# Identifying Suitable Locations for Beaver Settlements in Massachusetts

Introduction

The intention of this analysis focused on identifying locations within the Commonwealth that were hospitable for beaver (Castor Canadensis) populations to ensconce. The beaver is regarded as a "keystone species" as a result of the ecological impact they engender after colonization. For example, upon the constructing a dam, the stream bed increases in elevation causing the local water table to rise, sediments and organic materials are intercepted causing accumulation that stimulates wetland creation, to which provides accommodation for other species and ultimately transforms and improves the area's riparian zone. To predict ideal locations for beaver populations to colonize, this analysis used data from the MassGIS archives. This data used to conduct the analysis consisted of types of land usage, stream size, transportation routes, and anthropogenic house hold sizes.
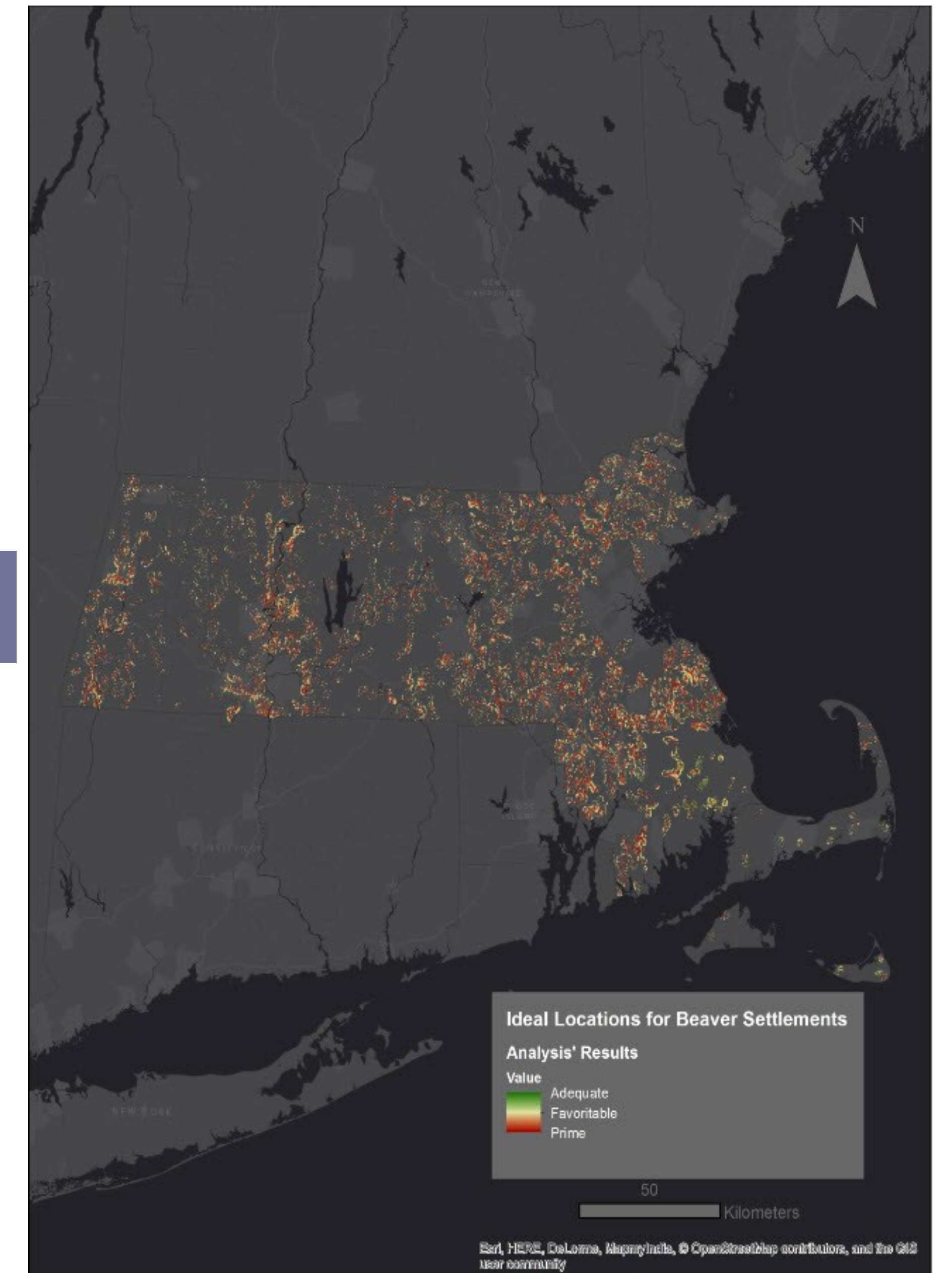
Methodology

The first part of the analysis sought to determine house hold size throughout the Commonwealth. The purpose of this step was to filter areas that had highly concentrated populations. These specific areas were determined to be unaccommodating for beaver and human coexistence because of the damage a collapsed lodge my inflict onto populations and property. In order to avoid the intermingling between anthropogenic and beaver populations, and provide enough space for beavers to exist without becoming a nuisance, the parameter of one household unit per acre was established to identify optimal habitat locations.

The next step was to identify rivers and streams that afforded good settlement locations. Beavers thrive in riparian environments because of the high vegetation that normally environs the land. Furthermore, a river's flow rate greatly influences the probability of settlement because of the beaver's preference for lower flow rates in order to construct their lodges with ease. Low stream flow sites were found by identifying the stream order of each river in the Commonwealth. Stream orders 'one through three' were determined best suited for beaver colonies along with the land parallel to the rivers extending 1000 meters inland.

Moving forward, the analysis focused on road proximity. It was determined that a 400 meters from any road was a ideal distance for beavers to establish a lodge. This distance from the roads would reduce the probability of interaction between vehicular traffic and beavers. The last dataset used in the analysis was land use. The land use dataset was filtered to represent terrestrial attributes that were accommodating for beavers to sustain a successful livelihood. The four datasets were calculated together, appended with weighted values, to determine ideal locations for beaver habitation.

Results

Conclusions

The raster calculations determined many areas throughout the Commonwealth that would accommodate beaver populations. This is most evident in the south shore. This could be due to the fact that there are many wetlands and placid streams located in southern Massachusetts, to which are ideal habitats for beavers. Most surprisingly is the dearth of suitable location in western Massachusetts. This could be due to rivers that have higher stream orders and improper land topography, which may discourage beaver settlements. In short, a more inclusive analysis is needed in order to pinpoint designated areas for beaver to populate.