or the past five years, we have been studying elk in a population of at least 4,000 that overwinter in seven herds in southwest Alberta, from the US border north to the Livingstone Range and the Porcupine Hills. Elk have been monitored with GPS telemetry so that we can record precise locations every two hours.

Recently we have been studying movements and behaviour of bull elk during the fall hunting season. We were surprised to learn that during weekends, when more hunters are in the field, some elk suddenly reduced
movement, increased the use of forested areas, and decreased the use of flatter terrain—and these were the elk that survived the hunting season. Other elk moved faster during weekends, increased the use of open areas and flatter terrain, but these elk were much more likely to be shot. Thus, with more hunters around, elk that were killed had increased their mobility, whereas elk that survived made the opposite behavioural choice. A noise, a truck or a quad approaching, or a hunter walking, evoked opposite behavioural responses in different elk. Those elk that decided to hide instead of run were more likely to elude hunters. Thus, it seems clear that one behavioural type of elk is most likely to be shot by hunters, while other elk adopted a hider strategy, and these elk were more likely to elude hunters. Although moving faster might seem like an effective strategy for an elk to escape from wolves, this behavioural response renders elk more vulnerable to human hunters. When hunters try to spot an elk, it is easier to see an elk that is moving, especially if the elk is in an open area. Obviously, we are less likely to detect an elk that is motionless and hidden in vegetation.

Individual elk shot by hunters moved faster exactly where the probability of encountering hunters was high, such as close to roads, in open areas, and in flatter terrain. Flatter terrain is generally more accessible to hunters. Those elk that used steeper, sloped terrain had a better chance of surviving the hunting season. For our study, we hired Bighorn Helicopters to capture elk (both cows and bulls) with a net-gun shot from a helicopter. Once netted, the elk becomes tangled and falls to the ground. To protect the animal and the researchers, legs are tied together before samples of blood, hair, fecal pellets, and a canine tooth (ivory) are collected. Before being released, a radio collar is attached to the elk’s neck. Within 20 minutes, all processing is complete and the animal is back on its feet.

This method of capture and handling has proven to be efficient and less stressful than when immobilized with drugs. All research protocols for handling animals must be approved by both provincial and university Animal Care Committees.

In addition to the different behavioural types of bulls, our telemetry data has revealed striking differences in the movements of bulls versus cows. Cow elk have a strong affinity for the same seasonal ranges. But young bulls often disperse, sometimes as much as 300 km.
Kyle Knopff with an Alberta trophy bighorn ram. Different behavioural types of bighorns are more vulnerable to predation by cougars.

kilocmeters from the place where they were captured. Dispersal can be permanent with the elk never returning, whereas in migration the animals usually return to seasonal ranges, even though sometimes covering long distances, even 200 kilometres.

As recently as five years ago, it was very risky to place a radio collar on a spike (yearling) bull for fear that the animal might disperse and we would never see the expensive radio collar again. We now have Lotek radio collars (made in Newmarket, Ontario) that record precise GPS locations within five to 10 metres, and the data is beamed to an Argos satellite and back to a receiving station. Ultimately, the data is sent to our computers where we can plot the locations in Google Earth. The elk can go anywhere on the planet and we will be able to track their movements. Every two hours, and it is all done remotely by satellite saving thousands of dollars in helicopter and staff time.

Using such advanced satellite technology, we have been able to track the movement of 31 bulls. We know exactly how long they travelled each day of the hunting season, and we know when and where they crossed a road or moved to remote areas. We know when bulls used a large pasture instead of a dense forest, and we are aware of when and where they were shot by a hunter.

We focused our analysis on males that were two-years-old (at least 3 points) when they faced the hunting season as potential targets. Among these 31 branch-antlered bulls that we monitored, 20 survived the hunting season, and 11 were shot. In the last 10 years, it is increasingly acknowledged that wild animals often have different individual personalities, often simplified into two behavioural types, commonly known as shy and bold individuals. This is similar to what we found in the elk, with shy individuals moving less, hiding in the forest and surviving the hunting season, whereas bold individuals that moved more and used more open areas were shot by hunters.

Most of us know well that our dogs or children have very different personalities; some of them being braver than others. The same appears to apply to elk. Similar results have been found in bighorns. Bighorns can have at least two different personality types (brave and shy), as documented in a study performed by Marco Festa-Bianchet and colleagues at Ram Mountain in the Brazeau Range west of Rocky Mountain House, Alberta. Bighorns have a different probability of survival when attacked by cougars depending on their personality, similar to what we recorded with elk.

Clearly not all elk respond to hunters in the same way. And some of this behaviour is heritable, meaning that it can be transferred generation after generation. If hunters can more easily shoot an elk characterized by certain behaviour, it means that harvest does not randomly remove animals from a population. This might have consequences (still unknown) and they might be negative.

Naturally, the hunter harvest is distributed among age and sex classes following rules that are different, depending on the population and the species. But we do not yet know the consequences of selection on certain behaviours. Certainly not all animals behave in the same way, and we might be able to adopt management policies in the future aimed to reduce hunter selectivity. Hunting mortality is often substantially higher than natural mortality for game animals, and wildlife managers have yet to consider strategies to guard against undesirable consequences from differential exploitation. Harvesting strategically might reduce the consequences of hunting, ensuring future wildlife populations and hunting opportunities.

We believe that it is important for hunters to know the consequences of harvesting. We must understand the effect of hunting to be able to defend hunting against those who are against it. Proactive research and monitoring will inevitably be in the interests of hunters. Sometimes we might need to modify harvest regulations and policies to ensure that hunting is sustainable and that hunters perpetuate the wildlife resources that we all enjoy.

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