ENVIRONMENTAL SCREENING
(Amendment)

Split Peak Prescribed Burn Plan

an addition to

Daer-Pitts

Prescribed Burn Plan

Prepared by: Robert Walker/Rick Kubian

Fire & Vegetation Management Section

Lake Louise & Yoho & Kootenay
National Parks Field Unit

Amended April, 2003

1.0 Project

1.1 Scope of Project

The re-introduction of fire into selected areas where it is necessary to maintain vegetation communities is called for in the Parks Policy (Parks Canada 1994), the Kootenay National Park Management Plan and the Lake Louise & Yoho & Kootenay National Parks Field Unit (LLYK) Fire Management Plan (Walker and Irons 1998).

This amendment is the result of a change in the operational plan for the Daer-Pitts Prescribed Burn Plan. The original area of the project has been increased by 600 hectares to more effectively create a downwind fuel break for the entire prescribed burn complex (Daer-Pitts Prescribed Burn + Split Peak Prescribed Burn Plan).

The additional area to be burned is from Split Creek north to the point where the rocky ridges of Split Peak run down to the Vermillion River. (**Figure 1 + 2**). The operational plan for this area is outlined in the Split Peak Prescribed Burn plan which includes the North Containment area and Primary Ignition area from the original Daer Pitts Prescribed Burn plan.

Figure 1. Split Peak Environmental Assessment Amendment Regional Scale

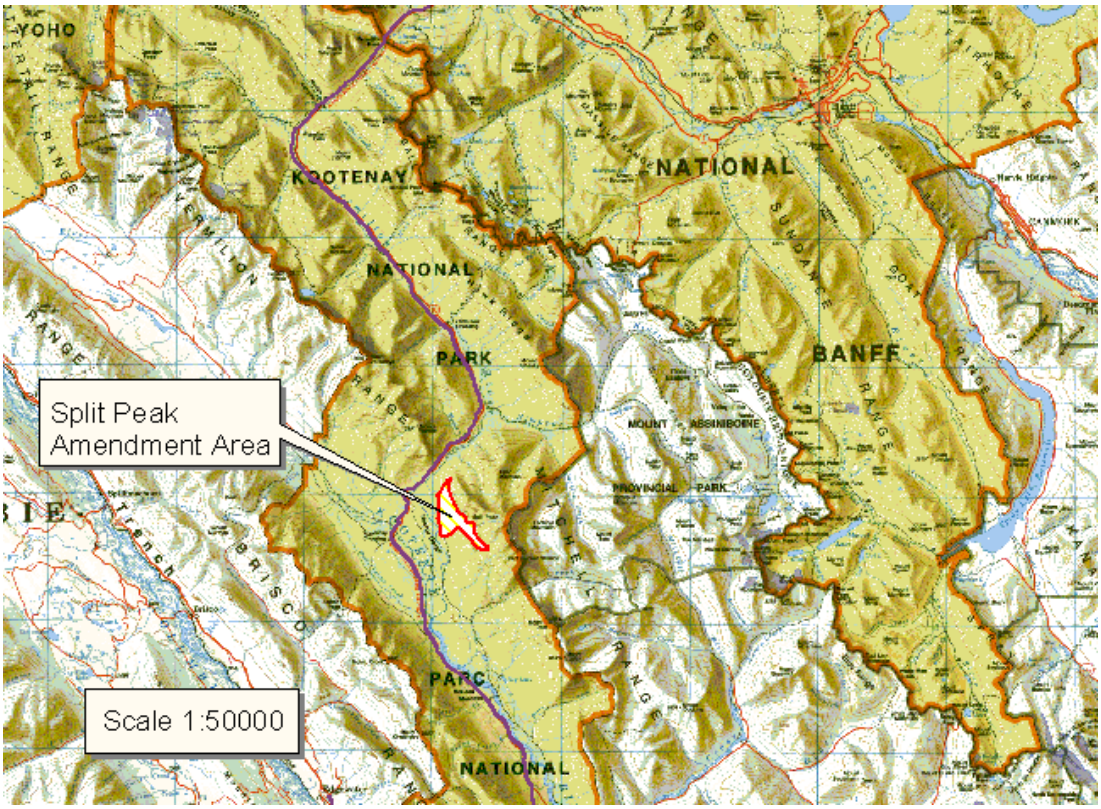
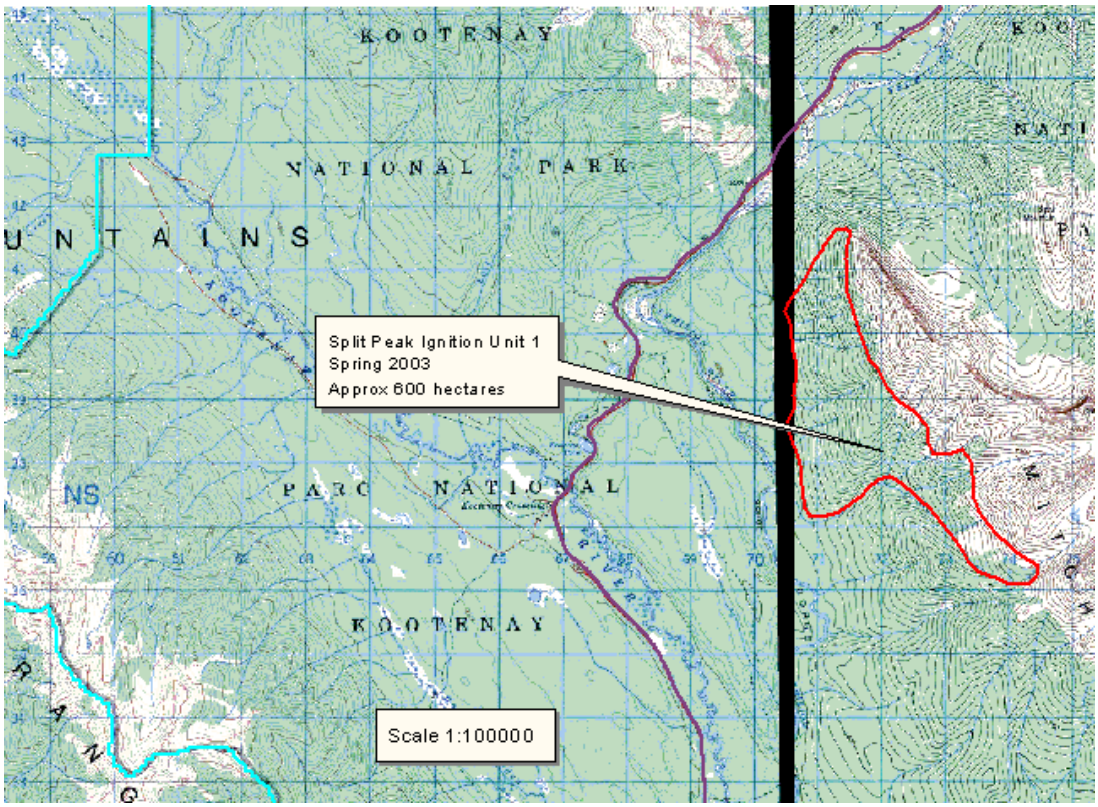


Figure 2. Split Peak Environmental Assessment Amendment Local Scale



The Daer-Pitts Prescribed Burn complex is a project designed to achieve several specific objectives: 1. to provide an opportunity for high quality, fundamental research into areas of immediate benefit to vegetation management in Rocky Mountain National Parks; 2.to create a mid-valley fuel break in support of future fire management options within the Kootenay Valley; 3. to reduce the build up of forest fuels resulting from almost twenty years of mountain pine beetle infestation in the area; 4. to re-introduce fire into an area where there is some evidence to suggest that it may have been excluded through past park management; 5. to provide a relatively low risk opportunity to gain LLYK experience in large scale prescribed fire operations. Future fire management options will include using the fuel break as a guard for burning additional areas of mountain pine beetle-killed forest to reduce potential fire behaviour in the valley and in support of the Park Management Plan target of burning 50% of the long-term average fire cycle.

1.2 Project Development Procedures

The scheduling of the project is dependent on weather and appropriate prescription windows may not occur every year. Ignitions will be timed so that there is sufficiently dry forest fuels to sustain ignition but the fire season is in its waning stages and there is insufficient daily burning period to allow for significant excursions beyond the project perimeter. The acceptable months are April-June

with an ignition time of 1100-1900. A few day's high pressure system would provide dry fine fuels. Moderate to good smoke venting conditions are also required. The actual ignition of the prescribed burn will require likely two but perhaps four days to complete. The prescribed burn will then be monitored daily but allowed to smoulder until precipitation extinguishes them. The monitoring may change to active management as defined in the Prescribed Burn plan should precipitation not occur. The ignition will be timed, if possible, to precede an expected significant change in the weather to aid natural extinguishment. The Burn Plan (operational) for this unit has been reviewed as part of Parks Canada's Prescribed Fire Review Process.

The only hazardous materials that will be used are aerial ignition materials (gelled fuel and or AID ping pong balls) for ignition, gasoline for chainsaws and pumps and helicopter fuel. Helicopter fuel will be used in a contained manner. A solid waste disposal pathway for the site will be established at the staging area. There will be no off-site land use. Personnel accommodations will be provided at Kootenay Crossing and/or in Radium.

To minimize disturbance to park visitors, moderate to good smoke venting conditions will be required. A large amount of localized smoke should be expected from this project and its distribution on the landscape will vary diurnally and be dependent on the weather. Regional scale smoke from the project will likely be short lived (2-3 days) but may persist in localized areas until extinguishment. Potential areas that may be affected include: Highway #93 and depending on complex weather factors, Sunshine Ski resort, Mt. Assiniboine Lodge, the towns of Canmore and Banff.

Regional smoke loads will be monitored by Parks Canada's National Duty Officer (NDO). The NDO will ensure that this factor is taken into consideration in terms of coordinating multiple prescribed burns in the Mountain Block at one time. Careful attention will be paid in an attempt to ensure that smoke loads are within the tolerance of the public. This project will be tied into ongoing efforts to analyze predict regional scale smoke patterns.

Smoke production may periodically make visibility difficult on Highway #93. This effect should be periodic and will depend on daily and hourly weather after ignition. Crews will be in place to put temporary slow downs or stoppages in place should the Incident Commander deem this step necessary to ensure public safety.

A comprehensive communications strategy has been developed to inform stakeholders of this project. It is contained in Appendix II.

1.3 Project Operational Requirements

This is a long-term operational project. Prescribed burns will be conducted periodically on a regular basis under a variety of burning conditions.

2.0 Site Description

2.1 Location

The project site is on the west facing slopes of the Mitchell Ridge in the Kootenay Valley of Kootenay National Park between the ridges running down to the Vermillion River from Split Peak and the Daer Creek drainage. The elevation of the site ranges from 1100 to 2000 m with an average slope of 30%.

The area, and timing, chosen for the prescribed burns optimizes safety to fireline personnel and other values at risk within both Kootenay National Park and adjacent Provincial lands.

2.2 Site Size

Amendment Area

Split Peak Ignition Section
Size: 600 ha
Perimeter: 16.5 km

The original areas assessed in the Daer-Pitts amendment that will be included in the Split Peak Prescribed Burn Plan are:

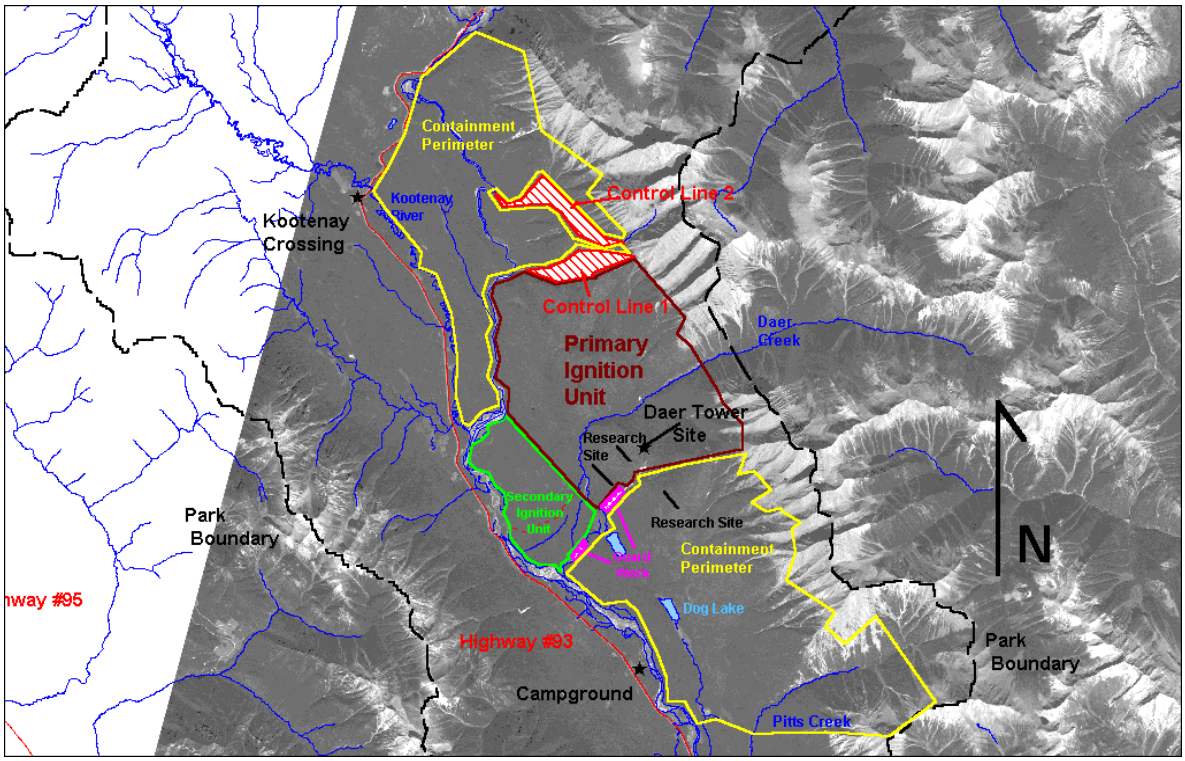
Primary Ignition Unit
Size: 2,232 ha
Perimeter: 22 km

North Containment Perimeter
Size: 2,229 ha
Perimeter: 22 km

The total Split Peak Prescribed burn area is approximately 5300 ha.

These areas are outlined in Figure 3.

Figure 3. Original Daer-Pitts Amendment



2.3 Land Use History

The Kootenay Valley was relatively unmanaged until 1900. The first recorded travelers through this area were Sir George Simpson and James Sinclair. At least 68 homesteads were claimed in the Kootenay Valley between 1910 and 1915 but very few went beyond the initial stages. The construction of the Banff-Windermere Highway during the 1910's and the subsequent creation of Kootenay National Park in 1920 defines land use through to the present. There are two significant park facilities in the general area of the amended burn unit. These include: Kootenay Crossing Warden Station and McLeod Meadows Campground.

2.4 Climate

The climate of the montane ecoregion of Kootenay National Park is strongly influenced by topography. Climatic data are relatively scarce. Inversions are common. The montane precipitation regime is characterized by a well defined June maximum and a second peak in winter. Annual precipitation in the montane is approximately 400 mm. Winds are generally light and their direction is determined primarily by topography.

2.5 Geology

The underlying geology of the project site varies (Achuff *et al* 1984). The montane ecosites are variously: calcareous colluvium (DG); glacial till (BY, DR),or fan and apron fluvial land forms (FR). The subalpine ecosites are either calcareous colluvium (SB, WF) or calcareous glacial till (BY).

2.6 Soil

The soil of the project site varies (Achuff *et al* 1984). The montane ecosites are variously: well drained Brunisols or Regisols (DG); moderately to rapidly drained Eutric Brunisols (DR), or well to moderately drained Eutric Brunisols (FR). The subalpine ecosites are either well drained Brunisols and Regisols (SB, WF) or well to moderately drained Eutric Brunisols (BY).

2.7 Vegetation

According to the ELC (Achuff *et al* 1984), the amended Split Peak area shared the following ecosites with the original Daer-Pitts Prescribed Burn: DR2, DG6, FR1 and FR3, SB3, SB4 and WF3. In addition to these ecosites the amended area includes BY1, DG3, DR5 and FV3 ecosites. The area of the ecosites found being discussed in this amendment are outlined in Table 1. As a cursory way of demonstrating significance the percentage of the total area represented by these ecosites is also given. It should be noted that the ecosite areas do not represent significant percentages of the total ecosite areas in KNP (none greater then 5%).

Table 1. Ecosites found in the amended area with percentages of total ecosite area in KNP.

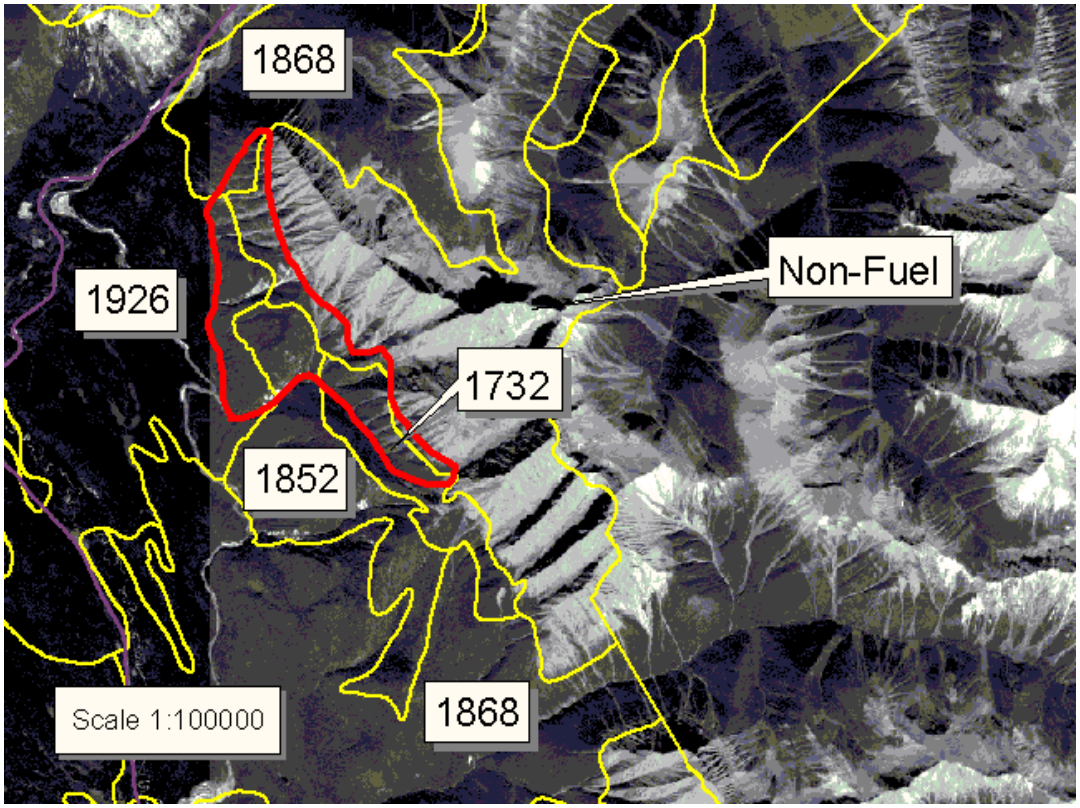
Ecosite	Area (ha) in Split Peak Amendment	% of total ecosite area in KNP
BY1	27	1.00
DG3	28	1.35
DG6	150	2.20
DR2	86	1.16
DR5	21	0.72
FR1	8	0.53
FR3	0.26	0.01
FV3	61	3.67
SB3	143	0.78
SB4	129	4.43
WF3	50	1.21

The ecosites change along an elevational gradient with the Montane ecosites (Daer - DR, Dry Gulch - DG, Fireside) predominating up to approximately 1800m and the Subalpine ecosites (Bryant - BR, Fairview - FV, Sawback - SB, Wildflower - WF) above that. Above 2150m is mostly rock.

The prescribed burn site is characterized by aspen poplar, mixed wood, lodgepole pine, white spruce, and Douglas fir in the Montane and Engelmann spruce and subalpine fir in the Subalpine. A significant proportion of the lodgepole pine in the burn unit have been killed by mountain pine beetle as a result of the infestation that began in 1979 and still continues to spread within the valley.

The amended burn unit contains a variety of stand ages representing an active fire regime (Masters 1990) as outlined in **Figure 4** .

Figure 4. Fire History of Split Peak Area (Masters 1990)



2.8 Hydrology/Aquatic Resources
The project site contains, or is adjacent to, several lakes, wetland areas, streams, the Vermilion and Kootenay Rivers.

2.9 Wildlife

The project site area is very important wildlife habitat. The ELC ranks many of the contained ecosites as high and very high for ungulates, carnivores, small mammals and birds (Achuff *et al* 1984).

BY1 low for: ungulates and carnivores
medium for: small mammals
high for: birds (Rufous Hummingbird, Wilson's Warbler, and Golden-crowned Kinglet)

DG3 medium for: ungulates (high to wintering Bighorn Sheep/Mountain Goats), carnivores, small mammals, and birds (high for Rock Wren/Dusky Flycatcher).

DG 6 high for: ungulates (mule deer, summer and fall), and; carnivores (lynx, coyotes in summer and cougar in winter)
medium for: small mammals
low for: birds

DR 2 high for: ungulates (elk in winter, deer in late summer and fall); carnivores, and; small mammals
medium for: birds (high for yellow-rumped warbler, Swainson's thrush, Steller's jay and orange-crowned warbler)

DR 5 high for: ungulates and carnivores
very high for: small mammals
low for: birds (very high for Townsend's Warbler)

FR 1 high for: carnivores (winter)
medium for: ungulates; small mammals, and; birds (high for olive-sided flycatcher)

FR 3 high for: ungulates (elk in winter, white-tailed deer in summer and fall); carnivores (winter), and; birds (yellow-bellied sapsuckers, Tennessee warbler, Swainson's thrush and brown-headed cowbird)

FV3 low for: ungulates
high for: carnivores (cougar)
medium for: small mammals and birds

SB 3 high for: carnivores
medium for: ungulates; small mammals, and; birds (high for Townsend's warbler, pine siskin, boreal chickadee, brown creeper and golden-crowned kinglet)

SB 4 high for: ungulates (not in this area), and; small mammals
medium for: carnivores, and; birds (high for ruby-crowned kinglet, yellow-rumped warbler and Townsend's Solitaire)

WF 3 very high for: ungulates (goat & sheep)
high for: birds (Clark's nutcracker)
medium for: carnivores (cougar), and: small mammals

The Daer-Pitts Avian Monitoring Program surveyed the site in both 1998 and 1999. The species identified in the program (Stuart-Smith 1998, 1999) are included in Table 2.

Table 2. Avian Species in Daer-Pitts Burn Unit.

Species	Total Individuals	KNP Status
American Robin	4	common
Black-capped Chickadee	2	common
Cedar Waxwing	3	uncommon
Clark's Nutcracker	1	common
Dark-eyed Junco	2	common
Golden-crowned Kinglet	1	common
Gray Jay	5	common
Hairy Woodpecker	2	common
Mountain Chickadee	7	common
Northern Flicker	1	common
Pileated Woodpecker	1	uncommon
Pine Siskin	4	common
Red-naped Sapsucker	1	common
Red-breasted Nuthatch	2	common
Red Crossbill	2	uncommon
Rufous Hummingbird	1	common
Townsend's Solitaire	2	uncommon
Townsend's Warbler	3	common
Warbling Vireo	8	common
Western Tanager	1	common
Yellow-rumped Warbler	4	common

2.10 Aesthetic Values

The southwest facing slopes between Split Creek and Daer Creek are visible to park visitors and people driving along Highway #93.

2.11 Forest Fuels Assessment

Fuel Distribution: Continuous forest fuels cover the bulk of the amended area with the exception of relatively open areas of high elevation rocky slopes and several avalanche paths. Deciduous fuels are represented by aspen poplar along the slope break at the base of the avalanche paths. Coniferous fuels change with elevation.

Fuel Continuity: Fuel continuity is disrupted on the steep slopes of Split Peak by a series of avalanche paths.

Description of Vegetation >3m: Varies with location. Many open-canopy stands at lower elevations, in aspen stands and in areas with significant mountain pine beetle-induced pine mortality. Closed canopy stands at higher elevations and within some lower elevation areas. Vegetation structure varies by species. Lodgepole pine and aspen lack significant ladder fuels while spruce and Douglas fir may have significant vertical fuel continuity.

Description of Vegetation < 3m: Montane regions interspersed with some tall grasses in open canopy and aspen stands. At higher elevations and in avalanche paths, typically forbs and shrubs.

3.0 Environmental Impacts

3.1 Environmental Effects

3.1.1 Wildlife

The effects of fires on terrestrial vertebrates may be direct and immediate or indirect and longer-term. The direct immediate effects include flight and mortality, while the indirect effects are attributable to modifications of the habitat. The consensus suggests that the indirect longer-term effects are more important than the direct immediate effects (GDG Environnement 1994). Amphibians, reptiles, birds and mammals are rarely killed directly by fires and panic reactions are rare (GDG Environnement 1994).

The following is a brief discussion of key ecosites and how they may be affected by fire.

The DG6 ecosite is of high importance to mule deer particularly in summer and fall. The value of the site is likely to decrease for the first summer and fall but increase as early as the following spring. The sites value to carnivores will likely be closely related to its ability to sustain ungulate populations. There are no noted management concerns related to fire.

The FV3 ecosite is of low importance to all wildlife save for birds. It is noted that removal of vegetation may increase erosion.

The SB3 ecosite is highly important to mule deer in the summer and fall, particularly south of the burn unit in the Mitchell Ridge area. Deer use upper subalpine and alpine areas for relief from heat and biting insects as well as for browse (Thomas 1995). The value of the site for mule deer may decrease for the first summer and fall after the burn. It is likely that the value of the site in subsequent years will increase. SB3 is highly important to cougar and lynx. The value of the site to ungulates will be positively correlated to its value for carnivores. High numbers of snowshoe hare are found in burned tracts of SB3 in Vermilion Pass. Hares prefer feeding in shrub lands and early successional mixed wood forests and cover is also very important for avoidance of predators (Telfer 1995). While suitable nesting habitat may be decreased for some bird species, insectivores may benefit from changes in arthropod diversity and abundance following fire.

The SB4 ecosites in this area of low importance to ungulates. SB4 is highly important to cougars in the summer. While suitable nesting habitat may be decreased for some bird species, insectivores may benefit from changes in arthropod diversity and abundance following fire.

The WF3 ecosite is very highly important to mountain goats, particularly as winter range on wind-blown south facing slopes. The project site is used by goats although, recently, the wildlife observation database contains few records for the area (Alan Dibb personal communication). A site survey in 1999 observed no goats in the burn unit. Burning the site during the spring may make is suitable for winter habitat as early as the following winter. Other species of concern for WF3 are bighorn sheep and grizzly bears (Achuff *et al* 1993). Clark's nutcrackers and grizzly bears are closely tied to the health of whitebark pine communities.

The indirect longer-term effects depend on the degree of modification of the available food (type, quantity and quality) and cover (dimensions, structure and distribution). However, the diversity and abundance of terrestrial vertebrates are believed to be largely unaffected by burns (GDG Environnement 1994). The net impact is considered to be positive in the long run.

Concern exists with operations affecting sensitive species in the area (Alan Dibb personal communication). This concern is specific to two known wolf den locations and the Mount Wardle Goat range.

3.1.2 Vegetation

The objective is to remove a substantial portion of the surface and canopy fuel in the project site. The environmental effect of this removal will be positive, however, as the dominant forest disturbance process in the project site is fire and the subsequent re-generation will be highly productive. The regeneration of many of the vegetation species found in the project site is dependent on periodic fire.

3.1.3 Landforms

No anticipated impacts. Some potential exists for localized erosion.

3.1.4 Aquatics/Hydrological Resources

An increased sediment and nutrient runoff may result if late fall precipitation is high. In addition, increased snow penetration of the canopy may cause changes in albedo and snowmelt within the project area. Fire is a persistent and dominant natural disturbance process in the Kootenay Valley (Masters 1990, Hallett 1996, Hallett & Walker 2000, Hallett *et al*, 2003). This increase will not be outside the natural range of variability in a fire-dependent ecosystem (GDG Environnement 1994).

Potential impacts of forest fire on aquatic habitats and populations span a continuum from severe to negligible. In general, the effects of fires are dependant upon the size of the stream, the severity of the fire, the steepness of slopes, stability of soils and climate of the area. In watersheds where small creeks have dissected terrain with steep slopes and unstable soils, the loss of vegetation and ground cover may result in soil slumping and surface erosion which greatly increases sediment loads.

The smaller creeks where sediment loads are likely to be greatest have too steep a gradient to provide suitable habitat for fish rearing, spawning, foraging or resting. The effects of erosion and sediment loads are primarily off-site, downstream impacts. These impacts are mitigated by increased stream flows, and the availability of pools, eddies, backwater channels, springs and other sources of ground and surface waters.

The impacts on riparian systems are also mitigated by choosing ignition patterns and fire cycles which limit burning in riparian areas. Although planned fires may occasionally spread into riparian areas as wildfires do; the impacts of planned fires will be less extensive and less severe because riparian fuels are often too wet to burn under prescribed conditions.

An increased sediment and nutrient runoff can be expected during the usually rainy early summer. This increase will not be outside the natural range of variability in a fire-dependent ecosystem (GDG Environnement 1994).

Helicopter fuel, gelled fuel and diesel fuel will be used during the operation and can both cause impacts on aquatic ecosystems. Fire foam may be used but will not be used within 10 metres of open water.

Additional concerns (Joanne Williams personal communication) focus on operational protocol regarding bucketing out of large pools that may be key habitat for fish populations.

3.2 Pollution

Helicopters will use jet fuel. Aerial ignition devices torches will use jet fuel mixed with gel or AID ping pong balls (potassium permanganate injected with glycol). Jet fuel and AID ping pong balls can cause impacts on aquatic ecosystems.

Significant levels of smoke will be produced as a result of incomplete combustion of forest fuels. This will occur both during the ignition phase and during the subsequent smouldering phase.

The distribution of smoke on the landscape will vary diurnally and be dependent on the weather. A large amount of smoke should be expected from this project and its distribution on the landscape will vary diurnally and be dependent on the weather. Regional scale smoke from the project will likely be short lived (2-3 days) but may persist in localized areas until extinguishment. Potential areas that may be affected include: Highway #93 and depending on complex weather factors, Sunshine Ski resort, Mt. Assiniboine Lodge, the towns of Canmore and Banff.

Regional smoke loads will be monitored by Parks Canada's National Duty Officer (NDO). The NDO will ensure that this factor is taken into consideration in terms of coordinating multiple prescribed burns in the Mountain Block at one time. Careful attention will be paid in an attempt to ensure that smoke loads are within the tolerance of the public. This project will be tied into ongoing efforts to analyze predict regional scale smoke patterns.

A comprehensive communication strategy has been developed to inform stakeholders of this project. It is contained in Appendix II.

3.3 Cultural Features

3.3.1 Aesthetics

There may be a perceived aesthetic impact to visitors after the burn. However, burned forests are a natural part of the forest mosaic. Subsequent re-vegetation will be rapid and aesthetically pleasing.

3.3.2 Public Facilities and Services

The East Kootenay fire road and the Dog Lake trail will remain closed from the day before the burn until the area is considered safe by the Fire Operations Warden.

3.3.3 Public Safety

While there are concerns about pubic safety in close proximity to a forest fire, these can be mitigated through control of access to the area. Smoke production may periodically make visibility difficult on Highway #93. This effect should be periodic and will depend on daily and hourly weather after ignition. Crews will be in place to put temporary slow downs or stoppages in place should the Incident Commander deem this step necessary to ensure public safety.

3.3.4 Cultural Heritage

Rod Heitzmann of the Cultural Resources Services section at the Western Canada Service Centre in Calgary completed an Archaeological Overview of the area covered off in this assessment. Heitzmann's report is contained in Appendix I. One archaeological site containing a small cluster of fire broken rock was located during a foot traverse of the site. It is unlikely to be adversely affected by the prescribed burn. His conclusion and recommendation is as follows:

> *This prescribed burn is unlikely to negatively affect archaeological resources. It is recommended that the burn be allowed to proceed. If any any cultural resources are encountered during the prescribed burn or exposed following the burn, these should be referred to Cultural Resource Services, Western Canada Service Centre, Calgary for recording and evaluation.*

3.3.5 Socio-Economic Impacts

Possible locations outside of the Kootenay Valley that may receive some smoke from this project are the Lower Bow Valley (Banff, Canmore), Mount Assiniboine Provincial Park and, possibly, Calgary. These areas all depend on tourism and, hence visibility, as a significant portion of their local economy. Smoke from this project in these areas will likely be short lived 2-3 days. Regional smoke loads will be monitored by Parks Canada's National Duty Officer (NDO). The NDO will ensure that this factor is taken into consideration in terms of coordinating multiple prescribed burns in the Mountain Block at one time. Efforts will be made to ensure that smoke loads are within the tolerance of the public.

4.0 Mitigating Measures

4.1 Environmental Effects

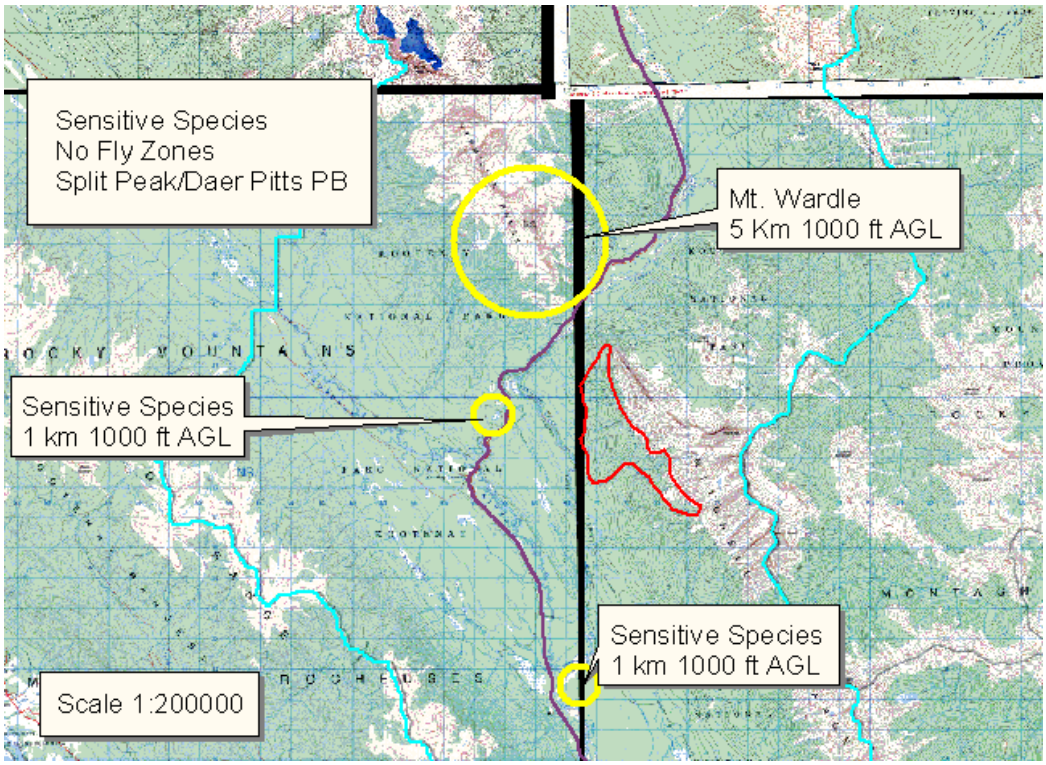
4.1.1 Wildlife

Personal communication with Alan Dibb LLYK Wildlife Specialist outlines the following mitigations:

- Sensitive Species No Fly Zone 1000 ft above ground in a 1 km circumference centered on: **50.95 E 116.02 N**
- Sensitive Species No Fly Zone 1000 ft above ground in a 1 km circumference centered on: 50.90 E 116.04 N
- Sensitive Species No Fly Zone 1000 ft above ground in a 1 km circumference centered on: 50.82 E 115.99 N

These No Fly Zones are illustrated in **Figure 5.**

Figure 5. No Fly Zones for Split Peak/Daer-Pitts Operations



4.1.2 Vegetation

No mitigation necessary.

4.1.3 Landforms

No mitigation necessary.

4.1.4 Aquatics/Hydrological Resources

Spill kits will be on site. Jet fuel and diesel fuel will be used in an appropriate, contained manner near water bodies. Jet and diesel fuel will be stored within portable “mini-berms” large enough to contain any spills.

Bucketing sites will be reviewed by the Aquatics Specialist Joanne Williams before extensive operations are undertaken. Williams will delineate preferred bucketing sites in the Vermillion River.

4.2 Pollution

Hazards to human health from smoke will be minimized by timing ignition patterns to minimize smoke production. Moderate to good smoke venting conditions will be required to ensure smoke dispersal but this will vary diurnally as well as daily during the smouldering stage. Significant smoke production during the smouldering phase is not anticipated as a result of the short burning periods, low temperatures and overnight relative humidity recovery.

4.3 Cultural Features

4.3.1 Aesthetics

No mitigation necessary.

4.3.2 Public Facilities and Services

Public information will be used to minimize inconvenience to park visitors and to promote understanding and appreciation for the role of fire in park ecosystems.

"Prescribed fire in progress" and "Smoke in Area" signs will be placed on the highway north and south of the project area.

A comprehensive communication strategy has been developed and will be implemented. It is contained in Appendix II.

4.3.3 Public Safety

The East Kootenay fire road and the Dog Lake trail will remain closed from the day before the burn until the area is considered safe by the Fire Operations Warden.

If highway visibility is compromised, a crew will be utilized to initiate traffic slow downs or temporary closures.

4.3.4 Cultural Heritage

No mitigation necessary for known resources. If any cultural resources are encountered during the prescribed burn or exposed following the burn, these will be referred to Cultural Resource Services, Western Canada Service Centre, Calgary for recording and evaluation.

4.3.5 Socio-Economic Impacts

No mitigation necessary. Possible effects of smoke in locations remote to the burn are generally non-mitigable beyond burn day. Ignition will be timed as closely as possible to a significant change in the weather to enhance natural extinguishment.

5.0 Cumulative Environmental Effects

This project is part of the implementation phase of the LLYK Fire Management Plan (Walker and Irons 1998). The implementation includes the creation of anchor units on the LLYK boundaries with Mount Assiniboine Provincial Park and the commercial forest adjacent to LLYK, a regular program of meadow/grassland restoration burns, managing lightning fires as well as other burns, as required, for the maintenance or restoration of fire as a natural process. The total burned area will be in the order of 10,000's of hectares per decade.

Given the long term variability in fire regimes in LLYK, this amount of disturbance is ecologically appropriate on the landscape scale (Masters 1990, Tymstra 1991, Hallett 1996, Rogeau 1996, Hallett & Walker 2000, Hallett *et al* 2003). At finer scales, the prescribed burn units will contribute to a greater diversity of habitat within the park as large fires have been infrequent during the last 70 years (Masters 1990, Van Egmond 1990, Tymstra 1991, Rogeau 1996). In addition, the net environmental impact of fire will be positive.

The smoke production may contribute to regional air quality concerns depending on weather and regional fire load. It is not expected that there would be a significant level of fires burning in the spring. However, there may be a significant level of smoke from slash burning in BC. The smoke from the Daer-Pitts PB should be confined to the Kootenay Valley to a large extent. Other possible locations that may receive some smoke from this project are the Lower Bow

Valley (Banff, Canmore), Mount Assiniboine Provincial Park and, possibly, Calgary.

The smoke production may periodically make visibility difficult on Highway #93. This effect should be periodic and will depend on daily and hourly weather after ignition.

6.0 Residual Impacts

None

7.0 Surveillance Requirements

It will be the responsibility of the Fire Operations Warden and the Fire & Vegetation Specialist to ensure that the operation is conducted in an environmentally responsible manner.

8.0 Monitoring Requirements

No direct monitoring is currently in place for the Split Peak Prescribed Burn. This burn will provide a landscape scale fireguard for the original Daer-Pitts Prescribed Burn that has a great deal of associated research. The research projects currently established within the Daer-Pitts burn unit are designed to use the fire as an experimental treatment and include data on: vegetation communities; avian communities; wildlife browse species; arthropod biodiversity, and; bark beetle behavior. Pre-burn data has been collected for vegetation and avian communities in both aspen and mixed conifer-dominated plant communities. Arthropod biodiversity data has also been collected from the aspen community. Extensive fuel reduction monitoring plots are in place that will be used to correlate the ecological effects to fire behavior. Three years were spent collecting this data and the Split Peak Prescribed Burn is required prior to burning the plot areas. The research and monitoring established in the Daer-Pitts Prescribed Burn will be directly related to the Split Peak Prescribed Burn in that the ecosites are very similar.

9.0 Knowledge Deficiencies

There are many knowledge deficiencies in the science of fire ecology and the use of fire for ecological restoration. The Daer-Pitts prescribed burns are intended to directly address some of those knowledge deficiencies. The results of the research conducted in conjunction with this project will lead to improved ecological objectives for prescribed burning and to an enhancement of the net environmental gains to be derived from prescribed burning.

10. References

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Appendix I
Archaelogical Overview

Appendix II

Communications Strategy for the Split Peak Prescribed Burn