

**Prepared for the US Senate Committee on Environment and Public Works  
Legislative Hearing on the Theodore Roosevelt Genius Prize:  
Innovative Solutions to Reduce Human-Predator Conflict**

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Chairman Barrasso, Ranking Member Carper, and Members of the Committee, thank you for the opportunity to be here today.

I am a wildlife biologist and animal tracker. For as long as I can remember, I have spent as much time as possible looking for wildlife for the experience of seeing them in their natural habitats.

I spent my childhood in Zimbabwe where we lived on a farm. The land was home to flowers, fruits, livestock, and wild animals. As a boy, I enjoyed catching snakes, fishing in the dam, breeding guinea pigs – as well as going out to explore the remote African bush with my mother - one of Africa's first female safari guides and bush pilots. I was enthralled by all wildlife - learning their behavior, how they survive and thrive, and what threatens them and their existence. From a young age, I knew I would pursue a career with animals.

I am honored to be here today to offer my perspective on human-predator conflict and how traditional and technologically innovative techniques can be used to reduce conflicts and benefit humans, wildlife, communities, and habitats. I applaud the Committee's work, especially in recently establishing five Theodore Roosevelt Genius Prizes to look for new ways to prevent wildlife poaching and trafficking; to promote wildlife conservation; to manage invasive species -among others- and potentially a new one to reduce human-predator conflict.

Growing up in Africa, the conflict between predator and human is a daily struggle that I witnessed first-hand - from leopards stealing livestock to people actually being preyed upon by species like crocodiles, lions and more. Unfortunately, in the long term, the predator almost always loses as eradication has typically been the method of resolution. However, especially more recently, innovative methods of predator deterrents have begun to arise. These deterrents, with a very small amount of focus and energy, could easily become the new standard. They will not only resolve the issue but support local economies by keeping the valuable apex predators in the system, which not only helps the biome, but supports ecotourism. The methods I am about to list all tend to be "in development" and have typically been crudely implemented by scientists like myself attempting to resolve a problem with little resources.

The following are non-lethal conflict resolution methods that are a mix of traditional and cutting-edge science.

Relocation - Once an animal has become habituated to eating livestock or dependent on human resources, it is nearly impossible to stop this behavior. This is when relocation becomes necessary. It involves trapping an animal and moving it far away from human presence.

The following examples are methods that avoid the necessity of relocation.

I'll note that understanding animal behavior and ecology of a species leads to coming up with successful deterrents. Just as we know electricity can work to deter sharks, we know based on animal behaviors what will be successful for individual species.

Animatronic Deterrents - In Malawi, there was an infamous hyena that used to raid village flocks constantly. An engineer friend of mine came up with a fascinating animatronic decoy. Because hyenas are scared of large animals, typically fleeing from large men, he designed and built a large motion-activated animatronic scarecrow to place at the entry points of the village. With solar panels to power them, they will scare away any hyenas that come near. This is a permanent fix requiring a bit of engineering to be sustainably successful.

### Alarm Systems

1. Foreign- Placing motion activated alarms such as strobing lights and loud sounds is often times enough to scare off anything lurking. Once again, this deterrent can be used on the outskirts of a village or the entry points to a livestock pen. This has proven successful for foxes, coyotes, leopards and more.

2. Organic- Knowing that certain animals fear and flee from others, this method is in my mind, a very simple yet useful one that is underutilized. Certain animals will not invade the territory or kill of another animal. If you have an active leopard problem, the simple solution of playing the growl of a lion will instinctually deter the leopard. Once again this should and would be motion activated, similarly to how a trail camera works.

Olfactory Deterrents - Like the above organic alarm system, an organic smell can often times be enough to deter a predator. Coyotes, for instance, are generally solitary and very territorial. If you have a persistent problem with a coyote, spraying (organic or synthesized) wolf urine around the perimeter can deter the coyotes from entering the area.

Commensalistic Deterrents - In many cases, using an animal to deter another animal has no negative effects at all. This is simply the sheep dog approach. Living in Africa, we would see that a trained packs of Rhodesian ridgeback dogs were a fantastic permanent solution to deterring lions. They stay close to home, create an alarm system and will easily run off a lion that is trying to sneak in for a free meal.

Building Materials - In almost all these cases, we create the encroachment problems that we then need to resolve. A perfect example is with big snakes. In many areas, we leave out old food or use thatched roofs for building materials. Both attract rodents and birds which in turn will attract large species of snakes such as pythons and boas. A simple solution is to use corrugated tin roofing and contain food waste.

Barrier Methods - In many places around the world, fresh water is the reason for predator/prey interactions. In fact, in almost every River Monster's episode on Animal Planet, Jeremy Wade is investigating the disappearance of a person due to them swimming or collecting fresh water. Using cages (like a shark cage) to create safe swimming and washing areas in river systems can eliminate things like crocodile, hippo and even piranha (however rare) attacks.

The list goes on, but the key element here is fully understanding the predator which we are trying to deter.

This point is true for predators in any habitat. There are several new pieces of technology that once properly understood and implemented will be the new standard—including noninvasive shark deterrents, such as “virtual cages” that use sharks specialized electroreceptive abilities. Before wrapping up, I'd like to share a few quick examples:

HECS technology - The HECS technology is a passive technology that blocks the bodies naturally occurring electrical energy. Basically, by wearing a wetsuit that has the technology of a faraday cage (the same thing that's in the door of your microwave oven) it blocks the bodies naturally occurring electrical energy signal. To a shark, you are now perceived more as an inanimate object than prey as you are no longer emitting EMR.

Shark Shield - The shark shield is a light weight wearable electronic device. Shark Shield's patented technology creates a powerful three-dimensional electrical field which causes unbearable spasms in the ampullae of Lorenzini (sharks sensitive EMR receptors) turning sharks away as soon as they come into contact with the electric field.

Clever Buoy - Clever Buoy is an autonomous marine monitoring system developed by Australian company, Smart Marine Systems (SMS). The system is an ocean monitoring platform that specializes in detecting large marine life using state of the art sonar and identification software systems to relay critical information to authorities responsible for beach safety.

Once technology like the clever buoy system is perfected, implemented and combined with something like the shark shield, you have a virtual technological net that can make any beach safe for swimmers, which is just amazing in my opinion! Once you have a populous educated about wearing a technology like the HECs suits, you are likely to see a reduction in encounters with swimmers and divers.

Thank you again for inviting me to be part of today's hearing. I look forward to answering any questions that the committee may have.