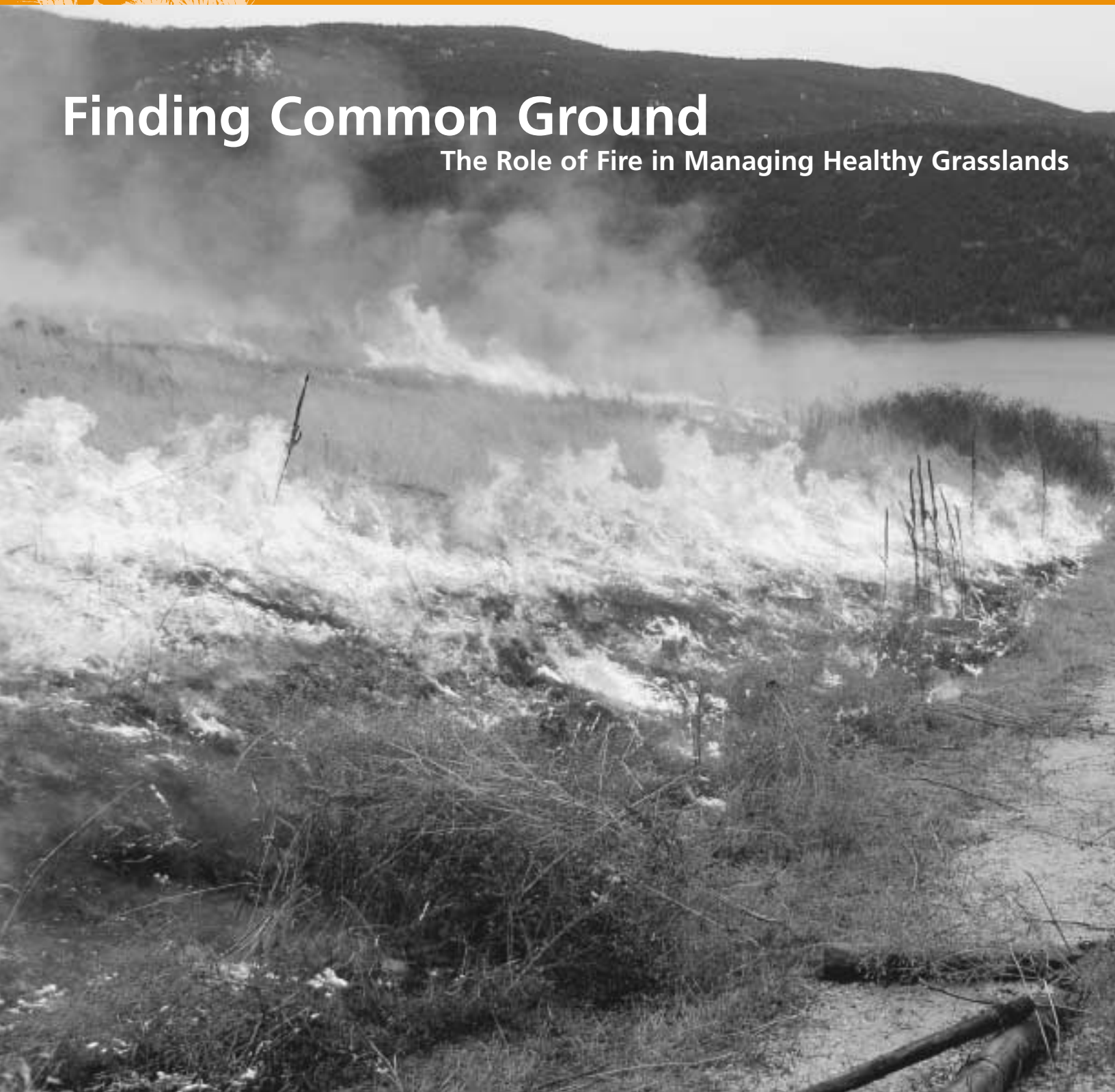
BC Grasslands

"The voice for grasslands in British Columbia"

OCTOBER 2004

Finding Common Ground

The Role of Fire in Managing Healthy Grasslands



MAGAZINE OF THE GRASSLANDS CONSERVATION COUNCIL OF BRITISH COLUMBIA

The Grasslands Conservation Council of British Columbia

Established as a society in August 1999 and subsequently as a registered charity on December 21, 2001, the Grasslands Conservation Council of British Columbia (GCC) is a strategic alliance of organizations and individuals, including government, range management specialists, ranchers, agrologists, grassland ecologists, First Nations, environmental groups, recreationists and grassland enthusiasts. This diverse group shares a common commitment to education, conservation and stewardship of British Columbia's grasslands.

The GCC Mission is to:

- Foster greater understanding and appreciation for the ecological, social, economic and cultural importance of grasslands throughout BC;
- Promote stewardship and sustainable management practices that will ensure the long-term health of BC's grasslands;
- Promote the conservation of representative grassland ecosystems, species at risk and their habitats.

COVER PHOTO COURTESY OF JUDY MILLAR, MINISTRY OF WATER, LAND AND AIR PROTECTION: A controlled burn at Kekuli Bay, March 2003

Message from the Chair

Maurice Hansen

The Quest For Fire

Fire could play an enormous role in managing BC's forested grasslands. This is so in my backyard, the East Kootenay Trench, and more so in the Boundary, Okanagan, Thompson and Cariboo. A start has been made at managing with fire in the Trench where the burning program has generated some notoriety. This kind of fire, purposely lit and with an object in mind, generates more than flame, heat and smoke however. It also generates fear, excitement and polarized for/against judgements. I want to think all this will pass eventually and fire as a management tool will settle into proficient maturity.

Last year, listening to the talk in the aftermath of the fire calamity, I was disgusted more than once at the shallow level of understanding that emerged regarding planned burning. The association between high fuel levels in the forest and 70 years of fire suppression produced the correct conclusion: absence of fire for decades was (largely) accountable for the woody material that has accumulated in the dry forests. Therefore put fire back in the system. The Ministry of Forests' hastily announced intention to do more burns didn't help much in clarifying the matter. Would this phase-one fuel reduction be accomplished by simply lighting up within some fuel breaks? If indices were used that would ensure this stuff would indeed burn, no one in their right mind would throw the match. You'd have to be crazy.

The only sensible way to use the fire tool is to ensure the heat doesn't get out of hand. What generally got missed in the chatter was that job one is mechanical fuel reduction. Fire then has a place as a tool to keep that wood from accumulating out of hand in the future. I have no trouble imagining how fire could be used for managing a lot of the landscape in Southern BC. I have no trouble imagining how this can be done safely. I have no trouble imagining how this landscape could be both biologically, aesthetically and economically attractive (and good for grasslands). And I have no trouble imagining how such a program could be put together. And I have even less trouble imagining why such a scenario isn't going to happen next week. Some major policy shifts are required. Proponents of ecosystem based land management are going to need luck, skill and cunning in their quest to make fire managed landscapes commonplace in British Columbia.

But after 2003 prospects were looking up. This year, 2004, with a number of spring burns behind them, our local Ministry of Forests was planning a fall burning program also. In August it looked like success was imminent. Six inches of rain later, a successful fall burn now seems as likely as snow in July. It's been so wet here that matches in the kitchen cupboard won't even light. On the grander scale fire consciousness has apparently followed the weather. At the recent Union of British Columbia Municipalities convention in Kelowna, it was reported to me that only four people showed up for a fuel management presentation.

So it looks like fuel management for public safety has lost some momentum. Recently slipped away in the mist and rain I guess. But the demand to simply manage our public lands better is also on the side of fire. The wet weather hasn't drowned out all the opportunities to push fire towards it's rightful place in the realm of land management. It just won't happen next week. Maybe next year though.

Message from the Executive Director

Bruno Delesalle

In the wake of development at the Stump Lake Ranch and a more recent proposal to develop a landfill on the Ashcroft Ranch, not to mention the numerous other developments proposed or underway throughout the Central and Southern Interior on grasslands, the GCC Board of Directors is considering its position and policy on development of grasslands. This is not an easy task, but it is a necessary one. Concerned citizens are contacting the GCC to inquire about our position on development. Where do we stand on the issue of development? How is the GCC going to respond to growing development pressures? These are important questions.

Although the GCC does not yet have formal policy on development, the Board of Directors has been very effective in working through these tough issues. The proposed GVRD landfill on the Ashcroft Ranch is symptomatic of the issues facing grassland conservation in British Columbia. Through a formal submission to the provincial government and the GVRD, the GCC has strongly recommended that development of the Ashcroft grasslands for a landfill not be approved.

The grasslands proposed for the Ashcroft landfill development are endangered ecosystems in British Columbia and several species at risk will be directly and indirectly impacted by this development. The direct impacts to grasslands are obvious: native grasslands and critical habitats will be lost forever. The indirect impacts on surrounding grasslands and the ranch are not as obvious, and I would suggest that these impacts are not being appropriately addressed or communicated in the environmental impact assessment process. This is partially due to the fact that it is very difficult to fully predict all the indirect impacts to the grassland and the species that depend on them. However, we do know that grasslands will be fragmented. The development of roads and the resulting increase in traffic, dust, noise, the spread of invasive plants, and other negative impacts will occur. The implications of these impacts may not be fully realized for years, if not decades.

There are two arguments presented to justify the development of the Ashcroft Ranch grasslands. The first is that only 200 hectares of grassland, not all native, will be affected by development. With a total of 98,000 hectares of grasslands in the Thompson Basin, the landfill will affect a mere 0.2% of the land. The perception is that the disturbance from the landfill development is relatively small and insignificant considering that it is on arid, unproductive land. The impacts are minor and localized, and the affected species can be relocated. Herein lies the problem: the relentless, incremental loss of the grassland land base from what is perceived as insignificant development at a very localized scale will continue unabated. This cancerous growth will continue to consume, fragment and degrade the integrity of BC's remaining grasslands.

The second argument is that the affected grasslands will be restored. The environmental impact assessment report suggests that "an attempt" will be made to restore native grasslands. However, it is very unlikely that native grasslands will be restored to their original state and integrity following this type of disturbance. We must therefore be honest and state that the impacts from the landfill development will be permanent.

Our position on the landfill development is clear. Grasslands represent only 0.8 % of our provincial land base. They are critical to maintaining endangered plants and animals and they are an important forage base for the ranching industry. Why would British Columbian's agree to develop a landfill on one of our province's most endangered ecosystems? It makes little sense. For this reason, the GCC has strongly recommended that greater consideration be given to locating the landfill on lands and ecosystems that are not endangered or as sensitive as grassland ecosystems. Further to this position, the GCC has stated that grassland values and range resources must be given higher recognition and attention in land use planning and decision-making at all levels of government. The ecological, social and economic values and services provided by grasslands and associated ecosystems are not appropriately recognized in cost benefit analysis, environmental impact assessments and land use decisions.

How is the GCC to respond to these growing development pressures? Two key initiatives will enable the GCC to begin addressing this issue. The first is the Priority Grassland Initiative. This initiative will use the recently completed provincial grassland GIS in conjunction with expertise from regional agrologists, ecologists, grassland experts and First Nations to identify high value, priority grassland areas for each major region across BC. Value criteria such as range condition, habitat, species diversity, species at risk, connectivity, forage values and other socio-economic values will be applied to identify priority sites. This collaborative and analytical process will yield strategic recommendations for each region supported by maps, data and other information. The key to this initiative is to extend the information and tools to provincial, regional, local and First Nation governments to inform land use planning and decision-making.

The second initiative dovetails with the Priority Grassland Process to complete a prob-

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In This Issue

Fire History in BC's Interior

by Ken Favrholdt, Ph.D. Candidate, University of Northern British Columbia

The catastrophic wildfires of 2003 in the Interior of British Columbia have been described as the worst in 50 years. It is also worth noting that the summer of 2003 was the driest on record since 1929. But such major fires as last year's are not recent phenomena and there may have been worse fires in the distant past, even before Europeans entered the scene. Today, however, the potential destruction to people, property and economically valuable timber is greater than in the past, which has been the motivation for suppressing wildfires.

Oral and written history can help us to trace and understand the nature of wildfires in early British Columbia. First Nations' traditional knowledge, early explorers' and fur traders' journals, and early settler and newspaper accounts are important sources of data about the location, size, and duration of wildfires. This article provides only a sketch but is suggestive of the detail of wildfire history in BC's Interior.

* * *

Fire has been a part of the history of BC's Interior since time immemorial. The Secwepemc (Shuswap) people of the South-central Interior used fire to improve their favourite root-digging sites and increase berry crops. Saskatoon bushes, for example, thrive as a successional species after fires. Natural fires, caused by lightning were, of course, uncontrollable. People simply relocated when fire threatened their small settlements. Before European contact, interior forests and grasslands experienced frequent, low intensity fires, possibly every five to 20 years, many probably set by the native inhabitants.

During the fur trade period of the 19th century, fire took on a different cultural meaning. The Hudson's Bay Company journals are filled with references to fire in the Kamloops area. Originally located on the present Kamloops Indian Reserve, then after 1842 on the North Shore (present Fort Street), the Hudson's Bay Company post was an important asset of the fur trade company. Fire, natural or human-caused, was regarded as a threat. By this time, it was part of the duties of the men in charge of the fort to record not only daily activities but also the weather.

In 1863, the year the Overlanders arrived in Kamloops, the Hudson's Bay Company post was relocated to the south side of the Thompson River, just west of the present Overlander Bridge, to intercept miners and

NEAR RIGHT **The aftermath of a fire near Horse Lake, summer 2003.**

FAR RIGHT **Strawberry Hill Fire, summer 2003.**

PHOTOS BY JESSE JONES

settlers. After the Fraser and Cariboo gold rushes, accidental fires were more common as ranchers and farmers cleared land. On October 4, 1868, it was reported in the HBC journal "…there must be some tremendous fires somewhere as the whole country is enveloped in smoke." Miners who visited Kamloops "report the woods about Seymour vicinity to be on fire which is probably one of the places where all this smoke comes from which has been enveloping the Country for so long a time." Seymour refers to Seymour Arm at the north end of Shuswap Lake, the site of a gold rush in the mid-1860s. By October 11, "the woods up the North River [the North Thompson River] are on fire," and the smoke did not clear until the end of the month.

The following year fires raged again in the Kamloops area and by May 1, 1869 the weather was very hot and "the air filled with smoke." On May 11, the HBC chief trader recorded there were "large fires up the South Bend" [the South Thompson River] causing "thick smoke which I suppose will last all summer." By June 30, "smoke was so dense as to hurt the eyes and almost choke one. Such a continuance of smoke must have a bad effect on the crops." The reference to agriculture refers to the Company farm, but smoke would have been a problems for settlers in the general area.

The Daily Colonist newspaper (in Victoria) reported that 1878 was the driest year ever recorded in the Interior. But droughts were no doubt periodic occurrences. 1892 was another year of extreme drought and fires. That year, bush fires, as they were called, and smoke filled the entire country in the neighborhood of Kamloops. It was thought that many grassland fires were caused by the local native people to improve the berry

crop the following year. Typical of the racist attitudes of the time, the newspaper suggested the government police should "catch the perpetrators and stop the practice."

* * *

In the twentieth century, preventing fires was taken more seriously because of the economic value of forests, ranches and the increasing threat to public safety.

1910 was a bad year for fires throughout BC and the Pacific Northwest. A major fire in the Fernie area of the Kootenays highlighted the danger to people and structures and fighting fires became a provincial effort. Five hundred men fought fires in the Boundary district that summer. The Kamloops Inland Sentinel paper reported over 400 fires around the province in August. The two principal causes of fires were campers and the railways. One-quarter of the fires were attributed to the CPR locomotives, although 95% of these were quickly extinguished. Donkey engines used in forestry and settlers clearing the land were other causes. As a response to the catastrophic fires of 1910, the BC Forest Service was established in 1912 and started battling fires from its inception. At the same time, methods were sought to prevent railways spreading fires to adjacent lands.

"Fire has been a part of the history of BC's Interior since time immemorial."

Major forest fires coupled with a heat wave made the summer of 1926 particularly dangerous. By this period, automobiles were becoming a common means of traveling through the province and tourism was growing; thus, so was the problem of cigarettes being thrown from cars. In that summer, major fires were out of control in the Salmon Arm district at Anstey Arm, Scotch Creek, and Fadear Creek in the Niskonlith Forest reserve. Other fires broke out at Criss Creek, Lytton, and Blue River. The largest fire erupted in early August in the Clearwater River Valley for 40 kilometres from Bear Creek Falls to Murtle Falls. By August 10, Kamloops was blanketed with smoke.

The Depression years were also bad for wildfires. 1931 was a year of prolonged drought with fires at Shuswap Lake and the McKinney fire east of Oliver. Again in 1934 there were heavy forest fires, including fires that raged between Nelson and the U.S. border. On August 28 Kamloops was hidden under a pall of smoke from fires between Golden and Lytton, from the lower Similkameen to the North Thompson. Fires also broke out at Spius Creek, Highland Valley, Mamette Creek (south of Walhachin), Venables Valley and Paul Lake. "Considerable range has been burned over," it was reported. The headline of the Kamloops Sentinel on August 28 stated, "Bad Forest Fires Hide City Under Heavy Smoke Pall." Other fires broke out at Douglas Lake, Mt. Ida (Salmon Arm), Adams River, and in the vicinity of Kelowna, site of "two fires, one on the east summit and one on the west."

World War II brought an appeal about the importance of the timber industry to Canada's war effort and insistence that the public be vigilant against incendiary fires. July 1941 saw a heat wave with record temperatures (42 degree Celsius) and the usual destructive fires. Following WW II, aerial fire suppression was initiated using contracted airplanes, followed by helicopters and large water bombers.

In the years since WW II, technology has had an increasingly mitigative effect on fires. Aerial fire suppression has become more commonplace, and the provincial government employs large firefighting crews every fire season. Unfortunately, the suppression of fires has altered the natural cycle of fire disturbance, and for that people, as we have seen in recent years, may have paid dearly in more disastrous fires. Modern fire suppression techniques, coupled with global warming, actually may be increasing the incidence of wildfires in British Columbia.

Ken Favrholdt is a PhD student in Natural Resources and Environmental Studies at the University of Northern British Columbia. He is the former curator of the Kamloops Museum and Archives and also the Secwepemc Museum and Heritage Park, and has written extensively on the local history of the Kamloops area.

Filmon's Fire Report

Released, Cam Fortems, Kamloops Daily News

The aftermath of a fire near Horse Lake, summer 2003.
PHOTO BY JESSE JONES

New homes must be fireproofed, high-risk areas cleaned up and firefighters better trained to guard against another disastrous wildfire year in BC, the provincial Firestorm review team urges.

Former Manitoba premier Gary Filmon, who headed the review, avoided criticizing actions of bureaucrats or firefighters in the Firestorm 2003 review, released during an open cabinet meeting in Victoria Friday. Instead, the 100-page report focuses on ways to prevent future destruction and to better prepare for wildfires in suburban interface areas.

"It's tempting to say, 'They could have or should have and it's possible they could have stopped it,'" Filmon said during a telephone news conference. "We wanted strategic decisions that deal with an overall approach as opposed to on-the-ground tactics."

One of the central recommendations of the Filmon report is a return to controlled burns conducted by the forest service, particularly in high-risk interface zones.

"It is clear that a successful record of fire suppression has led to a fuel buildup in the forests of British Columbia," states the report. "The fuel buildup means that there will be more significant and severe wildfires and there will be more interface fires, unless action is taken."

This is an excerpt from an article that first appeared February 28, 2004 and is reprinted here with permission from the Kamloops Daily News.

Grasslands Conservation Council submits concerns to Filmon Commission

In the wake of Firestorm 2003, the Grasslands Conservation Council of British Columbia submitted the following key points for consideration by the Filmon Commission:

1. Many dry ponderosa pine and Douglas-fir stands adjacent to open grasslands had open canopies due to removal of small stems by frequent fires. Grasses and other plants flourished beneath large, widely spaced, fire resistant trees. Since frequent fires prevented fuels from accumulating to high levels in these stands, fire intensity was often low, favoring survival of larger trees. High intensity fires occurred on some sites where fuel buildups were large, but their extent was limited.
2. In BC's dry Southern Interior, the decrease in fire frequency has resulted in many grasslands being replaced by forests; this reduction has been substantial in some areas. Open grassy forests adjacent to the grasslands have also been largely replaced by dense forests with few grasses or shrubs and large buildups of fuel, leading to increased risks of catastrophic wildfire.
3. The GCC recognizes that active management of forest encroachment and ingrowth in grasslands, dry forests and their interface is required to ensure no further loss of grasslands values, including threatened habitats, biodiversity, species at risk and maintenance of an essential forage base for wildlife and livestock.
4. The GCC supports a balanced approach to restoring and maintaining grassland and dry open forest ecosystems. The GCC's position with respect to fire as a management tool is as follows:
   a) Prescribed fire is an important tool for restoring and maintaining grasslands and dry open forests.
   b) Prescribed fire should be applied with clearly defined ecological and social objectives, and in combination with other appropriate tools.
   c) Fire science should continue to improve our understanding of the historic role of fires in BC and simulate as much as feasible, its past role in restoring and maintaining our grasslands and dry open forests.

   The GCC feels strongly that methods used to control fires in grasslands need to be carefully evaluated. It is our position that bulldozers should not be used for fire suppression in grasslands unless absolutely necessary. Bulldozers significantly impact grasslands by:
   a) Destroying vegetation and habitat,
   b) Disturbing soil and causing erosion, and
   c) Providing excellent seedbeds for invasive plants.

   Erosion and the spread of weeds are serious threats to biological diversity, grassland habitats, and productivity. Erosion should be avoided where possible. The GCC suggests that alternate fire suppression tools, such as foam lines and back burning, need to be used wherever possible.
5. Rehabilitation of burned grassland areas needs careful consideration and appropriate planning, prior to fire occurrence. Grass seeding can significantly aid the rehabilitation process; however, there is currently a lack of agreement on whether all burned grassland areas should be seeded, what species should be seeded, and when seeding should occur. Seeding is a significant issue that requires further discussion and planning. The GCC supports a collaborative process where government and other stakeholders reach agreement and develop a plan for rehabilitation of grasslands, including effective re-seeding of key areas, control of invasive plants, and monitoring of rehabilitation effectiveness.
6. In conjunction with this process, the BC government, in collaboration with other stakeholders, needs to take a proactive approach to develop the production and supply of native grassland seeds. Although native species alone are often not effective in restoration, economical sources of native seed are an essential component of restoration that is presently lacking.

The GCC is currently finalizing a policy on fire and the role of fire in management of grasslands. For more information, please contact the GCC at gcc@bcgrasslands.org or 250-374-5787.

Helping Our Land Heal

A Cultural Perspective on Fire and Forest Restoration

Tammy Allison, TEK Intern, and Henry Michel, B.Sc., En'owkin Centre

The use of fire has always been a part of the Culture of the First Nations of Interior British Columbia. However, the use of fire as a contemporary forest management tool is not well understood. The desire for better management of our dry forests, especially after recent extreme fire events, has stimulated an interest in the use fire and controlled burning as a way to prevent the uncontrolled fuel build-up that was a critical factor in many of the extreme fire events in 2003.

Forest Resource Extension Partnership (FORREX) and the En'owkin Traditional Ecological Knowledge (TEK) Intern Program undertook a project recently to demonstrate traditional Okanagan burning practices, and how the use of these practices could eliminate potential extreme fire events. Former Okanagan Elder and Fire Keeper, the late Annie Kruger led this workshop and field tour in November 2003. She brought participants to a demonstration traditional burn that her family conducted in the fall of 2002. This article will summarize the teachings that Okanagan and traditional Fire Keeper the late Annie Kruger presented during that tour.

Okanagan People, according to Elders, exist in a reciprocal relationship with the land. The land provides all foods, medicines, shelter and material goods needed for survival; in return, Okanagans are responsible to be caretakers of the land. This responsibility demands that Okanagans ensure all plant and animal communities have their food and shelter requirements met. Fire has been a major component of this responsibility for Okanagans.

The main reason for traditional burns was to increase the production of foods, materials and browse plants, and to maintain the wide-openness of the forest floor. It is felt that large old-growth canopy with wide-open forest floor provides a shaded ecosystem that is needed for the survival of plant and animal communities. Traditional burning maintained this wide-open state. Berry plants such as blackcaps (black raspberries), huckleberries, and soapberries; bird populations such as Blue Grouse, Willow (Ruffed) Grouse and quail; and mammals such as deer, moose, and elk are some of the populations that are said to increase as a result of fire.

With the use of fire, the land was able to provide new life and new growth, completing the circle of giving and receiving. Two types of burns are common in this traditional practice. Big burns occurred in the fall time, and smaller safe burns took place in the springtime. Fall burns were large in size; usually a whole mountainside or valley was burned at one time. Big burns occurred on cycles from three to 15 years, depending upon the density of the fuel that required burning. Safe burns were sometimes called cycle burning. In the spring the burns were smaller in size; the burning area only occurred from one block to another block. Safe burns were used to clean up the duff, and to enhance the variety of vegetation to encourage food and material plant production.

Traditional Okanagan burning practices were regularly maintained until about thirty or forty years ago. Elders speak of forest conditions then that are far different from what we have become accustomed to today. The general need was to have a wide-open forest of approximately 80 to 300 trees per acre. Fire Keepers visited an area on a regular basis to determine the frequency and prescription for burning. Today, only certain families maintain the practice in small confined areas such as on Indian Reserves and, in many cases, even this level of burning has been discouraged.

Being a Fire Keeper is a responsibility of life long learning passed down from generation to generation. Ceremonial lessons are taught to the trainees at a young age in their preparation for becoming a Fire Keeper. They are taught that all fire is sacred, all land is sacred, all air is sacred, and all water is sacred; these are the four elements of life. Fire is a purifier, it cleanses; the fire also warms us, cooks our food, and therefore it is an important element. The young trainees are also taught to talk to the fire, and tell the fire what they want it to do while it is burning. When the burn is completed, they are taught how to thank the fire for the work it has done. The children are taught the respect that they need to give to the fire. When they address the fire, they are taught to offer prayers from their heart, and not to dramatize their prayers. If you dramatize the prayers, you will end up loosing the impact of the prayers, and the respect for the fire. There are many other teachings to becoming a Fire Keeper.

"With the use of fire, the land was able to provide new life and new growth, completing the circle of giving and receiving."

It is a valuable and precious gift that some Okanagan families still carry out today. One of the last Fire Keepers on Penticton Indian Band was the late Annie Kruger. She passed her knowledge as a Fire Keeper down to her children and grandchildren. It is now living on with her memory, to help preserve, protect, and secure our land. This was her way of helping our land heal. Traditional Okanagan burning practices are still being practiced on the Penticton Indian Reserve, thanks to the late Annie Kruger.

Tammy Allison, from the Lower Similkameen Indian Band, has been working with En'owkin Centre as the Aboriginal Traditional Ecological Knowledge Intern for the past 18 months. Tammy also attends the En'owkin Centre for courses that will enhance her abilities in Traditional Culture and Language, as she feels that these are essential for the youth to learn.

Henry Michel is of Secwepemc (Shuswap) ancestry and is a member of the Williams Lake Indian Band. Born and raised in the little Secwepemc village of Sugar Cane on the Williams Lake Indian Reserve, Henry has a Bachelor of Education Degree from the University of British Columbia, a counseling certificate from the NECHI Training Institute, and has been employed with the En'owkin Centre in Penticton since 1987.

Fire in Mind

Don Gayton, M.Sc., P.Ag, FORREX

The Chippewa poet Louise Erdrich says that grass must always bow beneath the arm of fire. What Erdrich said in the language of poetry has long been echoed in the language of scientists, of other indigenous peoples, and of the ranching community: grasslands have a profound relationship to fire.

If we were to put this relationship in terms of Greek mythology, the three gods of the grasslands would be Fire, Grazing and Drought. We mortals have difficulty controlling this capricious trinity of disturbance. Frequently they conspire against us, sometimes they fight amongst themselves, and nobody is quite sure what they are going to do next.

Fire would be the god of grassland creation. The eminent geographer Carl Sauer said: "suppression of fire results in gradual recolonization by woody species in every grassland known to me." Historian Stephen Pyne writes, "with fire removed, grasslands everywhere have receded. What prairies have not been plowed under have suffered from spontaneous reforestation." The early history of the Canadian prairies is full of vivid stories of grass fires, and fire was a primary grassland management tool for First Nations peoples.

In a general sense then, there is an obvious connection between grasslands and fire. But as concerned stewards, we are challenged to go beyond the "general sense" into a more nuanced understanding of our own grasslands.

Fire is like an elephant at a tea party; it is unexpected, unpredictable, fascinating, and frightening. Fire presents huge challenges to our scientific style of management, precisely because it is so random and so unpredictable. Fire is hard to control, and even harder to study. Fire is influenced by many factors, and in turn, influences many other factors. Fire challenges the very best of our abilities as managers and students of the grasslands.

There are some things we know. We can predict fire behaviour based on the amount of fuel, the "thickness" of the fuel, the windspeed, the slope, the aspect, the ambient temperature and the relative humidity. And based on those calculations, we can also predict fire's impact on vegetation. In the grasslands, fire moves as a "front" just a few centimetres wide. Because grass fuels are fine, or "flashy," they ignite rapidly and then burn out equally rapidly. Fire's immediate impact on existing vegetation will be based on how hot that narrow front gets, and how long it stays at that peak temperature.

On the larger scale, grasslands are influenced by how often fires occur, the season of the year in which they occur, and how large the typical fire is. Fluctuating weather patterns influence fire; wet years increase the amount of available fuels but decrease the chances of ignition; dry years do just the opposite. Historically, a series of wet years followed by a very dry year would set the stage for numerous large fires. And grazing, of course, has a profound and reciprocal influence on grassland fire. More on that later.

Fire, like grazing, insect invasions, drought, hailstorms and so on, is a natural disturbance. In applying modern ecosystem-based management to grasslands, we strive to understand the historical, or pre-European, disturbance regime. There are three reasons for this. First, ecosystems co-evolve with natural disturbances, adapt to them, and even depend on them. Second, we know that in many cases, we have substantially disrupted the natural disturbance regime, and third, ecosystems function best when they are within, or close to, their historical range of variability for natural disturbance.

> *"The fact remains that the best timber ranges in interior British Columbia today were made by fire, and any comprehensive land use policy for the future must take this fact into account."*
> *—Edwin Tisdale, Agriculture Canada, 1949*

Prior to 1880, the dry, low elevation open ponderosa pine and Douglas-fir forests of the Southern Interior, together with their associated grassland understorey, experienced frequent, stand-maintaining fires. We know this from historical accounts, early photographs and from interpreting the record contained in fire-scarred trees. Grasses had a big part to play in these ground-oriented fires, as they provided the fuel continuity that carried fires through the forest stand. A major outcome of this frequent, low-intensity fire regime was the suppression of tree regeneration, resulting in open, savanna-type stands with few, large trees and an abundant grassy understorey. A host of factors, including settlement, agriculture, grazing and fire suppression have disrupted this fire regime, leading to "forest ingrowth"—the slow conversion of open, savanna-type stands with a healthy grass understorey, to closed forest stands with little or no understorey vegetation, as well as "forest encroachment" on to traditional grassland areas.

Tim Ross' 1961–1997 airphoto comparison work in the grasslands around Williams Lake showed both processes—encroachment and ingrowth—proceeding rapidly. Airphoto comparison work that I was involved with in the Rocky Mountain Trench also showed what has

UCC Natural Resource Science students conduct an experiment to observe how fire acts according to various terrains and surface materials. PHOTO COURTESY OF UCC PUBLIC RELATIONS DEPARTMENT

become a widely recognized phenomenon: fire suppression causing open grasslands to become treed grasslands, treed grasslands to become open forests, and open forests turning to closed forests.

Steve Taylor of the Canadian Forest Service used extrapolation methods to project the fate of open and treed grasslands near Kimberley; under the current management regime, they would be completely converted to forest by the year 2032.

The ecological role of fire in open, non-treed grasslands is less well known, since there are no convenient fire-scarred trees to turn to for a record of frequency. However, students of fire suggest that for grasslands that are topographically connected to an adjacent dry forest, the historical fire regimes would be similar. In fact, many of the fires that dry forest trees experienced likely started in the open grasslands below them.

John Parminter of the BC Ministry of Forests has done extensive fire research and suggests that both the Bunchgrass and Ponderosa Pine biogeoclimatic zones experienced a similar fire regime prior to European contact: an average fire return interval (time between fires) of five to 15 years, with an average fire size of five to 50 hectares. These averages, of course, mask a huge amount of variation. US Forest Service guidelines for bunchgrass-dominated mountain grasslands suggest a similar historical fire regime, with intervals between five and 40 years.

Fire in shrub-dominated grasslands is a big question mark. Nominally, our major shrubs, big sage, antelope-brush and rabbitbrush, are quite flammable and sensitive to fire, big sage particularly so. The conventional thinking is that historically, shrublands were held in check by frequent fire, but it's not that simple. As the eminent American range scientist Kendall Johnson says: "perhaps the most enduring question among students of western plant ecology is the nature of the big sagebrush zone prior to European settlement." After a detailed study of historical photos in the US Great Basin, Johnson concludes that "sagebrush is where sagebrush was."

Shrubs tend to be short-lived, and certainly there is evidence to show that overmature shrubs, with thick woody stems and heavy accumulations of dead branches, are very prone to firekill.

Modern managers apply prescribed fire to grasslands to get rid of accumulations of dead litter, to rejuvenate stagnated grass clumps ("wolf plants"), to enhance forage palatability, to reduce weed competition, and to reduce shrub and tree encroachment. Grasslands typically get burned in the spring, in that narrow calendar window when the dead litter has dried out but new growth hasn't started yet. A spring burn produces a dramatic change in "albedo" (some say "libido" as well). Albedo is a fancy word for the color of the earth. Dead grass litter is essentially white, and reflects most of the sun's incoming heat. A burned grassland is black, and the insulating layer of litter is removed, so a huge amount of that incoming solar heat is transferred into the ground. By burning grasslands we can, quite literally, "hurry spring" by days or even weeks.

I am a staunch advocate of burning grasslands to eliminate tree encroachment and forest ingrowth. I am much more hesitant about burning native grasslands to enhance grazing values. A spring burn generates lots of easily available green forage, and it's a free smorgasbord for grazing animals—both wild and domestic—from miles around.

The native bunchgrasses—the keystones of our native grasslands—run on a very tight energy budget. They carefully divide their solar-derived energy into producing leaves, producing roots, producing seeds, maintaining themselves through the winter, and so on. When these plants are grazed repeatedly, they drop everything else in favor of the first priority—producing more leaves. So a heavily grazed, poor condition native grassland, as many of our spring ranges are, is not a good candidate for burning, since it means those already stressed bunchgrasses are going to be subject to even more grazing stress.

There is a lot of talk about reducing grassland weed infestations through prescribed burning, but my guess is that for every successful instance, there are ten others where the weed problem stayed the same or even got worse after burning. The weeds you see are the tip of the iceberg: most of our range weeds are prolific seed producers. Contrary to many of our native species, weeds can germinate rapidly, and are designed to quickly capture the open niches that burns can create.

I'm all in favor of the thoughtful application of prescribed fire to create more grass and grasslands. But let's make sure the primary objective is to burn the small trees that are invading the grasslands, rather than the grass itself.

Don Gayton is Ecosystem Management Specialist with FORREX and has worked extensively with grasslands and dry forests. He can be contacted at don.gayton@forrex.org.

Grasslands and Dry-Forests in BC: The Role of Fire in Present

Walt Klenner, PhD, Ministry of Forests and André Arsenault, PhD, Ministry of Forests

Several concerns have been raised about the condition of grasslands and dry forest habitats in BC. Although many changes have occurred in these habitats since the arrival of European settlers in the mid-1800's, much of the recent debate has focused on the establishment of dense thickets or mature trees on sites that were formerly known or believed to be grassland or open forest. This has been called "encroachment," and is viewed by many as an unnatural ecological condition that has arisen as a direct result of fire suppression activities. Such "encroached" sites have relatively low understorey productivity, appear to produce low quality timber, and represent fuel-loading conditions that increase the likelihood of stand-replacing, catastrophic wildfires. To return sites that have undergone encroachment to a more natural condition, and to facilitate the production of forage, a proposed solution is to reintroduce a frequent fire regime across extensive areas. Although this solution appears to be intuitively simple, we believe that the current ecological conditions and social expectations are incompatible with simply applying frequent prescribed fire as may have happened in the past.

Illustration of grassland conditions in the vicinity of Ashcroft , ca. 1932.
PHOTO COURTESY OF MINISTRY OF FORESTS

Historically, grasslands and the dry forest areas of the Southern Interior were used extensively by First Nations peoples who derived sustenance and cultural values from the resources these ecosystems provided. Recollections from First Nations elders and early explorers about the grasses being "belly-high to a horse" provide a reference condition and expectation for the condition that might exist today if these areas were properly managed. Since the mid-1800's, livestock grazing, the displacement and/or restricted movements of First Nations peoples, the establishment of exotic plants (weeds), forest harvesting and fire suppression have changed the nature of the grasslands and open forest. It is widely believed that much of the dry forest and grasslands in the Southern Interior were sparsely treed prior to the mid-1800's, but this perspective should be placed in the context of systematic surveys and reports from the early 1900's. For example, Whitford and Craig (1918) in their book Forests of British Columbia, note that "the grasslands of the province have been much extended by fire…where the fires have ceased, the forest is again invading the places it once covered, especially on northern slopes."

Livestock grazing, particularly in the 100 years following settlement by Europeans, had a marked influence on the ecology of the grasslands and adjacent open forest. Year-around grazing by large numbers of livestock (cattle, sheep and horses) is well-documented, leading Whitford and Craig to note in 1918 that " the most characteristic plant of the natural grass lands in the southern part of the Interior system is the bunch grass (Agropyron spicatum). Over some areas it has practically been exterminated by over-grazing" (above photo). The ecological consequences of improper range management were exacerbated by periods of drought, several outbreaks of grasshoppers, and the introduction and spread of unpalatable weeds. The establishment and spread of weeds in the Southern Interior is poorly documented, but by 1921 the BC Forest Service Annual Report notes that "large portions of the range around watering places have been so badly depleted by overgrazing that very little vegetation except dandelions are growing on them." By 1946 the Annual Report noted that, "In some parts of the Interior the encroachment of certain undesirable weeds on the range has become noticeable – so much so that in some districts they have practically excluded all grasses," indicating that weeds were becoming or had become a widespread problem. Currently there are well over 100 exotic plant species that have become established in the grasslands and dry forests of the Southern Interior since the mid-1800's.

Since the 1950's, range management efforts have done much to improve the condition of the natural plant community. Weed abatement programs, the curtailing of year-around grazing, and the application of range management practices such as rest-rotation grazing systems have allowed for considerable recovery of these ecosystems. Is it time to begin an extensive program of prescribed burning in grasslands and open forest to further improve their condition, restore them to a more natural condition, and will this bring back the grasses that were "belly-high" to a horse?

We suggest that before embarking on an aggressive program to re-introduce fire into these ecosystems, several key issues need to be resolved or clarified. (1) What are the short- and long-term desired conditions of the grassland and open forest habitats, and does this represents a return to historic conditions or simply an emphasis on the commodities presently desired by humans? The historic extent of First Nations use of prescribed fire is

and Future Management

unclear since some historic reports contradict the view that extensive areas were in an open condition. Also, the use of the mid-1800's as a reference condition is not ecologically defensible as it represents only one brief period in the long-term evolution of the grasslands and open forest. For example, historic reports from the early 1900s note that in open forest, pinegrass was the dominant species. Relatively shady conditions in the understorey would have favoured pinegrass over bunchgrass, suggesting that canopies may not have been open enough historically to favour the development of bunchgrasses. (2) It is important that current conditions be critically assessed, and the consumptive uses or disturbances (both historical and present) that shaped and continue to affect the condition of these ecosystems be evaluated. As illustrated right, simply creating open canopy conditions does not necessarily create a vigorous understorey. (3) The full range of costs and likely benefits of interventions needs to be identified, along with the management systems that will most likely create the desired conditions, and (4) Treatments need to be coupled with the monitoring of key indicators to provide a basis for evaluating program efficacy.

Changes in the ecological condition and cultural environment between 1850 and present suggest that managing open forests and grasslands for multiple values will be more complicated than relying on frequent fire introductions to cure all problems. For example, many of the 100 or more exotic plants introduced over the last century are adapted to disturbed or exposed mineral soil and high light conditions, the very conditions likely to be created by frequent interventions with prescribed fire. Following fire, grazing by livestock or native ungulates may exacerbate weed invasions or diminish the likelihood that bunchgrass will dominate the plant community unless the site is allowed to recover for several years before livestock grazing is resumed – a practice that may not be socially acceptable. Key habitat features including soil lichens (cryptogam crust), downed wood and snags are diminished by frequent fires and the loss of these elements will have implications for maintaining the biological diversity of these ecosystems.

We advocate that a conservative approach be adopted in the application of prescribed fire or other treatments to the management of grassland and dry forest ecosystems, and adherence to three key principles of adaptive management: (1) establishing a quantitative description of the desired condition, and avoiding idyllic and misleading terms like "ecosystem restoration" or "natural ecosystems," (2) the use of multiple treatment options for achieving desired conditions to facilitate the evaluation of management actions, and (3) rigorous monitoring of treatments to periodically evaluate efficacy. Previous attempts to use prescribed fire to enhance the condition of grasslands and low-elevation forests should not be ignored. For example, in the 1923 and 1925 BC Forest Service (BCFS) Annual Reports, an evaluation of prescribed burning trials did not indicate satisfactory results, suggesting that fires were not effective at diminishing the density of conifer regeneration. Similarly, in the 1953 BCFS Annual Report, a review of encroachment issues in the Cariboo District came to a similar conclusion "fire as a solution has generally been a failure and succeeds only in reducing both grazing and forest values." Our understanding of dry forest and grassland ecology, and the appropriate application of prescribed fire has evolved since the publication of these reports, but these warnings from the past should lead present managers to be cautious and base actions on a monitoring program. In this context, fire should be viewed as a tool and not an objective.

To create the variety of conditions necessary to maintain biological diversity in grasslands and open forest habitats, a range of management systems, and disturbances (including no management) will likely be necessary. This can be achieved with careful strategic planning, but it should be remembered that a century of poor management and neglect may actually take longer to correct…short term disappointment may be part of the long-term solution.

Yellow pine stand on the boundary of the Little White Mountain Forest on Penticton Creek (ca 1925) PHOTO COURTESY OF MINISTRY OF FORESTS

Walt Klenner is a wildlife habitat ecologist with the Ministry of Forests in the Kamloops Region. He received his Ph.D. from the Department of Zoology at the University of British Columbia in 1990.

André Arsenault completed his Bachelor of Science in Ecology and his Masters of Science in Ecology both at the University of Quebec, and his Doctorate in Botany at the University of British Columbia. He worked as a plant ecologist for the Ministry of Forests, Kamloops Forest Region before assuming his current role as Silviculture Systems Researcher in the same region.

The Role of Fire in BC's Parks

by Eva Riccius, ParkWatch Coordinator, Canadian Parks and Wilderness Society - BC Chapter

For most of the 20th century in North America, wild fires were perceived as destructive and dangerous to humans and the environment. The effect of fire suppression on grassland ecosystems in BC has been dramatic. Smokey Bear taught us that "only you can prevent wildfires." And as a result ecosystems have changed, shifting out of their historic range of variability.

Fire ecologists have found that fires historically occurred frequently in many dry interior forest types, generally about every five to 15 years. Many areas that were traditionally grasslands in the South and Central Interior, along with areas in the Kootenay Trench, have slowly become forests. Encroachment on grasslands is an ongoing challenge for grassland managers and fire is an effective tool to reverse the trend of encroachment.

Parks have not been immune to encroachment and fuel loading. Already, BC Parks faces the challenge that grasslands are underrepresented with less than seven percent of BC Parks' system representing grasslands. These grassland ecosystems need to be managed prudently so that they continue to represent the ecosystem, habitats and species that they were set aside for. They require active management in an appropriate manner, which includes the reintroduction of fire. Left alone, the small amount of protected grasslands will dwindle.

BC Parks has recognized the need to restore grassland and open forest ecosystems that are fire dependent. A number of restoration projects have been carried out in parks such as: Wasa Lake Park, Kalamalka Lake Park and Vaseaux Lake Park. However, many more parks require restoration to ensure that grassland ecosystems are maintained.

"Restoration work comes with a price. It certainly is not as simple as lighting a match and letting an area burn."

BC Parks has been limited in its restoration efforts for a number of reasons including staff expertise and funds. Staff in the relevant regions have been building their expertise but, as we know, funds have become extremely limited.

Restoration work comes with a price. It certainly is not as simple as lighting a match and letting an area burn. A restoration project should begin with careful planning including an analysis of the historic fire regime , historic stand structure if the area was forested, and information about ecosystem values that are to be enhanced by the restoration (such as forage for wildlife). Clear ecological goals for the restoration should be set out so that monitoring and evaluation after the restoration are effective. The restoration plan may include the need to remove trees prior to a prescribed burn. This is required when the current stand structure is vastly different from the historic stand structure. After the restoration work has been completed, monitoring of the area should be carried out for a number of years to ensure that the goals set out at the outset of the restoration are met and to measure any negative impacts such as the introduction of invasive species. Monitoring and subsequent treatment can catch invasives early and prevent or control their spread.

Tree removal is a sensitive issue in parks. However, it is necessary in some restoration treatments for grasslands and open forests. Sometimes only a few trees are required to be removed and they may be left on site or used in the park. More often, however, the ecosystems are so far removed from their historic state that a significant number of small ingrowth trees need to be cut prior to burning the site (the large old trees from the pre-European settlement time should be left on the site). Leaving the cut trees on the site is not an option in these cases. There is just too much wood that would be left on the site creating a forest floor fuel problem and increasing fire intensity which would compromise the restoration goals. In these cases, the wood needs to be removed from the site to ensure that prescribed fire can occur and restoration goals are met.

BC Parks is bound by the Forest Act, which requires wood to be 'disposed of' according to the Act, meaning that it must be sold with a portion of the revenue returned to the province. This requirement could create a problem in that government could be tempted to cut trees in parks to create general revenue. Of course this would be unacceptable.

Last year BC Parks developed a tree removal policy specific to ecosystem restoration. Any tree removals

LEFT **A controlled burn at Kalamalka Provincial Park, spring 2002.** PHOTO COURTESY OF JUDY MILLAR, MINISTRY OF WATER, LAND AND AIR PROTECTION
RIGHT **Okanagan Mountain Park Fire, August 2003.** PHOTO BY PAT MCHUGH

must be justified in an ecosystem restoration plan, ecosystem management plan or vegetation management plan. The policy is designed to prevent the cutting of trees for the sake of generating general revenue for government. There is specific mention that tree removals are not to be used to fund infrastructure developments, or facility construction, maintenance or repair.

The policy is also explicit that tree removal is to be carried out in the most environmentally sensitive manner and treated sites are to be rehabilitated. In most cases, except in the close vicinity of infrastructure, prescribed fire will follow tree removals as part of the restoration process.

This summer, BC Parks obtained the approval to use funds from tree removals to offset the costs of restoration work rather than have the funds go into the government's general revenue. This will help pay for planning, burning and monitoring the restoration areas. It is still unclear what the total costs per hectare would be to restore grasslands and open forests inside parks. However, we know that the costs will be higher than in non-park lands because of the increased level of care that needs to be taken at all stages of the work. In the unlikely case that funds would remain after the restoration project is complete, those funds would be contributed to a dedicated fund for BC Parks.

While we are supportive of restoration work, we are cautious about supporting the tree removal policy outright. We will be watching closely to see how restoration projects are developed and implemented over the next few years. We have been very clear that we do not want to see the policy misused to generate general revenue for BC Parks and that it should be used explicitly for ecosystem restoration. The policy has the potential to allow excellent and much needed grasslands restoration projects to move forward in BC's grassland parks by thinning the encroachment areas and reintroducing fire.

Eva Riccius is an Ecosystem Specialist at CPAWS-BC. She has a Master in Resource and Environmental Management with a specialization in fire ecology and fire history.

Annie Kruger

Adapted from an article by Henry Michel and Tammy Allison

Annie Kruger PHOTO COURTESY OF HENRY MICHEL, THE EN'OWKIN CENTRE

Traditional Okanagan Fire Keeper Annie Kruger, Elder of the Penticton Indian Band, passed away on December 1, 2003. Throughout her life, Annie fought for a healthy environment, and her death was a great loss to the First Nations community and grassland stewardship in British Columbia.

Annie was a true steward of her environment and believed that it was important to share traditional information and knowledge with members of the scientific community. Annie recognized that the reasons for and methods of traditional burning are often different from those of the government. Although she was not constrained by government regulations, Annie had responsibilities handed down to her from her Elders: responsibilities to the land, the people and the new life that her burning generated. She believed that the land provides all of the food and materials for life and, in return, Okanagans must take care of the land. Annie acknowledged that the fire gives new life and new growth to the land, and that she could give to the land and receive life back.

According to Annie, traditional burning opens up the forest to encourage a wide diversity of species; however, burning carried out by the BC Ministry of Forests is done only to encourage select species of trees to grow.

During her life, Annie talked at length about her frustration at not being recognized for her important contribution to forest restoration. She understood that many individuals—from among her own people, Band Administrations, the general public, and the provincial Ministry of Forests—did not agree that she should be burning. Often her family had started prescribed burns only to be told to put them out. Sometimes the Ministry or the Penticton Indian Band Fire Department would step in to extinguish her burns. Regardless, Annie held strong to her belief that fire would bring new life and growth to the land and continued to work to that end. As such, she was a true grasslands aficionado.

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A controlled burn at Vaseux Lake, 2003. PHOTO COURTESY OF JUDY MILLAR, MINISTRY OF WATER, LAND AND AIR PROTECTION

Extension Note

Effects of Fire on Grassland Plants

by Kristi Iverson, Iverson and McKenzie Biological Consulting Ltd.

The grasslands of the Southern Interior have evolved and been shaped by the influences of fire. Most grassland plants are not only adapted to survive fire, but are also partially reliant on fire to maintain conditions for germination and abundant seed production. At upper elevations where grasslands meet forest, fire likely played a pivotal role in maintaining a dynamic flux between grassland and forests by periodically killing smaller trees that established in grassland areas.

The most common strategy of grassland plants to survive fire is to have underground structures that are unaffected by fire and able to re-sprout after the fire has passed through. Most common perennial herbaceous plants in the grasslands use this strategy, including balsamroot and mariposa lily. Balsamroot has a woody caudex with many growing points atop a thick taproot; it readily grows from these growing points after a fire. The nutrient flush provided by fire often results in more vigorous growth and seed production. Fires also seem to provide better conditions for the germination of seeds of balsamroot and other grassland herbs and the density of many perennial forb species typically increases a few years following fire. Mariposa lilies, which have a bulb rather than a caudex, also resprout after fire and usually become more abundant in the years following a grassland fire.

Many shrubs, including saskatoon, rose, and snowberry, are top-killed by fire but the roots survive and the plants re-sprout with succulent, vigorous, nutrient-rich growth that is like candy to browsing animals. Big sagebrush, a common shrub in the lower grasslands, has a much different approach. Sagebrush is usually killed by fire, although it often grows in conditions where fuel is discontinuous and burns are typically patchy. Surviving or adjacent sagebrush produce prolific wind-blown seed; sagebrush seed readily germinates on the nutrient-rich patches of bare soil left after the fire.

All of the bunchgrasses that characterize our grasslands are able to survive most fires, although they vary in their sensitivity to fire. Each bunch of a bunchgrass has a root crown with many basal buds capable of producing new shoots (tillers). The response of an individual clump of bunchgrass depends on the intensity of the fire, the residence time of the fire, season of the burn, the amount of dried litter (fuel) in each bunch, and the height of the basal buds. Most bunchgrasses are, at a minimum, reduced in cover for one to three years following a fire, but new growth is typically more nutritious and growth and seed production often increases after a few years.

Bunchgrasses are much more sensitive to fire during the growing season. For example, rough fescue, a common bunchgrass in lightly grazed upper grasslands, may be severely damaged by a hot growing season fire where lots of old stubble has accumulated over the years. A cooler early spring burn might result in very little damage. Bluebunch wheatgrass is very well adapted to fire and rarely has dense enough litter to result in much damage to bunches. Similarly, small bunchgrasses like junegrass and Sandberg's bluegrass have little fuel and are relatively undamaged by fire.

Unfortunately, many grasslands, especially at lower elevations, have been invaded by non-native annual grasses, particularly cheatgrass. Such grasses can alter fire effects on a grassland ecosystem. Cheatgrass grows and cures much earlier in the season and is extremely flammable. It is more likely to ignite earlier in the season while bunchgrasses are still growing and are susceptible to damage. Typically, a large proportion of the cheatgrass seed survives the fire. Although the number of cheatgrass plants may be reduced the year following a fire, the plants produce great quantities of seed that result in increased cover of cheatgrass in subsequent years. Cheatgrass usually germinates before any native grasses and effectively 'cheats' native grasses of the moisture they need to germinate and establish. Some grassland areas of the U.S. that have been extensive invaded by cheatgrass now have more frequent fire than historically occurred.

By understanding the effects of fire on different plants, prescribed fire can be used as an effective tool in managing grassland vegetation. Prescribed fire can be used to reduce cover of trees that have encroached onto grasslands. It can also be used to increase productivity and palatability of grasses and shrubs, remove thatch from decadent bunchgrasses, and increase the cover of traditional use plants such as balsamroot and mariposa lily. More information on the effect of fire on plants can be found in the Fire Effects Information System at http://www.fs.fed.us/database/feis

Kristi Iverson completed a cooperative education degree in Biology at the University of Victoria in 1994. While working for the Ministry of Forests, she had an opportunity to develop a classification of grassland ecosystems and subsequently discover her passion: grasslands. Kristi and her husband own Iverson & MacKenzie Biological Consulting Ltd., a private consulting firm based in Lac la Hache.

The underground structure of the balsamroot remains unaffected by fire and allows the plant to resprout after fire has passed.
PHOTO BY KRISTI IVERSON

Ponderosa Pine
PHOTO BY BOB SCHEER

Ponderosa Pine

The Effect of Fire on Ponderosa Pine

R.J. Habeck, United States Department of Agriculture

Pacific ponderosa pine has evolved with a thick back and open crown structure that allows it to survive most fires. Mature trees self-prune, leaving a smooth bole (trunk) that reduced aerial fire spread. Other adaptations to fire include deep roots, high foliar moisture content, and medium to light lichen growth. Seedlings prefer the mineral-soil seedbeds created by fire.

Fire effects on Pacific ponderosa pine vary according to the size, configuration, and density of the stand, in addition to fire severity. Generally, well-spaced seedlings and saplings are able to withstand low-severity fires, as are pole-sized and mature trees. Moderate- to high-severity fires, however, kill trees pole-sized and smaller. Mature Pacific ponderosa pines have a higher survival rate than younger trees due to their enhanced adaptations to fire.

The principal cause of mortality following fire is crown scorch rather than damage to the cambium or roots. The size of tree determines its ability to withstand scorch. Fire effects are also dependent upon other factors such as season, site condition, tree age and vigour, available moisture, and occurrences of insect and disease.

If fire consumes any part of the tree canopy, the total leaf area is reduced, thus decreasing photosynthesis. If burning results in damage to the bole or roots, nutrient and water transport are impaired. Heat from fire may kill living tissue and result in stress.

Crown scorch appears cause the majority of damage from fire to Pacific ponderosa pine. Crown damage is most severe in spring and early summer due to low foliar moisture content and the succulent nature of the buds and twigs. Survival of buds is also crucial to postburn survival of Pacific ponderosa pine. Buds can tolerate temperatures 20° C higher than the needles can due to their protective outer scales. Therefore, large trees can sometimes survive 100% crown scorch provided not all the buds are heat killed.

Pacific ponderosa pine is fire tolerant because it has thick, fire-resistant bark. By the time a young tree reaches five centimetres in diameter, it has an insulating layer of dead bark 0.3-0.6 centimetres thick. Pacific ponderosa pine also has a very moist core of high-density wood that dissipates the heat energy it receives, thus protecting the bole from lethal heat levels. Cambium damage most often occurs after the passing of high-severity fires. Young trees are most susceptible to cambium damage as a result of thinner bark and a higher occurrence of girdling (removal of bark and cambium resulting in death).

Pacific ponderosa pine can withstand low-severity fires, which generally occur during the wet months of early spring or late fall. A dry spring fire may occur when trees are in stress during leaf and bud burst, resulting in higher mortality rates. Trees become dormant toward fall and thus are more fire resistant. In fall, Pacific ponderosa pine can withstand up to 50% crown scorch, on average, while in spring it can survive only 30% crown scorch.

Pacific ponderosa pine's response to fire varies according to fire severity, tree age, and season. High-severity fires that occur during periods of high stress generally result in death. Low- to medium-severity fires generally restrict the growth and regeneration of the tree, but recovery is usually evident the following year. Immediately following fire, Pacific ponderosa pine may experience a large needle drop as a reaction to hot convectional air movement through the canopy.

Fire creates seedbeds favourable for establishment of Pacific ponderosa pine. The soil is often rich in available inorganic nitrogen, which benefits tree growth. The potential for regeneration after fire is generally considered good.

Information concerning the growth of Pacific ponderosa pine after fire is variable. This may be attributable to the beneficial effects of reduced competition and increased nutrient availability, which can be compromised by the detrimental effects of damage to the crown, cambium and roots.

This information was reprinted with permission from the United States Department of Agriculture Forest Service Fire Effects Information System (Habeck, R. J. 1992. Pinus ponderosa var. ponderosa. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2004, November 18]). For more complete information and citations, go to http://www.fs.fed.us/database/feis/plants/tree/pinponp/all.html.

Rattlesnakes use shrub and other woody debris for cover and are therefore at risk from fire
PHOTO BY BOB SCHEER

Snakes and Fire

Mike Sarrell, Ophiuchus Consulting

We often wonder what happens to wildlife during wildfires. Do they escape on fast feet or wings, or burrow to safety? And what about those animals that slither, unable to burrow effectively or 'outrun' advancing fires? Most of BC's snake species have evolved with reoccurring fires in grassland communities. The effect of fires on snake populations is dependent on what habitats are being used at that time of year and the intensity of the fire. The hibernacula (winter den) of snakes are generally situated on sparsely vegetated rocky areas so fires would have virtually no effect from October through March when the snakes are deep within their dens. However, that is when fires are least common and least severe.

Most snakes within a population disperse from the dens during April and May and then return to the dens in September. It is during this active season when fires are most common and intense.

Some snakes are less prone to fire-related mortality than other species. The Great Basin Gophersnake is little affected from direct mortality from fire as it spends the bulk of its active season down rodent burrows. Similarly, Desert Night Snake rarely leaves the rocky slopes and is usually deep under rock cover. The Racer is incredibly quick and usually very alert so it may outrun most fires and escape to a burrow or rocky area. Conversely, the slow-moving Northern Pacific Rattlesnake is more prone to fire as this snake often uses shrubs and course woody debris for cover during hot summers. Rubber Boas are equally at risk as they are slow moving and often take cover within rotten wood that would be consumed by fires. Both of these species have a fail-safe survival strategy: pregnant females spend the active season thermoregulating on rocky areas that would not be subject to hot fires and have ample crevices to retreat into, thereby improving the odds that they and their young would survive the fire and perpetuate the population.

One aspect of fires that has not been adequately investigated is the temporary loss of vegetative cover that conceals snakes from predators, especially Red-tailed Hawks and Golden Eagles.

Fire suppression activities can have negative effects on snakes. Anecdotal accounts of dead snakes reported by fire suppression crews in the Vaseux fire of 2003 consisted of one burned snake, one intentionally killed rattlesnake, and several snakes killed during the construction of cat guards. Conversely, many live rattlesnakes were observed within the burned area. However, preliminary counts at two known dens yielded only 20 and 40% rattlesnake population sizes compared to the largest pre-fire counts, suggesting that the fire may have had some impact on the populations of rattlesnakes within the burned area.

Snakes are an important part of grassland ecosystems and some species are considered at risk. We can reduce some of our impacts on snake populations by reinstating appropriate fire regimes to reduce fuel loading, use natural fire breaks wherever possible instead of cat guards, and ensure that all fire workers are appropriately orientated on snake conservation and safety. Land managers should attempt to conduct prescribed fires when snakes are in dens. If the den locations are known, then the area could be treated separately to ensure that the area is burned lightly and that prescribed burns are conducted when snakes are safe within the hibernacula. This is especially important if there is heavy fuel loading due to past fire suppression. And finally, we need to better understand what types of fires are detrimental to snake populations by examining pre- and post-fire snake populations for prescribed burns and wildfires. Intense wildfires due to heavy fuel loading may be extremely detrimental to snake populations that are already stressed by other human-related impacts.

Mike Sarrell completed a Bachelor of Science degree at the University of Victoria, and has been working with snakes for about 14 years. Mike owns Ophiuchus Consulting in Oliver, British Columbia.

UCC Natural Resource Sciences

Conservationists of the Future

Bronwen Scott, University College of the Cariboo

Early in March this year, 22 students from the Natural Resource Science degree program at The University College of the Cariboo in Kamloops, BC, attended the 2004 Species at Risk Conference in Victoria.

"The idea was to network," explained Karl Larsen, faculty sponsor of the trip. "Aside from taking in the presentations by speakers, the students get a wonderful opportunity to talk to the presenters and other delegates of the conference about research, fieldwork, and employment opportunities."

The UCC Natural Resource Sciences class on campus in Kamloops.

Thomas Lovejoy, keynote speaker, was the first person to use the term 'biological diversity' in 1980, was the originator of the innovative concept of debt-for-nature swaps in "underdeveloped" countries and the founder of the public television series Nature. He topped a remarkable list of speakers, among them author and environmental lawyer David Boyd, principal author of the Convention of Biological Diversity Ian Thompson, President of Marine Conservation Biology Institute Elliott Norse, and Wildlife Conservation Society North American Programs Director Bill Weber.

"A conference like this is especially relevant for students in the Interior," Larsen noted, "because a large percentage of listed species are indigenous to the grasslands."

With a solid grounding in grasslands biodiversity issues, the foresters, wildlife specialists and range managers of the future were paying attention.

Bronwen Scott is the media and sports information coordinator at The University College of the Cariboo. She is also a member of the Grasslands Conservation Council of BC and spends hours every week riding through the Lac du Bois grasslands near her home on the North Thompson river in Kamloops.

Call for Members

The GCC has enjoyed a busy and productive summer. It is to you, the members, we owe much of our success in 2004, and for that we thank you!

A great number of memberships are due for renewal in the coming months, and we are confident that we can rely on your continued assistance in our mission to conserve BC's precious grassland ecosystems. Our members nearly doubled in 2003, and we hope to continue our relationship with our loyal members, as well as to welcome many new grassland enthusiasts to our growing base of support. Please use the enclosed membership form to support the GCC and do your part to promote the stewardship of BC's grasslands.

GCC Annual General Meeting and Field Tour

The GCC Annual General Meeting was held on Saturday, June 19. It took place at Quilchena Ranch in Quilchena, BC and was attended by more than 30 GCC members and Directors. The field tour, held on Sunday, June 20 was also well attended, with nearly 40 participants. The tour was held in the pristine grasslands of Douglas Lake Ranch and attendees enjoyed a discussion with Douglas Lake Ranch manager Joe Gardner, as well as presentations on local history, grassland wildlife and plant ecology.

The GCC would like to express its sincerest gratitude to Joe Gardner and the Douglas Lake Cattle Company for allowing us to tour the grasslands of Douglas Lake Ranch.

BELOW **Joe Gardner of Douglas Lake Cattle Company, showing tour participants a map of grasslands owned by the ranch, as well as Crown lands managed by the ranch.** PHOTO BOB SCHEER

ABOVE Ray Van Steinburg and Hugh McLuckie on horseback at Pine Butte Ranch PHOTO COURTESY OF THE VAN STEINBURG FAMILY

Pine Butte Ranch Receives Environmental Stewardship Award

Released BC Cattlemen's Association

Ray Van Steinburg of the Pine Butte Ranch was presented with the 2004 Environmental Stewardship Award at the annual meeting of the British Columbia Cattlemen's Association (BCCA) in May.

With a philosophy that "Mother Nature is the boss," Ray and his right hand manager Hugh McLuckie modify their management practices on the ranch to accommodate the conditions. The Van Steinburgs and staff have been recognized for their commitment to the environment and their ability to manage the range even through years of prolonged drought. Receiving an average annual precipitation of nine to 11 inches, the main priority for the ranch has been water conservation. Stewardship programs being imple-

…continued on page 27

Profile of a GCC Director –

Katherine Gizikoff

Katherine was raised in Vancouver and escaped to BC's Interior after obtaining a Bachelor of Science degree in Agriculture from the University of British Columbia in 1981. She first fell in love with the Nicola Valley grasslands while working as a range agrologist for the Ministry of Forests. After leaving the Forest Service, Katherine entered into the field of land reclamation. With a Masters of Science degree in Resource Management, Katherine relocated to Alberta and worked for a large coal company re-establishing wildlife, grazing and waterfowl habitat values on mined lands throughout the western provinces. In 1992, Katherine moved back to the Nicola Valley and is now the principal of GGEM Consulting Ltd. She works throughout southern BC, specializing in land restoration. Katherine and her husband currently reside on a small acreage in Merritt with their two children and a small menagerie, including several horses, a pony, a donkey, cats and dogs.

Bill Ogilvie

Bill with his wife, Pam PHOTO COURTESY OF THE OGILVIE FAMILY

Bill, who passed away on July 8, 2004, will always be remembered for his smile, love of family and friends, and passion for the cattle business and the outdoors. Bill was born on December 13, 1929 in Vancouver, BC. His parents then moved the family to the Peace River region where they lived for a few years until they moved back to the Vernon area. He worked many jobs in the Vernon region, which included a registered trap line, picking fruit, logging, working at the Vernon box factory and working for the BC Forest Service at the local lookouts. In 1952 he moved to Kamloops to work at Hemming Tire Service. Bill continued to manage the business until 1975, at which time he purchased it and it became known as Ogilvie Tire Service. In 1967 Bill, and his wife Pam, had purchased a ranch in the Long Lake area of South Kamloops. When Bill retired from the tire business in 1980, he and his wife fulfilled their lifelong dream of operating a cattle ranch full time. Bill thoroughly enjoyed the friendships that resulted from his many years in the cattle industry, and will be sadly missed by all who knew him.

GCC Welcomes New Directors

The Grasslands Conservation Council of British Columbia is pleased to welcome Brad Arner, Barry Booth, Mark Quaedvlieg, and Dave Whiting to the Board of Directors. Also returning to the Board after a one-year hiatus is Michael Pitt. Brad Arner, of Kamloops, is the Manager of Conservation Programs for the BC Intermountain/Peace Region of Ducks Unlimited Canada. Barry Booth, of Prince George, and is the Northern Region Manager for the Land Conservancy of BC. Mark Quaedvlieg of Keremeos is the President of the Keremeos Stock Breeders' Association. Dave Whiting of Kamloops is recently retired from the Ministry of Sustainable Range Management and now specializes in land use planning and resource management with his consulting company, Dave Whiting Consulting. Michael Pitt is a retired Professor of Agroecology at UBC and now lives on Pender Island. The GCC is grateful for the expertise and enthusiasm these individuals bring to the Board of Directors, and looks forward to a bright future.

The GCC would also like to thank departing Directors Nichola Walkden and Ian Barnett for their hard work and dedication to grassland conservation and stewardship in British Columbia. Nichola Walkden of The Land Conservancy has been involved with the Council since its creation in 1996, and her commitment and enthusiasm for grassland conservation in the province is unparalleled. Ian Barnett of Ducks Unlimited Canada has spent two years on the GCC Board of Directors, and his extensive experience and knowledge served the Council well. The GCC is grateful for the contributions of both Nichola and Ian, and looks forward to working with them on grassland conservation and stewardship in future.

Conservation Partner Profile: Vancouver Foundation

Eva Cheung Robinson, Program Director, Vancouver Foundation

Responding in creative ways defines leaders and sets them apart. When Alice MacKay left $1,000 in her will to help improve the quality of life for her fellow British Columbians, she inspired W.J. and Alma VanDusen to build on her generosity. Convincing nine other local families to join them in giving $10,000, the VanDusen's cemented the corner stone of Vancouver Foundation, a name that is now synonymous with strengthening communities around the province.

Since its beginnings in 1943, Vancouver Foundation has grown to become Canada's largest community foundation, building and managing endowment funds to support charitable activities across BC. They now administer more than 800 separate endowment funds, with total funds on hand in excess of $560 million.

Today in BC, there are more than 40 community foundations that have received charitable gifts to create permanent endowments. Each year the income earned on these endowment funds is used to support community needs and opportunities. Last year alone, Vancouver Foundation distributed more than $32 million to hundreds of community initiatives throughout BC.

More than 130 community leaders volunteer their time to Vancouver Foundation's advisory committees. There is one advisory committee for each of its ten areas of funding: education, medical research and services, youth philanthropy, environment, health and social development, children, youth and families, arts and culture, four pillars fund, disability supports for employment fund, and animal welfare. Since these volunteers either work in, or have expertise in, the area of funding they serve, their expertise allows Vancouver Foundation to keep abreast of emerging community issues.

The Environment Advisory Committee was established in 1990 because Vancouver Foundation saw a need to encourage community participation in the resolution of broad environmental issues. The volunteer advisors serving on this committee are drawn from a wide spectrum of perspectives on environmental issues including industry, academics and environmental NGOs. Grants are made from the Foundation's unrestricted funds to support initiatives in conservation, stewardship, habitat restoration and urban issues. Over the past decade, Vancouver Foundation has distributed over $6.4 million in grants from unrestricted funds to the environment sector. An additional $1.3 million has been contributed from Donor Advised Funds to environmental projects around the province.

Vancouver Foundation is pleased to support the Grasslands Conservation Council of British Columbia. To date, Vancouver Foundation has provided four grants totaling $118,000 to the GCC for grassland conservation and stewardship.

Thompson's Paintbrush
ILLUSTRATION BY NICOLE BRAND

UPDATE: Education and Outreach Program

BC Grasslands Website

The BC Grassland website has continued to grow and expand. "Understanding Grasslands" was launched in March 2004, and contains an ecological overview of the grasslands in BC. The site, designed to educate and inform, features information on the various grassland communities in BC, the ecological processes that are involved in maintaining their health, and the plants and animals that rely on them for survival.

Planning for the sustainable range management component of the BC Grasslands Website has been completed, and work on this component has begun. When complete, it will include information on the past, present and future of ranching in British Columbia; updates on recent demonstration projects throughout BC and across the Pacific Northwest, including a special section on the GCC's work to develop a qualitative monitoring tool for the province; and how-to information for ranchers and range managers.

The GCC would like to thank the following partners for supporting GCC website development:

- Agriculture Environment Initiative
- BC Gaming Commission
- Habitat Conservation Trust Fund
- Vancouver Foundation

BC Grasslands Public Service Announcements

The BC Grasslands Public Service Announcements project is well underway. The BC Grassland PSA series will consist of several short, gripping announcements that are visually appealing and easy to understand. The announcements will feature two animated characters, a cow and a curlew, who will lead viewers on a journey of discovery through BC's grasslands. The first installment in the series is set to air in March 2005.

The BC Grasslands Public Service Announcement project is funded by the BC Gaming Commission, Habitat Conservation Trust Fund, and the Grazing Enhancement Fund.

A Book on Grasslands of British Columbia

The Grasslands Conservation Council has partnered with Chris Harris Photography to develop a coffee-table style book on grasslands of British Columbia. Chris Harris is a well known outdoor photographer who has published several books of photographs of the Cariboo-Chilcotin and Kamloops regions. The book will contain highly professional images and be written in a popular style with brief text.

The goal of the book will be to promote widespread public recognition of the importance of knowing and conserving the natural grasslands of BC. These values will be recognized as very personal and human as well as important for maintaining the diversity of life in BC. A sense of the great beauty and value of grasslands will be conveyed through dramatic images and fascinating insights into the environment and the many life forms that flourish in the grasslands. The importance of working ranches and conservation areas in maintaining grassland values will be clearly identified. Threats to the integrity of natural grasslands will be presented in the spirit of finding solutions. The book will focus primarily on grasslands of the Cariboo-Chilcotin region but will also draw on information about grasslands in other parts of the province. The book should be available for distribution by late 2006.

For an update on the book's progress, please visit Chris Harris' grassland book website: http://www.jnweb.typepad.com/bc_grasslands.

The GCC is now a partner in the Real Estate Foundation Signature Program: Planning for Community Transition in Non-Metropolitan Regions

The mission of the program is to support values-based planning processes that address regional and local land use and conservation concerns in non-metropolitan areas of BC. The Initiative will serve the following purposes :

a) It will encourage and support a collaboration of agencies (partners and others) whose responsibilities include planning related to land use concerns.

b) It will increase access to funding for research, education, feasibility and demonstration projects needed by these agencies.

c) It will build a resource of case studies, analysis and other practice-related information that will enhance the ability of collaborators to meet their planning challenges.

d) It will enable strategic planning related to sustainable land use development and conservation based on social, economic, environmental and governance values. It will foster, in the planning processes of partners and collaborators, implementation of the knowledge gained through research and collaboration.

UPDATE: Grassland Stewardship and Sustainable Ranching Program

Coalition for Licensing and Registration of Off Road Vehicles

Over the summer the Coalition finalized the "Solutions For a Sustainable Future" document —an Interim Report that presents a strong rationale for licensing and registration and better management of off road vehicles (ORVs) in British Columbia. Building on the rationale document, the Coalition is embarking on stage three of a four-stage process to develop administrative policy options for licensing and registration of ORVs in British Columbia. The final strategic document produced from this process will include a series of recommendations for government to address the need for registration and licensing of ORVs in BC. The Coalition expects to deliver a draft version of the completed "Solutions for a Sustainable Future" document by spring 2005. Please download a copy of the document at: <http://www.bcgrasslands.org/conservation/orv/coalition.htm>

The ORV Coalition has recieved funding from Agriculture Environment Initiative; BC Cattlemen's Association; The Brainerd Foundation; Canadian ATV Manufacturers Association; Canadian Parks and Wilderness Society; Cariboo Regional District; City of Kamloops; Federation of BC Naturalists; Greater Kamloops Motorcycle Association; Kamloops Naturalists Club; Ministry of Forests; Ministry of Sustainable Resource Management; Ministry of Water, Land and Air Protection; Pacific Northwest Motorcycle Association; Public Conservation Assistance Fund; Quad Riders ATV Association of BC; Regional District East Kootenay; Thompson-Nicola Regional District; Trails Society of BC; and West Coast Environmental Law.

The Coalition is currently working with the Deputy Minister's Committee on Environment and Resource Development's ATV – Interagency Policy Committee on developing solutions for British Columbia. This support is necessary for successful completion of this important initiative.

As a grassland conservationist we need your support to help us achieve better management of ORVs in BC. Please participate in the letter writing campaign to inform the Hon. Gordon Campbell of the need for action on this long-standing problem. Write a letter to the Premier and your MLA today requesting the mandatory licensing and registration of off road vehicles in BC.

Mitigating Fragmentation and Development of BC's Grasslands

The loss of large, natural grassland areas is due largely to:

- Development of ranches into rural, small/medium acreage subdivisions, and
- Urban encroachment.

Confusion and lack of information is preventing stakeholders from addressing the threats to BC's grasslands in a strategic and collaborative manner. The GCC is now conducting a provincial analysis to clarify information and take action on this emerging and growing problem.

To help guide this project, the GCC established the Mitigating Fragmentation and Development Project Advisory Committee. The committee consists of representatives from Ministry of Agriculture, Food and Fisheries; BC Cattlemen's Association; The Land Conservancy of BC; SmartGrowth BC; Aspen Park Consulting; Ministry of Sustainable Resource Management; and the Grasslands Conservation Council of British Columbia.

A workshop was convened on May 18th and 19th, 2004, in Kamloops to complete the first phase. A consulting team consisting of Stuart Gale (Stuart Gale and Associates), Sandra Bicego (Dovetail Consultants) and Janet Fontaine (Logistics Consulting) were retained to work with the Project Advisory Committee to organize and facilitate a workshop, prepare a workshop summary, and produce a strategic planning tool document to assist in the development of a strategy. The Workshop Summary can be downloaded at: http://www.bcgrasslands.org/conservation/fragdev/workshop.htm.

The GCC is now working with GG Runka Land Sense Ltd. and associates to produce a problem analysis document that will include the development of a strategy and implementation plan for solid results.

A sincere thank you to the following project funding partners: McLean Foundation; Ministry of Water, Land and Air Protection; Vancouver Foundation; Beef Cattle Industry Development Fund; Agriculture Environment Initiative; Sonoran Institute– Public Fund for Community Collaboration.

First Nations Relationship-building and Fall Directors' Meeting

At the GCC's Annual General Meeting in June 2004, the Board of Directors recognized the need to take pro-active measures to educate itself on First Nations' culture and issues, and explore ways we can strengthen relations with First Nations people, particularly those bands and councils with grasslands in the traditional territory. To achieve this, the Board established the First Nations' Relationship-building Committee and tasked the committee with organizing a one-day workshop focussing on First Nations issues and culture, to be held in conjunction with the GCC's Fall Directors' Meeting. The goal was to provide an interactive forum for GCC Directors to learn about First Nations culture using the resources of the Secwepemc Education and Culture Society and to engage in open, collaborative dialogue with First Nations' people on what it means to build healthy relationships that are mutually beneficial.

The workshop was held at the Chief Louis Centre, where GCC Directors and guests were treated to a Secwepemc cultural awareness program, an overview of the Secwepemc traditional territory and claim, and a presentation and discussion on the history and vision of Kamloops Indian Band's land management. The day's events were capped off with an interactive session on what it means to build healthy First Nations' relationships, lead by Chief Nathan Mathew.

Using this learning experience as the background, the GCC intends to develop and implement a First Nations' Relationship-building strategy in collaboration with the Shuswap Nation Tribal Council and other tribal council's and bands in grassland regions of the province.

Input on City of Kamloops' Official Community Plan – KAMPLAN 2004

As a result of City of Kamloops participation in the May 18th and 19th Mitigating Fragmentation and Development workshop, grassland conservation statements were incorporated into the City of Kamloops' Official Community Plan – KAMPLAN 2004. This document will guide the growth and development of Kamloops over the next five years, so having high-level guiding statements is important for

grassland conservation. The City took proactive measures to ensure those statements were included and asked for input and review from the GCC.

The GCC submitted a formal statement to the planning department with some suggestions for improvement of the statements and other items on the grassland conservation "wish list." The GCC intends to play a more active role in community and regional planning though the Priority Grasslands and Mitigating Fragmentation and Development projects.

BMPs for Motorized Recreation Activities in Grasslands – Educational Pamphlet

Building on the success of the foundational Best Management Practices for Recreation on Grasslands document, the GCC proposes to develop an educational pamphlet specifically for motorized recreation groups, commercial operators and individuals. The BMP pamphlet for motorized recreation groups will be a full-colour, sleek publication that addresses the impacts of motorized recreation on grasslands and strategies to limit those impacts.

Similar to the BMP document, the BMP pamphlet for motorized recreation will be developed in consultation with motorized recreation and other interests to ensure this educational piece speaks to them effectively.

The educational pamphlet is expected to be ready for Spring 2005.

The GCC would like to thank The Real Estate Foundation of BC for their support of this project.

Assessing Grassland Ecological Condition and Trend – A tool for British Columbia ranchers

Great progress has been made in modifying the Range Health Assessment protocol developed in Alberta for British Columbia. This summer, field inspections of lightly grazed sites, relic sites and exclosures were completed to determine benchmark conditions for species composition, soil characteristics, litter accumulation, litter cover, erosion, and invasive species specific to the Hamilton Commonage grasslands. More than 40 sites were sampled to develop reference site information specific to these grasslands.

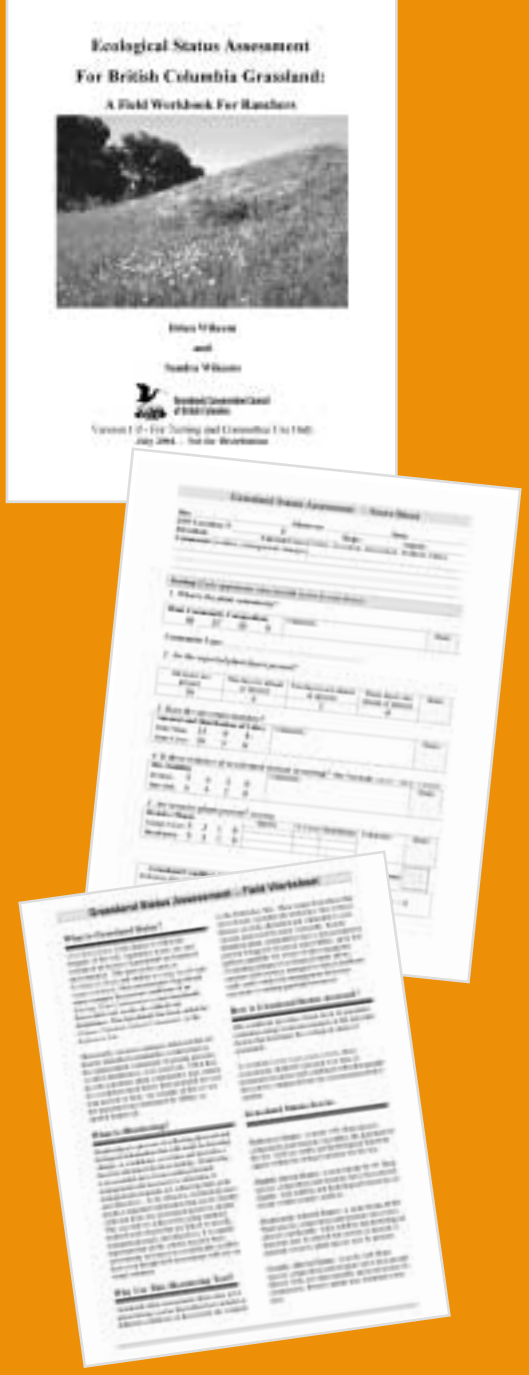
After two years of hard work and building support for this initiative, a first draft of the grassland assessment tools is complete. Although the current workbook is applicable only to the grasslands of the Nicola valley, it is an important building block to completing this handbook for all regions of the province.

Following two field sessions in August and September to test the technical aspects of the assessment tool, ten ranchers gathered at the Guichon Ranch on October 8, 2004 for a day of training and application of the visual assessment tool on the Hamilton Commonage grasslands. The goal for the day was to test the methodology and to receive feedback from the ranchers. Is this tool workable, practical, and does it provide appropriate information in an applicable format? The feedback was encouraging. There is consensus that we are on the right track!

Future steps will include the preparation of a revised draft incorporating the knowledge gained from field-testing and from a thorough review by the Technical Advisory Committee. A revised draft of the methodology is expected by the end of December 2004. At that time, planning will begin to select sites in the Cariboo, Okanagan and Kootenay regions to further refine the methodology and to establish pilot project sites to test the tool on an operational level with selected ranchers. Furthermore, partnerships will be formalized to ensure that the grassland assessment methodology is integrated into the Environmental Farm Plan Program and other relevant agricultural extension programs.

The GCC would like to thank the following funders for their support:

- The McLean Foundation
- Agriculture Environment Initiative
- Ministry of Water, Land and Air Protection
- Grazing Enhancement Program
- The Brink/McLean Grassland Conservation Fund
- Beef Cattle Industry Development Fund
- Habitat Conservation Trust Fund



RIGHT **The workbook for ranchers includes a summary worksheet for the field and a one-page score sheet. The methodology relies on visual assessments and observations, all of which are recorded on one score sheet with two or three photographs.**

There is agreement that British Columbia needs a tool to assess grassland condition and trend. This tool will be:

- **Practical, simple, and easy to use in the field;**
- **Based on existing science, knowledge and methods from BC and elsewhere;**
- **Rigorous enough to evaluate environmental change at an acceptable level of accuracy, and be repeatable over time;**
- **Based on indicators relevant to British Columbia grasslands that enable assessment of condition and trend; and**
- **Consistent with government standards and requirements.**

UPDATE: Development and Capacity Building

Meeting the Fundraising Challenge

A message from the Executive Director

Over the past year, the GCC has made progress in developing its membership and donor base, as well as developing our fundraising program. We do however have some significant challenges!

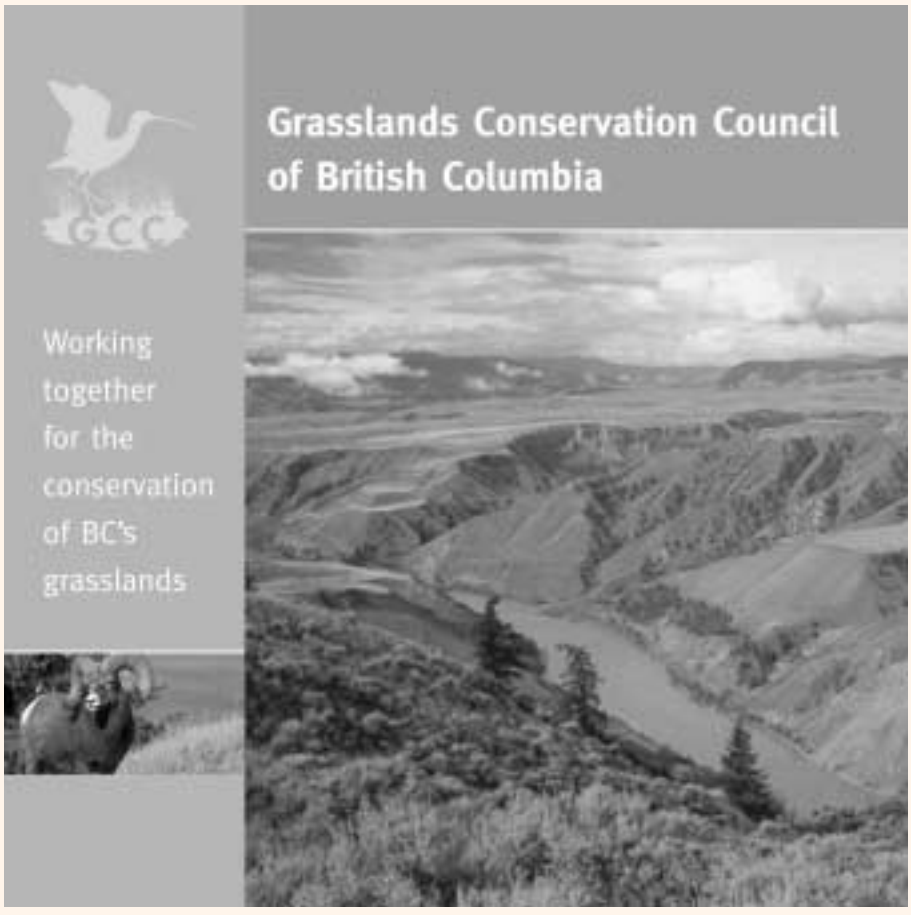
In June 2004 we lost our Development Officer. In the wake of this loss, we are re-grouping and preparing to find a replacement for this position. This is no easy task. Over the past five years I have come to realize the stark reality of establishing a fundraising program. Firstly, fundraising is hard work, and if it is not your cup-of-tea it can be a very difficult and intimidating job. Secondly, fundraising is a vocation that requires specialized people skills, significant experience, and a contagious passion for the cause. This is a tall order to fill.

The GCC is planning to fill the Development Officer position over the next two months in order to continue the development of the GCC fundraising and capacity building program. The GCC has developed a three-year fundraising strategy to guide this development. We will learn from our experience and build on our successes to establish a stable, diversified funding base that will enable the GCC to ensure the conservation and stewardship of BC's grasslands.

The GCC needs your help! Each day, grasslands are being lost to fragmentation and development, invasive plants, forest encroachment, urbanization and abusive recreation. You can help us protect BC's unique, life-sustaining grasslands. Please renew your GCC membership and remember, GCC memberships make a great gift! To arrange for a GCC gift membership, please contact our office at 250-374-5787. To donate to the GCC online, visit http://www.bcgrasslands.org/fundraising.htm and click on "Donate Now."

The GCC is working to identify priority grasslands for each region of British Columbia and developing a strategy to stop fragmentation and development of BC's endangered grasslands. Together, these initiatives will form the building blocks of a provincial grassland conservation strategy. In order to continue this important work, the GCC needs your help. Please donate to the GCC and help conserve grasslands around the province.

The GCC would like to thank the Bullitt Foundation for their continued support. Funding from the Bullitt Foundation has aided the GCC in building the necessary capacity to deliver on the priority grassland initiative, as well as continue the crucial Mitigating Fragmentation and Development project, and will be used to build a comprehensive provincial grassland conservation strategy.



UPDATE: Conservation of Grassland Ecosystems Program

A Conservation Risk Assessment – Identifying Priority Areas for Grassland Conservation and Stewardship

It has become increasingly clear that the GCC must build on the recently completed provincial grassland Geographic Information System (GIS) to identify, prioritize and delineate grassland areas for conservation and stewardship around the province.

British Columbia currently lacks an adequate strategy to ensure an appropriate level of grasslands conservation across the province. Federal, provincial, regional and community-based governments do not have the necessary awareness and information to mitigate the future loss and degradation of these endangered ecosystems. Land-use planners and decision makers have insufficient resources and direction with which to plan and manage for grassland sustainability over the long term.

The information, tools and partnerships are in place for the GCC to complete a priority grassland initiative that will provide much needed information and direction to local, regional and provincial governments, and First Nations for conservation of grasslands. If strategic and collaborative action is not taken now, critical grasslands and their values will be lost forever.

Using the recently completed provincial grassland GIS in conjunction with the expertise of regional agrologists, ecologists, grassland experts, ranchers and First Nations, this project will identify high value, priority grassland conservation areas in each of the major regions across BC. Values such as range condition, habitat, species diversity, species at risk, connectivity, contiguity and forage values will be used to identify priority sites.

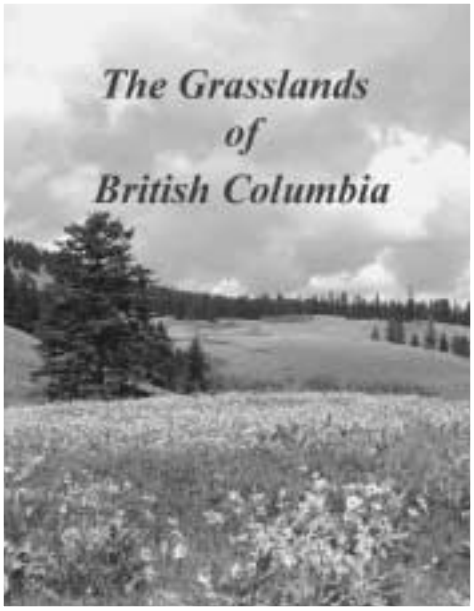
This collaborative process will yield regional priority grassland strategy documents with stewardship recommendations, supported by maps, data and other information that will be presented to government and other organizations that have jurisdiction over priority sites, including: provincial government agencies, regional districts, municipalities, First Nations, the federal government and landowners. Based on the land status and tenure of identified areas, the GCC will provide appropriate recommendations for specific stewardship activities on private, crown or First Nation lands. These activities may include proposed acquisition of special properties or the establishment of covenants on private land. This analysis and the resulting recommendations will enable the GCC to work proactively and in partnership with stakeholders to ensure that high priority grassland ecosystems are managed for their long-term integrity and health. The collective regional strategy documents will form the basis for an overall provincial grassland conservation strategy.

Partnerships

This project will link existing processes, such as existing Sensitive Ecosystem Inventories and The Nature Conservancy of Canada's ecoregional assessment and planning to provide a comprehensive analysis and product that will be usable, accessible, compatible and applicable to governments, regional districts, municipalities, First Nations and conservation organizations for land use planning and decision making.

The Priority Grasslands Initiative would not be possible without the generous contributions and support from a wide range of organizations:

- Ministry of Forests
- Ministry of Sustainable Resource Management
- Ministry of Water, Land and Air Protection
- Habitat Conservation Trust Fund
- Vancouver Foundation
- Wildlife Habitat Canada
- The Real Estate Foundation of BC
- The Nature Trust of BC
- BC Gaming Commission
- The Nature Conservancy of Canada



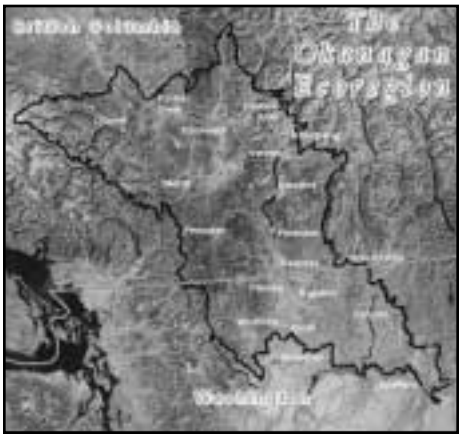
The Grasslands of British Columbia report now completed!

The Grasslands of British Columbia, a comprehensive report describing the variety of grasslands found in each region of the province, was completed earlier this year. The Grasslands of British Columbia is beautifully illustrated with photographs from around British Columbia. It begins with a broad introduction to the grasslands of North America and British Columbia, and continues with a thorough depiction of grassland types and associated ecosystems for each region of the province. The report is now available to purchase on CD or printed form, on a cost-recovery basis. For more information and to order your copy of The Grasslands of British Columbia, contact our office at 250-374-5787 or visit http://www.bcgrasslands.org/projects/conservation/characterization.htm.

Okanagan

Nature Conservancy of Canada's Okanagan Ecoregional Assessment

The Nature Conservancy of Canada (NCC) is committed to conserving Canada's biodiversity through habitat protection and other strategies needed to maintain the long term survival of all viable native plant and animal species. This conservation goal is furthered through the design and conservation of portfolios of sites within ecoregions. To this end, NCC has initiated the Okanagan Ecoregional Assessment.



The project purpose is to integrate the best available information on the ecology of the region from data sources and experts, and use it to identify the lands and waters most important for maintaining the region's biodiversity. Grounded in conservation science, the assessment follows methods outlined in Designing a Geography of Hope: A Practitioner's Handbook to Ecoregional Conservation Planning (Groves et al., 2000). NCC is working in partnership with The Nature Conservancy of Washington, the BC Conservation Data Centre and other BC and US partners to complete the assessment. The Okanagan Ecoregion includes 8.8 million hectares of land in southern BC and northern Washington that share similarities in geology, past glaciation, climate and species of plants and animals.

The set of conservation areas that will be identified in the assessment will be designed to capture the majority of known occurrences of rare species, natural biological communities and a portion of representative ecological systems in the ecoregion. These areas will be prioritized according to their relative biodiversity value and vulnerability to adverse impacts. High priority areas identified will form a starting point for designing more localized conservation strategies.

Assessment results will drive NCC's conservation actions on the ground. However, conservation opportunities that go beyond the capacity of any one entity will be identified, so NCC looks forward to working with others to achieve conservation goals. Additionally, the results will be available to public and private land managers, policy makers, local governments, conservation organizations, private landowners and private organizations across the ecoregion, to help them decide where to work and where to direct scarce resources.

For further information about NCC or the Okanagan Ecoregional Assessment, contact Barb Pryce, Okanagan Program Manager at 250-490-0395 or email at Barbara.pryce@natureconservancy.ca
Nature Conservancy of Canada website:
http://www.natureconservancy.ca

Thompson–Nicola

Kamloops–South Thompson Land Use and Habitat Atlas

The Land Use and Habitat Atlas is being assembled in response to ongoing, rapid urban and rural development within the City of Kamloops, the South Thompson Corridor of the Thompson Nicola Regional District, and First Nation lands in the Kamloops areas. The Land Use and Habitat Atlas is designed to assist the City and TNRD, First Nation governments and agencies, provincial and federal agencies, utilities, and the development community, to access selected natural resource and land use information and to improve land use decision-making. The Atlas will provide a foundation for future integrated natural resource information management at the appropriate scales for land use planning. It will also provide opportunities for student and faculty research for the benefit of the broader community.

Development proposals are often received too late in the planning process to effectively mitigate environmental impacts or development proposals are often reviewed with inadequate knowledge of the location or value of sensitive resources. This has resulted in loss or degradation of habitats that once supported fisheries, wildlife and sensitive ecosystems.

A common goal among many groups, agencies and developers is to plan sustainable communities - the Atlas will be a first step to accomplishing this goal.

For more information about the Atlas project, please contact Dave Whiting at 250-372-7088 or Brad Mason at 604-666-7015.

East Kootenay

EKCP Continues to Work for Environmental Conservation

EKCP Partners have been working diligently to conserve the working landscape in the East Kootenay.

The Nature Conservancy of Canada (NCC) has entered into working relationship with the Thunderhill Ranch, which lies along the west shore of Columbia Lake. A combination of purchasing a portion of the property (423 ha) and a covenant on another portion (179 ha) has resulted in a win-win situation in that the property is safe from the explosion of development in the area, the family ranch operation can continue to operate, and key wildlife habitat is secured. This arrangement is the first in the East Kootenay, where a ranch family can stay on the land and continue to ranch and agriculture / conservation forces have come together to "conserve the working landscape."

NCC has also purchased the Kootenay River property (3100 acres) of key valley bottom habitat along the Kootenay River. This property has switched hands a few times over the last 10 years, and it is now safe from development.

The Nature Trust of BC and Land Conservancy of BC are in the midst of funding raising for their latest acquisitions, the Hoodoo and Wycliffe properties respectively. Both properties are known for the grassland habitats and securing these properties was essential.

Partners have been working on numerous covenants with interested landowners who are keen to see their properties remain intact for wildlife.

…continued next page

The Kootenay Livestock Association, who is an EKCP partner, has been instrumental in hosting a session last June for their members to better understand the tools that are available to conserve working ranches. The default in the past was selling, but through this session, EKCP partners were able to offer up other examples of the various ways to stay on the land. There was an overwhelming response to the session and a very strong desire from the agriculture community to see their hard work in making their ranchers a good ranch, and a good place for wildlife as well. Due to the overwhelming response, EKCP partners are now strategizing on how best to deal with this increased demand.

The East Kootenay Environmental Society (EKES), another EKCP partner, hosted the 9th Annual Living Lakes Conference at Fairmont Hot Springs. Delegates from around the world were shown the Columbia wetlands, from Columbia Lake at Canal Flats to Golden, the longest stretch of un-dammed wetlands in the world. The tours of the wetlands, and surrounding grasslands and dry forests, left the international delegates awe-struck at the biodiversity in this region. Congratulations to EKES for showing the world the wonderful treasure we have in the East Kootenay, the on-going challenge will be conserving these treasures as development pressure increases.

For more information about the EKCP and its partners, please contact Darrell Smith, Program Manager, at 250-342-3655 or ekcp@cyberlink.bc.ca.

Executive Director

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lem analysis focused on policy and land use planning issues. The intent of this process is to strategically identify barriers to conservation and stewardship. The result of the problem analysis will be a strategic plan and action plan to mitigate fragmentation and development of grasslands.

After five years of hard work, the GCC is getting close to delivering the key building blocks to a provincial grasslands conservation strategy. We understand time is tight. Fragmentation and development will continue, unabated. For the GCC and other NGOs to effectively address conservation and stewardship of BC's endangered grasslands in a proactive rather than a reactive way, we must bring information and tools to the table at all levels of government to inform and influence land use planning and decision-making. Only then will we effectively address these complex issues.

Stewardship Award

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mented on the Pine Butte Ranch include riparian fencing, off-stream water developments and pasture rotation. Much of their range area also supports an abundance of wildlife (waterfowl, elk and mule deer) on a year round basis. It is important to Ray that enough grass is left for the wildlife.

The Van Steinburg family is a deserving recipient of the BC Cattlemen's Association 10th annual Environmental Stewardship Award. Very modest about the efforts made by his family and staff, Ray Van Steinburg said while accepting the award, "We never did the work expecting something like this. We just did it because it needed doing. This is truly an honour." He continued to say, "To have longevity, everything must start with a solid foundation. Take care of your soil and everything else will fall into place." This principle of good soil management has resulted in healthy grasslands and years of strong livestock production.

The GCC would like to extend their heartfelt congratulations to the Van Steinburg family and thank them for their dedication to grassland stewardship in British Columbia!

The GCC Needs Your Help!

BC Grasslands magazine is always looking for articles of interest to our members. If you are part of an organization or initiative working towards grassland conservation and stewardship in BC, please let us know!

Is there an issue important to grasslands conservation in the province that you would like to see covered in an upcoming issue of BC grasslands?

Please contact the GCC's Education and Outreach Co-ordinator, Sarah McNeil, at sarah.mcneil@bcgrasslands.org, or call 250-374-5787 to share your ideas!

BC Grasslands Magazine

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BC Grasslands is a bi-annual publication of the Grasslands Conservation Council of British Columbia (GCC). *BC Grasslands* is intended to serve as a platform for informing readers about GCC activities and other grassland programs across BC and Canada, as well as providing a forum on grassland ecology, range management, grassland conservation and stewardship.

BC Grasslands and the GCC welcome submissions of letters, articles, story ideas, artwork and photographs for each issue. Articles should be no longer than 600 words (300 words for letters to the editor) and submitted as electronic files (preferably MS Word 95 or newer).

BC Grasslands reserves the right to edit submissions for clarity and length. However, every effort will be made to work with contributors to ensure content remains unchanged. Deadline for submissions for the next issue of *BC Grasslands* is January 2, 2005.

Contributions, comments and inquiries can be made to:
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In the next issue of BC Grasslands...

A Balancing Act: Sustainable recreation in BC's grasslands

Working together for the conservation of BC's grasslands

The March 2005 issue will focus on managing recreation, particularly mountain biking, in BC's grasslands. The grasslands of British Columbia are rare and unique landscapes with an appealing climate, spectacular view and world-class recreation activities. An increasing number of people are recreating on grasslands every year, and with increased recreation comes increased pressure on grasslands and associated habitats. This issue of BC Grasslands will explore how recreation can be managed sustainably in a way that satisfies both the recreation and conservation communities. It will touch on such issues as voluntary best management practices for recreationists, the creation of designated recreation areas, and grassland recreation as an industry in British Columbia. We encourage submission of both articles and photos. The submission deadline in January 2, 2005. For more information, please contact Sarah McNeil at sarah.mcneil@bcgrasslands.org.

Send your submissions to:
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Call for Artists

As the GCC continues to grow, there is an ever-present need for grassland artwork for our publications and communications projects. Images can be drawings, photos or paintings of your favourite grassland landscapes or species. For all you ranchers out there, we'd love to see some of your artwork portraying working grassland landscapes. Please contact Sarah McNeil, our Education and Outreach Co-ordinator, with your offerings, ideas and inspiration at (250) 374-5787 or gcc@bcgrasslands.org

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*All grants and project sponsors over $1,000.

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- Our many dedicated and hardworking volunteers who have donated their time and energy to help the GCC grow and prosper.

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