

BSc Opportunity Internship

Project: "Tree Wrapping Effectiveness Assessment"

Project description:

Trees play an important role in savannas by limiting soil erosion, stabilizing ground temperatures, providing refuges, shade, and food resources to wildlife, and influencing nutrient cycle and water availability (Belsky 1994, Lindenmayer et al., 2012). While elephant-driven tree mortality is a natural process, the establishment of fenced nature reserves coupled with an increase in artificial perennial water resources, can lead to an increase in this mortality rate due to an increase in elephant density (Derham, 2016). To reduce this rate, reserve managers can either reduce elephant population size (e.g., culling or reduction of water availability), or protect the trees from being damaged (Derham, 2016). There are numerous solutions, including surrounding the tree with rocks to limit its access to elephants, and wrapping them in meshed wire to limit the access to the cambium, i.e., debarking opportunities (Derham, 2016). The latter solution has been implemented in Olifants West Nature Reserve since 2021 to protect marulas (*Sclerocarya birrea*) and knobthorns (*Senegalia nigrescens*) from elephants (*Loxodonta africana*), and its effectiveness is monitored by revisiting wrapped trees. Since 2021, a total of 672 trees (482 marulas, 190 knobthorns) have been wrapped in OWNr by Transfrontier Africa in Olifants West Nature Reserve, Limpopo, South Africa, as part of a long-term experimental method to protect these species against debarking and uprooting by elephants.

This research seeks to assess the effectiveness of tree wrapping in reducing elephant-driven tree mortality in a savanna ecosystem and aims to achieve the following objectives:

1. Assess the effectiveness of tree wrapping in protecting iconic trees from lethal elephant damages.
2. Identify potential factors that may optimise the effectiveness of this method (e.g., mesh size used, wrapping height, tree density).
3. Produce a guideline document to help reserve managers and landowners protect iconic trees using a non-invasive method for elephant populations.

The research will follow a systematic approach comprising the following steps:

1. Methodology redaction:

Conduct a brief literature review to better understand the context of the project and identify an appropriate methodology to assess the effectiveness of tree wrapping in protecting trees from elephants under field conditions. Identify factors in the literature that may influence the effectiveness of the tree protection method described. Compile a shortlist of the most important factors identified for which data are available.

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2. Fieldwork – Data collection:

Apply the suggested and validated methodology in the field to collect usable data that will address the research objectives. All the fieldwork will be conducted in Olifants West Nature Reserve (OWNR – 9,000 hectares), in the Greater Kruger Park, South Africa.

3. Data analysis & interpretations:

Analyse the data collected using appropriate statistical tests, identified in Step 1, and the factors shortlisted in Step 1, to assess the effectiveness of tree wrapping in protecting iconic trees from lethal elephant damage, and identify potential factors of importance in optimising the effectiveness of this method. If the method is found to be ineffective, identify and suggest alternative solutions.

4. Production of a guideline document – Applied Science & Conservation:

Produce a guideline document to help reserve managers and landowners protect iconic trees using a non-invasive method for elephant populations. This document is intended to popularise the findings of the research, to ensure that the method is implemented appropriately by the relevant stakeholders, based on scientific evidence. This step will contribute directly to the protection of iconic trees in the Greater Kruger Park.

5. Extended outcome – Facilitate a workshop/present the knowledge acquired to relevant stakeholders (if time permits):

Present the results and guidelines to relevant stakeholders to share the knowledge gained during the project. Facilitate a workshop to ensure the appropriate use of the method by the relevant stakeholders, based on the identified improvement factors (if any). Contribute to the management of human-wildlife conflicts in a private nature reserve, and to the conservation of iconic trees in a savanna ecosystem.

Transfrontier Africa NPC:

Transfrontier Africa (TA) is a non-profit environmental conservation organisation founded in 2006. The organisation aims to improve wildlife conservation and ecosystem sustainability by combining research, ecological monitoring, landscape security, community and women empowerment, and environmental awareness. TA is based in Olifants West Nature Reserve, in the Greater Kruger National Park and extends its actions to the Blyde Olifants Confluency Conservation Area and neighbouring communities.

For more information, please visit our website: <https://transfrontierafrica.org/> and consult the attached Interns / Students Information Package.

Position Details

Role title: BSc Intern.

Reporting to: Paul Allin, Research Coordinator, and Elwenn Le Magoarou, Research Assistant.

Duration of position: 3 - 6 months – ideally from February to May 2024.

Transfrontier Africa is offering:



Application deadline: 10 January 2024.

Location: Transfrontier Africa NPC, Ndlovu Bush Camp, Olifants West Nature Reserve, R40, Hoedspruit 1380, South Africa.

Accommodation: Shared accommodation with shared chalets in Ndlovu camp (Olifants West Nature Reserve). The price covers three meals per day, snacks and water. Interns have the opportunity to go into town twice a month to buy extra food or personal items, depending on needs and availability of vehicles. Transport from and to O.R. Tambo International Airport (Johannesburg) can be arranged at the expense of the intern.

Cost: R52,725 for 3 months and R13,500 per additional month (prices are indicative and subject to change from April 2024) – Covers accommodation in Ndlovu Bush Camp, three meals per day, snacks, two TA t-shirts, supervision in the field (fuel & labour costs), participation to the fieldwork of other scientific and reserve management projects and internship supervision.

Minimum requirements:

To apply for participation in this research, the minimum requirements include:

- Being registered in a BSc or similar degree in a relevant field, such as Ecology, Wildlife Biology, Conservation Science, Environmental Science, or a related discipline.
- Strong coursework and understanding of ecological principles.
- Prior experience or coursework in ecological research methodologies and data analysis.
- Proficiency in conducting thorough literature reviews to gather relevant information, mainly on human-elephant conflicts, elephant-driven tree mortality in a savanna ecosystem, tree protection methods.
- Familiarity with R statistical software program, or similar statistical software, for data analysis and ability to identify suitable statistical tests under supervision.
- Familiarity with Geographic Information System (GIS) software, such as ArcGIS or QGIS, for basic spatial analysis and mapping.
- Strong written and verbal communication skills to effectively present research findings in English.
- Ability to write scientific reports or research papers and contribute to project documentation (e.g., production of a guideline document).
- Ability to work independently as well as collaboratively with research team members as part of a multi-cultural and multi-disciplinary team.
- Ability and willingness to learn independently and proactively acquire new knowledge and skills necessary for the research project.
- Capacity to adapt to new methodologies, software, and analytical techniques as required by the study.
- High motivation and capability of working under remote field conditions.
- Ability to apply safety rules to ensure a safe working environment in the field and research station.

Transfrontier Africa is offering:



Application:

Application documents, including a Curriculum Vitae and a cover letter, should be submitted before 10 January 2024 to Paul Allin (research@transfrontierafrica.org) and Elwenn Le Magoarou (ecology@transfrontierafrica.org), with the subject 'Application – Tree Wrapping Effectiveness Assessment'. For any further information, please do not hesitate to contact us. Shortlisted candidates will be contacted for an interview during the week following the application deadline.

References

Belsky, A. J. (1994). Influences of trees on savanna productivity: Tests of shade, nutrients, and tree-grass competition. *Ecology* **75**(4), 922–932.

Derham, K., Schulte, B. A. and Henley, M. D. (2016). Wire netting reduces African elephant (*Loxodonta africana*) impact to selected trees in South Africa. *Koedoe: African Protected Area Conservation and Science* **58**(1), 1–7.

Lindenmayer, D. B., Laurance, W. F. and Franklin, J. F. (2012). Global decline in large old trees. *Science* **338**(6112), 1305–1306.