Connecting African Wild Dogs in Zambia

Introduction: African wild dogs (Lycaon pictus) are the most endangered carnivore in sub-Saharan Africa. Their population is estimated to be at 1,409 mature individuals. They face many threats to their survival, including accidental and targeted killings by humans, rabies, canine distemper, competition with other predators, and most significantly, habitat loss and fragmentation. As human development and agriculture grow, there is less habitat available for wildlife like wild dogs. Furthermore, because they live in low densities and have large ranges, wild dogs are especially vulnerable to habitat fragmentation. This analysis evaluates the habitat suitability of Zambia, which has several separated populations of African wild dogs, to determine possible locations for wildlife corridors to connect the existing populations.

Methods: The suitability analysis included land cover type, proximity to lion territory, roads, and mines, and the density of human population and human conflict. The Euclidean distance tool was used to categorize the distance from lion territory, roads, and mines. These categories were reclassified and given a value of one through five according to the suitability factors chart. Next, the Kernel Density tool was used to determine the density of human conflict, which was then reclassified and scored from one to five. Land cover data was reclassified by land cover type and scored one through five. Human population density was also reclassified based on density and scored one through five. To combine these factors, the scores were calculated into a raster. Land cover, roads, and population data were each weighted at 25%, human conflict and mines were weighted at 25%, and human development and agriculture were weighted at 10%. Lion territory was weighted at 5%. Based on this raster and the proximity between established African wild dog territory, potential wildlife corridors were determined.

Results: The suitability analysis revealed that the current African wild dog populations are separated by unsuitable habitat. For Path A, a major road separates two territories. To connect them, a wildlife crossing over the road to allow them to safely cross the road and move between the locations is recommended. Path B joins a small territory to a nearby large territory through fairly suitable habitat. Path C spans a long distance, connecting two larger territories through suitable habitat. These could be composed of protected land. Wildlife corridors like the ones proposed will allow wild dogs to be more resilient and to coexist better with humans. In the future, the ranges of this endangered animal should be considered in national land use planning to avoid further fragmentation.

Data Sources: IUCN, WorldPop, openAfrica, Acled, ArcGIS
Projection: Adindan UTM Zone 33N
Thank you to Carolyn Talmadge and Annie Nguyen for their help and patience.

Suitability of Wildlife Corridors for African Wild Dogs

- **Suitability: High** (Pathway 1)
- **Suitability: Medium** (Pathway 2)
- **Suitability: Low** (Pathway 3)
- **National Capital**
- **Provincial Capital**

**Land Cover:** African wild dogs prefer forests and are often found in savannas. Areas that are barren or used for farming are the least suitable.

**Lion Territory:** Lions compete with African wild dogs for prey, and sometimes kill them, especially the young. So lion territory is not ideal habitat.

**Human Population, 2019:** Conflict with human represents a major threat to wild dogs, so preference was given to areas with low human density.

**Roads:** Wild dogs often use roads to travel and rest, and are vulnerable to road accidents. Roads create barriers between populations.

**Human Conflict, 2015-2019:** Areas with human conflict are dangerous, bring wild dogs into contact with people, and are generally inhospitable for wild dogs.

**Mines:** Mines restrict suitable territory for wild dogs because they are unsafe and bring the animals in close contact with humans.