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Relocation Areas within Humboldt County for *Ursus Americanus*

Abstract

With the goal of finding the most suitable areas for black bear relocation, our group set certain requirements for what would fit the bill. Only the lands which fit the criteria were displayed on the final results map, and we hope to provide comfortable living areas for bears which need to be moved. There are bound to be conditions which were overlooked, but our project provides at least a core dataset which may be further refined in the future. Bears are wild creatures and should be treated respectfully as human populations continue to expand into natural habitats.

Introduction

Humboldt County contains a significant bear population, with the mild climate and available natural resources. However, with population increases in the past few decades, more black bears are being displaced from their natural habitats and ending up in dangerous areas. The safety concerns for the animals and humans alike are cause for relocating bears to remote and safe areas. Using a set of criteria, we found a prime set of lands within Humboldt County for the *Ursus Americanus*. For several bear relocations, it is advised to spread the chosen locations out to avoid any territorial issues. This project found initial areas which are thought to be some of the best living spaces for the black bear, but additional surveillance of the findings may be required before taking action.

Methods

The requirements set for this project are as follows:

- Further than 300 meters from any roadway
- At least 15 kilometers away from city boundaries
- Within 5 kilometers of a water source
- Land owned by the state or federal government
- Regions with medium-high density forest
- Areas within the natural black bear range
- Parcels of at least 3 square kilometers

** Note that Figures are grouped and are in chronological order on the next page**

First, all datasets were projected into WGS 1984 UTM Zone 10 North. The range of black bears (Figure 2) included all of Humboldt County, therefore not limiting any

selections of land. The next step was to clip the statewide datasets ,wetlands and vegetation (Figures 3-6), to only Humboldt County, for ease of processing and reduction of file sizes. Then, a 300 meter buffer was placed on the roadways dataset (Figures 7 & 8) and saved for later use. Humboldt wetlands was given a buffer of 5 kilometers, and practically highlighted the entire county, which means that all areas are close proximity to water sources. Next, the search by attribute tool on the land ownership data (Figure 9) was used to select federally and state-owned land (Figure 10), so to avoid any complications with private properties and native reservations. The road buffer was dissolved and erased from the government lands (Figure 11). Areas were calculated in

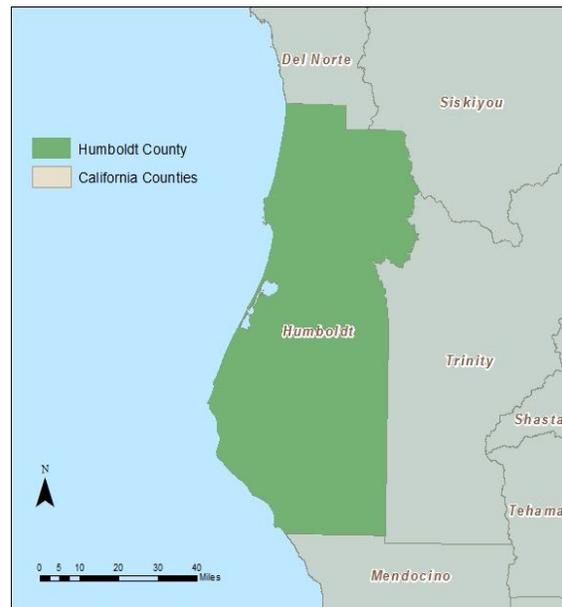


Figure 1: Humboldt County

terms of kilometers, and then all parcels which were smaller than 3 square kilometers were eliminated from the results (Figure 12). A 15 kilometer buffer was placed on city boundaries (Figures 13 & 14), which eliminated parts of the Redwood National Park and smaller areas which were too close to human populations.



Figure 2: Natural range of the American Black Bear

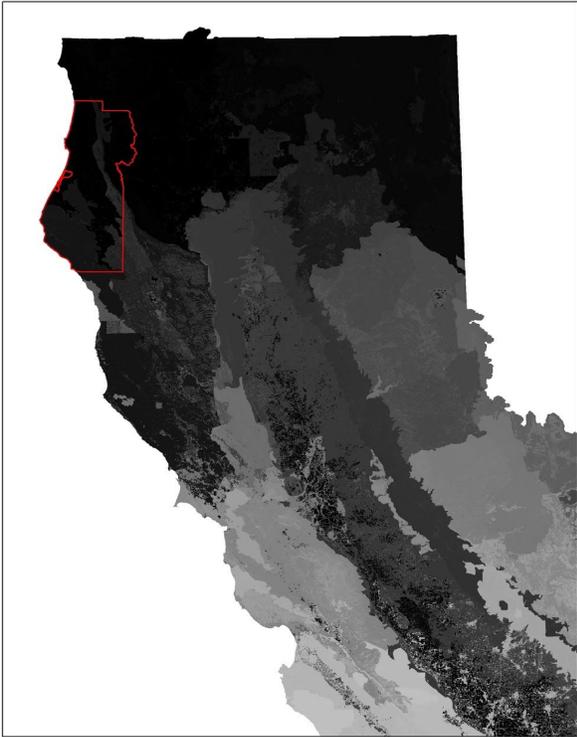


Figure 3: California vegetation

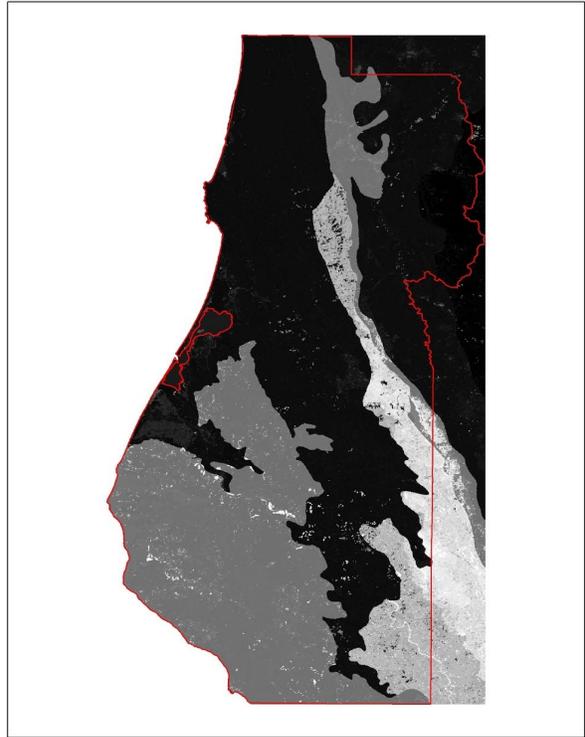


Figure 4: Humboldt county vegetation

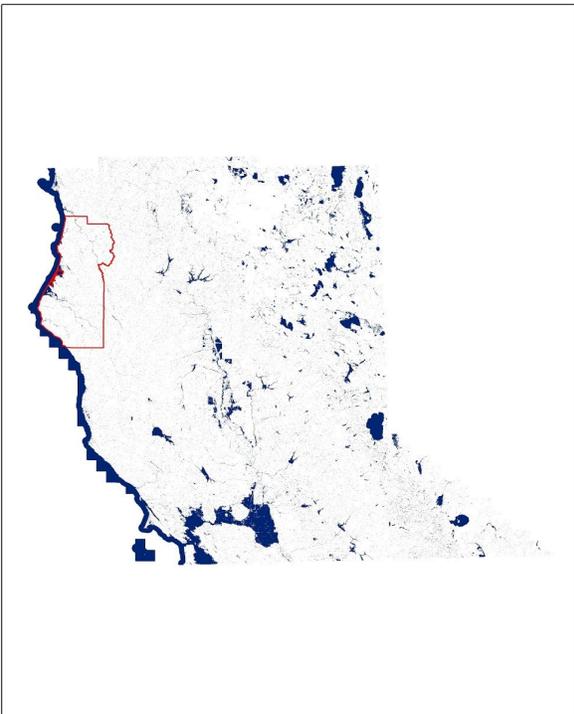


Figure 5: Northern California wetlands

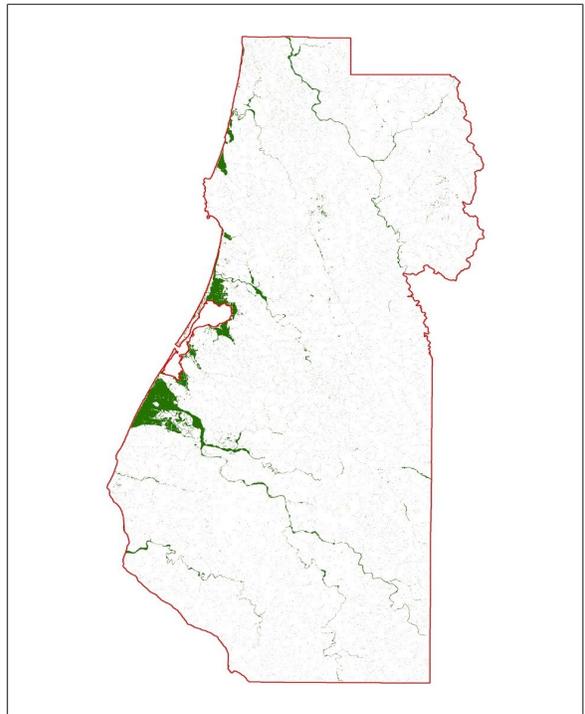


Figure 6: Humboldt County wetlands

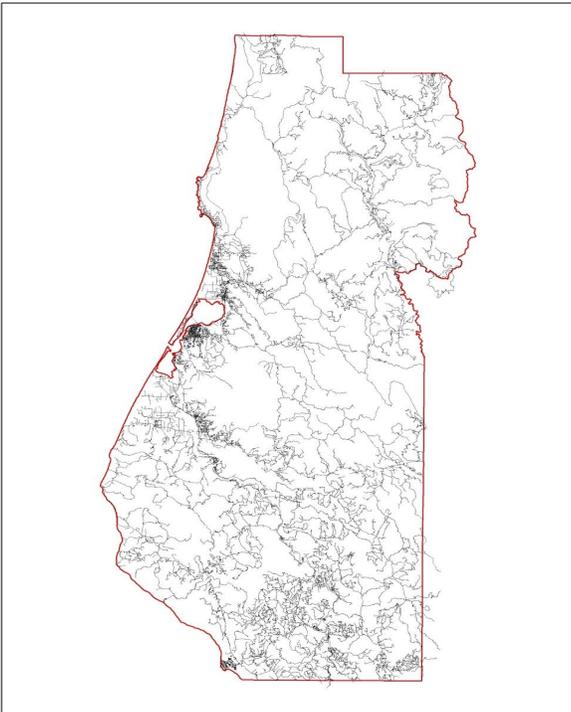


Figure 7: Humboldt County Roads

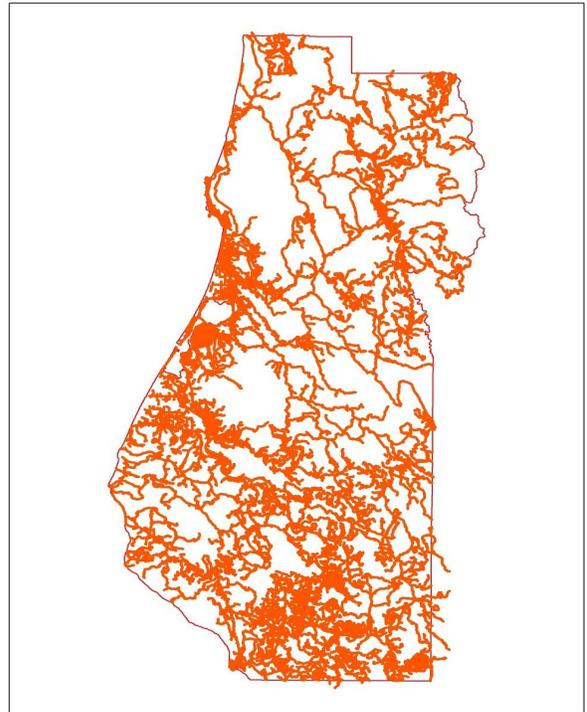


Figure 8: 300 meter buffer on roadways

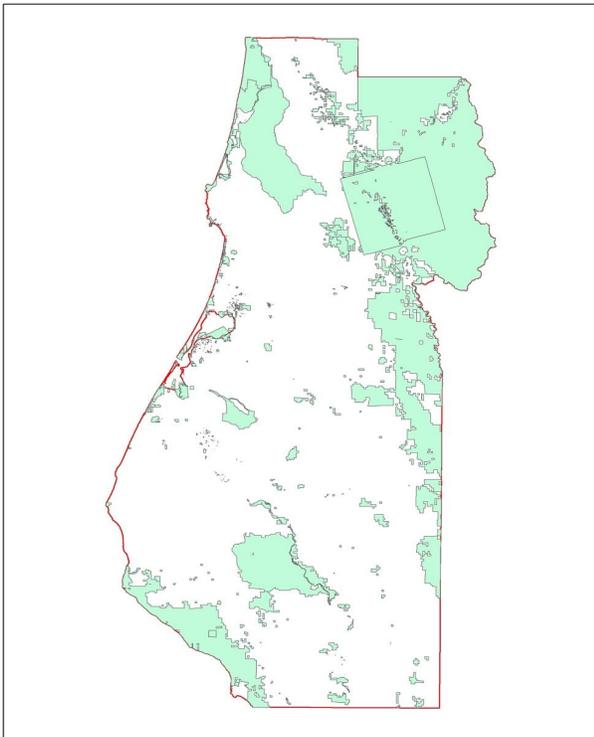


Figure 9: Land ownership dataset

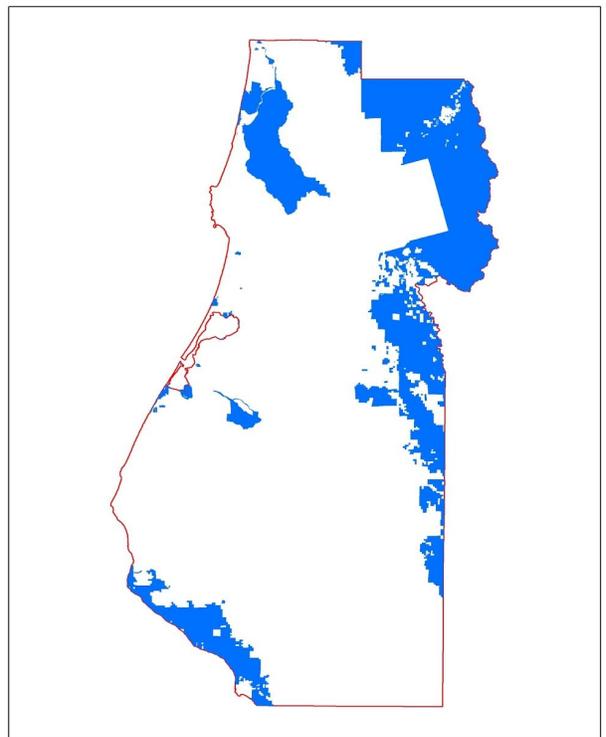


Figure 10: Government lands

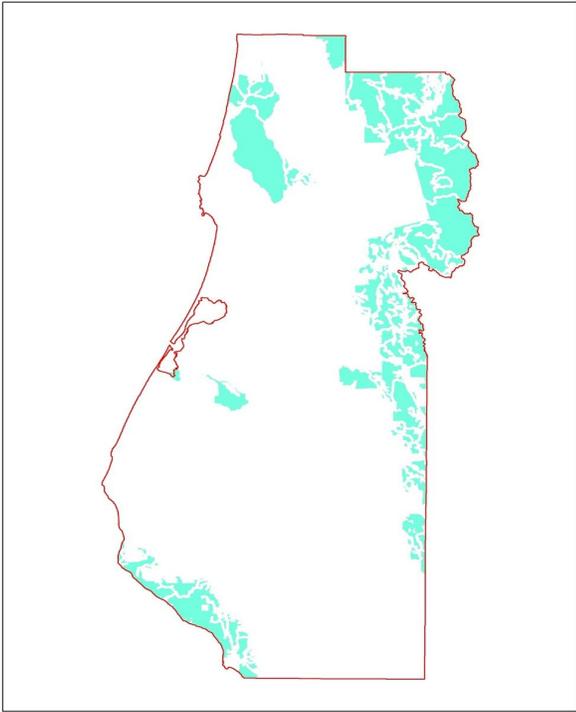


Figure 11: Gov.lands - road buffer

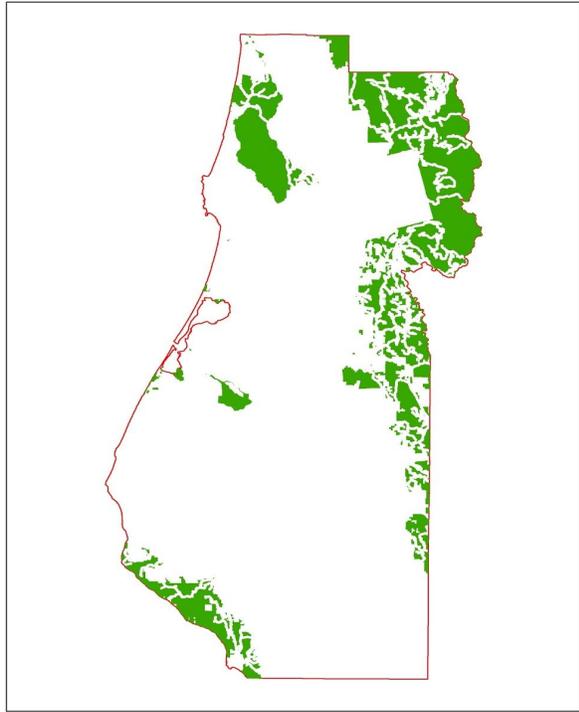


Figure 12: Gov. lands - roads - small areas

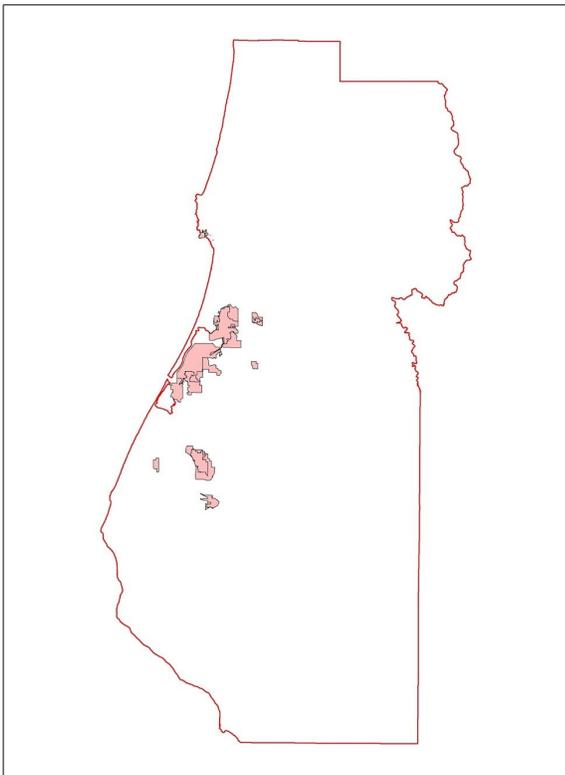


Figure 13: City boundaries

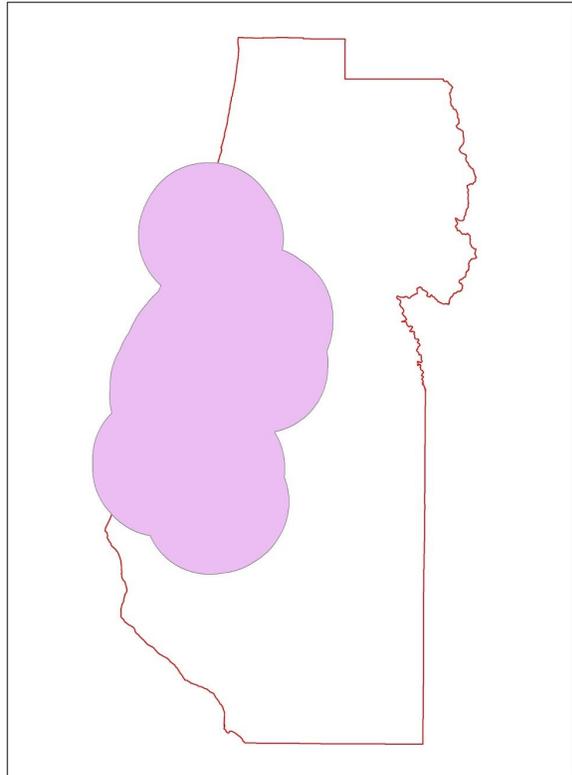


Figure 14: 15 km buffer around city areas

Results

The final areas are derived from all of the previously stated requirements. The following visual (Figure 15) helps to visualize the process of finding the resulting map which is displayed at the end. Note that the figures are meant for understanding how our group created this project and should not be seen as individual maps.

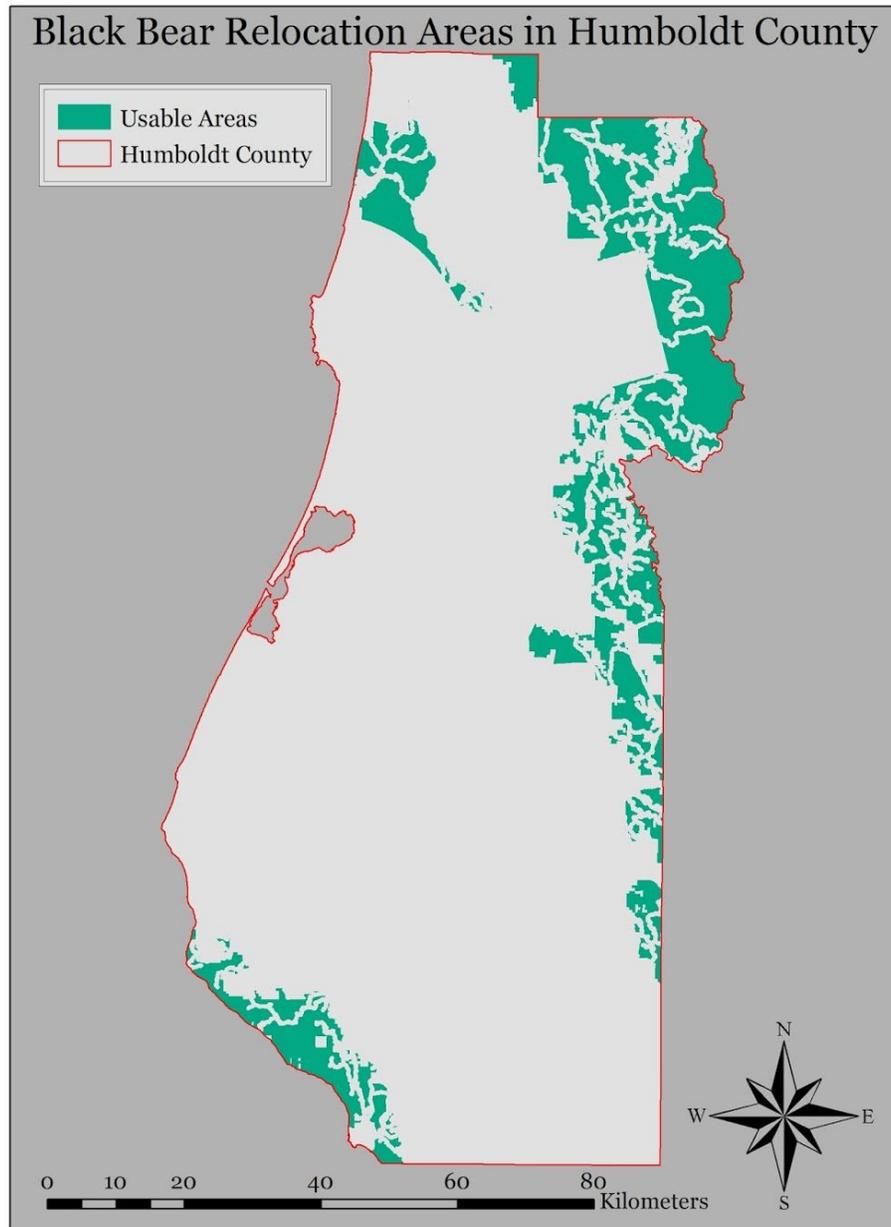


Figure 15: Usable areas for bear relocation in Humboldt County

Discussion

One major consideration that should be discussed is the movement of the black bear. Although we took into consideration the distance from residential areas and roads nearby, black bears are still wild animals and move where they please. With no fence or barricades to keep them bound within the resulting lands, the may animal decide to wander about into other areas. The hope is that with the considerations of comfortable habitat through the criteria, the bears will have what they need and not need to roam outside the parcel.

Conclusion

The final parcels showed that black bear relocation is possible in Humboldt County in several regions and can be done in a considerate matter bears' well being. The results met all of the defined criteria and should provide a satisfactory environment for black bear life. Other unknown factors may alter the true logistics of black bear relocation to these lands, and should always be considered if possible. Our goal is that the findings will benefit humans and bears alike, while giving the creatures suitable habitats.

Acknowledgements

<u>Datasets</u>	<u>Sources</u>
Humboldt County Outline	https://humboldtgov.org/276/GIS-Data-Download
California Wetlands Inventory	https://www.fws.gov/wetlands/Data/State-Downloads.html
Public Lands	https://humboldtgov.org/276/GIS-Data-Download
Roadway Centerline	https://humboldtgov.org/276/GIS-Data-Download
Black Bear Range	https://www.wildlife.ca.gov/Data/BIOS/Dataset-Index
California Vegetation Types	http://frap.fire.ca.gov/data/frapgisdata-sw-fveg_download
City Boundaries	https://humboldtgov.org/276/GIS-Data-Download