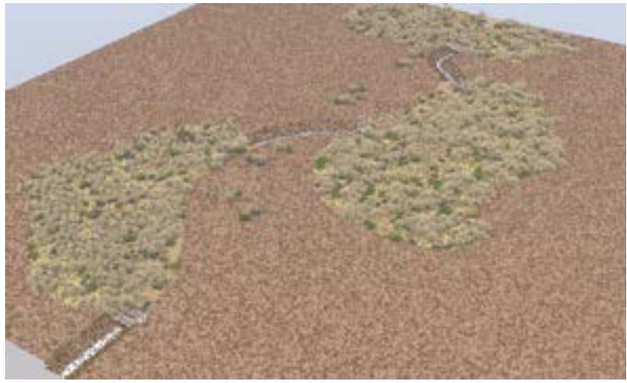


03 | POTENTIAL EARLY HABITAT ESTABLISHMENT



04 | POTENTIAL HABITAT ESTABLISHMENT





Production of process diagrams and visualizations

WITHOUT INTERVENTION

- Continued channelization and erosion
- Limited surface flow beyond channel banks
- Lower ground water table

WITH INTERVENTION

- Slowing and spreading of surface water flow
- Potential infill of channel feature overtime
- Potential raising of ground water table

POTENTIAL SAGE GROUSE HABITAT ESTABLISHMENT

ecologists & biologists

habitat restoration professionals

stakeholders & public

flaura & fauna habitat

academics

landscape architects

computer scientists

This project collaboration would not have been possible without the research grant funding provided by the Landscape Architecture Canada Foundation LACF

This funding supported
1. Cross disciplinary collaboration and knowledge sharing
2. Enhanced project engagement through a collaborative stakeholder workshop
3. Enhanced project scope with the involvement of a landscape architecture perspective and expertise on the project team

THANK YOU

LACF FAPC
LANDSCAPE ARCHITECTURE CANADA FOUNDATION
FONDATION D'ARCHITECTURE DE PAYSAGE DU CANADA