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HISTORICAL AND CURRENT STATUS OF ELK IN KANSAS

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Abstract: Elk (*Cervus elaphus*) historically occurred throughout Kansas but were extirpated from the state around 1890. Free-ranging elk populations were reestablished in Kansas through reintroduction efforts on Cimarron National Grasslands from 1981-1990, and on Fort Riley Military Installation from 1986-1994. Current elk distributions in the state have not been published following these reintroduction efforts. The current and historical distribution of this species in Kansas is described.

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Key words: *Cervus elaphus*, Cimarron National Grasslands, distribution, Fort Riley Military Installation, reintroduction

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The distribution of elk (*Cervus elaphus*) in Kansas from the post-settlement period until extirpation has been described by Hoffmeister (1947) and Choate (1987). However, the current distribution and status of elk in Kansas has not been reported following the reintroduction of free-ranging elk to the state. Our objectives were to provide a summary of historical documentation of elk in Kansas and report on the current distribution and status of elk in the state.

Elk remains dating back to the middle Holocene (4000-8000 years before present) have been recovered in Kansas, and archaeological evidence suggests that by the late Holocene elk were distributed throughout much of the United States including all of Kansas and the Great Plains (O'Gara and Dundas 2002). Elk were utilized by Native American tribes in Kansas for a variety of purposes. Elk bones were present in faunal remains recovered from village sites along the Big Blue River that were inhabited from approximately 1757-1825 by members of the Kansa tribe (Molloy 1993). Cementum annuli analysis of bones recovered from the village site indicated that cervid remains were mostly of 2-5 year old individuals and that hunting took place primarily from January to September (Molloy 1993). Some northern Plains tribes may have hunted elk during the winter as an important source of meat when bison (*Bos bison*) herds were not available (McCabe 2002).

Hunting of elk by Native Americans was also documented by Zebulon Pike as he crossed Kansas in 1806 (Jackson 1966). Pike observed members of the Pawnee tribe hunting elk on horseback along a tributary of the Solomon river in present day Smith County, Kansas (Jackson 1966). Elk were probably hunted primarily for meat by Native American tribes in Kansas, but other documented uses included using bones and antlers for tools, hides for clothing and shelter, and upper canines as decorative ornamentation (McCabe 2002). Hunting of elk by native tribes in the Great Plains may have been dictated in part by the availability of bison. Bison were hunted preferentially when available, with elk and other cervids providing an important secondary source of meat during times of

the year when bison were not readily available (McCabe 2002).

In addition to faunal remains associated with Native American villages, elk were also documented by early expeditions passing through the state. One of the earliest expeditions to document the presence of elk in the state was that of Lewis and Clark. On 5 July 1804, the expedition crossed to the Kansas side of the Missouri River in present day Doniphan County, and journal entries note that "Elk are plenty about these Praries" along with observations of a "great deel of Elk Sign" (Moulton and Dunlay 1986, pp. 350-351). Similarly, the expedition of Zebulon Pike observed elk while passing through Kansas during 1806. Pike sighted elk throughout the state and specifically mentions elk at locations along the Solomon River in north central Kansas and along the Arkansas River in central and southwest Kansas (Jackson 1966). Lt. James B. Wilkinson departed the Pike expedition near present day Great Bend during October 1806 and proceeded downstream along the Arkansas River where he noted that "the herds of buffalo, elk, goat [pronghorn antelope (*Antilocapra americana*)], and deer, surpassed credibility." (Barry 1972, p. 57). The Pike expedition hunted elk for meat throughout Kansas and Lt. Wilkinson used elk hides for canoes (Jackson 1966).

Written accounts compiled from other expeditions in the Great Plains during the time period of 1806-1857 indicated that elk were originally sighted most frequently in tallgrass prairie, but were not documented in this biome later than 1832 (Shaw and Lee 1997). Elk were seen by expeditions in mixed grass prairie regions through 1857, although they may have been sighted less frequently than sightings reported earlier from tallgrass prairie regions (Shaw and Lee 1997). It appears that elk populations in Kansas were first extirpated from the eastern part of the state. This pattern of extirpation may have been caused by increased hunting pressure and habitat modification in this area of the state due to higher human population densities present in eastern Kansas during the early 1800s.

In addition to expeditions passing through the state, records from settlers, hunters, and newspaper accounts provide additional evidence of the distribution and economic importance of elk in the state from 1850-1900. J. R. Mead, an early naturalist and hunter, saw no elk while traveling through eastern Kansas but noted that his first elk sighting occurred in 1859 along the Saline River, northwest of present day Salina, Kansas (Mead 1986). According to Mead, the eastern edge of elk distribution in Kansas from 1859-1864 was "a line drawn north and south through El Dorado, Butler County. All country west of that in Kansas was presumably ranged over by them. . ." (Hoffmeister 1947, p. 75). Mead also hunted elk and bison as late as 1863 in present day Sedgwick County along the Arkansas River (Mead 1986). Mead noted that elk were most abundant in the state north of the Smoky Hill River, and he saw herds of over 1,000 individuals crossing the Saline River near present day Lincoln, Kansas (Hoffmeister 1947). Elk herds of similarly large numbers were reported in the area up to 1866 (Cockrum 1952). As late as 1874, an article published in the Smith County Pioneer reported that "herds of elk feed in the sparsely settled portions during the winter time" (Fleharty 1995, pp. 26-27). Similarly, in 1875 the Ellsworth Reporter published a note indicating that "Antelope and Elk range over the hills in large numbers" (Fleharty 1995, p. 34). The drainages of the Smoky Hill, Solomon, and Saline rivers may indeed have been one of the last strongholds of elk in Kansas. Elk persisted in this region as long as any area of the state, with settlers reporting elk to be present in Ellsworth County as late as 1890 (Choate 1987).

In 1875, Knox compiled a list of mammals in Kansas and reported that elk were "Quite common in the west parts of the state" (Knox 1875, p. 20). However, it is important to note that declines in elk populations had probably already begun even in western Kansas during this time period. Settlers arriving in western counties during the 1800s often reported that elk were already extirpated in these areas although bones were frequently encountered on the prairie (Choate 1987). Settlers in western Kansas last reported elk to be present in the state in 1890 (Choate 1987). Presumably, elk were indeed absent from the state after this time, and by 1905 reports were first published that formally indicated that the species had been extirpated from the state (Cockrum 1952).

The economic importance of elk to early Kansans included market and some subsistence hunting (Mead 1986). Elk were prized by market and sport hunters for the value of their meat, hide, and even antlers (Mead 1986). Early settlers may have occasionally harvested elk for subsistence, but it is likely that small game was utilized more frequently than larger species such as elk or bison (Fleharty 1995). Following the decline of big game populations in the state, the selling of elk bones recovered along with bison bones on the prairies provided a source of income for some early Kansans (Fleharty 1995).

Following extirpation around 1890, free-ranging elk were absent from the state for over 90 years. A small captive herd was reintroduced to state lands on the Maxwell Wildlife Refuge in central Kansas in 1951 from the Wichita Mountains National Wildlife Refuge, Oklahoma. This captive herd served as a source for subsequent reintroductions to other areas of the state.

In 1981, the Kansas Department of Wildlife and Parks reintroduced 12 elk from Maxwell Wildlife Refuge to the Cimarron National Grassland in Morton County in southwestern Kansas. The Cimarron National Grassland is a 108,000-ac (43,725-ha) property managed by the U. S. Forest Service, and is characterized by shortgrass prairie vegetation with cottonwood (*Populus deltoides*) and saltcedar (*Tamarix ramosissima*) found along the Cimarron River. (Plant names are consistent with the USDA PLANTS database (NRCS 2007)). Subsequent reintroductions to the Cimarron herd from various source herds (indicated in parentheses) took place in 1982 (Maxwell Wildlife Refuge, n = 6), 1984 (Oregon, n = 2), 1988 (Trinidad, Colorado, n = 3), and 1990 (Moise, Montana, n = 10). Elk from this herd use areas outside of the national grassland boundaries, including parts of northwestern Oklahoma and southeastern Colorado (Bian and West 1997). This herd increased to about 120 elk in the mid 1990s (West 1995) under light hunting pressure (harvest of < 10 elk/year), but was significantly reduced in 1994 and 1995 (total harvest of 80-85 animals in all 3 states) in response to crop damage complaints. Today the herd numbers around 50 elk and is not hunted in Kansas.

A second free-ranging herd was established in 1986 on Fort Riley Military Installation in Geary and Riley counties in northeastern Kansas. Fort Riley is an approximately 101,000-ac (40,900-ha) property managed by the U.S. Army, and training areas are characterized by tallgrass prairie vegetation with some riparian woodland areas. Elk were initially reintroduced to this area with the release of 12 animals from Maxwell Wildlife Refuge (Pitts et al. 1987). Additional elk were introduced to Fort Riley from Maxwell Wildlife Refuge in 1987 (n = 7), 1990 (n = 2), and 1992 (n = 2). Further translocations were made from source herds in Trinidad, Colorado (1988, n = 5), Moise, Montana (1990, n = 8), and Wind Cave National Park, South Dakota (1994, n = 18) for a total of 54 elk released. Like the Cimarron herd, this herd was lightly hunted initially (harvest of < 10 elk/year), but was significantly reduced (by 100 elk) over a 2-year period (1999-2000) as a result of crop damage complaints on neighboring private lands. Today the herd numbers approximately 120 animals and supports an annual harvest of 10-15 elk (Matt Peek, Kansas Department of Wildlife and Parks, unpublished data).

The Fort Riley and Cimarron herds are the only free-ranging populations established through reintroduction efforts in the state. However, sightings compiled by Kansas Department of Wildlife and Parks, Fort Riley Conservation Division, and the Kansas Cooperative Fish and Wildlife Research Unit indicate that individuals and even small herds of elk are occasionally present in various additional areas of the state. Data on elk sightings received by Kansas Department of Wildlife and Parks were compiled beginning in 2000. These sighting reports were not actively solicited, but consist of information voluntarily reported to Kansas Department of Wildlife and Parks by employees and the public. The location of each sighting was recorded by county (and more precise geographic location if known) and the number of elk seen was also recorded. Since many of the sightings may have consisted of transient or dispersing elk, it is possible that there may be multiple sighting reports recorded for the same elk (or group of elk) at different geographic locations. Based on these

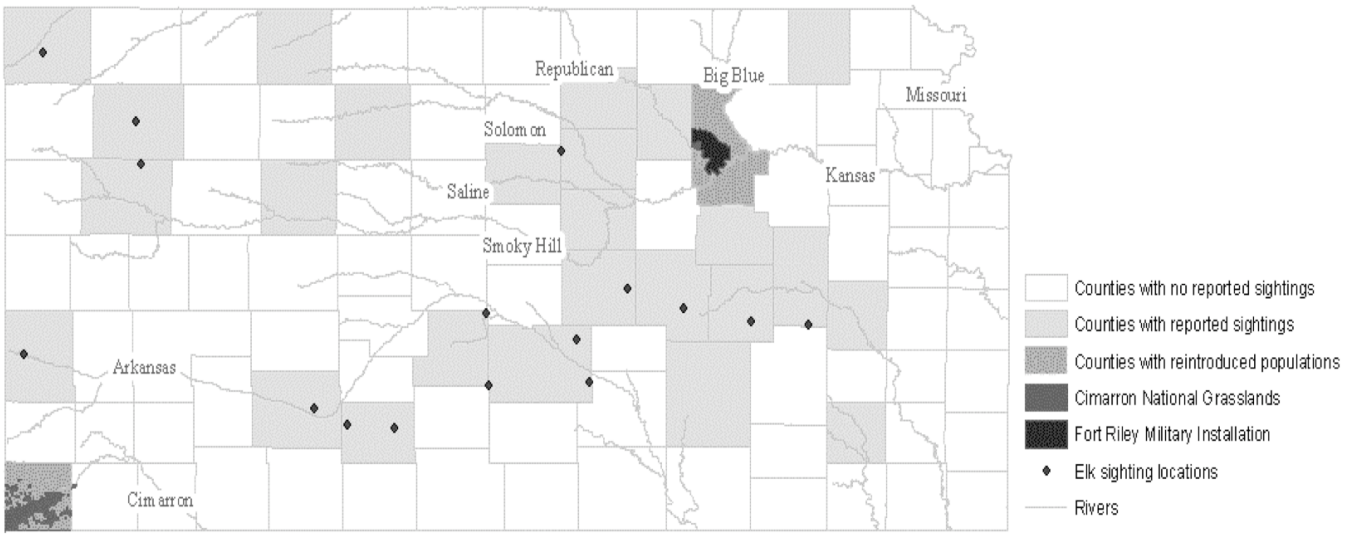

Fig. 1. Locations of reintroduced elk populations in Kansas and locations of elk sightings reported between 2000-2006.

records, counties with elk sightings distinct from the Fort Riley and Cimarron herds were mapped based on reports from 2000-2006. Elk known to have escaped from private game farms were excluded from our analysis. However, there are 82 registered captive facilities with elk in the state and there have been several cases of known captive escapes or releases since 2004 (Chastity Flowers, Kansas Animal Health Department, personal communication), so it is possible that some of the remaining sightings represent escaped or released captive animals.

Elk were sighted in 25 counties not including counties with reintroduced populations (Fig. 1). Most sightings consisted of individuals or pairs of elk usually believed to be transient. However, a herd of about 30 elk has become established in Hamilton County, and a few elk have been seen multiple times in other areas of the state suggesting the presence of resident (non-transient) animals. Cows with calves have also been observed on several occasions outside of areas where elk herds are considered established.

Elk have been known to disperse great distances and may rapidly colonize areas once established (McCorquodale et al. 1988, Petersburg et al. 2000). There is evidence to suggest that dispersal is occurring from established populations in Kansas as collared elk have been sighted independently in Morris and Pottawatomie counties. The most likely source for these dispersing elk is from the Fort Riley herd, where collars have been placed on elk as part of an ongoing research project. Future research using genetic analysis is needed to conclusively assign elk found outside of established populations to a known source herd thereby determining dispersal rates and patterns.

The documentation of elk throughout Kansas suggests the potential for colonization by dispersing elk throughout much of the state. However, complaints have arisen in the past when elk populations have increased beyond landowner tolerance levels. In response to these concerns, Kansas Department of Wildlife and Parks established regulations in 2006 authorizing hunt-own-land antlerless elk permits statewide except for Morton County. These regulations were an attempt to allow landowners to limit or maintain elk herd sizes at acceptable levels. By allowing landowners the opportunity to maintain elk at acceptable levels while at the same time being allowed the benefits associated with elk hunting, it is possible that small free-ranging herds of elk could be successfully maintained on additional areas of private land throughout the state. Knowledge of the distribution of elk populations and sightings in Kansas is valuable in predicting the potential for natural reestablishment by elk into other areas of the state, and will help to more quickly identify areas where elk have become established.

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APPENDIX: Illustrations

Appendix Fig. 1. Cow and calves at Fort Riley Military Reservation, Kansas. Photo by Nichole Lambrecht.

Appendix Fig. 2. Dispersing bull elk photographed with trail camera near Nemaha/Marshall county line.