10,000 or Bust: Elk Research in Kentucky

All photos courtesy: John Cox

The velvet still remains on the antlers of this male elk in eastern Kentucky. There are twice as many elk in Kentucky as compared to Yellowstone National Park.

by John Cox

The moist chill of an early October morning envelops our half awake, fully caffeinated bodies packed like loose jigsaw puzzle pieces into our worn out field truck. The mud-caked four-wheel drive loudly protests as we slowly and ungracefully ascend the rutted dirt road for the umpteenth time this year. Pulling to our overlook, we climb out to meet a thick morning fog that envelopes all but the distant green mountaintops of the southeastern Kentucky landscape. To our south the fog largely obscures the denatured old surface coal mine that extends its rolling, alien panorama for miles. It is this interplay between mountain and mine land that harbors the subject of our now decades-long research study, and our motivation for rising early on a less than forgiving morning. With our eyes rendered useless, we pause to listen. Minutes slowly tick by, then there it is, unmistakable; the mating bugle of the undisputed mountain monarch of the east, the elk (*Cervus canadensis*), only recently restored to its place in our rich ecological community.

Paleontologists tell us that elk have been well established in central North America for at least 50,000 years having moved south from the Beringia land bridge that once spanned Asia and North America. Unlike its smaller, more forest-dwelling cousin, the white-tailed deer (*Odocoileus virginianus*), the elk is a herd-forming animal primarily adapted for the open plains; it has large wide-spreading antlers, a high-pitched voice to carry long distances, a larger ruminant stomach better adapted for grazing, and a lighter colored rump patch used for social communication among herd members. The elk is also supremely adapted for speed and endurance to elude open plains predators such as wolves, long absent from Kentucky.

For millennia, Native Americans hunted the elk, not only for its meat and hide, but for antlers, teeth, and other body parts used to decorate clothing, mark trails, and for ceremonial purposes. The Shawnee tribe of the Ohio Valley referred to the elk as "wapiti" or "white rump" in reference to its light-colored and conspicuous rump area. Although we don't know how many elk roamed the Commonwealth at the time of European settlement in the mid-1700s, early settler accounts suggest that the majority of the population occupied the more open landscapes found in the central Bluegrass Region and the Barrens of Western Kentucky. Because smallpox decimated Native American populations after 1500, it's also likely that the reported large game numbers in the "paradise" of Kentucky reported by pioneers Daniel Boone, Simon Kenton, and others were the result of a century or more of relaxed human hunting pressure. By the Civil War, the elk was hunted to extinction statewide, and a few years later, it vanished from the eastern United States.

The popularity of elk as a game species led to reintroduction attempts in many eastern U.S. states in the early 1900s; Pennsylvania and Michigan were the first to establish small herds during this period. It would be nearly a century later before Kentucky would decide to embark on its own elk restoration program. From 1997-2002, more than 1,500 elk from six Western states were released in southeastern Kentucky. The objective has been to grow the population to 10,000 elk within a 16-county zone. And grow they have in the absence of harsh winters and large predators. An estimated 10,000-12,000 elk now roam this area, a number ten times the size of other eastern elk populations, and more than twice that in Yellowstone National Park.

By wildlife restoration standards, it would be hard to deny the resounding success of the Kentucky elk restoration program. A long lost ecological component has been returned, and for the past decade, hunters have eagerly anticipated having their name drawn for an elk tag, which now number nearly 1,000 per year. Local outfitters have sprung up to guide elk hunters and watchers, which in turn have injected much needed seasonal revenue into the local economy.

But not everyone is happy about the growing

Browse damage from elk can make reforestation efforts challenging.

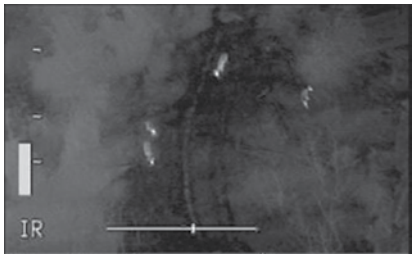
number of elk and the damage they sometimes cause. Typically weighing 500-700 lbs., elk are the second largest member of the deer family and eat six or seven times more than a typical white-tail. A small herd of elk can quickly overgraze a pasture or hayfield, strip fruit trees of their buds and bark, overbrowse tree seedlings used for reforestation reclamation, wreak havoc on a golf course, and be extreme road hazards for unsuspecting motorists.

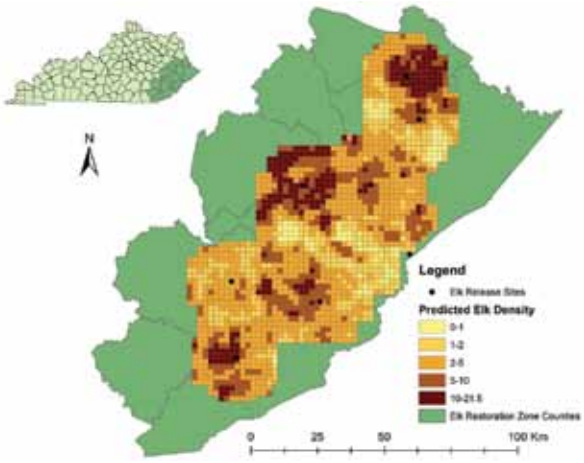
Managing the population size of elk within the social carrying capacity of the public and the local environment is challenging. Despite their large size, it is notoriously difficult to estimate the population size of elk scattered across large areas, because of their tendency to seek shelter during the day and their cryptic body colors blending in well with the landscape. In addition, elk are herd animals that can be surprisingly hard to locate from the air or ground because of their clustered distribution; it can sometimes take hours of expensive flight time to find the larger herds which may make up the bulk of the population—not-so gentle reminders that hunted animals don't want to be found.

My research lab has employed two primary technologies to better understand elk ecology and help state wildlife managers estimate elk numbers. The older radio-telemetry involves the capture and radio-collaring of individual elk that we can subsequently locate from an airplane or the ground. A newer and more expensive radio-telemetry technology involves the use of Global Positioning System (GPS) collars on elk, some of which transmit the location of an elk to us within 15 minutes using a cell phone text messaging service. Radio-telemetry allows us to use marked individual elk to estimate population size in what is known as a mark-recapture survey.

Graduate students from the University of Kentucky Department of Forestry have played a major role in research associated with the restoration of elk in Kentucky.

Another sophisticated technology we have employed to estimate elk-population size is the use of an aircraft equipped with a forward-looking infrared (FLIR) camera that essentially detects the thermal radiation (body heat) from animals. These cameras are advantageous because they can be used at night to see the heat signature of animals in a way similar to that used by the military and law enforcement. Because the cameras can detect as little as 1°(F) difference in temperature of objects, large bodied elk viewed at night stand out against a backdrop of cooler vegetation. When coupled with video and GPS mapping technologies, aircraft-based FLIR surveys allow large swaths of the landscape to be surveyed at night when elk are out feeding, thus providing researchers with a powerful tool to count and estimate elk numbers and densities that can in turn inform management of the species.





A variety of tracking techniques have allowed researchers in Dr. John Cox's lab to gather significant data on elk in Kentucky. The forward-looking infrared camera (above) allows researchers to spot elk at night. The map shows the predicted elk density in the 16-county elk reintroduction zone in southeastern Kentucky.

As the fog begins to slowly vaporize, the telemetry signal of Bull No. 66 betrays his close proximity. Only briefly does his wide-antlered silhouette appear before it fades back into the haze that shrouds his surroundings. Over the years, he has told us much about this population, his species, and ourselves. We are thankful.

About the Author:
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