

CANFOR LOGGING PLAN FOR WEST TROPHIES: PUBLIC MEETING 8 OF 9

CANFOR'S PROPOSED LOGGING IN UPPER CLEARWATER

(Briefing notes for meeting on 29 August 2016)

Upper Clearwater Referral Group
24 August 2016

Note: The following briefing notes have been prepared by the Upper Clearwater Referral Group in support of a meeting on 29 August 2016 with Kamloops Forest Service District Manager Racheal Pollard concerning Canfor's cutting plans for Upper Clearwater with reference to the Upper Clearwater Guiding Principles. For convenience these notes have been largely adapted from existing sources, including: (1) minutes of the Referral Group's meetings with Canfor between 29 July 2015 and 16 June 2016, (2) Forest Practices Board Investigation 14031: *Local Planning Commitments and Logging near Wells Gray Park*, and (3) letters to former District Manager Rick Sommer by geologist Cathie Hickson (28 May 2014) and lawyer Ethan Krindle (1 October 2015). Sources available upon request: trevor.goward@botany.ubc.ca.

I: INTRODUCTION

Later this year Canadian Forest Products (Canfor) intends to initiate industrial-scale logging on the western and eastern slopes of the Clearwater Valley north from Spahats Creek to Moul (Grouse) Creek. This area – hereafter referred to as “Upper Clearwater” – is subject to a prior land-use agreement, negotiated in the 1990s between local residents and the BC Forest Service.

The *Upper Clearwater Guiding Principles* document constitutes a Local Land-Use Plan under the 1995 Kamloops Land and Resource Management Plan. Signed into effect in November 1999 by District Manager Jim Munn, the Guiding Principles were intended to strike a lasting balance in Upper Clearwater between forestry interests and the interests of other user groups. In the words of Mr. Munn: *I believe that ... we have achieved a new level of understanding and trust in each other as individuals, businesses and government agents entrusted with the task of finding and implementing solutions to a broad range of sometimes seemingly conflicting values. I believe that with the guiding principles, there is a balance with which we can all live.*

The Guiding Principles stipulated that cutting proposals would henceforth be reviewed by a designated ‘Referral Group’ made up of local residents. The Referral Group would be tasked with soliciting input from valley residents and, based on this, would make recommendations to the District Manager, who in turn would decide if the cutting proposal should be approved. At the time the Guiding Principles were enacted, the District Manager had the authority to make that decision. However, in 2004 the BC government introduced the Forest and Range Practices Act (FRPA), which effectively removed the District Manager's decision-making authority in the

harvest approval process. Under FRPA, the District Manager has limited ability to withhold a cutting permit or road permit based on input from a third party such as the Referral Group.

During the transition to FRPA the Forest Service neglected to establish the Guiding Principles as formal government objectives. Because the Guiding Principles therefore have no legal standing under FRPA, neither Canfor nor BCTS makes reference to them in their forest stewardship plans. This situation has created a grey area of considerable ambiguity. On the one hand it is clear that Canfor under FRPA has the *legal right* to conduct business as usual within its cutting area. On the other hand, it is also the case that the residents of Upper Clearwater have a *moral right* to expect the BC Forest Service to uphold its part of the agreement.

II: THE UPPER CLEARWATER GUIDING PRINCIPLES

The Guiding Principles document represents the outcome of a formal, government-sponsored, years-long consensus-based public planning process between the residents of Upper Clearwater and the BC Forest Service. The stated objective of this planning process was to "...consult and come to agreement on Forest Stewardship Plans for the Upper Clearwater Valley, north of Spahats Creek". This public planning process was initiated in response to strong opposition by local residents to the proposed establishment of two woodlots here under the BC Forest Service's Woodlot programme.

The Guiding Principles document recognizes seven distinct "Plan Areas" on the eastern slopes of the Upper Clearwater. To broadly summarize, the residents of Upper Clearwater granted social license for the establishment of woodlots within two of these Plan Areas, in exchange for assurance that other interests would be protected in the other five. The Guiding Principles set out specific interests and principles to be followed when considering new logging activities within each Plan Area, as well as general principles applicable to all Plan Areas. In most of the Plan Areas, it was understood that only very limited salvage logging was to be permitted in future, an understanding echoed by District Manager James Munn in his May 1999 letter to the participants in the public planning process.

The largest of the Plan Areas is "Area G," defined as the western slopes of the Trophy Mountains north from Spahats Creek to Moul/Grouse Creek. It is within Area G that Canfor now proposes to undertake industrial-scale clearcut logging. Further logging is also proposed for the western slopes of the valley, also broadly within the purview of the Guiding Principles.

The Referral Group takes the position that the Guiding Principles represent more than just a set of forestry guidelines. During the negotiation process, valley residents were encouraged to expect a meaningful voice in forestry decisions affecting their valley. In effect, the Guiding Principles are a commitment by the Forest Service to work collaboratively with local residents. Because there has lately been some skepticism on this point, it seems fair to invoke the following thought experiment: *Given our endorsement of two unwanted woodlots covering more than 1000 ha of crown land, and given more than two years of intense negotiation by us, surely it's reasonable to expect that valley residents were promised something meaningful in return.* What valley residents were promised, in fact, was a meaningful voice in future forestry decisions affecting Upper Clearwater.

The following passages are taken from the Guiding Principles and to some extent capture the spirit and intent that suffused our collaborative negotiations with the BC Forest Service:

The guiding principles presented in this document are the work of a dedicated group of individuals who have met regularly ... to discuss issues around appropriate stewardship of land and resources in the Upper Clearwater Valley north of Spahats Creek. The Kamloops Land and Resource Management Plan identified the Upper Clearwater as a General Resource Management Zone and the Upper Clearwater process was initiated to ensure that any resource development activities in the area were carried out in consideration of the interests and values of local residents.

As part of the process, residents of the valley provided statements of interest outlining their values and concerns. Residents also worked hard to gather and map information about resources in the valley, including information about wildlife habitat, land ownership, commercial uses and values, human uses and values and features of geographical and geological interest. This combined information provided the foundation for a set of guiding principles for land and resource use.

These guiding principles were arrived at through an interest-based and consensus-based process. While not everyone agreed wholeheartedly with all aspects of the guiding principles, participants made a consensus agreement to live with the direction shown in this document in the greater interest of all.

The following guiding principles apply to all seven Plan Areas (emphasis added):

- *Maintain the **integrity and habitat quality of all wildlife habitat.***
- ***Minimize the disruption of wildlife movement within known movement corridors, especially in relation to adjacent portions of Wells Gray Park.***
- *Ensure the integrity and habitat quality of wetland areas is maintained.*
- *The right of the public use of all plan areas for purposes of **recreation on and enjoyment of Crown land must be respected, encouraged and not infringed upon.** Activities such as hiking, wildlife observation, hunting, fishing, skiing, snowshoeing, berry picking and associated activities are recognized as legitimate and appropriate uses of Crown land. All other uses of Crown land must respect the importance of public recreation.*

The following guiding principles apply to specifically to Plan Area G (emphasis added):

- ***Water quality and quantity are critical issues.** Numerous water licences, both domestic and for irrigation, are held in this area. Maintain water quality, quantity and timing of flow of the following creeks within their natural range of variability: Case Creek, Shook Brook, Fage Creek, Ordschig Creek, Duncan Creek and Byrd Creek. Ensure that any planned activities (e.g., timber harvest, road or trail construction) are preceded by a hydrological study to **ensure that water quality, quantity and flow are maintained.***
- ***Retain stands of oldgrowth timber in the plan area where these are identified.***
- ***Maintain visual quality from Spahats Picnic Area and Green Mountain.***

- *Any activities that occur within Plan Area G must be assessed for their impact on environmental quality, with particular emphasis on soil stability and water quality.*

III: REFERRAL GROUP/CANFOR INFORMATION EXCHANGE

Beginning in July 2015, the Referral Group entered into a formal information exchange process with representatives from Canfor and the BC Forest Service. The primary objective of this exercise was to communicate and review concerns of valley residents. Early in the process, each of the three parties outlined its goals for this process as follows:

Referral Group: *From the perspective of the Referral Group there are really two processes. One is short-term and relates to Canfor's immediate plans; that's what we're here to talk about. But the other is long-term and recognizes the Referral Group's need not to have to repeat this long and arduous consultation every five or ten years. When in 2000 local residents agreed to the creation of woodlots in Upper Clearwater, we expected that the Guiding Principles would be respected. But that's not what happened. When the BC government moved to FRPA in 2004, the Guiding Principles weren't grandfathered in like the Kamloops LRMP. ... This is the only reason we're caught in the present bind with Canfor – a process that has cost us four years of further sustained effort. This can't go on. Quite apart from the short-term process we're engaged in, we need to find some sort of long-term resolution to this situation – one that recognizes the balance achieved through the Guiding Principles 15 years ago, a balance based on cooperation and trust.*

Canfor: *First and foremost our objectives are to develop long-lasting, professional relationship with everybody here in the room. Otherwise, we're not going to be able to get any wood off the hillside, which is probably our second objective.*

Forest Service: *In the short term, the district is fully committed to seeing this process succeed and I'll do what I can to help make that happen. In the long term, I heard loud and clear that the Referral Group doesn't want to go through this again, in five years or in ten years. I will continue to work towards finding a solution towards that from the government perspective. It's not an easy flip-the-switch type of solution to locking down areas, but I think as long as we look like we can be innovative and try to work toward the short term objectives it will help towards finding a longer term solution.*

IV: CONCERNS RAISED WITH CANFOR

The primary objective of the Information Exchange meetings was to raise and discuss with Canfor and the BC Forest Service various concerns around Canfor's plans to log in the Clearwater Valley, with special reference to Area G. A total of 18 such concerns were raised and discussed over the course of our meetings. The concerns are mentioned (but not always adequately addressed) in the sections indicated. "GP" indicates direct linkage to the Guiding Principles:

- (1) the requirement to avoid negative impacts on streamflow and water quality affecting property owners located below Canfor's proposed clearcuts (GP; Section V);

- (2) the cumulative negative impact of industrial-scale logging in proximity to Wells Gray's declining Mountain Caribou (GP; Section VI; see especially Appendix 2);
- (3) the importance of maintaining forest structure in topographic localities conducive to heavy hair lichen production – again for Mountain Caribou (see Appendix 2);
- (4) the requirement to maintain known wildlife travel corridors and the importance of ensuring that post-logging leave strips are sufficiently broad to maintain existing wildlife travel corridors, e.g., in the face of windthrow along the margins of clearcuts (GP; Section VI);
- (5) the importance of recognizing that local tourism is grounded in wilderness, with a premium on untouched landscapes readily disrupted by industrial logging (Section VII);
- (6) the importance of placing logging activities out of sight of trail access to prominent existing and proposed tourist features (GP);
- (7) the importance of ensuring that future logging does not detract from key features of government-supported initiatives, i.e., (1) the Buck Hill Regional Park Proposal (proposed by the TNRD); (2) the UNESCO GeoPark (supported by BC government, now spearheaded by the TNRD); and (3) and World Heritage Proposals (earlier supported by BC government: Section XV);
- (8) the need to avoid logging in locales where competition from regenerating brush (Alder) could create problems for conifer regeneration and, again, wildlife travel;
- (9) the strict need to avoid herbicides use anywhere within Area G;
- (10) the critical need to ensure the post-logging stability of soil and, in the case of volcanic substrates, hyaloclastite deposits (GP);
- (11) the requirement to avoid logging oldgrowth forests (GP);
- (12) the requirement to undertake only salvage logging in Area G (GP);
- (13) the requirement to avoid creating visually disruptive clearcuts in sensitive areas visible from Spahats Picnic Areas (the “Million Dollar View”) and the Green Mountain Lookout tower (GP);
- (14) the requirement to sustain Canfor's public commitment not to overturn landscape objectives set through public planning processes without full public consultation and support (see Section XIII);
- (15) the requirement to sustain Canfor's public commitment not to impact parks or areas that provide critical habitat for species at risk (see Section XIII);
- (16) the possibility of lost infrastructure and revenue in the case of Roland Neave who in 2002 installed a micro-hydro reservoir on Shook Brook, historically a very stable stream. The Neaves sell excess electricity to BC Hydro.
- (17) the question of what happens from a legal perspective in the event of downstream damage to private property traceable to logging by Canfor; that is, whether it's possible to name Canfor and/or Canfor's hydrologist in a law suit. (see Section V).
- (18) Canfor's questionable use of professional reliance (see Section XII)

V: CANFOR'S RESPONSE TO HYDROLOGICAL CONCERNS

HISTORY OF LOGGING & HYDROLOGICAL PROBELMS

Oldgrowth forests are well known to absorb, retain and slowly release considerable quantities of snowmelt and rainwater, effectively acting to stabilize streamflow. Originally the upper portions of most creeks on the western slopes of the Trophy Mountains traversed oldgrowth. This changed, however, between the late 1970s and the early 1990s, when nearly half of the

oldgrowth forests here were removed by industrial-scale clearcut logging. Perhaps not surprisingly, the loss of so much old forest – about 1400 ha (3200 acres) – in such a short period appears to have triggered numerous adverse downstream consequences (see below).

For convenience, the clearcuts can be divided into two areas of development. The more southerly of these occupies about 700 ha (1600 acres) and consists of a single clearcut (“Big Bertha”) located south of Third Canyon Creek. The main impacts of Canfor’s proposed cutblocks in this area pertain mainly to known wildlife travel corridors and the viability of proposals to have Wells Gray and area designated as a UNESCO Geopark on the one hand and a World Heritage Site on the other hand; see Section XV below. The second area of development consists of about a dozen clearcuts located north of Third Canyon Creek, again with a total area of about 700 ha (1600 acres). It is to these latter clearcuts that attention is given here.

The first downstream hydrological impact of logging occurred in 1981, when clearcuts developed by Clearwater Timber Projects above the Hansen place adversely affected their water supply. Complaints were registered, but little was done to alleviate the situation.

About a decade later, in May 1992, logging in what is now Area G caused water to back up above one of the haul roads. When the ‘dam’ finally broke, a greatly swollen Fage Creek washed out the Clearwater Valley Road and at the same time destroyed a water intake system long used by George and Judy Briggs as a water source for irrigating their hayfields. Numerous letters of complaint were subsequently written to the Forest Service who, while admitting poor logging practices, and promising on several occasions to undertake remedial action, did little or nothing about this situation for several years. Even now, more than two decades later, Fage Creek generally stops running in late summer, whereas prior to logging it used to run all year round. At a meeting on 26 February 2016, Canfor’s hydrologist expressed surprise at how little work had been done to rectify the situation “at a time when there was a huge FRBC budget”.

Logging on the Trophies is also implicated in several other washouts along the Clearwater Valley Road. The first of these occurred on 11 July 1997 when a prolonged rain event caused a much-swollen First Canyon Creek to wash out its culvert. The same event caused the culvert at Second Canyon Creek to shift downhill, resulting in expensive repair. In July 1999 another summer rain event caused Spahats Creek to tear out its bridge, while two years later, in July 2001, yet another prolonged summer rain caused Grouse Creek to do the same. At a conservative estimate, the total cost for repairs is in the order of about \$6 million dollars. This was paid by taxpayers not by the forest company responsible.

MEETING WITH CANFOR’S HYDROLOGIST

At a meeting with Canfor’s hydrologist on 26 February 2016, the Referral Group related the hydrological issues outlined above. In response, the hydrologist emphasized that forestry has come a long way since the 1990s. He described his approach as “conservative,” being based on ground surveys, consultation with terrain specialists, and analysis of past streamflow based on old aerial photos. According to his research in Area G, only a single “channelized event” occurred (on Fage Creek) subsequent to the great stand-replacing wildfire of 1926. Based on this, he concluded that most of the streams here are fairly resilient to disturbance.

These assurances notwithstanding, it needs to be mentioned that only the lower and mid portions of these drainages actually burned in 1926. As already stated, the upper portions escaped the fire and, as oldgrowth, subsequently conferred a considerable buffering effect on stream flow. The fact, however, that approximately half of these mid-elevation oldgrowth stands has recently been removed by clearcut logging strongly suggests that at least some of their former buffering effect has also now been lost. To varying degrees, this leaves property owners living below these clearcuts vulnerable to the downstream effects of any future stand-replacing fire that might sweep across these slopes. It is the Referral Group's position that the five northern cutblocks proposed by Canfor – 125, 160, 157, 113, 120 and 111 – can only exacerbate this situation.

Without wishing to be critical, we must note that Canfor's hydrologist has a disturbingly weak grasp on local weather dynamics and especially on the implications of deepening climate change. After four years of working in the Clearwater Valley, he was still of the opinion that flood events here are generally associated with spring runoff, whereas in fact historic floods have nearly all been triggered by prolonged summer rain – quite another situation. Moreover, he professed to believe that the current trend to somewhat wetter climatic conditions in inland southern British Columbia is likely to result in lower risk of wildfire – a view that flies in the face of recent and on-going experience. Global warming is above all a transition to more *extreme* weather, i.e., to increasingly frequent extreme precipitation events punctuated by periods of record-breaking prolonged drought. The predicted trend to a wetter climate, if it occurs, will be discernible only at the scale of decades; while on the other hand the risk of wildfire varies more or less on a year-by-year basis. Looking ahead, valley residents should expect more frequent wildfires, certainly not less. At the same time we should also expect more frequent flood events. Clearly we are entering a period when resource management scenarios based on past weather events is no longer acceptable, the more so in steep mountainous terrain as in Upper Clearwater.

In summary, the Referral Group was not persuaded that Canfor's hydrologist has begun to grapple with the implications of deepening climate change. His practice of using past stream behaviour as an indicator of future stream behaviour can no longer be justified. Putting aside the question whether his approach is or is not "conservative," the fact remains that the downstream effects of industrial-scale cutblocks logged today will play out over a multi-decadal period of increasingly extreme weather. Were the proposed cutblocks planned for watersheds not previously affected by extensive logging, the situation would be different. As things stand, however, Area G has already been "heavily impacted" by logging. The resulting clearcuts will not regain full water retention capacity for many decades. In the mean time, adding five additional cutblocks to the northern portion of Area G can only exacerbate what can already be seen as a long-term experiment in risk management that began with excessive logging in the 1980s and 1990s. In the judgement of the Referral Group, this would not be in keeping with the terms or the intent of the Guiding Principles.

Whether further logging on the slopes above the Clearwater Valley Road will or will not lead to hydrological problems for downstream property owners is a question that unfortunately cannot be answered until the logging has taken place – and even then perhaps not for many decades thereafter. For practical purposes, however, the question may be moot insofar the BC Forest Service, Canfor, and Canfor's hydrologist have all made it clear to the Referral Group that

establishing direct causation between downstream flood damage and upstream management decisions is, for legal purposes, by no means straightforward. The Referral Group was led to understand that only the most flagrant disregard for proper road construction and culvert layout would likely lead to legal redress. No assurance was given that any downstream impacts resulting from the *cumulative effects* of clearcut logging would be actionable.

VI: CANFOR'S RESPONSE TO WILDLIFE CONCERNS

Wells Gray Park is home to a threatened population of Southern Mountain Caribou. The population declined sharply in the early 20th century after extensive wildfires destroyed much of the caribou habitat, a fact that may have contributed to the decision, in 1939, to establish Wells Gray Park. Certainly the long-term viability of this region's Mountain Caribou was a major factor in the decision, in the 1950s, to extend the park southward to include Battle and Table Mountains, and then again the 1990s, to encompass major portions of the Trophy Mountains.

The caribou population slowly recovered until the early 1990s, but then began to decline again. The decline is widely attributed to extensive logging around the perimeter of the park, especially in the west and southwest. In 2002 the Southern Mountain caribou population was listed as "threatened" under the federal *Species At Risk Act*.

Many residents of Upper Clearwater are concerned that industrial-scale logging in this area will negatively impact this threatened population even if the caribou never enter Plan Area G. This is because logging of mature forests creates early seral conditions favoured by moose and deer. This can lead to an increase in the population of these prey species, in turn causing an increase in the wolf populations that prey upon them. These same wolves may then re-enter Wells Gray Park and prey opportunistically upon the caribou. The Recovery Strategy for Southern Mountain caribou identifies this sort of increased predation due to nearby industrial activities (including logging) as the single most significant and immediate threat facing Southern Mountain caribou.

ccc Curiously, Canfor's response to this situation was to engage an owl expert to advise on block design. The Referral Group was unable to find any evidence that the consultant in question had any prior experience with Mountain Caribou. The Referral Group was highly critical of the resulting layout of the proposed cutblocks, which are generally too narrow to provide adequate travel corridors firm against windthrow.

A more detailed summary of local Mountain Caribou ecology appears in Appendix 2. Excerpted from an unpublished manuscript by Referral Group member Trevor Goward, this account is **not for general circulation**, but is included here to assist land-use managers in their deliberations concerning cutting proposals near Wells Gray Park.

VII: CANFOR'S RESPONSE TO TOURISM CONCERNS

Valley residents have repeatedly expressed concern about the potential negative impacts of Canfor's logging proposal on local tourism and recreation. Clearwater and Upper Clearwater have established themselves as a "gateway" to the internationally famous Wells Gray Provincial Park. Many tourists begin their stay locally and then proceed to the Park through the connecting

wilderness. The Park plays an important role in the local economy – in 2011, Clearwater hosted more than half a million visitors from around the world. 15% of the local population is employed or involved in the hospitality industry, which is estimated to bring in over \$20M per year in community revenue. It is clear that the Crown lands that connect Clearwater and Upper Clearwater with the Park, especially including the area north of Spahats Creek, make a significant and sustainable contribution to the local economy.

Within this context, it is important to assess Canfor's logging proposal for its potential to negatively impact public recreation that relies on this "wilderness buffer" as a connection between Clearwater and Wells Gray Park. As noted in the *Guiding Principles*, "The right of the public to use all plan areas for purposes of recreation on and enjoyment of Crown land must be respected, encouraged and not infringed upon... All other uses of Crown land must respect the importance of public recreation."

Canfor's response to these concerns has mostly been to generate computer images of the proposed cut blocks and attempt to convince the Referral Group that these concerns are thereby taken care of. Quite apart from the inadequacy of the images, this approach doesn't meaningfully engage with the issue, which pertains to visual quality as experienced by tourists seeking a 'wilderness' experience.

VIII: CANFOR'S PROPOSED CUTBLOCKS

Canfor's 2016 logging proposal for the west slopes of the Trophy Mountains (Area G) consists of 11 cutblocks totaling 425 ha (1050 acres), denoted as cross-hatching on the accompanying map; see Appendix 1. The adjacent grey areas are existing cutblocks logged between 1978 and the early 1990s. Future ('deferred') cutblocks appear as speckled areas. During the Information Exchange meetings, Canfor assured the Referral Group that logging is unlikely to take place on the steep west-facing slopes above the Clearwater Valley Road – an assurance, however, in conflict with Canfor's 2012 cutblock map, which showed five numbered cutblocks here. In any event, Canfor openly and repeatedly acknowledged that the cutblocks shown in Appendix 1 and summarized in the following table represent only one in a series of passes; that it will periodically return for more timber in years to come.

These cutblocks are in conflict with the Guiding Principles on three points:

1. Taken together, they contribute significantly to the volume of timber removed adjacent to Wells Gray Park, and hence can only be detrimental to the park's declining Mountain Caribou herds; see Section VII, and especially Appendix 2.
2. Six (seven?) of them qualify as 'oldgrowth', whereas the Guiding Principles specifically state that oldgrowth in the Plan Areas should be left standing. Again, this has potential negative ramifications for the eventual reestablishment of the Mountain Caribou.
3. Only salvage logging is endorsed by the Guiding Principles, whereas most of the cutblocks clearly do not qualify as salvage. According to Canfor's hydrologist, only cutblock 125 is justifiable as salvage; though in our final [!] information exchange meeting on 16 June 2016, Canfor disputes this, asserting that cutblocks 113, 121 and 160 also qualify as salvage. Upon investigation, the Referral Group acknowledges that *portions* of these cutblocks have 69%, 60% and 59% pine respectively [Stefan Borge

pers. comm. 5 July 2016], but nonetheless feels these percentages do not hold for the cutblocks as a whole; the hydrologist’s assessment seems more accurate to us.

CANFOR’S PROPOSED CUTBLOCKS IN AREA G, ARRANGED N TO S (SEE MAP) (BASED ON INFORMATION PROVIDED BY CANFOR’S HYDROLOGIST; CUT DATES SUBJECT TO CHANGE)				
Code (T)	Area (ha)	Status	Cut Date	Notes from Canfor’s hydrologist
125	44.1	young	2016-2017	the only block justifiable as “salvage” “fairly low risk” (but see discussion above)
160	9.1	young	2016-2017	“moderate risk” (but see discussion above)
157	23.8	old	2016-2017	“moderate risk”
147	???	old	unknown	“moderate or high risk” DEFERRED
167	???	old	unknown	“moderate or high risk” DEFERRED
113	137	young	2016-2017	further work needed (see discussion above)
120	16.3	old?	2016-2017	“low concerns”
111	11.1	old	2016-2017	“issues that need to be resolved”
158	???	old	unknown	“DEFERRED”
159	???	old	unknown	“DEFERRED”
121	32.2	young	2016	“no concern” (but see discussion above)
106	47.7	young	2016	“isn’t going to affect anything”
122	26.4	young	2016	“isn’t going to affect anything”
123	37.6	young	2016	“isn’t going to affect anything”
161	???	young	unknown	“DEFERRED”
115	39.6	young w vets	2016	“low risk”

IX: PUBLIC INPUT

The first meeting between Canfor and the Referral Group to discuss Canfor's intention to conduct industrial-scale logging in the Clearwater Valley north of Spahats Creek took place on 28 January 2012. Subsequent to that meeting the Referral Group held three information meetings with valley residents – one in 2012 and two in 2014 – seeking input on this issue. At all three meetings valley residents overwhelmingly opposed extensive logging here and insisted that the terms and intent of the Guiding Principles should be respected. The first and second of these meetings resulted in letters being sent to the BC Forest Service District Manager, while the third prompted a letter to Canfor asking for a moratorium on logging. To the best of the Referral Group's knowledge, none of these letters elicited a response.

In July 2015, the Referral Group was invited by Canfor and the BC Forest Service to enter into a formal information exchange process intended to communicate and review the concerns of valley residents. A precondition of this process was agreement by all parties to respect the terms and spirit of the Guiding Principles. After five meetings, the Referral Group agreed to bring Canfor's plans forward to valley residents at an open public meeting on 27 May 2016. The meeting was attended by 35 valley residents who after being informed of our deliberations were asked to vote (yes or no) on the following proposition: *Canfor's logging plans respect the intent of the Upper Clearwater Guiding Principles.*

The vote was conducted by ballot with 30 votes received. The voters were unanimous that Canfor's logging plans do *not* respect the Upper Clearwater Guiding Principles. Subsequent e-mail voting by valley residents unable to attend the public meeting brought the total *no* votes to 44, with still no *yes* votes. In total, 53 households were contacted, 29 of which contributed at least one vote. Five households actively abstained from voting, while 19 households did not respond. Thus it can be stated categorically that the residents of Upper Clearwater are overwhelmingly opposed to Canfor's industrial scale cutting plans. Note, however, that this is by no means to say that valley residents are unanimously opposed to logging *per se*, that is, so long as the terms and spirit of the Guiding Principles are respected.

The Referral Group communicated the results of the vote to Canfor and the Forest Service at a final information exchange meeting held on 16 June 2016. In response Canfor insisted that its plans respect the Guiding Principles and announced its intention to proceed with a permit application following an open house in Clearwater. After lengthy discussion it was (reluctantly) decided to forego the dispute resolution process outlined in the Guiding Principles and turn the final decision over to the District Manager.

X: UNRESOLVED CONCERNS

The following discussion taken from the minutes of the final information exchange meeting on 16 June 2016 captures some of the unresolved concerns and tensions around Canfor's proposed cutblocks:

Referral Group 1: *So what's Canfor's response to the unanimous vote by valley residents that your logging plans don't respect the intent of the Guiding Principles?*

Canfor: *Our response to the vote is that we feel that we are following the intent of the Guiding Principles. We've done it with our actions. I'm looking at the key points that were drafted by some of the people in this room. The first bullet was to consider interests of local people. I think we've been doing that since the first meeting and now with the meeting you had with Upper Clearwater residents. We're listening, we're deleting cutblocks that have visual impact, we're reconfiguring other blocks and using a different harvesting system. Another point was to manage for wildlife species. We hired a biologist who recommended that we maintain travel corridors for caribou in the ESSF zone. We feel we can harvest some timber while at the same time respecting the Guiding Principles.*

ccc Referral Group 1: *The caribou biologist you hired is an owl expert. As we've discussed, her proposed corridors are too narrow and will blow down. As for harvesting some timber, it was never the intent of the Guiding Principles that 500 hectares of forestland would be logged in a single pass*

Canfor: *The Guiding Principles don't include any specs on block size and volume.*

Referral Group 2: *That's because the Guiding Principles are meant to be **guiding** principles, not **guidelines**. The document expresses a definite intent, but doesn't contain specifics, nor was it meant to. We knew at the time that trying to include specifics like the ones you're asking for simply wasn't appropriate in such a document.*

Referral Group 1: *The Guiding Principles were negotiated in an atmosphere of trust. Nobody at the time thought it necessary to bring the document to a lawyer to check the wording. Its intent was clear to everybody involved. The residents of Upper Clearwater have no trouble grasping its intent; and in their judgment, Canfor's plans simply don't meet that intent. Over the past year the Referral Group has shared various concerns of valley residents. In response Canfor made small adjustments here and there, but not in a way that respects the intent of the Guiding Principles. If this were a first pass, then perhaps valley residents could accept some of Canfor's proposed cutblocks north of Buck Hill. However, this isn't the first pass. According to former District Manager Jim Munn, Area G has already been 'heavily impacted'. Now Canfor wants to create even more industrial-scale clearcuts – notwithstanding that further logging is certain to adversely affect Wells Gray's dwindling Mountain Caribou, and notwithstanding the deepening downstream concerns imposed by climate change ccc. Worse, you intend to proceed on the recommendations of a caribou biologist who's really an owl expert, and a hydrologist for whom the profound implications of climate change simply don't register. None of this is what we signed up for when we negotiated the Guiding Principles. It's as though the Guiding Principles didn't exist.*

Referral Group 3: *One of the most important concerns emphasized by the Guiding Principles is water quality. Yet when people look at Canfor's proposed cutblocks, it's hard to see what distinguishes them from the earlier cutblocks that caused so much grief. Throughout this process it was Canfor's responsibility to share information about their future harvesting plans so that the people who are downstream have an understanding of what Canfor plans to do that is different from what was done in the past. That hasn't*

happened. Canfor needs to explain why this large clearcut won't have the same disastrous hydrological effects that the earlier large clearcuts did. This was Canfor's chance to explain how and why the harvesting of the future was not going to cause the problems of the past. That is all people need to hear. That is the dialogue that prevents contention. It hasn't occurred.

Referral Group 1: *... Canfor's determination to proceed with cutting plans unanimously opposed by valley residents makes a mockery of its CEO's much touted pledge not to support actions that overturn landscape objectives set through public planning.*

Canfor: *We feel we have revised the plan significantly from Dave Dobi's original plan and have removed block W106. With block T115 along the park road, we are going to be looking at more of a patch cut so it will be less intrusive. And finally, the old plans called for lots of road development at T113. If we put the roads in then we will have issues there. We are looking at redesigning the lower portion of the block.*

XI: CANFOR VIS-A-VIS THE GUIDING PRINCIPLES

Canfor has publicly said it will respect the Guiding Principles and has also stated publicly, through the local media, that “we have been working with the public through the Upper Clearwater Referral Group to design our harvesting activities in a way that is respectful of the Guiding Principles for forestry as they apply to this area” and, “there is no reason a sustainable forest sector, a healthy environment and a world-class tourism industry can't coexist.”

The Referral Group entered into discussion with Canfor and the Forest Service in the hope that Canfor might see its way to doing things differently in the Clearwater Valley than other companies have done in the past. Early in the process, we suggested that a final test of Canfor's respect for the Guiding Principles would be the extent to which the resulting proposed clearcuts did or did not resemble ‘business as usual’. We submit that the cutblocks shown in Appendix 1 look like business as usual. While it is true that Canfor has to some extent attempted to adjust its plans in response to concerns raised, the resulting adjustments are clearly not within the terms or expectations of the Guiding Principles. By just about any metric, Canfor's proposed clearcuts for the Clearwater Valley look much like industrial cutblocks elsewhere.

The Referral Group feels that the sort of forestry that should be happening in a valley where non-forestry values predominate is the sort of forestry that sooner or later will have to happen everywhere. Sooner or later companies like Canfor will need to work *with* communities rather than *against* them. The Referral Group is disappointed that we sat around the table for the better part of a year and still can't assure our neighbours their water will not be impacted by the proposed clearcuts. The way Canfor wants to proceed is the way big logging companies have always proceeded: a few tweaks to the cutblock and everything's fine. Except that everything isn't fine. The situation we now face is precisely the situation the Referral Group has been trying to avoid throughout our deliberations, and which the Guiding Principles were designed to obviate: gridlock and escalating resistance. Depending on what the District Manager decides, Canfor may get its permit to log but unfortunately that is unlikely to be the end of the matter.

Quite apart from any of this, it has to be said that Canfor's determination to push forward with its cutting plans in the Clearwater Valley in contempt of the unanimous position of valley residents has put the Referral Group in an awkward position with respect to our neighbours; and to this extent Canfor's actions diminishes the authority of the Guiding Principles. Having taken pains to assure valley residents that Canfor actually does respect the Guiding Principles – a commitment that formed the basis of our deliberations – we now find ourselves having to reconcile its decision to utterly ignore the consensus view of valley residents. In short, we've been made to look like fools in the eyes of neighbours many of whom warned us that such an outcome was inevitable.

Furthermore, we were frankly appalled to learn during our final meeting on 16 June 2016 that Canfor had already begun constructing haul roads on the west side of the valley. Should it prove to be the case that Canfor's application for permits for road construction and logging were made subsequent to its first meeting with us on 29 July 2015, then we are forced to the conclusion that we have been dealt with all along us in bad faith. In that case, Canfor stands doubly guilty of betraying our entire engagement process – and again of making fools of us. This is simply no way to treat citizens who abide by the socially acceptable avenues of public discourse.

In a recent article in the North Thompson Times, it came to light that Canfor expects to secure 20% to 25% of its annual cut from the Clearwater Valley – this being the answer to a question the Referral Group posed early on (How much?), but which Canfor's representatives refused to disclose. And no wonder. How it is possible equate this level of logging with respect for the Guiding Principles is frankly beyond understanding.

The question the Referral Group's deliberations with Canfor was meant to address had nothing to do with Canfor's legal right to log – that was a given – but rather with its moral commitment to an agreement four years in place prior to the switch-over to FRPA. Unfortunately, Canfor in the end chose instead to negotiate entirely from its legal advantage. The final proof of this, again, is its steadfast decision to move forward with cutting plans unanimously opposed by valley residents.

XII: CANFOR'S USE OF PROFESSIONAL RELIANCE

A cornerstone of Forest and Range Practices Act is its emphasis on professional reliance. In the case of Canfor's proposed cutting plans, this emphasis is highly problematic and in effect runs contrary to the intent of the FRPA.

As already mentioned, Canfor's approach to ensure its cutblocks do not adversely affect Wells Gray's declining Mountain Caribou was to engage a consultant known for her work on Flammulated Owls. A Google search of this consultant's name and company yielded no links to Caribou, raising the question of why she was selected. Surely it goes without saying that professional reliance works only if the consultants engaged are professional workers endorsed by their peers. At the very least one would expect Canfor to have engaged a published authority on Mountain Caribou. Had this been done, the criticism levelled by the Referral Group at Canfor's cutblock design and layout might have had less purchase. Above and beyond all of this, it should be noted that the Guiding Principles state explicitly that oldgrowth is not to be cut in Area G.

Canfor's hydrologist, while on the surface more reputable, nonetheless refuses to meaningfully take account of global climate change in his harvest prescriptions. This is in marked contrast, for example, to Canada's structural engineers, who have lately begun to design buildings and bridges specifically to withstand more extreme weather events. Yet what is true of engineers is also true of hydrologists: the effects of decisions made today will be felt many decades into the future. Especially in steep terrain, prescriptions made today must engage with projected increasingly extreme weather events. Making matters worse, the Referral Group was unable to satisfy itself that valley residents adversely impacted, for example, by Canfor's cutblock 113 could depend on legal redress. The argument could always be made that any damage to property or water resulted from the cumulative effects of prior logging.

Finally, the Referral Group is disturbed by the refusal of Canfor to allow its terrain report to be vetted by highly regarded terrain specialists closely informed on the implications of working in volcanic settings. Again, this seems unprofessional.

Given the disastrous impacts of past logging in Upper Clearwater, Canfor's brand of so-called professional reliance is understandably not very reassuring to valley residents who will have to live with any downstream effects of its proposed cutblocks. Surely this is not outcome intended by FRPA.

XIII: CANFOR'S SOCIAL LICENSE

It seems clear that the right to engage in resource extraction on public lands must come with certain responsibilities to the landbase as to society at large, call a social license. It also seems clear that Canfor's CEO Don Kayne understands this. In July 2012 (that is, subsequent to the Referral Group's first meeting with Canfor concerning its cutting plans, which took place on 28 January of that year), he very publicly summarized the terms of his company's social license in the following terms:

- 1. Canfor does not support actions that would overturn landscape objectives set through public planning processes unless there is full public consultation and support.*
- 2. We will not support actions that impact parks, riparian areas or areas that provide critical habitat for species at risk, or other important environmental values such as biodiversity and old growth.*
- 3. We will not support actions that put us at odds with obligations of our registered professional foresters to uphold the public trust by managing forests sustainably.*
- 4. And we will not support actions that jeopardize our third-party forest certification, and risk access to domestic and international markets.*

It is the view of the Referral Group that Canfor's proposed cutting plans in the Clearwater Valley stand in direct opposition to its social license as expressed in Statements 1 and 2, above. Statement 1 is clearly relevant to the Guiding Principles document - itself the end-product of a multi-year formal public planning process. Nor can the unanimous local opposition to Canfor's plans in any way be construed as "full public consultation and support". With regard to Statement 2, it is worth emphasizing that Wells Gray's Mountain Caribou are currently in

precipitous decline, with a loss of about 75% of the herd since 2002. Given that past clearcut logging in the vicinity of Wells Gray is widely accepted as the ultimate cause of this decline, it follows that Canfor's planned cutblocks are likely to jeopardize its caribou in even further – again hardly in keeping with Canfor's stated commitment to environmental values. Finally, statements 3 and 4 seem to us to call into question Canfor's relation to sustainable forestry as a whole – statement 3 at the level of the Association of BC Forest Professionals, and statement 4 in terms of Canfor's various third-party certifications, i.e., CSA Z809, ISO 14001 and PEFC. Canfor appears to be leaving itself open to considerable criticism at both levels.

XIV: GOVERNMENT COMMITMENT TO THE GUIDING PRINCIPLES

The Guiding Principles document was signed into effect by District Manager Jim Munn in 1999, but has subsequently been given short shrift by most of his successors. Evidence for this statement is easy to advance.

On at least four occasions, the Forest Service has quietly disregarded the terms of the Guiding Principles:

1. In about 2006, it approved a permit for mining interests to log the south slope of Buck Hill without first passing this by the Referral Group
2. Around the same time, it approved a so-called pine salvage permit south of Grouse Creek, with the full knowledge that the target species was birch, not pine.
3. In 2014, B.C. Timber Sales awarded a permit to log the west slopes of the valley – again without taking reasonable efforts to involve the Referral Group.
4. In 2015, it approved applications by Canfor to establish and log a number of cutblocks (two or three, we believe) on the west side of the Clearwater Valley – this at a time when the Referral Group was in discussion with Canfor and the Forest Service concerning future logging activity in the Clearwater Valley.

On three other occasions, the Forest Service *actively* betrayed its commitment to the Guiding Principles.

1. In about 2002, it deleted the southern portion of plan area C. According to woodlot owner Larry Colbourne, the deletion was meant to accommodate a northward expansion of his woodlot. Ultimately, Mr. Colbourne recognized this as a betrayal of the Guiding Principles agreement (of which he was an active participant) and opted not to apply for expansion.
2. Around the same time, it deleted the entire southern half of Area G, presumably to allow Canfor to conduct salvage logging south of Third Canyon Creek without local input. Fortunately, District Managers Garth Wiggill and later Rick Sommer duly reinstated the deleted plan areas once the Referral Group had brought them to their attention.
3. In 2004, during the BC government's transition to the Forest Range and Practices Act (FRPA), the Kamloops LRMP was 'grandfathered' into the new regulations, though the Guiding Principles, which were an offshoot of the LRMP, were simply set aside. Here it can be noted that the two government employees who initiated and ultimately guided the

Guiding Principles were still working in the Clearwater District office. Clearly it was their responsibility to ensure that the Guiding Principles were not overlooked during this process; and yet apparently they did not. From this has followed four years of struggle and turmoil between Canfor, the Forest Service and the residents of Upper Clearwater.

Given the history outlined above, it would hardly be surprising if the Guiding Principles issue ultimately escalates far beyond the ability of either Canfor or the Forest Service to contain it. Note that we are now entering precisely the kind of situation the Guiding Principles document was negotiated to circumvent. The resulting loss of trust and cooperation and general good will among the parties involved is much to be lamented.

XV: RECENT DEVELOPMENTS

On 8 August 2016, i.e., subsequent to the Referral Group's final meeting with Canfor, Canada's Environment Minister Catherine McKenna issued a press release inviting Canadians to nominate candidate areas for future consideration as UNESCO World Heritage Sites:

<http://www.pc.gc.ca/eng/progs/spm-whs/sec06.aspx> . World Heritage Sites are internationally recognized places of cultural or natural significance formally preserved for future generations, sometimes through financial assistance or expert advice. According to the press release, successful nominations to be placed on Canada's tentative list will be announced in 2017 – “in honour of the 150th anniversary of Confederation”.

This invitation is the first such call out in more than a decade and provides a long-awaited opportunity to nominate Wells Gray Park for this honour – a proposal that first came to public attention in 2008 and received widespread support, notably by the Thompson Nicola Regional District (TNRD) and then-premier Gordon Campbell. The first group to formally take up the initiative was Tourism Wells Gray, which in 2011 funded a study comparing the pros and cons of applying for UNESCO World Heritage Site status versus UNESCO Global Geopark. This study attracted the attention of the Thompson-Okanagan Tourism Association (TOTA), which opted to apply for Geopark status. For political and economic reasons, the area proposed for this designation was expanded beyond Wells Gray Park to include communities along the North Thompson River corridor extending from Valemont in the north to Sun Peaks in the south.

In 2012, an informal group called the Wells Gray World Heritage Committee (WGWHC) formed to advance the interests of both proposals: the Geopark proposal in the short term, and the World Heritage proposal in the longer term. More recently, in July of this year, the TNRD announced that it will move forward with an updated scoping study. Dr. Catherine Hickson, a well-known geologist with considerable experience in the region, is supporting this initiative by convening a group of geological experts to help in creating the supporting geoscience information needed to move this Geopark initiative forward. Meanwhile, the newly constituted Wells Gray Wilderness Society (WGWS) has lately agreed to work with WGWHC to secure World Heritage Site status for Wells Gray Park; and later this year it will respond to Minister McKenna's invitation by formally nominating the park for this honour.

The WGWS nomination will be consistent with the TNRD's Geopark initiative but will focus on the park and adjacent portions of the Clearwater Valley. In so doing, it will seek to encourage

land-use decisions concordant with Wells Gray's wilderness and other values, and will promote the integration of those values into the social and economic fabric of nearby communities.

Consistent with these objectives, WGWHC strongly opposes industrial-scale logging in the Clearwater Valley, and has since its inception been critical of Canfor's plans – in the conviction that logging the valley at this time neither constitutes sound resource management, nor does it advance the medium- and long-term interests of the local economy. Minister McKenna's invitation offers a welcome opportunity for WGWHC to move beyond its public dispute with Canfor (see <http://www.wellsgrayworldheritage.ca/>) and work with WGWS to garner international recognition for our region, with emphasis on the wilderness values preserved in Wells Gray.

A defining element of the World Heritage Site and Geopark proposals is the region's volcanic story which in fact extends southward beyond the park's boundaries to Spahats Creek as well as to the town of Clearwater itself. Critical to the success of both proposals is appropriate resource management in four areas:

1. Within the viewscape looking north from the picnic area north of Spahats Falls (the 'million dollar view), especially including the western slopes of the Clearwater Valley.
2. The turnoff to the Trophy Mountains (block 115).
3. The Three Canyon Creeks area east of the park road and west of road 10 on Sheep Track Bench (blocks 106, 122 and 123).
4. Buck Hill, a key component of the Wells Gray volcanic story and since 2008 a candidate regional park under the TNRD (block 121).

While it might be feasible to log significant portions of Canfor's proposed cutblocks 106, 121, 122 and 123 without compromising these proposals, to date Canfor has signalled no real commitment to safeguard the pertinent viewsapes. Nor has it committed to ensure that existing game trails in the Three Canyon Creeks and Buck Hill areas will be excluded from logging – notwithstanding the repeated concern for the maintenance of wildlife corridors expressed in the Guiding Principles. Here it can be noted that existing game trails in the World Heritage Site scenario would provide critical points of access to for key volcanic features.

To its credit, Canfor has lately withdrawn a proposed cutblock on the western slopes of the Clearwater Valley within the viewscape west of Spahats Falls; but while this gesture is surely a welcome concession to the region's tourism economy, in fact it has little impact on the integrity of the valley's volcanic story, hence has no real bearing on either the World Heritage Site or Geopark proposals.

XVI: THE LONG VIEW

The Referral Group takes the position that the Clearwater Valley would greatly benefit from a long-term land-use plan consistent with the values and uses that define it – as gateway to Wells Gray Provincial Park, as a growing contributor to the local economy, as a key feature in the upcoming proposal to inscribe Wells Gray as a World Heritage Site, and as a wildland buffer helping to secure a future for the Mountain Caribou. Without a clear understanding and

agreement over long-term plans for land use in the valley, any negotiations and agreements reached at the present time are at best stop-gap and for that reason will inevitably need to be revisited again and again. This is clearly not the intention of the Guiding Principles, nor indeed does it respect the cooperation, trust and years of hard work that went into negotiating them.

APPENDICES

APPENDIX 1: CANFOR'S 2016 PROPOSED CUTBLOCKS (PLAN AREA G ONLY)

APPENDIX 2: MOUNTAIN CARIBOU ECOLOGY (WITH SPECIAL REFERENCE TO CANFOR'S CUTTING PLANS FOR UPPER CLEARWATER), BY TREVOR GOWARD

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In 2014, The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) published an updated status report on the Mountain Caribou, now divided into three populations, i.e., the northern, the central and the southern populations. Because these animals are virtually restricted to southern intermontane B.C., they must be seen as a uniquely Canadian responsibility. Here are some salient points concerning the southern population of the Mountain Caribou, with special reference to Wells Gray Park and adjacent areas:

- The southern population of the Mountain Caribou is formally classified by COSEWIC as endangered.
- Throughout its range the southern Mountain Caribou has declined 45% over the past three generations or 27 years, and 40% over the past 18 years.
- The Mountain Caribou alone of all ungulates passes the winter months primarily at subalpine and alpine elevations, where the snowpack can exceed two metres in depth and where terrestrial forage is buried out of reach.
- The southern Mountain Caribou is the most southerly reindeer in the world and the only one that relies on tree-dwelling hair lichens, especially *Bryoria*, as its primary winter food.
- Critical to understanding the winter ecology of the Mountain Caribou is their on-going need for ready access to hair lichens in amounts sufficient to offset the energy expenditure required for foraging in deep snow.
- In this connection, it is important to understand that tree-dwelling hair lichens are generally sparse in young regenerating stands.
- Only in oldgrowth forests older than about 120 to 150 years do they become sufficiently abundant, at least at landscape scale, to support Mountain Caribou (see below).
- As a rule, the heaviest hair lichen loadings occur in upper elevation oldgrowth forests.
- This partly explains the requirement of Mountain Caribou for vast tracts of oldgrowth Engelmann Spruce – Subalpine Fir (ESSF) forests. Having access to vast tracts of ESSF also enables the Mountain Caribou to spatially segregate from its main predator, locally the wolf.
- While the Mountain Caribou spends most of each winter in the ESSF, it nonetheless often migrates to lower elevations in early winter.
- Many caribou biologists believe that this annual migration to lower elevations can be explained by difficult travel conditions in the ESSF in times of deep, unconsolidated snow; but a more likely explanation is that caribou are forced down in early winter by an general inability to access copious hair lichens. In this view, caribou need a snow platform deep enough to elevate them to within foraging reach of hair lichens (see below).
- In support of this latter view, early winter migrations are much less pronounced in portions of the range subject to low snowpacks than in areas having deep winter snowpacks (i.e., owing to the inability of hair lichens to withstand prolonged burial by snow; see below).
- In winters when the snow platform is slow to develop, or when hair lichens otherwise remain out of foraging reach until later in the winter (see below), caribou may be forced

to lower elevations for extended periods of time. For convenience, these may be termed 'winters of forage deficiency'.

- During winters of extreme Forage Deficiency, Mountain Caribou are critically dependent on access to extensive tracts of lichen-rich oldgrowth forests at lower elevations in the Interior Cedar-Hemlock (ICH). Here they depend especially on hair lichens throughfall from higher in the canopy. The margins of wetlands also provide important habitat.
- In the past such winters have been relatively rare, the most recent one having occurred immediately following the La Niña year 1999-2000. During that winter, 2000-2001, the Mountain Caribou appears to experience a major dieback in southern British Columbia.
- Owing to on-going industrial-scale clearcut logging in the ICH, most of the lichen-rich oldgrowth forests formerly available to Mountain Caribou in winters of extreme Forage Deficiency no longer exist.
- A direct outcome of this situation is that the next Plan B winter is likely to trigger a major die-back of the southern Mountain Caribou, with a high probability that some herds will disappear altogether.
- Should such a die-back/die-off occur, it will be directly traceable to the B.C. government's Mountain Caribou's Recovery Implementation Plan, which in 2007 set aside 2.2 million ha of oldgrowth forest in the ESSF, but virtually none in the ICH.
- The take-home lesson from this event is that the long-term well-being of the southern Mountain Caribou is causally linked to the existence of extensive oldgrowth stands in both the ESSF *and* the ICH. In short, the Mountain Caribou can be seen as an emergent property of the intact Inland Rainforest prior to fragmentation by resource extraction.
- Finally it should be noted that the caribou die-back phenomenon described here operates outside the predator-prey narrative which for nearly two decades has preoccupied most if not all of B.C.'s caribou biologists.

Against this backdrop, I will now explain why Wells Gray must sooner or later become the final reserve for the southern Mountain Caribou: their last stand. I'm doing this so that Canfor may place its proposed cutting plans into proper perspective.

During the 19th century, the Clearwater River drainage – which would eventually become Wells Gray Park – supported large numbers of Mountain Caribou, perhaps as many as 700 animals. This changed, however, in the first decades of the 20th century when wildfire destroyed about 90,000 ha of forests here. The largest of these wildfires swept the valley in 1926, resulting in the loss of about 50,000 ha – most of it at ICH elevations and much of it oldgrowth. The loss of so much old forest was devastating to Mountain Caribou: first, presumably, because it greatly diminished the availability of contiguous low-elevation oldgrowth forests previously used by them in winters of Forage Deficiency; and second because regenerating burns favour deer and moose, which in turn support greater numbers of predators, here especially wolves, with resulting increased depredation on Mountain Caribou.

By 1935, the Mountain Caribou population in what is now Wells Gray had collapsed – a fact that appears to have contributed, in 1939, to a decision by the B.C. government to establish Wells Gray Provincial Park. Since then, the B.C. government has extended Wells Gray northward as Cariboo Mountains Provincial Park, which links northward to Bowron Lakes Park, and creates a Columbia Mountains counterpart the Rocky Mountain Parks – dedicated, in the former case to

the preservation of the Mountain Caribou. The government also twice extended Wells Gray southward in order to capture yet more prime wintering habitat for the Mountain Caribou: first in the 1950 to encompass Battle Mountain, and later in the 1990s to take in the Trophy Mountains – all justified in large part by the need for winter habitat for Mountain Caribou. Thus it can be said that three different governments over a period of more than half a century have seen fit to set aside land out of concern for the long-term well-being of Mountain Caribou.

From the 50s onwards, Wells Gray's Mountain Caribou gradually recovered until their numbers were sufficient to justify a limited entry hunt in the park beginning in the late 70s. By the late 90s, however, the caribou once again went into decline. Since 2002, Wells Gray has lost 75% of its caribou, that is, down from 325 to about 80. The decline in the last decade alone has been 60%, i.e., from 224 in 2006 to 80 now.

During this same period, Wells Gray's Mountain Caribou have abandoned their prime winter habitat in the southern portions of the park – the same areas added to it in the 50s and 90s – and retreated to less optimal winter ranges in the rugged Cariboo Mountains farther north (though some still winter in areas of more moderate relief outside the park's boundaries to the east and the west). The most important factor contributing to this shift in habitat use is increased predation by wolves whose numbers have lately been bolstered by intense logging just outside the park. A simple GoogleEarth fly-over of Wells Gray confirms that the park is now an island of wilderness in a sea of clearcuts. As mentioned, these clearcuts and young regenerating forests support robust populations of deer and moose, which in turn support the robust wolf populations that now secondarily predate on Wells Gray's Mountain Caribou. In essence this is a partial repeat of the situation in the early 20th century, except that the causal agent now is no longer wildfire but “sustainable” forest management.

On a more positive note, the 90,000 ha of forestlands that burned in the Clearwater Valley nearly a century ago no longer support many moose and deer. Instead they are now acquiring some of the attributes of oldgrowth: open stand structure, trees of various ages, copious dead standing and fallen wood, and – not least - heavy hair lichen loadings. Elsewhere in the range of the southern Mountain Caribou, the oldgrowth forests they depend on are being fragmented beyond any ability to support them. Only in Wells Gray, so far as I know, is the outlook actually improving for them. While it is true that most of the regenerating forests, which are situated in the ICH and lower portions of the ESSF, are not traditionally seen as important to Mountain Caribou, there is now good reason to revise this perspective, especially in light of the tragic failure of the provincial government's 2007 Recovery Implementation Plan, with its nearly exclusive focus on high-elevation ESSF set-asides. As I have tried to show above, large tracts of low-elevation oldgrowth forest are integral to the long-term maintenance of healthy of Mountain Caribou. First because they provide alternate habitat in winters when hair lichens are not readily available at upper forested elevations. And second, though I have not yet emphasized this point, because oldgrowth stands do not support robust populations of deer and moose, hence act as a ‘buffer’ against enhanced wolf populations, with resultant less intense predation.

Given that Mountain Caribou are declining across most of their range, it seems fair to say that land use decisions now being made by industry and government in and adjacent to Wells Gray will determine whether these iconic animals persist in the long term, or whether they continue to blink out one herd at a time. So here's the question: If the forest industry, Canfor in this case,

doesn't think it was necessary to respect the existential needs of Wells Gray's Mountain Caribou in Wells Gray, which will likely soon become the final stronghold of an endangered species that everyone knows is struggling, then where else would Canfor live up to this commitment front and centre in its social contract? If the answer is nowhere, then this is a problem that I suspect will come back to haunt Canfor.

It follows from these considerations that industrial-scale logging in the vicinity of existing herds of Mountain Caribou should be strongly discouraged - and nowhere more so than in the Clearwater Valley.

A few years ago, the province's leading caribou biologists met in Wells Gray to discuss the plight of the Mountain Caribou. **They indicated that government policy called for a graduated approach to caribou management: (1) No further logging should take place in areas critically important to Mountain Caribou; (2) If refraining from logging doesn't stabilize the population, then moose hunting and deer hunting should be liberalized; and (3) If that still doesn't work, then and only then should consideration be given to wolf sterilization programmes and such. They emphasize that this third step should be a final step, not a first or second step.**

I have spent many years studying hair lichens and have many publications concerning their taxonomy, ecology, biology, identification. I will now provide a brief introduction to the ecology of the three hair lichen species that constitute the exclusive winter forage of Mountain Caribou. I will attempt to show that management decisions made without a clear understanding of hair lichen ecology are unlikely to promote the long-term well being of these animals. As mentioned earlier, most caribou biologists focus on predator-prey relationships to the near exclusion of the equally complex relationship between caribou and the hair lichens that sustain them during the winter months.

Now it is well established that moderate loadings of hair lichens aren't sufficient to sustain wintering Mountain Caribou. To offset energy expenditure, they need sustained access to hair lichens in copious amounts. Such hair lichen loadings develop only under a narrow set of conditions.

First, hair lichens do not thrive on the foliated portions of conifer branches. Only on the defoliated portions of branches do they attain high biomass. The defoliated branches, moreover, must be exposed to frequent drying winds if they are to support heavy loadings of hair lichens. For both these reasons young trees support scanty hair lichens: first because they consist mostly of foliated branches; and second because whatever defoliated branches they have are usually on the inside of the canopy, where they are sheltered from ventilation by the outer foliated branches. As the tree ages, however, the proportion of defoliated branches to foliated branches increases. Only at about 120 to 150 years do trees in the ESSF have sufficient proportion of wind-exposed dead branches to support heavy loadings of hair lichens - and even then such loadings tend to be heaviest in the middle in the upper canopy, where winds are stronger. A somewhat similar pattern can be seen also in the ICH, which is why the 90,000 ha of forestlands now transitioning to oldgrowth status in the wake of fires that burned a century ago are so critically important to the (still declining) Mountain Caribou.

Unfortunately this transition to oldgrowth status is necessarily a slow process. We shouldn't expect a real improvement in the caribou's situation for another 30 to 50 years. Again, this raises the question: if Canfor insists through its logging plans on placing even further stress on the 80 Mountain Caribou remaining in Wells Gray, then one has to ask where Canfor would be willing take its social contract with respect to endangered species seriously. This is a question I'll return to later.

Second, hair lichens do not survive prolonged burial within the winter snowpack. Because winter snow in the ESSF usually accumulated to depths of between 2 and 3 m, hair lichens often form a distinct lower trimline marking the settled depth of the snowpack; below this trimline they are poorly developed or absent.

Let's say the lower hair lichen trimline occurs about 2 m above the ground. Because caribou forage comfortably to a height of about 1.7 m, they in this case need a settled snowpack of about 30 or 40 cm in order to forage freely. The settled snowpack thus provides them with a foraging platform.

In winters with exceptionally deep snows, the lower hair lichen trimline retreats upward owing to die-off. For example, the snowpack in the southern Columbia Mountains during the winter of 1999-2000 was about 1 m deeper than normal, which caused the trimline to rise by about that much, say from 2 m to 3 m above the ground. In succeeding winters, comfortable foraging by caribou in the ESSF had to wait until the snow platform had accumulated to a depth of nearly 2 m. Once elevated, the hair lichen trimline needs about a decade to settle to its 'normal' height above the ground. Until then, winters of low or late snowpack development can be stressful for Mountain Caribou, which must search elsewhere for above-average loadings of hair lichens. Now they depend on litter fall and, to some extent, on trees growing on windblown ridges. In extreme conditions they may be forced to migrate to lower elevations in search of oldgrowth forests, especially near the margins of wetlands.

As we move deeper into climate change, increasingly extreme weather will likely create more of these highly contrastive winters between deep snow and shallow snow. Now that most low-elevation oldgrowth forests have been logged, the Mountain Caribou increasingly faces periods of starvation when it is unable to find hair lichens in sufficient quantity to sustain it. Again, the only place where low-elevation oldgrowth is developing at the present time is in Wells Gray. It is in this context maintaining caribou becomes that important in Wells Gray.

And third, hair lichens do not grow at the same rate throughout their range, even at stand level. Partly this is owing to periodic die-back in marginal sites exposed, for instance, to low ventilation. And part it is a response to variable exposure to mist and fog, which promote rapid growth in these lichens. The optimum sites for heavy hair lichen loadings are the summits of hills, the shoulders of mountains, the edges of wetlands, and other places where cloud and mist often linger. It is for this reason – rapid hair lichen growth – that the escarpment along the western margin of Sheep Track Bench is critical for caribou forced down to middle elevations during winters of elevated hair lichen trimlines. These considerations have obvious implications for the area covered by Canfor's proposed cutblocks 106, 121, 122 and 123.