Appendix 14-D

Whitebark Pine Distribution, Health and Critical Habitat Assessment

Whitebark Pine Distribution, Health and Critical Habitat Assessment

Crown Mountain Coking Coal Project

NWP Coal Canada Ltd

Keefer Ecological Services Ltd

Keefer Ecological Services Ltd
3816 Highland Rd.
Cranbrook BC V1C 6X7
(250) 489-4140
www.keefereco.com

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1. Introduction

Whitebark pine (*Pinus albicaulis*; Pa) is one of three five-needle pine species found in British Columbia (BC). It is a species of conservation concern, identified as a blue-listed species[1] in BC and endangered[2] under the *Species at Risk Act* (SARA) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Keefer Ecological Services Ltd. (KES) was retained by NWP Coal Canada Ltd. to assess the health status, abundance, and habitat of this at-risk species within the Local Study Area (LSA) for the Crown Mountain Coking Coal Project (Project) baseline studies.

Whitebark pine grows on dry to moderately moist sites found in high elevation, upper subalpine habitats ranging from timberline to closed subalpine forests in western North America. Whitebark pine occurs most abundantly on drier, exposed south-facing slopes near treeline. In Canada, whitebark pine reaches its northernmost extent at approximately 55°N in the Coast Mountains and at about 54°N in the Rocky Mountains along the British Columbia and Alberta border (COSEWIC, 2010). Near the Canada-USA border, whitebark pine typically occurs from 1700 m to 2250 m (Environment and Climate Change Canada, 2017; COSEWIC, 2010). Within the Project study area, it is found above 1800 m, with the bulk of the population found above 1900 m (see Section 3 for more information).

Whitebark pine is a long-lived species, surviving over 500 years and occasionally greater than 1000 years (Arno and Hoff, 1989). Whitebark pine typically grows 5-20 m tall with a rounded to irregular crown. The form of the tree is dependent on local site conditions and competition levels. Trees take on a stunted and twisted form at treeline and exposed sites, ranging in height from 5-10 m, whereas trees in lower elevation, closed-canopy forests take on a straight form, reaching 20 m in height (Douglas *et al*., 1998).

Whitebark pine is associated with the bird Clark's nutcracker (*Nucifraga columbiana*). Whitebark pine cones are permanently closed and require the Clark's nutcracker to break open the cone and cache seeds for seed dispersal. The Clark's nutcracker is heavily reliant on the seeds as they provide an important food source (Arno and Hoff, 1989). While the Clark's nutcracker, is a prolific disperser of seeds—one bird may store up to 20,000 seeds per year, only a relatively small proportion (circa 15%) are placed in micro-sites and habitats where the seeds can germinate and grow (Lorenz *et al.*, 2011). In addition to the Clark's nutcracker, whitebark pine seeds are also a highly nutritious food source for the grizzly bear and the red squirrel.

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[1] Blue-listed species are defined by the BC Conservation Data Center (n.d.) as:
Any indigenous species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened.

[2] Endangered is defined under the *Species at Risk Act* as:
A wildlife species that is facing imminent extirpation or extinction

1.1 Threats to Whitebark Pine

Whitebark pine populations are a conservation concern as they are rapidly declining throughout Canada due to four main factors:

1) **White pine blister rust** - White pine blister rust is caused by the fungus *Cronartium ribicola* which was introduced to British Columbia in 1910 from Europe (Pigott, 2012). The fungus requires alternate hosts from the *Ribes* (currant and gooseberry), *Pedicularis* (lousewort), or *Castilleja* (paintbrush) genera. Fungal spores are released from the alternate hosts in the spring and land on the needles of the whitebark pine tree (COSEWIC, 2010). The fungus enters through the needles, travels down the branch to the main stem where it girdles and eventually kills the tree (Pigott, 2012).

2) **Mountain pine beetle** - Mountain pine beetle (*Dendroctonus ponderosae*) can kill and breed in whitebark pine. Trees already weakened by white pine blister rust are more susceptible to mountain pine beetle attack (Alberta whitebark and Limber Pine Recovery Team, 2014).

3) **Fire suppression** - Whitebark pine is a poor competitor. Under natural fire regimes, low intensity fires would burn through stands, removing the understory, which would allow whitebark pine to thrive (Alberta whitebark and Limber Pine Recovery Team, 2014). As well, Clark's nutcracker uses burned sites for seed caching, allowing for rapid regeneration of whitebark pine (Alberta Whitebark and Limber Pine Recovery Team, 2014). Years of fire suppression have allowed shade tolerant species to colonize whitebark pine habitats, limiting whitebark 's ability to establish and survive on sites.

4) **Climate Change** - The distribution of whitebark pine is dependent on temperature. Increasing temperatures will require whitebark pine to migrate to areas of suitable climate, adapt to changed climatic conditions or be extirpated (COSEWIC, 2010). Warming temperatures are expected to increase competition as lower elevation species migrate up which will increase tree stress, making it more susceptible to blister rust and mountain pine beetle attack. Further, increasing temperatures may increase the effects of mountain pine beetle on whitebark pine stands (COSEWIC, 2010).

1.2 Whitebark Pine Recovery

A draft recovery strategy for whitebark pine was developed by Environment and Climate Change Canada in 2017 to guide the establishment of:

A self-sustaining, rust-resistant population of whitebark pine throughout the species' range that demonstrates natural seed dispersal, connectivity, genetic diversity and adaptability to changing climate.

A key element to whitebark pine recovery is the identification of critical habitat to support the survival, seed dispersal, and regeneration of whitebark pine (Environment and Climate Change Canada, 2017). Critical habitat is defined by SARA as: "The habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species critical habitat in the recovery strategy or in an action plan for the species."

Whitebark pine critical habitat is described in the draft recovery plan to contain the following features (Environment and Climate Change Canada, 2017):

1) Polygons containing a high density of whitebark pine (equal to or greater than 2 m^2/ha for seed dispersal and regeneration) are considered critical habitat based on the following biophysical attributes:
    a. Cone-bearing and/or non-terminally infected whitebark pine; and
    b. Substrate areas that are:
        i. Within the subsurface root area of whitebark pine, and/or
        ii. Open areas not encroached with dense shrub or competitive trees in the understory or overstory, and
        iii. Well to rapidly drained, coarse or rocky soils.
2) Within 2 km of polygons that have a high density of whitebark pine, which is the median dispersal distance of the Clark's nutcracker, areas are considered critical habitat based on the following biophysical attributes:
    a. Natural open parkland and forest openings which are not encroached by dense shrub or competitive tree understory or overstory that:
        i. Are equal to or greater than 0.5 ha;
        ii. Have well to rapidly drained, coarse or rocky soils; and
        iii. Occur within the elevation limits for whitebark pine in the region.
3) Within the known range of whitebark pine, regardless of tree density, and within 2 km of polygons containing a high density of whitebark pine, critical habitat is identified where:
    a. Whitebark pine research and monitoring plots or transects are established to aid recovery efforts; and/or

b. Areas in which recovery efforts are focused on creating regeneration habitat to sow whitebark pine seeds or plant whitebark pines seedlings and/or areas in which seeding or planting have occurred.

Legislation to protect critical habitat has yet to be enacted; however, habitat still needs to be assessed based on the critical habitat criteria outlined in the proposed federal whitebark pine recovery plan (Environment and Climate Change Canada, 2017).

1.3 Objectives of Baseline Study

The objectives of the whitebark pine baseline study for the Project were to determine:

- The extent/distribution, health, and reproductive status of whitebark pine in the LSA; and
- Assess and map critical habitat for whitebark pine in the LSA.

2. Methods

2.1 Study Area Description

The whitebark pine local study area (LSA) of the Project spans 12,886 ha and comprises the bulk of the Alexander, West Alexander and Grave Creek watersheds of southeastern British Columbia, north of Crowsnest Highway 3 (Figure 1). The LSA encompasses four biogeoclimatic units, which include the dry warm Montane Spruce subzone (MSdw), Kootenay dry cool Engelmann Spruce-Subalpine Fir variant (ESSFdk1), dry cool woodland Engelmann Spruce-Subalpine Fir subzone (ESSFdkw), and dry cool parkland Engelmann-Spruce Subalpine Fir subzone (ESSFdkp) (MacKillop et al., 2018).

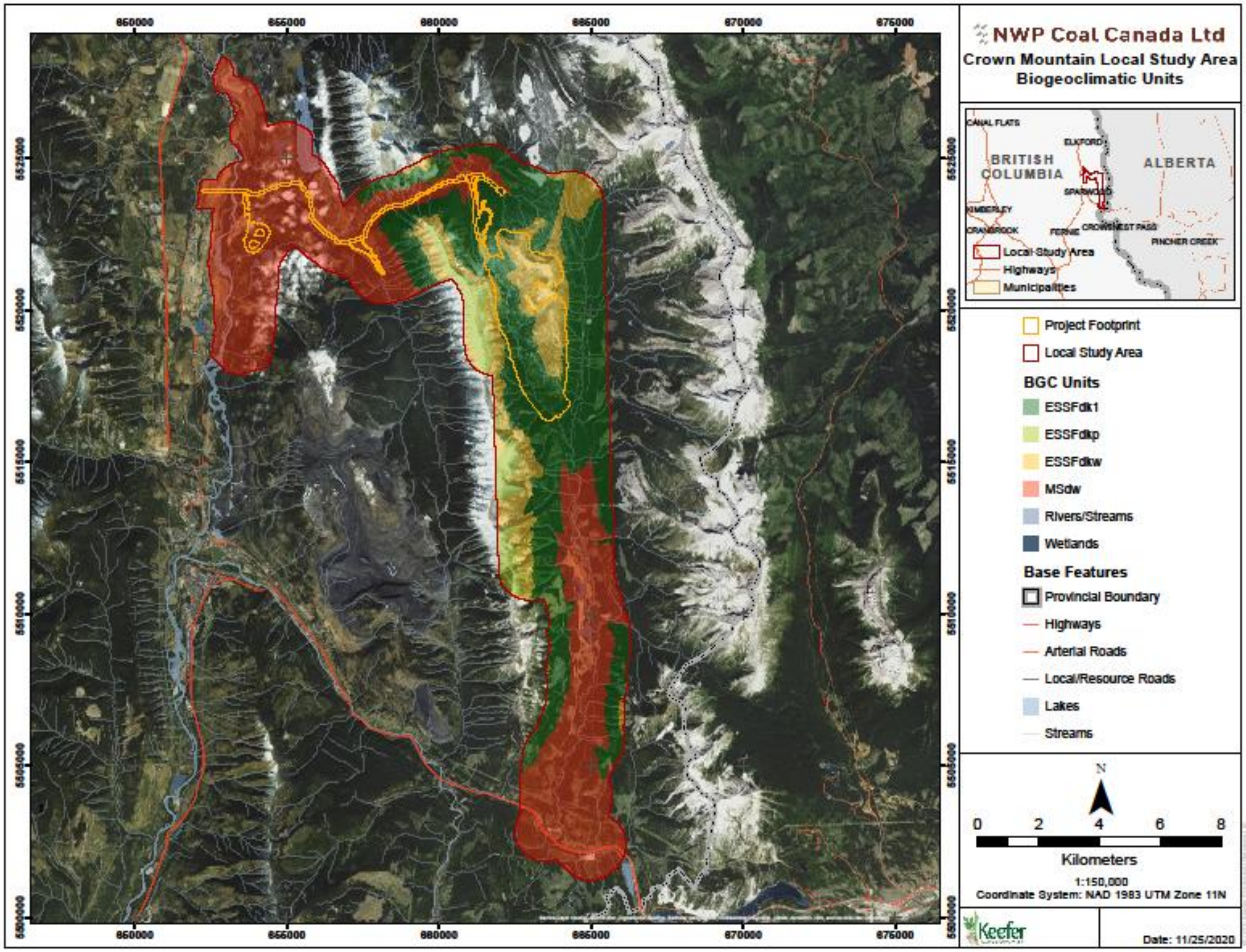

Figure 1. Local Study Area

2.2 Whitebark Pine Distribution

The distribution of whitebark pine throughout the LSA was delineated by identifying terrestrial ecosystem mapping (TEM) (Keefer Ecological Services Ltd., 2018) polygons known to contain whitebark pine based on trees found through TEM field surveys conducted in 2014, critical habitat field surveys conducted in 2018, other field surveys and Vegetation Resources Inventory (VRI; provincial government forest cover inventory) data. The TEM used for these purposes was completed by KES in 2019 to provide baseline data for the Project Environmental Assessment. Where no VRI data was available (i.e., Teck Private Land in the southern portion of Alexander Creek (about 2 km south of the confluence of West Alexander and Alexander Creeks and on the west side of the Erickson Ridge), TEM polygons were selected if they were predicted to contain whitebark pine based on biogeoclimatic classification, elevation, aspect, slope position and tree cover less than 50%. In some cases, TEM polygons were truncated if they extended below 1800 m elevation (the lower elevation limit for whitebark pine in the study area). Polygons were adjusted to elevation limits to better represent areas where whitebark pine may be found.

Three categories of whitebark pine distribution were depicted based on the data used to delineate polygons:

- Confirmed – TEM polygons where ground observations confirmed the presence of whitebark pine
- Potential – TEM polygons where VRI data suggested that whitebark pine is found
- Predicted – TEM polygons outside of areas with VRI data, within suitable habitat for whitebark pine (elevation above 1800 m, warm aspect, upper slopes, tree cover less than 50%)

2.3 Whitebark Pine Critical Habitat

Field studies for whitebark pine critical habitat was completed by KES in August 2018. Prior to field surveys, areas of potential whitebark pine critical habitat were initially mapped to identify key areas to be assessed in the field. Potential critical habitat was based on their likelihood of containing whitebark pine with sufficient basal area and sufficient stature to be of cone-bearing age, in upper slope and ridgetop landscape positions, with relatively open forest canopy, within areas near proposed mine infrastructure. Four polygons were delineated to guide field sampling searches (Figure 2).

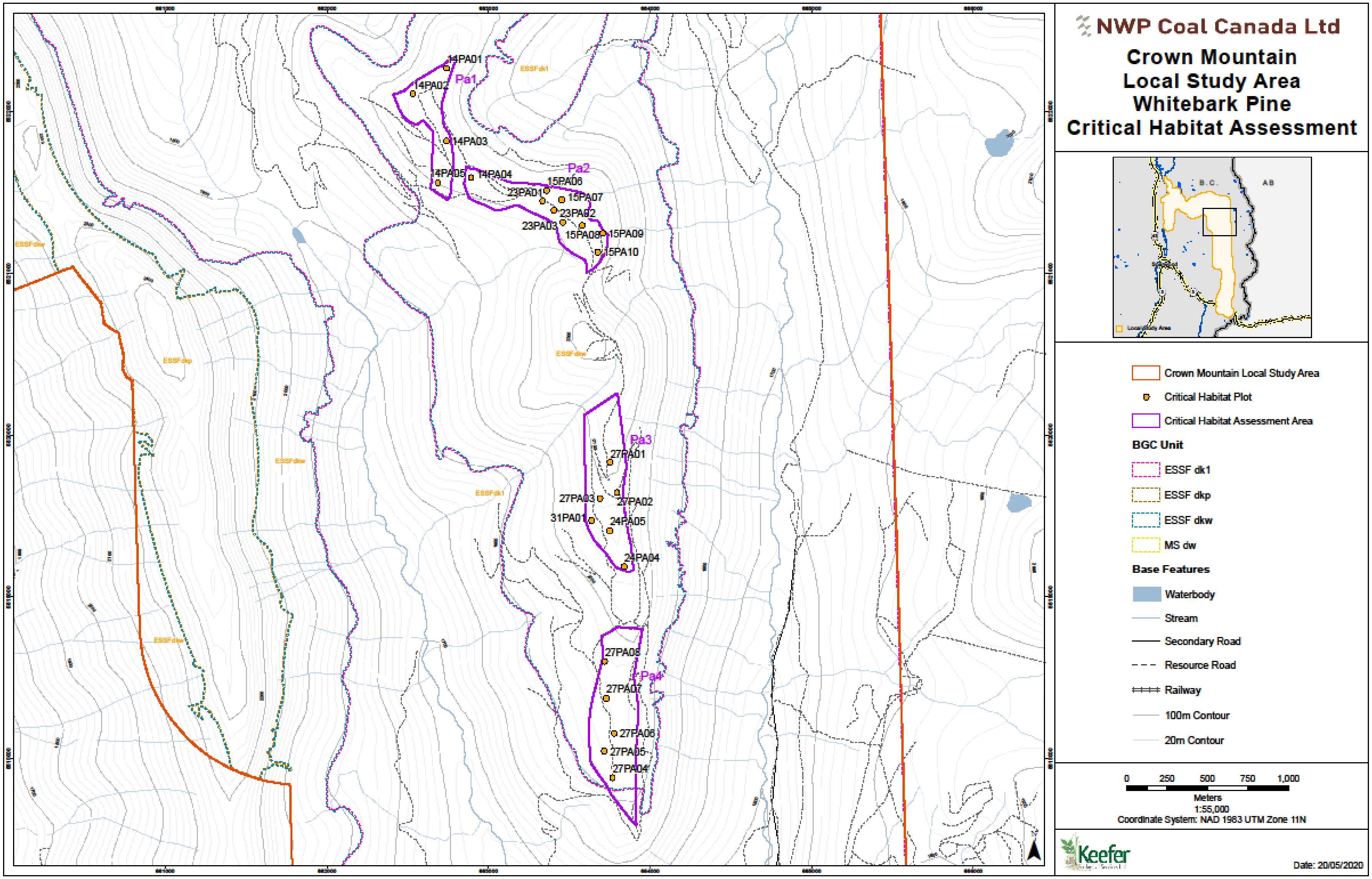

Figure 2. Whitebark Pine Assessment Polygons and Plot Locations

Twenty-four fixed-radius, critical habitat assessment plots were measured (Figure 2) within the four assessment polygons. There were between 4 and 9 plots established in each assessment polygon. The assessment polygons were selected to sample a range of tree sizes. This was done to determine whether an "image signature" could be determined for the threshold basal area (>2 m^2 / ha) of critical habitat.

Potential critical habitat was assessed in the field by measuring 11.28 m fixed-radius plots within each of the four assessment polygons. Plot locations were placed in areas of representative density of healthy whitebark pine for the sampling polygons. At each plot, a general site description was noted and the diameter at breast height (DBH) of all whitebark pine trees was measured to calculate basal area per hectare to determine if whitebark pine density was equal to or greater than 2 m^2/ha. The health of each tree was also assessed, as described below (Section 2.3), to determine if trees were infected with white pine blister rust. The presence of cones was documented and all whitebark pine trees below 1.3 m in height were recorded as seedlings and tallied. A minimum of 4 plots per sampling polygon were established.

Critical habitat was determined in whitebark pine sampling polygons based on the criteria outlined in the proposed whitebark pine recovery strategy (Environment and Climate Change Canada, 2017) and presented in Section 1. Basal area of whitebark pine was calculated for sample plots based on cone-bearing and/or non-terminally infected whitebark pine trees. Cone-bearing trees were defined as trees that are visibly producing cones and/or trees equal to or greater than 10 cm in diameter at breast height (DBH) (R. Moody, personal communication, October 9, 2018, based on diameter to age correlation for trees of cone-bearing age). Whitebark pine has the potential to produce cones at approximately 30-50 years of age with sizeable cone crops produced between 60-80 years of age. Whitebark pine produces mast cone crops at irregular intervals of 3-5 years; however, little to no cone production is common between mast years (Environment and Climate Change Canada, 2017). To capture reproductive trees in the inventory that are not producing cones, a 10 cm DBH limit was applied. The 10 cm limit is also used during 100 tree surveys, which are surveys that assess the health of the reproductive cohort before the selection of trees for cone collection (McKay and Shepherd, 2016). Non-terminally infected trees were defined as trees with less than 45% canopy kill (R. Moody, pers. comm., October 9, 2018). Whitebark pine sampling polygons were identified as critical habitat if average basal area of whitebark pine equalled or exceeded 2 m^2/ha in the polygon, tree cover was less than 50%, and soils were well to rapidly drained, coarse or rocky.

In order to identify other potential critical habitat, TEM polygons were assessed within the elevational range of whitebark pine throughout the study area. These polygons were assessed using imagery, VRI data, TEM and other survey field observations and observed characteristics for critical habitat. TEM polygons were predicted to contain critical habitat based on similarities to confirmed (by ground observation) critical habitat polygons using the following attributes: elevation, slope position, aspect, tree cover less than 50%, and two-kilometer distance from confirmed critical habitat criterion.

2.4 Whitebark Pine Health Assessment

The health of whitebark pine trees taller than breast height (1.3 m) was surveyed concurrently with the critical habitat using the same 24 critical habitat assessment plots described above. At each 11.28 m fixed-radius plot, health status was assessed as to whether the tree was infected with white pine blister rust, the percentage of canopy kill, whether mountain pine beetle had impacted the tree, and cause of death, if applicable. The presence of blister rust infection was also noted on seedlings (trees <1.3 m tall). In total, 763 whitebark pine were assessed for health.

Health of whitebark pine was assessed for each of the 24 critical habitat assessment plots by determining the percentage of trees examined during the critical habitat surveys that were impacted by white pine blister rust. The percentage of reproductive and non-reproductive trees impacted by white pine blister rust was also determined for whitebark pine sampling plots assessed during critical habitat surveys. As well, the health of seedlings surveyed on a polygon and plot basis was assessed by determining the percentage of seedlings impacted by white pine blister rust or other factors.

3. Results

3.1. Whitebark Pine Distribution

Abundant whitebark pine was found within the Project LSA, from elevations of 1800 m to the ridge top of Crown Mountain (2230 m) as shown in Figure 3a and 3b. The bulk of observations are located along or near the ridge crest, at or above 1900 m in elevation within the ESSFdkw biogeoclimatic subzone. However, significant large diameter (circa 60 cm DBH) trees were observed as part of the field studies within the LSA on west facing slopes well below the top of Crown Mountain. These large diameter trees are often found in more mesic habitats, within more closed forest than is described as usual habitat for the species (Environment and Climate Change Canada, 2017). The size, abundance, and health of these large trees is unusual for the Rocky Mountains of the East Kootenays (R. Moody, personal communication, January 15, 2019; B. Wilson, personal communication, March 28, 2019).

The site series that whitebark pine was observed on during field studies were primarily the subxeric to submesic ESSFdkw/103, with some sites belonging to the xeric to subxeric 102 and submesic to mesic 101 site series. Observations in the ESSFdk1 were primarily in the submesic 104 site series. As shown in Figure 3a and 3b, the distribution of whitebark pine within the LSA is centered on Crown Mountain. Areas within the LSA containing whitebark pine were identified using VRI data or habitat features where no VRI data exists. These are found primarily along Erickson Ridge (the ridge to the west of Alexander Creek). Whitebark pine is also found to the north of Crown Mountain along the ridge that extends from Crown Mountain and along the northern edge of the LSA in the upper Grave Creek drainage (Figure 3a). Additionally, VRI data indicates that whitebark pine is found just outside the LSA to the east and northeast of areas within the LSA that contain whitebark pine. Considerable area of potential whitebark pine habitat was mapped, based on habitat features observed on imagery and elevation, in areas where no VRI data was available (i.e., private lands south of Crown Mountain).

Whitebark pine was confirmed by ground observation in 14 TEM polygons for a total of 411 ha. Whitebark pine has potential to occur in a further 23 TEM polygons, with an area of 527 ha within the LSA, based on VRI data. Forty-one TEM polygons, with an area of 331 ha, were predicted to contain whitebark pine based on habitat conditions observed on imagery in areas that lacked VRI data (Table 1 Figure 3a and 3b).

Table 1 Whitebark Pine Distribution by Assessment Category

Distribution Category	Number of Polygons	Area (ha)
Confirmed	14	411
Potential	23	527
Predicted	41	331
Total	78	1,269

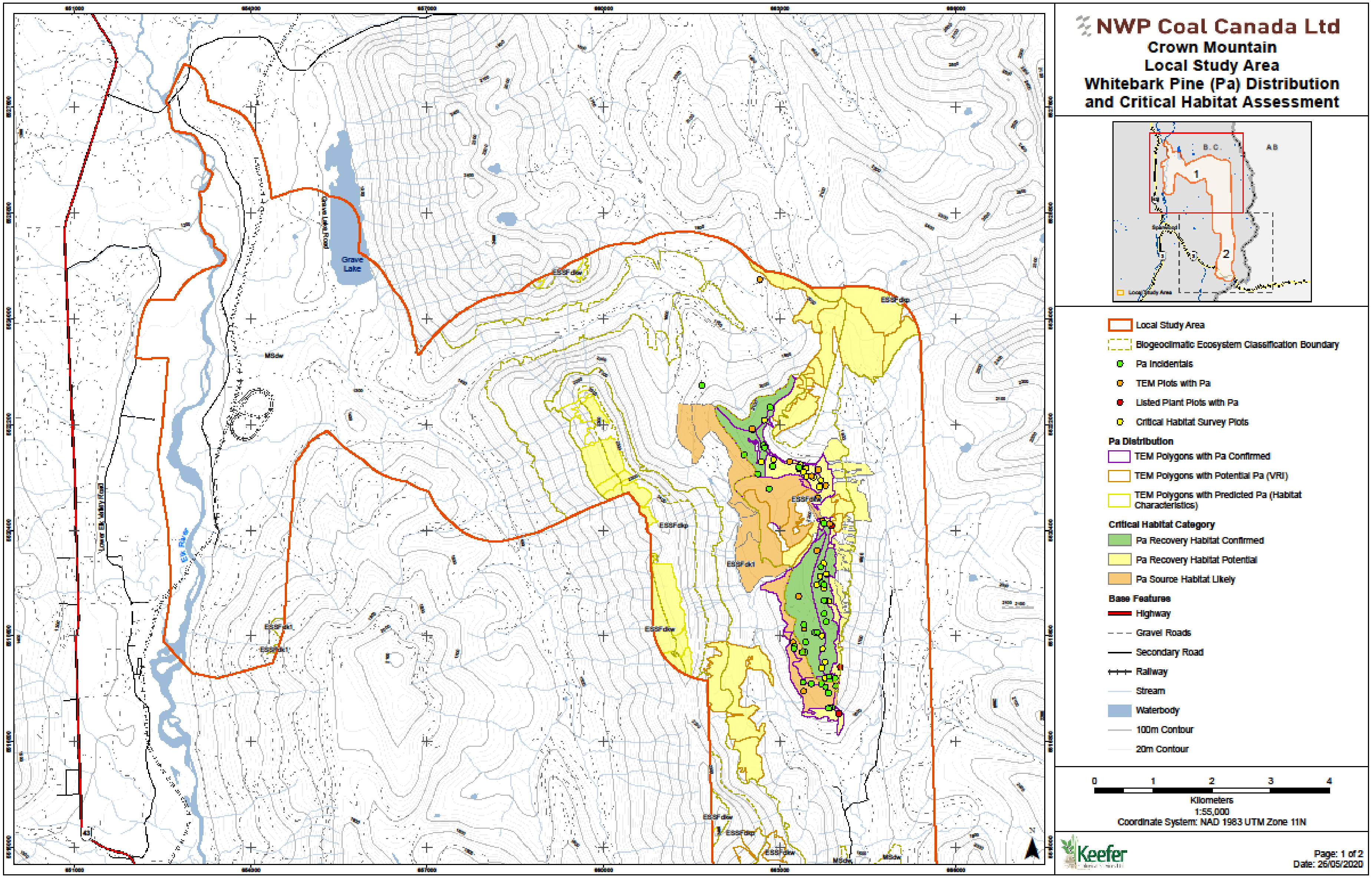

Figure 3. Whitebark Pine Distribution and Critical Habitat (North tile)

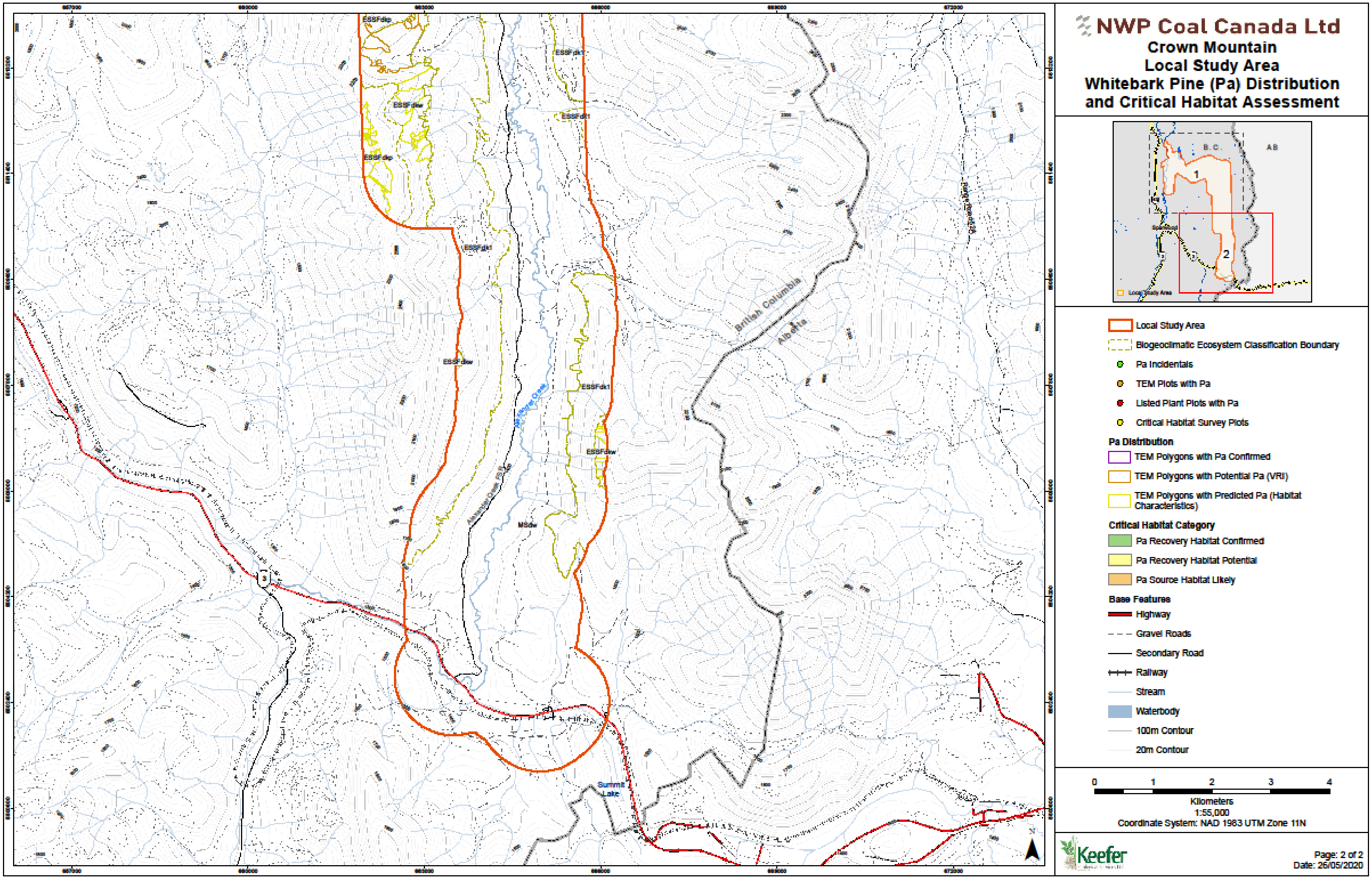

Figure 4. Whitebark Pine Distribution and Critical Habitat (South tile).

3.2. Whitebark Pine Critical Habitat

The assessment of critical whitebark pine habitat found that three (Pa1, Pa3, Pa4) of the four assessment polygons exceeded the 2 m2/ha threshold to be considered critical habitat as per the Environment and Climate Change Canada (2017) definitions presented in Section 1.2 (**Table 2**). The fourth (Pa2) had no plots that met the threshold and comprises primarily small diameter (<15cm DBH) trees. Five TEM polygons totaling 226 ha were confirmed as critical habitat from field surveys described in Section 2.3 (Figure 3 and **Figure 4**). All assessment data is contained in Appendix A.

Table 2 Critical Habitat Assessment.

Assessment Polygon	TEM Polygons[1] within Assessment Polygon	Number of Assessment Plots Within Polygon	Average Basal Area (m^2/ha) of Reproductive Whitebark Pine[2]
Pa1	129, 159, 162	4	**14.4**
Pa2	188	9	0.8
Pa3	282, 323	6	**8.9**
Pa4	323	5	**9.0**

[1] TEM polygon delineation completed by KES.

[2] Figures in bold exceed critical habitat basal area threshold.

In addition to the areas of critical habitat identified through field sampling of the assessment polygons as described above, additional areas of critical habitat were located as part of this baseline program. Areas of large, healthy, reproductive whitebark pine have been located on west facing aspects on Crown Mountain, well below the ridge top (within TEM polygons 323, 363). While no measurements were carried out on these large trees, they exceed the threshold basal area for being considered critical habitat based on comparisons with diameter and density information gathered on the assessment plots. These stands, while exhibiting denser over and under-story conditions than areas conducive to establishment of new whitebark pine stands, produce substantial seed for dispersal to other suitable regeneration areas and hence provide critical habitat as per the COSEWIC (2017) definition. This potential seed source critical habitat covers 244 ha (Figure 3 and Figure 4). Additional critical habitat exists in areas not visited during field surveys but identified as potential and predicted whitebark pine distribution polygons through examination of VRI data, imagery and elevation data. This additional critical habitat is found within two kilometers of confirmed critical habitat polygons described above, as per the critical habitat definition found in criterion 2 of Section 1. This critical recovery habitat is found in 63 TEM polygons covering 722 ha (Figure 3 and Figure 4).

3.3 Whitebark Pine Health Assessment

The whitebark pine health assessment was conducted at the 24 fixed-radius plots that were measured for critical habitat assessment (Figure 2). 189 trees that were greater than 1.3m tall were assessed, of which 73 were cone-bearing or >10 cm DBH (reproductive) and 116 were <10 cm DBH (non-reproductive). 574 seedlings (<1.3 m tall) were also assessed for health status at the 24 fixed-radius plots. The whitebark pine health assessment found that infection rates were high and increased with tree size (Table 3). Sixty-nine percent of reproductive trees, 66% of non-reproductive trees, and 17% of seedlings were either infected with white pine blister rust or dead due to the rust. Only 8% of reproductive trees, 28% of non-reproductive trees and 81% of seedlings were assessed as healthy.

Table 3 Average and ranges of whitebark pine health status across the 24 fixed-radius plots*

Health Status	Size Class			
	Reproductive	**Non-reproductive**	**All > 1.3 m tall**	**Seedlings**
Healthy	8% (0-33%)	28% (17-55%)	21% (3-41%)	81% (63-90%)
Infected or Dead	69% (54-78%)	66% (33-81)	67% (39-78%)	17% (10-36%)
Other Agent	23% (0-38%)	6% (2-33%)	12 (2-30%)	2% (0-10%)
Total Number Assessed	73	116	189	574

*Reproductive trees are those cone-bearing or >10 cm DBH, non-reproductive are >1.3m tall and <10 cm DBH, seedlings are < 1.3m tall). Infected or dead are those trees that are infected by white pine blister rust or have died due to the rust, Other Agent are trees unhealthy or dead due to agents other than blister rust; ranges reflect averages for the four assessment polygons.

4. Discussion

Whitebark pine was found widely distributed at higher elevations within the Local Study Area. The abundance of large-diameter whitebark pine found on the west side of Crown Mountain is unusual in the East Kootenay Rocky Mountains in that they are found in more mesic habitats, within more closed forest (R. Moody, personal communication, January 2019). The proposed federal Recovery Strategy for the Whitebark Pine (Environment and Climate Change Canada, 2017) identifies critical habitat as the habitat required to allow the species to persist and grow throughout its range. Suitable microsites for germination and growth are described as limited and include such features as limited under- and overstory competition, avoidance of frost impacts, protection from wind, snow or soil movement and adequate growing space (Environment and Climate Change Canada, 2017).

Whitebark pine is considered endangered by SARA as it is threatened by white pine blister rust, climate change, fire suppression, and mountain pine beetle; however, blister rust is considered the greatest threat to whitebark pine (Environment and Climate Change Canada, 2017). In the LSA, over two thirds of whitebark pine trees taller than 1.3 m were infected with or had died of white pine blister rust. Blister rust levels in southeastern BC have been documented to be some of the greatest in the province (Zeglen, 2002) with the highest levels being directly adjacent to the Waterton region (approximately 90 km. southeast of Crown Mountain on the east slope of the Rocky Mountains in Alberta) (Smith *et al.,* 2013). The levels of infection found as part of the Crown Mountain baseline program are similar to those in Smith *et al.* (2013). This suggests that maintenance of existing healthy trees is particularly important within the local area.

Whitebark pine is considered a keystone species (Ellison *et al*., 2005; Tomback, 2009). Whitebark pine plays an important ecological role by stabilizing soil and rock, reducing erosion, slowing the progression of snowmelt, decreasing flooding at lower elevations, and facilitating the survival and growth of conifers and understory vegetation by creating favourable habitat for establishment (Farnes, 1990; COSEWIC, 2010). Further, whitebark pine is very important for wildlife, particularly Clark's nutcracker, red squirrel, and grizzly and black bears as whitebark pine seeds are highly nutritious, containing about 52% fat, 21% carbohydrates and 21% protein. The seeds are a primary choice to store as a winter food source for the nutcracker and red squirrel and provide a rich source of calories for bears building fat deposits for winter hibernation (Pigott, 2012).

To recover this keystone species, the population and distribution objective for whitebark pine is (Environment and Climate Change Canada, 2017):

To establish a self-sustaining, rust-resistant population of whitebark pine throughout the species' range that demonstrates natural seed dispersal, connectively, genetic diversity and adaptability to changing climate.

A component to addressing this objective is the identification of critical habitat, which is needed for seed dispersal, survival, regeneration, and long-term recovery of whitebark pine (Environment and Climate Change Canada, 2017). Critical habitat was identified within the LSA, with 226 ha confirmed seed dispersal habitat and 244 ha predicted seed dispersal habitat based on observation of large seed-bearing trees. A total of 722 ha of critical regeneration habitat was found within two kilometers of seed dispersal habitat (both on Crown Mountain and nearby areas). Maintaining critical habitat within the LSA presents an area to focus on increasing rust-resistance levels in natural populations and mitigating or avoiding human-related impacts in these areas for species survival and recovery (Environment and Climate Change Canada, 2017).

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Appendix A. Critical Habitat Assessment Field Forms

In order to view, right click next two pages, select Acrobat Document Object and open.

Entered by M.J

Whitebark Pine Stand Study
11.28 Radius Plots
Jameson Resources Crown Mountain Project
PAGE 01

14 - PA - 01 - Plot Center BL 2 orange strips

Observers: J.Lowey, M.Juckers
Date: Aug 14, 2018
UTM: 11U 0662743E 5522269N
Elevation (m): 2193m

Understory Survey: Trees < DBH (1.4m)
Tally

Height < DBH	Active Cankers	Inactive Cankers	No Cankers	Other	Comments
</- 50 cm			卌		
> 50 cm			卌 ||		

PLOT #: 23 PA 01

Whitebark Pine Stand Study
11.28 Radius Plots
Jameson Resources Crown Mountain Project
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Slope: 45
Aspect: 258°
Site Description: rocky, gullied terrain
Abelias leading, Sx
Vacc sp., Grouse?
observed dead [illegible] in area
healthy Pa stems just outside plot

Observers: [redacted] JL / AE
Date: 08/23/2018
UTM: 663337, 5621445
Elevation (m): 2116 m

Understory Survey: Trees < DBH (1.4m)
Tally

Height < DBH	Active Cankers	Inactive Cankers	No Cankers	Other	Comments
</- 50 cm	II		~~IIII~~ I		
> 50 cm	II		III		