Site Suitability Analysis for Hibernaculum at the Silver City Trap Club

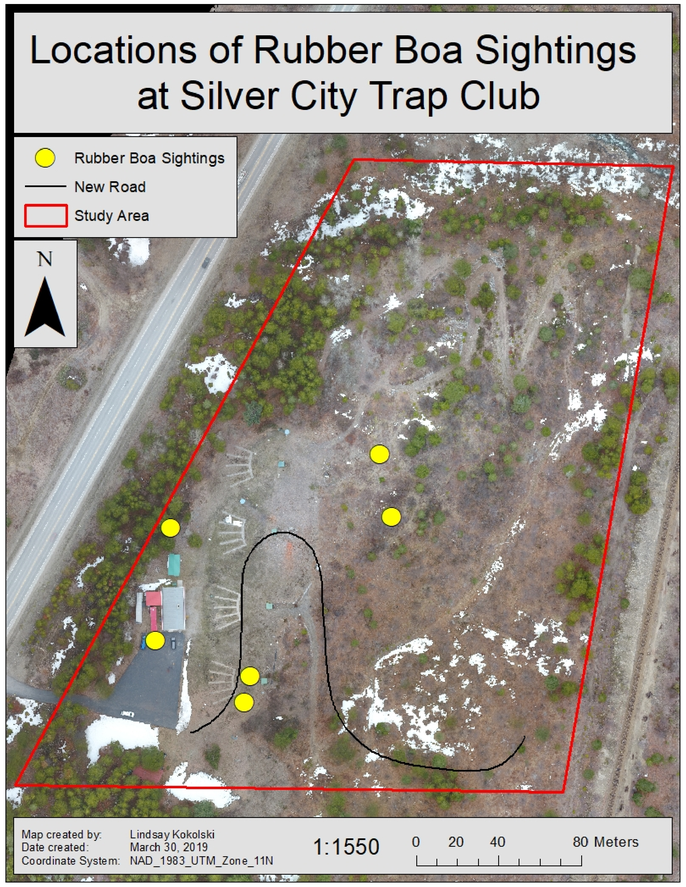
Introduction

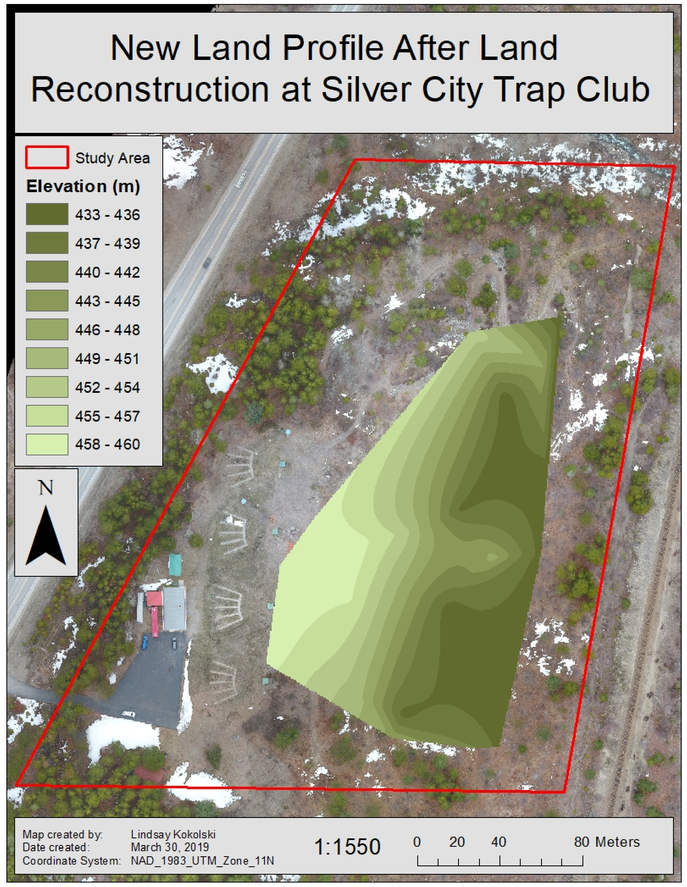
The West Kootenay region is known for the landscapes and ecological diversity it holds. With the rapid changing of the natural environment, susceptible species populations continue to decline. Reptiles such as the listed rubber boa (*Charina bottae)* are becoming subject to habitat loss and degradation, even here in its native region, West Kootenays.

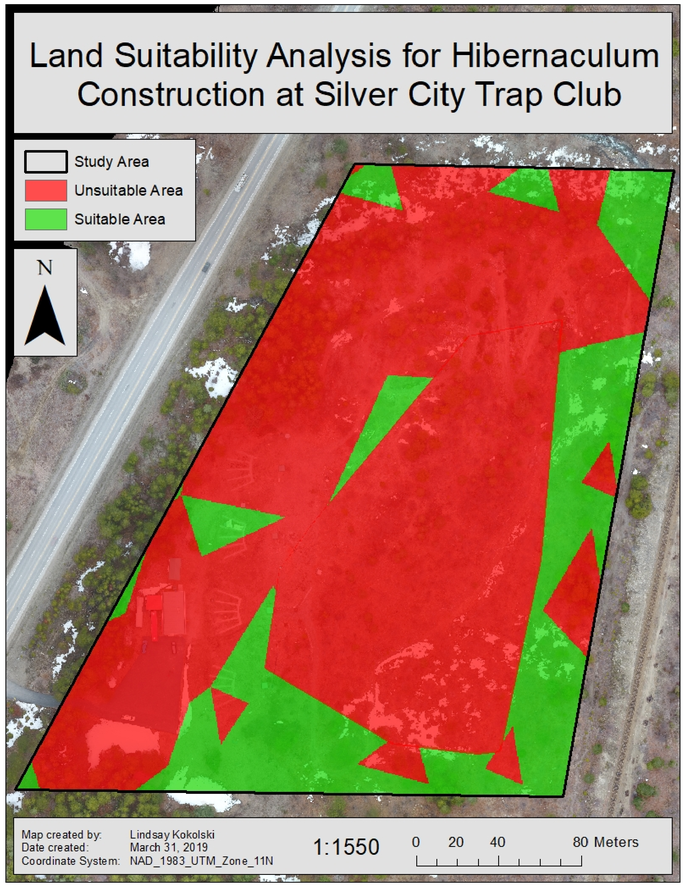
The former layout of the Silver City Trap Club resulted in the possibility of targets for shooting landing outside of the property. To stay in operation and to follow the regulations of a gun range, the club needed to undergo a major land reconstruction project on its grounds. Losing a large portion of habitat due to the land reconstruction, the club is now focusing on creating reptile hibernaculum on the suitable area that remains.

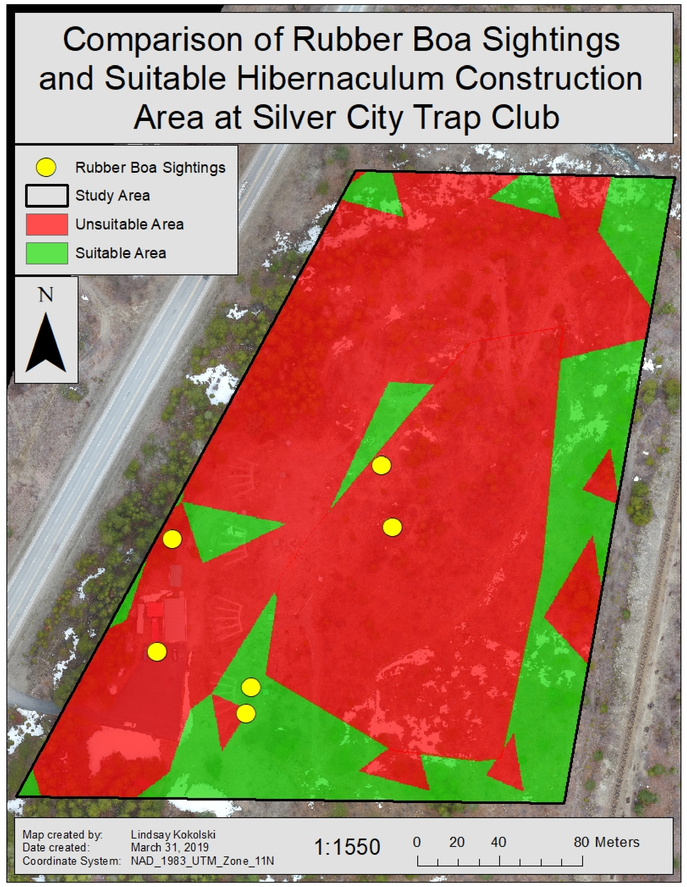
Methods

1. Initial client meeting was done to address their specific needs and desires. Existing data and information was collected from client.
2. Training for use of a GPS Trimble R2 paired with the Trimble Nomad handheld computer were taken. Training for post processing data on GPS Pathfinder Office was taken. Both of which were provided by Ian Dennis at the Applied Research and Innovation Centre
3. Using Trimble R2 and Trimble Nomad, point and line features were taken across the study area. Collecting data for physical location of snake sightings, point features for major changes in elevation (approximately 5m changes), and a line feature for a newly constructed road. Post processing was done on these features in the lab to create shape files.
4. The natural neighbor tool was used to create a newly interpolated surface using the elevation points that were collected in the field. This was done to provide base data for the area of land that had been reconstructed, since none existed.
5. A Digital Elevation Model that was collected from Geogratis was used to create layers for contours, aspect and slope.
6. Aspects were reclassified so that flat, east, southeast, south and southwest were set to 1 (suitable), and north, northeast, west and northwest were set to 0 (unsuitable).
7. Areas of high canopy cover, human disturbance and roads were created into polygons, changed to raster layers and reclassified. Anything falling inside of the polygons was set to 0 (unsuitable), anything outside of polygons was set to 1 (suitable).
8. Raster math was used to calculate the suitable areas across the site where the construction of hibernaculum could take place.
9. Maps created to display results of analysis.









Limitations and Assumptions

Working with high grade GPS equipment borrowed from the Applied Research and Innovation Center was a limiting factor. The computers at the main Selkirk College campus are not set up with specific software to work with the devices.

A previously conducted land survey that was supplied by the client had contour intervals that were accurate to 1m, but tools to digitize or export those contour lines from the PDF did not work. Instead, a DEM was used for the analysis. Even at 5m contour intervals, there was still slight error in the data that the DEM provided. Due to the potential error in the contour data derived from the DEM, it is possible that some area that was calculated as unsuitable could actually be suitable.

Timing posed as a limitation to this project. Because the fieldwork was conducted over the winter, the ground was covered in snow. This limited the variables that could be collected to only sightings, road lines and elevation points.


https://twitter.com/RichardGreenEco/status/1042516586526072836

Results and Discussion

From mapping the sightings of rubber boa snakes across the study area, it was clear to see that the sightings recorded were mostly located in the southwestern corner of the study area, with a couple lying towards the middle of the study area.

After creating a newly interpolated surface where the land was reconstructed due to regulations, the land was deemed unsuitable for habitat construction. The slopes were steep and the human disturbance in the area was large.

For a visual comparison, rubber boa sightings were overlaid onto the suitability analysis. Only two locations were found to be within suitable habitat area. The sightings that are located within unsuitable area are not far form suitable area. It is possible that constructing hibernaculum within the suitable area would lead to a large amount of reptile use.

Citations

Selkirk College O-Drive, I-Drive.
http://geogratis.cgdi.gc.ca/

Selkirk College

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Course: IEP271 GIS Applications II