Estimating density of sitatunga (*Tragelaphus spekii)* using time in front of the camera

Megan Brownlee, Mark Boyce, Camille Warbington

Department of Biological Sciences, University of Alberta

Introduction

- Sitatunga (*Tragelaphus spekii)* is a medium sized antelope in papyrus wetlands of sub-Saharan Africa
- Underrepresentation of sitatunga in scientific literature because their dense habitats are not well suited for typical survey methods
- Trophy hunt recently legalized in Uganda and has tremendous economic benefits and conservation incentives
- Important to understand sitatunga population densities in order to develop quotas for a sustainable harvest

Purpose

- To determine the population density of sitatunga in the Mayanja River area of central Uganda using the time in front of the camera (TIFC) model and camera trap data of sitatunga sightings from 2015 to 2018.
- To compare TIFC results to spatially explicit capture-recapture (SECR) density estimates to determine if TIFC serves as a reliable method for estimating wildlife population densities.

Methods

- 8.1 km² area of wetlands within the Mayanja River area of central Uganda
- Camera trap data from 2015-2018 used to determine sitatunga density
- Average of 26 cameras deployed each year

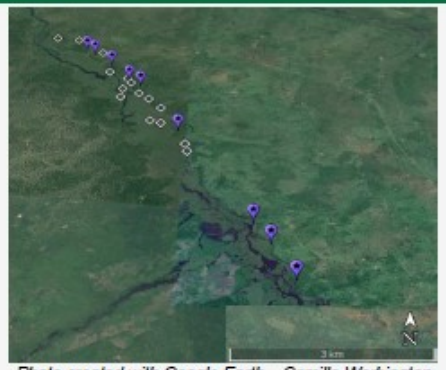

Photo created with Google Earth - Camille Warbington

$$\text{Density} = \frac{\Sigma(\text{number of individuals} \times \text{time in field} - \text{of} - \text{view})}{\text{area of field} - \text{of} - \text{view} \times \text{total camera operating time}}$$

Results

Sitatunga density estimates using TIFC and SECR methods. We used both 7 m and 5 m as effective detection distance (EDD); the former is the EDD used by ABMI for ungulates of size similar to that of sitatunga, and the latter was used to determine density in areas with a shorter detection distance, which is likely in the papyrus marshes.

Year of study	TIFC density with 7 m EDD (km^{-2})	TIFC density with 5 m EDD (km^{-2})	SECR density (km^{-2})
2015	12.8	25.3	17-26
2016	9.94	19.5	9-14
2017	3.29	6.45	4-9
2018	1.79	3.5	

Conclusions

- TIFC estimates of sitatunga density are comparable to SECR estimates, indicating that novel TIFC methods can serve as a valid and reputable measure of density.
- TIFC methods may be used to accurately determine density of populations that do not fit SECR assumptions and model requirements

Photo Credits - Camille Warbington