A Park Defender's Guide to

WILDLAND AND INTERFACE FIRE ISSUES

Integrating the needs of ecosystems, parks and communities
in fire management planning for parks

February 18, 2004

Valhalla Wilderness Society

Box 329, New Denver, British Columbia, Canada V0G 1S0
Phone: (250) 358-2333, Fax: (250) 358-7950, e-mail: vws@vws.org, http://www.vws.org

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Preface

British Columbia, Summer, 2003 — I am sitting by Slocan Lake near my home in New Denver, in the West Kootenays. My chest hurts and my sinuses are plugged. I feel like I can hardly breathe. The steep slopes of Valhalla Provincial Park are right across the lake, about a mile away. It's a sunny day, but the slopes are totally invisible, concealed by thick smoke from forest fires. But there is no fire burning in the park or anywhere else in the Slocan Valley. This smoke funnels into the valley from fires across the mountains, and even from hundreds of kilometres away, in the Okanagan or the U.S. The steep slopes of the valley and an inversion layer in the atmosphere capture the smoke and trap it for weeks.

That's the least of my worries at the moment. I know that at some point, Valhalla Park needs fire. But *not now*. It hasn't rained significantly for nearly two months. The foliage on unwatered shrubs is curled, crisp and brown. It's like living in a huge heap of kindling. Thirty thousand people have been evacuated from Kelowna, and homes are burning. It could happen here. It could start any hour, any minute. A fire could burn the whole park, severely scorching the soil. It could burn the adjacent village of Slocan. And even though the park is separated from lakeside villages by a mile of water, under these conditions a park fire could send embers into these communities. Dry slopes of forest surround us closely.

This report has been produced by an environmental organization whose directors live in the park-community interface. They have at stake both their homes and the park they worked for nine years to protect as a wilderness. The report did not begin in the summer of 2003. It began the previous year, in 2002, when the Valhalla Wilderness Society became involved in park fire issues.

Having no funds to hire a consultant, the directors sought help from numerous professionals at universities and in government agencies in Canada and the US. VWS received an outpouring of assistance for which we are deeply grateful. This report is a compilation of the information provided to us by scientists, enriched by the experience of VWS director Craig Pettitt, who was for many years the foreman of a Ministry of Forests Initial Attack crew, and VWS wildlife biologist Wayne McCrory.

This paper is about issues rather than conclusions, because even prominent fire ecologists and researchers say they do not know the answer to some of the problems presented by interface fires. They point out it's a matter of tradeoffs. Still, it is possible, by gathering all the basic context, putting it in some kind of order and weighing each element carefully, to make the trade-offs, and thus the options, more clear.

Anne Sherrod
Chairperson
Valhalla Wilderness Society

Summary

Events before and after the 2003 fire season demonstrated a shocking disconnect between the political levels of government and realities on the land, such as fire hazard (though we could just as easily name floods, landslides or threats to drinking water):

1. Ignoring scientific research and expert advice - Between 1996 and 2001, three different expert reports, from the Ministry of Forests, the Ombudsman and the BC Auditor General, warned the BC government of increasing risk to communities from wildland fires, and BC's insufficient preparation for a disaster.

2. Budget and staff cutbacks – In spite of the above reports, in 2001 the BC government undertook massive budget and staff cuts of public land management agencies responsible for fire preparedness. Whole MOF offices were shut down. In 2002-03, the government slashed the Ministry of Forest's protection budget by one-third, or $52 million. The fire preparedness budget was reduced by $8.5 million (Georgia Straight, Sept. 11-18).

3. De-regulation and privatization – The budget cuts are part of a program of privatizing control over BC's forests and parks. This has included extensive de-regulation of the timber industry. Future decisions will increasingly be made by corporations and for the profits of corporations. The current actions of BC timber companies using the profits from logging the public forests to sue the City of Kamloops and the Regional District of Thompson-Nicola because of mills damaged by the 2003 fires is an example of the difference between corporate interest and public interest.

   The government began action on a three-year plan to shift operations and control of park management to private businesses. The public was told this would leave more funds for conservation activities in parks. But in 2002, the conservation budget for protected areas — which funds fire management programs — was radically slashed. The decimation of the conservation budget meant that virtually the entire management of the park system was being turned over to private business interests, which would fund only those aspects that were part of their business and could be paid for by charging visitors fees.

What influence these factors may have had on the province's actual fire-fighting capacity is beyond the scope of this report. But they would have had a powerful effect upon fire preparedness, in the ability of the agencies to do scientific studies, field assessments, planning and implementation of plans — all functions that are key to the management of fuels and fire.

For instance, the Auditor-General had recommended that MOF undertake fire hazard mapping. Yet this same MOF had lain off a treasure trove of technical experts. MOF used to be able to inspect private land logging operations and force landowners to clean up heaps of logging slash that endangered adjacent forest and private property. Not anymore.

The province can fund whatever inquiries or studies it wants – *this report proposes that unless these three factors are reversed, this dangerous disconnect will continue and will increasingly endanger public safety and drain the public purse.*

BC provincial parks

If there is one message we heard from scientists and land managers throughout the summer, it was that there needs to be regular burning on the land, according to the forest type and natural fire regime of each area. Provincial parks are places where this should be happening. But managers can't just go around lighting up fires or letting lightning fires burn without knowing what else they might burn down. It requires lots of science, and that costs dollars; but it is a far more worthwhile investment for our tax dollars than many government expenditures.

One year before the disastrous 2003 fire season, VWS attended public meetings and held talks with the Ministry of Forests and BC Parks on fire management in Valhalla Provincial Park. VWS pointed out that there were three communities that could be at risk from a fire in Valhalla Park. However, these managers and technical staff said they did not have the funds to do hazard and risk assessments, to do a fire management plan for the park, or to implement a plan even if they had one.

Heavily used parks, such as Manning Provincial Park, and parks in the drier forest types, such as Okanagan Mt. Park, do have excellent fire management plans. But many provincial parks do not even have the preliminary field assessments that would form the basis for educated decision-making. For this reason, the BC Parks Vegetation Management Policy states that *all fires will be fought in a park unless it has a Fire Management Plan*. Such a plan must consider protected area size, fire history, natural fire regime, effects of fire suppression (fuel loading), historic use of fire by humans and values in need of protection.

As BC moved into the 2003 fire season, not one provincial park in the West Kootenays had a completed fire management plan, and there was reputed to be only one in the East Kootenays. This raises the question whether those parks that also actually have a fire management plan have the considerable funding required to implement it from year to year, with such practices as controlled burning.

A number of scientists told the author an elaborate, expensive fire management plan was not necessary for all parks. But all parks must have certain essential background studies, such as: risk analysis, ecosystem inventory, and fuel loading assessment over a broad geographical area.

Parks without park-specific studies or plans could benefit from *detailed* provincial-level park fire policy. Such a policy would define parameters that would recognize the need to take risks to reduce fuel loads or restore natural ecosystems, but also define limits to the acceptable degree of risk. In US and Canadian National Parks, such limits might include prescriptions on drought indicators for burning programs, and on such things as the size of park where wildfires can burn, the number of fires that can burn at one time, the maximum number of acres that can burn in a given year, the maximum size of individual fires, and limits on smoke emissions. The Valhalla Wilderness Society's research uncovered no such detailed controls for BC parks in 2002-03.

Lessons from the West Arm Park (Kutetl Creek fire)

This report is not based on the belief that fires should always be allowed to burn in a provincial park. In 2003 in West Arm Provincial Park, the Kutetl Creek fire was allowed to burn for several days under fire weather conditions that were extreme. This fire became the sixth largest fire in the province. At 25,700 hectares, West Arm Provincial Park would have been recognized

by anyone knowledgeable on park fire issues as too small to contain a wildfire. The US Forest Service uses a rough rule-of-thumb that a park must be at least 100,000 acres (45,000 hectares) to qualify for even prescribed lightning fires. A wildfire would be suppressed immediately in a park as small as the West Arm, especially with the nearby communities of Harrop-Proctor and Nelson.

A BC Parks consultant had done considerable work on a fire management plan for the West Arm Park, but the plan was not complete. The operative decision-making tool for West Arm Park was a Forest Fire Operational Plan, which stated: "INITIAL ATTACK – all fires at West Arm Provincial Park will receive initial attack … ENTIRE PARK IS PRIORITY #1."

Due to the failure to immediately suppress the Kutetl Creek fire, it ran out of control, requiring high-impact fire-fighting procedures in order to protect communities. *This caused serious damage to the park.* This included logging a strip of trees 22 metres wide for 7 kilometres into the park, and other corridors for fire breaks and access by heavy equipment. In general, fire is good for ecosystems and fire suppression is ecologically incorrect, especially for parks. But proper risk analysis and pre-planning would have suggested that the choice was really between fighting the fire when it was small or fighting it after it had grown huge and threatened communities. The latter alternative is much more damaging to a park, especially because the safety of the communities becomes the top priority at whatever cost to ecosystems.

In the aftermath, it appears that the damage to the park from the fire, itself, was not great, especially compared to the ecosystem benefits it will provide. ***However if rains had not come when they did, this fire would have caused evacuations and/or the loss of homes in Harrop-Proctor or even Nelson as well as far greater damage to the park, including another road that was being pushed in.***

All park defenders should understand that the unfettered or uninformed implementation of natural fire regimes in parks, especially those with interface issues, would quickly burn down public support for any sort of ecologically correct fire management.

The disconnect has *continued* since the 2003 fire season -VWS directors believe that there is a direct line between the government's decimation of public land management agencies and budgets, and the damage and danger caused by the Kutetl Creek fire. Nevertheless, before the end of 2003, it became clear that the wheels of the political levels of government were still rolling in a totally separate track from the realities that British Columbians had experienced on the ground.

> Continued cutbacks on public agencies – After the fire season was over, the government slashed another 76 jobs from the Ministry of Sustainable Resource Management, and approximately 28 jobs from the Ministry of Water, Land, and Air Protection. This brings the number of environment workers axed in 2003 to close to 300.
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> Park Lodges **- Government** agencies say building homes in the forest is responsible for a great increase in interface fires and interface areas requiring expense fuel treatments. *Yet this same government has recently decided to spread more lodges and tourism development in BC Parks.*

Salvage logging of burned landscapes - Post-fire salvage logging is being touted as necessary to remove dead trees that would provide fuel for future fires. But an exhaustive literature review by the US Forest Service (McIver and Starr, 2000) failed to find any support for this theory. In fact, several studies in the US suggest that post-fire salvage logging may actually increase the intensity and rate of spread of wildfires.

Scientists say that the burned landscape is very sensitive. Heavy water runoff, erosion and floods can occur afterward. Bringing heavy equipment onto a fire site can increase these impacts, damage soil and reduce productivity. Some scientists have identified criteria for sensitive areas that should not be disturbed by logging. Unfortunately, BC now has an almost totally de-regulated industry going after burned wood.

A few summary points

- Several scientists told the author that large areas with fuel buildup are simply going to burn because there is no practical way to stop it. Fuel reduction methods are labour intensive and expensive. They must be concentrated directly around homes and communities.

- Ongoing fuel reduction programs, such as prescribed burning, tree thinning, and fire breaks will cost money. Our present government might provide an injection of funds after the 2003 fire disaster, *but is it committed to fund and implement fire management year after year?* The current facts say "no." Whole institutional legacies of public service, scientific expertise and organization are being wiped out.

- Fire ecology experts should be immediately prioritizing parks and communities so that available funds can be concentrated in the areas of highest hazard. ***Every park with communities nearby should have the most essential kinds of studies, which are:*** ecosystem inventory, fuel loading assessment, and risk-benefit analysis over a broad geographical area, and over the long-term so that the hazard of allowing fuels to accumulate and the ecosystem damage of fire exclusion is taken into account.

- The spread of lodges and other human development into parks will greatly increase the interface area and obstruct management of fire for ecosystem health. It should be stopped immediately.

- ***Forest fire smoke is a serious human health hazard.*** British Columbians are facing cumulative smoke levels from sources such as prescribed burning, multiple wild fires, slashburning and mill smoke. Our air quality and health can be expected to deteriorate, and there is a pressing need to limit these effects through the use of science.

The remainder of this report is background material which discusses many other important issues related to wildland fires and fire management in parks.

I. THE CHALLENGE OF INTERFACE FIRES

Summer, 2002

Like most environmental organizations, the Valhalla Wilderness Society had long had a pat answer for fire management in parks: "Parks should have natural disturbance regimes" — meaning natural fires and other natural forest processes such as insects and disease. We had supported the burning program in Tweedsmuir Park and we had always asked for natural disturbances while participating in park planning processes.

By the summer of 2002, things were not that simple anymore. The US was having another one of its catastrophic fire seasons. The Biscuit fire in Oregon was burning through half a million acres at a cost of $155 million. The Hayman forest fire in Colorado was burning 600 structures, including 133 homes. The Missionary Ridge fire had just burned more than 50 structures, and killed a firefighter. And that was only a few of the fires burning south of the border, and only a fraction of the homes burned over the last 10 years in wildland fires.

By then, forest cover maps had shown that the Slocan Valley had almost no old growth forest left except what was in the park. The park's small population of grizzlies was now one of eleven threatened grizzly bear populations in BC that the provincial government had committed to recover.

It was amidst these circumstances that Valhalla Provincial Park had two lightning fires. Concerned about fuel accumulating on the forest floor, BC Parks decided to allow one of them to burn, with careful monitoring. VWS directors wondered whether it could burn the whole park. Where would the grizzlies go it if did? It was hunting along logging roads outside the park boundaries that had reduced the population to begin with. And could the fire travel down the valley to the Village of Slocan?

The VWS board was a microcosm of conflicts that form around the issue of wildland fire. Directors lined up on opposite sides of the issues. VWS director Craig Pettitt had been foreman of a Ministry of Forests Initial Attack crew for many years. All his instincts said to fight fires. VWS biologist Wayne McCrory had travelled to Wyoming's Yellowstone National Park, seen the result of the massive 1988 wildfire. He raved about the benefits of fire to ecosystems, and the fast recovery. Other board members pointed out the irony that the Ministry of Forests saves trees from fire in order to log them, but the ecology community can't save trees from fire to let them live and grow old.

These were emotional discussions. But we were to find out that fire stirs emotions everywhere. One government fire expert confided that even scientists and land managers don't always keep their cool when debating the issues.

Concerned that there were no fire ecology studies in the park (and no funding for any) VWS contacted a Victoria bureaucrat. He told us not to worry — there were plenty of studies available from the Okanagan. That's when the directors really started to worry. The Okanagan has fire-adapted, dry pine forests. What did that have to do with moist cedar-hemlock?

VWS asked BC Parks and MOF to do prescribed burning in the autumn, when conditions would be safe, until the government could come up with a fire management plan. The Parks-MOF team said they couldn't afford prescribed burning. That required all kinds of science and technical staff. But in addition — and what was most surprising — some managers were against prescribed burning on ecological grounds. As environmentalists, we had learned that prescribed fire was a safe way to get the ecological benefits of fire. A debate about prescribed burning vs. prescribed wildfire broke out. The debate was utterly predicable. Seeking scientific support for their view, VWS directors only learned that the same debate has been raging in scientific circles for years. It was only after reading a large heap of reports and talking to numerous fire scientists that the directors began to glimpse that the park managers might be right.

Summer, 2003

2,473 wildland fires, 250,970 hectares burned, 50,000 people evacuated, 344 homes lost, half a billion dollars in fire fighting costs. By one count, 12 parks had fires. At least 12 BC parks were involved, as well as Jasper, Kootenay and Banff National Parks.

The challenge of interface fires is to integrate *all* the different values. It is easy to say "Fire benefits ecosystems, let it burn," or "Human lives and property come first everywhere and always." But VWS directors learned, through our research, that it is really more accurate to say that *natural* frequencies and intensities of fire benefit ecosystems and help to safeguard communities from large, catastrophic fires. *Unnaturally* fast-moving and intense fires harm both communities and ecosystems. VWS believes both the positive and negative effects of fire on people, wildlife and ecosystems should be talked about — not in the context of whether fire is good or bad, but in the context of seeing that *decisions must be based upon science*. A scientific, ecosystem-based, approach to new fire programs and ecologically sound post-fire treatments is critically important.

II. RECENT "CATASTROPHIC" FIRE SEASONS: CONTRIBUTING FACTORS

There have always been huge fires and large fire seasons in BC, the rest of Canada and the western US. But why are they so pronounced in recent times? In 2000, over 5 million acres burned — two million acres more than in 1919. Yet helicopters, water bombers, computers, infrared scanners, fire retardant, and a lot of today's roads did not exist in 1919. There are new significances to be deciphered behind our more recent "catastrophic fires".

United States and Canada

First, the statistics: An upsurge in the area burned by wildfires annually began in the US in the mid-1980s. This increase has been mostly due to a few very large, high-intensity fires.[1] In 1988, these fires gained international attention when a number of prescribed lightning fires in Yellowstone National Park escaped. Under drought conditions, managers found to their surprise that a massive fire-fighting effort could not bring them under control. The fires threatened first this community, then that one, ultimately burning 247,000 hectares before the rains came.

[1] Hardy, C.C., et al., "Smoke Mgmt. Guide for Prescribed and Wildland Fire: 2001 Ed.", PMS 420-2 NFES 1279, Boise, ID, Natl. Wildfire Coordination Group.

The next year, drought brought an unusual fire season to Manitoba and Quebec. Manitoba alone had 1,140 fires — over six times the number in the average fire season. The fires burned 2.7 million hectares — about 5% of that province's land base.[2]

Since then, every few years there seem to be more and larger fires in the western US.
The annual area burned has fluctuated more in Canada than in the US. Yet, over the last ten years the running average has almost tripled, increasing from 1 million to 2.8 million hectares — about half the size of Nova Scotia.[3]

British Columbia

During the period when Canada and the western US were having a surge in the annual area burned, BC was experiencing a 17-year trough — by far the longest period since record-keeping began that BC had consistently low figures for area burned. Previous to that 17 years, it was common in BC to have sudden spikes in the area burned, and this sometimes happened several years in a row.

In 1994 and 1998 in the Okanagan, there were serious, hard-to-control interface fires. In 1994, there were 3,833 fires — considerably more than the 2,473 in 2003; but in 1994 the average fire size was only 7.36 hectares. In 2003, it was 101.48 ha.

In 1998, part of Salmon Arm had to be evacuated. That year, the number of fires was about equal to the number in 2003. But the average fire size was only 10.99 ha.

Whether the 2003 fire season will become a long-term trend in BC, no one knows. We do know that the trends of the last 15 years in the US and Canada began with a sudden spike in the area burned. These spikes did not happen every year, but they occurred more often than in the past.

Weather and climate

It needs to be understood that weather is the dominant factor that controls wildland fires. Weather affects the moisture content of the fuel, which is more important than fuel type. High fire hazard months are associated most closely with rainfall frequency, temperature and humidity.[4] Managers point out that in a severe enough drought, almost anything will burn given an ignition source; but if the fuel is wet, you can't start a fire if you try.

This is one of the key principles that forms the foundation of the fire management world. It helps to explain why we cannot prevent large fire seasons with hundreds or thousands of ignitions. It explains why, with an equal number of fires in 1998 and 2003 in BC, almost ten times the area of land burned in 2003 as in 1998. It explains why BC's moist upper elevation forest may be burning at the same time as a subdivision in Los Angeles, and why forest damaged by decades of fire suppression may be burning at the same as forests that have always had natural fire regimes.

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[2] Jardine, K., *The Carbon Bomb,* Greenpeace, 1994.
[3] Flannigan, M., Canadian Forest Service, CBC radio, Quirks and Quarks, Sept. 6, 2003.
[4] Flannigan, et al, "Fire Regimes and Climatic Change in Canadian Forests."

It also suggests that the governments, lobbyists and scientists who never had enough evidence to do anything about global warming have gotten us all in a lot of trouble. It explains why the best of fire-safe construction and fuel management do *not* excuse peppering the wilderness with resorts and spreading subdivisions into the forest fringes; and why the timber industry *cannot* stop forest fires, if only they could log it all.

Scientists predict fire hazard by using weather factors such as humidity, precipitation and wind to calculate fuel moisture indicators. In 2003, with record high temperatures and drought in BC, these indicators were at or near record high levels at many stations.

Some scientists believe that global warming is responsible for the increased drought and the trend in Canadian and US wildfire statistics. Fire regimes respond quickly to changes in climate. For years scientists have predicted that global warming will bring more drought, more lightning, more high wind, more fires, more intense fires, larger fires, and longer fire seasons. There may be a 50% increase in the area burned in Canada each year by the middle of the century.[5] Increased weather instability, freak storms, cooler temperatures in some areas and floods are also predicted.

Records kept by the National Climate Data Centre since the 1800s do show that temperatures in BC began to increase in the early 1980s. Global warming impacts are already considered to be a strong factor in the epidemic of mountain pine beetle. But only time will tell how this will affect our wildland fire profile.

One fire and global warming expert told the author that the ocean has a moderating influence on BC's climate. Conditions conducive to large fires are directly related to large-scale meteorological processes coming from the Pacific Ocean.[6] In the interior of BC, we experience this as high-pressure systems that bring warm, sunny weather for days or weeks; when they break up, we have storms, lightning and fires. This has been recognized as a key factor in BC fire weather at least as far east as Glacier National Park.[7] It is predicted that global warming effects will be most concentrated away from the ocean, in the middle of continents.

Scientists have long been concerned that increased fires would set up a vicious cycle that would accelerate global warming by emitting huge quantities of carbon dioxide into the atmosphere. This year we learned that BC's forest fires emitted more CO2 in one month than what 1,000,000 Canadians produce in one year, or about a quarter of BC's total yearly CO2 emissions (V. Sun, Sept. 23.) And that was only one of numerous large fire seasons that countries around the world are having.

Fuels

This summer, reports mentioned fire behaviour "never seen before". Actually, these behaviours have all been experienced in the past, in large, intense fires that happened before fire suppression was widespread: air currents shoot fire balls into the sky; fires create their own wind, sometimes described as "gale-force" or "hurricane-force" winds, and these carry burning debris several kilometres, causing fires to explode everywhere.

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[5] Ibid.

[6] Johnson, E.A., et al., "Old-growth, disturbance and ecosystem management," Can. J. Bot., 73: 918-926, 1995.

[7] Johnson, E.A., et al., "The influence of man and climate on frequency of fire in the interior wet belt forest, British Columbia," *J. Ecol*. 78:403-412, 1990.

But such fires are out of place in areas such as the Okanagan, where the dry ecosystem should burn frequently with low ground fires. High intensity fires in such areas are related to fuel accumulation caused by fire suppression. When fires are suppressed, thickets of small trees start to invade grasslands and crowd around older trees. They provide ladders for fire to climb into the canopy of the forest, where it can spread very rapidly, burn hot, and kill far more trees. Fuel management is the key to controlling the spread and reducing the consequences of fires, whether in dry forest areas, or in moist or wet ones.

The subject least talked about in the summer of 2003 was the influence of logging on fuel levels. Several US studies have found that logging increases fuels and fire hazard in several different ways: a) In dry interior ecosystems, logging has removed large trees of fire resistant species. What grew back was small trees of less fire resistant species that enabled fires to burn faster and hotter. b) Logging leaves behind highly flammable slash. c) Slashburns have a high risk of escaping. d) Small trees closely spaced on tree plantations are highly flammable.

We also know that forest (and consequently clearcutting) affects precipitation patterns on the local, regional and global scale.[8] We know that clearcuts can affect microclimates, making them warmer and drier. No one is asking whether we have passed some threshold where the deforestation of the planet will now affect global climate directly, rather than indirectly through the release of carbon dioxide and global warming. But maybe someone should.

Fire suppression

It is important to note that moist or wet forest areas may naturally have long intervals between fires. They may accumulate fuel for a hundred years or much longer before they burn. Fire suppression may have started only 40-100 years ago in a given area. So fire suppression has not yet caused unnatural fuel buildup everywhere in BC. It's just important to keep in mind that what is "natural" in these forests is to have a real holocaust every 100 or 200 or more years. Our changing weather could also start precipitating some of these fires. It needs to be remembered, then, that fire suppression, by postponing the fuel reduction, sets the stage for larger, more uncontrollable fires in the future.

Fire suppression also causes other ecological damage that will be discussed in later pages. All this being said, fire suppression will probably always remain an important tool of fire management. It is necessary when the fire hazard is high and vulnerable people and developments, or valuable resources, are within range of a fire.

This summer made it painfully clear that the people, equipment and funding the province has available to cover a large number of fires at one time can make a difference in the consequences of a severe fire season. In normal years in our wetter forests in the West Kootenays, it is possible to allow a time lag between the start of a fire and the Initial Attack, and still be confident that the fire can be put out. But during a drought as severe as in 2003, such a time lag can mean that fires will not be stopped *until the rains put them out.* This means that funding for fire fighting is a critical element in fire protection.

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[8] Dale, V. H., et al., "The Interplay between climate change, forests, and disturbances," *The Science of the Total Environment,* 262 (2000) 201-204.

On the bright side, there is abundant fire research going on at universities and government research stations. There are many promising technological developments that will enable better prediction of burning conditions, allowing us to use prescription fires with less risk of escapes. Unfortunately, funding to our research institutions in BC has been very poor this year.

Expansion of human development into wildlands

A 2001 Auditor General's report identified the spread of human development into wildlands as one of two main factors in the growth of interface fires. The report said that communities are not doing enough to prevent or reduce the consequences of interface fires. Land use restrictions to control activities that increase fire risks were mentioned by the Auditor General as having insufficient attention.

The presence of human development makes it difficult, if not impossible, to restore natural fire regimes. The Auditor General's report explained that the spread of development into wildlands forces the Ministry of Forests into suppressing wildfires to protect human lives and property. Eventually, the suppression allows dangerous levels of fuel to build up that eventually make a conflagration inevitable when the weather becomes dry enough. Firefighters can then do little to keep structures from burning.

Nine professionals at US universities and with the Columbia River Basin Inter-tribal Fish Commission have recommended:

> "Policies should be developed to reduce the number of human structures within areas with high potential for fires. New structures must be discouraged in fire prone areas. If healthy forests are to be recovered, then one has to be able to manage those without undue concern for human structures. Fire suppression policies across forest ecosystems should not become hostage to the encroachment of inappropriate human developments in fire-prone areas."[9]

The BC Auditor General's report criticized local governments with high or moderate risk of interface fire that do not include wildfire hazard assessments in their land use planning work. But this should extend to both regional and provincial governments. The provincial government permits tourism development in parks and on Crown land. Yet after the report of the AG — and even after the 2003 fire season — the BC government embarked upon a program of expanded lodges and resort development in BC parks and wildlands.

The BC government is so busy planning to permit new lodges that it has created a Minister of State for Resort Development. The new Minister, MLA Sandy Santori, comes from the region where the huge Jumbo Glacier Resort is proposed. The Ministry of Forests has warned that the Jumbo project area "is subject to a significant risk of wildfire in a typical wildfire season." MOF says that steep and timbered terrain in the Jumbo Valley "creates the potential for rapid fire spread and also offers the prospect of difficult emergency access and fire control in the event of

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[9] "Wildfire and Salvage Logging," by Dr. Robert L. Beschta, Oregon State University; Dr. Christopher A. Frissell, Oregon State University and University of Montana; Dr. Robert Gresswell, U.S. Fish and Wildlife Service; Dr. Richard Hauer, University of Montana; Dr. James R. Karr, University of Washington; Dr.G. Wayne Minshall, Idaho State University; Dr. David A. Perry, Oregon State University, Jonathan J. Rhodes, Columbia River Inter-Tribal Fish Commission.

wildlife outbreak…." The Jumbo Resort will bring up to 7,000 people into this dead-end valley with only one access road.

Over the province, the cumulative spread of human development into forest fringes and wildlands is stretching fire-fighting resources thin. The report for Jumbo Glacier Resort is most likely representative of what private landowners can be expected to do: it focuses on fire-safe construction techniques and maintenance of fire breaks around the property. That's fine for already existing structures and communities where firefighting responsibilities cannot be avoided. But when whole new settlements are proposed, the review process should ask whether they should be there at all.

As global climate change and drought continues, potential new resorts will not stand as protected islands unto themselves. They will depend upon fire-fighting on surrounding Crown land to protect them from huge fires that can cross fire breaks or send overwhelming heat and smoke into areas where people are trapped. The summer of 2003 showed that all BC residents share the same pool of firefighters, equipment and firefighting budget. Firefighters will not be able to protect anyone's home well if we keep scattering our developments throughout forest fringes and wildlands.

III. THE SPECIAL POSITION OF BC PARKS IN RELATION TO FIRE

Out of 800+ fires in the province, only a few burned in parks and fewer still started in parks. The Ministry of Forests (MOF) manages 88% of the province. The 12% that is protected cannot be expected to safeguard the whole province. By far most of our fire hazard comes from MOF lands.

Nevertheless, parks were seriously affected by fires, and park management affected the fires and many thousands of people. *Many* parks have areas that interface with communities — a fact overlooked by the BC Auditor-General's 2001 report. *The role of parks in the problems and solutions of fire management is large and should not be overlooked*.

Outside of park boundaries, there have been formidable blockages to the use of regular, low-intensity fire, partly coming from communities and partly coming from the timber industry and the political level of the government. These latter interests will tolerate no risk to commercial timber from fire. Industry has even developed a biased version of fire science — one that substitutes clearcuts for natural fire regimes, and promotes logging as fuel reduction. (If that were true, we would have one heck of a fire-safe province; but instead, the fire hazard steadily increases.)

MOF even forbids fires inside of parks if they pose a risk to commercial timber outside of park boundaries. Yet we are told repeatedly and emphatically by scientists that suppressing fire only postpones it to a later time when the fire will be much larger. *If* parks are properly funded, they are places where managers are ready to implement prescribed fires, whether ignited by park managers or by lightning. This can help reduce the risk for nearby communities.

With remote parks and remote areas in parks, the benefits are even greater. It is possible to allow wildfires to burn *in carefully identified areas, under prescribed and monitored conditions.* US fire managers say this is far less expensive than fire suppression. And it frees up the firefighting

crews, equipment and funding for protecting communities and special resources. This is critically important in those seasons where hundreds or thousands of fires are alive at one time. But these areas become high-priority for firefighters when they are invaded by lodges and resort development where hundreds or thousands of people are at risk. The demands on firefighting resources are enormously increased, and ecosystem health is no longer a priority.

In BC it has been observed that park funding is poor because the previous government doubled the park system. Firstly, that does not account for why the current government has drastically *reduced* funding to the system. But more importantly, BC Parks has a mandate for ecologically sound fire management. Why would anyone want fewer such areas? Why would anyone want to increase the demand on firefighting resources in these areas, and pay to have the fires controlled year after year to save the timber supply of the local logging company? Parks create a healthier situation for everyone.

The contribution of parks to solutions begins with basic scientific research. In compiling information for this report, the author discovered that over the last 30 years at least, numerous scientific studies on fire have occurred in parks and wilderness areas. Parks provide natural areas free of logging and agricultural clearing, where scientists can study fire behaviour and the effects of fire and fire suppression on plant communities. Fewer parks would mean throwing away a scientific resource that is keenly valued by many scientists.

Unfortunately, in BC, in order to justify privatization, the government has been portraying parks as recreation resorts enjoyed by a privileged few, who should be made to pay for their thrills; park employees are redundant, replaceable by entrepreneurs; park businesses are the major stakeholders in park decisions; park visitors are only customers, a market to be exploited. This is propaganda spin that has nothing to do with why our park system was created.

The economic suffocation of the park system has been most bizarre when park managers cut trees to reduce fire hazard. BC Parks has to pay stumpage on the trees it cuts, as if it were a logging company — out of budgets that this same government has slashed to the bone!

Now the government has brought in the Parks and Protected Areas Statutes Amendment Act. Section 9.1 enables the development of new resorts or other tourism development, subject only to the minister's "opinion," that the development is consistent with or complementary to the *recreational values* of the park involved. It used to be that the *Park Act* would prevent overdevelopment; and the Park Legacy Panel in 1998 determined, by overwhelming public demand, that ecological integrity is the highest priority in parks, above recreation. But now the only control is the Minister's "opinion" whether "recreational values" will be well served.

Throughout the 2003 fire season there was imminent danger to backcountry lodges and ski hills, either on Crown land or in parks. Lodges and other tourism development in Banff, Jasper and Kootenay National Parks were seriously threatened. Near Nelson, it was the Whitewater Ski Resort. Near Kamloops, it was the Sun Peaks resort. In the US, it was the lodge and information centre in Glacier National Park. These emergency situations will only increase as BC parks are increasingly developed.

The Bow Valley, the Banff townsite and some private tourism facilities were threatened by a number of fires that were escaped prescribed burns set by Parks Canada. These burns were aimed at making conditions safe for human structures and occupants, but the severe drought

made them uncontrollable. With increasing drought due to global warming, there will be less and less that governments can do to protect such facilities.

The 2003 fire season shows that the public needs to reclaim its original vision of parks as being for the health of the planet, the province, and all BC citizens. Parks are for stability in times of drought, fire or heavy rains. They protect water supplies and river system stability. All BC citizens should contribute to their support through taxes.

IV. THE ECOLOGICAL EFFECTS OF FIRE AND FIRE EXCLUSION

> *"Without fire the forest would become more and more homogenous, the long-lived white spruce gradually replacing pine, aspen, balsam poplar, and birch on the sites they frequent ... the conclusion must be that any influence tending toward diversifying the landscape at large and small scales will increase the diversity of the fauna as well as the population density of some species. By maintaining a mosaic pattern in the boreal forest, fire assists in the maintenance of diverse wildlife populations."*
>
> "Fire in the Boreal Forest"
> Dr. Stan Rowe and G. W. Scotter

The ecological benefits fire

For many years it has been an axiom in the ecology movement that "fire is necessary for ecosystem health." But whatever is the human intellectual knowledge of fire, it is underlain by a double-sided emotional relationship to the subject. At a deeply ingrained level, fire strikes terror in human beings. On one side of our relationship to fire, we associate it with death and destruction; fire strikes terror into humans. On the other side, fire means warmth and survival, and humans welcome it.

After all, some 500,000 years ago fire, by providing humans with the ability to keep warm as needed, played a key role in the emergence of pre-humans and early humans from cold caves into the dawn of many advanced human capacities. And early humans undoubtedly knew that high populations of game could be found in burned areas. Aboriginal cultures living close to the land retained this sense and knowledge much better than materialistic and technological cultures. By mixing knowledge with emotions, people today can come to appreciate that all the plant and animal species in the world need fire just as much as people.

A tree may live for 500 years, but the forest in which it grows may have started thousands of years ago after the Ice Ages. During that time, it would have seen many fires. Those fires played a key, determining role in shaping the forests we admire today. This is much the same role that a person plays in the garden: selecting species properly adapted to climatic conditions; keeping the soil fertile so that plants will grow healthy; cleaning away dead plant material to prepare seed beds for new growth; killing disease organisms and tree-destroying insects. All the fauna on earth eat from this garden and derive their health from it.

Low- and moderate-intensity fire consume vegetation and release the nutrients stored in it, fertilizing the soil. These fires also thin the forest, taking out small trees, which makes more water and nutrients available to surviving trees. This process produces the giant monarch ponderosa pine trees and the sequoias and redwoods of California.

When there is sufficient moisture content in the forest floor, these fires will leave the organic layer of the soil and the subterranean roots of trees and shrubs intact. Well-adapted native plants regenerate quickly. The regenerated plants will have higher vitamin, mineral, carbohydrate and protein content to feed wild animals.[10]

The reproductive cycle and life-span of native plants are intricately adapted to the seasonal timing of fire, and to fire frequency, which in turn are controlled by climate. Change the seasonal timing or the frequency of fire, and you start changing species.

Fires skip around the forest, leaving patches of live trees of different ages, sizes and species. Areas that do not burn provide refuges for wild animals. All these features leave critical legacies of the forest intact and replenish biological diversity.

High-intensity fire is lethal to large trees, destroys organic matter in the soil, and vaporizes large quantities of nutrients. The negative effects can include erosion, heavy spring runoff and landslides, and destruction of critical habitat for endangered species. Under natural circumstances, these negative effects are relatively short term and limited in frequency and the area they cover. Over the long term, high intensity fire plays a critical role by creating openings to let sunlight into the forest, by burning away thick accumulations of forest duff so that tree seeds can reach mineral soil, and by creating a "mosaic" of different age groups and different forest types.

This mosaic breaks up the continuity of fuel types, reducing the size and ferocity of future fires. It is also a very key foundation for biological diversity. The mosaic effect is especially enhanced by mixed-intensity fire regimes.

Fire intensity, which is heat, is not the same as fire severity, which refers to the effect on the land. A low intensity fire can severely burn the soil under certain conditions. A high intensity fire may have mixed severity. Even the "monster" fires of modern times have mixed effects on ecosystems. Of ten recent wildfires in the US — most of which were huge and some of which burned homes — on average, over 52% of the area covered had low severity fire, 24% had moderate severity and just 21% burned with high severity. The worst of these fires burned about one-third of the land they covered with high severity. Most of the rest had a far smaller percentage of land that was burned with high severity. [11]

These few facts are only the briefest glimpse into the awe-inspiring interconnections between all the parts of our natural world, in which fire is just as important a thread in weaving it all together as is water, itself.

The damage done by fire exclusion

Fire suppression changes the species of an ecosystem. For instance, it favours shade tolerant species such as Douglas fir and works against species such as ponderosa pine that need more light. This shapes the habitat for animal life. For instance, suppression reduces habitat for species such as Kirtland's warbler, that nests only in fire-maintained jack pine stands between

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[10] Rowe, S., Scotter, G.W., "Fire in the Boreal Forest," University of Washington, 1973.
[11] American Lands Alliance, "Restoration or Exploitation?," November 2003.

six and 21 years old.[12] In the Rocky Mountains, scientists have recorded around 15 species of birds associated solely with postburn sites, and 87 species in total have been found in burned areas.[13]

Especially in cold or dry ecosystems, decomposition of dead woody material is slow. Without fire, nutrients become tied up in dead woody material. Thickets of small trees crowd the larger trees, using up nutrients and causing water stress. This makes forests more susceptible to attack by insects and disease. Drought and resultant water stress are recognized factors in the current massive spread of bark beetles.[14]

High intensity fires will reduce MPB populations directly, and fire will also affect them indirectly by limiting the number of large, old lodgepole pines that are the food source. Building up a massive population explosion is a key factor in the spread of the beetles; reducing the density of large, old trees is an important deterrent.

One of the worst effects of fire exclusion is fuel accumulation resulting in abnormally intense, severe fires. In summary:

> *"When disturbances exceed their natural range of variation, the change in forest structure and function may be extreme.*"
>
> "The interplay between climate change, forests, and disturbances," Dale, et al., 2000

Such changes are compounded by other human impacts such as excessive logging, global warming and pollution. One example of this interaction is in fisheries. An environmental impact statement for the Bureau of Land Management in Montana explains that extensive dams, roads, culverts and lowering of water levels in streams can keep wildlife such as fish from escaping fires and can also block re-colonization. The report states: "…the severely diminished capacity of native species to survive or escape from fire is a source of substantial risk to the persistence of isolated populations."[15]

Natural high-intensity fire does sometimes damage ecosystems, though in the broader context of time and scale, the fire will be beneficial. One thing that seems to be affected is recovery times. According to the Beschta Report on ecologically sound post-fire management:

> "Delays in recovery may increase the likelihood of extirpation of stressed populations, or may alter the pathway of recovery altogether. As a practical example, areas that have experienced the effects of a severe burn and are likely to exhibit high erosion should not be subjected to additional management activities likely to contribute to yet more

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[12] Cole, D., and Landres, P., "Threats to Wilderness Ecosystems: Impacts and Research Needs," *Ecological Applications,* 6(1), 1996, pp. 168-184.

[13] Keane, R., et al., "Cascading Effects of Fire Exclusion in Rocky Mt. Ecosystems: A Literature Review," USDA Forest Service, Gen Tech Report RMRS-GTR-91, May 2002.

[14] "Wildland Fire in Ecosystems: Effects of Fire on Flora," USDA Forest Service Gen. Tech. Rep. RMRS-GTR-42-vol. 2, 2000.

[15] Fire/Fuels Management, Environmental Assessment Plan Amendment for Montana and the Dakotas, Bureau of Land Management, July 2003, http://www.mt.blm.gov/

> sedimentation. Efforts should focus on reducing erosion and sedimentation from existing human-caused disturbance, e.g., roads, grazing, salvage logging."[16]

Hydrology

When naturally intense fires burn out a large portion of a watershed, domestic water supplies can be damaged, fish streams muddied, stream channels damaged. In the Slocan Valley residents notice that watersheds burned 70-90 years ago are only recently starting to recover enough to deliver ample quantity and quality of drinking water.

Damage to hydrology — the ability of our slopes, stream channels and river systems to maintain stable, natural cycles of water flow — is cumulative, i.e., damage done by fires is added to the similar damage done by clearcut logging and roads. Our creeks accumulate the impacts on all the mountain slopes they drain, and our rivers accumulate the impacts from all our creeks. Destruction of water supplies, fisheries and stream channel stability are the result. This can accrue into major floods.

Soils

The worst hydrological damage occurs when very hot fires burn organic matter in the soil and leave a water-repellant layer that can cause massive erosion. Natural high-intensity fire will kill microorganisms in the organic layer of the soil, including the mycorrhizae fungi so important to soil productivity. However, studies have found that severe fires resulting from unnatural fuel levels due to fire exclusion can cause severe damage of this type.[17]

Wildlife

It is recognized amongst biologists that the larger, more violent and rapid-spreading fires caused by fire suppression increase the danger to wildlife. VWS bear biologist Wayne McCrory vigorously supports the idea of natural wildfire in parks, but he also sees the impacts of both natural and unnatural high-intensity fires on wildlife. He has surveyed mountain goat winter habitats and noticed that those which had high intensity fires recovered very slowly compared to sites that had had low intensity fires, due to the effect of intense heat on soils and substrates. The ability of mountain goats to find sufficient food in winter is extremely fragile.

In terms of parks, McCrory points out that some of them, like Valhalla, are relatively small and surrounded by development. If extensively burned, these parks do not have vast areas of habitat outside their boundaries for wildlife to feed on while the ecosystem recovers, as was the case with the Greater Yellowstone Ecosystem. His concerns extend to both individual wild animals, as well as populations and species survival.

It is a mistake to believe that large, unnaturally intense fires hurt only individuals and not populations or species. As noted by wildlife biologist David Cole:

> "Restoring fire (whether natural- or management-ignited) in high-frequency, low-intensity systems that now contain large amounts of fuel may cause stand-

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[16] Beschta, et al., "Wildfire and Salvage Logging".

[17] Keane, R., et al., "Cascading Effects of Fire Exclusion in Rocky Mt. Ecosystems: A Literature Review," USDA Forest Service, Gen Tech Report RMRS-GTR-91, May 2002.

replacing crown fires that burn the old, large trees within a forest. As protected areas increasingly provide the last refugium for certain species or communities, a single fire may cause the extirpation or extinction of a population, species, or community."[18]

Peat fires and the Chilcotin Wild Horses

For about a month during the summer of 2003, BC's largest wildfire of the year raged across the lodgepole pine forests and wild meadows of the Brittany Triangle in the Chilcotin, about 200 km west of Williams Lake. Despite bulldozers running three abreast to create wide fireguards for hundred of kilometers, the fire did not stop until it had burned 29,000 hectares. The burned area included Nunsti Provincial Park. The area is home to some 200 or more wild horses that have lived there over two centuries. They are believed to be derived from the Spanish mustangs brought to the Americas in the late 1490s by the Conquistadores.

For the past two years the horses and the ecosystem have been under study by McCrory, sponsored by a group called Friends of Nemaiah Valley (FONV).[19] As a result of this work, the whole area has been declared a wild horse refuge by the Xeni Gwe'tin First Nations. McCrory and others had been previously aware of the explosiveness of the pine forests due fuel loading from decades of fire suppression by the Ministry of Forests. So no one was surprised when a huge wildfire broke out during the 2003 drought, travelling about 50 kilometers from the Chilko River to the Taseko River.

McCrory and his colleagues returned in early October to inventory the impacts of the fire on habitats, and to survey the de-activation of the fireguards. Local people had persuaded the forest service to de-activate them in order to protect wildlife; they had also sought a cancellation of the hunting season. This appeared to be progressing well. But at the time, no one knew whether many of the horses had survived.

During their 10-day survey, the study team found huge areas of blackened forest where the fire had burned most intensely. In other areas, patchy low- and moderate-intensity fire had left some forest green and intact. A critical concern was the specialized habitats upon which the horses depend for grass and sedge forage: dozens of large and small meadows. Many of these are called "dry" meadows. They are raised lake beds from long ago that no longer flood, or that flood only slightly in the early spring. Others are called "wet" because of flooding by beavers, or because they are still, for much of the year, partly flooded lake beds.

McCrory assumed that by October the Ministry of Forests had put out all the fires. He was surprised to discover that most of the meadows had either small or large peat fires still burning underground. He learned that it was possible for the fires to burn through the winter. In many instances, the smoldering peat had already burned off entirely to depths of two or more feet, leaving beds of reddish ashes and the boulders that had formed the original lakebeds. It might have taken thousands of years to lay down a peat layer that thick. Now that resource was being destroyed over a large area.

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[18] Cole, D., and Landres, P., "Threats to Wilderness Ecosystems: Impacts and Research Needs," *Ecological Applications,* 6(1), 1996, pp. 168-184.

[19] McCrory, W.P. 2002. Preliminary conservation assessment of the Rainshadow Wild Horse Ecosystem, Brittany Triangle, British Columbia, Canada. A review of grizzly and black bears, other wildlife, feral horses and wild salmon. Report to Friends of Nemaiah Valley (FONV), Victoria, B.C.

Taking into account the large area covered by the fire, and the value of the grizzly bears and horse herds that seasonally depended upon the meadows, McCrory believed that the further destruction of these irreplaceable bogs should be avoided if possible. He and FONV coordinator Dave Williams phoned the Fire Control Officer in Williams Lake and expressed their concerns. The officer disagreed, telling them that the fires were a natural part of the ecology and the fires were too expensive to put out, but that they would look into it further.

BC Parks, although more concerned, deferred to the position of the Ministry of Forests. MOF told McCrory and Williams that one of the meadows they had looked at would cost $10,000 to save, and that to extinguish all of the peat fires would cost over $30,000. McCrory and Williams went out with a small volunteer crew, with the permission of BC Parks, and found that the peat fires could be put out by digging a trench along the narrow fringe of peat that was still smoldering and throwing the host sods into the middle of the burned sections, in some cases craters of reddened ash and boulders. In the spring, the trenches dug to stop the peat fires will be filled in and natural revegetation recovery monitored over time.

The first peat fire they put out in an hour. Testing another meadow, they found that 9 peat fires could be put out in 4 hours using the same methods. They then sent a memo out to the Forest Service and Parks, again expressing their concerns and requesting a small fire crew to put the rest of the fires out. The Ministry of Forests refused. BC Parks flew in several ecologists to study the situation and set up permanent plots to measure the recovery. One of the ecologists told McCrory they had no data on the pattern and extent of previous fires on the meadows.

Frustrated by the lack of action, and erring on the side of precaution, McCrory returned in late October with a volunteer crew. They put out well over 100 peat fires. During the main fire, McCrory's remote cameras (originally set up to document the horses' key feeding areas) had captured photographs of an exodus of wild animals from the fire, including bear, lynx, wild horses, and deer — one with numerous burn spots. Remains of a few dead animals are now being found in the burned area, but as in the case with many fires, many of the larger mammals survived. A helicopter survey by the Xeni Gwet'in First Nations and Dave Williams of FONV in late October located 113 wild horses just north of the burn suggesting most of the horses had survived. By then, some grizzly bears, deer, moose, and wolves were returning to the burned area.

But this was only the beginning of the survivors' struggle. The sheer size of the fire is a factor. Bears who lost their berry patches *en masse* at the time of most critical need raided fruit trees, where they were vulnerable to being shot. Open burned areas left them vulnerable to hunting and poaching. This happened all over BC last summer and fall. With government cutbacks, the conservation officers are just shooting any trouble bears. Last year 203 black bears and 10 grizzlies were shot in the West Kootenay region alone. While there is much more concern about the survival of grizzlies as a species, shooting 203 black bears in one region alone hardly represents a harmonious relationship between people and wildlife.

Over the winter, McCrory plans on trying to find out more about peat fires in other grassland ecosystems and returning to monitor the condition of the horse herds in late winter. Given that some 50-75% of the grassland forage was allowed to burn up, there are concerns that some of the horses will still starve, especially if it is a severe winter.

Old growth and old-growth dependent species

Decades of clearcut logging have concentrated much of our remaining old-growth forest in parks. GIS maps produced by VWS scientists show that the Inland Temperate Rainforest has been shockingly fragmented, with very few unprotected intact forest areas left larger than 1,500 ha.

Some species, such as the mountain caribou, are dependent upon old-growth for their survival, and there is not nearly enough in parks to support them. They particularly depend upon tree lichens, which are easily burned and can take over 100 years to grow back. In the inland temperate rainforest, about 11 mountain caribou herds are hanging on the edge of survival. This species uses wetter ecosystems where fire is infrequent.

Taken together, massive clearcut logging and the increase in high-intensity fires mean that more and more of our trees, both inside and outside of parks, are going to be young – very young, in a world where it will be more difficult for a tree to grow at all. VWS believes that one of the most important roles of parks is to allow trees to fulfill their whole life cycle. This makes the question of what kind of fire management practices a park should have an important and complex one.

The need for an ecosystem-based approach

When the government makes decisions about fire management without sufficient field assessments, we are getting a "one-size-fits-all" approach that is capable of doing considerable harm to our forests. The ponderosa pine ecosystems of the Okanagan compose only about 5% of BC's forest. Yet repeatedly, we have heard Okanagan conditions projected onto other types of forest in BC.

Awareness of the differences is critical for prioritizing areas for fire hazard and fuel reduction, and for determining which fire management methods are best. The following information is very general and is provided to show why professional field assessments are important to fire management.

Dry forest types

These forests are characterized by high frequency, low-intensity fires. They have had most of the research. Scientists are more or less unanimous on how to manage them.

Dry ecosystems such as the grassland-Ponderosa pine areas of the Okanagan and East Kootenays would have low-intensity fire about every 5-30 years under natural conditions. The last 100 years of fire suppression may have prevented as many as ten fires in these ecosystems. Fuel accumulation likely exceeds natural levels by a large amount, making uncharacteristically hot fires possible. Some species in these areas are not adapted to survive high-intensity fires. In the Okanagan, these forests have attracted heavy residential and tourism development, greatly increasing the danger to homes and communities

The thick bark of the older trees in these forests — trees such as Ponderosa pine, douglas fir and larch — is resistant to fire. Their deep roots are protected from fire. And they are self-pruning, keeping their branches above the level of ground fires.

There is little, if any, scientific dispute about what they need: if interface areas are anywhere near — prescription burning. Areas of heavy fuel loading that are near interface areas may first need mechanical brushing and thinning that leaves the large trees and takes the small ones. Small parks in dry forest types may never be able to allow natural lightning fires.

Lodgepole pine

Lodgepole pine forests have a mixture of understory fires and stand-replacing fires at fairly frequent intervals. Lodgepole pines, the pine bark beetle and fire have an intricate relationship.

Lodgepole pines require hot fires to open their seeds. They may burn every 35-100 years. But the trees are relatively resistant to fire until there is enough fuel to create hot, stand-replacing fires. When they are about 80-160 years old, they become susceptible to mountain pine beetles. The trees killed by the beetles increase the flammability of the forests, and the likelihood of a high-intensity fire.

The current mountain pine beetle epidemic is the worst one in recorded history in BC. Scientists believe that warmer weather, perhaps caused by global warming, is the chief factor in the severity of the epidemic. Fire exclusion has also contributed. Natural fire regimes help keep the beetles in check in two ways: they reduce the percentage of trees that are at the susceptible age of 80-160 years, thereby reducing the food of the beetle; a medium- to high-severity fire will also kill beetles, slowing down reproduction.

Moist forest types

Fire frequency and intensity are mixed in our moist forest types. Little research has been done on these forests. There is major division in the scientific community about prescribed fires in these forests.

Many of the scientific reports and statements one reads about prescribed fire refer to "fire-adapted ecosystems." This means dry forest types where fires are frequent. Moist forests are very different. One example is the interior cedar-hemlock (ICH) forest found at low- to mid-elevations in southeastern BC, and just east of the Coast Mountains in west-central BC.

However, there are 12 different subzones, with 24 variants and phases, of the ICH alone. Some of these forests are in transition areas. They may be quite dry, with species belonging to drier ecosystems — Ponderosa pine, douglas fir, larch. Some of the driest have been found to have natural fire return intervals as often as every 11-24 years. Others are categorized as "moist" and others are "wet." Some studies show return fire intervals ranging from every 200-800 years.[20]

In between high-intensity fires, these forests will have a number of low-intensity ground fires. Commonly, once they are cleared by fire, moist forest types may reburn two or even three times over a relatively short period. Scientists do not understand reburn very well, but it makes some of them very leery of prescribed fires in these forests.

[20] Wong, C., Dorner, B., and Sandmann, H., "Estimating Historical Variability of Natural Disturbances in British Columbia, Ministry of Forests, 2003.

Forests that have long fire-return intervals have not missed many fires because of suppression. Still, they are accumulating fuel, becoming more flammable with time. When a sufficient drought comes along and lightning strikes, the resulting fire is likely to be major. Fire easily climbs into the canopies where there is a very high, flammable biomass.

Land managers are often reluctant to ignite fires in these forests because they do not want the risk and liability of lighting fires in forests that are naturally prone to large, high-intensity, high-velocity crown fires. Prescribed *lightning* fires — letting nature "light the match" and standing by to put the fire out after is has burned a predetermined area of land —are favoured by quite a few managers and scientists.

Others point out that in interface areas, it may be better to use human-ignited fires under cooler conditions and risk a conflagration, rather than suppress fires and let the fuel loads build. But opponents point out that because an area, once burned, may burn two or three times in a short period, prescribed burning does not relieve fire hazard in the same way as in dry forest fire regimes. They say that prescribed fire may increase the area that is burned, setting up an unnatural fire regime.

This issue is taken up in more detail in the next section, "Major Issues in Fire Management." Suffice it here to say that the "one size fits all" approach to fire management isn't even good for one kind of forest, let alone all the different forest types in BC. Residents in areas with moist or wet forest types should beware of a fire-management approach based upon dry, fire-adapted forests.

Wet forest types

Wet forest types such as Sitka spruce-hemlock-cedar forests of the coast, or subalpine areas in the interior, or the wettest areas of the interior inland rainforest, were not shaped by fire and do not need it.

Some of these forests have fires only about every 500 years — in extreme cases, 800-2,000 years. But these forests will burn with ferocious intensity if sufficiently dried out in a drought.

The Inland Temperate Rainforest covers a mountainous area in the southeastern quadrant of the province. It is common in these steep mountains for water from mountain peaks to drain underground all the way to the valley bottom, or perhaps to be captured in subsurface pools on benches at mid elevations. In the ICH, it is possible to find giant, ancient trees, especially western cedar, at the foot of these wet slopes. The trees have survived because the ground moisture protected them from forest fires for hundreds or thousands of years. Most of the stands have been logged, and what remains is very precious.

In recent years, explorers discovered some huge trees in the Incommapleux watershed of the East Kootenays. Tree dating has confirmed that some of these trees are 1,000-2,000 years old. Cedars are not fire resistant, so it is likely that wet ground protected them. Scientists have found very rare lichen and fern species in this forest. Some samples cannot be identified. Additional samples are necessary to determine whether these are previously unknown species. But it is clear that this is a primeval forest. As global warming continues, fire will increasingly threaten such stands. VWS believes it is important to protect such a resource from burning during a severe drought when the ground may be unnaturally dry.

V. MAJOR ISSUES IN FIRE MANAGEMENT

The great Yellowstone fire and its relevance to fire management today

Agricultural burning to clear land and sterilize soil is very old and happened everywhere, but the restoration of natural fire for ecosystem health started in US national parks in 1968. By 1988, 26 national parks and approximately 50 Forest Service wilderness areas had natural fire programs.[21] At that time, Yellowstone had been allowing selected lightning fires to burn, with careful monitoring, for about 16 years without problems. But in 1988 disaster — not for the park, but for burning programs all over the US — struck.

Yellowstone managers were allowing multiple wildfires to burn at one time. A severe drought set in, but the Park Service followed weather reports that repeatedly turned out to be erroneous. US park managers had not yet experienced uncontrollable catastrophic fire, and no one conceived that seemingly distant communities could be threatened by the fires. Suddenly the fires took off and joined up. A massive fire-fighting effort that would have contained them in earlier years failed, as the fire threatened first this community, then the other.

It burned until the rain came in autumn, covering 800,000 acres (324,749 ha — equivalent to six and a half Valhalla Parks.) No homes were lost; however, the fire stopped just short of the visitor centre where a group of people was trapped. The taxpayers spent $140 million to put out fires in a park with a $20 million/year budget. The resulting public and Congressional furor assailed the whole idea of allowing fires in parks, throughout the nation. Fire programs were shut down almost entirely for two years during an investigation.

The burned areas made a rapid recovery and Yellowstone became a sort of mecca for ecologists and environmentalists who went to see the "rebirth" that often follows fire. Surrounding tourism businesses lost about $65 million over two years, but within five years, there were more visitors than ever at Yellowstone National Park.

The Senate investigating committee exonerated the park managers and supported the use of natural fire in parks. However, it put many controls in place that determined the shape of fire management in the US today. These controls represented a considerable advance in reducing risk and integrating the many values of the wildland-urban interface. US fire management rules today are about the best in terms of safety, science and social responsibility that can be imagined.

The only problem is, it isn't working. There are too many constraints. Managers can't find enough opportunities to get the fuel burned. Most fire management in the US, even in parks and wilderness, is still predominantly a reliance on fire suppression. Even when they can burn, many managers are unwilling to risk the kind of political conflagration that happened over the Yellowstone fire. Burning programs in the US have never recovered to their pre-1988 levels. And now scientists are warning that the fuel loading is just getting worse and worse in many areas.

A few key conclusions can be drawn from this story:

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[21] Parsons, D, "The Challenge of Restoring Natural Fire to Wilderness," USDA Forest Service Proceedings RMRS-P-15-VOL-5.2000.

- The need to allow wildfires to burn has *already* been weighed against the huge costs to society of taking risks and making a mistake, and weighed by an *infuriated* Congress. The necessity for allowing wildfires to burn was *validated* and US policies and laws were later augmented to encourage this.

- *It is possible to over-regulate.* Too many regulations for short-term safety compromise long-term safety. These regulations come from governments who are pressured by residents who do not want to take risks. This is called the risk-suppression cycle. Unwillingness to accept risks causes us to rely on fire suppression, which increases the hazard and risk. The only way to break out of the cycle is to be willing to take more risks.

- *There is a limit to how much risk should be taken*. The fabulous ecological benefits of the Yellowstone fire would not have been much to celebrate if the fire had consumed the visitor centre with the people in it. It is possible to burn down public and government support for fire programs by taking too much risk.

- *Ecosystems can recover from even catastrophic-level fires*. But caution should be used with this point. We hear a great deal about how the buffalo are still roaming and the grizzlies are better than ever after the Yellowstone fire. But the Greater Yellowstone Ecosystem was, from the beginning, outstandingly productive wildlife habitat. It consists of Yellowstone and Grand Teton National Parks, surrounded by seven national forests, three national wildlife refuges and other public and private lands in Montana, Wyoming and Idaho. Altogether this is 18 million acres of land with many places for wildlife to go while an 800,000-acre burn recovers.[22] Wildlife in our small parks in southern BC, which are too often "islands of extinction," cannot be expected to be similarly resilient.

More fire planning is needed in BC

The primary concern of the Valhalla Wilderness Society is that fire implementation in parks should have proper planning. In exploring US wildland fire management policies, we noticed that it was universally accepted that land managers should do as much of the decision-making as possible in non-crisis conditions. In other words, at the planning table rather than after a fire has started. US park and wilderness managers are encouraged to use natural fire, but they must have an approved fire management plan before they can do this. The US contemplates having fire management plans for every scrap of federal land; but many wilderness areas so far do not have one.

Canadian national parks also require a fire management plan before using natural fire, as does the BC Parks "Vegetation Management" document. A few BC provincial parks, such as Manning, Robson, Okanagan Mt., Bowron and Mt. Assiniboine have detailed, ecosystem-based "fire management plans." These excellent plans assess ecosystem types, fire history, values at risk, fuel loading, etc. and zone the park for different fire management methods, including fire suppression, managed wildfire, prescription burns, and mechanical brushing and thinning.

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[22] Silverman, A., "Appropriate Risks for Recreation in Wildlands," USDA Forest Service, *Proceedings: Symposium on Fire in Wilderness and Park Management,* p. 97, General Technical Report INT-GTR-320, p 89.

However, many BC parks do not have a fire management plan. Such parks have only a "pre-attack plan," which is a statement about whether and how fires will be fought.

BC Parks will never have the kind of funding that Canadian or US national parks have, and we should not expect the degree of technology and scientific analysis that are used there. Still, certain kinds of scientific assessments are essential in parks with interface issues. VWS asked a number of fire ecology experts how fire programs could be pared down to essential elements, to make them faster and more cost-effective. The answers can be put together this way: Do not try to do a whole park at once; you don't need a fire-history study for every park, you may not even need GIS mapping. These are appropriate goals for the future, to be worked on a little at a time. But you do need:

- Preliminary studies that are essential for any burning to take place — such things as ecosystem inventory and fuel load assessment, carried out by fire ecology experts. BC Parks' reliance upon the Ministry of Forests, without the aid of professional ecologists sympathetic to park values, is a large problem.

- With these preliminary studies, the province needs to set priorities so that the areas with the most hazard and the highest consequences if a fire did break out, can be addressed first as funds become available.

- Both human-set prescribed fires and prescribed lightning fires need risk-benefit analysis. All these assessments and analysis need to take place over a *broad geographical area*, because of the possibility that a fire could escape and threaten communities. They also need to include the *benefits of fire*. Risk-benefit analysis should be over the *long-term*, because the benefits of fire are long term.

Fire suppression vs. prescribed fire vs. wildfire

The following view expresses the general case against fire suppression in parks and wilderness:

> "(The philosophy of suppressing all fires) is unethical in wilderness where fires burned until the early part of this century … Fire is the single most influential natural force operating in our wildernesses. That is the most significant reason to allow fire to play its natural role — even though there are other reasons many specialists could list … (Fire suppression) is ecologically incorrect. In fact, we need to figure out how to use prescribed fire on other multiple-use lands, to return health, vigor and biodiversity to our ailing forests … Prescribed fire is cost-effective, usually only a fraction of the cost of suppressing the fire."[23]
>
> David Jolly, Regional forester
> Northern Region, Forest Service
> Missoula Montana

VWS supports this view, but the material below will include some situations where exceptions need to be made:

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[23] Jolly, D., "Challenge Address: Fire in Wilderness and Park Management," USDA Forest Service, *Proceedings: Symposium on Fire in Wilderness and Park Management,* General Technical Report INT-GTR-320, p 3.

Immediate Impacts of Fire suppression

Fire suppression damages ecosystems in both immediate and long-term, cumulative ways. An example of immediate damage is fire retardant. If the common retardant "Firetrol" is accidentally dropped into streams, it will kill fish. If sunlight falls on it, more fish will die. Two thousands gallons of retardant were once dropped into a river in Oregon. It killed 20,000 fish, and it is estimated that it will take over 20 years to restore fish populations and size of the fish.[24]

The US will switch to another, less poisonous, albeit still toxic, retardant in 2005, but BC has an 8-year contract with the Firetrol company. In one fire season alone, in 1992, BC's Ministry of Forests dropped 45 million litres of Firetrol. There were four accidental drops over water in 2003, though they were judged not to be serious (by the Ministry of Forests).[25] With the number and size of fires expected to increase, the use of retardant will increase. And no one seems to know how long the poison lasts in the environment, how much of it is gradually washed into streams by rain and snowmelt, or what is its effect on drinking water.

It is urgent for BC to substantially reduce fire suppression, especially in parks. But it must also be taken into account that suppression of a small fire is far less damaging than putting out a large one. If the fire is allowed to grow large and ends up threatening communities, not only will there be large-scale firefighting, but park values will no longer be the top priority.

An environmental impact assessment for the Bureau of Land Management (BLM) in Montana cites some of the immediate effects when intervention has to take place after a fire has run out of control:

> "Suppression operations introduce fire retardant, aviation fuel, or lubricants into streams and wetlands; expose soils on steep slopes adjacent to streams during fire line construction; damage riparian vegetation and soils from use of heavy equipment off of established roads; reduce natural streamflow during drafting and pumping; and damage vegetation and soils if fire camps are established in or adjacent to sensitive riparian areas. Although minimum-impact suppression technique (MIST) and "light-on-the-land" techniques have been developed, the primary objective during emergency suppression is to protect life and property. Because species and habitat protection is logically placed below protection of human life and property, there is no assurance that MIST techniques can and will be followed in all situations."[26]

In the fight to control a large fire that burned into the US Glacier National Park in 1988, 25.5 miles of fire breaks were constructed — 19.3 miles with bulldozers and feller-bunchers, and 6.2 miles by crews with hand tools. The heavy equipment lines were 10 to 30 feet wide and deep enough to reach mineral soil. These fire lines are damaging to the visual integrity of landscapes. They also become host to numerous exotic species. In

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[24] Parfitt, B., "Flames and Poisons," Georgia Straight, October 9-16, 2003.
[25] Ibid.
[26] Fire/Fuels Management, Environmental Assessment Plan Amendment for Montana and the Dakotas, Bureau of Land Management, July 2003, http://www.mt.blm.gov/

Glacier National Park, substantially more exotic species have been found on these lines than on the burned areas, and more still than those that had invaded the park before the fire.[27]

Ecologically friendly methods of firefighting include: 1) slowing down fires rather than putting them out altogether; 2) using water instead of retardant; 2) pumping water from large streams and lakes rather than small ones; 2) keeping heavy equipment out of riparian zones and off of sensitive soils.

The size of the protected area is a key factor

In weighing these factors, the size of the protected area is enormously important. The smaller the park, the more likely interests outside the park, including logging companies and communities, could be threatened and demand fire suppression.

Risk analysis before setting fires or allowing them to burn is meaningless if there is not a limit to the acceptable degree of risk. Following the Yellowstone fire, US national park policy set limits on drought indicators for burning programs. The US also limits such things as the number of fires that can burn at one time, the maximum number of acres that can burn in a given year, the maximum size of individual fires, and limits on smoke emissions.[28] (As stated earlier, the constraints have been too restrictive and are leading to increased fire hazard.)

In the US, the problem with small parks is well recognized. For these parks, human-ignited prescribed fires during cool weather conditions may be best. Robert Mutch, Technology Transfer Specialist, US Forest Service, presented this case at a wilderness and park fire management symposium:

> "We have learned over the years that a prescribed natural fire (lightning-ignited fire) program is best served when the wilderness is large enough to accommodate the growth of fires of long duration. But how do we manage the smaller wildernesses that are fire adapted? …
>
> "Generally, fire management plans have not been developed for wildernesses smaller than 100,000 acres (40,000 hectares) in these regions … prescribed natural fire plans probably have not been developed because the risk of fire escape is high from these smaller wildernesses. We have learned in some of the recent drought years that even large wildernesses do not guarantee that prescribed fires will not escape to lands adjoining wilderness …
>
> "What options remain for us in wilderness fire management, if wildernesses do not lend themselves to prescribed natural fires because the risk of escape is high from small, long or narrow wildernesses? The option we generally have been following in the West is one of suppressing all fires in smaller wildernesses. This is a valid and legitimate option under many circumstances … one must question which is more natural in the

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[27] Benson, N., and Kurth, L, "Vegetation Establishment on the Rehabilitated Bulldozer Lines after the 1988 Red Bench Fire in Glacier National Park," *Proceedings: Symposium on Fire in Wilderness and Park Management,* General Technical Report INT-GTR-320, p 164.

[28] Botti, S. and Nichols, H., "Availability of Fire Resources and Funding for Prescribed Natural Fire Programs in the National Park Service," USDA Forest Service, *Proceedings: Symposium on Fire in Wilderness and Park Management,* p. 97, General Technical Report INT-GTR-320.

> management of wilderness ecosystems: attempting to exclude all fires through a suppression-only approach, or managing fire-adapted ecosystems in small wildernesses with prescribed burns ignited by managers? The latter approach will come closer to perpetuating natural ecosystems in wilderness."[29]

In the case of smaller parks, the principal fire hazard to communities actually comes from surrounding Crown land administered by the Ministry of Forests. That includes 88% of BC's land base, on which the government and MOF will not tolerate a fire that threatens commercial timber values. The effort to burn off fuel loads in small parks does very little to protect communities if the surrounding forest management for miles around does no burning. Small parks actually have little ability to capture a lightning strike. The lightning that hit Okanagan Mt. Park could just as easily have struck a few miles away, outside the park boundary, and the results would have been the same, no matter what prescription burning the park had done.

Fire suppression and prescribed burning to protect natural assets of parks

It is recognized in most fire management material we've seen, both in the US and in Canada, that fire suppression can take place in certain locations within a park on account of highly-valued natural assets. When random lightning strikes are allowed to burn without park-wide analysis to identify such areas, features that were key to the character of the park and the public's relationship to the park, can be lost. There is more on this issue in later pages.

Should humans or nature light the match?

Lightning-caused fires tend to take off only during hot, dry weather. It is possible for humans to ignite fires, selecting from a whole range of temperature and moisture variations. While this is a critical management tool, it should not be treated as a panacea that will give us all the benefits of fire without the risks.

Generally, manager-ignited fires are safer and can produce up to 50% less smoke. But do they really mimic natural fire? No. Only when one understands the intricacy of the adaptations plants have made to fire can one appreciate the seriousness of this concern. The seasonal timing of fires for some plants is very important, as is the heat of fires and many other factors about which we know very little.

Human ignited fires are used because they are sometimes the only safe alternative. But even then, managers need some degree of warm, dry weather for setting fires, and some of these fires could be big. It is possible for weather conditions to change unexpectedly, and it is possible for predictions to be innacurate. For this reason, many park and wilderness managers prefer prescribed lightning fires.

Wilderness advocates often express a demand to allow fires to run free in wilderness areas. This should be contemplated only in very large parks in the northern areas of the province where communities are not at stake. "Prescribed" lightning fire is very different and has a defined procedure. An area where lightning fires will be allowed to burn is identified on a map well

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[29] Mutch, R., "Prescribed Fires in Wilderness: How Successful?" USDA Forest Service, *Proceedings: Symposium on Fire in Wilderness and Park Management*, p 38, General Technical Report INT-GTR-320.

before the fire season starts, and after doing studies to determine fuel loading and risk-benefit analysis. A perimeter for the fire is defined. Fire fighting crews stand by to put the fire out when it reaches the limits. This is a reasonably safe procedure for many parks.

Moist forest types with low frequency, high-intensity fire regimes

As stated earlier, there is major division in the scientific community regarding management-ignition prescribed fires versus prescribed lightning fire in moist forest types with stand-replacing fire regimes. In summary, some scientists say that fires ignited by managers in cooler weather, in the hopes of having an understory fire that will burn off fuel loads, either 1) smolder because of too much fuel moisture, and leave more flammable fuel than what was there to begin with, or 2) if it is hot and dry enough, they escape and cause an uncontrollable conflagration.

Another opinion is that major lethal fires are going to happen in these forests no matter what we do, and that prescribed burning will only add to the area burned, initiate the reburn process, and open these forests overly much to the drying influences of global warming.

A recent US Forest Service study says that fires should not occur too often in our moist forests. They have thin-barked tree species such as cedar and hemlock. Hemlock is easily killed by fire. The larger cedars may survive fires, especially if they are on wet ground, but many do not. These fire-susceptible species have shallow roots that are easily damaged by fire. They have much higher levels of nutrients stored in their crowns, which are vaporized by fire. If this happens too often, it can exhaust the soil.[30]

Juxtaposed against this is considerable need to reduce fuel loads in parks that are sometimes too small to contain natural fires; and scientists who believe that management-set fires are possible and necessary. The following excerpts portray two positions on this issue:

Jerry T. Williams, Branch Chief, Fire Use and Fuels,
Fire and Aviation Management, USDA Forest Service, Washington, DC:

> "Wilderness fire programs can carry high risks, but the risks become inherent in stand-replacement fire regimes where drought conditions are an important — and indeed necessary — predisposing factor to the kind of fire behaviour that is natural in terms of ecological process. When burning conditions develop in these types, long-duration fires and high-intensity burning characteristics are common. The opportunities to check fire spread diminish rapidly as fire size increases in stand-replacement regimes … Although management ignitions may appear to be in conflict with wilderness values, they have an important advantage: they allow for a wider use of fire and enable managers to better mitigate the risk of exceeding boundaries by choosing the times and the place of ignitions … They may be particularly advantageous in stand-replacement fire regimes. Less risky late season management ignitions can emulate fire's natural ecological role when proximity to boundaries or the absence of lightning may otherwise preclude fire's presence."[31]

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[30] Graham, Russel , et al, "The effects of thinning and similar stand treatments on fire behaviour in Western forest," Gen. Tech. Rep. PNW-GTR-463, USDA Forest Service, Pacific Northwest Research Station.

[31] Williams, J.T., "Managing Risk in Wilderness Fire Management," USDA Forest Service, *Proceedings: Symposium on Fire in Wilderness and Park Management*, p 22, General Technical Report INT-GTR-320.

Research in the Canadian Rockies has seriously challenged the above view:

J.M.H. Weir, Senior Park Warden, Canadian Parks Service, Prince Albert National Park;
K.J. Chapman and E.A. Johnson, Division of Ecology, University of Calgary:

> "In the closed-canopied coniferous forest of the southern Canadian Rockies, lightning-caused wildfires have accounted for 95% of the area burned … 3% of these lightning-caused wildfires account for 95% of the area burned. Most fires remain small, but a few occur under conditions, which allow them to increase rapidly in size. Only this 3% of fires influence the area burned and fire frequency …
>
> "Extreme fire behaviour is preceded by a persistent anomolous high pressure system which produces prolonged periods of above normal temperatures and below normal precipitation … During these years, it is unlikely that fire suppression can significantly influence the total area burned …
>
> Fire managers would like to implement a prescribed burning program designed to completely replace the natural fire frequency. This management action assumes that wildfire suppression has completely removed natural fire from the landscape … However, if fire suppression has not effectively removed wildfire from the landscape, the natural and prescribed fire frequencies are simply additive.
>
> "…adding a prescribed burning frequency of one for every 100 years to a wildfire frequency of one for every 100 years would increase the fire frequency of the landscape to one for every 50 years … A consequence of this addition would be to reduce the percentage of the landscape older than 200 years from approximately 13 percent to 2 percent …
>
> What fire management strategy would be most appropriate in natural or wilderness areas of closed-canopied coniferous forests? Any fire management program must recognize that suppression of fires during the infrequent years of extremely dry fuel moisture may never be possible, but that suppression during low and moderately dry fuel years will be possible. The first strategy is to continue to attempt suppression of all fires but recognize the suppressible fires would probably have remained small even if they were not suppressed. The second strategy is to allow most wildfires to burn except where public safety, administrative boundaries, and facilities are threatened. Both strategies recognize that large fires will occur in extremely dry years and maybe unsuppressible.. In preparation for these large fires, frequent, localized fuel management (fire breaks) around facilities, roads, trails and other priority areas should be performed to facilitate protection from fire."

A General Prescription for Unprotected lands

The following, from a report signed by eight US scientists,[32] seems to be excellent advice for unprotected lands:

[32] Beschta, et al., "Wildfire and Salvage Logging".

> "Fires should be allowed to burn naturally when feasible. In some drier forest types that may be prone to intense fires and that are irreplaceable wildlife habitat, prescribed fires or underthinning to remove fire ladders (leaving the larger, fire resistant trees) may be considered to reduce fuel loads. Fire suppression may also be necessary to accomplish the short-term goals of protecting human structures and lives. Prescribed burning may be a useful tool in reducing fuels around developed areas and may make it easier to protect those areas. Large fires will likely be necessary (and inevitable) to maintain or restore some landscapes …
>
> "Policies should be developed to reduce the number of human structures within areas with high potential for fires. New structures must be discouraged in fire prone areas … "Fire suppression activities should be conducted only when absolutely necessary and with utmost care for long-term integrity of the ecosystem and the protection of natural recovery processes …
>
> "Fire suppression activities should not include bulldozing stream channels, riparian areas, wetlands, or sensitive soils on steep slopes or using such areas as access routes for vehicles and other ground-based equipment …

Experts repeatedly emphasize that there needs to be a concentrated effort around communities. Fire breaks are important. These can be open strips of land planted to grass, or with aspen and birch trees. One expert told the author that the moist canopies of aspen and birch will bring a fire right to the ground where it can easily be fought.

Mechanical fuel reduction

Cutting trees for fuel reduction is the opposite of logging for profits; it is a special technique that leaves the large trees and takes the small ones. Commercial logging cuts down large trees that burn more slowly and leaves small diameter wood. According to a 1999 US Forest Service report, even selection thinning that takes larger diameter trees and leaves small ones to grow for future logging will not reduce the risk of fires reaching the crowns of trees, where they can travel rapidly. [33]

In the US, under the Bush administration, mechanical fuel reduction has become a nightmare. VWS has heard reports that it is being conducted by timber companies in remote areas, and taking large trees. We also hear there is massive elimination of huckleberry bushes and other key wildlife foods out in the bush. The impacts include removing the shade provided by the bushes and drying out the areas, and wiping out cover and food for wildlife. This would produce a severe crisis with bears in BC.

Fire management plans for BC parks have already recommended mechanical thinning, and the government already has a Tree Removal Policy to accommodate these recommendations. If it isn't misused to profit commercial interests, this method is critically important for areas where there are hazardous levels of fuel and very high values at risk.

To be effective, the slash must be removed. This usually requires a road to be economically feasible. Limited use of this method in high hazard areas is accepted by VWS near existing roads. However, *roads should not be built for this purpose, inside or outside of parks.* Road

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[33] Graham, Russel , et al, "The effects of thinning and similar stand treatments on fire behaviour in Western forest," Gen. Tech. Rep. PNW-GTR-463, USDA Forest Service, Pacific Northwest Research Station.

building is one of the most damaging ecological practices in our province, causing hundreds of landslides. And it is expensive, requiring a *lot* of commercial logging to pay for it. Road building to reduce fuel hazard would bring erosion, landslides, stream channel instability and, cumulatively, over the long term, floods — all in the name of preventing fires. But some US studies have shown that logged and roaded areas have higher intensity fires than unroaded areas. (See the last section of this report.)

Similarly, the removal of large quantities of shrubs out in areas remote from communities is a recipe for ecological disaster. If there are any benefits to this method, it is when it is focused in the immediate vicinity of human infrastructure.

This method will never equate to the benefits of natural fire because it will remove the fuel rather than consuming it and releasing the nutrients into the soil. There are many other differences. In parks this method should be very limited.

Government staff should do any thinning and brushing that happens in a park. *Allowing this to be done on a commercial basis would install in the park system a collective of consumptive commercial interests who would then begin to apply pressure to change policies to suit their profits.* We already have enough damage from private contractors in parks, who have formed their own association and lobby heavily for increased business opportunities; to add to this a *consumptive* private interest would be devastating to the prospects for protecting parks.

Forest fire smoke: a serious health hazard

These are some of the key points about smoke hazard:

a) *The health hazard of forest fire smoke and the conflicts it causes in the interface are well-recognized.* The following is from the US Smoke Management Guide available on the internet:

> "The health effects of wildland smoke are of real concern to wildland fire managers, public health officials, air quality regulators and all segments of the public. Fire practitioners have an important responsibility to understand the potential health impacts of fine particulate matter and minimize the public's exposure to smoke.[34]

b) *The main concern is particulate matter (PM). Scientific research has linked forest fire smoke to heart and respiratory problems.* Some kinds of pollution that include PM have been linked to increased stroke risk.[35]

c) *The large, catastrophic fires pose by far the worst health hazard*. Hospital admission records were studied after the fire storm in western Montana that burned 7 million acres in 2000. Admissions for respiratory disease went from 8.6 per 10,000 residents in 1999 to 16.4 in 2000, a 90% increase. Admissions for heart problems went from 22.1 per 10,000 to 34.6, a 57% increase.[36] As one researcher points out, it's better to have your smoke in small doses than in large ones.

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[34] Hardy, C.C., et al., "Smoke Mgmt. Guide for Prescribed and Wildland Fire: 2001 Ed.", PMS 420-2 NFES 1279, Boise, ID, Natl. Wildfire Coordination Group.

[35] "Air Pollution May Increase Stroke Risk," *Stroke Journal Report,* Oct. 10, 2003, based on a report by Tsai, S., Goggins, W.D., ,and Chiu, D.

[36] Bible, R. "Breathless," *Wildfire Magazine,* Jan. 2001.

d) *Prolonged exposure to lower levels of forest fire smoke is also hazardous.* Sources may include prolonged wildland fires, prescribed burning, slashburning and mill smoke. According to the US Smoke Management Guide:

> "Wildland fire managers should be aware of sensitive populations and sites that may be affected by prescribed fires, such as medical facilities, schools or nursing homes, and plan burns to minimize smoke impacts. *This is especially true when exposure may be prolonged*. Days or weeks of smoke exposure are problematic because the lung's ability to sweep these particles out of the respiratory passages may be suppressed over time. Prolonged exposure may occur as the result of topographic or meteorological conditions that trap smoke in an area."

e) *Children, seniors, and people with impaired lungs are especially at risk*. Some sources say that healthy adults are not much affected. A survey in the Slocan Valley showed that a relatively small but prolonged amount of forest fire smoke caused numerous people considerable distress while others hardly noticed it. Those who responded to the survey and who were affected tended to have asthma or to be elderly.

f) *In order to avoid massive amounts of smoke, communities and land managers must work together, with managers minimizing smoke levels and communities tolerating some degree of smoke.* As with fire risks, there should be a limit to the acceptable level of smoke risks. The following are some aspects of a potential solution:

- Prescription burning, if properly managed, results in considerably less smoke than natural fire, and potential only one-half the amount of dangerous particular matter that would be produced by a similar wildfire.

- It is possible for managers to time prescribed fire to correlate with atmospheric conditions in which smoke will 1) disperse quickly, 2) avoid sensitive airsheds, 3) consume less fuel, or 4) consume fuel more efficiently.[37]

- Residents kept informed of efforts to minimize smoke levels can become tolerant of lower levels of smoke if these are temporary rather than chronic and if the residents understand the trade-offs.

- Prescribed burning should be scheduled for some other time when cumulative smoke levels from multiple sources are too high. Also, prolonged burns that last for weeks or months should be reviewed if the smoke is trapped in a valley or health problems are being noticed.

g) *BC lacks air quality standards that should accompany widespread prescription fires.* During the managed wildfire in Valhalla Park, we learned that there is no mechanism for measuring air quality or considering smoke levels in the decision-making process to allow fires to burn. There was no requirement to address cumulative smoke levels from multiple sources. There was no

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[37] Huff, M.H., Ottmar, R.D., Alvarado, E., Vihnanek, R.E., Lehmkuhl, J.F., Hessburg, P.F., and Everett, R.L., "Historical and Current Forest Landscapes in Eastern Oregon and Washington," Part II: Linking Vegetation Characteristics to Potential Fire Behavior and Related Smoke Production, USDA Forest Service, Pacific Northwest Research Station, PNW-GTR-355, Oct. 1995.

limit on how long residents could have to breathe the smoke. A fire started in May could just as well fume until September — it was all up to the discretion of the district Parks people. Perhaps this need not require rocket science. Slash burning in the area of our home office was once as bad a smoke problem as what we experienced from forest fires this year. The Ministry of Forests instituted controls that considerably diminished the air quality impacts.

In the US, "Under current procedures, if the cumulative impacts are anticipated to violate applicable air quality standards, prescribed burns are not conducted until conditions improve."[38] This sounds ideal, but managers say that having to comply with the *Clean Air Act* is crippling the ability to reduce fuel loads, increasing the risk of catastrophic fires that cause the most serious impacts from smoke inhalation.

VI. HIJACKED: THE ECOLOGICAL TRUTH ABOUT FIRE

For years the ecological truth that has been painstakingly gather by research scientists to help our ailing environment has been hijacked by commercial interests and diverted to serve their private interests. What arrives at the public's doorstep, instead of real fire ecology principles, is industry's claim that clearcuts can mimic natural fire regimes, that logging is fuel reduction, and that trees on burned landscapes are wasted unless logged. The following are some key points taken from scientific sources.

Clearcuts are NOT the equivalent of natural fire

- Commercial logging tends to take the larger trees and leave the smaller ones. Fire tends to remove the smaller and leave the larger, more fire resistant ones.

- Fires release nutrients into the soil, causing a flush of growth that may last for many years. Logging removes most of the nutrients, piles the slash in a concentrated area and burns it.

- Fires do not cut into slopes to build logging roads or compact soil with heavy equipment. Logging roads and soil compaction cause far worse hydrological damage than fires.

- In areas where repeated logging of an area occurs far more frequently than natural fire regimes, this causes cumulative nutrient loss and resulting decline in forest health.

- Logging reduces biological diversity, whereas fire increases it.

Logging is NOT fire prevention.

The ways that logging can contribute to fire hazard have already been described. The following are excerpts from scientific reports:

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[38] Bureau of Land Management, "Fire/Fuels Management, Environmental Assessment Plan Amendment for Montana and the Dakotas", July 2003, http://www.mt.blm.gov/

Logging up through the 1980s in the dry pine forests of the Sierra Nevada:
"Timber harvest, through its effects on forest structure, local microclimate and fuel accumulation, has increased fire severity more than any other recent human activity … Typically, loggers harvested fire-resistant species and large trees, and these were replaced by greater numbers of much more fire-susceptible smaller trees. This pattern of biomass removal contrasted markedly with that of presettlement surface fires, which tended to kill (and later consume) small trees and leave many large trees to survive. Large quantities of debris left after logging led to severe fires, establishing vegetation patterns still evident today."[39]

1995 survey of vegetation characteristics, Eastern Oregon and Washington:
"Logged areas generally showed a strong association with increased rate of spread and flame length, thereby suggesting that tree harvesting could affect the potential fire behavior within landscapes. Wilson and Dell (1971) describe two main reasons for the fuel and potential fire problems in Pacific Northwest forests and rangelands: fire exclusion has allowed unnatural and hazardous levels of fuels to accumulate, and intensive forest management annually produces high fuel loadings associated with logging residues. As a by-product of clearcutting, thinning, and other tree-removal activities, activity fuels create both short- and long-term fire hazards to ecosystems. The potential rate of spread and intensity of fires associated with recently cut logging residues is high (see for example, Anderson 1982, Maxwell and Ward 1976), especially the first year or two as the material decays … Even though these hazards diminish, their influence on fire behaviour can linger for up to 30 years in the dry forest ecosystems of eastern Washington and Oregon. Disposal of logging residue using prescribed fires, the most common approach, also has an associated high risk of an escaped wildfire (Deeming 1990). The link between slash fires and escaped wildfires has a history of large conflagrations for Washington and Oregon (Agee 1989, Deeming 1990).

"Spatially continuous fuels associated with thick regeneration in plantations can create high surface-fire potential during early successional stages. This was evident in most of the roughly 275 hectares of 1- to 25-year old plantations burned in the 3,500-hectare 1991 Warner Creek Fire … The fire moved swiftly through the openings created by past harvests, killing nearly all the regeneration but usually missing adjacent stands greater than 80 years old."[40]

Also in the US, President Bush claimed while running for election that the increase in large fires was due to insufficient amounts of logging. Environmental organizations began to photograph, map and document fires in their local areas. One example from the Montana Wilderness Association:

"On August 6, a 'plume-driven' fire storm on Deer Mountain consumed 11,000 acres of recently-logged Darby Lumber Co. land, creating a powerful convection which melded eight separate fires into one. 70 homes, 159 outbuildings destroyed. Montana's largest 2000 fire started in areas that were 93% roaded and spread rapidly though extensively-logged areas…"

Another from the Southwest Forest Alliance:

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[39] Sierra Nevada Ecosystem Project, "Final Report to Congress," Ch. 4, pp 62, 64.

[40] Huff, M.H., Ottmar, R.D., Alvarado, E., Vihnanek, R.E., Lehmkuhl, J.F., Hessburg, P.F., and Everett, R.L., "Historical and Current Forest Landscapes in Eastern Oregon and Washington," Part II: Linking Vegetation Characteristics to Potential Fire Behavior and Related Smoke Production, USDA Forest Service, Pacific Northwest Research Station, PNW-GTR-355, Oct. 1995.

> "In 1994, a record fire year, logged over areas burned intensely throughout the west (Huff et al. 1995, DellaSalla et al. 1995b) One low intensity fire in Washington State grew to 2,000 acres within 24 hours of moving into an area of heavy slash (USFWS 1994)."

This kind of work needs to be done in BC by both scientists and environmental activists.

Burned wood left standing on fire sites is not wasted and does not need salvage logging

Burned trees, living and dead, provide a source of nutrient replenishment for the soil. Their bodies are the basis of the "rebirth" so commonly celebrated, starting with microbes and insects that help to break down the wood. The snags provide habit for birds that nest in cavities and eat insects. The large woody debris absorbs water, holding it on slopes and affecting moisture in the microclimate.

In 1995 eight scientists from US Pacific Northwest universities and a representative of the Columbia River Inter-Tribal Fish Commission, submitted recommendations on post-fire management to the US Forest Service. More than 50 scientists endorsed the report in an open letter to President Clinton. Entitled "Wildfire and Salvage Logging," and informally called "The Beschta Report," it says there is no evidence that salvage logging reduces fire hazard on burned areas. It says the information to confirm whether this is true or not should be available, given analysis of recent fire history. It also states:

> "There is considerable evidence that persistent, significant adverse environmental impacts are likely to result from salvage logging … These impacts include soil compaction and erosion, loss of habitat for cavity nesting species, loss of structurally and functionally important large, woody debris … Areas that have experienced the effects of a severe burn and are likely to exhibit high erosion should not be subjected to additional management activities likely to contribute to yet more sedimentation."

The report recommended that "Salvage logging by any method must be prohibited on sensitive sites, including: severely burned areas, erosive sites, fragile soils, roadless areas, riparian areas, steep slopes, or any site where accelerated erosion is possible." For other sites outside these categories, the report recommended that salvage logging must leave at least 50% of the standing dead trees, all trees older than 150 years, and all live trees. It stated emphatically:

> "Because of the wide range of chronic ecological effects associated with roadbuilding, the building of new roads in the burned landscape should be prohibited."

VII. FIRE PLANNING IS NECESSARY TO PROTECT THE WHOLISTIC VALUES OF PARKS AND WILDERNESS

There are very good reasons why all US land management agencies, the Canadian Park Service and the BC Parks Vegetation Policy require a fire management plan before prescribed lightning fire is allowed in a park or wilderness area. Firstly, experience has shown that large, catastrophic fires are less likely to be triggered if there is adequate knowledge of the ecosystem and its conditions. Secondly, the planning process allows careful consideration of the whole spectrum of park values.

During the preparation of this report, the author encountered spirited debate on the following themes:

- "How can managers 'protect' park resources if they let them burn down?"
- "Parks cannot protect static forest conditions, but must be managed for evolving ecosystems. Preservation is impossible and has been the wrong goal for parks all along."
- In the US: Protecting "natural" values must mean restoring natural fire regimes, but suppose this can only be done with human-ignited prescription fires? That violates "wilderness," which precludes human intervention.
- In Canada: "Should we manage for wilderness, which includes recreation, or for ecological integrity, which considers only ecosystems?"

To find agreement, people trying to work through these valid dilemmas must avoid putting everything they mean by parks or wilderness into a single word, and then looking to the word to tell them what to do. Too often, people have disparate perceptions of the most common key words such as "park," and "wilderness". We need to turn instead to the spirit and intent of our various Park Acts and Wilderness Acts.

Preservation

"Preservation" has always meant protecting parks from people, not nature. Parks were meant to protect key areas endangered by resource extraction, and by residential and commercial development that continually displaced natural and living things. Parks were also to be protected from meddling in which humans thought they knew how to improve upon nature. Wilderness was to be the great scientific laboratory to which scientists would go humbly to be instructed.

The chief threat to parks and wilderness is always economic goals. When any natural thing is weighed against economic goals, nature almost always loses. Above all, parks should protected from this. Parks express faith that, in the long term, nature will show us hidden ingredients of survival and health that we cannot yet understand. What has been learned about ecosystems only makes these goals more urgent. Nothing has happened in the last 100 years to make this kind of preservation "impossible".

Wilderness vs. Ecosystem Management

For many years the author has tried to articulate many varied values of wilderness, seen and unseen. But these values all flow from a few basic criteria: 1) large size, 2) very, very little or no development, and 3) no motorized access. It is critical that fire management maintain these criteria.

It is true that the concept of wilderness includes non-motorized, primitive recreation. But such recreation is for frivolous entertainment. VWS has been working for 25 years, and has spearheaded the protection of four wilderness parks in BC, and played a major role in the protection of many others. This was done, not only to protect ecosystem health, but also in the belief that wilderness is an urgent necessity to the human spirit. In wilderness, one can find sanctuary amidst the harmony of nature in these discouraging times of destruction of the natural world, of grossly excessive and cynical profiteering, and the betrayal of principles by governments all over the world.

Wilderness is sometimes deemed to be something other than an ecosystem value. That is untrue because many who go to the wilderness are seeking the total balance in nature — a balance provided only by ecosystem health; a balance which teaches wholeness by the experience, itself. Wilderness designations protect ecosystems better than any other, because they allow the preservation of a sufficiently large, intact area to give one the experience of integration and wholeness.

Years ago the author camped on the site of a "prescribed natural fire" while backpacking in the Selway-Bitterroot Wilderness. Trees were growing back. It was not a pleasant place to hike or camp. It was exhaustingly hot, the thick brush made it hard to watch out for rattlesnakes, and it is really amazing how much of the pleasure of camping comes from the harmony provided only by advanced stages of plant succession, with mature trees. Nevertheless, adventure requires taking the good with the bad.

Back then, if I had thought that park managers lit the fire, I would have resented their interference with nature. However, the fact was, as I cooked my dinner in solitude by the Selway River, I couldn't tell whether nature lit the match or a park manager lit it. I didn't know the area of the burn was pre-studied on a map and the burn was conducted with firefighters standing by.

Such knowledge comes to one through the intellect. Someone has to have that knowledge and use it to maintain the ecological health of wild areas. But the wilderness experience comes through the sight, sound, and experience of remoteness gained only by traversing the distance on one's own locomotive power. Wilderness is not an intellectual perception. It is based on feeling and intuition, but it is a perception of things that are real and true. We could decide to change the definition of wilderness to allow roads, firebreaks and forest thinning; but the wilderness sense is as unerring in a human being as in a marten. The minute it sees a road or a stump or a tree that's been pruned, it will go somewhere else, and it will be a tragic day when there is nowhere else to go.

The human sense of the primeval may be unscientific and based on perception and emotion. But it is the intuitional form of the "precautionary principle" that scientists advise, and it has been a far more sensitive early warning system than the scientific, intellectual version. This is what

created our first parks and wilderness areas, and why there is widespread support for prescribed lightning fires in wilderness areas.

The quotation offered below exemplifies what might, on first glance, be seen as a split between wilderness values and ecosystem values. The person quoted would prefer to protect old, intact forests (ecosystems) even if it means human intervention such as human-ignited fire or even fire suppression (violating wilderness). The rationale is scientific. But these old forests are also part of the natural wholeness that people are seeking in wilderness. The author knows from ten years of wilderness backpacking that a wilderness with grizzly bears and wolves is felt by the traveller to be a more whole wilderness than one without. The disappearance of mature and old forests is a deduction from the experience of wholeness.

In summary, the author sees no fundamental separation between wilderness and ecosystems. Ecological integrity is translated through the human intuitive sense, resulting in the experience of wholeness and the public demand for wilderness. Ecologically sound fire management is forcing us to make unhappy trade-offs only because we live in a world where nature has been shamefully fragmented. To save key stands of large, old trees we may sometimes have to use human-ignited fire or fire suppression. VWS directors agree with most of the following statement:

Stephen Woodley, Parks Canada

"If the historical or natural role of fire is for infrequent, large fires to burn huge areas, how can this guide management in most national parks? Clearly it is unacceptable for large-scale, high-intensity fires to occur in many national parks. In many cases the area burned by historical, large-scale fires would exceed the total area of the national park. Such a large-scale fire would reduce the entire park to an early successional stage, with consequence loss of habitat for species found only in older age class habitats. It would also endanger lives and property in and around the park. Such a situation might be acceptable in a far northern park where the park is embedded in a landscape that is relatively unimpacted by humans. It is clearly not acceptable where a park is embedded in a landscape of intensive agriculture, forestry and urbanization …

"The park should consider its ecological role in the greater ecosystem in which it is embedded. If older age class vegetation is being underrepresented in lands adjacent to some parks, then the vegetation management objectives of the park should be to protect a higher percentage of old-age vegetation …

Increasingly, it is recognized that there is no correct formula for fire management. It is not a simple matter of conducting a fire history study and then preparing a fire management plan to duplicate some historical fire frequency. Parks must seek individual solutions to fire management, depending on their own unique situations …

In some cases it will be possible to have entire parks, or large zones in parks, where fire frequencies are unaltered by humans (discounting global warming). In these areas, lightning-caused fires can burn without any intervention. They will simply be monitored … Some parks will have a mix of observation zones, full suppression zones and evaluation zones … Other parks, especially in the more developed regions of the country, will have to use just prescribed fire.

> "With the use of prescribed fire, it is essential that detailed vegetation management objectives are in place"[41]

However, VWS would not like to relegate natural fire to only very large northern parks. The only other problem with the statement is that it doesn't begin to plumb the wholistic values of parks, which cannot be measured in terms of the seral stages of forests.

Integrating the Intangible and Tangible Values of Parks:
The need to identify special landscapes for fire protection

As stated earlier, it is widely recognized in US, Canadian and BC fire management that management-ignited understory fires, or even fire suppression, are warranted to protect key natural assets of parks. Fire management plans for BC provincial parks do identify such areas. These plans zone a park for different fire management techniques such as: fire suppression, prescribed management-ignited fires, prescribed wildfires and sometimes, in highly flammable areas near human infrastructure and homes, mechanical brushing and thinning.

One consideration should be key areas that caused a park to be preserved in the first place, perhaps because they are unique in beauty and balance, inspiring in the special way in which it has all come together. This issue is not a matter of whether the vegetation will grow back. If a stand-replacement fire takes place, it may set the entire area back to an early stage which would never — of itself — have engendered decades of labour to achieve the preservation. One would not say that the redwood parks are the same even if the actual redwoods are destroyed, just because there are still young redwoods left. ("You still have a forest.") A very few ten- or even 100-year old redwoods is hardly the same as a stand of 1,000-2,000 year old trees.

These concerns are crucially important even though they are intangible. In the Slocan Valley, VWS directors feel that the confluence of inspiring beauty and balance at Nemo Creek in Valhalla Provincial Park is not the same as at any other creek mouth in the Valhallas, and thus can't be treated the same as many others. It is worth using prescribed fire under cool conditions, and even fire suppression when conditions are hot and dry, regardless of the implications to "wilderness" values.

This does not mean that a park should be considered useless because the resources for which it was set aside have been burned. The park will still fulfill key important purposes of ecosystem integrity and enable scientific study of natural processes in landscapes unaltered by man. But there is a huge value in the mature natural assets of a park, and efforts should be made to maintain that value; the fate of these areas should not be left up to such agencies as the Ministry of Forests.

This introduces a requirement to sensitively estimate candidential areas for burning in parks. The question that goes to the very heart of the matter is: What was the point of the preservation — what was central to making it a park? Clearly, it isn't just another area, identical to what surrounds it; there are special features which make it what it is. Some of these features may not be gravely injured or destroyed by fire, but some may be, at least for the lifetime of all of us living now. These areas, which may compose relatively small parts of a medium or large

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[41] Woodley, S., "Playing with Fire: Vegetation Management in the Canadian Parks Service," USDA Forest Service, *Proceedings: Symposium on Fire in Wilderness and Park Management*, p 30, General Technical Report INT-GTR-320.

provincial park, are as important to human well-being and the higher tenets of society as people's homes.

We are in danger of having the solution consume the reason why the park was created, unless we recognize that the intangibles are as important as the facts. The drive for solutions can produce a velocity of shallow means which can destroy essentials in what it seeks to ultimately preserve. And the means considered are shallow if the unique qualities of every park are not considered in the planning process. These are some of the factors that press upon the question of natural versus management-ignited prescribed fire.

It is unreasonable for anyone to demand a quick, simple solution to what is a long-standing, complex problem. The crucial point in pre-planning for wildland fire use is to not be stampeded into acting without thoroughly considering all the factors in the light of what studies are possible. The government must be made aware that anything less than a carefully planned approach to fire, based on the wholistic values of parks, is a contribution to the problem, foisting greater danger to communities and to the parklands which generations have long laboured to preserve.

VWS is, then, in favour of both natural and prescribed burning undertaken only when all the relevant factors have been balancedly assessed with an eye to the unique aspects of every area in question. It may not be possible to gain these crucially necessary studies, given the government's apparent agenda to starve BC Parks of funding and its intransigence to anything which balks its privatization agenda. Still, the wildfires of 2003 have pushed us into the eye of the storm. Something substantial *must* be done along the lines sketched here before the remainder of the storm sweeps in. We may be lucky, given a wet winter and spring, to gain more time, but, irrespective, there is not much time left.

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