

Kentucky Elk Program Plan of Work for 2015-2019

Introduction

This document (Plan of Work) outlines the questions and projects of greatest need for the Kentucky elk project in the five-year period of 2015-2019. The projects identified within this Plan were chosen to meet the Goals, Objectives, and Strategies laid out in the 2015-2030 Kentucky Elk Management Plan (Management Plan). While the Kentucky Elk Management Plan is a long-term guiding document, this Plan of Work is intended to provide a concrete collection of projects that can be implemented to fulfill the vision provided by the Management Plan.

As the inaugural version of this document, the 2015-2019 Plan of Work does not have a section to discuss previous projects. However, future documents (2020-2024 Plan of Work, 2025-2029 Plan of Work, etc.) will include an analysis section that discusses the successes and shortcomings of projects in the recently completed Plan of Work. This analysis will allow KDFWR staff to evaluate future needs and identify potential programmatic improvements.

Ongoing Projects

2015 begins a new five-year project cycle, but KDFWR Elk Program staff are presently engaged in one long-term project – the Wisconsin Elk Restoration Project – that continues into the 2015-2019 Plan of Work cycle.

Wisconsin Elk Restoration Project

In 2014, KDFWR committed to serve as a source population for the Wisconsin Elk Restoration Project. Trapping for this project began in January 2015, with the intent to provide Wisconsin with 150 total animals over a three to five year period. KDFWR Elk Program staff translocated 27 animals to Wisconsin in 2015, and expect to continue trapping 30 – 50 individuals per year until achieving the target goal of 150 total translocated animals. The primary field season for this project begins in early January and continues through mid February.

Identification of Greatest Needs

This Plan of Work was developed by Kentucky Department of Fish and Wildlife Resources (KDFWR) Elk Program staff with input from staff from Southeast and Northeast Regional Programs, Research Program, Wildlife Health Program, and Law Enforcement Division. Public input was not gathered for specific project development, but Kentucky citizens had

Kentucky Elk Management Plan

opportunity to participate in the creation of the Management Plan that provided guidance for this Plan of Work.

KDFWR staff identified four broad needs for the 2015-2019 project cycle. These needs are:

- Refine the baseline knowledge of Kentucky elk population demographics and vital rates.
- Improve the understanding of Kentucky elk population distribution and herd size across the restoration zone
- Improve opportunities for elk-related recreation
- Standardize KDFWR response to negative elk-human interactions.

The following sections examine the rationale for each of these broad needs, suggests specific projects that can address these needs, and frames these projects within the wider context of the Kentucky Elk Management Plan.

It is important to note that a variety of potential projects are suggested under each of the broad needs. This does not necessarily mean that each of these projects must be implemented to successfully address the challenges and/or opportunities inherent to that need. Instead, this diversity of projects should be viewed as providing KDFWR Elk Program staff with a variety of options in answering the questions at hand. This will provide Elk Program staff with the flexibility to select the most appropriate projects as conditions evolve. An integrated timeline forecasting the primary periods of fieldwork for all potential projects can be found in Appendix A.

Project Discussion

Refine the baseline knowledge of Kentucky elk population demographics and vital rates

To adequately manage Kentucky's elk herd, KDFWR staff require current information regarding trends in population growth and maintenance. These data can be used in direct analyses of specific population metrics, as well as for development of overall population models. Specific projects to address this need may include:

Use of cementum annuli data to improve understanding of Kentucky elk age-at-harvest structure

Project overview

KDFWR staff will increase collection of incisors from hunter-harvested elk across the restoration zone. Following collection, incisors will be sent to a lab for cementum annuli analysis, which will permit Elk Program staff to develop a robust age-at-harvest

Kentucky Elk Management Plan

structure for Kentucky elk. Data sheets used for incisor collection will also allow KDFWR staff to note the general area in which the animal was harvested. After several years of collection (to establish adequate trend data), Elk Program staff can use this information to compare age-at-harvest trends between different parts of the elk restoration zone. These comparisons may have utility in exploring the intensity of harvest rates in different areas and/or management units.

Additional points of discussion

KDFWR Elk Program has relatively few personnel. Coupled with the distributed nature of hunters across the landscape, it is difficult for KDFWR staff to efficiently meet hunters at harvest sites to collect incisors. While KDFWR has staffed voluntary check stations in the past, this technique did not prove efficient either. As such, KDFWR should investigate additional means of acquiring incisors. Potential means of increasing sample size could include mandatory incisor mail-in programs, a voluntary incisor mail-in program with incentives, data collection points at prominent highway intersections that hunters must travel to leave the restoration zone, and collaboration with taxidermists and meat processors.

This project is complementary to an additional project listed in this Plan of Work: Development of a supplemental Kentucky elk population model using Statistical Population Reconstruction.

Proposed timeline

1. **September 19, 2015:** Begin intensified incisor collection at the beginning of the 2015-2016 elk hunting season.
2. **January 18, 2016:** Incisor collection efforts end at the close of the 2015-2016 elk hunting season.
3. **March 2016:** Send all incisors to the laboratory for cementum annuli analysis.
4. **Summer 2016:** Categorize and analyze age data after receiving the cementum annuli report.
5. **Ongoing:** Repeat the sample collection and analysis protocol in additional years, as needed.

Justification within the 2015-2030 Kentucky Elk Management Plan

Strategy I.1c; Strategy I.1e; Strategy I.1h; Strategy V.2a

Investigation of mid-winter pregnancy rates to improve understanding of adult female elk reproductive capacity

Project overview

KDFWR staff will bolster cow reproductive data through a three-pronged sampling approach. Sampled animals will include hunter-harvested cows, adult females captured

specifically for pregnancy testing, and females captured as a result of other projects. This three-pronged approach will serve to increase the sample size, as well as diversify the geographic representativeness of the project. Reproductive testing will be conducted with BioPryn, a blood-based pregnancy test the Elk Program has successfully utilized for past projects.

Sampling of hunter-harvested cows will require that a fresh blood sample be collected from the animal as soon as possible following harvest. This will likely be accomplished by the hunter during the field dressing process. Sampling this group of animals will include some logistical challenges, but it has the potential to significantly increase the study's sample size and geographic representativeness. If field staff are present and can identify a fetus, BioPryn sampling will be unnecessary. Collection of a fetus will also allow Elk Program staff to calculate the approximate conception date.

Sampling of adult females captured specifically for pregnancy testing will be implemented through a combination of trapping and free-darting throughout the elk restoration zone. All healthy, available adult females encountered will be sampled. Yearling females will be sampled as well, but their results will be analyzed separately as a component of a separate project (Investigation of mid-winter pregnancy rates to improve understanding of yearling female elk reproductive capacity).

Finally, females captured as a result of other projects will also be tested for pregnancy. Projects that will likely lead to the capture of supplemental females include the Wisconsin elk restoration project and Elk utilization of forested habitat project.

Additional points of discussion

Simulations conducted within the current Kentucky Elk Population Model have demonstrated that female reproductive rates are one of the driving factors behind population maintenance and increases. As such, this project should be regarded as high-priority.

Sampling hunter-harvested elk for pregnancy will result in many of the same logistical challenges encountered when collecting incisors from harvested elk. As a result, it may be advisable to subsample hunters (thus reducing logistical difficulties) and/or enlist the help of KDFWR personnel in other areas of the state to collect samples closer to the hunter's place of residence.

This project is complementary to four additional projects included in this Plan of Work: Improved knowledge of age-at-harvest structure, Improved knowledge of yearling female reproductive rates, An update of calf survival rates, and Development of a supplemental Kentucky elk population model using Statistical Population Reconstruction.

Proposed timeline

1. **December 1, 2016:** Begin collecting samples from hunter-harvested animals on December 1, 2016 and continue through the end of the 2016-2017 hunting season. This starting date will increase accuracy of the BioPryn test.
2. **January 1, 2017:** Begin collecting samples from elk captured as a result of other projects as soon as possible in 2017. Continue data collection from these animals as long as these complementary projects are in place.
3. **Close of elk season, 2017:** Hunter-harvest pregnancy sampling ends.
4. **January, 2017:** Begin collecting samples from adult females captured specifically for pregnancy testing following the end of the 2016-2017 elk season.
5. **April 15, 2017:** Suspend sampling efforts for females captured specifically for pregnancy testing to maintain the health and safety of study animals.
6. **Late April 2017:** Send all BioPryn samples to the laboratory for analysis.
7. **Summer 2017:** Categorize and analyze pregnancy data after receiving the laboratory report.
8. **Ongoing:** Repeat the sample collection protocol in additional years, as needed.

Justification within the 2015-2030 Kentucky Elk Management Plan

Strategy I.1a; Strategy I.1c; Strategy I.1h; Strategy V.2b

Investigation of mid-winter pregnancy rates to improve understanding of yearling female elk reproductive capacity

Project overview

KDFWR staff will gather yearling reproductive data using the same three-pronged sampling approach described within the Improved knowledge of adult cow reproductive rates project overview. KDFWR elk managers previously assumed that very few yearling elk successfully breed, but recent KDFWR observations suggests that yearlings have relatively high pregnancy rates.

To determine the effect yearling pregnancies have on herd reproductive output, this project would deploy collars on yearling elk so KDFWR staff could monitor calf production in subsequent years. Results from BioPryn tests of hunter-harvested and supplemental elk could help establish a baseline for overall yearling pregnancy rates, while only individuals captured specifically for this project would be used to determine impacts of yearling pregnancies on overall herd reproductive output.

Additional points of discussion

Simulations conducted within the current Kentucky Elk Population Model have demonstrated that reproductive rates are one of the driving factors behind population maintenance and increases. It was previously assumed that yearling reproduction

Kentucky Elk Management Plan

played a relatively small role in herd reproductive output. Recent observations suggests that yearling pregnancies occur at a higher rate than previously thought, however. Despite potentially higher yearling pregnancy rates than previously thought, evidence from livestock operations indicates that female cattle bred as yearlings often do not re-breed the following year due to the physical stress of maintaining a pregnancy before reaching full adulthood. KDFWR currently lacks evidence to determine which of these scenarios is occurring within the Kentucky elk population. This project would help answer that question, and should be regarded as high-priority.

Sampling hunter-harvested elk for pregnancy will encounter many of the same logistical challenges encountered when collecting incisors from harvested elk. As a result, it may be advisable to subsample hunters (thus reducing logistical difficulties) and/or enlist the help of KDFWR personnel in other areas of the state to collect samples closer to the hunter's place of residence.

This project is complementary to three additional projects listed in this Plan of Work: Improved knowledge of age-at-harvest structure, Improved knowledge of adult female reproductive rates, and Development of a supplemental Kentucky elk population model using Statistical Population Reconstruction.

Proposed timeline

1. **December 1, 2016:** Begin collecting samples from hunter-harvested animals on December 1, 2016 and continue through the end of the 2016-2017 hunting season. This starting date will increase accuracy of the BioPryn test.
2. **January 1, 2017:** Begin collecting samples from supplemental elk as soon as possible in 2016. Continue data collection from these animals as long as complementary projects are in place.
3. **Close of elk season, 2017:** Hunter-harvest pregnancy sampling ends.
4. **Elk season 2017-2018:** Repeat sampling protocol from previous year.
5. **Elk season 2018-2019:** Repeat sampling protocol from previous year.
6. **January, 2019:** Begin collecting samples from yearling females captured specifically for pregnancy testing following the end of the 2016-2017 elk season.
7. **April 15, 2019:** Suspend sampling efforts for females captured specifically for pregnancy testing to maintain the health and safety of study animals.
8. **Late April 2019:** Send all BioPryn samples to the laboratory for analysis.
9. **Summer 2019:** Categorize and analyze pregnancy data after receiving the laboratory report.
10. **Ongoing:** Repeat the sample collection protocol in additional years, as needed.

Justification within the 2015-2030 Kentucky Elk Management Plan

Strategy I.1a; Strategy I.1c; Strategy I.1h; Strategy V.2b

Use of vaginal implant transmitters to update estimates of elk calf survival rates

Project overview

KDFWR staff will measure elk calf survival by collaring elk calves as soon as possible following birth and then monitoring their mortality through recruitment. Elk Program staff will accomplish this by outfitting adult female elk captured for a complimentary project (Investigation of mid-winter pregnancy rates to improve understanding of adult female reproductive capacity) with vaginal implant transmitters (VITs). Following VIT expulsion, KDFWR staff will locate the birth site with radio telemetry and outfit the calf with a very high frequency (VHF) radio collar. KDFWR staff will monitor calf survival until the beginning of the elk hunting season, at which point all surviving calves will be considered successfully recruited into the population.

Yearling elk will not receive VITs due to the supposed lower pregnancy rates exhibited by this class of animals. This could artificially bias survival rates if adult females and yearling females have differential calf survival rates. If concurrent research (Investigation of mid-winter pregnancy rates to improve understanding of yearling female elk reproductive capacity) demonstrates that yearling pregnancy are higher than previously assumed, yearling elk could be outfitted with VITs in future years.

Additional points of discussion

KDFWR and University of Kentucky staff encountered significant issues with VIT reliability in early Kentucky elk research. Equipment manufacturers redesigned the VIT structure to address these concerns, however, and a recent Kentucky pilot project demonstrated success when deploying redesigned VITs in elk.

Use of VITs in other KDFWR projects suggests this method requires a substantial investment of staff time, but it is nevertheless the best available means to obtain unbiased calf survival data.

This project is complementary to two additional projects in this Plan of Work: Investigation of mid-winter pregnancy rates to improve understanding of adult female elk reproductive capacity and Development of a supplemental Kentucky elk population model using Statistical Population Reconstruction.

Proposed timeline

1. **January 2019:** Begin capturing females for VIT deployment following the end of the 2018-2019 elk hunting season.
2. **January 2019:** Complete weekly monitoring of all VITs from the time of deployment.
3. **April 15, 2019:** Suspend VIT deployment efforts to maintain the health and safety of study animals.
4. **May 1, 2019:** Begin daily monitoring of all VITs.

Kentucky Elk Management Plan

5. **Mid May 2019:** Begin monitoring all VITs twice each day after the expulsion of the first VIT.
6. **Mid May 2019:** Perform daily mortality sweeps of all calves following the first collar deployment.
7. **June 2019:** Continue monitoring VITs twice daily until the last VIT is recovered or June 30, 2019 whichever comes first.
8. **August 1, 2019:** Transition to weekly mortality sweeps for all available elk calves.
9. **September 2019:** End calf mortality sweeps at the beginning of the 2019-2020 hunting season.
10. **Ongoing:** Repeat protocol in additional years, as needed.

Justification within the 2015-2030 Kentucky Elk Management Plan

Strategy I.1a; Strategy I.1c; Strategy V.2b

Improve the understanding of Kentucky elk distribution and herd size across the restoration zone

To best manage the Kentucky elk herd, KDFWR staff require ongoing knowledge of elk distribution throughout the restoration zone, as well as estimates of herd sizes at both local and landscape scales.

Elk utilization of forested habitats

Project overview

KDFWR staff will partner the United States Forest Service (USFS) to study elk habitat use in forested habitats. This will be accomplished by deploying global positioning system (GPS) collars on elk within or adjacent to the Daniel Boone National Forest (DBNF). The available habitat within the study animal's home ranges will be characterized based on forest management treatments (various silvicultural applications, prescribed fire, ongoing timber harvests, unmanaged forests, etc.), and elk habitat use of these different habitats will be quantified from the collar data.

If elk densities within the study area prove to be low for efficient deployment of GPS collars, KDFWR staff may use active translocation to bolster elk populations within targeted areas of the DBNF. These collared, translocated animals will then be monitored for habitat utilization as described above following a suitable period of acclimation.

Additional points of discussion

This project will allow KDFWR to examine elk habitat utilization within a predominantly forested landscape. This information will likely prove very important in the coming years since recent observations suggest that elk utilization of forested habitats is increasing. It should also be noted that much of the public property under

Kentucky Elk Management Plan

long-term public management (particularly lands managed by the USFS and the United States Army Corp of Engineers) is predominantly forested. As such, baseline knowledge of elk use of these properties may prove helpful in informing later management decisions.

This project will be complementary to one other project proposed in this Plan of Work: Multi-agency collaboration to improve habitat for elk and associated species on the Daniel Boone National Forest. Additionally, two other projects proposed in this Plan of Work may prove important to implementation of this project, including: Establishment and enhancement of elk populations in the Kentucky Elk Restoration Zone through active translocation and Development of an incentive program for landowners who provide trapping access for elk restoration projects.

Proposed timeline

1. **Summer 2015:** Collaborate with the USFS to identify potential project locations on the DBNF.
2. **January 19, 2016:** Following the end of the 2015-2016 elk season, begin capturing elk to deploy GPS collars.
3. **April 15, 2016:** Suspend sampling efforts to maintain the health and safety of study animals.
4. **Spring 2016-Spring 2018:** Monitor elk habitat use via the GPS collar uplink.
5. **Ongoing:** Repeat protocol in additional years, as needed.

Justification within the 2015-2030 Elk Management Plan

Strategy I.1c; Strategy I.1g; Strategy I.1h; Strategy I.1i; Strategy II.2a; Strategy II.2b; Strategy II.2d; Strategy II.2e; Strategy II.3a; Strategy II.3b; Strategy II.5a; Strategy II.5b

Localized surveys of elk herds using an unmanned aerial system

Project overview

KDFWR Elk Program staff will use an unmanned aerial system (UAS) to conduct fine-scale surveys of elk herds throughout the elk restoration zone. The UAS will be equipped with both natural color and thermal imaging cameras, the combination of which will allow KDFWR staff to quickly locate and categorize elk herds on the landscape. All information from both camera systems will be digitally stored to allow staff to conduct further analyses in an office setting.

Additional points of discussion

Aerial surveys offer the advantage of covering relatively wide swaths of landscape while providing biologists with a better vantage point for locating elk herds. Traditional aerial surveys using fixed-wing or rotary-wing aircraft are both expensive and dangerous, however. The use of an UAS for elk surveys will allow staff to retain many of

Kentucky Elk Management Plan

the benefits of traditional aerial surveys while minimizing the downsides of traditional aerial surveys.

While a proposed timeline is included, the regulatory climate surrounding UASs is evolving very rapidly. This has led to a substantial backlog at the Federal Aviation Administration (FAA), which could delay the implementation of this timeline.

Proposed timeline

1. **February 2015:** Begin researching the functionality of UAS for elk surveys.
2. **Summer 2015:** Compile final components list and submit purchase requisition.
3. **Spring 2016:** Complete necessary training to meet FAA guidelines.
4. **Spring 2016:** Submit mission paperwork to FAA.
5. **Autumn 2016:** Begin conducting UAS elk surveys.
6. **Additional:** Continue conducting surveys in areas of interest across the elk restoration zone, as needed.

Justification within the 2015-2030 Kentucky Elk Management Plan

Strategy I.1b; Strategy I.1c; Strategy I.1h; Strategy I.2c

Development of a supplemental Kentucky elk population model using Statistical Population Reconstruction

Project overview

KDFWR staff will partner with the University of Missouri to develop a Kentucky-specific elk population model using Statistical Population Reconstruction (SPR). SPR models have gained prominence in recent years due to their ability to provide reasonably accurate and precise population estimates using a variety of population parameters. KDFWR staff would collaborate with Dr. Millspaugh to identify the required data sets for model construction, provide Dr. Millspaugh with the required data, and then compare the model results to currently used methods of population estimation (the existing Kentucky Elk Model and other survey methods).

Additional points of discussion

It is understood that population models are merely a representation of the true conditions in the environment, but models can nevertheless provide valuable insights about changes in population trends. The SPR model could prove helpful in that it would provide an additional means of examining elk herd population growth.

Many of the parameters required for SPR model construction are already collected by KDFWR staff for use in the existing Kentucky Elk Model. As such, additional data collection required specifically for this project will be relatively minimal.

Kentucky Elk Management Plan

This project is complementary to four other projects proposed in this Plan of Work, including: Use of cementum annuli data to improve understanding of Kentucky elk age-at-harvest structure, Investigation of mid-winter pregnancy rates to better understand adult female elk reproductive capacity, Investigation of mid-winter pregnancy rates to better understand yearling female elk reproductive capacity, and Use of vaginal implant transmitters to update estimates of elk calf survival rates.

Proposed timeline

1. **Summer 2015:** Collaborate with Dr. Millspaugh to examine existing Kentucky elk data sets and determine whether additional data is required for model construction.
2. **Autumn 2015-Spring 2016:** Collect additional elk demographic and vital rate data as needed to permit SPR model construction.
3. **Summer 2016:** Provide relevant data sets to Dr. Millspaugh.
4. **Winter 2016:** Receive a preliminary copy of the Kentucky Elk SPR Model.
5. **Winter 2016-Spring 2017:** Collect additional elk demographic and vital rate data as needed to improve SPR model performance.
6. **Summer 2017:** Finalize the Kentucky Elk SPR Model.
7. **Autumn 2017:** Compare results and simulations from the Kentucky Elk SPR Model to existing population modeling techniques.
8. **Ongoing:** Continue periodically updating data sets required for robust SPR model performance.

Justification within the 2015-2030 Kentucky Elk Management Plan

Strategy I.1a; Strategy I.1c; Strategy I.1h; Strategy I.2c

Using genetic mark-resight techniques to develop local population estimates

Project overview

KDFWR will use next-generation DNA sequencing to analyze DNA collected from elk fecal samples within a mark-resight framework to develop local elk population density estimates. This project would likely be undertaken with Dr. Travis Glenn at the University of Georgia. This project could help estimate local population densities at different areas within the elk zone.

Additional points of discussion

Biologists from the Eastern Band of Cherokee Indians, the North Carolina Wildlife Resources Commission, and the Great Smokey Mountains National Park are currently conducting an elk density study on the North Carolina elk population using this method. KDFWR staff will have the opportunity to observe their results and seek their advice prior to attempting to replicate this method in Kentucky. The determination of whether

Kentucky Elk Management Plan

the KDFWR Elk Program pursues this project will largely hinge on the success of the North Carolina genetic mark-resight project.

Proposed timeline

1. **April 2018:** Meet with biologists from the North Carolina Wildlife Resource Commission, the Eastern Band of Cherokee Indians, and the Great Smokey Mountains National Park to gain insight into their ongoing elk genetic mark-resight project.
2. **Summer 2018:** Contact Dr. Glenn's laboratory to consult about the viability of using this technique in Kentucky.
3. **Winter 2018-Spring 2019:** Begin collecting elk fecal pellet samples.
4. **Spring 2019:** Ship samples to Dr. Glenn's laboratory for analysis.
5. **Summer-Autumn 2019:** Combine laboratory results with spatial information to develop local density estimates.

Justification within the 2015-2030 Elk Management Plan

Strategy I.1b; Strategy I.1c; Strategy I.1h; Strategy I.2c

Improve opportunities for elk-related recreation

Elk are highly esteemed for their recreational value in Kentucky and other states. KDFWR seeks to provide a wide range of recreational opportunities to citizens of the Commonwealth and other states. To meet this demand, KDFWR explores a range of management options that include coordination with other public agencies as well as partnerships with private landowners.

Development of a Voucher Cooperator Program to increase hunter access on private lands

Project overview

KDFWR staff will create a Voucher Cooperator Program through which private landowners who allow limited public elk hunting access to their property will have avenue to receive an elk permit as compensation. To receive an elk permit, landowners must accumulate 20 points; landowners receive two points credit for each bull elk harvested on their property, and one point for each harvested cow elk. Only elk harvested as a direct result of the Voucher Cooperator Permit Program will count toward the landowner's cumulative points.

Following the development of the program framework, Elk Program Staff will work with the KDFWR GIS Program and I & E Division to create an online sign-up system that will allow hunters to locate and sign up for eligible properties.

Kentucky Elk Management Plan

Additional points of discussion

KDFWR staff developed the general framework for the Voucher Cooperator Program in 2014, and began implementation in early 2015. This program is intended to increase elk hunting access for the general public while incentivizing landowners to maintain healthy elk herds on their property.

Proposed timeline

1. **January 2015:** Begin developing implementation guidelines.
2. **April 2015:** Complete implementation guidelines, and begin publicizing the Program.
3. **August 2015:** Open available properties to hunters through the online sign-up system.
4. **September 16, 2015-January 18, 2016:** Monitor Voucher Cooperator Program success throughout the 2015-2016 hunting season.
5. **February 2016:** Conduct an evaluation of the Voucher Cooperator Program's strengths and weaknesses by seeking landowner and hunter input.
6. **Spring-Summer 2016:** Change Voucher Cooperator Project implementation as needed to improve the experience of both landowners and hunters.

Justification within the 2015-2030 Elk Management Plan

Strategy I.1e; Strategy I.1g; Strategy II.4a; Strategy II.4e; Strategy IV.1a; Strategy IV.1c; Strategy IV.1d

Establishment and enhancement of elk populations in the Kentucky Elk Restoration Zone through active translocation

Project overview

KDFWR staff will trap elk from existing herds within the restoration zone and transfer them to new areas within the restoration zone with vacant habitat and/or low elk population densities. Trapping efforts will occur from the end of elk hunting season until mid spring. Corral trapping will be the primary capture method, as this technique allows the translocation of multiple elk at once. This serves to minimize staff time per elk moved, as well as increase animal welfare by ensuring that translocated animals have an immediate herd within their new territory.

Additional points of discussion

KDFWR Elk Program has substantial experience capturing elk for restoration projects. Elk Program staff have successfully trapped animals for translocation to Missouri, Virginia, and Wisconsin in recent years. Perhaps more substantive, however, are past translocation projects to Corrigan Wildlife Management Area (WMA) and Fishtrap WMA. These projects involved the transfer of elk to vacant habitat within Kentucky, and

Kentucky Elk Management Plan

both have resulted in thriving elk herds. These successes suggest that future in-state translocations could also prove effective at increasing recreational opportunities across the elk restoration zone.

This project could be substantially enhanced by the successful implementation of another project proposed in this Plan of Work: Development of an incentive program for landowners who provide trapping access for elk restoration projects.

Proposed timeline

1. **Summer 2015:** Identify locations to which elk could be translocated.
2. **Fall 2015:** Begin identifying source herds for in-state translocation efforts.
3. **January 19, 2016-April 15, 2016:** Initiate trapping and translocation efforts.
4. **Ongoing:** Repeat trapping and translocation protocol in later years, as needed.

Justification within the 2015-2030 Elk Management Plan

Strategy I.1e; Strategy I.1f; Strategy I.1g; Strategy I.1i; Strategy IV.1a; Strategy IV.1d; Strategy V.2a

Multi-agency collaboration to improve habitat for elk and related species on the Daniel Boone National Forest

Project overview

KDFWR will collaborate with the USFS to design and implement habitat improvement projects for elk and related species on the DBNF. Elk Program staff will provide species-specific recommendations during the project planning process, and will provide implementation assistance where available. These projects may include the use of prescribed fire, forest thinning, timber harvests, and the development of wildlife openings.

Additional points of discussion

Habitat projects undertaken with the USFS are subject to the National Environmental Policy Act (NEPA) process; this process will likely take at least twelve months. Project implementation can begin following the completion of all NEPA requirements.

This proposed project will take place in the same project area as another project proposed in this Plan of Work (Elk utilization of forested habitats). Findings from Elk utilization of forested habitats project may prove especially helpful in designing specific habitat projects on the DBNF. It is possible that our evolving understanding of elk utilization of forested habitats from this research will suggest dramatic improvements to habitat projects that could increase their effectiveness on the landscape. As such, adaptive management principles should take precedence in all specific actions considered as a part of this proposed project.

Kentucky Elk Management Plan

Proposed timeline

1. **Summer 2015:** Begin working with USFS personnel to develop habitat projects.
2. **2015 and 2016:** Develop specific project timelines as the NEPA process is completed.
3. **2016:** Where possible, help USFS staff implement habitat improvement projects.

Justification within the 2015-2030 Elk Management Plan

Strategy I.1h; Strategy II.1a; Strategy II.1b; Strategy II.1c; Strategy II.1d; Strategy II.2d; Strategy II.2e; Strategy II.3b; Strategy IV.1d; Strategy IV.3b; Strategy V.2a; Strategy V.2b

Development of an incentive program for landowners who provide trapping access for elk restoration projects

Project overview

KDFWR will create an Elk Restoration Cooperator Permit to incentivize private landowners to provide trapping access for elk restoration projects. Under this program, cooperating landowners would receive points for elk removed from their property as source animals for elk restoration projects. Upon the accrual of a set number of points, the landowner would receive one fully transferrable, either sex elk permit for the next full elk hunting season. Points will be cumulative between all individual tracts owned by the landowner, and will carry over from year-to-year. These permits may be used on any property the landowner owns during their designated hunting season.

Only elk trapped specifically for restoration projects will be valid for inclusion in this program; elk trapped for other reasons (nuisance, safety concerns, etc.) will not be eligible for point accrual for the Elk Restoration Cooperator Permit. All potential trapping locations for Elk Restoration Cooperator Permits will be ranked according to a scoring sheet that will take into account potential impacts to local elk populations, ramifications for recreational opportunities, and logistical feasibility. Rankings will be conducted by KDFWR Elk Program staff, and will be used to determine priority for participation in the Elk Restoration Cooperator Permit program.

Additional points of discussion

Implementation of this project will require legislative approval. As such, KDFWR Elk Program staff will develop the project framework, and then work with KDFWR leadership to seek legislative support and approval.

This project is complementary to another proposed project in this Plan of Work: Establishment and enhancement of elk populations in the Kentucky Elk Restoration Zone through active translocation. This project would also be complementary to the ongoing Wisconsin Elk Restoration Project.

Kentucky Elk Management Plan

Proposed timeline

1. **Summer 2016:** Develop a program framework for the Elk Restoration Cooperator Permit, along with a white paper describing the program's highlights.
2. **Autumn 2016:** KDFWR leadership identifies legislators who will sponsor and support the bill.
3. **2017 Legislative Session:** The enabling legislation is passed into law.
4. **Spring 2017:** Begin identifying potential landowners with whom to partner.

Justification within the 2015-2030 Elk Management Plan

Strategy I.1i; Strategy II.4a; Strategy IV.1a; Strategy IV.1e

Develop a survey to measure the overall economic impact of elk on the Kentucky economy

Project overview

Elk-related recreation is contributing to the economic wellbeing of eastern Kentucky and the Commonwealth as a whole. However, to date there has been no examination providing an overall estimate of the impact of the elk herd on the Kentucky economy. To fill this knowledge gap, KDFWR will commission a survey to investigate the overall economic impact of elk to Kentucky.

Additional points of discussion

KDFWR staff conducted elk hunter surveys that provided estimates of hunter expenditures. However, there has been no comprehensive survey of non-consumptive recreational users. This information may be used to help KDFWR Elk Program staff identify areas that could benefit from additional management. This information may also prove useful to tourism advocates in determining sectors for increased investment.

Proposed timeline

1. **Spring 2017:** Identify and choose an entity providing public dimensions surveys.
2. **Summer 2017:** Collaborate with the survey company to develop a survey framework that will answer KDFWR needs.
3. **Autumn 2017:** Survey is conducted
4. **Winter 2017:** Synthesize survey results and distribute to partners.

Justification within the 2015-2030 Elk Management Plan

Strategy IV.1b; Strategy IV.1d; Strategy IV.3a; Strategy IV.3b

Partner with other agencies and/or organizations to facilitate the development of elk viewing areas for non-consumptive users

Project overview

KDFWR staff will provide technical guidance to groups/entities who are establishing opportunities for non-consumptive elk recreation. KDFWR Elk Program staff may provide information regarding elk biology and ecology, habitat improvement to increase elk presence and visibility, best management practices for maintaining public safety around large mammals, and development of collaborative efforts between other agencies, organizations, and entities.

Additional points of discussion

Opportunities for non-consumptive elk recreation have been relatively underdeveloped in Kentucky, despite the fact that Kentucky has the largest elk herd in the eastern United States. Further development of this sector could help KDFWR achieve its Mission by increasing public knowledge of the Commonwealth's wildlife resources.

Proposed timeline

1. **Summer 2017:** Gather information about non-consumptive elk recreational opportunities in other eastern states.
2. **August 2017:** Compile proven models from other states into a single report that permits the identification of common links to success.
3. **Ongoing:** Make KDFWR Elk Program staff available for providing technical guidance to new and ongoing ventures that will increase non-consumptive recreation in Kentucky.

Justification within the 2015-2030 Elk Management Plan

Strategy IV.1a; Strategy IV.1b; Strategy IV.1d; Strategy IV.1e; Strategy IV.3a; Strategy IV.3b; Strategy V.1e

Standardize KDFWR response to negative elk-human interactions

KDFWR staff receive relatively few annual reports of elk-human conflict. However, it is important that agency staff provide a consistent message to the public who are experiencing these issues. Development and adoption of a Standard Operating Procedure (SOP) for elk nuisance would fulfill this need.

Kentucky Elk Management Plan

Develop an Elk Damage Standard Operating Procedure for the KDFWR Wildlife and Law Enforcement Divisions

Project overview

KDFWR Elk Program staff will draft a SOP for addressing elk nuisance issues. This SOP will be provided to the leadership of the Wildlife and Law Enforcement Divisions for review. Following any necessary revisions, KDFWR leadership will adopt the Elk Damage SOP and disseminate it to the appropriate staff.

Additional points of discussion

KDFWR currently lacks an official SOP for dealing with negative elk-human interactions. To date, the low occurrence of elk nuisance complaints has meant that relatively few KDFWR staff have been able to respond to these complaints, thus maintaining consistency in how these issues were handled. As elk herds increase and veteran KDFWR staff retire, however, it will be important to ensure that all damage complaints are handled in a consistent manner. The Elk Damage SOP will also provide a consistent framework to deal with elk that are infected with meningeal worm, since landowners often view neurologically-impaired as a nuisance issue.

Proposed timeline

1. **Spring 2016:** Begin drafting Elk Damage SOP.
2. **Summer 2016:** Provide draft Elk Damage SOP to Wildlife Division and Law Enforcement Division Leadership for review.
3. **September-October 2016:** Make any necessary revisions to the draft Elk Damage SOP.
4. **November 2016:** Adopt Elk Damage SOP as official agency policy.

Justification within the 2015-2030 Elk Management Plan

Strategy I.1e; Strategy I.1f; Strategy I.1g; Strategy I.1h; Strategy III.2a; Strategy III.2b; Strategy III.2c

Appendix A. Kentucky Elk Program Plan of Work for 2015 – 2019 At a Glance

Year	2015				2016			
Season	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter
Project	10	6, 10, 12	2, 8	3, 4, 6, 8	1, 6, 8, 10, 11, 16	12, 13, 16	2, 7, 8, 16	3, 4, 7, 8

Year	2017				2018			
Season	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter
Project	1, 3, 7, 8, 11, 13	8, 14, 15	2, 7, 15	3, 4, 7, 14	1, 3, 7, 11	9	2, 7	3, 4, 5, 7, 9

Year	2019			
Season	Spring	Summer	Autumn	Winter
Project	1, 3, 4, 5, 7, 9, 11	5, 9	2, 5	3, 4

Project Key

- ¹ Wisconsin Elk Restoration Project
- ² Use of cementum annuli data to improve understanding of Kentucky elk age-at-harvest structure
- ³ Investigation of mid-winter pregnancy rates to improve understanding of adult female elk reproductive capacity
- ⁴ Investigation of mid-winter pregnancy rates to improve understanding of yearling female elk reproductive capacity
- ⁵ Use of vaginal implant transmitters to update estimates of elk calf survival rates
- ⁶ Elk utilization of forested habitats
- ⁷ Localized surveys of elk herds using an unmanned aerial system
- ⁸ Development of a supplemental Kentucky elk population model using Statistical Population Reconstruction

- ⁹ Using genetic mark-resight techniques to develop local population estimates
- ¹⁰ Development of a Voucher Cooperator Program to increase hunter access on private lands
- ¹¹ Establishment and enhancement of elk populations in the Kentucky Elk Restoration Zone through active translocation
- ¹² Multi-agency collaboration to improve habitat for elk and related species on the Daniel Boone National Forest
- ¹³ Development of an incentive program for landowners who provide trapping access for elk restoration projects
- ¹⁴ Develop a survey to measure the overall economic impact of elk on the Kentucky economy
- ¹⁵ Partner with other agencies and/or organizations to facilitate the development of elk viewing areas for non-consumptive users
- ¹⁶ Develop an Elk Damage Standard Operating Procedure for the KDFWR Wildlife and Law Enforcement Divisions

DRAFT