

Project Update: October 2020

## Background

Spatial modelling of the invasive plant *Opuntia*: Habitat, abundance and distributions under climate change in Serengeti National Park, was the project which was implemented in Serengeti National Park. The main goal of this project was to model the habitat, abundance and distribution of *Opuntia* species under current environmental conditions and to predict changes in the future in the Serengeti ecosystem.

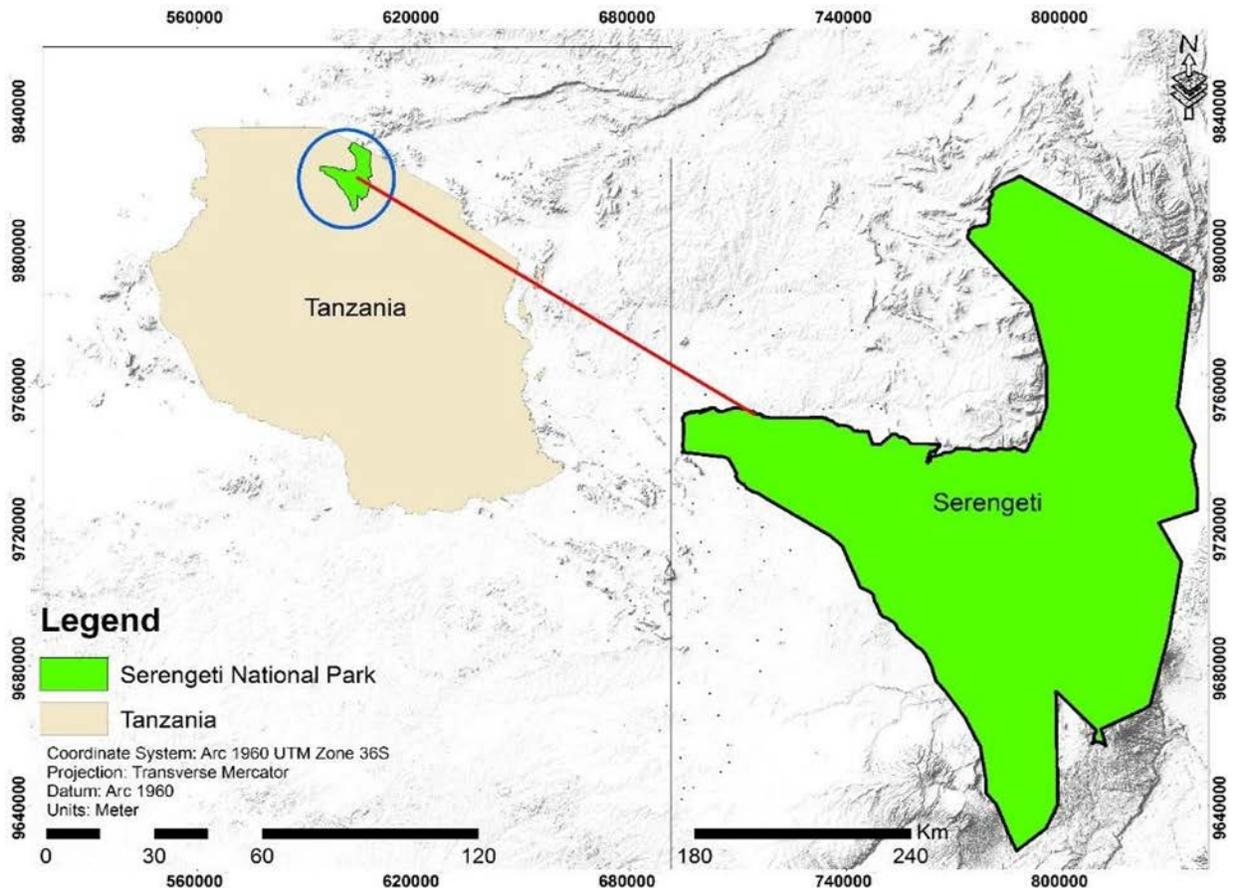


Figure 1: Map of project site (Serengeti National Park)

## Project site

The project was conducted in Serengeti National Park which is located at the latitude of - 2.33333 and the longitude of 34.833332 figure 1. The park is located in the northern part of Tanzania, and it's bordered by three regions: Arusha, Simiyu and Mara. Serengeti is the oldest Park in Tanzania and well known worldwide for supporting the largest great wildebeest migration remaining in the world. It is also the core protected area in a much larger ecosystem, that includes Ngorongoro Conservation Area, Loliondo Game Controlled Area, Maasai Mara National Reserve (Kenya), Ikorongo Game Reserve, Grumeti Game Reserve, Kijereshi Game Reserve and Maswa Game Reserve. The park landscape consists of a large fertile plain of short grass in the south, with rolling long grass hills adjacent, and open treed woodlands and riverine forests in the west and north.

Generally, the park is classed as a savannah grassland. Additionally, the park landscape offers a unique counter-gradient of rainfall and soil fertility that creates a diversity of habitats for wildlife, most notably the largest terrestrial migration of wildebeest and zebra followed by its predators and vultures.

### **Fieldwork**

Field data collection was conducted from 18 August to 10 September 2020 in Serengeti National Park. Stratified sample was done and four strata (figure 3) were established based on bio-geoclimatic zones (low rain volcanic shallow soils (south), black cotton wooded savanna (Maswa), alluvial flood plain with ironstone soils with mixed acacia woodlands (west), granitic leached soils with clay swales with combretum, Acacia woodlands (north), sandy soils (*Terminalia* woodland) and riverine closed canopy forests).

### **Sampling unit**

A total number of 88 field plots of 4 x 4 m distributed in four strata were established figure 4. In each plot grass biomass (disc pasture height in plot of 4 x 4 m measured randomly), vegetation, level of grazing, identification of dung heaps numbers, termite mounds (50 m radius), dominant tree species (500 m radius){No trees, > 500 m, 300 – 500 m, 150-300m, <150m}, herbivores species (500m radius) an soil characteristics were recorded. Again, spatial location of *Opuntia* species (presence and absence) were also recorded.

### **Spatial location of *Opuntia***

In each sampling plot of these strata, the random points which were visited to assess the "available" habitat. At each plot "used" and "available" points were set up and a sample design such as a 4 x 4 m plot in which were used to collect covariates variables. Spatial location of presence and absence of *Opuntia* (figure 5) were marked and recorded. A total number of 301 *Opuntia* plants were identified and recorded as presence data.

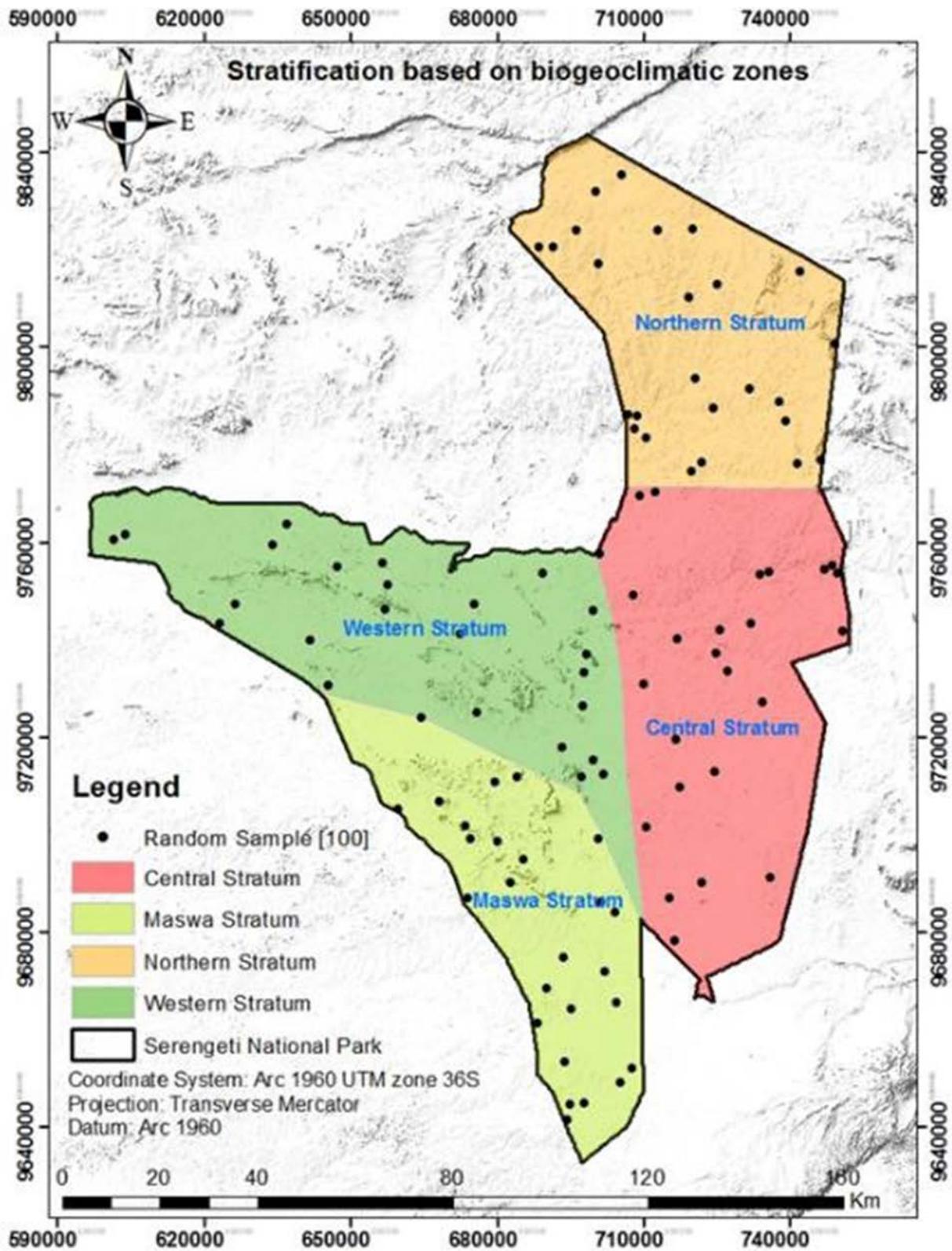


Figure 3: Strata



Figure 4: Field plot establishment and data collection



Figure 5: Spatial location of *Opuntia*

## Conclusion

Data collection were successful achieved, some field work challenges were well contained and managed. Currently, field team is continuing to organise the variables collected for data analysis.





