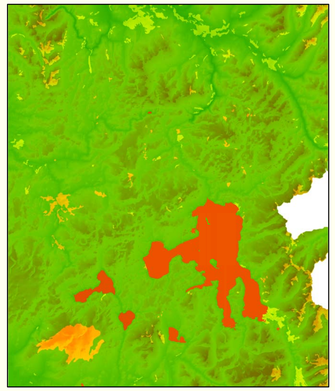
Wolf Route Through Yellowstone National Park

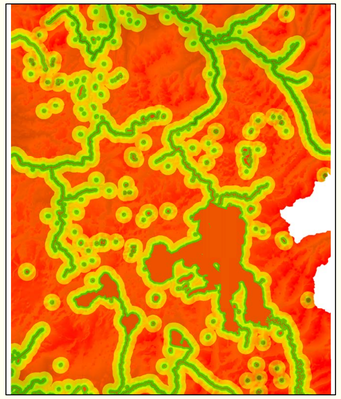
Wolves passing through the Yellowstone National Park from the South to the North require a safe passage to travel through.
This project uses Least Cost Path Analysis to find the best route for a safe wolf passage.
Impact of landcover like vegetation, thermal plateau, water, and non-forested areas; slope along the path; distance from any human presence; and closeness to roads or any human path networks were all taken into account in created a final weighted surface cost.

N

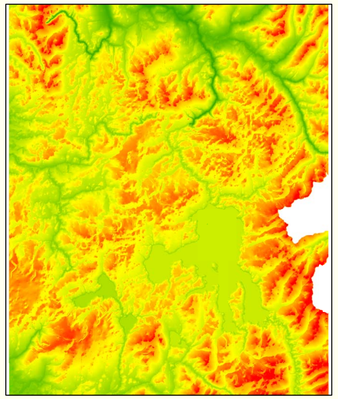
Landcover Surface Cost



Water Surface Cost



Slope Surface Cost



Surface Cost Categories

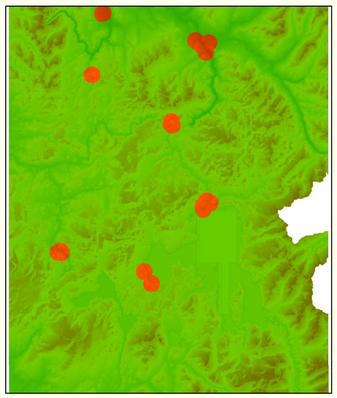
- 1
- 20
- 40
- 999

Cost	Distance to Human
1	Greater than 2km
999	Less than 2km
Weight	35%

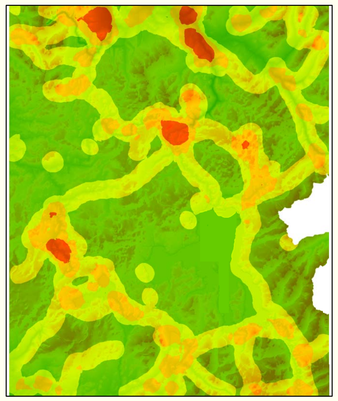
Cost	Landcover
1	Wetland; Coniferous; Forest; Mixed Forest
20	Non-forested
40	Thermal; Plateau
999	Water
Weight	15%

Cost	Slope
1	20 degrees
20	20 – 30 degrees
40	30 – 45 degrees
999	Greater than 45 degrees
Weight	10%

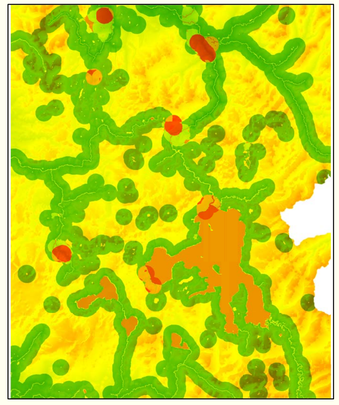
Human Distance Cost



Road Density Cost



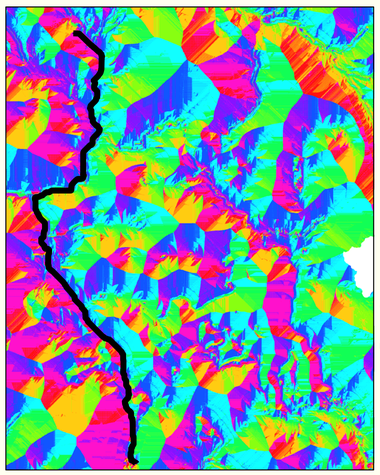
Weighted Surface Cost



Cost	Distance to Water
1	50m - 500m
20	500m – 1000m
40	1000m – 2000m
999	Greater than 2000m or Less than 50m
Weight	25%

Cost	Road/Trail Density
1	0 - 0.00012
20	0.00012 - 0.000368
40	0.000368 - 0.000792
999	0.000792 - 0.001803
Weight	15%

The weight of each feature, and the cost of each type of feature are listed in the tables above. The maps on the left provide a visualization of the individual cost analysis for each feature with a final weighted cost analysis of all the features combined together.

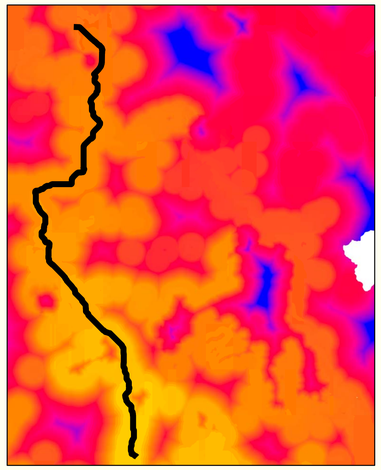


Wolf Cost Direction

- N
- NE
- E
- SE
- S
- SW
- W
- NW
- N

Wolf Cost Path

- Wolf_Route



Wolf Cost Distance

Measurement in Metres

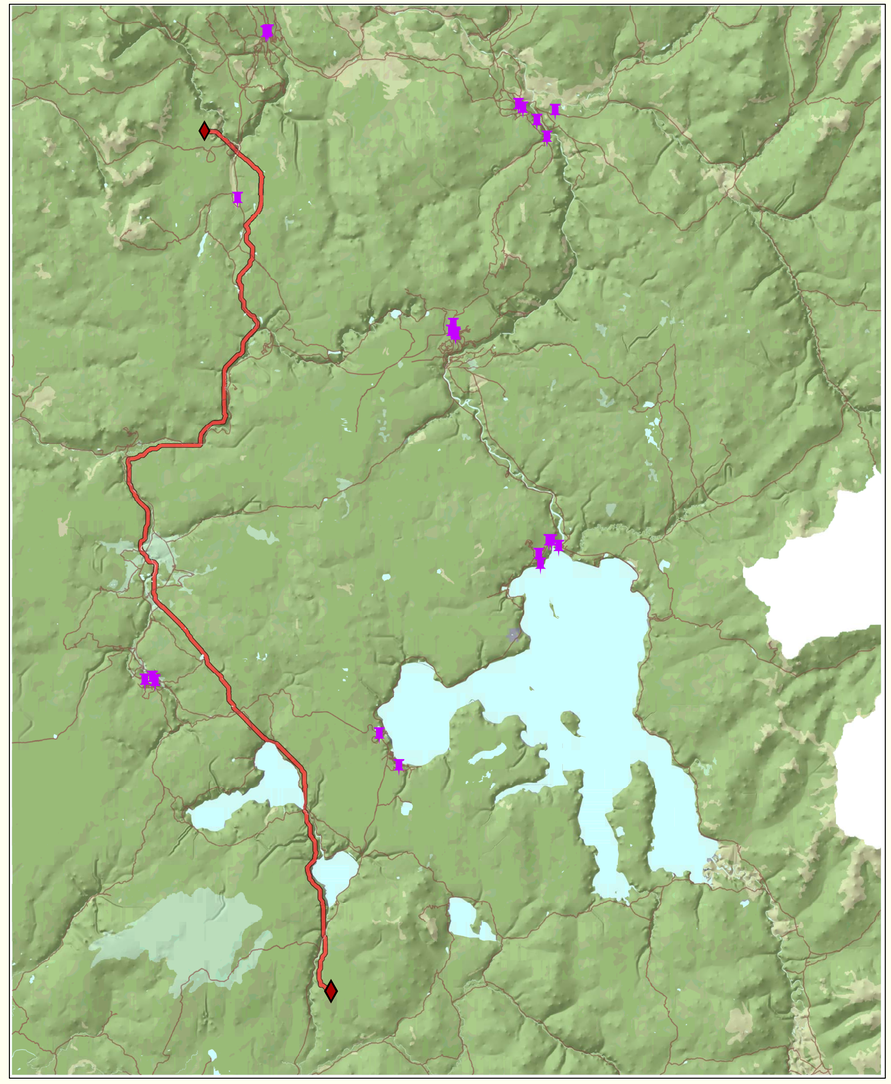
High : 3.66522e+006

Low : 0

Wolf Cost Path

- Wolf_Route

Maps on the left show the combined least cost distance and the direction of the route for the wolves. Least cost route calculated from these maps are laid over the map to show the Wolf Route and the least cost distance buffer from that route.



0 5 10 20 30 40

Kilometres

1:250,000

- Place Names
- Road Network
- Water Network
- Wolf Route

Landcover Type

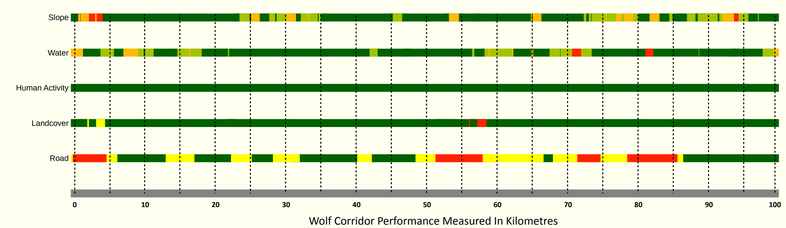
- Forest Wetland/Wetland
- Nonforested
- Thermal Plateau
- Water

The final map above is a real life depiction of the placement of all the affecting features compared to the Least Cost Wolf Route.

Wolf Corridor Performance Evaluation Guide

- 1
- 20
- 40
- 999

The graph below explains the cost along the Wolf Route in relation to each feature that was taken into account for this analysis with 1 being the least costly to 999 being the most costly.



Source: https://www.nps.gov/gis: Vegetation/2016; Navteq: Water, Roads, POI, City, Hamlet/2012; USGS: Contours/2016; MWilliams: DEM, Landcover, Placenames/2016)

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February 20th, 2017