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Illegal and Unsustainable Hunting of Wildlife for Bushmeat in Sub- Saharan Africa



A PROBLEM SOLVING GUIDE

Wilderness Problems, Guide No. 2



**Center for
Problem-Oriented
Policing**

About the Wilderness Problem-Specific Guide Series

These guides summarize knowledge about how wildlife authorities can reduce the harm caused by specific wildlife crime problems. They are guides to preventing and improving the overall response to incidents, not to investigating offenses or handling specific incidents; neither do they cover technical details about how to implement specific responses.

Who is this bushmeat guide for?

This guide is aimed at wildlife officers and non-governmental conservation practitioners who have identified the illegal and unsustainable hunting of wildlife for bushmeat, as an important threat in a specific site or landscape. These include:

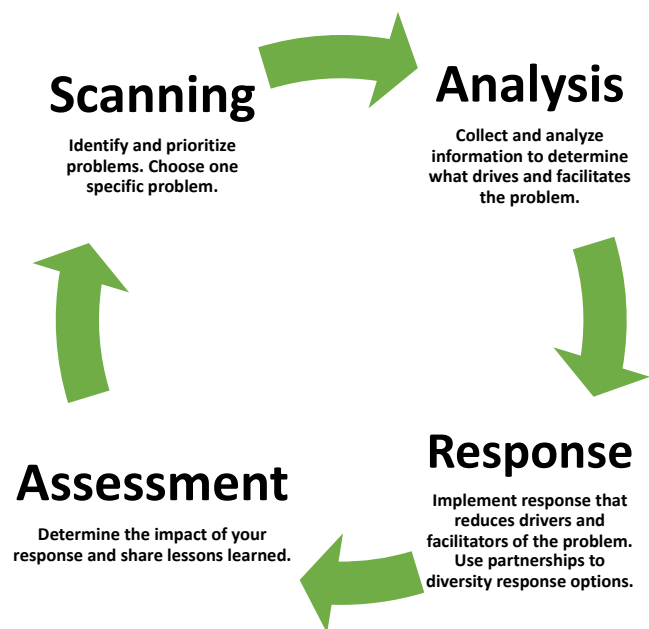
- Protected Area Managers and their deputies
- Conservation NGO Project Leads
- Wildlife officers and NGO conservation practitioners of whatever rank or assignment, who have been tasked to address the problem

These guides will be most useful to problem solvers who:

Understand basic problem-oriented policing principles and methods. The guides are designed to help conservation practitioners decide how best to analyze and address a problem they have already identified. The guides are structured in the same way as the SARA process (right). This covers how to define your problem (Scan); questions you will need to answer to guide you to an effective intervention (Analysis); types of interventions you could use (Response); and ways to check if your intervention worked (Assessment).

For a primer on Problem-Oriented Wildlife Protection, we recommend first reading this:

Lemieux, A.M. and Pickles, R.S.A. (2020). *Problem-Oriented Wildlife Protection*. Phoenix, AZ: Center for Problem-Oriented Policing, Arizona State University. ([link](#))



The SARA Process

Can look at a problem in depth. Depending on the complexity of the problem, you should be prepared to spend weeks, or even months, analyzing it. Carefully studying a problem before responding helps you design the strategy most likely to work in your area of interest. You should not blindly adopt the responses others have used; you must decide whether they are appropriate to your local situation. What works in one place may not work everywhere.

Are willing to consider new ways of doing business. These guides describe responses other wildlife authorities and conservation practitioners have used or researchers have tested. Not all of these responses will be appropriate to your particular problem, but they should give a broader view of the kinds of things you, or other stakeholders in the problem, could do.

Understand the value and limits of research knowledge. For some types of problems, a lot of useful research is available to conservation practitioners; for other problems, little is available. These guides summarize the research available on a problem, but recognize that for some problems there is not enough research, and for others the research may not be relevant for your local problem.

Are willing to work with others to find effective solutions to the problem. A wildlife authority cannot implement many of the responses discussed in these guides by themselves. They must frequently implement them in partnership with other responsible private and public bodies including other government agencies, non-governmental organizations, private businesses, public utilities, community groups, and individual citizens. An effective problem solver must know how to forge genuine partnerships with others and be prepared to invest considerable effort in making these partnerships work. Each guide identifies particular individuals or groups in the community with whom wildlife authorities might work to improve the overall response to that problem. Thorough analysis of problems often reveals that individuals and groups other than the wildlife authority are in a stronger position to address problems or aspects thereof and that wildlife authorities ought to shift greater responsibility on to them to do so.

What is not covered in this bushmeat guide?

This guide describes the problem of illegal and unsustainable hunting of wild animals for bushmeat for personal consumption and commercial trade across sub-Saharan Africa and the factors associated with its occurrence. It provides advice on how to analyze your local problem, a review of responses to the problem, and what is known about these responses from evaluative research. Related problems not directly addressed in this guide include:

- Illegal killing of wildlife for traditional medicine and spiritual amulets
- Illegal killing of wildlife for ceremonial attire
- Illegal killing of wildlife for trophies, ornaments and jewelry
- Illegal killing of wildlife in retaliation for human-wildlife conflict
- Encroachment of farmers into protected areas
- Facilitation of wildlife crime by law enforcement officers
- Smuggling wildlife and wildlife products across land borders

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General description of the problem

Unsustainable and illegal bushmeat hunting constitute the most serious threat to many wildlife populations across Africa^{1 2 3 4 5 6}. Bushmeat hunting is responsible for the significant depletion of ungulate populations across more than half of African protected areas², and the decline of overall wildlife populations across almost all West and Central African protected areas⁶. Targeted bushmeat hunting is also driving populations of lowland gorillas, drills, Preuss's red colobus and other threatened primates towards local extinction^{1 7 8 9}. Bushmeat hunting is nevertheless likely to be widely under-reported^{10 11}.

Indirect harms. Depletion of ungulate prey caused by bushmeat hunting is the greatest threat to the conservation of lions across much of Africa and is an important threat to other large carnivores, such as leopards, cheetahs, African wild dogs, and spotted hyena^{2 12 13 14 15 16 17 18}. Overhunting of ecosystem engineers such as elephants, gorillas and hippos, can reduce tree recruitment, causing altered forest structure and reduced carbon sequestration^{1 5 9 19}.

Snare bycatch. Snaring is one of the most popular methods of killing large mammals for bushmeat in sub-Saharan Africa. Mortalities as bycatch in snares set for bushmeat is an important driver of decline among carnivore populations, notably of lions, leopards, African wild dogs and spotted hyenas²⁰. These carnivores use trails for travel, have head heights close to the heights of snares set for many target ungulate species and may also be attracted to and frequent snare lines for scavenging opportunities²¹. For instance, mortalities in snares set for bushmeat killed 11.5% of adult lions in Zambia's Luangwa valley²⁰, 18% of lion mortalities within Limpopo NP²¹ and 11.7% of collared adult female lions in Zimbabwe's Hwange National Park^{22 23}. Elephants and great apes are also often wounded or killed as bycatch in snares and traps set for ungulates^{7 20}.

Fishing down the line. Bushmeat hunters often act according to predictions of optimal foraging theory, selecting prey based on the maximum profitability (i.e. biomass and proximity) available per weapon type used^{10 24 25}. This results in a depletion of prey populations that begins with larger bodied, as well as gregarious and diurnal species, and follows with targeting smaller bodied species^{1 10 25 26}, analogous to trends in global fisheries known as 'fishing down the line'. Such trends do not appear to be influenced by the conservation status of a species, so long as the threat of persecution is negligible.

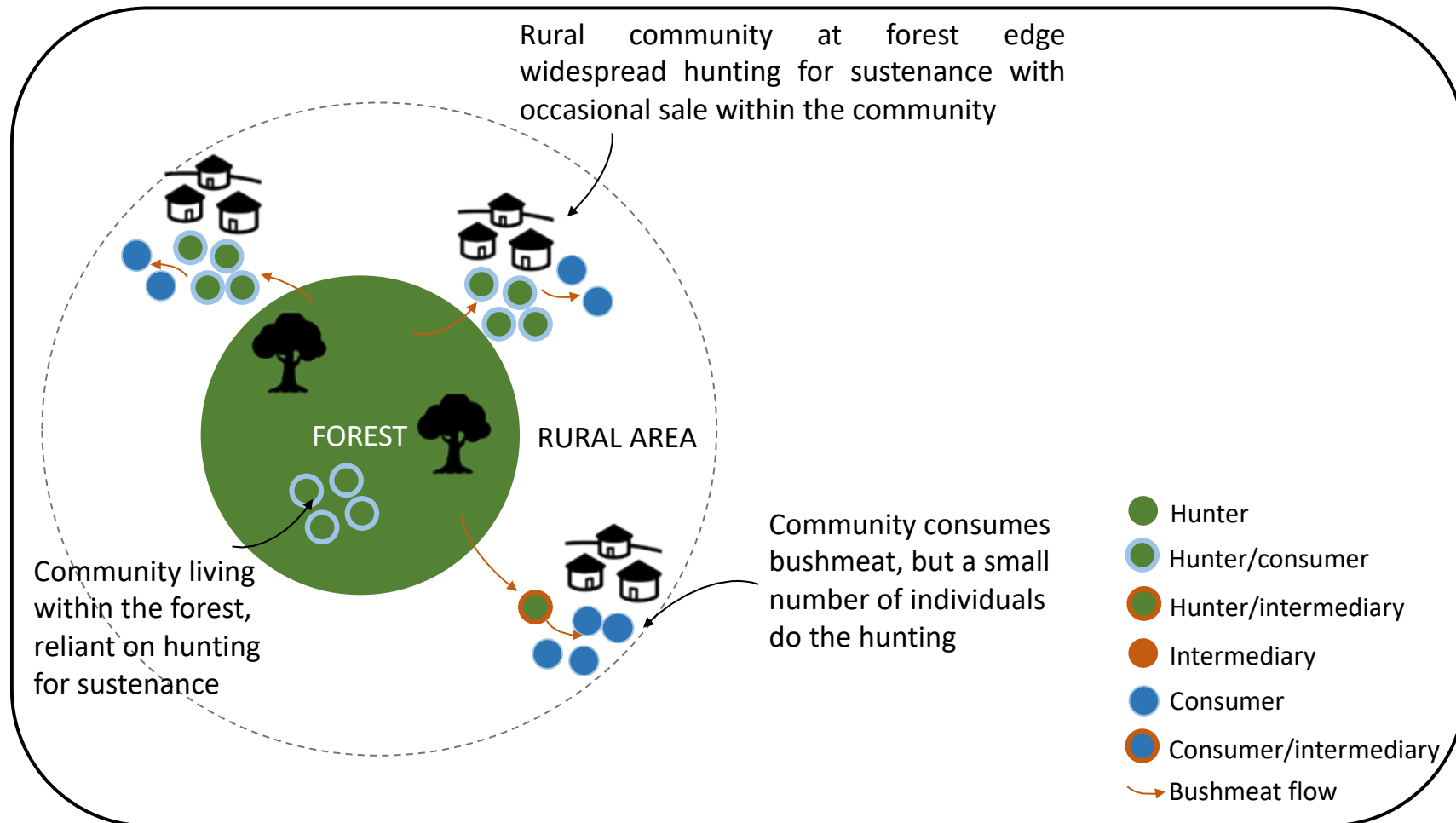
A growing problem. Bushmeat hunting appears to be increasing across Africa as indicated by declining ungulate populations in over 25% of Mozambican, Angolan, Zambian and Zimbabwean National Parks². Global travel restrictions aimed to curb COVID-19 will likely result in increased levels of bushmeat hunting resulting from reduced tourism revenues to African National Parks and governments and restrictions on the operations of conservation agencies²⁷.

Bushmeat trade scenarios

Below are simplified diagrams of bushmeat consumption and trade scenarios; some are more commercialized and complex than others. Multiple trade scenarios may occur at the same time in the same area. Trade type and volume will strongly influence what interventions will likely be effective (adapted from Coad et al (2019)²⁸).

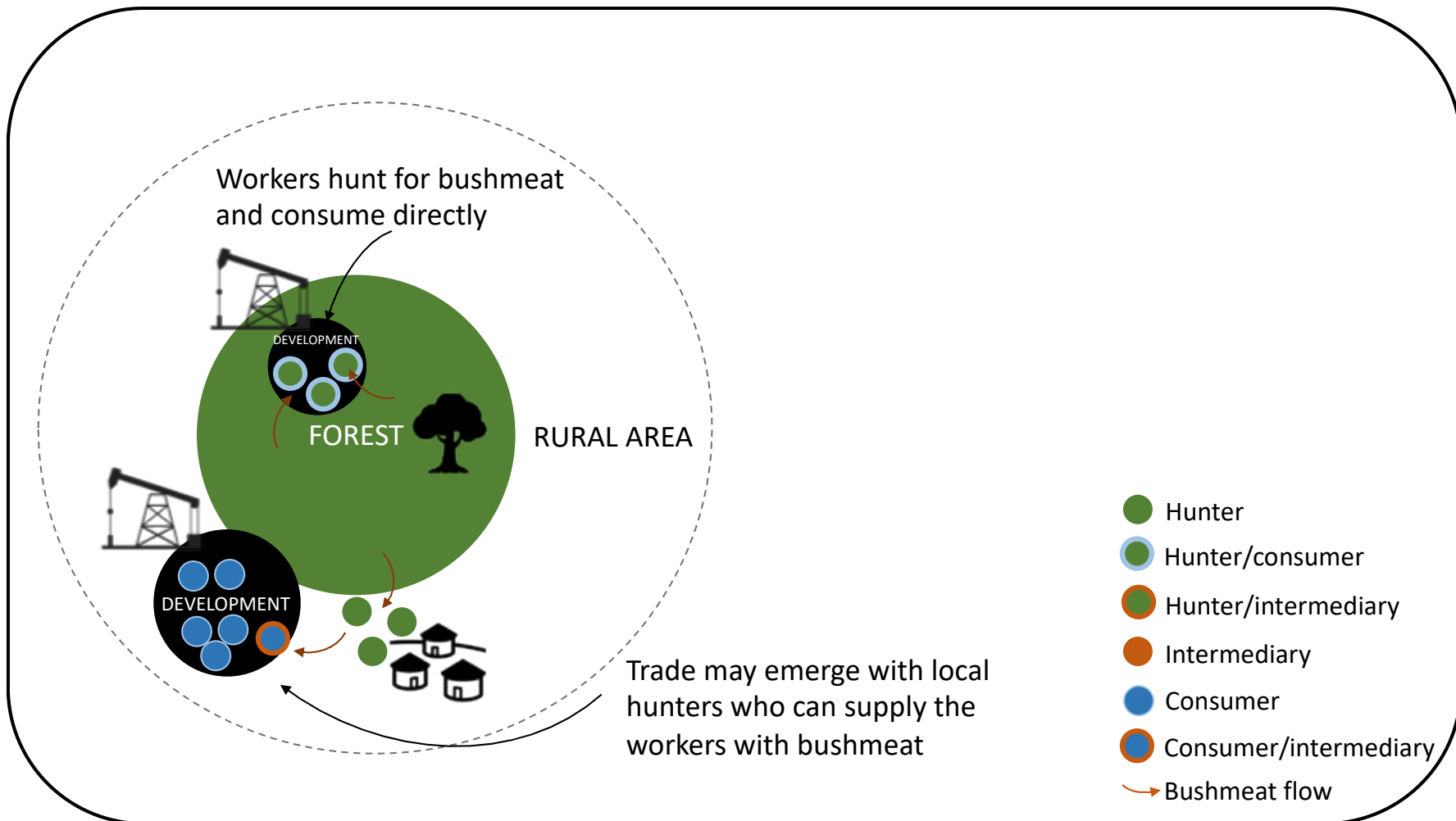
Sustenance and occasional sale in rural communities

Bushmeat transported a short distance from where hunted and consumed within rural communities. Little trade or specialisation and few true intermediaries. In southern Africa the high density of communities fringing forests results in large volumes of bushmeat being removed for sustenance and local sale. Main drivers are accessibility to bushmeat source and need for cheap meat.



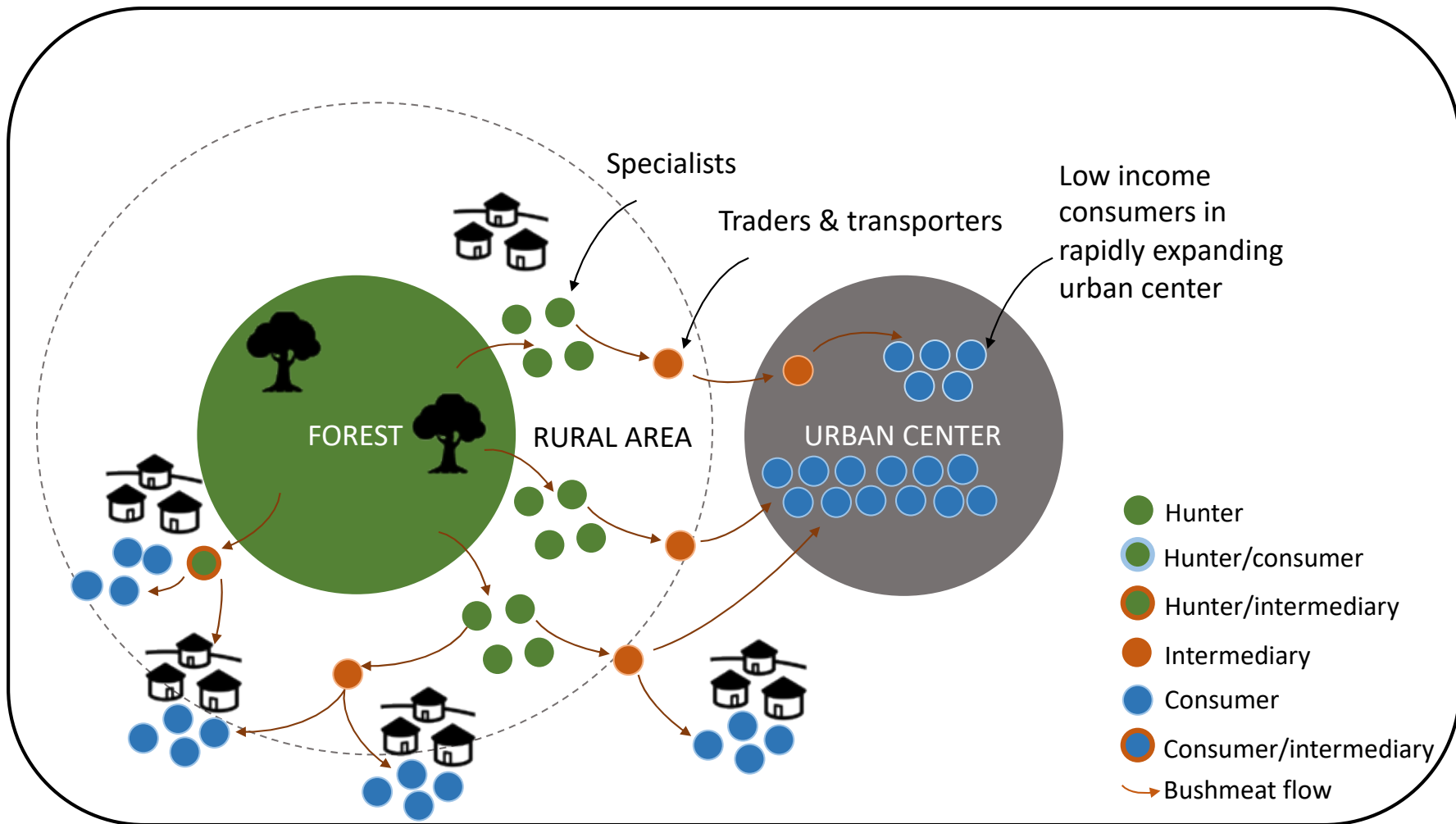
Clustered consumption around rural infrastructure and extractive industries.

Concentrated workforce in close proximity to a source of wild meat for example mines, logging camps and road developments. Workers hunt themselves or trade emerges with hunters from local communities. Main drivers are ease of access to bushmeat source to hunt or purchase, cheap meat, affordability and workers' preference.



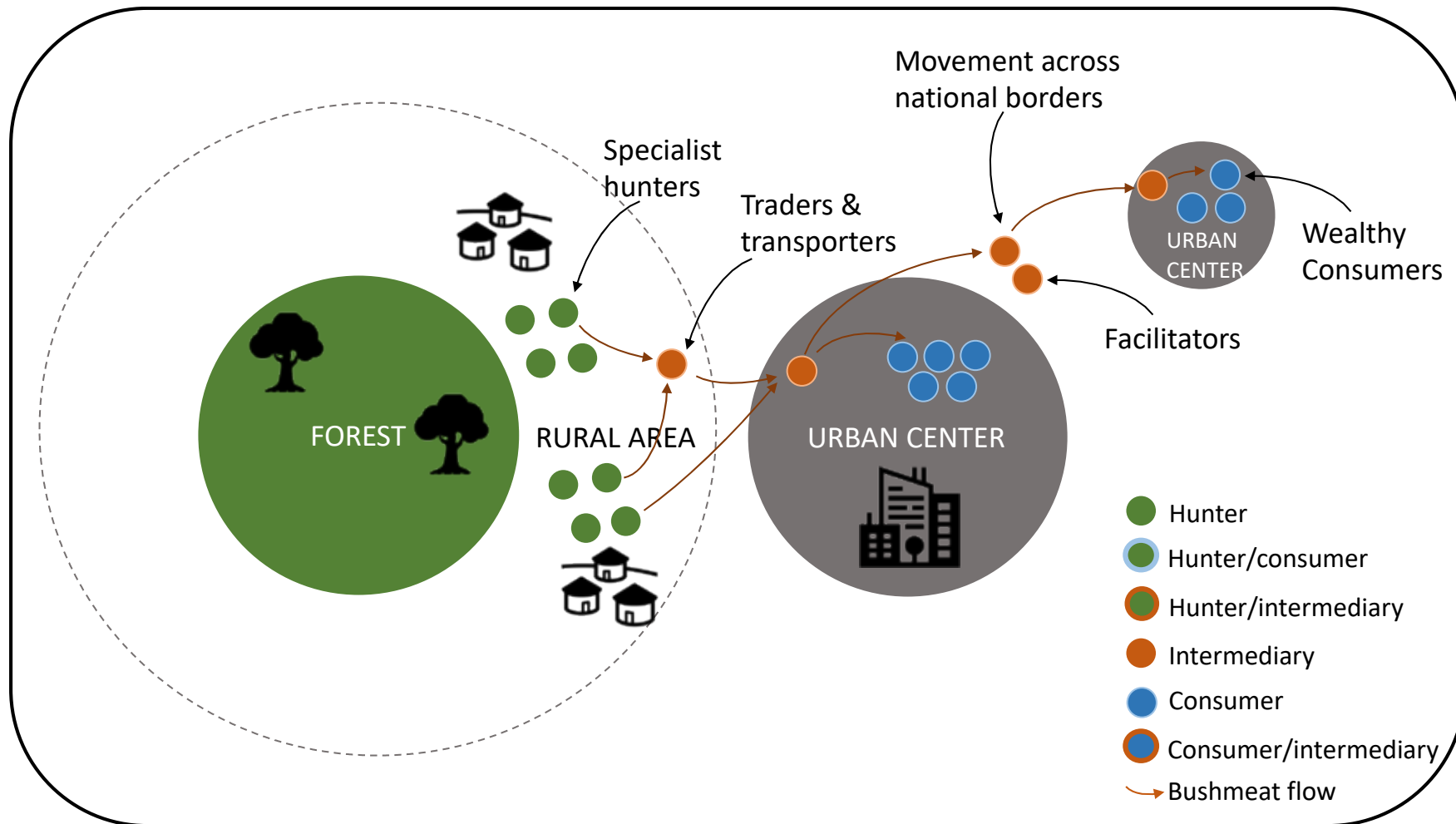
Supply of cheap meat to newly urbanizing and rapidly growing rural populations

Rapid population growth in rural communities, and urbanization create a large low-income consumer base, with forests and protected areas surrounded by communities. That leads to specialization of hunters, traders and transporters and may involve organized criminal gangs.



Supply of luxury meat to high-income urban groups.

Meat consumption rates and preference for wild meat rise with income. High-income groups can afford the costs associated with longer supply chains and a larger number of intermediaries and facilitators. That may lead to specialization of bushmeat hunting and supply and can involve organized criminal gangs.



Scanning: Define your bushmeat problem

‘Bushmeat hunting’ will likely be too broad a problem to prevent at your site. In the scanning phase, identify the different types of bushmeat hunting and trade scenarios that make up the larger problem and determine where ‘most of the problem’ lies. These can then be prioritized, with one being selected for deeper analysis.

A specific problem is easier to solve than a general one: it gives you focus and allows you to tailor your interventions to the nature of the problem. When it is time to assess whether or not your intervention is working, you’ll find measuring impact is easier and more conclusive with tightly defined problems. There are no hard rules on how to frame a ‘type’ of bushmeat problem, but the next page will give you some ideas for how to make it specific. Try to be specific in terms of *crime*, *time* and *place*. For example:



You may need to do some exploratory work first, starting the process of asking questions about the nature of each problem which you’ll continue and go into in more depth in the Analysis Phase.

Read more:

www.wildmeat.org provides an evidence-base and research toolkit for wild meat researchers, practitioners and policy makers.

For an overview of types of bushmeat trade and examination of response options see: **Coad *et al* (2019) Towards a sustainable, participatory and inclusive wild meat sector. CIFOR. Bogor, Indonesia ([Link](#))**

Ways to help define your bushmeat problem

By Time

Your problem may have noticeable peaks in the year where most of the problem occurs. For example:

1. *Bushmeat hunting during the Dry Season*
2. *Bushmeat hunting during public holidays*
3. *Bushmeat hunting by night at the end of each month*

By Victim

Hunters will likely target specific species or groups of animals for bushmeat. For example:

1. *Hunting primates for bushmeat*
2. *Hunting ground birds for bushmeat*
3. *Hunting nesting turtles and their eggs for bushmeat*

By Place

Setting logical geographical boundaries makes addressing the problem much easier, and is essential in large landscapes. For example:

1. *Bushmeat hunting in the Northern Highlands in District Y*
2. *Bushmeat hunting at six key waterholes in Park X*
3. *Bushmeat hunting from the main road running through Forest B*

By Method

Some types of bushmeat hunting have very specific methods and your responses may differ depending on the method. For example:

1. *Bushmeat hunting by shooting from hides*
2. *Bushmeat hunting using snares*
3. *Bushmeat hunting using dogs and spears*

By Hunters

Consider breaking the problem down by hunter groups. For example:

1. *Bushmeat hunting by local youths*
2. *Bushmeat hunting by construction workers*
3. *Bushmeat hunting by organized criminal gangs*

By Motive

Different bushmeat problems will involve different motives- for both hunting and consumption. For example:

1. *Bushmeat hunting for personal sustenance*
2. *Bushmeat hunting to raise cash for farming equipment and fertilizer*
3. *Bushmeat consumption as a luxury meat*

By Consumers

Different bushmeat problems may have distinct consumer groups. For example:

1. *Bushmeat consumption by forest edge communities.*
2. *Bushmeat consumption by mine workers*
3. *Bushmeat consumption by high income individuals in the nearby city.*

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Analysis: Who, what, where, when, how, why?

Below are four questions that you could ask as part of an analysis of your bushmeat problem. Depending on the type of bushmeat problem you are dealing with, you may not be able to answer each one on your own. Partnerships will help you overcome this hurdle, as partners can provide information about the problem and may be interested in helping you implement a response. This is important to keep in mind because you will have work within the mandate and resources of your organization when responding to the problem, both of which have limits.

Four fundamental questions to answer

How bad is your bushmeat problem now?

Who can give you information about the problem?

Where are the weak points in your bushmeat problem?

What responses have been tried and why didn't these work?

How bad is the problem now?

Set baseline measures, then think about responses. You want certainty in regard to whether your bushmeat problem improves, worsens or is static so that you can be informed about whether you should expand, modify or end the intervention. Potential metrics and indicators you could consider using to measure this are illustrated on pages 35-36 of this document. Each indicator relies on an information source and data collection method. Identify which indicators already exist from different stakeholders and can be used, and where investment will be needed to start collecting information on a new indicator.

Who can give you information about the problem?

Data triangulation is key for problem analysis and impact assessment. The table below lists groups that may have an interest in reducing the bushmeat problem and may already have information they could share with you. Some groups may also become project partners and could play a role in helping reduce the problem. A diverse set of data will help you better understand the problem from different angles, which in turn should help you match interventions to root causes or facilitators.

Local police	May know about the bushmeat trade in urban marketplaces, which may inform what species are being sold, the size of the markets, and so forth.
National park authority, forest department	Will know details about the problem at a park or community level and may have observation data of the problem within the park or forest.
Customs or border agencies	Agencies responsible for controlling transnational trade could provide details on which routes are used, and what methods are used to smuggle bushmeat.
Village authorities and religious groups	Village authorities and religious groups play a crucial role in compliance with national laws and traditional customs and can play a proactive role in engaging with hunters directly.
Hunters, vendors and consumers themselves	Some of the best people to describe the nature of the trade are those involved in it. Depending on the form of the bushmeat problem, interviews with actors involved can be done through questionnaire surveys and interviews of retired, active, recently arrested or imprisoned actors.
Rural health authorities	Bushmeat harvesting and consumption brings risks of disease transfer to people. Rural health authorities may keep records of this, and which communities are most affected.
Ministry of Agriculture, Rural development agency	May keep records on local employment levels, seasonal unemployment, food security issues and temporal patterns of planting/harvesting. The Rural Development Agency should be aware of groups or initiatives in your area that could form part of your response.
Landowners, agribusiness and private industry	Private land-owning groups may experience trespassing for bushmeat hunting. They may be able to provide more insights into methods used and approaches they have taken which have shown success. If hunters are crossing adjoining land-owners' property to access your site, they could support in controlling access.
Safari hunters	Safari hunters have economic incentives to control bushmeat hunting and may be able to assist with alternative livelihood and protein programs.
Tourist and recreational groups	Businesses that are likely to be negatively impacted by the loss of wildlife are likely to be motivated to assist with your response. They may have observations of where and when hunting is occurring, details of methods, etc.
Rural societies and associations	Game Scouts Association and other associations of farmers or other rural groups could provide insight into the problem.
Transportation companies	Bus, rail and taxi companies, truck haulers and other conveyance companies which might be used to transport meat to cities may be able to provide you with information on routes, conveyance and smuggling methods used. Owners and drivers can play an active role in preventing their transportation being used for transporting bushmeat.
International conservation and humanitarian NGOs	In some cases, development NGOs operating in these rural areas may have knowledge of the bushmeat trade and the drivers behind it and may be key sources of information and partners in reducing it (even though they are focused on the human component rather than the wildlife component).
Local NGOs	Local NGOs may have smaller footprints but may have a greater understanding of local conditions and may have specialist knowledge in certain areas.
Academic researchers	Researchers may have or be able to collect and analyze data on bushmeat hunting and trade activities, local socioeconomics, wildlife population trends etc. Accessing these data can be useful with the scanning, analysis and monitoring phases of a program.

Where are the weak points in your bushmeat problem?

Exploring the themes described below will help you identify weak points in the problem and the forces that shape hunters' decision making. That will guide you to how you can make bushmeat hunting less financially rewarding, harder to do successfully and riskier if you do it, while finding ways to make alternatives more rewarding.

Weak points could be where the problem is concentrated and presents a clear target; such as one community disproportionately accounting for the hunting pressure, but willing to consume alternative protein sources. It could also be where there is high reliance on specific factors which cannot easily be replaced, such as access to firearms manufactured by a small number of artisans.

For additional questions you might ask when exploring the 5Ws and 1H of your problem, who—what—when—where—why—how, see the Appendix of this guide. Don't be discouraged by not being able to answer all these questions initially, it may take time to develop relationships with other stakeholders who can help answer them.

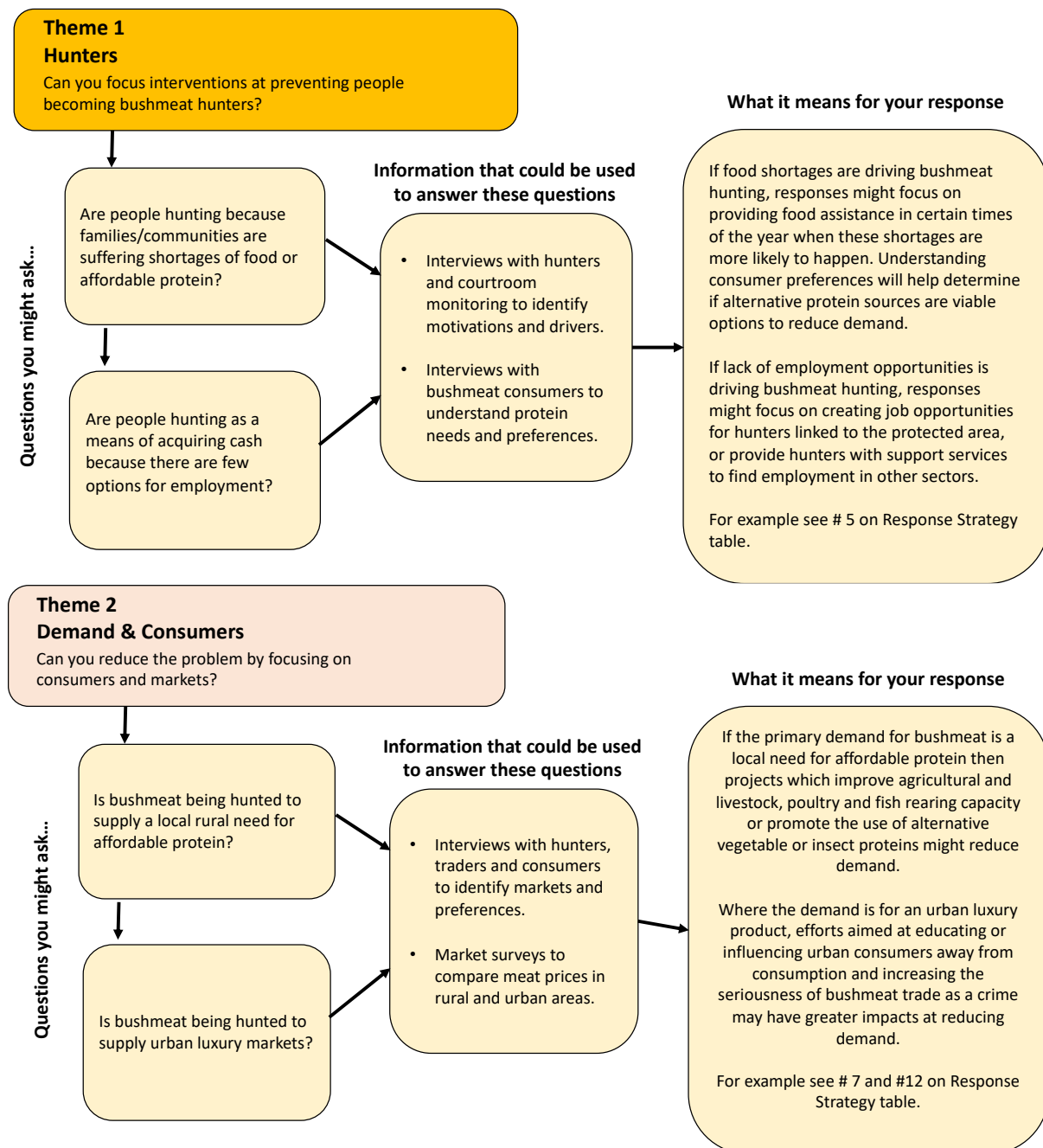


Read more:

For an example of how to use crime scripting to break down your bushmeat problem see: **Hill, J. Identifying gaps in knowledge with crime scripting: an example for bushmeat poaching.** in *The Poaching Diaries (vol. 1): Crime Scripting for Wilderness Problems* (ed. Lemieux, A.M.) (Center for Problem Oriented Policing, Arizona State University, 2020). ([Link](#))³⁴

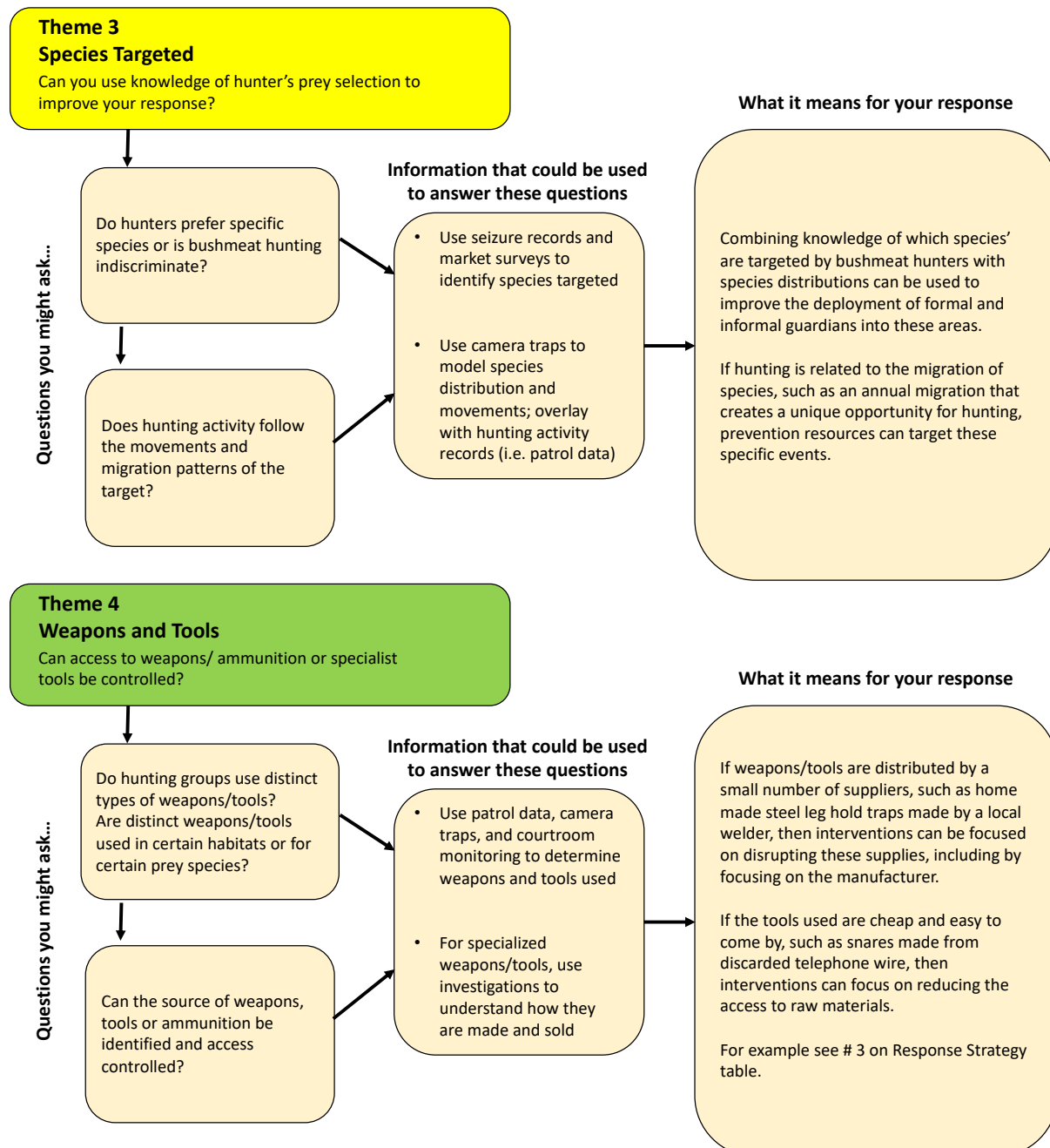
Demand and supply

The bushmeat trade is driven by individuals that create supply and demand. Harvesters and consumers modify their behaviors in response to market dynamics²⁹. Understanding these pressures, and which is stronger, helps prioritize where to invest your response. People consume bushmeat because it's cheap, more widely available than alternatives, they have a taste preference, or other cultural attachment. Identifying what groups of people are consuming bushmeat in the context of your problem, where and why, are the first steps to crafting a demand-reduction strategy. Looking at the problem from the supply side, identifying distinct groups who harvest the bushmeat and pinpointing what pressures and opportunities trigger them to hunt, and stop hunting, will allow you to find what interventions might prevent people from going hunting- and which are likely to fail.



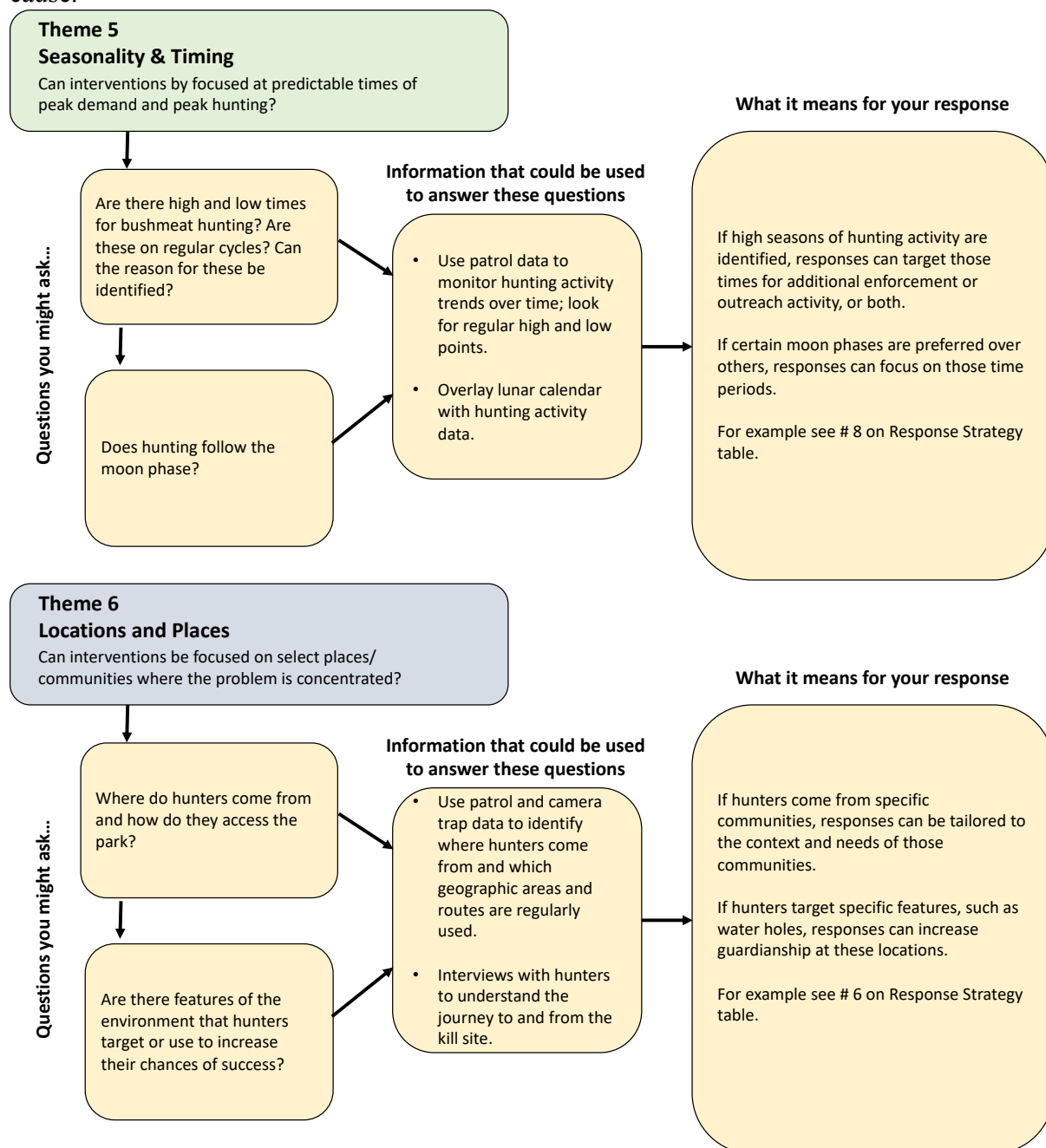
Target and method

Killing an animal requires the hunter to understand the behavior, habitat preferences and physiology of their target – either a specific species, or a class of animal (such as arboreal mammals). Asking questions about which species are targeted for bushmeat, where they concentrate in the landscape and why, will help you identify areas and times of increased risk, and design more direct protection responses. Hunting also requires specific equipment such as rifles or gin traps, which may be limited by a small number of manufacturers or distributors. Asking questions how the weapon, and other specialist tools, are procured by hunters, can inform you to what extent a control strategy is likely to disrupt your hunting problem, and where it should be targeted.



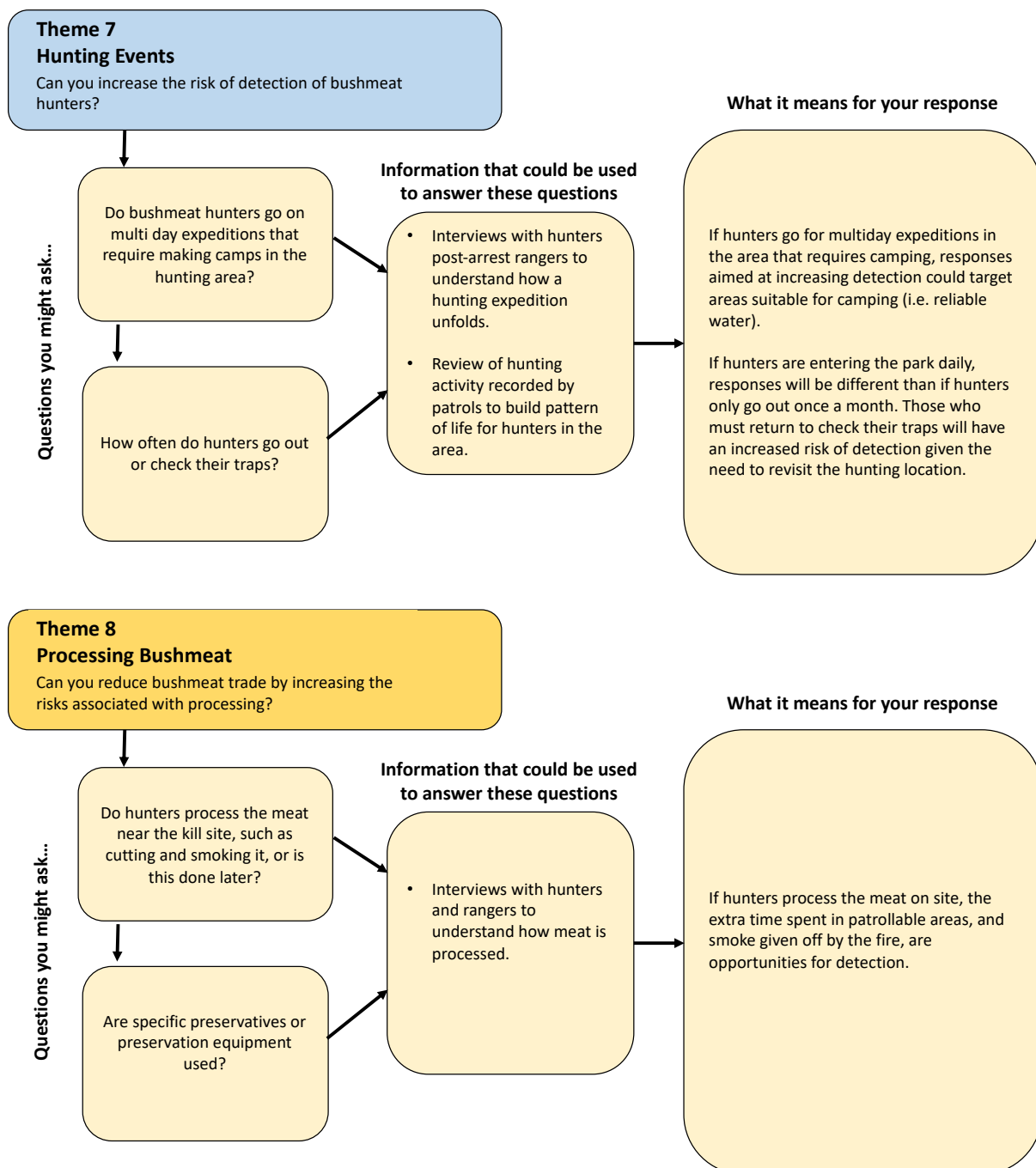
Time and place

Bushmeat hunting often has distinct rhythms over the year, following shifts in abundance and concentrations of wildlife, demand fluctuations among consumers, and opportunities of hunters. Bushmeat hunting spikes have been associated with providing meat for festivals⁴, free time among farmers between planting and harvest^{4,30-32}, and generating cash to pay school fees before the new term^{30,33}. Certain places are used disproportionately more in the hunting and trade of bushmeat than others: certain landscape features, such as waterholes and salt licks attract wildlife, others such as ridgelines, funnel it. Some communities consume far more bushmeat than their neighbors. Identifying when and where bushmeat hunting and consumption regularly spikes, allows you to target resources to prevent this. Asking why it spikes at these times and in these locations will help tailor your intervention to address the cause.



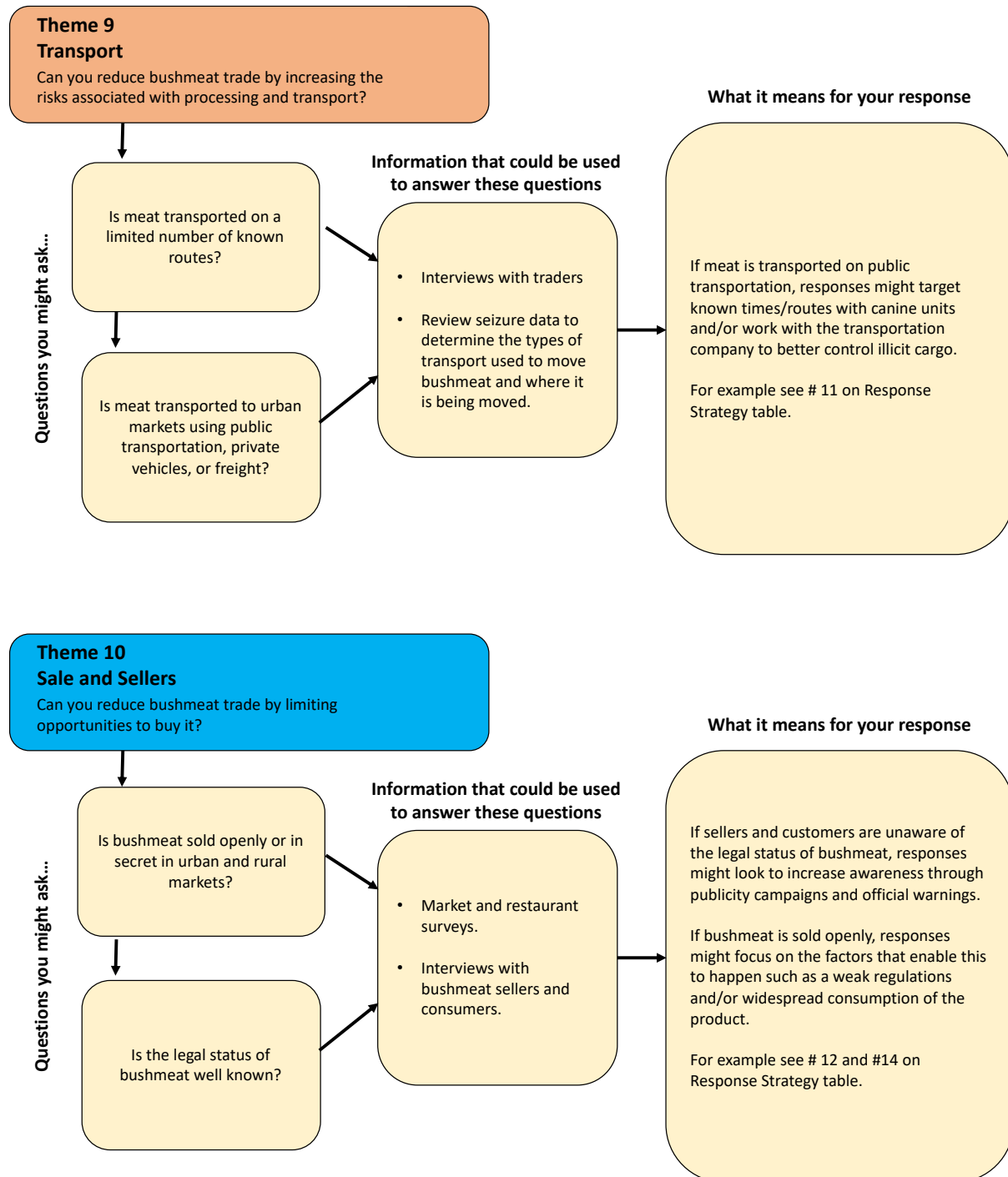
Hunting events and processing bushmeat

Piecing together the stages of bushmeat hunting from ranger reports, examinations of incident sites and hunter testimonies can help identify specific criminal opportunities which the hunt is dependent on to be successful (For an example, see *The Poaching Diaries*, Chapter 7)³⁴. Removing or changing these opportunities can increase the risks of detection of hunters, or effort of the hunt to a level where potential hunters decide a hunt is not worth it. Bushmeat harvesting usually requires some form of processing – butchery, preservation and storage of meat (smoking, freezing or drying), requiring time and specific locations (such as a water source where a hunting team can camp for several days and dry meat). Because bushmeat is a perishable commodity, disrupting the processing of bushmeat denies benefits to the hunters, as rotten meat cannot be sold, disincentivizing potential hunters.



Transport and trade

Transporting bushmeat can present vulnerabilities where detection risk becomes high. Asking questions about how bushmeat is moved to the consumer from point of procurement can help you refine the routes and types of conveyances to focus interventions on. Identifying how and where bushmeat is sold and by which groups of people allows you to guide regulatory control measures more effectively. See Gluzek et al. (2021)³⁵ for a recent example of a conservation criminology approach to understanding urban markets for wild meat.



What responses have been tried and why didn't they work?

Before embarking on a new project, checking why others have failed in the past will help avoid preventable mistakes. There may also be initiatives in progress which are showing signs of success which could be adapted or expanded.

1. What are the current strategies used by ranger teams to disrupt bushmeat hunting? Do they target high risk areas and times?
2. What are the typical outcomes for those who are caught (i.e., arrest, prosecution)?
3. What has been the relationship between the park and rural communities?
4. What has been done in surrounding parks with similar problems? Have their strategies reduced bushmeat hunting incidents?
5. What has been done to reduce demand for bushmeat?
6. Can you identify reasons why interventions to prevent bushmeat hunting have not been successful?

Response: Finding the right solution(s)

Once you have analyzed your local problem and established a baseline for measuring effectiveness (see Assessment section), you should suggest and prioritize possible responses to the problem. As you weigh your options, focus on those that are realistic, specific to your context, and not overly complicated. Some identified responses may not be possible for you or your organization to implement alone – in such cases look for opportunities to partner with other agencies or organizations that may be able to assist. Finally, discuss proposed interventions with your field teams and key stakeholders to identify and understand any unforeseen challenges associated with implementing the planned course of action.

Key considerations when developing a response

Know what you can and cannot do. When responding to your bushmeat problem, it's important to make clear what you can do, because it is your function and mandate, and what you cannot do, because it is someone else's responsibility. For example, protected area personnel will not be able to work on projects that reduce demand in urban areas. Instead, they should focus their efforts on responses that disrupt the supply of bushmeat, but keep an open eye for partners that can help with other stages in the trade.

Do not try to do everything yourself. Tailored responses to bushmeat hunting, especially those targeting hunter and consumer motivation, will require solid partnerships to implement. In some cases, this might require a different government agency or civil society organization to lead a project. While sitting in the passenger seat may not be the standard way of doing business, giving control to responsible and qualified partners will help you diversify your response options.

Situational Crime Prevention (SCP). SCP can be used to complement ongoing law enforcement operations by focusing on ways to target and reduce specific criminal opportunities through:

- Increasing the *efforts* and *risks* associated with crime (e.g., conducting vehicle searches for bushmeat along major transport routes);
- Reducing *rewards* (e.g., health inspectors fining or closing restaurants serving bushmeat) and *provocations* (e.g., targeted livelihood programs in key communities and offender rehabilitation and employment programs); and
- Removing *excuses* (e.g., demand reduction campaigns).
- Note that not all 25 SCP techniques^{36,37} may be applicable to your specific bushmeat problem – focus on those that are relevant.

Reduce demand for bushmeat. Potentially a key tool in addressing the bushmeat trade that is highly context specific. For instance, responses focused on the harvesting of bushmeat for pure sustenance and sporadic sale among rural communities (see bushmeat trade scenarios, pages 5-8) may be more effective when addressing food security issues whereas consumption among urban elite will require addressing different behavior change levers (e.g., health risks associated with unhygienic meat) if the intervention is to be successful^{4,38,39}.

Focused deterrence. This approach may be useful when a small group of hunters are known to be responsible for a disproportionate amount of the bushmeat problem^{40,41} and are unlikely to be influenced by alternative approaches to crime prevention such as access to alternative livelihood opportunities. Research indicates that focused deterrence can reduce crime⁴² by increasing the actual or perceived certainty, celerity, and severity of punishment. Of those three, increasing the certainty of punishment is generally considered the most effective⁴³.

Reward compliant behavior. Developing approaches that encourage communities and other stakeholders to obey rules and regulations, while simultaneously dissuading undesirable and/or harmful behaviors is crucial. An example may include a conservation credits or performance payments system whereby key communities generate monetary or non-monetary credits for verified wildlife sightings in their area but are deducted credits based on signs of illicit harvesting. Although not without its challenges, this type of approach links investment to positive wildlife outcomes while simultaneously improving the economic security and livelihoods of those people living with wildlife⁴⁴.

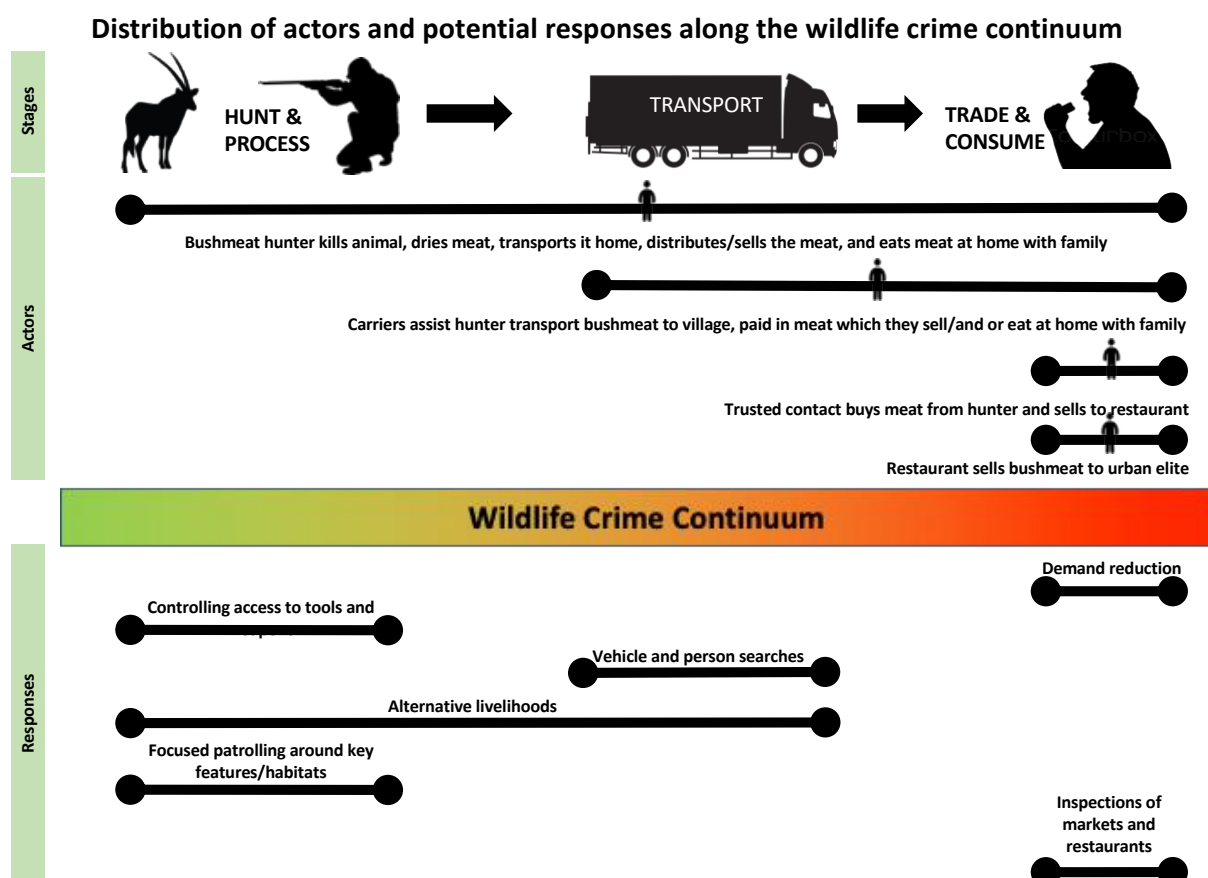
Unintended consequences. Thoroughly evaluate the costs, benefits and risks before initiating a response. Consideration should be extended to the broader impact of a response including its potential effect on other stakeholders, ongoing conservation initiatives (including law enforcement) and the natural environment⁴⁵. For instance, sinking a borehole in support of an alternative livelihoods farming project aimed at reducing bushmeat hunting may inadvertently attract elephants and increase the potential for human wildlife conflict. Also consider that technological responses may provide better ‘coverage’ or ‘protection’ but this may come at a perceived or real cost to the privacy of community members.

Describe the mechanism whereby your intervention will reduce the problem. Think like an offender in order to design effective and efficient responses that target vulnerabilities in the wildlife crime continuum. How will the proposed response alter behavior and in so doing reduce the problem? For instance, will increasing security around key water points during the dry season force illegal hunters into more marginal areas where chances of success are reduced or can they carry in their own water supplies? Will relying on their own water supplies reduce the duration of their forays into a protected area? Detailed consideration of the mechanism of behavior change will assist you determine whether to reject or modify a response before

committing resources to it. Keep in mind though that the motivation behind all responses to bushmeat hunting is to protect wildlife populations rather than to apprehend offenders.

Opportunity costs. In rural settlements where bushmeat can be harvested from surrounding lands with little financial cost, consumers may be less inclined to switch from cheaper bushmeat to more expensive alternatives, particularly where there is a preference for the former²⁸. Explore responses that increase opportunity costs (social and financial) and decrease financial returns from bushmeat harvesting.

Think along the wildlife crime continuum. As you unpack your problem and think about solutions, be sure to not only map out actors involved at different stages in the bushmeat trade, but how responses could be tailored to different stages. The figure below is an example how you might overlay the behavior of actors with different reduction strategies as bushmeat moves from source to consumer.



Overview of potential responses

While by no means comprehensive, the response strategies presented in the table below provide a foundation of ideas for addressing your bushmeat hunting problem, from the perspectives of both reducing hunting incidents and demand for the product. The response options are drawn from a variety of research studies, published reports and personal communications with conservation practitioners. Several of the strategies may apply to your particular problem and it is often more effective to implement multiple responses using an integrated approach. Therefore, it is not necessary to limit yourself to one response, but be sure you have a tailored strategy that fits the context of your problem.

Stages Targeted: Hunt and Process

1. Conservation credit initiatives

Analysis theme: Hunters

How it works...

Encourages compliance with national laws by incentivizing the conservation of living wildlife through providing performance payments, based on independently verified data (e.g., from community run camera traps) to communities actively protecting wildlife.

Communities living in or near wildlife areas perceive tangible benefits to not illegally hunting wild animals which outweigh the cost of lost income or protein from hunting. Hunting is seen as causing harm to the community by preventing receipt of benefits leading to community pressure against rule breakers.

Works best if...

Majority of community reaps the benefits.

Small, close communities in which rule breakers are easily identified.

Community not already engaged in significant commercial sale of bushmeat.

Positive wildlife outcomes are rewarded and illicit activity is penalized.

Coupled with alternative livelihoods programs linked to wildlife-based tourism or legal and sustainable use of wildlife.

Considerations...

Who pays for it? Requires long-term and reliable investment and is therefore at risk of sudden collapse if funding becomes unavailable. Could lead to resentment if project is abruptly terminated⁴⁴.

Community development initiatives (e.g., building of schools, clinics, and boreholes, or provision of farming implements and inputs) may be preferable to cash payments which may be subject to elite capture and result in disillusionment among the broader community.

Balance to be struck between benefits being spread among the community and meaningful benefits realized by individual households.

Establishment of reliable indicators that take into account environmental fluctuations (e.g. drought) that may impact wildlife populations⁴⁴.

Individual greed and associated hunting may jeopardize the conservation efforts of the majority.

Read more: Jones *et al.* (2020)⁴⁶.

2. Display rules along protected area boundaries and areas where bushmeat is consumed

Analysis themes: Hunters, Demand and Consumers

How it works...

Posting rules removes excuses

Works best if...

There is a general willingness to obey wildlife laws where they are known.

This is a new exploitation of forest resource.

Infractions are detected and swiftly penalized.

Considerations...

Wildlife law enforcement can reduce bushmeat hunting by educating local community members, and/or recreational hunters, on the legality of bushmeat hunting in protected areas; and by clearly demarcating protected areas and no hunting zone boundaries.

Signs at entrances to markets and shopping areas indicating that bushmeat is illegal and the penalties involved alerts the conscience of patrons and forces them to decide whether to offend or not. Work with restaurant associations to encourage members to voluntarily hang signs.

3. Reducing the accessibility of snare materials

Analysis Theme: Weapons and tools

How it works...

Control or removal of wire from the landscape increases the effort needed to hunt.

Works best if...

Wire for snares is not already widespread and readily available.

Wire sources can be controlled or protected from theft.

Considerations...

Wire for electricity or telephone cables should not be left in bundles unguarded. Left-over wire from infrastructure projects should be collected (and destroyed).

Protected Areas, farms, and private lands that use fences should consider using mesh rather than steel-wire fencing, which can be stolen and converted to snares⁴⁴.

*Note: because snares can be made from a wide variety of everyday materials, your analysis may indicate it is impossible to control access as hunters will simply switch from one source to another. If that is the case, simply look for other responses that target a different analysis theme.

<h2>4. Reform programs for hunters</h2> <p>Analysis Themes: Hunters, Weapons and tools</p>		
<p>How it works... Conservation programs employ former hunters to use their skills and knowledge for positive conservation outcomes including in law enforcement, wildlife monitoring, and tourism sectors (as guides/trackers), thereby reducing provocation to engage in illegal hunting.</p>	<p>Works best if... Benefits of stable, legal employment outweigh income or sustenance derived from (potentially more lucrative) illicit hunting.</p> <p>Hunters are provided amnesty and employment opportunities in exchange for a full declaration of prior hunting activities.</p> <p>Hunters surrender their illicit firearms and poaching tools.</p>	<p>Considerations... Former hunters may be a real or perceived source of information leakage and corruption, thus hampering integration into and effectiveness of conservation initiatives.</p> <p>In addition to removing hunters from the system this approach potentially adds considerable knowledge and experience to conservation initiatives, including details of poaching activity and wildlife crime networks.</p> <p>Read more: Lotter <i>et al.</i> (2016)⁴⁷ (here)</p>
<h2>5. Promoting and facilitating consumption of alternative protein to bushmeat</h2> <p>Analysis Themes: Hunters, Demand and Consumers</p>		
<p>How it works... Promoting vegetable (e.g., beans) or insect proteins (e.g., wild harvest or farmed Mopane worms – <i>Imbrasia belina</i>), can potentially reduce the demand for bushmeat for local household consumption and contribute to revenue generation.</p> <p>Supporting the development of community level fish farming projects and/or farming of alternative livestock including rabbits, cane rats, ducks and domestic guinea fowl can provide communities with reliable, affordable protein thus potentially reducing local demands for bushmeat for local consumption and commercial sale.</p>	<p>Works best if... The main need is cheap protein, with no specific cultural taboos that cannot be overcome.</p> <p>The consumption of insect proteins is already a well-established practice.</p> <p>Wild harvest is well regulated to ensure sustainability.</p> <p>Alternative proteins are in regular and sufficient supply, tasty and healthy</p>	<p>Considerations... Promoting new sources of proteins may require cultural shifts requiring significant engagement with traditional leadership, substantial education or media campaigns, or incentives such as employment.</p> <p>Kruger National Park, South Africa allows a regulated wild harvest of Mopane worms, an established cultural practice, by local communities living adjacent to the park for household consumption and income generation. Importantly, this initiative has also been shown to improve local perceptions of and interest in conservation.</p> <p>Read more: Swemmer <i>et al</i> (2020)⁴⁸</p>

6. Development of alternative livelihood initiatives

Analysis Themes: Hunters, Demand and Consumers, Sale and Sellers

How it works...

The creation of alternative livelihood initiatives involving communities living in or adjacent to wildlife areas can reduce provocations and household reliance on the sale of bushmeat through the development of long term, profitable and sustainable economic opportunities linked to living wildlife.

May include small-scale projects (e.g. honey or food crops) or integrated conservation & development projects (ICDPs) (e.g. ecotourism, small-scale community wildlife and cultural tourism industries, sustainable agro-forestry)⁴⁴.

Works best if...

Program is backed by an independent, accountable organization and strong governance structures are in place to avoid elite capture or favoritism.

Hunters are willing to exchange hunting revenue for business income streams or paid employment.

There is a direct linkage between living wildlife and poverty reduction.

Benefits are received by households where decisions are being made to poach or trade.

Considerations...

Wildlife authorities likely to require partner support to implement alternative livelihoods interventions at scale.

Initiatives to supply wildlife-based enterprises such as tourism lodges require consistent quality and appropriate supply of produce, stable and sustainable demand and well-developed supply chains between producers, service providers and consumers.

Tourism-based initiatives are vulnerable to the impacts of global pandemics such as Covid-19.

In large communities, benefits accrued per household may not be sufficient to discourage continuation of illegal hunting⁴⁴.

Unintended consequences - if benefits are only received by households inclined to poach there is a risk it may inadvertently entice others to engage in illicit behavior. Income generating programs may augment hunting income, enable hunters to purchase firearms or free up more of their time to hunt. Increased wealth may also increase demand for bushmeat product.

Read more: Lindsey *et al.* (2015)⁴⁴

7. Improving agricultural practices to increase food security and income generating opportunities

Analysis Themes: Hunters, Demand and Consumers

<p>How it works... Improving local agricultural practices through training workshops and capacity building (e.g., permaculture techniques) reduces reliance on bushmeat for local household consumption and provides economic opportunities through the sale of produce.</p>	<p>Works best if... There is a trusting relationship between farmers and partners implementing capacity training. Increased farming commitment reduces time available for harvesting bushmeat.</p>	<p>Considerations... Permaculture may lead to improved human health and increased resilience to environmental changes, but challenges have also been reported including high labor input, pest and disease infestations, and lack of knowledge of permaculture practices. Integration with other forms of sustainable agricultural practices can potentially contribute to improved rural livelihoods but further research is required on its contribution to overall food security and productivity compared to conventional practices⁴⁹. Willingness of farmers to adopt new techniques - adoption can be risky without the requisite expertise or support. Costs associated with initial outlay for new farming inputs and materials may need to be provided or subsidized by donors. Read more: Softfoot Alliance Permaculture (here)</p>
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8. Development of community education programs

Analysis Themes: Hunters

<p>How it works... Cash income to cover school fees (and other expenses such as farming inputs) may result in predictable spikes in bushmeat harvesting by 'seasonal' hunters to offset these costs. Through the development of targeted scholarships, provision of school fee subsidies or establishment of no-fee or low fee rural schools, financial pressure can be relieved from the most vulnerable families, thereby reducing a key driver of poaching.</p>	<p>Works best if... Participants only hunt to cover specific expenses such as school fees for their children and are not regularly engaged in illicit hunting. Education programs are seen as a direct benefit of wildlife conservation.</p>	<p>Considerations... The link between wildlife conservation and educational opportunities should be reinforced. Long-term commitment is required from private sector or development agencies looking to establish and operate rural schools. Education programs should not only improve future prospects of the beneficiaries but also promote future conservation efforts. Read more: Children of Conservation (here)</p>
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9. Community based natural resource management (CBNRM) programs

Analysis Themes: Hunters, Demand and Consumers

How it works...

CBNRM schemes promote conservation through sustainable natural resource management that empowers local communities with strong rights and tenure of those resources. CBNRM aims to increase benefits of living near wildlife and offset losses incurred through human-wildlife conflict. May reduce bushmeat demand through increased economic benefits (including employment), from wildlife-based tourism and regulated hunting and provision of meat from trophy hunted animals.

May remove excuses for illegal hunting and also reduce frustration associated with being excluded from management of and legal access to natural resources.

Works best if...

Programs or benefits are not captured by the elite.

Efforts are in place to educate community members on the benefits of sustainable management of wildlife, including for local consumption.

CBNRM schemes are developed as buffer zones around PAs.

Benefits flow directly to communities rather than to government first.

Benefits are received by households where decisions are being made to poach or trade.

Considerations...

Greater devolution of ownership and stewardship of wildlife to local communities has been widely advocated. However, significant financial resources, technical expertise, capacitation and strong governance structures are required to initiate such programs and overcome documented challenges including elite capture and accountability⁵⁰.

In large communities, benefits accrued per household may not be sufficient to discourage continuation of illegal hunting⁴⁴.

Unintended consequences - if benefits are only received by households inclined to poach there is a risk it may inadvertently entice others to engage in illicit behavior.

A variety of initiatives have been established in Namibia (the conservancy program), Zimbabwe (CAMPFIRE), Zambia (ADMAGE) and Mozambique.

Read more: USAID CBNRM ([here](#)) and Global Environmental Management Support ([here](#))

10. Improving economic security among communities through micro-lending and cooperative saving initiatives

Analysis Theme: Hunters

How it works...

Can help impoverished communities become more self-sufficient without having to rely on commercial bushmeat poaching.

Works best if...

Program is managed by an independent accountable organization.

Benefits are realized at the individual or household level.

Participants are involved in decision-making.

Considerations...

In Serengeti National Park, Tanzania, the Frankfurt Zoological Society provides a revolving fund where individual members contribute a certain amount of money, take out loans and re-pay them after a certain period of time with an agreed interest rate in order to establish small environmentally friendly business enterprises. In order to become members, applicants must also give up all forms of poaching. Analysis of the program has shown it to have successfully aided in the reduction of local bushmeat poaching.

Results suggest that as a complementary strategy community conservation banks could increase the effectiveness of CBNRM programs in reducing poaching.

Read more: Kaaya and Chapman (2017) ⁵¹ .

Stage Targeted: Transport

11. Vehicle and person searches

Analysis Theme: Transport

How it works...

Conducting vehicle and person searches along protected area boundaries or along known bushmeat transport routes can be an effective method at increasing the risk to poachers and/or intermediaries and may also increase costs and effort of transport as more circuitous routes are used in an effort to avoid the authorities.

Works best if...

Transport routes including roads and railways are limited.

Motivated and professionally trained and handled detection dogs are used.

Involves strong collaboration and partnerships.

Considerations...

Searches should be random or intelligence-based to avoid setting patterns.

Multiple authorities can work together including police, transport authorities and wildlife authorities.

Wildlife authorities may partner with NGOs to develop detection dog capacity.

Use of detection dogs may be limited in certain environments e.g., areas with tsetse fly infestations.

Access to adequate veterinary care, facilities and continuation training.

In areas where product pricing is heavily influenced by avoidance of risk rather than supply and demand, increasing risks may result in poachers and intermediaries settling for lower prices.

Read more: Parker (2015)⁵² ([here](#)).

Stages Targeted: Trade and Consume

12. Media campaigns to reduce desirability of bushmeat

Analysis Themes: Demand and Consumers, Sales and sellers

How it works...

Aim to disrupt markets and deny benefits to those involved by reducing demand for the product. Highlights the threat the trade poses and the dangers associated with selling, purchasing and consuming illegal bushmeat, including health and legal risks.

Actively promote legal suppliers of game meat.

Works best if...

Addressing intrinsic motivating factors.

Messaging targets the urban elite who can afford legal game meat.

Promotes legal alternatives.

Considerations...

Target audience – for instance women may play a key role in motivating or discouraging family members to hunt or sell bushmeat

Is the trade driven by supply or demand?

The scale of demand vs supply

Read More: This is Not A Game campaign in Zambia ([here](#)).

13. Regulate trade in wild meat

Analysis Theme: Demand and Consumers

How it works...

Assist compliance by developing a regulated and sustainable supply of legal wild meat harvested through wildlife ranching on private and community lands (e.g., Game Management Areas or Wildlife Management Areas). This may fulfil some demand for bushmeat in both rural and urban populations.

Wildlife ranching on private and community lands is well developed for example in Namibia, Zimbabwe and South Africa.

Works best if...

Game farms are located on marginal lands outside of PA, such as former commercial cattle farms, and are therefore not encroaching on available wildlife habitat.

There is a well-resourced regulatory body overseeing compliance.

Considerations...

A trade in legal game meat can be used to launder illegal bushmeat thus exacerbating the problem.

Legal trade may stimulate demand.

Clear licensing or other identification methods are needed to allow consumers to distinguish legal from illegal game meat⁴⁴.

Wildlife ranching may be constrained in countries where there is lack of clear government policy on ranching and/or where landowners do not have outright ownership of wildlife on their property⁴⁴.

Legal game is always likely to be more expensive than illegally harvested bushmeat due to the production costs. An exception may be game meat produced as a by-product of trophy hunting.

Commercially retailed game meat needs to be conscious of consumer preferences related to how meat is prepared and processed.

Veterinary disease restrictions may restrict movement of product within and between countries⁴⁴.

Game ranching may require fencing of wildlife habitat which reduces species' connectivity, migration and dispersal abilities. Additionally, game ranching may result in increased predator persecution as a result of human wildlife conflict⁵³.

Read more: Coad *et al.* (2019)²⁸ and Lindsey *et al.* (2015)⁴⁴

14. Disrupt trade by closing butchers, markets or restaurants selling bushmeat

Analysis Theme: Demand and Consumers

How it works...

Collaborate with police and other government authorities, including health inspectors, to conduct spot checks that disrupt illegal trade.

Encourage authorities to implement laws restricting the trade in bushmeat by issuing fines and shutting down establishments/vendors repeatedly supplying bushmeat

Works best if...

If meat is consumed as luxury.

Authorities have the capacity to conduct regular spot checks.

Corruption is low.

There is broad level support within communities for the action.

Considerations...

Closing businesses may be met with resistance and so alternative sources of meat should be available or known.

Assessment: Determine what works, what fails

It is vital to be able to say with certainty whether or not your bushmeat problem decreased from the baseline you established, and it is important to know if that change was caused by your intervention, or by other factors.

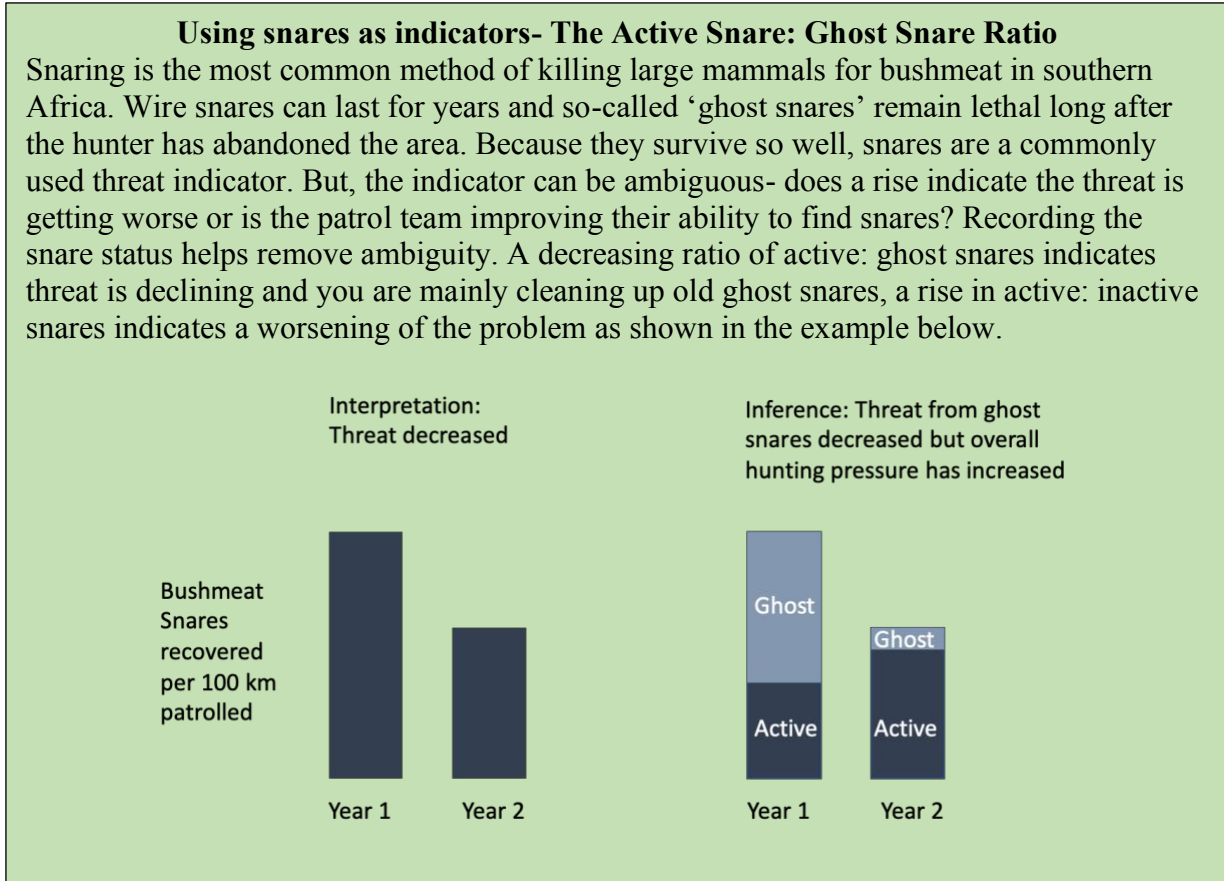
Monitor response implementation Tracking how your intervention was implemented will clarify how effective it actually is in reducing the bushmeat problem. Did a theoretically sound strategy prove ineffective due to technical implementation issues, or was it conceptually flawed from the beginning? For instance, did reliance on too many stakeholders, make coordination difficult and implementation slower and patchier than planned? Did your firearms amnesty target a large enough number of communities and did a sufficiently high proportion of respondents receive their incentives within your target timeframe?

Threat Indicators over different time frames As your goal will be to stabilize or increase your focal wildlife population, monitoring these trends over time will form an important part of your assessment. If your wildlife population doesn't recover despite other indicators showing a decline in your bushmeat problem, there may be a separate threat that requires addressing. It may not always be practical to conduct wildlife population assessments as frequently as desired and there will be a lag between response implementation and population recovery. You will need to rely on other indicators to help evaluate the success of a particular intervention at different time frames. These indicators can be compared to road signs – indicating whether the intervention is on the right path to reaching the ultimate goal. Some suggested indicators for measuring if the bushmeat problem has declined relative to your baseline are shown in the figure on page 36.

Avoid threat indicator pitfalls Unlike human victims, wildlife cannot report crime or let you know if things are getting better. Bushmeat hunters will often go to great lengths to avoid detection, including avoiding travel on gravel/sand roads, crossing boundary lines where tracks are less easily detected, sweeping away tracks, hiding snare lines and traps, and camping in remote areas¹¹. Every indicator has its own biases, limiting your understanding of the true change in the bushmeat problem: Patrol observations reflect where patrol teams went and how often, surveys reflect truthfulness of respondents and survey coverage. Three ways to avoid being led astray are:

1. **Adjust for changes in your effort to record the indicator.** If you increased your patrols over the years, consider using a detection rate. If you modified your strategy to target specific areas, make sure that point in time is clearly marked on your graph.
2. **Compare like for like.** Compare the situation now with the same season in previous years, compare it with the same geographical area you sampled earlier.

3. **Use indicators from independent information sources.** A single indicator will rarely tell you if your response is successful. Compare multiple indicators from different sources, collected by different methods. This triangulation dilutes possible error from any one indicator.



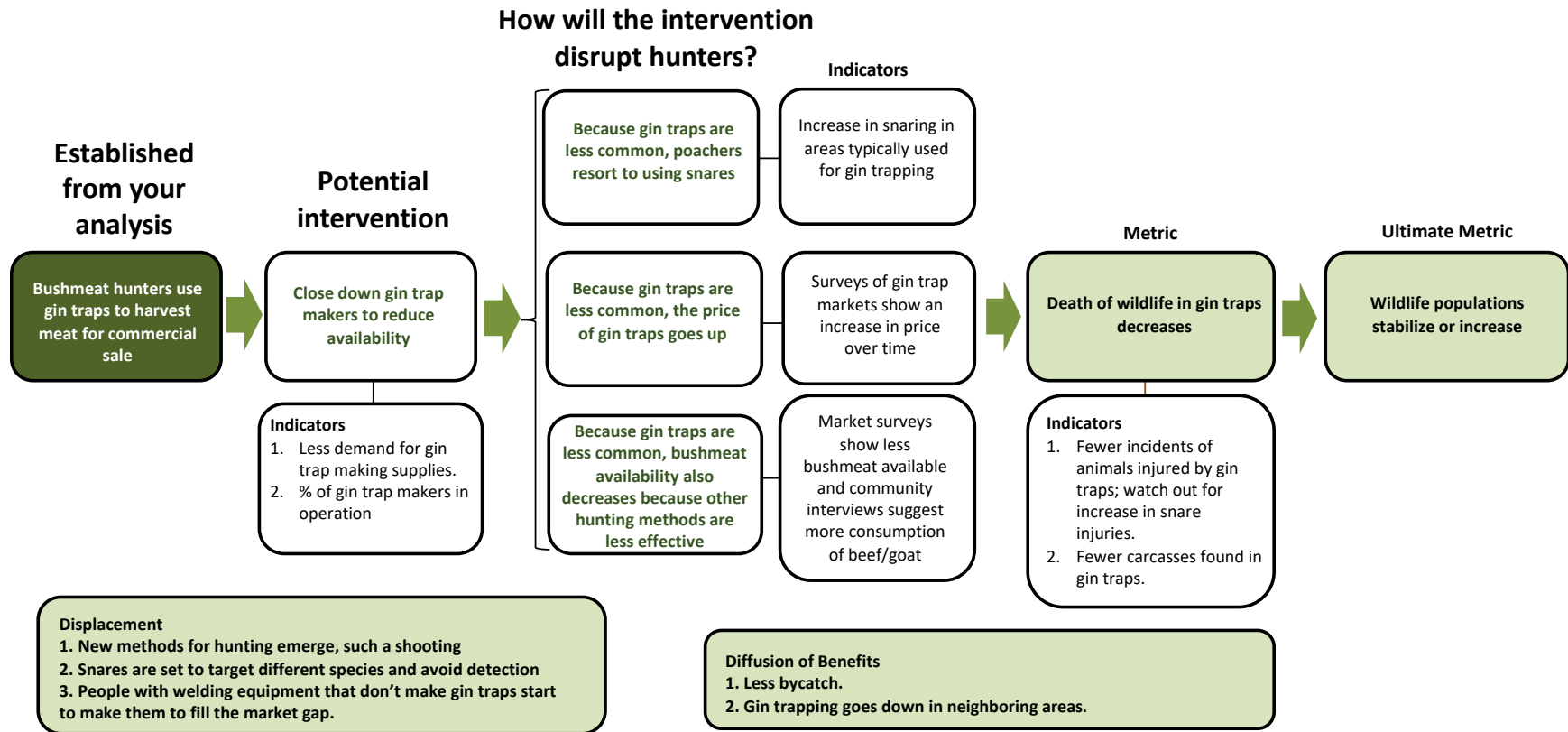
Anticipate adaptation, displacement and diffusion Aside from your bushmeat problem reducing or worsening, it may change form as people involved adapt to your intervention. Preventing hunters accessing firearms may cause them to switch to trapping or bow hunting, sometimes with a reduced kill success rate. Awareness of changes not only in your target area, but also in areas immediately surrounding it is important to determine if you have displaced your bushmeat problem into a neighboring area, or if you see diffusion of benefits- reducing your bushmeat problem also causes a reduction in neighboring areas.

Read More:

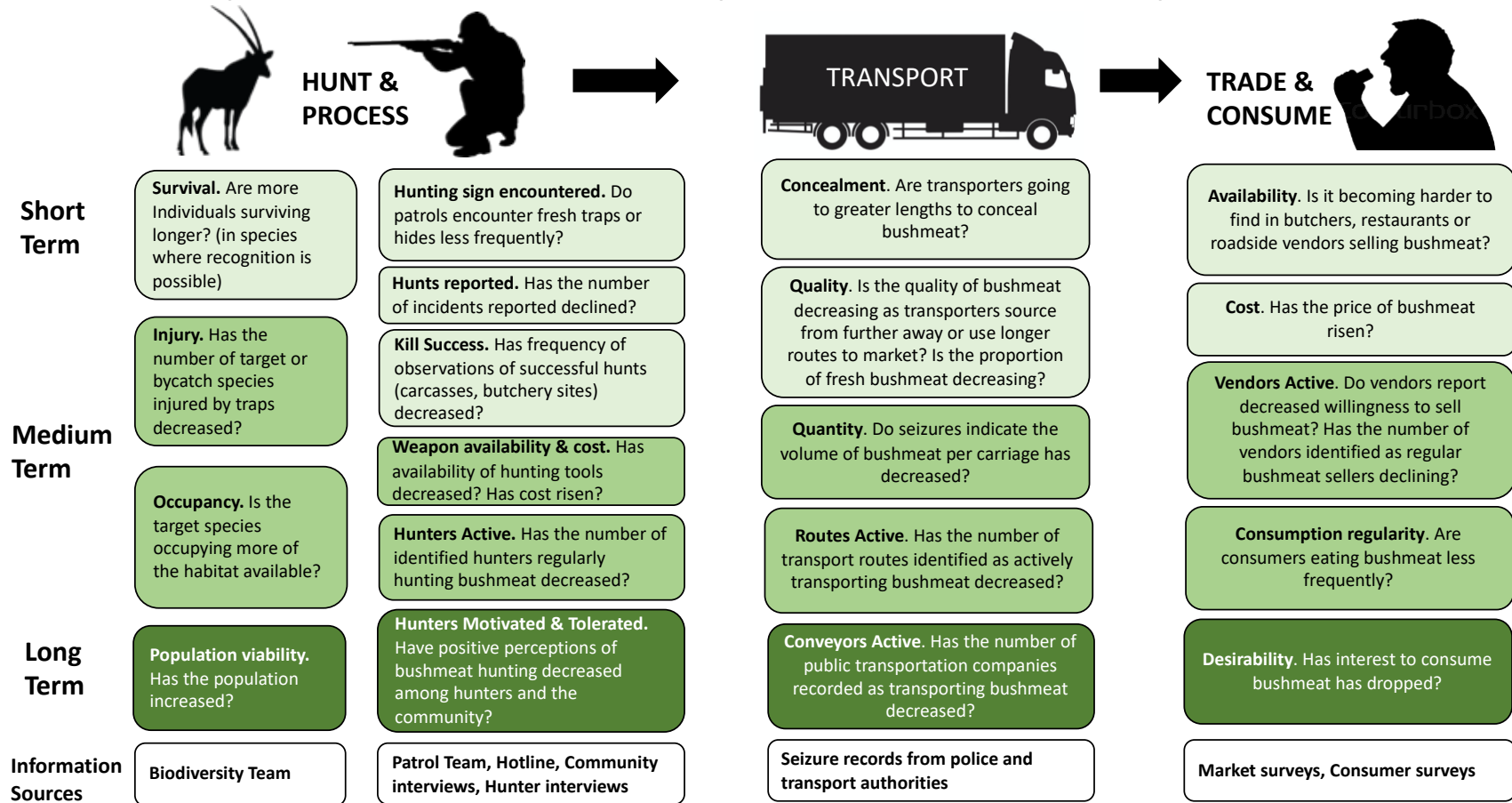
Problem-Solving Tools Guide No. 10 *Analyzing Crime Displacement and Diffusion* ([Link](#))⁵⁴

For more detailed guidance on measuring effectiveness, see the Problem-Solving Tools Guide No. 1 *Assessing Responses to Problems: An Introductory Guide for Police Problem-Solvers* ([Link](#))⁵⁵

Tailor indicators to your intervention. Monitoring impact requires careful thinking about how an intervention will change behavior and how this can be detected/measures. The indicator map below shows how you can sketch out indicators and metrics for your response, using a hypothetical bushmeat problem involving gin traps.

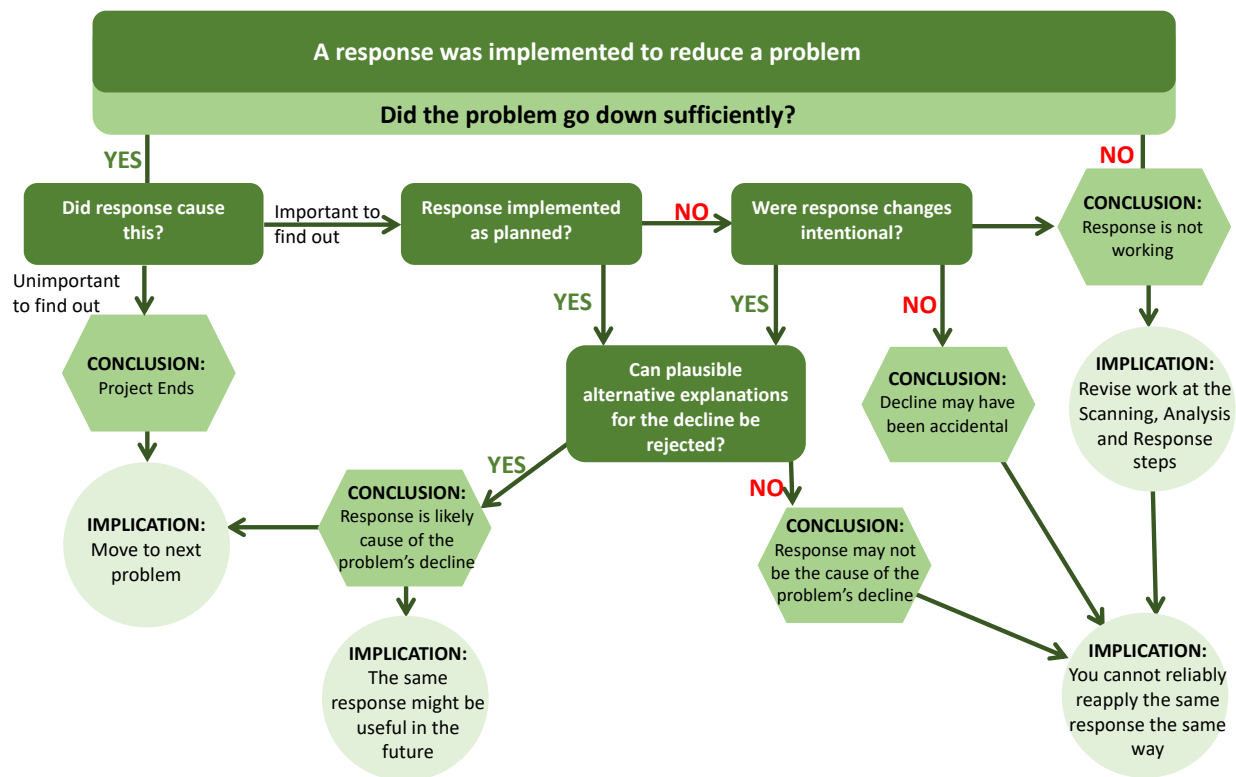


Ways to measure if the bushmeat problem has reduced since your baseline



Assess, adjust, document and disseminate Once the response has been implemented and the indicators monitored, the extent to which your response caused the decline in the problem can be assessed. Where necessary, adjust your response accordingly. Interventions often fail because of poor implementation, not because the idea itself was flawed. Review how you implemented the intervention and revised it over time as you adapted to challenges. Finally, ensure that your response implementation and assessment is documented thoroughly. Your case study could be used internally to guide responses to similar problems, as a training module for new problem solvers, and even shared broadly so other organizations might adapt a similar approach or set of approaches.

The flowchart below, reproduced from Lemieux and Pickles (2020)³⁷ with permission from the authors, illustrates how to think through the assessment of your response and implications for future work.



Conclusion

The bushmeat trade differs from other illicit trades in wildlife commodities as it frequently provides food security to rural communities either directly, or indirectly through generating income to purchase food. When opportunities for harvesting persist, the problem is always at risk of rising in response to crises- economic shocks, destabilization and pandemics- as motivated hunters and consumers exploit the opportunities available. Under all climate change scenarios and human population trends, the risk of these crises is forecast to increase over the next decade. Ensuring a sustained reduction of your local bushmeat problem in the long term will require a

combination of removing opportunities for harvest and trade and reducing motivations of potential hunters and consumers. Working with rural communities in your landscape to reduce their reliance on bushmeat as a food source or income generator must be a central component in your strategy.

Don't be disheartened by the size of this task and the scope of your mandate. The more you understand the context of your problem and its drivers, the easier it will be to link your bushmeat reduction project with broader national and regional stakeholders aimed at addressing food insecurity and human health.

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Appendix

Further questions to consider

Why?

1. Why do people poach? *This is possibly the most important question and the answer to which may aid in developing the most effective anti-bushmeat poaching program.*
2. Are local bushmeat poachers hunting out of necessity?
3. Are they hunting to provide their family or community with needed food or protein? Are local communities suffering food shortages?
4. Are they hunting to earn income? Are there alternative economic opportunities?
5. Are they aware of laws protecting wildlife?
6. Are they seeking prestige as a hunter?
7. Are they poaching out of boredom or curiosity?
8. Are they poaching out of resentment for PA or government policy?
9. Can the reasons why poachers select entry points be identified?

Who?

1. What form of employment do poachers engage in?
2. Do poachers have extended periods of free time?
3. Are there people who instigate the poacher's decision to hunt? Are there people who discourage the poacher from hunting?
4. Are there specific roles in a poaching team?
5. What is the process of recruitment to join a poaching incursion?
6. Are poachers aware of park regulations?
7. Are the poachers residents of local villages? Which villages?
8. Are they of the same tribal/linguistic group as those managing protected areas?
9. How old are they?
10. Are they experienced poachers or just kids?
11. Have they been arrested before?
12. Do they have other employment?
13. Are they involved in the management, decision making or ownership of protected areas?

14. Are they respected members of their village?
15. Are they coming from other parts of the country or even from across borders?
16. How many are in a typical poaching group?
17. Are they traditional hunter-gatherers? Are they poaching for subsistence or for markets?
18. Who are the intermediaries? Are they local or from afar?

What?

1. Which species are they killing?
2. Which species do they appear to be targeting (killing more than would be expected based on their availability)?
3. Are they processing carcasses in the bush or carrying out fresh meat?
4. Do they dry or smoke the meat?
5. Is the meat prepared for transport and distant markets?

Where?

10. Where do poachers hunt?
11. Do they hunt in areas with more wildlife?
12. Do they hunt close to park edges?
13. Do they travel or hunt in areas with lower patrol effort?
14. Do they regularly hunt in the same areas?
15. Do they move their hunting areas following intensive patrol efforts?
16. Where do they camp? Do they hide their camps?
17. Where do they process the meat?
18. Where do they enter and exit protected areas?
19. Do they use roads or avoid roads?
20. Where do they store the meat?
21. Where do they sell the meat?
22. Can the distributions, habitat use and movements of targeted species of wildlife be predicted?
23. Can landscape and biological features that attract game, and therefore attract poachers (water points, salt licks, fruiting trees, recently burnt areas, recent regrowth etc) in your site be located?

24. Can landscape features that funnel game be located in your site?
25. Do poachers follow certain landscape features for movement and navigation?
26. Do poachers create navigational aids to find their way?
27. Are there specific landscape characteristics of where poachers make lay-up points and camps?

When?

1. Are there clearly definable events which trigger bushmeat poachers decision to hunt?
2. Is there a distinct annual seasonality to bushmeat poaching? Are these related to other activities such as farming or livestock rearing?
3. Are there religious events, festivals or holidays in the calendar when bushmeat poaching rises?
4. Does poaching follow the moon phase?
5. Are there certain times in the day when key activities happen in the poaching incursion? Do these differ for different hunting methods? Different species or habitats?
6. Do poachers take advantage of changes in shift and predictable patrol routines by your patrol team?
7. Does bushmeat poaching increase during times of financial and food-security. Drought, economic recessions and collapse of fisheries
8. Does bushmeat poaching follow seasonal species migrations?
9. Is there seasonality to local bushmeat poaching?
10. Are there increases in poaching near holidays?
11. Do poachers travel and hunt by day or night?
12. Does poaching increase during full moons?
13. Does poaching decrease after a patrol?
14. How long do poachers spend on a hunting trip?
15. How often do they return to an area or to check snares or traps?
16. Do they hunt at times of lower ranger patrols (holidays, nights)?

How?

1. Are weapons made by a small number of specialist manufacturers?
2. Are they distributed by a limited number of vendors?
3. Can the source of certain key weapons and ammunition be identified?
4. Is there leakage of ammunition for firearms?

5. Can different 'signatures' be determined between different hunting groups or weapon manufacturers?
6. Can access to key tools, parts, ammunition or ingredients be controlled?
7. Where are wire snares sourced?
8. Can you control the source of wire snares? Protect fences, change fencing types, remove telephone cables?
9. Where are steel traps sourced? Is there a local manufacture?
10. What tools or weapons are used by local poachers?
11. Are different tools used for different species? Are different tools used in combination?
12. Is tool/weapon choice a reflection of the risk of being detected?
13. Do poachers carry firearms? If so does this represent a threat to rangers?
14. Do they use dogs as a warning of anti-poaching patrols?
15. Where do poachers acquire their tools/weapons? Can these be regulated?
16. Can the tools used tell you what species are being targeted? Can the species killed tell you what tools are used?
17. Do poachers access PA by foot, vehicle, boat? Thru PA entrance points or by avoiding these?
18. Do poachers move to important wildlife areas to start hunting? Do they track animals? Do they use visual searches?
19. Do they anchor snares, traps or nets to trees? Do they build brush fences? Are there specific requirements or characteristics for facilities to store bushmeat before onward sale or transportation to end market?
20. Are specific conveyances preferred to transport bushmeat?
21. Are specific private transport, logistics or haulage companies used to transport the bushmeat?
22. Are there distinct methods to conceal bushmeat?
23. Are there requirements to preserve the meat on the journey?
24. Are there preferred times when bushmeat is moved from one facility to another?