Finding Forests Fit for the Fisher

A habitat suitability analysis for the fisher *(Martes pennanti)* by Angela C. Suffia

Figure 1. Historical and current range of the fisher (https://www.fws.gov/yreka/fisher.html)

Introduction

The fisher, (*Martes pennanti*) is a small carnivore belonging to the weasel family that once flourished in Washington State. By the mid– 1900's fishers were extirpated from the state due to over trapping and habitat loss. Translocations have been occurring since 2008, slowly reestablishing the species. Due to their specific habitat requirements, fishers are one of the most specialized mammals on the North American continent (Zielinski et al. 2004). The Olympic Peninsula was chosen as the project extent because it was one of two areas in Washington previously deemed appropriate for fishers by the department of fish and wildlife. The aim of this analysis was to pinpoint areas in the Olympic Peninsula that satisfy the unique habitat requirements, therefore having greatest potential to support newly introduced individuals.

Figure 2. A close up view of a fisher (http://oregonconservationstrategy.com/strategy-species/fisher/)

Methods

Factors critical to fisher habitat suitability were identified from scholarly sources. Datasets were re-classified according to the parameters suggested by the literature, specified in Table 1. Re-classified rasters were added together in Raster Calculator creating a suitability score for each raster cell in the study area. For elevation, canopy cover, roads and slope datasets, there were cells that would be deemed uninhabitable despite other factors; these cells were used as multipliers in the Raster Calculator to determine uninhabitable areas. Weights were applied to datasets containing the most essential factors such as forest age (1.5), water proximity (1.25) and canopy cover (1.25) to highlight their importance in terms of suitability.

	0 (Not Suitable)	1 (Sometimes Suitable)	2 (Highly Suitable)
Slope (%)	0-10, 60-88	40-60	11-40
Canopy Cover (%)	0-40	41-60	61-100
Elevation (m)	0-100, 1800-2425	1000-1800	101-1000
Forest Age (years)	0-149	150-249	250-642
Freshwater Proximity (mi.)	> 2	1-2	< 1
Road Proximity (mi.)	N/A	< 2	> 2
Land Cover Type	Developed/barren land	Deciduous forest/shrub	Evergreen/mixed forest
Forest Type	No data	Cottonwood, Alder, Maple, & Birch	Cedar, Hemlock, Fir, & Spruce

Table 1. Classification scheme for spatial datasets of fisher habitat factors.

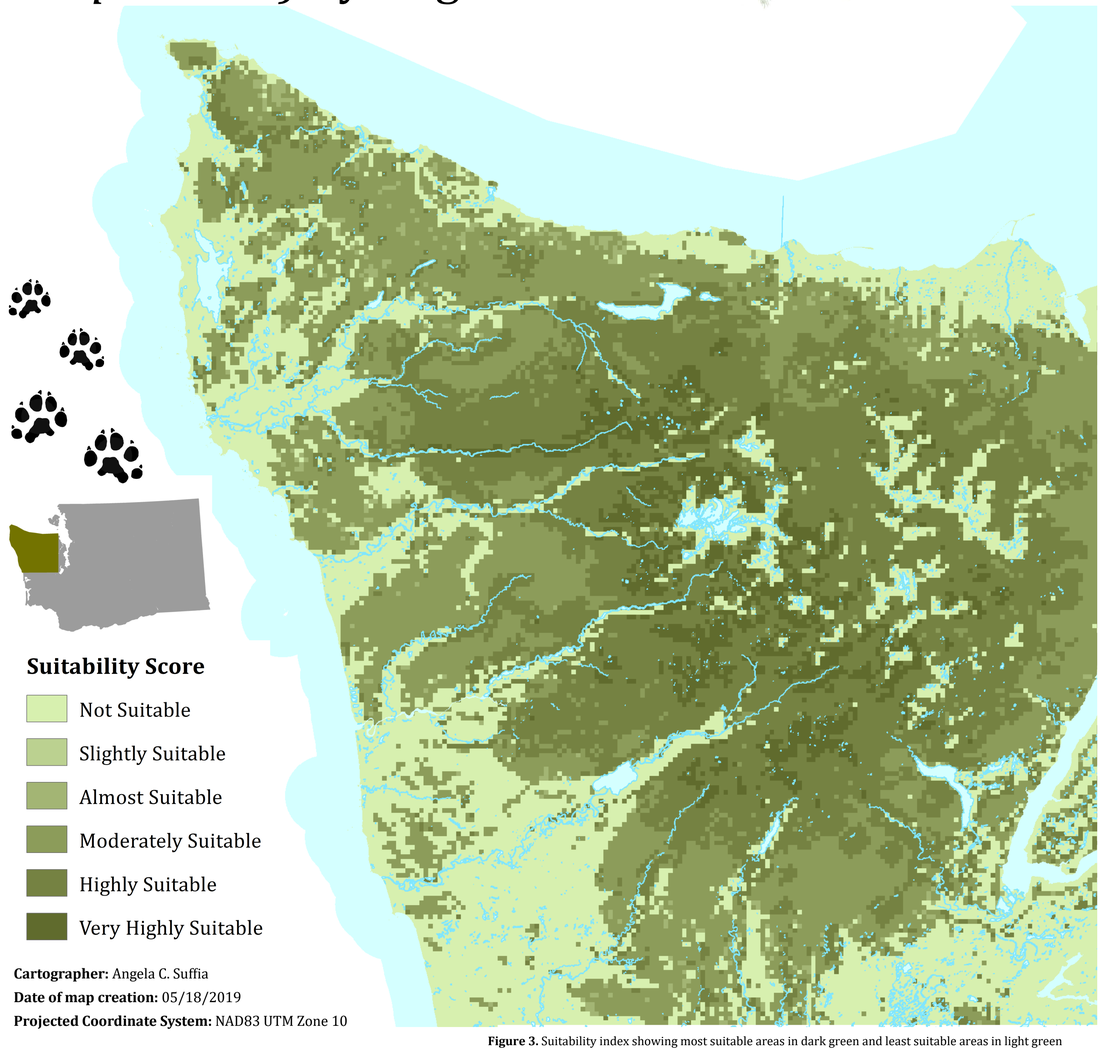

Figure 3. Suitability index showing most suitable areas in dark green and least suitable areas in light green

Results

The most suitable fisher habitat is restrained to the Eastern Olympic Mountain Range. These areas are ideal for reintroduction as they satisfy unique habitat requirements of the fisher and have the highest potential to have the resources necessary to support a new population of fishers. Further analysis may be conducted to locate areas with the most contiguous patches of suitable habitat. Contiguous patches have the highest potential to support fishers in search of mates and food.

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References

Data Sources: Wa. State Dept. of Transportation; National Land Cover Database (NLCD); United States Geological Survey (USGS); USDA Forest Service
Literature: Aubry KB, Houston DB. 1992. Distribution and status of the fisher (Martes pennanti) in Washington. Northwestern Naturalist. 73(3): 69-79.
Zielinski WJ, Truex RL, Schmidt GA, Schelexer FV, Schmidt KN, Barrett RH. 2004. Home range characteristics of fishers in California. Journal of Mammalogy, 85(4): 649-657.