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Draft of Utah Division of Wildlife Resources statewide management plan for elk

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UTAH DIVISION OF WILDLIFE RESOURCES STATEWIDE MANAGEMENT PLAN FOR ELK

I. PURPOSE OF THE PLAN

A. General

This plan was developed by a 15 person advisory committee commissioned by the Wildlife Board to revise the statewide elk management plan. The committee consisted of a member of the Wildlife Board, one member from each of the five regional advisory councils, one member from each of four sportsmen groups (RMEF, SFW, UBA, BOU), and one representative each from the US Forest Service, Bureau of Land Management, Utah Farm Bureau, CWMU Association, and Utah Guides and Outfitters. This group met eight times from September 2009 to February 2010. The group identified issues to be addressed in the plan and then developed goals, objectives, and strategies to address those issues.

This document will provide overall guidance and direction for Utah's elk management program for five years from the date of approval by the Utah Wildlife Board. This plan briefly describes general information on elk natural history, management, habitat, and population status. It also discusses issues concerning elk management in Utah identified by the elk committee and outlines the goals, objectives, and strategies for managing elk in Utah. The plan will be used to help set priorities for elk management programs and will provide overall guidance for individual unit management plans.

B. Dates Covered

The elk plan will be in effect for a period of five years upon approval of the Wildlife Board. (Expected dates covered March 31, 2010 – March 31, 2015).

II. SPECIES ASSESSMENT

A. Natural History

Elk (*Cervus elaphus*) are members of the cervid family along with deer, moose, and caribou. Elk are the same species as European red deer, even though visually they are quite different. North American elk are also commonly called wapiti to distinguish them from European red deer. Wapiti is the Shawnee name for elk and means "white rump" or "white deer." There are six recognized subspecies of elk in North America with all of the elk in Utah of the subspecies known as Rocky Mountain elk (*C. e. nelsoni*). In 1971, the Rocky Mountain elk was designated as Utah's state animal.

Elk males, females, and young are known as bulls, cows, and calves, respectively. Calves are generally born as singles (twins are extremely rare) after a gestation period of approximately 8–8.5 months. Calves are normally born from mid May until early June and weigh approximately 13 pounds at birth. Elk are gregarious animals and, as such, often gather into large nursery bands of cows and calves in early summer. During this time, it is common to see groups of several

hundred elk. Within a few weeks those nursery bands disperse into smaller groups across the summer range.

The antlers of bulls begin to grow as soon as the old antlers are shed in late winter or early spring. Bulls generally live apart from the cows and calves through the summer antler growing period. Bulls often band together in small groups during this time. The velvet that covers and provides nourishment to the growing antlers begins to shed in early August. In Utah, the rut or breeding period for elk begins in early September and continues until mid October with the peak of the rut typically occurring in mid to late September. In early September, bulls begin to bugle and gather cows into harems of approximately 10–20 females. Breeding bulls vigorously defend their harems from other “satellite” bulls who attempt to steal cows for themselves.

After the rut, bulls leave the cows and calves and either become reclusive or band together with other bulls. It is common to see large groups of bulls in the late fall and winter. In late spring, cows seek solitude for calving. At this time, yearlings from the previous year are often aggressively driven away by the cows and forced to find new home ranges. As new calves are born, the cycle of life begins again.

B. Management

1. UDWR Regulatory Authority

The Utah Division of Wildlife Resources operates under the authority granted by the Utah Legislature in Title 23 of the Utah Code. The Division was created and established as the wildlife authority for the state under section 23-14-1 of the Code. This Code also vests the Division with necessary functions, powers, duties, rights, and responsibilities associated with wildlife management within the state. Division duties are to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state.

2. Past and Current Management

Elk along with bighorn sheep were probably the most common game animals in Utah prior to settlement times. Indians, trappers, and pioneers all used elk as a source of food and clothing. Unrestricted hunting eliminated most of the elk in Utah by the end of the nineteenth century. Because of the low elk numbers, elk hunting seasons were closed in Utah in 1898.

Large scale transplant efforts are a major reason for the reestablishment of elk in Utah. Interstate transplants of elk occurred from 1912 to 1925 to reestablish elk to their historic range. During that period, elk were transplanted from Yellowstone National Park and released on the Fishlake, Oquirrh Mountains, Mount Timpanogas, Mount Nebo, Logan Canyon, and Manti. A few elk were also captured from Montana and released in Smithfield Canyon during that period. In addition to the interstate transplant efforts, elk have also been captured and transplanted to and from source herds within Utah. Those transplants occurred in the late 1970s and 1980s and were mainly released on the eastern and southern Utah mountain ranges.

Elk herds in Utah were managed by the Board of Big Game Control from 1925 until 1996. In

1996, the Board of Big Game Control was abolished and replaced with five Regional Advisory Councils and a Wildlife Board that regulate the management of all wildlife in Utah.

Elk were hunted under a limited entry hunting system until 1967 when the Board of Big Game Control adopted an “open bull” hunt strategy on most large elk units. Smaller elk units continued to be managed as “restricted permit” or “limited entry” type hunts. That hunting strategy continued until 1989 when a “yearling only” regulation was initiated on the two largest elk herds, the Manti and Fishlake. Yearling only was later replaced with a “spike only” regulation and expanded to other units.

Elk herds in Utah are currently managed under a combination of “spike only”, “any bull“, and “limited entry” hunting regulations. The any bull units are located primarily in northern Utah and are generally on units with large amounts of private land, large wilderness areas, or units with very low elk populations. Spike hunting is used on all limited entry units except 3 and is intended to reduce bull:cow ratios while still allowing for trophy quality bulls. Both any bull and spike bull hunts are general season hunts designed to provide hunting opportunity. In 2008, DWR issued nearly 38,000 general season permits (14,300 any bull, 12,500 spike, and 11,150 archery). The harvest rate on those hunts is fairly low with success rates in 2008 averaging 12.9%, 15.6%, and 12.3% for the any bull, spike, and archery hunts, respectively.

Limited entry hunting is managed based on an average age of the harvested bulls. Those age objectives are based on the premise that in order to achieve a given average age of harvest, a certain age structure must be present in the population. The higher the age class objective, the more the age structure will be shifted towards older animals, and, as such, the greater the likelihood of a hunter harvesting a larger trophy animal. Over the past 10 years, limited entry harvest ages have been over objective on most units and current statewide average age of harvest is 6.6 (Table 1).

C. Habitat

Elk are a generalist ungulate, and have a varied diet which consists of grasses, forbs, and shrubs. The percentage of each food type can vary based on availability. This flexible diet allows elk to live in a variety of habitat types including all of Utah’s mountains as well as some of the low deserts (Figure 1). Although elk inhabit most habitat types in Utah, they prefer to spend their summers at high elevations in aspen conifer forests. Elk will spend the winter months at mid to low elevation habitats that contain mountain shrub and sagebrush communities.

Elk in Utah are more closely tied to aspen than any other habitat type. Aspen stands provide both forage and cover for elk during the summer months and are used for calving in spring. For several decades, aspen has been declining throughout the West with overgrazing, lack of disturbance (e.g., logging, fire), and extended drought all being listed as potential reasons for the decline. If the declines in aspen continue, it will reduce the amount of potentially suitable habitat available for elk and, as such, reduce the number of elk those habitats can support.

Water is also an important component of elk habitat, and the lack of sufficient water distribution could limit the number of elk we can have in certain areas of Utah. In Utah, Jeffrey (1963)

found that elk on summer range preferred areas within 0.33 miles of a permanent water source. Other studies have shown elk use of summer range declined markedly beyond 0.5 mile from water (Mackie 1970, Nelson and Burnell 1975).

D. Population Status

Elk are well established throughout Utah with the current statewide population estimated at approximately 68,000 animals (Figure 2). From 1975 to 1990, the elk population in Utah grew rapidly from an estimated 18,000 elk to 58,000 elk (average annual growth rate = 1.08). This rapid increase was largely due to low population levels and the abundance of available habitat (i.e., the population was well below carrying capacity). Since that time, population growth has slowed down considerably through the use of antlerless harvest designed to maintain populations at established population objectives, as well as reduce populations in areas with poor range conditions due to drought. On the majority of management units across Utah, the elk population is at or near the population objective (Table 2). As such, until unit population objectives are increased, the statewide elk population will likely remain at its current level.

III. ISSUES AND CONCERNS

A. Habitat

Healthy and productive elk herds require good quality habitat. Both the quantity and quality of habitat are important for sustaining elk populations, and the loss of and/or degradation of elk habitat will likely result in a reduction in elk numbers. Crucial elk habitat is continuously being lost in many parts of Utah. In other parts of the state, habitat is being fragmented due to human expansion and development. Urbanization, road construction, OHV use, and energy development have all impacted elk habitat. Mitigation for loss of elk habitat due to human causes is essential to maintaining and improving elk populations.

The quality of habitat is a major factor in determining elk herd size. Habitat improvement projects are essential to maintaining healthy herds and expanding populations where appropriate. When habitat improvement projects are completed, all ungulates benefit including elk, deer, and livestock.

Habitat quality for elk has declined in some areas of Utah due to a variety of causes. Many high quality elk summer ranges such as aspen habitat has been gradually replaced by conifers. Additionally, many shrub dominated winter ranges have been replaced by annual grasses or invasive weeds that are not beneficial to elk. Increasing elk population objectives will require continued and aggressive habitat improvement efforts.

B. Population Size

Historically in Utah, elk herd size has been a source of considerable controversy. Most sportsmen would like to see more elk, whereas some landowners and livestock operators would like to see fewer. Controversy about elk herd size has been greatly reduced since the establishment of elk unit management plans. Those plans specify the number of elk for each unit in the state and are developed with input from local constituents. The combined approach

of using aerial surveys and improved population models has also helped to improve the confidence in population evidence of both DWR personnel and members of the general public. Elk have also become more tolerable to landowners since the creation of the CWMU, landowner permit, and Walk-In Access programs which have allowed them to benefit from elk herds on their properties. Expenditures by sportsmen organizations and others for habitat improvement projects have also made elk more acceptable.

C. Hunting Issues

Utah currently has a high quality elk hunting program that is producing many older age bulls in the harvest. In recent years, Utah has harvested more record book elk (including the new world record non-typical elk in 2008) than any other western state. Although maintaining this high quality continues to be an issue, having the opportunity to hunt limited entry elk units is also an areas of concern to many hunters.

Hunting issues dominated most of the discussions of the elk plan committee. The committee looked thoroughly at every aspect of Utah's elk hunting program and agreed that Utah should continue with a program that provides a diversity of hunting opportunities including both general and limited entry hunting seasons. The committee also looked for ways to increase hunting opportunity for mature bulls without greatly reducing the quality of bulls in the harvest.

D. Poaching

Poaching is not considered to be a major problem in Utah; however, it is extremely difficult to determine the true extent to which elk are being poached in the state. Although poaching has not resulted in overall declines in elk population numbers in Utah, poaching of mature bulls can be significant and has reduced hunter opportunity in some localized areas. Units that are most susceptible to poaching typically only have small isolated elk populations and issue very few bull elk permits. High grading of bulls may also be occurring on some units where hunters kill one bull elk and then abandon it to look for a larger bull. Continued law enforcement efforts are needed to maintain hunting opportunity.

E. Predator Management

Utah's elk populations have increased dramatically in Utah since 1970 even with presence of several predator species. Although mountain lions, black bears, and coyotes may all occasionally prey on elk, there are no known instances of predators causing elk herd declines in Utah. Predator management occurs in some elk herd units due to declining or depressed mule deer populations on shared ranges, and also occurs when deer herds are chronically below population objectives. In some instances, elk herds may have benefited by this predator management that was initiated for deer and other ungulate species.

Although wolves are not currently established in Utah, many sportsmen are concerned that wolves could impact elk populations and elk hunting. Recent studies in surrounding western states have implicated predation by wolves as a reason for localized elk herd declines, particularly in areas with poor to marginal habitat quality (Hamlin and Cunningham 2009). To

deal with the potential establishment of wolves in Utah, DWR in conjunction with the Wolf Working Group developed a wolf management plan that was passed by the Utah Wildlife Board in 2005. This plan will be used to guide wolf management in Utah through 2015 or until wolves are shown to be established in Utah.

F. Disease Issues

Similar to other wild ungulates, elk are susceptible to a wide variety of viral, bacterial, and parasitic disease. In Utah, elk populations have not been documented with many disease or parasite issues of significance. Some of the diseases and parasites either documented or considered a concern to Utah elk populations include brucellosis (*Brucella abortus*), bluetongue (BTV) or epizootic hemorrhagic disease (EHD), chronic wasting disease (CWD), and elaeophora (*Elaeophora schneideri*).

Brucellosis is an infectious bacteria known to affect mammals and humans worldwide. The disease is of great economic importance to the livestock industry because of its ability to cause disease in humans as well as late term abortions, non-viable calves, and sterility in adult cattle. Transmission of brucellosis occurs when an animal licks or ingests infected fetal materials, aborted fetuses, uterine discharges, or contaminated feed or water. Depending on environmental conditions, such as cool temperatures and moisture, the bacteria can remain viable in uterine discharges, including the aborted fetus for prolonged periods of time (Crawford et al. 1990). Brucellosis is thought to be self-limiting in free-ranging elk populations because of their secretive nature during parturition and the fact that most female elk quickly consume fetal materials after birth (Thorne 2001). However, this has not been the case for elk of the Greater Yellowstone area where feed ground practices that concentrate elk during the period when abortions are most likely have allowed the disease to persist and increase in prevalence (Thorne 2001). This finding has also been reported in Idaho, where the prevalence of brucellosis antibodies is two to four times higher in elk that use feed grounds (Etter and Drew 2006).

In late 1960's controversy began to surface in Utah regarding the status of brucellosis in elk. The origination of Utah elk from the Greater Yellowstone Area caused much concern in the agricultural community, given the findings of brucellosis in those herds in the early 1930's (Tunncliff and Marsh 1935). Moreover, the proximity and possible exchange of elk in Utah with possible brucellosis positive elk from Wyoming has also caused concern. In response, the UDWR has agreed to monitor the disease status of elk at Hardware Ranch on an annual basis and a trapping and testing program was initiated in 1969. Between 1969 and 1971, blood samples were collected from 101 elk, all of which were sero-negative for brucellosis (Follis 1972).

Serological testing of elk populations has continued on an annual basis throughout Utah and includes elk that use feed grounds on private property in Rich County, Hardware Ranch, and the Millville Face in Cache County, where a privately operated elk feed ground is located. Additionally, elk captured in Utah and used for supplementation/restoration efforts in other states have all tested sero-negative for the disease. To date several thousand elk have been tested for brucellosis, and no elk in the state of Utah has ever been classified as a suspect or reactor for brucellosis through UVDL, which is our official state laboratory (UDWR unpublished data).

BTV and EHD are two arboviruses of concern in Utah. Those viruses are transmitted by sand flies and biting gnats (*Culicoides* spp.) during mid-summer to early fall and typically disappear with the onset of frost (Trainer 1970, Nettles and Stallknecht 1992). BTV and EHD are virtually indistinguishable from one another with clinical signs of both diseases being characterized by lethargy, decreased wariness, high temperature, edema in the head and neck, hemorrhage, and mucous membranes that have a cyanotic appearance (Lankester, 1987). In 2001 and 2002, EHD was documented in several mule deer mortality events throughout central and southern Utah (UDWR unpublished data), and because both diseases are known to occur throughout Utah, they may be of concern for elk.

CWD is a contagious, slow-acting, and fatal degenerative disease known to affect members of the cervid family including elk (Williams and Young 1982, Miller et al. 1998, Miller et al. 2000, Williams et al. 2002). CWD affects the central nervous system of an infected animal resulting in weight loss, deterioration of body condition, and eventually death (Williams and Young 1982, Williams and Young 1992, Spraker et al. 1997, Williams et al. 2002). CWD was first documented in Utah in a hunter-harvested mule deer in late 2002 and has been found to occur in three distinct geographic areas: the North Slope and South Slope Units near Flaming Gorge and Brush Creek, the La Sal Mountains Unit, and the Central Mountains Unit near Fountain Green and the Spencer Fork Wildlife Management Area.

Surveillance for CWD in Utah includes hunter-harvest surveillance in areas known to have positive mule deer and targeted surveillance focusing on the removal of sick or symptomatic animals. In November 2009, the first elk known to have CWD in Utah was documented in a hunter-harvested female elk from the La Sal Mountains, where it is estimated to affect less than 1% of the population. Currently, CWD has not been documented in elk from any of the other known CWD positive areas.

The arterial worm *Elaeophora schneideri* is a non-pathogenic parasite of the carotid and maxillary arteries of mule deer, white-tailed deer, and domestic sheep. Although non-pathogenic in mule deer, *E. schneideri* has been shown to have detrimental effects on elk (Raedeke et al. 2002). Transmission of elaeophora microfilaria occurs through horsefly species (*Hybomitra* spp. and *Tabanus* spp) which obtain microfilaria from feeding on infected mule deer. After a period of incubation in the fly, the infective larvae are passed onto other vertebrates (Hibler and Adcock 1971). The larvae migrate through the blood stream of the new host and can eventually be found in the carotid arteries, maxillary arteries, and concentrated in capillaries around the forehead and face (Lankester and Samuel 2007). Clinical signs include cropping of the ears, necrosis of the muzzle, brain damage, traveling in circles, and a condition known as clear-eyed blindness, which is a lack of the pupil to respond to stimuli (Hibler and Adcock 1971, Lankester 1987). In Utah, most if not all elk populations share significant ranges with mule deer, providing a transmission opportunity for *E. schneideri* microfilaria. Although elaeophora has not been determined to have caused death in elk from Utah, it has been identified as the cause of death in moose from northern Utah (UDWR unpublished data) and, as such, should be monitored.

G. Access Management

The use of off highway vehicles (OHVs) in Utah has dramatically increased in recent years. OHV registrations have increased more than 3-fold from 1998 to 2006 (from 77,509 to 200,842) and more than 100 times in the past 30 years. Uncontrolled use of OHVs can cause damage to elk habitat and disturbance to elk during critical phases of their life cycle. Shed antler gathering and the associated human disturbance on crucial winter ranges, especially with the use of OHVs, can cause undue stress on elk during a time when they must conserve energy. Federal land management agencies are currently struggling with significant issues involving the use of OHVs on public land. Those agencies recognize OHV use as a legitimate use of public land, but also recognize the potential problems associated with uncontrolled use.

There is also an increased demand for more walk-in and horseback only access areas in the state. Many hunters want the opportunity to hunt in a remote area that has lower hunter densities, and where they don't have to compete with OHV traffic. Biologically, limiting areas to foot and horse travel can limit hunter pressure, reduce harvest, and increase hunting opportunity.

H. Depredation Issues

Depredation of private croplands continues to exist in some areas despite careful management of elk populations. In some localized areas depredation can be a significant problem. DWR has committed substantial resources to address depredation concerns, and there are numerous programs designed to assist land owners with depredation situations. Depredation problems need to be addressed in a timely and efficient manner so that landowners will better tolerate migratory populations of elk.

I. Private Land/ CWMU Issues

The value of private lands to the elk population cannot be overstated. Many crucial elk habitats throughout the state are privately owned, and, unfortunately, some of those private rangelands have been converted to housing developments, recreational properties, or other uses that result in a loss of elk habitat. As such, programs that provide incentives for private landowners to manage their properties to benefit elk and other wildlife species are essential to the success of the state's elk management program. Programs like the CWMU, private landowner permit, and Walk-In Access programs currently provide incentives for landowners to manage for healthy habitat and elk population on their properties. Additionally, the Utah Watershed Restoration Initiative has worked with numerous cooperating landowners to provide funding and other resources to accomplish vegetation treatments on both private and public lands to benefit elk and other wildlife species, as well as livestock.

J. Winter Feeding

Supplemental feeding is often viewed by the public as a viable solution to a lack of suitable winter range. However, there is abundant evidence that the potential harm created by feeding elk far outweighs the limited benefits. Winter feeding programs are generally very costly and can cause problems for elk including behavioral changes, range destruction, and expansion of

disease problems. Recent research conducted in Utah has shown that elk feeding programs in Utah can be reduced or eliminated without creating new problems (Mangus 2009).

Although there are negative consequences of winter feeding, it is also recognized that feeding may be necessary to sustain elk populations in emergency situations. It may also be necessary to temporarily feed elk to reduce depredation problems or to keep elk from impacting deer populations in extreme conditions. In Utah, winter feeding of big game is currently guided by the winter feeding policy. Under this policy, feeding is discouraged except under extreme circumstances. With the discovery of chronic wasting disease in Utah, the feeding policy was updated to state that “the Division will not participate in any emergency big game feeding program that occurs within the known range or use area of any big game population where chronic wasting disease, brucellosis or tuberculosis has been detected.”

K. Competition

Competition occurs when two species use the same limited resource, and one of the two suffers in some way because of that use. Competition can potentially occur between elk and other ungulates such as livestock or deer. Competition most often occurs where habitat is limited such as on crucial winter ranges or on the summer ranges of some drier units.

Concern has been expressed by some sportsmen and others that elk populations are responsible for declines in deer herds; however, there is currently little evidence to support that idea. Deer herd declines have occurred in areas where there are few or no elk, and deer herd increases have occurred in areas where there are large elk populations. There is also concern that elk and livestock compete for the same forage on shared ranges. Ranges where elk coexist with mule deer and livestock should be closely monitored to prevent over use and competition. Additionally, habitat improvement projects should be focused in those areas to reduce competition and improve range conditions for all species.

IV. USE AND DEMAND

Elk have become one of the most sought after big game animals in Utah. Geist (1998) in Deer of the World says the following of red deer, the elk of the old world:

“It adorns coats of arms, crests and monuments and is the deer of legends, poetry, and songs. Castles were built in its honor and to display its antlers, and throughout history its hunting and management generated passions that transcended life, death, and reason...”

Sportsmen are no less passionate about elk and elk hunting in Utah today. Hunter demand and interest for limited entry permits has always been high and is increasing (Table 3). In 2009, a total of 51,591 hunters applied for 2,765 limited entry permits. In recent years, the odds of drawing an elk permit have decreased substantially (from 1 in 42.3 in 2002 to 1 in 18.7 in 2009) due to the increased number of limited entry permits being issued.

In addition to limited entry permits, Utah sold 40,362 general season elk permits for any bull and spike only hunts in 2009. Although the demand for general season elk permits has

remained relatively constant over the past five years, the permits do sell out a little earlier each year, indicating the demand for general season elk hunting in Utah.

Elk are also a high interest watchable wildlife species. Nearly everyone enjoys seeing elk in the wild. Units which produce large bulls are especially attractive not only to hunters but to wildlife watchers as well. Many thousands of hours and considerable money is expended each year in elk watching activities. At Hardware Ranch alone, 30,000 to 50,000 people participate in elk viewing each year, and nearly 1400 people participated in the Hardware Ranch elk festival in 2004.

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VI. STATEWIDE MANAGEMENT GOALS AND OBJECTIVES

A. Population Management Goal: Maintain healthy elk populations throughout the state that are managed within habitat capabilities and in consideration of other land uses.

Population Objective 1: Seek opportunities to increase population objectives in individual elk unit management plans to attain a total statewide population objective of 80,000 elk, ensuring that any increases will be subject to an analysis of the impacts to habitat, landowners, livestock operators, and/or mule deer populations.

Implications: The total herd size objective from all elk unit management plans is currently 68,825 elk. If local committees, Regional Advisory Councils, and the Wildlife Board approve increases in herd size objectives on specific elk units to a total of 80,000 elk, it would represent a 16% increase in the statewide elk herd size objective.

Strategies:

- a. DWR will provide a list of elk units that have the potential for population increase with a recommended population objective.
- b. On units where populations increase is possible, DWR will establish local committees to review individual herd unit management plans to see if herd size objective could be revised.
 - 1) These committees will be established within six months following plan approval.
 - 2) These committees will consist of the DWR unit biologist and regional wildlife manager as facilitators, two local sportsman's representatives, and one representative from each of the following (if applicable): Farm Bureau, Cattleman Association, Wool Growers Association, Bureau of Land Management, USDA Forest Service, local elected official, RAC member, CWMU Association, Sportsmen for Fish and Wildlife, Mule Deer Foundation, Rocky Mountain Elk Foundation, and local land owner or land owner association representative. The local sportsman's representatives will be appointed by the DWR and the landowner representative will be appointed by the county commission or county council. Recommendations from these committees will then be forwarded to the Regional Advisory Councils and Wildlife Board for public input and approval.
 - 3) These committees shall be provided with the results (if available) of habitat projects completed in the previous five years, planned projects for the next three years, and DWR range trend data or any other applicable data.
- c. Support objectives and strategies in this plan to protect elk habitat and mitigate losses.
- d. Support habitat improvement projects that increase forage for both big game and livestock.
- e. Identify and support the acquisition of leveraged pieces of property (such as Wilcox Ranch and Book Cliffs Initiative) that could be obtained in willing-seller willing-buyer transactions that would allow for increased elk populations.
- f. Form a new committee to develop an incentive program that provides public land grazers not in a land owner association or CWMU funding to improve habitat on public or private land in coordination with land management agencies.

- g. Utilize the Predator Management Policy where needed to help elk population achieve objectives including the management of wolves if necessary.
- h. Investigate and manage disease outbreaks that threaten elk populations including chronic wasting disease, brucellosis, and tuberculosis.
- i. Utilize antlerless harvest as the primary tool to manage elk populations within herd size objectives and to target specific areas where range concerns or depredation problems exist.
- j. Monitor all elk populations by helicopter survey on a three year rotational basis to evaluate herd size, calf production, herd composition, and habitat use and collect other elk population and habitat information as manpower and budgets permit on years when units are not flown.
- k. Utilize a standardized and reliable population model to evaluate herd size and population trends on an annual basis and continue to educate the public on the use and validity of population modeling in wildlife management.
- l. Develop a program to obtain private, state, and federal funds (\$2 million private, \$2 million state, and \$4 million federal) for projects such as fencing and highway passage structures to minimize highway mortality while preserving traditional migration routes.
- m. Implement research studies on specific herd units that are chronically below population objective to identify problems and recommend solutions.
- n. Support incentive programs for landowners that will encourage elk populations on private land such as the CWMU, landowner permit, and Walk-In Access programs.
- o. Address all depredation problems in a timely and efficient manner to increase landowner tolerance of elk populations in accordance with current laws, rules, and policies.
- p. Continue efforts to minimize the impacts of shed-antler gathering on elk populations.
- q. Support law enforcement efforts to reduce illegal taking of elk and educate the public concerning poaching and harassment of elk.
- r. Properly manage elk populations to minimize competition with mule deer on crucial mule deer range.

B. Habitat Management Goal: Conserve and improve elk habitat throughout the state.

Habitat Objective 1. Maintain elk habitat throughout the state by identifying and protecting existing crucial elk habitat and mitigating for losses due to human impacts.

Implications: Loss of crucial elk habitat will need to be minimized to achieve population objectives. Mitigation is essential for loss or degradation of all crucial habitats due to human impacts.

Strategies:

- a. Identify and characterize elk habitat throughout the state.
- b. Work with land management agencies and private landowners to recognize and properly manage elk habitat, especially calving and wintering areas.
- c. Minimize human disturbance in existing crucial elk habitats.
- d. Mitigate for losses of crucial habitat due to human impacts and energy development.
- e. Acquire additional important elk habitat to offset loss of habitat.
- f. Support programs that provide incentives to keep private rangelands as elk habitat.
- g. Support the establishment of multi-agency OHV plans developed on a county level or planning unit level to prevent resource damage and to protect crucial elk habitat.
- h. Seek to maintain less than 2 miles of roads per square mile within crucial elk habitat.
- i. Support and participate in efforts to establish and enforce OHV management in crucial elk habitat.
- j. Work with county, state, and federal agencies to limit the impacts to habitat effectiveness from roads by reclaiming unused roads, properly planning new roads, installing highway passage structures, and implementing temporary road closures during periods stressful to elk population.
- k. Identify crucial habitat that has the potential to be developed and contact and educate counties and municipalities to promote zoning that benefits elk.
- l. Recommend local jurisdictions assess impact fees as a way to mitigate impacts to crucial elk habitat.
- m. Coordinate with land management agency and energy development proponents to develop an effective mitigation plan for all oil, gas, and mining proposals and large scale developments (e.g. solar, wind, and recreation) which have the potential to impact crucial elk habitat.
- n. Encourage energy development companies to minimize the impact of disturbance through directional drilling and the use of other Best Management Practices that promote the conservation of wildlife resources.
- o. Promote state and federal land management agencies' acceptance of offsite mitigation from energy development to increase or enhance elk habitat.

Habitat Objective 2: Improve the quality and quantity of forage and cover on 250,000 acres of elk habitat with emphasis on calving habitat and upper elevation elk winter range by the end of this plan.

Implications: Elk habitat will need to be improved throughout the state in order to sustain and increase unit population objectives. If habitat projects cannot be completed because of

insufficient budget, environmental restrictions, or poor climatic conditions, population objectives may be difficult to achieve.

Strategies:

- a. Continue to support the interagency big game range trend study of crucial ranges throughout the state.
- b. Conduct an annual evaluation to monitor range condition, utilization, and trends as manpower and budget allow.
- c. Work with land management agencies, conservation organizations, private landowners, and local leaders through the regional Watershed Restoration Initiative working groups to identify and prioritize elk habitats that are in need of enhancement or restoration.
- d. Initiate broad scale vegetative treatment projects to improve elk habitat with emphasis on calving habitat and winter ranges.
- e. Seek opportunities to improve aspen communities on summer ranges which provides crucial calving habitat.
- f. Encourage land managers to manage portions of forests in early succession stages through the use controlled burning and logging. Controlled burning should only be used in areas where there are minimal invasive weed and/or safety concerns.
- g. Seek opportunities to obtain additional funding for habitat improvement projects.
- h. Emphasize improvement of upper elevation winter ranges to encourage elk to winter at higher elevation than mule deer.
- i. Discourage the practice of winter feeding in most cases, which can cause habitat degradation. Feeding of elk will be in accordance to Division policy. Support research to determine how to reduce or eliminate current elk feeding programs.
- j. Support land management agencies in the proper management of crucial elk habitats.
- k. Continue to support the conservation permit and habitat enhancement programs that provide crucial funding for habitat improvement efforts.
- l. Support the efforts of conservation groups to improve elk habitat and growth of elk herd numbers.
- m. Work with state and federal land management agencies to use livestock as a management tool to enhance crucial elk ranges.
- n. Work with land management agencies and county weed boards to control the spread of noxious and invasive weeds throughout the range of elk in Utah.

C. Recreation Management Goal: Provide a diversity of elk hunting and viewing opportunities throughout the state.

Recreation Objective 1: Continue to offer a diverse hunting program for elk that allows for both general season and high quality limited entry hunting opportunities.

Implications: Utah currently has a diverse elk hunting program (i.e., General Season Any Bull units, General Season Spike units, Limited Entry units managed at 4 different age classes, etc) that provides opportunities for youth, people with disabilities, and various weapon types and seasons for a variety of hunting interests. Management strategies should focus on maintaining this diversity.

Strategies:

- a. Provide varied levels of limited entry elk hunting quality by maintaining 4 categories of age class harvest objectives (Table 1).
- b. Achieve an average age of harvested bull elk within established objectives on all limited entry units to assure a balanced and diverse age structure of the bull segment in the population.
 1. Accurately monitor the age of harvested bull elk by collecting a statistically valid sample of teeth from all seasons on all limited entry units. Provide incentives to encourage hunters to submit teeth or implement mandatory tooth submission if necessary.
 2. Recommend limited entry bull permits on each unit based on an average of the last 3 years of age data; increasing permits on units above objective and reducing permits on units that fall below objective.
- c. On limited entry units, set permits for the 3 weapon types based on the following percentages: 25% for archery, 60% for rifle, and 15% for muzzleloader.
- d. On appropriate limited entry units, provide a late season rifle elk hunting opportunity that will reduce harvest rates and help increase future hunting opportunity. On these units, the percent of rifle permits in the early season rifle hunt will not exceed 65%.
- e. On limited entry units without a late rifle hunt, set permits for the 3 weapon types based on the following percentages: 30% for archery, 50% for rifle, and 20% for muzzleloader.
- f. On appropriate limited entry units, provide a premium limited entry hunting opportunity that will allow 3% of the limited entry rifle hunters to hunt all seasons for a premium fee.
- g. Continue to provide statewide spike bull hunting opportunity. In 2010 and 2011, set the spike bull permit cap at 13,750, and, if harvest success remains below 20%, increase the spike bull permit cap to 15,000 for the remaining 3 years of the plan (2012–2014).
- h. Continue to provide unlimited archery permits that allow hunting on both spike and any bull units.
- i. Continue to provide any bull elk hunting opportunities on the current any bull units. The any bull permit cap will be set at 14,300 for the life of this plan
- j. Continue to encourage primitive weapon opportunities that provide hunting opportunity with reduced harvest rates.
- k. Establish season lengths that will provide adequate hunting opportunity without negatively affecting elk populations.

- l. Provide hunting opportunities that will encourage youth participation and maintain family hunting traditions.
- m. Seek opportunities to expand youth hunting on any bull units.
- n. Continue to support the CWMU, landowner permit, and Walk-In Access programs that provide incentives for private landowners to manage for elk and their habitat.
- o. Identify and support the acquisition of leveraged pieces of property (such as Wilcox Ranch and Book Cliffs Initiative) that control access to or management of larger tracts of public land for the purpose of increasing hunting and wildlife viewing opportunities.
- p. Support the responsible use of off-highway vehicles in specified areas during hunting seasons.
- q. Support law enforcement efforts to reduce the illegal kill of bulls.

Recreation Objective 2: Increase opportunities for viewing of elk while educating the public concerning the needs of elk and the importance of habitat.

Implications: Increased viewing opportunities for elk should be accompanied by efforts to educate the public on the importance of habitat. Education should be a component of all viewing opportunities.

Strategies:

- a. Install interpretive signs in elk viewing areas emphasizing the importance of habitat.
- b. Produce written guides and brochures to educate the public on how and where to view elk and the importance of crucial habitats.
- c. Promote public tours and spring range rides on crucial elk winter ranges to demonstrate the importance of winter range to elk.
- d. Work with the media to promote interest and educate the public concerning elk and their habitat needs.

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Figure 1. Elk habitat, Utah 2009.

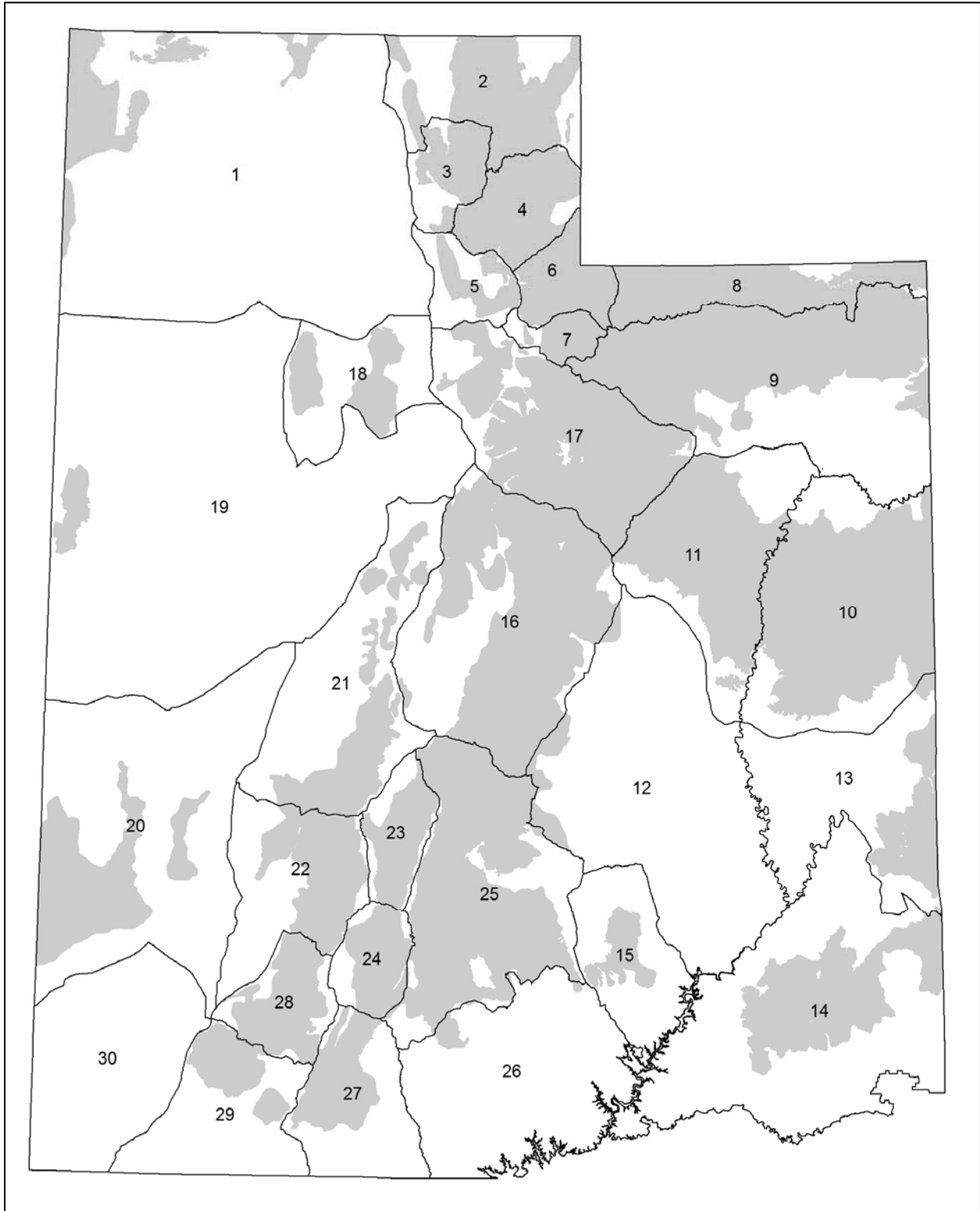


Figure 2. Statewide post-season elk population estimates, Utah 1975–2008.

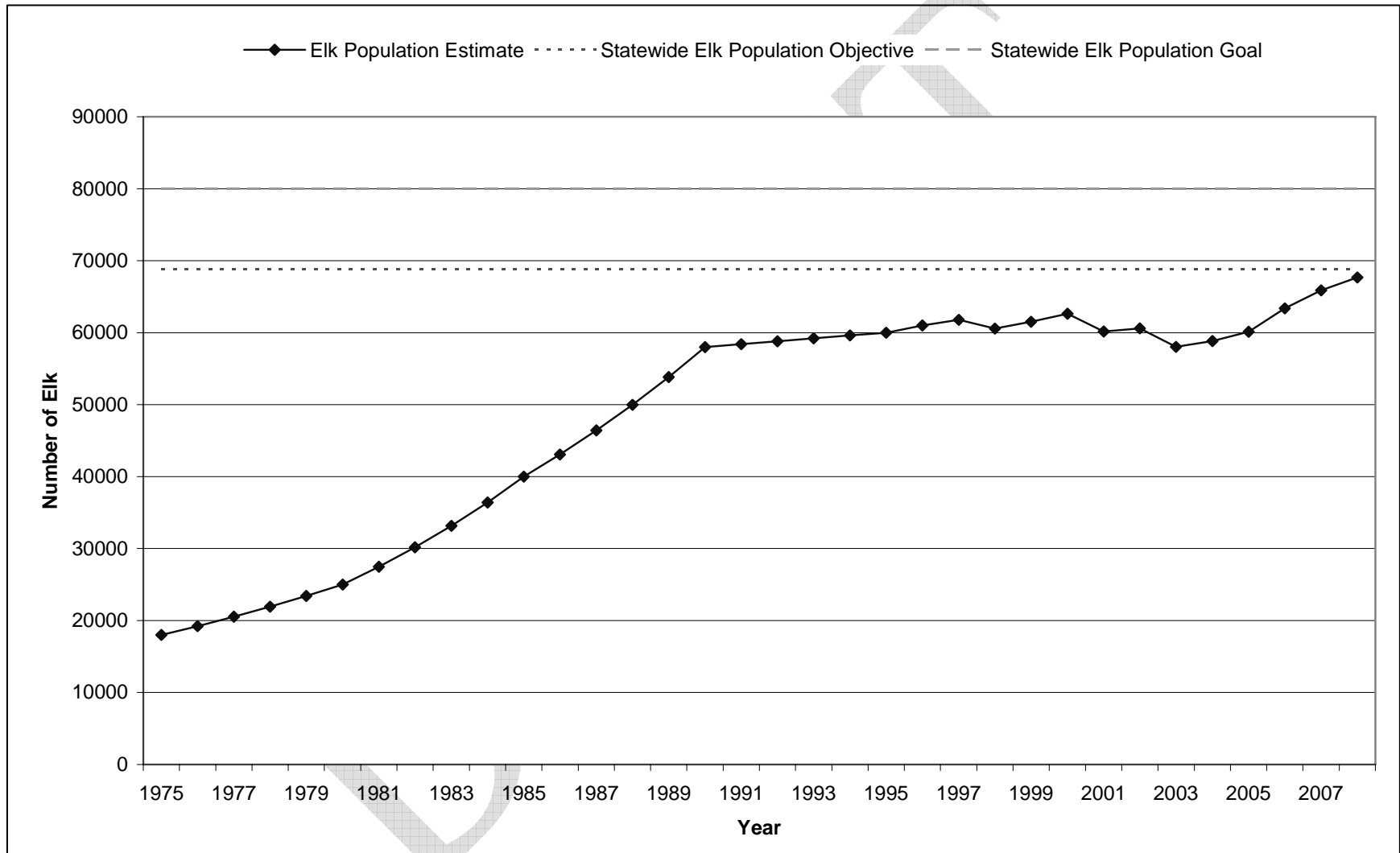


Table 1. Age objectives and average age of harvested bull elk by management unit, Utah 2001–2009.

Unit	Age Objective	Year									3-year average
		2001	2002	2003	2004	2005	2006	2007	2008	2009	
Beaver	7.5-8.0	6.0	7.0	6.0	7.5	7.1	6.8	7.7	7.0	7.6	7.4
Book Cliffs, Bitter Creek/South	6.5-7.0	5.6	6.5	5.8	6.4	6.5	6.6	7.3	6.7	7.2	7.1
Book Cliffs, Little Creek	7.5-8.0	7.3	—	7.6	6.8	6.9	7.8	8.1	7.4	7.9	7.8
Box Elder, Grouse Creek	4.5-5.0	6.0	4.0	—	5.0	—	6.4	5.0	4.2	4.0	4.4
Box Elder, Pilot Mountain	5.5-6.0	7.0	6.7	5.5	7.0	7.5	7.3	4.7	5.5	4.5	4.9
Cache, Meadowville	4.5-5.0	—	—	6.0	6.0	7.2	6.8	6.5	7.1	6.9	6.8
Cache, North	4.5-5.0	3.4	4.4	4.0	3.8	4.7	4.4	4.5	5.4	5.3	5.1
Cache, South	4.5-5.0	4.7	6.4	6.3	4.7	6.5	6.6	6.5	6.8	6.8	6.7
Central Mountains, Manti	5.5-6.0	5.9	7.0	7.1	6.7	6.9	7.3	7.2	6.3	7.0	6.8
Central Mountains, Nebo	6.5-7.0	5.6	6.0	6.3	6.3	6.6	7.6	6.9	6.1	5.8	6.3
Fillmore, Oak Creek	4.5-5.0	5.0	5.8	4.5	4.8	5.3	4.8	4.6	3.7	3.9	4.1
Fillmore, Pahvant	7.5-8.0	8.2	7.6	7.1	7.5	8.5	7.7	7.8	7.9	8.0	7.9
La Sal, Dolores Triangle	5.5-6.0	—	—	—	—	—	—	—	—	—	—
La Sal, La Sal Mountains	5.5-6.0	4.2	5.8	6.3	5.7	5.7	5.9	7.4	6.9	7.1	7.1
Monroe	7.5-8.0	6.0	7.5	7.1	7.2	7.8	8.2	7.9	7.8	7.4	7.7
Mount Dutton	5.5-6.0	5.7	6.5	5.9	6.2	6.7	6.8	6.6	6.2	6.0	6.3
Nine Mile, Anthro	5.5-6.0	8.3	6.9	8.0	6.7	6.4	6.6	7.1	5.6	6.3	6.4
Nine Mile, Range Creek South	4.5-5.0	—	—	—	—	—	5.3	8.5	8.9	5.3	7.6
North Slope, Three Corners	5.5-6.0	3.1	4.3	4.6	5.1	5.1	5.5	5.0	5.1	5.7	5.3
Oquirrh-Stansbury	5.5-6.0	4.5	5.0	5.7	5.9	7.0	6.6	7.3	6.5	6.0	6.6
Panguitch Lake	5.5-6.0	6.6	6.3	7.1	6.1	7.0	7.0	5.8	5.7	5.7	5.7
Paunsaugunt	4.5-5.0	6.2	6.6	4.8	5.5	5.4	6.0	5.9	6.7	5.3	6.0
Plateau, Boulder / Kaiparowits	7.5-8.0	5.5	6.0	5.9	7.2	7.0	8.4	7.8	8.3	8.2	8.1
Plateau, Fish Lake / 1000 Lake*	5.5-6.0	7.2	7.2	6.8	6.3	6.4	7.6	7.3	7.2	6.8	7.1
San Juan	7.5-8.0	8.1	7.7	8.0	7.7	7.5	7.6	8.0	8.1	7.8	7.9
South Slope, Diamond Mountain	6.5-7.0	4.2	4.4	5.7	5.2	5.5	5.5	5.5	5.5	4.8	5.3
Southwest Desert, Indian Peaks	6.5-7.0	7.9	8.1	7.2	7.7	8.1	8.2	9.2	8.0	8.2	8.5
Wasatch Mountains	5.5-6.0	6.0	6.1	6.4	6.8	7.1	7.2	7.1	7.3	6.7	7.0
West Desert, Deep Creek	4.5-5.0	6.5	7.8	6.5	6.9	8.8	8.0	8.2	7.6	7.1	7.7
Statewide average		6.0	6.3	6.2	6.2	6.7	6.8	6.8	6.6	6.4	6.6

*Age objective will increase from 5.5-6.0 to 6.5-7.0 if population objective increases from 4800 to 6500.

Table 2. Elk herd population estimates and objectives by unit, Utah 2003–2009.

Unit	Population Objective	Year						
		2003	2004	2005	2006	2007	2008	2009
Beaver	1,050	300	300	900	900	875	850	800
Book Cliffs (All)	7,500	3,200	2,850	2,830	2,525	3,900	4,500	4,650
Box Elder (All)	675	330	330	300	300	380	400	425
Cache (All)	2,300	1,950	1,950	2,030	2,000	2,050	1,750	2,200
Central Mountains, Manti	12,000	11,100	8,800	9,400	10,500	10,000	10,000	10,600
Central Mountains, Nebo	1,450	1,450	1,530	1,500	1,580	1,373	1,550	1,550
Chalk Creek	1,900	2,200	2,100	2,000	2,000	2,150	2,090	1,900
East Canyon	1,000	800	1,500	1,200	1,580	2,125	1,650	1,275
Fillmore (All)	1,425	1,400	1,400	1,250	1,150	1,350	1,900	1,500
Henry Mountains	0	25	25	25	25	25	30	25
Kaiparowits	25	20	25	25	25	25	25	25
Kamas	650	500	600	600	600	600	570	600
La Sal (All)	2,500	2,650	2,600	1,970	1,900	2,100	2,500	2,300
Monroe	1,800	1,300	1,430	1,575	900	1,000	1,000	1,050
Morgan-South Rich	3,500	4,500	4,300	4,100	5,100	4,502	3,800	4,400
Mt. Dutton	1,500	1,400	1,635	1,625	1,600	1,270	1,400	1,500
Nine Mile, Anthro	700	810	750	720	720	1,000	1,050	1,320
Nine Mile, Range Creek	1,600	1,780	1,350	1,300	2,000	2,100	2,100	2,180
North Slope, Summit	300	120	270	270	270	280	280	300
North Slope, Three Corners	500	420	435	450	435	1,075	830	800
North Slope, West Daggett	1,300	1,400	950	1,000	1,100	1,015	1,000	1,100
Ogden	800	650	650	690	700	700	780	780
Oquirrh-Stansbury	900	700	700	700	740	600	750	725
Panguitch Lake	1,100	900	1,065	1,125	1,150	872	950	1,000
Paunsaugunt	175	60	80	80	75	24	30	50
Pine Valley	50	30	30	50	50	50	50	50
Plateau, Boulder	1,500	1,500	1,540	1,700	400	500	900	1,500
Plateau, Fish Lake / Thousand Lakes	4,800	2,700	3,070	3,500	4,000	4,350	4,800	5,700
San Juan	1,300	1,130	1,140	1,350	1,400	1,100	1,400	1,400
San Rafael	0	50	50	50	50	30	20	30
South Slope, Vernal / Diamond Mountain	2,500	2,600	2,470	2,250	2,260	3,030	2,770	2,700
South Slope, Yellowstone	5,500	5,300	5,000	5,270	5,300	5,600	5,600	5,600
Southwest Desert, Indian Peaks	975	970	1,400	1,600	1,100	1,206	1,120	1,150
Wasatch Mountains, Avintaquin	1,250	1,250	1,150	915	1,200	1,250	1,300	1,400
Wasatch Mountains, Central Region	2,600	3,160	2,850	2,850	2,800	3,184	3,850	3,000
Wasatch Mountains, Currant Creek	1,200	1,440	1,200	1,140	1,200	1,200	1,600	1,500
West Desert, Deep Creek	200	200	200	200	200	175	185	100
Zion	300	300	300	300	300	300	500	500
Statewide Totals	68,825	60,595	58,025	58,840	60,135	63,366	65,880	67,685

Table 3. Drawing odds of obtaining a limited entry bull elk permit, Utah 1998–2009.

Year	Residents			Nonresidents		
	Applicants	Permits	Odds	Applicants	Permits	Odds
1998	21921	789	1 in 27.8	1931	60	1 in 32.2
1999	24146	831	1 in 29.1	2788	65	1 in 42.9
2000	27398	789	1 in 34.7	3278	63	1 in 52.0
2001	31068	831	1 in 37.4	4622	70	1 in 66.0
2002	34141	862	1 in 39.6	5539	76	1 in 72.9
2003	34707	978	1 in 35.5	6270	86	1 in 72.9
2004	38275	1272	1 in 30.1	8044	106	1 in 75.9
2005	39238	1533	1 in 25.6	9021	118	1 in 76.4
2006	40869	1805	1 in 22.6	9401	147	1 in 64.0
2007	43681	2065	1 in 21.2	10930	163	1 in 67.1
2008	41822	2352	1 in 17.8	8949	215	1 in 41.6
2009	40925	2526	1 in 16.2	10666	239	1 in 44.6