

2004

First Nations Perspectives on the Grasslands of the Interior of British Columbia

Michael D. Blackstock

Rhonda McAllister

Follow this and additional works at: <https://digitalcommons.usf.edu/jea>

Recommended Citation

Blackstock, Michael D. and McAllister, Rhonda. "First Nations Perspectives on the Grasslands of the Interior of British Columbia." *Journal of Ecological Anthropology* 8, no. 1 (2004): 24-46.

Available at: <https://digitalcommons.usf.edu/jea/vol8/iss1/2>

This Research Article is brought to you for free and open access by the Open Access Journals at Digital Commons @ University of South Florida. It has been accepted for inclusion in Journal of Ecological Anthropology by an authorized editor of Digital Commons @ University of South Florida. For more information, please contact digitalcommons@usf.edu.

First Nations Perspectives on the Grasslands of the Interior of British Columbia

MICHAEL D. BLACKSTOCK

RHONDA MCALLISTER

Abstract

Although the First Nations Elders from the interior of southern British Columbia, Canada, recall times when grass was “belly-high to a horse,” today they worry about the deteriorated state of the grasslands. Using ethnographic and historical research methods, this paper documents recognized First Nations experts’ historical memory of the grasslands. Based on the ethnographic accounts, this paper also attempts to reconstruct the effects of colonization on the grassland ecology and First Nations culture. Secondary sources such as early settlers’ accounts and current grassland ecology research are used to augment the testimony of the experts. Two eras are described: 1) Pre-contact era (the three hundred years prior to contact); and 2) Post-contact era (1846-present). The horse, elk, and sharp-tailed grouse were common on the pre-contact grasslands. Overgrazing of the grasslands occurred soon after the miners and gentlemen ranchers brought in their horses and cattle. Sagebrush increased proportionately to the decrease in grasses. The First Nations culture changed from gathering sustenance off the grasslands to servicing the needs of the new settlers, and then to marginalization by industrial agriculture. A key argument of the paper is that when First Nations’ access to water was diverted by settlers and the wetlands were drained, cultivated, and polluted (both culturally and ecologically), First Nations’ access to the grassland was restricted. The paper concludes by defining grassland restoration from a social and ecological perspective and proposes that water be a key focus of the restoration process.

Introduction

“The grasses were belly-high to a horse, back then.” The Nlaka’pamux (Thompson), Silx (Okanagan), Secwepemc (Shuswap), Stl’atl’imx (Lillooet), and Ts’ilquot’in (Chilcotin) nations—First Nations of the southern interior of British Columbia (BC)—relied, for at least ten thousand years, on the lower, middle and upper elevation grasslands (Gayton 2003:7; Jules 2001) (Figure 1). Plants found in grassland regions were intensely used and managed by First Nations people for subsistence as well as for medicines, technology and for spiritual and ceremonial purposes. Plants such as arrow-leaved balsamroot (*Balsamorhiza sagittata*), bitterroot (*Lewisia rediviva*) and spring beauty (*Claytonia lanceolata*) were important food sources. Shrubs such as saskatoon (*Amelanchier alnifolia*) provided sources of food and medicine while trees such as paper birch (*Betula papyrifera*) found in the wetter areas of the grasslands provided materials for the construction of baskets.

A First Nations historical perspective on grassland ecosystems, beginning with images of ecosystem structure and function prior to European contact, is essential for a meaningful analysis of grazing impacts. Additionally, the First Nations ecological perspective can provide important insight for the management of grasslands and thus should be considered an essential component of grassland restoration projects.¹ This paper has two purposes: 1) to record First Nations perspectives on how agricultural activities, especially grazing, have affected their land and culture thereby helping to define the reference conditions of the grasslands; and 2) to discuss grassland restoration ecology from a First Nations perspective.

Using ethnographic and historical research methods, this paper chronologically documents land use in British Columbia from pre-European contact through the present. The ethno-historical accounts reveal distinct First Nations and Western

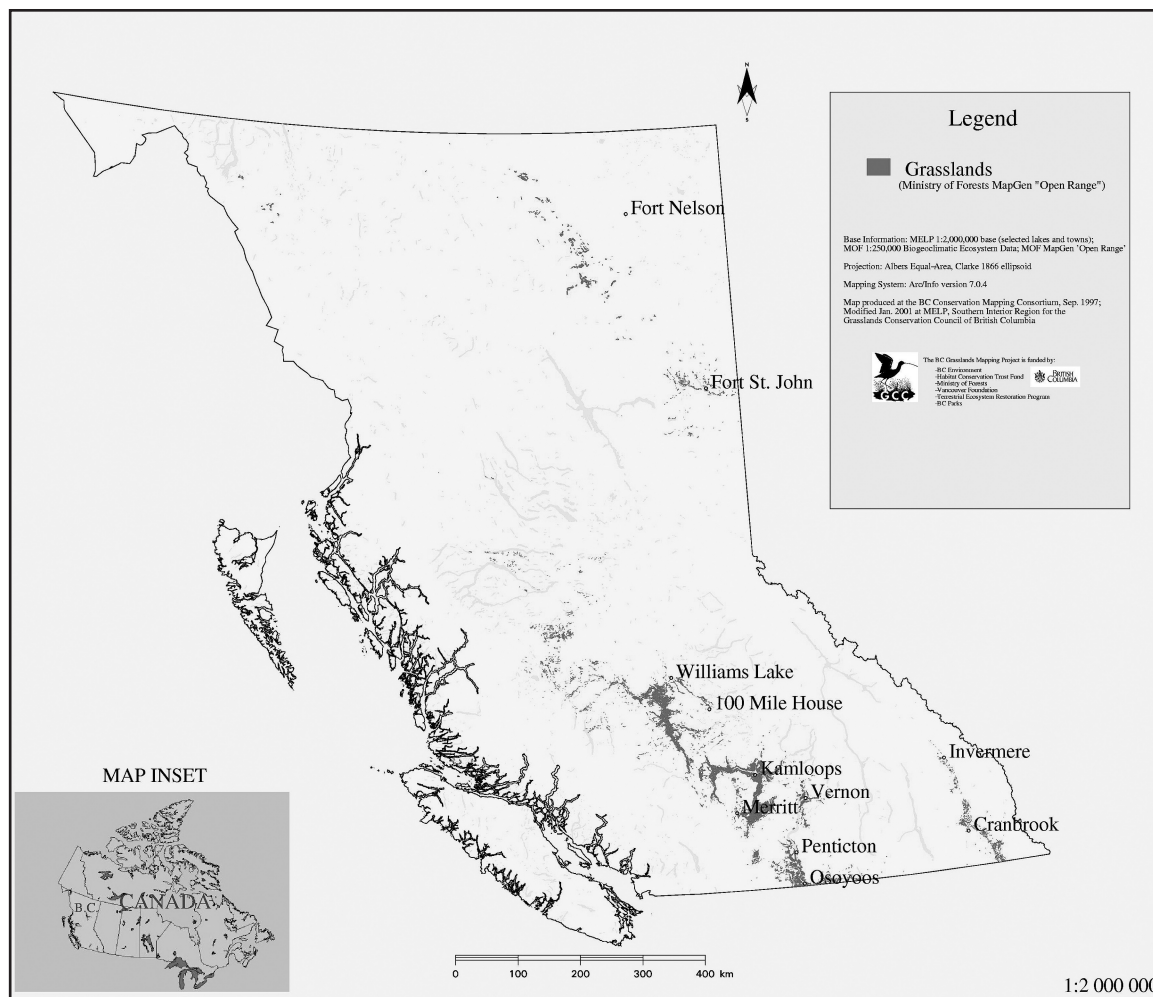


Figure 1. Location of grasslands in British Columbia.

ecological perspectives on the structure and function of grassland ecosystems. The data suggest that overgrazing of the Interior Plateau grasslands by livestock began early in the settlement of British Columbia. Furthermore, land encroachment and water diversion by the ranchers, along with the introduction of the horse, created major shifts in the cultural systems of First Nations. Ultimately, it is clear that part of the challenge of restoring the ecological health and traditional uses of grasslands lies in revising traditional definitions of 'restoration.'

Methodology

Within an historical ecology framework (Bismanis et al. 2003; Swetnam et al. 1999), two types of ethnographic data were collected to document First Nations experts' first-hand knowledge of grassland ecology. First, primary ethnographic data were collected in the form of qualitative and verbal documentaries (oral history). Next, secondary data were collected in the form of written "documentaries" (e.g., written, tabulated, mapped or photographic records) and ecological records (e.g., records of

pollen, charcoal, plant macrofossils, phytoliths, etc.) (Swetnam et al. 1999). Interviewees were chosen because of their expert knowledge about the grasslands and ranching, in combination with their respected knowledge of First Nations history.² They represent a cross-section of the three primary nations who inhabit the grasslands, and are acknowledged in the First Nations communities as knowledge keepers or community experts—they would be called upon by their community to speak about the grasslands.

Four interviews were conducted, taped and transcribed, based on a common set of questions.³ In one case an interpreter was used to translate the occasional indigenous word usage during the interview. Each interviewee had the opportunity to review the transcribed interview and a draft of this paper; they provided the research team with written permission to publish the transcribed material.

A thematic analysis was completed on each transcript. Three steps were involved in the thematic analysis: 1) labelling a theme in the margin of each paragraph of transcript text; 2) creating a map of themes encompassing all transcripts; and 3) analyzing recurring or anomalous themes. Recurring and strongly emphasized themes such as wetlands and the horse are captured in the theme analysis; however, just as important are anomalies such as pre-contact irrigation. Thematic analysis also involved crosschecking anomalies in accounts with other Elders, as well as secondary sources. The hypotheses and assumptions that emerge are derived from the inductive reasoning process, but they also rely on the crosschecking process to establish validity. Where possible, secondary written sources, both ethnographic and ecological, were reviewed to further explore and corroborate themes that emerged from primary interviews.

Limitations of the Methodology

Elders' fragmented and brief recollections of the recent past combined with the scarcity of Elders who are keepers of oral history hundreds of years old limit our ability to retrodict reference conditions of the grasslands. As Swetnam et al. (1999:1201) point out, historical ecologists are faced with the "fading record" problem—how to capture what is left now as reliability decreases over time.

The scale of interpretation is also a limitation. The Elders' recollections are a mix of specific memories of exact locations or general senses across large landscapes (e.g., "belly-high grass"). Thus the knitting together of themes and accounts can create scaling errors. A sample of four interviewees does not represent the diversity of perspectives that the variety of First Nations communities may have about the grasslands and its history. Swetnam et al. (1999) discuss other related limitations of historical ecology such as cultural filtering (i.e., be wary of cultural biases inherent within the documentary record), the no analogue problem (i.e., past ecological conditions may have no contemporary to compare with) and the distance decay problem (i.e., extrapolation validity for described conditions at one locale decreases as spatial and temporal distance increases).

This paper's intent is to capture the First Nations perspective. Although there is inherent cultural bias in the research methodology utilized, there is archival value in capturing oral testimony. As the First Nations knowledge keepers pass away, so too does their oral record. Therefore it is imperative for the researcher to capture not only their knowledge but also be able to place it within a context. Specifically the researcher needs to analyze any potential biases the Elder may have that might influence the documentary record.

Brief Biographies of Four First Nations Elders

The late Grand Chief Gordon Antoine was the Chief of the Coldwater Indian Band, and Grand Chief of the N'lakapamux Nation in the Nicola Valley, near Merritt, British Columbia. In 1993, Chief Antoine was awarded the Order of British Columbia for his community leadership. Chief Antoine, along with his father, was a cattle rancher. Since his graduation from Merritt Senior Secondary School, he was an active member of his community, serving in diverse arenas such as local government, post-secondary education, socio-economic development, private enterprise, and natural resources.

The Honourable Len Marchand is a member of the Okanagan Indian Band and honorary Chief of the Okanagan nation (situated around the cities of Vernon, Penticton and Osoyoos, BC). He attended the University of British Columbia where he achieved

a degree in Agriculture (B.S.A.) in 1959, and in 1964 he completed a Master of Science degree in Forestry (M.S.F.) at the University of Idaho. His career included agricultural research, where he co-authored one of the first guides to grassland range management (McLean and Marchand 1968), and research papers that described native grassland vegetation from a successional and genetic perspective (van Ryswyk et al. 1966). Next, Len entered a long and distinguished career in Canadian politics; for instance, he served as the federal Minister of State for Environment (1977-79). He was a director of the Western Indian Agriculture Corporation (1979-84).

Elder Nathan Spinks is past chief of the Lytton Indian Band, Nlaka'pamux (Thompson) Nation located along the arid grassland benches paralleling the Fraser River, British Columbia. Spinks is also a farmer and cultural advisor for the band.

Born and raised in Kamloops, British Columbia, Mr. John Jules is a member of the Kamloops Indian band of the Secwepemc nation and is currently the Cultural Resource Management Administrator. He achieved a Bachelor of Arts degree in anthropology, archaeology and linguistics from Simon Fraser University. He has twenty years of experience in forestry and range management with the Kamloops Indian Band and has been involved in the ranching business.

The Study of Grassland Modification in British Columbia

Reconstruction of an ecological and cultural profile for the interior prehistoric grasslands is a difficult task. Richard Hebda (1982) provides a post-glacial history of grasslands in Southern British Columbia using paleo-ecological investigations of cores by the technique of pollen analysis. There are a few researchers, such as Alexander (1992) and Balf (1978), that have used ethno-archaeological reconstruction techniques, including the use of first settlers' notes and diaries, to provide glimpses of grassland systems in the past. Alexander (1992) attributes the difficulty in reconstructing prehistoric seasonal grassland use by the Secwepemc (Shuswap) and Stl'atl'imx (Lillooet) peoples to the lack of ethnographic data. Even where data are available, however, the impressions of the grassland ecosystem

documented by ethnographers and explorers should not be considered to "represent stable conditions," but should be viewed as a snapshot (Black et al. 1999:5).

In their study *Biodiversity and Land-use History of the Palouse Bioregion: Pre-European to Present*, Black et al. (1999) presented a land-use history of the grasslands in the Palouse bioregion, the northern extent of which overlaps the southern interior grassland bioregion at Osoyoos, British Columbia. The researchers used a multi-scale approach to review historical vegetative, soil, fire regime and human settlement data to monitor changes at three scales: bioregional (e.g., aerial and satellite imagery), county (e.g., soil surveys), and fine (875 ha study area mapping).⁴ What follows is a brief description of the grasslands during the two hundred years before European contact based primarily on interviews with local experts. Since the study conducted by Black et al. (1999) is compatible from a bioregional and research point of view, it supplements this paper's discussion on land use changes as a secondary source of data.

Prehistoric Grasslands (Prior to 1846)

The prehistoric grasslands, as the Elders remember, were wide-open expanses where people, elk, horses, and sharp-tailed grouse freely roamed seeking water, foods and medicines. Most communities in the area managed their grasslands using fire, and some even practised irrigation using small clay-packed ditches to grow beans and corn.

Wetlands

Given that most of the grasslands are held, cultivated and managed privately, and that Black et al.'s (1999:10) study concluded that their broad-scale analysis probably "vastly underestimated the past abundance of riparian areas and the small patches of wetlands," it is supposed here that prehistoric grasslands had more wetlands than do contemporary grasslands (see Black et al. 1999:11 for a similar hypothesis about the Palouse grasslands). When asked if there were more wetlands in prehistoric grasslands, Gordon Antoine stated emphatically: "Yes, yes, yes. Every pothole used to have ducks. Now they're all

gone. One area was on 'Hillcrest' above Stump Lake, and another area was 'Sh chek ush' or IR #4 behind the Quilchena store; and all along the road going to Princeton." John Jules echoed Antoine's response: "Absolutely. With damming, some upper wetlands became artificial lakes and lower ones dried up. Also, wetlands were filled in to facilitate growing crops."

Water diversion projects to irrigate crops and to water livestock, along with the draining of wetlands to cultivate crops and establish settlements, were responsible for the disappearing wetlands (Antoine 2001; Black et al. 1999; Jules 2001; Nicholas 1998).⁵ A North Carolina State University research report (Anon. 2001) suggests that less than half of the original wetlands in the United States remain. The report also points out that remaining wetlands may be suffering from functional degradation; specifically, wetlands may be less efficient in their capacity to process pollutants. The gradual loss of wetlands must have had a significant effect on the First Nations cultures since "Wetland environments have had an important role in human affairs around the globe and throughout antiquity" (Nicholas 1998:31). Cattail (*Typha* spp.), tule (*Scirpus* spp.), reed (*Phragmites* spp.) and Indian hemp (*Apocynum cannabinum*) are important wetland plants used for baskets, mats, sandals, rope, and building construction (Antoine 2001; Nicholas 1998).

Irrigation

Elder Nathan Spinks (2002) recalls how the Nlaka'pamux (Thompson) people near Lytton, British Columbia constructed small irrigation ditches to bring water from the creeks that fed the Fraser River to their bean and potato crops. Spinks was asked to describe how the pre-contact irrigation systems were constructed, and he answered:

Well you know a long time ago before the board (lumber) came, I question my grandparents lots of times, 'You know, how do you make that water go down that goddamn gravel, how do you do that?' OK, you wanna learn somethin' today, we'll do it, so you wanna give me a basket.' He took a basket himself and some of that clay. You see, and there's a right kind of clay is what they put on the ditches and they'd let that water run on the ditch you know

that clay and then they'd chink it all up and then they would let the water run. Then they'd kinda smooth it out a little bit and they'd let it bake. They'd let it bake until they figures it's ripe and that clay does not move . . . Just like cement. That was before the white man ever came around here that's what they did.⁶

This account is very significant since it indicates that small portions of the grasslands were irrigated, and that First Nations were not simply gatherers of grassland herbs and medicinal plants, but in fact may have practiced some form of agriculture.

Fire

Prior research well documents the fact that First Nations people used fire to manipulate grassland succession to maintain browse for ungulates, suppress sagebrush, and encourage herb growth (Black et al. 1999; Jules 2001; Turner 1999). Jules (2001) says the Elders adapted their use of fire to suppress the intruding sagebrush. The Secwepemc people managed tree encroachment on the prehistoric grasslands through landscape burning of the grasslands. The burning also created healthy forage for the ungulate species. Jules (2001) explains that burning "was happening for, we like to say, thousands of years" and it stopped after the 1870s.⁷ Although the topic of fire was not a central focus of the elders interviewed for this study, it does demonstrate pre-contact human intervention on the grasslands.

Elk

Though they no longer inhabit the interior grasslands, there were once elk (*Cervus elaphus*) grazing the grasslands. The explorer George Dawson (1891:32) retells Shuswap oral history about the origin of the elk in the Kamloops area:

The supernatural being **Kwil-i-elt'**, at the outlet of Kamloops lake was swallowed by the elk monster, and **Kwil-i-elt'** stabbed the elk in the heart with the weapon he carried, and then cut his way out of its belly and came to shore, bringing the elk with him, and inviting his friends to eat some of the meat. As to the elk, he reduced it to its present position, saying to it 'You will no longer kill men, they will in future always kill you.'

Gordon Antoine also discussed elk, or **stxec**, in the pre-contact period:

In terms of pre-contact archaeology, in the middens, elk was the big thing. In terms of my understanding there was a major dying off of the elk just about the time cattle and other things turned up in the [Nicola] valley. My view is that maybe *Brucellosis* may have knocked them off—the elk in that period of time. The archaeologist suggests that it's about 140-150 years ago that they just got wiped out of the valley. And there are, in fact, a couple locations in the valley where, if one is familiar with the prairie cultures of the Head Smashed in Buffalo Jump, there are one or two of those kind of elk killing spots in the valley. And there's also been, I haven't verified it yet, but there's also been the . . . herds migrate in the spring, moving from one location to another. Periodically, they would break through the ice . . . the ice wouldn't be thick enough and so, for example, they say Lundbum Lake has a whole pile of elk horns laying in the bottom and they may still very well be there.⁸

The Nlaka'pamux hunters would chase the elk into box canyons or wooden fence-like corrals as a hunting technique; later these places also functioned as horse corrals (Antoine 2001). Teit (1900:248) also suggests that elk were driven over cliffs. John Jules (2001) explains that the grasslands were—and potentially still are—prime areas for elk. Birds such as the sharp-tailed grouse (*Tympanuchus phasianellus*) and the sandhill cranes (*Grus canadensis*) were also common on the prehistoric grasslands and associated wetlands.

Horse

Prior researchers suggested that the introduction of the horse and the smallpox epidemic were two major events that affected First Nations in the 1700s (Black et al. 1999). All four individuals interviewed for this study agreed that the horse (*Equus* spp.) was present on the prehistoric grasslands. In the minds of the Elders, the story of the horse is symbolic to the pivotal cultural and ecological changes experienced on the grasslands. The horse was introduced and accepted, which re-shaped the First Nations political economy, but there was a bounty on the horse's destiny in the early 1900s because of its perceived negative impact on colonial cattle ranching.

Horses were present on the grasslands since at least 1807 when explorers Simon Fraser and David Thompson both reported seeing horses in British Columbia, even as far north as Fort George (Prince George) (Fraser 1966:63; Thompson 1968:375-378). The explorer Alexander Henry (1988:xiii) claims the Cheyenne traded Spanish horses with the Assiniboine and Cree as early as 1745. Francis Haines (1938) documented the spread of horses northward in North America. Originating in the seventeenth century with Spanish settlements in New Mexico, horses spread northward beginning in the 1650s and may have crossed what is now the Canadian border, east of the Rocky Mountains, as early as 1720 (Haines 1938). There are pictographs in the Similkameen valley that depict a Spanish-like rider on a horse and Teit (1900:Appendix) reported pictographs featuring horses near Spences Bridge. Thompson (1968:377-378) gives a detailed account of wild and tame horses while camped on the plains of the Kootenais during the early 1800s:

The horses all come from Spanish horses, which have very much multiplied, as every year the mares have a foal. There are several herds of wild horses in places along the mountains, especially on the west side of the mountains; on the pine hills of Mount Nelson, these have all come from tame horses that have been lost, or wandered away from tents where sickness prevailed.

Simon Fraser (1966:118-119) observed on July 14, 1808, at the confluence of the north and south Thompson River that "the country was well stocked with animals, such as horses, deer, beaver." Clearly, horses were present, in abundance, throughout British Columbia, by 1807.⁹ Horses were probably introduced to the Okanagan people in the early eighteenth century by the Sanpoil, Columbia and Colville tribes; in turn, the Okanagans traded horses with the Similkameen and Thompson (Teit 1930: 249). The horse affected culture; Teit describes changes in the Okanagan way of life below.

Horses soon became generally used for riding and packing; and distant visiting, trading, and hunting journeys were made easy. Horses also constituted a new source of wealth. A great impetus was given to

intertribal trade, visiting, and even intermarriage; also new methods of hunting became possible, and transportation of large quantities of meat and fish could now be effected over long distances in a short time with little labour. (Teit 1930:250)

Horses were also a source of meat (Teit 1908:533). Geopolitical landscapes expanded because First Nations who had the horse had an advantage in trade and warfare (Teit 1930:255). For instance, Teit (1900:178; 1930:214, 257) attributes the disappearance of the Stuwí'w people in the Nicola and Similkameen valley during the late eighteenth century to the introduction of the horse and the consequent expansion of the Okanagan and Thompson peoples' territories. Simon Fraser (1966) mentioned several times how the Indians "do not like either to sell or lend their horses." Gordon Antoine (2001) posits:

... they were a significance of your wealth—**xʷe?pit** [Nlaka'pamux term meaning wealth]—within our community. The more horses you had, the wealthier you were. It didn't matter if you . . . didn't have any cash. It's just that the more horses you had, the wealthier you were.

John Jules (2001) explains:

... we became part of the horse culture at least since the beginning of the 1790s. There are stories that our Elders tell, and there are stories that are told amongst the Flathead and the Nez Perce that we of this community used to go down that far to ride out onto the plains to hunt buffalo with them.¹⁰

The Nlaka'pamux people have a word for buffalo, **qʷisp**, which translates into 'narrow ass;' they may have also participated in the buffalo hunts to the south or east of their territory.

It is commonly assumed that First Nations people were passive foragers that had little or no impact on the land; however, they actually did manage and intervene with the grasslands. Boyd (1999) suggests that we have misjudged the extent to which First Nations were able to modify their environment as well as their knowledge of it. Clearly they understood the concepts of plant succession, soil fertilization and aeration, and that pruning enhanced growth and

fruit production (Boyd 1999). While First Nations people did help to shape the pre-contact landscape, they in no way modified it to the magnitude that European settlers and postsettlement agriculture did (Boyd 1999).

Contact Grasslands (1846 - present)

Rapid changes occurred in the grasslands, and consequently in the First Nations way of life once the European settlers starting making their start on the grasslands. The gold rush during the 1850s¹¹ marked the first increase in grazing pressure on the grasslands which had been inhabited, in pre-contact times, by elk and horses, along with many of the red and blue listed (endangered) species, such as the sharp-tailed grouse. Also mid-century, the elk began to disappear and property boundaries began to demarcate grazing interests and to foreshadow the land use disputes of the coming decades over grazing rights.

The grazing that was affected within our lands began more than one hundred years ago, it actually first impacted in a large way with the gold rush. Previous to that, there was of course, the fur brigades and we did have horses, cattle and those things in association with that. But with the influx of the miners, beginning about 1852, Kamloops became one of the springboard areas and actually started a cattle and horse industry that our people became involved in a very large way. And of course what happened with that, is it did affect our culture in a lot of ways. Of course the fur trade was beginning to go into decline so there were newer opportunities and they immediately seized upon that. The biggest thing that happened in an adverse way with the grazing is that a lot of the areas did tend to become over grazed. (Jules 2001)

Cattle and Changes in Ground Cover

Cattle were first introduced to the interior of British Columbia in 1840 when the Hudson's Bay Company brought them to Kamloops. With the cow's arrival on the grasslands in the mid-nineteenth century came the need for water, fencing, and the cultivation of the grasslands for hay and grains. "There were certainly a few at the post here, prob-

ably kept mainly for milk. By the 1850s, however, real beef appeared on the festival menus, since the cattle herd was now a little larger" (Balf 1978:2; Vrooman 1941:20). Balf (1969:16) describes how the Thompson's River and New Caledonia brigades possessed large numbers of horses that were grazed at Paul Creek and at a summer range in Grande Prairie; the pastures moved to Tranquille meadows and Lac du Bois when the fort moved, and by the 1950s, they began using the south side of the river.

Prior to European settlement, bunchgrasses dominated the grasslands; however, most of the perennial grass prairie in the Palouse bioregion was gone by 1900 (Black et al. 1999). According to Don Gayton, Ecosystem Management Specialist, (2001a) "a full-scale ecological conversion took place very shortly after settlement. Tall, well-spaced bunchgrasses were replaced with low-growing, grazing-resistant introduced bluegrass, forbs, shrubs and weeds." The introduction of alien plants to the grasslands had considerable ecological impacts. According to Gayton, smooth brome grass was an early agronomic pasture crop in Europe and most likely purposefully brought to the grasslands to mitigate the effects of overgrazing. Other species like Kentucky bluegrass were most probably accidentally introduced as hitchhikers in imported seed or hay (Gayton 2001b). Early weed species would have likely included mustards, burdock, mullein and pigweed. With no natural predators, many of these plant species found the climate and soils of the interior favourable for growth and firmly established themselves. The replacement of indigenous plants with introduced species had far reaching effects on the grasslands and in turn, on the people and animals that relied upon them. Len Marchand (2001) describes the overgrazing:

I heard many a story among Okanagans that before the coming of the white man, grasses on the Six Mile and Goose Lake ranges grew up to a horse's belly. With the coming of the gold rush and the establishment of ranches overgrazing devastated the grasslands. Where are we now? Thousands of hectares of grasslands once dominated by climax species such as bluebunch wheatgrass and rough fescue are covered with weeds like downy brome and the knapweeds.

John Jules (2001) further describes the change as:

. . . an immediate over-population of animals that affected the carrying capacity of our lands. Going with that, it gave the immediate rise of the sagebrush, a lot of our Elders speak of the bunchgrass areas as being very expansive, there wasn't really that much sagebrush within our area previous to that, but because of over-grazing . . . there became an infusion of sagebrush.

Anderson (1973) found a similar pattern in the Osoyoos area. Hebda (1982, after Anderson 1973) argues that around Osoyoos lake sagebrush proliferated while forestland and grassland declined in area due to logging and cattle ranching (overgrazing).

Water Diversion from Indian Reserves

The homesteading of settlers and, in particular, the farmers and ranchers was accompanied by fencing, water diversion for irrigation, wetland draining and damming. The gentlemen ranchers from the United States positioned their ranches and water licenses in key locations throughout the watersheds:

After the mid 1860s is when settlement really began to happen in a large way throughout BC. We had what we like to term as the 'gentleman ranchers' that came in from America that seen what we were doing and knew that there was a real economic opportunity for them to do the same thing that we were doing. So they came in and set up large ranches, you look at Douglas Lake, you look at a lot of the other ranches that are around the interior and specifically around reservations between the Shuswap/Okanagan nations territories as we call them anyway. You look at the situations at where these ranches were placed, a lot of them actually were strategically placed in areas where they controlled the watersheds. You control the watershed you control the use of the land. Basically the health of the land requires water. So without the use of that water, they can go to the governments and say that the Indian people weren't utilizing their land in the way that they termed 'usage.' (Jules 2001)

Knight (1996:171) supports Jules' testimony by saying that "some Indian reserves were large enough to sustain farming, but in many cases either the size of the reserve, the quality of the land, or the absence

of sufficient irrigation water restricted the extent to which farming could develop.”¹² Drake-Terry (1989:168,196) in her book *The Same as Yesterday* documents a case of settlers and a mining company diverting water from the Colochopa and Fountain Indian reserves near Lillooet, BC. Thus residents on Indian reserves started to notice a decline in availability of water reserves for emerging agricultural production, especially potato crops.¹³

Elder Nathan Spinks (2002) recalled below a particular event where he feels his village was unscrupulously denied access to water licenses:

When the water license first started, they (Indians) were all told, ‘You’re all going to have to start today, you’ve gotta make your ditch from the creek, and then you get a license.’ So the Lytton people they had to go and make this here ditch (flume) and they had to make, lumber. So when everybody had to start so naturally the white man’s gonna go as close to the creek headwaters to get that license. And the Indians, you know, were down at the bottom of the list, they all went out and they made that lower ditches. See the Indians just about won the race here to have the number one license. Just about, and Indian Affairs went to work and said, ‘We want to go partners with you people.’ That’s what Indian Affairs said, ‘We want to go partners with you people on that ditch for St. George’s [residential] school.’ But instead the Indian Affairs made themselves be number one even though we built the ditch and we was number two water license. But we got that license now, but it’s a long time to get it back. So that’s how it went. You go up to 25 mile, the same thing there. Twenty-five mile people had the water license long before the white people there had the water license and yet they (Indians) can’t use that water, they took the ditch away from the Indian people.

Jules (2001) feels First Nations were at a disadvantage in the agriculture industry early on because of their lack of access to water. The 1876 Indian Reserve Commission expressly confirmed that the Kamloops Reserve Indians had a prior right to “all the water which they require or may require for irrigation and other purposes from St. Paul’s Creek, and its sources, and northern tributaries . . .” (Bartlett 1988:47-48). Drake-Terry (1989) gives numerous examples where the provincial government authorized miners, ranchers

and farmers to use land, minerals and water that were previously set aside for First Nations. Until the 1930s the provincial government claimed all tribal lands and resources as provincial crown lands and continued to extract whatever resources they wanted in spite of federal officials’ assurance to First Nations that the lands belonged to them (Drake-Terry 1989:168).

In 1884, Premier Smythe decided that federal reserve commissioners had no right to allocate water to reserves in the interior of British Columbia. Indian Commissioner Powell argued that federal authorities did indeed have the right since Indian reserves in the dry interior would be useless without water (Drake-Terry 1989:168). According to Kenichi Matsui (2002), the Colonial government set aside reserves for the BC First Nations but did not explicitly mention aboriginal rights to water. Although some colonial gold commissioners like Peter O’Reilly at Yale recognized the prior rights of Indians to water, Matsui (2002) suggests that no land ordinances or mining legislation granted authority for water rights to First Nations people during the colonial period. For example, in Kamloops, the reserve commissioner in 1877 acknowledged 500 inches of water. However, the record of this acknowledgement was not officially filed until 1888; the delay gave advantage to ranchers like Harper’s Ranch (soon owned by the Western Canadian Ranching Company) over the local First Nations people (Matsui 2001). The debate between the province and the federal government over water rights continued for several decades—from the late nineteenth century to the early twentieth century.

Restricted Access to Grasslands and Restricted Mobility

The First Nations’ access to the grasslands and wetlands for secular and sacred use was restricted not only by the Indian reservation policies but also, as Gordon Antoine (2001) reveals, by land titling:

My mobility in the valley has really changed because of fencing. My mobility in the valley has really changed because of fee simple title replacing national citizenship title, as it were. The land that I could move in . . . I could move across grazing areas where now, there are huge signs that say ‘No Trespassing.’

The grassland landscape was overlain with property boundaries beginning with the gold rush, followed by the gentlemen ranchers and the Indian Reserve commissions of the 1860s and 1870s. During this time, the pressure began to build with regards to the question of whose grazing or water rights were whose—the rancher or the Indian (Knight 1996:171). Disputes began to arise. For instance, the Bonaparte Indians and local ranchers' hostility to each other in 1873 was in large part because of grazing disputes—the Indian reserve size was not sufficient (Anon. 1873:123-124). Commonages were briefly established in the late 1870s and 1880s to allow ranchers (both Indian and White) to share summer grazing lands; in reality the Indian ranchers gained very little access.

The introduction of the horse to the grasslands was successful—too successful, in fact, in the eyes of the late nineteenth century white ranchers. White ranchers pressured the provincial government to introduce *An Act for the Extermination of Wild Horses* on April 17, 1896. The act permitted a person to shoot or otherwise destroy an unbranded stallion (20 months or older) found on public lands east of the Cascade Mountains. Gordon Antoine (2001) recalls that 600 of the Coldwater band's horses were shot in 1946 when a bounty of two dollars for each set of ears was offered. Although the *Grazing Act* was introduced in 1919 to regulate the use of crown land for grazing, First Nations gained very little access to the new tenure system. The Chief Inspector of Indian Agents, W.E. Ditchburn, advocated on behalf of First Nations in the interior for grazing areas. First Nations continue unauthorized grazing of their livestock on provincial crown land because large and small ranches have tied up fee simple and tenured grasslands, and their reserve lands are too small.

John Jules (2001) describes the effect of *Indian Act* policies on land access:

One of the things like I was saying about the 1870s the Department of Indian Affairs took control of our land base; they were the only ones that could sign leases, permits, contracts or anything for and on behalf of Indian people. So without any kind of consultation in any meaningful form, they virtually had carte blanche in who had access to our lands. You know so . . . in some ways we did impact some

of the ranches by working for them, developing relationships that way. But coming on and who controlled the lands was DIA and through DIA other third party interests whether it was rancher or whomever they chose to deal with. You look at the dam even at Paul Lake; we had no control over that yet it was signed away on our behalf.

Adaptation by British Columbia's First Nations

In his book *The Resettlement of British Columbia*, Cole Harris (1997:240) summarizes the effects of colonial settlement and the reserve system on First Nations:

Native peoples, most of who lived on reserves, no longer burned the range to control shrubs and encourage the plants they once had gathered. Cattle occupying much the same ecological niche had replaced many of the deer and other animals they formerly hunted, but cattle were owned and wildlife was not. Native peoples could not hunt the herds that now occupied the range. The replacement of deer by cattle, and the protection of the latter by property law, dispossessed Native communities as effectively as did survey lines and fences.

As discussed earlier, the First Nations were familiar with the horse before the gentlemen ranchers arrived. In 1992, the Commissioner of Grazing, T.P. Mackenzie, wrote about his frustration with how the Nicola and Similkameen Indians, in his opinion, were determined to raise "useless" horses rather than pursue the White's preference for cattle ranching: "I am confronted with the fact that they have the horses and that it will take time to make any changes" (Mackenzie 1922). However, the Indian horsemanship was an employable skill; many First Nations people worked for the ranchers, and still do (Jules 2001). Indians were good cowboys (Figure 2), as Len Marchand (2001) reflects:

Oh, they were really good cowboys. I had an uncle, Alex Marchand, a strong, raw-boned guy about 5'10½, and 180 lbs, who competed in the early days of the Calgary Stampede. The history was great. Okanagans participated in rodeos wherever they were held: Falkland, Keremeos, Kamloops, etc. I used to love to sit and listen to Uncle Alex's cowboy stories. And you know something? They got better as time went on!



Figure 2: Indian Cowboy in the Nicola Valley (photo courtesy of the Nicola Valley Museum Archives Association, photo #PN80).

Alexander Ross (1965: 111), while travelling near Fort Okanagan in 1811, saw a group of natives and commented that “the party were all mounted on horseback to the number of seventy-three, and exhibited a fine display of horsemanship.”

First Nations people, while exhibiting expert horsemanship, also demonstrated a recognized ability to manage all aspects of ranching and farming. It is interesting to note that while non-native ranchers were being established in the Nicola Valley, i.e., Douglas Lake Ranch—1872; Guichon Ranch—1882; and the Lauder Ranch—1876 (British Columbia Cattlemen’s Association 1988), First Nations from the Douglas Lake Band (now known as the Upper Nicola Indian Band) had already established successful operations on their own lands. In the government of Canada sessional paper No. 10, L. VanKoughnet (1878:7), Deputy Superintendent General of Indian Affairs in

1877, reports “I have much satisfaction in placing on record the fact that the Indians of Douglas Lake, in the Fraser Superintendency of British Columbia, were awarded, at the Centennial Exhibition held in Philadelphia in 1876, two diplomas and a medal for wheat grown by them.” It was under the reign of Chief Chilitza¹⁴ that Douglas Lake band received this bronze medal award for the superiority of their red chaff wheat crops (Walker 1880:359).

In addition to the farming award noted above, Rolf Knight (1996:176) reports that Chief John Chilitza was a very successful rancher, by any standard, and he was considered to have owned “some of the best stallions and brood mares.” Duncan C. Scott (1918:31), Deputy Superintendent General of Indian Affairs in 1918, reports below on the industries and occupations of First Nation people of the interior of British Columbia:

The Indians of the Lytton, Kamloops, Kootenay, Okanagan and New Westminster agencies engage in farming, including the raising of grains, fruit and vegetables of all kinds. Marked progress has of late years characterized their agricultural efforts. They are well supplied with farm machinery and equipment, of which they take good care. Chief John Chilitza, of the Upper Nicola band, is reputed to have the most complete farming equipment of any individual farmer in the interior of the province . . . The Indians of the Kamloops, Kootenay, New Westminster and Okanagan agencies raise horses and cattle. They take good care of their stock, and are meeting with marked success in this industry. The Indians of the Kamloops agency own about 5,000 horses and about 2,000 head of cattle. The above mentioned Chief John Chilitza won the first prize and diploma at the Kamloops fall fair for the best bred stallion on exhibition.

In summary, several changes are clear. First Nations’ cultivation switched from transplanting native plants to growing potatoes and grains; furthermore, their participation in the agriculture industry waned when the transition from horse-powered to industrial agriculture was made in about 1930 (Black et al. 1999). Horse populations began to decline in the late nineteenth century because of wild horse hunting by white ranchers.

First Nations and Scientific Perspectives on Grassland Management

Based on this partial reconstruction of the grassland system over time, how should these changes be interpreted and how do different cultural perspectives influence restoration efforts? We use as a point of departure the lifeways and landscapes of the indigenous population. First Nations lived in the river valleys and conducted subsistence activities on the grasslands while colonial settlers lived on the grasslands. First Nations were hunter-gatherers and low-impact agriculturists of native species, while settlers were high-impact agriculturists of introduced species (Black et al. 1999).

Scientific Perspective

Ecological classification of the grasslands reflects western science's perspective of ecosystem management. The grasslands' genesis dates back to the receding glaciers of the last Ice Age; the vegetation in the valley bottoms was annihilated (Gayton 2003:7). British Columbia has divided the province into fourteen biogeoclimatic zones based on climate, geography and vegetation.¹⁵ These zones are then further divided into subzones based on plant associations. According to this classification system, various subzones of the Bunch Grass (BG), Ponderosa Pine (PP) and Interior Douglas-fir (IDF) biogeoclimatic zones form the majority of the grasslands of the Interior Plateau. Although the latter two ecosystems are treed, they are mostly open and park-like with the understory being dominated by grasses and forbs. A combination of the physiography and climate of this region restrict the establishment of trees and facilitate the dominance of the grasslands (British Columbia Ministry of Forests 1991:126). In British Columbia, there are three types of grasslands:

1. Lower grasslands that are characterized by a dry, hot climate and dominated by big sagebrush and bluebunch wheatgrass. They are found at lower elevations, usually below 500-800 m elevation.
2. Middle grasslands that are dominated by bluebunch wheatgrass and sandberg's bluegrass, above 500 or 600 m.

3. Upper grasslands that occur on hillsides and higher elevation plateaus. Wheatgrass is still a component of the plant community; however, it is dominated by various species of fescues.

Hebda's (1982:185) pollen study of the grasslands of the southern interior of British Columbia concludes that both *Artemisia*-dominated (cf. *Agropyron-Artemisia*) and grass-dominated (*Agropyron-Poa* or *Agropyron-Festuca*) grasslands, which have a history of over 10,000 years in the province, were more widespread than they are currently and probably were "climatic-climax zones."

The Southern Interior grasslands are considered to be an extension of the Pacific Northwest Palouse Prairie (Gayton 2003:7). Black et al. (1999) describe the plant species that form plant associations in the Palouse Prairie region of northwestern United States. The Palouse Prairie extends into southern British Columbia and forms the southern-most parts of British Columbia's grasslands. The Palouse region was classified according to aspect and moisture regimes. There are many of the same plant associations in this region as in the lower, middle and upper grasslands of British Columbia—in each, the dominant species is bunchgrass. Although the classification systems are different between British Columbia and the Palouse bioregion, they have similar underlying approaches and there are enough similarities in plant communities, climate and physiography to make meaningful comparisons.

First Nations Perspective

Clearly, First Nations people had a classification system of their own. We had occasion to hear, first hand, the following Secwepemc oral history told by John Jules that revealed a great deal of ecological information. The Secwepemc oral history was translated by the late Ida Williams of the North Thompson Indian Band. With permission from John Jules and the Secwepemc Cultural and Education Society, the story is briefly paraphrased here.

Coyote went to a gathering where he participated in the games and won everything. Raven was there and wanted to take Coyote's eyes from him. He

takes Coyote's eyes and sets him free to find his way home. Coyote loses his way. Coyote feels around on the ground for something to make eyes out of. He found some kinnikinnick berries and stuck them into his eye sockets. He could see but not too well. As Coyote made his way downhill, he asked various trees what they were so he knew where he was. When he finally got to the saskatoon bush, he knew he had made it home.

The Secwepemc Cultural and Education Society (1994:35) language department explains the degree of knowledge contained within the story:

When you are travelling in the country, in the mountains and woods, you will notice that vegetation occurs within fairly well defined areas. Tree species that grow at certain elevations are usually good indicators of how high up you are, and what kind of precipitation and soils the area you are in has. Foresters and ecologists call this combination of climate, elevation and soil or land that determines what trees and other plants you will find Biogeoclimatic Zones. Secwepemc people also had and have a good sense of how trees are indicators of how high up on a mountain you are. As people travel in the mountains, hunters use predominant tree species to orient themselves as to what elevation they are at.

The Secwepemc vocabulary shows how the people classified their ecosystems:

ne skwelk'wélt	alpine zone
ne skwelkwelk'wélt	subalpine
ne melénllp	balsam tree zone
ne qwli7t	lodgepole pine zone
ne tsqellp	douglas-fir zone (includes grasslands)
ne s7etqwllp	ponderosa pine zone (includes grasslands)
ne ctsetém	in the valley (grasslands)

These data strongly suggest that Secwepemc First Nations understood transitional plant associations over an elevation gradient.

Interpreting Changes

Change to the grasslands is typically characterized from a traditional ecological perspective as a successional process that is influenced by a number of biotic (e.g., fire and grazing) and physical (e.g., climate and soils) factors, in a non-linear way (Gayton 2003:3-15). The challenge of historical and ethnographic ecology is to weave historic natural surveys together with documentary and participant recollection. Gayton (2003:15) eloquently describes this challenge: "Understanding succession on British Columbia grasslands now is like trying to reconstruct a whole motion picture from a few isolated fragments of damaged footage."

There is a consequent cultural change when succession occurs; the corollary is also true. Humans are a significant biotic factor not explicitly identified by Gayton (2003) that have a significant influence on grassland succession.¹⁶ Approximately 76 to 99% of British Columbia's grasslands have been severely altered or lost since European settlement began (Grassland Conservation Council of British Columbia 1999). Pitt (2000:4) explains that since about 1930, it is unlikely that any large contiguous areas of unaltered grasslands existed in British Columbia, and that "ancient" grasslands should be considered a more endangered landscape than should "ancient" old-growth forests. In the Palouse Prairie of the United States, only a little more than 1% of the native prairie remains and it has been declared one of the most endangered ecosystems in the United States (Black et al. 1999). Human activities such as hydroelectric power, intensive agriculture, off-road recreation, urbanization, livestock grazing, fire suppression, forest encroachment, and invasion by alien plant species have all contributed to the demise of natural grasslands (Pitt 2000:4).

Grassland environments were extensively used by First Nations communities as travel corridors, settlement areas, and hunting grounds and for gathering ethnobotanical plants (Grassland Conservation Council of British Columbia 1999). Contrary to the belief of the early explorers and settlers, the park-like natural grasslands were not solely the work of nature. The indigenous people of the area actively manipulated and managed

the land for their own purposes. Based on Gordon Antoine's (2001) testimony, the Nlaka'pamux people have words relating to cultivation in their language, which indicates a form of "wild" crop management in the pre-contact era:

... the other notions that we have is, in terms of our relationship with grasslands and that kind of thing, is that the old ones were really knowledgeable of what should be transplanted or transplantable and what couldn't be. There is a word for transplantation in the language, it's **sexpe?me** [transplanting]. There's a word for tilling the soil, **λ'lule?x'me** [tilling]. And these are not new words, they're old words, they're words from when the language was all by itself yet in the area. There's a word for planting, **k'enlq**. And again, it's not a new word. It's not like a word like **lpel**, which is a borrowed word for shovel—from the French people.

The most important management tool in pre-contact grasslands was fire. Generally there is no consensus on the historical frequency and cause of fire in the grasslands but it is recognized that they burn less frequently now than in the past. Anthropogenic fire was often used in the quest for food. The First Nations people used it to create suitable environments for their favourite food plants such as spring beauty (*Claytonia lanceolata*, also known as Indian potato), *Camas* spp. and other such root crops and many species of wild berries (Black et al. 1999; Boyd 1999). However, landscape fires were deliberately set for reasons other than food production. In her paper *Time to Burn* (1999), Nancy Turner describes testimony from a Tahltan guide who explains that his people often set grass fires in order to approach a herd of caribou from downwind. Fire was used for other purposes as well, including to clear brush from campsites, village sites and trails, to drive game in hunting, to obtain edible insects, to improve communication and visibility, for offensive and defensive strategies in war, to protect forests from crown fires, and to create future supplies of dry fuel wood (Turner 1999).

Early settlers used fire to clear land for settlement, agriculture and livestock grazing. Since then, the frequency of fires has declined due to fire suppression, human settlement, the presence of roads which act as fire breaks, and the conversion of grasslands

to crop fields and rangelands (Black et al. 1999). A significant result of fire suppression is increased tree density and the buildup of fuels as well as the encroachment of trees and shrubs into the grasslands (Gayton 2003:9). Subsequently, when fires do occur they are usually of higher intensity and may give exotic annual grasses an edge over native species in burned areas (Black et al. 1999).

Human-caused changes to the functional rhythm of water availability and quality, including the draining of wetlands and water diversion, had a significant influence on cultural systems. Suddenly, Indian reserves rich in water became deserts, since upstream ranchers diverted water for their cattle or traditional plants disappeared in drained wetland ecotones. Blackstock (2002) emphasizes the need to focus on water-based ecology because fresh water is seen, by First Nations Elders, as a central driver of ecosystem function. Gayton's (2003) western science successional perspective is silent on water as a significant factor, however.

Grassland Restoration

"Grasses used to be belly-high." The authors have heard firsthand the elders' recollection of the old days; the natural grasses were "belly-high to a horse." In discussion with local ranchers, the "belly-high" debate has been brought forth and subsequently rejected as "myth" or "physiologically impossible." There was no consensus among the range specialists consulted in this matter; however, it was agreed that *Festuca scabrella* (rough fescue) could indeed reach a meter high with a full seed head. There is discussion over whether fescue species may have occupied a wider range of habitats in the pre-contact landscape; i.e., occupied lower elevational sites. Don Gayton (2001b) explains that the height the grasses could reach would be site specific. For instance, on the south facing slopes it would probably never reach belly-high, but grass along the Thompson River flats may have hidden the whole horse. Since it is impossible to go back in time to inventory the grass species in the pre-contact era, the only option is to seek out areas of refuge that have not been impacted by grazing in the near past. The authors found such an area

in an upper-elevation grassland where the fescue did, in fact, reach a meter in height and would have theoretically been “belly-high to a horse” (Figure 3).

Additionally, regional scientists like Dick (Richard) Cannings, a leading naturalist, ornithologist and co-author of the award winning book *British Columbia: A Natural History* (1996) were asked for their assessment of changes to the wetlands in the Interior grasslands. Cannings responded:

I'm not an expert on this topic, but my gut feeling would be that most of the wetland loss occurred more than 25 years ago, whereas grassland loss is continuing with new conversions to agriculture (e.g., ginseng and grapes in BC) and urbanization/housing. So if you look at bird population trends over the last 25 years, wetland species may appear fairly stable (though perhaps far below what they once were), while grassland species are strongly declining. (Cannings 2002)

The field of restoration ecology is relatively new. Often, the definition of restoration is based solely on technical performance criteria such as structural replication and composition (Higgs 1997). Table 1 lists significant points from various sources that may be considered from a restoration perspective.

A common theme among Anderson, Higgs, and the Society for Ecological Restoration is the inclusion of social values in restoration projects. Anderson goes further to suggest that restoring the forces that shaped the model community is essential, a perspective that mandates the inclusion of pre-contact management practices in restoration plans. Higgs and Kimmerer include traditional ecological knowledge in their discussions of restoration. To some degree, all of the above sources also include ecological concepts inherent in western science. The authors are suggesting that social values, forces that shape the biophysical environment, and traditional ecological knowledge



Figure 3. “Belly-high” bunchgrass on upper elevation site.

along with western science are necessary to restore segments of the grasslands in the southern Interior of British Columbia. Anthropologist Eric Higgs recommends that restoration should not only be measured by biological performance criteria but also “its worth adjudicated in historical, social, political, cultural, aesthetic, and moral contexts” (1997:339).

Future Paths to Restoration

More specifically, how might these models relate to First Nations’ perspectives on restoration? The most common First Nations answer to the question “What should we do to restore the grasslands?” is “Leave it alone.” However, as the First Nations’ pre-contact practice of irrigation and the use of fire

Table 1. General perspectives on Ecological Restoration.

Author	Significant Points
Anderson (1996)	<ul style="list-style-type: none"> • . . . restoration involves not only reintroducing plants and animals known to exist in the area historically, but also reproducing the forces that shaped the model community. • The goal (of restoration) will not be exactly to <i>re-create</i> a static historic landscape.
Cairns (1995)	<ul style="list-style-type: none"> • The Natural Resource Council notes that full ecological restoration should include self maintenance and/or self-perpetuation . . . that the restored patch should be integrated with its larger ecological landscape.
Higgs (1994)	<ul style="list-style-type: none"> • Restoration should concentrate on an inclusive scientific practice that recognizes the legitimacy of applied studies, social scientific research, policy work, traditional ecological knowledge, and the like.
Higgs (1997)	<ul style="list-style-type: none"> • Restoration offers a redemptive opportunity. We heal ourselves culturally, and perhaps spiritually, by healing nature.
Kimmerer (2000)	<ul style="list-style-type: none"> • Traditional knowledge observations tend to be qualitative in nature and create a diachronic database, i.e., a record of observations from a single locale over a long time period . . . in contrast . . . scientific observations tend to be quantitative in nature and represent synchronic data, i.e., short term observations from a range of sites.
Society for Ecological Restoration (1996)	<ul style="list-style-type: none"> • The process of assisting recovery and management of ecological integrity. Ecological integrity includes a critical range of variability in biodiversity, ecological processes and structures, regional and historical context, and sustainable cultural practices.
Swetnam et al. (1999)	<ul style="list-style-type: none"> • Human changes to the ecosystem must operate within the limits of nature’s ‘ways to be.’ Swetnam (1999:1201-1202) believes the <i>nonequilibrium paradigm</i> forebodes pinpointing a single fixed point in an ecosystem’s history, which can become the reference condition. Historical ecology’s primary objective, however, is to define the limits of human interventions by examining historical patterns and processes.

shows, there has long been at least a limited form of grassland manipulation. How can such apparent contradictions be resolved? Nathan Spinks' (2002) comparison of First Nations and European settler irrigation methods helps to clarify the issue. Spinks views most sprinkler irrigation methods as a waste of water. On the other hand, small ditch irrigation employed by pre-contact First Nations in the Lytton area slowly brought water to the plants and deeply soaked the soil where it was needed. The First Nations farmer controlled each ditch by blocking or releasing the flow. In addition, watering was only necessary a few times a year. The real question to address in grassland restoration is likely to be related to the degree of intervention and conservation of water as a central principle, rather than an attempt to create a system that functions with no human intervention.

The romantic conservationist perspective of First Nations grassland management may be "nature knows best," which is compatible with the principles developed by Alan Watson Featherstone, Executive Director of Trees for Life, an organization devoted to the restoration of the Caledonian forest in Scotland. Trees for Life views restoration as a natural process that would normally take place in the absence of human intervention (Featherstone 1996). Human needs (social, cultural, and spiritual), however, demand the sorts of ecological interventions which have caused past variability in most ecosystems (Swetnam et al. 1999). Many traditional cultures maintain the perspective that humans are dependent on the "web of life." Such cultures often are, in fact, connected to the web of life in a secular and sacred way (Featherstone 1996). Both this knowledge and related behaviours could influence ecological restoration projects on the grasslands.

In the case of western Canada's First Nations, restoration of traditional activities on the grasslands needs to begin with restoring the delivery of a suitable quality and quantity of water, in a functional rhythm, to the grassland ecosystem. The people we interviewed focused on wetland and water issues, which reflects the emphasis Elders expressed in *Water-based Ecology: A First Nations' Proposal to Repair the Definition of a Forest Ecosystem* (Blackstock 2002). To

them, water is the lifeblood of an ecosystem (Blackstock 2001, 2002), and should be the first focus of restoration plans. Grassland water restoration would focus on livestock management (e.g., prevention of livestock from urinating or defecating into any water source); fencing sensitive wetlands and using automated pump and trough watering systems; fencing springs; restoring natural stream channel water flows; restoring wetland ecosystems; and examining water rights allocations.¹⁷

The second phase of restoration would focus on reintroducing and/or enhancing native grassland plants (e.g., tule, rough fescue or balsam sunflower—*Balsamorhiza sagittata*) and animals (e.g., elk, sharp-tailed grouse or sandhill cranes). Fencing enclosures on grasslands to prevent livestock from trampling plants would create, for example, a First Nations sustenance refuge where medicine or sustenance plants may be harvested.¹⁸ Historical land use studies and regular inventories and monitoring of grasslands (Gayton 2003) and wetlands will assist restoration work. Comparing historical aerial photography of the grasslands to determine wetland loss could be an important first step. Another prerequisite for grassland restoration is the ability of First Nations to access the tenured crown range land either through co-operative management with existing tenure holders and/or management under their own tenure.

Conclusion

Humans influence grassland succession, which in turn influences cultural change and alterations to land use patterns. A central factor influencing change not yet prevalent in Western discourse is water. Consequently, we define restoration as: *a co-operative human vision to facilitate an increasing role for natural ecological processes, with a special emphasis on repairing the functional rhythm of water, in ecosystems which are perceived to be negatively impacted by predominant human forces of development or natural catastrophic events*. Restoration is not thought of here as a nostalgic strategy to return to the past.

Not unexpectedly, there are a variety of visions for restoring the grasslands. For instance, John Jules' (2001) vision is to begin restoration with the

reintroduction of elk to the grasslands of Kamloops, British Columbia. Len Marchand (2001) feels that BC grasslands need to be represented in Canada's National Park system and that overgrazed sagebrush grasslands can be slowly restored beginning with the use of prescribed fire to decrease the sagebrush presence. He also has hopes that a southern interior university, such as the University College of the Cariboo, would become the leading grasslands research institution in Canada, since there is such a variety of grassland ecosystems in the vicinity of Kamloops, British Columbia. Gordon Antoine (2001) understands the need to restore Nlaka'pamux sustenance practices on grasslands without alienating the needs of British Columbia's ranching industry. His vision includes restoring access for First Nations people, in the spirit of co-operation, to large tracts of privately managed grasslands to facilitate the traditional harvest of wild potatoes, wild asparagus and mushrooms, for instance.

Dr. Michael Pitt (2000:4) explains the role of the ranching industry in the long-term conservation of BC grasslands:

Humans comprise a natural part of the grassland ecosystem. To ignore this human presence is artificial and shortsighted. For example, at least 80% of BC grasslands are privately owned. If ranching becomes uneconomical, or ceases to be an attractive lifestyle, then these privately-held ranches would face mounting pressures to subdivide . . . Without a healthy cattle industry, therefore, grassland biodiversity in British Columbia might actually decrease.

To be successful, a grassland restoration project needs support and co-operation from all interested parties, which includes trying to reach a consensus on a definition for restoration and a set of guiding stewardship principles. First Nations communities whose reserves are located on the grasslands should consider developing a range management plan to begin the restoration of productive range on their lands. For example, British Columbia needs to put an emphasis on wetland monitoring in the same way that the United States Department of Agriculture does in their National Resources Inventory, by tracking

the amount and cause of losses and gains to wetlands (United States Department of Agriculture 1997, Table 19). There are already a number of efforts underway to begin grassland restoration. For example, a joint grassland restoration initiative between two interior First Nation communities and the provincial Ministry of Forests will include a prescribed burn in the grasslands of their traditional territories during the spring of 2004. The Grassland Conservation Council of British Columbia also has some restoration projects in progress.¹⁹ We suggest that a common vision of restoration and a common understanding of land use history will allow all stakeholders to begin an effective restoration process and monitor succession.

Acknowledgements

The authors recognize the late Grand Chief Gordon Antoine, Len Marchand Sr., Nathan Spinks and John Jules as the main contributors to this paper. Their expertise and patience guided its direction, although the authors are solely responsible for any interpretation errors. The authors would also like to recognize Joyce Sam, Mandy Jimmy, Marjorie Serack, Judy Steves, Glenn Heyes, Dick Cannings, Sid Jules, Cole Harris, Kenichi Matsui and Don Gayton for their assistance. Special thanks to Mona Jules of the Secwepemc Cultural Education Society for providing us with a written copy and translation of an oral history belonging to the Secwepemc people. We would like to acknowledge Ryan Holmes, Ministry of Sustainable Resource Management, for preparing the map used in Figure 1. This paper is dedicated to the memory of Grand Chief Gordon Antoine, a highly respected knowledge keeper and leader of his nation. He passed away shortly before the publication of this paper.

Michael D. Blackstock, 515 Columbia Street,
Kamloops, BC, Canada, V2C 2T7

Rhonda McAllister, 636 Robson Drive, Kamloops,
BC, Canada V2E 2B7

Notes

- ¹ Rexford Daubenmire (1982:149) defines grasslands as a unit which has a conspicuous layer of graminoids: "But while the plant cover of many areas is composed almost entirely of graminoids, in other areas a continuous grass layer may coexist with scattered shrubs, scattered trees, or an open forest cover." Restoration is defined in the last section of this paper.
- ² During Michael Blackstock's eight years of experience as a First Nations liaison for the Forest Service in the southern interior of British Columbia, he has come to know who the First Nations communities have self-designated as their experts on the topics of water, grasslands and oral history. These are the experts that were asked to participate in this research. No one refused the invitation to participate.
- ³ Interview questions:
 1. How has grazing affected the land?
 2. What would the valley have looked like 100 years ago (changes in plant communities, water, soil)?
 3. How have these changes affected you (your people/culture)?
 4. Can cows, horses, and sheep coexist with the natural grassland and forest ecosystem (how about with the indigenous animals)?
 5. If we could roll back the clock, what would you have done differently?
 6. What can be done now?
 7. How were ranches established?
 8. What effect did the homesteads, fences, and grazing have on your relationship to the land?
 9. How did horses affect your life?
 10. What significance do horses have to you?
 11. How long have horses been used in your community?
 12. How would you describe the relationship between horses and people?
 13. How were horses corralled before barb-wire fences?
 14. How important is water on the grasslands?
- ⁴ "This multiscale approach also allowed us to take advantage of data collected and reported at different spatial scales and geographic extents. In general, data available for the entire basin were coarser than those obtained for the county; data for the small area were at a yet finer spatial resolution" (Black et al. 1999:9).
- ⁵ Black et al. (1999) report that 97% of the wetlands in the Palouse bioregion were converted to cropland, hayland or pasture land.
- ⁶ Michael Blackstock crosschecked this account with Grand Chief Gordon Antoine in the Fall of 2003. Grand Chief Antoine said that yes, there was pre-contact irrigation in his nation and he thought the clay was bentonite clay, which is confirmed by the Ministry of Mines to be sourced in the Nicola Valley area.
- ⁷ Cawker (1978) as cited by Hebda (1982:180) found, through pollen analysis, that *Artemisia tridentata* populations, in the southern Okanagan-Similkameen area, suffered in the period 1860-1890 because of widespread burning followed by a recovery in the period 1900-1920.
- ⁸ Woolliams (1979:8) describes a feast hosted by Chief Nicola, son of Chief Rolls-over-the-earth, where "Nicola celebrated his revenge [on the Lillooet Indians] with a feast of elk for his allies, piling high the resultant elk antlers and bones near the crescent-shaped lake that became Nicola's Lake." Mr. Ward Marshall (2001), a former resident of the Aspen Grove area south of Merritt, recalls seeing elk horns in Bluey Lake around 1915. In his recollection they were still very hard and in good shape. At that time, Ward was told about an historic forest fire that decimated the area—the fire was known by the locals as "the big one." Apparently, the elk went into the lake to escape the fire but were asphyxiated by the smoke.
- ⁹ Feral horses had a huge impact on grasslands—thus the government's policy to put a bounty on them. Unmanaged herds, because of their ability to graze the grass to the soil surface (removing the apical meristems on bunchgrasses) could hamper the plant's ability to survive. Cows, on the other hand, having only lower front teeth, could not as easily remove meristematic tissue enabling the plants to resume growth. Cows also lack the "pawing" instinct of the horse when looking for forage on snow-covered pasture.
- ¹⁰ Woolliams (1979:7) tells of how Chief Rolls-over-the-Earth (Okanagan Nation) occasionally went buffalo hunting on the eastern plains.
- ¹¹ The gold rush began in the Interior in 1852 on the Thompson River when gold was discovered near Nicomen, and traded at the Hudson's Bay post in Kamloops (Drake-Terry 1989:36).
- ¹² Knight (1996:171) describes how First Nations built wooden flumes on the Bridge River and Ka'tsam reserves for irrigation purposes. Drake-Terry (1989:xvii) estimates that only ten percent of the Indian reserve lands, allocated in 1881, in the Lillooet area were suitable for cultivation.
- ¹³ "British Columbia has a unique history within Canada with respect to the setting aside of Indian water rights. Unlike elsewhere in Canada, Indian water rights were the subject of prolonged disputation and consideration between the province and the federal government . . . As the government was primarily concerned with the interests of the settlers, the province was reluctant to recognize Indian water rights to the detriment of the settlers" (Bartlett 1988:43).
- ¹⁴ There is a confusing array of spellings for Chief Chilitza, Upper Nicola Band (formerly known as the Douglas or Douglas Lake band), and they include: Chillihtitza, Chillihtitza, Chilliheetza, Chillechia, Salihitza, Shilisa, and Shillihitsa.

¹⁵For more information on the ecosystem classification system used in British Columbia (BC) please refer to Special Report Series 6 - Ecosystems of British Columbia by the BC Ministry of Forests.

¹⁶Gayton (2003) was also silent on the significant influence of water as a factor.

¹⁷During a helicopter flight of the Nicola Valley grasslands during a drought year, 2003, the lead author observed cattle walking, defecating or laying in seasonally dried wetlands, and a wetland that was recently excavated and drained.

¹⁸Gayton (2003:25-34) provides a case history of seven grassland reference areas where exclosures were constructed to monitor vegetation change due to grazing.

¹⁹Background information on the Grassland Conservation Council of British Columbia can be read at their website: www.bcgrasslands.org.

References Cited

ANON.

1873 "Letter: Walkem to Powell (December 26 and 29, 1873)," in *Papers connected to the Indian land question*. Pp. 123-125. Victoria: Queens Printer.

ANON.

2001 *Wetlands loss and degradation*. North Carolina State University. [Http://h2osparc.wq.ncsu.edu/info/wetlands/wetloss.html](http://h2osparc.wq.ncsu.edu/info/wetlands/wetloss.html).

ALEXANDER, D.

1992 "A reconstruction of prehistoric land use in the Mid-Fraser River area based on ethnographic data," in *A Complex culture of the British Columbia plateau: Traditional St'at'imx resource use*. Edited by B. Hayden, pp. 99-176. Vancouver: UBC Press.

ANDERSON, M.K.

1996 Tending the wilderness. *Restoration and Management Notes* 14(2):154-166.

ANDERSON, T.W.

1973 "Historical evidence of land use in a pollen profile from Osoyoos Lake, British Columbia," in *Geological Survey of Canada, report of activities, part A*. Geological Survey of Canada paper 73-1, pp. 178-179. Ottawa: Geological Survey of Canada.

ANTOINE, G.

2001 Personal communication (transcribed interview: June 26, 2001).

BALF, M.

1969 *Kamloops: A history of the district up to 1914*. Kamloops, BC: Kamloops Museum.

BALF, M.

1978 *Bunch-grass beef: Ranching in the Kamloops district*. Kamloops, BC: Kamloops Museum.

BARTLETT, R.H.

1988 *Aboriginal water rights in Canada: A study of aboriginal title to water and Indian water rights*. Canadian Institute of Resource Law. Calgary, AB: University of Calgary.

BISMANIS, A., M. MACGREGOR, S. DEWHURST, AND G. HALSETH.

2003 *A guide for managers and researchers: Incorporating forest history into sustainable forest management*. Unpublished Report. University of Northern British Columbia.

BLACK, A.E., E. STRAND, P. MORGAN, J.M. SCOTT, G.R. WRIGHT, AND C. WATSON.

1999 "Biodiversity and land-use history of the Palouse bioregion: Pre-European to present," in *Perspectives on the land use history of North America: A context for understanding our changing environment*. Edited by T.D. Sisk, Chapter 10. U.S. Geological Survey, Biological Resources Division Science Report. [Http://biology.usgs.gov/luhna/chap10.html](http://biology.usgs.gov/luhna/chap10.html).

- BLACKSTOCK, M.D.
2001 Water: A First Nations spiritual and ecological perspective. *BC Journal of Ecosystems Management* 1(1):54-66. [Http://www.forrex.org/JEM/archiveVol1iss1.asp](http://www.forrex.org/JEM/archiveVol1iss1.asp).
- BLACKSTOCK, M.D.
2002 Water-based ecology: A First Nations' proposal to repair the definition of a forest ecosystem. *BC Journal of Ecosystems and Management* 2(2):7-12. [Http://www.forrex.org/JEM/archiveVol2iss1.asp](http://www.forrex.org/JEM/archiveVol2iss1.asp).
- BOYD, R.
1999 "Introduction," in *Indians, fire and the land in the Pacific Northwest*. Edited by R. Boyd, pp. 1-30. Corvallis, OR: Oregon State University Press.
- BRITISH COLUMBIA CATTLEMEN'S ASSOCIATION.
1988 *Landmarks and branding irons: A guide to some historical ranches in the Nicola Valley of British Columbia*. Kamloops, BC: British Columbia Cattlemen's Association.
- BRITISH COLUMBIA MINISTRY OF FORESTS.
1991 *Ecosystems of British Columbia, special report series 6*. Edited by D. Meidinger and J. Pojar. Victoria, BC: British Columbia Ministry of Forests.
- CAIRNS, JR., J.
1995 Ecosocietal restoration: Re-establishing humanity's relationship with natural systems. *Environment* 37(5):4-33.
- CANNINGS, R.J., AND S.G. CANNINGS.
1996 *British Columbia: A natural history*. Vancouver, BC: Greystone Books.
- CANNINGS, R.
2002 Personal communication (email: January 24, 2002).
- CAWKER, K. B.
1978 Historical dynamics of *Artemisia tridentata* Nutt. in south-central British Columbia. Ph.D. diss., Simon Fraser University, Burnaby, BC.
- DAUBENMIRE, R.
1982 "Plant geography and grassland classification," in *Grassland ecology and classification: Symposium proceedings, June 1982*. Edited by A.C. Nicholson, A. McLean and T.E. Baker. Kamloops, BC: Ministry of Forests.
- DAWSON, G.
1891 "Notes on the Shuswap people of British Columbia," in *Proceedings and transactions of the Royal Society of Canada for the year 1891*. Ser. 1, Vol. 9, Sec II. Pp. 3-44. Montreal.
- DRAKE-TERRY, J.
1989 *The same as yesterday: The Lillooet chronicle the theft of their lands and resources*. Vancouver: Friesen Press.
- FEATHERSTONE, A.W.
1996 *Trees for life newsletter*. April. [Http://www.restore-earth.org/restearth](http://www.restore-earth.org/restearth).
- FRASER, S.
1966 [reprint] *The letters and journals of Simon Fraser: 1806-1808*. Edited by W. Kaye Lamb. Toronto: The Macmillan Company of Canada.
- GAYTON, D.
2001(a) Personal Communication (email: November 5, 2001).
- GAYTON, D.
2001(b) Personal Communication (email: December 5, 2001).
- GAYTON, D.
2003 *British Columbia grasslands: Monitoring vegetation change*. FORREX Series 7. Kamloops, BC: Forest Research Extension Partnership (FORREX).
- GRASSLAND CONSERVATION COUNCIL OF BRITISH COLUMBIA.
1999 *Grasslands*. Kamloops, BC: Grassland Conservation Council of British Columbia.
- HAINES, F.
1938 The northward spread of horses among the Plains Indians. *American Anthropologist* 40:429-437.

- HARRIS, C.
1997 *The resettlement of British Columbia: Essays on colonialism and geographical change*. Vancouver: UBC Press.
- HEBDA, R.J.
1982 "Application of the method of pollen analysis to vegetation history of grasslands," in *Grassland ecology and classification: Symposium proceedings, June 1982*. Edited by A.C. Nicholson, A McLean and T.E. Baker, pp. 157-192. Kamloops, BC: Ministry of Forests.
- HENRY, A.
1988 *The journal of Alexander Henry the Younger, 1799-1814, Vol 1*. Edited by B. Gough. Toronto: Champlain Society.
- HIGGS, E.S.
1994 Expanding the scope of restoration ecology. *Restoration Ecology* 2(3):137-146.
- HIGGS, E.S.
1997 What is good ecological restoration? *Conservation Biology* 11(2):338-348.
- JULES, J.
2001 Personal communication (transcribed interview: August 15, 2001).
- KIMMERER, R.W.
2000 Native knowledge for native ecosystems. *Journal of Forestry* August:4-9.
- KNIGHT, R.
1996 *Indians at work: An informal history of native labour in British Columbia 1858-1930*. Vancouver: New Star Books.
- MACKENZIE, T.P.
1922 Letter to W.E. Ditchburn, Esq., Inspector of Indian Agencies. 12, May 1922. RG 10 (National Library of Canada and Indian and Northern Affairs, Canada) File no. 028248.
- MARCHAND, L.
2001 Personal communication (transcribed interview: July 31, 2001).
- MARSHALL, W.
2001 Personal communication (telephone conversation: December 28, 2001).
- MATSUI, K.
2001 Personal communication (email: December 26, 2001).
- MATSUI, K.
2002 Reclaiming Indian waters: Dams, irrigation, and Indian water rights in western Canada, 1858-1930. Ph.D. diss., University of British Columbia, Vancouver.
- MCLEAN, A., AND L. MARCHAND.
1968 *Grassland ranges in the southern interior of British Columbia*. Publication 1319. Ottawa: Canadian Department of Agriculture.
- NICHOLAS, G.P.
1998 "Wetlands and hunter-gatherer land use in North America," in *Hidden dimensions: The cultural significance of wetland archaeology*. Edited by K. Bernick, pp. 31-45. Vancouver: UBC Press.
- PITT, M.D.
2000 Why do we need a provincial strategy for grassland conservation? *BC Grassland (Grassland Conservation Council of British Columbia Newsletter, Kamloops, BC)* July/August: 4.
- ROSS, A.
1965 *The fur hunters of the far west*. Edited by K.A. Spalding. Norman: University of Oklahoma Press.
- SCOTT, D.C.
1918 "Report of the Deputy Superintendent General of Indian Affairs," in *Canada sessional paper 1918*. 53(27):31.
- SECWEPENC CULTURAL EDUCATION SOCIETY.
1994 Xexelip Xelxeleq (Throw your eyes up and pop it back in). In *Secwepenc Plants and Environment Teacher's Guide*. Kamloops, BC: Secwepenc Cultural Education Society.
- SOCIETY FOR ECOLOGICAL RESTORATION.
1996 California Chapter. [Http://www.sercal.org/](http://www.sercal.org/).
- SPINKS, N.
2002 Personal Communication (taped and transcribed interview: October 14, 2002).

- SWETNAM, T., G.D. ALLEN, AND J.L. BETANCOURT.
1999 Applied historical ecology: Using the past to manage for the future. *Ecological Applications* 9(4):1189-1206.
- TEIT, J.
1900 "The Thompson Indians of British Columbia," in *The Jesup North Pacific Expedition*. Vol. II (1). Edited by F. Boas. Memoir of the American Museum of Natural History. New York: G.E. Stechert.
- TEIT, J.
1908 "The Shuswap," in *The Jesup North Pacific Expedition*. Vol. II (2). Edited by F. Boas. Memoir of the American Museum of Natural History. New York: G.E. Stechert.
- TEIT, J.
1930 "The Okanagon," in *The Salishan Tribes of the Western Plateau*. Edited by F. Boas, pp. 109-294. Forty-fifth Annual Report of the Bureau of American Ethnology. Washington: U.S. Government Printing Office.
- THOMPSON, D.
1968 [reprint] *David Thompson's narrative of his explorations in western America: 1784-1812*. Edited by J.B. Tyrrell. Toronto: The Champlain Society.
- TURNER, N.J.
1999 "Time to burn," in *Indians, fire and the land in the Pacific Northwest*. Edited by R. Boyd, pp. 185-218. Corvallis, OR: Oregon State University Press.
- UNITED STATES DEPARTMENT OF AGRICULTURE.
1997 *Summary Report: 1997 National Resources Inventory*. Washington, DC: U.S. Department of Agriculture.
- VANKOUGHNET, L.
1878 "Report of the Deputy Superintendent General of Indian Affairs," in *Canada Sessional Papers 1878*. No. 10 (7).
- VAN RYSWYK, A.L., A. MCLEAN, AND L.S. MARCHAND.
1966 Climate, native vegetation and soils of some grasslands at different elevations in southern British Columbia. *Canadian Journal of Plant Science* 46:35-50.
- VROOMAN, C.W.
1941 A history of ranching in British Columbia. *The Economic Annalist* April: 20-25.
- WALKER, F.A.
1880 *United States Centennial Commission International Exhibition, 1876*. Edited by F.A. Walker. Reports and Awards. Vol. IV. Groups III-VII (359). Washington: Government Printing Office.
- WOOLLIAMS, N.G.
1979 *Cattle ranch: The story of the Douglas Lake Cattle Company*. Vancouver, BC: Douglas and McIntyre.