

## **Masters thesis opportunities to examine drivers of population dynamics in large mammals of southern Africa**

I am seeking 1 or 2 Masters students to carry out their thesis on drivers of population dynamics in large mammals of South Africa. We have access to an enormous database that includes information from photographs taken since 2010 from over 30 study areas, each with up to 245 camera traps, distributed through Botswana, Kenya, Mozambique, South Africa, Tanzania, and Zimbabwe (Pardo et al. 2021). Species have been identified and individuals counted in >9M photographs using machine learning algorithms informed by >150K volunteer citizen scientists. The project focuses on data analysis and applicants must be willing to familiarize themselves with state of the art statistical modelling approaches. There will also be an opportunity to visit field sites if the student obtains funding (e.g., via Erasmus+), but this is not required. Projects will develop and examine hypotheses regarding associations between environmental factors (i.e., management and climatic variables) and changes in abundance of focal species. A promising modeling approach is currently being published by colleagues (Farr et al. in press). Successful applicants are expected to work together and independently, and these efforts will lead to manuscripts suitable for publication in international scientific journals. The student will be supervised by Dr. Brady Mattsson (IWJ) and co-supervised by Dr. Rahel Sollmann (Leibniz Institute for Zoo and Wildlife Research, Berlin) and Dr. Jan Venter (Nelson Mandela University, South Africa). This is an excellent opportunity to work with a motivated international team of scientists.

### Desired knowledge and expertise

1. Familiarity with literature review techniques including online databases
2. Familiarity with the scientific method, including formulating and examining hypotheses
3. Good writing skills, including formulating logical arguments
4. Solid understanding of wildlife ecology and landscape ecology
5. Critical thinking
6. Good communication abilities in English, both oral and in writing
7. Generalized linear models, including use of discrete distributions for the response variable
8. Interest in statistics/hierarchical statistical modeling
9. Population modeling
10. Hierarchical statistical models, such as occupancy modeling
11. Bayesian analysis, including Markov-chain Monte Carlo simulation and parallel computing

### To apply

Email your application as a single PDF to [brady.mattsson@boku.ac.at](mailto:brady.mattsson@boku.ac.at). The application must include the following: 1) one-page cover letter summarizing your background and interests along with an explanation for why you are applying for this particular opportunity; 2) Curriculum Vitae; and 3) research-oriented (e.g. Bachelor's thesis) writing sample in English. Applications are evaluated on a first come – first serve basis.

### Literature cited

Farr, M.T., O'Brien, T., Yackulic, C.B. and Zipkin, E.F., in press. Quantifying the conservation status and abundance trends of wildlife communities with detection-nondetection data. *Conservation Biology*. <https://doi.org/10.1111/cobi.13934>

Pardo, L.E., Bombaci, S., Huebner, S.E., Somers, M.J., Fritz, H., Downs, C., Guthmann, A., Hetem, R.S., Keith, M., Roux, A.L. and Mqatsa, N., 2021. Snapshot Safari: A large-scale collaborative to monitor Africa's remarkable biodiversity. *South African Journal of Science* 117: 1-4.