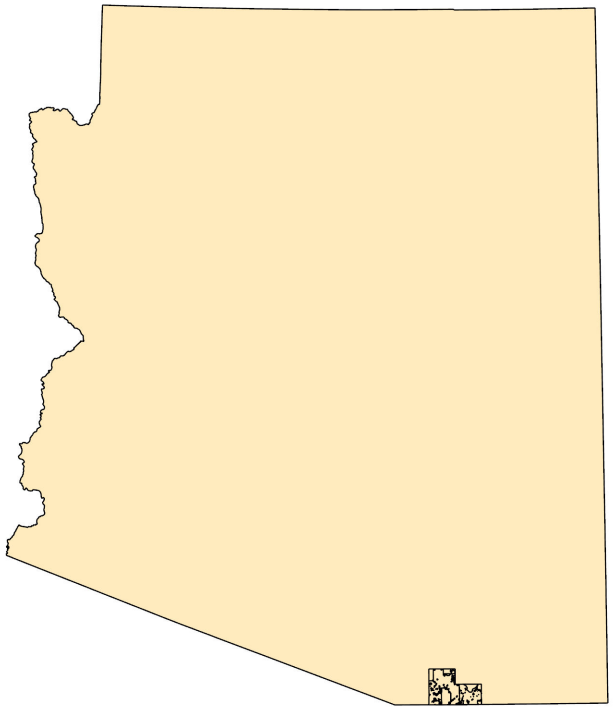
Sierra Vista Ranger District

Lepus Octopedis Habitat Modeling Project

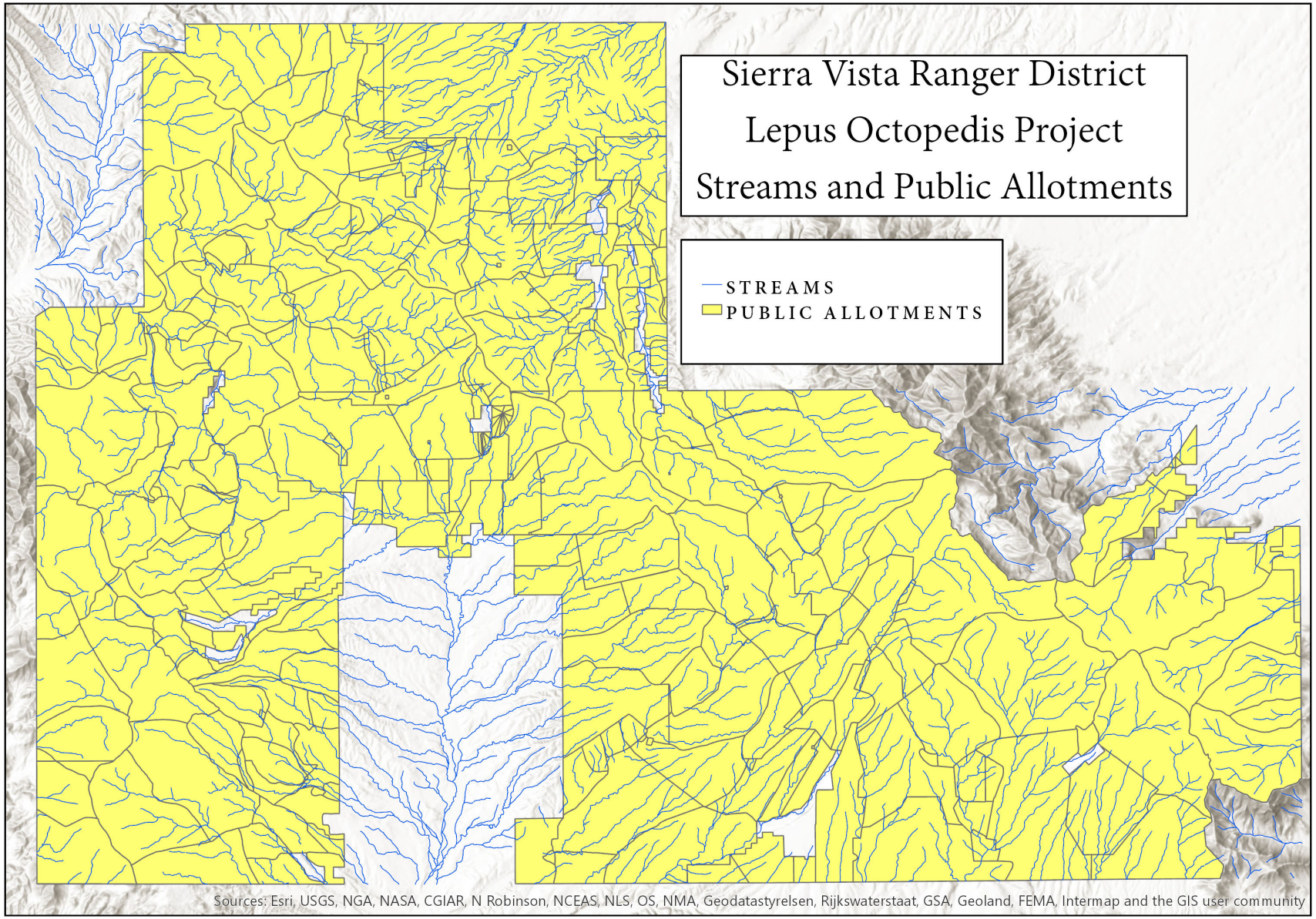
Locator Map: Sierra Vista Ranger District

The purpose of this project was to identify suitable areas in which a newly engineered species, *Lepus octopedis*, may be released. It requires:

- Open, preferably grassland areas (not heavily forested, pine areas)
- Low densities of predators



The species additionally requires proximity to a perennial water source and must be released on public Forest Service allotments.

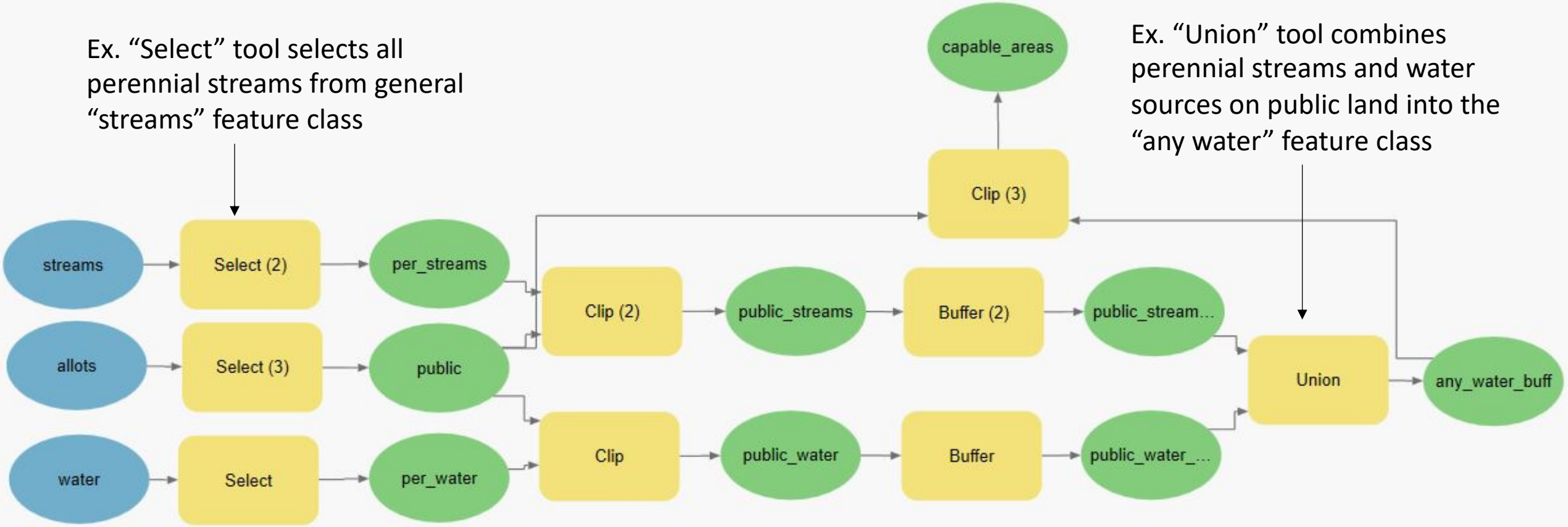


GIS Database Development and Cartographic Design: November 2018
Sandy A. Slovikosky
Projection and coordinate system: UTM Zone 12, NAD 1983
Data Sources: USFS, USGS, State of Arizona

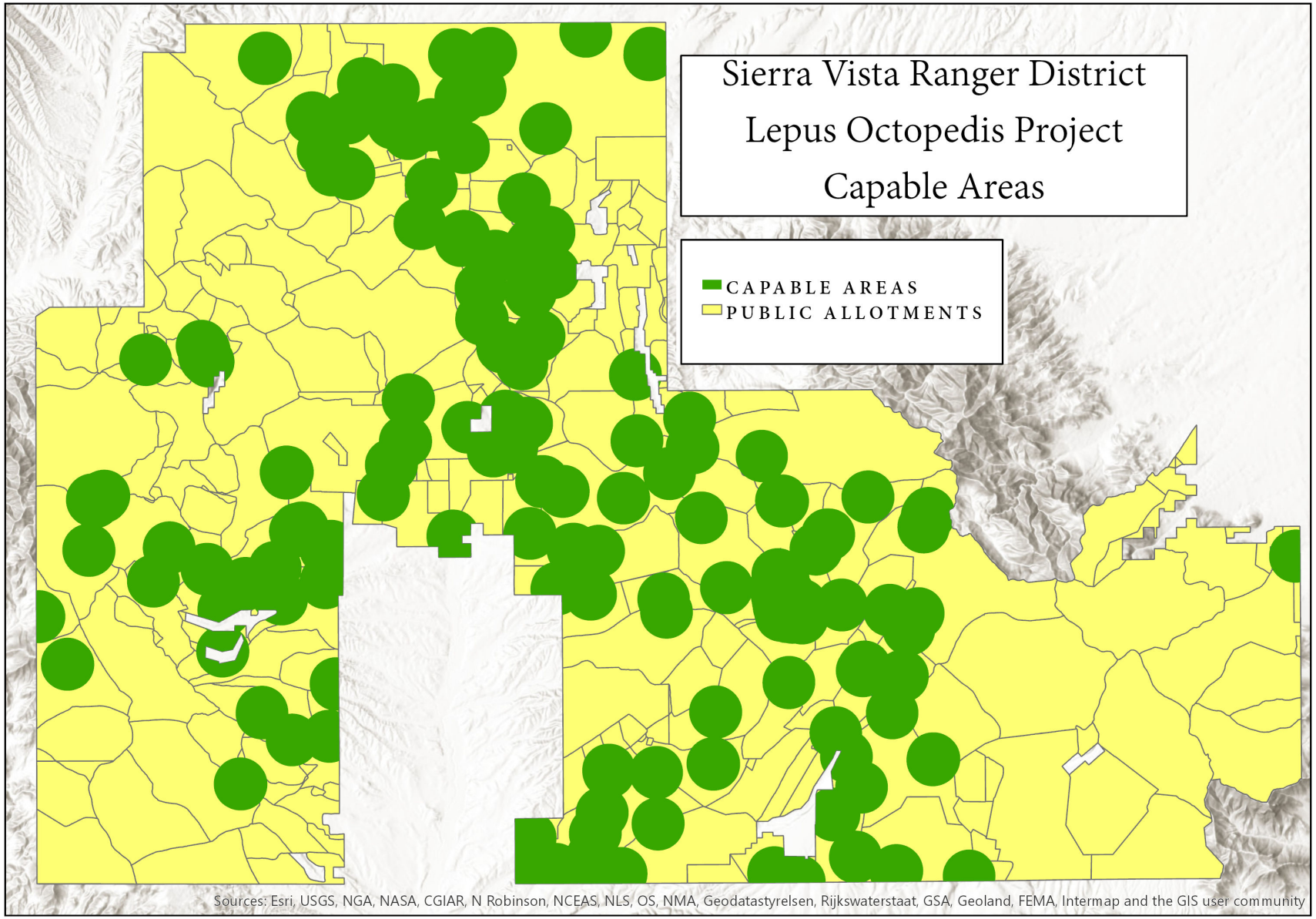
0 4.25 8.5 17 Kilometers

N

A conceptual flowchart was created by stringing together feature classes containing various forms of data and associated attributes. This model was then run to add the newly created feature classes to a map, displaying combined and trimmed polygons representing capable areas and public land.



After the conceptual flowchart was created, it was run to add the new feature classes to the base map. Capable areas were symbolized to demonstrate regions on public land close to perennial water sources.



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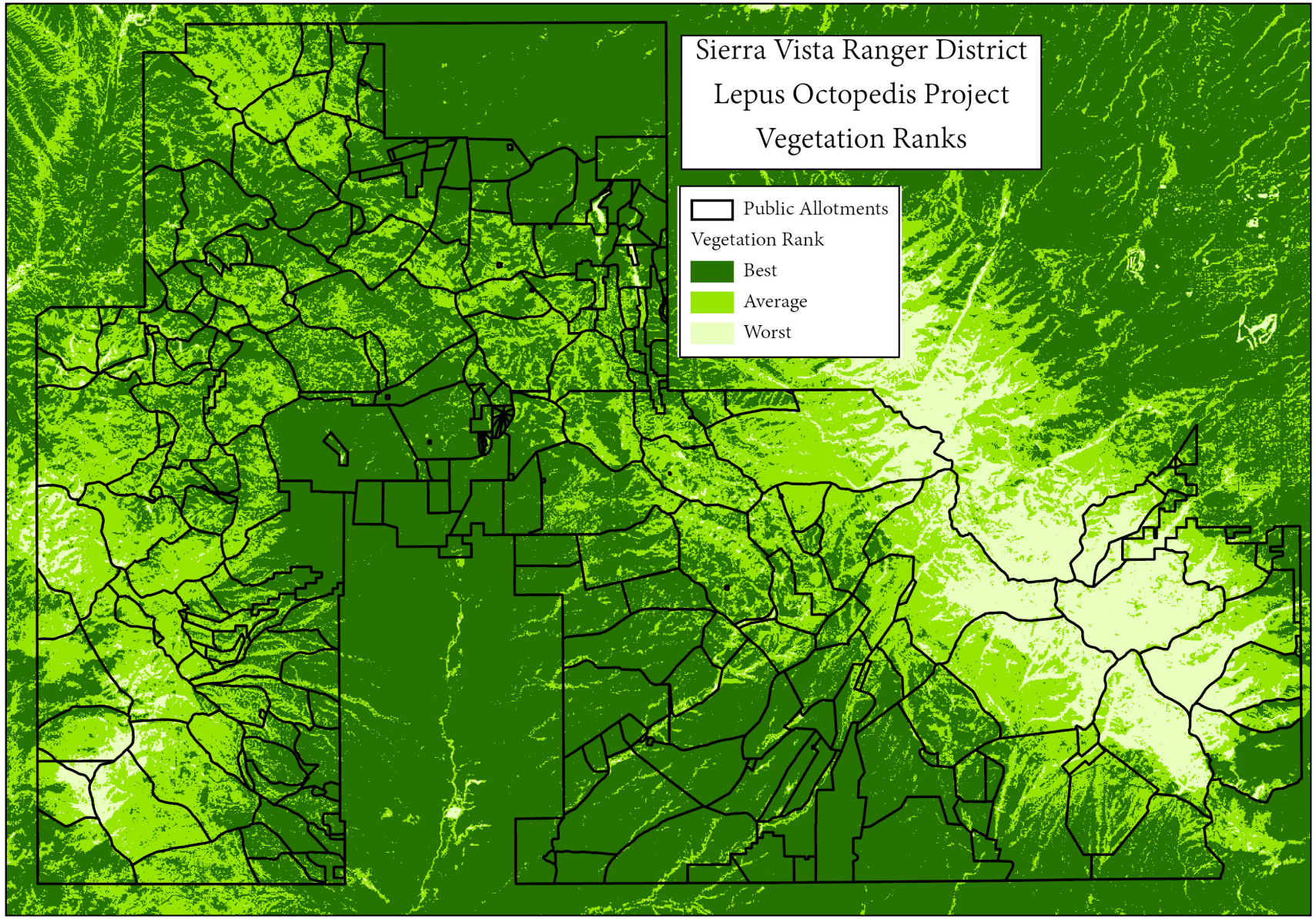
Vegetation type was determined by creating a raster that distinctly outlined separate NDVI indices using a natural breaks (jenks) classification method. Areas with the most photosynthesis are based on light and dark regions (and hence most and least woody).



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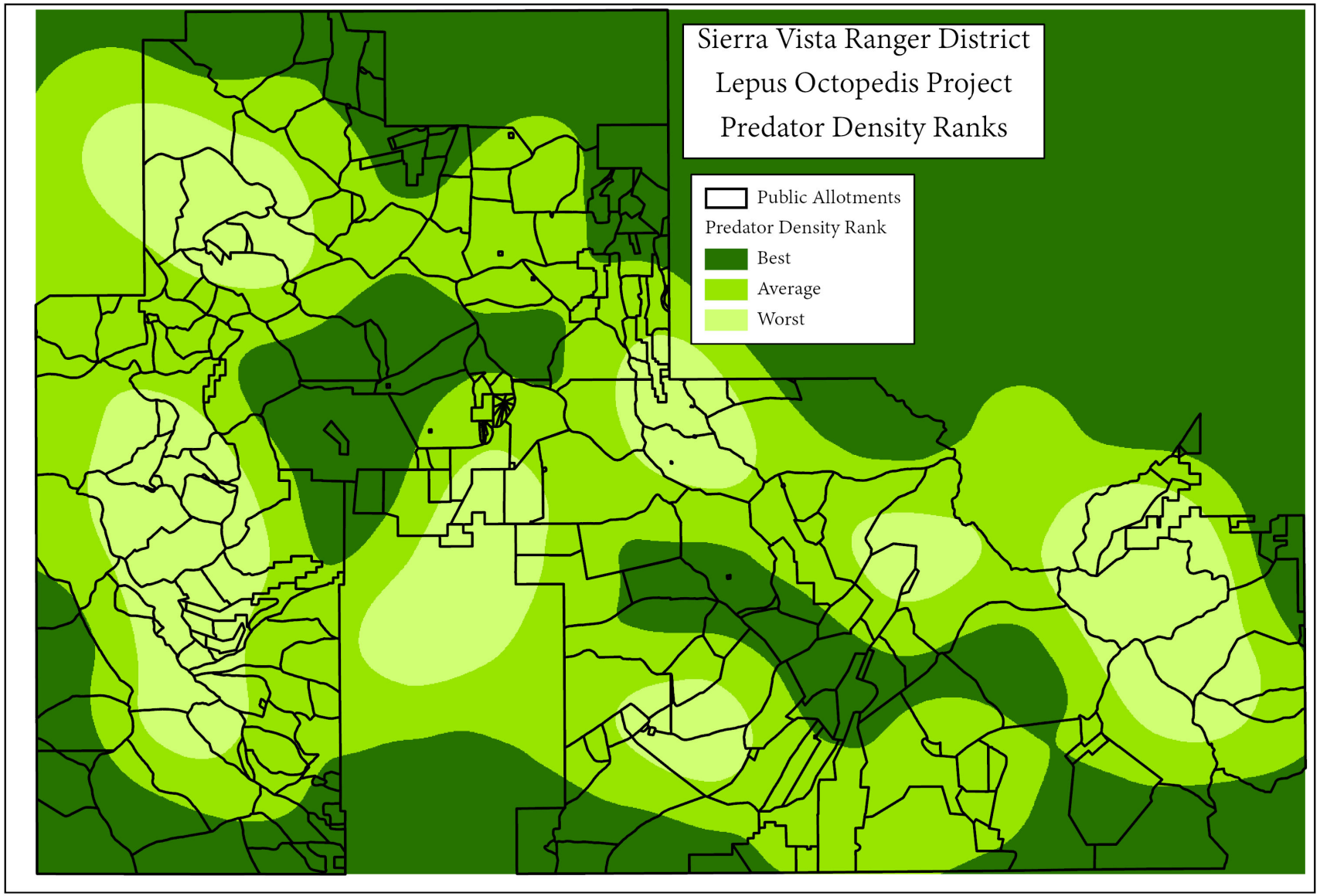
Predator density was determined by creating a raster that displayed areas of highest density based on home range size. These were also broken into three zones using a natural breaks (jenks) classification method.



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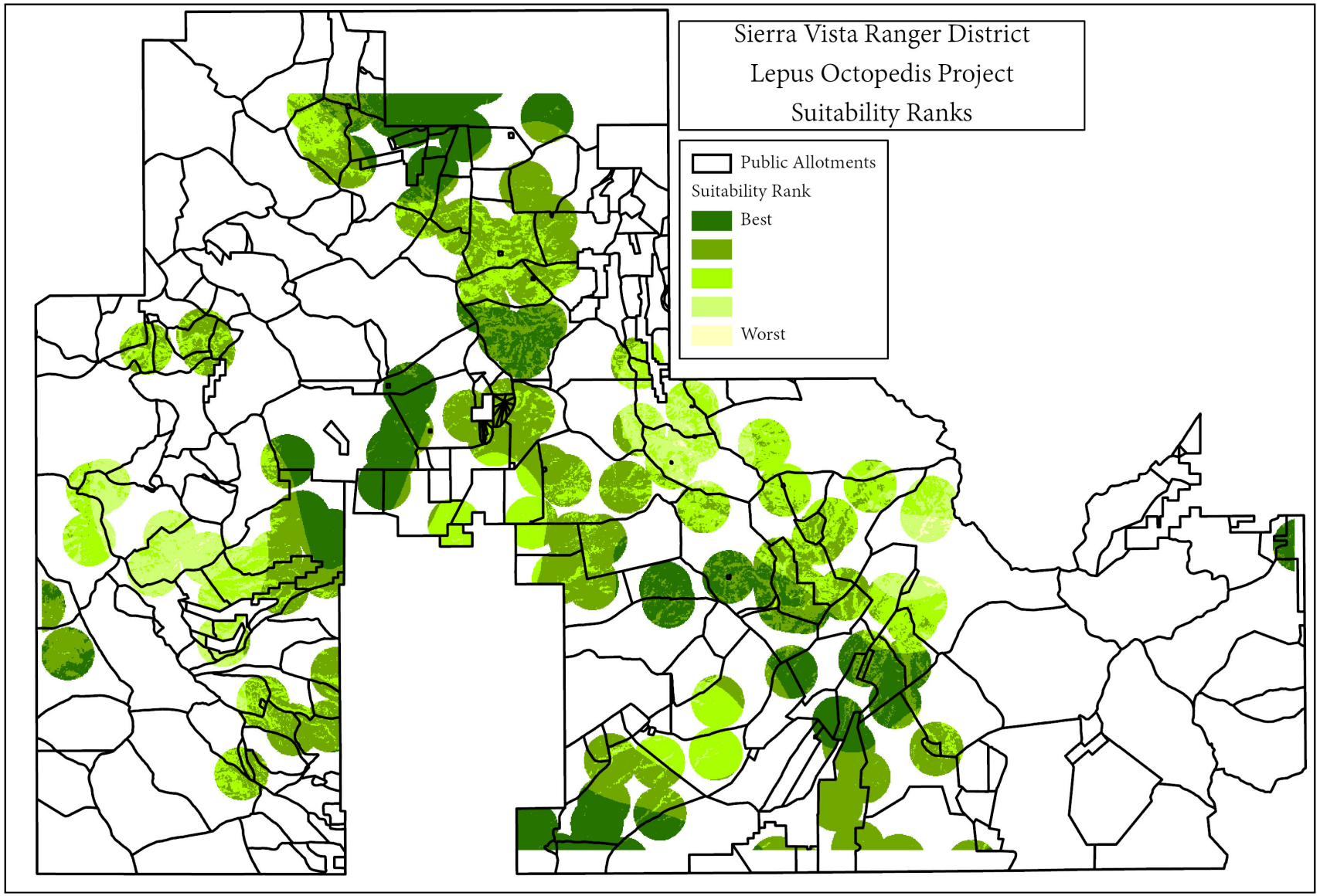
A suitability matrix was designed based on vegetation type and density of predators. 1 represents best (open areas and few predators), while 5 is worst (dense areas and many predators).

Predator Density Rank

Vegetation Rank

	1	2	3
1	1	2	3
2	2	3	4
3	3	4	5

The suitability raster was made by combining the vegetation and predator density rasters and manually entering values derived from the suitability matrix into a separate attribute field.



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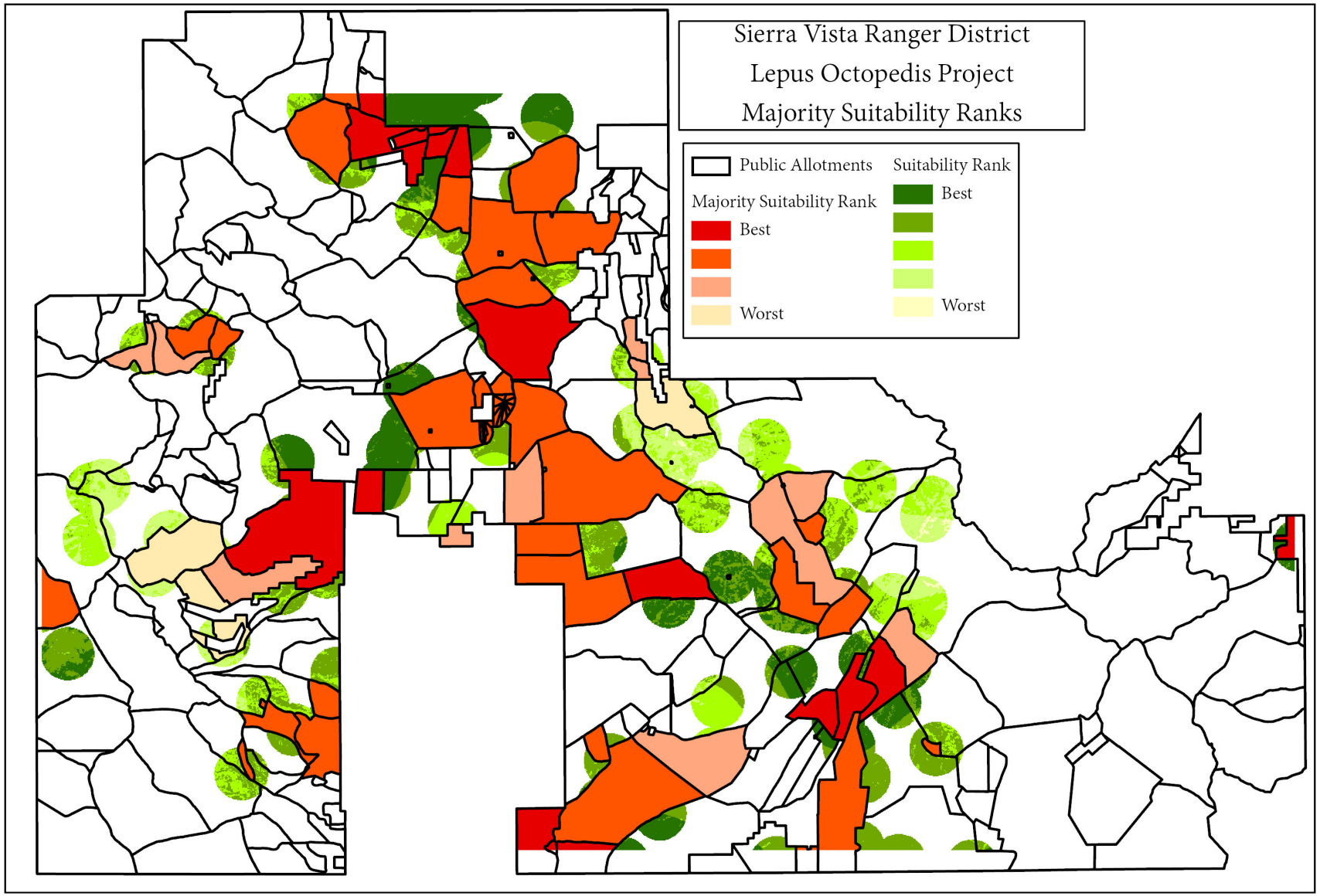
The rankings from the suitability matrix were then applied to public allotments; each allotment was characterized by the ranking that made up the majority of it.



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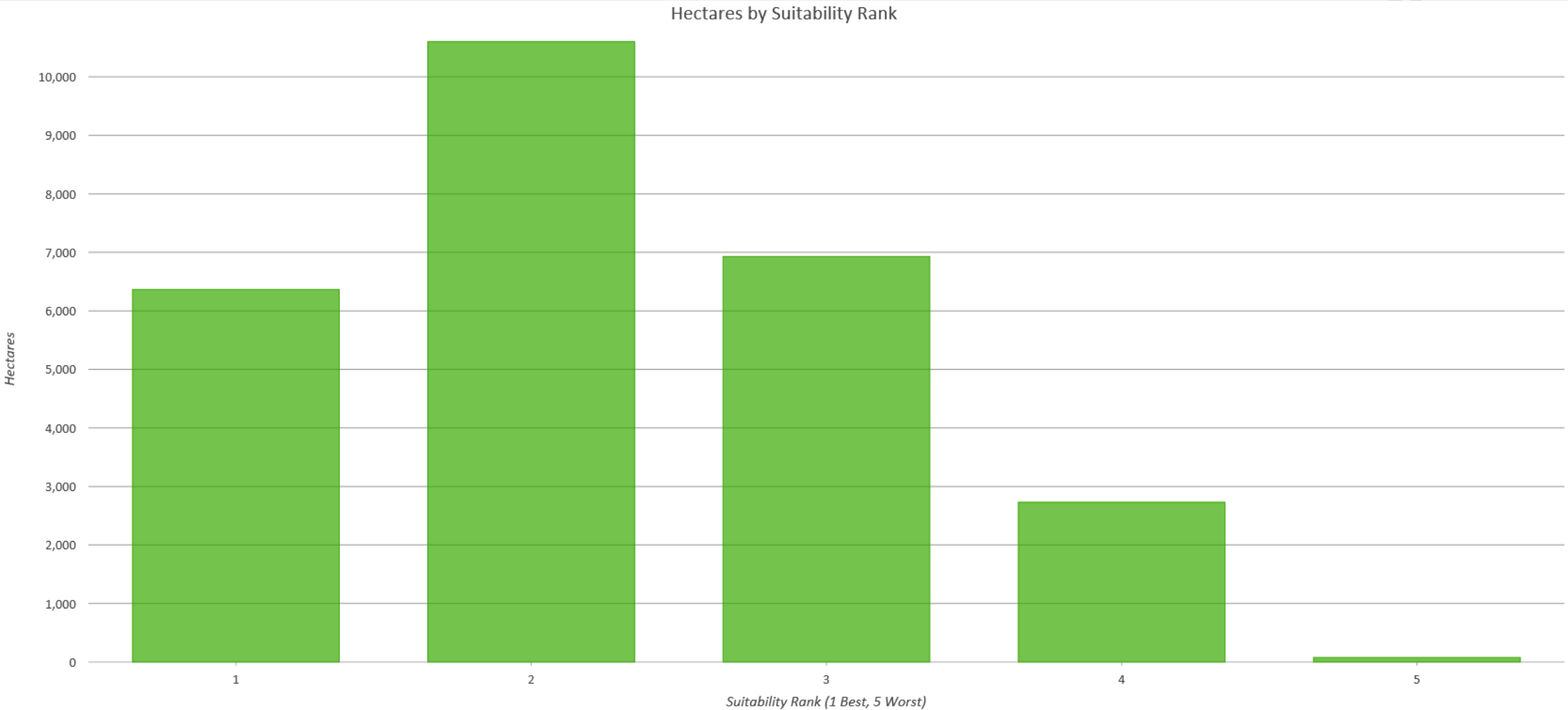
Zones with a ranking of 2 composed the majority of hectares, followed by approximately equal representation of 1 and 3.



Conclusion (1 of 2)

This model takes into account public land, perennial water sources, vegetation type, and predator density to create suitability rasters. In conclusion, I will choose allotments for raising *Lepus octopedis* that have a high ranking of 1 or 2 in both general suitability ranks and the majority class. These correspond to 73, 153, 183, 132, 276, 150, 12, 213, and 254.

Conclusion (2 of 2)

The primary reservation of using this model is the fact that some allotments characterized by a majority ranking of 1 or 2 may contain vast areas of unsuitable habitat. Thus, *Lepus octopedis* may not do nearly as well in some regions as the model appears to demonstrate.