

EARTHWATCH INSTITUTE FIELD REPORT

Project Title: South African Wildlife

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Position/Affiliations: Regional Ecologist, South Zululand, Ezemvelo KZN Wildlife

Research Site: Hluhluwe iMfolozi Park, Northern KwaZulu-Natal, South Africa

(28°15'S, 32°10'E)

Local Management Status of the Research Site: proclaimed protected area

Scientific names of primary species being studied:

English name	Genus	Species
Buffalo	<i>Syncerus</i>	<i>caffer</i>
Bushbuck	<i>Tragelaphus</i>	<i>scriptus</i>
Bushpig	<i>Potamochoerus</i>	<i>larvatus</i>
Duiker, Blue	<i>Cephalophus</i>	<i>Monticola</i>
Duiker, Grey	<i>Sylvicapra</i>	<i>Grimmia</i>
Duiker, Red	<i>Cephalophus</i>	<i>Natalensis</i>
Elephant	<i>Loxodonta</i>	<i>Africana</i>
Giraffe	<i>Giraffa</i>	<i>camelopardalis</i>
Impala	<i>Aepyceros</i>	<i>Melampus</i>
Zebra	<i>Equus</i>	<i>burchellii</i>
Kudu	<i>Tragelaphus</i>	<i>strepsiceros</i>
Nyala	<i>Tragelaphus</i>	<i>angasii</i>
Reedbuck, Common	<i>Redunca</i>	<i>arundinum</i>
Reedbuck, Mountain	<i>Redunca</i>	<i>fulvorufula</i>
Rhino, Black	<i>Diceros</i>	<i>bicornis</i>
Rhino, White	<i>Ceratotherium</i>	<i>simum</i>
Steenbok	<i>Raphicerus</i>	<i>campestris</i>
Warthog	<i>Phacochoerus</i>	<i>Africanus</i>
Waterbuck	<i>Kobus</i>	<i>ellipsiprymnus</i>
Gnu (Wildebeest)	<i>Connochaetes</i>	<i>taurinus</i>

Key Research Objectives:

- Establish estimates of population size for the 15 largest herbivores in HiP
- Incorporate data collected into an established database to develop a continuous data set
- Assess long term trends in animal populations
- Results from the census directly inform conservation management decision making e.g., number of excess animals available for game auction.

- Auditing conservation management practice through assessing population trends in relation to management actions and intervention.
- Establish baseline dataset that can be utilised for more refined analysis both by EKZNW and visiting researchers in research projects.

Date this report was completed: 9 May 2005

Data Collection and Results

- a) Give a concise account of the data you have collected during the past field season.
- Over a three month period in the winter of 2004, 4 teams collected census data across the park, applying the DISTANCE sampling method using line transects.
 - The total number of sightings was less than in previous years due to the fact that there were fewer volunteers. However, for the most common species the data was sufficient to determine reliable population estimates (see table under results).
 - The data collected is essentially sightings data, collected along 25 transects, for up to 15 species of herbivore in HiP.
 - After the sightings data are calibrated, they are analysed using the DISTANCE program, to determine an estimate of population size for each of the herbivore species.
 - Only those species that had sufficient number of sightings can be analysed in this way.
- b) What progress have you made towards achieving your original objectives?
- For the most common species, all the data have been analysed and incorporated into EKZN Wildlife's official records database, thus providing official estimates for these populations for 2004.
 - The results from the 2004 Game Census were used to assess population performance and make decisions regarding population management in HiP at the official Animal Population Control meeting in November of 2004.
 - We would still like to look more closely at the rarer species, which previously have been slightly neglected in the main analysis, to simply look at long term trends in terms of percentage of sightings and whether these have changed spatially. This is planned for August 2005.
 - The long term records are also being used and analysed in detail in a PhD project, to understand the spatial variation in different species, in relation to rainfall, soils and vegetation structure. This PhD is due for completion in 2007. The information is also made available to other research projects which require baseline information to be incorporated into their research projects in HiP. See results from one study looking at the effect of fire on grazer movements and the consequences for grazing lawns (Archibald and Bond).
- c) Please provide a summary of your results (even if they are preliminary).
- All populations are performing as expected.
 - Management interventions in terms of the number of removals for common species are achieving desired effects in terms of influence on growth rates.

	Total 2004	Prop HGR 2004	Prop IGR 2004	Growth rate 2004
Buffalo	3152	1113	2039	5.70%
Kudu	1239	240	999	2.20%
Nyala	7490	3448	4042	6.70%
Rhino W	1731	562	1169	7.10%
Giraffe	719	335	384	7.20%
Wildebeest	3082	717	2365	3.9
Warthog	3184	742	2442	8.20%
Zebra	3389	846	2543	4.40%
Impala	24471	4354	20117	9%
Waterbuck	707			4.4

Significance/Benefits of Research

a) What is/are the significance/benefits of your research at the following levels?

- local (in the area of the research site)
 - Results have contributed to developing long term records which enable an analysis of long term trends.
 - The results have directly enable decision making on animal population control which influences the entire ecological integrity of the reserve.
 - The census audits population performance of all the species surveyed.
- National
 - Results ensure we are able to manage one of the most important protected areas (Pas) in South Africa responsibly.
 - Results influence and contribute to land use planning and biodiversity conservation plans (C-Plans), by providing up to date assessment reports on the “status of biodiversity”.
 - HiP is the most important donor population for black and white rhino in South Africa and therefore needs to be managed appropriately. The census results provide an indication of how well we are managing the park.
- International
 - The successful conservation efforts in HiP have resulted in saving the white rhino from extinction. Currently management is aiming to achieve the same success for black rhino. This can only be achieved if there is a clear understanding of population dynamics and ecosystem processes. The census provides the baseline data for achieving this understanding.
 - Results from the census work are being incorporated into several MSc and PhD projects that will contribute to our understanding of ecological processes in HiP and African savannas in general.

b) How do your findings contribute to issues of sustainability?

Census results enable us to track population trends and growth rates through time. This provides us with information to identify the number of "excess" animals of common species, or to determine a removal percentage which will not significantly negatively affect the population performance. Where appropriate, the common species are harvested at a sustainable rate either to reduce the growth rate of the species or provide animals for conservation reasons to other areas. The rationale for dampening the growth rate is that it avoids having the population grow too fast. The risk of populations growing too fast (exponentially) is that the populations may crash, given the fact that it is fenced area and there is no opportunity for emigration. The animals are either offered for conservation initiatives in other areas, sold at the annual game auction or, in the case of excess animals, culled and the meat used for research, neighbour sales (sold cheaply to neighbours so that local communities receive some benefit from the park), donated for neighbouring local communities for special functions, etc. "Harvesting" of animal populations for all species is sustainable. It is also important to note that the benefits gained by local communities contribute to the overall sustainability of conservation. The contribution of animals to conservation initiatives, either through donation or via the auction contributes to the sustainability of wildlife and the commercial game industry.

Dissemination of Results

a) Have you provided details of results from your research to or within:

- Scientific papers
 - A report reviewing long term trends is planned for December 2005. It is hoped that this will be published, but at the very least it will be an internal report.
- Management plans and reports (in progress or completed)
 - Yes, report produced by Sue van Rensburg as an internal report for our animal population control meeting held in October 2004, used by the HiP management team to decide on animal population control interventions for the year of 2005.
- Presentations (given or planned)
 - None on the 2004 data specifically.
 - Highlighting the benefits of the partnership with Earthwatch in conducting monitoring programs (elephant impact and the census), as well as the methods used to collect the data, are often presented at information talks held throughout the year to students and interested groups, last year to a field group from the IUCN.
- Popular articles or films (in progress or completed)
 - A Japanese film production company did a documentary of the game industry trade and featured the methodology of the game census in their program.
- Books, chapters, illustrations

Information has been supplied to several researchers who are currently analysing the data in more detail in relation to other factors. Once these projects are complete and the research results published, Earthwatch will be acknowledged in the publications and

these will be forwarded to the Earthwatch offices for publication on the available systems.