

Historical Elk Migrations Around Jackson Hole, Wyoming

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ABSTRACT

Natural resource managers today are facing increasingly complex challenges when deciding how to manage elk in and around Jackson Hole. One challenge is how to handle the unintended consequences, such as increased likelihood of disease transmission, from feed grounds around Jackson and around the state. Historical migrations might have prevented some of the problems experienced now with high concentrations of elk. This paper attempts to answer two questions: Where did the elk that spent the summer in the Jackson Hole region spend their winters before and around the time of white settlement? What effects did white settlement have on elk habitat and natural migration patterns? This study mainly concerns migrations through Jackson Hole and those to the Green River Basin. The evidence in primary and secondary sources suggests that elk did indeed migrate through Jackson Hole to the Green River Basin and Red Desert area of Wyoming. However, settlement of the area by whites around the turn of the century seems to have shortened these migration routes, so that elk now over-winter in Jackson. However, it may also be that a population of elk always stayed in Jackson Hole. The study concludes that re-establishing historical migration routes *may* be an ecologically and biologically viable option.

Thousands of elk reside in Jackson Hole, Wyoming, a valley south of Yellowstone National Park. Olaus Murie, renowned wildlife biologist and resident of Jackson Hole, once described elk as one of the “burning topics” in Jackson Hole (Murie and Murie 1966: 121). They remain so today, especially with recent efforts to prepare an environmental impact statement and a long-term plan for elk management. Jackson Hole stands at the center of controversy over elk in large part because it is the site of the National Elk Refuge. The federal government created the refuge in 1912 and initiated an artificial feeding program to ensure the survival of the herd through the winter months, when finding forage is difficult. The designation of the refuge and the artificial feeding programs were viewed as ways to protect the elk and to keep them out of the haystacks of area ranchers. Both the natural forage and supplemental feed concentrate elk on refuge land in the winter, and this concentration of elk has led many people to associate the valley with the elk herds that spend the winter there.

Jackson Hole may not have always been the first choice for elk in the winter, however. Their presence on the refuge in what many consider unnaturally high numbers has been a primary source of a long-standing controversy. Many people speculate that elk only passed through Jackson Hole on their way to warmer valleys in the Green River Basin and Red Desert southeast of Jackson. Numerous secondary sources assert these migrations as fact (e.g., Blair 1987; Murie 1951; Nelson 1994; Richter 1982; Saylor 1970). For example, Allred (1950: 597) stated that “the great semidesert area lying in southern Sublette and Fremont Counties and northern Sweetwater County, in western Wyoming, until 1913 was undoubtedly one of the greatest wildlife wintering areas in the United States.” Allred (1950) discussed parts of shed elk antlers and mounds of

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collected antlers and skulls as physical evidence of migrations and tales from ranchers as sociocultural evidence of migrations. These sources cited fences, poaching, and easily accessible artificial feed in Jackson Hole as factors that contributed to the end of the migrations.

Thus, while the refuge and feeding programs were effective in protecting the elk herd, natural resource managers today must deal with the unintended consequences of the programs' success, one of which is the concentration of elk in the Jackson area. Such concentration may prove beneficial to the tourist industry by attracting tourists to the region, to hunters, hunting organizations, and state game agencies by bringing in revenue from guiding hunts or selling licenses, and to citizens by making elk easy to observe; however, high concentrations can create problems for managers, such as taxing the forage base and facilitating the spread of diseases like brucellosis and tuberculosis. Migrations might have alleviated some of the problems experienced now with high concentrations of elk. Migration routes and corridors also contribute to the health of species by providing avenues for outbreeding and gene flow among different populations (Smith 1996).

In this study, I attempt to answer two questions: Where did the elk that spent the summers in the Jackson Hole region spend their winters before and around the time of white settlement? What effects did white settlement have on elk habitat and natural migration patterns? This study mainly concerns migrations through Jackson Hole and those to the Green River Basin. The evidence comes from secondary sources in various public libraries and from primary sources in the archives of Yale University, Yellowstone National Park, the American Heritage Center in Laramie, Wyoming, the Museum of the Mountain Man in Pinedale, Wyoming, the National Elk Refuge in Jackson, and the Teton County Historical Society in Jackson.

Elk migrate during limited periods, and direct observation will most likely occur by those who live near or frequent migration corridors. The first written records of elk migrations do not appear until whites began to settle the region around 1870. While early settlers' records provide valuable information regarding migration routes, the archival evidence suggests that settlement itself almost immediately shortened migration patterns. This means that there was limited opportunity for direct observation of elk migrations to the Green River Basin and Red Desert if they did exist. The scarcity of records of direct observation, however, does not mean that it is impossible to determine whether such migrations occurred. I have constructed a historical picture of elk migrations by "triangulating" a number of sources and pieces of information—information about ecological conditions and interactions between Native Americans and game species, direct observations by early settlers, secondhand reports of direct observations, and early proposals by game managers to establish wildlife refuges for elk and other species in the area of the Green River Basin and Red Desert. No single piece of evidence provides a strong case that the majority of elk that summered in the mountains around Jackson once

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migrated through the valley. Taken as a whole, however, the evidence strongly suggests that such migrations did indeed occur, perhaps with the exception of a small population that over-wintered in Jackson.

GEOGRAPHY AND HABITAT OF JACKSON HOLE AND THE GREEN RIVER BASIN: WAS MIGRATION A BIOLOGICAL POSSIBILITY?

A primary factor in the quality of habitat is the availability of food, or forage. While information regarding the availability of forage alone cannot lead to conclusions about migrations, it can suggest whether elk migrations to the Green River Basin and Red Desert were desirable and possible.

Northwestern Wyoming contains three valleys that roughly form a triangle. Jackson Hole lies to the north, Star Valley to the south, and the Green River Basin to the southeast. While elk today do not migrate to the Green River Basin, it provides habitat for elk that is in many ways preferable to that in Jackson Hole. It is more verdant than Jackson Hole (Calkins 1973). Most of Sweetwater County itself, through which the Green River flows, receives less than eight inches of precipitation a year and contains high plains desert habitat (Garceau 1997). However, the Green River corridor widens into valleys with arable land that is suitable as wildlife habitat. Less snowfall in the Green River corridor also makes forage more accessible than in Jackson Hole, which receives several feet of snow a year that creates a barrier between the wildlife and forage. Allred (1950: 1-2) claimed that the “heavy beamed, immensely barred, eight-pointed elk antlers” found in the Green River basin constituted evidence that the basin provided forage of high nutritive quality.

While it seems clear that elk would benefit from migrating to the Green River Basin for easier access to forage, two conflicting hypotheses exist regarding the potential movement of elk from the Jackson region to the Green River valley. One report, written by Glen Cole in 1969, claims that, by the time the snow was deep enough to force elk out of Jackson Hole, deep snow would also block mountain passes out of the valley (Anonymous, undated). This argument assumes that snow is the trigger for migration. Altmann (1956), however, claims that cold temperatures and the absence of food (because summer grazing leaves forage so short it is almost flush with the soil by late August) drive elk to the lower country rather than snowfall.

Some of the archival literature discusses the migration of elk to the Green River Basin in relation to the preferable habitat found there. In a report on the Jackson Elk herd in 1927, it was said that: “Formerly herds of elk from the southern part of the Yellowstone National Park and from the high regions along the Continental Divide immediately south of the Park passed Jackson on their autumn migration and wintered in the Green River Basin. The settlement of the country and the introduction of cattle and sheep deprived the elk of this wintering group. As a result the migrating herds now stop in Jackson Hole and vicinity, a region of scant summer rainfall and heavy winter snows in which the elk are unable to get sufficient forage” (Commission on the Conservation of the

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Jackson Hole Elk 1927: 1). This passage highlights the milder winter climate in the valleys surrounding the Green River, which would provide more forage and more accessible forage in the winter. The passage also claims that the migrations did indeed occur.

Why, then, do elk stop their migrations in Jackson if preferable winter habitat lies just south in the Green River valley? To answer this question, I will refer to archaeological and archival evidence that the migrations did indeed occur and that changes wrought in the natural environment by white settlement most likely led to termination of these migrations.

INDIAN USE AND EARLY EXPLORATION

Early use of Jackson Hole by Native Americans might also provide some insight into the historical migration patterns of elk. Information regarding Native American use of the valley can help to establish a baseline of conditions that existed around the time of white settlement, against which to measure changes caused by settlers.

The first well-dated archaeological evidence indicates that people began using the region about 6500 to 7500 B.C. (Wright 1992). The valley eventually became home to or was used by various Indian tribes, including the Bannocks. The oldest evidence of use by nomadic tribes includes an obsidian knife approximately 8,000 years old. It is speculated, however, that these bands occupied the valley only in the summer to gather plants and fish and traveled to more favorable hunting grounds in the winter (Betts 1978). That they moved to more favorable hunting grounds suggests that elk may not have been abundant in Jackson in the winter.

About 150 years before the arrival of white settlers, Indians seemed to have abandoned the valley altogether. Tribes with knowledge of the plant and fish resources of Jackson were displaced by Shoshonean-speaking people who lacked the skills or the desire to harvest plant and fish resources. These tribes inhabited areas outside the valley, presumably where wildlife was abundant. The Blackfeet and Gros Ventres lived to the north, the Crows to the northeast and east, and the Shoshonis to the southeast in the Green River Basin (Betts 1978). Communal hunts occurred in the Green River Basin, as well as on the Great Plains, and on the Snake River Plains west of the Tetons (Betts 1978).

The earliest whites to visit the region, explorers who came to establish fur trading posts, did not stay. John Colter traveled through Jackson Hole in 1807-1808 to make trading contacts with Native Americans for Manuel Lisa's trading posts (Marean 1955). Explorers' journals provide the earliest written records regarding wildlife. While my research did not include an exhaustive survey of them, I examined some writings by explorers that suggest that elk migrated to the Green River Basin. Osborne Russell, who traveled the Rocky Mountains from 1834-1843, reported seeing thousands of antelope migrating down the Bear River toward "their winter quarters which is generally in the Green River valley" (quoted in Blair 1987: 7). A small population of pronghorn antelope

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continues today to migrate three hundred miles between summer ranges in Jackson Hole and winter ranges in southwest Wyoming (Smith 1996). There may be a correlation between antelope and elk migrations: if traveling that distance proved (and proves) advantageous for antelope, it is postulated, it would also have been advantageous for elk (Blair 1987).

SETTLEMENT BY WHITES

Information about habitat, Indian use, and early explorers' observations is not conclusive about the presence or absence of elk in Jackson Hole in the winters on its own. Moreover, it is always difficult to determine the exact causes of wildlife population numbers and behavior. But it is fairly clear that activity by white settlers played a large role in altering the migration patterns of elk. It is clear that new patterns of settlement brought by homesteaders changed whatever dynamic had existed.

The mere presence of people in the region may have changed migration patterns. Indians reported that emigrant trains chased game away from trails (Blair 1987). The Oregon Trail ran north of present-day Sweetwater County, and "emigrant traffic scattered buffalo herds, drove off game, and destroyed grass and timber" when traffic on the Oregon Trail increased during the California Gold rush in the middle of the nineteenth century (Garceau 1997: 17). In 1862, Ben Holladay, a freighter, opened the Overland Trail south of the Oregon Trail. It ran east to west across what is now Sweetwater County, and the settlements of Rock Springs, Bitter Creek Station, and Green River arose as stage stations on the trail (Garceau 1997). By 1869, the Union Pacific Railroad track was completed, and it followed the Overland Train across Wyoming (Garceau 1997). Sweetwater County, in which the Green River Basin is located, began to develop as a ranching and mining frontier.

Green River City became the center of freighting and supply for ranchers in the Green River Basin. In the 1870s, ranchers allowed their cattle to roam in the basin during the winter months, and cowboys rounded them up in the spring. Rancher J. M. Huston, who participated in those early days of open-range herding, said that "We used the west side of the river for summer range, and the desert and river in the winter time" (quoted in Garceau 1997: 22). By 1877, there were at least 11,377 cattle and 1,965 sheep in the area, most of them grazing on public government land.

It did not take long for the population of Sweetwater County to double from 2,561 in 1880 to about 5,000 in 1890. The new settlers brought more livestock, taxing the forage on public lands. To combat overgrazing of public lands, cattle and sheep ranchers began to establish private ranches throughout the county. With private ownership came fences (Garceau 1997).

In 1876, about the time of settlement of present-day Sweetwater, reports from the explorers in the Jackson region suggest that game was also present in Jackson Hole as late as December of that year. Members of an expedition led by Lieutenant Doane reported following a herd of elk on December 1, 1876,

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around the present location of Moose (Potts 1960, 1990). But game was so scarce along the shore of the Snake River that members of the Doane expedition had to shoot horses for meat (Potts 1960, 1990). Eight years later, in 1884, John Carnes and John Holland became the first year-round residents of Jackson Hole (Marean 1955). The town of Jackson itself was created in 1901. With this development came cows, sheep, permanent dwellings, and fences.

Most of the literature that mentions elk migrations suggests that settlement and changes in the landscape coincide with changes in elk migrations. Nelson (1994: 279), for example, states that “When white men first came to Wyoming, the elk summered in the mountains and migrated to the desert plains in the winter. Gradually, as their migration routes were settled by homesteaders, the elk ceased to migrate and tried to winter in the mountains. They starved by the thousands and also caused quite a problem by raiding the ranchers’ haystacks.” Blair (1987) says that the Red Desert and Green River herds of elk were driven back into Jackson Hole by the excessive hunting and settlement they experienced in the Red Desert and Green River.

Saylor (1970) also blames settlement of the Green River Basin in the 1880s and 1890s for shortened elk migration routes. Barbed wire fences on ranches blocked the migration routes. A 1927 report by the National Conference on Outdoor Recreation reported that serious die-offs of elk first occurred when animals were cut off from their natural winter range by this settlement and the fences that came with it. The elk began to collect in Jackson Hole around haystacks (Commission on the Conservation of the Jackson Hole Elk 1927). This report indicates that not only were migration routes blocked, but haystacks provided for an easy source of food in the winter. Artificial feed may have the same effects today as haystacks in the early part of the century in holding animals in place.

Preble (1911: 20) also mentions the appearance of wolves in Jackson Hole, “which were formerly unknown there,” about 1898 or 1900. He goes on to say that they came from the Green and Wind River regions, “probably following the introduction of stock.” While it is impossible to say for sure, if elk were becoming scarce in the Green and Wind River regions and more abundant in Jackson Hole, another factor for the appearance of wolves in Jackson may have been the declining prey base in the Green River and Red Desert. Wolf packs that were introduced in Yellowstone National Park are now found on the National Elk Refuge, most likely because of the abundant elk found on the refuge. Like much of the other historical evidence available, this is not direct evidence of migration, but it supports other evidence.

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EVIDENCE OF MIGRATIONS: DIRECT OBSERVATIONS AND REPORTS OF DIRECT OBSERVATIONS

While early settlers may have changed the distribution of elk in the region, their accounts provide the best indication that elk migrated through Jackson to the Green River Basin. Ira Dodge of Cora, Wyoming, for example, reported that

20,000 elk passed his place in the fall headed for the Red Desert just north of the Green River (Commission on the Conservation of the Jackson Hole Elk 1927). A book written by the granddaughter of one of the first residents of Pinedale, Wyoming, Pauline Canfield Bayer, tells a similar tale. Ms. Bayer used to watch the “annual trek of the elk” from the Jackson region to the desert (Bayer 1988: 152). She reports that they came down through the Hoback Canyon and the Gros Ventre, across the sagebrush flats of Pinedale to the desert. Settlers killed the elk for meat and trapped them to ship east.

While these are the only two direct observations I found in the literature, many secondary sources contain references to direct observation. Much of the writing that suggests that elk once migrated to the Green River Valley via Jackson Hole began when early settlers worried that settlers might in fact drive the elk to extinction. One of the most famous advocates of elk protection and one of the first residents of Jackson, Stephen Leek, wrote letters and notes indicating that migrations through Jackson to the Green River Basin did indeed occur. Leek devoted much of his time to elk, traveling around the country on the Orpheum Vaudeville circuit with photographs of elk in Jackson Hole. He was even called “The Father of the Elk.”

One of the main threats that Leek addressed was illegal hunting, or poaching. Elk were pressured not only indirectly by settlement and the use of forage by livestock, but also directly by “tuskers,” or tusk hunters, who killed elk by the hundreds for their eye teeth. Many poachers came from outside the valley to profit from tusks, which ran as much as \$100 a pair (Betts 1978). The first official attempt to protect elk from white poachers came in the late 1890s in response to a group of tuskers who built cabins in the northern end of the valley and sold elk meat, hides, scalps, and tusks to commercial interests outside the valley (Betts 1978). Guides and outfitters organized an association to help game wardens enforce Wyoming’s anti-poaching laws, and several residents reported poaching activities to authorities (Saylor 1970; Jacoby 1997).

Leek mentioned elk migrations in a report on tusk hunting. He said that “many thousands [of elk] again passed through toward the south as a neighbor remarked ‘You see that black trail yonder on the mountain-side, ten thousand elk have passed over it on their way south to the Red Desert’” (Leek, undated: 1). Leek also made a direct reference to elk migrations in a letter to Mr. Carroll Sprigg of Dayton, Ohio, dated April 7, 1923. Leek says that while “elk used to go lower than this valley to winter, domestic sheep and wire fences forbid their going there any more.” In this letter, Leek also provided some clues about the obstacles to elk preservation at the time. He says that ranchers were beginning to favor sheep over cattle because sheep require less range. This, Leek said, would be detrimental to wildlife because sheep would reduce the availability of winter forage for elk. Leek made it clear, however, that “the future of the elk depends entirely upon the people of this new country” and that “in place of getting their ill will by placing restriction upon the range that they believe is of no benefit to the elk, and ignoring their wishes, it would be better to seek

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their good will and co-operation, make it possible [sic] for them to make a living without getting sheep, and to their interest to perpetuate not only the elk but all game animals of this region.” Thus, Leek recognized that protecting elk required consideration of social and political factors as much as biological factors.

Other secondary sources containing reports of direct observation include reports written just after the migrations were said to end as well as literature written in the middle of the century. Wogenson (1951: 2), for example, reported that elk migrated to the Red Desert and Green River basin. An anonymous speech in the National Elk Refuge files (Anonymous 1936: 2) reports that while up to forty thousand elk stayed in Jackson in the winter “many more migrated south onto the Red Desert where they found sufficient forage to carry them through the winter months.” The Bureau of Biological Survey (Sheldon *et al.* 1935) also reported that “narratives of old-time experiences with game” describe “the annual trek of the elk, the bison, and the antelope when autumn storms cause them to pick their way out of the higher mountains through the Gros Ventre Basin and the Hoback River country into the more favorable winter ranges of upper Green River and the sagebrush areas of western Wyoming.” The Sheldon report included a map of suspected former migrations.

Finally, former National Elk Refuge director Almer Nelson interviewed Emile Wolff and others who settled in Jackson Hole between 1885 and 1890. In a report on the interviews, Nelson (1960) indicated that thirty-five to forty thousand elk stayed in Jackson Hole between 1885 and 1890, that “great bands [also] drifted into the surrounding mountains during the summer months from their winter range on the Red Deserts, Green River, Wind River and other parts of Wyoming,” and that others went west into Idaho over the Teton Pass, Misqueto Creek, and the Koerner Trail.

One final indication of elk migrations to the Green River Basin is the proposal to set up game preserves, in part for elk, in the Green River at about the same time that the above references mentioned the change in migration patterns. Frank Dunham proposed a winter game preserve on the Red Desert north of Green River in Sweetwater County (Blair 1987; Commission on the Conservation of the Jackson Hole Elk 1927). The state game warden made a similar proposal in 1907, including a six-mile-wide strip of land near the head of the Green River Divide (Commission on the Conservation of the Jackson Hole Elk 1927). Finally, the Wyoming legislature passed a proposal in 1909 recommending the protection of an area similar to those proposed in the two earlier proposals.

The migrations seemed to have ended by the early 1900s. Casebeer (1960), a Teton National Forest range conservationist, reported that 1882 was the first record of a disastrous winter loss of elk and that the winter of 1886-87 marked the beginning of the end of migrations to the Green River. Almer Nelson’s (1960) interviews with early Jackson residents supports Casebeer’s reports.

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Nelson indicated that thirty-five to forty thousand elk stayed in Jackson Hole between 1885 and 1890. While some reported that the last migration occurred as early as 1905 because of settlement of the Upper Green River Valley (Wogenson 1951), others dated the last migratory movement of elk from Jackson to the Upper Green River Valley as late as 1913 (Casebeer 1960) or even 1917 (Allred 1950). An anonymous speech (Anonymous 1936: 2) reported a less firm date, but also placed “the last such migration of elk south...early in this century.” The report cited settlement and sheep herding—reducing available forage for wildlife—as reasons for the termination of migrations. Some reports indicated that a few elk may have started the migration south as late as the winter of 1920-21, when a lone cow was found in a stand of aspen on Shoal Creek, or as late as 1918 when elk could be seen on the ridges of Hoback Basin (Hansen 1922).

EVIDENCE THAT ELK HAVE ALWAYS STAYED IN JACKSON

While much of the evidence indicates that the majority of the elk that summered in Jackson went further south for the winter, there may have always been some elk that wintered in Jackson. A report called “The Government Ranch in Jackson Hole” stated that in 1877 a *Field and Stream* magazine correspondent reported that 15,000 elk wintered south of Yellowstone in the Shoshone and Snake River valleys (although this report is considered to be exaggerated). Wogenson (1951: 2) reported that estimates of the elk herd in Jackson at the turn of the century ranged from “20,000 to 30,000 animals, with some claims of even 60,000.” An anonymous speech in the National Elk Refuge files (Anonymous 1936: 2) also reported that “some of the early settlers have told me that they estimated there were between thirty-five and forty thousand elk here [in Jackson] in the winter.” Leek also reported that “many thousands remained [in Jackson Hole], they were in sight on every hillside, they lined the banks of every stream, they over-ran every ranch in the lower valley” (Leek, undated: 1). He reported, too, that “during the fall of 1910 the elk were driven down from the mountains early by heavy snow storms in more than their usual numbers, but now because of extensive settlements and many wire fences on the upper Green River the elk could not [sic] longer migrate to the Red Desert to winter, but must all remain in Jackson’s Hole” (Leek, undated: 1).

The possibility that elk remained in Jackson during the latter part of the nineteenth century does not preclude the possibility of their also migrating to the Green River Valley and Red Desert. In a study of elk behavior in the early 1950s, Altmann (1956) found that elk break into smaller groups for migration. It seems that many of the citizens making reports on the location of elk were witnessing and recording changes in migration patterns, changes that eventually led the entire elk herd to stay in Jackson Hole over winter.

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CONCLUSION

Evidence in various archives indicates that migrations of elk did indeed occur through Jackson Hole to the Green River Basin and Red Desert. It is difficult to say whether elk herds were also always found in Jackson Hole, although at the time of the settlement of Jackson, evidence suggests that herds broke into smaller groups, with some staying in the valley and some migrating further south to the Red Desert. Factors such as hunting pressure, fences, competition for forage from sheep and cattle, and later the availability of artificial feed seem eventually to have led the entire elk herd to stay in Jackson Hole.

Thus, re-establishing historical migration routes *may* prove a biologically and ecologically viable option. It *may* provide one way to improve management to maintain the health of the herd while also meeting the demands of the many interest groups concerned with elk management.

However, I would like to stress that the information in this paper is meant only to inform the policy process and to provide a historical picture of ecological conditions and does not constitute a management recommendation. For a more complete examination of the biological and ecological potential for re-establishing migrations, see Allred (1950), who discusses attempts by the Wyoming Game and Fish Commission in the 1940s and 1950s to re-establish these corridors. The information provided here is not sufficient to evaluate the potential success of any proposed policy, however. The problems experienced in elk management extend beyond the biological. For example, tension over state and federal control and over agency jurisdiction continues to pervade the elk question. As Stephen Leek observed early in the century, wildlife preservation depends on people, on their interests and demands. Citizens today continue to advocate the inclusion of “representatives of the Jackson Hole community” to “develop a community-based, long-term vision for wildlife management in Jackson Hole” (Day 1998). As with historical debates about elk management, current debates involve the way that communities interact as much as the way animals behave. Only after considering the social and political conditions can the potential for creating and implementing a policy to re-establish historical migration be adequately evaluated.

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