MINUTES

REGULAR MEETING OF FOREST AND WILDLAND ADVISORY COMMITTEE
OCTOBER 9, 2019, STARTING AT 3:00 – 5:00 P.M.

In the Flute Room
4325 Blackcomb Way, Whistler, BC V8E 0X5

PRESENT:

Name	**Meetings to Date: 9**
Present:	
AWARE, Claire Ruddy, Chair	9
Member at Large, Derek Bonin, Co-Chair	9
Councilor, Arthur DeJong	8
Member at Large, John Hammons	9
WORCA, Matt Cooper	3
Member at Large, Melanie Tardif	8
Recording Secretary, Heather Beresford	9
Regrets:	
Member at Large, Trevor Burton	2
Member at Large, Mac Lowry	3
Member at Large, Colin Rankin	6

ADOPTION OF AGENDA

Moved by D. Bonin
Seconded by M. Tardif

That the Forest and Wildland Advisory Committee adopt the Forest and Wildland Advisory Committee Agenda of October 9, 2019.

CARRIED

ADOPTION OF MINUTES

Moved by A. DeJong
Seconded by J. Hammons

That the Forest and Wildland Advisory Committee adopt the Forest and Wildland Advisory Committee Minutes of September 11, 2019.

CARRIED

PRESENTATIONS

Updates

Council:

- October 8 Council meeting: WFRS length of service awards
- UBCM – met with Minister Donaldson (FLNR) and discussed multi-year funding for wildfire program; met with Minister Heyman (MOE) and

discussed need for local governments to have expanded authority to pass bylaws that address climate change more effectively
- Whistler Climate March on September 27 with 400-500 people
- Discussed municipal natural assets management options

AWARE:
- Eco-Citizen video almost complete
- Wrapping up summer programming
- Contributing to RMOW Parks Master Planning opportunities

WORCA:
- New board members elected at recent AGM – M. Cooper and S. Kemp will continue with FWAC
- Trail crews finish in early November: maintenance on lower LOTS to maintain blue rating; HiHi area trails maintained to keep blue rating; Jane Lakes trail work completed.

RMOW:
- Developed 10 year wildfire mitigation plan with Blackwell & Associates
- Wildfire thinning project in Kadenwood complete; will start Spruce Grove/White Gold project area after Thanksgiving
- Awarded 3 year contract for interface fuel thinning projects.
- Alpine trails and grizzly bears – vegetation mapping project due Dec. 19/19; draft grizzly bear-human conflict mitigation plan completed. Referred to FWAC, AWARE, Coast to Cascades GBI.

Cheakamus Community Forest:
- Fuel thinning on Cheakamus Lake Road will continue over winter 2019/20.
- No other harvesting taking place in 2019
- CCF recruiting for a new forest manager to replace Tom Cole.

Trail Planning Work Group:
- Meeting scheduled for late October.

Annual FWAC Report to CCF

A presentation by Heather Beresford, Environmental Stewardship Manager, was held regarding the draft FWAC Annual Report to the CCF and a discussion was held.

- Final edits made
- Attached to minutes as Appendix 1

Moved by D. Bonin
Seconded by A. DeJong

That the Forest and Wildland Advisory Committee adopt the 2018 CCF Annual Report.

CARRIED

Grizzly Bear – Human Conflict Mitigation Strategy

A presentation by Heather Beresford, Environmental Stewardship Manager, was held regarding the Grizzly Bear – Human Conflict Mitigation Strategy and a discussion was held.

- Executive summary should include key recommendations.

- AWARE and Coast to Cascades Grizzly Bear Initiative will review and provide written comments
- Map 1 – label the grey areas
- Suggestion to add information on grizzly bear habitat, life cycle, importance as an indicator/keystone species

FWAC Membership

FWAC Membership: Kathi Bridge and David Powe have resigned. Other members in attendance confirmed 2020 membership.

OTHER BUSINESS/FUTURE AGENDAS

- **BC Parks** – no speaker confirmed yet; continue to request
- **November** – CCF 2020 harvesting plans

MOTION TO TERMINATE

Moved by M. Tardif

That the Forest and Wildland Advisory Committee Meeting of October 9, 2019 be terminated at 4:38 p.m.

CARRIED

Chair, Claire Ruddy	Recording Secretary, Heather Beresford

APPENDIX 1: 2018 CCF ANNUAL REPORT

FOREST & WILDLAND ADVISORY COMMITTEE ANNUAL REPORT ON 2018 CHEAKAMUS COMMUNITY FOREST OPERATIONS

Photo Credit: Bob Brett

2018 FWAC Recommendations

1. **FWAC recommends that the CCF make a concerted effort to improve community communications** – with the aim of improving dialogue and understandings between community interests and CCF operations partners:

   1.1 the CCF annually update 1-3 plan and regularly update the 4-10 year harvesting and fuel management plans and post them to the CCF website and clearly communicated them to the public during open houses;

   1.2 the CCF clearly documents and reports any changes or differences between actual annual and planned activities in public communication materials (e.g., website and open houses); and

   1.3 if required, a communications specialist be identified to work with CCF operations staff to translate operational plans to communications materials for open houses and CCF website

   1.4 Post annual FWAC report on CCF website to support public communication and understanding.

   1.5 FWAC recognizes that CCF produces an annual report and encourages CCF to continue producing and posting its annual report

2. **FWAC recommends that the CCF conduct a review of strategic harvesting plans** in light of the current Allowable Annual Cut (AAC), CCF forest management objectives, and levels of harvest from forest operations – and, when appropriate, prepare an updated timber supply analysis to develop a revised AAC that incorporates current thinning practices, EBM old growth targets and other economic and operational constraints:

   2.1 FWAC understands that the AAC is a legal agreement with the province, however, the AAC appears to be high given the CCF's harvesting history over recent years of forest operations;

   2.2 FWAC recommends that recreation/tourism economic values are taken into consideration in the review, and in assessing costs and benefits of harvesting to meet AAC targets; and

   2.3 FWAC recommends that the review recognize and incorporate fuel reduction forest operations into AAC calculations.

3. **FWAC recommends an assessment and report of options for thinning second growth stands and/or stands that have lower impact for mixed older forest types.**
This could involve: (1) specifying lower impact practices (i.e., machine types and harvesting methods) in harvesting requirements; and (2) including more comprehensive second growth thinning (in association with fuel reduction strategies) in harvest development plans.

4. **FWAC recommends that long term monitoring plots be established to evaluate the effectiveness of the fuel treatments** over time and support review and refinement of fuel management and related prescriptions.

5. **FWAC recommends that a framework be developed and implemented for explicit identification and protection from forest harvesting of significant old legacy trees and old forest stands outside of mapped old growth or other harvest restricted areas**, and reporting of the trees and stands identified in reporting of annual harvest and fuel treatment operations.

6. **FWAC urges the CCF to demonstrate to the CCF partner communities the benefits of the community forest** by providing initiatives such as bursaries, scholarships, donating to community events, supporting community goals around recreation values and environmental stewardship, purchasing community equipment, hosting events in the Interpretive Forest and others.

Contents

List of Tables and Figures

1. Introduction

1.1 Cheakamus Community Forest Background

The Cheakamus Community Forest (CCF) operates under the K3V forest license and is one of 60 community forests in British Columbia. Situated on more than 33,000 hectares surrounding Whistler, the CCF was established in 2009, when the Lil'wat Nation, Squamish Nation and Resort Municipality of Whistler (RMOW) jointly signed a 25-year tenure with the provincial Ministry of Forests and Range. Together, these three equal partners oversee the management and operation of the forest under the auspices of the Cheakamus Community Forest Society, an independent not-for-profit organization.

1.2 Purpose and Content of the Annual Report

The purpose of the Forest and Wildland Advisory Committee's (FWAC) annual report on the Cheakamus Community Forest's (CCF) harvesting operations is to ensure that CCF operations are conducted in a manner that support the RMOW's tourism- and nature-based economy, provide recommendations for forest management improvements to the RMOW Council, the CCF Board of Directors and forestry manager, and to the forestry operations contractor. Field observations are drawn from a field trips held on October 4, 2018 and May 6, 2019.

Each year, FWAC asks a series of key questions (Section 3.3) with each annual report that provide insight into the CCF's adherence to its operational plans and silviculture strategy, how it minimizes impacts to visuals and other values, communicates with the public, balances access with protecting habitat, and delivers wildfire fuel mitigation projects. FWAC notes that as in previous years, the CCF is still under-delivering on the annual allowable cut and recommends that the CCF reconsider the AAC in the next provincially mandated Management Plan. Wildfire risk mitigation efforts are positive but should be reviewed to assess the impacts on ecosystem values, carbon sequestration and in relation to the overall wildfire risk. As well, the CCF could make improvements to its public communication strategy and efforts.

In keeping with FWAC comments in 2016 and 2017, additional measures to protect other values should be employed and different equipment more suited to individual stand conditions could be used during operations.

CCF should review and update the guiding Ecosystem Based Management (EBM) Plan (2009) to fully account for updated understanding of EBM values and emerging forest management concerns. FWAC also noted that a plan will be needed for Crater and Jane Lakes to get ahead of the increasing public use that is likely to occur.

The appendices contain: (A) a summary of 2017 FWAC recommendations and outcomes up to the time of 2018 Annual Report; (B) notes from FWAC field trips; and (C) a summary of wildfire treatment objectives.

2. Key Questions and FWAC Comments

In its analysis and associated comments, the Forest & Wildland Advisory Committee considers six key questions based on the Committee's Terms of Reference.

Table 1: Key Questions and FWAC Comments

Key Question 1: Is the CCF using best management practices to respect ecological principals to maintain biodiversity?
FWAC Comments: (1) In keeping with FWAC comments in 2016 and 2017 Annual Reports, there is continued community concern regarding CCF harvesting of old forest. FWAC recognizes that while the CC has exceeded Provincial requirements for protection of old forest in the CCF by establishing voluntary EBM reserves (in 2015), concerns continue to be expressed among whistler commun members. CCF should continue to report on age classes of areas logged, as well as harvested (ha.). CCF should also document areas logged relative to the EBM Plan strategies, and the are existing protected old and mature forest within the CCF and the Whistler Landscape unit which encloses the CCF. (2) FWAC suggests that the CCF make a concerted effort to improve community communicatio with the aim of improving dialogue and understandings between community interests and CCF operations partners. For example, the CCF could retain graphic design expertise to produce ar distribute a poster/map that illustrates the location of old and mature forest and the location of t various Provincial and voluntary EBM reserves.
Key Question 2: Do the CCF operations match the annual harvesting plans and other guiding documents?
FWAC Comments: (1) Annual harvest volume has been well below allowable annual cut for several years. When appropriate, the CCF should consider an updated timber supply analysis to develop a revised AAC that incorporates current thinning practices and old growth constraints. (2) CCF mapping and public communications do not clearly convey multi-year harvesting plans. FWAC recognizes the challenges involved, and also that harvesting plans can change from year to year. However, there is a legitimate interest among community members in planned forest harvesting operations. (3) If required, a communications specialist should be identified to work with CCF operations staff to translate operational plans to communications materials for open houses and the CCF website.
Key Question 3: Are the harvesting operations sensitive to visual impacts? And were other measures applied to minimize impacts on the shared use of the forest, particularly regarding tourism?
FWAC Comments: (1) In general, CCF harvesting operations appear sensitive to visual impacts. (2) Given the importance of off road recreation in the CCF region, harvesting plans should consider visual impacts from key recreational features (e.g. trails and viewpoints), as well as from roads.

Key Question 4: Does the fuel management harvesting bring the CCF closer to community wildfire risk management and forest health objectives?
FWAC Comments: (1) Note change in wording of this question to more accurately reflect FWAC Terms of Referen (2) FWAC notes and supports the increased attention that is being put to wildfire fuel managem planning and associated forest operations. (3) Wildfire fuel management forest operations should be reviewed in relation to the CCF EBM (2009) and annual harvesting operations - and reported in public communications – to assess t impacts of fuel management activities on ecosystem values (e.g., riparian areas) and carbon sequestration (e.g., harvesting in younger age class forest stands). (4) The effectiveness of the wildfire fuel management treatments should be evaluated in relatio the overall wildfire risk. (5) Monitoring should be undertaken by the RMOW and CCF to know if the work is meeting its fire mitigation objectives. Monitoring is key to knowing if work is effective and how to adapt. (6) The tree scarring from the fire management treatments promotes the spread of fungus and decay in retained trees that can reduce the forest health. FWAC is also of the opinion that a mo concerted effort should be made to minimize tree scarring in future thinning treatments.
Key Question 5: Does the harvesting balance access with protecting habitat and managing species of special concern?
FWAC Comments: (1) Note that values are overlapping (forest health, wildfire risk management, habitat and specie special concern, and “other values”) and are best addressed in an integrated approach rather th as separate planning or management entities. (2) FWAC comments related to road and recreation access planning have been made previous (2016, 2017). FWAC supports the initiative of RMOW to undertake recreation trail planning that incorporates ecosystem and wildlife values (such as grizzly and black bear habitat and use, we and other sensitive ecosystems). CCF work to date on access management planning (e.g., acc principles and access road framework) should be publicly available (e.g., on the CCF website) communicated to ensure that CCF habitat protection measures and related data (e.g., mapping understood and utilized in related planning initiatives.
Key Question 6: Does the harvesting maintain other values (e.g., water, recreation, reduced soil and residual tree damage, GHG emissions, fuel management)?
FWAC Comments: (1) Note that values are overlapping (forest health, wildfire risk management, habitat and specie special concern, and “other values”) and are best addressed in an integrated approach rather th as separate planning or management entities. (2) In keeping with FWAC comments in 2016 and 2017, additional measures to protect other va should be employed and different equipment, more suited to individual stand conditions (fuel thinning projects) could be used during operations (i.e., to lessen footprint and impacts of machinery and operations on ground cover, tree and water values). (3) CCF should review and update the guiding Ecosystem Based Management (EBM) Plan (20 to fully account for updated understanding of EBM values and emerging forest management concerns – specifically adaptation to climate changes, wildfire risk management, changing recreation uses and increased recreation demand, and understanding of forest carbon

sequestration. FWAC understands that a revision of the CCF EBM plan could be quite expensiv so this comment should be tempered by the financial position of the CCF.

(4) Carbon credits from the CCF operation should to be documented for the public to realize their value to the community.

(5) CCF should implement a long term monitoring program including photo point and permanent sample plot establishment – growth rate, mortality, crown closure, understory and floristic development.

(6) Noted that a plan will also be needed for Loggers, Crater and Jane Lakes to get ahead of the increasing public use that is occurring. Further discussion between RSTBC, RMOW and CCF on WIF maintenance and recreation plan for Jake-Jane-Crater-Loggers Lakes is recommended.

Summary of Comments:

Economic return to partner communities, employment, harvesting quotas as well as impacts on values such as recreation, tourism, and biodiversity values, influence management assumptions and harvesting plans. The CCF should continue to share information about why we are harvesting timber in the CCF, as well as “what, how much and where.” The rationale needs to be explicit and communicated among CCF partners and community stakeholders.

The CCF’s forest resources provide direct value to the community from the sale of logs and carbon credits. This needs to be documented in an open and transparent manner to illustrate the value of operating the CCF to the public. In addition, non-monetary values generated from the CCF need to be accounted for.

Trends, economic context and community interests that should be integral to CCF plans and activities include continued limited market and low prices for different timber types within CCF; alternative employment and training opportunities for CCF partners (including thinning, fuel management and forest-based tourism); increasing attention to fuel management strategies; increasing recreation and tourism demand and use along the Sea to Sky corridor and CCF region; and continued community concern for natural values, including old growth timber and wildlife.

The utilization of logs from the fuel treatment areas to help offset the costs of the treatments and contribute to the annual allowable cut is positive. The landscape fuel treatments that retain approximately 250 - 300 stems per hectare (sph) rather than higher sph are a more effective fuel management strategy by more significantly reducing the crown cover.

The fuel hazard is generally lower in riparian areas therefore these areas can be omitted from treatment which will also help to maintain biodiversity.

3. Harvesting Information and 2018-2020 Annual Operating Plan

3.1 Harvesting Information

Table 2: Harvesting Summary 2018 (Source: Harvest Billing System, December 31, 2018)

Unit	FWAC site visit	Silvicul-ture Strat-egy/Pur pose	Area (ha) harvest ed in 2018	Age Class	BEC Zone	Contrac-tor	Planned Harvest (m^3)	Actual m3 Har-vested in 2018	Actual cumul ative harves t for block (M3)
C03 (Cheak Lake Road)	Oct. 201 & May 2019	Fuel thinning	34.5	50 years	CWH ms1	Lil'wat Forestry Ventures	Fuel thinning	524.12	7723
Ck15 (Jane Lakes area)		Harvesti ng Moderat e/ low	9.0+	250+	CWH ms1	Sqomish	6,350	4,853.0 9	
N01 (Alpine Meadows)		Fuel thinning	15	75 years	CWH ms1	Lil'wat	Fuel thinning	284*	2793.4 *
R05 (Cal-laghan Road)	Oct. 201	Fuel thinning	4.1	40-50 years	CWH ms1	Sqomish	Fuel thinning		
R06 (Cal-laghan Road)	Oct. 201	Fuel thinning	R06 & R07 = 19.6	40-50 years	CWH ms1	Sqomish	Fuel thinning	1,643.5 8	
R07 (Cal-laghan Road)	Oct. 201	Fuel thinning	R06 & R07 = 19.6	40-50 years	CWH ms1	Sqomish	Fuel thinning	1,533.5	
W80 (Wedge) Used to be W08		Fuel thinning	10.6	Plantat on 1971-7	CWH ms1	Lil'wat	3,735	2,904.4	
TOTAL								12159.2	

* Totals include both N01 Alpine Meadows & CCF5 (Cemetery site)

The annual allowable cut (AAC) for the CCF is 21,000 cubic meters (m^3) per year. The current 5-year control period is 2014 - 2018 for a total of 105,000 m^3. The volume harvested that is counted towards the AAC is primarily the logs scaled but also includes the waste remaining at

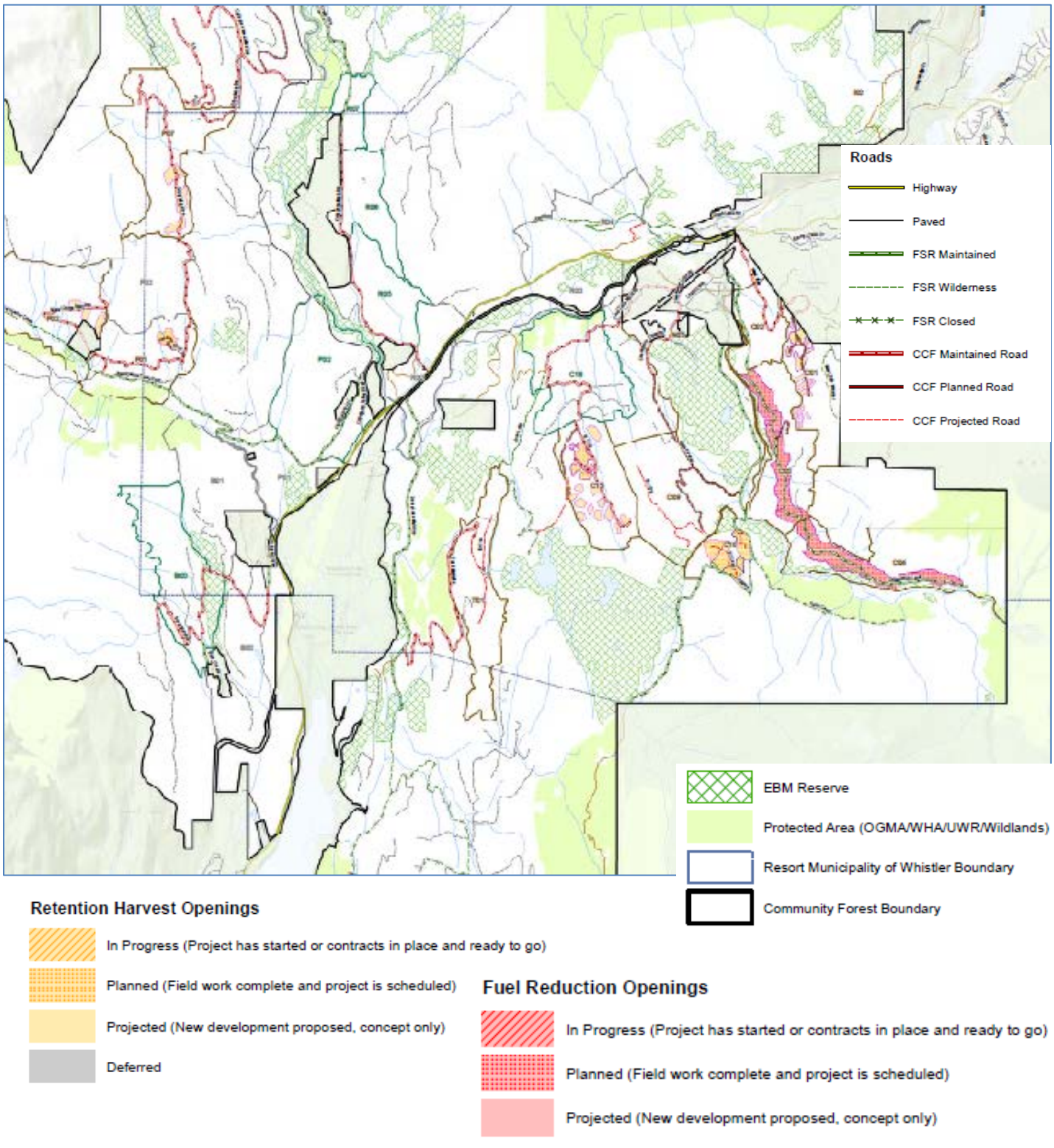
the harvesting unit. As of December 2018 the CCF harvested 65,230 m3 or 62.8% towards the current cut control period. See Table 3.

FWAC recognizes the operational challenges with weather conditions and fluctuating market conditions that influence the volume harvested each year. FWAC encourages the CCF to reduce waste and utilize more residue by harvesting marginal logs and marketing minor forest products. This greater wood utilization will contribute more volume towards the AAC. In addition, where economically and operationally feasible, FWAC encourages the CCF to commercial thin second growth stands to make up the balance of the AAC. Both of these strategies will reduce the forest fire fuel loading and complement the wildfire mitigation strategies that are implemented in the forests surrounding the RMOW.

Table 3: Cut Control Information as per MFLNRO Cut Control Statement, year-end 2018

	2016 (m^3)	**2017 (m^3)**	**2018 (m^3)**
Volume of Timber Harvested includ waste	6,869	17,283	13,466
Total Volume Attributed to License Cut Control Period	34,480	51,764	65,230
Cumulative AAC to Year End	60,000	80,000	103,811
Percent Harvest of Cut Control Peri		51.76%	62.8%

3.2 2018-2020 CCF Annual Operating Plan[1]



[1] https://www.cheakamuscommunityforest.com/wp-content/uploads/2018-2020_Annual_Operating_Plan_Map.pdf

Appendix A – 2017 FWAC Recommendations and Outcomes

Table 4: Recommendations and Outcomes from 2017 Annual Report

2017 Recommendation	Outcome
1. Resolve the policy disconnects in the CCF tenure between fuel management and regular harvesting, and other activities on the ground managed by other agencies.[2]	
2. Retention and planting of deciduous species on skid trails will assist in maintaining a lower fuel hazard.	CCF will be planting deciduous in autumn 2019 or Alpine Meadows project site.
3. Skid trails should avoid crossing streams or at a minimum remove excess slash from channel during skid trail restoration. Small cable logging methods can minimize the need for temporary skid trails.	The CCF continues to look for ways to minimize impacts to streams.
4. Long term monitoring plots should be installed to evaluate the effectiveness of the fuel treatments over time to learn what works best for future prescriptions.	Not done.
5. Fuel thinning treatments should be planned in the context of an overall management regime that projects well into the future. This can provide a timeline for subsequent future thinning and optimum target tree densities for each thinning over the life of the stand.	CCF following 10 year plan prepared by Blackwell Associates.
6. FWAC supports the wildfire fuel reduction programs and encourages the RMOW and CCF to continue and even increase the amount of area treated each year. A proposed method for these thinning operations is to have contractors use cable-based rather than ground-based systems in order to reduce damage to trees and soil. In addition, FWAC recommends that more deciduous trees such as black cottonwood be retained and planted when possible to reduce the fire hazard.	Provincial funding available to the RMOW has decreased since 2018 when the Union of BC Municipalities changed its program criteria and funding levels. The Forest Enhancement Society o BC continues to support the CCF/RMOW projects landscape level fuel breaks, but not wildland urba interface. Contractor on Kadenwood project is usi cable-based system but the CCF is not. CCF will b planting deciduous in autumn 2019 on the Alpine Meadows project site.

[2] Note: FWAC's intention behind this recommendation was to highlight that fuel management activities are increasingly a focus for CCF forest operations, and that this focus should be more integrated with "regular" harvesting planning and activities, and related cut incorporated in AAC analysis and reporting.

7. The CCF silviculture plan does not include spotted owl requirements and should consider adding a reference.	Silviculture strategy not updated.

Appendix B – FWAC Field Trip Notes

October 2018 Field Trip

Callaghan A01 (H1, H2)

Although this area was harvested before the 2018 period covered by this report, it was visited in October 2018 and is included in this report. Unit A01 is a First Nations' cultural area in the moist submaritime BEC zone at the 800-850m elevation of Callaghan valley. Because the area is a "snow hole," BEC zones are pushed down to a lower elevation. The site was harvested as moderate retention with 40-50 trees/hectare retained. There may be some blowdown in future, but unit has already survived one winter and will probably lose ~10% over next 5 years. There were 250 stems per hectare (sph) originally of big trees. The CCF left 50 trees/ha and tried to retain big old yellow cedar – trying to leave trees that are good wildlife trees, with appropriate spacing and hopefully lower dollar value. Riparian buffer areas show what area was like before harvesting. It was difficult to retain much understory due to being damaged when dropping the large trees.

Piles were burnt over next two weeks following the field trip, and the trails were replanted afterwards. The unit was replanted with red cedar while yellow cedar, balsam and hemlock will regenerate naturally. Red cedar is being planted at higher elevation (1000m +) to account for climate change. Four species are planted on site to provide a better opportunity to adjust to climate change. Cedar have more value to First Nations.

Tom Cole and Robert Seaton of Brinkman Climate joined FWAC at this point in the field trip. Robert is conducting the audit for the 2014 -2018 carbon project. His job is to determine if the CCF did what it said it was going to do, then to prepare a report prior to verification. Robert commented that there is less blowdown than expected. Group discussed changing forest profile to adapt to climate change and achieve climate flexibility. Need to plant trees that will still survive for the next 40 – 50 years. Multiple species helps ensure something will survive in 80 – 100 years when things are really different. Robert will quantify the carbon asset on site and access other impacts like disease and pests. The biggest question is how to model the wildfire thinning strategy and how it affects future forest profile.

FWAC held a discussion to explore if the waste material can be utilized. It's complicated. Leaving piles to rot slowly is optimum for carbon. Running it through a biofuel plant is no benefit to the CCF carbon project because while the time intensity of carbon release changes, the amount of carbon released is the same. The biofuel plant option would be a benefit if it avoided burning coal to generate power. Using waste wood for pellets is carbon neutral. Planting trees to cut for pellets is not.

Brinkman will ensure data sources are still correct, include changes over the last five years and run model to create the carbon estimate. It will include live and dead trees, and soil carbon. Will determine what exists with CCF operations compared to what it would be if CCF didn't exist. The difference between the base line and project case creates the carbon offsets.

Additionality means the forest management must do additional things beyond "business as usual." Receiving money for carbon should allow CCF to do more of the additional activities. CCF is doing expensive forest management, so needs the carbon money to continue doing that. The price of carbon should be going up and will continue to provide funds for CCF.

- CCF has four carbon pools:
    - Widening riparian areas
    - Leaving more retention on sites
    - Extending rotation to 100 years
    - Identified EBM reserves – spatially defines a set of areas where carbon is stored rather than just a theoretical percentage of the forest.

Callaghan FSR Wildfire Fuel Thinning - Rainbow 07

FWAC visited the R07 site in October 2018 when CCF was about to begin test burns as it worked toward achieving the objective of leaving no more than 1 kg/m2 of fine fuels on the ground. It costs about $2000 per hectare additional cost to do manual clean up after mechanical work because it's hard to get down to 1 kg/m2. In two years, most of that fine fuel would be decayed and present no fire risk so CCF is in discussions with fire ecologist to determine if it's better to stay at a little higher amount for fine fuels in the short term, save costs and thin more area. It is also exploring options to thin/clear more beside the road and less inside the block.

Merchantable timber recovery averaged 161 m3/ha with a net recovery of $2500/ha. Total cost including hauling 40 tonnes/ha of biomass to composter is $12,500/ha (including merchantable timber recovery) while WUI sites in Whistler are $30-33,000/ha because typically there is no merchantable timber.

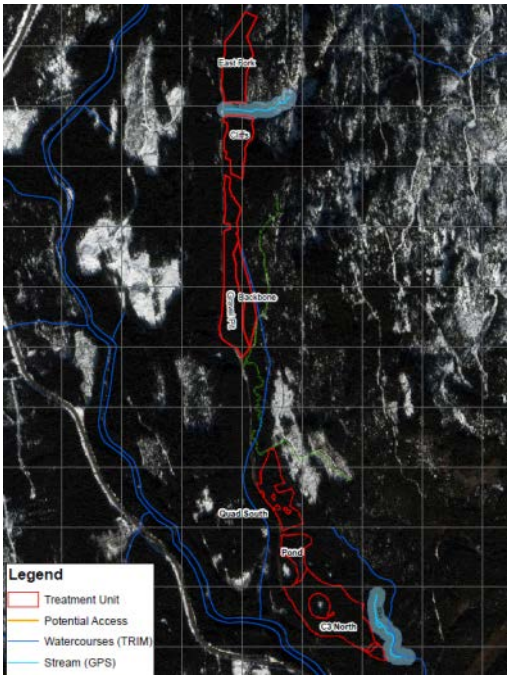


Figure 1: Callaghan Road Wildfire Fuel Thinning Locations

Retained trees will grow more quickly once thinned and sites will require maintenance in the future. Treatments accelerate growth of trees toward old growth conditions. Other sites have come back quite spindly so maintenance should be fairly low. A "tree island" is formed where little understory grows. Not good ecologically, but good from wildfire point of view.

At the time, there were still 3.5 hectares to complete on the Powerline site and it was completed the following month.

Unit R07 was already pruned before this current work. Treatment is targeting 40% crown closure and achieved 50% closure with irregular spacing. Opening the crown benefits fire-fighting because the retardant can get to the ground. The strategy is that a fire would lose energy, drop to the ground and be fightable. It's also harder to start a serious fire from the road once the thinning is done and it could be fought more easily.

Still determining implications of fuel thinning for the forest profile and carbon project over time. Still only

have a relatively small area (40 hectares) to do analysis on.

Rainbow05, C3 North

These sites were started in 2015. Natural hemlock regeneration is occurring on skid trails already but ground disturbance eliminated ground regrowth. Originally, riparian areas were left alone but now science is showing that riparian areas can be the weak link in fuel breaks and can burn in wildfires. Blackwell prescriptions now will treat half of the 15m riparian area.

The CCF needs to scale up and not continue with small sites like the 3.5 hectares adjacent to C3 North. Scaling up will reduce costs per hectare and achieve more protection for the valley.

Storage of material at the composter is a challenge. Timing of thinning projects is not optimal for providing material to the composter. If an alternate storage site is used first then moved to composter, costs increase due to double handling.

Cheakamus Lake Road Wildfire Fuel Thinning (C03)

Generally, creation of landscape-scale fuel breaks has been limited in its use by local governments in BC as a measure to protect communities from the threat of wildfire. Fuel treatments within municipalities are generally limited to urban green spaces, and high hazard fuels directly adjacent to homes. While effective at limiting fire behaviour locally, these treatments may have little impact in the event of a catastrophic landscape-level wildfire, where communities are threatened by ember showers from fires that may be kilometers away.

The objective of the Cheakamus Lake Road project is to provide a landscape-scale, linear fuel break in an area identified through quantitative modeling as a high priority for treatment. This fuel break will be created by converting the existing stand fuel type from high hazard to a condition that will significantly reduce potential fire growth, rate of spread and size (fire behaviour potential). In addition, the treatment unit (TU) location adjacent to the Cheakamus Lake Road will improve access and safety for firefighting crews, should a wildfire burn through this area.

Funding was received by the CCF from the Forest Enhancement Society of BC to pay for 75% of the fuel thinning with the RMOW providing the remaining 25%. It is planned to complete the remaining units in winter 2019/20.

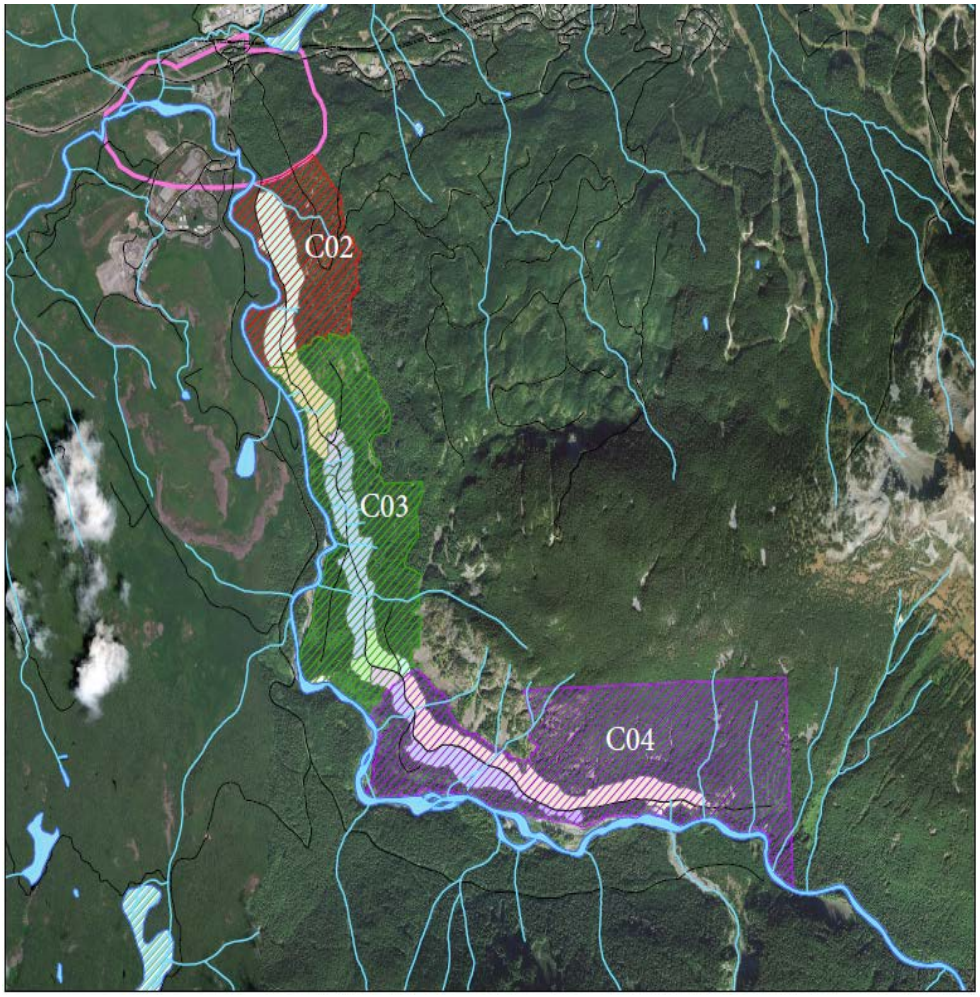


Figure 2: Cheakamus Lake Road Wildfire C03 Location Map

The plan was to carry out the thinning project on 69 hectares from November through February because BC Parks wanted the road to remain open in the summer. The project focused on Unit C03 of the Cheakamus Lake Road which has lots of trails in the area so the CCF conducted a spring trail clean up with WORCA and the RMOW. Crew weren't able to stockpile material on the road side, so removed it as the project progressed. There was concern that the feller-buncher would want to drop all 30 hectares then snow would close out the work leaving all material to be removed in the spring when recreation begins but that didn't happen.

The CCF and RMOW were letting the public know that the road was closed and the work underway through RMOW social media, signs and support from WORCA. Some areas in prescription weren't done due to topography and were netted out.

WORCA wants to extend Far Out to Flashback. The CCF asked WORCA to wait until fuel treatment was complete before building trails in the area.

Tom Cole held a project information session in the Function Forestry office in early November.

May 6, 2019 Field Trip

Cheakamus Lake Road Wildfire Fuel Thinning (C03)

Attendees: Tom Cole, Colin Rankin, Matt Cooper, Derek Bonin, David Powe, Melanie Tardif, John Grills (CCF Director), Arthur DeJong, John Hammons, Alistair McCrone (RSTBC Recreation Officer)

First Stop: Debris pile at entrance to Cheakamus Crossing/Waste Water Treatment Plant

The CCF signed a compatibility use agreement with BC Hydro to store and process wood debris under the hydro lines. The chipper was off site for repairs with the work taking longer than expected.

The Cheakamus Lake Road was reopened on May 15. Final clean-up work will continue through May and June, with short road closures controlled by flaggers. Material is chipped to 4" minus size and goes to the Callaghan composter but costs to date have not been tallied. Due to the high disposal process costs, RMOW will top up to an additional $15/green tonne for chipped material beyond the $20/green tonne that it normally pays other contractors.

This is the first time fuel thinning has been undertaken in the winter. CCF will be assessing the differences between doing this work in the winter vs summer.

Second Stop: Road side at Kilometre 3
Working in the extreme snow events over Christmas was very difficult and the site had to shut down. Coming back in January during the cold snap was much more productive.

Winter work leaves more fine fuel <2.5cm (branch breakage) on the ground that requires raking. The fuel specialist determined that once the fine fuel is macerated on top of the snow it meets the prescription objectives, or at least within one season because a fire will still be driven out of the crown, and the fine fuels rot within 1-2 years. Grinding on top of the snow left debris concentrations at grinding locations and delayed snow melt. The spacing trials experimental sites were left as controls, but the sludge trial was abandoned.

Tree scarring was discussed and FWAC was of the opinion that a more concerted effort should be made to reduce tree damage (barking). Scarring was lower when operating in the winter. It didn't happen during the tree falling but happened when two machines with brush rakes were added and they bumped into trees more. Forest Manager expects <5% mortality in the future. Scarring may open trees to more potential for infection and rot but defect contributes to future wildlife or as coarse woody debris.

114 hectares are planned to be thinned and this phase treated 34.5 hectares 100-150 metres on both sides of the road. Riparian zones were not treated for 20m on either side because they have a heavy deciduous component, but thinning within 25m of the road is required.

Operator can leave up to 5 piles per hectare as long as they are further than 15m from the road or back boundary.

Project financials could break even if CCF didn't have to pay stumpage. They are recovering ~200m3/hectare, similar to the Wedge project. Clean up costs and debris disposal are extra. The ditches will be cleared out and cleaned up.

Third Stop: Valley View Lookout
The Highline and Farside trails were affected here. Farside section by the road was treated and will be rebuilt by RMOW and Highline may be re-routed at the top by RMOW. WORCA will fix Far Out and Flashback and repair HIHI.

During spring break up, road use turned the road to mud so very coarse material was added to build up the road.

The work opened up views to Crater Rim/Loggers Lake. The parking area below the look-out needs to be cleaned up. The CCF or RMOW should consider replacing the Valley View look out

sign. Additional manual thinning, pruning or tree removal is needed and is anticipated to improve interpretation and view scape.

Monitoring should be undertaken by the RMOW and CCF to know if the work is meeting its wildfire mitigation objectives. Monitoring is key to knowing if work is effective and how to adapt.

Discussion regarding length of time needed for crown closure to re-occur and berry growth to take place. Thinning will lead to increased sun and increased tree growth which will store more carbon.

Discussion about how the thinning may affect pathogen transmission and spread as a result of tree scarring.

Fourth Stop – Whistler Interpretive Forest History Sign (on Loggers Lake road)
Cheakamus Crossing Phase II property line ends at the parking lot below the steep hill. Employee housing is eventually proposed up to the parking lot.

BC Hydro maintains the FSR as access to its tower on Black Tusk. The BC Hydro line will go subsurface through the Cheakamus Crossing Phase II property and is being considered for the rest of the way as well.

The steep hill past the parking lot is a problem to maintain. FWAC made suggestions to black top the hill.

CCF is pursuing industrial access to the Basalt Valley area of Cheakamus Valley via the FSR through the quarry. It is proposing to leave Loggers Lake Road as recreational access only resulting in a clear separation of recreational and industrial traffic.

FWAC previously raised concerns about further fragmenting the landscape by building additional road in Basalt valley but only 150m of new road needs to be built to connect existing old road system.

RSTBC Recreation Officer noted that changing access changes peoples' use patterns, especially if a loop is created. Access through the quarry is not likely to be open to the public so no loop would be created but be cognizant of unintended consequences of access changes. The development of Cheakamus Crossing Phase II will make Loggers Lake and trails even busier, therefore a plan needs to be created to appropriately develop and maintain access to the lake area.

Fifth Stop – Upper End of Proposed Basalt Valley Road

Viewed stand that was planted in 1975 that the CCF Forest Manager suggested would be harvested to help pay for the new road. FWAC commented that the stand should not be harvested as it was younger than the 100 year rotation that would be compatible with maximizing carbon capture and fostering stand level biodiversity as per the CCF Silviculture Strategy. FWAC also suggested that perhaps the proposed road be treated as a capital investment rather than being treated as an operational expense financed from current revenue.

Appendix C – Wildfire Fuel Management

Fuel Management Objectives

The objectives of the prescriptions are to:

- Reduce fire risk to residences, infrastructure and forest ecosystems by reducing ignition potential and fire behaviour within the Wildland Urban Interface upland forests;
- Demonstrate the principles and practices of FireSmart and vegetation management to community members and the public;
- Improve natural barriers that reduce the continuity of fuel loads and wildfire risk;
- Retain the natural character of the forest; and provide for ecosystem restoration and enhancement potential;
- Minimize negative impacts to, and where possible enhance, the many values of the treated stand, including recreation, public safety, aquatic and wildlife habitat, and privacy.

Fuel Management Strategies

The fuel management objectives will be achieved using the following strategies:

- Maximize retention of dominant and codominant canopy trees to maintain a cool, moist, and dark understorey microclimate;
- Thin from below (i.e. smallest trees first) to reduce ladder fuels and crown bulk density;
- Reduce crown continuity to a target of 40% crown closure to reduce the risk of crown fire spread;
- Prune retained trees to a minimum height of 2m or maximum 60% tree height to reduce ladder fuels and risk of crown fire
- Remove ladder fuels on mature trees to prevent candling;
- Reduce fine surface fuel loading and flammable understorey vegetation to reduce the risk and behaviour of surface fire;
- Retain and encourage deciduous tree species and shrubs to reduce fire behaviour and provide wildlife habitat; and
- Minimize the creation of surface fuel by chipping of treatment slash, and pile burning where feasible;
- Rehabilitate disturbed areas upon project completion