The Lochsa Elk Herd

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History and Future

By

James M. Peek, Thomas A. Leege
and Michael W. Schlegel

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McKetta flew Peek into the Lochsa drainage to photograph current vegetation conditions in summer 2016. George Hatley, “Mr. Appaloosa” (1924-2011), Don McPherson, Conservation Officer (1926-2011), Idaho Fish and Game, Herman Kuykendall (1935-2020) and Jim Renshaw, former outfitters, were interviewed to learn more of the history of the Lochsa elk. Gary R. (Sam) McNeil (1938-2016), regional wildlife manager headquartered at Lewiston, provided highly valuable insights into the recent history of elk management in the Lochsa. This work would not have proceeded without the contributions of these people. This work was supported by Rocky Mountain Elk Foundation, Idaho Department of Fish & Game, U.S. Forest Service, University of Idaho College of Natural Resources and Idaho Cooperative Fish & Wildlife Research Unit.

CHAPTER ONE

INTRODUCTION

Central Idaho requires travel from the prairies down into the river canyons, contrasting with most of the intermountain west where people travel in the valleys and look up into the mountains. But central Idaho with its steep canyons that were made by ancient rivers and glaciers, has been travelled as much along the higher country as in the valleys. When Lewis and Clark first entered what is now Idaho, they looked down on the Lochsa River. If you live on the Camas Prairie in Grangevillle or Cottonwood or one of the smaller towns, you drive down to the Clearwater River or to the Salmon River. If you live on the Palouse, you drive down to the confluence of the Clearwater and the Snake River at Lewiston and Clarkston. Of course, if you live at Kamiah or Kooskia or Orofino along the Clearwater, you look up, the original inhabitants' view from their habitations. If you drive north towards Coeur d'Alene from the Palouse, you eventually come down onto Coeur d'Alene Lake. The geology of central Idaho is primarily derived from the sculpting by the great ancient rivers in the region, resulting in the remnants of those same rivers being surrounded by steep slopes and stream sides that were not easily accessible to original peoples travelling through, and require we today to drive in "up and down country".

When Lewis and Clark came across the Bitterroots in 1805 and again in 1806, they travelled the trail on the high ground used by the native peoples, the Lolo Trail. And going across to the west the first time, they travelled in a huge snow fall in September. There is little doubt that the hunters they had with them were skilled, but did they really scour the Lochsa drainage and locate game in such conditions? And when they finally got down to the Clearwater and contacted the Nez Perce people, were they just given the dried salmon and dogs to eat and the tribesmen kept those tasty elk for themselves? We know now that the tribesmen hunted elk in the Lochsa. Lieberg (1899) met Indians that were burning in the Lochsa, probably to stimulate berry-producers but perhaps elk habitat as well. Aboriginals across the continent are known to use fire for purposes of acquiring game and creating habitats for various plants and animals. Perhaps those tribesmen in 1805 didn't have any elk to give Lewis and Clark. Perhaps they

didn't have enough elk but had plenty of salmon to give. Perhaps they had plenty of elk and were not inclined to share with those emaciated white intruders. Perhaps the salmon were the prized protein and not elk. Perhaps they were more interested in creating habitat for berry-producing shrubs and palatable forbs, with elk just being an added benefit. Likely, tribesmen were purposefully burning for all of these reasons, but why Lewis and Clark were provided salmon remains a mystery.

The stimulus for this review came from a field trip initiated by the Rocky Mountain Elk Foundation into the Fish Creek drainage in July 1990. Discussions about future management of the population and the habitat inevitably led to discussions about the past and what had been learned. A large body of information on elk and their habitat has accumulated over the past century for the Lochsa River drainage, from the Idaho Department of Fish & Game (IDFG), the United States Forest Service (USFS), the University of Idaho (UI), and from many individuals. This information is virtually a history of elk and elk habitat management in northern Idaho. It was apparent to all that the record available in project reports and separate publications would, if synthesized, prove useful in providing direction for the future.

Reviews of conservation and management of the Scottish red deer (Darling 1937), the red deer on Scotland's Island of Rhum (Clutton-Brock et al. 1982), the Sun River elk population in Montana (Picton and Picton 1975), the Gallatin elk in Montana (Lovaas 1968), the northern Yellowstone National Park elk (Houston 1982), the Jackson Hole elk in Wyoming (Boyce 1989), and the White River elk in Colorado (Boyd 1970, Freddy 1985) provide historical perspective on those populations which serve as sources from which managers and others have benefited. Changes in management direction as conditions changed, or better understanding of the ecology and behavior as information accumulated, are evident for each of these populations. Management in the Lochsa and elsewhere in North America, initially intended to increase populations gave way to concern over damage to habitat through grazing, then to effects of land use practices such as logging on summer ranges, then to concerns over how to spread harvest equitably among increasing numbers of hunters, to concerns over depletion of bulls in populations, and now to the relationship of predators to this species.

Our purpose was to accumulate, analyze, and synthesize the available records relevant to the management of the Lochsa elk herd. We attempt to place the population dynamics of the elk herd and the ecology of its habitat in context of other reviews of elk biology.

Information Sources Used in This Report

Available records and documents concerning elk population management from IDFG include checking station data, hunter report cards, telephone survey results, mandatory reports, hunter densities, and elk census and population characteristics. Additional information on elk movement patterns and food habits was obtained from IDFG and USFS reports, University of Idaho publications, and graduate student theses.

Logging, roads, prescribed burning, and wild fire data for the Lochsa drainage came from the Clearwater National Forest Supervisor's Office, Powell Ranger District, and Lochsa Ranger District. Plum Creek Timber Company, Missoula, supplied access to their logging and road records for their lands in the upper Lochsa drainage. The early surveys of elk were provided by the Clearwater National Forest and the Nezperce National Forest.

We used a geographic information system (GIS) to store, analyze, and display spatial data on elk, logging, roads, prescribed burns, and wild fires. The software for the GIS is PC ARC/INFO from the Environmental Systems Research Institute. The project included four categories of map data. The first shows compartment (drainage basin) boundaries digitized from 1:24,000 base maps. Roads were the second category of the map data and also were digitized from 1:24,000 U.S. Geological Survey base maps. Spatial and temporal distribution of wildfire and prescribed fires were digitized from 1:100,000 maps, obtained from the Powell and Lochsa ranger districts.

Attribute data consist of elk population, elk harvest, logging, and roads. The first three contain historical records based on compartments, each of parts of the drainage. Elk and logging data often have more than one record for a compartment. The road data include road number and year of construction.

We assessed vegetation changes over the past 20 years by analyzing multi-spectral scanner (MSS) satellite imagery taken in 1972 (the first year such images were obtained) and 1991. Landsat 5 Multispectral Scanner imagery for summer 2012 (ESRI ArcGIS 10.4.1) was used to classify habitat within the Lochsa River drainage, which was defined by the Game Management Unit 12 boundary, into the five habitat types. Spectral classes were assigned to one of the five vegetation categories based on models developed from over 130 reference points of known vegetation.

CHAPTER TWO

LOCHSA RIVER DRAINAGE

The Lochsa River is designated Game Management Unit 12 by Idaho Department of Fish and Game (Figure 2-1). The U.S. Forest Service subdivides Unit 12 into 63 compartments for management purposes. Bisected from the northeast to the southwest by the Lochsa River and U.S. Highway 12, the 789,114 acre (319,343 ha) area extends to the Idaho/Montana border and Lolo Pass in the east and nearly to the small community of Lowell along the Clearwater River in the west.

The southern portion of Unit 12 includes the northernmost portion of the Selway-Bitterroot Wilderness. A detailed description of the Unit 12 boundary is provided in the annual big game season hunting regulations and maps by IDFG. U.S. Forest Service, Clearwater-Nez Perce National Forests, provide a detailed map of the National Forests that include the Lochsa.

The area is steep, mountainous terrain, dissected by innumerable streams and draws (Figure 2-2). Elevations range from about 1312 feet (400 m) near Lowell to over 8530 feet (2,600 m) on peaks dotting the game unit's perimeter. Geology is complex, but the basic formation is the Idaho Batholith which is primarily composed of coarse-grained quartz (Greenwood and Morrison 1967). Western redcedar, grand fir, subalpine fir, Douglas fir, mountain hemlock, and western hemlock associations define the climax communities of much of the area but elevation, aspect, and successional stage define current vegetation. Ponderosa pine and Douglas fir associations prevail at lower elevations and on drier sites. Subalpine fir, lodgepole pine, and Engelmann spruce associations dominate higher elevations. Seral shrubfields, Ponderosa pine, Douglas fir, western white pine, and lodgepole pine occur following disturbance of these forests, originally likely by various pathogens such as mountain pine beetles or spruce budworm that weakened and killed trees, which subsequently became victims of windfall or blowdown, and finally by wildfire. In recent times logging is also a disturbance, most recently in the eastern portions of the drainage on the Powell Ranger District and the private “checkerboard” sections that were originally given to the Northern Pacific Railroad and subsequently to its

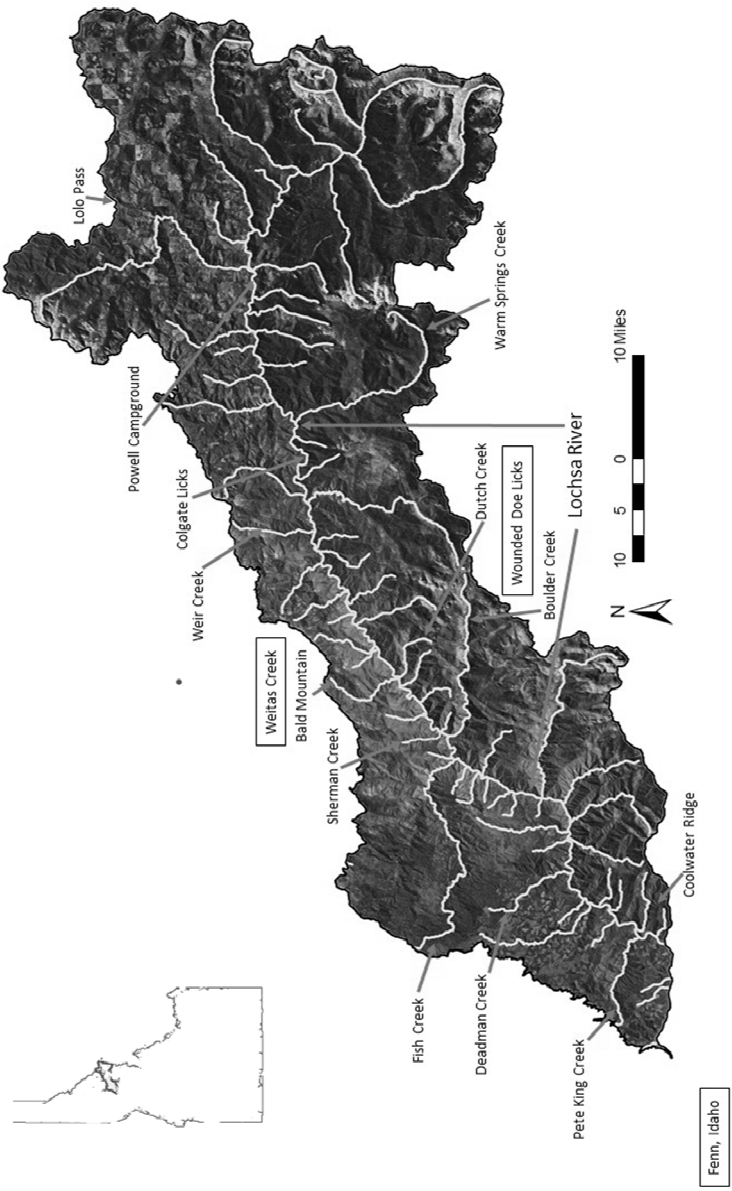

Figure 2-1. The Lochsa River drainage and its general location within the state of Idaho.

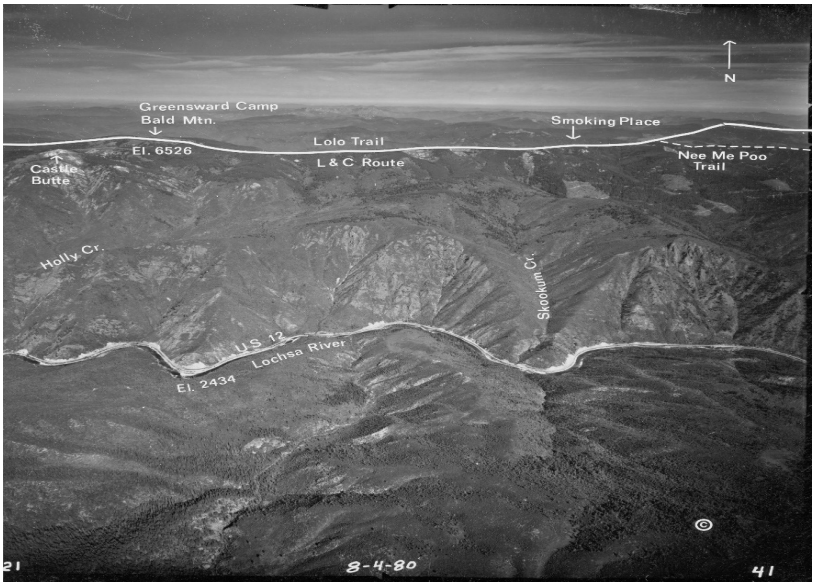

Figure 2-2. Photo of Lochsa River facing north, taken in 1980 by U.S. Forest Service. U.S. Highway 12 is visible along the River. Drainage to left (west) is Holly Creek, Skookum Creek to right (east) in the high foreground. This is approximately 80 km east of the confluence of the Lochsa River and the Selway River. Darkest color is mature timber, lighter is regenerating timber, and lightest is nonforested area. Courtesy of University of Idaho Library.

land management spinoff, Plum Creek Timber Company, and most recently Western Pacific Timber. Current status of the private timberlands is in flux as Western Pacific Timber seeks to divest itself of those holdings.

The Lochsa drainage experiences a climate that is "transitional between a north-Pacific coastal type and a continental type" (Finklin 1983:11). Temperatures are moderate compared to similar latitudes further east. Average daily temperatures may range from 28^0 F (-2 C) in January to 89^0F (21 C) in July. Peaks of precipitation occur during fall and winter with a secondary peak in late spring. Annual total precipitation may range from 40-70 inches (1.02-1.78 meters) depending on elevation. During winter deep snows often occur although snow depths are mediated by elevation and aspect. Daily weather records have been recorded nearby at the Fenn Ranger Station on the lower Selway River since 1939 (Table 2-1). This station is located about five miles up the Selway River from its confluence with the

Table 2-1. Climate summary for Fenn Ranger Station, 1939-2016. Location is about 5 miles (8 km) from the confluence of the Selway and Lochsa Rivers on the Selway [1].

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Maximum Temperature (C)	1.8	6.1	10.8	16.3	21.4	25.4	31.7	31.6	24.7	15.9	7.1	2.7	16.3
Average Minimum Temperature (C)	-4.6	-2.7	-0.8	1.9	5.4	8.8	10.9	10.2	6.9	2.9	-0.7	-3.4	2.9
Average Total Precipitation (cm.)	8.8	8.6	9.4	9.1	8.9	8.4	2.5	3.0	5.3	7.4	11.4	10.9	96.8
Average Total SnowFall (cm.)	43.2	20.6	8.4	0.5	0.0	0.0	0.0	0.0	0.0	0.3	11.4	26.6	120.9
Average Snow Depth (cm.)	17.8	12.7	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	45.6

[1]Data from Western Regional Climate Center, Reno, Nevada.

Lochsa at 1560 feet (475.5 meters) elevation. There are disjunct species found on the west coast such as Pacific dogwood and scotch broom, reflecting the high moisture regime and the moderate temperatures in the lower area. Annual snowfall average is 47.6 inches (1.21 meters) with most of that occurring from December through February, although snows are also recorded in October, November and March. Average snow depth is 7 inches in January, 5 inches in February and 1-3 inches (0.03-0.09 m) in April and December, respectively.

The Powell Ranger Station records illustrate the climate at the upper elevations at 5873 feet (1790 meters) near Lolo Pass (Table 2-2). Annual temperatures range between 55.9 F (13.3 C) average maximum for all months to 29.5 F(-1.39 C) average minimum for all months. Temperatures for January and December average at freezing for the highs and in the low 20's and high teens for the lows. Total snowfall averages 166.5 inches (4.23 meters), with depths averaging between 2 and 2.7 feet (0.6-0.8 meters) in January through March. The Lochsa drainage climate can be characterized as wet and mild in comparison to most of the northern Rocky Mountain forests.

Access and Timber Harvest

Road construction started in 1926 in the Lochsa by the USFS. The highway up the Lochsa was completed as a gravel road in 1960. Two years later, 1962, the road was paved. Two peak years of road building occurred: 1935 when 145 miles (234 km) of road were built which followed the extensive fires of 1934 and coincided with the presence of the Civilian Conservation Corp, and 1969 when 178 miles (286 km) of road were built which coincided with sharply increased timber harvest (Figure 2-3). Roads are concentrated in the east and west ends of the drainage with few roads south of the Lochsa River. Road building averaged 19+-30 miles (30 ± 49 km) built annually between 1926 and 1990. Total miles of road built during the 65-year period equaled 1194 miles (1,922 km).

Our records for timber harvest begin in 1950. The area of timber harvested annually increased in general through 1990 with precipitous decline after that (Figure 2-3). Similar to trends throughout the Northwest, peak logging occurred in the 1980s. Between the 1940s and 1992, 57,351 acres (23,212 ha) of the drainage have been logged. As would be expected, the distribution of logging coincides with the distribution of roads that are concentrated at the east and west ends of the Lochsa drainage with little occurring on the south side of the Lochsa River.

Table 2-2. Climate summary for Powell Ranger Station near head of Lochsa River and Lolo Pass[1]. Data is for the period August 1962- July 2013.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Max. Temperature (C)	0.1	3.6	7.6	12.1	17.8	22.4	28.2	27.9	22.1	13.9	4.3	-0.5	13.3
Average Min. Temperature (C)	-8.9	-7.9	-5.1	-2.1	1.2	5.2	7.2	6.2	2.2	-1.5	-4.6	-8.7	-1.4
Average Total Precipitation (cm.)	14.5	9.4	8.4	6.9	7.6	7.6	3.3	3.8	5.6	7.4	11.7	12.7	98.3
Average Total SnowFall (cm.)	124.	70.4	51.3	17.3	2.8	0.3	0.0	0.0	0.0	4.1	45.7	107.	424.
Average Snow Depth (cm.)	71.1	81.3	60.9	15.2	0.0	0.0	0.0	0.0	0.0	0.0	7.6	35.6	22.9

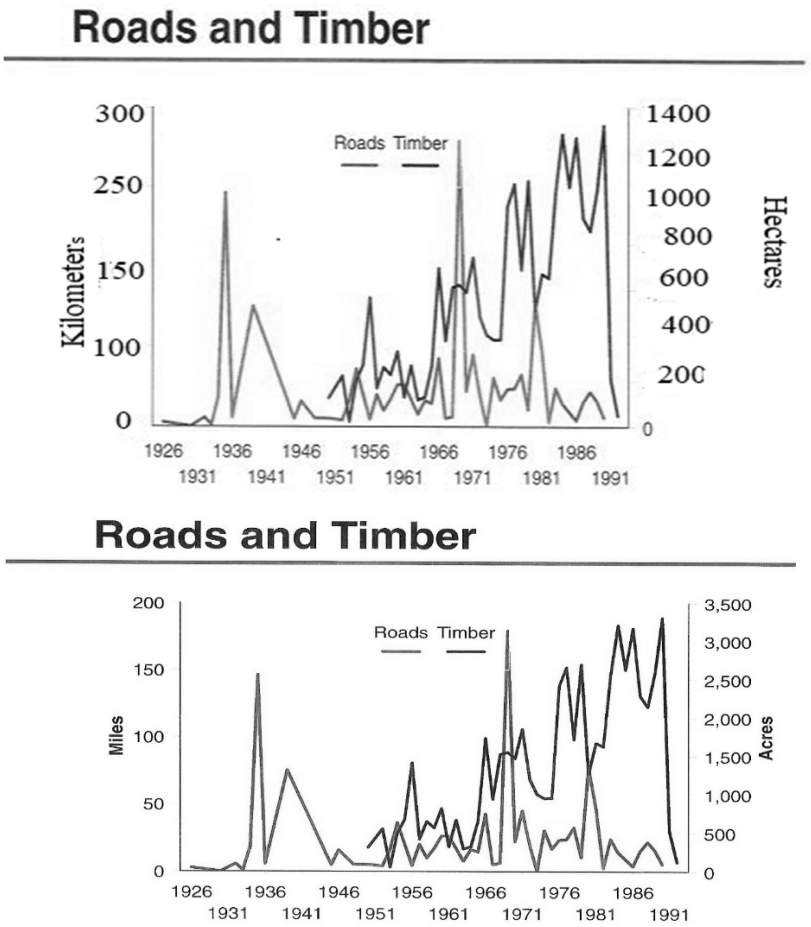

Figure 2-3. Length of roads built, and area of timber cut in the Lochsa from 1926-1991. This includes Clearwater National Forest and Plum Creek Timber harvests.

Some logging and associated road construction has occurred since1991, but this shows the trends. More recent activity is at higher elevations on the eastern portions of the drainage. These cuts are not much used by elk because of deep snows and the presence of wolves. These activities illustrate efforts by U.S. Forest Service to proceed with multiple use management as much as possible. Campgrounds along the Lochsa River are also available,

with the DeVoto Memorial Grove with its huge western red cedars being one of the more attractive sites. The River attracts floaters, kayakers, and fishermen from late spring through fall. A number of suspension bridges provide access for hikers and stock to cross the river to the south to the Selway-Bitterroot Wilderness. Roads and trails provide access to the north side of the river, but some roads are managed to reduce vehicle access that affects elk distributions.

CHAPTER THREE

ORIGINS OF ELK IN THE LOCHSA

Elk are members of a large group of antlered species in the genus *Cervus* that occur across the northern hemisphere. Wherever their relatives and they themselves occur, they are and have always been a prize for their flesh, hides, antlers, teeth, and bones. They represent a highly adaptable complex of species and even today the taxonomy of the complex is not completely agreed upon. As one would imagine, taxonomic status of North American elk, more properly designated wapiti to distinguish it from the European elk (North American moose), has been examined and re-examined numerous times, as indicated by changes in its scientific name. We use elk and wapiti interchangeably throughout this report. It was originally designated by Carl von Linnaeus as *Cervus elaphus* in *1758*, part of the red deer complex that occurs across the northern hemisphere. In 1780, attention to what the wapiti should be designated finally resulted in classifying it as *C. canadensis*. However, after extensive studies of behavior, distribution, and morphology, the scientific name was changed back to *C. elaphus* in 1973 (Jones 1983). Recent analyses suggest that the European and Asian red deer complex, plus the North American wapiti, may well be three different species (Geist 1998, O'Gara 2002, Polziehn and Strobeck 1998). The international journals are now using *C.canadensis so* the issue is likely settled for now and our wapiti is classified as it was prior to 1973.

From the standpoint of management and conservation of wapiti in the western part of North America, the scientific designation at the species level doesn't matter as much as the designation of subspecies. The Tule elk, Roosevelt elk, Manitoba elk, and Rocky Mountain elk are considered different subspecies, with management significance. Conservation of Tule elk currently includes introductions to formerly occupied range and otherwise suitable habitat in California. Roosevelt elk occur west of the Cascade Range in Canada and the US. Rocky Mountain elk are thought to have been re-established to formerly occupied range primarily from introductions from Yellowstone National Park in the U.S. and Banff National Park in Canada (Polziehn et al. 1998). They now range east of the

Cascades clear to suitable habitat in states and provinces that border the Atlantic Ocean.

Introductions of Yellowstone elk into Idaho, including the Lochsa, occurred from 1915 through 1946 (O'Gara and Dundas 2002), with an additional 68 from eastern Oregon put into the Pete King drainage of the lower Lochsa in 1976 (Leege 1979). Recent analyses suggest that Lochsa elk are part of the elk population that extends across Idaho and adjacent states and provinces, owing to interchange between groups across this broad region. However, the Lochsa population appears to be moderately distinguishable within this huge complex (Aycrigg and Garton 2014), perhaps because of being less likely to move or intermingle with populations in other areas, or perhaps having less gene flow with the Yellowstone introductions than other populations in Idaho had.

Elk probably evolved in open country where grasses were important in the diet (Guthrie 1966, 1968). The grasses occurred in the drier forests as well as shrub/steppe and prairies. Their premolars and molars show low wide crowns (selenodont), adapted to grinding the silicaceous opaline phytoliths in grasses of the more open regions further east and south. The adaptation includes delayed attainment of complete adult dentition to about three years. Adult tooth wear is relatively fast when compared to the browse-feeding moose. A moose, which replaces all of its milk teeth at 21 months, has high crowned (hypsodont) premolars and molars adapted for cutting and crushing the lignaceous woody forage that is actually less wearing on dentition than grass. Both elk and moose show equivalent tooth wear patterns at the 8 to 10 year age range, but the moose has used its adult teeth approximately a year and a half longer than the elk (Peterson 1955, Quimby and Gaab 1957).

Elk are highly gregarious, a further adaptation to living in open habitat (Geist 1971). Herds of over 200 in summer and over 500 in winter may occur in more open country, although evidence from the northern Yellowstone suggests that those large herds that occupied the open slopes are readily detected by wolves and have largely disappeared with the advent of the gray wolf (Mao et al. 2005). The gregarious-ness facilitates early detection of predators, but wolves also tend to prey on elk in larger groups (Hebblewhite and Pletscher 2002).

Additionally, suitable forage in montane and prairie rangeland is usually more evenly distributed than in forests, where forage may be more dispersed and patchy. Group sizes in forested habitats, including harem size, are smaller. In forests, depending upon size and tree densities, the probability of seeing predators at a distance is lower as is the probability of predators seeing elk. Scent and sound also weigh in on these probabilities

for both predator and prey and how this differs between forests and open country would be difficult to generalize. Gower et al. (2009) concluded that group sizes for any given elk population represent an interaction between forage availability, competition between individuals for food, and predation risk. While larger group sizes should occur where predation risk is high, Hebblewhite and Pletscher (2002) found elk living in small groups may rarely encounter wolves while predation increased as elk density increased. Variation in different areas suggest that generalizations were difficult.

There is evidence of the genus Cervidae, from which wapiti descended, in the early North American fossil record (Kurten and Anderson 1980, O'Gara and Dundas 2002). The record is unevenly distributed across the northwestern states and adjacent Canada but it does give an indication of early presence. The early relatives of wapiti first appeared in southwest Idaho during the late Pliocene epoch, around 2.4 million years ago (Kurten and Anderson 1980). The current-day wapiti appeared to be well distributed across the northwestern states and adjacent Canada as early as 8,000-10,000 years ago. They persisted in North America in glacial refugia, colonizing suitable habitat that became available as the continental ice sheet retreated northward (Geist 1971). Wapiti were present in the Yellowstone at least 2000 years ago, based on evidence from the Lamar Cave (Hadly 1990). The mountain-valley complex of northwestern Montana contained wapiti as far back as 4000-8000 years before present.

The excavations at Medicine Hat, Alberta, revealed the existence of wapiti along with dire wolves, gray wolves, a panther, mammoths, horses, moose, antelope, bighorn sheep, caribou and bison (Woodburne 2004). We live with many fewer large mammals than existed in Pleistocene times over 10,000 years ago.

Impressions of the Lochsa elk are bound up with the Lewis and Clark expedition and major catastrophic wildfire events in the first third of the twentieth century. Visions of large bands of elk trailing through shrub fields in the deep, heavy snows (Figure 3-1) are mixed in with the knowledge that the Lewis and Clark expedition found little sign of these animals when they passed through the region a century and a half before. The old perception that elk were primarily prairie animals and late arrivals to the mountains following the wildfires was undoubtedly spurred by these early events in northern Idaho.

However, Space (1964) reported that the Lewis and Clark journals did present evidence of elk in the Lochsa in 1805. Nez Perce guides reported elk plentiful in the Papoose Creek (renamed to Imnamatnoon Creek) area and around the Jerry Johnson and Colgate Hot Springs. Indians were said to hunt elk around those hot springs.

Robbyn Johnson, an archaeologist for the Clearwater National Forest at Kamiah, reported elk remains at the mouth of Boulder Creek and at Powell were at least 3000 years old (personal communication to James Peek, 12 October 2000). These hunters were using atlatls, an open country weapon that would be suitable for use further west along the breaklands of the Clearwater. They sought to convert the forests to more open lands with fire, which grew edible plants for humans and wildlife alike. Johnson thought that the meadows and other open sites were probably continuously occupied for 5-6000 years, which suggests that harvests were not high enough at any time to indicate excessive harvest of the wildlife resource or the edible plants.

Additional evidence of elk being present in the Lochsa prior to 1800 was provided by Sappington and Carley (1989). Investigations of sites along the highway proposed for improvement required examination for artifacts that indicated the presence of aboriginals. Two sites were carefully examined by these archeologists, the Beaver Flat site and the Pete King Creek site. Beaver Flat, 4.5 miles west of the Boulder Creek campground, was initially occupied approximately 8,000 to 10,000 years ago. Bone fragments were present but were not identifiable. The Pete King site, near the confluence of the Selway and Lochsa Rivers, yielded numerous prehistoric artifacts. It was judged on the basis of the presence of hunting toolkits, and evidence of processing of elk, deer, and bear, that the site was used in fall and spring for hunting. Radio-carbon dating suggested occupation spanned from 2800-3100 years ago. Historical artifacts located in upper strata of this site included spent cartridge cases. Examination of sites distributed along the Clearwater River from the confluence of the Selway and Lochsa Rivers to its confluence with the Snake River show elk, deer, and bighorn sheep being present (Sappington 1994). Bison remains probably came from trips into Montana for taking that species. The archeological records and early accounts suggest that elk were present long before Europeans entered the region.

John Mullan's trip to survey the Lolo Trail in 1854 found elk sign east of Lolo Pass on Lolo Creek (Baird and Baird 2003). Their description of the Lolo Trail at Bald Mountain indicates extensive communities dominated by bear grass and mountain ash, similar to what Lewis and Clark recorded half a century earlier.

H.M. McCartney reported his trip of 1879 to locate a railroad route through the Bitterroots, going up the Lochsa drainage (Baird and Baird 2003). They recorded seeing over 200 elk at Elk Prairie, 150 miles east of Lewiston. McCartney wrote that this was the finest game country he had

ever travelled in. The country was considered too rough for construction of a railroad.

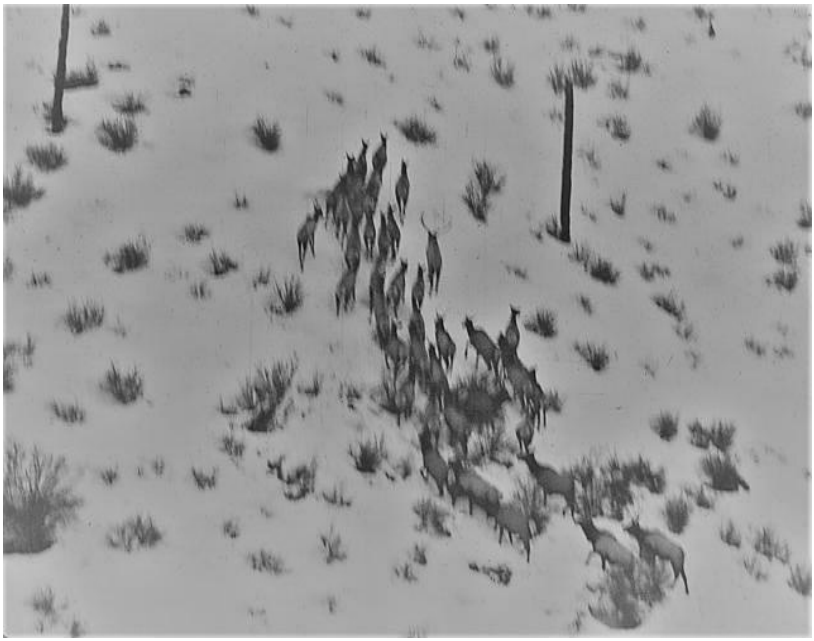

Figure 3-1. A band of elk on a shrub field in the Lochsa. Photograph by Tom Leege.

The surveys conducted in 1897 by Leiberg (1899, Figure 3-2,) reported that Indians burned approximately 1,110,000 acres over a 200 year period. One purpose of their trip was to hunt in the Lochsa and elk were definitely a part of the quarry.