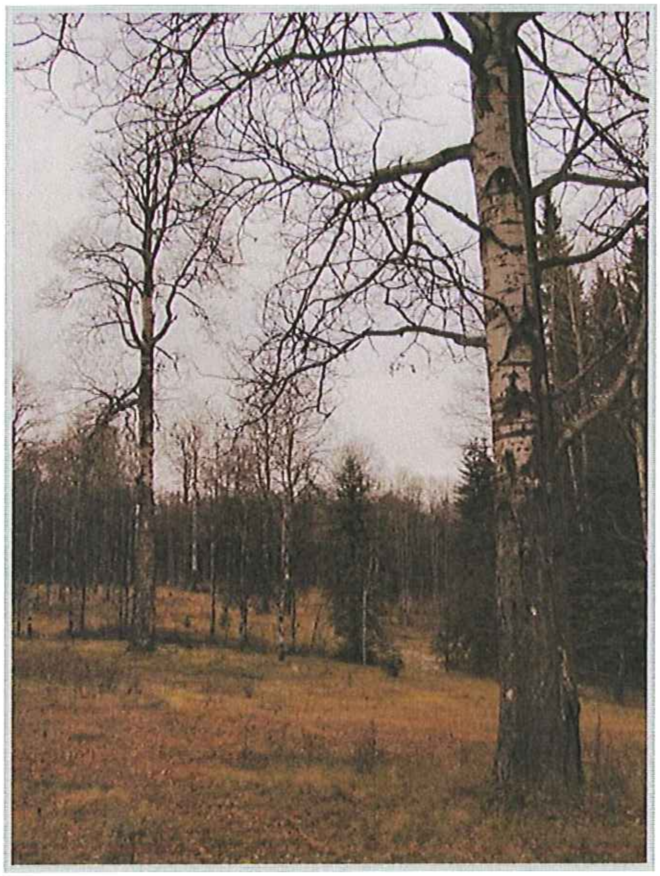
POPLAR MOUNTAIN ASPEN STANDS

ECOSYSTEM RESTORATION STRATEGIC PLAN

Treatment Priorities



Prepared by:

Crispin S. Guppy, M.Sc., R.P.Bio.
Consulting Biologist and Land Use Planner
4627 Quesnel-Hydraulic Road
Quesnel, BC V2J 6P8
email: cguppy@quesnelbc.com; cris@ecofor.ca
phone: 250-747-1512

Prepared for:

Sandra Latin, P. Ag.
Range Officer, Quesnel Forest District
Ministry of Forests and Range
322 Johnston Avenue
Quesnel, BC
V2G 3M5

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1. Introduction

1.1 Ecosystem Restoration Planning

The *Ecosystem Restoration Provincial Strategic Plan* of the Ministry of Forests, Mines and Lands (Government of British Columbia 2008) provides direction for ecosystem restoration. The initial objective of the plan is to target fire-maintained ecosystems that are being degraded through the suppression of wildfires and First Nations-initiated fires, combined with the absence of a planned schedule of prescribed fires. The reduction in fire frequency has resulted in trees encroaching on historic grasslands and the in-growth of trees into previously open forests. The encroachment and in-growth results in loss of forage for wildlife and livestock; loss of critical wildlife habitat including habitat for species at risk and economically important species; loss of First Nations traditional plants; loss of native grasslands; reduced recreational and aesthetic values; and an increased risk of catastrophic wildfires through increased fuel loads.

Most of the historically fire-maintained ecosystems of the Central Interior of British Columbia are in the Bunchgrass, Ponderosa Pine, and Interior Douglas-fir Biogeoclimatic Ecosystem Classification (BEC) Zones. However, there are local sites in other BEC Zones that have historically been maintained as grasslands or open forests, or aspen forests in a matrix of conifer forests, through a combination of wildfires and First Nations-initiated fires; such sites are usually dry south-aspect slopes that are frequently (but not always) associated with rivers or lakes. The provincial strategic plan for ecosystem restoration emphasizes the importance of the historical role of First Nations people in shaping and maintaining certain ecosystems. Their management practices and the resulting ecosystem condition is considered to be the reference ecosystem that existed during the pre-European contact era (Government of British Columbia 2008).

1.2 Poplar Mountain

Poplar Mountain is a low, rounded hill area located about 40 km northnorthwest of the village of Nazko, British Columbia, and 95 km northwest of the city of Quesnel (Fig. 1). The dominant forest types in the area are conifer forests, primarily white spruce and lodgepole pine. Parts of Poplar Mountain have been historically dominated by trembling aspen forests of various ages, including extremely old (for aspen) forests, with a shrub understory and pinegrass (*Calamagrostis rubescens*) ground cover. The south and southwest slopes of Poplar Mountain were an island of aspen-leading open forest with pinegrass ground cover, including small patches of open range, in an area dominated by coniferous forests (Morton 1977). The area provided an oasis of grass and aspen habitat for wildlife species and livestock that is otherwise mostly absent in the general area. The southwest edge of the study area borders Kluskoil Lake Provincial Park; the park area was removed from consideration because any treatments within the park will be part of the park management plan.

Spruce, pine, and young aspen encroachment into the aspen stands have negatively affected the historical characteristics of the open aspen stands, especially over the last 40 years. In the absence of active management, most of the aspen stands are being replaced by dense aspen and conifer stands. The changes to the stands are resulting in higher tree densities and closed canopies, with significant increases in shade. The implications of replacement of open aspen forests with conifer and dense aspen forests include declines in biodiversity, declines in rangeland size and quality of forage, and increased overall risk of catastrophic wildfires.

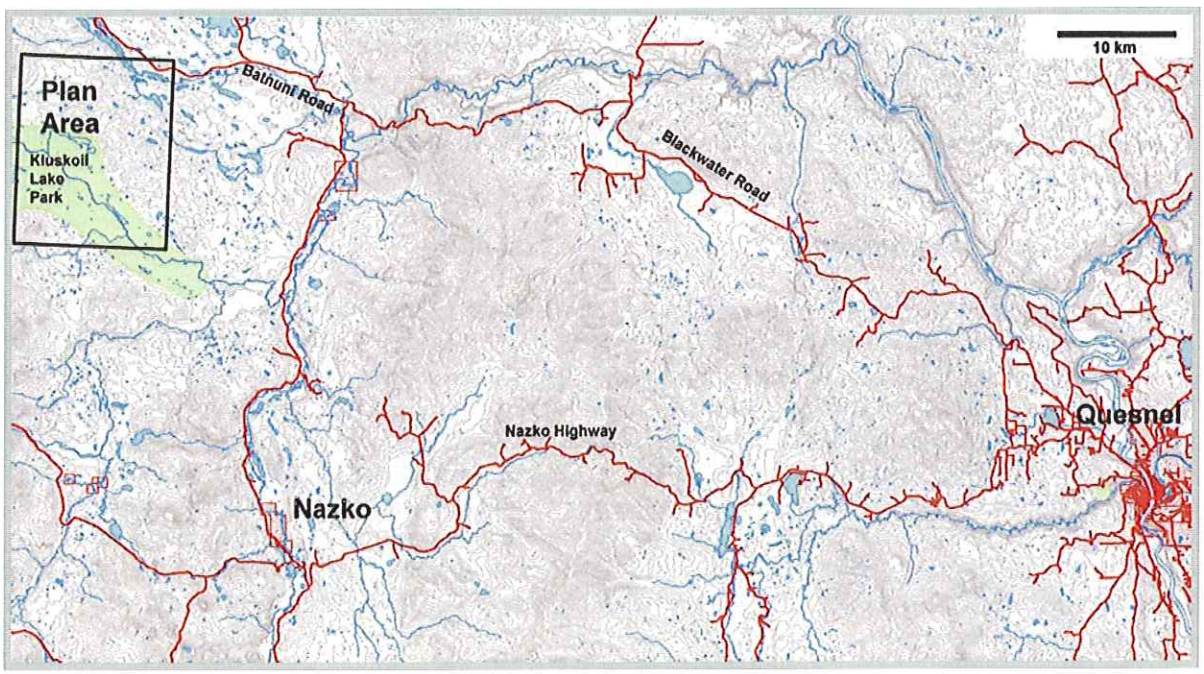
The open aspen stands, with a minor component of grasslands, of Poplar Mountain are disclimax (disturbance climax) ecosystems maintained by fire disturbance. Disclimax ecosystems have sufficient soil moisture to support dense stands of trees and will convert to normal (for the area) conifer forest in the absence of disturbance by fire or other mechanisms such as tree cutting or mowing. Fires set by aboriginal peoples, in combination with natural lightning-initiated fires, are likely to have established and maintained the disclimax open aspen forests and grasslands in the Central Interior of BC prior to European settlement. European settlement reduced fire frequency through disruption of historic fire management practiced by aboriginal peoples, and through reduction in the size of lightning-caused wildfires. The advent of grazing by domestic animals may also have reduced fuels on the ground (primarily dead grass) through overgrazing, reducing the initiation and spread of fires.

The objectives of this plan are to, within the Poplar Mountain aspen forest areas,

- Minimize the long-term damage to aspen-parkland vegetation and soils;
- Maintain treated sites in a restored condition; and
- Improve and increase habitat for aspen-parkland dependent native plant and animal species and associated plant communities.

No part of Kluskoil Park is included in the plan because its management is defined in a park management plan.

Figure 1. Location of the Plan Area.



2. Methods

2.1 File Review

The Ministry of Forests (Quesnel office) range file for the Poplar Mountain area, including an informative hand-drawn map from 1977, was reviewed. Information prior to the mid-1970s was not available, however the available files provide information for about the last 35 years.

2.2 GIS Methods

Available GIS data was compiled and overlaid to review the characteristics of the Poplar Mountain area and to establish the boundaries of the project area. Layers included:

- TRIM data
- Predictive Ecosystem Maps (PEM)
- Vegetation Resource Inventory forest cover
- Land Ownership
- Indian Reserves
- Biogeoclimatic Ecosystem Classification Units
- Old Growth Management Areas
- Ungulate Winter Range
- Critical Fish Habitat polygons
- Conservation Data Centre Sensitive and Non-sensitive element occurrences
- Draft Moose High Value Wetlands
- Provincial 1:20,000 Wetland Map
- Fish Inventory data (FISS)
- Range Tenures
- Access
- Crown Tenures
- Forest Harvesting and Silviculture Maps
- Parks and Protected Areas
- Map of areas burned in 1995
- Orthophotos

The vegetation resource inventory data was used to determine the proportion of forest cover that is aspen. Forest cover polygons were divided into six categories of aspen:

- 100% conifer 422 polygons
- Aspen 2-15% 276 polygons
- Aspen 19-35% 157 polygons
- Aspen 40-55% 50 polygons
- Aspen 60-75% 58 polygons
- Aspen ≥ 80% 100 polygons

Three small Douglas-fir leading polygons (Fd, FdPl, and Fd(Pl)) are within the project area; they were also identified, and excluded from the treatment areas. Wetlands ("swamps"), non-productive brush (NPBr), lakes, and streams were identified as potential boundaries for controlled burns. A single non-productive black spruce leading polygon is within the project area; it was treated as being a wetland. In addition a fringe of black spruce is present around most wetlands but the stands are too narrow for mapping as separate polygons.

The following categories of land use and environmental considerations were found to ***not*** be present in the areas proposed for treatment:

- Private land
- Indian Reserves
- Critical Fish Habitat
- Ungulate Winter Ranges
- Woodlots
- Known occurrences of Species at Risk
- Moose High Value Wetlands (but the aspen forests are heavily used by moose in the winter)

There are three non-legal Old Growth Management Areas (OGMAs) at least partly within the study area (Fig. 3):

- CAR_RCA_268
- CAR_RCA_287
- CAR_RCA_288

OGMA 288 is pine and spruce with the aspen component < 50% for most of the area, but the northwest edge is aspen > 70% The other two OGMAs have high aspen components (70-85%). The OGMAs are excluded from the proposed treatment areas – they require a separate management plan, which can only be developed once data has been collected on the ecological impacts of spring burns in the treatment areas. Since they are excluded from treatment, the OGMA areas can be used as "control areas" when assessing the ecological impacts of the treatments.

Contour data was used to estimate slope, aspect, and elevation; this information had little value because most areas were quite similar in these characteristics.

2.3 Orthophoto Review

Digital orthophotos were visually reviewed using GIS, in conjunction with other relevant layers. The orthophotos were from the year 2006; hence most of the mature and old lodgepole pine was "red-attack" from Mountain Pine Beetle, making it easy to distinguish pine stands from spruce. The orthophoto review identified a number of polygons that were mixed pine and aspen, and once the beetle-killed pine was removed would have considerable cover of aspen. Orthophoto and field review identified that some of these stands are now clearly aspen ≥ 50%; they were assigned an aspen proportion of 60% (Map 093g021 polygons 83, 89, 91, 97, 124, 701).

2.4 Access

Access is limited to the existing trail network and to helicopters, except a recent clearcut by BC Timber Sales is adjacent to a small part of the northern boundary of the project area. Other forest industry roads are too distant from treatment units to be useful. Access was not considered in prioritizing treatment areas, because costs are not anticipated to vary significantly.

2.5 Field Review

A one-day field visit was made on November 11, 2010 by all-terrain vehicle, after which snow accumulations made further visits not feasible. The route in the field visit followed the established trails of the Alexander Mackenzie Heritage Trail and a trail to the White's Lake cabin, with a loop through the west end of the trail driven off-trail to examine unique old aspen stands. The purpose of field work was to provide a basic understanding of the character of the aspen stands, to provide a basis for air photograph and map interpretation. This provided the framework for initial delineation and attributing of the polygon database, with delineation of treatment units.

3. Project Area Summary

3.1 Area Summary

The boundary of the plan area (Fig. 2) was derived from the area mapped as open aspen forest and rangeland in 1977 (Morton 1977), with modifications to exclude the areas of Kluskoil Lake Park and the northeast corner near Titetown Lake (both are outside the terms of reference for this plan). There are 1320 forest cover polygons partly or entirely within the study area, for a total area of 30,354 ha. Of these, 136 are "swamp" (wetlands), 65 are lakes/ponds and double-line rivers, 1 is non-productive forest, 43 are non-productive brush, 12 are open range, and 1063 are forested (including those harvested or partly harvested). There are 641 polygons with aspen ≥ 2% ; the remaining 422 are 100% conifer. A minor component of the forest has been recently harvested, along the north edge of the study area. Most of the study area is covered by parts of TRIM map sheets 093g021 and 093g022, with corners of 093G011 and 093G012.

3.2 Topography

Topographic relief is generally low, consisting of fairly gentle rounded slopes up to the summit of Poplar Mountain. Pilot's Knoll is a small outcrop of bedrock with a vertical south aspect cliff and patches of open grassland with sparse aspen. Most of the aspen forests are located on south to southwest facing slopes, as well as slope crests. The elevation range is from 900 m on the east side, to 935 m at White's Lake on the west side, to 1045 m at Pilot's Knoll – an elevation range of only 145 m.

3.3 Biogeoclimatic Ecosystem Classification Units

The study area includes two Biogeoclimatic Ecosystem Classification (BEC) Units:

- Sub-Boreal Spruce Dry Warm, Blackwater Variant (SBSdw2)
- Sub-Boreal Pine-Spruce Dry Cold (SBPSdc)

The core of the study area is SBSdw2; only the low elevation fringes on the east and west are SBPSdc (Fig. 3).

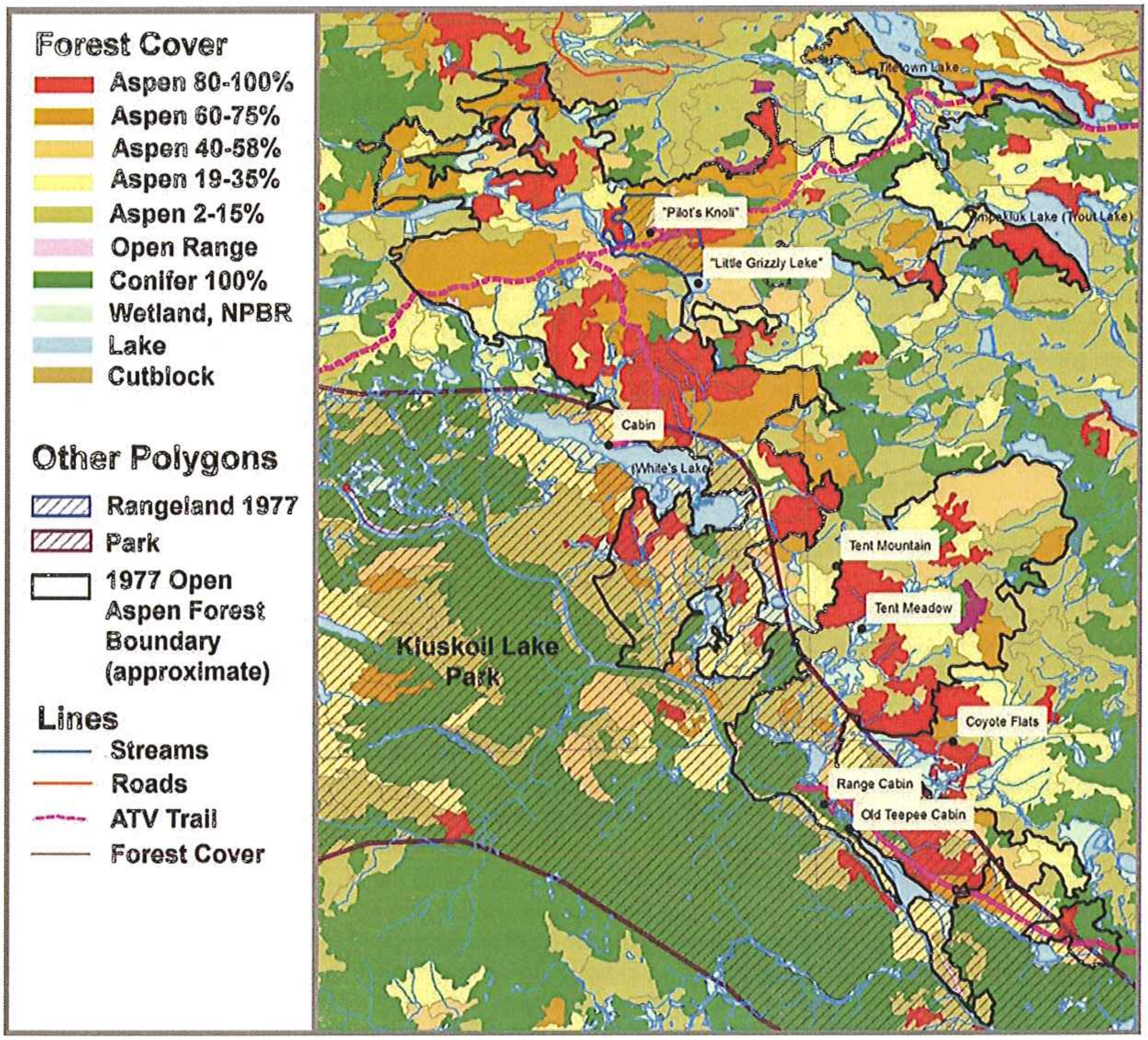
The SBSdw2 occurs in a narrow band in the central and northern Central Cariboo and Quesnel Forest Districts, northward into the Prince George and Vanderhoof Forest Districts. The landscape is typically a gently rolling plateau with elevations usually between 750 m to 1200 m. The zonal Hybrid White Spruce / Douglas-fir – Pinegrass (SP; /01) site series dominates the study area, as expected. It occurs on most gentle to moderately steep slopes from upper to lower slope positions, and soils are primarily Luvisols developed in loamy morainal deposits (Steen and Coupé, 1997). In the SBSdw2 the old forest canopy is typically dominated by hybrid white spruce and Douglas-fir but, due to frequent wildfires in the past, most stands are less than 150 years old and typically have an even-aged Douglas-fir or lodgepole pine-dominated canopy; however in the study area Douglas-fir is uncommon, and lodgepole pine and spruce dominate. Tree regeneration is typically primarily Douglas-fir and spruce, but sometimes includes subalpine fir; however in most of the project area Douglas-fir regeneration is less common than typical. The undergrowth has a moderate to high cover of pinegrass, a sparse to moderate cover of low shrubs, and a nearly complete moss cover dominated by red-stemmed feathermoss and knight's plume. Principal shrubs typically include prickly rose, birch-leaved spirea, and Sitka alder (Steen and Coupé, 1997).

In the SBSdw2, sites drier than those of the zonal site series are moderately common and occur on hill crests, steep slopes, south- and west-facing slopes, and coarse soils (Steen and Coupé, 1997). They have more dry-site shrubs such as common juniper and Soopolallie, more frequent kinnikinnick, and little or no black twinberry.

The SBPSdc generally has poorer cold air drainage than the SBSdw2. The area adjacent to the SBSdw2 is very similar to that BEC unit in the plan area, and this plan does not distinguish between the two units.

Figure 2. Forest Cover and "1977 Open Aspen Forest" Boundary in the Plan Area

Forest cover (aspen percentage) is based on forest cover map data, supplemented with additional aspen areas from orthophoto review. Place names are from Morton (1977) – Pilot's Knoll is the local name for the highest point of Poplar Mountain.



3.4 Aspen Forest Plant Communities

The dominant open aspen forest plant communities are described by an unpublished Ministry of Forests map (Morton 1977), and are:

Poplar-Peavine Rose community: A tree layer of aspen, cottonwood and spruce; a shrub layer of rose, small poplar, and willow; and an herb layer of forbs (fireweed, peavine, paintbrush, bedstraw, yarrow) and grasses (pinegrass, wheatgrass, brome, blue wild-rye, bluejoint).

Poplar-Aspen-Soopalalie community: A tree layer of aspen, cottonwood, and spruce; a shrub layer of kinnickinick, sheperdia, rose, small cottonwood, willow and saskatoon; and an herb layer of forbs (aster, peavine, strawberry, meadow-rue, fireweed, paintbrush, dandelion) and grasses (pinegrass, timber ricegrass, wheatgrass, brome, bluejoint).

These plant communities do not correspond to any currently recognized in the SBSdw2 or SBPSdc, but, based on the late-season field review, appear to be an accurate description of the aspen-leading stands.

3.5 Biodiversity Values

The large mature and veteran aspen trees are excellent wildlife trees. The ancient aspens that occur in some stands in polygon 118 are perhaps unique in the central interior for their abundance and size; I estimate their age as > 200 years. The forest cover data estimate for the forest polygon with the oldest aspen is 148 years, with adjacent spruce stands up to 268 years; the veteran aspen trees may match the spruce in age. Two Old Growth Management Areas (OGMAs) include the oldest aspen polygon, as well as the adjacent old spruce stands. The OGMAs are not focussed on rare plant communites (Fig. 3), but two are obviously focussed on unique old aspen stands. The open parkland with small patches of open range is important in maintaining general biodiversity, because of the rarity of such stands in the central interior.

3.6 Species at Risk – Plant and Animal Species

There are no known records in the Poplar Mountain area (Conservation Data Centre) of provincially red- or blue-listed plant or animal species, or species nationally listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or the Species at Risk Act (SARA). Species at Risk that are likely to be present at least occasionally in or near the treatment areas are:

- Western Toad (wetlands and adjacent upland areas)
- Grizzly Bear
- American White Pelican (White's Lake)
- Sandhill Crane (wetlands)
- Short-eared Owl (grassland patches)

Other species at risk may be present but have not been detected in the general area; the Quesnel Forest District as a whole is very poorly inventoried and this type of habitat is completely without inventory.

3.7 Species at Risk – Plant Communities

The Predictive Ecosystem Map includes most of the terrestrial plant communities, but does not address most non-forested wetland and wetland/upland transition plant communities (Table 1). Seventeen rare plant communities are potentially or probably present, both forested (Table 2) and non-forested (Table 3).

The wetland and wetland/upland transition communities have not been classified in this area, and therefore the presence / absence of rare non-forested communities is generally unknown. If present:

- The forested wetlands are unlikely to burn in the spring due to high water tables and snow remaining under the trees. If they do burn, burning of the trees would be detrimental to the communities.
- The non-forested wetlands are unlikely to burn in the spring due to high water tables, although some of the dead grass and sedge material on the surface may burn. If they do burn, it may benefit the wetlands by burning encroaching trees.
- The wetland/upland transition communities are likely to burn in the spring, which may benefit the communities by burning encroaching shrubs and trees. The provincial Conservation Framework states that ecological restoration is a priority for all three of these communities; spring burning will assist in their restoration.

The predicted presence /absence of forested plant communities was determined from the Predictive Ecosystem Map (Table 1; Fig. 3).

Table 1. List of Site Series (modified from PEM report)

For non-forested areas, only site series that occur in the study area are listed

Site Series No.	Site Series Code	Site Series Name	Typical Soil Moisture Regime	Typical Landscape Setting Where Unit is Modelled
SBSdw2				
01	SP	SxwFd – Pinegrass	Mesic	All medium texture upper to lower water shedding <30%
02	DC	FdPl – Cladonia	Xeric	Shallow crests, thin, dry soils – medium and coarse
03	LK	Pl – Kinnikinnick – Wavy-leaved Moss	Subxeric	Coarse – Rare, restricted to 10-30% warm SW slopes on eskers
04	DP	Fd – Pinegrass – Aster	Subxeric – submesic	Steep SW – dry warm upper slopes (includes coarse)
05	SM	SxwFd – Cat's-tail Moss	Submesic	Steep NE – cool dry slopes, upper – mid only, medium and coarse
06	LP	Pl – Pinegrass – Feathermoss	Submesic	All coarse upper shedding slopes, also medium deep crests
07	BF	PlSb – Feathermoss	Mesic	Cool, frosty mesic to submesic, not moist, gentle mid-toe
08	ST	Sxw – Twinberry	Subhygric – hygric	Moist – frosty, sloping seepage, WT > 50 cm – medium and coarse
09	SD	Sxw – Devil's Club – Knight's Plume	Hygric	Moist, rich, not-frosty, sloping seepage (not mapped – rare)
10	SH	Sxw – Horsetail	Hygric	Wet, flat (< 5%) frosty valleys and depressions, WT < 50 cm
11	BS (=Wb/08)	Sb – Soft-leaved sedge – Sphagnum (= Sb – Soft-leaved sedge – Peat-moss)	Hygric – subhydric	Forested organics, cold, very wet, flat, frosty depression
SBPSdc				
01	LI	Pl – Juniper -Feathermoss	Mesic	All medium texture upper to lower water shedding <30%
02	LC	Pl – Kinnikinnick – Cladonia, Shallow	Xeric	Shallow crests, thin, dry soils – medium and coarse
02	LC	Pl – Kinnikinnick – Cladonia, Typic	Xeric	
03	LC	Pl – Kinnikinnick – Feathermoss, Typic	Subxeric – submesic	
03	LC	Pl – Kinnikinnick – Feathermoss, Sand	Subxeric – submesic	
03	LC	Pl – Kinnikinnick – Feathermoss	Subxeric – submesic	Coarse – Rare, restricted to 10-30% warm SW slopes on eskers
04	BF	PlSb – Feathermoss	Submesic	Steep SW – dry warm upper slopes (includes coarse)
05	SB	Sxw – Scrub birch – Feathermoss	Subhygric	Steep NE – cool dry slopes, upper – mid only, medium and coarse
06	SM	Sxw – Horsetail – Meadowrue	Subhygric – hygric	All coarse upper shedding slopes, also medium deep crests
07	BB (= Wb05)	Sb – Scrub birch – Sedge (= Water sedge – Peat-moss)	Hygric -subhygric	Cool, frosty mesic to submesic, not moist, gentle mid-toe
08	SH (= Ws07)	Sxw –Horsetail – Glow Moss (= Sxw – Common horsetail – Leafy Moss)	Hygric -subhygric	Moist – frosty, sloping seepage, WT > 50 cm – medium and coarse
00	OW	Open Water		
00	WE	Non-forested Wetland		
00	BR	Non-productive Brush		

Table 2. Rare Plant Communities: Forested

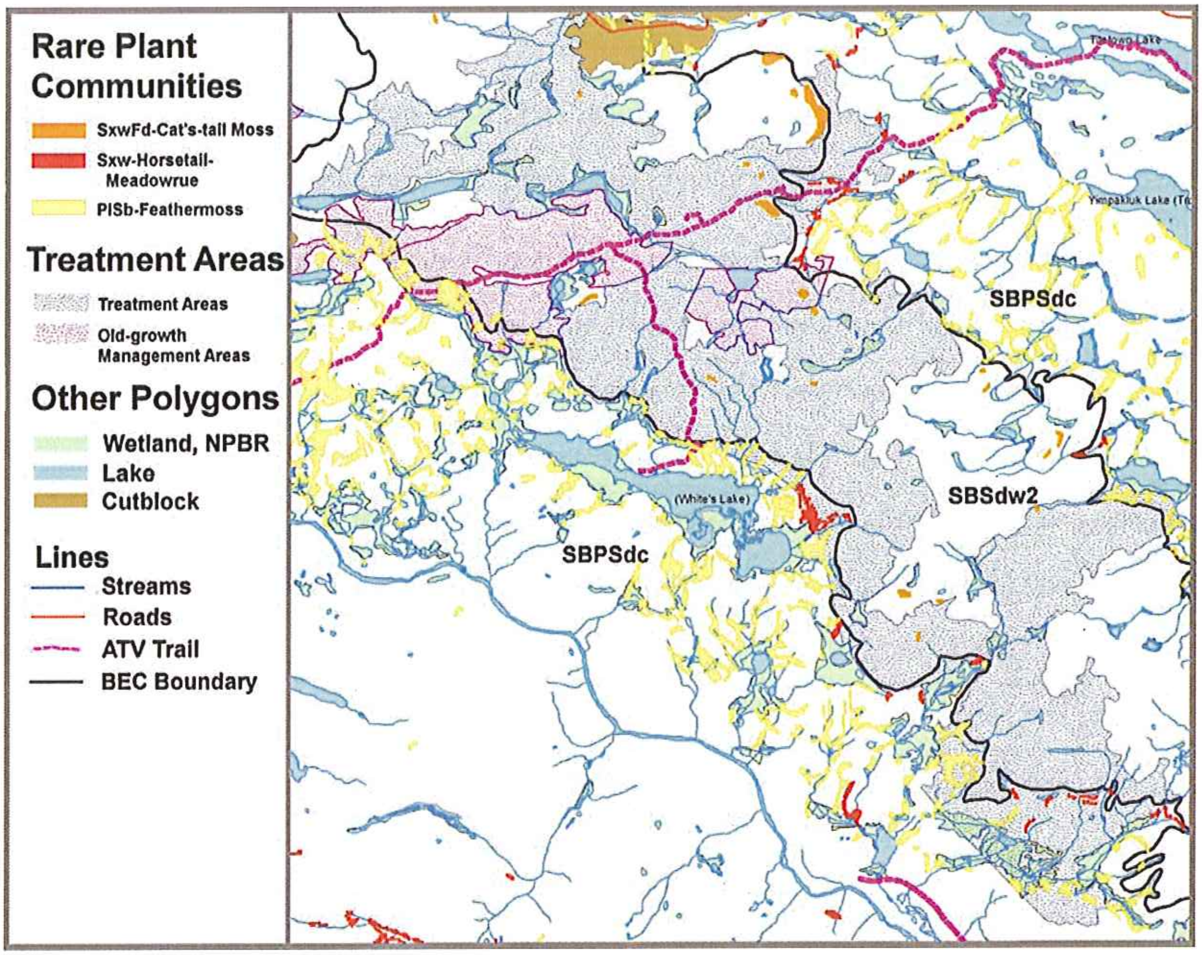
English Name	Latin Name	Site Series (Code)	Conserv-ation Status	Conservation Framework Action Group	Burning Significance	Comments ("treatment areas" are from Section 4 of this plan)
Terrestrial Forest – From Predictive Ecosystem Map						
Douglas-fir - hybrid white spruce / electrified cat's-tail moss	*Pseudotsuga menziesii - Picea engelmannii x glauca / Rhytidiadelphus triquetrus*	SBSdw2/05 (SM)	S3	Classification; Monitor Trend; Review Use	Negative	Total SBSdw2/05-leading polygons: 21 9 polygons are within the treatment areas.
Douglas-fir - lodgepole pine / clad lichens	*Pseudotsuga menziesii - Pinus contorta / Cladonia spp.*	SBSdw2/02 (DC)	S3	Monitor Trend	n/a	No DC-leading polygons.
hybrid white spruce / horsetails - western meadowrue	*Picea engelmannii x glauca / Equisetum spp. - Thalictrum occidentale*	SBPSdc/06 (SM)	S3	Monitor Trend; Review Use	Negative	Total SBPSdc/06-leading polygons: 38 17 polygons are within the treatment areas.
lodgepole pine - black spruce / red-stemmed feathermoss	*Pinus contorta - Picea mariana / Pleurozium schreberi*	SBSdw2/07 SBPSdc/04 (BF)	S3	Monitor Trend	Negative	Total SBSdw2/07-leading polygons: 0. Total SBPSdc/04-leading polygons: 341. 20 polygons are within the treatment areas.
hybrid white spruce / foam lichens	*Picea engelmannii x glauca / Stereocaulon spp.*	SBSdw2/00	S1	Classification	n/a	Not present on Poplar Mountain (air photo, geology, and field)

Table 3. Rare Plant Communities: Non-forested

English Name	Latin Name	Site Series	Conserv-ation Status	Conservation Framework Action Group	Burning Significance	Comments
Wetlands – Types not classified, and therefore not known to be present but may be in general area						
awned sedge Fen – Marsh	*Carex atherodes* Fen – Marsh	SBPSdc/Wm03	S2?	Eco Protect; Eco Restore; Plan; Private Land; Rev Status; Review Use; Status Rpt	n/a	Too wet to burn in the spring.
Black spruce / buckbean / peat-mosses	*Picea mariana / Menyanthes □anadensis / Sphagnum spp.*	SBSdw2/Wb11	S3	Monitor Trend	Negative	Unlikely to burn in spring due to surface water and snow. Potential negative effect is burning of black spruce.
Drummond's willow / bluejoint reedgrass	*Salix drummondiana / Calamagrostis canadensis*	SBPSdc/Fl05	S2S3	Monitor Trend	No significance	Unlikely to burn in spring due to surface water and snow. If willow is burned it will rapidly regenerate from roots.
Hard-stemmed bulrush Deep Marsh	*Schoenoplectus acutus* Deep Marsh	SBPSdc/W15	S3	Monitor Trend	No significance	The dead tops of cattails may be burned off with a spring burn, but this will be neither positive or negative to the community.
Slender sedge / common hook-moss	*Carex lasiocarpa / Drepanocladus aduncus*	SBPSdc/Wf05	S3	Monitor Trend; Rev Status	n/a	Too wet to burn in the spring.
Shore sedge – buckbean / hook-mosses	*Carex limosa – Menyanthes □anadensis / Drepanocladus* spp.	SBPSdc/Wf08	S3	Monitor Trend; Review Use	n/a	Too wet to burn in the spring.
Swamp horsetail – beaked sedge	*Equisetum fluviatile – Carex utriculata*	SBPSdc/Wm02	S3	Monitor Trend; Rev Status	n/a	Too wet to burn in the spring.
Scrub birch / water sedge	*Betula nana / Carex aquatilis*	SBPSdc/Wf02	S3	No New Actn	n/a	Too wet to burn in the spring.
Tamarack / low birch / bluejoint reedgrass – sedges / peat-mosses	*Larix laricina / Betula pumila / Calamagrostis □anadensis – Carex* spp. / *Sphagnum* spp.	SBSdw2	S1	Classification; Monitor Trend	Negative	Unlikely to burn in spring due to surface water and snow. Potential negative effect is burning of tamarack and birch.
Wetland/Upland Transition Communities – Types not classified, and therefore not known to be present but may be in general area						
tufted hairgrass Community	*Deschampsia cespitosa* Community	SBPSdc/Gs04	S3	Eco Restore; Inventory; Plan; Private Land; Review Use; Status Rpt	Positive	Spring burning will remove undesirable shrub and tree encroachment without harming the herbaceous vegetation.
Baltic rush – field sedge	*Juncus balticus – Carex praegracilis*	SBPSdc/Gs03	S3	Eco Protect; Eco Restore; Inventory; Plan; Private Land; Review Use; Status Rpt	Positive	Spring burning will remove undesirable shrub and tree encroachment without harming the herbaceous vegetation.
Nuttall's alkaligrass – foxtail barley	*Puccinellia nuttalliana – Hordeum jubatum*	SBPSdc/Gs02	S2	Eco Protect; Eco Restore; Inventory; Plan; Private Land; Review Use; Status Rpt	Positive	Spring burning will remove undesirable shrub and tree encroachment without harming the herbaceous vegetation.

Figure 3. Locations of OGMAs and Predicted Rare Plant Community Locations

The "treatment areas" are from Section 4 of this report.



3.8 General Wildlife and Fish Values

There has apparently been no inventory of wildlife use of Poplar Mountain. The aspen stands are excellent moose winter habitat (feeding on shrubs and young aspen); black bear spring habitat (feeding on new herbaceous vegetation and aspen buds) and possibly denning habitat (large diameter trees); grouse habitat; and there are numerous high value "wildlife trees" (Guppy 1995). The open aspen stands are visually similar to those in the Peace River lowlands (fire-maintained) that have a wide diversity of plants and insects, but appear to have a much lower diversity and the primary grass is pinegrass rather than other grasses.

All streams should be assumed to be fish-bearing in the absence of inventory, with rainbow trout the only fish likely to be present.

3.9 Range Use History

The available range use information is from the Ministry of Forests, Mines and Lands (Quesnel office) range management files. Poplar Mountain is one of the oldest ranching areas in the Cariboo Region. Beginning in the late 19th century the area was used as a stop over on cattle drives from the Chilcotin to the Cariboo, and the general area was the site of some of the first homesteads in the region, in the early 20th century. Poplar Mountain continues to be an important source of forage for several ranches in the Nazko area (MoF Range files). Further information regarding range use prior to the 1970's is not in the files.

In the 1970's Poplar Mountain Ranch ran up to 500 head of cattle for a total of approximately 2000 animal unit months in the total Poplar Mountain range unit (the present plan area is only a portion of the range unit). Four different ranchers running on the area resulted in management problems and overgrazing of some areas. The construction of a drift fence, creation of a management plan, and removal of two of the permittees solved these problems. Range use was down to 292 head in 1982 and 100 in 1983 for summer range. Pelican Ranch stopped using the area in 1984 through 1986 and lost their grazing rights. From May through September in 1987 and 1988 there were 250 head, then the area experienced non-use again in 1989. There are presently three overlapping authorized range tenures, for a total of 1393 animal unit months (AUMs), which is an unusually large amount of forage for a similar size forested area in this region. The field review on November 11, 2010 suggested that grazing in 2010 was generally quite light on Poplar Mountain, with only a few small localized patches of heavy grazing near water and salt licks.

3.10 Developments

There is no private land associated with the area, and the primary existing use of the area is livestock grazing. There is apparently no livestock or other fencing in the area. Range cabins on the shore of White's Lake and near Teepee Lake are outside the project in Kluskoil Lake Provincial Park. There are no First Nations settlements in the area, but First Nations practice of cultural activities (especially hunting) likely occurs throughout the study area. The Kluskus and Nazko bands are the most likely First Nations peoples to use the area. Historic burning by these peoples was probably a key factor behind the existence and distribution of the aspen stands. A small amount of harvesting has occurred on the north boundary of the project area, and forest road development is occurring near the southeast boundary.

The Alexander Mackenzie Heritage Trail passes east-west through the middle of the area, with a branch trail south to White's Lake and another short branch to Pilot's Knoll. The only damage from prescribed burns that might occur to the trails is from trees falling across them. A range cabin is near the shore of White's Lake, at the end of the branch trail (Fig. 2). It is likely protected from the burns by forest and lake, but the possibility of a burn extending to the cabin should be specifically considered before to burning. I know of no other developments or structures in or near the treatment areas.

3.11 Prescribed Burn History

Limited records of prescribed burns are in the Ministry of Forests, Mines and Lands (Quesnel office) range management files. There have been three prescribed burns on Poplar Mountain that are at least partially documented, in the springs of 1977, 1991, and 1995. The only post-fire assessment was a brief report by the Ministry of Environment (Guppy 1995). In 1998 another range burn was proposed, but was not carried out. It is probable that other burns occurred prior to 1977 that are not in the range file.

The ecological effects of the spring 1995 burn were assessed with respect to impacts on wildlife habitat by the Ministry of Environment in September 1995 (Guppy 1995). The observed effects of the burn were:

- ***Wildlife trees*** *– some existing dead, standing snags ignited, became fire hardened, and sometimes fell over. Their value as wildlife trees was severely decreased even if they remained standing.*
- ***Course woody debris*** *– some logs were burned or fire hardened, and some stumps were destroyed.*
- ***Old aspens*** *– some were killed by the fire, especially if a scar containing dry flammable wood was present.*
- ***Young aspens*** *– a very few were killed by the fire.*
- ***Old conifers*** *– few were killed by the fire.*
- ***Young conifers*** *– isolated trees were sometimes killed, and lower branches on more of the trees were killed.*
- ***Shrubs*** *– killed in local areas where the fire was hot.*
- ***Grasses*** *– no obvious effects, but there may be long term community shifts.*
- ***Organics*** *– the surface layer burned off in many areas, especially the accumulated dead grass.*
- ***Community Composition*** *– almost certainly altered in some/all areas.*
- ***Douglas-fir*** *– the area to the east of Poplar Mountain has numerous Douglas-fir vets, and some knolls are Douglas-fir dominated. These should be protected from Range and Harvesting activities.*

The long-term impacts were suggested to be: *The maintenance of the aspen parkland habitat type in this area is dependent on periodic burning, and therefore the continuation of range burning is supported by [Ministry of Environment]. The minor adverse impacts of this range burn on wildlife habitat are more than offset by the positive effect of maintaining the habitat type. However, the long-term impacts of repeated burning on wildlife habitat will be strongly dependent on*

- *the pattern of burning.*
- *the frequency of burning, and*
- *the intensity of the fires.*

The review of Guppy (1995) was very limited in scope and detail; hence only the most obvious effects of the prescribed burn were noted.

3.12 Invasive Plant Species

Invasive plant species are presently a minor concern in the study area. Invasive plants can displace native species and result in extirpation of local native plants and animals. However, the dense swards of pinegrass will suppress the establishment and/or spread of most invasive species, in the absence of soil disturbance. Local patches of Canada thistle were noted in the field inspection, near salt licks and along wetland edges, but the weed did not appear to be a significant problem in the area. There are no invasive plant occurrences for the study included in the *Land Resource Data Warehouse* Invasive Plant records.

During treatment operations, soil disturbance and new trail or road development should be avoided to reduce the potential for invasive plants to become established and to ensure seed beds of native species remain intact. All treatments in the aspen areas should avoid soil disturbance, construct no new trails or roads, and use no machinery beyond all terrain vehicles; hence there should be little or no increase in invasive species in response to the treatments. However, where invasive species are noted in the field, consideration should be given as to whether control measures should be incorporated in the treatment prescriptions.

3.13 Pre-European Wildfire Frequency and Types

The Sub-Boreal Spruce (SBS) Biogeoclimatic Zone forests, under natural conditions, burn every 75 to 125 years on average, with the fires destroying the existing forest and initiating a new forest. As a result, few stands became over 120 years old and most consisted of even-aged dense pine stands with (in older stands) pinegrass, kinnikinnick, and lichens on the forest floor (Steen and Coupé, 1997).

The existing forest age distribution of Poplar Mountain is generally consistent with that typical of the SBS, with some differences (Fig. 4). The oldest two aspen-leading stands are 168 and 188 years, with the next oldest being 10 polygons at 148 years. and the oldest conifer stands are 218 years (3 polygons) and 228 years (1 polygon). There have been few stand-initiating fires for over 60 years, which has resulted in an age class distribution that is older than what would have occurred under pre-European conditions. This is consistent with the decreased fire initiation and increased suppression of wildfires after European settlement.

The pattern of distribution of old aspen stands (Fig. 5, Age Class 8) suggests that the major wildfire that initiated the oldest existing forest stands on Poplar Mountain occurred about 150 years ago, around 1860. Younger aspen stands of all age classes down to Age Class 4 (61-80 years) are scattered throughout the aspen area of Poplar Mountain; indicating frequent stand-initiating fires throughout the pre-European and early European settlement period. Stand-initiation was in relatively small patches, suggesting that ground fires or burning of only small clumps or individual trees may have dominated younger stands. As noted above, stand-initiating fires stopped on Poplar Mountain around 60 years ago (1950).

The 1977 area of open rangeland near Pilot's Knoll (Fig. 5), is especially noteworthy. The area is now aspen-leading forest. This suggests that the pre-European pattern of succession was for wildfire to destroy an aspen stand to create open rangeland (about 1930 for Pilot's Knoll), and then the area gradually re-grows with aspen. Pilot's Knoll was still predominantly rangeland almost 50 years after stand initiation, but sufficient aspen was regenerating throughout that time to form the present 80 year old stand. In 1977 the aspen must have been developed enough for the rangeland conversion to aspen forest to be nearly complete.

In the Tent Mountain area, south of Poplar Mountain, there are no very old stands (Age Class 8) and most older conifer and aspen stands are in Age Class 7 (121-140 years). All stands were initiated less than 140 years ago (Age Class 7 or less). There is a full range of Age Classes below that however, down to age 60 years; there have also been very few stand-initiating fires in the last 60 years in the Tent Mountain area. The burn pattern has been similar to Poplar Mountain, but fewer aspen-leading stands have resulted. This suggests that the total frequency of burning near Tent Mountain has been less than for Poplar Mountain, permitting spruce and pine regeneration to continue, but only marginally less because aspen-leading stands are present throughout the area.

The conifer forest area on the southwest side of White's Lake and the Blackwater River has a high proportion of Age Class 8 forest, and very little aspen. This suggests that the area had a normal SBPS pattern of burning prior to European contact, with the suppression of wildfires over the last 60 years allowing the stands to become uncharacteristically old.

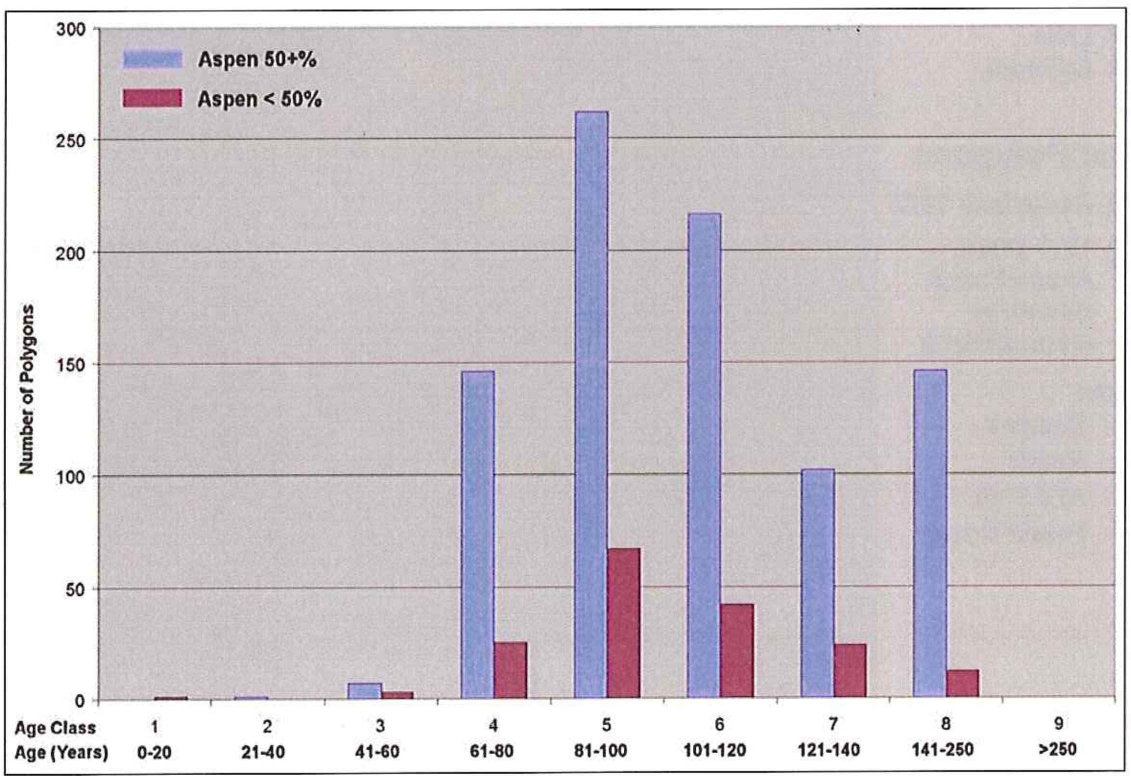
The pre-European aspen forests with some grassland ecosystems would have been established and maintained by frequent burning; the burning would have been initiated by both lightning and First Nations peoples. The burns were hot enough to regularly kill most trees and initiate new stands, suggesting that it occurred in the late summer when most natural wildfires occur. There is little difference in the age distributions of conifer-leading and aspen-leading stands, other than more Age Class 8 conifer stands that may have resulted from the replacement of aspen with spruce and pine through succession, suggesting that spring stand-initiating burns in the aspen stands, which did not burn conifer stands, were absent. However, spring ground fires may have occurred in the aspen stands; there is no evidence for or against this possibility.

The frequent stand-initiating fires on Poplar Mountain would have resulted in a landscape dominated by grassland and open aspen forest. The modern aspen-leading stands of Poplar Mountain correspond to the pattern of pre-European aspen forests, but with the age distribution of the forests much older due to the lack of stand-initiating fires, and with open rangeland almost completely eliminated through succession. Stand-initiating fires in all forest types ended in the 1950s. This suggests that the development and maintenance of aspen stands resulted from the destruction of conifer seeds in drier soil areas (and hence no conifer regeneration) and retention of conifer seeds in moister soil areas (and hence conifer regeneration), rather than through more frequent fires occurring in the aspen areas. However, spring ground fires in the aspen areas may have also destroyed conifers in those areas.

Most pre-European fires were likely stand-initiating late summer fires that initiated both aspen and conifer areas, with a possible additional component of fires that did not initiate stands in the aspen area (ground fires). The frequency of fires may or may not have been the same in both areas, but in any case the conifer seed bank was destroyed only in the aspen areas.

If is important to note that the aspen-leading areas of Poplar Mountain were clearly ***not*** the result of more frequent stand-initiating fires compared to the adjacent conifer-leading areas. If that had been the case, then the age class distribution (Fig. 3) of the aspen stands would have been shifted to the left (younger) compared to the conifer age class distribution. This is not the case; hence the aspen-leading stands were ***not*** maintained by spring burning that created a ground fire in the aspen stands and did not burn the conifer stands.

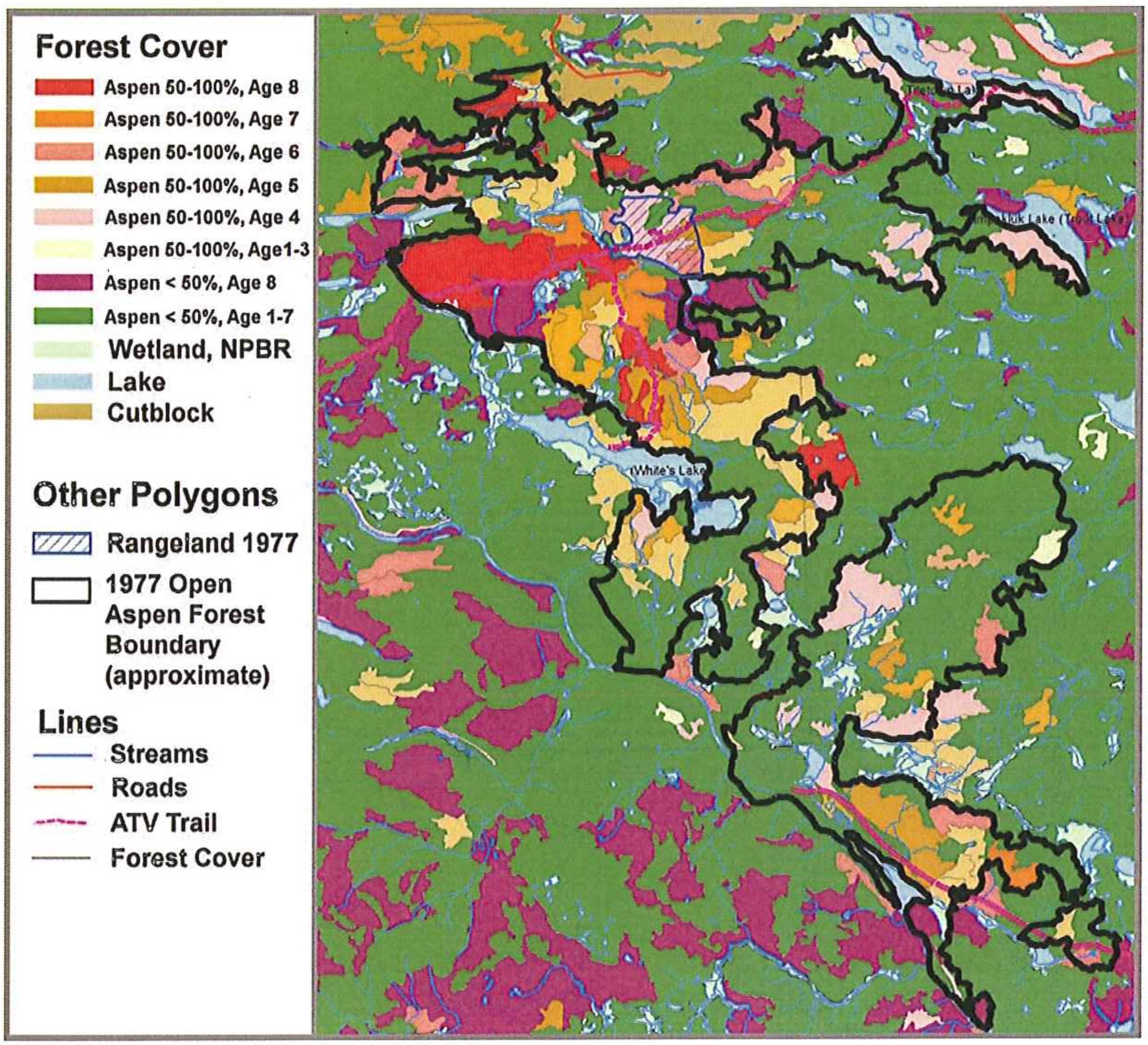
Figure 4. Forest Age Class Distribution Chart
(from VRI Projected Age Class 1).



Spring burning, as found during the post-burn assessment of Guppy (1995), does not kill most trees. Although not included in that report, I noted at that time that most tree mortality occurred when a piece of coarse woody debris resting against a trunk was burned, creating a local hot fire, or when a tree had exposed dry damaged wood near the base of the trunk. The cool, rapid fire of dead pinegrass foliage was seldom sufficient in itself to kill any age of healthy aspen or conifer tree, or even most shrubs. The more frequently burning occurs, the less coarse woody debris will accumulate and the lower the tree and shrub mortality will be. It appears that, under a treatment regime consisting only of spring burns, the entire aspen forest will develop into a very unique, close-canopy stand of ancient, widely spaced aspens and scattered conifers with an understory of pinegrass and little else. The stands of ancient aspens in some areas of polygon 118 have this character, which is a product of the suppression of stand-initiating fires.

Figure 5. Forest Age Class Distribution Map

Aspen-leading stands are based on forest cover map data supplemented by orthophoto and field review.



4. Ecosystem Restoration Plan

4.1 Reference Ecosystem Condition

The reference condition of the aspen-dominated areas of Poplar Mountain was apparently aspen-dominated forest with components of grassland, with the forest age distribution including many younger stands than at present. The canopy closure of the aspen was apparently "open", because the 1977 Ministry of Forests map labelled the area "semi-open grassland" within the context of the two forest types described in Section 3.4. The pre-European proportion of the area that was grassland is unknown, with only one significant polygon near Pilot's Knoll remaining in 1977 (Morton 1977), but likely varied from over half the area immediately after a major stand-initiating fire, to a minor part of the area just before a major stand-initiating fire. This condition would have been maintained by stand-initiating fires, started in the late summer by lightning and First Nations peoples, that were more frequent than the average of 75-125 year frequency typical of the SBS. These fires burned the conifer seed bank in what are now aspen-leading stands, but not in what are now conifer-leading stands, presumably with the difference depending on soil moisture.

4.2 Treatment Objective – Desired Future Condition

The provincial *Ecosystem Restoration Provincial Strategic Plan* states that First Nations management practices and the resulting ecosystem condition is considered the reference ecosystem that existed during the pre-European contact era (Government of British Columbia 2008). The reference ecosystems are the desired future condition of the aspen stands of Poplar Mountain. The broad classifications of reference ecosystems that would have been present in aspen areas of Poplar Mountain are:

Open range – dry areas that are primarily grassland with shrubs and a scattering of mature trees. The goal for open range sites is to maintain crown closure at 10% or less (Government of British Columbia 2008).

Shrubland – moist or wet areas that are non-productive forest, wetlands, and brush. The goal for shrublands is to maintain them without trees (Government of British Columbia 2008).

Open aspen forest – crown closure target is 40% or less, with retention of a proportion of the largest trees on site; the areas have significant values for both range and timber, and the management goal is to evenly balance tree / grass production by manipulating tree distribution and crown density (Government of British Columbia 2008).

The **desired future condition** for aspen stands on Poplar Mountain, to achieve the reference ecosystem condition, is therefore aspen forest of various ages, primarily stands with crown closure < 40%, with scattered patches of open range with <10% crown closure. Existing shrublands and wetlands should be maintained essentially free of trees. Tree retention should emphasize the largest diameter stems.

The **treatment objective** is to achieve this desired future condition for approximately the historic (1977) area of open aspen stands and open range, outside Kluskoil Provincial Park and including modern aspen stands.

4.3 Treatment Units

Three treatment units were defined based on the historic (1977) open-aspen forest area (Fig. 6), with the following changes:

- Conifer stands with 0% aspen component were deleted (other than two small polygons), as well as most stands with 2-19% aspen component.
- Adjacent areas with a significant aspen component were added.
- Wetlands and shrublands were deleted where possible, but are not expected to be actively managed – some spring burning may occur, incidental to management of upland areas.
- Kluskoil Lake Park was deleted, because it falls under a park management plan.
- Old Growth Management Areas were deleted; a separate management plan may be developed for them.
- The northeast end of the 1977 area was deleted, because it is outside the project area.
- The south end of the 1977 area was deleted, because once the Park area was deleted there was little significant aspen area remaining.

The comparison of the treatment unit boundaries with the 1977 boundary and OGMA boundaries is shown in Figure 6; the treatment unit boundaries are shown alone for clarity in Figure 7.

Figure 6. Treatment Units in Relation to OGMAs and 1977 Boundary

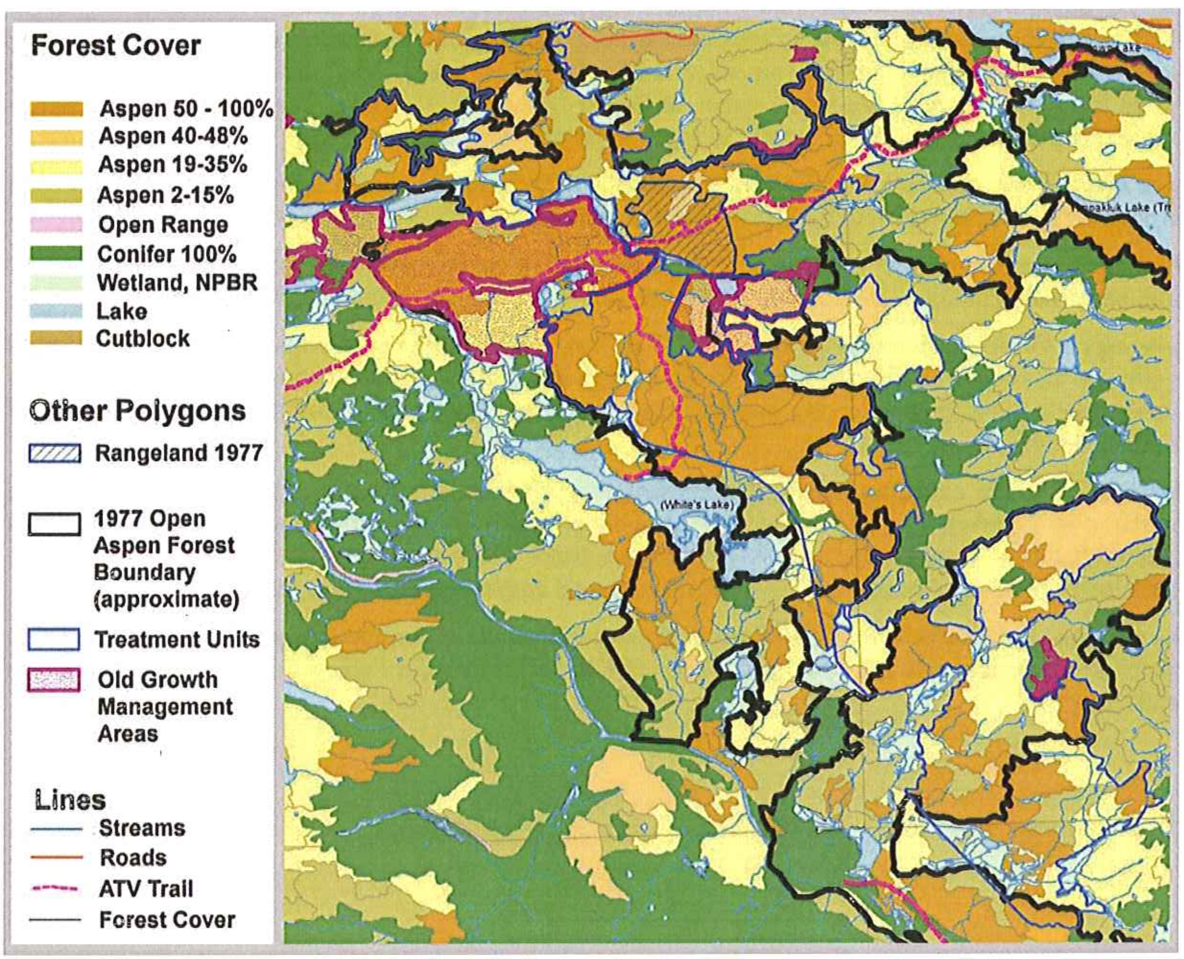
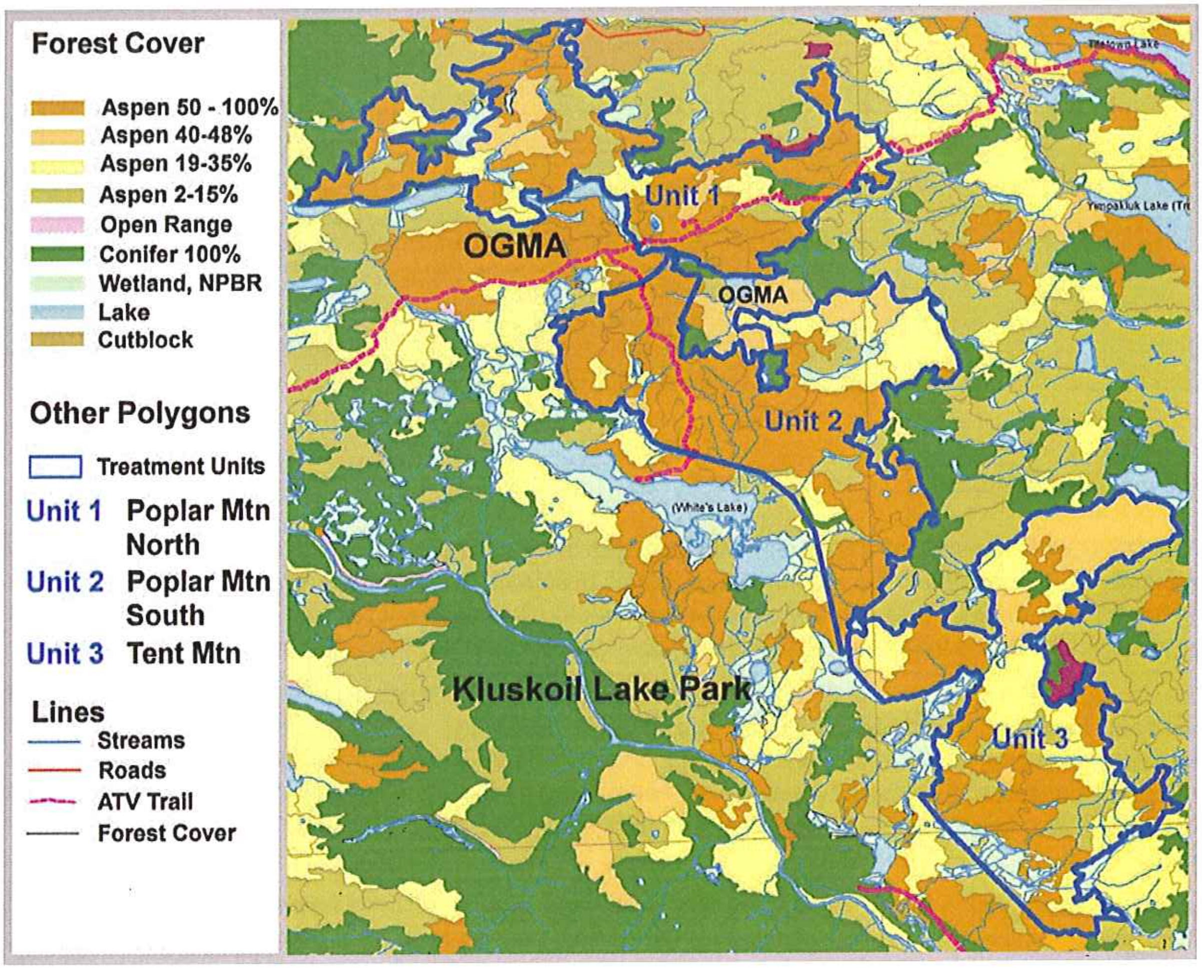


Figure 7. Treatment Unit Map



4.4 Treatment Priority

Treatments areas were assigned to initial treatment priority classes based upon their assessed attributes (Table 4). Initial treatment priority was based upon a combination of factors:

- Dominance of aspen in the existing mature stand type.
- Areas burned in 1995 were lower priority than areas that were not burned at that time.
- Amount of conifer and aspen regeneration.
- The need for a control area for post-burn ecological impact assessment.
- Treatments in Old-growth Management Areas must maintain OGMA values.

All three treatment areas could be burned in the same year if desired; the OGMA area needs to be protected from burning.

Table 4. Initial Treatment Prioritization

Priority	Treatment Unit No.	Area (ha)	Priority Reasons	Comments
OGMA	1	345.7	Do not burn – maintain as a reference area.	A large unit composed mostly of *Old Growth Management Area*. About 1/2 burned in 1995.and has a variety of ages of aspen stands for use in comparisons.
1	3	298.4	Only 10% burned in 1995.	
1	4	174.0	Not burned in 1995.	
1	6	101.5	Not burned in 1995.	Three separate treatment polygons, with complex boundaries. (15.9; 64.4; 21.2 ha)
2	7	344.6	Mostly burned in 1995. Abundant dead pine in some areas.	This area should be burned before the dead pine decays too much to be dry in the spring. Burning dry dead pine on the ground will result in local hot fires that will kill some aspen, resulting in younger patches of aspen regeneration. Complex boundary.
3	2	196.6	About 2/3 burned in 1995. Almost pure aspen with little regeneration.	May be difficult to prevent a burn in this area from escaping into Treatment Unit 1. Trail (low fuels) on boundary could be used to reduce risk of escape of ground fire along most of boundary..

4.5 Treatments

The objective is to restore and then maintain the aspen areas on Poplar Mountain as close to pre-European conditions as is feasible. The recommended initial treatment is spring burning for the three treatment units, with the OGMA area being reserved as a standard of comparison for post-treatment assessment of the effects of the prescribed burns. Abundant pine grass occurs in most areas, to carry the fire.

However, the hot late-summer fires burning during pre-settlement times will have resulted in somewhat different long-term forest conditions than can be achieved through spring burning. Therefore, additional treatments are required to restore and maintain the aspen stands to an approximation of the pre-European reference condition. Slashing of regeneration and cutting of mature aspen and confers within the aspen stands will also be required in conjunction with the spring burning, to reduce ingress and decrease canopy closure.

A major consideration in the initial treatment is the large amount of dead immature and mature pine in both the treatment units and the surrounding forest. This may result in local patches of hotter fires in the treatment units, which will kill more aspen and conifers of all ages and burn more brush (which will help to move the treatment areas towards pre-European condition). It may also make an escape of the fires more likely; Protection Branch will have to assess this carefully.

Machine work and soil disturbance to construct firebreaks should be avoided; such activity is ecologically highly undesirable because of the risk of weed invasion of a relatively weed-free area. However, if the risk of a burn escaping is unacceptably high, consider clearing a perimeter trail by chainsaw. Water could then be applied using an ATV, 4-wheel drive tractor, or small tracked machine without blading the trail. Avoid using a machine to clear the perimeter trail – even if there is no blading of the trail, the required backing and turning and pushing of logs and stumps will result in considerable soil disturbance.

The first, initial treatment under this plan is:

- Conduct a spring burn of all Treatment Units (except Unit 1) as soon as possible. It has been 16 years since the last burn in some of the area and a much longer time for the rest of the area. The initial burn will then set the baseline conditions and time for the long-term treatments.
- The high occurrence of dead pine in some of the treatment area may result in considerable mortality of regeneration and mature trees in some parts of the treatment areas; hence the slashing or falling that is part of the long-term treatments is unnecessary prior to the initial burn, although it could be implemented if desired.

Long-term treatments required to achieve an approximation of the pre-European reference condition are:

- Slashing of aspen and/or conifer regeneration, with retention of widely scattered (> 100 m spacing) Douglas-fir stems (where present) to eventually develop into veterans, and retention of sufficient aspen regeneration to achieve/maintain a range of canopy closures of mature trees from < 40% to closed canopy. There should be a minimum 20 m no-slashing reserve on all wetlands, ponds, and streams, for wildlife habitat and to minimize livestock grazing in those areas.
- Felling of selected individuals or groups of mature aspen and conifers *in some areas*, to reduce canopy closure to < 40%, with retention of the largest trees. The areas selected for low canopy closure should be the areas that have the driest soils and hottest sun exposure, to minimize aspen regeneration. The objective of 40% canopy closure may need to be increased with experience, in order to provide sufficient shade to reduce excessive aspen regeneration. Selective commercial harvesting on snowpack and frozen ground may be appropriate. Bladed access roads should be limited to conifer areas, with only temporary unbladed winter snow trails into the aspen areas. There should be a minimum 20 m no-falling reserve on all wetlands, ponds, and streams, and falling should be directionally away from the water features.
- Spring burning should follow slashing of regeneration and/or felling of mature trees by about 2 years, so that needles have fallen from the slash and snow/moisture retention in shaded areas on the ground is minimized.
- Strive to include the edges of the Treatment Units in the treatments; otherwise conifers will encroach on the aspen areas from the edges.
- Do not treat the Old Growth Management Areas, unless the results of the post-burn assessment provides a treatment plan that maintains or enhances OGMA values.

The post-burn assessment (below) may provide for alternative treatments.

4.6 Treatment Frequency

One memo in the MoF files suggests a spring burn frequency of every 3 to 5 years to control aspen encroachment and in-growth, extending to every 8 to 10 years once the encroachment is under control. Another memo suggested a burn frequency of every 5 to 10 years. In reality, the required fire frequency is unknown due to lack of data. The previous burn plans did not explicitly address the desired long-term condition of the aspen stands, although "open aspen stands" was implied, and do not assess whether frequent spring burns will achieve the desired condition.

The pre-European reference condition of the aspen stands resulted from hot late-summer fires that may have occurred every 20-30 or so years, although data is lacking. The pre-European frequency of late-summer fires in any case is somewhat irrelevant, because late-summer burns cannot be used to restore / maintain the aspen forests due to the risk of the fire escaping.

The treatments recommended above may successfully restore and maintain the aspen stands to a condition that has similar ecological and range values of their pre-European reference condition, with the treatment frequency being:

- The initial spring burn should occur as soon as possible.
- The first implementation of the long-term treatments should occur as soon as possible (5 years?) after the initial spring burn, in at least one Treatment Unit.
- The treatment frequency for slashing followed by burning should be about every 10 years, modified through experience.
- The treatment frequency for felling of mature trees to achieve and maintain < 40% canopy closure in some areas should be about every 20 years, or as specified in a silviculture plan designed to achieve the pre-European reference condition.

The post-burn assessment (below) may provide for alternative treatment frequencies.

4.7 Initial Post-burn Assessment

There should be a post-burn assessment (positive and negative) of the effects of the first spring burn in the June to mid-July following the burn, with the OGMA area used as the standard of comparison to determine vegetation responses. The OGMA area has a range of aspen ages, and was partly burned in 1995, thus providing numerous points of comparison. It is important that the assessment be completed prior to mid-July to maximize the diversity of herbaceous plants that are present, and so that ephemerally visible indicators of fire damage are still present. The time required for the assessment will depend on its thoroughness, on the amount of area assessed, and on the advice of a forest community ecologist. A one week period (living in the range cabin) is a reasonable first approximation for the field work.

The assessment crew should include a forest plant community ecologist and a wildlife habitat ecologist. The objectives of the assessment of the effects of the spring burn should be to:

- Assess the effects on the plant community, including plant species abundance, diversity, population size, species at risk (observed or potential), and forest structural components.
- Assess the effects on the animal community (vertebrates and invertebrates), including animal species abundance, diversity, population size, and species at risk (observed or potential).
- Assess the likely future effects on the plant and animal species and communities of the recommended long-term treatments.
- Recommend amendments to this plan to restore and maintain the reference pre-European forest types and other wildlife values. Including a management strategy for Treatment Unit 1, the Old Growth Management Areas.

Limited time will be available for the post-burn assessment, given budget limitations. The assessments will generally be qualitative rather than quantitative; hence professional expertise will be important.

5. References

Guppy, C.S.. 1995. Poplar Mountain Field Inspection – Range Burn. Memorandum to Sandra Latin, R.O. Range, Quesnel Forest District. 12 pp.

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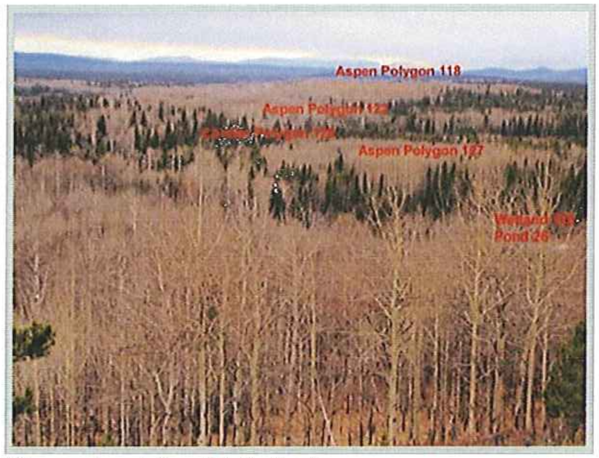
Province of British Columbia. 2008 [draft]. Ecosystem Restoration – Provincial Strategic Plan. Victoria, BC: Ministry of Forests and Range. 25 pp. http://www.for.gov.bc.ca/hra/Restoration/Draft%20-%20Ecosystem%20Restoration%20Prov%20Strategic%20Plan.pdf.

Steen, O. A., and R. A. Coupe. 1997. A Field Guide to Forest Site Identification and Interpretation for the Cariboo Forest Region. B.C. Min For., Williams Lake.

6. PHOTOGRAPHS

Refer to Figure 2 for polygon numbers.

View southward from Pilot's Knoll

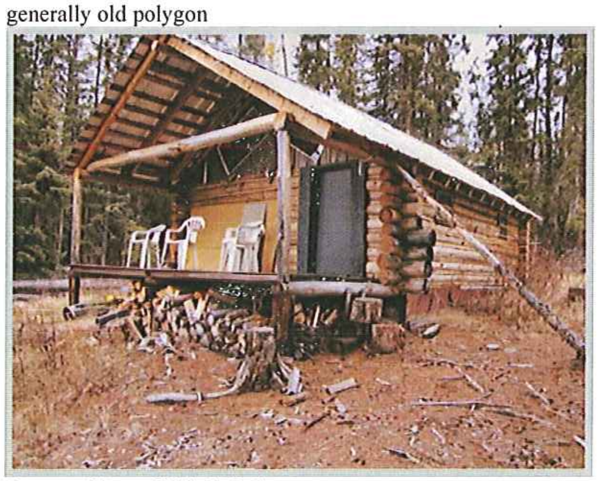


View westward from Pilot's Knoll

Polygon 383 – pure aspen stand (mature) along trail to range cabin

Polygon 118 (OGMA) – a relatively young stand within a generally old polygon

Open range polygon on edge of White's Lake



Range cabin on White's Lake