

## **Lecture 08: Project Proposal**

### **1. Discussion of Project Mini Proposal**

#### **Format for Class Mini Proposal**

Title of the project

Proposers

#### **OBJECTIVE**

*Project objective (capstone statement, executive statement)*

#### **DESCRIPTION**

Background

Study Area

Proposed Tasks

Deliverables

References

## Examples of Project Proposals

Example 1:

### Optimal Division of Pasture Land

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#### **OBJECTIVE:**

To determine the optimal division of a pasture in a Management Intensive Rotational Grazing (MIRG) system.

#### **DESCRIPTION:**

##### *Background:*

Management Intensive Rotational Grazing (MIRG) is a grazing strategy designed to maximum the productivity and economic benefit of a pasture by capitalizing on ecological factors that control productivity. In practice, a pasture is divided into parcels that are grazed for a limited time and subsequently allowed to recover before being grazed again. This strategy increases the productive capacity because most of the pasture is left in fallow so the grasses can recover. Other advantages that improve productive capacity include managed nutrient cycling, diverse seasonal productivity of grasses, and improved management of genetically favorable grasses. Traditionally, pasture division has been conducted with little rationality behind it other than availability of drinking water for animals and "common sense". The decision to use GIS is based on the assumption that a rational approach to dividing pasture land will result in cost and labor efficiency and maximum productivity.

##### *Study area:*

Three parcels that make up an 1800-acre ranch in a semi-arid region of eastern Washington State have been selected as the site for this project.

The site varies dramatically in topography, vegetation, soil quality, and water availability making it an ideal setting for this experiment.

*Proposed Tasks:*

Use soil, vegetation, and surface water data to quantify and map the expected availability of forage for the pasture. Define criteria for different "management intensity" scenarios. Partition pasture according to different "management intensity" scenarios and determine carrying capacity and rotation schedules for each scenario.

## Locating optimal land for reforestation in the Baraboo Hills, Wisconsin

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### OBJECTIVE:

We propose to identify and prioritize the best areas for reforestation in order to establish the maximum amount of new interior forest allowed by budget and time constraints.

### DESCRIPTION:

#### *Background:*

Fragmentation of forest through deforestation allows invasive species easier access to critical high diversity forest habitats. Specifically, songbirds that live in these habitats are extremely sensitive to changes in the landscape caused by development and deforestation. These human activities destroy or divide songbirds' habitat and allow invasive species to infiltrate into the affected areas. One such invasive species, the cowbird, is known to parasitize the nests of songbirds. Cowbirds live in the open areas surrounding a forest and will parasitize up to 200 meters into a forest (Temple 1988). In order to reduce the negative impacts on songbird populations caused by habitat destruction and invasive species such as cowbirds, areas surrounding songbird habitats need to be reforested. Spatial analysis is one way to locate the best areas to reforest.

*Study Area:*

The Baraboo Hills, found in Wisconsin's Sauk and Columbia counties, are one of the most ancient rock formations in North America. Since the various forests found in the hills are the largest remaining blocks in Wisconsin, the hills contain the state's most diverse habitat of natural forest flora and fauna. Because recent development has threatened this habitat via deforestation, the hills are an ideal location for studying the effects of reduced interior forest upon the native forest species. The Nature Conservancy has been active in the area since the 1960s, developing rich datasets that will be necessary for this application. The analysis of the 33,963 acre area will be conducted using specific requirements laid out by the Conservancy.

*Proposed Tasks:*

We will first use orthophotos to update the existing forest area edges. We will then use this new forest edge to determine large, homogenous areas of forest blocks. Using an array of variables, we will then determine areas contiguous to these blocks that maximize interior forest based on geometric relationships, while keeping a close proximity to high diversity habitats. Finally, we will combine and analyze the created files to prioritize the reforestation into eighty acre segments a year, over ten years.

*Source:*

Temple, SA, and JA Cary. 1988. Modeling dynamics of habitat-interior bird populations in fragmented lands. *Conservation Biology* 2: 340-347.