Journal of Tourism Quarterly Research Article
ISSN 2689-2294 (Online) 2025, 7(3-4), 61-77

Human-Wildlife Conflict in Chiredzi Gonarezhou National Park: Overview – Conflict to Coexistence

Vitalis Basera[1], Makandwa Godfrey[1]

[1]Department of Tourism, Hospitality and Leisure Sciences, Manicaland State University of Applied Sciences, Mutare, Zimbabwe

E-mail: vitalisbasera@yahoo.com

Abstract

The successful conservation of wildlife and the well-being of communities living adjacent to protected areas largely depends on the extent to which the communities and wildlife themselves can coexist. Where coexistence fails, human-wildlife conflicts (HWC) arise. Almost every country in the world faces some form of HWC, and highly biodiversity, developing countries like Zimbabwe particularly struggle with this issue. HWC is one of the major challenges experienced by communities living adjacent to wildlife areas across the country. HWC often severely impacts the livelihoods, security and wellbeing of the people who live alongside wildlife and whom we ask for support for wider conservation goals. The purpose of this study was to provide the detailed information on the status, nature and dynamics of HWC, how it is experienced and how communities living in and adjacent to HWC hotspots around Gonarezhou are affected. Knowledge gained from this study will inform the design and implementation of a suite of strategies and interventions in HWC mitigation. After appreciating the status of HWC the goal will be to increase the capacity of these local communities to coexist and sustainably protect and manage wildlife and other natural resources. This study was conducted in eight wards with HWC hotspots around Gonarezhou in Zimbabwe Zimbabwe in particular Chitsa, Chibwedziva, Twanani, Batanai, Chichingwe, Xibhavahlengwe, Sengwe and Xini. The local communities in these study sites live alongside and share their space with wildlife. A mixed methods approach was used to conduct this study, which involved the use of quantitative and qualitative data collection techniques. The data was collected in September to October 2024. The quantitative data collection involved the use of structured household questionnaires, and a total of 560 households were interviewed across the study sites. The qualitative data collection techniques involved discussions with 28 focus groups and 12 interviews with key informants across the eight study sites. Results from household surveys showed that attitudes towards wildlife protection are generally positive. The incidences of HWC varied across the study sites with some sites such as Sengwe and Xibhavahlengwe experiencing higher levels of conflict. The study recommend for a holistic solution which addresses both HWC and poverty is critical in protecting biodiversity and improving livelihoods in communities around Gonarezhou National Park.
Keywords: Conflict, Human Wildlife Conflict, Problem Animals, Community, Stakeholders

1. Introduction

Wildlife is one of Zimbabwe's most valuable natural resources. The country has a very high level of biodiversity and the wild mammal fauna of the country includes all the "Big Five" – African elephant, white and black rhinos, lion, buffalo and leopard – but also many species of antelopes, zebras and giraffes (ZimParks, 2023). In

Zimbabwe, wildlife produces important economic activity through consumptive use and non-consumptive use. However, despite the high level of biodiversity and its economic significance, Zimbabwe faces multiple sustained wildlife management challenges. These include Human Wildlife Conflict (HWC) which refers to struggles that arise when the presence or behavior of wildlife poses actual or perceived direct, recurring threats to human interest or needs often leading to disagreements between groups of people and negative impacts on people and/or wildlife (IUCN, 2020). HWC results from a variety of ecological and anthropogenic drivers that exert pressures on landscapes where humans and wildlife share space. Some of the ecological drivers of HWC include seasonal changes, natural calamities, and animals' life cycles, as well as the movement patterns of animals. Habitat loss, changes in land use, livestock management, expansion of agricultural practices, climate change, resource extraction, infrastructure development, and urbanisation are some of the anthropogenic drivers of HWC (FAO, 2024).

Human population growth and increased demand for agricultural land especially in developing countries is having a significant impact on traditional wildlife habitat and ranges. The increased interactions between humans and wildlife is leading to wildlife attacks on humans, livestock predation and crop raiding and this is a cause of much conflict between farmers and wildlife throughout the world (Adams, 2004). The most common HWC incidents undermine human welfare, health and safety. HWC also results in human-induced wildlife mortality when communities undertake retaliatory killing or poisoning of livestock carcasses subsequent to carnivore attacks. According to a presentation by the Zimbabwe Parks and Wildlife Management Authority (ZimParks), there has been a substantial increase in HWC reports received over the past few years, with problem animal reports increasing by 293% over a 5-year period from 2016 (ZimParks, 2023). To put the impact of HWC into perspective, during the period January to March 2021, 22 people, 167 cattle and 79 goats were killed, while 26 people were injured. These statistics exclude the crop damage and other infrastructural damage which ZimParks has not been quantifying.

It is therefore important for the authorities and stakeholders to understand the status, nature, and dynamics of HWC, how it is experienced and how it affects communities in HWC hotspots around the communities bordering Gonarezhou National Park to inform wildlife conservation initiatives and the design and implementation of effective interventions. These communities facing HWC need to increase their capacity to sustainably manage and protect community-based natural resources, which include wildlife, in anticipation of future shocks and stresses (Gandiwa, Gandiwa, & Muboko, Living with Wildlife and Associated Conflicts in A Contested Area Within the Northern Gonarezhou National Park, Zimbabwe, 2012). Additionally, this study can aid on policy and legal frameworks which impact community based natural resource management. Currently the Zimbabwe Wildlife Policy of 1992 and the Parks and Wildlife Act (Chapter 20:14) are being reviewed, and a HWC Policy is being developed. The expectation is that this study will feed into these policy and legal reform processes.

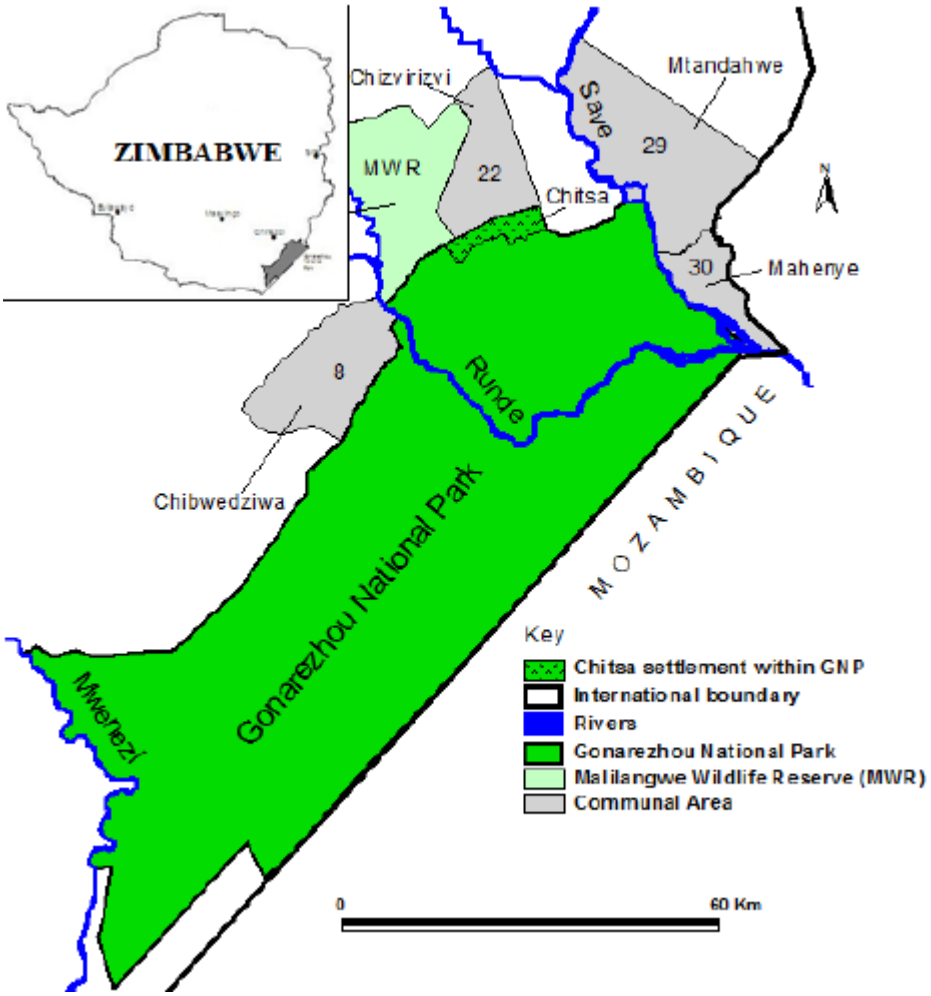
Resolving HWC is central to successful sustainable development and this requires the harmonisation of both environmental and human development goals. The conservation of wildlife and the well-being of communities living alongside protected areas and wildlife habitats is largely dependent on the coexistence between these communities and wildlife (Gandiwa, Heitkönig, Lokhorst, Prins, & Leeuwis, 2018). Coexistence is a dynamic state in which the interests and needs of both humans and wildlife are generally met, though this coexistence may still contain some level of impact to both and is characterised by a level of tolerance on the human side (FAO, 2024; IUCN, 2020). Developing solutions for HWC has therefore become an urgent conservation priority in human dominated wildlife landscapes. However, the complexity of HWC would warrant a coordinated suite of responses and effective management of HWC would require applying a variety of approaches in parallel to achieve the desired impact (Barlow, Greenwood, Ahmad, & Smith, 2010).

HWC is one of the major shocks or challenges experienced by communities living adjacent to wildlife areas across the country (Durant, et al., 2022). The purpose of this study is to provide with detailed information on the status, nature and dynamics of HWC and how it affects and is experienced by particularly communities living around Gonarezhou HWC hotspots across Chiredzi District. This is the first step in providing an opportunity for these vulnerable communities to cope with and mitigate the effects of HWC while conserving the natural resource base for sustainable livelihoods. Knowledge gained from this study will inform the design and implementation of a suite of strategies and interventions, including HWC mitigation to be implemented by authorities and other stakeholders. The goal will be to increase the capacity of these local communities to coexist and sustainably protect and manage wildlife and other natural resources (Gross, et al., 2021). The study will also guide HWC management in the HWC hotspots through the provision of primary evidence and also feed into ongoing national legal and policy reforms that include review of the Parks and Wildlife Act and the review and possible drafting of a new Wildlife Policy for Zimbabwe.

2. Methodology

This study was conducted in eight wards with HWC hotspots around Gonarezhou in Chiredzi Zimbabwe in particular wards of Chitsa, Chibwedziva, Twanani, Batanai, Chichingwe, Xibhavahlengwe, Sengwe and Xini (Fig 1). Chiredzi district is in south-east Zimbabwe in Masvingo Province. A large part of the district is found in natural region V, although there are some parts that lie in natural region IV. Areas in natural region V are characterised by aridity and uncertain rainfall patterns. Chiredzi is one of the largest districts in the country with over 95% of its area taken up by Gonarezhou National Park (GNP) and other protected areas like Malilangwe Nature Reserve and Save Valley Conservancy. There are 32 wards with a population of 275759 people in Chiredzi (ZIMSTAT, 2024) and 9 wards with CAMPFIRE projects.

Fig 1: Map of Gonarezhou in Chiredzi, Zimbabwe



The study selected eight wards and twenty eight villages sampled in this study were purposely selected based on the HWC prevalence map (Fig 1) to gather data on local peoples' experiences with HWC, perceived trends in HWC and attitudes towards problematic wild animals.

Table 1. The case study area on human-wildlife conflict and the wildlife areas bordering these communities.

Communal land	**Ward**	**Villages**
Sangwe	Chitsa	Chitsaneni, Gudo, Sibizapasi, Tinhongeni, Machinzu, Chitete
Matibi II	Chibwedziva	Chipachini, Dopi, Chehondo, Chihosi, Muchingwizi
	Twanani	Chingele, Machindu
	Batanai	Gondweni, Zamani
	Chichingwe	Chichingwe
	Xibhavahlengwe	Malifumuni, Chamabvuwana, Pahlela
Sengwe	Sengwe	Kosvi, Mpandle, Sengwe

	Xini	Malipati, Hlarweni, Mugivisa, Samu, Chilothela, Dumisa

In some instances where the wards were smaller, then less villages were selected and in big wards more villages were selected. Random sampling was used to select the villages from the purposely selected wards. The villages were then selected from a list of all the villages in the wards. The study team then used a systematic sampling approach to select households for interviewing from the village lists. This approach was used by Makumbe, Mapurazi, Jaravani and Matsilele (2022) in the study of HWC in Save Valley Conservancy in determining residents' attitude toward wildlife conservation and produced convincing results. This study was conducted in these selected wards to gather data on local peoples' experiences with HWC, perceived trends in HWC, and attitudes towards problematic wild animals.

A mixed methods approach was used to conduct this study. The quantitative data collection involved the use of a structured household questionnaire. The qualitative data collection techniques involved focus group discussions with villagers and key informant interviews with ZimParks, Chiefs, Village Heads, Councillors, Researchers and Chiredzi Rural District Council official. The use of these methods allowed complementarity of methods and data triangulation (Braun & Clarke, 2006). Enumerator training for the household surveys was done before data collection and the enumerators were trained on survey techniques, sampling protocols and interviewing techniques. All the data in this study was collected in September 2024 for four wards study site and in October 2024 for the other four wards study sites.

Quantitative data was electronically captured from the selected respondents using Tablets with the Open Data Kit (ODK). The use of the ODK application minimised data entry errors, quickened data entry, cleaning and validation while in the field. The surveys were set up using XLS Form and Open Data Kit Collect which are both open-source tools for online and offline data collection. The XLS Form is the standard language used in developing ODK based surveys and allows the user to specify the questions, responses and the validation rules that are enforced when collecting data. Once the forms were completed, they were loaded onto an android based app to collect the data. To cater for network challenges, the survey used a combination of online - offline tools. After data collection, the household interviews data was downloaded from the Kobo Collect server in XLS format.

Household interviews were conducted totaling to 560 in twenty eight villages of the eight wards. A systematic random sampling approach was used to select households for administering the questionnaires. A village register obtained from the village head in each of the selected villages was used as a sampling pool. A household was taken as the unit of analysis because it is where all decisions are primarily taken. The household heads were targeted as the respondents. In case of their absence, their spouse or another permanent resident adult in the household took part in the interview. The interviews were done by a team of trained enumerators who had been involved in household interviews for the baseline survey in the study communities. Interview dates were communicated to each selected household one or two days in advance by a local guide hired in each ward. Before conducting the interviews, the general purpose of the study was explained to each interviewee and permission to conduct the interview was sought. Interviews took approximately 20 -30 minutes to complete. Interviews were conducted upon the condition that the individuals were willing to participate fully. Villagers not involved in interviews were selected for focus group discussions in groups of between 5 to 8 villagers.

Descriptive analysis was used to analyse the data based on the research questions. The findings were interpreted in light of existing research on HWC and the objectives of the study. The results were presented as percentages. Qualitative data obtained from FGDs and KIIs was analysed through Thematic Content Analysis approach

(Hennink, Hutter, & Bailey, 2020). Findings from qualitative analyses were integrated with quantitative findings to provide a more comprehensive and context-specific picture as well as triangulating the findings.

This study involved soliciting sensitive information from target communities and key informants, therefore some of the ethical considerations that were adhered to during and after the study included: Free, Prior and Informed Consent (FPIC), doing no harm and confidentiality. The permission to carry out the study was sought from the relevant authorities including the Manicaland State University of Applied Sciences (MSUAS) Research Board, District Development Coordinator, Chiredzi Rural District Council, ZimParks, the local Councilors, Chiefs and village heads. Free, Prior and Informed Consent was sought from all study participants; participants of household interviews, focus group discussions, key informant interviews and HWC victims. The study ensured the confidentiality of personal level data by not sharing personal data of study participants with anyone outside of the study team. The data obtained was securely handled at all stages of the study.

3. Results

3.1 HWC trends and current status in HWC hotspot communities around Gonarezhou National Parks.

3.1.1 Wildlife species in communities

The study found that the species mostly encountered by the respondents across the study sites were elephants (more than 88% of the respondents), hyenas (more than 52%) and lions (more than 48%). Some of the respondents especially in Chibwedziva and Sengwe mentioned that they also encountered baboons, buffalos and bushpig. The household survey results are consistent with data obtained through FGDs and key informant interviews which established that elephants, lions, baboons and hyenas are the wildlife species most encountered in these communities. FGD participants in Chibwedziva and Chitsa bemoaned the increase in the population of elephants within their communities and called for the responsible authorities to find solutions as elephants were endangering people's lives. Furthermore, people in these HWC hotspots are now getting indoors by 6pm to avoid encounters with these dangerous wildlife species.

In some of the study sites, it was established that the mobility and presence of elephants in the communities is seasonal and they are most frequently seen in the communities during the rainy season. FGD participants in Chitsa highlighted that when the water level in the Save River is low, wildlife crosses the river from Gonarezhou National Park into the communities and elephants, hyenas, lions and jackals are commonly seen during the dry season in this community. In Sengwe (Mpandle village) FGD participants complained that hyenas are seen or heard almost every day in their communities. FGD participants from all study sites mentioned that wild animals encroach into their communities because the fence which used to border National Parks, wildlife areas and communities has been destroyed in some parts.

In Twanani (Chingele and Machindu Village), FGD participants and key informants expressed concern regarding the increase in jackals and hyenas and complained that they attack their livestock throughout the year. Another FGD participant from Dumisa village revealed that jackals were preying on goats during the day. Key informants from all study sites concurred that HWC has significantly affected communities in a negative way because wildlife species raid crops, attack livestock as well as injure or kill people in communities adjacent to wildlife areas. Given the current status quo, study participants in all study areas suggested that the responsible authorities should drive away the wild animals from the communities. Further to that, they suggested that a

permanent solution will be to demarcate boundaries between communities and wildlife areas. Drawing from the findings of this study, the state of HWC in these areas is precarious and requires urgent intervention.

3.1.2 Attitudes towards wildlife

Attitudes of communities towards wildlife protection across the study sites are generally positive. A significant proportion of respondents in Chitsa (74.1%), Chibwedziva (48.8%), Twanani (68.1%) and Batanai (33.1%) felt that it is important to protect wildlife resources (Fig 5). However, a significant proportion of respondents in Chichingwe (33.9), Xibhavahlengwe (43.1%), Sengwe (44.0%) and Xini (26.7%) felt that it is not important to protect wildlife. There was a significant difference between the views of male and female respondents on the importance of wildlife protection. A significantly higher proportion of males (48.3%) than females (40.6%) felt that it is important to protect wildlife, while significantly more females (24.7%) than males (18.6%) felt that it is unimportant to protect wildlife.

The majority of respondents who benefit from CAMPFIRE programs in Sengwe reiterated that wildlife should be conserved. One of the FGD participants in Kosvi elaborated that the people of Sengwe want to conserve wildlife because they are seeing the benefits from the CAMPFIRE program. A key informant from Chichingwe noted that people generally have a positive attitude towards wildlife conservation because of the benefits they derive from the conservancy, even though the benefits are still low. In Batanai (Gondweni and Zamani villages) participants expressed negative attitudes towards wildlife protection. They argued that they are not benefiting from wildlife and also cited the lack of freedom of movement during the night and the risk of being killed or injured by elephants, hippos and crocodiles.

A significant proportion of the respondents in Matibi II (79.5%), Sengwe (49.3%) and Sangwe (43.8%) agreed that it is their responsibility to protect wildlife. However, the majority of the respondents in villages (especially villages along boundary line very close to national parks) disagreed and some strongly disagreed, while others remained neutral about their responsibility towards wildlife protection. There was a significant difference between the views of male and female respondents on their responsibility towards wildlife conservation. Significantly more males (50.3%) than females (43.8%) agreed that it is their responsibility to protect wildlife, while significantly more females (16.9%) than males (12.8%) disagreed that it is their responsibility to protect wildlife.

The majority of the respondents in Chitsaneni (76.6%), Machinzu (50.3%) and Chipichini (42.7%) agreed that they are willing to participate in wildlife conservation initiatives. However, the majority of the respondents in Hlarweni and in Chilotela village disagreed (16.5% and 12.5% respectively) and some strongly disagreed (20.9% and 24.4% respectively), while others remained neutral (30.0% and 30.8% respectively) that they are willing to participate in wildlife conservation initiatives. There was a significant difference between the views of male and female respondents on their willingness to participate in conservation initiatives. Significantly more males (48.9%) than females (42.3%) agreed that they are willing to participate in conservation initiatives, while significantly more females (14.2%) than males (10.6%) disagreed that they are willing to participate in conservation initiatives.

The negative attitudes towards wildlife conservation and the unwillingness to participate in conservation initiatives by the respondents in Chichingwe, Gondweni and Malifumuni could be due to the fact that they do not have a CAMPFIRE programs and are not receiving any direct benefits from wildlife unlike villages such as Malipati and Sengwe where communities are benefitting from CAMPFIRE. This study has shown that gender plays an important role in perceptions of wildlife conservation. Women that participated in our study showed significantly more negative attitudes toward wildlife than men. This could be attributed to the fact that women

are disproportionately affected by HWC compared to men as they are involved in activities like guarding crop fields and collecting firewood and water which puts them at risk of wildlife encounters and attacks.

The majority of the respondents across all study sites said that they dislike or strongly dislike lions. However, 23.7% of the respondents in Matibi II indicated that they like lions and 9.4% strongly like lions. The majority of the respondents across all study sites said that they dislike or strongly dislike elephants. However, 27.1% of the respondents in Sengwe indicated that they like elephants and 12.3% said they strongly like elephants in and they mentioned benefits from tourism and trophy hunting as reasons for liking elephants. Although some of the communities that live alongside wildlife realise the importance of wildlife conservation and are willing to participate in conservation initiatives they however do not like dangerous wildlife species like lions and elephants. The reasons given for the dislike included that elephants kill people and destroy crops and that lions are dangerous and they kill people and livestock.

The majority of the FGD participants from all study sites expressed negative attitudes towards dangerous wildlife species like lions, elephants and crocodiles. They reiterated that they are losing crops and livestock to wildlife and a participant from Pahlela village added that that as subsistence farmers they exist one crop failure away from poverty. Their area has very limited livelihood opportunities and with crop failure and livestock attacks, some people are resorting to fish poaching activities in the Save River.

FGD participants expressed frustration that they receive no compensation from the responsible authorities like the RDCs and ZimParks and they suggested that ZimParks and the RDCs should take responsibility for conserving wildlife. In this regard, the majority of FGD participants from all study sites suggested that there should be culling of elephants, hyenas, jackals, baboons, hippopotamus and crocodiles. They reiterated that such a move would reduce HWC as well as safeguarding their livelihoods and protecting their lives.

3.1.3 Nature of human-wildlife conflict

The results of the study showed that respondents across the study sites are experiencing HWC on a regular basis. The incidences of HWC varied across the study sites with some sites like Sengwe and Sangwe experiencing higher levels of conflict (83.6% crop raids and 56.4% livestock) compared to Matibi II. Crop loss was one of the frequent and problematic experiences felt by communities across the study sites in Sengwe (68.5%), Sangwe (71.5%) and Matibi (83.6%). This is followed by livestock loss and then attacks on humans

The FGD findings established that all communities living alongside wildlife experience various forms of HWC. However, it was noted that the level and intensity of the conflict varies from community to community. Overall, all the study sites are prone to HWC every year due to their proximity to wildlife areas, wildlife corridors and national parks. FGD participants from the study sites bemoaned the fact that they can hardly plant and harvest without experiencing crop raids. These results demonstrate that HWC is an increasing problem for the communities living alongside wildlife areas and their proximity to wildlife areas makes it difficult to avoid HWC.

3.1.4 Wildlife species causing HWC

Elephants are responsible for most of the attacks on humans across the study sites in Matibi II (49.1%), Sengwe (75%) and Sangwe (42.4. Buffalos, crocodiles and lions are also significantly contributing to the attacks on humans. The hippopotamuses (19.1%) are also responsible for attacks on humans, especially fishermen along the Save and Runde rivers. Whilst FGD participants from Mugivisa and Samu villages mentioned that there are generally very isolated cases of human attacks by wildlife in these areas and they only experience a few injuries

caused by hyenas every year. It was also established that every year crocodiles and hippopotamus injure and kill a number of people along Runde river and Save river in Chiredzi.

FGD participants in research sites were particularly concerned by the rate at which people are losing their lives to elephant attacks within their villages. The participants stated that instead of declining, cases of human attacks by elephants are increasing each year. As such they called for urgent intervention from the responsible authorities and stakeholders to reduce loss of life and injuries in their communities. Oftentimes the family custodians are the ones that get killed or injured leaving the families without a provider. Elephants are contributing the most to crop raiding across all study sites in around Gonarezhou.

During FGDs and key informant interviews, participants noted that baboons, monkeys, bushpigs, buffalos and birds are responsible for destroying crops mainly in Chiredzi. But most participants confirmed that elephants were the main wildlife species responsible for crop losses in the study sites. The participants mentioned that elephants tend to destroy crops during the rainy season which is just before the ripening stage. They went on to say that elephant raids cause households to become food insecure and it goes to show why food insecurity is common in communities across the country that live alongside wildlife.

The majority of respondents in Sengwe (57.1) lost their livestock to hyenas and in many study sites hyenas are a problem throughout the year. The majority of the respondents in Matibi II (74.2%) and Sangwe (65.5%) lost their livestock to lions. Lions and hyenas attack cattle, calves, goats, sheep and donkeys and can attack livestock inside or outside kraals and also in the pastures. Baboons in all the villages are also contributing to livestock predation especially of poultry and small livestock and crocodiles are also contributing to livestock predation and jackals are also causing conflict within their communities.

3.2 Drivers of HWC

3.2.1 Proximity to wildlife areas: One of the major drivers of HWC in the study sites is the proximity of these communities to national parks, conservancies and wildlife areas, the study sites are all located in wildlife areas (Fig 1). Animals from these wildlife areas can easily cross into nearby communities and cause livestock predation and crop raiding and sometimes kill or injure people. During FGDs, participants from all the study sites underscored the derelict state of fences bordering wildlife areas. Consequently, this makes it easier for wild animals to encroach into communities. Participants in Chitsa ward mentioned that during seasons when water levels are low, wild animals easily cross the Save River and move from Gonarezhou National Parks into nearby communities. Therefore, the proximity of these communities to wildlife areas increases their susceptibility to HWC.

3.2.2 Increase in wildlife population in the study sites: A number of key informants and FGD participants highlighted that owing to increased anti-poaching activities and conservation efforts, the population of wild animals in wildlife areas had indeed increased. This trend has also been witnessed in other parts of Zimbabwe – some beyond the focus of this research study. One key informant from Malilangwe Wildlife Reserve attributed the HWC to the increase in the population of humans and that humans end up competing with wildlife for limited resources. The majority of the FGD participants believe that the number of wild animals in national parks, wildlife areas and conservancies is increasing to an extent that there might not be enough food for elephants, baboons, lions, buffalos and hyenas in these areas. This then results in these species encroaching into communities in search

of food, raiding crops and killing livestock and injuring or killing people. This study showed that wildlife poses a serious threat to human security in most communities that are based close to wildlife areas.

3.2.3 Poaching: Poaching of plains game may also be a major driver of HWC in some study sites. Results from the survey carried out in Chibwedziva indicated that there were high frequencies of sightings of lions, elephants, hyenas and very limited sightings of plains game in the communities. This may suggest that there are now limited populations of plains game in GNP mainly as a result of poaching by the communities bordering GNP. The decimation of plains game may then drive the predators to look for food outside of the Protected Area which results in increasing HWC. During FGDs, some participants concurred that there was some level of poaching in the wildlife areas by community members. Some FGD participants in Sengwe explained that some of the poachers would first go into Mozambique to reach GNP. They would also transport the poached meat through the same route and barter trade it for a bag of mealie meal or other items.

3.2.4 Expansion of human settlements and crop fields into wildlife areas: Expansion of crop fields into wildlife areas and the clearing of land for agricultural and residential uses was cited as one of the major factors fuelling HWC. The population of humans in these areas has been increasing over the last few decades leading to encroachment of humans into wildlife areas due to the increased demand for land and resources. Some of the FGD participants confessed that they have settled in wildlife areas. During the FGDs, some participants from rural areas expressed concern over how some village heads sometimes allocate crop fields in wildlife corridors to new families. Key informants from the villages concurred that the taking up of land in wildlife corridors for resettlement use is the main cause of HWC. Other factors that come with human settlement also aggravates HWC. For instance, the study established that the cutting down of trees for firewood and resettlement in forests also contributes to conflict. Also, with deforestation and resettlement, wild animals need to come closer to communities to search for water, pastures and food which heightens HWC.

3.2.5 Limited grazing areas: In most of the study sites FGD participants and key informants highlighted that they have very limited grazing area due to the increase in human population which has resulted in the expansion of human settlements and crop fields into what used to be grazing areas. Due to this encroachment into wildlife areas, their livestock is prone to predator attacks, particularly during the summer season when water and food is scarce. During FGDs, some participants in Chitsa, Batanai, Chichingwe and Xibhavahlengwe, indicated that their specific wards have inadequate pastures and they instead bring their livestock to graze in the forests which contain wildlife such as lions, jackals and hyenas. They further indicated that when they see predators like lion, jackal or hyena, they have to abandon their livestock to protect themselves. The lack of grazing areas may also be indicative of the absence of land use plans or the lack of enforcement of these plans in the communities.

3.2.6 Limited water sources for people, livestock and wildlife: This study found that there are limited water sources for people, livestock and wildlife in all the study sites. To support this point, one key informant from Xini observed that HWC also emanates from limited water sources as human beings and wildlife often share the same water sources. FGD participants in the Malipati, Hlarweni, Mugivisa, Samu, Chilothela and Dumisa revealed that they receive low rainfall which results in the rapid drying up of water sources. The participants also bemoaned the fact that they do not have boreholes in their areas and as a result, they share water from the rivers with wildlife and livestock. This trend seems to be prevalent in various communities as it was reiterated in several FGDs across the study sites. Some FGD participants noted that local streams and swampy areas were drying up leaving livestock vulnerable to water scarcity and forcing them to travel long distances to drink water in the Save River where they are at risk of crocodile attacks. The silting of rivers and dams is an emerging challenge noted by key informants. The participants noted that siltation is reducing the available drinking water for humans and livestock and increasing water insecurity.

3.2.7 Poorly constructed livestock shelter: Poorly built kraals are a common sight among livestock-owning households in all the villages. Some of these kraals are built with branches and others are built with poles that are poorly spaced. These poorly constructed structures mean that predators can easily scare the livestock out of the kraals and kill them. During FGDs, participants highlighted that most people did not know how to construct good kraals that can protect their livestock from predators. They further highlighted that they also have challenges in accessing fence and poles for kraal construction and because of those challenges, they end up erecting poor structures which would expose their livestock to predation by hyenas, lions, and jackals. Most FGD participants in communities that live alongside wildlife do not reinforce their kraals or adopt elevated kraals for goats. This study found that communities that use elevated kraals for goats have a significantly reduced rate of predation of goats by hyenas. Some FGD participants in Twanani mentioned that livestock predation had reduced due to people adopting the use of predator-proof mobile bomas.

3.2.8 Fluctuations in River flows: One of the drivers of HWC mentioned in study is the fluctuation of the river flow of Runde river and Save rivers respectively. During FGDs, participants highlighted a connection between river flow and predator attacks, during the rainy season, when the river flow is at its peak, predator attacks are rare but during the dry season when the river flow is low predator attacks increase. Predators such as hyenas and jackals are able to cross the rivers when they are low and attack livestock. During the dry season herders also move their livestock to greener pastures by the riverbed and this increases the likelihood of crocodile attacks.

3.2.9 Lack of meaningful benefits from CAMPFIRE: One of the drivers of HWC is the combination of a lack of meaningful benefits from wildlife for communities living alongside wildlife as well as costs incurred from HWC. The FGD participants in Sengwe bemoaned the fact that they do have CAMPFIRE programs and do not benefit from wildlife resources. Concerns were raised as to why they do not benefit from wildlife in the way that other communities living adjacent to wildlife areas do. FGD participants in areas without CAMPFIRE programs expressed a negative attitude towards the conservation of wildlife. They insisted that responsible authorities should cull some wildlife species particularly elephants, baboons, hyenas and crocodiles. One key informant from Batanai suggested that the responsible authorities should plough back the proceeds from wildlife into the affected communities to improve tolerance.

During FGDs, some participants pointed out that Mahenye ward was one of the first areas in Zimbabwe to establish a functional CAMPFIRE program that resulted in tangible benefits to the community. However, there was a huge drop in community benefits following the exit of USAID support in 2003 (Gandiwa, Gandiwa, & Muboko 2012). One key informant pointed out that when community members consider the cost of living with wildlife (crop raids, livestock predation, injury or death to humans) versus the lack of meaningful benefits to the community, some end up using retaliatory strategies such as poisoning, trapping, poaching and destroying wildlife habitats. As such, the lack of meaningful benefits from CAMPFIRE and Conservancy projects can escalate HWC. Some of the FGD participants in these study sites noted with concern that wounded animals (from trophy hunting) in the CAMPFIRE areas, especially elephants, are prone to attacking and killing people.

3.3 The impacts of human-wildlife conflict on livelihoods

Participants across all study sites expressed concern regarding access to social services in their respective communities. It is evidently clear from the findings of this study that access to education and health facilities is

also greatly impacted by the presence of wildlife species like elephants, lions and buffalos around human settlements.

3.3.1 Access to Social Services: Results of this study showed that the majority of respondents across the study sites live more than 3 km away from the nearest health facility with a significant number living more than 5 km away from the nearest health facility. FGD participants across the study sites stated that access to health facilities is a major challenge and this is consistent with data obtained in key informant interviews. In a key informant interview, a headman from Chichingwe explained that people walk 14 kms to access the nearest clinic. The situation is made worse by the fact that there is only one vehicle to transport people in the area and it leaves in the early hours of the morning. The location and availability of health facilities in these study sites affects the right to health (access, availability – distance) and often a sick and frail person has no other option than to walk long distances to get treatment. This is particularly a challenge for pregnant women, the elderly and the young as they must walk long distances to access health facilities. Through these long and challenging journeys people also have an increased risk of encountering wildlife.

FGDs participants in the study areas bemoaned the distance between their households and educational facilities. They underscored that primary and secondary schools are located far away from their households. As such, school children walk for 6 to 10 kms to and from schools through wildlife populated forests and paths. In Sengwe, participants highlighted that although some of the schools are near, children have to pass through forests they are likely to encounter elephants. These elephants endanger their lives and then affects mobility and safety, especially of young school-going children.

To reduce the risks of being attacked by elephants and buffalos – students in Xini walk to school school after sunrise and there are also donors who gave the students bicycles to reduce walking burden. The majority of the FGD participants highlighted that as a precautionary measure they have resorted to escorting their young children to school. In some severe cases, children only attend school out of the farming season because wild animals, particularly elephants, roam the communities during the farming seasons thus endangering the lives of community members and their young children. These reflections show that access to educational and health services is a major issue for most communities living alongside wildlife in Zimbabwe.

3.3.2 Main source of livelihoods: The main livelihood source for most households across the study sites is crop farming and livestock rearing. The FGD participants across the study sites revealed that many families around GNP, rely on crop farming for their livelihoods. All of the study areas are in natural region V which receive very low rainfall and require drought tolerant seed varieties and therefore households mainly grow maize, sorghum and other small grains for subsistence. Key informants from all study sites reiterated that they rely on rain-fed subsistence agriculture because there are no water sources for irrigation. The FGDs demonstrated that some of the communities in these study sites engage in other sources of livelihoods like gardening, however, climate change effects have been cited as a major challenge. The study established that there are serious water challenges in much of the study sites. In Chitsa they hardly have any boreholes or rivers which makes it impossible for them to engage in irrigation activities.

3.3.3 Main source of household income: The sources of income varied across the study sites. The major source of a household's income is sale of agricultural produce. The main source of income for households in other villages is casual labor on farms belonging to other villagers, working in Chiredzi town and in surrounding areas conservancies. The household survey results are consistent with the FGDs and the key informant interviews carried out in communities living alongside wildlife in Zimbabwe.

3.3.4 Threats to livelihoods: Results from this study showed that the major threat to respondents' livelihoods in is crop raids, droughts, livestock predation, lack of employment and poor economy. These results were confirmed by key informants and FGD participants. During the FGDs participants highlighted that crop raids, droughts and predation on livestock are major threats to their livelihoods. This is because communities identify farming as their major source of household income. FGD participants across all study sites disclosed crop raiding as a major threat to their livelihoods. Crop raiding, mainly by elephants, buffalos, bush pigs and baboons, results in lower yields and increases food insecurity in all study sites. The FGD participants also noted that when the crops are reaching ripening stage, a variety of wildlife species encroach into fields and raid the crops.

Another cause of concern that was reiterated across the study areas was the impact of climate change. One informant from Chibwedziva reported that climate change has impacted negatively on their households' sources of income due to the limited water sources which results in competition between humans, their livestock, and wildlife. The rains are erratic and sometimes not sufficient to support growth of crops. Taken together, all these threats affect livelihoods and food security at the household level. FGD participants and key informants in all wards revealed that their areas are very dry (semi-arid). One key informant from Sengwe highlighted that communities living adjacent to wildlife are located in natural region IV and V, which are drought prone areas which is a major impediment to agrarian driven livelihood activities. As such, FGD participants from Sengwe highlighted that growing traditional crops is no longer viable due to the changing weather patterns. In response and in seeking to enhance their chances of getting better yields, communities are now growing drought tolerant crops such as millet and sorghum.

The study findings show that livestock predation is prevalent in Chiredzi. The location of these communities adjacent to wildlife areas makes them very susceptible to livestock predation by wild animals. One of the FGD participants in Batanai mentioned that wild animals like hyenas come from the game park and kill their goats and cattle. Wards located adjacent to wildlife areas also lose livestock to predation by hyenas, jackals, lions and crocodiles. One FGD participant in Xini highlighted that jackals even attack their goats during broad daylight. The findings confirm that droughts, livestock predation and crop raids are major obstacles to the respondents' livelihoods. If the communities' crops escape drought, then the crops are still at risk of raids from elephants, bush pigs, baboons and buffalos. It is a challenging and precarious position for communities to be in.

3.3.5 Impact of HWC on food security: Results from this study show that HWC has a negative impact on household food security. More than 96% of respondents across all study sites indicated that crop raids resulted in food shortages for their households. Crop raiding by elephants and other wildlife species damages maize and other crops and results in poor crop yields. Poor yields mean that there is decreased food security among the farmers and insufficient food for their families. Since most farmers in the study sites rely on the selling of agricultural produce to raise incomes, the destruction of crops through HWC suggests that the income from crops would also be drastically reduced and they might incur debts or fail to pay off existing debts.

This study revealed that the food security situation in the communities living alongside GNP is extremely precarious, which leaves many households' food insecure and hunger stricken. During FGDs, participants highlighted that once their crops are raided by wildlife, they become food insecure because most of the time the animals destroy everything. Some FGDs participants in Chitsa mentioned that often elephants destroy all their crops in the fields as well as in the granaries. Any shock to crop yields through crop raiding worsens the plight of the households and some participants stressed that they have reduced their food portions with some resorting to eating only one meal a day.

Other households in the study sites rear poultry, cattle, goats and other domestic animals. These livestock provide a source of livelihood and income for the households in many of these study sites. However, respondents indicated that although they do livestock production, they also suffer losses due to HWC. FGD participants also highlighted the gravity of HWC on their livestock production. One of the FGD participants in Chilothela mentioned that most households lose goats and cattle to predation by hyenas and lions. Another FGD participant described when lions attack a kraal sometimes they kill livestock but only eat one. Communities in Chiredzi also complained about crocodiles that attack their livestock along the major rivers namely, Save and Runde respectively. Most households living along these major rivers are losing livestock to these predators and this leads to food insecurity. One of the study's main findings is that food security in the study sites is adversely affected by HWC.

3.4. Mitigation strategies used by the communities to address HWC.

3.4.1 Current mitigation against crop damage

FGDs established that communities living alongside wildlife are using a number of mitigating strategies to reduce crop raids by elephants, bush pigs, buffalos, kudus, monkeys and baboons. The main mitigation strategies that are being implemented include but are not limited to fencing, use of scare crows, planting chilli around fields (chilli produces a scent which repels elephants, as such, they are deterred from encroaching into crop fields), use of reflectors, use of lights, use of dogs to chase baboons, making noise, beating tins/drums, and guarding the fields (day and night). In Xini, FGD participants highlighted that they sometimes use chilli bombs, chilli strings and burning elephant dung with chilli to scare away elephants. The use of chilli was also confirmed by key informants in these areas.

In some study sites, like Sengwe and Chitsa, FGD participants noted that they do not have a localised method to get rid of elephants because they are scary and can break any type of fence. However, FGD participants applauded the efforts by responsible authorities and stakeholders in the erection of an energised fence. They highlighted that since the installation of the solar powered fence, crop raids by wild animals have generally decreased. Some of the strategies being used by these communities indeed come with some associated risks (human insecurity). Participants in some study areas mentioned that sounding drums to scare elephants is still risky because elephants can keep advancing even when they hear the sound of drums, consequently endangering their lives. Some FGD participants in Sengwe felt hopeless in the face of wildlife encroachment into communities. They strongly felt that it was better to be safe than to try and protect their fields and end up dead or injured.

3.4.2 Current mitigation against livestock predation

Kraaling livestock is the main mitigation measure against livestock attacks by wild animals. Herding of livestock is mainly being used in Chiredzi. A significant number of respondents also fence off their livestock enclosures to prevent livestock predation. The FGDs showed that communities in all study sites use several mitigation measures to avoid livestock predation by carnivores such as hyenas, lions and jackals. Kraaling livestock is one of the main strategies being used by communities across all study sites to prevent livestock attacks. Other mitigation strategies used by communities is the reinforcement of kraals by putting strong poles and thorns around them, as well as the use of mobile bomas, the herding of livestock and making fires near kraals during the night. FGD participants in Xini pointed out that one of the mitigation measures, herding their livestock, also leaves them at risk of attacks by predators,

4. Conclusions

Human-wildlife conflict is still a major problem that has not been effectively resolved in Zimbabwe. Wildlife is posing a direct and enormous threat to the safety and livelihoods of communities living alongside wildlife across the country in particular reference to Chiredzi. Addressing HWC in communities around Gonarezhou National Parks requires striking a balance between conservation priorities and the needs of these vulnerable people. Results from this study supports earlier studies conducted across Zimbabwe by various researchers including Gandiwa, Heitkönig, Lokhorst, Prins and Leeuwis (2018); Makumbe, Mapurazi, Jaravani and Matsilele (2022), Matseketsa, Muboko, Gandiwa, Kombora and Chibememe (2019) among others. Their findings showed that HWC is being experienced across several communities although the dynamics and extent of the conflict varies from place to place. However, elephants, hyenas and lions are the top three conflict species in many areas across the communities around GNP. Consequently, the implementation of mitigation measures across the communities targeting these three species will greatly reduce HWC.

Communities that live alongside wildlife lose their livestock to predators, their crops to elephants, baboons and other herbivores, their property including houses and granaries gets damaged and sometimes people get injured or killed by wildlife. When such incidents become a recurring issue, retaliation against the species blamed often follows, leading to conflict about what should be done to remedy the situation. For example, a previous study in Kariba found that the residents drive elephants away from residential areas using stones and burning fire logs and that they also kill or injure buffaloes using snares (Mhlanga, 2001). The communities around GNP believe the current response to HWC by the responsible authority is unsatisfactory, and this could potentially escalate the conflict even further and most likely undermine the success of the CAMPFIRE programs and weaken the effectiveness of biodiversity conservation programs in these areas. This study as well as other previous studies Musiwa and Mhlanga (2020), Makumbe, Mapurazi, Jaravani and Matsilele (2022) found that the general perception of the communities is that authorities seem to be more concerned about protecting wildlife at the people's expense and do not seem to show any concern over loss of human life and destruction of livelihoods and property. Urgent solutions for HWC management are therefore needed so that both people and wildlife are protected.

Although communities around GNP have coexisted with wildlife for more than half of a millennia, it appears that the conflict is now becoming more frequent and graver. The rise in conflict has mainly been due to the increasing demand for land, such that at present some of the wildlife corridors are being encroached by crop fields and settlements in Chiredzi. While the communities living alongside wildlife are experiencing costs from doing so, their attitudes towards wildlife conservation are still generally positive. It is therefore imperative that all the affected communities, stakeholders and interested parties work together towards finding lasting solutions for HWC, so as to reduce the costs that these communities incur from living with wildlife.

This study presented an overview of the state of HWC in communities around GNP in Chiredzi in the quest to move from conflict to coexistence between human and wildlife. There is need to further enquire from stakeholders and recommend the best HWC conflict mitigation strategies. New designs and models of managing HWC are required for positive development of these communities. Any HWC management measures put in place both at the local and at the national level should nevertheless recognise and respect the rights and development needs of local communities, while at the same time recognising the need to promote biodiversity conservation.

Acknowledgements

This study was funded by Manicaland State University of Applied Sciences.

REFERENCES

Adams, W. A. (2004). Biodiversity conservation and the eradication of poverty. *Sciences, 306*, 1146-1149.

Barlow, A., Greenwood, C., Ahmad, I. U., & Smith, J. L. (2010). Use of an Action-Selection Framework for Human-Carnivore Conflict in the Bangladesh Sundarbans. *Conservation Biology, 24*, 1338-1347.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 77-101.

Dheer, A. D. (2021). Emotions and Cultural Importance Predict the Acceptance of Large Carnivore Management Strategies by Maasai Pastoralists. *Frontiers in Conservation Science, 23*.

Durant, S. M., Marino, A., Linnell, J. D., Oriol-Cotterill, A., Dloniak, S., Dolrenry, S., & Yirga, G. (2022). Fostering Coexistence Between People and Large Carnivores in Africa: Using a Theory of Change to Identify Pathways to Impact and Their Underlying Assumptions. *Frontiers in conservation Science, 12*(7).

FAO. (2024, September 2). *Sustainable Wildlide Management and Human Wildlife Conflict.* Retrieved from Food Agriculture Organisation: www.fao.org/forestry/wildlife-partnership

Gandiwa, E., Gandiwa, P., & Muboko, N. (2012). Living with Wildlife and Associated Conflicts in A Contested Area Within the Northern Gonarezhou National Park, Zimbabwe. *Journal of Sustainable Development in Africa, 14*(6), 252-260.

Gandiwa, E., Heitkönig, M. A., Lokhorst, A. M., Prins, H. H., & C., L. (n.d.). CAMPFIRE and human-wildlife conflicts in local communities bordering northern Gonarezhou National Park, Zimbabwe. *Ecology and Society , 18*(14), 7.

Gross, E., Jayasinghe, N., Brooks, A., Polet, G., Wadhwa, R., & Hilderink-Koopmans, F. (2021). *A Future for All: The Need for Human-Wildlife Coexistence.* Gland, Switzerland: WWF.

Hazzah, L. D.-T. (2014). Efficacy of two lion conservation programs in Maasailand, Kenya. *Conservancy Biology, 28*(3), 851-861.

Hennink, M., Hutter, I., & Bailey, A. (2020). *Qualitative research methods* (2nd ed.). London: Sage Publications.

IUCN. (2020). *IUCN SSC Position Statement on the Management of Human-Wildlife Conflict.* IUCN.

King, L. R. (2022). *Save the Elephants' HEC Toolbox, English Edition* (1st ed.). Nairobi, Kenya: Save the Elephants.

Leslie, S., Brooks, A., Jayasinghe, N., & Koopmans, F. (2019). *Human Wildlife Conflict mitigation: Lessons learned from global compensation and insurance schemes.* HWC SAFE Series. WWF Tigers Alive.

Lichtenfeld, L. L. (2015). Evidence-based conservation: predator-proof bomas protect livestock and lions. *Biodiversity Conservancy*, 483-491.

Makumbe, P., Mapurazi, S., Jaravani, S., & Matsilele, I. (2022). Human-Wildlife Conflict in Save Valley Conservancy: Residents' Attitude Toward Wildlife Conservation. *Scientifica*, 11.

Matanzima, J. M. (2022). Negative human–crocodile interactions in Kariba, Zimbabwe: Data to support potential mitigation strategies. *Oryx, 1-5. doi:10.1017/S003060532200014X*, 1-5.

Matseketsa, G., N., M., Gandiwa, E., Kombora, D. M., & Chibememe, G. (2019). An assessment of human-wildlife conflicts in local communities bordering the western part of save valley conservancy. *Matseketsa G., Muboko N., Gandiwa E., Kombora D. M., Chibememe G. (2019). An assessment of human-wildlife conflicts in local communities bordering the western part of save valley conservancy, Zimbabwe. Global Ecology and Conservation. 20 doi: 10.1016/j.ge, 20*.

Mhlanga, L. (2001). Conflict between wildlife and people in Kariba town, Zimbabwe . *Zambezia*, xxvii.

Musiwa, A. R., & Mhlanga, W. (2020). Human–wildlife conflict in Mhokwe Ward, Mbire District, North-East Zimbabwe. *African Ecology*, 786-795.

Songhurst, A. M. (2015). Finding pathways to human–elephant coexistence: a risky business. *Oryx, 50*(4), 713-720.

Songhurst, A., McCulloch, G., & Coulson, T. (2015). Finding pathways to human–elephant coexistence: a risky business. *Oryx, 50*(4), 713-20.

Treves, A. K. (2003). Human-Carnivore Conflict and Perspectives on Carnivore Management Worldwide. *Conservation Biology, 17*.

ZimParks. (2023). *Human Wildlife Conflict.* Harare: Zimbabwe Parks and Wildlife Management Authority.

ZIMSTAT. (2024, September 21). *ZIMSTAT*. Retrieved from Zimbabwe Population and Housing Census: www.zimstat.co.zw