

## Introduction: What is Citizen Science?

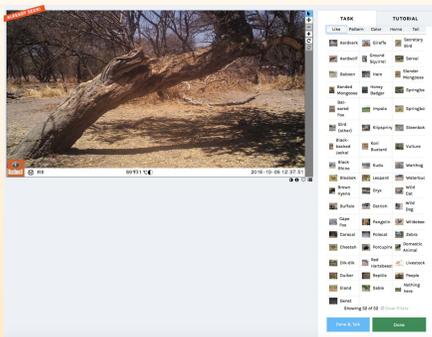
**Citizen Science is the system of outsourcing the collection and analysis of mass data to the public.** Citizen Science projects are administered by professional scientists who conduct research by using volunteer labor. It is used to make data collection and analysis cheaper and more time efficient for the researcher.

## Cheetahs of Namibia Project

The goal of the project was to create **more effective conservation programs to protect cheetahs**, other carnivores, and the ecosystem through the **outsourcing of camera trap classifications** to volunteers. Volunteers classified various species in the Greater Waterberg Landscape in Namibia and the researcher used this to predict predator and prey populations<sup>2</sup>.

## Methods

The citizen science project worked by having the participants classify animals by species.



There were 54 options of species, each accompanied by example images of the species to educate participants and make the classifications

more reliable. There was also the option of saying there was no animal present. Participants could classify more than one animal in the image and were asked to click the right animal multiple times to reduce random mistakes.

## Classification Trial Data

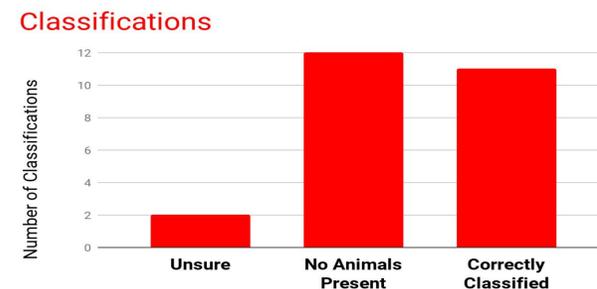


Figure 1: The graph on the left displays a 10 minute session where a new participant made 35 classifications for a camera trap project similar to the Cheetahs of Namibia Project



Displayed above are the 3 categories of classifications. The first image shows an animal that can be classified as either a dik-dik or duiker. Because of images like this, participants are unsure of their classifications and the reliability of the results is questionable. The PI addresses these inaccuracies by grouping the animals into small antelope and large antelope categories<sup>3</sup>.

## Benefits and Challenges of Using Citizen Science for this Project

### Benefits:

- Mass Data Analysis
- Cost / Time Effective

### Challenges:

- Inaccuracies/ Credibility

### How the Researchers Address these Challenges:

To account for **inaccuracies**, the principle investigator of the project, Dan Beringer, confirmed that **each image is classified by 10 participants and if there is no consensus within these votes, then the researcher will reclassify the animal.** Some of the similar species are also grouped into a small antelope and large antelope prey category<sup>3</sup> to reduce varying results.

Dan Beringer also commented on the **credibility** of the project explaining that the Cheetahs Conservation Fund will determine if the results are credible.<sup>3</sup> Professionals will review the images that had little consistency within the 10 votes to make the data more credible.

## Personal Participation

### Weekly Personal Participation



Figure 2: The graph above displays my personal participation where I classified animals for an hour a week. There is generally an upward trend that levels out with the exception of a dip at week 6 where I was distracted by midterms. The upward trend is due to my improvement in speed as I classified more animals and no longer needed to search for the right animal. I did not experience volunteer fatigue.

## Conclusion

### Citizen Science was the Right Choice for this Project!

There were many benefits of using citizen science for this project and the researchers accounted for the challenges. **Citizen science allowed the researchers to get large quantities of data in a short amount of time and the data was effectively analyzed by the participants.** The inaccuracies were accounted for by grouping similar species and having the researchers reclassify inconsistent classifications. The data are used to identify the diversity of the prey vs predators. Based on the completion of the project in a timely manner, there was participant motivation. So overall, citizen science was the right choice for this type of project.

## References

- <sup>1</sup> "What is Citizen Science?" *SciStarter*. Last modified 2018. Accessed November 28, 2018. <https://scistarter.com/citizenscience.html>.
- <sup>2</sup> "Cheetahs of Central Namibia." *Zooniverse*. Last modified 2018. Accessed November 26, 2018. <https://www.zooniverse.org/projects/danberinger/cheetahs-of-central-namibia>.
- <sup>3</sup> Dan Beringer, Zooniverse message, October 29, 2018.