

2013-2014 Kentucky Department of Fish and Wildlife Resources Elk Report



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Introduction

The Elk Program is administered under the Wildlife Division of Kentucky Department of Fish and Wildlife Resources (KDFWR). The KDFWR is an agency of the Kentucky Tourism, Arts & Heritage Cabinet. It is overseen by a nine-member commission who are nominated by Kentucky’s sportsmen and sportswomen. The nominees chosen by the sportsmen and sportswomen are sent to the Governor, who appoints the Commission members for each district. The department employs about 450 full-time staff, which includes conservation officers, wildlife and fisheries biologists, conservation educators, information and technology staff, public relations and administrative professionals.

KDFWR receives no money from the state’s General Fund. Agency funding is provided through the sale of hunting and fishing licenses, boating registration fees, and federal grants based on the number of licenses sold in the state.

The Elk Program is tasked with managing the elk herd in the state to provide ample hunting opportunity while balancing the needs of consumptive and non-consumptive user groups. The Elk Program currently includes three biologists: Dan Crank, Will Bowling and Gabe Jenkins. Program staff are based out of headquarters in Frankfort as well as the elk zone in eastern Kentucky.

Elk In Kentucky

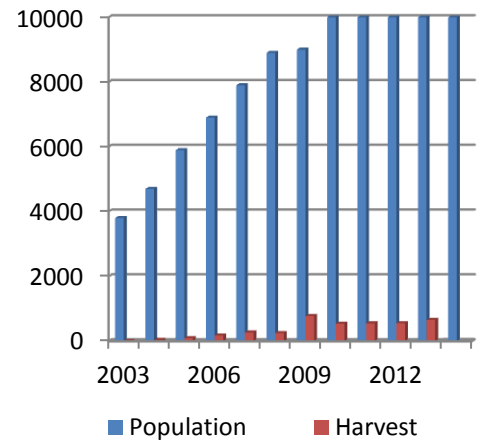
Elk are native to KY and were present until the mid 1880’s, when the population was eliminated due to habitat degradation and overhunting. This is why the Kentucky elk program is considered a restoration, not an introduction.

Kentucky’s present elk herd is a free-ranging, wild herd established from 1,550 wild elk captured out-of-state and released into southeast KY between December 1997 and March 2002. Contributing states included Utah, Kansas, Oregon, North Dakota, Arizona, New Mexico, with the majority of elk captured in Utah. Release sites were located in Harlan, Knott, Leslie, Letcher, Martin, Perry, and Pike counties. The elk restoration zone covers 16 counties in the southeast region of the state (approximately 3.5 million acres).

The current estimated population is approximately 10,000 animals. Kentucky has the highest elk population of any state east of the Mississippi River.

The first elk hunt was conducted in 2001. Six bulls and six cows were harvested, with all hunters filling their permit. The same number of permits was issued in 2002 and 2003. In 2004, the number of permits was increased to 40. Beginning that year, legal deer hunters were also allowed to harvest elk outside designated elk zones in order to control populations, keeping elk numbers low in agricultural areas or poor elk habitat. The number of elk permits has increased nearly every year since 2004, with a total of 1,010 permits available in 2013.

Elk Population Estimate

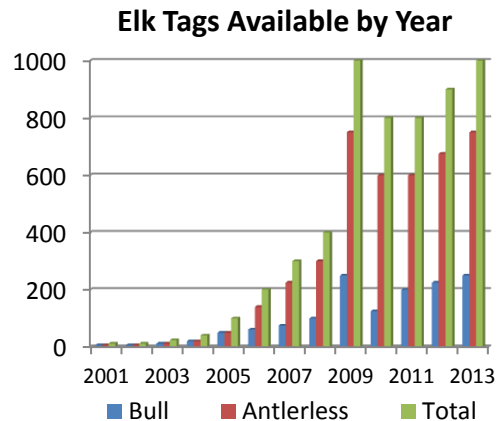


Elk Hunting Permits

General Quota Hunt Permits

The majority of KY elk permits are issued by way of a computer-randomized drawing. Applicants must apply online between Jan 1 and April 30 each year. They may apply for each of four permit types (bull archery, bull firearm, antlerless archery, and antlerless firearm), but no more than once for each type. Both resident and non-resident hunters may apply for the elk

permit drawing. A maximum of 10% of the available permits may go to non-resident applicants. During the month of May, applicants' names are drawn at random by a separate Kentucky government agency (the Commonwealth Office of Technology [COT]) and then randomly assigned a permit type based on their application choices.



Commission Permits

There are 10 Commission permits that can be used for either bulls or cows. These permits are assigned each year by the KDFWR Commission members to conservation groups. Those groups then auction or raffle the permits in order to raise money for conservation projects.

Landowner Permits

KDFWR has a program that allows large land holders in the elk zone to enter their land into management agreements, in order to provide hunters additional public access to huntable land. Landowners are issued an either-sex elk permit for every 5,000 acres enrolled in the public access program. Those permits may only be used on the land the landowner enrolled in the agreement. However, the landowner may transfer or sell the permit to whoever they choose, and many landowner permits are auctioned by conservation groups.

Youth Permits

Hunters that are 15 years of age or younger may apply for the youth-only drawing. There are currently 10 youth-only either-sex permits. Youth that are not chosen during the youth-only drawing are entered back into the general drawing pool in order to give them a chance at the remaining general quota hunt permits. Youth may also apply for the general drawing twice, giving them 3 chances.

Late Season Hunt Permits

The late season hunt is designed to remove elk in areas that have had elk damage concerns over a number of years. The dates of the hunt correspond with the time of year when most damage occurs. This allows hunters to target elk that are likely causing damage, and to alleviate that burden to local landowners. Hunters are limited to the Knott County and Stony Fork EMU (Elk Management Unit). Only applicants that live inside the 6 counties within the two Elk Management Units are eligible to be drawn in the late season hunt. In recent years, 25 hunters have been drawn for the late season hunt.

Out of Zone Elk Permits

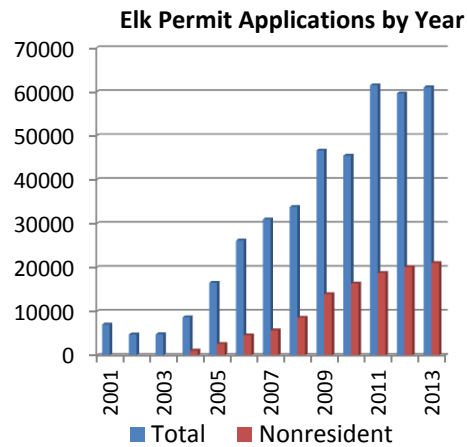
Elk may be taken from any county outside the 16-county Elk Restoration Zone by hunters who possess an annual Kentucky hunting license and an out-of-zone elk permit. These hunters must follow deer season and equipment regulations, but are not required to possess a deer permit.

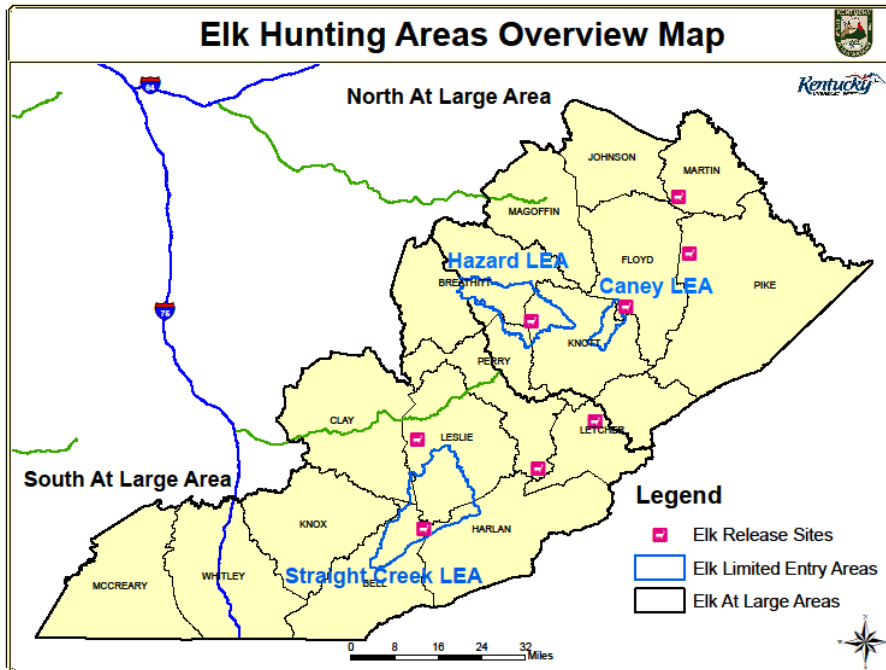
Quota Drawing Process and Statistics

How Permits Are Drawn

Elk applications go on sale January 1 of each year and can only be purchased online at fw.ky.gov. Hunters can apply for two different permit types. The application period ends at midnight on April 30, 2014. After the application period, a computer drawing conducted by the COT randomly selects the hunters from the pool of applicants. Drawn hunters must then rate (from 1-5)

which areas they would like to hunt. These areas include Hazard Limited Entry Area (LEA), Straight Creek LEA, Caney LEA, North At Large, and South At Large. A second computer drawing is held and hunters are assigned a hunting area based on their stated preference and the randomized order in which they were drawn.





Odds

The odds of drawing a permit are shown in the table below. These numbers are based on how many applicants were in each permit type and how many permits were issued.

Type	In State Odds	Out of State Odds
Bull Firearm	1/134	1/627
Cow Firearm	1/26	1/85
Bull Archery	1/77	1/561
Cow Archery	1/13	1/66
Either-sex – Youth	1/87	1/239

License and Permit Fees

Residents

Elk Lottery Application: \$10/application

Elk Permit: \$30

General Resident Hunting License: \$20

Non-residents

Elk Lottery Application: \$10/application

Elk Permit: \$365

General Non-resident Hunting License: \$130

General Information about the 2013-2014 Season

Season Dates

Archery Season Dates

Bull Only: September 21–October 4, 2013

Either-sex archery and crossbow: Oct 19–20, Nov 9–Dec 13, Dec 28–31.

Either-sex archery only: Oct 19–Dec 13, Dec 28–Jan 20, 2013.

Firearms Bull week 1: October 5–11

Firearms Bull week 2: October 12–18

Firearms Cow week 1: December 7–13

Firearms Cow week 2: Dec 14–20

Bag Limits

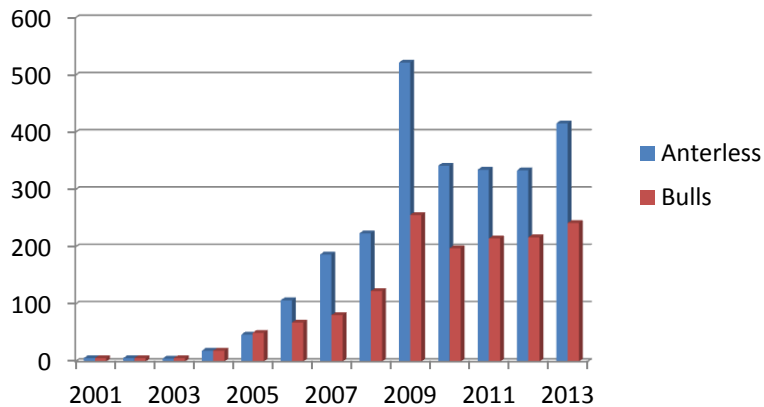
Elk hunters may only take one elk per year.

Area Permit Allotment

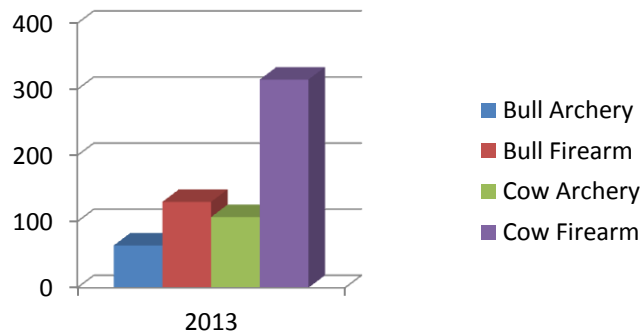
	Caney LEA	Hazard LEA	Straight Creek LEA	North At Large	South At Large	Total
Bull Archery	4	16	16	32	32	100
Cow Archery	9	75	61	73	72	290
Bull Firearm Week 1	3	17	17	19	19	75
Bull Firearm Week 2	3	17	17	19	19	75
Cow Firearm Week 1	12	66	46	53	53	230
Cow Firearm Week 2	12	66	46	53	53	230
Total	43	257	203	249	248	1000

2013-2014 Harvest Results

Total Harvest by Year



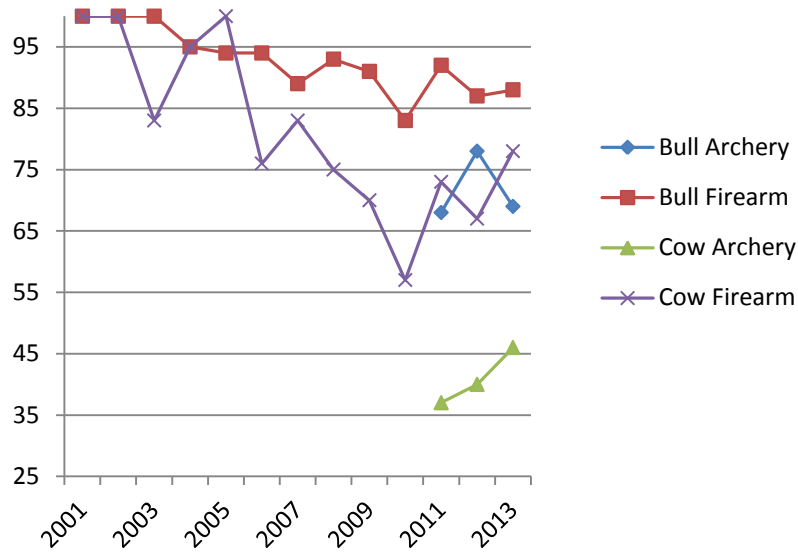
Weapon Type Harvest Summary



Success Rates by Area

	Caney LEA	Hazard LEA	Straight Creek LEA	North At Large	South At Large
Bull Archery	50%	83%	73%	71%	43%
Bull Week 1	100%	88%	82%	88%	77%
Bull Week 2	100%	100%	76%	92%	79%
Cow Archery	33%	31%	27%	51%	32%
Cow Week 1	50%	86%	73%	51%	77%
Cow Week 2	58%	74%	50%	59%	72%

Overall Success Rates by Weapon Type



Boone and Crockett Entries

Score	Hunter	County	Method	Year
372 6/8 *	Terrell Royalty	Knott	Modern Gun	2009
371 0/8	Greg Neff	Bell	Modern Gun	2007
367 7/8 *	Kelvin Jackson	Harlan	Modern Gun	2008
367 0/8	Bill Auxier	Knott	Modern Gun	2007
361 4/8	Franklin Scott	Knott	Modern Gun	2006
357 0/8 *	Bruce Brantley	Perry	Crossbow	2011
356 6/8 *	Chris Godby	Knott	Modern Gun	2009
353 2/8	Daniel Ware	Breathitt	Modern Gun	2012
353 1/8	Wesley Gage Fultz	Leslie	Modern Gun	2007
349 2/8 *	Andy Kidd	Perry	Modern Gun	2006

* Indicates Non-typical

Changes to the 2014-2015 Elk Season

The fee structure for elk permits will change for the 2014–2015 season.

Residents: Elk Lottery Application: \$10/application
Elk Permit: \$100 for bull, \$60 for cow
General Resident Hunting License: \$20

Non-residents: Elk Lottery Application: \$10 (total = \$20 if you apply for 2 types)
Elk Permit: \$550 for bull, \$400 for cow
General Non-resident Hunting License: \$140

Also, there will be a change in how hunters are assigned to hunting areas. If a small group (up to 5) of drawn applicants would like to hunt the same area, they will be able to rank, and be drawn for, their preferred hunt areas as a group.

Disease Surveillance

Brainworm (*Parelaphostrongylus tenuis*)

Brainworm, or meningeal worm, is the common name for a parasite that affects elk and other deer species. White-tailed deer are carriers of the parasite, but have evolved resistance to the disease. The parasites are limited only to deer species; therefore there is no disease risk to most livestock. Brainworms are small parasitic worms that travel through the body and end up in the spinal cord or brain, where they cause damage to nervous tissue. Elk infected with the parasite may become emaciated, disoriented, and show abnormal behavior such as a loss of fear for humans. Most affected individuals ultimately die from complications caused by the disease. Approximately 4-6% of elk in Kentucky contract the parasite. Brainworm symptoms are similar to those caused by Chronic Wasting Disease (CWD), but the two are in no way related. KDFWR biologists actively seek out animals showing brainworm symptoms and collect biological samples for testing. If you see an elk that fits the description, please contact your local biologist.

Chronic Wasting Disease

Chronic Wasting Disease (CWD) is a disease of high concern to deer and elk across North America. It is caused by a certain type of protein (prion) and causes damage to brain tissue. KDFWR has tested thousands of deer and elk statewide and have not detected the disease.

Current Research

SURVIVAL AND CAUSE-SPECIFIC MORTALITY OF ADULT BULL ELK IN KENTUCKY

John Hast and John J. Cox, University of Kentucky

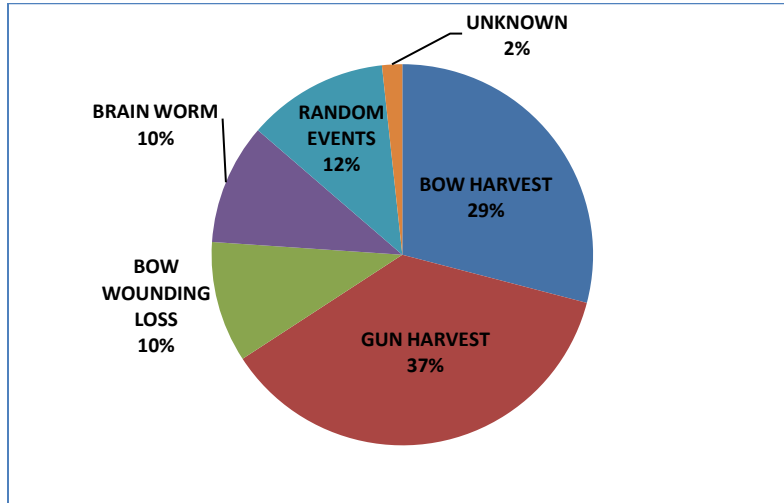
Dr. Tina Brunjes, R. Daniel Crank, Will Bowling, and Gabriel Jenkins, KDFWR

In the fourth year of the Kentucky bull elk project, we plan to address the following objectives concerning the ecology of bull elk, 1) how long bulls live (survival), 2) how many die each year (mortality), and 3) what causes them to die (cause-specific mortality). Elk management in the eastern United States lacks the decades of research available to western elk managers. As such, taking into consideration the dynamics of the growing Kentucky herd as well as hunter goals that change over time, local research projects must be used to tailor management actions.

To examine the question of bull elk survival and cause specific mortality, we chemically immobilized 176 adult bull elk between 2011 and 2013 and equipped them with radio tracking collars. Additionally, we took a variety of other samples such as blood, tissue, fecal, and body measurements while the elk was immobilized. Elk were monitored once weekly via radio telemetry from the ground or air outside of the general hunting season and multiple times per week during the hunting season. Elk were immediately investigated upon the confirmation of a mortality signal and a necropsy was performed once the expired elk was located. Any hunter harvested elk were examined and an additional set of samples were taken post-harvest.

We had a unique chance to evaluate bull mortality and survival when the old system of elk hunting units (EHU) was changed to the current limited entry areas (LEA) and at-large areas for the 2013 hunting season. This research made it evident that LEAs were necessary due to high levels of hunting pressure that had potential to adversely impact local elk populations. This research has helped us sustain our goal of providing as much elk hunting opportunity as possible, while continuing to maintain high hunter satisfaction.

At this point in the study, 117 of the 176 (66.4%) captured elk have died. Of these mortalities, 76% were hunter related, 10% were attributed to brainworm, 12% were random mortalities (ie. fence kill, road kill, etc.) and 2% were unknown mortalities. Overall, we see that most mortality of Kentucky bull elk is related to hunter harvest during the fall hunting season.

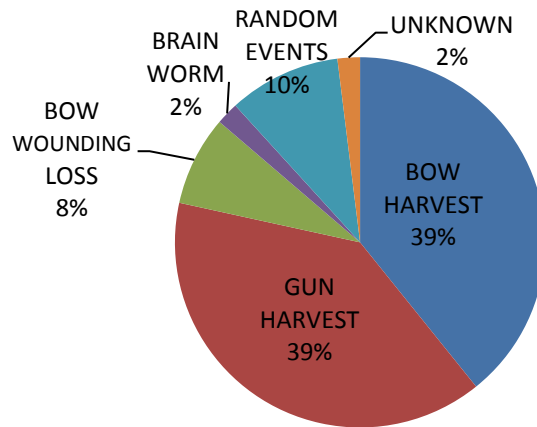


This pie chart illustrates the sources of mortality through the first three years of the bull elk project. It is evident that hunters are the largest source of mortality for bull elk. Brain worm and random events are not causing enough mortality to be of concern for elk managers, and are a fact of life with any wild elk population in the eastern United States.

When specifically investigating mortality events in a time period overlapping the fall bull hunting season (August 1 to February 1) we noted that the middle age classes of bulls (4.5 to 5.5 years old) were taking the brunt of the harvest pressure. In the fall of 2012, bull elk 4.5 and 5.5 years old had a 41% and 35% chance of surviving the hunting season, respectively. This heavy harvest of middle age class bulls does not allow many animals to grow into the trophy age class, usually considered to be 9.5 years of age.



This chart is a Kaplan-Meier survival analysis of bull elk during the 2012 fall hunting season. This graph can be interpreted, for example, as any 5.5 year old bull has a 35% chance of surviving the hunting season. Inversely, any 5.5 year old bull has a 65% chance of death during the fall hunting season. The red box indicates a heavy harvest of 4.5 and 5.5 year old bull elk and prompted the installation of Limited Entry Areas (LEA) for following hunting seasons to alleviate pressure on these middle age bulls. In these age classes, less than half survived to get bigger the next year. This indicates that hunters are willing to harvest bulls before they reach peak antler size.



This pie chart illustrates the sources of mortality for bull elk during the fall hunting season. Brain worm deaths are lower as most animals succumb to brain worm during the heat of the summer.

The changes in the hunting unit structure in 2013 allowed us to examine the impact of a reduction in hunters on bull survival by age class. The Hazard LEA encompassed our study area and permit numbers were set at 65; this was a reduction from 95 permits in 2012. Our main question was: how will an almost 1/3rd reduction in permit numbers influence bull survival in each age class? Following the installation of a Limited Entry Area (LEA) system and a 1/3rd reduction in permits in the Hazard LEA, there was only a slight increase in 4.5 and 5.5 year old bull survival during the 2013 bull hunting season.



When comparing the Kaplan-Meier analysis of the 2012 (red, right bar) and 2013 (blue, left bar) bull hunting seasons, it is clear that the 1/3rd reduction in permits in the Hazard LEA did very little to improve the survival rate of the middle age class bull elk. We plan to investigate this permit reduction again during the 2014 hunting season to determine if any long-term trends become evident.

Given the quota system of elk permit allocation that the state of Kentucky employs, most elk hunters each year are first time hunters. Our data suggests that most hunters choose to harvest a middle aged bull, thus bottlenecking bull numbers as they grow out of the 5.5 year old age class. The recent installation of the three new LEAs occurred in response to the localized overharvest of bull elk in areas with large tracts of public land and ease of hunter access. By reducing the permit numbers in these areas we expect to maintain good hunter success, while still allowing more bulls to grow into the trophy age classes (9.5 years old and above).

Cause-Specific Mortality, Behavior, and Group Dynamics of Cow Elk in Kentucky

Brittany L. Slabach, John T. Hast, John J. Cox, P.H. Crowley. University of Kentucky Depts. of Forestry and Biology; Dr. Tina Brunjes, R. Daniel Crank, Will Bowling, and Gabriel Jenkins, Kentucky Department of Fish and Wildlife Resources

Summary. With an established herd that is actively hunted, information on cause-specific mortality, habitat use, and herd demographics (e.g., the age and sex classes that compose the herd) are important to understand population persistence. The current bull elk ecology project has provided valuable information regarding Kentucky's bull elk population, yet matching information is missing for the cow elk population. Understanding these parameters can aid in management decisions concerning hunter placement, herd movement patterns, and overall population health.

Cow elk are ecologically important for the growth and persistence of the population, differing in their behavior and activity patterns from bull elk. The lifespan and potential lifetime reproductive rate (how many calves a cow has over her lifetime) of cow elk is not completely understood. Group membership and interactions between individuals can have important implications for population spread and habitat use, response to disturbances (e.g., hunter-harvest and roadways), and for disease transmission within a population. Harvest of individuals is presumed to be the greatest cause of mortality of cow elk in Kentucky, yet cause-specific mortality has not been documented. Given the success of the bull elk ecology project we have aimed to address, 1) cause-specific mortality, 2) lifespan, 3) lifetime reproductive rate of cow elk, 4) group membership, demographics, and movement between groups, and 5) the development of a model to investigate how disease may spread through the population if a crisis situation were to occur.

Methods. We have outfitted a total of 94 cow elk with very high frequency collars (VHF) collars and ear tags for individual identification (2013, N = 40; 2014, N = 54) in order to monitor for cause-specific mortality and behavioral patterns. We deployed all collars within the Hazard Limited Entry Area (Figure 1). We captured, subsequently sampled, and marked with ear tags an additional 14 individuals (2 cow calves and 12 bull calves) via corral trapping. We delivered vaginal transmitters (VIT) to a total of 10 adult cows in an effort to assess the potential for monitoring calving events and reproductive success of cows (2013, N = 5; 2014, N = 10). We collected physiological data (e.g., age, body condition, body size) and assessed behavioral interactions between individuals, as well as herd membership, during three key biological seasons; (a) winter herds, (b) nursery herds, and (c) rut harems. We collected behavioral data for the rut prior to the peak of the rut to not conflict with the opening of the bull archery season.

Results to Date

Cow Age. We analyzed age data via tooth rings in the lower incisor. The age of all marked individuals (cow, calf, and spikes) ranged from 1–20 years. Four obvious age classes emerged, (a) calves, (b) yearlings, (c) 2–7 years old, and (d) 11–20 years old. Four original release cows are in the sample population with two aged 15, and the others aged 17, and 20 respectively. In order to gain a better understanding of the age distribution of the population, we will continue to collect incisors from hunter-harvested cows.

VIT. All cows that received vaginal implant transmitters, or VITs, in 2013 calved between May 20 and June 10, 2013, yielding 3 bull and 2 cow calves. The average distance from the birthing site was 119.2 meters, with one calf traveling over 300 meters from the birth site within the first 24 hours. All calves were in excellent condition, with an average body weight of 29.2 lbs (SD = 5.4). Calving sites varied between grassland and closed canopy cover. We opportunistically sampled two additional bull calves once discovered at their bedding site. We measured and marked individuals, but no further information was gathered.

Mortality. A total of 55 marked individuals were on the landscape (includes marked cows, calves, and yearling bulls) in 2013. Of these, 38 were cows marked with VHF collars and 7 were calves that were marked with VITs (total N = 45). A total of 19 mortalities occurred for a mortality rate of 42% in 2013. 17 were hunter harvested (2 archery; 15 gun), plus one wounding loss and one unknown. Table 1 illustrates mortality loss by age class. The majority of mortalities are a result from hunter harvest during the cow gun season, with the highest percentage of individuals being taken between 2–7 years of age.

Prior to the start of the cow harvest, one death of unknown causes occurred. We have ruled out brainworm infection and we are currently investigating the cause of death. After the 2014 capture season, 3 adult cow mortalities occurred. We euthanized one individual because of a severe lung worm infection, we lost one adult cow because of capture myopathy, and we lost to unknown causes. At the time of this update, the total sample of cows outfitted with VHF collars was 70. An additional year of collar deployment and monitoring is necessary to finalize the study.

Mortality Cause 2013 (% of total mortalities)	Age Class			
	A: Calves (N = 7)	B: Yearlings (N = 6)	C: 2- 7 yr (N = 26)	D: 11- 20 yr (N = 6)
Gun Harvest (78%)	2	4	8	1
Archery Harvest (10%)	0	0	2	0
Wounding loss (5%)	0	0	0	1
Unknown (5%)	0	0	1	0
Total (% of Age Class)	2 (28%)	4 (67%)	11 (42%)	2 (34%)
Total % of Population (N = 45)	4.0%	9.0%	24%	4.0%

Cause-Specific Mortality for the 2013 Field Season. Mortalities are represented by age class. Age classes are categorized as follows: A – calves, B – yearlings, C – 2-7 yrs, and D – 11- 20 yrs. Total percent of mortalities by type, within each age class, and total percent of population is represented.

Contacts

If you have questions about the elk herd or elk hunting opportunities, please visit the elk webpage at fw.ky.gov/Hunt/Pages/Elk-Hunting.aspx or call the KDFWR Info Center at 1-800-858-1549.

Approximately 95% of Kentucky is privately owned. To successfully manage our wildlife resources, the KDFWR works cooperatively with Kentucky’s private landowners. One of the essential ingredients in conserving Kentucky’s wildlife resources is habitat improvement. Wildlife biologists are available to work with interested individuals or groups on properties that they own or have management rights on. To contact your local wildlife biologist for assistance with wildlife management on your property see the map below.

