Snapshot Safari South Africa experience

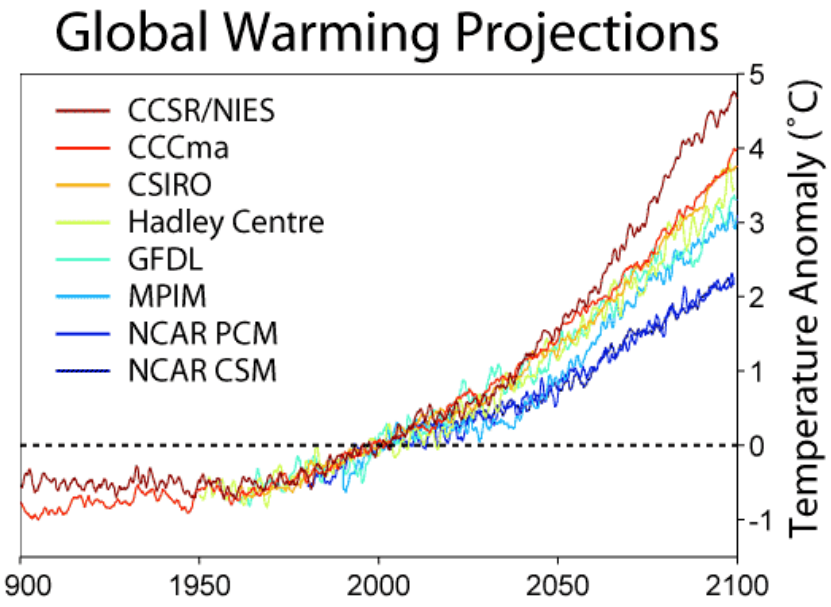
LAIN E. PARDO, NICHOLAS R. OSNER, SARAH HUEBNER, JAN VENTER AND HERVÉ FRITZ

Context

Need for tools to assess these patterns in the most accurate and timely way possible to inform conservation planning

New technologies

Continuous tracking (monitoring)



https://mathbench.umd.edu/modules/climate-change_iconic-graphs/page05.htm

Context

Little work in Africa (but growing nicely!)

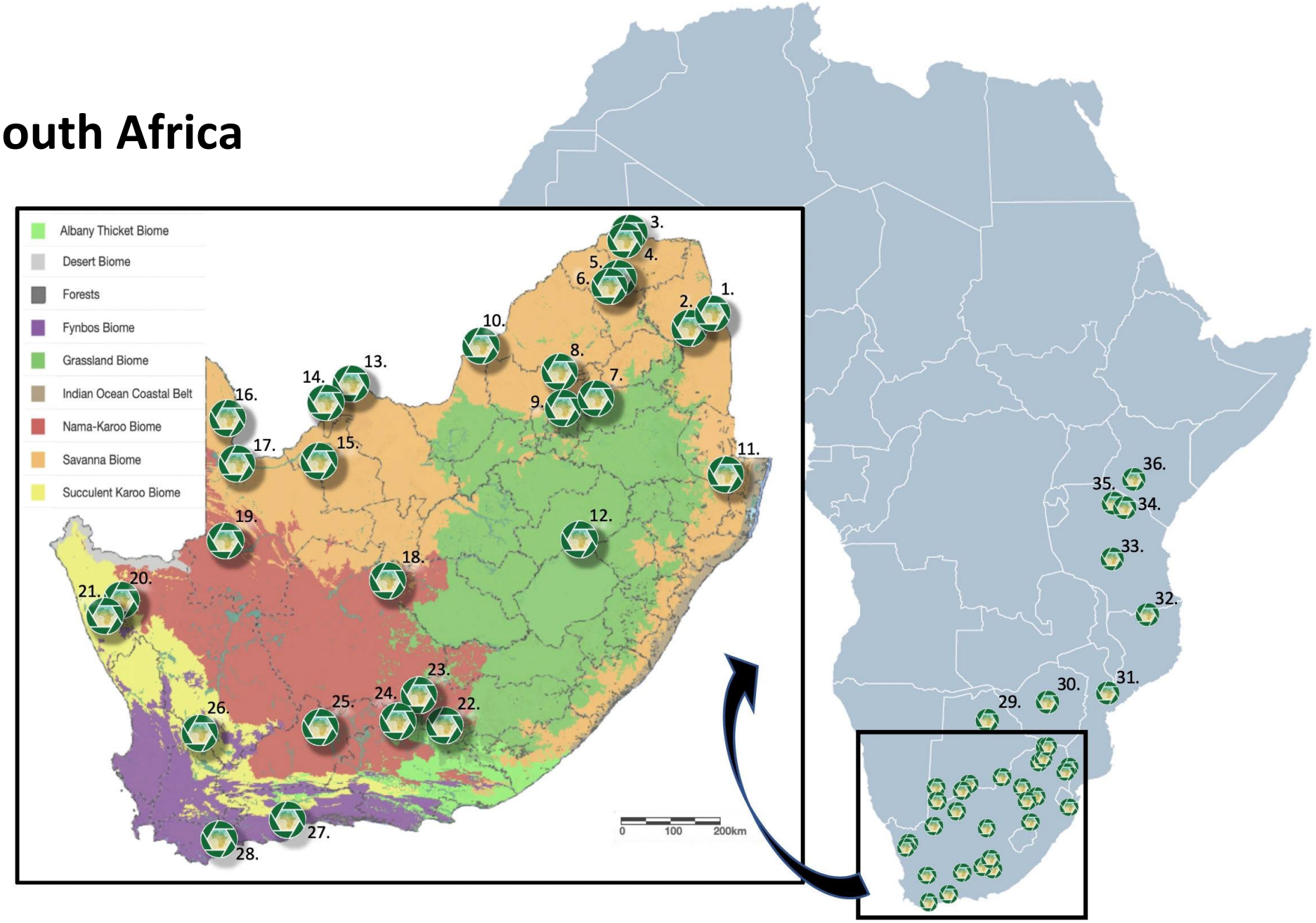
The most recent red list assessment in South Africa *(EWT and SANBI 2016)*:

- 11% of species could not be assessed due to lack of information
- 17% were listed as Threatened with extinction
- 10% were listed as Near-threatened

What can we do from a scientific perspective to reduce the rapid rate of biodiversity loss?

Snapshot Safari project

Snapshot Safari South Africa



Snapshot Safari SA

NELSON MANDELA UNIVERSITY

Mika Vermeulen, Jan A. Venter, Craig Packer, Rob Slotow, Colleen Downs, Michael J. Somers, Mike Peel, Lourens Swanepoel, Nokubonga Mgqatsa, Hervé Fritz, Sandi Willows-Munro, Mark Keith, Dan Parker, Aliza Le Roux, W. Maartin Strauss, Robyn S. Hetem and Craig J. Tambling, Sarah Huebner, Lain E Pardo…

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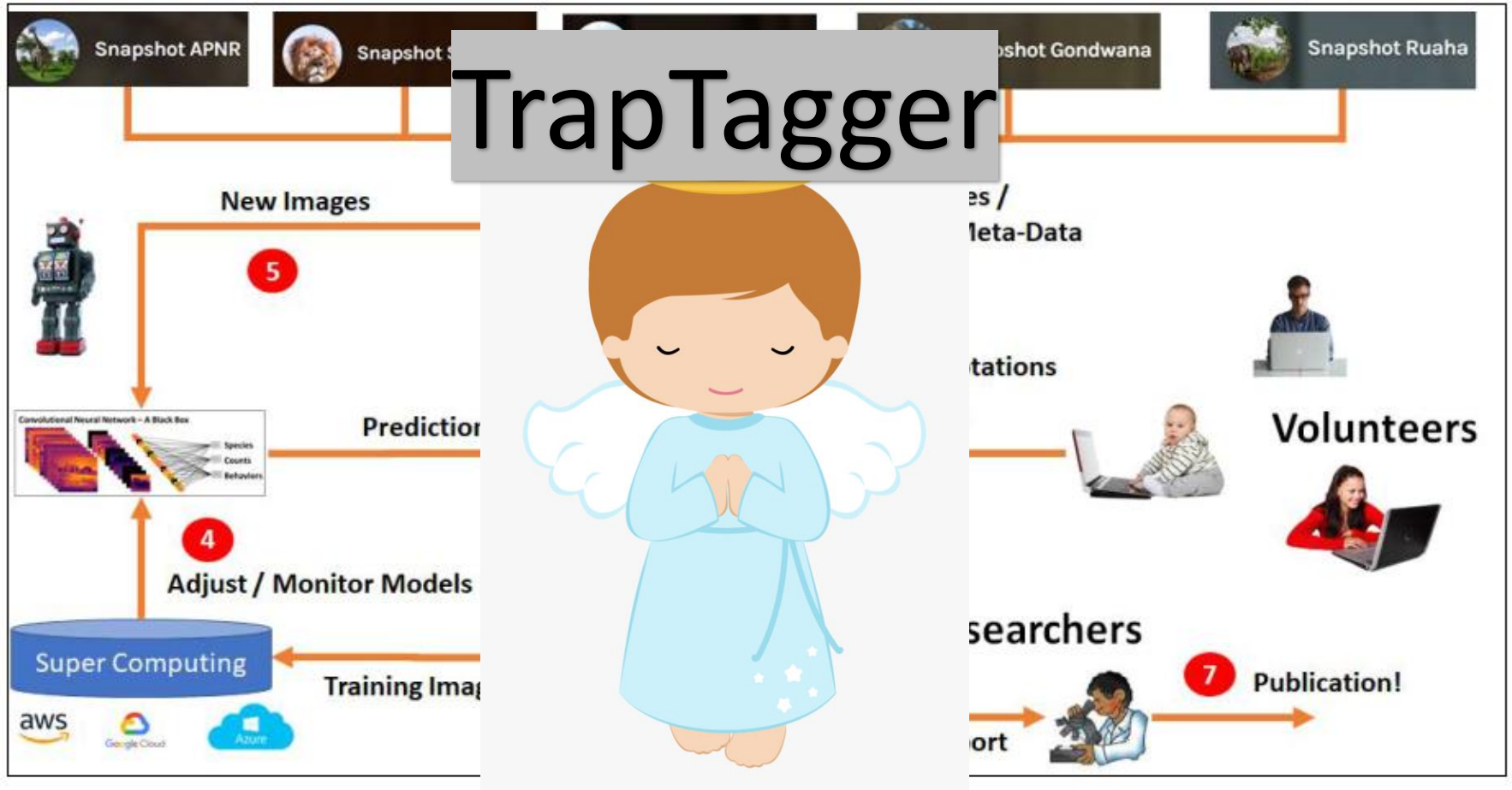
Historically, we (scientists) struggled to make meaningful assessments due to lack of information and data.

Currently, we might be struggling with exactly the opposite: **vast amounts of data!**

Initial data processing workflow on Zooniverse



TrapTagger & WildEye

- TrapTagger developed by WildEye
- Automated species identification
- African organization

Snapshot Safari SA

Current data processing workflow

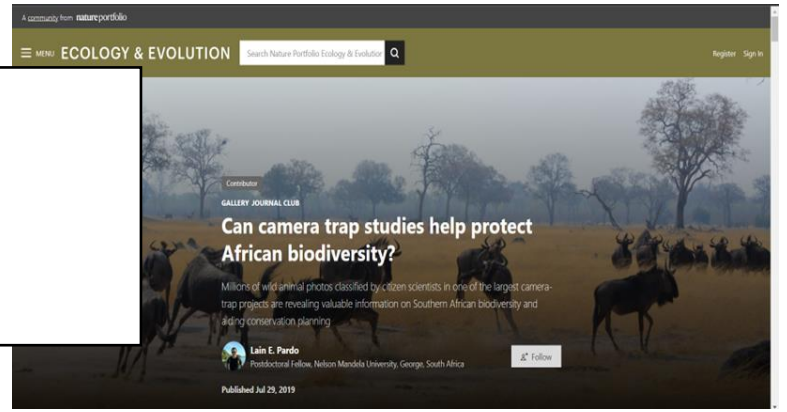
WildEye

Manual id = experts

Automated id: AI classifier

Species records (output, csv file)

Publication
Outreach
Collaboration
repositories



How are we contributing to fill information gaps?

1) species occurrence knowledge
2) hypothesis testing (research)

Results

New species records

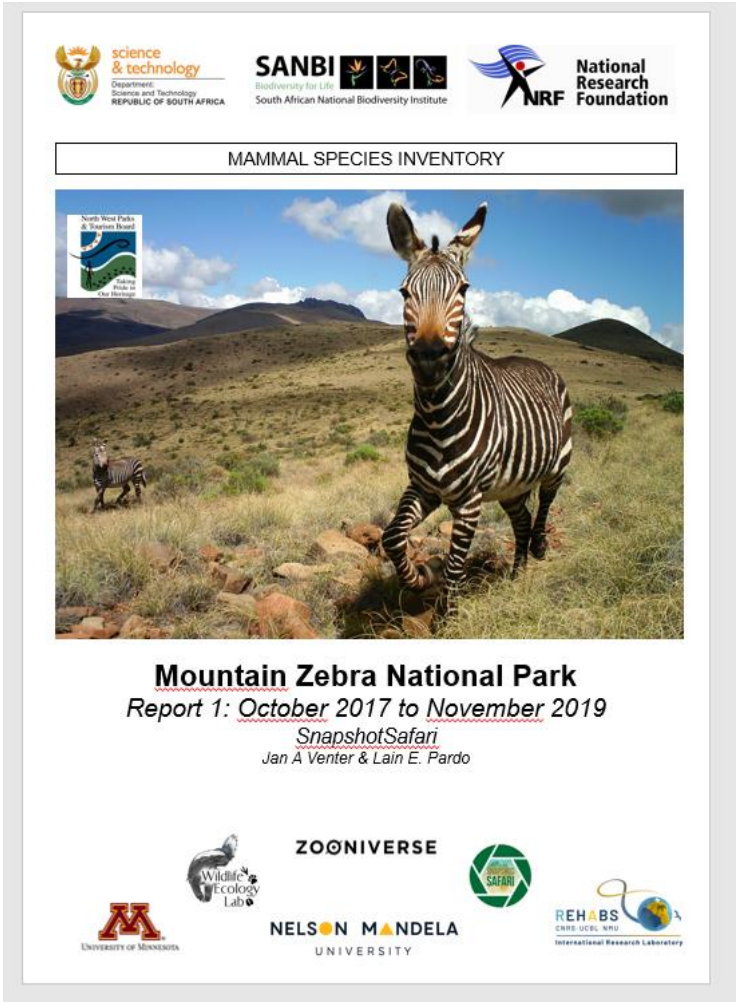
Leopard in Karoo NP

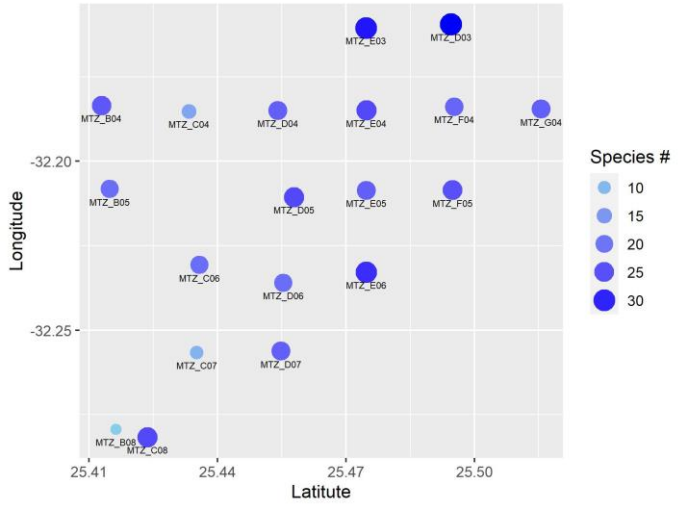
Cheetah in Namaqua

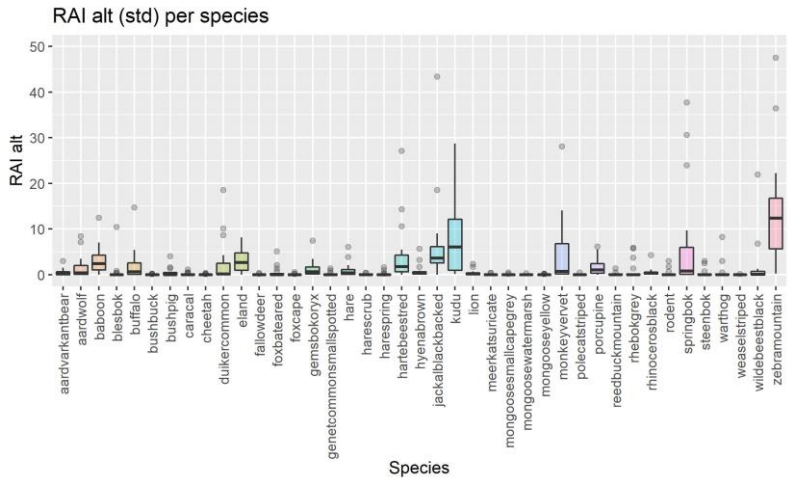
Brown hyena in Candeboo

Results

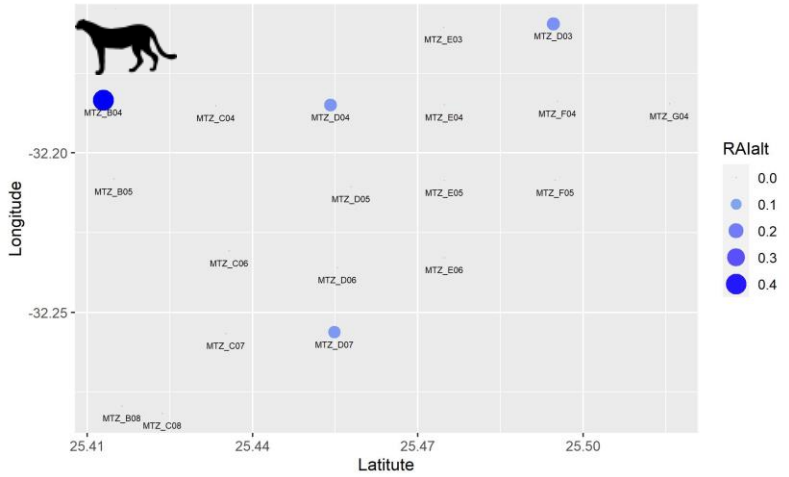
Biodiversity reports

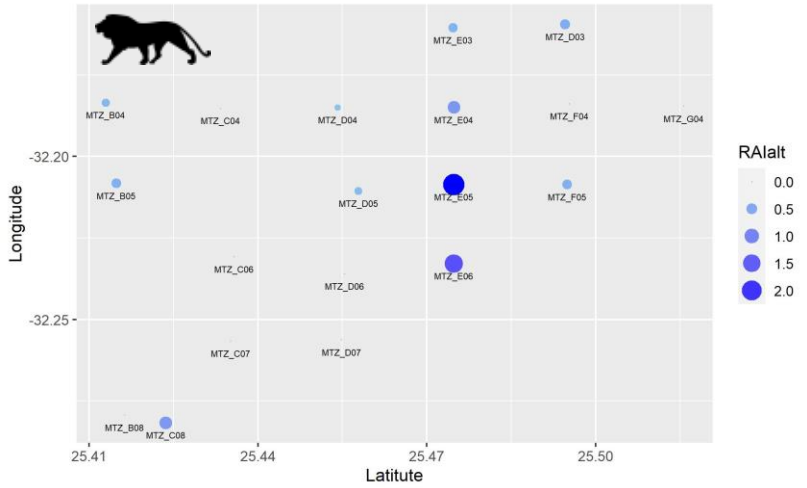


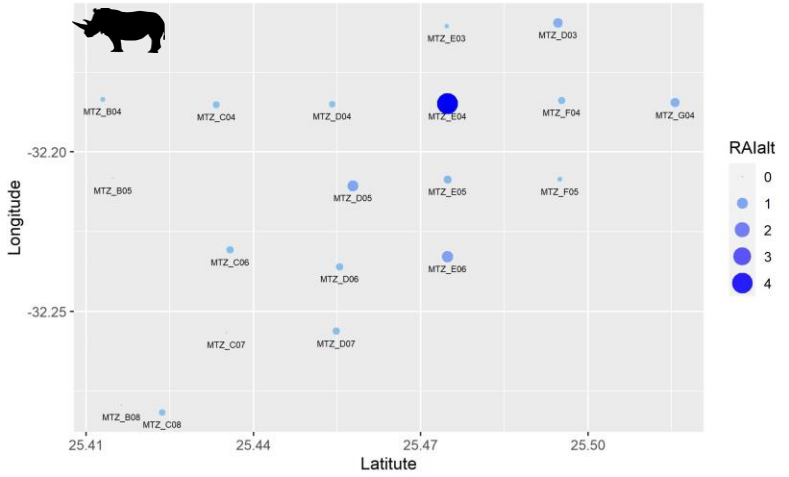


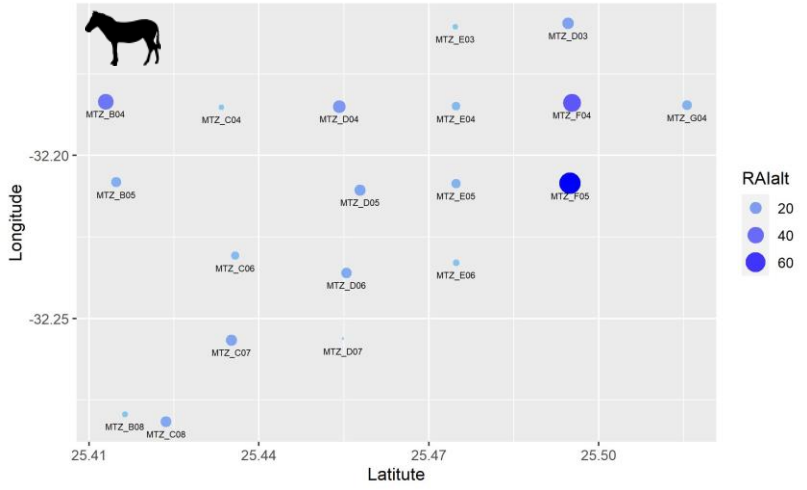


Relative Abundance Index of species of special concern









Data processing codes

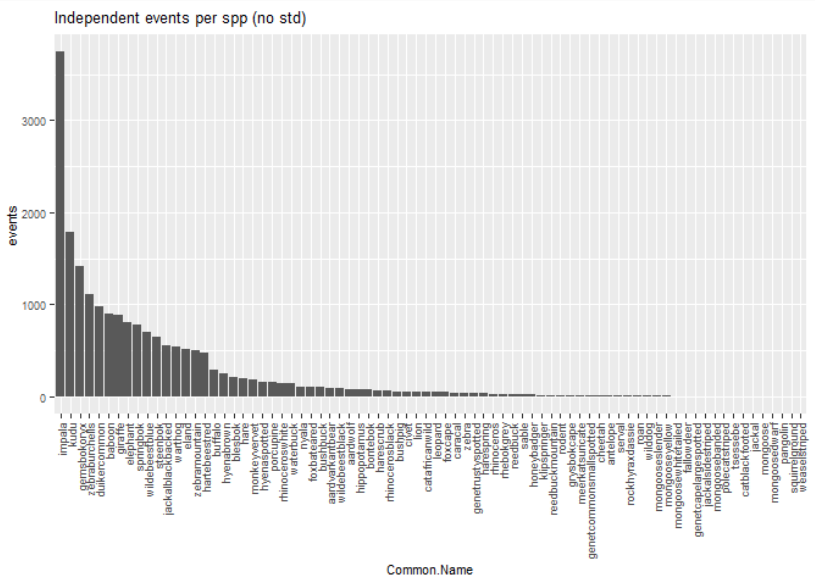
- Reports for FBIP in Darwin Core
- Open source codes to process data (GitHub: https://github.com/LainPardo/Snapshot_Safari)

Plot species records/events

```
sp_allsites <- sp_rec %>%
  group_by(Common.Name) %>%
  summarise (events = n())
#write.csv(sp_allsites , "data_out/sp_list_events.csv")

#library(forcats)

sp_allsites %>%
  mutate(Common.Name = fct_reorder(Common.Name, desc(events))) %>%
  ggplot(aes(x = Common.Name, y = events))  +
  geom_bar(stat = "identity") +
  theme(axis.text.x  = element_text(angle = 90,hjust = 1, vjust = 0.5),
        text = element_text(size=8))+ #working
  ggtitle("Independent events per spp (no std)")
```



Results

Publications

- 4 scientific publications
- 14 theses (MSc and PhD)
- Some blogs or commentaries in newspapers/popular articles

Assessing different methods for measuring mammal diversity in two southern African arid ecosystems

Chloe Burt[1] · Hervé Fritz[1,2,3] · Mark Keith[4] · Chloé Guerbois[2,3] · Jan A. Venter[1,2,4]

Received: 25 August 2020 / Accepted: 3 March 2021 / Published online: 16 March 2021

Abstract
Management and conservation actions are only as effective as our ability to monitor and assess biodiversity trends. We therefore compared the cost efficiency and effectiveness of several standard methods to assess mammal diversity using camera traps, live traps, track plates, mist nets for bats, acoustic bat surveys, spotlight surveys, and block transects recording individual animals, scat, and tracks. We also assessed local knowledge through interviews. We surveyed on two contrasting arid ecosystems in South Africa. Our data indicated that block transects were the most cost-efficient and effective method at ascertaining terrestrial mammal species richness. Depending on the goal of the study and the area, a combination of block transects with camera traps or spotlight surveys is a viable option. However, our study indicated the best combination to detect species across different taxonomic groups was block transects and live traps. Local knowledge interviews can be a good addition to a survey as it assesses

Check for updates

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Snapshot Safari: A large-scale collaborative to monitor Africa's remarkable biodiversity

Nature is experiencing degradation and extinction rates never recorded before in the history of Earth.[1,2] Consequently, continuous large-scale monitoring programmes are critical, not only to provide insights into population trends but also to aid in understanding factors associated with altering population dynamics at various temporal and spatial scales.[3] Continuous monitoring is important not only for tracking rare or threatened species but also to detect the increase of potentially invasive species[4], and the trends in the populations of common species, which in some regions are declining even more rapidly than are rare species[2].

The combination of citizen science and cutting-edge technologies has improved monitoring programmes.[5] In this regard, camera traps have become a popular tool to engage with society while obtaining accurate scientific data.[3] The importance of advances in technological monitoring has even been highlighted by the United Nations Environment Programme (UNEP) through the proposed 'Digital Ecosystem framework', a complex distributed network or interconnected socio-technological system.[6]

Monitoring species and ecosystems is critical to Africa – a highly biodiverse continent with numerous mammal species threatened by human activities such as poaching, overhunting, and climate and land-use change.[7] Over half the terrestrial mammals in Africa have experienced range contractions of as much as 80% on average, including predator species such as lions (*Panthera leo*) and large ungulates.[2] In sub-Saharan Africa, human impacts are projected to increase, and trigger an increased extinction risk.[7] However, information on the conservation status

Mammal Research
https://doi.org/10.1007/s13364-022-00636-4

ORIGINAL PAPER

Check for updates

Habitat structure, not the anthropogenic context or large predators, shapes occupancy of a generalist mesopredator across protected areas in South Africa

Lain E. Pardo[1,2] · Lourens Swanepoel[3,4] · Gonçalo Curveira-Santos[5] · Hervé Fritz[1,2] · Jan A. Venter[1,2]

Received: 27 September 2021 / Accepted: 21 April 2022

Abstract
Black-backed jackals (*Canis mesomelas*) are opportunistic mesopredators occupying a variety of ecosystems across South Africa (SA). They can move between protected areas (PAs) and surrounding human-dominated landscapes where they are prone to conflict with wildlife and livestock farmers and subsequently face high persecution rates. However, it remains unclear to what extent the anthropogenic landscape matrix in which PAs are embedded affects black-backed jackal occupancy within PAs at large spatial scales. Therefore, in this study, we explore how different sources of environmental variation inside and

Limitations and future

- Need for user-friendly processing tools
- Need to work closely with other fields such as engineering and statistics
- Data sharing/access: some progress but still need protocols
- Open data: how open? What about rhino photos?

The data lifecycle

BES Guides to Better Science (britishecologicalsociety.org/publications/guides-to)

Conclusion

Snapshot Safari South Africa:

- Potential to expand our knowledge of southern Africa biodiversity
- Largest camera trap project in southern Africa
- Promising trends to improve data analysis (e.g. this conference)
- Replace “parachute science” with “global science” *(sensu Asase et al 2020)* in African countries
- **Our data is available for anything you need!**

THANK YOU!

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