



**ZIMBABWE NATIONAL
LEOPARD CONSERVATION STRATEGY
AND ACTION PLAN
2023-2027**



Zimbabwe Parks and Wildlife Management Authority



The Minister for Environment, Climate, Tourism and Hospitality Industry, Secretary for Environment, Climate, Tourism and Hospitality Industry, Parks and Wildlife Management Authority Board and the Director General have approved the implementation of the Zimbabwe National Leopard Conservation Strategy and Action Plan (2023-2027).

Signature:  _____
Dr. Fulton Upenyu Mahgwanya

Date: 09/01/2023

DIRECTOR-GENERAL - ZIMBABWE PARKS AND WILDLIFE MANAGEMENT AUTHORITY

Signature:  _____
Dr. Agrippa Golden Sora

Date: 09/01/2023

BOARD CHAIR - ZIMBABWE PARKS AND WILDLIFE MANAGEMENT AUTHORITY

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Date: 14/02/23

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Signature:  _____
Hon. Mangaliso Ndhlovu (MP)

Date: 20/02/23

MINISTER FOR ENVIRONMENT, CLIMATE, TOURISM AND HOSPITALITY INDUSTRY

FOREWORD BY THE DIRECTOR GENERAL DR. FULTON U. MANGWANYA



The Zimbabwe Parks and Wildlife Management Authority is determined to pursue an evidence based approach to the management of key wildlife species such as elephants, rhino, lion, cheetah, leopard and African wild dogs. Based on scientific information from research and monitoring activities, a number of species-specific management plans have been drawn up to guide the management of these species. Through collaboration with our key stakeholders, we have finally managed to produce the first Zimbabwe National Leopard Conservation Strategy and Action Plan (2023-2027).

Leopards being a cryptic and notoriously difficult species to monitor; the ZPWMA fully recognizes and supports the efforts that are being made on the ground by a wide range of individuals and institutions in their contribution to the conservation of leopards. We thank all of those involved in this vital and honourable work, and urge them to continue their efforts.

The Government is aware of the pressure in the current conservation environment that perceives an approaching extinction of leopards in Africa and opposes sustainable use of the species. The Government perceives this pressure to be a factor that limits the resources available to conserve leopards and their habitats, and the range of plant and animal species that occur in these wildlife areas. Sustainable use of natural resources has been and remains a central pillar of successful conservation in this country. The Government has every intention of maintaining its policy in this regard.

In signing this Management Plan, the Government recognises and supports the efforts that are being made on the ground and elsewhere, by a wide range of individuals and institutions, to protect and manage our leopard populations. We are also aware of the current and likely ongoing challenges being imposed on our conservation efforts by the global coronavirus pandemic. We thank all of those involved in this vital and honourable conservation work and urge them to continue their efforts and support.

We believe this document will provide clear guidance on the way forward to continuing protection and management of our leopards and a framework for effective and ongoing collaboration between all stakeholders involved in this noble effort. In addition, this document will unlock funding for the conservation of the species and the entire wildlife ecosystems as the funding community will have a government endorsed species management plan.

SUMMARY

This is the first conservation strategy and action plan that has been developed for leopards. Leopards are an important component of naturally functioning ecosystems in Africa. Leopards are used for consumptive and non-consumptive tourism. Leopards are hunted for their trophy in Zimbabwe with a national quota of 500, however, on average about 150 leopards are harvested annually. Quotas for harvesting leopards are adaptively management each year using data from ground surveys and trophy quality data.

The plan follows an essentially similar structure and logic as the plans that have been developed for rhinos elephant and lions. The initial step involved convening a workshop that included key stakeholders in the conservation and management of leopards. The two and a half day workshop was held in Harare from the 20th to the 22nd April 2022 and involved a series of presentations on leopards and break out groups working on the main components of an initial draft log frame and action plan. The proceedings of the workshop were circulated to participants for comment and the results have been incorporated into this plan.

The strategy focuses on the following long term and shorter-term goals, and five key components, in keeping with related plans for rhinos, elephants, and lions:

Long-term Vision: *Leopards conserved and managed sustainably for their aesthetic, cultural and ecological values and the socio-economic development of Zimbabwe.*

Goal: *(Immediate objective or purpose):*

To secure and where possible, restore as many viable leopard populations and habitats as possible in Zimbabwe, whilst mitigating their negative impacts and enhance their value for the benefit of people through sustainable use.

Targets:

- 1. Ensure the persistence of key leopard populations in state protected areas and other important populations, including those of current marginal viability*
- 2. Reduce human leopard conflict*
- 3. Optimise wildlife conservation-related net benefits to local communities and landholders*

In order to meet these goals, and to effectively contribute to national policy objectives, the following five components and strategic objectives have been adopted as the primary focus for strategic action in achieving the immediate and long term conservation of leopards in Zimbabwe:

1. Protection and Law enforcement to ensure the effective protection of all leopard populations in Zimbabwe
2. Biological monitoring and management of leopards to achieve viable and diverse populations that are within upper and lower acceptable limits to change in numbers and distribution
3. Implementing social, economic and cultural strategies to enhance the contribution of leopards to rural livelihoods, protected area management and national development
4. Building conservation capacity and ensuring that sufficient and appropriately trained personnel, equipment, infrastructure and finances are mobilised, available and used efficiently and effectively to achieve leopard conservation
5. Ensuring coordination, collaboration and programme management with local, and international stakeholders to implement these strategic objectives.

These strategic components can readily be framed as objectives, and outputs with a set of *necessary and sufficient activities*, and key performance indicators that need to be implemented to achieve the outputs and targets. These are framed at a national strategic level from which more detailed annual plans that fit available resources and requirements at local or regional levels can be developed.

An overview of the main conservation plan is provided in the following Objectives Tree. The sets of key activities for each Output are provided in Section 4.

Objectives Tree

Long-term Vision: Leopards conserved and managed sustainably for their aesthetic, cultural and ecological value, and the socio-economic development of Zimbabwe

Goal: (Immediate objective or purpose):

To secure and where possible, restore as many viable leopard populations and habitats as possible in Zimbabwe, whilst mitigating their negative impacts and enhance their value for the benefit of people through sustainable use.

- Targets:
1. Ensure the persistence of key leopard populations in state protected areas and other important populations, including those of current marginal viability
 2. Reduce human leopard conflict
 3. Optimise wildlife conservation-related net benefits to local communities and landholders

Key Components	1. Protection and law enforcement	2. Ecological Monitoring and Management	3. Social, Economic and Cultural Framework	4. Building Conservation Capacity	5. Coordination, collaboration, and program management
Strategic Objectives	Objective 1. Ensuring effective protection of all leopard populations in Zimbabwe	Objective 2. Implementing effective ecological management to achieve viable and diverse populations that are within upper and lower acceptable limits to change in numbers and distribution	Objective 3. Implementing strategies that enhance the contribution of leopards to rural livelihoods, protected area management and national development	Objective 4. Ensuring that sufficient trained personnel, equipment, infrastructure, and financing are available and used efficiently and effectively for conservation of leopards	Objective 5. Ensuring effective coordination and collaboration with local, national, regional, and international stakeholders to implement this leopard conservation strategy and action plan.
Outputs	Output #1: Management, security, social, and law enforcement actions to minimise, illegal losses of leopards, their prey, and habitats, implemented	Output #2: Adaptive, evidence-based management to maintain viability of leopard populations implemented	Output #3: Fair distribution of financial benefits from leopards improved and tolerance for living with leopards increased	Output #4: Sufficient numbers of trained, equipped, motivated and effective personnel are deployed and operational	Output #5: Coordination mechanisms to assess and review adaptive leopard management and strategic planning established and operating

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Acronyms and Abbreviations

CAMPFIRE	Communal Areas Management Plan for Indigenous Resources
CITES	Convention on International Trade in Endangered Species of Flora and Fauna
CSP	Conservation Service Provider
IUCN	International Union for the Conservation of Nature
KAZA	Kavango Zambezi Transfrontier Conservation Area
KPI	Key Performance Indicator
NGO	Non-Governmental Organisation
NP	National Park
NDF	Non Detriment Finding
RDC	Rural District Council
SA	Safari Area
SADC	Southern Africa Development Conference
SMART	Spatial Monitoring and Reporting Tool
SOAZ	Safari Operators Association of Zimbabwe
TFCA	Transfrontier Conservation Area
ZPHGA	Zimbabwe Professional Hunters and Guides Association
ZPWMA	Zimbabwe Parks and Wildlife Management Authority
ZRP	Zimbabwe Republic Police

Staff abbreviations (used to indicate responsibilities in the action plans)

DG	Director General
DSS	Director Scientific Services
DoP	Director of Operations
RM	Regional Manager
S/AM	Senior/Area Manager
CET	Chief Ecologist Terrestrial
CLES	Community Liaison and Extension Services
PRM	Public Relations Manager
HRM	Human Relations Manager
NCC	National Carnivore Coordinator
LCWG	Large Carnivore Working Group
ZIWC	Zimbabwe Institute of Wildlife Conservation

Acknowledgements

The support and guidance provided by ZPWMA and Panthera for the development of this conservation strategy and action plan is gratefully acknowledged, as is the contribution to its development by the participants in the consultative workshop on leopard conservation and management held at Cresta Lodge in Harare on the 20-22 of April 2022.

1. INTRODUCTION AND BACKGROUND

Of the big cats (lions, tigers, leopards, and jaguars), leopards (*Panthera pardus*) are the most widely distributed with nine recognised subspecies (Stein et al 2019, Fig. 1). The subspecies in Africa, *Panthera pardus pardus*, is widely distributed in mostly fragmented populations in sub-Saharan Africa with only a possible remnant population north of the Sahara in Algeria. Under the IUCN Red List, the conservation status of leopards is listed as Vulnerable A2cd, it is listed in Appendix I under CITES, it is listed under Appendix II of CMS, and the African sub-species is listed as Threatened under the US endangered Species Act. In South Africa leopards are listed as Vulnerable (Swanepoel et al 2016). In Zimbabwe leopards are listed as a dangerous animal in the Ninth Schedule to the Parks and Wildlife Act and do not have any specially protected status. However, leopards play an important ecological role as key apex predators in protected areas and, importantly, play a key economic role as a member of the “Big Five” in the wildlife-based tourism industry (van der Meer et al 2016).

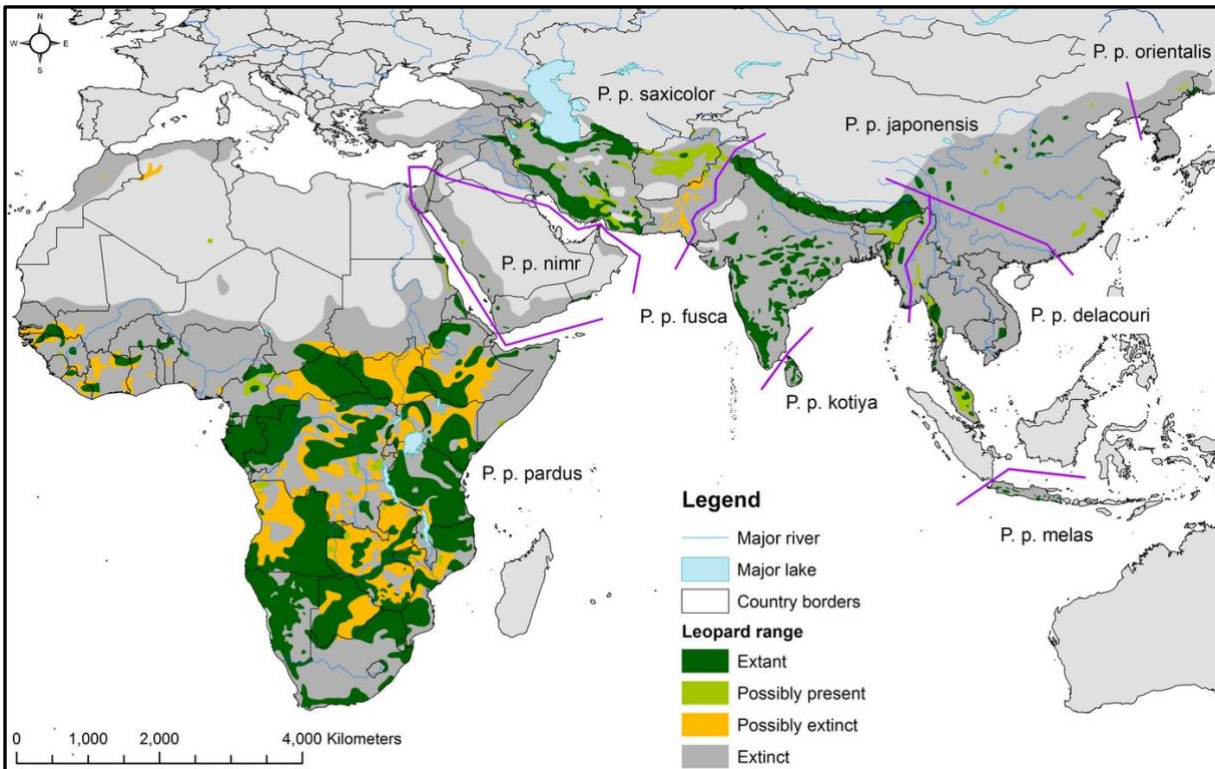


Figure 1. Distribution of nine subspecies of leopard across their ranges showing extant, possibly present, possibly extinct, and extinct range areas. The loss of historic range for leopard has been between 63-75% but in some areas the loss of range has been as high as 97%. For Africa range loss has been between 48-67% with wide variation between regions. In West Africa it was between 86-95% compared with southern Africa with losses of between 28-51% loss. *P. p. pardus* range in Africa covered 6.6 million km² in 53 patches with a median patch size of 10,972 km². In Zimbabwe extant range was estimated to be 41% of the country. (Source: Jacobsen et al (2016).

This is the first Conservation Action plan for Zimbabwe leopards. Its development follows on a Non-Detriment Findings (NDF) in 2012, a leopard management workshop in March 2016 and submission of a revised NDF to US Fish & Wildlife Service in 2016. A leopard conservation and action plan workshop in

April 2022 served as a prelude to the development of this conservation action plan. The structure of the plan follows those developed and used for rhino, elephant, lion, cheetah and wild dogs, with the result that there is some measure of overlap in many of the activities that are required for the protection and conservation of each species.

There is a lack of long-term data on the distribution, number, and trends in leopard populations in Zimbabwe. Because of their ability to subsist on a wide range of prey, leopards may not have suffered the level of decline that lions did following the Rinderpest pandemic that swept through the country in 1895-96 – a pandemic in which both wild and domestic cloven-hoofed animals were reduced to very low levels.

As human populations have grown over the last century, and as agriculture and habitat change has expanded, conflict between people and leopards has increased and constrained both the distribution and numbers of leopards, and abundance of their prey in the country. However, leopards can inhabit a very wide range of habitats but prefer to hunt in areas that provide sufficient cover (Hayward et al 2006). As with most large predators, their numbers are directly dependent on their prey base (e.g., Hatton et al 2015, Loveridge et al 2022). Leopards prey opportunistically on a very wide range of species but with a general preference for those with a body mass of between 10 to 40 kg, with a modal weight of 23 kg, and a distinct preference for species such as impala, bushbuck, and common duiker (Hayward et al 2006).

During the April workshop participants listed 21 issues affecting leopard conservation in the country of which the following were ranked as the most important:

1. Habitat loss and fragmentation, competing land uses, and lack of tools to maintain leopard habitat
2. Depleted prey base (bushmeat poaching and habitat change)
3. Doubtful population status and information on leopard population numbers and trends as a result of limited research capacity and funding
4. Impacts of anti-sustainable use lobbies
5. Poorly regulated hunting, illegal hunting, poisoning, retaliatory killing, and poaching

Identification of these key problems has been taken forward into the strategic action plans and a new activity relating to the use of modern techniques in genetic analysis has been added and needs to be highlighted. The collection and analysis of tissue samples from the full range of leopard populations in the country can provide an estimate of the total population as well as provide insights into the genetic diversity and health of the sub-populations within Zimbabwe (e.g., Dutta et al 2012 and 2013). Associated with the need for improved information on the numbers, population structure, and dynamics of leopards in Zimbabwe is the need to develop and use effective ageing criteria to improve the management of trophy hunting and associated quotas.

An important recommendation from stakeholders is to establish a post within ZPWMA for a full-time Large Carnivore Coordinator to oversee the implementation of conservation of our larger carnivores, namely, lion, leopard, cheetah, painted dog, and hyaena.

Human large carnivore conflict remains an ongoing problem as does illegal bushmeat hunting that impacts directly on leopards and their prey base. As a result, the importance of outreach programmes between conservation areas holding leopards and other large carnivores requires particular attention (e.g., van der Meer and Dullemeent, 2021).

1.1 Distribution, numbers, and trends

In the early 1960s a country-wide questionnaire survey found that leopards were distributed throughout the country, with all but four quarter degree squares showing presence of leopards (Child and Savory 1964). A recent distribution map (Fig. 2) shows leopards widely distributed in the south and west of the country and in the Zambezi Valley, with a few isolated areas in the central highlands. However, recent density estimates between 2018-2020 have varied widely from as high as 18 leopards per 100 km² in Gonarezhou National Park in 2020 to 1.2/100 km² in Zambezi National Park, and even less in some areas surveyed adjacent to protected areas. A similar range of densities, apart from the very high density recorded in Gonarezhou, was recorded in the 2013 national survey (Fig. 3).

An overall estimate of the number of leopards in the country is not available and their current range and degree of range fragmentation, needs to be more accurately defined. Trends in some recently surveyed populations reflect possible declines (Table 1).

Table 1. Camera trap estimates of leopard densities in areas for which there are estimates at intervals of between two and seven years (Source: Survey Reports)

Survey Site	Year	Leopard/100 km ²	Year	Leopard/100 km ²
Ingwezi Game Park	2011	3.3	2018	2.2
Zambezi National Park	2016	2.9	2019	0.9
Matetsi Safari Area	2016	2.6	2019	1.2
Chizarira National Park	2017	1.0	2019	1.2
Matusadona National Park	2016	12.0	2018	4.4
Mana Pools National Park	2015	4.8	2020	3.3
Hurungwe Safari Area	2018	2.9	2020	3.3

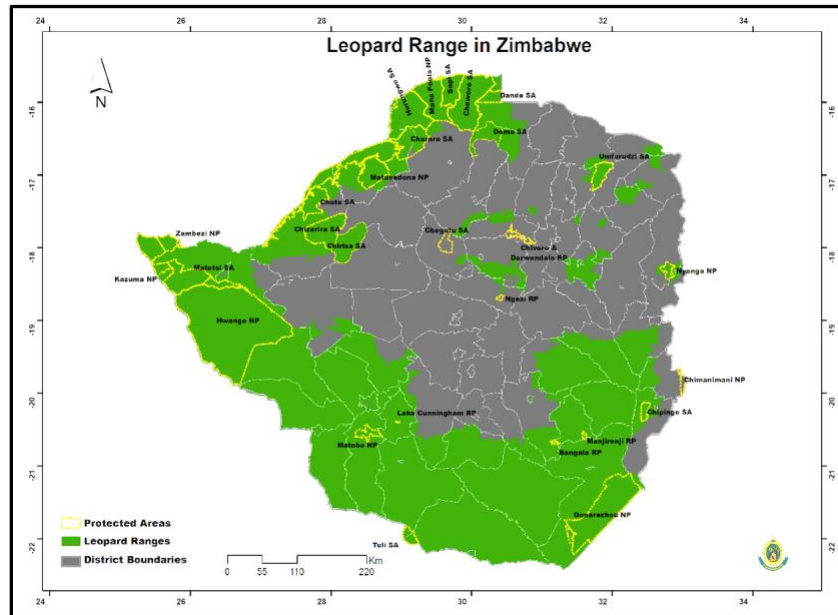


Figure 2. Distribution of leopards in Zimbabwe (green shaded area, yellow lines are lines boundaries of state protected areas, thin white lines are district boundaries) Source: ZPWMA 2018.

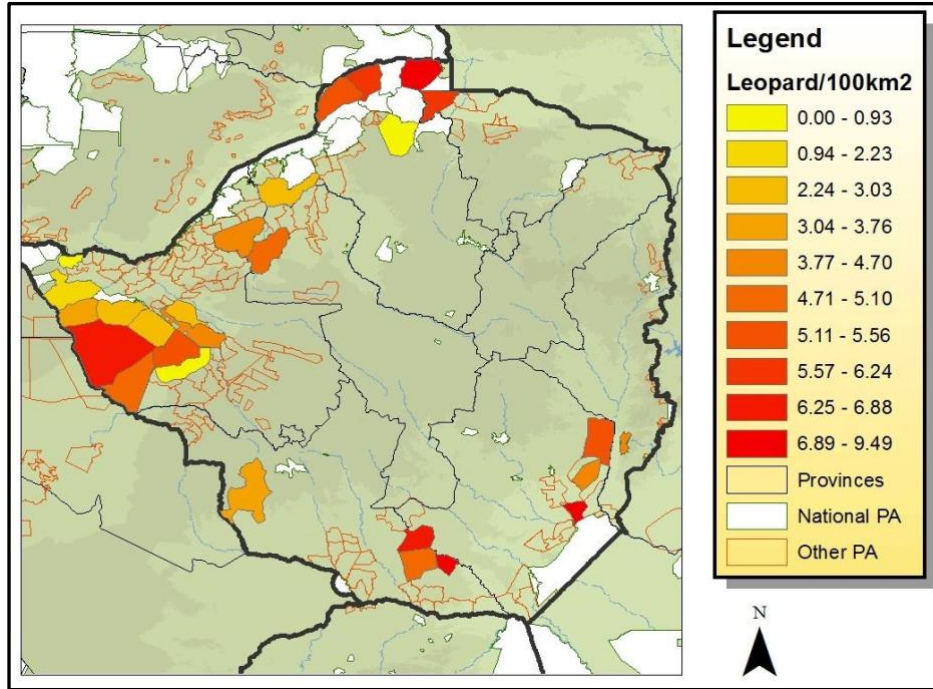


Figure 3. Summary of density estimates from spoor transects and camera trapping in the 2013 national leopard survey showing the range of leopard densities in the areas covered. (Source: ZPWMA 2018)

Loveridge et al (2022) developed a predictive model of leopard densities in which leopard densities were associated with productivity, wooded sites, and rugged terrain, and negatively affected by human appropriation of above ground net primary production (disturbance), trophy hunting, and bushmeat poaching. The model was tested against camera trap survey estimates of leopard density in 16 sites in the Zimbabwe component of KAZA. This is a promising development in gaining an improved understanding of factors driving leopard distribution and densities.

1.2. Implementation of the strategic plan

1.2.1 Institutions and roles

i) Zimbabwe Parks and Wildlife Management Authority

The ZPWMA through the Parks and Wildlife Act, Chapter 20: 14, has a national mandate to manage wildlife in the country. By the same instrument it is appointed the lead agency in the conservation and management of leopards, i.e., protection, monitoring, research, and sustainable use. It is also responsible for establishing collaborative arrangements with other governmental and non-governmental organisations to conserve and manage leopards in the country.

ii) Intra-governmental organisations

ZPWMA works jointly with security organisations such as Zimbabwe Republic Police (ZRP), Zimbabwe Defence Forces, and the President's Office to protect leopards, curb illegal killing, and control trade in leopard products. ZPWMA works with these organisations through the Joint Operations Command as well as through direct bilateral arrangements with them and the Judiciary. ZPWMA also works with Customs at ports of exit and entry to improve control of illegal movement of wildlife products across boundaries.

iii) Inter-governmental organisations

ZPWMA works closely with sister organizations from neighbouring countries such as Zambia, Mozambique, South Africa and Botswana in wildlife protection, information sharing and leopard monitoring through bilateral and regional arrangements under SADC. At international levels, ZPWMA is both the CITES Management Authority and CITES Scientific Authority and works with other countries through CITES and other inter-governmental agreements to control trade in leopards and to protect leopards. Both the Northwest Matabeleland and the Sebungwe regions fall within the Kavango-Zambezi Transfrontier Conservation Area (KAZA) and involve collaboration in the conservation and management of large carnivores within this framework. ZPWMA is also working with the Convention on Migratory Species and their African Carnivore Initiative that seeks to establish a task force to examine the illegal trade in carnivore products.

iv) Non-governmental organizations

Both local and international organizations partner with ZPWMA in leopard management. They mobilise resources for protection, research, and monitoring, and assist directly with leopard monitoring and research programmes, information sharing, and advocacy. Non-governmental organizations and other government agencies will also partner with ZPWMA in the control and management of leopard and human conflict through developing material for education and awareness, coming up with strategies to control the problem and come up with self-sustaining project for communities affected by leopard conflicts for example, livestock depredation.

v) Private sector

The corporate community participates in managing leopards mainly through resource mobilization. Safari operators report poaching and assist in anti-poaching patrols. Through lease and trophy fees they provide revenue to ZPWMA. They help develop infrastructure, provide funds to communities and supplement diets with meat from hunted trophy animals.

Zimbabwe subscribes to the principle of sustainable utilisation of wildlife resources including recreational hunting of leopards whereby offtakes are adaptively managed and monitored through a participatory and science-based process.

vi) Local Communities

Local communities are involved in leopard management in CAMPFIRE areas, through sharing information, advocacy, and wildlife protection. They report incidents of human-leopard conflict.

1.2.2. Funding and resources

Adequate and sustainable funding and provision of other resources are important to effective conservation of leopards. Resources are mobilized from within ZPWMA, by the private sector, and by intergovernmental, non-governmental organizations, and Conservation Support Organisations. Partnerships between ZPWMA and other stakeholders are some of the innovative measures being developed to secure funding for large carnivore conservation. There may be a need for the Government to provide additional support to their conservation and the prey base on which they depend, particularly given the current levels of subsistence and commercial poaching, and the continuing anti-hunting sentiment in North America and Europe.

1.2.3 Coordination

i) ZPWMA

ZPWMA takes the lead in coordinating other institutions in leopard and large carnivore conservation activities in the country. It will convene and chair the proposed Large Carnivore Working Group meetings. Similar meetings are scheduled for rhinos and elephants and the possibility of amalgamating these meetings will be explored.

ii) National Carnivore Coordinator

This Action Plan provides for the appointment of a National Carnivore Coordinator (NCC) within ZPWMA who will be responsible for coordinating leopard, lion, cheetah, hyaena, painted dog, conservation and management activities in the country. The NCC will liaise with the International Conventions Office in ZPWMA on international matters affecting carnivore conservation and also liaise with the CAMPFIRE office for matters affecting the conservation of carnivores in CAMPFIRE districts. The draft Terms of Reference for the NCC are provided in Annex 8.2

iii) Large Carnivore Working Group

As reflected in the Proceedings of the April 2022 Workshop on leopards a strong recommendation was made for a Working Group to be established to work on specific issues relating to the conservation of lions, leopards and other large carnivores (cheetah, painted dog, hyaena) in the country and to annually review progress in implementing the species specific Action Plans. The Working Group will document progress in implementation, suggest needed revisions to the Action Plans, and make their report available to the Director General of ZPWMA.

The Working Group should meet at least twice a year to review the implementation of the national, regional, and local plans. The Working Group will strengthen links with various bodies at national and regional levels including within the TFCA framework. ZPWMA will convene and chair the Working Group meetings. The draft Terms of Reference for the NCC Working Group are provided in Annex 8.1.

1.2.4. Monitoring and evaluation

Monitoring the implementation of this Action Plan will use the Key Performance Indicators contained in Section 4 and reported on by the NCC on an annual basis. A major evaluation of progress will be assessed every two years and in 2027. Monitoring and evaluation should be done at each local area level, at the regional level, and at the National level.

1.2.5. Links with regional and continental initiatives

This Action Plan recognizes the existence of the KAZA Carnivore Conservation Strategy (that includes northwest Matabeleland and the Sebungwe), and initiatives that are currently taking place at a continental level, including by the African Union. These include the development of the Common Strategy on Combating Illegal Exploitation and Illegal Trade in Wild Fauna and Flora in Africa. At the SADC level initiatives involve developing a Plan of Action and implementing the SADC Protocol on Wildlife Conservation and Law Enforcement. This Action Plan will be reviewed periodically in the light of developments that are taking place in the SADC Region, Africa and beyond.

1.2.5. Regional strategies within Zimbabwe

The devolution of management oversight to regional levels, with more detailed action plans within the national plan (see example on page 15), provides the basis for effective adaptive management at regional and local levels. An example of how this might be devolved to the regional level is provided in Annex 1.

1.2.6. Protecting leopards for the future

Poaching and the illegal wildlife trade are serious concerns for all leopard range states. Protecting the habitats and prey base for leopards and minimising the loss of leopards to an increasing threat of trade in body parts, are now an important, if not primary, component of this Action Plan.

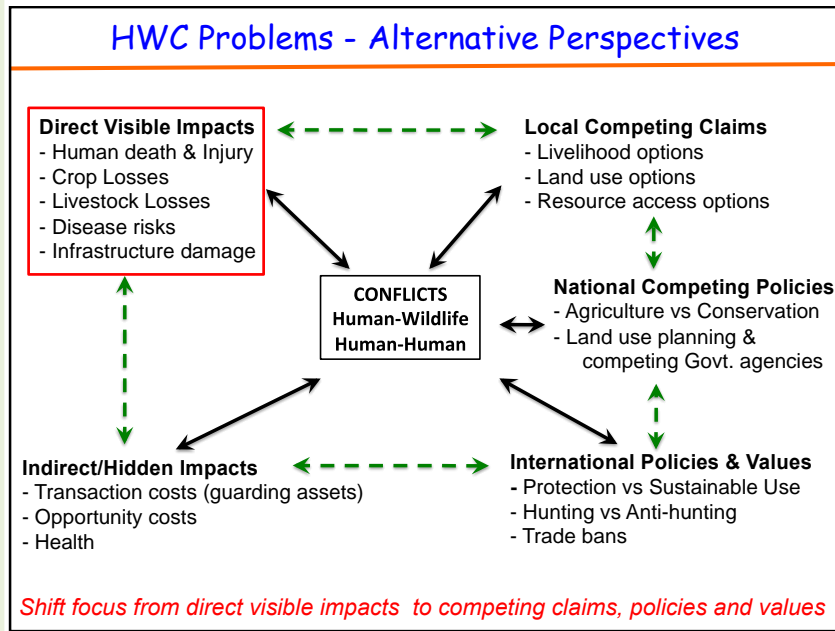
1.2.7. Human-Leopard conflict

As Zimbabwe's human population grows, leopards and other large carnivores are being restricted to smaller areas and as human populations and settlement increase on the immediate boundaries of protected areas leopards are increasingly likely to threaten livestock and occasionally, human lives. As a result, in many rural areas where leopards occur in Zimbabwe, conflicts with people are likely to increase, creating negative attitudes towards their conservation. These conflicts often occur among the poorest of rural farmers, which complicates the issue in social and economic terms. Unresolved conflicts stimulate poaching or retaliation. Poachers or retaliators can be seen as "local heroes" because they remove the source of the conflict. A major challenge for large carnivore conservation is keeping these conflicts to a minimum.

Developing a Social, Economic, and Cultural Framework in which leopard conservation takes place has been identified as a Key Component of this Action Plan to address and minimise human-leopard conflicts and build an appreciation of the importance of conserving large carnivores.

BOX 1: Towards a Comprehensive Strategy to Reduce Human-Large Carnivore Conflict

Conflict between people and wild animals tends to focus on the immediate and direct visible impacts of a wild animal on a person or on his/her belongings, such as domestic livestock or crops or on risks of contacting disease. While it is appropriate to minimise such direct conflicts it is also important to examine the wider circumstances and related issues that involve competing claims, policies, and values that contribute to the problem. The following diagram provides a summary overview of the issues and complexities involved.



While lions and leopards do occasionally attack and injure or kill people, conflict between humans and large carnivores most commonly revolves around the loss of livestock to predation by large carnivores (Kuiper et al 2015, Loveridge et al 2017). Measures to effectively reduce such losses have recently been developed and include herding practices, the use of predator proof mobile bomas, the positioning of flashing lights to keep predators away, and using vuvazelas (trumpets) to chase them away.

However, attention also needs to be directed to issues relating to land use planning, competing resource claims and policies, and dealing with international pressures that bear on the conservation, management and sustainable hunting of lions and leopards, and the equitable distribution of benefits that may be derived from them through tourism.

2. LOGIC AND STRUCTURE OF THE PLAN

The strategic framework is based on the Logical Framework structure and the development of clearly stated objectives, outputs and the *necessary and sufficient* activities (or actions) required to achieve the outputs within a specified time frame. The structure requires a set of key performance indicators that are intended, as far as possible, be SMART, i.e. Specific, Measurable, Achievable, Realistic and Time-bound, and fit the usual requirements of results based management. The five key components of the plan are:

1. Protection and law enforcement
2. Biological monitoring and management
3. Socio-economic and cultural sustainability
4. Building conservation capacity
5. Coordination, collaboration and programme management

Table 1. Structure of the Leopard Strategic Plan

Long-term Vision	The long term vision of the 2006 plan has been retained the draft and remains applicable to the period of this plan
Targets	The five targets included in other species action plans are retained
Key Components	The five key components are the primary themes or headings of the strategy under which the framework is organised.
Strategic Objectives	The strategic objectives reflect briefly, but more explicitly, the policy intention for the respective components
Outputs (expected outcomes)	The outputs are statements that reflect the expected results that will be realised during the time frame of the plan. Outputs are therefore expressed in the past tense.
Key Activities (Actions)	Key activities represent the <i>necessary and sufficient</i> actions that need to be completed to achieve the Outputs. They are those that are vital to achieve the Outputs and are those on which the major emphasis should be placed. <i>National level Activities can be cast as Outputs at sub-regional level, with more detailed and relevant time specific activities, KPIs, and budgets, at that are appropriate to that regional or local area level.</i>
Key Performance Indicators (KPIs)	The Key Performance Indicators (KPIs) provide a basis on which to measure and monitor the success or otherwise of the Strategic Objectives, Outputs, and Activities.
Means of Verifying the KPIs	It is clearly necessary for the verification and monitoring of KPIs that the manner in which they can be tracked and verified needs to be clearly established. Equally important is the need for monitoring protocols to be standardised across local and regional levels so that national and sub-regional level KPIs and statistics can be compiled. This will then allow valid comparisons of performance across regions and local areas to be made
Implementation Strategy	As outlined in the previous section the ZPWMA will interact and collaborate with a wide range of agencies and stakeholders in the implementation of this plan

The top-level strategic components of the Action Plan encompassing the Long-term Vision, Targets, Key Components, Strategic Objectives and Outputs are summarised on page 11 in Section 3 below. The top-

level components of the plan are then followed by a set of tables in Section 3 (page 11) and Section 4. (page 12) that provide action plans for the expected Outputs (or outcomes) of each the five strategic components of the plan. The Activities and KPIs within these tables are set at a national strategic level. **Activities** listed at the national level will, for the most part, form **Outputs** at the regional or local area level. These Outputs will, in turn, generate more detailed regional and local *specific activities* and actions with more specific KPIs and means of verification (see example on page 15).

3. VISION, TARGETS AND KEY COMPONENTS

Long-term Vision: Leopards conserved and managed sustainably for their aesthetic, cultural and ecological value, and the socio-economic development of Zimbabwe

Goal: (Immediate objective or purpose):

To secure and where possible, restore as many viable leopard populations and habitats as possible in Zimbabwe, whilst mitigating their negative impacts and enhance their value for the benefit of people through sustainable use.

- Targets:**
1. Ensure the persistence of key leopard populations in state protected areas and other important populations, including those of current marginal viability
 2. Reduce human leopard conflict
 3. Optimise wildlife conservation-related net benefits to local communities and landholders

Key Components	1. Protection and law enforcement	2. Ecological Monitoring and Management	3. Social, Economic and Cultural Framework	4. Building Conservation Capacity	5. Coordination, collaboration, and program management
Strategic Objectives	Objective 1. Ensuring effective protection of all leopard populations in Zimbabwe	Objective 2. Implementing effective ecological management to achieve viable and diverse populations that are within upper and lower acceptable limits to change in numbers and distribution	Objective 3. Implementing strategies that enhance the contribution of leopards to rural livelihoods, protected area management and national development	Objective 4. Ensuring that sufficient trained personnel, equipment, infrastructure, and financing are available and used efficiently and effectively for conservation of leopards	Objective 5. Ensuring effective coordination and collaboration with local, national, regional, and international stakeholders to implement this leopard conservation strategy and action plan.
Outputs	Output #1: Management, security, social, and law enforcement actions to minimise, illegal losses of leopards, their prey, and habitats, implemented	Output #2: Adaptive, evidence-based management to maintain viability of leopard populations implemented	Output #3: Fair distribution of financial benefits from leopards improved and tolerance for living with leopards increased	Output #4: Sufficient numbers of trained, equipped, motivated and effective personnel are deployed and operational	Output #5: Coordination mechanisms to assess and review adaptive leopard management and strategic planning established and operating

4. ACTION PLANS

4.1 Protection and Law Enforcement

Objective: Ensuring effective protection of all leopard populations in Zimbabwe

Output: Management, security, and law enforcement actions to minimise, illegal losses of leopards, their prey, and their habitats, implemented

KPI: Illegal killing of leopards maintained at less than 5% in all populations and less than 5% of leopard habitat encroached by settlement by 2027

MV: National level monitoring data on illegal activity, including trophy hunting, successful convictions, carcass and poisoning records, status, and trends of all leopard populations, verified data on extent of encroachment, if any, and area of available habitat.

NOTE: Several of the activities listed here are part of the National Elephant Management Plan, and the National Lion Management Plan, and plans for other key species such as rhino, would be included within the purview of the activities indicated by the National Elephant Management Plan (NEMP).

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
1. Ensure full compliance with hunting and guiding regulations and quotas set	All Safari Operators and Professional Hunters and Guides complying with hunting regulations and guidelines	Records and reports of non-compliance and penalties enforced	Immediate and ongoing	ZPWMA
2. Insist on returns, (including nil returns) being fully completed and submitted on time (as per ZPWMA deadline) and instigate penalties for non-compliance	Submission of incomplete and nil returns reduced to less than 2% of returns due to be submitted each year. Penalties for non-compliance in place and communicated to all operators, hunters and guides	Records of returns against quotas issued Records of penalties issued/actioned	Implemented immediately and ongoing	ZPWMA
3. Appropriate informer systems established and supported at national, regional, and local levels (NEMP)	1. An active informer system/network operating within each region at both regional and local levels by Jan. 2023 2. National level informer system targeting middle men and higher crime syndicates operating by Jan. 2023	Operational reports Records of arrests and successful prosecutions resulting from informer reports Records of payments for information	Immediate and ongoing	DG, ISM, RMs
4. For each key population introduce specialized training on leopards to existing (and required) rapid response anti-poaching units for deployment to all range areas	Training materials available on leopards biology, ecology, illegal trade and human-leopard conflict for rangers engaged in law enforcement All rapid response units received an initial training session and one follow up training session by Dec 2023	Training materials developed Record of training sessions (when, where and who were trained)	By Dec 2023	ZIWC, HRM, RM
5. Support community governance structures to do law enforcement in their landscapes	Training materials developed for Governance structures by Dec 2023 and training sessions conducted in at least 10 CBNRM areas by Dec 2024	Training materials Reports on training sessions	Start activities by June 2023	ZIWC, NGOs, CSPs

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
6. Improve investigation and prosecution of crimes (collection and preservation of evidence, genetic material, ballistics evidence, professional prosecution of cases, information for legal profession) particularly for trade in leopard skins.	1. At least two of law enforcement staff trained in scene of crime collection and preservation of evidence, ballistics evidence, etc. in each area/station level 2. Percentage of investigations resulting in successful prosecutions from each region greater than in 2022 3. Monthly liaison sessions on wildlife crime and law enforcement held with members of the judiciary	Staff training records Monthly reports Court records Minutes of meetings with judiciary (prosecutors and magistrates)	Immediate and ongoing	ISM, RMs, S/AMs
7. Set up local, regional, and national and intelligence databases*	National, regional and local databases recording and analysing illegal activity (nature, time and locality of activity and profiles of those involved if known) – using SMART	Inspection of operating SMART databases	Immediate and ongoing	ISM, RMs, S/AMs
8. Enhance international and transboundary collaboration in law enforcement particularly on the illegal trade in leopard skins and other body parts	1. Incentive schemes (see Section 4.3) that encourage the public and members of rural communities to contribute to law enforcement (e.g. through informer hotline) established in each region 2. Larger number of incidents of community contribution to law enforcement (e.g. whistle blowers) by Dec. 2023 3. Number of hotlines established and assessment of their performance	Record and analysis of operating incentive schemes and hotline reports Record and analysis of performance of hotlines	Immediate and ongoing	RMs and S/AMs
9. Identify, quantify, and reduce illegal settlements and encroachment in all legally designated wildlife areas	Illegal settlements reduced to less than 5% of wildlife areas by 2027 (i.e. in state and community protected areas)	Records and maps of illegal settlements and of wildlife land recovered	Ongoing to 2024	DG, RM, S/AMs, CET, CAMPFIRE Assoc., RDCs, (Ministry of Lands)
10. ZPWMA to undertake a study with the support of relevant stakeholders to determine the scale on the illegal use of leopard skin and body parts	Study completed and fully reported on by Dec 2023	Copy of final report	Study immediate completed by Dec 2023	DSS, CET, NCC
11. Engage traditional healers (THs) and leaders and the relevant associations e.g., ZINATHA on leopard conservation and encourage them to access skins	Measurable increase in access to legally obtained body parts by traditional healers Periodic sample surveys of THs access to body parts	ZPWMA records of providing leopard body parts to traditional healers	Annual review of items provided to THs	DSS CLES

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
and other body parts legally through ZPWMA				
I2. Improve control at ports of entry and exit by adequately training and building capacity of personnel	Training materials for customs officials on illegal wildlife trade developed and training sessions implemented	Training materials available Record of training sessions	Immediate and ongoing	CLES, ZIWC, CSP
13. Lobby for the establishment of a Wildlife Crimes Court	Five Functional Wildlife Crimes Court(s) established (No of meetings with Ministry of Justice, Legal and Parliamentary Affairs) by Dec 2024	No of courts established and records of cases dealt with by Wildlife Crimes Courts	Immediate and ongoing	DG and Ministry
14. Review potential impacts of special permits on sustainable utilization of leopards	Report on impacts of special permits on leopard populations by Dec 2023	Copy of review report Number of special permits issues	During 2023	DSS, CET, NCC

An example of a National level **Activity** being used as an **Output** at the regional level is provided below for Activity #3 from the table above. This provides the basis a national strategic activity to be defined more specifically to suit the local situation and in much greater detail at this level than is appropriate in the national Action Plan.

LAW ENFORCEMENT (at REGIONAL or LOCAL LEVEL)						
Output	Activities	Key Performance Indicators	Means of Verification	Time Frame	Indicative Costs	Lead agency
3. Appropriate informer systems established and supported at national, regional, and local levels	1. Recruit informers and contacts 2. Maintain hotline for whistle-blowers 3. Procurement of vehicles (4) and deploy strategically . Constant liaison with informers . Standardise rewards to informers	1. Number of arrests and successful convictions based on information from intelligence system 2. Number of incursions reported on/reacted to by local communities 3. Number of reports per informer leading to arrests and convictions	Validation of informer record Records and reports of training sessions Whistle-blower reports	Within one year and then ongoing	Vehicles Reward payments Telecommunications equipment Vehicle maintenance and fuel	ZPWMA

4.2 Ecological Monitoring and Management of Leopards

Objective: Implementing effective biological and ecological management to achieve viable populations that are within upper and lower acceptable limits to change in numbers and distribution

Output: Adaptive, evidence-based management to maintain viability of leopard populations implemented

KPI: Leopard populations within each sub-region are genetically and demographically viable, and within the preferred upper and lower limits in 2027

MV: Results on population trends in numbers, population and genetic structure, and viability from an agreed and implemented national monitoring plan

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
1. Establish and maintain a national collection of leopard tissue samples for genetic analysis and an associated database of leopard genetics	Appropriate collection and storage of tissue samples and database established and functioning by Jan 2024 Tissues analysed and reported on by Dec 2024	Stored tissue samples and records of accession and analyses conducted Reports of genetic analyses	Collection to start immediately and ongoing	ZPWMA DSS, NCC, CSPs
2. Monitor trends in all leopard populations using the most appropriate and cost-effective methods and tools for the areas being surveyed	National leopard monitoring plan developed and in place by March 2023 and in use in at least two areas by Oct 2023	1. Survey and patrol reports 2. Completed survey results for areas in which surveys took place	Monitoring plan by Mar 2023 and used by Oct 2023	DG, DSS, LCWG, CET, NCC, RMs, S/AMs
3. Define current leopard range and abundance, and explore options for extending range, and recovery of leopards, and potential to maintain connectivity between fragmented populations	1. Map of current leopard range and abundance based on survey results and other information available by Dec 2023 2. Estimates every two years of range expansion / contraction for each region based on all available information 3. Use and effectiveness of corridors assessed from ground sightings and reports, movements of satellite collared animals	Current estimate of leopard range and subsequent bi-annual estimates and associated maps Reports on leopard locations in database from ground sightings, spoor transects, citizen science reports and photos, satellite collar records.	Initial map by Dec 2023 Immediate and assessments every 2 years	DG, CET, NCC, RMs, S./AMs in conjunction with SOAZ, ZPHGA, CSPs, and CAMPFIRE Association
4. Develop a Citizen Science program for leopards (and large carnivores)	Platform and database for citizens to submit records of carnivore sightings and photos in place and being used	Records in Citizen Science database	Immediate and ongoing	NCC, CSPs,
5. Establish a data base for human-leopard conflict and control of problem leopards	Database in place and operating from area, region (or cluster), and national levels	Records in databases at each level	Immediate and ongoing	DG, DSS, CET, NCC, RMs S/AMs, RDCs

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
6. Use research findings, expert opinion, and informed public opinion to establish thresholds of potential concern (TPCs) to initiate management action in respect of changing trends in leopard populations and their prey	Thresholds of potential concern (TPCs) established for at least four key areas / habitats and selected indicators of change monitored every two years	Documented TPCs by Dec 2024 and their use in the selected areas by Dec 2022	Ongoing and by Dec 2024	NCC, CET and RMs, CSPs, and Conservancies
7. Carry out appropriate management actions when leopard populations (and prey and habitat) are projected to move beyond TPCs	Management actions taken in relation to TPCs being passed (i.e. above or below threshold). (e.g. capture and translocation, changing hunting quotas, hunting moratorium)	Records of management actions considered, actions taken and results	Ongoing	DG, DSS, CET, RM, S/AM, Conservancies
8. Produce a handbook to standardise a full range of methods for assessing leopard populations numbers and structure across the country.	Handbook written and being used in all regions and for all carnivores in the country by June 2024	Copies of handbook available and reports using the methods advocated	In use by June 2024	DG, DSS, CET, NCC and CSPs
9. Community-based monitoring of large carnivores introduced in CAMPFIRE areas where leopards are being hunted	In at least two areas communities are monitoring large carnivore presence and human-carnivore interactions and using the information to manage human carnivore conflict and carnivores by Dec 2024	Details of methods and guidelines provided to communities, training sessions, and community reports	Guidelines by mid 2023, Training by Dec 2023 Operating by June 2024	DG, DSS, CET, NCC and CSPs, RDCs
10. Monitor trophy quality (age, size, sex, skull measurements, body length, hunting effort) to establish trends and inform quota setting	1. Database and field recording protocols and forms established and operating by Dec. 2023 2. Annual analysis of trophies taken as % of quota, and trend in trophy quality and ages of trophies	Consolidated annual records of trophies taken Annual report of trophy quality by region for quota setting workshop	Dec. 2023, then annual and ongoing	DC, CET, NCC, RMs, SOAZ, ZPHGAZ, CAMPFIRE
11. Recognising the sensitivity of leopard population dynamics to interventions (legal and illegal), use modelling to explore potential outcomes of alternative management strategies (e.g., Management Strategy Evaluation - MSE)	Number of instances in which models were used to project alternative outcomes of lion management actions and policies Potential use of MSE explored by June 2023 and if appropriate introduced in Dec 2023	Management and associated modelling reports	Ongoing	CET, NCC, Researchers and Stakeholders

4.3 Social, Economic, and Cultural Framework

Objective: Implementing strategies that enhance the contribution of leopards to rural livelihoods, protected area management and national development

Output: Fair distribution of financial benefits from leopards improved and tolerance for those living with leopards increased

KPIs: 1. Annual assessment of leopard derived benefits shows more equitable distribution between deserving stakeholders and a stable or increasing contribution to national development. 2. Trends in number of incidents of human-leopard conflict decline annually

MV: Annual Reports on the distribution of revenues from consumptive and non-consumptive use of leopards and annual records and analyses of Human-Leopard Conflict

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
1. Provide incentives and promote partnerships and joint venture opportunities to strengthen leopard conservation, including across land use boundaries	1. Policy instruments that demonstrate and establish incentives to conserve leopards by June 2023 2. Improved levels and growing trends of private and community investment in leopard conservation measures by Dec 2024 3. Number of poaching incidents/number of arrests based on prior information and leads from communities / land holders reported annually	Documented policies and list of operating partnerships / joint ventures that promote leopard conservation and management Record of investments in leopard conservation measures assembled by leopard/carnivore coordinator	Immediate and ongoing	DG, CA, RDCs, Private sector, CSPs and Ministry ECTHI
2. Explore opportunities for building cooperation between protected areas and neighbouring land uses to enhance leopard/carnivore conservation - farm produce to tourist table - wild life friendly beef - community support projects and crafts - school support and visits - support for livestock and predator proof bomas	1. Cross border cooperative initiatives to enhance tolerance and conservation of leopards taking place in at least 10 sties by July 2024 and, 2. Corresponding decline in Human-leopard conflict.	Reports of cooperative ventures and records of human-leopard conflict	Immediate and ongoing	DG, DSS, RM, S/AM, CSPs, RDCs, and Conservancies
3. Facilitate the transparent distribution of the benefits and costs of leopard management and conservation	Policy instruments adopted that result in more transparent and equitable benefit distribution than benchmark assessed in 2023	Benchmark data and annual record of extent and distribution of leopard derived benefits (revenue, development projects, products received by beneficiaries) and costs of leopard/ carnivore conservation	Ongoing	DG, CA, NCC, RDCs, Private sector (ZPHGA)

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
<p>4. Implement effective techniques and land use strategies and planning to mitigate human-leopard conflict.</p> <p>Integrated land use planning</p> <ul style="list-style-type: none"> - Education and awareness - Accountable incident reporting, data collection and analysis - Community driven tactical interventions. - Social security, tolerance funds, payments for Ecosystem Services 	<p>1. Higher levels of investment (facilitation, funds and manpower) provided for mitigating human-leopard conflict by ZPWMA, communities and private sector partners</p> <p>2. Protocols for land use and Human-Leopard-Conflict developed and implemented by June 2023</p> <p>3. Declining trends in incidents of HLC – annually</p> <p>4. Leopard distribution extended in community-based conservation areas by Dec 2025</p>	<p>Records of human-lion conflict incidents (in HLC Database)</p> <p>Research report on strategies and protocols to develop wildlife-based land use system and mitigate HLC</p> <p>Records of lion distribution</p>	<p>Protocols developed by June 2023 and ongoing</p> <p>Initial research report by Dec. 2023 and annually</p>	<p>DG, DSS, NCC, CA, RDCs, Traditional Leaders, Private sector</p>
<p>5. Include information on leopards and their conservation in school curricula and promote environmental education in Communities adjacent to key leopard populations</p>	<p>1. Number and quality of leopard information packages developed and delivered to schools by June 2024</p> <p>2. 25% of schools in, or neighbouring, leopard/carnivore areas receiving and using information on leopards/carnivores by Dec 2024</p>	<p>1. Information packages developed</p> <p>2. Reports of delivery and use of leopard/carnivore conservation information packages</p>	<p>By Dec 2024 and Ongoing</p>	<p>ZPWMA, CLES, NGOs, CSPs Ministry of Primary and Secondary Education</p>
<p>6. Develop and implement an effective communication strategy for local regional and international audiences</p>	<p>Information strategy developed and launched by June 2024</p>	<p>Information strategy document</p>	<p>By June 2024 and ongoing</p>	<p>DG, DSS, PRM, NCC,</p>
<p>7. Promote/publicise positive examples of best practice in leopard conservation and management</p>	<p>Number of examples publicised</p>	<p>Record of articles publicised</p>	<p>Ongoing</p>	<p>ZPWMA, CET, PRM, CSPs</p>

4.4 Building Conservation Capacity

Objective: Ensuring that sufficient and appropriately trained personnel, equipment, infrastructure and financing are mobilised, available and used efficiently and effectively for conservation of leopards

Output: Sufficient numbers of trained, equipped, motivated and effective personnel are deployed and operational

KPI: Law enforcement, monitoring and research staff are trained equipped and deployed at levels that enable them to implement this action plan as specified in the previous three components

MV: KPIs for Components 1, 2, 3, and 5 are being met each year, individual staff training records, equipment registers, vehicle and staff deployments for leopard (and/or large carnivore) conservation.

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
1. Analyse current capacity and identify needs across all sectors	Capacity assessment and needs report completed by June 2023	Capacity assessment report	By June 2023	DG, DSS, RM, HRM, CSPs
2. Secure funding to support the implementation of the leopard conservation and management strategy	1. Funds and allocated budget for leopard conservation meet annual requirements for effective conservation as measured by KPIs for activities 3-8 below and those of Components 1, 2, and 3 2. More than 75% of revenue derived from leopards channelled into leopard conservation and management	Record of funds available (USD) and investment by ZPWMA, Private sector, NGOS, and CAMPFIRE in leopard conservation measures (Compiled annually by NC C	Ongoing	DG, DSS, NCC, NGOs, CSPs
3. Establish sustainable funding programs to build and maintain necessary human and material resources to meet leopard conservation objectives	1. Manpower density for protection of leopards (No. of km ² /operational field personnel) 2. Level of effective deployment of field staff (e.g. record % of available man days spent on patrol in the field - see example of records envisaged under Section 8 Notes on monitoring, page 25)	Consolidated record of number of field personnel and days operational (law enforcement, research and monitoring, elephant management) for each area in the leopard range compiled and reported on at annual LCWG meetings. Records of vehicle months, VHF radio operation, fully functional stations, operating research facilities, compiled and consolidated at station, area and regional levels and reports .	By June 2023 Immediate action for some key areas (e.g. Sebungwe and Zambezi Valley) and by June 2024 for all regions	DG, DSS, RM, S/AM, NCC, LCWG, CSPs, NGOs,
4. Initiate and/or maintain continuity in research and monitoring necessary for the conservation and adaptive management of leopards and their prey	1. Number of research programs 2. Research-person days spent on monitoring / assessing leopards populations in relation to TPCs 3. Research person days spent on monitoring leopard population parameters in each population/region	Research reports and papers on leopard conservation and management from ZPWMA staff and external researchers	Ongoing	DSS, CET, NCC, CSPs, Area Ecologists,

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
5. Strengthen, collaborate, and coordinate research and monitoring in all leopard range areas.	1. Number of researchers (internal and external), budgets, equipment, vehicles, and active research programmes increased by more than 25% by July 2023 and 50% by July 2024	Staff register, budget allocations, Asset register, research permits issued, MOUs with collaborators, reports and published papers on leopard conservation and management	Immediate and ongoing through 2023 and 2024 and beyond	DSS, CET, NCC, LCWG, CRPs,
6. Establish training and in-service retraining of personnel in all aspects of leopard conservation and management	Increased levels of training (50 to 100%?) compared to 2022 levels in: 1. Number of training days and programmes initiated 2. Number of staff trained (rangers, ecologists, extension officers) 3. Number of communities trained and implementing leopard management programmes 4. Number of leopard conservation campaigns conducted	Record of staff training and re-training in staff files and annual summary report of training Record of communities trained Record of training programmes Record of CSP contribution	Immediate and ongoing through to 2024	DSS, CET, NCC, HRM, ZIWC, CLES,
7. Strive to achieve best standards for leopard management and hunting	1. Best standards for leopard management in Zimbabwe, based on international standards, drafted and distributed to all practitioners	Record of best practices complied with/not complied with	By June 2023 and ongoing	DG, DSS, DoP, CET, NCC, HMS
8. Engage national, regional, and international expertise and capacity for leopard conservation.	1. Number of expert driven decisions made from Consultations 2. Number of collaborative and outsourced projects with external experts	Reports and record of collaboration with external experts	Ongoing	DSS, CET, NCC
9. Align leopard (and large carnivore) work with the ZimParks Research Strategy framework.	Number of Leopard research and conservation projects that align with ZimParks Research Strategy and this Action Plan	Reports an analysis of alignment of projects with research strategy and this Action Plan	Ongoing	DSS, CET, NCC, LCWG
10. Establish effective reporting procedures that enable capture/consolidation of data from field to Head Office levels	Implement SMART and/ equivalent effective data capture and management systems	Operational Database	Ongoing 2023 - 2027	ZPWMA all levels

4.5 Coordination and Programme Management

Objective: Ensuring effective coordination and collaboration with local, national, and international stakeholders to implement this leopard conservation strategy and action plan

Output: Coordination mechanisms to assess and review adaptive leopard management and strategic planning established and operating

KPI: National Carnivore Coordinator appointed, Large Carnivore Working Group established and active, regional leopard conservation committees with appropriate stakeholder membership and participation appointed and active, and an information dissemination programme operational

MV: National Carnivore Coordinator’s quarterly report, minutes of meetings, and records of completed planned actions/activities, record of Large Carnivore Working Group meetings and activities.

NOTE: *Given the overlap in Objectives, Outputs and Activities between the leopard and lion conservation strategies, and the obvious applicability of these to other large carnivores, it may be appropriate to establish a full time position for a National Carnivore Coordinator*

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
1. Identify and capacitate a national large carnivore technical coordinator to drive program implementation for leopards and other large carnivores	National Carnivore Coordinator (NCC) identified, appointed, and resourced by March 2023	NCC in place, resourced, and operating	Operating by May 2023	DG
2. Merge the existing carnivore conservation and management committees (established by other plans) to form a large carnivore working group	Large Carnivore Working Group established by May 2023	Agenda and report of first meeting of the committee	June 2023	DG, DSS, NCC
3. Strengthen links with neighbouring states to confer on the management of shared leopard populations, particularly in relation to TFCAs	1. Consultative meetings held with neighbouring states on shared leopard populations at least twice each year 2. Joint cross border projects initiated and completed	Record of attendance at and reporting to regional and international leopard conservation bodies of which Zimbabwe is a member Record of projects initiated/completed	Ongoing and projects initiated in 2023	DG, DSS, CET, NCC, TFCA Coordinator
4. Strengthen coordination between relevant stakeholders in the leopard conservation strategy.	1. Regular meetings and a workshops convened with the hunting industry on hunting and large carnivore management issues 2. Key issues resolved by June 2024	Record of meeting and workshop proceedings Record of large carnivore hunting issues resolved	Immediate and ongoing	DG, DoP, RM, S/AM, NCC, CET, CSPs, SOAZ

Key Activities/Actions	Key Performance Indicators	Means of Verification	Time Frames	Responsibility
6. Hold an annual technical large carnivore workshop including all relevant and interested parties.	The first meeting is held before the end of 2023 and then each year thereafter	Record of meeting and who participated each year	First meeting in 2022	DSS, NCC, CET
7. Share the progress on the implementation of the plan with the relevant and interested stakeholders	Half yearly progress reports prepared and circulated to stakeholders in July and December	Copies of progress reports and circulation list	Ongoing each year	NCC
8. Develop an annual implementation plan with budgetary requirements	Annual plan developed by NCC and submitted to DSS and DG in December each year	Copies an annual plan	First plan by Dec 2023	CET, NCC

5. NOTES ON MONITORING

Monitoring of a wide range of activities and actions should be a central component in implementing the action plan. It will require careful thought as to precisely what should be monitored and in the design of the recording protocols and forms that will be used. Ideally records should in a form that can be aggregated from field to head office level to provide local, regional and national level statistics of progress in lion conservation and management. The following table (adapted from the Zimbabwe rhino policy and management framework 2011-2016) provides an example of the data that needs to be compiled for each population to gauge progress in population status, performance and law enforcement.

SEE NOTES BELOW	Name of person completing this data form					
	Date on which this data form was completed					
	Name of area covered					
	Size of area in km ²					
	YEAR	2020	2021	2022	2023	2024
	Date of population estimate					
	Leopard population estimate (number) (as per National Monitoring Plan)					
	No of natural mortalities					
	No killed illegally					
	No killed on PAC					
	No killed on trophy hunts					
	No of carcasses found that died in previous years					
	Total mortalities					
1	No of leopard poaching incursions/attempts detected					
	No of incursions/poaching attempts intercepted					
	Leopard poachers arrested during the year					
	- How many were given bail					
	- How many were given jail sentences					
2	- Of these how many received mandatory sentences					
	Number of poachers killed during the year					
	Number of firearms recovered from poachers					
3	Total man-days spent on patrol					
4	Average number of staff available to patrol at any one time					
5	Total number of vehicle months available during the year					
6	% of the area that has secure HF radio communications					
7	% of the year that that the VHF system was functional					
8	Number of incursions reported on / reacted to by local community					
9	Hunting regulations infringements					

NOTES:

1	These are incursions into the area by poachers clearly intending to use firearms, poison, heavy snares, etc to kill elephants, rhinos, lions, leopards, or attempted incursions that were intercepted before they took place
2	Mandatory sentences for elephant / rhino / lion / leopard poachers or dealers are 9 years for first offence and 11 years on second
3	This is actual patrolling effort expressed in patrol man-days carried out per year (not total staff x 365 days)
4	This is the average number of men (including deployments from other areas) in the field at any one time
5	Each vehicle available for law enforcement operations should be multiplied by the number of months it was available for field operations
6	e.g. if only three-quarters of the area has VHF radio reception then this figure will be 75
7	e.g. if the VHF radio system was only functional for 3 months of the year then this figure would be 25
8	Refers to the number of times the local community (not paid informers) volunteered information on actual or potential incursions of elephant/rhino/lion/ leopard poachers, and/or freely provided information/help leading to interception/ arrests
9	Refers to infringements of the regulations by safari operators/hunters/guides (e.g. shooting under age trophies, exceeding quotas, transfers of quotas from other areas, hunting from vehicles, baiting and hunting on park boundaries, etc.

Note that data required for items 3-9, are those that would be required for an assessment of law enforcement across the parks and wildlife estate and are part of the monitoring and reporting required under the rhino, elephant, lion, and leopard and other carnivore management plans.

6. CONCLUDING COMMENT

This is an ambitious plan that mirrors many of the components that form part of the rhino, elephant, and lion conservation and management plans. All of these action plans involve overlapping activities, particularly in law enforcement, social, economic and cultural frameworks and in capacity building. There is thus a need to find ways of bring these efforts together in a coordinated manner that will work at all levels, from national, to regional, to local areas in both state protected areas and private and communal wildlife areas. This may entail appointing staff to specifically drive and coordinate the implementation of the suite of species specific action plans at each level.

Establishing and maintaining a Large Carnivore Working Group holds the promise of being able to draw on a wider range of scientific and technical expertise to assist ZPWMA in the implementation of this action plan and it will be important to nurture the voluntary input that this entails.

7. REFERENCES

Note: This list of references includes many that are not cited in the text above but have served to inform the development of this conservation strategy and action plan.

- Balme, G. A., Batchelor, A., de Woronin Britz, N., Seymour, G., Grover, M., Hes, L., Macdonald, D. W., & Hunter, L. T. B. (2013). Reproductive success of female leopards *Panthera pardus*: The importance of top-down processes. *Mammal Review*, 43(3), 221–237. <https://doi.org/10.1111/j.1365-2907.2012.00219.x>
- Balme, G. A., Lindsey, P. A., Swanepoel, L. H., & Hunter, L. T. B. (2014). Failure of Research to Address the Rangewide Conservation Needs of Large Carnivores: Leopards in South Africa as a Case Study. *Conservation Letters*, 7(1), 3–11. <https://doi.org/10.1111/conl.12028>
- Braczkowski, A. R., Balme, G. A., Dickman, A., Macdonald, D. W., Johnson, P. J., Lindsey, P. A., & Hunter, L. T. B. (2015). Rosettes, Remingtons and Reputation: Establishing Potential Determinants of Leopard (*Panthera pardus*) Trophy Prices Across Africa. *African Journal of Wildlife Research*, 45(2), 158. <https://doi.org/10.3957/056.045.0158>
- Bunnefeld, N., Hoshino, E., & Milner-Gulland, E. J. (2011). Management strategy evaluation: A powerful tool for conservation? *Trends in Ecology & Evolution*, 26(9), 441–447. <https://doi.org/10.1016/j.tree.2011.05.003>
- Child, G. and Savory, C. R. (1964) The distribution of large mammal species in Southern Rhodesia. *Arnoldia*, 1(14), 1-15.
- Dutta, T., Sharma, S., Maldonado, J. E., Wood, T. C., & Seidensticker, J. (2012). A reliable method for individual identification and gender determination of wild leopards (*Panthera pardus fusca*) using non-invasive samples. *Conservation Genetics Resources*, 4(3), 665–667. <https://doi.org/10.1007/s12686-012-9618-5>
- Dutta, T., Sharma, S., Maldonado, J. E., Wood, T. C., Panwar, H. S., & Seidensticker, J. (2013). Fine-scale population genetic structure in a wide-ranging carnivore, the leopard (*Panthera pardus fusca*) in central India. *Diversity and Distributions*, 19(7), 760–771. <https://doi.org/10.1111/ddi.12024>
- Funston, P. J., Groom, R. J., & Lindsey, P. A. (2013). Insights into the Management of Large Carnivores for Profitable Wildlife-Based Land Uses in African Savannas. *PLOS ONE*, 8(3), e59044. doi: 10.1371/journal.pone.0059044
- Gillson, L. & Duffin, K.I. (2007) Thresholds of potential concern in the management of African savannahs. *Phil. Trans. R. Soc. B* (2007) 362, 309–319 doi:10.1098/rstb.2006.1988
- Gillson, L., Biggs, H., Smit, I. P. J., Virah-Sawmy, M., & Rogers, K. (2019). Finding Common Ground between Adaptive Management and Evidence-Based Approaches to Biodiversity Conservation. *Trends in Ecology & Evolution*, 34(1), 31–44. <https://doi.org/10.1016/j.tree.2018.10.003>
- Havmøller, R. W., Tenan, S., Scharff, N., & Rovero, F. (2019). Reserve size and anthropogenic disturbance affect the density of an African leopard (*Panthera pardus*) meta-population. *PLOS ONE*, 14(6), e0209541. <https://doi.org/10.1371/journal.pone.0209541>
- Hayward, M. W., Henschel, P., O'Brien, Hofmeyr, M., Balme, G. & Kerley, G. I. H. (2006). Prey preferences of the leopard (*Panthera pardus*). *Journal of Zoology*, 270, 298–313.
- Hatton, I. A., McCann, K. S., Fryxell, J. M., Davies, T. J., Smerlak, M., Sinclair, A. R. E., & Loreau, M. (2015). The predator-prey power law: Biomass scaling across terrestrial and aquatic biomes. *Science*, 349(6252), aac6284. doi: 10.1126/science.aac6284

- Joubert, C. J., Tarugara, A., Clegg, B. W., Gandiwa, E. and Muposhi, V. K. (2020) A baited-camera trapping method for estimating the size and sex structure of African leopard (*Panthera pardus*) populations. *MethodsX*, 7, 1-12.
- Kuiper, T. R., Loveridge, A. J., Parker, D. M., Johnson, P. J., Hunt, J. E., Stapelkamp, B., Sibanda, L. & Macdonald, D. W. (2015). Seasonal herding practices influence predation on domestic stock by African lions along a protected area boundary. *Biological Conservation*, 191, 546–554. doi: 10.1016/j.biocon.2015.08.012
- Lichtenfeld, L. L., Trout, C., & Kisimir, E. L. (2014). Evidence-based conservation: predator-proof bomas protect livestock and lions. *Biodiversity and Conservation*, 24(3), 483–491. doi: 10.1007/s10531-014-0828-x
- Lindsey, P. A., Romanach, S. S., Tambling, C. J., Chartier, K. and Groom, R. (2011) Ecological and financial impacts of illegal bushmeat trade in Zimbabwe. *Oryx*, 45(1), 96–111.
- Loveridge, A. J., Kuiper, T., Parry, R. H., Sibanda, L., Hunt, J. H., Stapelkamp, B., Sebele, L. & Macdonald, D. W. (2017). Bells, bomas and beefsteak: complex patterns of human-predator conflict at the wildlife-agropastoral interface in Zimbabwe. *PeerJ*, 5, e2898. doi: 10.7717/peerj.2898
- Loveridge, A.J., Sousa, L. L., Seymour-Smith J. L., Mandisodza-Chikerema, R. and Macdonald, D. W. (2022) Environmental and anthropogenic drivers of African leopard *Panthera pardus* population density. *Biological Conservation* 272. <https://doi.org/10.1016/j.biocon.2022.109641>
- Loveridge, A.J., Mandinyenya, B., Van der Westhuizen, H., Seymour-Smith, J.L, Sibanda, A., Sousa, L.L. 2022. Report on lion and leopard populations from camera trap surveys in Gonarezhou National Park, Zimbabwe. Unpublished report. Gonarezhou Conservation Trust and Wildlife Conservation Research Unit. 15pp.
- Naude, V. N., Balme, G. A., O’Riain, J., Hunter, L. T. B., Fattebert, J., Dickerson, T., & Bishop, J. M. (2020). Unsustainable anthropogenic mortality disrupts natal dispersal and promotes inbreeding in leopards. *Ecology and Evolution*, 10(8), 3605–3619. <https://doi.org/10.1002/ece3.6089>
- Oriol-Cotterill, A., Valeix, M., Frank, L. G., Riginos, C. and Macdonald, D. W. (2015) Landscapes of coexistence for terrestrial carnivores: the ecological consequences of being downgraded from ultimate to penultimate predator by humans. *Oikos*, 124 (10), 1263-1274.
- Packer, C., Brink, H., Kissui, B. M., Maliti, H., Kushnir, H., & Caro, T. (2011). Effects of Trophy Hunting on Lion and Leopard Populations in Tanzania. *Conservation Biology*, 25(1), 142–153. <https://doi.org/10.1111/j.1523-1739.2010.01576.x>
- Searle, C. (2021). Status & ecology of leopard (*Panthera pardus*) in African conservation landscapes [Http://purl.org/dc/dcmitype/Text, University of Oxford]. <https://ora.ox.ac.uk/objects/uuid:49b6354a-4285-4831-aa09-3924856766e1>
- Searle, C. E., Bauer, D. T., Kesch, M. K., Hunt, J. E., Mandisodza-Chikerema, R., Flyman, M. V., Macdonald, D. W., Dickman, A. J., & Loveridge, A. J. (2020). Drivers of leopard (*Panthera pardus*) habitat use and relative abundance in Africa’s largest transfrontier conservation area. *Biological Conservation*, 248, 108649. <https://doi.org/10.1016/j.biocon.2020.108649>
- Stein, A.B., Athreya, V., Gerngross, P., Balme, G., Henschel, P., Karanth, U., Miquelle, D., Rostro-Garcia, S., Kamler, J.F., Laguardia, A., Khorozyan, I., Ghoddousi, A., 2020. *Panthera pardus* amended version of 2019 assessment). In: The IUCN Red List of Threatened Species 2020: e.T15954A163991139. <https://doi.org/10.2305/IUCN.UK.2020-1.RLTS.T15954A163991139.en>. Downloaded on 15 July 2022.
- Swanepoel LH, Balme G, Williams S, Power RJ, Snyman A, Gaigher I, Senekal C, Martins Q, Child MF. 2016. A conservation assessment of *Panthera pardus*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. *The Red List of Mammals of South Africa*,

Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

- Tarugara, A., Clegg, B. W., Gandiwa, E., & Muposhi, V. K. (2019). Cost-benefit analysis of increasing sampling effort in a baited-camera trap survey of an African leopard (*Panthera pardus*) population. *Global Ecology and Conservation*, 18, e00627. <https://doi.org/10.1016/j.gecco.2019.e00627>
- Trouwborst, A., Loveridge, A. J. and Macdonald, D. W. (2019) Spotty Data: Managing International Leopard (*Panthera pardus*) Trophy Hunting Quotas Amidst Uncertainty. *Journal of Environmental Law*, 2019, 0, 1–26
- van der Meer, E., Badza, M. N. and Ndhlovu, A. (2016) Large Carnivores as Tourism Flagship Species for the Zimbabwe Component of the Kavango Zambezi Transfrontier Conservation Area. *African Journal of Wildlife Research*, 46(2):121-134
- van der Meer E and Dullemeont H (2021) Human-carnivore coexistence: factors influencing stakeholder attitudes towards large carnivores and conservation in Zimbabwe. *Environmental Conservation* 48: 48–57. doi: 10.1017/ S0376892920000491
- Vucetich, J. A., Burnham, D., Johnson, P. J., Loveridge, A. J., Nelson, M. P., Bruskotter, J. T., & Macdonald, D. W. (2019). The value of argument analysis for understanding ethical considerations pertaining to trophy hunting and lion conservation. *Biological Conservation*, 235, 260–272. doi: 10.1016/j.biocon.2019.04.012
- ZPWMA NDF (2016) Preliminary non-detriment finding assessment: preliminary report for leopards in Zimbabwe. December 2012. Harare.
- ZPWMA (2018) Zimbabwe’s review of the Convention on International Trade in Endangered Species (CITES) leopard (*Panthera pardus*) quota. AC30 Doc. XX Annex, Harare, 12pp.

8. ANNEXES

8.1 Terms of Reference for Large Carnivore Working Group

Function: To annually review the National Leopard Conservation and Strategy and Action Plan and progress in implementing the Action Plan; to review budget and policy decisions by the Leopard / National Carnivore Coordinator; to provide guidance to the Ministry of Environment, Climate, Tourism and Hospitality Industry, and the Parks and Wildlife Management Authority on matters relating to the conservation and management of leopards in Zimbabwe.

Role of Individual Group Members: The role of the individual members includes:

1. Understanding the strategic implications and outcomes of initiatives being pursued through the Action Plan Outputs;
2. Appreciating the significance of the Action Plan's implementation for major stakeholders and for the future of leopard conservation;
3. Being committed to and actively involved in, implementing the most efficient and effective Action Plan;
4. Being willing to suggest changes to the Action Plan or any regional/local action plan to achieve efficiency and effectiveness.

Duties: The Committees primary responsibilities include:

- Agreeing and recommending on major technical decisions concerned with Large Carnivore conservation and management;
- To meet and discuss priority large carnivore conservation issues
- To review large carnivore trophy hunting and provide recommendations to improve the sustainability and ethical practice of trophy hunting
- To make recommendations on captures and translocation and assist in the development of protocols to guide capture and translocation of large carnivores
- To identify areas for large carnivore recovery and connectivity and make appropriate recommendations
- To assist with recommendations on areas of excess and depleted large carnivore populations
- To identify and help develop appropriate methods for problem animal management
- To assist in developing reports for international conventions and position statement with regard to large carnivore conservation for the country
- Developing recommendations on policy issues when appropriate;
- Overseeing the monitoring and implementation of the Action Plans;
- Advising the ZPWMA and the NCC on sourcing of funds;
- Monitoring funding, expenditure and effectiveness.

Composition: The members of the Large Carnivore Working Group:

1. Director Scientific Services (Chair)
2. CET/NCC (Secretarial);
3. Representatives of ZPWMA, Ministry, CAMPFIRE, ZRP;
4. Carnivore researchers in Zimbabwe
5. Private sector, Wildlife Industry, and NGOs/CSPs representatives

Time Frame: The Committee will meet at least once a year, and can be called upon to meet more frequently as the need arises.

Minutes and Meeting Papers: The Coordinator(s) will record Minutes. Minutes will be circulated within one month of Committee meetings. The Coordinator(s) will keep a record of resolutions and action points up to date.

Recommended actions may be tabled without a meeting by a signed unanimous consent circulated, compiled, and maintained by the respective Coordinators.

Quorum Requirements: A quorum exists when [75%] of the Committee members are present.

8.2 Terms of Reference for the National Carnivore Coordinator

Function: To coordinate lion and leopard (and other large carnivore) management in Zimbabwe; to work with stakeholders including the National and Regional Committees, ZPWMA, communities, private landowners, safari operators, and researchers

Duties: The Large Carnivore Coordinator's duties include:

1. Coordinating major technical decisions concerned with large carnivore conservation and management;
2. Developing and implementing agreed large carnivore policy;
3. Ensuring the successful implementation of all required actions;
4. Advising the Large Carnivore Conservation Committee;
5. Liaising with stakeholders;
6. Collecting, collating and disseminating required reports under the Action Plan;