

# The Traceable Arrow: The Efficient Way to Wildlife Management through Bow Hunting

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## Background

Hunting limits are variable and are set each season based on estimations of an animal's total population size and the average number of hunters in that region. Limits are to prevent overhunting and to roughly know what percentage of the initial population will be potentially taken and recovered during the season. Limits are regulated by purchasing tags, which must be turned in to account for a downed animal. The animal's population is controlled by issuing a certain number of tags/season or tags/day depending on total number. This metric is used to regulate game populations all over the U.S. by the Game and Fish Commission. The flaw with tags and bag limits are that they correspond with recovered, not wounded, animals. This leads to a greater number of animals that are killed but are never accounted for. The primary objective of this research was to create an idea to lessen the impacts of wounded unrecovered animals. The traceable arrow is the perfect solution for bow hunting. It allows for easier recovery of fatally shot animals by pinpointing the location of the wounded animal, thus allowing for more accurate population estimates and less animals that are killed for no reason.

## Methods/Steps

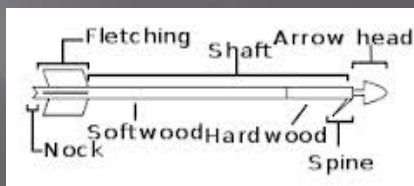
- A study by Pederson, Berry, and Bossart showed that roughly 18% of the deer shot by a bow are wounded and not recovered. This equates to hundreds of thousands unrecovered deer a year.
- To create an arrow that can be traced, you have to find the right transmitter and receiver components that are small enough to carry and fit inside the shaft of an arrow but powerful enough to be detectable from miles away.
- A company out of Europe named Euro-Eye sells a perfect match. The TRX-1000 receiver and the TRX-mini flat transmitter. The transmitter is as small as a paper clip and has an effective range with the receiver from 2-40 miles and will last up to a year on and 2 years on dormant. The transmitter works by emitting a RF pulse at around 40 bpm.



TRX-1000  
Receiver



TRX-mini flat  
Transmitter



Components of an Arrow

## Methods/Steps Cont.

- The TRX-mini flat transmitter goes inside the back of the arrow shaft by removing the nock and adhering it to the transmitter with epoxy.
- The antenna then slides into the hollow shaft allowing for a protective casing.
- The nock is retrofitted with a small wire trigger, so when the entire arrow passes through the hide of an animal the nock and the transmitter are left inside the body cavity, allowing for tracking on only deadly pass through shots.
- The transmitter is activated by waving a small magnet in front of the mini flat housing. The receiver then makes increasingly loud audible beeps in the direction of the arrow.
- The size and weight of the transmitter are negligible and does not alter flight path of the arrow.

## Discussion

Maintaining healthy populations of game animals is the main driving force behind creating this arrow. By having a more holistic view of the number of animals shot and taken during hunting season, a more accurate assessment of the total population numbers can be found. This does not only benefit the environment by keeping unnecessary animals from dying but also appeals to a great majority of outdoorsmen that are avid hunters. Hunters hate losing wounded animals, especially if it is considered a trophy. That is why by creating this product and making it available for consumers to purchase, will not only help those using the arrow by allowing for full recovery of their game but also create revenue that is pertinent for a product to survive. It fits in well with all three pillars of sustainability by making hunting and wildlife population control and estimates more efficient, while still being able to provide monetary profit to sustain its production.

## Literature Cited

- Pederson, M. A., S. M. Berry, and J. C. Bossart. 2008. Wounding Rates of White Tailed Deer with Modern Archery Equipment. Proc. Annual Conference Southeast Association Fish and Wildlife Agencies 62: 31-34
- Euro-Eye.com
- Trout Jr., J.; 2001. Finding Wounded Deer. Outdoorsman's Edge.