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Lab 10

In this lab, I used the Suitability Modeler in ArcGIS Pro to conduct a suitability analysis for puma habitat in the state of California. Puma habitat requires the following characteristics: rugged terrain; forested land cover; proximity to water; and distance from roads. The Suitability Modeler applies transformations to each variable of interest to help quantify the relationship between the variable and habitat suitability. The transformations I used most frequently in this analysis were the Small/MS Small and Large/MS Large transformations. In the Small transformation, values smaller than a user-defined midpoint value are assigned high values and values larger than the midpoint are assigned low values. The MS Small transformation is similar but uses the data's mean and standard deviation instead of a user-defined midpoint. The Large and MS Large transformations are the inverse of the Small and MS Small transformations.

The results of the suitability analysis showed that many areas close to water were rated as higher in suitability for puma habitat. This result aligns with our prior knowledge that puma prefer habitat that is close to a water source.

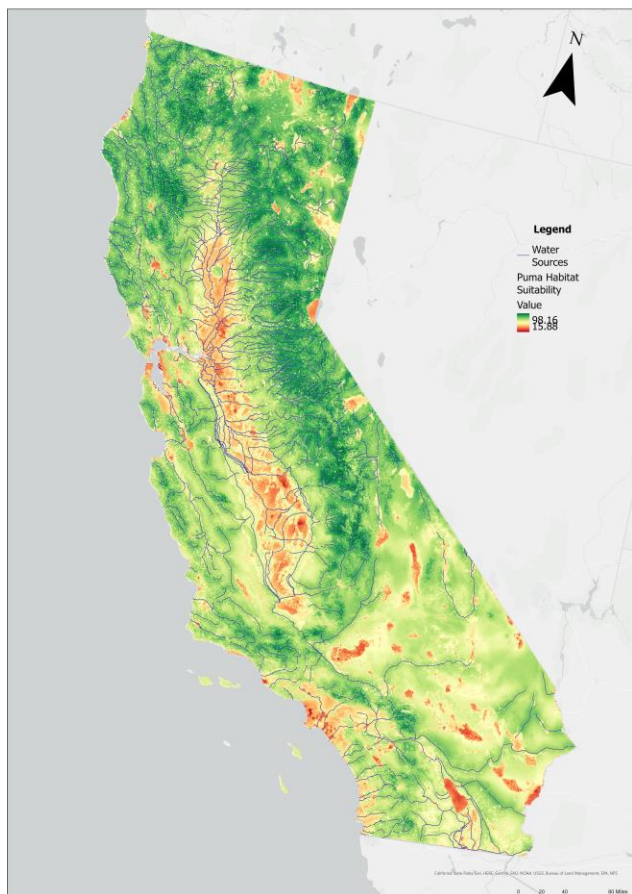Puma Habitat Suitability and Proximity to Water

Figure 1. Puma habitat suitability and proximity to water. Areas with a higher suitability rating are shown in green.

The analysis also showed that puma habitat suitability decreased in areas close to roads. Roads represent a danger to puma (as puma might be hit by passing cars) and can also be used as proxy for the presence of humans.

Puma Habitat Suitability and Proximity to Roads

Figure 2. Puma habitat suitability and proximity to roads. Areas with a higher suitability rating are shown in green.

Finally, documented puma sightings in the California area were overlaid on the habitat suitability map. Most of the documented sightings occurred in areas of high suitability, which is a useful check that the results of the suitability analysis are reasonable.

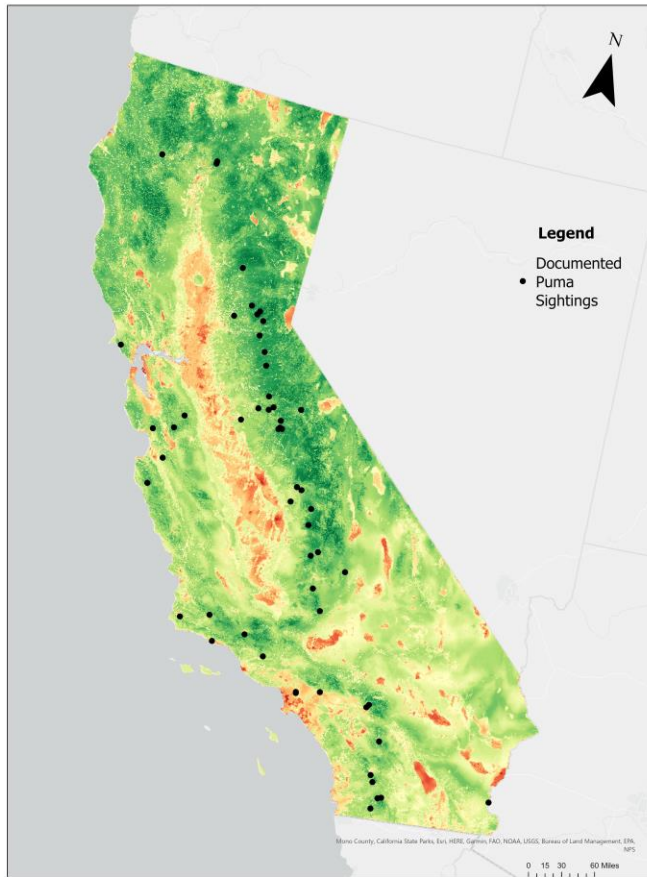# Puma Habitat Suitability and Documented Puma Sightings

Figure 3. Puma habitat suitability and documented puma sightings. Areas with a higher suitability rating are shown in green.