



Hunting and Law Enforcement in Keo Seima Wildlife Sanctuary: Lessons for Management

A research briefing produced for, and informed by research carried out as part of the project “*Learning from observational data to improve protected area management*”, funded by the UK’s Natural Environment Research Council [grant NE/N001370/1]. The project was a collaboration between the University of Edinburgh, the University of Oxford, the University of York, the Wildlife Conservation Society Cambodia and the Cambodian Ministry of Environment.



Summary

- Hunting using snares is one of the main threats to wildlife in Keo Seima Wildlife Sanctuary (KSWS). Snares are used for hunting to eat, hunting to sell and for protecting fields from wildlife damage and, once set, they can remain an active threat to wildlife for several months.
- Law enforcement is an important tool for reducing the harm caused by snaring. Patrol teams primarily aim to reduce the threat of snaring by deterring hunters from setting snares in the first place, and by finding and removing snares.
- There are a number of options for patrol strategy, including targeted intelligence-led patrols, patrols focussed on finding and removing as many snares as possible, and those following standard routes. The balance of different patrol types should be based on clear conservation objectives, and robust evidence about the effectiveness of alternative approaches for meeting these objectives. This project aimed to provide some of this evidence.
- We carried out snare-finding experiments, which showed that search teams generally detect only a small proportion of snares, even when effort is high. This suggests that snare removal alone will rarely be sufficient to prevent unsustainable levels of animal mortality. Rangers vary in their skill at finding snares, so when snare removal is a priority (e.g. for the protection of known wildlife hotspots) choosing, training and rewarding the right people is important.
- Patrols are not currently seen as an effective deterrent to hunting by villagers and few hunters report that they have been caught. If the priority for a law enforcement programme is to deter potential hunters, the rules governing wildlife use and the punishments for offences should be clear, widely understood and consistently applied, and communities need to be aware of the correct judicial procedure that rangers should be following.
- However, law enforcement efforts are most likely to be successful when they form part of a larger strategy for changing snare hunters' behaviour that reduces the attractiveness of snaring relative to other livelihood options.
- While snares remain a key threat to wildlife, we found that dogs were being widely used for hunting. This is also of pressing concern for conservation. Greater understanding of the problem is needed before effective means of intervention can be recommended.

Background

Hunting is a key threat to wildlife within protected areas worldwide, and pressure from hunting is particularly severe in Southeast Asia. Snares are one of the most widely-used methods for hunting, and are a serious conservation concern because they affect a wide range of species, often including those not specifically targeted by hunters, they can remain active for a long time after they are set, and they are difficult to detect and remove from a landscape.

Ranger patrols are an important tool for reducing the threat of snaring within protected areas. However, for patrolling to be an effective contribution to tackling snaring, there is a need for site-specific evidence on the ability and motivation of rangers to detect snares, the characteristics of hunters, their reasons for hunting, the techniques they use and the

species they catch. This briefing discusses the challenge of tackling snaring within Keo Seima Wildlife Sanctuary (KSWS) in eastern Cambodia, focusing on the results of research carried out there between April 2016 and December 2018. The work included experiments to measure rangers' ability to detect snares and the length of time snares persist once they have been set, and interviews with members of rural communities to understand the methods used for hunting, which species are most often caught, eaten or sold, seasonal patterns of hunting, knowledge of rules about hunting, and perceptions of law enforcement. The work was carried out by a team funded by the UK government's Natural Environment Research Council, as a collaboration between three UK universities (Edinburgh, Oxford, York), WCS-Cambodia and the Cambodian Ministry of Environment.



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Keo Seima Wildlife Sanctuary

KSWs covers an area of 2,927km², including evergreen, semi-evergreen forest and deciduous forest, and provides habitat for important populations of elephants, wild cattle, primates, mammalian carnivores and birds. Approximately 20,000 people live in or near KSWs, and snaring is a serious conservation threat (e.g. populations of deer species like Eld's deer, sambar, and muntjac, and wild cattle species like gaur and banteng are rapidly declining due to snaring and hunting with dogs). Snares are set by people visiting the forest specifically to hunt, those visiting the forest for other purposes, and by those seeking to protect the boundaries of farms. They are typically made from wire, cable or nylon. Anti-snare patrols in KSWs are conducted by a dedicated four-man team, led by a WCS staff member and supported by three local guides. Between 2010 and 2015, 5,080 snares were removed from KSWs by patrol teams. Previous surveys have found particularly high snare densities in dense forest in the eastern part of the Sanctuary near the Vietnamese border, but recent wildlife monitoring suggests that the species targeted by commercial hunters may now be rare in these areas. Our research on snare detection was conducted in mixed forest around Sre Pleng patrol station, which is situated in the south of the Sanctuary, because this was identified by KSWs and WCS staff as an area of high ungulate density, in which snaring was prevalent, and where the people using snares were from the KSWs area (and therefore could in principle be targeted by conservation interventions to change their motivations for snaring). The situation is potentially very different in other areas (e.g. snaring hotspots near the Vietnamese border), so our findings should not be extrapolated beyond the Sre Pleng area.

Snare detection and persistence

Our snare detection experiments confirmed previous findings by O'Kelly et al. (2018)¹ that search teams find a relatively small proportion of all snares present in an area. O'Kelly et al. found that an average of 20% of experimental snares set were detected, varying between 11% and 30% depending on vegetation type and patrol team. In our study, we used a similar approach, but focussed on understanding how search effort by teams affected the amount of snares detected. We found that increasing the time spent searching only produces a relatively minor increase in the number of detections. For example, in our experiments a team searching a 500m x 500m area of forest for 15 minutes only found one snare out of ten on average, but even searching for 90 minutes a team still only found three snares out of ten (Figure 1). We also found important differences in the ability of different individuals to detect snares, with half of all detections being made by only four of the 29 individuals involved in the search teams.

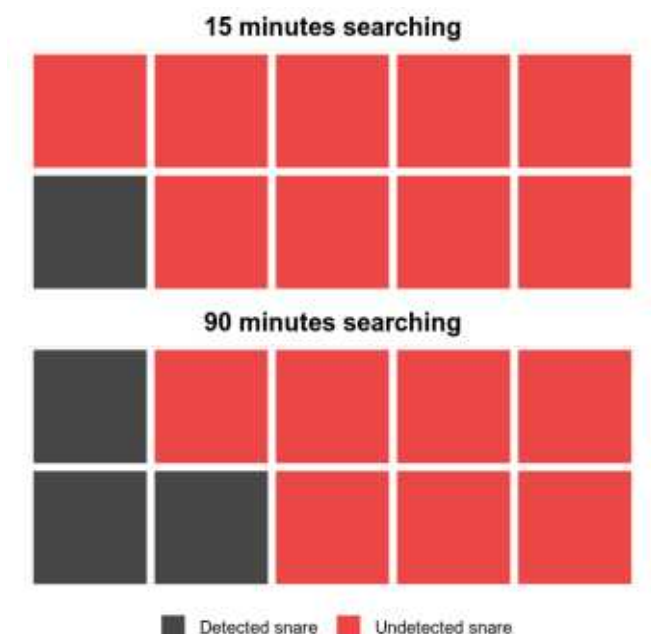


Figure 1 | Most snares are not detected by search teams. A team searching a 500m x 500m area of forest for 15 minutes is expected to find one snare out of ten, but even if a team searches the same area for 90 minutes (i.e. six times as long) they are still only expected to find three snares out of ten (i.e. the majority of snares are not detected).

If snares go undetected, they can remain active within a landscape for a long time after they are set and therefore pose an ongoing threat to wildlife. Our experiments showed that 50% of snares are still active 31 days after they are first set, and that 10% of snares are still active after 110 days.

In theory, patrol teams can reduce the threat of snaring in two ways; by deterring hunters from setting snares in the first place, or by finding and removing snares. In practice, however, the low rate of detection and the long persistence of snares means that snare removal alone is unlikely to be sufficient to reduce pressure on wildlife to acceptable levels, with the possible exception of targeted snare removal from known hotspots of hunting or wildlife. Developing effective strategies to reduce the incentives for hunting and discourage people from placing snares should therefore be a priority.

Who is snaring in Seima, and why?

We interviewed 705 households in 18 villages in the vicinity of Sre Pleng, to understand people's hunting strategies, why they hunted, and how they felt about hunting.

Only 8% of these households said that they currently catch wildlife and 27% said that they had caught wildlife in the past. However, obtaining precise estimates of the prevalence of hunting is difficult because people may be unwilling to discuss the subject openly for fear of punishment, so these numbers are likely to underestimate the total number of hunters. Almost all the people who said they hunted now said that they did it to catch animals to eat, but 30% also hunted to sell meat to other villagers or to traders.



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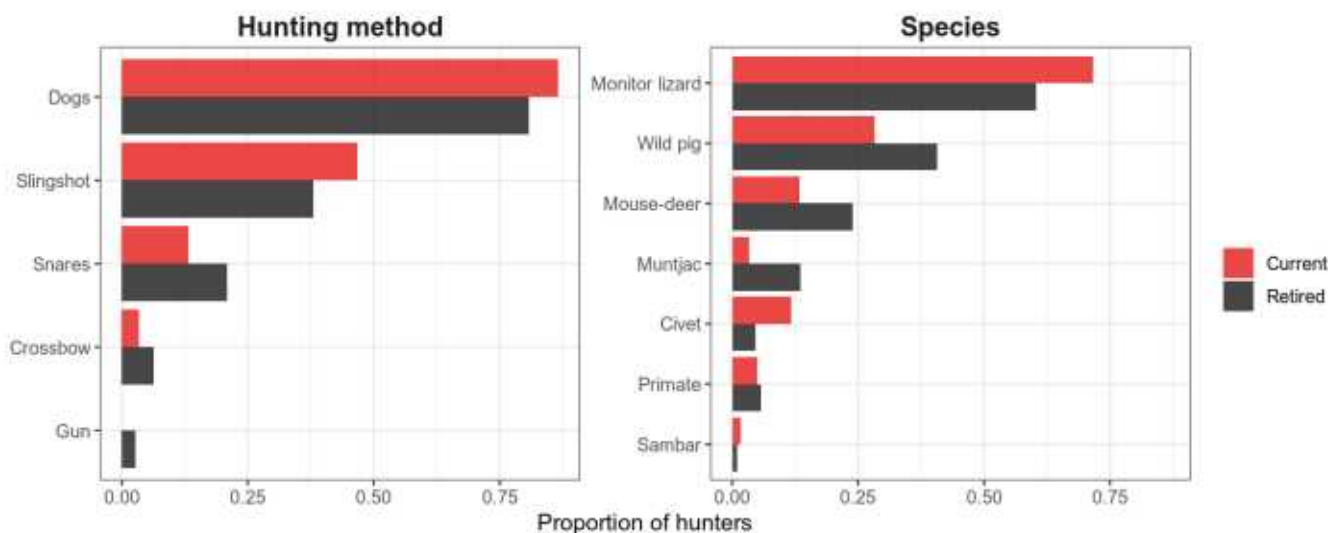


Figure 2 | The proportion of self-declared hunters who use different hunting methods and the species they report catching.

Only 13% of people who said they were current hunters reported using snares, compared with 21% of self-reported retired hunters (Figure 2). The most commonly reported methods for hunting were dogs (87% of self-declared current hunters) and slingshots (47%), and many hunters said they used more than one method. More than half of current hunters said they caught monitor lizards, with 28% catching wild pig and 12-13% catching mouse-deer and civets. However, hunting is not the only reason why people use snares. One in five households said that they set snares around their fields to protect crops from wildlife damage. On average, households reported setting 20 snares for this purpose but a few households used many more snares (100-300 in total).

A large majority of households (including self-declared non-hunters) believed that the hunting, consumption, and sale of wildlife in the area had decreased in the preceding five years, and the most common explanations given by former hunters was that wildlife was getting harder to catch (43%) or that they had less time available now (35%). Only 5% of former hunters reported fear of encountering patrols as a reason for stopping, and amongst all households only 13% believed that patrolling was the reason for the decline in

hunting. This suggests that patrols do not currently create a strong deterrent to hunting. The estimated probabilities of being caught were relatively high; 40% of interviewees thought that it was likely that a person going hunting would be caught by a patrol and 64% thought that it was likely that if a person was caught they would receive a penalty. However, only 2% of households reported having ever been caught personally by a patrol for a hunting offence (or about 6% of people saying they had ever hunted).

Awareness of the rules regarding snaring and the consequences of breaking them is also seemingly low, with 29% of households being unsure whether there are any such rules or believing that there are no rules, and 24% being unaware of the penalties if someone was caught hunting. One in four households also believed that snaring around farms was legal.

These numbers all have to be treated with caution because people are likely to have been answering strategically, either to give the answers they thought our researchers might want to hear, or so as not to incriminate themselves.

Using these findings

Hunting poses an ongoing serious threat to wildlife in KSWs. The available evidence suggests that law enforcement teams in Seima are currently only able to detect a small proportion of snares that are set in the forest, and do not create a strong deterrent to snaring.

The large number of snares that go undetected means that snare removal alone is unlikely to be effective as a general conservation strategy. In certain circumstances, targeted snare removal may be effective for protecting wildlife hotspots. By improving the training and motivation of rangers to search for snares, carefully selecting the individuals who are most skilled at finding them to take part in patrols, and rewarding success, it might be possible to increase the proportion of snares found. However, alternative conservation strategies aimed at reducing the snaring threat will also be needed.

In theory, the deterrent effect of patrols can be increased by making people think it is more likely that they will be caught if they go hunting (e.g. by increasing the number of patrols, investing more in intelligence gathering, or reporting successful arrests), or by ensuring that more arrests result in punishment (e.g. by carefully documenting evidence and working with courts to ensure that punishments are consistently and fairly applied). However, law enforcement efforts can also be improved by working with local people to explain the rules and explore how hunting can be made less appealing. For example, local people may prefer to do other things than hunting, if they can make enough of a living.

This project demonstrates how carefully conducted research can be used to inform better conservation strategies. In our case, we used independent experiments designed specifically to maximise the likelihood of detecting illegal activities, and social surveys with local communities to draw the conclusions presented here. Further research could explore whether hunting practices, the prevalence of snaring, and perceptions of patrols differ between these communities and communities in other parts of KSWs, explore perceptions and potential solutions to the practice of hunting with dogs and test the potential of training and rewards to improve ranger motivation and success at finding snares.



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Project updates and further information

Project website: <http://bit.ly/patroldata>

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