

BSc Thesis Opportunity Internship

Project: "Leopard Distribution in Hoedspruit, Limpopo, South Africa"

Project description:

Leopards (*Panthera pardus*) are charismatic big cats that play a vital role in maintaining ecological balance in their habitats. According to the International Union for Conservation of Nature (IUCN), leopards are listed as vulnerable due to their declining populations worldwide. In South Africa, most leopard research has been conducted within protected areas, despite the fact that 63% of suitable leopard habitats occur outside these protected areas. This research aims to study leopard distribution and movement in the Hoedspruit area, situated in the Greater Kruger in Limpopo, South Africa. This research is using presence-only data collected by numerous reserves and citizen scientists. The data will be analysed using Species Distribution Modelling software such as MaxEnt (maximum entropy modelling) or R packages. Additionally, the project requires to create spatial maps for data visualization and analysis in GIS software (ArcGIS or QGIS)

The research aims to achieve the following objectives:

1. Identify the key environmental variables influencing leopard distribution in the study area.
2. Pre-process leopard presence-only data and environmental variables for further statistical analyses.
3. Generate spatial maps depicting leopard distribution.

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

1. Data Collection:

From sources such as Landsat, to gather relevant environmental variables (e.g., vegetation type, elevation, proximity to water sources, human settlements etc...) that may influence leopard distribution.

2. Data pre-processing:

Cleaning and standardization of the presence-only data obtained from various sources. Processing and preparation of the environmental variables for the analysis.

3. Environmental Data Analysis:

Conduct a comprehensive analysis of the collected environmental data to identify variables significantly associated with leopard presence. Employ statistical techniques such as correlation analysis, chi-square tests, or regression models to determine the environmental factors influencing leopard presence.

4. Spatial Mapping:

Utilize GIS software (ArcGIS or QGIS) to create spatial maps depicting leopard distribution, potential habitat suitability, and environmental variables. Generate leopard density maps, hotspot analysis, and spatial clustering to identify areas of high leopard activity. Overlay the maps with relevant contextual data, such as land

use, protected areas, and human settlements, to understand the broader implications for leopard conservation.

Extended outcomes

1. A spatial distribution map indicating leopard presence within the studied area.
2. Identification of key environmental factors influencing leopard presence.
3. Identification of potential human-leopard conflict areas.

In-fine, this research aims to assess the spatial distribution of leopards in Hoedspruit in South Africa using presence-only data. By employing presence-only species distribution modelling and conducting comprehensive environmental and spatial analysis, this study will contribute to the understanding of leopard ecology, aid in conservation efforts, and promote coexistence with local communities.

Transfrontier Africa & On Track Foundation:

Transfrontier Africa (TA) is a non-profit environmental conservation organisation that aims to improve wildlife conservation and ecosystem sustainability by combining research, ecological monitoring, landscape security, community and women empowerment, and environmental awareness. One of the key objectives of the organisation is to support reserve management in making informed decisions based on scientific evidence.

The On Track Foundation (OTF) is a non-profit organisation and its purpose is to promote wildlife conservation and to protect endangered and threatened species, whilst also focusing on supporting local communities. This purpose engages a holistic approach to wildlife conservation that includes provision of many elements of conservation practice to address local wildlife management issues.

For more information, please visit our websites: <https://transfrontierafrica.org/> (TA) & <http://ontrackfoundation.org/res.html#> (OTF) 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 to 6 months – from February or March 2024.

Deadline: 10 January 2024.

Location: Transfrontier Africa NPC, Olifants West Gate, Balule Nature Reserve, R 40, 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 once a week or twice a month

to buy extra food or personal items. Transport from and to O.R. Tambo 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) – Covers accommodation in Ndlovu Camp, food, participation in other conservation projects, two TA t-shirts for fieldwork, supervision in the field (fuel & labour costs) and internship supervision.

Minimum requirements:

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

- Enrolled in the third year of a bachelor's degree (or higher 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 and basic knowledge of statistical analysis.
- Prior experience or coursework in ecological research methodologies, data collection, and analysis.
- Proficiency in conducting thorough literature reviews to gather relevant information on leopard ecology, habitat requirements, and previous research on leopard distribution in South Africa.
- Strong knowledge of MS Office and strong interest in learning software for reporting and research purposes (QGIS, R statistical software).
- Prior experience in using R statistical software program for data analysis is desired.
- Prior experience in using Geographic Information System (GIS) software, such as ArcGIS or QGIS, for spatial analysis and mapping is desired.
- Strong written and verbal communication skills to effectively report research findings in English and contribute to project documentation.
- 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.

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 – Leopard Distribution BSc'. 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.