

ECOLOGICAL RESTORATION PRESCRIPTION
Premier Lake Provincial Park

ADMINISTRATION			
Licencee		GEOGRAPHIC LOCATION	
B.C. Parks		Premier Lake Provincial Park	
Legal Description		BCGS Mapsheet	Landscape Unit
Premier Lake Provincial Park ERP Area #2		82G082/092	I04 Premier Lake

PROJECT OVERVIEW

Premier Lake Provincial Park was established in 1940 and encompasses 838ha. The park contains a diversity of ecosystem types, provides both front country and backcountry recreational opportunities, and has an important cultural heritage and archaeological history. The primary role of the park is to protect representative forest, lake and remnant ecosystems of the Rocky Mountain Trench. The secondary role is to maintain holiday destination, tourism travel route, day use backcountry and local community outdoor recreation opportunities in a mountain lake setting. The tertiary role is to provide an opportunity for grassland/open forest ecological restoration as well as associated research. The primary objective of this prescription is to achieve the tertiary role of the park.

Premier Lake Provincial Park is located approximately 12km east of Skookumchuck, BC. The park offers habitat for regionally important wildlife, including Rocky Mountain Bighorn Sheep. It also provides brood stock for the provincial rainbow trout hatchery program. The park has a variety of habitat types and is contained within the Interior Douglas-fir dry mild (IDFdm2) biogeoclimatic subzone. These are characterized by very hot, dry summers and cool winters with very light snowfall.

Historically, in the absence of fire suppression, the park would have experienced high frequency, low intensity surface fires every 4-50 years. Such fires would have maintained relatively open grassland with scattered large veteran Douglas-fir, western larch and ponderosa pine. The density of overstory trees was dependant on soil moisture and the stochastic nature of naturally occurring wildfire. The park has departed from its more natural ecological condition due to fire suppression activities, which began in the early 1900's. As a result, the park now exhibits a much higher density of trees and a lower proportion of open grasslands than historically occurred. In addition, the forest structure is now dominated by multiple ages and sizes, which is resulting in further departure from the parks historic ecological condition. This change in forest composition has eliminated the potential for re-introduction of fire due to the potential for creating catastrophic wildfire, without prior tree removal treatments.

The treatment area encompasses approximately 165ha and is located in Class 1 bighorn sheep winter range. There have been numerous projects within the park over the last 15 years designed to enhance winter range opportunities for ungulates within the park. This project complements these projects and is designed to allow for the re-introduction of prescribed fire into the landscape.

This project is designed to restore the park to more historic ecological conditions and allow for the potential for re-introduction of prescribed fire into the ecological processes in the park. This is consistent with the tertiary role of the park, in providing opportunities for grassland/open forest ecological restoration.

This prescription is being completed in conjunction with the BC Timber Sales Program, who have developed an ecological restoration prescription adjacent to this treatment area on the east side of the park. These ER projects are being implemented as part of a larger landscape unit planning process being coordinated by BC Wildfire Service.

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PROJECT OBJECTIVES	
Wildlife	To restore/promote forest and grassland conditions to those that favour wildlife species that have historically used ecosystems contained within Premier Lake Provincial Park. The park contains Class 1 ungulate winter range. Known wildlife species that use the park include: Bighorn Sheep, Elk, White-tailed and Mule Deer, and Badger. Ecological restoration is expected to have a positive influence on known wildlife species. Restoring forest structures to those more representative of pre-fire exclusion conditions, and re-introducing low intensity ground fires will benefit flora and fauna that have historic distribution within the area.
Biodiversity	To restore forest and grassland conditions to those that promote the diversity of plants and animals that have historical distribution or have historically used ecosystems contained within Premier Lake Provincial Park. The park provides important wildlife habitat for a number of regionally important species including Bighorn Sheep, American Badger, White-Tailed and Mule Deer, Elk, Painted Turtle, as well as a host of avian species. The park contains remnant rare and endangered ecosystems including the Antelope Brush/Bluebunch Wheatgrass plant community (IDFdm2 02) and the Douglas-fir/Snowbrush/Balsamroot plant community (IDFdm2 03). It is anticipated that ecological restoration treatments will benefit these plant communities by reducing crown closure and re-introducing fire into these ecosystems.
Hazard Trees	To manage hazard trees in high use areas to minimize the risk of injury to people using the park for a wide range of activities, while maintaining a sufficient number of dead/dying trees to provide for wildlife habitat. Where hazard trees have high value to wildlife they will be retained within wildlife tree patches or as individual trees with safe work zones.
Fisheries	To maintain the current distribution of fisheries within the park by minimizing any potential negative impacts of ecological restoration treatments on riparian areas and riparian function. This will be achieved by maintaining riparian reserve zones along fish bearing streams and managing associated riparian management zones to minimize wind throw and fire impacts and to provide for large organic debris recruitment. Premier Lake and Staples Creek provide spawning opportunities for native Rainbow Trout. The lake also is used to provide egg retrieval from spawning rainbow trout in association with the Kootenay Trout Hatchery.
Water Quality	Staples Creek is the only fish-bearing stream within the treatment area. A riparian management zone has been placed along this stream to ensure maintenance of water quality. There are no perceived short or long term issues with ecological restoration treatments and water quality.
Forest and Grassland Health	To minimize the impact of current and future forest and grassland health factors to the range expected within pre-fire exclusion stands. Promoting historic forest and grassland conditions will result in relatively healthy forests and grasslands whose dynamics are not driven by forest health factors. To minimize the impact of invasive plants on the grassland resource by encouraging forest and grassland conditions that promote healthy and vigorous native plant communities.
Restoration	To return forest and grassland conditions to those that are more representative of natural conditions that would be expected in the absence of fire exclusion.
Fuels Reduction	To reduce fuel loading to the range of conditions expected within pre-fire exclusion forests. Such conditions were ones that resulted in high frequency, low intensity ground fires. Reduction of forest fuels will also achieve wildland urban interface fire hazard reduction objectives for private parcels to the north of the project area.

Fire Management	<p>To re-introduce fire to restored ecosystems within the historical frequency and intensity expected in pre-fire suppression forests. Historically, these ecosystems sustained low intensity, ground based fires every 4-50 years. Re-introduction of fire will reduce the probability of catastrophic wild land-urban interface fires from occurring.</p> <p>This ERP is being implemented as part of a larger landscape unit planning process being coordinated by BC Wildfire Service.</p>
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LINKS TO BC PARKS HIGHER LEVEL PLANS:

The following documents/plans were referenced during the development of this Ecological Restoration Prescription:

- *Premier Lake Provincial Park, Purpose Statement and Zoning Plan, February 2003.*
- *Premier Lake Provincial Park, Ecological Restoration Plan completed by Tim Ross, March 2005.*
- *Premier Lake Provincial Park-Ecological Restoration Project (Phase 3): BC Parks Impact Assessment Process, Level 1, Preliminary Screen Report, July 2015.*
- *Forest and Range Practices Act, Government Actions Regulation: Order-Ungulate Winter Range – U-4-008 Invermere TSA.*
- *Identified Wildlife Management Strategy- Accounts and Measures for Managing Identified Wildlife. Ministry of Water, Land and Air Protection. 2004..*
- *Forest Practices Code Biodiversity Guidebook. Ministry of Forests. 1995.*
- *Forest Practices Code Soil Rehabilitation Guidebook. Ministry of Forests. 1995. March 2007.*
- *Biophysical Resources of the East Kootenay Area: Soils. Wildlife Technical Monograph TM-1. Report No.20. L.E.H. Lacelle. Ministry of Environment. March 1990.*
- *Preliminary Field Reconnaissance Letter Report-Premier Lake (Ecosystem Restoration Project). Completed by Arrow Archaeology Ltd. October 25, 2006.*
- *Preliminary Field Reconnaissance Report-Non Permit Premier Lake Provincial Park Ecological Restoration Plan - (Parks) Polygon #2 Completed by Arrow Archaeology Ltd. April 24, 2007.*
- *Preliminary Field Reconnaissance Archaeological Assessment Letter Report-Premier Lake Area #2, Treatment Units 1,2,3,4 & 5. Completed by Arrow Archaeology Ltd. December 5, 2007.*
- *Preliminary Field Reconnaissance –Non HCA-Permit. Premier Lake Park Controlled Burn Fire Guard Construction (Treatment Units A, B, B1, C, C1 & D) (Park Polygons #8, 11 & 2). Completed by Tipi Mountain Eco-Cultural Services Ltd. April 26, 2011.*
- *Preliminary Field Assessment Final Report-Premier Lake Provincial Park Polygons 1,3,4,5 Tree Removal Plan & Eco-Restoration. Completed by Eagle Vision Geomatics and Archaeology Ltd. October 20, 2011.*
- *Preliminary Field Reconnaissance Archaeological Assessment Letter Report-Premier Lake Park – Rockbluff Lake Treatment Unit #1. Completed by Tipi Mountain Eco-Cultural Services Ltd. November 26, 2014.*
- *Best Management Practices for Tree Removals in Parks and Protected Areas – Planning. Diamond Head Consulting Ltd. April 2004.*
- *Ecosystem Restoration Program Rocky Mountain Trench Forest Stewardship Plan 2012-2017 Companion Document - Routine Monitoring Protocols.*

AREA DESCRIPTION (ha)

Premier Lake Provincial Park is located approximately 12km east of Skookumchuck, B.C. The forest cover is dominated by Douglas-fir, with minor amounts of yellow pine, spruce, lodgepole pine, western larch, paper birch and trembling aspen. The majority of the forest cover has established since the last major fire event in the 1930's. There are scattered fire survived veteran and dominant Douglas-fir, western larch and yellow pine in the overstorey. Fire exclusion since the 1930's has resulted in forest densities that are in excess of what would be expected in the NDT4 (frequent stand maintaining fires) in the absence of fire exclusion. Relatively high stand densities have reduced the abundance and distribution of dry belt plant communities.

The area will be managed to the Open Forest Habitat type, as identified in the Kootenay Boundary Higher Level Plan Order.

SU ¹	GROSS (ha)	NON-PRODUCTIVE (ha)		RESERVES (ha)	NET AREA ⁴ (ha)
		NAT ²	UNN ³		
1	153.6	0.0	9.6	5.7	138.3
TOTAL	153.6	0.0	9.6	5.7	138.3

SU 1: Open Forest Habitat Type

1. Standards Unit

2. Non-Productive Natural

3. Non-Productive Un- Natural (roads, landings, gravel pits, etc.)

4. Net Vegetated area

SU	• CRITICAL SITE FACTORS (affecting the timing of operations and the manner in which they affect them)
1	<ul style="list-style-type: none"> • Signage must be placed at all entries into the project area warning the public of dangers and closing the area to public access during active operations. • The park contains very sensitive soils. Ensure that operations occur during conditions that will minimize soil disturbance. Generally, this will occur during the winter season on frozen soils and a suitable snowpack. • There are 3 polygons within the treatment area where no soil disturbance is permitted. See Tree Removal Guidelines for additional details. • The Yankee/Canuck Lake & Cats Eyes Lake Trails are located along the northern edge of the treatment area. These trails must be protected/maintained in their present condition during/following ecological restoration treatments. • The campground is located along the northeastern edge of the treatment area. Retain a buffer of understorey stems where the boundary is adjacent to the campground. See Tree Removal Guidelines for additional details.

MANAGEMENT STRATEGIES FOR RESOURCE VALUES/AFFECTED PARTIES

GRASSLANDS

The proposed ecological restoration treatments, along with planned prescribed fire, will enhance forage for wildlife that use the area. The prescribed post-treatment forest structure will be conducive to the production of palatable shrubs and grasses. Treatments should result in a shift back to native plant species such as bluebunch wheatgrass and rough fescue.

Invasive plants are widespread throughout the project area. Invasive plants within the park include Canada and bull thistle, burdock, curled dock, hounds tongue, diffuse and spotted knapweed, ox-eye daisy, Sulphur cinquefoil, sowthistle and yellow hawkweed. A rigorous monitoring and treatment program should be implemented to minimize the impacts of invasive plants on ecological restoration objectives. Requirements under **Tree Removal Guidelines** (page 14) must be implemented to minimize the spread/introduction of additional invasive plants in the park.

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VISUALS

Premier Lake Provincial Park is not within a Visual Quality Objectives polygon; however, portions of the area will be visible by park users along the main access road and the lake. It is expected that ecological restoration treatments will be visibly evident in the short term (0-5 years post-treatment), but the mid to long term (>5 years post-treatment) visual impacts will be negligible. Signage and education are the two primary methods of positively influencing the perception of the potential visual impact of ecological restoration treatments on park users. Wildlife tree patches will also lessen the potential visual impact of ecological restoration treatments.

TERRAIN, SOILS AND GEOLOGY

Soils and geology within the project area include glaciofluvial sands and gravels associated with the Keeney soil association, morainal soils of the Flatbow association and colluvial soils of the Big Fish formation. The Keeney and Big Fish soil associations are characterized by relatively gravelly, shallow, basic soils while the Flatbow soil association is characterized by finer textured soils that have developed on morainal parent materials. Soils throughout the park are generally quite shallow and sensitive to disturbance. Terrace margins exhibit varying components of bedrock, especially the east slopes above Quartz Lake. There are also bedrock pockets scattered throughout the treatment area. Excavated/bladed trails should not be constructed unless there is no other practicable way to implement ecological restoration treatments. Excavated/bladed will only be constructed with explicit approval from a BC Parks supervisor or their designate.

WILDLIFE

The project area is within class 1 Bighorn Sheep winter range and is also used heavily by other wintering ungulates. Ecological restoration treatments have been tailored to enhance habitat for bighorn sheep, as well as mule deer and elk.

The area has also been identified as important American Badger habitat in the Conservation Data Centre database. Ecological restoration treatments are expected to benefit this known species at risk.

Restoring forest structures and grassland conditions to those more representative of pre-fire exclusion conditions, and re-introducing low intensity ground fires will benefit flora and fauna that have historic distribution within the area, including rare and endangered species.

FOREST HEALTH

Armillaria root disease was confirmed during the development of this prescription. It is estimated that 3-8% of the forest is infected. Promoting more open grown forest conditions consistent with ecological restoration objectives will minimize the impact of armillaria root disease on the forest within the project area. Low levels of armillaria root disease will promote diversity through creation of wildlife trees and future coarse woody debris.

COARSE WOODY DEBRIS

The downed and damaged trees and snags within the treatment area will provide sufficient material, post-harvest, for the maintenance of CWD on this IDF site. Anticipate a minimum of 2m³/ha of CWD with a piece size of 7.5+ cm diameter throughout the treatment area. This will be recruited from stems outside of normal utilization standards. CWD densities will vary across the treatment area and some areas may be void of CWD due to its absence pre-treatment.

FIRST NATIONS REFERRALS

The following First Nations have traditionally received referrals regarding operations within Premier Lake Provincial Park:

Ktunaxa Nation.

Secwepemc Nation, including the Shuswap Indian Band.

Referrals will be conducted by BC Parks and any concerns will be addressed prior to implementation of this Ecological Restoration Prescription.

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ARCHAEOLOGICAL SITES MANAGEMENT STRATEGIES

Six Preliminary Field Reconnaissances (PFR's) have been completed in and around the treatment area. These include PFR's completed by Arrow Archaeology Ltd. in 2006 and 2007, Eaglevision Archaeology in 2011 and by Tipi Mountain Eco-cultural Services in 2001 and 2014. The results and recommendations of these PFR's have been incorporated into this prescription.

Soil disturbance is not permitted, subject to completed AIA's, within the boundaries of known and/or potential archaeological sites.

CULTURAL HERITAGE VALUES MANAGEMENT STRATEGIES

Traditional use sites have not been identified within the park. First Nations referrals will specifically solicit input regarding traditional First Nations uses within the park.

This Ecological Restoration Prescription (ERP) has been referred to First Nations for input regarding Cultural Heritage Resource Values.

FIRE HAZARD MANAGEMENT STRATEGIES

The overall fire hazard management strategy is to reduce the fire hazard to low to allow for re-introduction of fire into the ecosystem. This will be achieved by converting multi-layered, high density forests with fuel accumulations beyond historic levels that favour large crowning type fires to more open grown forests with fuel accumulations within the historic range of variability that favour more frequent, low intensity ground fires. Two primary strategies will be implemented to achieve this objective: Partial removal of overstory coniferous cover and removal/reduction of understory coniferous vegetation. Overstory removal will be achieved through tree removal while understory removal/reduction will be achieved through mechanical and manual treatments.

It is the intent to manage fire on the landscape in conjunction with the adjacent BC Timber Sales cutblock to the east and BC Wildlife Service's Landscape Level Wildfire Planning Strategy.

RECREATION			
Recreation Values			
☒ Frontcountry hiking	☒ Day Use/Picnic	☒ Camping	☒ Winter recreation
☒ Backcountry hiking	☒ Wildlife watching	☒ Fishing	☐ Rock climbing
☒ Mountain biking	☒ Canoe/Kayaking	☒ Hunting	☒ Other: Ice fishing
☒ Beach/Swimming	☒ Horseback riding	☐ ATV's	☐ Other:
How treatment may/will affect recreation values in area:	<p>Treatments are not anticipated to affect recreation use within the area in the long term. The majority of recreational use within the park is concentrated around Premier Lake and mountain bike/hiking trails located throughout the park. There are no dedicated trails within the treatment area.</p> <p>Motorized vehicle use along the Premier/Wolf Creek Road is not permitted from December 1 to April 30, so will not be impacted by treatments completed under this prescription. Users of the Quartz Lake Road may be impacted during times of active treatment operations. This will be a short term impact that will impact winter use of Quartz Lake, primarily by ice fishers. Treatment activities are anticipated to have a positive impact on park use in the long term due to benefits from access upgrades, as well as increased non-motorized off-road accessibility resulting from ecological restoration treatments.</p> <p>Tree removal within the area is expected to have short term impacts due to vegetation changes, particularly with repeat users of the park. Long term, however, ecological restoration treatments are anticipated to have a positive impact on park user experience through increased opportunity for wildlife viewing, increased viewing distance and scientific education.</p> <p>Upgrading of roads within the park to allow for safe and efficient treatment activities is also expected to have a positive impact by reducing surface erosion and stabilizing existing road surfaces. Negative impacts may include increased hunting pressure resulting from road upgrades, as well, as increased site lines provided by opening up of the understorey.</p>		
Recommended mitigation measures:	<p>Ensure that existing trails within the project area are not adversely impacted by tree removal operations and all tree removal related disturbance/debris are removed concurrent with operations. Trails must remain in their pre-treatment condition unless, otherwise explicitly authorized by a BC Parks representative.</p>		
Seasonal Requirements:	<p>Tree removal operations will be completed during the winter months on frozen soils and a suitable snowpack (minimum 30cm, compactible snowpack) to ensure minimal disturbance to recreational features and recreational use.</p>		

Stakeholders	
Private property owners:	There are private properties located north of the project area. The property owners will be consulted/informed regarding ecological restoration activities within the park.
Adjacent forest tenures:	The project area is adjacent to a forest tenure to the east. This ecological restoration prescription is being coordinated in conjunction with a planned BC Timber Sales cutblock to the east. This prescription is consistent with objectives contained in the adjacent block.
Range/Trappers/Guides:	There are no range users, trappers or guides operating within the project area.
Commercial values within park:	There are no commercial operations within the treatment area.
PO considerations:	The park operators will be consulted during the development of this ecological restoration prescription. In addition, they will be informed regarding the timing and implementation of treatment operations. .
Other:	There are no known other land users within the project area.

ECOLOGICAL DESCRIPTION					
SU	NDT ¹	BEC ZONE ²	SUBZONE VARIANT	SITE SERIES* (% composition)	GRID LOCATION (SMR / SNR) ³
1	4	IDF	dm2	01/03/04	3 (2/4) / C (B-D)
<p>Ecological classification as per Braumandl, T.F. and M.P. Curran (Eds.). <i>A Field Guide for Site Identification and Interpretation for the Nelson Forest Region. LMH20. Ministry of Forests. 1992.</i></p> <p>*The site has been classified as the IDFdm2. The predominant site series is the 01 with the 03 site series occurring on rockier outcrops and warmer aspects. The 04 site series occurs in moisture receiving areas and cooler aspects. The entire treatment area will be managed to the IDFdm2 01 site series, Open Forest ecosystem component.</p> <p>1. Natural Disturbance Type as per the Biodiversity Guidebook. 2. Biogeoclimatic Ecosystem Classification-Interior Douglas-Fir sub-zone 3. Soil Moisture Regime / Soil Nutrient Regime</p>					

TERRAIN DESCRIPTION								
SU	SLOPE (%) DOMINANT (RANGE)	L/U ¹	ASPECT	SLOPE POSITION	GULLIED (Y/N)	DRAINAGE	ELEVATION (m)	
							MIN	MAX
1	15 (0-40)	S/B	varied	Mid-lower	N	Well-Moderately Well	910	1080
1. Length and Uniformity								

RIPARIAN MANAGEMENT STRATEGIES					
SU	WATERBODY NAME / TYPE	RIPARIAN CLASSIFICATION			
		RIPARIAN CLASSIFICATION	RIPARIAN RESERVE ZONE RRZ (M)	RIPARIAN MANAGEMENT ZONE RMZ (M)	RIPARIAN MANAGEMENT AREA RMA (M)
1	Premier Lake	L1	0	0	0
1	Quartz Lake	L1	0	0	0
1	Staples Creek	S3	20	20	40
1	Non-classified drainages	NCD	0	0	0

Premier Lake is located approximately 230m north of the project area. Implementation of this ecological restoration treatment is anticipated to have a long term positive affect by returning ecosystems surrounding the lake to more historic ecological conditions.

Quartz Lake is located within reserve #R3. Implementation of this ecological restoration treatment is anticipated to have a long term positive affect by returning ecosystems surrounding the lake to more historic ecological conditions.

Staples Creek is located adjacent to the northeast block boundary. This stream is an important spawning stream for rainbow trout. The treatment unit is not within the riparian reserve zone of this stream; however, it is within the riparian management zone (RMZ) of this stream. The overstorey within the RMZ will be treated the same as the remainder of SU 1. All understorey stems within the RMZ of this stream will be protected. Treatments are designed to protect overstorey stems within the riparian area during re-introduction of fire into the park. See for additional constraints relating to riparian values.

Riparian classifications are based on stream width and gradient measurements. A formal fish and fish habitat assessment has not been completed. Staples Creek has been confirmed fish-bearing north of the Yankee/Canuck trail.

The ERP map shows a number of mapped streams. These do not meet the definition of streams (*i.e.*, continuous alluvial bed, defined stream channel, *etc.*). These have been assessed as non-classified drainages (NCD's). See **Tree Removal Guidelines** (page 14) for additional constraints regarding these non-riparian features.

STAND STRUCTURAL DESCRIPTION

RESERVES									
SU	NO. #	AREA (ha)	TYPE	GENERAL DESCRIPTION	FOREST COVER DESCRIPTION				
					SPECIES COMPOSITION ¹	AGE (years)	Height (m)	SI ₅₀ ²	CC ³ (%)
1	R1	0.28	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes.	FdLw	60-100	23	17	90
1	R2	0.42	WTP-IB	Interior forest conditions with a mature, multi-layered spruce, larch, Douglas-fir, aspen and birch forest.	SeFdPILw(CIA t)	80-150	23	15	50
1	R3	55.7	WTP-OB	Rock outcrops, cliffs and coniferous forest surrounding Quartz Lake, as well as a movement corridor north of Quartz Lake. This area is heavily used by ungulates during the winter, as well as, bears during the summer.	FdLwSe	20-150	15	12	70
1	R4	0.11	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R5	0.43	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R6	0.65	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R7	0.08	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R8	0.08	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R9	1.76	WTP-OB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R10	0.40	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R11	0.07	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R12	0.07	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70

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SU	NO. #	AREA (ha)	TYPE	GENERAL DESCRIPTION	FOREST COVER DESCRIPTION				
					SPECIES COMPOSITION ¹	AGE (years)	Height (m)	SI ₅₀ ²	CC ³ (%)
1	R13	0.24	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R14	0.31	WTP-OB	Rock outcrops adjacent to Quartz Lake.	FdLwSe	20-150	15	12	70
1	R15	0.50	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities. This reserve provides a visual break of the treatment area from Premier Lake viewpoints.	FdLw	20-150	23	17	70
1	R16	0.07	WTP-IB	Interior forest conditions with a variety of coniferous size and age classes. Includes a varied component of wildlife trees with active cavities.	FdLw	20-150	23	17	70
1	R17	2.31	WTP-OB	Coniferous forest surrounding adjoining to R3 to provide a movement corridor from valley bottom to upland habitat. This area is heavily used by ungulates during the winter, as well as, bears during the summer.	SeFdPILw(CtAt)	80-150	23	15	50

*Wildlife Tree Patch: IB-In-Block; OB-Out of Block

1-Fd-Douglas-fir, Lw-western larch, Se-interior spruce, Py-yellow (ponderosa) pine, Ep-paper birch, At-trembling aspen, PI-lodgepole pine.

2-SI₅₀-reference height at age 50.

3-CC-overstory crown closure

PRE - TREATMENT FOREST STRUCTURAL DESCRIPTIONS FOR SU 1

GENERAL FOREST DESCRIPTION / HISTORY:

- The forest is dominated by Douglas-fir with lesser components of western larch, spruce, ponderosa pine, lodgepole pine, paper birch and trembling aspen. The majority of stems have established since the last major fire event in the early 1900's. There are scattered older veteran Douglas-fir, western larch, lodgepole pine and ponderosa pine in the overstory. Dense patches of understory, both Douglas-fir and spruce have established in canopy openings. There are low lying, receiving areas that are dominated by spruce and deciduous stems. The majority of these areas have been reserved from tree removal. The age ranges from 50-150 years old. The forest density is likely higher than historic forest densities on the site due to fire exclusion. Fire exclusion has also resulted in ground fuels in excess of the historic range.

LAYER	SPECIES COMPOSITION	AGE	HT (m)	SITE INDEX	DENSITY (sph)	VOLUME (m ³ /ha)	INVENTORY LABEL
1	Fd ₇ Lw ₂ Se ₁ (PIPyEp)	50-175	20-33	14	225	165	FPI(Py) 8351-14

WINDTHROW HAZARD

This SU has a moderate to high windthrow hazard for both boundary exposure and for individual tree overturning. The relatively high pre-treatment forest density and moderately dense crowns indicate a higher windthrow hazard while orientation to prevailing winds indicates a lower hazard. Reserve tree specifications have been designed to maintain windfirmness.

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TREATMENT IMPLEMENTATION

FOREST STRUCTURAL OBJECTIVES SU 1

POST TREATMENT

LONG TERM FOREST STRUCTURAL OBJECTIVES:

To create a forest with relatively open forest canopy characteristics. The target forest will be relatively open grown and dominated by Douglas-fir with minor components of western larch and yellow pine. The majority of the trees will be mature with some trees established in the understory to provide for older age class recruitment. The total target forest density will range from 76-200sph¹, of which 20-50sph* will be greater than 35cm dbh.

CHARACTERISTICS OF LEAVE TREES:

The reserve tree objectives are to retain:

1. Mature overstorey reserves of approximately **20-50 sph*** of mostly good to fair quality Fd, Lw and Py greater than 35cm in diameter, with 30-60% live crowns, to be randomly distributed over the unit as single trees or as small clumps of 3-10 trees. The largest trees available must be reserved from tree removal. The target inter-tree spacing to achieve reserve tree densities is approximately 15-20m; however, reserve tree distribution should not be uniform. Anticipate some areas where reserve tree densities may exceed 50sph, where there are significant densities of larger trees, and other areas where reserve tree densities are less than 20sph. On average, the reserve tree densities must be within the 20-50sph range for the entire treatment area. Clumps of trees must be chosen for reserves on ridgetops and limb-tied clumps of Douglas-fir.
2. Retain all veteran trees.
3. Retain all healthy trembling aspen and paper birch.
4. Understorey: Expect 30-70 sph of understorey trees randomly distributed throughout the SU as single trees and clumps. Expect portions of the SU to be void of understorey. Understorey reserves should target good quality Sx and Fd with good stability. These reserves will provide recruitment into older age/size classes over time. It is anticipated that a portion of these trees will be killed during forest maintenance treatments. It is also anticipated that new regeneration will also establish post-treatment. Understorey must be treated down to a density of 30-70sph. Approximately 43% of the understorey has been previously treated.
5. Understorey trees are not to be thinned within the RMZ of Staples Creek, as identified on the ERP map.

1. Stems Per Hectare

*Target stocking includes 20-50 sph of the largest 1/3 of the existing diameter range where available.

FUNCTION OF LEAVE TREES:

1. To provide species and forest structural diversity consistent with pre-fire suppression forest structures.
2. To provide structural diversity to minimize windthrow.
3. To provide for some wildlife thermal cover.
4. To provide future snag and coarse woody debris recruitment.

FUNCTION OF UNDERSTORY

1. To provide for mature tree recruitment.
2. To provide for some wildlife screening cover.

Debris Disposal SU 1

All trees cut as part of this ecological restoration prescription must be removed from the treatment area or otherwise disposed of. Contractors are encouraged to maximize the economic value obtained from the fibre.

Methods used for disposal of debris must meet the soil disturbance guidelines set out in this prescription. Contractors are encouraged to remove as much debris to landing sites as economically feasible.

Where it is not economically feasible to remove all debris to landing sites, then alternatives include mechanical grinding at landings, mastication, chipping or piling and burning. Where grinding and/or chipping are used and the debris is spread back onto the site, the chip depth may not exceed 15cm. Debris should be directed in a uniform manner and not be concentrated in piles or in riparian or wet areas.

Burning of debris in piles and/or concurrent with treatment operations must be consistent with the *Open Burning and Smoke Control Regulation*. All burning must be consistent with the standards contained in Appendix 1: Pile Burning Standards.

Burn piles must not be located within the reserve zone of Staples Creek, as identified on the ERP map.

A fuel free 5m fire break must be established along the perimeter of the treatment unit following tree removal activities. This includes the perimeter around wildlife tree patches. All conifers and woody debris >4.0cm in diameter and >1.5m in length must be removed from this area, unless otherwise specified by a BC Parks representative. Debris removed from the fire break must be spread back in to the treatment area in such a manner as to not create a continuous hazardous fuel bed (debris accumulations should be no greater than 50cm average depth and no greater than 3m² in area)

BEST MANAGEMENT PRACTICES ALL TREATMENT UNITS

TREE REMOVAL:

1. Retain wildlife trees with significant evidence of cavities, nests and/or use as wildlife trees. A safe work zone must be placed around these trees, where applicable. Where the contractor is unsure whether a tree has significant wildlife values then a BC Parks representative must be consulted prior to removing/reserving the tree.
2. Retain all existing tree "stubs".
3. When removing trees in and around aspen trees, effort should be made to skid over and around roots to promote suckering of aspen stems.
4. Retain all downed CWD and stumps in their present condition. Skidding and felling operations should avoid damage to these features.
5. Where a reserve tree must be felled for safety reasons then it should be felled as high as possible on the bole to create a wildlife tree "stub". Felling of wildlife trees may not be done without the prior approval of a BC Parks representative and must be replaced by another tree with similar attributes.
6. Scarring of reserve trees is not permitted. Felling of trees adjacent to reserve trees should avoid contact with branches and boles of reserve trees, to the extent practicable.
7. Soil disturbance should be kept to the minimum extent possible to avoid mineral soil exposure (except where harvesting within 1 tree length of aspen trees).
8. Machine traffic should travel perpendicular to slope direction where slopes exceed 30% grade
9. Tree removal operations must avoid park infrastructure such as sign posts, historic markers, etc. Where unavoidable damage occurs then the contractor must repair/replace them as required.
10. All equipment must be free of oil/fuel leaks. Any unforeseen oil/fuel leaks/spills must be cleaned up immediately and a BC Parks representative notified.
11. Equipment must be inspected prior to start-up to ensure that it is free of oil/fuel leaks and invasive plants.

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REHABILITATION TIME FOR TEMPORARY ACCESS STRUCTURES

RECOMMENDED TIME TO COMPLETE REHAB (MEASURED FROM COMPLETION OF TREATMENT): Rehabilitation of temporary access structures must be completed concurrent with tree removal. All new roads and processing areas are temporary and must be fully rehabilitated post-treatment.

Exposed mineral soil should be re-vegetated post-treatment. Where natural regeneration of grasses is problematic then consideration must be given to broadcast seeding exposed mineral soil with a seed mix that has been approved by a BC Parks representative. In most cases, this will be a native seed mix that is consistent with the vegetation complex present on site. Consideration may be given to utilizing a relatively short lived agronomic erosion control species, such as Annual Rye until such time as native vegetation re-colonizes to an acceptable stocking; however, this must be approved by a BC Parks representative prior to seeding.

Rehabilitation must follow procedures contained in "Soil Rehabilitation Guidebook, FPC, March 1997.

MANAGEMENT STRATEGIES FOR TEMPORARY ACCESS STRUCTURES

Temporary access structures will be rehabilitated post-treatment.

SU	GENERAL LOCATION :	MAX ALLOWABLE HEIGHT OF CUTBANKS (m)	AVERAGE HEIGHT OF CUTBANKS (m)	EQUIPMENT TO BE USED (IF OTHER THAN EXCAVATOR)
1	Short sections of bladed skidroad may be required where side slopes exceed 25%	0.3	0.1-0.4	

EXCAVATED/BLADED SKID ROADS MUST NOT BE CONSTRUCTED ACROSS SLOPES EXCEEDING 30% WHERE THE UNDERLYING PARENT MATERIAL IS COMPRISED OF GLACIOFLUVIAL MATERIALS. UNBLADED TRAILS RUNNING WITH THE SLOPE SHOULD BE USED IN THESE SITUATIONS.

PROPORTION OF THE TOTAL AREA OCCUPIED BY PERMANENT ACCESS (%)

TOTAL	COMMENTS
6.3	All new roads and processing areas are temporary and must be fully rehabilitated post-treatment.

TREE REMOVAL GUIDELINES AND CONSTRAINTS for SU 1

Equipment recommended:	<p>Felling: No felling restrictions. Directional felling with a feller buncher. Hand felling on slopes where excess soil disturbance may occur using a feller buncher. The post-tree removal stump height should be the lowest practicable and not exceed 20cm.</p> <p>Skidding: Rubber tired skidder, small crawler.</p> <p>Trail Construction: Tracked excavator</p>
Soil disturbance mitigation:	<p>Soil conditions must be as described under Soil Disturbance Limits.</p> <p>Soil rehabilitation as per Forest Practices Code of BC Act, <i>Soil Rehabilitation Guidebook</i>, March 1997.</p>

Additional requirements/Constraints:

1. All equipment is required to be washed and free of dirt and debris prior to entering the park; this is required to prevent the spread of invasive plants. An inspection and sign-off by a BC Parks or a designated representative must be completed for each piece of equipment prior to commencement of work to minimize the potential for the spread of invasive plants.
2. Soil Disturbance limits as described below:
 - Skidding of trees must be done to minimize soil disturbance. Methods to achieve this are:
 - a) ensure that skidding occurs on frozen soils with a suitable snow pack:
 - b) avoid areas of concentrated skid trails. Random skid, wherever possible.
 - c) Where skidding results in linear concentrations of slash, the contractor must break up these linear accumulations by random skidding across them with a drag of trees, or some other method approved by a BC Parks representative.
3. Skidding must not occur directly up/down draws or NCD's. Natural drainage patterns must be maintained at all times. Where natural drainage patterns are altered by tree removal activities then they must be re-stored to their pre-treatment condition.
4. For **archaeological considerations** the following must be implemented:
 - a. Utilize previously disturbed areas such as roads, bulldozed areas and tree throws for skidding and pile burning.
 - b. No disturbance of mineral soil on ridge crests or on terraces within 20m of the margins.
 - c. No pile burning on ridge crests or within 20m of terrace margins.

SAFETY ISSUES

1. Signage must be placed at all potential entry spots into the project area during active tree removal activities warning of the hazards that may be encountered.
2. All contractors implementing this Ecological Restoration Prescription must be Worksafe BC registered and BC Forest Safety Council certified.
3. A minimum of one employee of the contractor responsible for implementing this Ecological Restoration Prescription must be a certified wildlife danger tree assessor.

TREE AND BOUNDARY MARKING INFORMATION

BLOCK BOUNDARY: Pink "Ecological Restoration" ribbon
TREATMENT UNITS: Pink "Ecological Restoration" ribbon
WILDLIFE TREE PATCHES: Pink "Reserve Zone" ribbons.
ROADS: Pink "road centerline" single ribbons
LANDING: Three sets of "triple" road ribbons

SITE DISTURBANCE HAZARD RATINGS				
SU	SOIL COMPACTION	SOIL DISPLACEMENT	SURFACE SOIL EROSION	SLOPE INSTABILITY INDICATORS
1	H	H	H	None found
SOIL DISTURBANCE LIMITS				
SU	MAXIMUM ALLOWABLE SOIL DISTURBANCE WITHIN THE NET AREA (%)		MAXIMUM EXTENT SOIL DISTURBANCE LIMITS MAY BE TEMPORARILY EXCEEDED TO CONSTRUCT TEMPORARY ACCESS STRUCTURES (%)	
1	5.0		5.0	

The pre-rehabilitation soil disturbance will be limited to 5%. This soil disturbance limit may be comprised of a combination of dispersed disturbance and temporary access; however dispersed disturbance types that cannot be rehabilitated must not exceed 5% pre-rehab. Excavated temporary access structures should only be constructed if it is the only practicable way to remove trees from the area. Excavated temporary access structures must be approved by a BC Parks representative prior to construction. All temporary access structures, bladed or unbladed, will be rehabilitated post-treatment.

Construction of trails must be done in consultation with BC Parks staff or their designate.

Tree removal must be completed during the winter months with frozen soils and a snowpack to minimize soil disturbance and to protect any rare and endangered plants that may occur within the project area.

Up to 11 temporary landings may be constructed to process trees from the project area. Roadside processing may also be used to minimize the need for additional landings. Landings and roadside work areas must be located in consultation with BC Parks staff or their designate. All landings and roadside work areas must be rehabilitated to their pre-treatment condition. Rehabilitation must be completed as per the *Forest Practices Code of BC Act, Soil Rehabilitation Guidebook. March 2007*. Portions of the treatment area contain roads that are under the authority of the *Ministry of Transport and Highways* and the *Ministry of Forests, Lands, and Natural Resource Operations*. All road use and related activities must be approved by, and be consistent with, all requirements of these two organizations.

POST-TREATMENT RESTORATION & MONITORING RECOMMENDATIONS
<p>The objective is to re-introduce fire into the park ecosystem. It is recommended that the majority of debris is removed prior to implementing prescribed burns. Spring burns are recommended. Timing should be such that the area is broadcast burned when surrounding upslope areas are still relatively moist and have high soil moisture and foliar moisture content. This will enable broadcast burns to be implemented without constructing bladed fireguards.</p> <p>Due to the high fuel loading that has resulted from fire exclusion and the proximity of the park to private residences, it is not realistic to expect that prescribed fire will be re-introduced into 100% of the park. All broadcast burning within the park must be implemented according to a burn plan that has been signed off by the BC Parks Kootenay Okanagan Regional Director and a certified type 2 burn boss and is consistent with BC Wildfire Service's most current format / template.</p> <p>In addition, a post-treatment reconnaissance level survey will be completed to assess treatment success, achieving post-treatment objectives, fuel loading and any post-treatment slashing and/or fuels treatment requirements.</p> <p>Regularly scheduled reconnaissance surveys should be completed to coincide with the post-treatment maintenance activities schedule described below. These surveys would monitor forest and grassland conditions and provide recommendations for maintenance activities that may be required to ensure the maintenance of acceptable forest and grassland conditions.</p> <p>A pre/post-treatment photo monitoring program must be implemented to evaluate the effectiveness of ecological restoration treatments.</p>

Regeneration method:	Natural
Seed source:	Seed trees, coppice.
Monitoring (survival rates):	Reconnaissance level surveys
Monitoring dates:	Post-tree removal, 2 years and every 5 years thereafter.

POST-TREATMENT MAINTENANCE RECOMMENDATIONS

A regular schedule of post-tree removal ecological restoration treatments should be implemented to ensure that the forest and grassland conditions within the project area remain within the natural range of variability of those expected in natural stands in the NDT4 disturbance type. Such treatments would consist of the following, in order of preference:

1. Ecological maintenance burning
2. Hand fuels treatment followed by ecological maintenance burning.
3. Hand fuels treatment only.

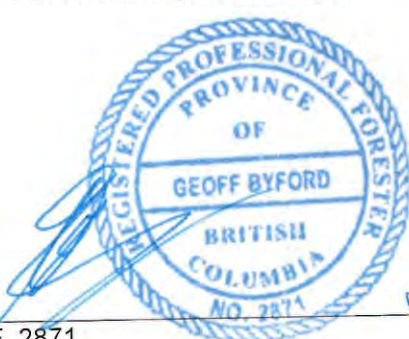
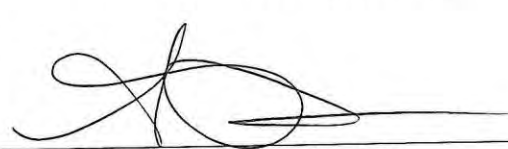
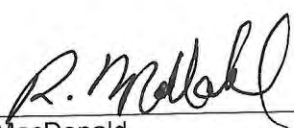
Treatment Timing:

Treatment timing should mimic historic stand disturbance intervals. A maintenance treatment should be scheduled every 4-50 years to coincide with the natural range of variability in historic fire return interval.

Treatment Constraints:

1. Defensible boundaries should be established around the perimeter of the project area if maintenance burning is to occur, particularly adjacent to private land and any infrastructure.
2. Ecological maintenance burning should be planned to avoid damage to reserve areas within the project area.

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PROFESSIONAL ENDORSEMENT			
Prepared by:  July 13, 2016		Professional Signature & Seal  July 13, 2016	
		Geoff Byford, R.P.F. 2871 Tanglefoot Forestry Consultants Ltd.	
Geoff Byford, R.P.F. Date Submitted		Date	
PRESCRIPTION APPROVAL			
BC Parks Project Lead  Amanda Weber-Roy, BNRS, P.Ag Date JULY. 13, 2016		Regional Section Head  Rob MacDonald Date JULY 14/2016	
Ministry Professional (RPF/RPBio/PAG)		Primary Contractor	



ECOLOGICAL RESTORATION PRESCRIPTION

LOCATION: PREMIER LAKE PARK

UTM GRID  UTM Reference

Zone	East						North						
11	5	9	6	5	7	4	5	5	3	0	5	8	7
Lat.		49° 55' 11" N					Long.		115° 39' 17" W				

Mapsheet Reference: 82G 082/092
Forest Region: Kootenay Boundary
Forest District: Rocky Mountain
Land District: Kootenay

Mag. 16° 8' east of T.N.
Date: July 12, 2016
Mapscale: 1:10000

Area Summary

Standard Unit	Gross Area (ha)	NP Unn (ha)	NP Nat (ha)	Reserves (ha)	Net Area(ha)
1	153.6	9.6	0.0	5.7	138.3
TOTAL	153.6	9.6	0.0	5.7	138.3

Ecological Description

Standard Unit	Ecosystem Restoration Objective	BEC	Site Series Composition
1	Open Forest	IDFdm2	01/03/04

References

- Paved Road
- Main Road
- Secondary Road
- Proposed Road
- Temporary Road
- Spur Road
- Abandoned Road
- Block Boundary
- Ecosystem Unit
- Treatment Unit Boundary
- Timber Type Line
- Riparian Reserve Zone
- Riparian Management Zone
- Existing Landing
- Proposed Landing
- Bridge
- Culvert
- Brush
- Cultivated
- Gravel Pit
- Scrub
- Lake
- Seep
- Stream
- Stream/Indef
- Dam
- Proposed Trail
- Existing Trail
- Railway
- Transmission Line
- Cut & Seismic Lines
- Fence
- Ridge
- Height of Land
- Rock Bluff
- Swamp
- L Logged
- SL Selectively Logged
- B Burn
- Windfall
- Alpine
- Slide
- Station Location
- UTM Reference Point

LEGEND

- Proposed Treatment Area
- Riparian Management Zone
- Park Boundary
- WTP
- Lake Feature

