Rachel Delorie, NR319 Fall 2024

Wolverine Reintroduction in Rocky Mountain National Park

BACKGROUND

Historically, Wolverines ranged from the Sierra Nevada mountains in California to the Southern Rocky Mountains as far south as New Mexico. This decrease in habitat range is largely due to historic unregulated trapping and human development in their natural habitats. Additionally, human-induced climate change is causing unusual weather patterns and warming temperatures across the globe. wolverines require persistent deep snow for burrowing, and warming temperatures are decreasing the area that meets the wolverine's specific habitat needs.

METHODS

A suitable area for wolverine reintroduction was determined by performing a weighted overlay with snow cover, elevation, and road buffer layers. The analysis output a raster layer of area within Rocky Mountain National Park that fit within my 3 criteria.

CRITERIA

1 ROADS

Must be at least 1 mile away from any road.

2 SNOWPACK

Must have persistient snow cover year-round.

3 ELEVATION

Must be 10,000 ft (3048m) or higher in elevation.

1 ROADS

Wolverines are naturally inclined to avoid high-risk areas, including roads

Wolverines can travel up to 15 miles daily for scavenging

To exclude roads, a 1-mile buffer was placed around all roads within the park and removed from the final map with an extract by mask tool

2 SNOWPACK

Wolverines are specifically adapted to survive in harsh winter environments

Dens created in the snow are perfect for food storage and keeping kits safe

Only "Persistent" snow cover areas were used to ensure wolverines would have ample deep snow

3 ELEVATION

Elevation is a critical because wolverines prefer high-alpine environments

Elevations of 10,000ft (3048m) are ideal elevations per their preferred habitat

An elevation raster was used in the weighted overlay where 3048m+ was deemed suitable

FINDINGS

636,444,900 m²

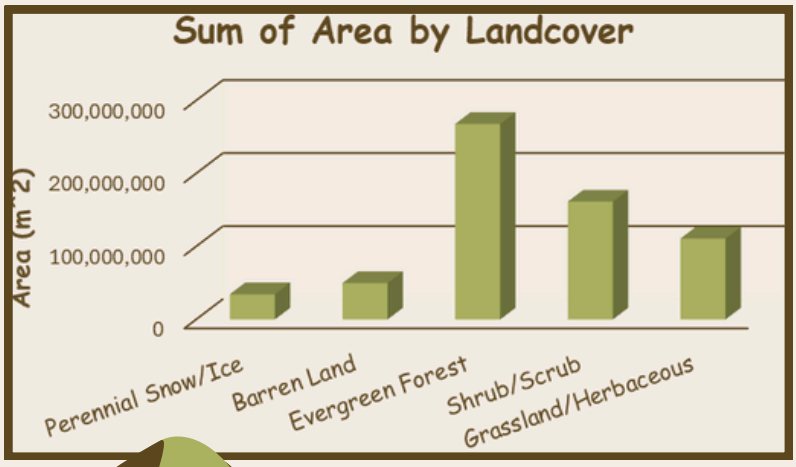
Total suitable reintroduction area in Rocky Mountain National Park

267,903,900 m²

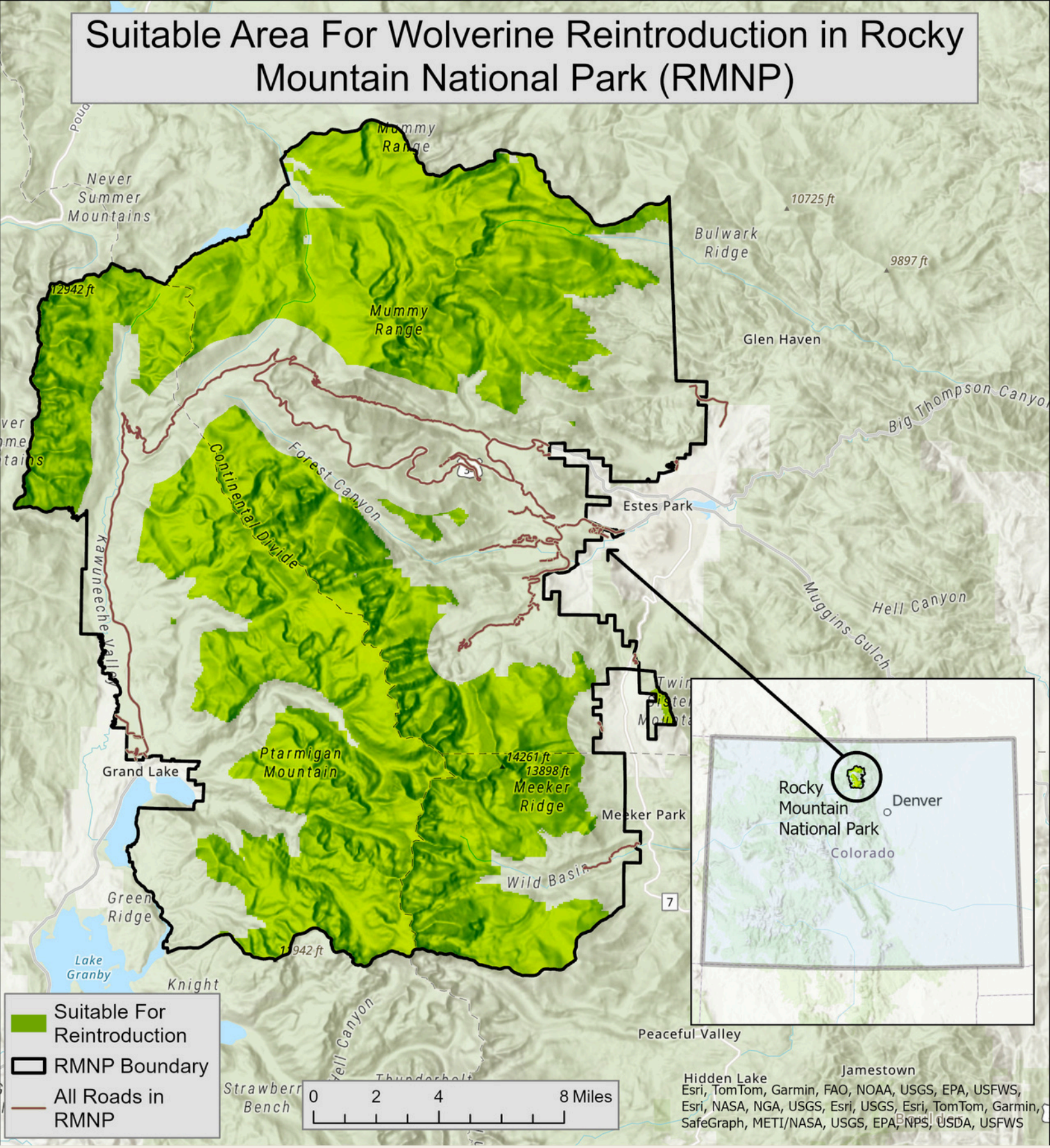
The majority of suitable habitat is Evergreen Forest

3,399 m

Average elevation of suitable area



Suitable Area For Wolverine Reintroduction in Rocky Mountain National Park (RMNP)



Layer Credits

Transportation
Owner: Esri_US_Federal_Data
https://www.arcgis.com/home/item.html?id=f42ecc08a3634182b8678514af35fac3
Roads in RMNP
Rachel Delorie
Derived from US Roads and RMNP Roads layers acquired through NR319
Elevation
Credit: USGS
Derived from NR319

RMNP Roads
National Park Service, Rocky Mountain National Park
Acquired through NR 319
RMNP Boundary
Credit: National Park Service
Acquired through NR 319
USA NLCD
Created: 6/5/2019, Updated: 11/15/2023
Credits: MRLC.gov
https://landscape10.arcgis.com/arcgis/rest/services/USA_NLCD_Land_Cover/ImageServer

Snow Cover
Derived from MODIS data by former NR319 TA, Jack Reuland
https://csurams.maps.arcgis.com/home/item.html?id=7a64311212944d5fb8339b3c295a2c34
Suitable Areas
Rachel Delorie
Derived from Snow Cover, Elevation, and Roads in RMNP layers
RMNP Roads National Park Service, Rocky Mountain National Park Acquired through NR 319

References

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https://defenders.org/blog/2024/01/wolverines-where-they-live-and-why-theyre-endangered
https://canadiangeographic.ca/articles/why-wont-wolverines-cross-the-road/