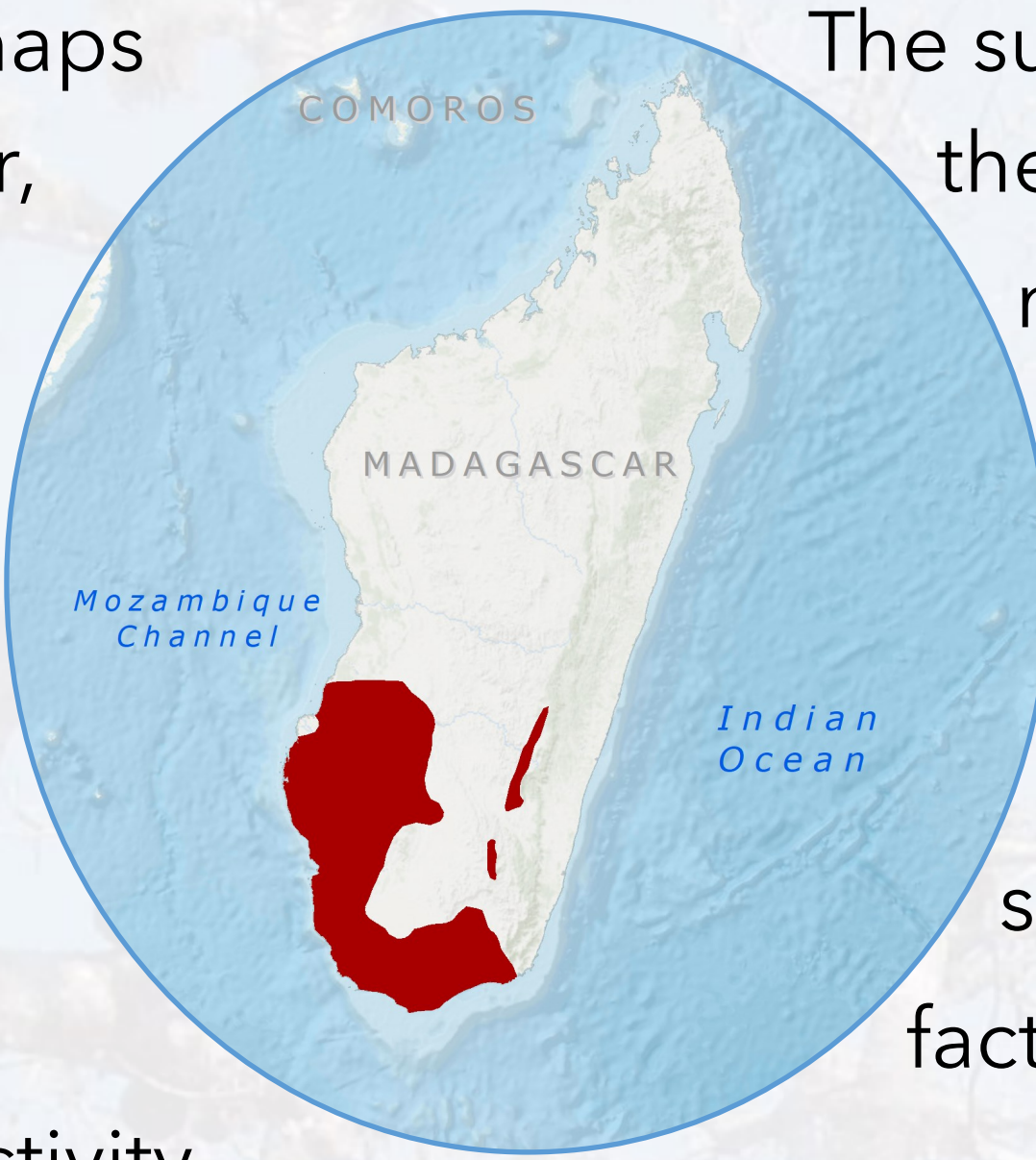


Identifying Suitable Conservation Areas for Ring-tailed Lemurs in Madagascar



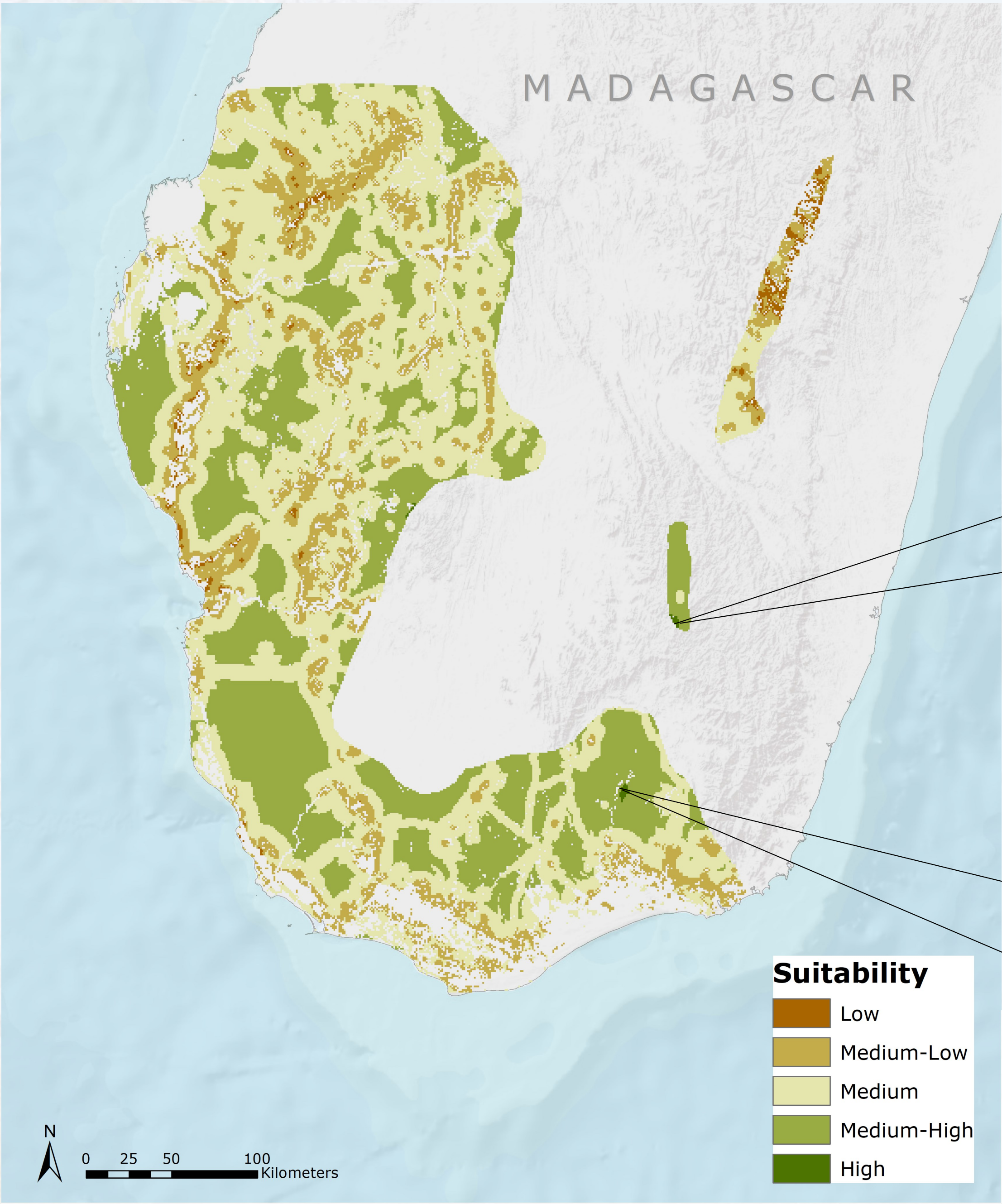
Introduction

Ring-tailed lemurs (*Lemur catta*) are perhaps the most widely studied species of lemur, and are found exclusively in the dry forests and shrublands of southern Madagascar. They are currently classified by the IUCN as endangered, and wild populations are decreasing. Major threats to this species are primarily anthropogenic, as habitat fragmentation and loss is primarily caused by human activity such as agriculture and illegal slash and burn logging. While populations do exist in several protected areas, further protection is needed for this species to persist. This analysis considers several factors that impact the viability of lemur populations and conservation sites in order to identify the areas most suitable for conservation within the species' range.



Results and Conclusions

The suitability analysis identified multiple areas in the range of *L. catta* that fit the criteria necessary for a successful conservation site. The areas with the two highest scores were in Mahabo and Ebelo. Further research on long-term conservation is needed to see how well conservation areas protect native species, as well as to identify any more factors associated with long-term persistence.



Tufts

Kate Brown

GIS 101

Projection: Tananarive 1925 Laborde

Data Sources:

IUCN, Climate Change Initiative, WorldPop, World Food Programme, NASA Fire Information for Resource Management, ESRI Data Maps

Photo Sources:

Petr Kratochvil, Hiroki Ogawa, Olivier Lejade

Methods

A weighted suitability analysis considering several ecological and anthropogenic factors that contribute to the destruction of ring-tailed lemur populations was performed within the natural range of *L. catta*. These factors were reclassified and given values between 1 and 5, with 5 being the most suitable for a conservation site. Once the suitability analysis was performed with these four factors, the map was masked to fit within the suitable habitat types as proper habitat type is critical to the ability of this species to persist.

Mahabo

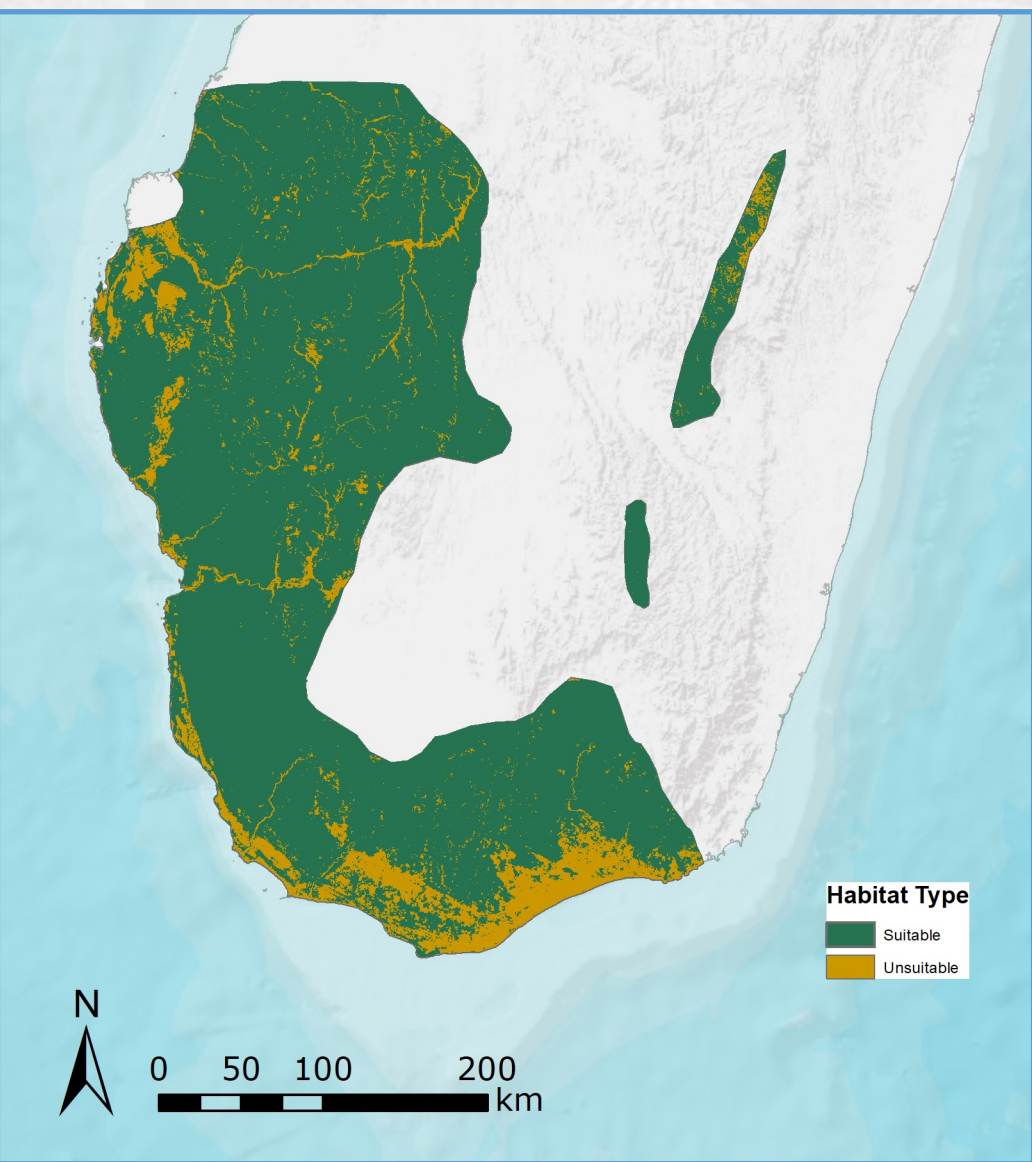


Ebelo



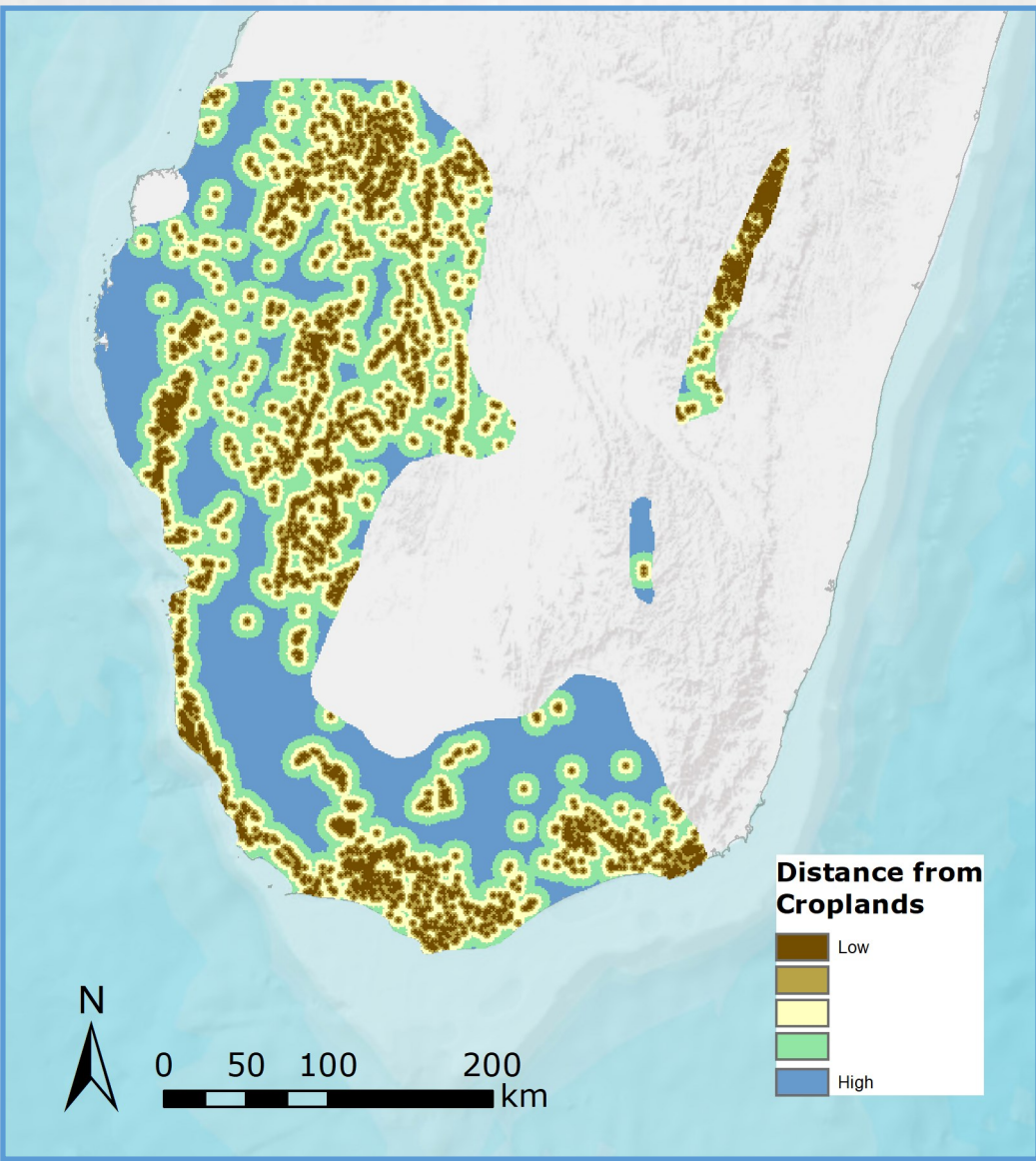
Suitability Factors

Habitat Suitability



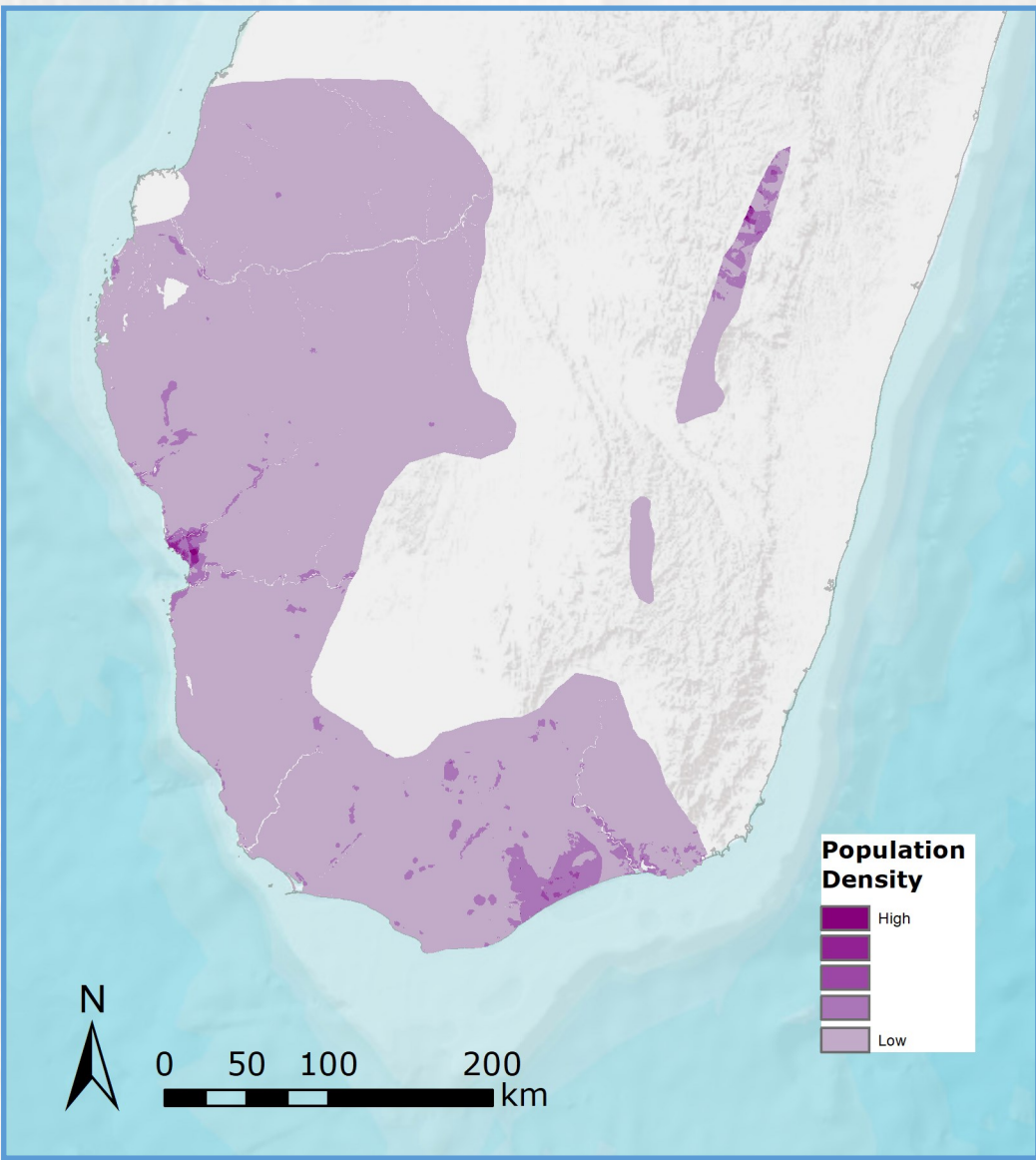
Ring-tailed lemurs are flexible in their habitat use and are found in forest and shrubland habitats. Land use data from CCI was used to identify suitable habitat types within the range of *L. catta*. The final suitability analysis was masked to areas of suitable habitat.

Distance from Croplands



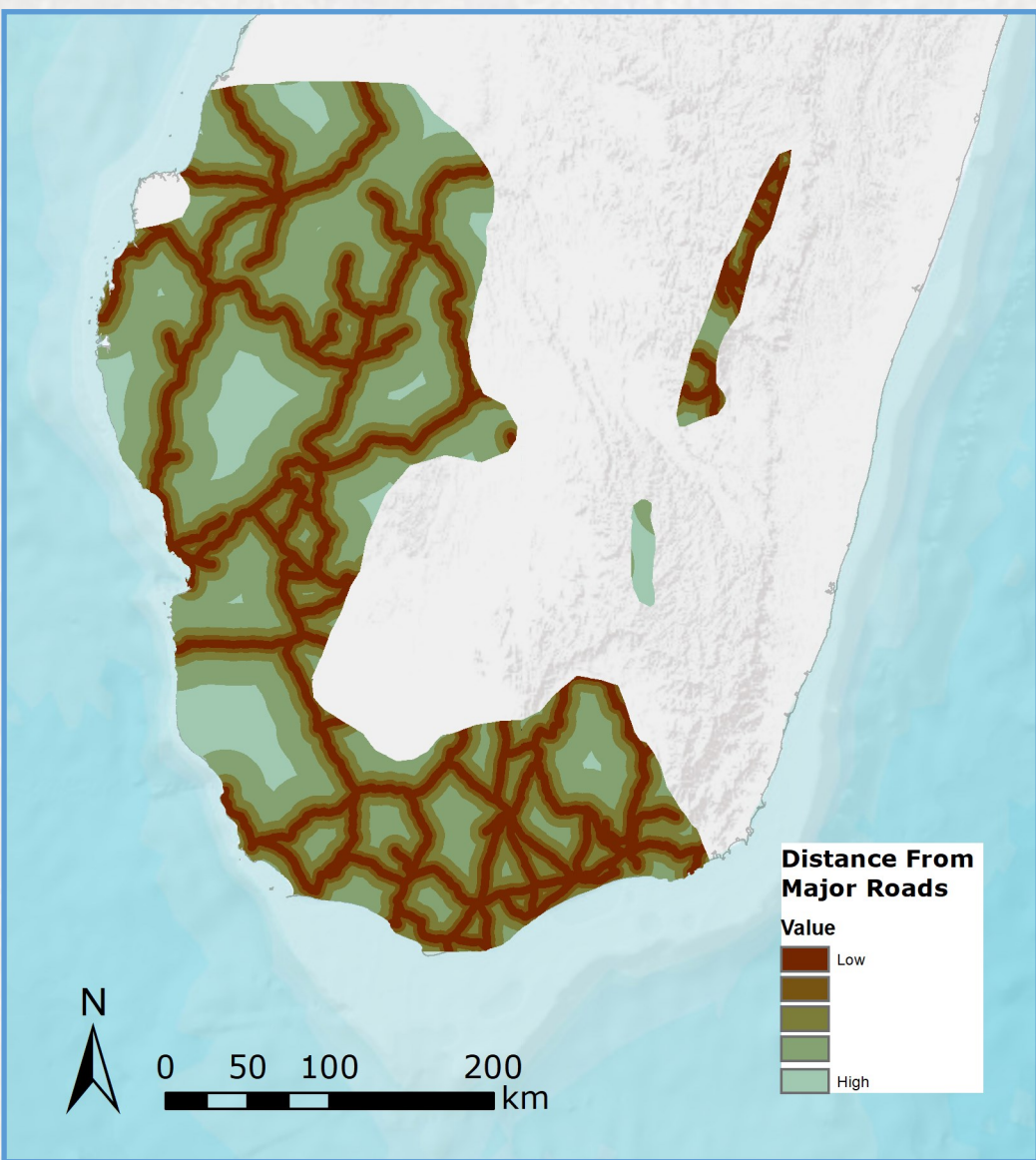
Human agricultural activity caused severe habitat fragmentation and has a major impact on survival of *L. catta* populations. A Euclidean distance analysis was performed to identify areas of land that are suitably distanced from croplands. Distance from cropland was weighted 30% in the final analysis.

Population Density



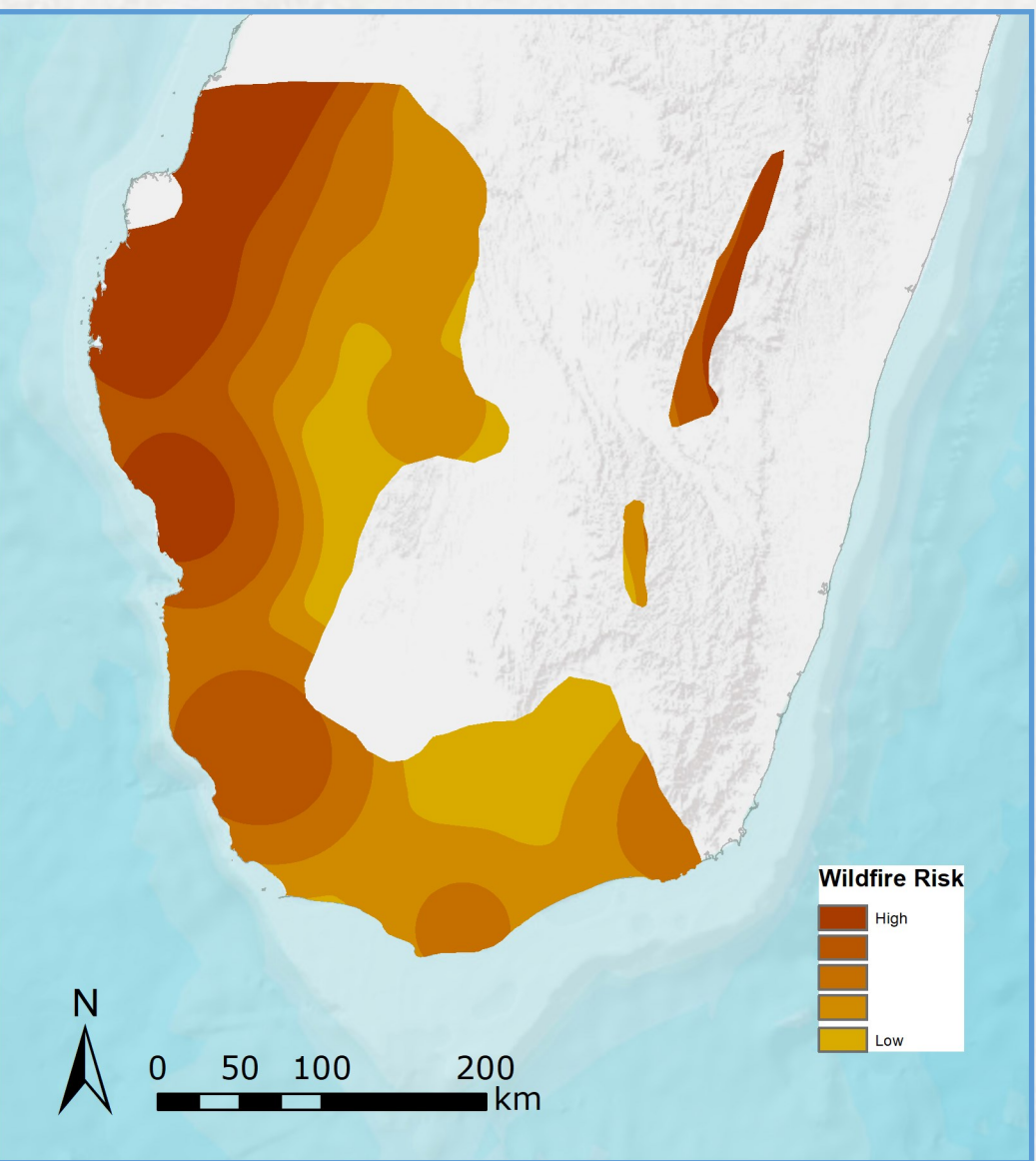
Human population density strongly correlates with decreasing lemur populations. A kernel density analysis was run on data gathered by WorldPop to identify areas of higher and lower human population density. Population density was weighted 25% in the final analysis.

Distance from Roads



Roads promote the spread of illegal hunting, harvesting, and slash and burn agriculture, which are all major threats to conservation. A Euclidean distance analysis was performed on data from WFP to identify distance from major roads. Distance from roads was weighted 30% in the final analysis.

Wildfire Risk



Wildfires, often caused by slash and burn forestry, threaten both lemur populations and any conservation site. A kernel density analysis was performed on data from NASA to identify areas at high risk for wildfires. Wildfire risk was weighted 15% in the final analysis.