Welcome and congratulations on beginning your exciting journey to become an Intern at Transfrontier Africa’s Balule Conservation Project. We thank you for choosing our organization and contributing to the conservation of the African Biome. With your contribution and assistance, we are able to continue the important and ground-breaking research currently undertaken within the reserve. It is the support like yours that has reinforced and maintained pioneering policies, such as ethical and sustainable hunting practices, anti-poaching initiatives based on scientific modelling, rhinoceros conservation models, robust scientific research and the sustainable management of the reserve.

We look forward to working with you.

**CONTINUOUS AND ON-GOING RESEARCH**

### Ecological Carrying Capacity Survey

<table>
<thead>
<tr>
<th>Objectives:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• To establish the ecological carrying capacity for consumers (grazers) of BNR</td>
</tr>
<tr>
<td>• To advise on hunting quotas</td>
</tr>
<tr>
<td>• To monitor the health and functionality of the ecosystems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods:</th>
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</thead>
<tbody>
<tr>
<td>• Transects established North and South (from Olifants River).</td>
</tr>
<tr>
<td>• 10 x 10m plots every 1km on the transects</td>
</tr>
<tr>
<td>• Grass species recorded and evaluated according to forage factor</td>
</tr>
<tr>
<td>• Calculate carrying capacity using Dankwerts model</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Schedule:</th>
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</thead>
<tbody>
<tr>
<td>• Plots revisited every January to February only</td>
</tr>
<tr>
<td>• Estimated time required is 14 days (weather permitting)</td>
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</table>

<table>
<thead>
<tr>
<th>Goals:</th>
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</thead>
<tbody>
<tr>
<td>• To accurately establish the grazer carrying capacity</td>
</tr>
<tr>
<td>• To provide a basis on which to allocate hunting quotas</td>
</tr>
<tr>
<td>• To establish a habitat, score for BNR and therefore evaluate the health of the ecosystem</td>
</tr>
<tr>
<td>• To continue research in order to assist in making appropriate management decisions</td>
</tr>
<tr>
<td>• To ensure compliance to our contractual agreements with the APNR</td>
</tr>
</tbody>
</table>

**Project Supervisor:**
Warren North
Transfrontier Africa
**Species Population Dynamics**

**Objectives:**
- To determine the population dynamics of consumers within BNR
- To evaluate the sustainability of decisions made relating to sport-hunting
- To support the annual aerial census and provide sex and age demographics

**Methods:**
Distance sampling technique

- A visibility index has been established for 3 basic routes.
- Routes driven 5 times consecutively – 10h00 – 15h30.
- All herbivores counted within the transect – sex and age demographics recorded.

**Schedule:**
- September – October only. Set to coincide with aerial census.
- Every day for 15 days

**Goals:**
- To establish age and sex demographics of herbivores
- To assist decision-making and ensure sustainability with hunting quotas.

**Body Condition Scoring**

**Objectives:**
- To monitor the effects of the current drought in megaherbivores
- To evaluate the sustainability of decisions made relating to sport-hunting

**Methods:**
- Set routes driven three times weekly
- Recording of individual identification of species, GPS location and body score.

**Schedule:**
- April – May (End of Summer)
- September – October (End of Winter)

**Goals:**
- To compare contemporary data with previous studies, lending insight into the effects of the current drought.

**Grass Phytomass / Standing Crop Biomass Survey**

**Objectives:**
- To determine the available standing crop of grass at the end of winter.
- To determine the need for, or desirability of fire in the BNR as a management tool
- To monitor ecosystem health and functionality

**Methods:**
- Transects established North and South (from Olifants River).

**Schedule:**
- Plots revisited every September only – before first rains
- 10 x 1m plots every 1km on the transects
- Grass above the ground is cut in the plots and weighed, packed and weighed again.
- Estimated time required is 10 days (weather permitting)

**Goals:**
- To accurately establish grass moisture content
- To establish the fuel load for veldt fires
- To provide comparative data on ecosystem health

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### Impact of Alien Vegetation on Biodiversity and ecological integrity

**Objectives:**
- To control the spread of *Alien vegetation* through the use of chemical, biological and mechanical means
- To determine whether different vegetation types and ecological conditions influence the density of the plants and how the age structure varies between each habitat type

**Methods:**
- To control the spread of *Alien Vegetation*, the research team has segregated BNR into time/space sections, to better fight incursions.
- Within each section, 1 kilometer plots are walked to locate of *alien vegetation* within that region.
- *Alien Vegetation* coordinates are then recorded in order to determine its location amongst the differing vegetation types. In addition, height, number of cladodes, distance to nearest neighbor and tree are noted.

**Schedule:**
- Data collection and control occurs on a monthly basis for the differing segregated sections. Landowners will be notified in advance to treatment occurring within their region.
- *Alien Vegetation* control, data collection and revisits will occur 3 times a week: Monday, Wednesday and Friday 09:00-16:00hrs
- Treatment is dependent on weather – herbicide application is excluded in windy and wet conditions.

**Goals:**
- To reverse the incursion of *Alien Vegetation*, within Balule Nature Reserve

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### Predator Population Dynamics

**Objectives:**
- To determine and monitor the population dynamics of predators within BNR

**Methods:**
- Data booklets were given to particular lodges to log sightings and relevant information, which are collected weekly.
- Researchers utilize scat analysis and camera traps strategically placed at active water holes to opportunistically gather predator and prey information.

**Schedule:**
- Scheduling to accommodate intern arrival.
**Goals:**
- To monitor the predator populations.
- Maintain a database of current predator demographics and spatial data

**Project Supervisor:**
Leonie Hofstra
Transfrontier Africa

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**Diet Composition of Apex Predators through Scat Analysis**

**Objectives:**
- To determine the prey selection by apex predators within BNR to better understand the effects of the ongoing drought.

**Methods:**
- Collect predator scat samples from field transects.
- Follow hair identification guidelines to analyze scat samples and identify majority prey species.

**Schedule:**
- Data booklets are collected on a weekly basis.

**Goals:**
- To accurately portray prey populations in order to sustainably manage hunting within the reserve.
- To compare contemporary data with previous studies, lending insight into the effects of the current drought.

**Project Supervisor:**
Madison Kucinick
Transfrontier Africa

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**Implementation of Bat Boxes to mitigate Human-Wildlife Conflict**

**Objectives:**
- Design and test the effectiveness of species-specific bat boxes.
- Discourage bats from roosting in the roofs of lodges and homes in Balule Nature Reserve.
- Create materials to educate the public on bat ecology and benefits

**Methods:**
- Research, design and build bat boxes to place at participating properties.
- Design an experiment to test the efficacy of the boxes.

**Schedule:**
- Scheduling to accommodate intern arrival.

**Goals:**
- Mitigate human-wildlife conflict between property owners and bats.
- Find a practical solution to property and structural damage due to bats.
- Promote cooperation between landowners and management in finding solutions to wildlife problems.

**Project Supervisor:**
Leonie Hofstra
Transfrontier Africa