

**Effects on birds of different land-uses
in north-eastern Botswana**

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Abstract

A drive into the country will soon confirm the effects of agriculture on the environment. Different agricultural practices such as vast fields of monocultures, forests of exotic timber, and large intensive feed lots of livestock, will be evident. The need to provide food for an increasing population particularly in Africa is the driving force behind the intensification of agriculture. The production of increased food supply is often considered without knowledge of the impacts on the environment.

The North East District of Botswana is a small district compared to other districts of Botswana but unlike these large districts the population density is comparably high with a demand for agricultural space. Botswana is a desert margins area under threat of desertification with many signs of desertification being evident throughout the country. The main agricultural activity in the North East District is livestock farming with horticulture being practiced on the banks of sandy river beds. The district provided an ideal area to compare the impacts of different livestock farming techniques.

Four different approaches of livestock farming were examined with the number of livestock cattle in particular, being a noticeable difference and the grazing intensity of these cattle being another important difference. This study examined the impacts of these different grazing techniques on the environment with a particular reference to birds. Data was collected using a point count system with 28 points evenly spaced in a grid across the different land uses. Each point was subject to a total of six surveys with summer and winter having three surveys each. It was expected that bird numbers and species would be impacted by the grazing intensity while the different feeding and nesting guilds may also respond to grazing intensity. Statistical analysis included geostatistical analysis, uni-variant, multi-variant and non-metric multi-dimensional scaling.

The results show that birds were impacted by grazing intensity with species richness and bird numbers being negatively affected. However, feeding and nesting guilds were impacted differently. Climate change and land degradation are a reality and will impact on avian diversity and sound management practices need to be implemented to protect biodiversity in marginal areas.

Key words: *impacts, environment, land use, grazing, birds, feeding guilds, nesting guilds*

Abbreviations

ANOVA:	Analysis of variance
CLM:	Communal Land Management
GPS:	Global Positioning System
ILM:	Intensive Land Management
MLM:	Moderate Land Management
NMS:	Non-Metric Multi-dimensional Scaling
OIV:	Observed Indicator Value
RLM:	Riparian Land Management
SD:	Standard Deviation
UNCCD:	United Nations Convention to Combat Desertification
UNEP:	United Nations Environment Program
UNDP:	United Nations Development Program
UNICEF:	United Nations Children's Fund