



KENTUCKY'S DECADE OF BEAR RESEARCH

**Documenting
the return of
a Southern
Appalachian icon**

By Steven Dobey

TEN YEARS AGO, the American black bear was a species whose habits and general status were largely unknown in Kentucky. At that time, bears were relatively uncommon and their suspected range was a fraction of what it is today.

By the early 2000s, however, increased sightings and hints of reproduction prompted the Kentucky Department of Fish and Wildlife Resources to embark upon a mission to study this animal that was making its presence known in the rugged mountains of eastern Kentucky.

THE JOURNEY BEGINS

Trapping bears for research monitoring doesn't happen overnight. Extensive planning, training and funds must be

Radio collars allow researchers to track bears.

committed before the first trap is laid on the ground. By 2002, Kentucky Fish and Wildlife had accomplished those preliminary goals and prepared to start trapping bears. With much excitement, biologists put out the first trapline along Pine Mountain in early July of that year.

BEAR NUMBER 1

It has been said that a journey of a thousand miles begins with a single step. For Kentucky's ongoing bear research efforts, that first step was taken on July 9, 2002.

At 8:59 a.m. on that hot and steamy morning, biologists placed the first radio tracking collar on a black bear for purposes of research monitoring in the Commonwealth.

That 122-pound female bear, identified



JOHN HAST PHOTO



BEN AUGUSTINE PHOTO

At 9:44 a.m., researchers injected the bear with a drug to reverse the immobilization medication. Six minutes later, the revived bear ventured unharmed into the woods. This 3-year-old animal — captured in Choctaw Gap of Harlan County — would be the first step on a decade-long path of documenting the natural return of black bears to Kentucky.

INITIAL STUDY PLAN

Collectively, the black bear is not a species that falls into the category of easy when it comes to wildlife research. Bears are reclusive animals. They lead solitary lives, except when mothers have cubs or during the June-July breeding season. Bears generally occur at low densities. They are incredibly wide-ranging and difficult to capture in the remote habitats where they thrive. It is their elusive nature, however, which prompted many of the questions that needed to be answered.

With that in mind, the initial research goals were simply to trap and place radio collars on as many bears as possible during the summer months, when the animals are most active. Doing so would provide general biological information and allow researchers to determine the sex and age structure of Kentucky's growing bear population. Likewise, radio collars allowed researchers to document important population characteristics such as survival, movement patterns and home range size.

Tranquilized by a dart gun in its den, Kentucky's first radio-collared bear awaits replacement of its tracking device in 2010.

THE EARLY YEARS

Following the capture of bear F001 in 2002, Kentucky Fish and Wildlife biologists had continued success with trapping and deploying radio collars on bears. That first year, biologists captured eight male and four female bears for research purposes.

During the winter of 2002-2003, bear research took another important step: Kentucky Fish and Wildlife partnered with the Department of Forestry at the University of Kentucky (UK). The university provided valuable research support, including graduate students to collect and analyze data.

With UK now on board, Kentucky Fish and Wildlife research began steamrolling in the summer of 2003. Trapping efforts now expanded from Pine Mountain to Cumberland Gap National Historical Park in Bell County.

Researchers and biologists trapped then released 35 individual bears for research from 2002-06. Meanwhile, during those years, complaints of nuisance activity and the number of bears being killed on the road rose significantly.

Biologists took samples and collected information about all bears being handled. Many of the bears captured for nuisance behavior were fitted with radio collars

as F001, provided the first data that would be collected from so many bears afterward. Following immobilization by a dart gun, biologists recorded its measurements, pulled a small tooth for aging, collected hair for genetic analyses, applied ear tags, marked it with a permanent tattoo and fitted the bear with a radio collar.

The thick leather collar included a box which emitted a very high frequency (VHF) signal. Biologists on foot or flying overhead could use an antenna and receiver to hone in on the signal and find the bear.



BEN AUGUSTINE PHOTO

to evaluate their movement patterns. Collectively during that 5-year period, 81 individual bears were handled for research or management purposes on 164 occasions.

Researchers increased their trapping success and were able to document the range expansion of Kentucky's bears during these years.

Kentucky's bear program took another step when it reached a new milestone on Feb. 18, 2005. At 11 a.m. that day, researchers conducted the first den visit to a radio-collared research bear. The den, located just outside the community of Partridge in Letcher County, contained a

7-year old female bear with three cubs born that winter.

The den research began nearly eight years ago continues today. Each winter, biologists and researchers fly over the mountains of eastern Kentucky to locate bears wearing radio collars. Finding the dens often requires a strenuous hike. Once there, researchers can document whether cubs are in the den and gather information about what kind of sites the mothers select.

THINGS BRUIN IN BIG SOUTH FORK

While range expansion by bears along Pine Mountain continued throughout the

mid-2000s — as the research predicted — something quite interesting began happening around the Big South Fork National River and Recreation Area.

McCreary County, which is located on the Tennessee border, is the northern boundary of the Big South Fork area. Prior to 2006, Kentucky Fish and Wildlife had received few reports of bears there. The only bear handled before that time was a 362-pound adult male that died after being hit by a vehicle in October 2004.

Bear rarity in McCreary County changed beginning in 2006. That year, Kentucky Fish and Wildlife documented

Facing page: UK graduate researcher John Hast keeps four cubs warm while other researchers examine the mother. The high number of cubs indicates the mother is in great condition.

seven collisions with bears in McCreary County between March and July. This trend continued: Bear sightings and reports of nuisance activity increased every year from 2006 through 2009.

Kentucky Fish and Wildlife expanded its research into McCreary County to document what appeared to be the sudden emergence of a bear population.

During the summer of 2009, Kentucky Fish and Wildlife joined with UK to initiate a pilot study to evaluate a full-scale hair snare project: researchers set up a number of trap sites by putting out bait, then encircling the pile with a low strand of barbed wire. Bears visiting the bait piles snagged their fur as they ducked underneath the barbed wire, which provided hair samples for researchers.

Researchers used these hair samples to extract DNA and provide a unique genetic identification of each bear. More importantly, acquisition of DNA data allowed the comparison of genetic characteristics from bears in McCreary County to those along Pine Mountain. Since years of tracking radio-collared bears had documented no movement between the two areas, the goal of the hair snare research was to shed light on the origin and status of bears in the Big South Fork area.

THREE STEPS FORWARD, ONE STEP BACK

Cooperative research between UK and Kentucky Fish and Wildlife provided invaluable data that would be used to manage the state's expanding bear population. In the summer of 2008, however, tragedy dealt research efforts a fateful and unexpected setback.

Separate, distinct bear population in McCreary County.

Since the onset of bear research efforts in Kentucky, Dave Maehr, a PhD professor of conservation biology at the University of Kentucky's Department of Forestry, served as the primary cooperative investigator on behalf of the university. His commitment to research and fascination with black bears had long been a driving force for bear research in Kentucky.

On June 20, 2008, Maehr died in a plane accident while tracking radio-collared black bears near Lake Placid, Florida.

While the period immediately following his death was a time of sadness, it was also a time to reflect on how far bear research had come in the Commonwealth. Great strides had been made. Kentucky Fish and Wildlife was now reaping the rewards of those exhaustive hours spent afield trapping and tracking bears. Biologists and researchers decided the only thing to do was move forward and continue implementing the best research possible. That is what Dave Maehr would have wanted.

In the years following Maehr's death, considerable strides were made to document the population dynamics of Kentucky's growing bear population.

By 2011, hair snares had largely

replaced trapping to estimate bear numbers. During the first years of research, bears were trapped, tranquilized with a dart gun, marked with a tattoo and affixed with an ear tag before being released. The capture of unmarked bears in subsequent years helped researchers determine the abundance of animals in an area.

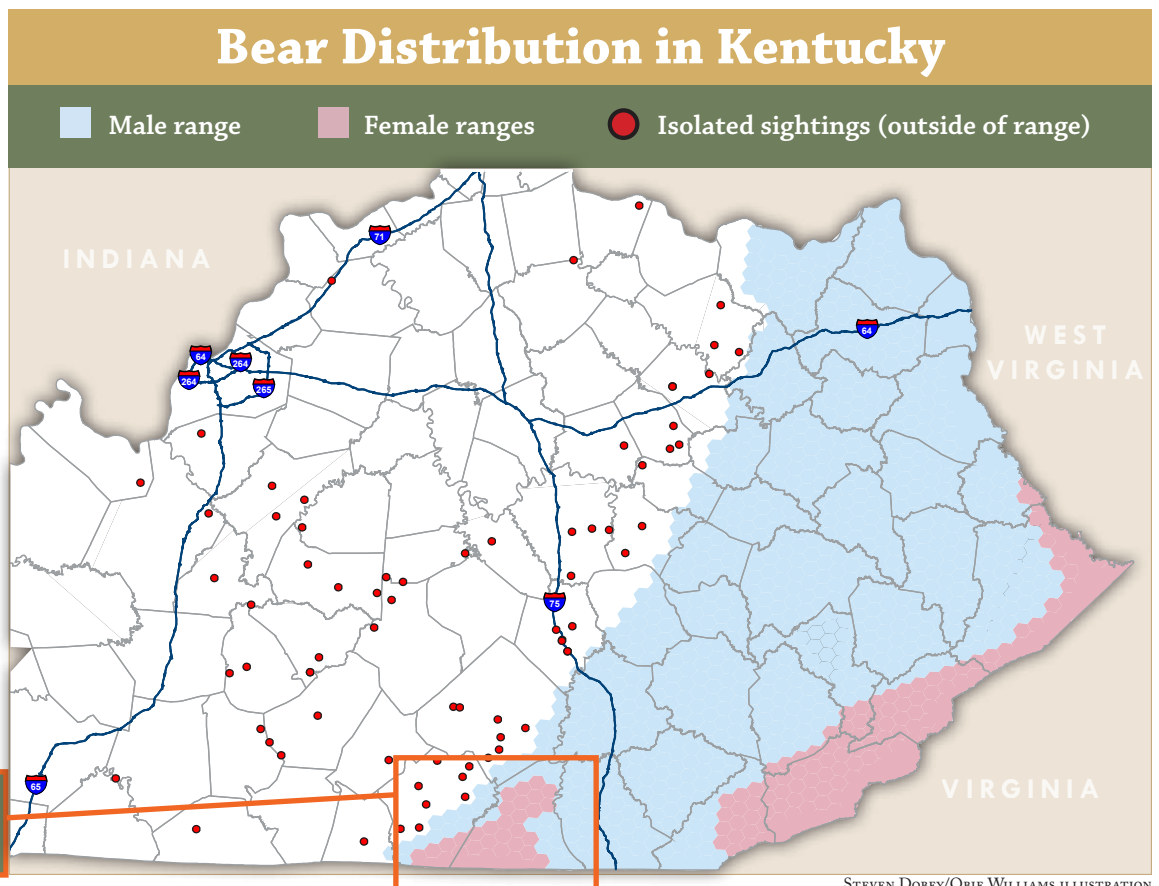
However, bears learned to avoid capture because of their previous experience with being trapped. Hair snares proved less invasive and provided a more accurate count. Bears ignored the wire of the snare and continued to go for the bait.

Advances in technology changed bear research as well. Traditional VHF radio collars were replaced by GPS-enabled devices that could provide real-time locations via remote download, or even a text message.

Bear research today has expanded from a relatively small locale around Kingdom Come State Park in Harlan County to a regional complex that includes Bell, Harlan, Letcher and McCreary counties.

OVER A DECADE OF RESEARCH

By the close of summer 2012, Kentucky Fish and Wildlife biologists and UK



STEVEN DOBEY/OBIE WILLIAMS ILLUSTRATION

Top: Locating bear dens often takes biologists into rugged terrain.

Bottom: A researcher crawls inside a hollow tree to replace a radio collar on a dened bear.

cooperators had handled 343 individual bears on 638 occasions for research and management purposes. To date, biologists have deployed radio collars on 345 different occasions and collected invaluable data concerning the general habits of bears in Kentucky.

Male black bears roam extensively. Research shows that an average male bear in Kentucky has a home range of 275 square kilometers, or 68,000 acres. In comparison, female bears move less extensively within home ranges of approximately 20 square kilometers — slightly less than 5,000 acres. The reason for this vast difference boils down to reproduction.

Male bears stay on the move throughout the summer as they establish social hierarchies and claim breeding rights.

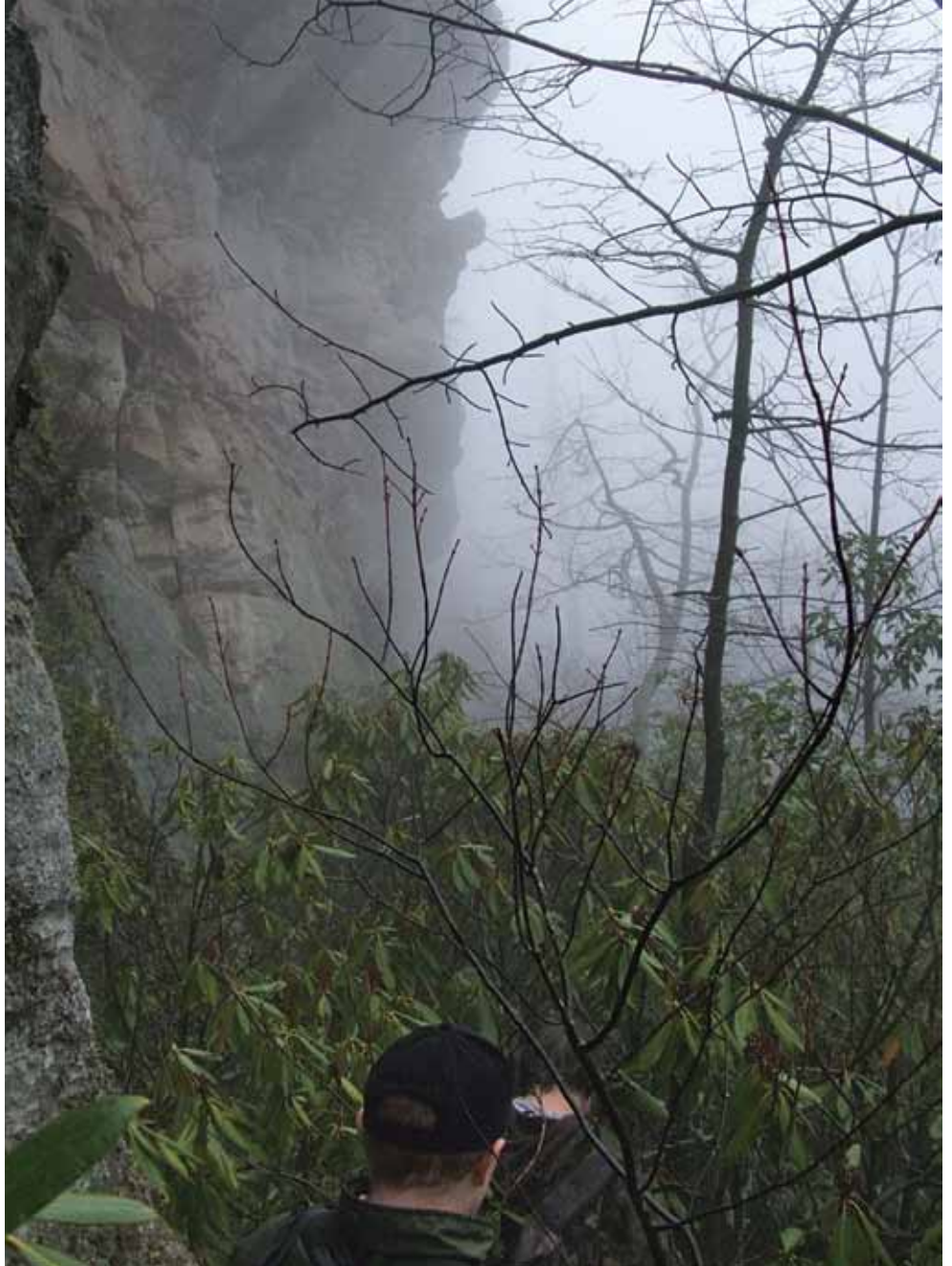
Conversely, female bears seek out the most productive habitats and wander little once they find the right area. This is because areas that provide the most food and secure sites to den help promote successful litter survival.

Since the first den visit in 2005, researchers have examined 77 den sites occupied by radio-collared female bears. In the dens which contained cubs, litter sizes averaged 2.4 cubs with sex ratios generally skewed towards males.

Survival estimates for bears in Kentucky fall within the ranges of other Southern Appalachian populations. Annual survival rates exceed 95 percent for female bears, while that rate is approximately 75 percent for male bears each year.

The considerable variation in survival between sexes is largely due to the wandering nature of males. More male bears are hit on the roads by cars or die due to interactions with people.

Since 2002, the average male bear captured for research purposes was 3.1 years old and 275 pounds. The average female bear was 3.2 years old and 154 pounds. The heaviest bear captured to date was an adult male trapped in the Big South Fork area of McCreary County in 2010. Because that bruiser bottomed out a 500-pound scale,



JASON PLAXICO PHOTO



JOHN HAST PHOTO

biologists could only estimate its weight at 550 pounds.

KENTUCKY'S TWO BEAR POPULATIONS

Of particular interest to researchers are the findings of the bear genetic work in the Big South Fork area. Comparison of DNA collected from bears in McCreary County to those along the Pine Mountain corridor indicates the areas are currently home to two distinct populations.

Furthermore, the samples collected from bears on Pine Mountain indicate they are a genetic mix that ranged into Kentucky from Virginia and West Virginia as those populations expanded during the past two decades. Bears in McCreary County, however, share more genetic similarities with the Great Smoky Mountain National Park population. The park was the source of 14 female bears relocated into the Tennessee portion of the Big South Fork from 1996-97.

Move forward 13 years: A 2010 hair snare study estimated approximately 40 bears in McCreary County alone. These findings are impressive considering the naturally low rates of reproduction and slow expansion of home ranges by female bears.

From a biological perspective, the natural expansion and successful establishment of these bear populations into Kentucky over the last 20 years is a testament to the overall health of the state's mountain ecosystems.

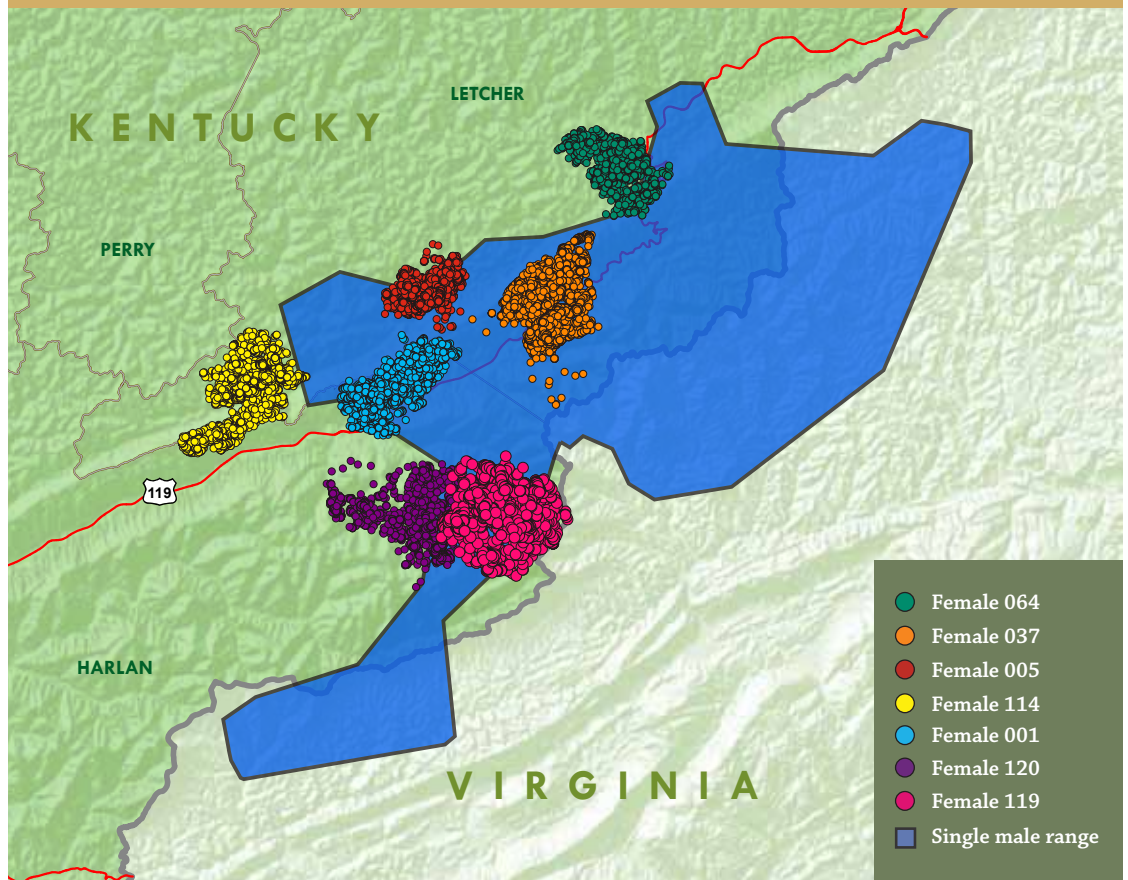
MOVING FORWARD

Currently, Kentucky Fish and Wildlife is involved in the later stages of a large-scale recapture study using baited hair snares throughout the core bear range along Pine Mountain. This multi-year study will provide the best estimate of bear abundance for this region.

More importantly, this study will allow biologists to better predict the effects of hunting upon the growth and range expansion of Kentucky's bear population.

In the McCreary County area,

Bear Home Ranges Along Pine Mountain



STEVEN DOBEY/GARY SPRANDEL/OBIE WILLIAMS ILLUSTRATION

researchers will continue visiting bear dens to document the number of cubs being born. In addition, a future hair snare study is being considered to estimate how much the bear population has grown since the 2010 study. Those findings would be of particular significance considering the bear population expansion currently underway in Tennessee, just south of the Big South Fork area.

ALL COMES FULL CIRCLE

More than a decade of extensive research has offered not only a vastly improved understanding of black bears in the Commonwealth, but has also provided the opportunity to document the natural return of one of the Southern Appalachian's most iconic wildlife species to Kentucky. Findings from ongoing research have allowed Kentucky Fish and Wildlife to identify areas of future expansion, alleviate human-bear conflicts, implement a hunting season and improve monitoring of these growing populations.

Who pays for all this work? Each person who buys a hunting or fishing

Data collected from radio collared bears show the vast differences in the home range size between a male and several female bears.

license, hunting permit, firearm or box of ammunition contributes to state and federal funds that make research like this possible. Hunters and anglers have laid the foundation for bear management in Kentucky for decades to come.

The success of Kentucky Fish and Wildlife's bear program is a credit to the countless hours worked by department personnel and university staff since 2002. Likewise, it is fitting that in 2012, one of the summer technicians assisting with trapping efforts was Clifton Maehr, son of the late Dave Maehr.

And to think, all of this started with the first research capture of bear F001 on that hot and steamy morning of July 9, 2002.

That bear is still around. It's now 14 years old, wearing its seventh different radio collar – and still roaming the rugged slopes of Pine Mountain. ■