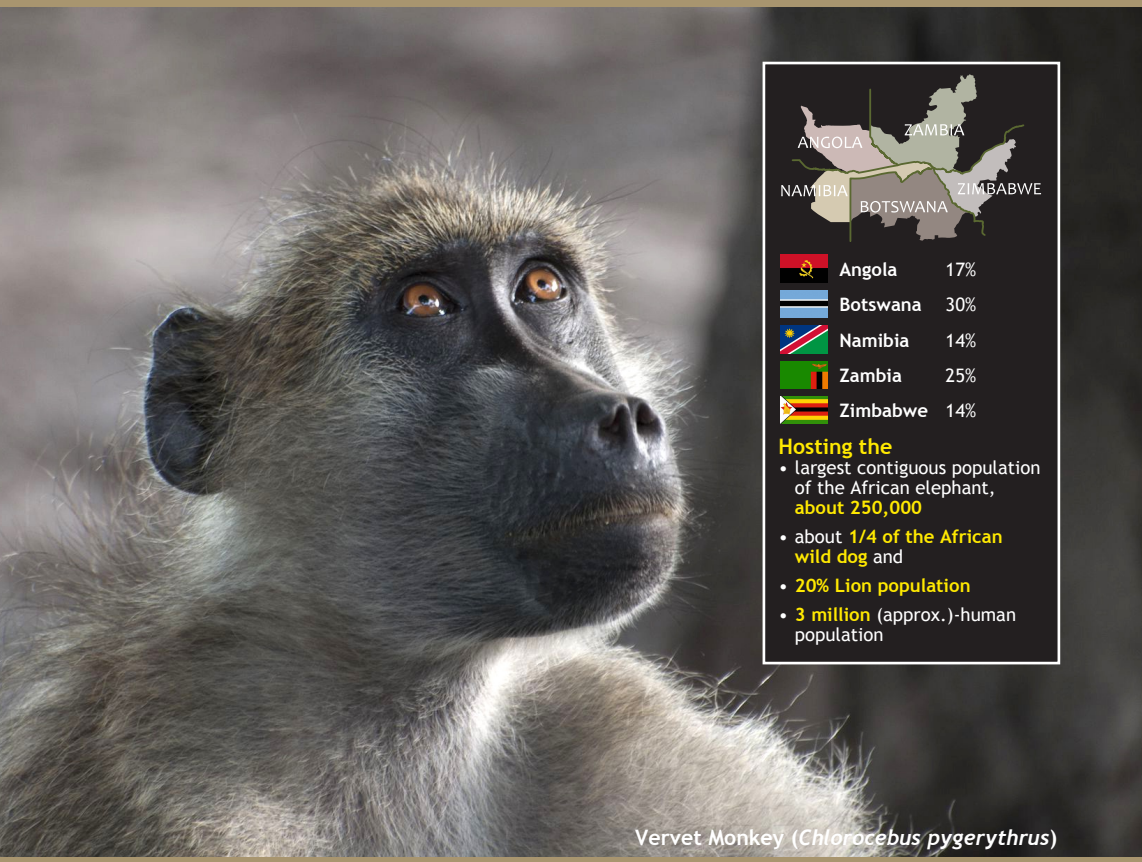
KAVANGO ZAMBEZI
TRANSFRONTIER CONSERVATION AREA (KAZA TFCA)

A MANUAL for REDUCING and MITIGATING HUMAN-PRIMATE CONFLICT (HPC)



Vervet Monkey (*Chlorocebus pygerythrus*)

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Abbreviations

HPC	Human Primate Conflict
HWC	Human Wildlife Conflict
KAZA TFCA	Kavango-Zambezi Transfrontier Conservation Area
PA	Protected Areas

KAZA Mission

"To sustainably manage the Kavango Zambezi ecosystem, its heritage and cultural resources based on best conservation and tourism models for the socio-economic wellbeing of the communities and other stakeholders in and around the eco-region through harmonisation of policies, strategies and practices"

1. Introduction

Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA) is a transboundary collaborative initiative of five Partner States; Angola, Botswana, Namibia, Zambia and Zimbabwe, in the conservation of shared natural resources and the development of the communities in and around the landscape. The TFCA is a mosaic of multiple land uses composed of:

- Protected areas (PAs) in the form of: national parks; game reserves;
- wildlife/game management areas; forest reserves; and conservancies/ community concessions areas;
- and Communal areas (settlement, pastoral, and arable farming).

There are about 3 million people settled across the KAZA landscape. The human population is mainly rural, largely dependent on subsistence pastoral and arable agriculture. The multiple land use status of the KAZA landscape present many development challenges and opportunities for the resident communities.

Figure 1: Chacma baboon (Papio ursinus).

Human-primate conflict (HPC) is a subset of human wildlife conflict, defined as any human primate interaction which results in negative effects on wellbeing of humans and the conservation of primates and their environment. Human primate relationships are complex, ranging from relatively peaceful coexistence to extreme levels of hostility. In the KAZA TFCA, locals live alongside two widely distributed primate species namely baboons and monkeys which can impose costs upon local people that are frequently cited as the drivers of conflict, including crop feeding and destruction of stored food, depredation upon livestock, aggressive interactions with humans, damage to property, and disease transmission in both directions.

As human populations continue to grow and people make deeper incursions into natural habitats through agriculture, mining, settlements and infrastructure developments, human primate interactions and conflicts will become more widespread and prevalent. Effective human-primate conflict mitigation is difficult to implement because it requires a complex set of social and technical measures that need to be combined flexibly at different temporal and spatial scales.

HPC mitigation measures can be implemented directly within the conflict zone or rely heavily on official policy beyond the conflict zone. Methods can also be short term, for example traditional deterrent and disturbance methods. They can also be long term for example fencing, land use planning, education and awareness raising programmes, translocation, compensation schemes and community conservation.

For the purpose of this manual, baboons and monkeys will be used as primary examples of primates as they are the species widely found in the KAZA TFCA region.

Figure 2: Vervet monkey (Chlorocebus pygerythrus)

1.1 Goal of the manual

The overall goal of this manual is to:

- improve the understanding of conflict between people and primates and
- assist the affected communities in applying best practice management to reduce and mitigate the conflicts.

1.2 Objectives of the manual

The objectives of this manual are to:

- Equip users of the manual with knowledge on human-primates conflicts; and
- Assist users of the manual to understand and apply best management practices in reducing and mitigating human primates conflicts.

1.3 Targeted users of the manual

- Farmers (subsistence and commercial) experiencing and affected by human primates conflicts.
- Wildlife managers and extension officers.
- People interested in coexistence of people and primates.

2. Human Primates Conflicts and its management

The recent rapid escalation of human-wildlife conflict involving primates reflects today s realities, that is, previous primate habitat has suddenly turned into human dominated habitat. Primates species commonly found in KAZA TFCA are baboons and monkeys. These are the most challenging of all the larger mammals to control because they are so intelligent. Baboons are among the hardiest of primate pests because they are so adaptable. They also breed rapidly in response to culling.

Other primates besides baboons also target human foods making conflict a major threat to the survival of groups in a growing number of primate populations. The factors generating conflict namely human population growth, conversion of wild lands to agriculture, compression of existing primate populations and primates adapting to a new foraging context, will continue to play a role in the future of primates. Human primate situations can escalate when local people or institutions are unable to deal with the conflict effectively. Where possible, people assigned to resolving a conflict situation should already have, or be trained to acquire, the necessary expertise.

Furthermore, simply arriving at a site and taking an interest in conflict can lead to problems in itself, since it immediately raises expectations that a solution will be forthcoming. If the needs of the local people are not addressed, conflict levels may increase both between humans and primates, and among humans about the value of primates. It is crucial to understand the local issues related to the conflict, and to assess how you are equipped to address the problem to avoid careless action when implementing any conflict mitigation strategy.

2.1 Behavioural traits of primates

Recognizing and easing underlying social tensions is fundamental to effective conflict mitigation. The issues surrounding human primate conflict will sometimes be site specific, but a broader understanding of similarities across different sites is beneficial when designing and implementing any conflict mitigation program.

Certain members of primates namely monkeys and baboons share traits such as curiosity, large social groupings, flexible and omnivorous diets, high agility, adaptation to living on the ground and bold temperaments, allowing them to thrive in areas of cultivation and human settlement, including tourist lodges and religious sites.

Detection of danger

- Baboons and monkeys are widely found in rural and urban areas of the KAZA TFCA. The two species have well developed eyesight, which they primarily rely upon to detect danger.
- Their eyesight, apparently the most developed amongst the mammal's species, is particularly attuned to movement, which they are able to detect quickly even at long ranges.
- It is practically impossible to approach a troop of baboons unnoticed, for the simple fact that if you can see them they can definitely spot you well before approaching too close.
- Where they detect even minute changes to routine and obstacles they are not familiar with, they will first avoid it, an observation that must be exploited to provide good repellence. Baboons are observant and quickly recognize weak points in the various preventative measures placed against them.

Social systems

- Baboons and monkeys have a well-developed and disciplined social structure governing their behaviour. During foraging the dominant males remain fairly well hidden relying on the sub-adults to detect danger however when commuting it is the dominant troop males that determine direction and lead the troop though not often from the front, more by audial grunts.
- The social systems are affected by three main ecological factors namely distribution of resources, group sizes and predation. Within a social group, there is a balance between cooperation and competition.
- Cooperative behaviours include social grooming (removing skin parasites and cleaning wounds), food sharing and collective defence against predators or of a territory.

Communication

- Communication of the primates relies on their sense of smell for many aspects of social and reproductive behaviour. Specialised glands are used to mark territories.
- They also use vocalisations, gestures and facial expressions to convey their psychological state. Like humans, chimpanzees can distinguish the faces of familiar and unfamiliar individuals.

2.1 Behavioural traits of primates (cont)

Diet and feeding

- Most primates include fruit in their diets to obtain easily digested nutrients including carbohydrates and lipids for energy.
- Primates prefer fruit above all other food items and even seeks out and eats them when they are not abundant. They also eat leaves and leaf buds, seeds, blossoms, stems, pith, bark and resin. Insects and meat make up a small proportion of their diet.
- Baboons move in predictable patterns along established paths or roads while foraging but also establishing their own paths particularly in broken country along the side of steep slopes mostly inaccessible to other animals that become more conspicuous the closer these paths occur to their night roosts.

Use of tools

- Primates are known to use tools both in the wild or when in captive. The use of tools by primates is varied and includes hunting (mammals, invertebrates and fish), collecting honey, processing food (nuts, fruits, vegetables and seeds), collecting water, weapons and shelter.

Roosting

- Baboons sleep in a well-defined roost usually in tall trees in a wooded gully or at the base of a hill or in thick dense riverine vegetation. These roosts can often be recognised from the air as clearly defined paths may be seen emerging from them in a pattern similar to the spokes of a bicycle wheel.
- The troop may have several other temporary roosts nearer the crop, which they will use for convenience, depending on where their preferred food source is at any one time.
- Roosts are recognised by the pungent smell emanating from them, as well as the ground beneath being devoid of vegetation (depending on the level of occupation).
- Interestingly there is increasing observations that indicate an association with bush pig that forage beneath the roost feeding on baboon faeces particularly when enriched during crop raiding forays

2.2 Common problems caused by primates

Human primate conflict occur in a variety of settings including farms, roads, temples, villages, towns and contexts resource overlap, food provisioning and tourism. Below are some of the common problems that are caused by interactions of humans and primates (baboons and monkeys mainly) in KAZA TFCA.

Damage of crops

- Damage of crops that results from invasion of crop fields by primates like baboons and monkeys for feeding can be seasonal. It is influenced by availability of both crops and wild food resources, and intensity may vary as a function of local crop assemblages, planting patterns, growth stage, and ripening periods, with certain crops and developmental stages being consumed preferentially.

2.2 Common problems caused by primates (cont)

- Baboons cause great devastation to cereal crops that include maize, pine plantations, sugarcane and sometimes wheat which they chew like sugar cane spitting out the pith.
- Primates also consume ripe agricultural fruits most often during periods of wild fruit scarcity, but certain seasonal crops such as mango were targeted when available, irrespective of wild fruit availability.
- Hence, crop consumption may be a fall back strategy, but also a preferential means of accessing a high energy food.

Attacks on humans

- Attacks on people by free ranging primates occur mostly in the context of tourism and food provisioning (where primates are also well habituated to people), and in areas of high anthropogenic disturbance, such as on the edge of villages, in towns, and tourist sites.
- Baboons are more afraid of men than of women, of women than children. But being energetic rather than lackadaisical improves anyone's success, a fact that many farmers in KAZA TFCA already know.
- Baboons are not considered dangerous, however, where little resistance is put up whilst crop raiding, they have learned to intimidate particularly women and children working in lands in the communal areas in order to raid the crop.
- Reports of child kidnapping and aggression toward humans is on the increase in urban areas that seldom occurs in natural populations, unnatural behaviour not ever seen in the wild.

Predation of livestock

- Occasionally baboons can be a problem predating on livestock, particularly lambs.
- Species that include small mammals in their natural diet, such as baboons and chimpanzees, likely pose a greater risk to livestock.
- For example, Chacma baboons (Papio ursinus) on Gokwe Communal Land, Zimbabwe, predate young goats and sheep, with over half of total livestock killing (52 percent of 241 killings) across three years attributed to baboons

Transmission of zoonotic diseases

Primates can spread many diseases to people and can cause severe injuries. Examples of a primate that can transmit diseases to people are through monkey bites which can include serious wound infections, herpes B virus, and rabies. If a person is bitten or scratched by a monkey, the wound should be thoroughly cleaned with soap and water and seek medical attention.

Figure 3: Occasionally, baboons predate on livestock and in the wild on impala calves as in the photograph.

3. Methods of reducing and mitigating human primates conflicts

Effective human-primates conflicts resolution requires multifaceted approaches, which acknowledge that conflict is a result of not simply economic loss but also deep rooted cultural values and clashes among human groups with different interest and values. The challenge in conflict mitigation is to understand the crop-raiding behaviour and find better ways to manipulate the costs and benefits of raiding, for example, by using up time, increasing risks, or decreasing benefits. Methods of control should also consider the human context, past, present, and future. Changing crop varieties may help. Furthermore, mitigation techniques have to manipulate costs and benefits by using up time, increasing risks or decreasing benefits sufficiently to push raiders back to natural foraging.

3.1 Repellents

- Use of repellents in reducing and mitigating HPC is a traditional method that aims to deter primates like baboons and monkeys having access to vulnerable crop fields. Basic types of visual, sound, and chemical substances that deter baboons from approaching or settling in crop fields.
- Widely used visual repellent are scarecrows. These are often ineffective at deterring baboons from entering certain areas, as most primates will readily habituate to them.
- Stock whips, home-made pipe bangers and bells are the traditional sound repellents. Caution is required when considering any visual, sound and chemical repellents as they may displace target primates to new locations and farms or impact non-target wildlife and humans.
- Vulnerable crops can be sprayed with chemical repellent, such as a bittering agent, that makes that gives an unpleasant experience to the baboons. Capsicum solution (hot chilli oil) has been used on plants raided ny primates, but this method can reduce the palatability of crops.

3.2 Guarding crops

- Many farmers use common traditional practices to reduce and mitigate HPC in KAZA TFCA and in other regions across the world where there exists a primate-agriculture interface. Active guarding of the crops throughout the day and not only on predictable times is important to reduce crop loss. However, guarding and chasing are time and labour intensive and there is increased risk of injury.
- Understanding when primates target certain areas may enable people to direct their resources more effectively. Watch towers are widely used to provide shelter to the guards especially those who deal with chronic incursions.
- The guarding measures preferred by different groups of people vary such as patrolling fields and shouting, banging objects, throwing stones or spears, using catapults, and using guard animals like dogs. Chasing primates with a pack of dogs or throwing stones also heightens the perception of risk and improves success.

3. Methods of reducing and mitigating human primates conflicts

3.3 Fencing

- Widely used method in KAZA TFCA to keep animals out of agricultural areas but traditional fencing is largely ineffective in mitigating HPC due to primate's agility. Live hedges of carefully chosen and locally available species known to be unattractive to primates could be an effective means of isolating vulnerable crops from the forest edge, particularly when interspersed with unpalatable crops.
- Clearing the vegetation around fences may enhance visibility and discourage more fearful primates from entering agricultural areas. Electric fences can become ineffective due to the primates ability to learn to overcome the physical barrier.

3.4 Buffers zones and barriers

- Barriers and buffer zones around primate habitat might discourage primates from crossing into human settlements and agricultural areas.
- Barriers like deep and wide water filled boundary canals can deter baboons from crossing into agricultural areas. However, not all primates are fearful of water. Corrugated zinc sheets placed around individual fruit trees that do not have canopy connectivity have been effective in deterring primates from feeding on fruit crops and tearing bark.
- Buffer zones are blocks of land located between natural forests and cultivated areas that can discourage primates from crossing between them. The method is a land use practice that is designed to reduce human primate interactions. Buffer zones are likely to be more feasible in areas where there is a hard edge between primate habitat and human activities, for example on the edges of some national parks.

3.5 Translocation

- Translocation of either people or primates as a HPC mitigation measure should be considered only as a last resort it is expensive and labour intensive.
- Moving people from areas experiencing aggressive primates is more likely to yield a long lasting solution to HPC. The method is more likely to succeed if combined with direct or indirect benefit sharing schemes. However, the translocation of problem primates is stressful to the animals, can be dangerous and potentially life threatening for the animal.

3.6 Education and awareness raising programs

- As with all HWC situations, education is the basis of changing attitudes towards a conflict situation. This may promote a better understanding of primate behaviour thus reducing damage across a range of contexts from tourist settings to village encounters. However, the method do not offer a technical solution to resolve human primate conflict.
- Education informs people about how to behave or not to behave when encountering primates potentially reducing the incidence of aggressive interactions. The method can also equip locals with knowledge on growing of crops that are unpalatable to primates yet being of high commercial value.

3. Methods of reducing and mitigating human primates conflicts

3.7 Financial incentives

- The provision of financial incentives can be a successful method in reducing and mitigating HPC. When revenue from tourism activities involving primates is distributed to local communities, negative perceptions towards primates and the damage they might cause, can be partially addressed.
- It is important to consider that schemes that achieve successes in the short term may cause serious problems in the long term. For example, tourism can create negative situations with primates and requires careful management of behavioural problems, (such as stealing food from tourists) to the more serious risks of disease transmission.

3.8 Monetary compensation

- Monetary compensation for damaged property and / or lost revenues can provide short term mitigation of HPC. However, it addresses only the symptoms and not the causes of the problem.
- Key determinants of success for compensation schemes typically include the accurate and rapid verification of damage, prompt and fair payment embedded in a transparent process, a long term source of funding capable of responding to variations in damage over time, clear rules and guidelines that link payment to sound management practices, an appreciation of the cultural and socioeconomic context and an ability to actively monitor the primate population of interest.
- Compensation schemes often fail to provide incentives for local people to conserve primates, especially when they do not identify and target those most affected by primate damage.

3.9 Lethal control

- Killing a baboon or monkey by shooting or other means is the ultimate escalation of risk. This method of mitigating HPC is only effective if the animal is killed in full view of the group caught in the act of raiding. Otherwise, the connection between action and consequence, benefit and cost, is not learned by the rest of the troop. Male baboons, in particular, often emigrate from the group so a male s disappearance is unremarkable.

4. Recommendations for totally habituated baboons

Baboons are resourceful and when they come across crop fields, houses and properties where the food is easily available (lying on tables, displayed in kitchen windows, spread out on picnic benches, growing in vegetable gardens, stuffed into dustbins), they will feed on this feast and be back for more. This will become their habit.

In addressing a habituated baboon, identify what is attracting the baboons. This can be food, water or garbage, or a combination. Take action to remove the source, or at least make it a lot harder for the baboon to get to what is attracting them in the first place. Then look at ways of deterring baboons from your property/home. The following are some of the recommendations for consideration.

Figure 4: A troop of baboons at a roosting site.

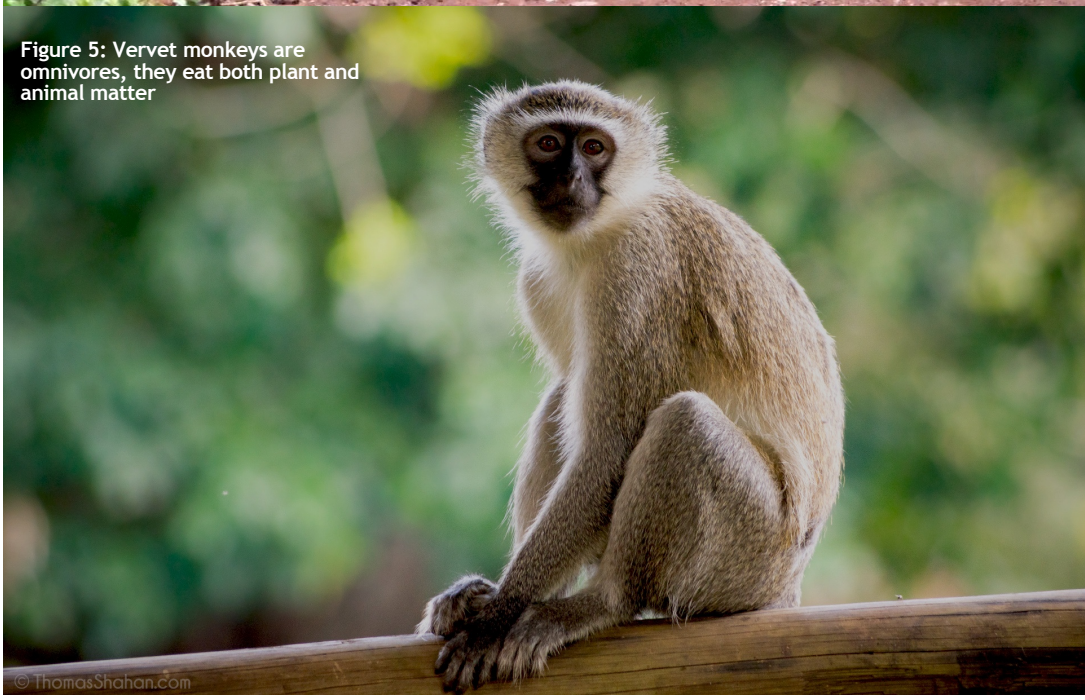

Figure 5: Vervet monkeys are omnivores, they eat both plant and animal matter

4. Recommendations for totally habituated baboons (cont)

- Remove all the infected baboons by lethal control.
- Discourage new incursions around towns, villages or homes following lethal control by physically chasing away new incursions. This can prevent baboons re-establishing themselves in the area again.
- Diligently remove and incinerate all rubbish in an environmentally appropriate way.
- Encourage community buy in to enforce local bi-laws and ensure clean living.

4.1 Tips on an encounter with a problem primate (baboon)

- Remain calm and stand up straight to display a strong and confident yet non-threatening behaviour.
- Do not walk through a troop of baboons; instead, wait for an opportunity to walk around them, or wait for them to leave before you proceed.
- If they do not appear threatened by your presence and if they will not move from your path, keep your distance and make a loud noise such as clapping your hands to encourage them to move on.
- Do not smile or show your teeth as male baboons may view this action as a sign of aggression.
- Baboons can mock charge you and sometimes back off when only a few metres away.
- Get rid of any food that you may have in your hands by securing it in your concealed bag.
- Be prepared to quickly drop your baggage if a baboon tries to go after any of your food inside.
- Never feed a baboon, and never try to grab back food or anything else that it takes from you. Baboons can fight aggressively to defend food that they have taken.
- If one presents itself aggressively by standing tall, showing its teeth, vocalizing a threat, or charging towards you, do not make eye contact, and back away slowly without turning your back.
- If you encounter a baboon troop, first realize that they are not looking at you as food. They are not driven to attack and eat you, but if you threaten their territory or if you have something that they want, like food, they may be driven to defend themselves or act out to get what they want. They can become dangerous primarily when they feel threatened or when they re socialized to associate humans with food.
- Large male baboons will defend the others in their troop, so if you get too close to them, a large male might present himself and stand between you and the others. Males will often show their large front teeth as a warning sign. If you do not heed it, they can charge at you. They can also vocalize sounds of alarm when they feel threatened. If one is threatened enough to charge and then bite you, its bite can easily break bones or even kill, as male baboons have long, sharp incisors and incredibly powerful jaws.

Figure 6: An alpha male baboon can be intimidating to humans.

Figure 7: Young baboons are weaned at about one year and reach sexual maturity between 5-8 years.

Figure 8: Baboon proof garbage bin.

Figure 9: Baboons are highly intelligent animals that can use different tools in their every day life.

Figure 10: Baboons have loose cheeks which allow them to gather food while foraging to eat later.

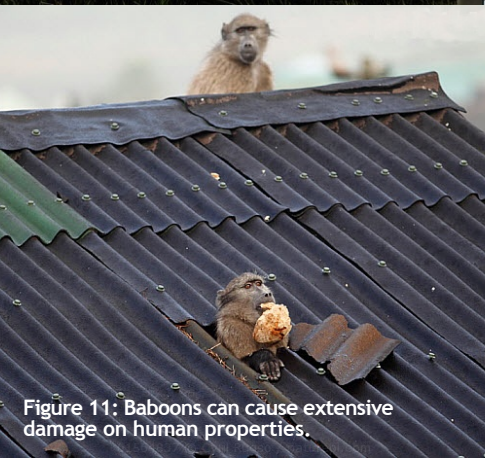

Figure 11: Baboons can cause extensive damage on human properties.

4. Recommendations for totally habituated baboons (cont)

4.2 What to do when a baboon is in your home

- Firstly remain calm, and do not block their exit route. Baboons can read human body language and if you appear threatening, they will be nervous and unpredictable. Do not stare at them or look them directly in the eyes as this will be interpreted as aggressive behaviour and they make react similarly.
- Make sure that they have an obvious escape route open windows and doors.
- Act with confidence (be the alpha male) and show them you are serious about getting them out your space.
- Do not try to get food back from a baboon, it will fight you to retain the food.
- Work towards getting the baboon towards the shortest escape route.
- Encourage the baboon towards the escape route with a water spray bottle.

5. Training

Training should be a continuous process for all stakeholders. Various programs of training targeting farmers and extension officers should be executed periodically to improve the technical capacity of the various stakeholders that are responsible to respond to HWC. The understanding of animal behavior and wildlife management, as well as the general awareness programs should be part and parcel of the authorities responsible for wildlife management.

6. Conclusion

It is essential to have accurate spatial and temporal geo-referenced information about when and where the conflict is occurring. This understanding, together with implementation of appropriate mitigation measures, should lead to a better focus on target areas and the most relevant species. Wildlife management and conservation authorities need to understand the HWC hotspots in their respective components and design robust programs for support to the communities against wildlife damages. The support programs should be accompanied by effective support on implementation of mitigation measures, and Monitoring & Evaluation tools. In order to realize positive result in dealing with HWC all stakeholders are requested to ensure that:

- The above interventions are constantly implemented and supported, and not just as occasional campaigns;
- There is greater active participation in the strategic activities by the various parties responsible HWC mitigation;
- There are opportunities to Introduce other innovative mechanisms and approaches on dealing with any type of HWC; and
- Adequate capacity in terms of equipment, skills set, technology and financial resources are in place to effectively support HWC mitigation.

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