

Considerations for Forest and Range Stewardship under the *Forest and Range Practices Act*

Jim Snetsinger, Chief Forester

FREP

CHIEF FORESTER'S REPORT

October 2009

FREP Mission: To be a world leader in resource stewardship monitoring and effectiveness evaluations, providing the science-based information needed for decision-making and continuous improvement of British Columbia's forest and range practices, policies, and legislation.

INTRODUCTION

Monitoring and effectiveness evaluations are foundational elements of the *Forest and Range Practices Act (FRPA)* and crucial to its success over time. In this, my first Chief Forester's Report on the **Forest and Range Evaluation Program (FREP)**, I discuss the program's progress and future direction. I also introduce some important considerations for forest and range stewardship that have been brought to light by the monitoring results to date for three resource values—biodiversity, fish/riparian, and water quality. Overall, I am pleased with the results and believe that we will achieve continued improvements by making a few small, but key, changes where they count the most. By sharing the information contained in this report, I wish to encourage a dialogue among professionals that will lead to continued improvements in practices and the success of professional reliance under *FRPA*.

FREP began resource stewardship monitoring in 2005 to assess whether forest and range practices are meeting the intent of government objectives for 11 forest and range resource values.¹ The program determines whether forest and range practices and legislation are meeting government's broader intent for sustainable management of British Columbia's natural resources. Resource stewardship monitoring results from the past three years across 29 forest districts provide a baseline of practices conducted under the *Forest Practices Code of British Columbia Act*. Many of the same or similar practices are likely to occur under *FRPA*, given the commitment that the two regulatory approaches would offer comparable environmental standards. Over the next several years as we move forward in the implementation of *FRPA*, all FREP monitoring will assess activities that occur under this new regulatory framework. To date, the focus of most FREP work has been the environmental stewardship aspect of forest and range management at the site, cutblock or individual stream level. Future work will include examining stewardship at the broader landscape/ watershed level, and, expanding the environmental stewardship aspect to include social and economic considerations.

FREP continues to perform well as a collaborative, multi-agency initiative. Under my sponsorship, the FREP Working Group guides program activities, working

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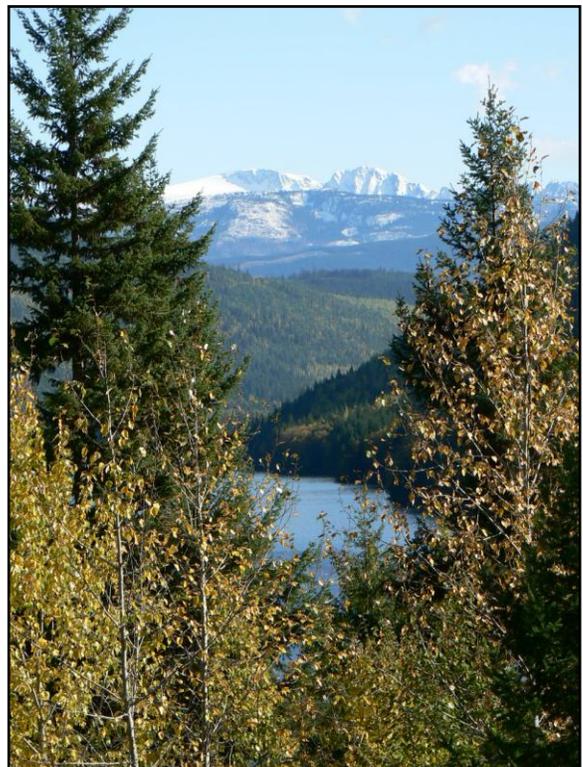


PHOTO CREDIT: Ted McRae, Okanagan Shuswap Forest District

¹ These resource values are biodiversity, cultural heritage, soil, water, fish/riparian, forage and associated plant communities, timber, recreation, resource features, visual quality, and wildlife.

closely with district and regional staff of the Ministry of Forests and Range and with staff from the Ministry of Environment, the Integrated Land Management Bureau, and the Ministry of Tourism, Culture and the Arts.²

FREP maintains a high standard of data quality through well-designed and implemented data management tools and quality protocols—a strength that has earned the program high recognition from the National Quality Institute. I have great confidence that the information FREP produces is reliable and will greatly assist forest managers responsible for applying best information to their duties under professional reliance.

How do we use the results from FREP monitoring? Our priority is to influence continued improvement in practices through generating new knowledge about the effectiveness of forest and range practices and communicating it to professionals. If necessary, other methods to secure change may include Chief Forester's guidance, new or amended policies, or legislative changes.



PHOTO CREDIT: Blake Fougere, Sunshine Coast Forest District

FREP asks evaluative questions about the sustainability of each resource value. These questions serve as the starting point for the development of appropriate indicators and monitoring protocols by subject matter experts and scientists. Used together, the indicators and protocols provide information on the state of resource values and help to quantify baselines and trends. Program staff analyze results to determine resource value trends and issues, and to identify how

practices are working. Sharing these outcomes is essential to support resource professionals in developing forest stewardship plans and to continually improve forest and range practices. The indicators that FREP monitors are some of the most critical ecological aspects of each resource value. As a result, an understanding of the indicators and the protocols will provide professionals with a valuable planning and decision-making tool for pre- and post-harvest activities.

CONSIDERATIONS FOR FOREST AND RANGE STEWARDSHIP

The results to date for the biodiversity, fish/riparian, and water quality resource values are largely positive. The "Considerations for Forest and Range Stewardship" presented in this report are based on an assessment of practices. These assessments have shown practices that are working well and those that could be improved. The considerations in the report reflect suggestions to build on current successes and continue to improve the condition of these resource values. In keeping with the results-based approach, these considerations are neither directive nor prescriptive. Front-line forest and range professionals are best positioned to develop site-specific, innovative, local, and cost-effective solutions for the stewardship of our public forests and rangelands.

Biodiversity³

The goal of stand-level biodiversity monitoring is to determine whether the present policy of retaining wildlife tree patches and riparian reserves is achieving the desired levels and types of structures necessary to maintain species diversity. Blocks harvested under legislative requirements set out in the *Forest Practices Code of British Columbia Act* were randomly selected. The resulting field data was compiled by biogeoclimatic (BEC) zone. The results are compared to a baseline dataset developed from pre-harvest cruise data. The analysis of close to 650 blocks has shown varying strengths and challenges within the different biogeoclimatic zones.

The average retention by BEC zone found in these code blocks is much higher than the minimum default from *FRPA*. For example, average retention ranges from 11.5% in the BWBS to 26.6% in the IDF⁴. Much of this retention is found in areas that are constrained from harvesting (e.g., difficult terrain, riparian reserves) and therefore while providing significant ecological value; they have relatively small economic impact. Coarse woody debris (CWD) volumes found in the harvested areas of the Code blocks are comparable to the range of volumes found in the unharvested retention patches.

² Detailed business models and information concerning provincial, regional, and district roles and responsibilities are available on the FREP website (<http://www.for.gov.bc.ca/hfp/frep/index.htm>).

³ Resource value team leaders: Nancy Densmore (Nancy.Densmore@gov.bc.ca) and Richard Thompson (Richard.Thompson@gov.bc.ca)

⁴ BWBS (Boreal White and Black Spruce); IDF (Interior Douglas Fir) Biogeoclimatic zones

Other biodiversity indicators range greatly among the Province's BEC zones. I am particularly pleased to see the results from the SBS, MS, and SBPS BEC zones in the central interior of the province where there has been especially good retention of large trees and maintenance of tree species diversity⁵.

Forest and Range Stewardship Considerations for Stand-Level Biodiversity:

FREP conducted stand-level biodiversity assessments on a variety of practices, some that are resulting in positive stewardship outcomes while others leave room for improvement. The following considerations are based on both the successes found and areas where opportunities for improvement were found:

- Retaining more long coarse woody debris pieces (e.g., ≥ 20 cm diameter and 10 m long) improves the long-term ecological value of this wood. Bigger pieces of coarse woody debris decay more slowly and provide habitat and other ecological services for a longer time (e.g., into the next rotation when new coarse woody debris will become available). Professionals can avoid breaking up non-merchantable wood left on-site.
- Retaining higher densities of large trees, particularly in the Coastal Western Hemlock and the Interior Cedar Hemlock biogeoclimatic zones, will enhance the amount of habitat available to wildlife-tree users and contribute to long-term coarse woody debris recruitment. One way to achieve this is by choosing patch areas with densities of large trees representative of pre-harvest conditions, and/or leaving large and safe trees standing as dispersed retention.
- Leaving large retention patches generally makes it more practical to retain large dead trees. In smaller patches, these trees are potentially dangerous to forest workers and therefore often felled.

Fish/Riparian⁶

The goal of monitoring the health of stream channels and their adjacent riparian management areas is to determine whether forest and range practices are achieving the desired result of protecting fish and other aquatic values by maintaining channel and riparian functions.

In the first three years of operational riparian assessments, routine stewardship monitoring was completed province-wide for more than 1000 randomly sampled streams. Findings to date include:

- 87% of all streams sampled (fish-bearing and non-fish bearing) were found to be in one of three classes of proper functioning condition⁷
- Fish habitat is being well protected with 93% of all fish-bearing streams in one of three classes of proper functioning condition – this increased to 96% of streams where there were riparian reserves in place
- The FREP results closely corroborate the results reported by the B.C. Forest Practices Board in their 1998 assessment of the Code -- the similarity of monitoring results obtained from two independent and different methodologies lend strong support that these findings are accurate and reliable.



PHOTO CREDIT: Tracy Coombes, Nadina Forest District

Forest and Range Stewardship Considerations for Fish/Riparian:

While the results to date indicate that riparian management practices under the Forest Practices Code were effective, I believe we can virtually eliminate future forest management-related issues by learning from the practices that resulted in the best outcomes. The majority of riparian issues found were on S6 streams (S6 are non fish-bearing streams). Focussing the enhanced riparian practices described below on key streams (e.g. those connected to downstream fish-bearing water bodies and drinking water sources) will help maximize benefits to habitat, and minimize costs:

- Limiting the introduction of logging debris into channels helps maintain channel network connectivity, reduce stream bank and channel bed damage and resulting sedimentation.

⁵ SBS (Sub-Boreal Spruce); MS (Montane Spruce); SBPS (Sub-Boreal Pine Spruce)

⁶ Resource value team leader: Peter Tschaplinski (Peter.Tschaplinski@gov.bc.ca)

⁷ Properly Functioning Condition; Properly Functioning – Limited Impacts; Proper Functioning – Moderate Impacts

- Limiting physical contact of logging equipment with the banks and beds of S6 streams reduces stream bank damage and resulting sedimentation.
- Falling and yarding away from channels whenever feasible reduces stream bank damage and resulting sedimentation.
- Retaining more trees (at a minimum, non-merchantable, understorey, and smaller vegetation) for S4 and key S6 streams maintains shade (enhanced habitat and stream temperature regulation) and improves stream bank stability, thereby reducing stream bank damage and resulting sedimentation.
- Managing roads and stream crossings to limit fine-sediment delivery to streams reduces sedimentation and enhances water quality for fish habitat and human water consumption.
- Preplanning drainage from roads
- Identifying priority road segments that are both capable of generating sediment and transporting it to streams
- Recognizing that running road surfaces themselves can be a major source of sediment and planning for it
- Using coarse ballast road materials on road segments capable of delivering sediment to streams
- Incorporating higher densities of strategically placed culverts
- Making use of crowned roads, rolling dips and kick outs to manage road surface water and channel it into ditches or the duff layer⁹ under the forest canopy
- Armouring or seeding exposed sensitive soils
- Avoiding grader berms that concentrate road water towards streams.

Water Quality⁸

The goal of resource stewardship monitoring for water quality is to determine whether forest and range practices are protecting water quality for drinking water and fish habitat. Forest management impacts are determined by estimating the amount of fine sediment generated from roads, cutbanks, ditchlines, and cutblocks. A range component involves assessing impacts of livestock activity that occur in conjunction with forest management. These assessments evaluate the outcomes of forest and range management practices to sustain good water quality.

Water quality assessments showed that as a result of practices under the Forest Practices Code, 71% of sites scored very low or low for sediment generation (a primary indicator of water quality), while an additional 23% scored moderate. In addition to FREP generated assessments, the water quality protocol is being used by a number of licensees to meet their sustainable forest management certification monitoring requirements.

Forest Stewardship Considerations for Water Quality:

Best water quality management practices generally focus on controlling sediment generation and erosion from roads, cutbanks and other sources of exposed soil that can carry sediment into streams. Best practices incorporate sediment and erosion control into road location, design, construction, maintenance and deactivation. Community watersheds and watersheds used for drinking water will benefit the most from the implementation of the following considerations developed in consideration of practices that are currently working well and those that could be improved:

- Avoiding areas with a high potential for sediment generation in the road layout stage

Considerations for Range Stewardship:

- Avoiding overgrazing will help minimize exposed soils and sediment generation
- Limiting cattle access to stream banks and stream channels will eliminate direct fecal and urine inputs and reduce the formation of algal mats, which are detrimental to both human health and fish habitat (reduced oxygen)
- Keeping livestock from standing in or drinking directly from streams will significantly reduce pugging¹⁰ along stream banks
- Keeping dung a minimum of three metres from the water's edge will significantly reduce direct fecal inputs
- Providing control structures will limit direct access to stream banks and stream channels
- Reducing bare and compacted soil will reduce the amount of fine sediment available for transport into stream channels.



PHOTO CREDIT: Alex Marshal, Sunshine Coast Forest District

⁸ Resource value team leader: Dave Maloney (David.Maloney@gov.bc.ca)

⁹ Duff is the leafy, woody mulch that makes up the top layer of soil
¹⁰ Pugging is the kneading of soil and water by animal hooves. This action punches into the soil layer and disturbs the ground generating fine sediment available for transport into stream channels.

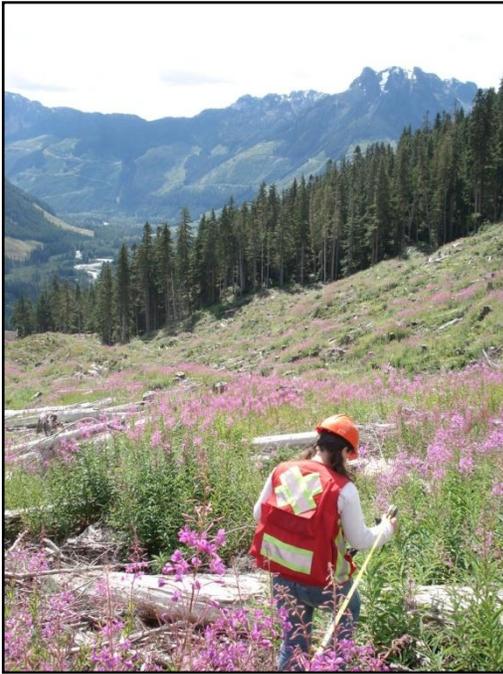


PHOTO CREDIT: Andrea Lyall, Squamish Forest District

SUMMARY

This report, along with more detailed FREP reports,¹¹ contains key information that I anticipate will broaden the knowledge base of all those who are charged with managing our forests. I trust it will enhance dialogue and collaboration between forest and range managers and our partners, and continue to improve our collective accountability to the citizens of British Columbia. In the spirit of the results-based approach, the forest and range stewardship considerations presented here are non-prescriptive. Front-line forest professionals are best positioned to develop site-specific solutions that are innovative and cost-effective and will lead to continued improvement of forest and range resource management. As further results are reported over the next several years and as we further explore landscape-level assessments, FREP's value to forest and range management in British Columbia will become ever more apparent; professionals will continue to learn from these monitoring outcomes, and we will see forest and range practices improve and the FRPA model succeed.

Next year's Chief Forester's FREP Report will include considerations for forest and range stewardship of some of the other resource values, reflect on what changes have occurred over the year, and begin to present results under FRPA. To ensure that this report is a valuable resource, I encourage you to do four things:

1. Carefully review the considerations for forest and range stewardship in this report in the context of

2. your role and responsibility for planning or implementing forest and range practices.
2. Visit the FREP website at <http://www.for.gov.bc.ca/hfp/frep/> and (or) contact any of the resource value team leads for more detailed information on the monitoring protocols, indicators, and results to help enhance your professional knowledge and understanding.
3. Consider the FREP resource value monitoring indicators in your planning and (or) implementation of forest and range practices. These indicators are key attributes and indicators of resource value health – manage these well and the resources will be managed well.¹²
4. Send any feedback you may have on the content or format of this report, or suggestions for future Chief Forester's FREP Reports, to: Alanya.C.Smith@gov.bc.ca (250) 387-8922 or Peter.Bradford@gov.bc.ca (250) 356-2134



PHOTO CREDIT: Connie Herman, Arrow Boundary Forest District

FOR MORE INFORMATION

<http://www.for.gov.bc.ca/hfp/frep/>



¹¹ See listing of FREP reports and report summaries at <http://www.for.gov.bc.ca/hfp/frep/publications/reports.htm>.

¹² FREP is currently collaborating with the Forest Investment Account (FIA) to develop opportunities for licensees to use FREP indicators, protocols and data in their sustainable forest management (SFM) certification monitoring. For more information on this opportunity, please contact Kerri.Brownie@gov.bc.ca

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PHOTO CREDITS (FROM TOP LEFT): STEVE LEHNERT; TED McRAE; SCOTT DUNN; (FROM BOTTOM LEFT) PETER BRADFORD; MIKE GRAINGER; THOMAS CHEN

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