

Mechanisms of Deterring Illegal Hunting at the Ann and Sandy Cross Conservation Area in Alberta, Canada

Tyrell Benson and Antoine Hébert-Breton

Abstract: The ASCCA is working to protect the wildlife within its conservation area limits and to preserve nature by recreating the sustainable environment that was once there (Shyba, 2015). These 4800 acres of land are open to visitors, with limited access, in order to reduce contact between visitors and animals, and to reduce environmental damage that visitors might cause by walking in the area without hindrance. Even with visitors having limited access to the CCA, elk, deer, moose, and other animals have become acclimated to visitor presence and are not as wary of humans as they might be in more isolated areas (Shyba, 2015). This has had an impact on the health of wildlife in the CCA, particularly in relation to illegal hunting, which has been a rising issue at the CCA for some time.

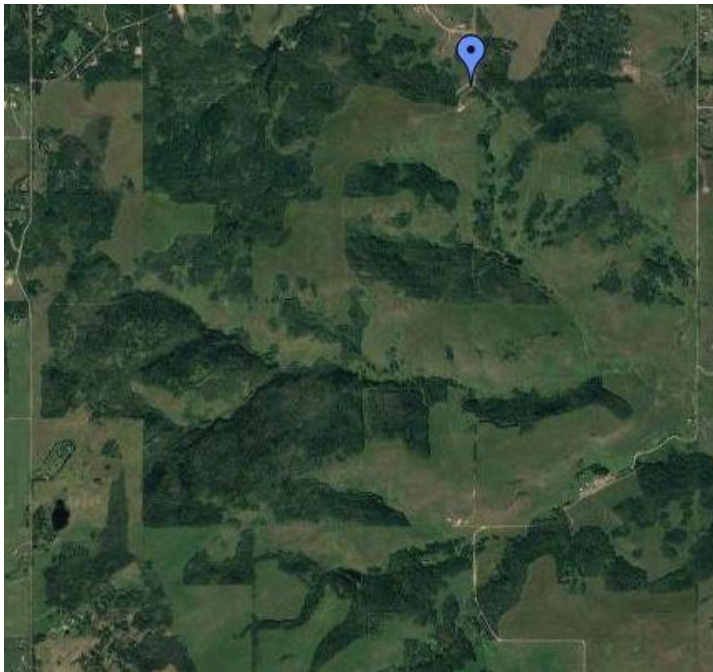


Figure 1. Satellite image view of Ann and Sandy Cross Conservation Area (Roadways on both the eastern and western borders of the Conservation Area boundary. The Conservation Area is 1.5km from the city limits of Calgary, as indicated by markers along Highway 22x (Shyba, 2015). The blue pin marks the parking lot location for the visitors, just North of visitor building.).

Introduction

Poachers are hunters who engage in illegal hunting activities either by harvesting wildlife they are not permitted to, hunting in areas they are not permitted to, or a combination of these. Poachers enter the CCA to illegally hunt elk, deer, moose, and other animals because they know that the wildlife is less responsive to the presence of humans in the CCA than in other locations. Even though the boundary of the CCA is protected by fences, poachers still enter the area to hunt illegally. Some poachers will use the road along the eastern boundary of the CCA to their advantage, waiting for other poachers to stir up and push game eastward from western boundary of the park, to be killed near the roadway along the CCA's eastern border (Shyba, 2015, Fig. 1).

While the identity of poachers in this area is not singular or definable to one profile or demographic, the evidence of poaching and sightings of poachers at the CCA suggest that the individuals who partake of this illegal activity are not hunting purely out of need for sustenance, since they have been seen with expensive hunting equipment and vehicles. Illegally hunted animal remains, removed only of hides and antlers, with the meat of the animals left at the kill site, confirm that poaching for some reason other than food procurement, is likely occurring. Since this illegal hunting is likely not, for the most part, based out of need or desperation, as suggested by the evidence, several mechanisms which discourage poaching and threaten repercussions for poaching, may be effective in combatting the issue of illegal hunting at the CCA.

In the following sections, general methods of deterring poaching are presented and discussed on their individual merits. While scholarly literature and professional expertise were relied upon for the background of this work, a large amount of creative and personal license was taken by the authors in response to their ASCCA supervisor's request for ideas from the perspective of the authors, whose young and academically driven understandings of the world are apart from scholarly professional rhetoric and might provide unique insight into the illegal hunting issue discussed here. Some of the suggestions presented here are likely already in use by the ASCCA either to a limited extent or for purposes other than addressing illegal hunting, but this paper identifies that these methods

could be most effective in addressing the issue of illegal hunting when applied strategically and with consistency.

Methods

This work began with a consultation of ASCCA staff, more specifically with the project supervisor Greg Shyba, on the issue of illegal hunting at the CCA. On a visit by the authors to the CCA, the supervisor provided a tour of the CCA zones which are closed to the public and answered questions on the current issues of poaching in the area. The supervisor provided some ideas on how the issue of illegal hunting might be addressed, drawing on personal and professional encounters with illegal hunting. Throughout the first few weeks of research, following the visit to the CCA, a compilation of literature was created to support the project deliverable. In addition, several ideas were identified as to how illegal hunting might best be addressed at the CCA. For the remainder of the project, these ideas were developed with the support of scholarly literature, and consultation with law enforcement and conservation professionals.

Results

Drone Surveillance

A drone equipped with two cameras, one visual spectrum camera for day uses and a thermal imaging camera for night uses, would create a capacity for real-time monitoring of CCA zones at any hour (Hambrecht et al., 2019). A GPS tracking device that is incorporated into the drone would designate the drone's location so that the location of any illegal hunting activities captured by the drone's cameras would be relayed to the ASCCA drone operator. The drone's flights could either be manually controlled by a staff member or follow specific routes programmed into its software beforehand. During its flight, the drone's cameras would film or photograph everything, recording anything that has a significantly different heat signature or appearance relative to those of the environment. Images and/or video captured by the drone could either be viewed after a flight or at the time of flight on the operator's phone, depending on the model of drone and the ASCCA's preference. If a human figure appeared during the

drone's flight and recording, the GPS location at the time of the recorded sighting could be used as a general locator of the human activity, which could then be either investigated by ASCCA staff, or reported to a wildlife officer to decrease risk of confrontation between ASCCA staff and potential poachers.

Community Outreach

Contact with surrounding communities by ASCCA staff members to discuss the issue of illegal hunting around the Conservation Area could prove useful in informing community members' social attitudes and understanding of the issue of poaching (Steinmetz et al., 2014). ASCCA staff members could go to grade schools and post-secondary institutions to educate the community about the importance of conserving the CCA environment, as well as about the impact that poaching has on the wildlife. This might change community member ethics toward poaching and influence poachers within the community to stop their illegal activities (Steinmetz et al., 2014). The community could also be educated on avoiding buying animal products that do not have a traceable processing history, and encouraged to make a habit of asking sellers of these animal products where the product came from to decrease the chances of buying something that was killed by a poacher, thereby decreasing the support for the illegal hunting industry (Ripple et al., 2015).

Animal Tagging

Animal tagging allows changes in animal location and behavior to be tracked remotely. The catching of animals could be done with nets or harmless traps, though the use of tranquilizers might be necessary for sedating animals during the handling process (Kamminga et al., 2018). Once a sensing device with an internal GPS is attached to an animal, the animal could be constantly tracked for any abnormal behavioral changes (Kamminga et al., 2018). Whenever the sensing device detected a sudden abnormality in the animal's behavior (ie. very rapid change in movement or location) it would send an alert to an ASCCA computer, and GPS coordinates of the animal would also be relayed so that an ASCCA staff member or a wildlife officer might go to investigate for any illegal hunting activity (Kamminga et al., 2018).

Visual Notices

Visual notices in the form of signs may be posted to notify individuals that illegal hunting activity may be reported to Report A Poacher, or to notify individuals that there are patrols and surveillance occurring in the area, or that a local crime watch is in effect. All of these visual notices may aid in providing opportunity for illegal hunting activity to be reported and subsequently addressed by law enforcement and ASCCA staff. Signs like these may also be used as a deterrent to poaching, notifying potential poachers that there are repercussions to engaging in illegal hunting activity.

Increased Patrols

Patrols of protected areas have long been a method used to deter poaching (Massé, 2020). Patrols can be done by law enforcement, staff of a protected area, and citizen volunteers in order to gather intelligence information on poaching activities occurring within the protected area, as well as maintain a vigilant presence as a deterrent to illegal harvest of game (Massé, 2020). Intelligence information may be, but is not limited to, recorded sightings of suspicious vehicles, recorded sightings of remains of illegally hunted animals, recorded sightings of poaching equipment, and recorded sightings of vandalism (ie. fences cut or damaged, potentially for illegal access to protected areas by poachers). Intelligence information may be recorded through notes, photographs, or video. Maintaining a vigilant presence may occur simply by the act of patrolling, with patrollers being sighted by or leaving sign of their presence, thereby discouraging individuals from hunting illegally, for risk of being caught in the act (Massé, 2020).

Game Cameras

Game Cameras may be mounted on stands, trees, or fenceposts in strategically significant places which will allow for photographic or video capture of illegal hunting activities (Kamminga et al., 2018). These cameras may also be hidden to avoid them being detected by poachers (Kamminga et al., 2018). Cameras can operate at any time of day and any time of the year if they are of good quality. Game cameras can therefore constantly capture illegal hunting activity which occurs in their field of view.

Restricted Access

While a substantial portion of the Cross Conservation Area is already only accessible by staff and those privileged with special permissions by the ASCCA, road access along much of the CCA boundary makes these restricted areas easily accessible to those lacking a regard for the private nature of this property. Road access along the CCA boundary by poachers might be limited by restricting road access on roads paralleling the CCA boundary to local traffic only – including ASCCA staff, ASCCA permitted entrants, and local residents.

Discussion

Drone Surveillance

In order to fly a drone, an ASCCA staff member would need to have a drone permit and be present during the manually operated or pre-programmed flight, taking staff time away from other duties. The drone could be programmed to do different flights throughout the day in order to surveil various zones of the ASCCA, including those zones that are more susceptible to being used as poaching grounds (Hambrecht et al., 2019). The flight of the drone is, however, limited to its battery life, and the disadvantage would be that it cannot stay in the air for prolonged periods of time. Drones usually come with an automatic return bay programmed into their software, so that when the drone's battery is almost depleted it returns automatically to its starting point (ie. the CCA visitor building) for recharging and maintenance. While drones are not extremely expensive, the cost of cameras needed for drone surveillance and the maintenance of these items, may be more costly.

It is also notable, that while a vision spectrum camera would be perfect for day use in areas that do not have too many trees, a thermal imaging camera would be needed for densely forested areas and night viewing, further increasing start-up and maintenance costs (Hambrecht et al., 2019). Moreover, the physical disadvantage of thermal imaging cameras is that they often cannot differentiate a poacher's heat signature from heat which radiates from the surrounding environment on hot days (Kammainga et al., 2018). The use of both cameras on a drone would allow for the detection of any suspicious activity during most days and nights, regardless of forest coverage, but the cost associated with the technology,

maintenance, training, and time away from other duties may be prohibitive. The benefit of this method of surveillance in reducing in-person confrontations between ASCCA staff and potential poachers, however, should not be overlooked.

Community Outreach

Using the community outreach method to prevent poaching could change the way that people think for the better (ie. improved social norms and moral obligations regarding poaching) and increase community understanding of the importance of protection of animals from poachers (Steinmetz et al., 2014). This method also has potential to build greater trust between ASCCA staff and community members, which could prevent poachers in communities from hunting in protected areas, as well decrease community tolerance towards poaching (Steinmetz et al., 2014). While time consuming to commit ASCCA staff to interactions with surrounding communities, the benefits of such a commitment toward altering community views on the issue of poaching could prove rewarding and lasting. Outsourcing community outreach initiatives to willing volunteers should also be made a consideration.

Animal Tagging

This method for preventing poaching is time and resource intensive because animals must be safely caught, and sensing devices must be attached to the animals without causing undue harm or stress. Animal tagging also has the potential to be dangerous for the staff who have to handle the animals. While animal tagging does provide opportunity to address poaching issues when animal behavior or location rapidly change and this information is relayed by the tracking device to ASCCA staff computers, it is likely that animals will be killed before ASCCA staff or wildlife officers can respond.

Visual Notices

Visual notices, such as Report A Poacher signs and Crimewatch signs, would certainly aid in discouraging poachers who are concerned about being caught in the act of illegal hunting. While some of these signs are already posted in the area, posting signs with more spatial frequency, particularly along roadways which border the CCA, could be of benefit in ensuring these visual notices are not missed.

It is of particular importance that these signs are not posted and left as empty warnings. Without action to back up what the signs say, poachers will likely develop the impression that the CCA is a place whose governing organization is “all talk” and does not *actually* protect its borders or the wildlife within them. This could lead to an issue of chronic poaching in the CCA, especially when such rumors circulate between individuals who engage in illegal hunting activity. The ASCCA should, therefore, take care to back up these visual notices by the creation of a visual human presence and by reporting any poaching activity to law enforcement as immediately as possible.

Increased Patrols

Thus far, patrols have been effective in detecting poaching activity at the CCA, as indicated by the supervisor’s account of multiple instances where poachers or evidence of illegal hunting had been seen within the CCA boundary. This is, therefore, a valuable method of detecting illegal hunting, but requires some items to be addressed in order to be most effective at stopping illegal hunting. Some means of communicating information as soon after illegal hunting activities are detected during a patrol, would be of utmost importance. The benefit of communicating information about poaching activities as soon as they are detected is that the evidence gathered will be more legally robust. For instance, law enforcement is more likely to be able to locate and approach poachers when they have been spotted recently, and a search warrant or other document is more likely to be issued to law enforcement if someone has recently been seen poaching, recent knowledge being one of the requirements for such a document to be issued, in most cases. For this reason, being able to relay information about poachers or evidence of poaching at the time of discovery would be of great value.

Considerations must, of course, be made for the time and labor-intensive nature of patrols, and these should be carefully considered by the ASCCA in terms of the financial and human resources which can reasonably be allocated to patrol activities. The time away from other duties of law enforcement or ASCCA staff, were they to be tasked with patrols, may simply create an untenable situation and alternatives, such as obtaining citizen volunteers to patrol at designated times, might be more reasonable. The ASCCA should, of course, look to its own legal safety if citizen volunteers were tasked with patrols, and be aware of the legal liability

which could result from sending citizen volunteers on an ASCCA sanctioned errand, should anything unfortunate occur to said volunteers during their patrols.

In terms of further maximizing the effect of deterring poaching through patrols, efforts should be made by those patrolling to create a visible presence, perhaps by dressing in brightly coloured or reflective clothing (Massé, 2020). This would make patrollers a visible presence to poachers, which may discourage them from hunting illegally within the CCA boundaries for fear of being caught. Moreover, highly visible clothing would promote safety of patrollers, preventing them from being misidentified as animals and shot by poachers, or hit by vehicles when patrolling along roadways. Were the ASCCA to expand its patrols, especially to citizen volunteers, mandatory use of highly visible clothing could also reduce the liability of the ASCCA in the event of a tragic incident like those previously discussed.

Game Cameras

The benefit of using game cameras to monitor and gather intelligence on poaching activity is that they are not subject to time restraints, as humans doing surveillance and patrols are. Game cameras can operate at all times and, if properly maintained, under any environmental factor or weather condition (Kamminga et al., 2018). This does, however, mean using game cameras of a robust design which may be of a greater expense. The risk of this is that the cameras may be seen and stolen, as high-value items. To prevent this, along with disturbance of wildlife, game cameras should be well camouflaged (Kamminga et al., 2018).

As mentioned, game cameras must be maintained to be of any use in monitoring illegal hunting and recording information on these crimes. It should be noted that because game cameras are static objects, they must be strategically placed to serve this purpose, and number of game cameras required should be assessed and weighed in terms of expense versus the actual potential for these cameras to be effective at catching poaching activity through picture or video. Due to the large perimeter of the CCA and multiple avenues by which poachers might access the property, a considerable number of game cameras might be required, at a greater expense than other methods of addressing the illegal hunting issue.

Restricted Access

The benefits of restricting access to the CCA by designating those roads which parallel the CCA boundary as local access only (local residents, ASCCA staff and ASCCA permitted entrants), are clear. Assuming compliance with local access only signs, poacher access to the CCA would be greatly reduced. While there are no foreseeable negative implications for wildlife by use of this method, there are most certainly jurisdictional and legal considerations to be made in terms of limiting travel along a public roadway, and these would have to be explored in depth. While it is a viable option for discouraging poaching, restricting road access should be discussed with government and law enforcement officials, due to the legal implications of such action.

Conclusion

The use of drones would be a great way to give the ASCCA an aerial view of its forests and hills, but it would not be sufficient to prevent illegal hunting. Other prevention methods would have to be used as well to assure prevention because drones cannot surveil the surroundings of the conservation area, at all times, due to charging and maintenance requirements. Drones might best be used in conjunction with other methods, perhaps being dispatched to record poacher activity when a very recent report of a poacher sighting was made.

Since the ASCCA likely wants to retain its financial resources as much as possible, a viable alternative to drones which might offer the greatest benefit at the lowest cost of time and financial resources is the use of game cameras to detect and monitor illegal hunting activities. As previously discussed, game cameras have the potential to capture images and video of illegal hunting activities at any time and under any conditions. Due to the large area belonging to the CCA, however, game cameras should be strategically placed at common points of entry and trouble spots for illegal hunting, to keep their implementation costs low. They should also be used in conjunction with other strategies to maximize their effect in addressing the issue of poaching.

Patrols, which can occur inside and outside the CCA boundary, and may be performed by not only the law enforcement, but also ASCCA staff and volunteers, could be done in

addition to the use of game cameras. Sightings of illegal hunting activities and evidence could be reported immediately by patrollers much of the time using radios or cellphones, while game cameras could act to supplement these reports when there is no one available to patrol. Patrols would also discourage illegal hunting by creating a common and vigilant presence, making it harder for poachers to hunt animals, out of fear that they might be caught by any number of different individuals. To this end, it is advisable that patrollers make efforts to be seen, wearing highly visible clothing both to maintain a visible presence and ensure their own personal safety. Citizen volunteer patrollers would be incredibly useful for this work and might even be incentivized to do the work by an offer of access to otherwise restricted CCA areas, during their patrols. The use of cameras by patrollers to capture evidence of sightings of poaching activity would also be of great benefit.

Putting up more notices and signs around the boundaries of the CCA would be an effective way of conveying that there is risk to poaching in and around the CCA, but should be supported using other methods so as not to be an empty warning that will eventually be ignored. As such, patrols and surveillance should be regarded essential to backing-up visual warnings such as these.

Addressing the community around the ASCCA would also be an effective way educating the citizens about the importance that wildlife plays in nature and would provide an opportunity to designate social norms and moral obligations for CCA patrons, concerning the protection of the CCA. Done appropriately, and with the goal of community building, this could help educate CCA patrons and direct them away from a neutral stance on the issue of poaching to one of desire to take action to prevent illegal hunting within the CCA borders. While it may be a painstakingly long process to change a community's way of thinking like this, little wins such as obtaining one more volunteer to do patrols for poaching activities could be well worth the effort and could help to fill these roles for the long-term. In the event of limited staff availability, the ASCCA should consider the option of hiring or volunteering local university science students for community outreach initiatives.

Going through the process of sedating and placing sensing devices with attached GPS trackers would be time consuming, like the Community Outreach method. Although this method does increase the potential to save wildlife by providing information of animal behavior and movements that could help to identify problem areas for poaching, and so determine best responses based on other methods discussed (ie. designating game cameras and patrols in an identified problem area). This may, however, simply be a task better left to law enforcement, who are trained and practiced in utilizing such equipment and the data it provides.

Organized hunts, orchestrated by the ASCCA in partnership with Alberta Fish and Wildlife through the hunter safety training program were investigated as a potential option to deterring poaching, but it found that this can often lead to more poaching, based on the literature review completed prior to this work (Chapron and Treves, 2016). While this may be investigated further, it is the conclusion of this paper that while beneficial in other ways, organized hunts within the CCA would not discourage poaching activity.

What is the big picture for poaching prevention?

The key to poaching prevention will be using all the tools available to stop this illegal activity from happening at the Cross Conservation Area. No one method listed here, or anywhere else, is going to prove effective in preventing every instance of illegal hunting. While some methods may be more effective in *most* cases than others, these should be supplemented where they fall short, with the best tool for the job. Such is the case with patrols, where human patrollers cannot be expected to operate twenty-four hours a day for every day of the year, making game cameras and other modern technology useful. Additionally, limiting how much modern technology must be used by using volunteers as resources, makes the cost more manageable, so that the ASCCA can make use of the best equipment available, without overspending on purchasing, operation, and maintenance costs. Measures such as community outreach, visual notices (signs), animal tracking, and restricting access, can all be used as preventative medicine, backed up by efforts to surveil and report illegal hunting activity. Just as illegal hunting prevention is currently a joint effort between organizations like the

ASCCA, government organizations, law enforcement, and communities, it must also be a joint effort of various techniques and methods by the ASCCA.

As a final and closing thought, the authors spoke to a former law enforcement officer who suggested that the ASCCA could reach out to former law enforcement and take steps to have them “sworn-in” as special constables for the express purpose of doing surveillance of poaching activities in and around the CCA property. While this would likely be quite an involved process which the ASCCA would do well to consult with Alberta Fish and Wildlife, Alberta Sheriffs branch, and the Royal Canada Mounted Police about, it may prove a viable long-term solution to the issue of illegal hunting in the Cross Conservation Area. Moreover, making a permanent and committed move toward having law enforcement dedicated to dealing with the issue of illegal hunting specifically, would align with the ASCCA’s aspiration to be recognized from the local to the international levels as a model of sustainability, and a leader in landscape-level approaches to the management of protected areas (Shyba, 2015). Indeed, such a step would set a great example for conservation areas across Canada and the world, and it could all start at the Ann and Sandy Cross Conservation Area.

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