

WOLVERINE REINTRODUCTION SITE ANALYSIS IN GRAND COUNTY, COLORADO

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BACKGROUND

Colorado recently passed legislation to reintroduce wolverines, which have been absent from the state since the 1920s, with the last confirmed sighting in 1919. Wolverines require high-elevation alpine habitat with persistent snowpack for denning and large, undisturbed territories for their extensive home ranges. This analysis identifies suitable reintroduction sites in Grand County based on elevation, snowpack, and disturbance criteria.

CRITERIA

Elevation Distance $\geq 2,743$ m (9,000 ft)

Elevations above 9,000 ft correspond to alpine and subalpine zones above tree line. This threshold ensures habitat selection overlaps with documented wolverine occurrence patterns in the Rocky Mountains.

Snowpack Persistent Snow Cover

Deep, persistent spring snow cover (April 15-May 14) is the best predictor of wolverine occurrence in the contiguous U.S. (Aubry et al., 2007). Persistent snow also provides year-round thermal refugia and supports prey availability.

Road Distance Distance ≥ 1 km

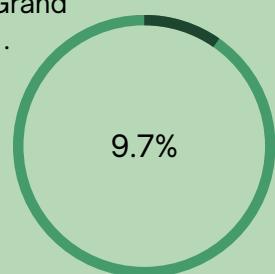
Wolverines have extremely large home ranges and are sensitive to human disturbance. Roads serve as a proxy for human activity including traffic, recreation, and development. A 1 km buffer provides separation from human disturbance.

ANALYSIS METHODS

Three binary suitability rasters were created (1 = suitable, 0 = unsuitable) for elevation, snowpack, and road distance. These layers were combined using raster multiplication in ArcGIS Pro. Areas meeting all three criteria were classified as suitable habitat. Land cover and elevation statistics were extracted for suitable areas using NLCD data published by Esri.

RESULTS: TOTAL SUITABLE AREA

The elevation range was from 2,744 - 4,121 m, with an average of 3,425 m. The total area of suitable land for wolverine reintroduction in Grand County is about 463.66 km². This proportion of the land suitable for wolverine reintroduction constitutes an approximate 9.7% of the land in Grand County.



RESULTS: LAND COVER

LAND COVER	AREA (KM ²)	%
EVERGREEN FOREST	169.63	36.6%
SHRUB/SCRUBS	155.98	33.6%
GRASSLAND	70.82	15.3%
BARREN LAND	33.31	7.2%
SNOW/ICE	28.32	6.1%

DISCUSSION

The suitable wolverine habitat identified is dominated by Evergreen Forest, Shrub/Scrub, and Grassland/Herbaceous. These high-elevation habitats are typical ecosystems where wolverines historically thrived. The lack of developed land (<0.1%) indicates that suitable areas remain largely undisturbed by humans. The concentration of suitable habitat in areas with persistent snowpack and elevations averaging 3,425 meters aligns with documented wolverine requirements.

CONCLUSIONS

This analysis identified 463.66 square km of suitable wolverine habitat in Grand County, CO. The concentration of suitable areas in high-elevation evergreen forests and alpine shrublands aligns with wolverine habitat preferences documented throughout their range. These findings provide a spatial framework to guide Colorado Parks and Wildlife in selecting specific release sites within Colorado for wolverine reintroduction efforts.

DATA SOURCES

Elevation: USGS 3DEP (Tiles n40w106, n40w107, n41w106, n41w107)

Snowpack: MODIS-derived Colorado snow (Moore et al., provided by NR319 course materials)

Roads: USGS Transportation Dataset

Land Cover: National Land Cover Database

References

Aubry, K.B., McKelvey, K.S., and Copeland, J.P. (2007). Distribution and broadscale habitat relations of the wolverine in the contiguous United States. *Journal of Wildlife Management*, 71(7), 2147-2158.

U.S. Fish and Wildlife Service. (2024). Wolverine (*Gulo gulo*). Environmental Conservation Online System. <https://ecos.fws.gov/ecp/species/5123>

Suitable Wolverine Reintroduction Areas in Grand County, Colorado

