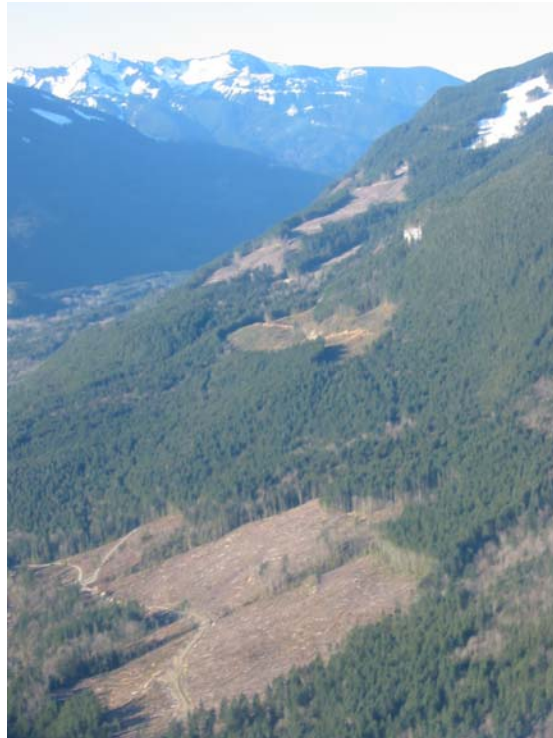




DRAFT Issues & Alternatives Document

FORESTRY and FOREST MANAGEMENT

July 31, 2008



Cutblocks on north side of Chilliwack River, February 2006



Selective harvesting site near Ford Mountain, April 2006

Acknowledgements

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Chilliwack River Watershed Strategy Issues & Alternatives: FORESTRY and FOREST MANAGEMENT

1.0 General Description of the Issue

1.1 Purpose of Report

The purpose of this Forest Management Issues and Alternatives Report of the Chilliwack River Watershed Strategy is not to critique or evaluate forestry policies within the Province of BC. Much literature exists on this subject already, prepared by people qualified to do so. The value of forest harvesting is recognized for local economies and employment, as well as to satisfy continual demand for timber products. Reducing or restricting forestry activities is beyond the jurisdiction of this watershed strategy, and could result in a number of secondary impacts beyond the economic impacts to the watershed, such as making it difficult for local companies to compete with international interests and resulting in more intensive forestry activities in other nearby watersheds.

This watershed strategy is intended instead to help address some of the concerns expressed by the local community about forestry activities within the Chilliwack Valley, particularly as it relates to environmental concerns within the watershed and impacts along ‘community-Crown interface areas’ – those areas where activities that occur on Crown land impact private property and community enjoyment of the land. As with other Issues and Alternatives Reports within this watershed strategy, the focus of the Forest Management section maintains a focus on achieving the community vision prepared as part of public input collected earlier in this planning process. This vision identified a desire to see resource extraction occur in a more sustainable manner. This watershed strategy is hoping to work towards this vision by addressing forestry-related issues that pertain to improving information exchange and stakeholder input, reducing conflicts between forestry and other land values, and ensuring that downstream impacts from logging are minimized, particularly when they can potentially affect identified sensitive or valued sites.

Although forest management encompasses many aspects and activities within the forested regions of the watershed, including forest fire management, recreation, forest health (e.g., bark beetle infestations), etc., this section largely focuses on logging (machine operations and vegetation removal) and road development (for access to stands and transport of machines and timber). Other significant aspects of forest management are either dealt with in other Issues and Alternatives Reports, or are considered beyond the scope of this Watershed Strategy.

Also of note are the significant interconnections between forestry and salmon, representing the need for an ecosystem approach to watershed management and the importance of protecting each component of the natural environment. Not only do forests provide critical habitat, food, and shelter that allow pacific salmon to flourish, but salmon provide critical nutrients to the forests that allow our trees to grow healthy and tall. If one component of this cycle is removed or depleted, the entire process will become

imbalanced and threatened. Therefore, protecting ecosystem *function* is in the best interest of all watershed users, including forest companies, to ensure the long-term health of the Chilliwack River Watershed.

1.2 *History of Forestry in the Chilliwack River Watershed*

First Nations have long utilized forest resources from within the Chilliwack River Watershed. Traditional use of forests include harvesting trees for the construction of dwellings and canoes, and weaving the bark and roots of cedar trees, as well as other trees and plants, into baskets, mats, clothes, nets, ropes, etc. Non-timber forest uses included berry harvesting, mushroom harvesting, collecting other botanical forest products, and, of course, hunting, fishing, or trapping the various wildlife and fish species that rely on forest habitats.

In addition to mining, the Chilliwack River Watershed owes much of its recent development history to the forestry industry, which began in the area in the early 1900s. In the 1920s, railroad logging operations became very efficient at clearing the easily-accessible timber from the valley bottom. The watershed's rich forest fire history also helped shape both the logging industry and landscape of the watershed (Figure 1). A rail accident in 1938, which resulted in a massive fire that destroyed over 30,000 hectares of productive forest from Liumchen Creek to Chilliwack Lake, contributed to changing forestry operations in the region from railroad logging to truck logging in the 1930s.¹ This shift, in concert with most easily-accessible timber in the valley bottom either being burned or previously harvested, lead to logging up into the side drainages of the watershed into the major tributaries, moving higher up the slopes and further back into the watershed, a trend that continues to the current time.²

1.3 *Current Forestry in Chilliwack River Watershed*

Forestry comprises both the dominant land use and the largest economic resource within the Chilliwack River Watershed. The portion of the watershed that is north of the Canada-US border is mostly under Provincial jurisdiction, and comprises the Chilliwack Landscape Unit, located within the Chilliwack Supply Block of the Fraser Timber Supply Area (TSA). Of the approximately 65,000 hectares within the Chilliwack Landscape Unit, 87% is within either the Crown forested land base or the Timber Harvesting Land Base.³ Figure 2 shows the forested land base within the Chilliwack Landscape Unit, as well as primary tenure holders:

- Ch-ihl-kway-uhk Forestry Limited Partnership
- BC Timber Sales
- Probyn Logging
- Northwest Hardwoods/Weyerhaeuser
- Scott Paper

¹ FVRD, 1983

² HayCo, 1992

³ George et al, 2005

- Tamihi Logging
- Walter Bell

The remaining 13% of the land base is either non-Crown land (e.g., private property), non-forested (e.g., alpine, rocks, etc), or non-productive forests. Other environmental or geographic constraints further reducing the amount of harvestable timber within the Chilliwack River Watershed include Parks and Protected Areas, Old Growth Management Areas, and Special Management Zones such as Spotted Owl Management Areas (Figure 3). The headwaters of the Chilliwack River, as well as a number of its tributaries, are located south of the Canada-US border, within the North Cascades National Park, the Mount Baker Wilderness Area, or the Mount Baker-Snoqualmie National Forest. As a result, forestry activities are largely prohibited in much of the headwaters of the Chilliwack River Watershed.

As locally economies slowly shift away from resource dependency, as residential and recreational use of the valley increases, and as significant landscape-level events such as flooding and landslides continue to threaten downstream property and habitat, the concerns about forestry-related impacts within the watershed continue to increase, necessitating the need for discussions and watershed strategies such as CRWS.

1.4 Forestry-Related Watershed Impacts

Although there is a rich history of forestry in the region, and the socio-economic impacts of the industry are significant for both non-First Nations and local First Nations, forestry operations do contribute to significant on-site and downstream impacts throughout the Chilliwack River Watershed. Forestry activities on slopes above sensitive waterways are of particular concern.

Many of the impacts and potential impacts that can have important long-term social and environmental implications include:

- A loss of tree cover and the creation of roads can increase flood frequency and flow, widen channels, lead to erosion and destabilization of stream banks, increase stream temperatures, and result in a loss of large woody debris. All of these activities directly affect fish and fish habitat. For example, high stream temperature can incrementally affect aquatic species composition and survival and sediment deposition impacts survival of salmon eggs and their prey.
- These same factors can affect surface drinking water quality.
- A loss of mature and old growth forests can influence wildlife species that depend on these habitats (e.g., spotted owl, coastal giant salamander).
- The creation of roads and recreational sites through forestry activities has increased access for recreational use of the watershed. If unable to keep up with the demand and use of recreational sites, they can lead to impacts as described in the Illegal Dumping section of the Watershed Strategy, or can conflict with residents and other government agencies.

- Large clear cuts and roads can significantly detract from the visual quality of the watershed, which is of particular concern to residents and businesses that rely on the tourism industry.
- The potential public safety risk associated with increased use of Chilliwack Lake Road by logging trucks.
- Global impacts associated with reduced carbon sequestration from deforestation

Forest management attempts to mitigate watershed impacts through practices such as retaining riparian vegetation and requiring special management techniques for specific areas (e.g., old growth management areas), logging and logging-related activities inevitably results in some impacts on local and downstream watershed conditions. These impacts can be loosely categorized as affecting the immediate vicinity (terrestrial), the stream morphology, or the in-stream conditions (Table 1).

Table 1 Impacts and potential impacts associated with logging and forest road development on the watershed. ⁴

Site of Watershed Impacts	Watershed Impact or Potential Impact from Forestry Activities
Terrestrial (immediate vicinity of logging operations) – of particular note on hillside slopes above sensitive waterways	<ul style="list-style-type: none"> • Habitat disturbances • Increased access and recreation opportunities via forest service roads • Increased snowpack and earlier and more rapid snowmelt • Change in species composition, habitat complexity and diversity • Increased compaction and drying of upper soil layer (erosion and loss of soil/ nutrients) • Reduced water storage potential of forest soil and subsequently, increased water availability for surface runoff and stream flow • Reduced slope stability (loss of root structure, reduced water retention/evapo-transpiration) • Increased number (frequency) and size (volume) of landslides and mass wasting events • Visual quality impacts • Increased blow-down impacts • Loss of other values and usage (e.g., cultural use, recreational use)
Downstream (hydrology and stream morphology)	<ul style="list-style-type: none"> • Changes in Large Woody Debris recruitment • Increased sediment deposition and aggradations • Changes in flow volumes (higher peak flows and flash flooding, lower base flows) • Changes in timing of flows (earlier peak flows) • Increased streambed and bank scour/erosion (thus increased channel width, depth, energy, and velocity) • Increased physical barriers to fish (from inadequate road crossings, debris jams, etc.) • Reduced bank and shelter for fish • Interfering with aquifer integrity, causing creek beds to dry up
In-stream (water quality and chemistry)	<ul style="list-style-type: none"> • Increased turbidity and total suspended sediment (TSS) • Increased dissolved organic carbon levels • Reduced dissolved oxygen (due to organic sedimentation and temperature increases)

⁴ From: Dallaire, 2006; Guthrie, 2002; Jordan, 2006; Matheussen et al, 2000; Millard et al, 2002; Scherer and Pike, 2003; Toews and Hetherington, 2006; Tripp and Poulin, 1992; Wipfli, 2005

	<ul style="list-style-type: none"> • Increased mercury concentrations (bio-availability) • Reduced organic leaf litter inputs and primary and secondary productivity upstream – resulting in downstream reductions in stream invertebrate abundance • Increased water temperature (increased direct sun exposure)
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The Forest Practices Board, BC’s independent forest watchdog group, recently conducted an audit of stream riparian management within the Chilliwack Forest District to see how well the forest practices have been in compliance with legislative requirements.⁵ Although there were concerns associated with sedimentation rates noted at a number of constructed stream crossings, this audit found that harvesting practices did not generally result in adverse impacts to channel beds and banks and that “licensees’ harvest planning and practices reflect effective stream riparian management according to the criteria and indicators employed.” (p8).

Sedimentation and slope failures associated with forestry practices has been a long-time concern within the Chilliwack River Watershed. Sediments can result in a number of adverse impacts on both the physical and biological characteristics of streams, including burying salmon eggs and invertebrates, causing abrasion and damage to sensitive fish gill tissues, and reducing the amount of light available for aquatic plants (therefore less food for fish). A 1975 study⁶ on forest harvesting impacts at high elevations in BC (two of which were located within the Chilliwack River Watershed – at Depot Creek and at Liumchen Creek) found that “the primary causes of soil failure were poor road construction and location. These accounted for over 80% of the failures investigated, either directly, due to cut and fill emplacement, or indirectly, by diverting run-off from natural channels. In terms of the total area disturbed by failures and erosion, 70% was caused by faulty road construction practices.” (p57). Although it has been pointed out that current forest management practices have improved significantly over the last few decades to minimize the impacts on sedimentation and slope failures⁷, the Chilliwack River Watershed is still facing potential issues associated with past logging and forest management practices.

Besides forestry and forest road development, other forest management issues, many of which are discussed in other chapters of the Chilliwack River Watershed Strategy, that can also have significant watershed impacts include:

- Forest fire management and suppression
- Invasive plant species introductions, spread, and management
- Outbreaks of forest pests, including bark beetles
- Visual quality
- Recreation/user conflicts and safety

⁵ Forest Practices Board, 2004

⁶ Utzig and Herring, 1975

⁷ Fried, G., BC Timber Sales. June 24, 2008. pers. comm.

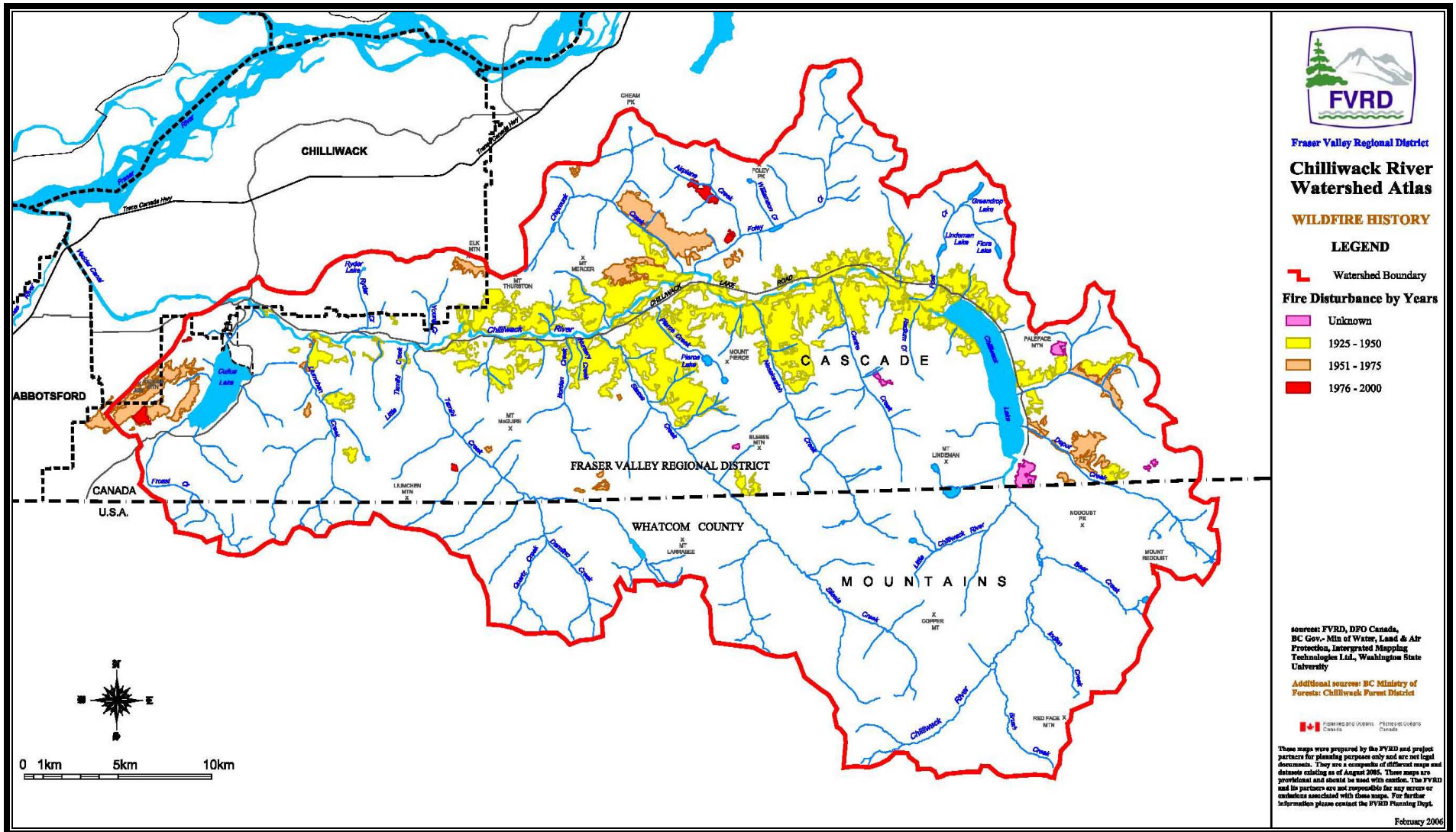


Figure 1 Wildfire history within the Chilliwack River Watershed. A massive wildfire occurred in 1938, destroying over 30,000 hectares of productive forest timber.

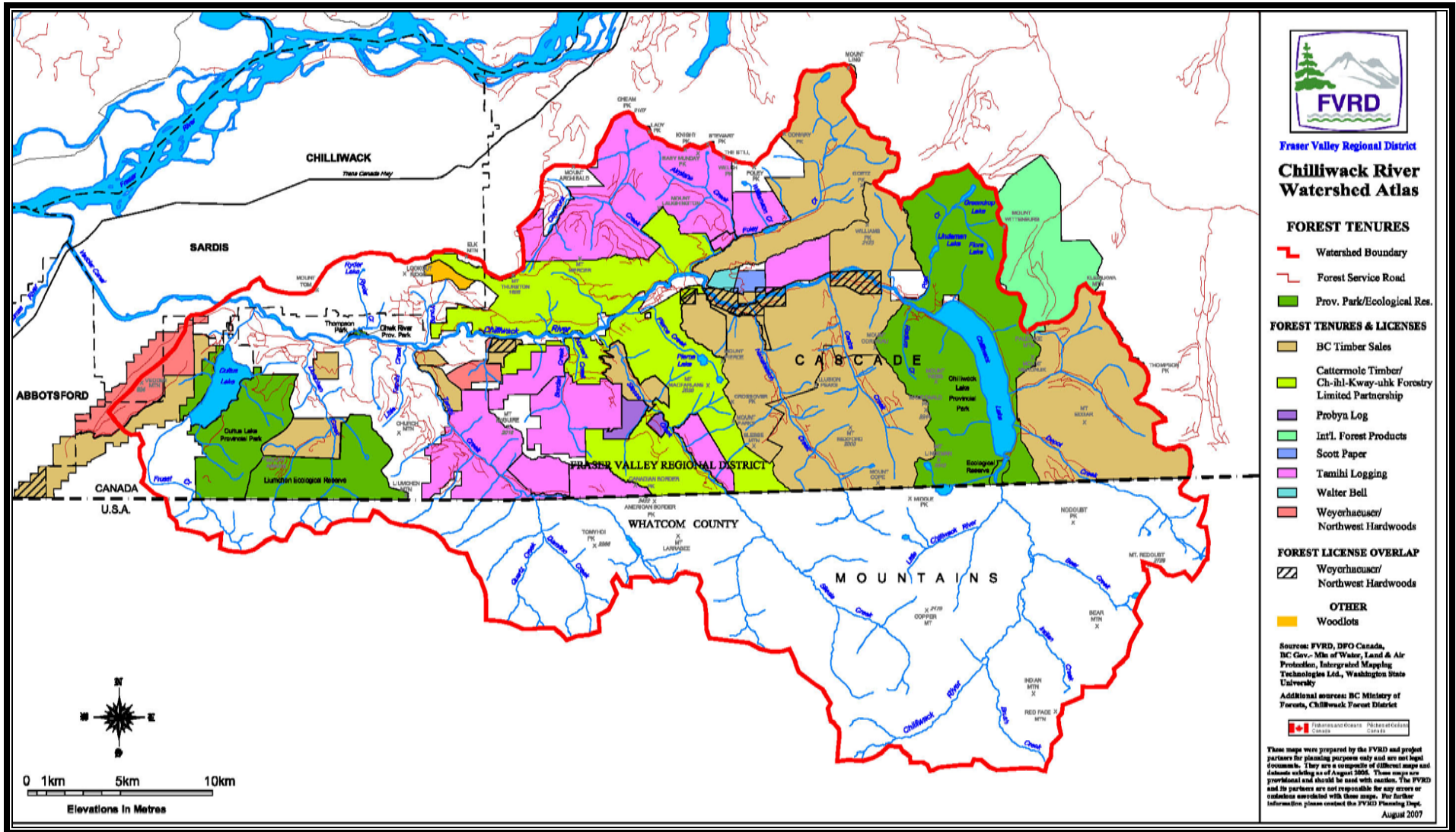


Figure 2 Forestry tenures and licenses and forest service roads within the Chilliwack River Watershed (based on best available current data). Of note is that except for woodlots, logging tenures within the watershed are all currently volume-based (as opposed to area-based tenures). The chart areas assigned to licensees can be adjusted to account for new information and better inventory.

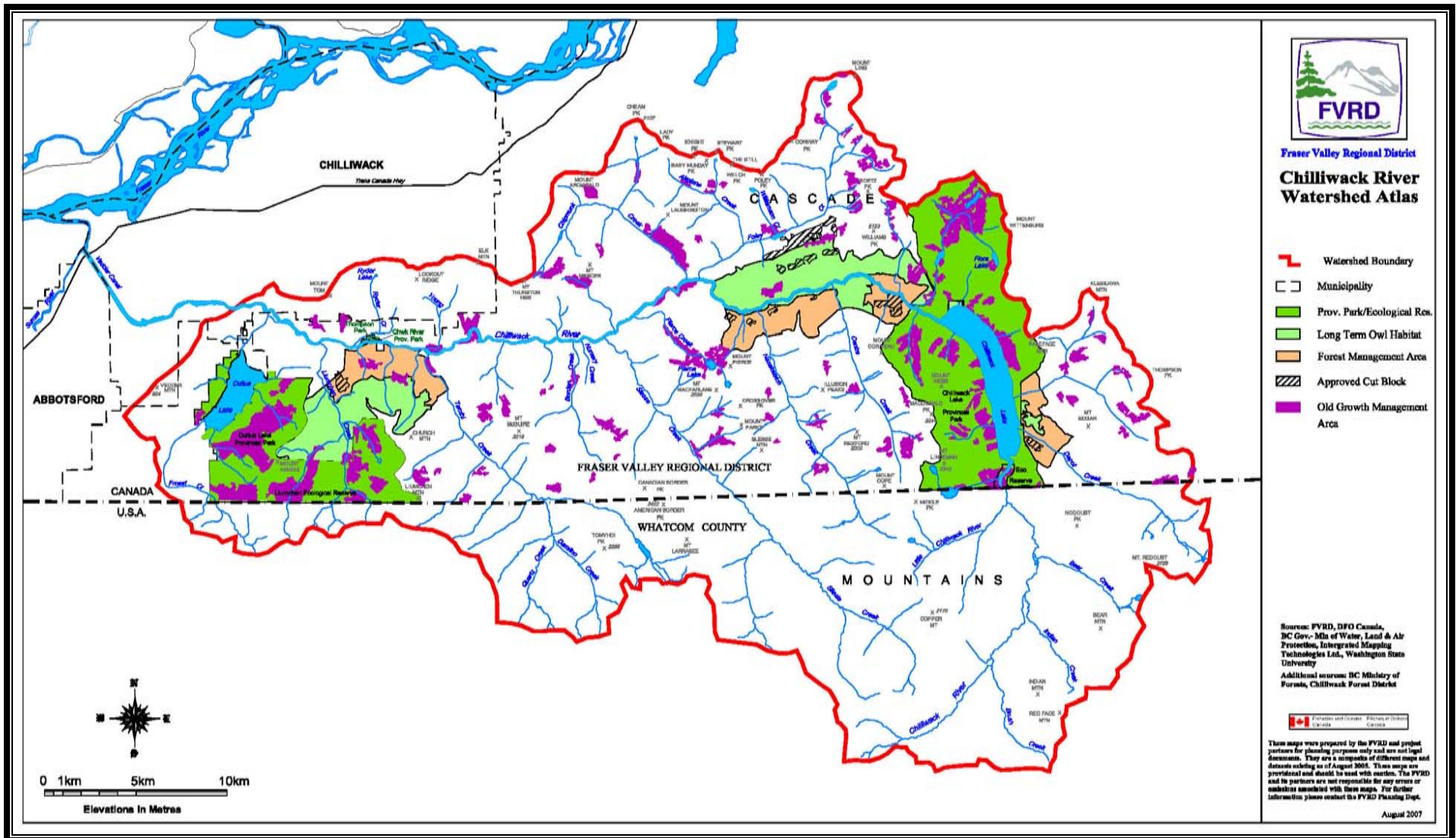


Figure 3 Forestry constraints within the Chilliwack River Watershed (including protected areas, Old Growth Management Areas, Special Management Zones/Spotted Owl Management Areas). Note that Ungulate Winter Range areas (Mountain Goat, Black-tailed Deer, and Mule Deer) are not included on this map as they have yet to be formally approved by Cabinet.

2.0 Specific Examples of Concern

Forestry-related issues and concerns were amongst the most numerous concerns identified during public outreach activities during the start of the Chilliwack River Watershed Strategy process. These concerns identified by the community, as well as those issues identified by project participants throughout the process, were related to the real, perceived, or potential impacts of logging and forest management on:

- Wildlife and habitat (e.g., salmon/riparian habitat, deer and goat winter range, spotted owl habitat, biodiversity)
- Water quality (siltation, water clarity)
- Drinking water protection
- Stream hydrology/water quantity (erosion, runoff, peak flood volumes and frequency)
- Visual quality/aesthetic appeal of the watershed for locals and potential tourists
- Slope stability
- Roads/deactivation/access
- Invasive species (including bark beetles) introduction and spread (see Invasive Species Issues & Alternatives Report)
- Flood, landslide, and erosion potential (see River Hazards Issues & Alternatives Report)
- Cultural/archaeological impacts (see Cultural Resource Management Issues & Alternatives Report)
- Environmental implications of recent policy and legislative changes (shifting to a “results-based code” from Forest Practices Code, Riparian Areas Regulation, etc.).

It is worth noting that the purpose of this watershed strategy is not to evaluate current forestry practices in BC. Nor is it the intent of the strategy to gauge the scientific merit of each watershed concern raised by the community and to separate “fact from fiction”. Whether the concerns raised by the watershed community regarding forest management impacts on the Chilliwack River Watershed are real or perceived, the fact that the concerns exist on such a large scale demonstrates that efforts need to be undertaken to address this issue.

3.0 Contributing Factors/Causes

The high level of current community concern associated with watershed impacts of logging in the Chilliwack River Watershed is most likely attributed to a number of potential factors or causes, including the following:

- Logging continues to be the dominant landuse within the watershed, with highly visible operations and evidence on the landscape.
- Much of the timber in the watershed was destroyed in 1938 and is now approaching harvestable age again.

- Recent watershed events (including various clay slides and flooding of the Chilliwack River in 2006) have heightened public concerns about how upslope forestry impacts (past or present) are potentially impacting their downstream homes or recreational areas.
- Due to the recreational and aesthetic value of the Chilliwack River Watershed, and its proximity to a large urban area with reducing ‘natural’ landscapes, there has been a shift in economic priorities within the watershed from resource extraction to recreation, tourism, and residency. The increased use of backcountry areas for recreational or spiritual purposes contributes to increased exposure to, and concern about, forestry practices in otherwise relatively ‘natural’ locations.
- Raised environmental awareness and education (e.g., climate change, biodiversity, etc.) has resulted in increased concern about land use activities in general.

4.0 Overall Level of Community Concern

Based on the large number of comments received during public outreach activities in December 2005, forestry-related impacts were rated of **very high** concern in the Chilliwack River Watershed by the community.

5.0 Relevant Policies and Strategies

5.1 Forest Management Regulatory and Planning Framework

The BC Ministry of Forests and Range regulate and authorize the location, amount, and objectives of forest operations within the Province. The *Forest and Range Practices Act* (FRPA) is the primary statute outlining the requirements and criteria needed by licensees (see subsequent section on Relevant Jurisdictions and Legislation).

Forestry Planning

Forest Stewardship Plans

Under the *Forest and Range Practices Act* (FRPA) and its regulations, all major tenure holders must prepare a Forest Stewardship Plan (FSP), which must approved by the Province, prior to harvesting activities. The FSP describes the forest development units, the areas within which road building, forest harvesting, and silviculture activities are proposed, and strategies to be implemented in order to achieve the objectives set by the Province. Objectives relate to the preservation and protection of numerous forest values, including soils, visual quality, timber, water, fish, wildlife, biodiversity, recreation, cultural heritage resources, and other potential site-specific objectives such as wildlife habitat areas and old growth management areas. FSPs are not required to show detailed locations of future roads and cutblocks, just general areas.

Public Input and Review: Licensees have the sole responsibility to due proper and adequate consultations for FSPs, including with First Nations. Government (Ministry of Forests and Range) has the responsibility to ensure that adequate consultation was

conducted.⁸ People who are expected to be directly impacted by the proposed harvesting are to be contacted directly by the licensee through a referral process; others are entitled to submit written comments during a 60 day public review period, advertised through one or more notices in the local newspaper that state when and where the plan can be reviewed and how to provide comments.

The following tips are provided by the Ministry of Forests and Range to help ensure that comments made by the public are fully considered:⁹

- identify interests, uses, and attributes in specified areas within the FSP that are important to you
- identify your concerns about how forest development could affect those interests, uses, and attributes
- provide any other information you feel the forest licensee needs to be aware of; and
- contact information is included.

All written comments received during the review period that are relevant to the FSP must be considered by the forest licensee. When submitting the proposed FSP to the BC Forest Service for approval, licensees must also include a copy of the published notice, a copy of comments received, and a description of how they have addressed these comments within their plan. The FSP will only be approved if it is felt that the licensee has satisfied their obligations and addressed the public comments accordingly.

Site Plans

In addition to the Forest Stewardship Plan, licensees must also prepare a site plan to identify the approximate location of cutblocks and roads, and show how these site-specific plans will be consistent with provincial objectives. The site plan must only be made available to the public if specifically requested, and does not need Minister approval.¹⁰

Higher-level Plans

Higher-level planning describes the legal objectives for various landscape units. A Sustainable Resource Management Plans for the Chilliwack Watershed was prepared by the Province in 2005.¹¹ Input from First Nations, other agencies, and the public were obtained in the preparation of this document during the 60 day public review and comment period prior to plan approval.

Permits

In addition to having an approved Forest Stewardship Plan, other required approvals include cutting permits, which includes detailed quality and quantity of timber to be harvested, as well as any necessary road and road-use permits.

⁸ Allan Johnsrude, BC Ministry of Forests and Range, Chilliwack Forest District. Personal Communications, June 22, 2007.

⁹ Province of BC, 2006

¹⁰ BC Ministry of Forests and Range, 2005

¹¹ George et al, 2005.

Timber Supply Review

The Province's Chief Forester determines the maximum amount of timber – the Allowable Annual Cut (AAC) – that may be harvested per year from a specified area. In determining the AAC for the area, a number of factors from a number of different sources, including technical reports, the Province's social and economic objectives, and public input, are considered.¹² Once determined for the area, the AAC is then allocated by MOFR to the various forms of tenure that share the right to harvest timber within the area.

The rationale for the AAC determination is made available to the public, and are reviewed and updated every five years (but the length of time can be postponed if significant change is considered unlikely, or be shortened if conditions change) as part of a Timber Supply Review. The Timber Supply Review “examines the impacts of current forest management practices on the timber supply, economy, environment and social conditions of the local area and the province.”¹³

The most recent Timber Supply Review for the Fraser Timber Supply Area (which includes the Chilliwack Forest District and the Chilliwack River Watershed) is from August 2004.¹⁴ Pending delays or a determination that no significant change is likely, the next review will occur in 2009.

5.2 Designations to Protect Watershed Areas and Features

Identified wildlife habitat and sensitive areas are considered ‘constraints’ on forestry activities, and require either special management or avoidance to help protect the important watershed features. These constraints limit the number of cutblocks allowed in a single drainage basin, typically to a timber clearcut equivalency of less than 10%, thus reducing the overall impact of logging on watershed function.¹⁵

The following are a few of the specific designations and management strategies that help to protect these watershed features that are relevant to the Chilliwack River Watershed. Unfortunately, describing each designation in relation to the process, the legal framework, the applicability, and the challenges or limiting features of each, is beyond the current capacity of the Chilliwack River Watershed Strategy, but are instead simply summarized here in point form as an overview.

Identified Wildlife Management Strategy¹⁶

¹² BC MOFR, 2006

¹³ BC MOF, 2003

¹⁴ Ministry of Forests and Range, Fraser Timber Supply Area Website: <http://www.for.gov.bc.ca/hts/tsa/tsa30/docs.htm> (Jan 28, 2008)

¹⁵ Comments made by Gene MacInnes, Operations Manager, MOFR during CRWS Forestry Tour. April 13, 2006. (Photos and notes from tour available at:

<http://www.chilliwackwatershedstrategy.ca/docs/2006%2004%2013%20Forestry%20Tour.pdf>)

¹⁶ BC Ministry of Environment, Identified Wildlife Management Strategy Website: <http://www.env.gov.bc.ca/wld/frpa/iwms/index.html> (Jan 29, 2008)

- An initiative of the Ministry of Environment and the Ministry of Forests and Range that includes consultation with other resource ministries, stakeholders and the public
- Goals are to minimize the effects of forest and range practices on Identified Wildlife situated on Crown land and to maintain their limiting habitats
- Implementing measures for Identified Wildlife may not limit the volume of short-term harvest levels by more than 1%
- Cannot address the issues of habitat supply, habitat connectivity and population viability
- Two categories of Identified Wildlife:
 - Species at Risk
 - endangered, threatened, or vulnerable species of vertebrates and invertebrates, and endangered or threatened plants and plant communities that are negatively affected by forest or range management on Crown land and are not adequately protected by other mechanisms
 - Regionally Important
 - species that are considered important to a region of British Columbia, rely on habitats that are not otherwise protected under FRPA, and may be adversely impacted by forest or range practices
- IWMS applies to all Crown land regulated by FRPA as well as to private land that is subject to a tree farm or woodlot license, and addresses only forest and range practices regulated by the FRPA (not hunting, poaching, agriculture, or urban development)
- Identified Wildlife can be managed through a number of tools and designations, including:
 - wildlife habitat features (WHF)
 - wildlife habitat areas (WHA)

Wildlife Habitat Features (WHF)

- Can include:
 - Fisheries sensitive features
 - defined as (a) the littoral zone of a lake (b) a flooded depression, pond or swamp that is not a stream, wetland or lake, but either perennially or seasonally contains water, and is seasonally occupied by a species of fish referred to in the Forest Planning and Practices Regulation definition of a fish stream.¹⁷
 - Nests of a bald eagle, osprey, great blue heron, or a category of species-at-risk that is limited to birds
 - Mountain Beaver ground burrows
 - Areas occupied by Tall Bugbane
 - Non-classified wetlands associated with a species-at-risk
 - any other localized feature that the minister responsible for the Wildlife Act considers to be a wildlife habitat feature.

¹⁷ BC Forest Planning and Practices Regulation Website:
<http://www.for.gov.bc.ca/tasb/legsregs/frpa/frparegs/forplanprac/fppr.htm#section7> (Jan 29, 2008)

- Once a WHF becomes identified and approved (by the Minister of Environment), forest licensees must not damage or render ineffective unless granted an exemption.
- No WHFs have been identified or approved to date, but work is ongoing

Wildlife Habitat Areas (WHA)

- WHAs are mapped areas determined as necessary to meet the habitat requirements of Identified Wildlife, particularly habitats believed to be most limiting and critical
- Designated Under the authority of the Minister of Environment (since delegated to the Deputy Minister of Environment)¹⁸ to limit the impact of forestry activities on these critical areas.
- Once approved, WHAs and their accompanying legally-established specific management practices must be followed
- According to the Ministry of Environment WHA website¹⁹, there are currently a total of 56 WHAs within the Chilliwack Forest District covering 16,724 hectares (note that the Chilliwack Forest District covers an area much larger than the Chilliwack River Watershed). These WHAs include the following Identified Wildlife species:
 - Mountain Beaver
 - Grizzly Bears
 - Tall Bugbane
 - Pacific Water Shrew
 - Spotted Owl (Figure 3)
 - see Ministry of Forests and Range FTP Site for Spotted Owl Management Plan (1999) for the Chilliwack Forest District: ftp://ftpsry.env.gov.bc.ca/pub/outgoing/Wildlife/Spotted_Owl/
 - Establishes Special Resource Management Zones requiring low-impact harvest strategies to maintain spotted owl habitat within the Chilliwack Forest District, including:
 - commercial thin (to create future habitat for spotted owl by maintaining a representative distribution by species, maintaining a mix of tree sizes and canopy layers, and retaining specific volumes of coarse woody debris for prey species)
 - selective harvesting (e.g., only harvest 30% of timber)
 - variable retention (e.g., 50% of the block must be within two tree lengths of standing timber).
 - Note: Ungulate Winter Ranges (UWR) for Mountain Goat, Black-tailed Deer, and Mule Deer have been identified and mapped throughout the Fraser Timber Supply Area (TSA), but have not yet been approved. Discussions are currently underway with the Ministry of Environment to have the UWR approved through and Order.²⁰

¹⁸ BC Ministry of Environment, Identified Wildlife Management Strategy Website: <http://www.env.gov.bc.ca/wld/frpa/iwms/index.html> (Jan 29, 2008)

¹⁹ BC Ministry of Environment, Wildlife Habitat Areas Website: <http://www.env.gov.bc.ca/wld/frpa/iwms/wha.html> (Jan 30, 2008)

²⁰ Chartwell, 2007

Old Growth Management Areas

- Old Growth Management Areas (OGMAs), legally established under Order to identify the amount of old forest that will be maintained to address biodiversity values
- As legally established objectives within Higher Level Plans (e.g., Sustainable Resource Management Plans), all Operational Plans must remain consistent with these OGMA objectives.
- Of the 5170 hectares of OGMAs established within the Chilliwack Landscape Unit (i.e., the Chilliwack River Watershed), 4444 hectares (86%) are either within existing Protected Areas or are on forest lands that do not contribute to the Allowable Annual Cut (i.e., not located within the Timber Harvesting Land Base).²¹ (see Figure 3)

Fisheries Sensitive Watersheds

- Enabled by Section 14 of GAR and Section 8 of FPPR
- Watersheds must meet two criteria: (a) significant fisheries value, and (b) watershed sensitivity
- Defined after recognizing “the integral linkage between upland conditions and their influence on maintaining aquatic conditions necessary to sustain healthy fish populations”²²
- Purpose is to establish objectives within Forest Stewardship Plans, for designated watersheds, that conserve important fisheries values attributes to:
 - Conserve the natural hydrological conditions, natural stream bed dynamics and integrity of stream channels in the Fisheries Sensitive Watershed,
 - Conserve the quality, quantity, and timing of water flows required by fish in the Fisheries Sensitive Watershed, and
 - Prevent the cumulative hydrological effects of primary forest activities in the Fisheries Sensitive Watershed from resulting in a material adverse impact on the fish habitat in the watershed.
- Includes natural stream bed dynamics, stream channel integrity, quality, quantity and timing of water flow, and natural, watershed level, hydrological conditions and integrity
- Designations are, in part, driven by the results of the Province’s Watershed Evaluation Tool (WET), a model used to comparatively assess and prioritize watersheds across the Province based on their fisheries values and their watershed sensitivity rankings. This model is still relatively new and evaluation results are not yet available.
- While a number of pilot Fisheries Sensitive Watersheds have been designated throughout the Province (e.g., Gordon and Klanawa Rivers on Vancouver Island), none are yet located within the Chilliwack Forest District.

Riparian Protection

²¹ George et al, 2005

²² BC Ministry of Environment, Fisheries Sensitive Watersheds Website: <http://www.env.gov.bc.ca/wld/frpa/fsw/index.html> (Jan 30, 2008)

- The *Forest Planning and Practices Regulation (Forest and Range Practices Act)* outlines the minimum required riparian zones to be retained during forest operations.
 - Reserve Zone Widths vary from 0 – 50m, with Management Zone Widths varying from 20 – 100m.
- Along the Chilliwack River, there is a Reserve Zone Width of 50m, within which no logging is permitted, and a Management Zone Width of an additional 20m, within which only selective harvest is permitted.
- A specialist may be required to determine whether removing trees from an alluvial fan would cause rapid movement of the channel.²³

Temperature Sensitive Streams²⁴

- Enabled by Section 15 of the *Government Actions Regulation (GAR)*
- Minister may designate a portion of fish stream as temp sensitive if: (a) trees are required adjacent to the stream to manage the temperature of that portion of the stream, and (b) management of the temperature of the designated portion in not otherwise provided.
- There are currently no streams designated as temperature sensitive

Steep Slopes

- Logging and road development along steep slopes has been shown to result in increased erosion and landslide potential.²⁵
- The Ministry of Forests and Range do not have slope thresholds that automatically restrict logging on steep slopes. On slopes that exceed 60%, licensees need to perform a geotechnical study to assess the potential for adverse affects (slides) and mitigative actions that may be required.

5.3 First Nations Interests and Participation

Forestry impacts in the past have resulted in destruction or disturbances to sites of cultural significance to local First Nation. For example, Tamihi Creek, an important cultural site for spiritual and ceremonial bathing, is rarely used anymore due to a loss of privacy at the site from logging and recreational impacts. The ceremonies were not relocated to less accessible areas and consequently, the cultural practices and traditions are being threatened.

The Sto:lo Heritage Policy Manual (2003) was prepared to proactively preserve heritage sites and traditional use sites within the Sto:lo Traditional Territory. It defines the policies and requirements for licensees to follow prior to commencing logging activities and requires appropriate consultation and assessment to ensure protection and preservation of important sites.

²³ Comments made by Gene MacInnes, Operations Manager, MOFR during CRWS Forestry Tour. April 13, 2006.

²⁴ BC Ministry of Environment, Temperature Sensitive Streams Website: <http://www.env.gov.bc.ca/wld/frpa/tss/index.html> (Jan 30, 2008)

²⁵ Guthrie, 2002

During a Cultural Heritage Tour organized for CRWS participants in January 2006, it was noted that there was a breakdown in passing information on from the Ministry of Forests and Range to contractors regarding sensitive cultural sites and the law.²⁶ As the specific locations and uses of these sites are often sacred and confidential, trust and information exchange between First Nations and the Province is needed, but it is up to the Province to ensure that logging plans prepared by licensees reflect these interests.

Recent policy changes in the BC government have resulted in First Nations now becoming significant players in forest industry activities within the Chilliwack River Watershed. As a result of the 2003 Forestry Revitalization Plan, in which the province's largest forest licensees were required to return about twenty percent of their replaceable logging rights to the Crown, much of this volume became redistributed to First Nations.²⁷

The Soowahlie First Nation, who have long been involved in forestry activities, have recently entered into a Joint Venture forestry agreement with three different logging companies to form Th'ewali Forestry Ltd, and are also interested in the start-up of value-added forestry activities.

In May 2004, the Province and the Ch-ihl-kway-uhk Tribe signed a forestry agreement seeing the bands receiving revenue sharing totaling \$3.8 million and access to 277,100 cubic metres of timber over five years.²⁸ The resulting company, the Ch-ihl-kway-uhk Forestry Limited Partnership (CFLP), a First Nations owned and controlled company comprised of numerous local bands including Aitchelitz, Kwaw Kwaw, Apilt, Skowkale, Skwah, Skway, Squiala, Tzeachten and Yakwekwioose communities, is expected "to provide a wide range of benefits, including employment and skills transfer/training, as well as business opportunities and economic development for the Ch-ihl-kway-uhk people".²⁹ CFLP partnered with Probyn Logging to manage and operate the forestry operations within their forestry tenure located within the Traditional Territory of the Ch-ihl-kway-uhk Tribe. The 9 bands comprising the Ch-ihl-kway-uhk Forestry Limited Partnership have recently submitted a Forest Stewardship Plan within their Traditional Territory of the Chilliwack Landscape Unit, a forestry plan that will provide revenue to the First Nations as well as avoid watershed impacts to areas of cultural significance to the Ch-ihl-kway-uhk people.

6.0 Relevant Jurisdictions and Legislation

6.1 Federal Government

Although forestry activities are largely regulated through provincial legislation, forestry activities must still be compliant with relevant federal legislation.

²⁶ Photos and notes from the CRWS Cultural Tour available online at: <http://www.chilliwackwatershedstrategy.ca/involved.html> (Jan 30, 2008)

²⁷ BC Ministry of Forests and Range, 2006

²⁸ BC Ministry of Aboriginal Relations and Reconciliation Website, http://www.gov.bc.ca/arr/firstnation/stolo_tribal/default.html#member_bands (Aug 7, 2007)

²⁹ Chartwell Consultants Ltd., 2007

Fisheries Act (R.S., 1985, c. F-14)

Section 35 (1) of the *Fisheries Act* states that “No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat.” This requirement (known as HADD), is permitted with the correct approvals being granted under Section 35 (2) of the *Fisheries Act*, which states that “No person contravenes subsection (1) by causing the alteration, disruption or destruction of fish habitat by any means or under any conditions authorized by the Minister or under regulations made by the Governor in Council under this Act.” Proponents of projects that may result in a HADD need to consult with DFO for approvals and potential project requirements prior to commencing. In considering the project, DFO may apply their principle of “no net loss” if applicable, and may require suitable compensation or mitigative strategies to prevent or compensate for any potentially negative consequences of the project. All forestry operations must also avoid violation of Section 36 by discharging a deleterious substance into fish habitat.

Species-at-Risk Act (2002, c. 29)

The federal *Species at Risk Act* (SARA) makes it an offence in sections 32 and 33 to:

- “kill, harm, harass, capture or take an individual of a listed species that is extirpated, endangered or threatened;
- possess, collect, buy, sell or trade an individual of a listed species that is extirpated, endangered or threatened, or its part or derivative;
- damage or destroy the residence of one or more individuals of a listed endangered or threatened species or of a listed extirpated species if a recovery strategy has recommended its reintroduction.”

These prohibitions apply to all SARA listed species that occur on federal lands (e.g. lands owned by the federal government, such as national parks, lands used by the Department of National Defence, reserve lands, and most of the land in the three territories). In addition, these prohibitions apply to listed aquatic species (e.g., fish) because of the *Fisheries Act*, and migratory birds covered by the *Migratory Birds Convention Act*, wherever they occur.

For other listed species that occur on non-federal lands, the provinces and territories are given the first opportunity to protect them through their laws. If the province or territory does not act, SARA has a "safety net". The Governor in Council, on the recommendation of the Minister of the Environment, may order that the prohibitions in sections 32 and 33 apply for a given species in a province or territory. The Minister must make a recommendation if, after consultation with the provincial or territorial minister, the Minister finds that the species or its residence is not effectively protected. To date, this power has not been exercised.

In BC, some protection is given to species at risk through the existing BC *Wildlife Act* (see below). A *Wildlife Amendment Act* has been drafted, and will if passed, increase the protection for species at risk in BC (e.g., expand the number of species listed).

Migratory Bird Convention Act (1994, c. 22)

The *Migratory Bird Convention Act* applies across Canada and is intended to protect and conserve migratory birds and their nests. Through this Act, the Governor in Council is granted the power to create regulations “12.1.(h) for prohibiting the killing, capturing, injuring, taking or disturbing of migratory birds or the damaging, destroying, removing or disturbing of nests” and for “12.1.(i) prescribing protection areas for migratory birds and nests, and for the control and management of those areas.” The forestry industry must not violate the regulations of the *Migratory Bird Convention Act* regardless of their compliance with provincial acts and regulations.

6.2 Provincial Government

Forest and Range Practices Act (RSBC, 2002, c 69)

Forestry operations fall largely under the jurisdiction of BC Ministry of Forests and Range, with FRPA as the primary piece of legislation. While the *Forest Act* pertains to the amount of timber that can be harvested and who can do the harvesting, the Forest Practices Code, and its replacement, the *Forest and Range Practices Act* (FRPA), both pertain primarily with how harvesting is done.³⁰ FRPA is a “results-based” system designed to streamline forestry red tape and the regulatory framework to improve forestry efficiency and competitiveness. Rather than dictating procedures, under FRPA, the Province establishes objectives, including biodiversity, fish, recreation, visual quality, cultural practices and heritage, and water quality. The forestry operators have to determine how to meet these objectives through planning, design, and ongoing monitoring conducted by certified professionals.

The FRPA *Government Actions Regulation* is important as well as it gives the minister responsible for forests the power to enact measures to protect fish, wildlife and biodiversity within riparian areas and fish habitat in fisheries sensitive watersheds. This Regulation sets criteria for riparian reserve zones (50 m for the Chilliwack River) and riparian management zones beyond the riparian reserve zones where some limiting logging activities are permitted. The most relevant sections of the FRPA and the FRPA – *Government Actions Regulation* are included in Appendix A.

FRPA essentially sets out the requirements for forestry operations, but the forestry industry must still conduct their operations in accordance with other pertinent provincial legislation including the *Water Act*, *Environmental Management Act*, and *Wildlife Act*.

Private Managed Forest Land Act (RSBC, 2003, c 80)

The *Private Managed Forest Land Act* and the *Private Managed Forest Land Act – Private Managed Forest Land Regulations* set objectives for privately managed forest lands that are not covered by the FRPA. These management objectives include soil conservation, water quality, and fish habitat. The relevant sections of the *Private*

³⁰ BC Ministry of Forests and Range, 2005

Managed Forest Land Act and the *Private Managed Forest Land Act – Private Managed Forest Land Regulations* are included in Appendix A.

Forestry Revitalization Act (RSBC, 2003, c 17)

The *Forestry Revitalization Act* is a component of the Forestry Revitalization Plan that was introduced in 2003, aimed at diversifying BC’s forest sector through timber reallocation. The Province’s largest forestry companies were required to return 20% of their replaceable logging rights to the Crown, which then became redistributed to First Nations, small tenure holders, or sold at auction.³¹

6.3 Regional and Local Government

Local governments cannot prohibit or regulate forestry operations; however, they do have some level of indirect authority through their powers to designate land use. The following FVRD Bylaws influence forestry activities within the Chilliwack River Valley (Electoral Area “E”).

1. The FVRD Official Settlement Plan for the Chilliwack River Valley³² recommends that all resource extraction sites should be redeveloped and rehabilitated so that it returns to “as natural a state as possible” following abandonment or termination of resource extraction operations (Section 8).
2. The FVRD Zoning Bylaw, as outlined in the FVRD Official Settlement Plan for Electoral Area “E” (Bylaw No. 400, 1983) states that, “Except where specifically prohibited, forestry, mining and reclamation will be permitted in LIMITED USE areas” (Part III, Limited Use Policies). Over 87% of the Chilliwack River Valley (Electoral Area “E”) is zoned LIMITED USE.

Note that bylaws and other acts and regulations are subject to change and amendments. Check relevant websites for the most updated version.

7.0 Vision & Goals

7.1 VISION

Forest harvesting within the Chilliwack River Watershed occurs in a sustainable manner that respects the values of all stakeholders and does not negatively affect important and vulnerable watershed features and functions.

7.2 GOALS

1. *Public Education*: To increase the level of awareness and understanding of forestry and forestry-related issues within the Chilliwack River Watershed amongst the local community, First Nations, agencies, users, and other stakeholders.

³¹ BC Ministry of Forests and Range, 2006

³² Fraser Valley Regional District, 1983.

2. *Public Input*: To have abundant and easily-accessible opportunities for meaningful First Nations, public, and stakeholder input into forestry management that results in decision-making that fully takes into account the abundant and diversity of values within the Chilliwack River Watershed.
3. *Protection/Tools*: To adequately protect or mitigate forestry-related impacts on important and vulnerable watershed features and functions.
4. *Improved Information*: To acquire and disseminate improved information about localized and watershed-scale impacts of forestry and forest management on the Chilliwack River Watershed.

7.3 MEASURES

1. Complaints or observations of forestry-related environmental impacts
2. Baseline data collection (e.g., net change in kilometer length of active/usable forest roads within the watershed over time)
3. Ongoing monitoring and data collection of watershed conditions (both positive and negative) using relevant indicators of environmental or habitat quality

8.0 Strategies to Achieve Goals

There are a number of potential options or strategies that may help to achieve the above mentioned goals related to forestry impacts within the Chilliwack River Watershed. These options, or the need for the options, were identified by a number of sources either before or during this watershed planning process, including existing literature (e.g., Hay Co 1992 Chilliwack River Hazard Management Study), CRWS field trips, and Project Team participants. Brief overviews of these strategies are provided here, with additional details within the subsequent sections.

Like mining, forestry is a highly regulated industry largely under provincial jurisdiction; therefore, options for alleviating local concerns regarding forestry impacts fall mostly outside the scope of the Chilliwack River Watershed Strategy. Strategies that would require provincial policy or legislative changes were considered beyond the scope of CRWS and were therefore not included in this analysis.

- (1) **Information Sessions and Tours** – can be held to inform the local community and stakeholders about forest practices within the watershed
- (2) **Forums for Dialogue and Information Exchange** – opportunities for the public to express concerns and ideas and to build trust between stakeholders
- (3) **Enhanced Public Comment and Review Requirements** – exceeding minimum requirements to make it easier for the public to review and provide comments
- (4) **Email or Website Notification of Review Period** – to better inform community and stakeholders about upcoming review periods and comment deadline
- (5) **Investigate Potential for EBM Principles in CRW** – to learn from, follow lead of, and build on momentum of, new legal framework for logging in BC’s central coast

- (6) **Designations or Tools to Protect Identified Sites** – avoidance or low-impact practices for sites of high value or sensitivity
- (7) **Pursue Fisheries Sensitive Watershed Designation** – to ensure forestry activities do not negatively impact downstream fish populations
- (8) **Reduce Watershed Impacts from Forestry Roads** – to reduce instability and sedimentation impacts from forestry roads
- (9) **Habitat Restoration Projects** – to mitigate past impacts and repair or speed the recovery of watershed features and functions negatively impacted from past logging
- (10) **Monitoring with Environmental Indicators** – to monitor the relative health of the ecosystem, to track trends over time, or to document site-specific impacts associated with a land use change or impact
- (11) **Watershed Modeling** – to help determine sustainable rate of harvest for the watershed and areas of vulnerability
- (12) **Economic Assessment of Forest Industry and Impacts** – a cost-benefit analysis of the forestry industry, including watershed impacts and gains and losses to other watershed users potentially impacted by forestry activities

9.0 Analysis

A fundamental principle behind the watershed recommendations is that both the forest industry and the public (including government) have their own responsibilities regarding watershed sustainability:

- ***Forest industry responsibilities:*** Forestry provides many economic opportunities to the community who live within the valley or adjacent municipal areas. There is a *forest industry responsibility* to be accountable for the environment and to practice due diligence across the various operating areas. Public awareness and information exchange through an open door policy is key to better understanding.
- ***Public responsibilities:*** The public benefits from the social contributions of past and future forestry related activities such as access and recreational areas (now managed through the Ministry of Tourism, Sport and the Arts). There is a *public responsibility* to take care of the natural resources within the valley or many of these benefits could be lost through closures and could lead to increased unauthorized use placing pressure on a smaller area of access.

Lack of watershed-scale planning and information, beyond the cursory OGMA-oriented overview provided in the existing Sustainable Resource Management Plan for the Chilliwack Landscape Unit, has resulted in numerous data gaps and uncertainty about landscape level forestry impacts on the Chilliwack River Watershed. As a result of this limited information, it is a challenge to prepare meaningful recommendations for this

watershed strategy. Consequently, many of the suggestions and recommendations focus on improving our understanding of watershed values and impacts with the intent of eventually influencing forestry-related management decisions.

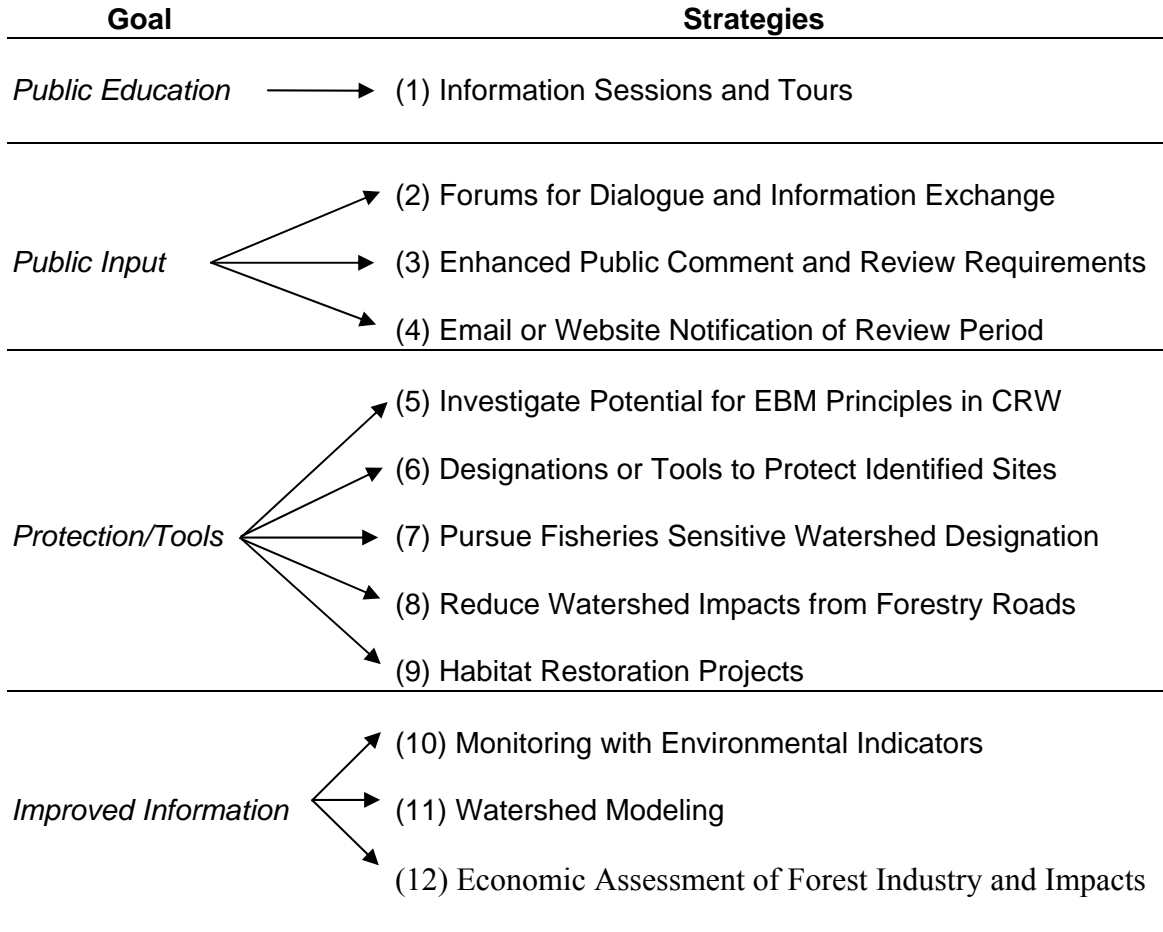


Table 2 provides a brief evaluation of each option, with associated benefits and challenges with each option, as well as a potential champion or lead stakeholder.

Table 2 Analysis of available options or strategies for dealing with forestry-related watershed impacts within the Chilliwack River Watershed.

Option/ Strategy	Advantages	Challenges	Potential Champion
(1) Information Sessions and Tours	<ul style="list-style-type: none"> • Engages and informs stakeholders • May alleviate community concerns • Opportunity to inform stakeholders about new forestry practices and improvements • More transparent decision-making 	<ul style="list-style-type: none"> • May not provide suitable opportunity for community input or influence • May be viewed as propaganda or spin by disenfranchised community • May be difficult to attract interest by those not already engaged 	Licenseses, MOFR
(2) Forums for Dialogue and	<ul style="list-style-type: none"> • Chance for stakeholders to discuss values and issues with forest industry 	<ul style="list-style-type: none"> • May be difficult to attract interest by those not already engaged 	Licenseses, MOFR,

Option/ Strategy	Advantages	Challenges	Potential Champion
Information Exchange	<ul style="list-style-type: none"> Regular opportunities for public education and involvement means fewer surprises when FSPs and/or amendments are advertised Less conflict ('war in the woods') which allows for a more efficient planning process and less last minute challenges 	<ul style="list-style-type: none"> Contentious issues may lead to negative or hostile sessions Experienced facilitator may be required Dialogue challenges with large numbers of participants Not everyone is willing to express views in front of large audience Sensitive information 	NGO (e.g., FVRWC)
(3) Enhanced Public Comment and Review Requirements	<ul style="list-style-type: none"> More and improved opportunities for stakeholders to provide input Less conflict Could lead to more representative views by community 	<ul style="list-style-type: none"> Would need to be supported by decisions that reflect these comments and opinions Cost and effort by licensees 	Licensees
(4) Email or Website Notification of Review Period	<ul style="list-style-type: none"> Would help to ensure interested stakeholders are aware of opportunity to express views and concerns Could lead to more representative views by community Could be central website that includes all Crown land notifications potentially affecting watershed (e.g., mining, IPPs) 	<ul style="list-style-type: none"> Would need to be supported by decisions that reflect these comments and opinions Time and money required for website maintenance and updates Would need constant updating Informing community about website and ensuring its repeated use 	Licensees, MOFR, NGO (e.g., FVRWC), FVRD
(5) Potential for EBM Principles	<ul style="list-style-type: none"> Can follow lead, and maintain momentum of, legal orders created for central coast of BC Potential for added value with eco-friendly timber label Could reduce watershed impacts on key features identified by stakeholders 	<ul style="list-style-type: none"> Uncertainly about watershed or economic implications Unproven policy and practices Scale of CRW may not be appropriate Significant time and effort invested in central coast 	MOFR, MOE, First Nations, licensees, NGOs, etc.
(6) Designations or Tools to Protect Identified Sites	<ul style="list-style-type: none"> Reduce forestry impacts in highly valued or sensitive sites or areas Reduce conflicts between stakeholders Free and open to apply for Indicates to others about the value and sensitivity of the land, which may help to influence other land-use decisions 	<ul style="list-style-type: none"> Designations may require legal approval Added costs to harvest by licensees or reduced harvest rates 	MOFR, MOE
(7) Pursue Fisheries Sensitive Watershed designation	<ul style="list-style-type: none"> Area objectives authorized by the Minister of Environment at the behest of the Lieutenant Governor in Council Listed in Schedule 2 of the Forest Planning and Practices Regulation (FPPR) 	<ul style="list-style-type: none"> Community and industry buy-in The objective must be consistent with the objectives set by government The objective set by government applies only to the extent that it does not unduly reduce the supply of timber from BC's forests 	MOE, FVRD, CRWS
(8) Reduce Watershed Impacts from Forestry Roads	<ul style="list-style-type: none"> Ensure that existing and planned roads will be properly maintained and deactivated as required Address the long standing non-status roads which are a continuing source of environmental problems Work cooperatively with resource users to minimize future access concerns Ensure responsibility and maintenance of roads by road users, as required 	<ul style="list-style-type: none"> Funding source to address those remaining roads/hot spots that are not monitored by industry or government Public responsibility and education Gating or deactivation may hinder recreation opportunities 	MOFR, MOE, ILMB

Option/ Strategy	Advantages	Challenges	Potential Champion
(9) Habitat Restoration Projects	<ul style="list-style-type: none"> • Can repair or speed the recovery of areas impacted by past forestry activities • Opportunities for public engagement and stewardship • Funding opportunities available 	<ul style="list-style-type: none"> • May not address the root cause of environmental impacts in the watershed • Time and effort (grant applications, coordinating project, obtaining permits) • Long-term monitoring and maintenance of projects often deficient 	CRAC, FVRWC, DFO
(10) Monitoring with Environmental Indicators	<ul style="list-style-type: none"> • Provides baseline data to assess current conditions and determine future trends • Fills in existing data gaps about forestry impacts on watershed • May identify issues or areas for improving forest management • Relatively easy to collect most data • Data collected by community members helps empower local stewards • Resources/guides available (Streamkeepers, Provincial water quality guides, etc.) 	<ul style="list-style-type: none"> • Need to identify a champion with appropriate equipment and facilities • Need to ensure consistency of data methodology and equipment (for geographic and temporal comparisons) • Data management, storage, and access • Need long-term commitment to provide sufficient baseline and trend data • Difficult or impossible to definitively attribute environmental trends with specific activities given multiple land-uses within watershed 	Licensees, MOFR, MOE, community groups, students (UCFV)
(11) Watershed Modeling	<ul style="list-style-type: none"> • Information can be used to communicate concerns, empower the local community and to gauge impacts from other land-uses • Can be used for ongoing analysis to determine degree of potential impacts and speed of recovery • Ensure watershed as a whole, and individual tributaries, are not over harvested beyond sustainable levels 	<ul style="list-style-type: none"> • Cost of detailed analysis required – determined by funding sources • Who would lead the project(s) with appropriate equipment and facilities Need to ensure consistency of data methodology and equipment as well as data management, storage, and access • Political will and socio-economic implications of lowering AAC 	NGO, Academic researcher, FVRD, MOFR, MOE, DFO
(12) Economic Assessment	<ul style="list-style-type: none"> • Would give snapshot of current socio-economic impacts from forestry to compare with future trends or changes • Could help identify economic hot spots or opportunities for improved collaboration and reduced conflict 	<ul style="list-style-type: none"> • Very difficult to collect meaningful data due to sensitivities around disclosure • Study expenses • Challenge between study results and potential policy changes 	NGO, Academic researcher, FVRD, MOFR, MOE, DFO

10.0 Recommendations

Although there were concerns or limitations associated with all of the listed options, with the limited information available at this point, with the lack of higher level planning, and with the notion that “where higher level planning is not yet complete, precaution must guide management at lower scales.”³³, all of the suggested options or strategies are recommended at this point on behalf of the Chilliwack River Watershed. These recommendations are repeated below.

(1) Information Sessions and Tours

There continues to be much confusion, misunderstanding, and distrust amongst the public about the forest industry and forestry practices in general. Methods such as open houses and field trips or tours will help to engage and inform the public, First Nations, user groups, agencies, interest groups, and other stakeholders that are affected by forestry activities about the forest industry and forest practices within the Chilliwack River Watershed.

Information sessions are currently held by licensees to discuss a proposed forestry plan, but we recommend that these be held more frequently, either by licensees or Ministry of Forests and Range staff, to provide more general information about forests and forestry within the Chilliwack River Watershed.

Adequately informing the public about current issues, practices, and plans ensures that they have the opportunity to form and express an informed opinion on these matters, rather than opinions based on hearsay or misperceptions based on past forestry practices. Informing and educating the public is only the first step however, in leading towards stakeholder satisfaction and watershed sustainability (Figure 4). It is also of vital importance that stakeholders express their concerns and issues about proposed forest plans, and that these concerns will ultimately be addressed by licensees and MOFR in making forestry-related decisions in the best interest of all watershed stakeholders. Recommendations 2 -5 focus on enhancing the other steps in this model.

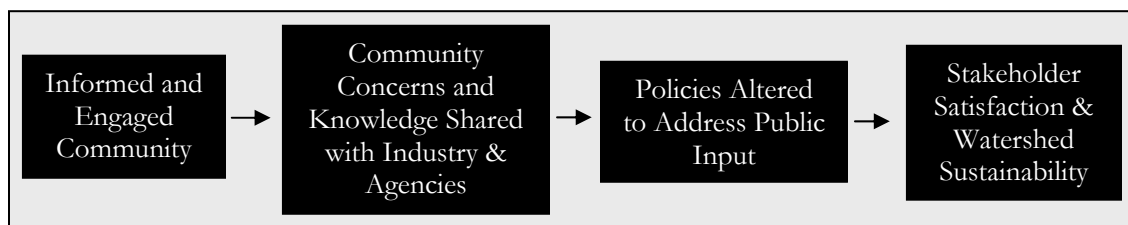


Figure 4. Steps contributing towards stakeholder satisfaction and watershed sustainability. Model assumptions include (1) community is interested and non-apathetic; (2) opportunities are provided for sharing ideas and concerns; (3) policy changes are not hindered by regulatory constraints or lack of agency commitment; (4) a correlation exists between stakeholder satisfaction and watershed sustainability.

³³ Coast Information Team, 2004

(2) Forums for Dialogue and Information Exchange

As opposed to information sessions, which are designed to relay information to the public, forums such as open houses or workshops that are designed for dialogue and information exchange provide an opportunity for the public to relay information and concerns to the forest industry or regulatory authority, or to clarify any fears or misconceptions they might have. They also help to forge interpersonal relationships and trust between stakeholders, and help to reduce problems or concerns that may later arise further in the planning process.

Of particular importance is the need for the community and other stakeholders to share their values, opinions, sites, ideas, and information with forestry-related decision-makers. Some areas may be particularly sensitive to forestry impacts, such as sensitive fish and wildlife habitat, locations of species-at-risk, culturally significant sites, special and unique locations, or downstream areas prone to flooding from upstream logging, need to be identified and shared so to ensure management decisions are made with the best information possible. This information, possibly collected as part of the FSP or amendment process, can then be used to aid the decision-making process involving siting locations, appropriate land designations, or conditions to be attached to forestry practices. Management provisions could include increasing buffer widths, smaller clearcut sizes, maintaining wildlife corridors, avoiding unstable slopes, etc.

CRWS recommends that a number of public forums be held, either by relevant government agencies (e.g., Ministry of Forests and Range), licensees, local community groups (e.g., Fraser Valley Regional Watersheds Coalition), or combinations, to enhance the dialogue and information exchange about forestry, forestry impacts, significant or sensitive watershed features, and local values, within the Chilliwack River Watershed.

(3) Enhanced Public Comment and Review Requirements

Given the size and influence of forestry activities throughout the watershed, the potential impact of forestry activities on a number of watershed values, features, and functions, and the continued promotion and growing popularity of the region's recreational value and potential ("Chilliwack – The Great Outside", the slogan used for Tourism Chilliwack), decisions regarding forest management within the Chilliwack River Watershed affect a lot of people. Consequently, people need to be given an adequate forum for expressing their concerns and sharing their information with forestry decision-makers.

The public is entitled to review and comment on forestry plans. Licensees are required to allow a 60 day review and comment period, to advertise these opportunities in a newspaper, and to demonstrate to the Ministry of Forests and Range that they 'considered' all comments received during this period in their final forest stewardship plan. During the CRWS process however, comments were received that the community is very frustrated with their lack of meaningful input into forestry decision-making, and that they are not provided the adequate tools to voice their opinions. Often people failed to observe the notification in the local paper, and complaints have been raised about

proposed plans only being available in hard copy format, in the forester's offices, during regular working hours. This may create an intimidating environment for some; others may simply not be able to view the plans because they are out of town or are not available during working hours.

Because of this level of frustration, and the significance of the Chilliwack River Watershed for recreational, environmental, cultural, and other values, CRWS recommends that licensees go beyond the minimum legal requirements for community consultation during the public review and comment period of the forest stewardship planning process. Suggestions include:

- Holding public information sessions (recommendation 1) and public forums (recommendations 1 and 2) early and often throughout the planning process
- Expanding notification beyond local newspapers so that a wider audience of stakeholders (which includes people who do not live within the local newspaper distribution area) is informed about public review and comment period
- Making the proposed plan available in an electronic format and be able to be viewed or downloaded over the Internet. This will help ensure that the proposal is accessible to a wide number of stakeholders and will provide more representative feedback.

(4) Website or Email Notification of Review Period

As mentioned in the prior recommendation, advertisements in the local newspaper for upcoming public comment periods can be easily overlooked or not seen by stakeholders not within the local area. To further enhance the ability of stakeholders to be made aware of public review and comment periods, CRWS suggests that a more informative and useful notification tool would be through a website or email distribution list.

A local website that provides an overview of current and upcoming review periods, with links for more information on project details, potential impacts, and how to submit comments, could become a valuable community asset allowing stakeholders to remain up-to-date on issues that can affect them. It can be hosted by government or a non-government organization, and could be utilized as a local source for posting and finding all government notifications as they arise (e.g., mining proposals, IPP proposals, etc).

(5) Investigate Potential for Ecosystem-based Management Principles in CRW

In order to protect the ecosystem and cultural values along the central coast of BC, collaboration between the Province, First Nations, the forest industry, and environmental groups recently culminated in the establishment of ecosystem-based management (EBM) land use objectives for the region. As a landmark policy decision and new legal framework for the forestry industry, this strategy is designed to “ensure that ecosystems and critical wildlife habitat will be protected from resource development, including the

protection of culturally significant 1,000 –year-old cedars and salmon-rich streams.... while balancing the needs of the environment with the people who depend upon the land for their livelihoods and way of life.”³⁴ Forest licensees will be required to integrate EBM principles into their forest stewardship plans. The forest industry will be compensated for the reduced harvest rates within the region by higher prices attached to the eco-friendly labeling the timber will receive, and by receiving a reduction in the stumpage rates they will pay on Crown timber. The process and subsequent practices adopted along the central coast can become a template for sustainable logging practices elsewhere, including the Chilliwack River Watershed.

The Chilliwack River Watershed has many of the same important ecosystem and watershed values as the central coast. While the identical practices and policies determined to best preserve the integrity of the central coast may not be same as those for the Chilliwack Valley, the process used to determine those practices and policies on the central coast can be equally applied to the Chilliwack River Watershed. As a result, CRWS recommends that the process used to develop and establish the Ecosystem-Based Management objectives along the central coast be studied for applicability in the Chilliwack River Watershed, and if suitable interest exists amongst stakeholders, be copied or amended and applied locally. The development of EBM along the central coast should be closely followed by local stakeholders, and opportunities to learn from their experiences and to capitalize on potential market segments created as a result of their practices (e.g., eco-friendly timber labeling) should be pursued.

(6) Designations or Tools to Protect Identified Sites

The Chilliwack River Watershed has extremely high recreational, cultural, and environmental values that need to be protected and preserved by appropriate forestry practices. CRWS participants noted that we need to provide tools for the community to influence decisions, not just provide comments. If management activities are not adequately adjusted to address the concerns expressed by stakeholders during consultation, then stakeholders will eventually stop providing comments and input.

Many provincial policies are in place to protect the forest industry from losses to harvest volumes, but there are a number of forest practices and designations that can be applied for areas identified by stakeholders as valuable and vulnerable. Practices such as selective logging, avoiding steep slopes, retaining wildlife corridors, and appropriate siting and maintenance of forestry roads, and designations such as Wildlife Management Areas, Wildlife Habitat Features, OGMAs, etc.(see Section 5.0), can and should be sought for identified areas.

CRWS recommends that sites identified as being significant or vulnerable to forest activities are given appropriate levels of protection, either through legal designations or through low-impact harvesting provisions within future forest stewardship plans. It is

³⁴ Province of BC, 2008

also recommended that both upstream, downstream, and watershed-scale factors be considered.

(7) Pursue Fisheries Sensitive Watershed Designation

Under Section 150 of the Forest and Range Practices Act, and Section 8 of the Forest Planning and Practices Regulation, watersheds of both high fish values and high sensitivities to landuse impacts can be designated as a ‘Fisheries Sensitive Watershed’. This designation requires that forestry activities do not negatively impact downstream hydrology and habitat in order to protect downstream fish populations.

Designations are, in part, driven by the results of the Province’s Watershed Evaluation Tool (WET), a model used to comparatively assess and prioritize watersheds across the Province based on their fisheries values and their watershed sensitivity rankings. This model is still relatively new and evaluation results are not yet available. Data and information pertaining to the fish values, the fisheries values, and the watershed sensitivity of the Chilliwack River Watershed should be forwarded to the Ministry of Environment during the upcoming consultation process for this model, expected in 2008.³⁵

Given both the extremely high fish and fisheries values within the Chilliwack River Watershed, CRWS recommends that this designation be pursued with the Ministry of Environment for the entire watershed or for key tributaries within the Chilliwack River Watershed.

(8) Reduce Watershed Impacts from Forestry Roads

Inadequately-constructed or wrongfully-situated forestry roads have been shown to have very significant watershed impacts resulting in unstable slopes and increased downstream sedimentation. The Chilliwack River Watershed would benefit from rehabilitating and retiring old roads, from improving road maintenance practices, and from preparing a thorough access management plan that outlines future road locations, recreation management plans, and an assessment of existing roads.

A number of forestry-related recommendations were made as a result of a 1992 geotechnical study along the Chilliwack River.³⁶ These recommendations are repeated here as they are viewed as still relevant and important to preserving the watershed health of the Chilliwack River Watershed.

1. “A major program is required to rehabilitate and retire old roads and landings throughout the watershed. These programs should include:
 - retrieving sidecast on the oversteepened sideslopes or roads and landings;

³⁵ Lars Reese-Hansen, FSW Coordinator, MOE. Personal Communication. August 1, 2007.

³⁶ HayCo, 1992 pp99-100

- a removing culverts and bridges;
- re-establishing natural drainage patterns;
- revegetating disturbed sites.

The Centre Creek watershed, the Chipmunk/Foley/Airplane watersheds and Liumchen watershed are suggested as priorities.”

2. “A program should be initiated to improve forest harvesting and road construction practices throughout the watershed. This program should focus specifically on:
 - less cross-stream yarding and much greater attention to protecting in-stream natural debris and riparian vegetation, particularly on steep headwater stream channels;
 - much less sidecasting on steep sideslopes during road and landing construction. Endhauling of material should be required;
 - avoiding construction of roads in stream channels and on floodplains to avoid the need of river training works to protect the roads;
 - placing emphasis on installing self-maintaining features in road and culvert design. These include fords, permanent dips in road surfaces, outsloped roads, stable cutbank slopes and other features which reduce the need for road maintenance;
 - avoiding the use of log cribs to hold road fill in place on steep sideslopes.”
3. “A program should be initiated to greatly improve road maintenance practices. This program should focus specifically on:
 - emphasizing self maintaining features wherever practical;
 - avoiding grader berms along roadsides;
 - avoiding the pushing of material which has ravelled onto roads over the edge of the slope;
 - maintaining ditches and natural hillside drainage patterns to avoid water running down the road surface.”

In addition to the sedimentation and destabilization impacts associated with forestry roads, forestry roads also provide access for backcountry users, which can also lead to negative environmental impacts if left unattended after forestry operations are complete. Consequently, it is also recommended that the Ministry of Forests and Range, in consultation with licensees, recreation groups, and other interested stakeholders, prepare an access management plan for the Chilliwack River Watershed. This plan should determine:

- what state the existing roads under road permit/road use permit will be left in after use,
- the location and condition of non-status roads and whether they should be decommissioned,
- what roads are planned for the future and their potential impact on known values,

(9) Habitat Restoration Projects to Mitigate Past Impacts

Although they may not address the root cause of environmental impacts in the watershed, restoration projects within the watershed, such as bank stabilization, off-channel habitat creation, and large woody debris placement, can repair or speed the recovery of areas impacted by past forestry activities. This issue is further discussed within the CRWS Fish Habitat Restoration and Enhancement report.

(10) Monitoring with Environmental Indicators

Although logging has been conducted within the Chilliwack River Watershed for almost a century, we still know very little about the landscape impacts and environmental consequences resulting from harvesting and forest management. As a result, detailed policy or site-specific recommendations are not possible at this point. To help fill this information gap, CRWS recommends that a long-term environmental indicator monitoring program be adopted, particularly given that the Chilliwack River Watershed is of unique value and in need of rigorous monitoring. Such a program, conducted by government, industry, non-profit organizations, or academic institutions and shared with all stakeholders, would help to determine the relative health of the ecosystem, to track trends over time, to document site-specific impacts associated with a land use change or impact, and to identify issues or areas where forestry policies can be adjusted to reflect the measured watershed impacts. Monitoring sites should be established at both upstream and downstream sites along both the Chilliwack River as well as key tributaries that are potentially impacted by forestry activities.

Anecdotal observations and past research suggest the following indicators could be included in a watershed monitoring program:

- Sedimentation (turbidity, total suspended sediment, total dissolved sediment)
- Water nutrient levels
- Aquatic and terrestrial species abundance and biodiversity
- Composition of riparian species and habitats
- Presence or distribution of species-at-risk or species of regional significance
- Invasive species spread and distribution
- Density of forestry roads
- Stream crossings within the watershed
- Number of landslide or erosion occurrences downstream of forestry activities
- Other measures of watershed health and ecosystem function

(11) Watershed Modeling

As previously mentioned, there is a lack of higher-level planning for the Chilliwack River Watershed. As a result, forestry management decisions are largely based on site-level plans without a greater understanding of cumulative impacts at a watershed-scale. In order to gain a greater understanding of hydrological impacts at a watershed scale due to

forestry activities and practices, either current or proposed, CRWS recommends that computer modeling be utilized for the Chilliwack River Watershed, either as a whole or for key tributaries.

Computer modeling, such as the 'Water Balance Model powered by QUALHYMO' (QUALity HYdrologic Model) – an inter-governmental engineering model designed to reduce development impacts on a watershed's hydrology patterns³⁷ – could provide useful analysis and risk assessment for watershed impacts due to forestry and other cumulative affects given the local topography, soil conditions, rainfall patterns, vegetation conditions, etc and could help with identifying sensitive areas and with setting appropriate logging rates for within the Chilliwack River Watershed. One of the key recommendations outlined in the HayCo (1982) study was to identify a sustainable rate of harvest for the entire watershed and for areas of vulnerability so that forestry activities are well distributed throughout the watershed, incorporates cumulative and downstream impacts, and accounts for all watershed values as well as remaining timber resources and past levels of harvest. Computer modeling would help in this regard. QUALHYMO is scheduled to be launched online on April 1, 2008.

(12) Socio-economic Assessment of Forest Industry

Although less then during peak times in the forest industry, forestry still contributes substantially to the local and regional economy in terms of employment, value of timber, and secondary impacts (lodging, food, supplies, machinery and maintenance, vehicle use and maintenance, etc.). The local economy in the Chilliwack River Watershed, because of its proximity to large population sources, is slowly shifting away from primary sector dependency and becoming more reliant on tertiary sector economies such as recreation and tourism. With the approach of the Olympics, a growing population base, and continued promotion of the Chilliwack River Watershed as a recreation destination, this trend will likely continue.

Because of the new economic situation in the watershed, a thorough socio-economic assessment of the forest industry in the Chilliwack River Watershed is recommended. This would provide a snapshot of current conditions and would help to identify economic hot spots or opportunities for improved collaboration and reduced conflict. Comparing the economic benefits from forestry with the costs (including habitat restoration costs, social and environmental externality costs, the lost opportunity costs from recreation, tourism, etc., and the added costs recreation and other alternative activities would have to the watershed) would provide useful insight into the true value of forestry to the local region and would allow decisions be made accordingly.

³⁷ Water Bucket Website: <http://www.waterbucket.ca/> (Jan 30, 2008).

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Appendix A: Relevant Provincial Legislation

BC Forest and Range Practices Act (SBC 2002, c. 69) ³⁸

Part 5 – Protection of Resources: Protection of the environment

46 (1) A person must not carry out a forest practice, a range practice or another activity that results in damage to the environment, unless in doing so

- (a) the person
 - (i) is acting in accordance with a plan, authorization or permit under this Act,
 - (ii) is not required to hold a plan or permit because of an exemption under this Act and is acting in accordance with this Act, the regulations and the standards,
 - (iii) is carrying out a controlled burn for the purpose of range improvement, wildlife habitat improvement or another purpose authorized by the minister, or
 - (iv) is acting in accordance with another enactment, and
- (b) the person does not know and cannot reasonably be expected to know that, because of weather conditions or site factors, the carrying out of the forest practice, range practice or other activity may result, directly or indirectly, in damage specified by regulation.

(2) A person who contravenes subsection (1) must

- (a) take appropriate action to prevent any further damage,
- (b) promptly notify the district manager of the damage, and
- (c) take any remedial measures that the minister requires under section 74.

(3) A person who discontinues a forest practice, a range practice or another activity referred to in subsection (1) may resume that practice or activity only if and when

- (a) it can be resumed without contravening subsection (1), and
- (b) the minister is satisfied that any remedial measures required under subsection (2c)
 - (i) have been carried out, or
 - (ii) will be carried out at the appropriate time.

FRPA Forest Planning and Practices Regulation ³⁹

Objectives set by government for water, fish, wildlife and biodiversity within riparian areas

8 The objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia's forests, to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas.

Objectives set by government for fish habitat in fisheries sensitive watersheds

8.1 (1) In this section "fisheries sensitive watershed" means an area identified in Schedule 2 of this regulation... (Chilliwack River is NOT identified in Schedule 2)

³⁸ Available: <http://www.for.gov.bc.ca/tasb/legsregs/frpa/frpa/frpatoc.htm> (Mar 14, 2007)

³⁹ Available: <http://www.for.gov.bc.ca/tasb/legsregs/frpa/frparegs/forplanprac/fppr.htm> (Mar 14, 2007)

Stream riparian classes

47 (2) A stream that is a fish stream or is located in a community watershed has the following riparian class:

- (a) S1A, if the stream averages, over a one km length, either a stream width or an active flood plain width of 100 m or greater;
- (b) S1B, if the stream width is greater than 20 m but the stream does not have a riparian class of S1A;
- (c) S2, if the stream width is not less than 5 m but not more than 20 m;
- (d) S3, if the stream width is not less than 1.5 m but is less than 5 m;
- (e) S4, if the stream width is less than 1.5 m.

(3) A stream that is not a fish stream and is located outside of a community watershed has the following riparian class:

- (a) S5, if the stream width is greater than 3 m;
- (b) S6, if the stream width is 3 m or less.

(4) Subject to subsections (5) or (6), for each riparian class of stream, the minimum riparian management area width, riparian reserve zone width and riparian management zone width, on each side of the stream, are as follows:

Riparian Class	Riparian Management Area (metres)	Riparian Reserve Zone (metres)	Riparian Management Zone (metres)
S1-A	100	0	100
S1-B	70	50	20
S2	50	30	20
S3	40	20	20
S4	30	0	30
S5	30	0	30
S6	20	0	20

(5) If the width of the active flood plain of a stream exceeds the specified width for the riparian management zone, the width of the riparian management zone is the outer edge of the active flood plain.

(6) The minister may specify a riparian reserve zone for a stream with a riparian class of S1-A if the minister considers that a riparian reserve zone is required.

(7) The riparian reserve zone for a stream begins at the edge of the stream channel bank and extends to the width described in subsection (4) or (6).

(8) The riparian management zone for a stream begins at

- (a) the outer edge of the riparian reserve zone, or
- (b) if there is no riparian reserve zone, the edge of the stream channel bank,

and extends to the width described in subsection (4) or (5).

Restrictions in a riparian management area

50 (1) A person must not construct a road in a riparian management area, unless one of the following applies:

- (a) locating the road outside the riparian management area would create a higher risk of sediment delivery to the stream, wetland or lake to which the riparian management area applies;
- (b) there is no other practicable option for locating the road;
- (c) the road is required as part of a stream crossing.

(2) If a road is constructed within a riparian management area, a person must not carry out road maintenance activities beyond the clearing width of the road, except as necessary to maintain a stream crossing.

(3) A person who is authorized in respect of a road must not remove gravel or other fill from within a riparian management area in the process of constructing, maintaining or deactivating a road, unless

- (a) the gravel or fill is within a road prism,
- (b) the gravel or fill is at a stream crossing, or
- (c) there is no other practicable option.

Restrictions in a riparian reserve zone

51 (1) An agreement holder must not cut, modify or remove trees in a riparian reserve zone, except for the following purposes:

- (a) felling or modifying a tree that is a safety hazard, if there is no other practicable option for addressing the safety hazard;
- (b) topping or pruning a tree that is not wind firm;
- (c) constructing a stream crossing;
- (d) creating a corridor for full suspension yarding;
- (e) creating guyline tiebacks;
- (f) carrying out a sanitation treatment;
- (g) felling or modifying a tree that has been windthrown or has been damaged by fire, insects, disease or other causes, if the felling or modifying will not have a material adverse impact on the riparian reserve zone;
- (h) felling or modifying a tree under an occupant licence to cut, master licence to cut or free use permit issued in respect of an area that is subject to a licence, permit, or other form of tenure issued under the Land Act, Coal Act, Geothermal Resources Act, Mines Act, Mineral Tenure Act, Mining Right of Way Act, Petroleum and Natural Gas Act or Pipeline Act, if the felling or modification is for a purpose expressly authorized under that licence, permit or tenure;
- (i) felling or modifying a tree for the purpose of establishing or maintaining an interpretive forest site, recreation site, recreation facility or recreation trail.

(2) An agreement holder who fells, tops, prunes or modifies a tree under subsection (1) may remove the tree only if the removal will not have a material adverse effect on the riparian reserve zone.

(3) An agreement holder must not carry out the following silviculture treatments in a riparian reserve zone:

- (a) grazing or broadcast herbicide applications for the purpose of brushing;
- (b) mechanized site preparation or broadcast burning for the purpose of site preparation;
- (c) spacing or thinning.

Restrictions in a riparian management zone

52 (1) A holder of a minor tenure who fells trees in a cutblock within a riparian management zone of a class described in Column 1 must ensure that

- (a) the percentage of the total basal area within the riparian management zone specified in Column 2 is left as standing trees, and
- (b) the standing trees are reasonably representative of the physical structure of the riparian management zone, as it was before harvesting:

Column 1 Riparian Class	Column 2 Basal Area to be Retained Within Riparian Management Zone (%)
S1-A or S1-B stream	≥ 20
S2 stream	≥ 20
S3 stream	≥ 20
S4 stream	≥ 10
S5 stream	≥ 10
S6 stream	Not applicable
All classes of wetlands or lakes	≥ 10

2) An authorized person who cuts, modifies or removes trees in a riparian management zone for an S4, S5 or S6 stream that has trees that contribute significantly to the maintenance of stream bank or channel stability must retain enough trees adjacent to the stream to maintain the stream bank or channel stability, if the stream

- (a) is a direct tributary to an S1, S2 or S3 stream,
- (b) flows directly into the ocean, at a point near to or where one or more of the following is located:
 - (i) a herring spawning area;
 - (ii) a shellfish bed;
 - (iii) a saltwater marsh area;
 - (iv) an aquaculture site;
 - (v) a juvenile salmonid rearing area or an adult salmon holding area, or

(c) flows directly into the ocean at a point near to the location of an area referred to in paragraph (b) and failure to maintain stream bank or channel stability will have a material adverse impact on that area.

Temperature sensitive streams

53 An authorized person who fells, modifies or removes trees in a riparian management area adjacent to a temperature sensitive stream, or a stream that is a direct tributary to a temperature sensitive stream, must retain either or both of the following in an amount sufficient to prevent the temperature of the temperature sensitive stream from increasing to an extent that would have a material adverse impact on fish:

(a) streamside trees whose crowns provide shade to the stream;

(b) understory vegetation that provides shade to the stream.

Protection of fish and fish habitat

57 An authorized person who carries out a primary forest activity must conduct the primary forest activity at a time and in a manner that is unlikely to harm fish or destroy, damage or harmfully alter fish habitat.

Private Managed Forest Land Act (SBC 2003, Chapter 80) ⁴⁰

Division 1 — Management Objectives on Private Managed Forest Land

Water quality

13 (1) The forest management objective for private managed forest land with respect to water quality is to protect human drinking water, both during and after harvesting.

(2) Nothing in subsection (1) requires an owner to retain additional streamside trees or additional understory vegetation to address problems with water quality that originate outside of the owner's private managed forest land.

Fish habitat

14 (1) The forest management objective for private managed forest land with respect to the protection of fish habitat, both during and after harvesting, is to retain sufficient streamside mature trees and understory vegetation to protect all of the following:

(a) a natural variation in water temperatures;

(b) sufficient cover for fish;

(c) a continual source of large woody debris for stream channel stability purposes;

(d) a vigorous mass of roots capable of controlling stream bank erosion;

(e) a filter to prevent the transport of sediment into stream channels;

(f) woody debris sufficient for in-stream habitat;

(g) a source of nutrients to the stream through litter fall.

(2) Nothing in subsection (1) requires an owner to retain additional streamside trees or additional understory vegetation to address problems with fish habitat that originate outside of the owner's private managed forest land.

Critical wildlife habitat

⁴⁰ Available: http://www.qp.gov.bc.ca/statreg/stat/P/03080_01.htm#section14 (Mar 14, 2007)

15 The forest management objective for private managed forest land with respect to critical wildlife habitat is to facilitate the long term protection of that habitat by

- (a) providing a reasonable opportunity for a person designated in writing by the deputy minister to the minister responsible for the administration of the Wildlife Act to assess whether critical wildlife habitat is present on private managed forest land, and
- (b) fostering efforts of the government and the owners to enter into agreements for the protection of any critical wildlife habitat identified under paragraph (a).

Private Managed Forest Land Act Private Managed Forest Land Regulations (2004) ⁴¹

Critical wildlife habitat

5 (1) The wildlife minister, in accordance with section 7, may

- (a) establish or vary an area of private managed forest land as critical wildlife habitat if
 - (i) the habitat of one or more species at risk is located on the land, and
 - (ii) the habitat on the land is required for the survival of one or more of the species at risk because there is insufficient suitable habitat found on Crown lands within that ecoregion, or
- (b) cancel the establishment of an area as critical wildlife habitat.

(2) Within an area of critical wildlife habitat, an owner must carry out any timber harvesting and related activities, and any road construction, in accordance with the requirements of the notice given or amended under section 7.

An owner may be required to provide information

6 (1) If the wildlife minister has reasonable cause to believe that there may be an area of private managed forest land that qualifies for establishment as critical wildlife habitat, the wildlife minister, in writing, may notify the owner that an area of the owner's private managed forest land may qualify for establishment as critical wildlife habitat.

(2) An owner who receives a notice under subsection (1) must give the wildlife minister information respecting any road construction or timber harvesting and related activities that the owner is proposing for the area during the 30 day period immediately following receipt of the notice.

Requirements if critical wildlife habitat is determined to be present

7 (1) Before critical wildlife habitat is established or varied under section 5, the wildlife minister must give a notice in writing to the owner of the private managed forest land

- (a) describing the location, nature and extent of the critical wildlife habitat,
- (b) specifying the amount of habitat required for the survival of the affected species at risk, and
- (c) specifying the area within the critical wildlife habitat where road construction and timber harvesting and related activities must be modified and the extent of that modification.

⁴¹ Available: http://www.qp.gov.bc.ca/statreg/reg/P/371_2004.htm (Mar 14, 2007)

(2) Unless otherwise agreed to by the owner, an area referred to in subsection (1) (c)
(a) must not have been previously described in a notice to the owner given or amended under this section,
(b) must not exceed, in combination with any other areas identified in notices to the owner given or amended under this section, an amount of area that is the lesser of
(i) 1% of all the land identified in that management commitment, or
(ii) the area required for the survival of the species at risk, and
(c) must not be subject to a period of modified operations exceeding one year from the date the notice is received by the owner.

(3) The establishment of the area of critical wildlife habitat identified in the notice to the owner given or amended under this section becomes effective on the date the notice is received by the owner of the private managed forest land.

(4) The requirements, if any, to modify road construction, timber harvesting and related activities on an area, specified in a notice to the owner given or amended under this section, becomes effective
(a) subject to paragraph (b), 14 days after the notice is received by the owner, or
(b) on a date specified by the minister.

(5) The wildlife minister may, in writing, at any time after issuing a notice under subsection (1),
(a) amend the content of the notice that is in effect provided that the content of the amended notice complies with the requirements of subsection (2), or
(b) cancel the notice that is in effect.

(6) An amendment or cancellation referred to in subsection (5) becomes effective on the date the notice is received by the owner.

(7) If the wildlife minister determines, at any time after issuing a notice under subsection (1), that a portion of the area that is subject to the notice
(a) is not required for the survival of the species at risk, or
(b) is no longer critical wildlife habitat,
the minister must immediately cancel the notice.

Previously unrecognized critical wildlife habitat

8 (1) The ministry responsible for the administration of the Wildlife Act may publish, from time to time, a list of species at risk that specifies, by ecoregion, those species for which the wildlife minister determines there is insufficient suitable habitat on Crown lands within that ecoregion.

(2) If an owner knows that there may be, on the owner's land, habitat for a species specified on the list referred to in subsection (1), the owner must
(a) promptly notify the wildlife minister, and

(b) refrain from carrying out any road construction or timber harvesting and related activities that could negatively impact the habitat until the earliest to occur of the following:

- (i) the expiry of 14 days from the time the wildlife minister receives the notice under paragraph (a);
- (ii) being advised by the wildlife minister that the activity may be carried out;
- (iii) receiving a notice under section 7.

(3) The wildlife minister may relieve the owner of a requirement to notify the wildlife minister under subsection (2) (a) with respect to one or more species at risk.