

Impact of Land Resettlement on Wild Animals in Whalley Range and Lone Kop Farms of Mashonaland West Province of Zimbabwe

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Abstract:

This study aimed to determine the impact of resettlement on wild animals in Whalley Range and Lone Kop farms in Zimbabwe. The research was conducted from February 2005 to July 2005. The main objective was to determine if there is a significant relationship between resettlement and wild animals. Four transects each 4km long, were used to determine wild animals habitat change. Two wild animal species namely *Patamochoerus porcus* (wild pigs) and *Phacochoerus Aethiopicus* (warthogs) were selected because they can cause serious crop damages in a short period of time and can easily adapt if their habitats are under threats. Where warthog holes, wild pig breeding areas, shallow excavations and/or wallowing areas were found, the following variables were measured to characterise the nature of the habitat. Questionnaire and key informant interviews were also conducted to gather supplementary data. A total of 167 structured questionnaires (72 in Whalley Range and 65 in Lone Kop) were administered. The questionnaires solicited for, among other things, information on wild animal presence and absence and major causes of wild animal disappearance on both farms. The study found out that wild animal presence in the area has changed following resettlement. Many animals are no longer present on the farms (e.g. *Phacochoerus Aethiopicus*-warthog and *Equus burchelli*-zebra) while others are still present although in low numbers (e.g. *Patamochoerus porcus*-Wildpigs, and *Papio ursinus*-baboons) than was the case before people were resettled. The main cause wild animal loss is the introduction of agriculture after resettlement. In order to ensure that the remaining wild animals do not disappear, the study recommends that a wildlife zone where the remaining animals would be kept should be established on Whalley Range.

Introduction

Land in Zimbabwe is viewed as the only resource that can help in uplifting the people's standards of living (Ministry of land, agriculture and rural settlement, 2001). Therefore the government of Zimbabwe started the resettlement programme soon after independence. The aim of the programme was to reduce pressure in communal areas that were overpopulated and to try and balance the mis-match between land

planning and the agro ecological regions in Zimbabwe. By the late 1990's the land reform was done at a slow pace due to constitutional laws that only permitted a willing buyer willing seller concept. The government then amended the constitution and started the fast track land resettlement (Ministry of land, agriculture and rural settlement, 2001). A lot of land including large-scale farms owned by white farmers, conservancies and new areas were taken by the government and given to black people to start farming. The impacts of resettlement on wild animals still remain unknown. However Kwashirai (2003) and Msipa (2003), using the methods of interviews, observations and media reports managed to research on the impacts of land resettlement in Zimbabwe. Their results show that the land resettlement has come with a price to the natural environment. The main environmental problems caused by land resettlement include massive deforestation, woodland degradation, resource use conflicts, wildlife poaching, wildlife loss, squatter settlements, communal communities encroachment on protected areas for grazing and fuel wood collection. There is widespread hunting of wild animals in most of these areas. There is also loss of habitat for most wild animals as trees and breeding areas are lost when farmers prepare their plots.

The increased loss of habitat will result in a lot of wild animals being lost. Some of the wild animals that will be affected by habitat loss include the warthogs, impala, wild pigs, wildebeests and the elands. The warthog prefer moist habitats with plentiful vegetation and tend to avoid drier, open areas. Apart from that it enjoys wallowing in water like the wild pigs. On the other hand the wild pig prefers dense thickets during the day and feeds at night (Cumming, 1975). Both the warthogs and the wild pigs are mostly found in the savanna regions. However, due to widespread land clearance for agricultural purposes their habitats are being lost.

According to Kirby (2003) wild animals usually suffer whenever human beings are introduced in areas where the wild animals live. At most the wild animals are forced to leave to other areas since they fail to co-exist with human beings. Although the Government of Zimbabwe introduced the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) programme to help in the co-existence of people and wild animals, it is unfortunate that during the land reform the CAMPFIRE programme was not considered in some areas where wild animals already existed.

According to IUCN (2003) a habitat is a place where a plant or an animal naturally lives. This habitat loss is the main cause of species loss in less developed countries. The main causes of habitat loss include urbanisation, deforestation and agriculture. The clearing of land for agricultural purpose has caused a lot of habitat loss in the tropical forests. As the world populations continue to expand the pressure for land for agriculture and development in particular will increase and this results in habitat loss.

Objectives

The general objective is to determine the impact of land resettlement on wild animals in Whalley Range and Lone Kop.

Specific objectives

The specific objectives of the study are to:

- Assess wildlife animal change due to resettlement.
- Identify and assess warthogs and wild pigs habitat in the two farms.
- Recommend policies and planning measures that may help in the management of wildlife animals.

Hypotheses

One hypothesis was formulated to guide the study.

- There is a significant relationship between resettlement and wild animal change.

Study area

Location of the study area

Two adjacent farms namely Whalley Range and Lone Kop ranch has been selected for the study (Figure 1). The two farms are located in Kadoma's Rural District. The two farms have a total area of approximately 10 000 hectares (ha). Whalley Range, which is the approximately 5600 ha in size is bigger than Lone Kop that has an estimated area of 4400ha. Prior to land resettlement the two farms were game areas where many wild animals such as zebras, impalas, wild pigs, elands, wildebeests and warthogs were kept.

The two farms experienced both land resettlement. Whalley Range was acquired in 1996 under the previous resettlement programme (Phase I) while Lone Kop ranch was acquired in 2002 under the fast track land resettlement (Phase II).

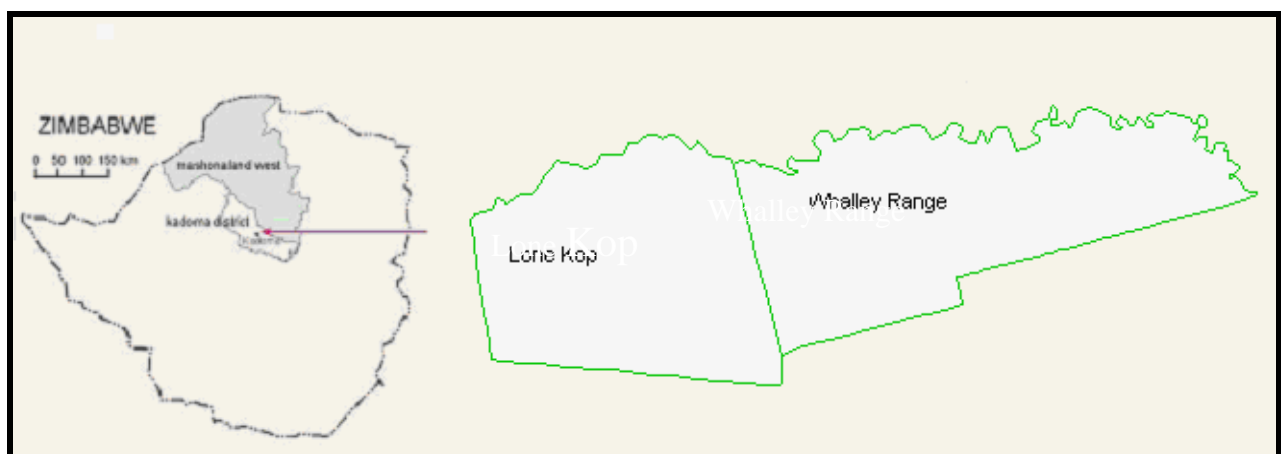


Figure 1: Location of the study area

Whalley Range was divided into 104 self-contained plots ranging in size from 50-70 hectares. In these plots an individual household was given a plot to manage, under this arrangement there is no provision for communal grazing area since the grazing area is within the plots. However there are two villages in Whalley Range with each village having 6ha of land. In contrast, people were resettled in Lone Kop ranch using the A1 villagised model in which each household was allocated an average of 6 ha arable land. About 29 ha of land were left for grazing, which is communally owned.

People were resettled in Lone Kop ranch using a Quota system. About 80% of the land in Lone Kop ranch was given to the Rural District Council (RDC) to allocate people residing in congested communal areas. Some 15% was given to the war veterans as a way of showing gratitude for their contribution to the liberation of this country while the remaining 5% were given to the ex-detainees and members of the uniformed forces.

Demographic characteristics of the study area

Records kept by Agriculture Research and extension services (AREX) show that a total of 151 families were resettled in Whalley Range and 124 families were resettled in Lone Kop. Whalley Range has 104 plots and 2 villages and Lone Kop has 5 villages. Village 1 in Whalley Range consist of ex-farm workers who used to work at Whalley Range while village 2 consists of families that where resettled from Porter Farm in Harare in 1992. Both farms have an average household size of 5 persons. People who were resettled in these farms came from different parts of the country although most of them came from nearby City of Kadoma.

Physical characteristics of the study area

The area under investigation was predominately a woodland area before resettlement with very few areas of bare/fallow area that used to be area of agriculture. The dominant tree species in the area include Mopani (*Colophospermum mopane*), Mususu (*Terminalia sericea*), Munhondo (*Julbernardia Globiflora*). The area has a dense network of streams that flow to the main rivers of Muzvezve and Mombe rivers. So it is an area that is in-between two river networks.

The two farms in agro-ecological region III and the central ecoregion of Zimbabwe. The altitude of the area ranges from 900-1,500m with a mean annual rainfall range of 700-1,000mm and a mean annual temperature range of 17,5-20 degrees Celsius (Chenje, Sola and Paleczny, 1998).

Methods

Determining wild animal change on the farms

The study area used to be a game reserve sustaining numerous wild animals such as the zebras, warthogs, elands, baboons and wild pigs before resettlement. The research therefore choose two wild animals only and focused on the Warthogs (*Phacochoerus aethiopicus*) and the Wild pigs

(*Patamochoerus porcus*). The two wild animals were selected for two main reasons. Firstly, they can cause serious crop damages in a short period of time (Kenmuir and Williams, 1975). Secondly they can adapt to new survival strategies if their habitats area under threats.

The warthog (*P. aethiopicus*) is a medium sized animal that feeds on grass and roots. One main characteristic of the animal is that it uses holes as part of its habitat. According to Cumming (1975) and Kenmuir and Williams (1975) the animals use holes of antibears and other wild animals for refuge from other predators. In most cases the warthogs feed during the day and take refuge in the evening.

On the other hand the wild pig (*P. porcus*) is a pig like animal that likes dense thickets as part of its habitat. They feed on grass and roots like warthogs but Wines (2003) added that they enjoy wallowing in water. Wild pigs always leave shallow rounded excavations in areas they breed. These rounded excavations form part of their breeding areas.

In this study wild animal change was assessed indirectly through analysis of habitat change. Habitat change was used as a measure of wild animal change because available literature (e.g. Tivy, 1990) shows that any change in habitat has direct impacts on animal loss.

Determining warthog habitat

According to Cumming (1975) warthog habitats can be identified by observing holes/burrows of antibears and other wild animals that they use for refuge when attacked by predators and preventing from bad weather. Research has also shown that warthogs take to their holes in the evening and emerge in the morning (Cumming, 1975). In this study holes were used to characterise warthog habitats. To verify the usefulness of the holes the study relied on footprints as a measure on usefulness of the holes.

Determining wildpig habitat

Past studies have demonstrated that wild pigs prefer dense thickets and wallowing in water. According to Williams and Kenmuir (1975) wild pigs leave visible marks whenever breeding because they dig and turn over litter. They also leave shallow rounded excavations, which are easy to identify. The research used these marks to characterise their habitats.

Direct observation and GPS measurements

The Ground Positioning System (GPS) was used to map both warthog and Wildpigs habitats. In both areas points where therefore taken were any of the habitat was identified. Each habitat for example warthog holes was investigated for evidence of use and presence of animals through field survey. For the warthog's holes identified in the field, observations were done in the morning (between 6am and 8am) and in the evening (between 5pm and 7pm). The number of warthogs that left and entered the holes was

recorded. For wild pigs the habitats were verified by looking for the presence of footprints/tracks in the breeding zones.

Sampling the wild animals

To prevent randomly walking in the area the research used transects as a standard way of identifying habitats. The method used for developing transects was that of stratified random sampling. Firstly an image of 2002 was classified into the following vegetation classes grassland, woodland, water and cropland using the supervised classification method. The classified image was used as the sampling frame, and vegetation classes as strata's.

Grids of 500m² were then overlaid on the classified image. The selection of this size was based on the fact that a distance of 500m was workable by the researcher and that both warthog holes and Wildpigs breeding zones tend to be far apart. Each grid was assigned a unique number. These numbers were then used to determine grids from which sampling points were randomly selected. Two points was randomly selected from each land cover type.

Two points, which were near to each other, were joined to form a 4km long transect. It is along these transects that all habitat observations were made. The resultant transect map is shown on Figure 2.

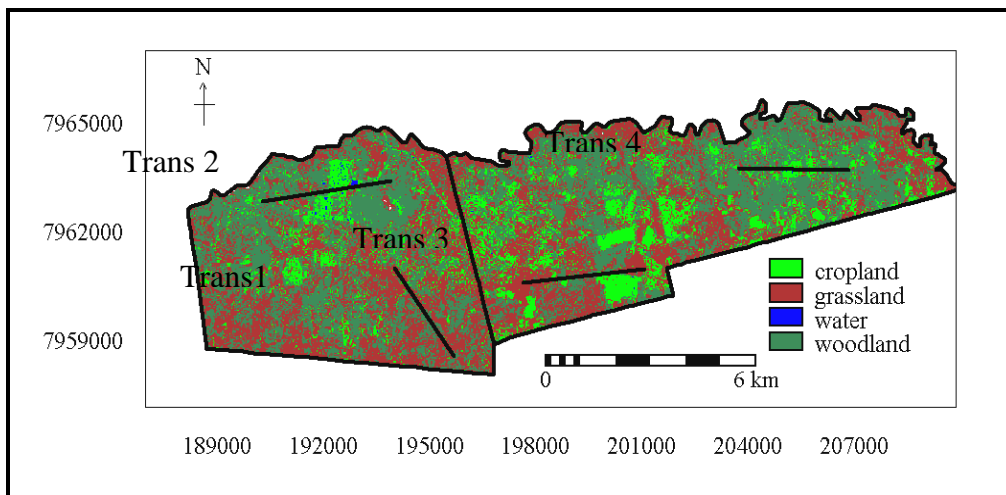


Figure 2: Transects used

Whenever a visible mark associated with each of the two animals was observed along the transects the following variables were measured, tree height, tree diameter at breast height, tree names (species) were recorded, the number of holes present, number of shallow holes present and location of sampling points.

The questionnaire survey

In order to qualify the data for Remote Sensing and interpret any observed changes in both vegetation and wild animals, a questionnaire was administered to key informants in order to gather relevant additional information. A questionnaire was administered to local people living in the area. This Questionnaire gathered information on the socio-economic profile of the farmer, animal loss, habitat loss, methods used to hunt animals and conservation measures being implemented by new farmers.

The sampling size was determined using the following formula proposed by, Shaw and Wheeler (1985). Using this method, 72 questionnaires were administered in Whalley Range and 65 in Lone Kop ranch. The selected populations to be interviewed were then distributed proportionally within the farms. Using percentages the study was able to distribute the number of questionnaires according to villages.

The selection of the respondents was done after a closer look at the characteristics of the area. In Lone Kop and the two villages in Whalley Range, the respondents were selected using a systematic sampling method where respondents were selected by systematically skipping one household before interviewing the next. This was done so as to have a fair distribution of the people interviewed.

As for Whalley Range the method used was that of taking plot numbers. Plots were randomly selected by picking a number and those households selected were interviewed. Field observations were also done on the area to compensate the uncertainty from satellite images. Photos as proof on deforestation were taken. Other materials like books, newspapers, bulletins, and Internet was used as secondary data.

Results

Results show that there has been a decrease in the number of wild animals that are now present in Whalley Range. As shown by figure 3 it is clear that there has been a decline in the numbers of wild animals observed when respondents settled on the farm. The worst affected wild animal species affected by habitat change due to expansion of agriculture following resettlement in Whalley Range include Buffalo, warthogs and sables.

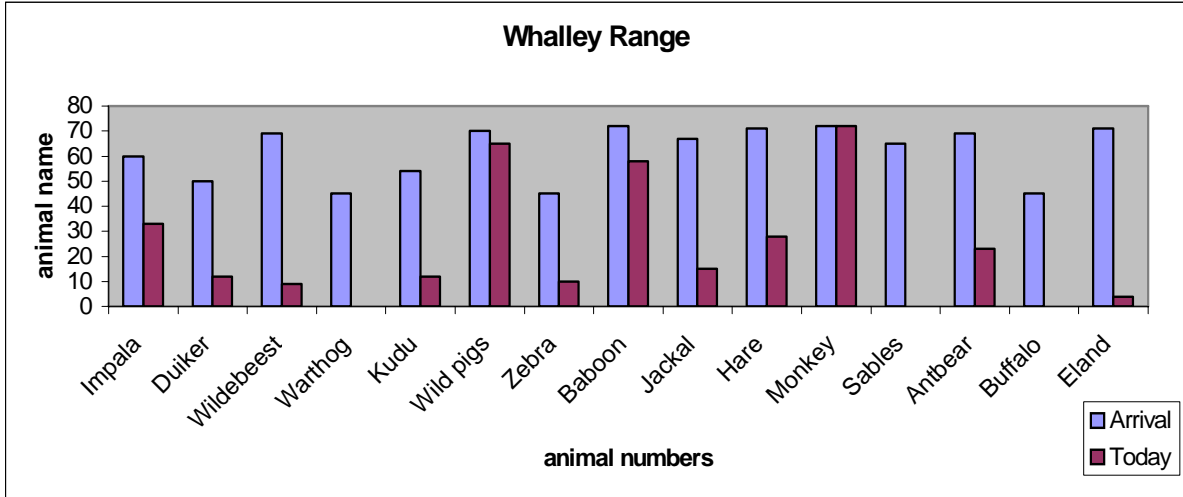


Figure 3: Presence and absence of wild animals in Whalley Range

However, some wild animals like monkeys and Wildpigs have remained in the area suggesting that resettlement has not had a significant negative impact on these wild animals.

In Lone kop results show that wild animals like wildpigs, monkeys and jackals area still present in the area and most respondents (90%) indicate that they still see them in significant numbers. However some wild animals like wildebeests and warthogs are present but with low numbers, because they are being seen less frequently than what was the case when farmers were resettled in the two farms. On the other hand some wild animals like sables and buffalo's are no longer present in the area. Their absence could be attributed to the fact that they have migrated to nearby protected parks while others like sables were taken by the former commercial farmer upon acquisition of his farm.

In general wild animal presence has declined since the arrival of the farmers in the area. Most low numbers from respondents are in Whalley Range than in Lone Kop, this could be as a result that, in 1996 prior to resettlement in Whalley Range all the wild animals where transferred to Lone Kop but during the resettlement of Lone Kop nothing was done.

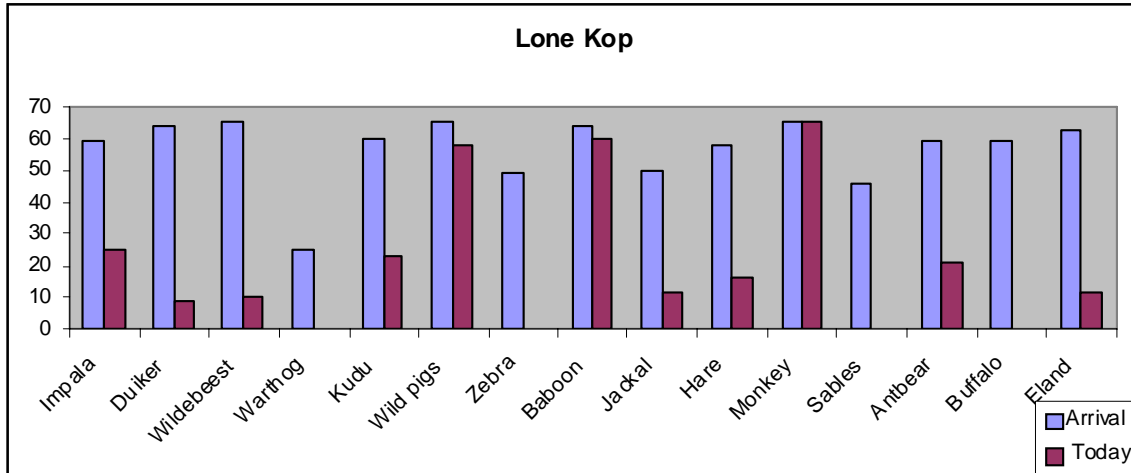


Figure 4: Presence and absence of wild animals in Lone Kop

Using this information an exploratory data analysis was first done to test if data are normally distributed or not. The results show that data are normally distributed for both Whalley Range and lone Kop.

The data were also tested for normality using the Kolmogorov-Smirnov test and found to be normally distributed ($p > 0.05$). The results of a paired T-test show that for all the 15 wild animal species assessed, their populations at arrival were significantly ($p > 0.05$) higher than at present when farmers arrived on the farms. This clearly demonstrates that resettlement has impacted negatively on wild life abundance on the farms.

Possible reasons for wild animal loss

Respondents were asked to identify major reasons accounting for loss of wild animals. Most respondents in Whalley Range and lone Kop stated that most wild animals are scared of humans hence they cannot co-exist with them. The overwhelming majority of respondents in Whalley Range believe that the major factor accounting for wild animal loss was the deliberate transfer to Lone Kop upon their arrival.

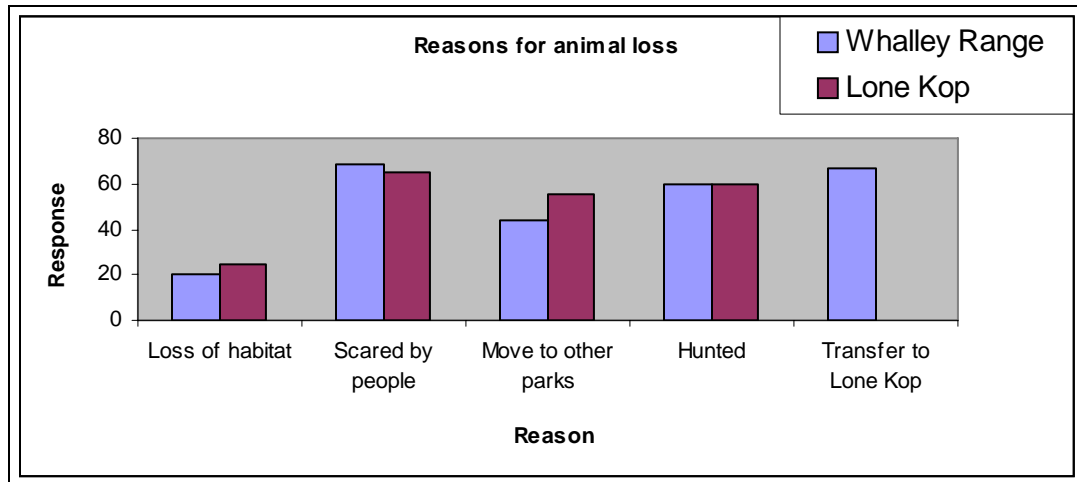


Figure 5: Reasons for wild animal loss on both farms

Another important reason for the loss of wild animals cited in both farms is hunting. Those who cited hunting as a major cause believe that most of the wild animals were hunted during the fast track land resettlement. They further blame many outsiders who were not allocated pieces of land on both farms who took advantage of the fast track programme and greedily hunted wild animals illegally for commercial reasons. The most cited reasons for hunting wild animals and these include household consumption, selling and protecting crops.

Available literature e.g. Kwashirai (2003) show that the introduction of human beings on game reserves results in stiff competition for both space and food between the wild animals and the humans and the livestock they keep. Additionally, the noise caused by people as well as cattle bells tend to irritate some wild animals thereby causing them to migrate to quieter habitats.

Contrary to the funding obtained through GIS and RS few respondents were of the opinion that habitat modification fragmentation and loss due to agricultural expansion cause wild animal loss. This seem to indicate that most respondents do not have adequate knowledge on how their activities impact on wild animals hence there is need for awareness campaigns. However all those who admitted hunting have given the reason of doing so in order to protect their crops. A lot of people kill the wild animals so as to protect their crops in the field.

Detecting animal loss using habitat as a measure

Using habitat as a measure of wild animal abundance (presence) only two warthog holes were identified along transect one and two (see Figure 6). These hole where verified for both use of holes (using footprints) and presence of animals (using morning times and evening times) using the methods outlined in the methodology. Of all the two warthog holes identified none of the holes were in use. This suggests

that the warthogs might have left the area and most of the holes are old and no signs of animals habitating in them were found.

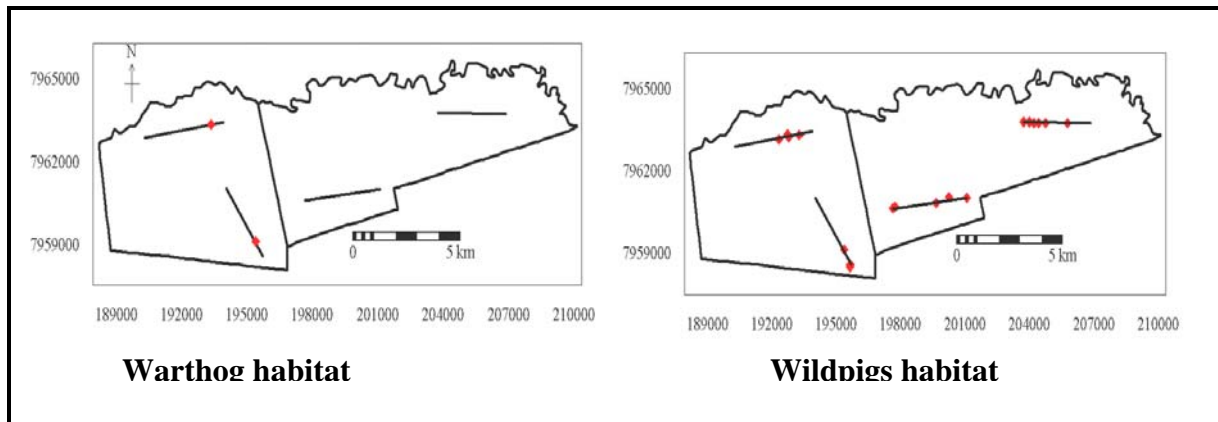


Figure 6: Warthog holes and Wildpigs habitat identified during transect surveys

For the holes found in transect one, the holes were located near the old dam where the area is surrounded by grassland. However the holes themselves were around an anthill where vegetation was dense. The other holes were located in transect two. This area is located near one of the small Kopje in the area. The kopje is within the area that has been allocated for grazing.

It is important to note that all the holes were found in Lone Kop. This could be as a result of time for resettlement, which contributed to vegetation cover loss due to agriculture, as a result warthog habitat holes were likely to be lost in Whalley Range than in Lone Kop. Apart from that agricultural activities might have destroyed the existing holes in Whalley Range since the practice started earlier than in Lone Kop. Transfer of animals before 1996 could have caused the increase of holes in Lone Kop.

As for wild pigs a lot of excavation marks and wallowing areas were found in both Lone Kop and Whalley Range. Most points were found on areas that have short trees with a diameter of about 15cm to around 35cm, and height of about 2 to 3 meters. However a few tracks were found in areas that have thick vegetation.

Some of the excavation marks were identified on crop fields, thereby validating concerns raised by respondents that wildpigs cause considerable crop damage. However it is important to note that the fields had crops like maize and cotton. For those wallowing grounds identified, most of them were located around grassland areas that are wet.

The results of transects clearly show that Warthogs are no longer present as seen by the non-use of the habitat holes that were identified. As for the Wild pigs it is clear that some of them still exist. Since some points were found in the fields this means that the future of the wild pigs is at risk as the farmers hunt

them for reasons of field protection. The responses from questionnaire show that all the people in all the farms have admitted that they will kill the wildpigs if they find them in their fields. So the remaining wild pigs are still under threat.

All the institutions like DNR, FC, AREX and RDC have accepted that wild animals have decreased in the two farms. The Department of Parks and Wildlife management has done nothing to the wild animals that were there during the fast track land resettlement. The only thing that came up was the idea of CAMPFIRE in the area, which came up in 2003, but nothing has happened so far (Natural Resources Bulletin volume 16, 2004). In Whalley Range meeting were held and committees formed for the CAMPFIRE programme but results from both the people and institutions indicate that nothing was done as from that time.

However most plans for AREX, DNR, FC and RDC are being hampered by lack of money and transport to visit these areas frequently. In most cases transport to visit these farms is not available and when available it is fuel that is the problem and at the end no visits to these farms are being made. At the present moment the RDC and DNR are working on by-laws that will be used to conserve resources in all the rural areas around Kadoma with resettled areas included. These by-laws have been forwarded to the relevant authorities to be passed.

Conclusions

The study has shown that due to habitat modification and fragmentation that has accompanied resettlement, the population of most wild animals has drastically dropped with some wild animals such as warthogs and sables having completely disappeared on the two farms. However, other wild animals like elands and wild pigs are still present albeit in much smaller numbers than was the case before resettlement took places.

Apart from loss of habitat through agricultural expansion, other causes of wild animal loss on both Whalley Range and Lone Kop farms include widespread hunting. However these wild animals that are still present are under threats, as humans consider them a menace and are prepared to hunt them in order to minimise the crop damage they cause.

Recommendations

In order to tackle the above negative impacts, the study recommends the following plans and policy intervention measures:

- Firstly a wildlife zone or a wildlife corridor must be implemented in Whalley Range were the remaining wild animals should be kept. For the wildlife zone to be established, surrounding farmers should

donate a part of their plot, which they are under utilising so that a contiguous wildlife zone will be formed as shown in figure 5.

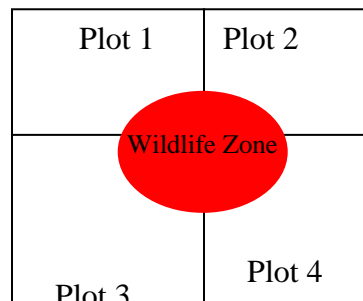


Figure 7: Illustration of a wildlife zone

The wildlife zone is not a CAMPFIRE zone since the farm (Whalley Range) does not meet the requirements of CAMPFIRE. The study recommends that the management of the wildlife zone be given to farmers who would have surrendered part of their fields with the one surrendering more getting more benefits. The ownership of the wildlife zone should be given to the farmers. The study also recommends that farmers should develop the zones by establishing safari areas and generating income through game hunting.

- Secondly the study recommends the establishment of a CAMPFIRE area in Lone Kop. This is so because Lone Kop meets all the requirements of CAMPFIRE in that it is communally owner. The study recommends that all the conditions under the current CAMPFIRE Programmes be applied to this farm;

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