

ARKANSAS GAME AND FISH COMMISSION



STRATEGIC ELK MANAGEMENT PLAN

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STRATEGIC ELK MANAGEMENT PLAN

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PREFACE

This plan was developed by a team composed of representatives of the Arkansas Game and Fish Commission, National Park Service, and Rocky Mountain Elk Foundation. Ms. Charlene Risner and Ms. Julie Farris with the Commission provided invaluable assistance with manuscript preparation. Initially the plan was developed by the 10-member Elk Committee operating under the direction of the Wildlife Management Division (WMD). Prior to completion, the plan received a thorough review by staff of the Arkansas Game and Fish Commission (AGFC) and National Park Service (NPS) with comments incorporated prior to approval by the AGFC. The major purpose of the plan is to provide strategic, long-term guidance and direction for the Commission's elk management program. Operational planning based on priorities in this plan will occur annually in conjunction with the AGFC budgeting process, and biennially in conjunction with biennial personnel requests. This strategic plan will be evaluated and updated on a five-year cycle beginning in 2001.

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....6

INTRODUCTION

History 7
Range and Distribution..... 7
Management 8
Significance of the Resource..... 10

STRATEGIC ELK MANAGEMENT PLAN

Elk Management Philosophy..... 16

Elk Resource Goals

Goal I 16
Objective A 16
Objective B..... 16
Objective C 17
Objective D 17

Goal II..... 18
Objective A 18

Goal III..... 18
Objective A 18
Objective B..... 18
Objective C 18

Goal IV 19
Objective A 19
Objective B..... 19
Objective C 19

Goal V..... 19
Objective A 19
Objective B..... 20
Objective C 20

Habitat Goal

Goal VI..... 20
Objective A 20
Objective B..... 21
Objective C 21

Education Goal

Goal VII..... 21
Objective A 21
Objective B..... 22
Objective C 22

Commercialization Goal	
Goal VIII	23
Objective A	23
Objective B	23
Objective C	23
Administrative Goals	
Goal IX	23
Objective A	23
Objective B	24
Goal X	24
Objective A	24
Objective B	24
Objective C	24
Evaluation	24
Literature Cited	26
APPENDICES	28
A. Priorities for Elk Plan Objectives	28

STRATEGIC ELK MANAGEMENT PLAN

EXECUTIVE SUMMARY

Arkansas' elk herd originated from 112 Rocky Mountain elk stocked near the Buffalo National River in the early 1980's. The herd has grown but remains relatively small numbering approximately 450-500 animals. The present herd range covers approximately 315,000 acres in portions of Newton, Searcy, Boone and Carroll Counties. Most of the elk occur on public land along the Buffalo National River. These public lands are comprised primarily of National Park Service land and the state-owned Gene Rush WMA. Herd size and a limited distribution requires intensive management to maintain a viable and huntable population compatible with habitat conditions and public acceptance. This long range strategic plan addresses all aspects of the elk resource to include population management, habitat management, research and surveys, public education, elk commercialization and elk program administration. A primary goal is to maintain 450-500 elk within the designated primary elk range with minimum standards for post season bull/cow and calf/cow ratio's set at 40:100. These ratio's were established based on data collected on the herd prior to the establishment of Arkansas' elk hunting season. Hunting is the primary management tool which will be used to control elk numbers both within and outside of the primary elk range. Efforts will be made to work closely with private landowners in managing elk on private land both within and outside of the primary elk range. Elk on private land outside of the primary elk range will be maintained at levels acceptable to private landowners. Habitat management on public land within the primary elk range will be expanded to ensure long-term habitat conditions are available to support the herd. Research and survey work will involve ecological studies of elk within the current primary elk range, continued periodic infrared surveys for population monitoring, helicopter elk counts, harvest data collection, monitoring of nuisance elk complaints and non-hunting elk mortalities, public/landowner surveys, and an evaluation of the state to determine if other areas will support elk from a biological and sociological standpoint. If new sites are found, efforts will be made to stock and manage elk in these areas in the future. Public education is vital for obtaining and maintaining support for elk management in Arkansas. Efforts to educate Arkansans will involve publications, videos, television/radio programs, a watchable wildlife program, expanded project wild elk programs and a mobile elk education trailer.. A greater emphasis will be directed at improving law enforcement efforts and minimizing elk poaching through cooperative plans and programs developed by the Arkansas Game and Fish Commission and the National Park Service. Arkansas' elk herd is fragile and some efforts have already been made to address elk commercialization in Arkansas which is a potential threat to the herd. Through updated policies and regulations concerning captive elk, threats to the free-ranging elk herd can be minimized. Funding is vital in order to implement this plan and outlined program work. Efforts will be made to streamline funding allocations for projects and secure and maintain funding partnerships for elk projects with private organizations and state/federal agencies

INTRODUCTION

History

Historically, the North American Elk (*Cervus elaphus*) numbered in the millions and occupied habitats spanning most of the North American continent. Continental exploration, settlement and exploitation reduced elk populations in number and range to a few persistent herds in the mountainous West. Only the elk's remarkable adaptability prevented total extirpation from the continent.

The eastern elk (*Cervus elaphus canadensis*) was the subspecies adapted to environmental conditions in the eastern boreal and hardwood forests, and was native to Arkansas. Arkansas' native elk probably persisted no later than the 1840's, as no reliable historical record reports their occurrence after this date (Anonymous 1951, Sealander and Heidt 1990). This subspecies of elk is considered extinct.

The U.S. Forest Service introduced Rocky Mountain elk (*Cervus elaphus nelsoni*) in the Black Mountain Refuge in Franklin County in 1933. Three bulls and 8 cows from the Wichita Mountains Wildlife Refuge in Oklahoma were released. An Arkansas Game and Fish Commission (AGFC) study conducted in 1943 indicated that an estimated population of 75 elk remained in and around Franklin County (Anonymous 1951). By 1948 the population had grown to 125 but reports indicated that the future of the herd did not look promising. The herd increased to an estimated 200 by the mid-1950's and then disappeared. The cause of the disappearance was not determined but there was considerable speculation that illegal hunting, natural mortality, and shrinkage of suitable range through natural ecological succession eventually resulted in extermination of the herd.

Beginning in 1981 and continuing through 1985, a total of 112 Rocky Mountain elk were stocked at 5 release sites in Newton County, Arkansas (Table 1). All release sites were in the vicinity of the Buffalo National River (BNR). One hundred five (105) of the stocked elk were captured in Colorado, and 7 were captured in Nebraska. A number of elk were ear tagged and tested for diseases such as brucellosis and leptospirosis prior to release in Arkansas.

Range and Distribution

Arkansas' current elk herd ranges along the BNR drainage in Newton and Searcy Counties and on private land in portions of southern Boone and Carroll Counties. Since initial stockings in the early 1980's, surveys indicate the herd has expanded its range to approximately 315,000 acres (492.3 mi²). The range covers approximately 95 miles of the upper, middle and lower sections of the BNR. All of the 17,652 acre Gene Rush Wildlife Management Area (GRWMA), owned by the AGFC, is also included within the current range (Fig. 1). Elk do range onto private land bordering National Park Service (NPS) and AGFC lands. Since 1981 elk sightings have been documented in 14 different Ozark counties; however, it appears that elk sighted in counties other than Newton, Searcy, Carroll and Boone are transient animals. There is no evidence that a resident breeding population has been established in other areas of the state.

Based on aerial surveys, field observations and population modeling, the current elk herd numbers approximately 450-500 animals. This equates to approximately one elk per .98 - 1.1 mi² (630 - 700 acres) of occupied range. Based on available habitat along the middle and lower sections of the BNR, it appears that elk may continue to expand their current range toward the mouth of the Buffalo River. Although suitable range exists on private lands within and adjacent to the occupied elk range, increasing human-elk conflicts indicate that private landowners will likely not be willing to tolerate extensive elk use of private lands.

Adjacent Ozark National Forest lands border NPS property in the upper and lower sections of the BNR drainage. There is some potential for elk on these lands; however, it appears limited at this point in time due to current forest management programs and the lack of large dispersed openings which provide ample year-round ground forage (grasses and grasslikes) for a large herbivore such as elk. Other potential elk restoration sites may exist within the state; however a thorough feasibility/evaluation study is necessary before future elk stocking plans can be developed.

Management

Population management has involved herd protection with no legal hunting allowed between 1981-1997. A few nuisance elk have been captured and moved in order to solve public relations problems on private lands. Since initial stockings, some elk have been lost to poaching and disease problems (primarily meningeal worms) (Cartwright 1995). Some limited efforts to treat infected animals were undertaken in the 1980's by a local private veterinarian. Costs and the inability to adequately monitor the success or failures of these efforts made it quite impractical as a management tool for free-ranging elk. Animals with meningeal worm infestations are currently not treated and are occasionally sacrificed in late stages of infection by AGFC and/or NPS staff. It appears that most elk that succumb to meningeal worm infestations are less than 2 years of age (M. Cartwright, pers. comm.). Research and survey efforts have involved the annual recording of AGFC/NPS staff field observations of elk, recording of documented elk mortalities, late winter helicopter counts (Table 2.), an infrared census project in 1994, collection of elk harvest data since 1998, a cooperative 2-year nuisance elk research project initiated in 1997, and an ongoing statewide GIS elk restoration feasibility study initiated in 2000. Between 1992 and 2000 the AGFC and RMEF funded cooperative habitat improvement projects on the GRWMA. In addition the AGFC, RMEF and NPS have funded cooperative habitat projects on NPS lands along the BNR which involve reestablishment of native warm season grasses, fescue eradication and establishment of wildlife friendly cool season grasses, rejuvenation of old field habitats through controlled burning and mechanical removal of invading hardwoods, and annual maintenance of open hay meadows through cooperative farming operations. A complete inventory of open land habitat on NPS lands is underway, and long-term openland management plans will be finalized in 2001.

Damage problems involving elk have involved road-kills and nuisance animals on private lands. Documented road-kills total 10 from 1986 through 2000 (Table 3) which is an average of less than one annually (M. Cartwright, personal comm.). Elk have expanded onto private land in Boone and Carroll Counties and research data indicates no movement of these elk

to and from the main herd in the Buffalo River drainage (Herner-Thogmartin 1999) . Since 1990 nuisance elk complaints have increased gradually. Major complaints have involved fence damage, garden/food plot damage, excessive consumption of pasture grasses, hay consumption, and damage to wildlife feeders. The Commission's elk harvest program appears to be addressing some of the nuisance elk problems on private land with a controlled annual harvest.

An elk committee composed of AGFC, NPS and RMEF representatives initiated the development of an elk hunt plan (Elk Committee 1997) in March 1996. In January 1997, the Commission approved Arkansas' first elk hunt for the fall of 1998. Justification for the first hunt included: 1) increasing elk damage and nuisance complaints; 2) a need for increased recreational opportunity; 3) a projected increase in economic benefits especially at a local level; 4) a need to collect herd condition data for management purposes and; 5) a need to condition elk to humans to minimize future human/elk conflicts. Information obtained from a simulated elk hunt held in the fall of 1997 (Cartwright and Linebarger 1997) and population estimates obtained from the use of a computer model (Bartholow 1996) were used to finalize the hunt plan in the fall of 1997. The hunt plan, proposed season structure and regulations were approved by the Commission in the spring of 1998.

Arkansas' first elk season was held in the fall of 1998. The split season included two 5-day hunt periods in September and December. Twenty permits (10 bull and 10 antlerless) were issued with 10 bulls and 7 cows harvested (Fig. 2). The Arkansas Game and Fish Commission donated two of the bull permits to the Rocky Mountain Elk Foundation for fundraising purposes. These permits generated \$87,500 for elk project work with 85% of that total returned to Arkansas for in-state elk project work. Almost 16,000 (15,840) Arkansas residents applied for 18 permits through a random draw process (Fig. 3). Applicants voluntarily donated almost \$63,000 for elk project work in Arkansas. Arkansas' second elk season held in 1999 was also a split season with two 5-day hunt periods held in September and December. Eighteen permits (9 bull and 9 antlerless) were issued through a random drawing process for 3 elk zones within the primary elk range. An additional 179 permits were issued in elk zone 4 (private lands elk zone). These permits were sold to qualifying permit applicants at a cost of \$35.00 each and entitled each permit holder with written permission to hunt on private land in elk zone 4. The Commission donated two bull permits to RMEF for fundraising purposes which generated \$35,000 for elk project work with 85% of the total returned to Arkansas for in-state elk project work. An additional bull permit was donated to the Newton County Elk Festival Committee and fund raising efforts generated \$2,288.00 for elk project work in Arkansas. Nine thousand four hundred fifty nine (9459) applicants applied for draw permits and voluntarily donated \$28,087.00 for elk project work in Arkansas. A total of 9 bulls and 7 antlerless elk were harvested in the 3 elk zones within the primary elk range. A total of 22 elk (7 bulls and 15 antlerless) were harvested in elk zone 4 making a total of 38 elk harvested for the state with elk hunting opportunity provided for a total of 197 hunters. Arkansas' third elk season held in 2000 was a split season with two 3-day hunt periods held in late September and early December. Twenty permits (8 bull and 12 antlerless) were issued for 4 elk zones within the primary elk range with 6 bulls and 6 antlerless elk harvested. An additional 161 either-sex permits were issued in elk zone A (private lands elk zone) with 7 bulls and 5 antlerless elk harvested. A total of 24 elk (13 bulls and 11 antlerless elk) were harvested in the state with elk hunting opportunity provided for a total of 181 hunters. The Arkansas Game and Fish Commission donated two of the bull permits to the Rocky Mountain Elk Foundation for fundraising purposes. These permits generated \$32,500.00 for elk project work

with 85% of that total returned to Arkansas for in-state elk project work. Three thousand seven hundred forty three (3743) Arkansas residents applied for permits through a random draw process. Applicants voluntarily donated \$8,213.00 for elk project work in Arkansas

Major management efforts over the next 10 years will involve controlling herd size to minimize nuisance elk problems on private land. Controlled harvest through established hunting seasons will be the primary tool used. Habitat management efforts will be directed toward improving habitat conditions on the GRWMA and NPS lands along the BNR in order to attract and hold elk on public land thus minimizing private land nuisance elk problems. The state will be evaluated to determine if other areas exist which would be suitable for establishing an additional free-ranging elk herd in addition to the BNR herd. Research efforts will be directed toward determining ecological relationships within the BNR primary elk range. We also will determine habitat use, movement patterns, food habits, and mortality factors as well as reproductive characteristics. Data will be used to update elk population models and develop harvest strategies. Efforts will also be made to educate the public about elk and purchase/lease more public land within the current primary elk range for elk management. Elk are at risk from future introductions of diseased animals and commercial operations involving diseased captive animals (Nettles and Corn 1988). Elk commercialization involving captive animals has been addressed to some extent through the development of new policies and regulations designed to protect wild elk in the state.

Significance of the Resource

Most of the more than 900,000 elk in North America occur in the western U.S. and in portions of western Canada (Bunnell 1997). National data which addresses consumptive and nonconsumptive uses of elk indicate that elk rank just below deer and turkey in terms of big game hunter numbers (U.S. Fish and Wildlife Service 1997). In 1995 more than 835,000 elk hunters in the United States and Canada spent over 5,300,000 days hunting elk (Bunnell 1997). That same year, hunters harvested over 167,000 elk. The importance of elk is also reflected in license sales. The number of elk licenses sold in the United States and Canada increased from slightly over 500,000 in 1975 to over 950,000 just 20 years later. On a more localized level, an economic survey conducted in the state of Montana in 1985 indicated that elk hunters contributed over \$58 million annually to Montana's economy (Youmans 1992). Elk populations established in the eastern U.S. may provide up to \$16.00 per acre of occupied range to the economy. This would equate to over \$3,000,000 annually for a typical elk range consisting of a minimum of 200,000 acres (Ad Hoc Committee on Elk Reintroduction 1997).

On a national level wildlife-watching is also a major activity and is very important to both local and national economies. In 1996 more than 62 million U.S. residents enjoyed a variety of wildlife-watching activities spending more than \$29 billion dollars (U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, Bureau of the Census 1997). In Arkansas, 658,000 state residents 16 years of age and older participated in wildlife-watching in 1996 and spent \$191 million dollars (U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, Bureau of the Census 1998). No data is available on the economic impacts of elk viewing in Arkansas. A 1990 study in Montana indicated that wildlife viewing annually contributed more than \$44 million to Montana's economy

(Youmans 1992). A high proportion of Montana's wildlife viewing economy was believed to be attributable to elk. Elk viewing is very popular in Michigan and Pennsylvania. In 1989, Pennsylvania reported 7200 recreational visits to their 300 animal herd with a total viewing income of \$85,320.00 or \$284.40 per animal unit (Shafer and Wang 1989).

It's quite apparent that elk have important cultural, aesthetic, social and ecological values. General observations indicate an increasing public interest in viewing and photographing elk in Arkansas. Even though quantitative data for Arkansas is unavailable concerning elk values, it is apparent that the potential exists to increase consumptive and non-consumptive wildlife recreational opportunities and to enhance the state and local economy through proper herd management.

Table 1. Elk stocked in Arkansas between 1981 and 1985.

YEAR	SOURCE	BULLS	COWS	CALVES	UNKNOWNNS	TOTAL	RELEASE AREA
1981	Colorado	1	3	3	-	7	Newton Co.
1983	Colorado	-	-	-	24	24	Newton Co.
1984	Nebraska	-	-	-	7	7	Newton Co.
1985	Colorado	5	44	25	-	74	Newton Co.
TOTALS		6	47	28	31	112	

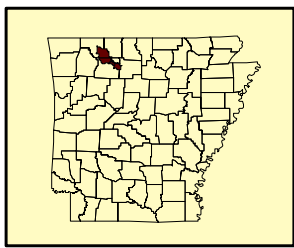
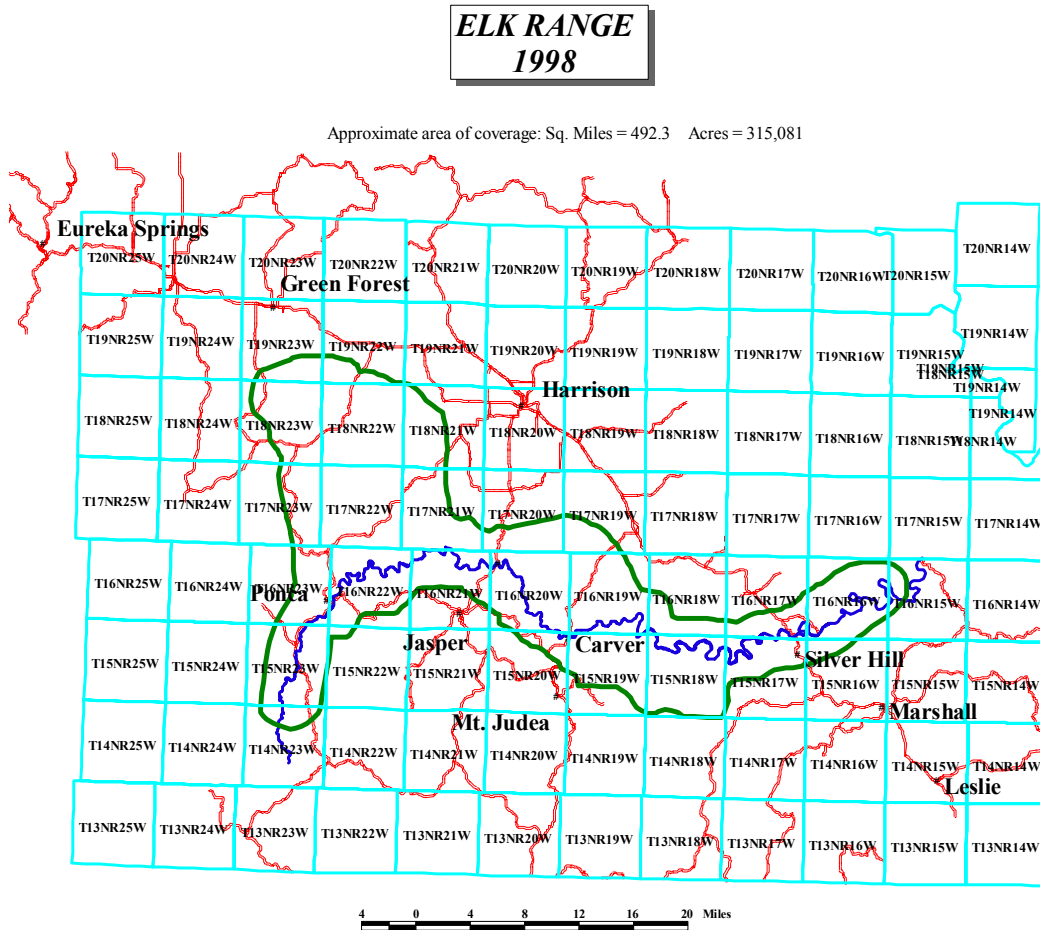
Table 2. Helicopter elk count data for Arkansas, 1991-2000.

HELICOPTER ELK COUNTS, 1991-2000									
Buffalo River Corridor					Private Land (Boone & Carroll Counties)				
Year	Antlered Bulls	Cows	Calves	Total	Antlered Bulls	Cows	Calves	Total	Grand Total
1991	18	41	17	76	No Survey				76
1992	35	78	31	144	No Survey				144
1993	35	63	32	130	3	7	2	12	142
1994	30	78	32	140	0	0	0	0	140
1995	49	82	28	159	1	1	0	2	161
1996	46	90	45	181	3	14	6	23	204
1997	41	99	39	179	6	10	6	22	201
1998	46	100	39	185	7	21	12	40	225
1999	63	113	53	229	7	22	11	40	269
2000	49	146	48	243	7	25	10	42	285

Table 3. Documented non-hunting elk mortalities through 2000.

DOCUMENTED ELK MORTALITIES 1981-2000		
CAUSE	#	%
POACHING	35	29%
PROBABLE M. WORM	29	24%
MENINGEAL WORM	9	8%
LEPTOSPIROSIS	3	2%
TRAUMATIC INJURIES	9	7%
ROAD-KILLS	10	8%
UNKNOWN	26	22%
TOTALS	121	100%

Fig. 1. Arkansas' current elk range.



Produced: April 21, 1999
 By: Arkansas Game & Fish Commission
 Wildlife Management Division
 GIS_Programs Coordinator



Fig. 2. Arkansas' elk harvest by year.

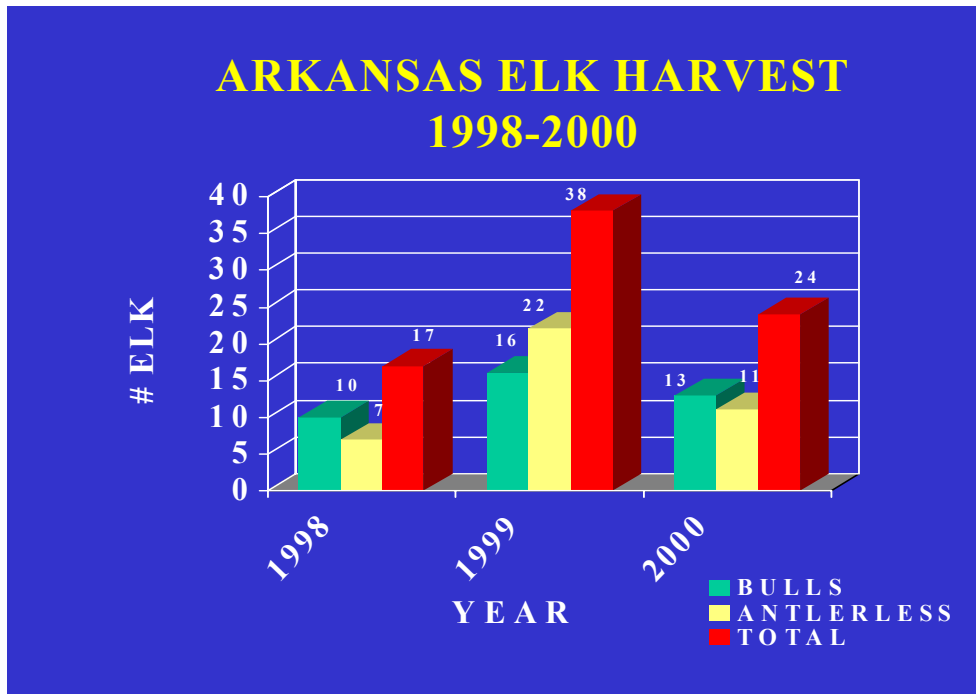
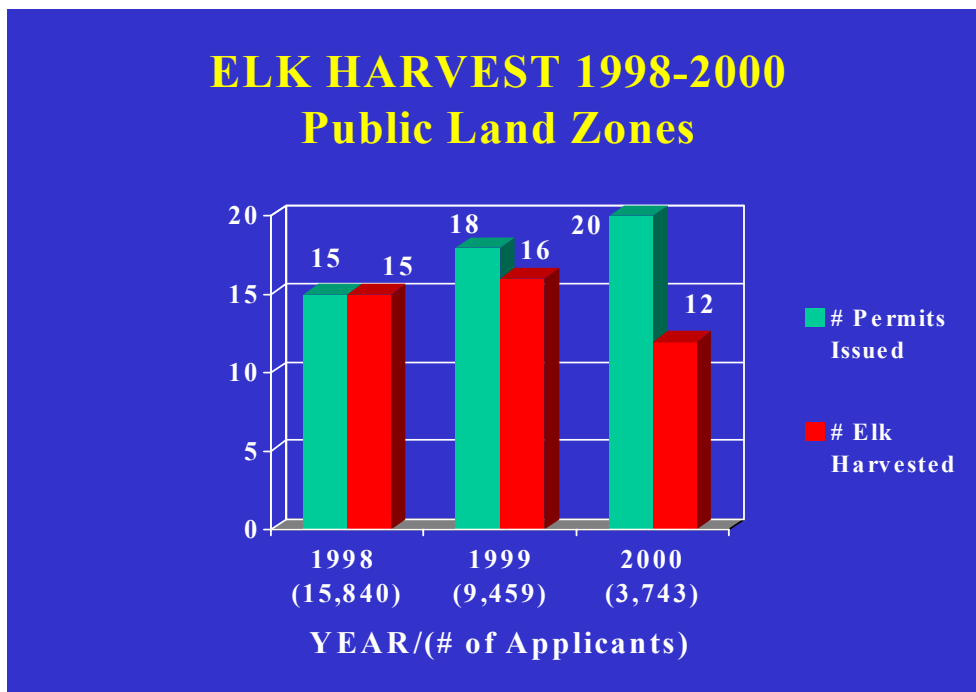


Fig. 3. Arkansas' annual elk harvest and permits issued for public land hunting zones.



STRATEGIC ELK MANAGEMENT PLAN

ELK MANAGEMENT PHILOSOPHY:

The Commission's philosophy is to manage Arkansas's elk population for a healthy, productive herd with distribution and population levels that are compatible with public acceptance, habitat capability and other natural resource goals.

ELK RESOURCE GOALS

GOAL I: To maintain a pre-hunt elk population of 450-500 animals within the designated primary elk range with a minimum post season bull:cow ratio of 40:100 and a minimum calf:cow ratio of 40:100.

The elk herd has increased in numbers and distribution since the original stocking of 112 animals between 1981-1985. This growth has resulted in herd expansion onto private land where human/elk conflicts have increased. There is a need to maintain an established number of elk on public land in order to minimize human elk conflicts on private land. Hunting is the only viable option for effectively maintaining elk population numbers at levels compatible with habitat conditions and human tolerance levels. Controlled harvest is necessary to prevent population decline within the primary elk range and to maintain adequate age and sex ratio's in the herd.

OBJECTIVE A: Establish boundaries for a designated primary elk range for managing the BNR elk herd.

Due to growing problems in managing elk on private lands and conflicts between elk and landowners, it is imperative at this point in time to designate a primary elk range for long term management. This primary range may be increased or decreased in size in future years depending on public tolerance of elk on private lands.

STRATEGY 1. The elk committee will use available population and habitat data to designate a primary elk range for long-term elk management purposes. This task will be completed in 2001.

OBJECTIVE B: To monitor the elk population within the designated primary elk range.

STRATEGY 1. Conduct late winter aerial elk counts to monitor population trends. Annual counts will be initiated in February.

STRATEGY 2. Conduct a late winter infrared survey within the primary elk range to assess population levels. This survey will be conducted on a 5-year rotation with the first survey to be conducted in January 2002.

STRATEGY 3. Update an elk population model each year using harvest and aerial elk count data. Model updating will be done prior to annual season recommendations.

STRATEGY 4. Collect harvest and herd health data. Data will be collected annually during established elk seasons.

STRATEGY 5. Collect data and assess health and disease status of elk lost to non-hunting mortality factors.

OBJECTIVE C: Use controlled hunting to maintain population objectives.

STRATEGY 1. The elk committee in cooperation with other AGFC and NPS staff will develop recommendations on permit numbers, season structure, regulations and bag limits for elk. Annual recommendations will be submitted to the Wildlife Management Division of the Arkansas Game and Fish Commission in December.

OBJECTIVE D: To obtain information on the ecology of elk in Arkansas.

Long-term management of elk requires updated knowledge of the species and its habitat requirements. Data on Rocky Mountain elk in Arkansas is very limited as this is a newly introduced species. Data on the extirpated eastern elk, native to the state, is insufficient for making current management decisions. Knowledge of re-introduced free-ranging Rocky Mountain elk is very limited for the eastern U.S. No data is available for southern states such as Arkansas as past re-introduction attempts have been unsuccessful. The adaptability of Rocky Mountain elk to southern habitat and climatic conditions is largely unknown and a clearer understanding of basic ecological relationships is necessary for development of future management programs.

STRATEGY 1. Contract a long-term cooperative research project in segmented phases within the primary elk range. Study phases will be designed to obtain baseline data on elk behavior, movements, reproduction, natality, mortality, habitat use and food habits. The first phase of the long-term cooperative study will be initiated in July 2001.

STRATEGY 2. Contract a cooperative 3-year research project within the primary elk range designed to assess: 1) the impact of meningeal worms on the BNR elk herd and; 2) determine practical methods that can be used to minimize elk losses due to meningeal worms. The cooperative study will be initiated in July 2003.

GOAL II: To manage a limited elk population outside of the designated primary elk range so that, when surveyed, 90 percent of landowners feel that elk numbers are acceptable.

Arkansas' elk herd continues to expand onto private land. Staff observations indicate that some landowners within the current elk range are not willing to tolerate any elk; others are receptive to a limited number of elk on their property but do not want to see an increase from current levels. The other extreme is that some landowners seem to have no problem with elk on their property and do not complain but, in fact, enjoy viewing the elk. Maintaining numbers of elk on private land at a level acceptable to landowners is a feasible option. The only other reasonable option is total elimination of elk on private property.

OBJECTIVE A: To monitor elk on private land outside of the designated primary elk range.

STRATEGY 1. Conduct late winter aerial elk counts to monitor population trends. Annual counts will be initiated in February.

STRATEGY 2. Survey landowners (telephone or mail) outside of the designated primary elk range on a 3-year rotation to obtain information on elk distribution and attitudes/opinions about elk and elk management.

STRATEGY 3 Collect harvest and non-hunting mortality data to monitor population trends.

GOAL III: To reduce the annual documented poaching loss of elk to less than 1% of the estimated annual pre-hunt population.

Poaching and disease have been the two primary documented mortality factors associated with Arkansas' elk herd. With a limited herd, it is important to minimize poaching losses not only to allow herd expansion in unoccupied range but also to allow more animals to be utilized legally by sportsmen through established hunting seasons.

OBJECTIVE A: To evaluate and update current elk regulations, penalties and elk values.

STRATEGY 1. Members of the elk committee will work with the AGFC and NPS enforcement staff in drafting updated elk regulations.

OBJECTIVE B: Maintain a reward for elk poaching of \$5000.00.

OBJECTIVE C: Develop an AGFC/NPS cooperative elk enforcement plan.

STRATEGY 1. Members of the elk committee will work with AGFC and NPS enforcement staff in drafting a cooperative law enforcement plan for the BNR elk herd.

GOAL IV: To minimize nuisance elk problems on private land and maintain documented elk complaints at less than 20 annually.

Landowner tolerance will be the major factor which determines the level of elk which will be maintained on private lands outside of the designated primary elk range. In addition landowner tolerance of elk on private lands within the designated primary elk range will be a big factor in determining target population levels to maintain within the designated primary elk range. Intensive education and economic incentives are additional factors that will influence landowner tolerance in future years and ultimately elk numbers and distribution on private land.

OBJECTIVE A: Develop partnerships with landowners and the RMEF in addressing nuisance elk problems on private lands.

STRATEGY 1. The elk committee will work with landowners, AGFC staff and the RMEF in the development and implementation of a nuisance elk policy and other strategies designed to reduce nuisance elk problems.

STRATEGY 2. Establish a database and maintain records of documented elk complaints. Elk complaint forms will be utilized by AGFC/NPS staff for recording data. Records will be maintained annually and an annual report will be prepared.

OBJECTIVE B: Use controlled hunts and permit strategies to reduce nuisance elk problems on private land.

STRATEGY 1. The elk committee in cooperation with other AGFC and NPS staff will develop recommendations on permit numbers, season structure, regulations and bag limits for elk. Annual recommendations will be submitted to the Wildlife Management Division of the Arkansas Game and Fish Commission in December.

OBJECTIVE C: Increase forage enhancement projects on AGFC and NPS lands within the designated primary elk range.

STRATEGY 1. Forage enhancement projects will be incorporated into habitat management plans developed under objective # 6 of the Elk Management Plan.

GOAL V: To identify future elk stocking sites on public land.

The current elk herd has limited potential for expansion due to availability of suitable public lands with sufficient elk habitat. There is a need to evaluate other areas in the state to determine if additional populations of elk can be established and maintained. Additional elk in other parts of the state would mean increased recreational opportunity in the form of hunting and wildlife-watching. It would also mean greater benefits for local economies.

OBJECTIVE A: Utilize GIS techniques to evaluate potential sites for future elk stocking.

STRATEGY 1. Complete an ongoing 2-year GIS cooperative contract study designed to determine if other feasible elk stocking sites exist in Arkansas based on established site selection criteria. The study will be completed in 2003.

STRATEGY 2. The elk committee will work with the contractor under STRATEGY 1 in the development of biological standards and criteria for the selection of any potential elk release sites.

OBJECTIVE B: Assess sociological issues and concerns in relation to potential elk stocking sites deemed biologically suited for elk.

STRATEGY 1. Conduct a 2-year cooperative contract study designed to assess public attitudes/opinions and support for stocking elk on any potential stocking sites selected under OBJECTIVE A.

OBJECTIVE C: Use information obtained under OBJECTIVES A and B to develop recommendations on future elk stockings in Arkansas.

STRATEGY 1. An elk stocking plan will be developed and submitted to the AGFC for approval if data obtained under OBJECTIVES A and B indicates that future elk stockings are feasible in other sites in Arkansas.

HABITAT MANAGEMENT GOAL

GOAL VI: To manage and improve elk habitat within the designated primary elk range.

Proper management of elk habitat especially on public land within the primary elk range is critical for long term viability of the herd. This effort will allow managers to maintain a healthy viable population for consumptive (hunting) and non-consumptive users (viewing, photography). Efforts will be made to provide adequate habitat to maintain the population objective established under Objective # 1. In addition to intensive habitat management, additional private lands within the designated primary elk range will be purchased or leased to enhance the elk herd.

OBJECTIVE A: To maintain adequate habitat for elk on public lands within the designated elk range.

STRATEGY 1. Inventory openlands, conduct a botanical assessment and develop criteria for field classification on NPS land.

STRATEGY 2. Develop a cooperative openland habitat management plan for NPS lands.

STRATEGY 3. Implement cooperative openland habitat management plan work on NPS lands. Work will be done in order to help achieve the elk population goal established under resource goal I.

- STRATEGY 4. Provide cost-share incentives for private cooperators for maintenance of hayfields on NPS lands.
- STRATEGY 5. Update the elk habitat management plan for the Gene Rush WMA. Planned work will be conducted in order to help meet the elk population goal established under resource goal 1.
- STRATEGY 6. Establish and maintain permanent openings, waterholes, and a preferred forage base as outlined in the Gene Rush WMA elk habitat management plan.
- STRATEGY 7. Train and certify (red-card) AGFC staff for prescribed burning on NPS/USFS/AGFC lands.
- OBJECTIVE B:** Purchase/lease land to manage for elk within the designated primary elk range.
- STRATEGY 1. AGFC staff will work to secure more land to manage elk within the designated primary elk range. Opportunities will be investigated and pursued through cooperative partnership efforts with RMEF and other conservation agencies.
- OBJECTIVE C:** Protect key elk habitats within the designated primary elk range.
- STRATEGY 1. Identify key calving and elk wintering areas within the primary elk range. Protect these areas through conservation easements, lease agreements, land exchanges, landowner incentives, and fee purchases.

EDUCATION GOAL

GOAL VII: Increase public awareness of elk.

Public support for the elk program is critical for securing additional funds for additional program work. Education is the key to obtaining public support. Human tolerance for elk on private lands can be improved through intensified public education efforts. Arkansans will ultimately decide the fate of elk in the natural state and public knowledge of elk and the elk management program will insure that more decisions will likely be made based on facts rather than emotions.

- OBJECTIVE A:** To develop and implement a watchable wildlife program for elk.
- STRATEGY 1. Wildlife Management and I & E staff of the AGFC will cooperate with other conservation agencies such as the RMEF to develop a draft program plan.
- STRATEGY 2. The draft plan will be reviewed and submitted to the Commission for approval.

STRATEGY 3. Budgets for plan work will be submitted and work implemented.

OBJECTIVE B: Develop educational materials on Arkansas elk.

STRATEGY 1. WMD staff and I & E staff will cooperate with the RMEF in developing an Arkansas elk video and a portable elk program display board for public education purposes.

STRATEGY 2. The elk committee will cooperate with I & E staff and RMEF in the development of a booklet on Arkansas' elk herd.

STRATEGY 3. The elk committee in cooperation with the Enforcement and I & E divisions will cooperate in the development of a poaching reward poster which will be posted within the elk range.

STRATEGY 4. The elk committee will work with the RMEF to secure an elk trunk for use by the NPS. The trunk will be used for park visitor programs and for local school programs.

STRATEGY 5. The WMD and I&E divisions will cooperate in the purchase of a mobile elk education trailer for use at RMEF banquets, schools, fairs, sports shows, and conservation organization meetings.

STRATEGY 6. The elk committee will work with the WMD and I & E staff in developing a small brochure on tips that landowners can use to minimize elk damage problems on private land.

OBJECTIVE C: Utilize various media avenues to educate the public about elk.

STRATEGY 1. The elk committee will work with I & E staff to develop an annual feature article on elk for the AGFC magazine.

STRATEGY 2. The elk committee will work with I & E staff to have elk programs annually using media outlets such as AETN, and statewide radio/T.V. stations.

STRATEGY 3. The elk committee will work with the WMD and I & E staff in the development of special news releases and magazine/newspaper articles on elk program work in the state.

COMMERCIALIZATION GOAL

GOAL VIII. Develop a policy and regulations addressing the commercialization of elk.

Wildlife commercialization is a growing activity in the United States. Some states have taken steps to resolve potential commercialization problems through the development and implementation of regulations. This has resulted in more commercialization interest in states with no regulations or guidelines. Arkansas recently took positive steps regarding this issue and adopted some new regulations regarding wildlife commercialization. The risk of disease transmission (bovine tuberculosis, bovine brucellosis, chronic wasting disease etc) from captive elk to wild populations of elk and deer and to domestic animals is of paramount concern to state wildlife agencies, farmers and state/federal animal health agencies. An additional risk involves the potential dilution of the wild elk gene pool by escaped domestically reared elk that may be related to red deer. Arkansas' new captive wildlife regulations prohibit the rearing of red deer in counties found within or adjacent to the current elk range.

OBJECTIVE A: Inventory captive elk herds in Arkansas.

STRATEGY 1. A mail survey will be used to obtain information from AGFC staff and other agencies/organizations on the location, status and commercialization of captive elk in Arkansas.

OBJECTIVE B: Identify potential commercialization problems involving elk.

STRATEGY 1. Conduct an updated literature search and a mail survey of state wildlife agencies to obtain information on problems associated with commercialization of elk.

OBJECTIVE C: Use information from OBJECTIVE A, STRATEGY 1 and OBJECTIVE B, STRATEGY 1 to update agency policies and regulations.

STRATEGY 1. Enforcement, Wildlife Management and Information/Education staff will cooperate with the elk committee in the development of recommendations for updating agency policies and regulations concerning commercialization and captive elk in Arkansas.

ADMINISTRATIVE GOALS

GOAL IX: To establish procedures for the allocation of donated elk program funds.

Funds are essential for managing the elk herd in Arkansas. Donated monies are entrusted to the Arkansas Game and Fish Commission to use wisely and efficiently in elk management efforts. It is important that funds used provide maximum benefits for the elk herd which will result in greater public support and potentially more donated money for future elk program work.

OBJECTIVE A: Obtain Commission approval for the elk committee to serve as a clearinghouse for allocation of donated elk funds.

OBJECTIVE B: Develop forms, instructions and procedures for the use of donated elk funds.

STRATEGY 1. The chairman of the elk committee will appoint a subcommittee to develop, monitor and update standard forms and procedures.

GOAL X: Maintain a sufficient level of funding to meet objectives outlined in the elk management plan.

Insufficient funds will seriously impact efforts to meet objectives outlined in the elk management plan. Therefore it is critical for this plan or any plan to have a sufficient level of funding throughout the plan period in order to realize projected wildlife benefits. Efforts must be made to secure adequate funding in order for the elk plan to be successful.

OBJECTIVE A: Establish and maintain funding partnerships between the AGFC, RMEF, NPS, universities, other conservation agencies and other private organizations.

OBJECTIVE B: Solicit funding from non-consumptive user groups.

STRATEGY 1. Members of the elk committee will develop and maintain an updated list of priority elk projects with projected costs.

STRATEGY 2. Members of the elk committee will develop a list of non-consumptive user groups that might be potential contributors to future elk projects.

OBJECTIVE C: Recognize partners involved in funding elk projects.

STRATEGY 1. Develop partnership signs to post in the vicinity of elk project work on public lands.

EVALUATION

The following techniques will be used in evaluating the effectiveness of strategies used to meet plan objectives:

- 1) An elk population model will be updated annually to measure impacts of management strategies.
- 2) Infrared aerial surveys will be conducted within the primary elk range on a 5-year rotation to measure effectiveness of strategies to meet elk management goals.
- 3) Helicopter elk counts will be conducted annually in late winter to measure effectiveness of strategies to meet elk population goals.

- 4) Biological and harvest data will be collected during annual elk hunting seasons to determine if plan goals and objectives are being met.
- 5) Data will be collected on non-hunting elk mortalities to assess and monitor health status. Work will be done in cooperation with the Southeastern Cooperative Wildlife Disease Study.
- 6) Periodic herd health checks will be conducted to determine health status. Work will be done in cooperation with the Southeastern Cooperative Wildlife Disease Study.
- 7) Landowner surveys (mail/telephone) will be conducted on a 3-year rotation in areas outside of the designated primary elk range. Data will be used in assessing progress toward meeting plan goals and objectives.
- 8) Elk damage complaints will be catalogued and evaluated to assess progress in meeting plan goals and objectives.
- 9) Contract research reports will be reviewed and evaluated to determine progress toward meeting plan goals and objectives.
- 10) Habitat plans for public lands will be developed, periodically reviewed and updated. Project reports will be used to assess progress toward meeting plan goals and objectives.
- 11) Publications, video's, media plans, media specials, news releases, popular articles etc will be reviewed and evaluated to assess progress toward meeting plan goals and objectives.
- 12) Elk regulations, program budgets, project reports and public input will provide information for assessing progress toward plan goals and objectives.

Literature Cited

- Ad Hoc Committee on Elk Reintroduction. 1997. Impacts of reintroducing North American elk to the southeastern United States. A report of the SEAFWA's ad hoc committee investigating elk reintroduction. Southeastern Assoc. of Fish and Wildl. Agen. 37 pp.
- Anonymous. 1951. (Holder, T.H., editor). A survey of Arkansas game. Federal Aid Publ., Project 11-R. Arkansas Game and Fish Commission., Little Rock. 155 pp.
- Bartholow, J. 1996. Pop-II system documentation. IBM-PC Version 7.16. Fossil Creek Software, Fort Collins, Colo. 50 pp.
- Bunnell, Dwight. 1997. Status of elk in North America, 1975-1995. RMEF special report # 1. The Rocky Mountain Elk Foundation. 27 pp.
- Cartwright, M. E. 1991. Status of Arkansas' elk herd. Status report prepared for the Arkansas Game and Fish Commission. Little Rock, Arkansas. 15 pp.
- Cartwright, M.E. 1995. Return of the elk. Arkansas Wildlife. Arkansas Game and Fish Commission publication. Vol.26 #4. pp. 2-4.
- Cartwright, M. E., and A. E. Linebarger. 1997. Simulated elk hunt. In-service note prepared for the Arkansas Game and Fish Commission. Little Rock, Arkansas. 2 pp.
- Elk Committee. 1997. Elk hunt plan. Plan prepared for the Arkansas Game and Fish Commission. 18 pp.
- Gill, R. 1990. Monitoring the status of European and North American cervids. Gems Information Series No. 8. Global Environment Monitoring System. Nairobi: United Nations Environment Programmed. 277 pp.
- Herner-Thogmartin, J.H. 1999. Ecology of an introduced Rocky Mountain elk (*Cervus elaphus nelsoni*) herd in Arkansas. M.S. thesis. Univ. of Arkansas, Fayetteville. 118 pp.
- Nettles, V.F., and J.L. Corn. 1998. Model health protocol for importation of wild elk (*Cervus elaphus*) for restoration. Special report prepared for the Rocky Mountain Elk Foundation and Member Agencies of the Southeastern Cooperative Wildlife Disease Study. 25 pp.
- Sealander, J.A. and G. A. Heidt. 1990. Arkansas mammals: their natural history, classification and distribution. The University of Arkansas Press. Fayetteville. 308 pp.
- Shafer, E.L. and M. Wang. 1989. Economic amenity values of fish and wildlife resources: six case studies in Pennsylvania. Final report for USDA Forest Service Cooperative Agreement No. 23-195. Pennsylvania State University, University Park, PA 16802.

U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, Bureau of the Census. 1997. 1996 national survey of fishing, hunting and wildlife-associated recreation. Washington, D.C. 176 pp.

U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, Bureau of the Census. 1998. 1996 national survey of fishing, hunting and wildlife-associated recreation, Arkansas. Washington, D.C. 47 pp.

Youmans, H.B. 1992. Statewide elk management plan for Montana. Montana Dep. Fish, Wildl. and Parks, Wildl. Div. Helena. 170 pp.

Appendix A. Priorities for elk plan objectives.

Objectives

Highest Priority

Elk Resource – Goal I

Objective A: Establish boundaries for a designated primary elk range for managing the BNR elk herd

Objective C: Use controlled hunting to maintain population objectives

Objective B: To monitor the elk population within the designated primary elk range

Habitat Management – Goal VI

Objective A: To maintain adequate habitat for elk on public lands within the designated elk range

Objective C: Protect key elk habitats within the designated primary elk range

Elk Resource – Goal II

Objective A: To monitor elk on private land outside of the designated primary elk range

Elk Resource – Goal IV

Objective A: Develop partnerships with landowners and the RMEF in addressing nuisance elk problems on private lands

Objective B: Use controlled hunts and permit strategies to reduce nuisance elk problems on private land

Objective C: Increase forage enhancement projects on AGFC and NPS lands within the designated primary elk range

Education – Goal VII

Objective C: Utilize various media avenues to educate the public about elk

Administrative – Goal IX

Objective A: Obtain Commission approval for the elk committee to serve as a clearinghouse for allocation of donated elk funds

Objective B: Develop forms, instructions and procedures for the use of donated elk funds

Medium Priority

Education – Goal VII

Objective B: Develop educational materials on Arkansas elk

Habitat Management – Goal VI

Objective B: Purchase/lease land to manage for elk within the designated primary elk range

Elk Resource – Goal V

Objective A: Utilize GIS techniques to evaluate potential sites for future elk stocking

Objective B: Assess sociological issues and concerns in relation to potential elk stocking sites deemed biologically suited for elk

Objective C: Use information obtained under OBJECTIVES A and B to develop recommendations on future elk stockings in Arkansas

Elk Resource – Goal I

Objective D: To obtain information on the ecology of elk in Arkansas

Elk Resource – Goal III

Objective A: To evaluate and update current elk regulations, penalties and elk values

Objective B: Maintain a reward for elk poaching of \$5000.00

Objective C: Develop an AGFC/NPS cooperative elk enforcement plan

Administrative – Goal X

Objective A: Establish and maintain funding partnerships between the AGFC, RMEF, NPS, universities, other conservation agencies and other private organizations

Objective C: Recognize partners involved in funding elk projects

Lower Priority

Commercialization – Goal VIII

Objective A: Inventory captive elk herds in Arkansas

Objective B: Identify potential commercialization problems involving elk

Objective C: Use information from OBJECTIVE A, STRATEGY 1 and OBJECTIVE B, STRATEGY 1 to update agency policies and regulations

Education – Goal VII

Objective A: To develop and implement a watchable wildlife program for elk

Administrative – Goal X

Objective B: Solicit funding from non-consumptive user groups