



Multiple Resource Value Assessment (MRVA)

Robson Valley Timber Supply Area
Prince George Natural Resource District

December 2013

FOREWORD

Forest management in British Columbia is governed by a hierarchy of legislation, plans and resource management objectives. For example, federal and provincial acts and regulations, Land Use and forest stewardship plans, and protected areas and reserves collectively contribute to achieving balanced environmental, social and economic objectives. Sustainable forest management is key to achieving this balance and a central component of forest management certification programs. The purpose of Multiple Resource Value Assessment (MRVA) reports is to provide resource professionals and decision makers with information about the environmental component of this 'balance' so that they can assess the consistency of actual outcomes with their expectations.

The *Forest and Range Practices Act (FRPA)* lists 11 resource values essential to sustainable forest management in the province; biodiversity, cultural heritage, fish/riparian and watershed, forage and associated plant communities, recreation, resource features, soils, timber, visual quality, water, and wildlife. The MRVA report is a summary of the available field-based assessments of the conditions of these values. Field assessments are generally conducted on or near recently harvested cut blocks and therefore are only evaluating the impact of industrial activity and not the condition of the value overall (e.g., they don't take into account protected areas and reserves). Most of the information is focused on the ecological state of the values and provides useful information to resource managers and professionals on the outcomes of their plans and practices. This information is also valuable for communicating resource management outcomes to stakeholders, First Nations and the public, and as a foundation for refining government's expectations for sustainable resource management in specific areas of the province.

I encourage readers to review the full report and direct any questions or comments to the appropriate district office.

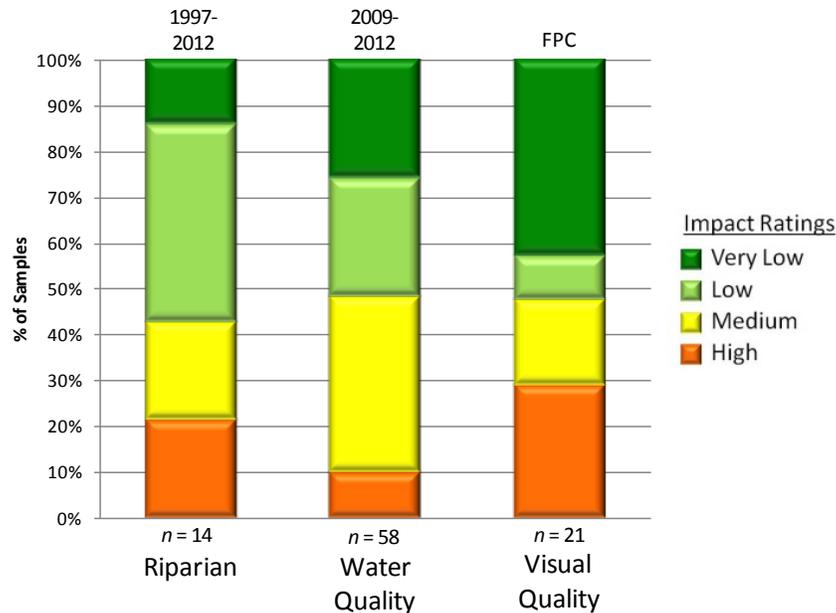
A handwritten signature in black ink, appearing to read 'Tom Ethier', is positioned above the typed name.

Tom Ethier
Assistant Deputy Minister
Resource Stewardship Division
Ministry of Forests, Lands and Natural Resource Operations

MULTIPLE RESOURCE VALUE ASSESSMENTS—IN BRIEF

Multiple resource value assessments show the results of stand and landscape-level monitoring carried out under the Forest and Range Evaluation Program (FREP). This report summarizes results for riparian, biodiversity, water quality (sediment), and visual quality monitoring conducted in the Robson Valley Timber Supply Area and includes a district manager commentary of key strengths and weaknesses. Through MRVA reports, decision makers communicate expectations for sustainable resource management of public resources and identify opportunities for continued improvement.

Figure 1: Robson Valley Timber Supply Area site-level resource development impact ratings by resource value with trend. (Riparian and visual quality trend by harvest year/era. Water quality trends by evaluation year.)



Important Context for Understanding this Assessment

The extraction and development of natural resources, along with natural factors (e.g., insects, wind, floods), influence and impact ecological condition. The goal of effectiveness evaluations is to assess these impacts on the state of public natural resource values (status, trends, and causal factors); such evaluations *do not assess compliance with legal requirements*. These evaluations help resource managers:

- assess whether the impacts of resource development result in sustainable resource management
- provide transparency and accountability for the management of public resources
- support the decision-making balance between environmental, social, and economic factors
- inform the ongoing improvement of resource management practices, policies, and legislation.

The resource development impact ratings contained in this report are based on assessments conducted within the areas where resource extraction takes place and do not reflect the ecological contributions of parks, protected areas, or other conservancy areas.

Although this report focuses on forestry-related activities, FREP monitoring protocols have also been applied to other resource sector activities, including mining (roads) and linear developments (hydro and pipelines). Procedures are being adapted to expand monitoring into these resource sectors over time.

INTRODUCTION

The development of the *Forest and Range Practices Act (FRPA)* had several key objectives, including:

- simplifying the forest management legal framework
- reducing operational costs to both industry and government
- allowing “freedom to manage”
- maintaining the high environmental standards of the *Forest Practices Code of British Columbia Act (FPC)*.

As part of the results-based *FRPA* framework, the provincial government committed to conducting effectiveness evaluations and publically reporting the monitoring results. The science-based information provided by these evaluations will be used to determine whether *FRPA* is achieving the government’s objectives of maintaining high environmental standards and ensuring sustainable management of public resources. If those objectives are not being met the monitoring results will be used to help inform the necessary adjustments to practices, policies, and legislation. Government is delivering its effectiveness evaluation commitment through the Forest and Range Evaluation Program (FREP; for details, see <http://www.for.gov.bc.ca/hfp/frep/>). The 11 *FRPA* resource values monitored under FREP include: biodiversity, cultural heritage, fish/ riparian & watershed, forage and associated plant communities, recreation, resource features, soils, timber, visual quality, water and wildlife.

Multiple Resource Value Assessments (MRVAs) reflect the results of stand- and landscape-level monitoring carried out under FREP. The program’s stand-level monitoring is generally conducted on forestry cutblocks, resource roads, or other areas of industrial activity. As such, these evaluations provide a stewardship assessment of resource development practices. Landscape-level monitoring of biodiversity, visual quality, and wildlife resource values is more broadly an assessment of the overall landscape. Reports on MRVAs are designed to inform decision making related to on-the-ground management practices, statutory decision-maker approvals, and data for the assessment of cumulative effects.

This report summarizes FREP monitoring results for the Robson Valley Timber Supply Area. MRVA reports clarify resource stewardship expectations, and promote the open and transparent discussion needed to achieve short- and long-term sustainable resource management in British Columbia.

MRVA reports are intended for those interested in the status and trends of resource values at the timber supply area (TSA) or natural resource district scale, such as natural resource managers and professionals, government decision makers, and First Nations. These reports are also useful in communicating resource management outcomes to the public.

Government managers and decision makers are encouraged to consider this information when:

- discussing district or TSA-level resource stewardship with staff, licenced stakeholders, tenure holders and First Nations
- clarifying expectations for sustainable resource management of public land
- integrating social and economic considerations into balanced decision making
- reviewing and approving forest stewardship plans
- developing silviculture strategies for TSAs
- assessing Timber Supply Reviews and their supporting rationale
- informing decision making at multiple scales.

Natural resource professionals are encouraged to consider this information, along with other FREP information such as reports, extension notes, protocols, and monitoring data to:

- maintain current knowledge of the resources they manage
- inform professional recommendations and decisions, particularly when balancing environmental, social, and economic values
- enhance resource management, consultation, and treaty rights discussions between First Nations, government, and licensees.

Published FREP reports and extension notes contain detailed findings for each resource value. These documents are available on the FREP website at:

<http://www.for.gov.bc.ca/hfp/frep/publications/reports.htm>. Licensees can request data collected on their operating areas. FREP staff will assist licensees with the analysis of their data and the preparation of licensee-specific MRVA reports.

Although this MRVA report documents monitoring results at the district or TSA level, the MRVA concept is scalable. Reports for individual licensees, treaty settlement areas, or landscape units can be produced when sufficient monitoring data is available. Reports can also be prepared at the regional or provincial levels. This report provides site-level resource value assessments and trends through comparisons of cutblocks harvested before 2005 with those harvested in 2005 or later (where data is sufficient). FREP's site assessment monitoring results on each resource value are categorized by impact (very low, low, medium, or high). This classification reflects how well site-level practices achieve government's overall goal of sustainable resource management. Site-level practices that result in "very low" or "low" impact are consistent with sustainable management objectives. Practices resulting in "high" impact are seen as inconsistent with government's sustainability objectives. For a description of the MRVA methodology see Appendix 1.

ROBSON VALLEY TSA – ENVIRONMENTAL AND STEWARDSHIP CONTEXT

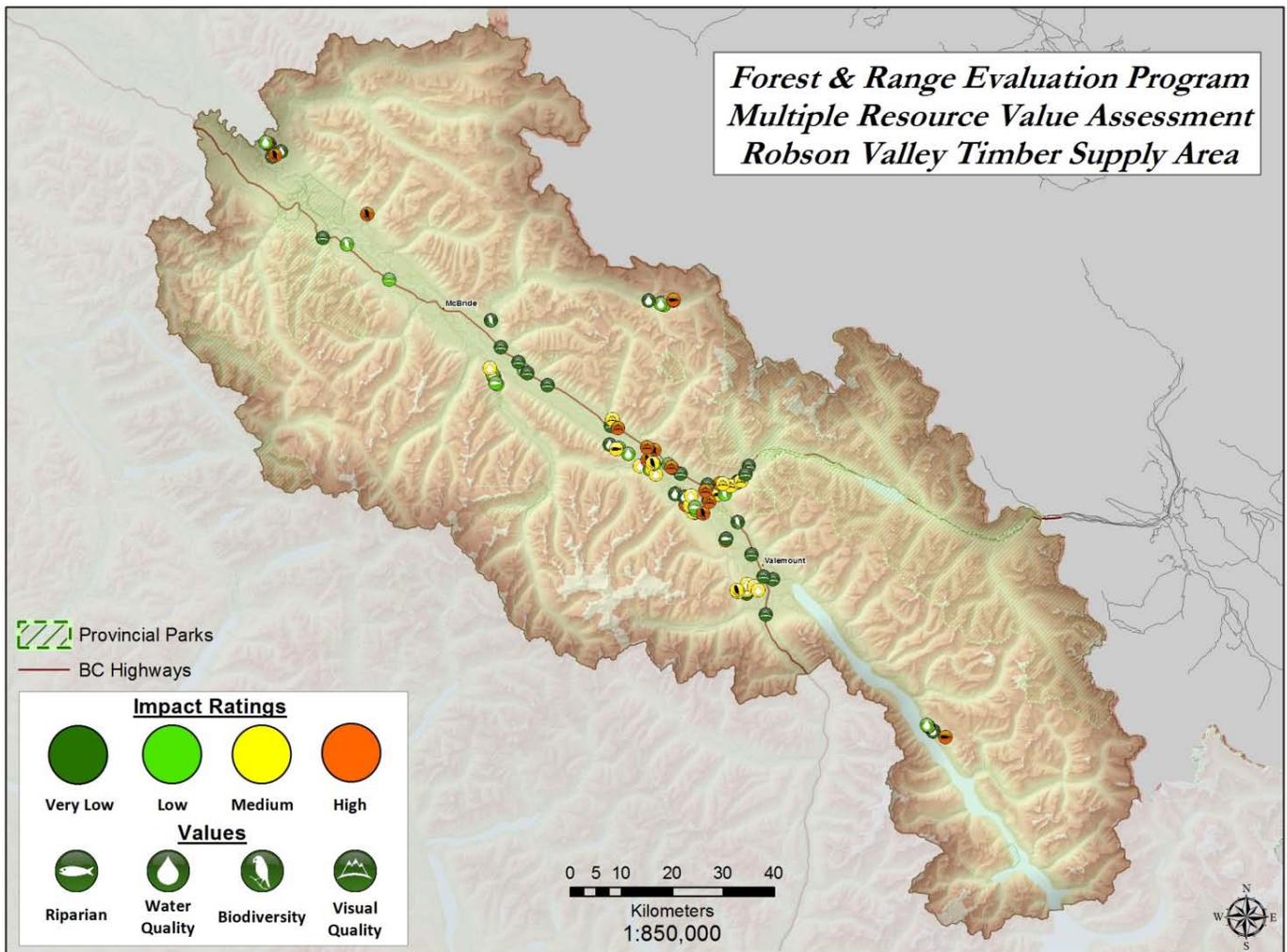
This report covers the Robson Valley Timber Supply Area, one of the two TSAs that now make up the Prince George Natural Resource District (figure 2). The TSA is bordered to the west by the Wells Gray and Bowron Lake provincial parks, and the Mitchell Lake-Niagara protected area which connects them, and by the Kakwa Recreation Area to the north. To the east are the Willmore Wilderness Area, Jasper National Park and Mount Robson and Mount Terry Fox Provincial Parks. The TSA covers a total area of approximately 1.46 million hectares. Mount Robson Provincial Park is found within the TSA as well as West Twin Provincial Park (and protected area) and other small provincial parks and protected areas. The mix of habitats in this TSA supports a variety of wildlife species, including Mountain Caribou, Grizzly Bear and Mule Deer, as well as Wolverine, Cougar, Wolf and Lynx. Chinook Salmon are also present, and a number of species in the TSA are listed as endangered, threatened or vulnerable. No First Nations' communities are located in the Robson Valley TSA, but five First Nations have aboriginal interests in the TSA. The Lheidli T'enneh Band and the Simpcw First Nation claim traditional territories in much of the Robson Valley, and the Canim Lake Band, the Soda Creek Band, the Red Bluff Band all have asserted traditional territory in the TSA.

The TSA is located in scenic mountainous terrain where forestry operations are physically difficult due to steep rocky slopes, unstable terrain, streams and avalanche chutes. Surface water is the primary source of water for domestic and agricultural use. Summer tourism and winter outdoor recreation are important to the local economy.

Forestry operations must comply with land-use objectives for visual quality objectives, ungulate winter range, old growth, wildlife movement corridors, and fisheries sensitive watersheds. Only 15 percent of the TSA area is considered available for timber harvesting under current management practices.

The two large mills that used to operate in the TSA have closed, negatively affecting the local economy. Mountain pine beetle has infested almost all the pine in the TSA, about 17 percent of the timber supply. The timber supply is dominated by old spruce-subalpine fir stands. Regenerated stands will be harvested at a younger age and smaller volume than existing stands so timber supply is expected to drop significantly in the future. Therefore, there is demand to harvest as much damaged pine as possible.

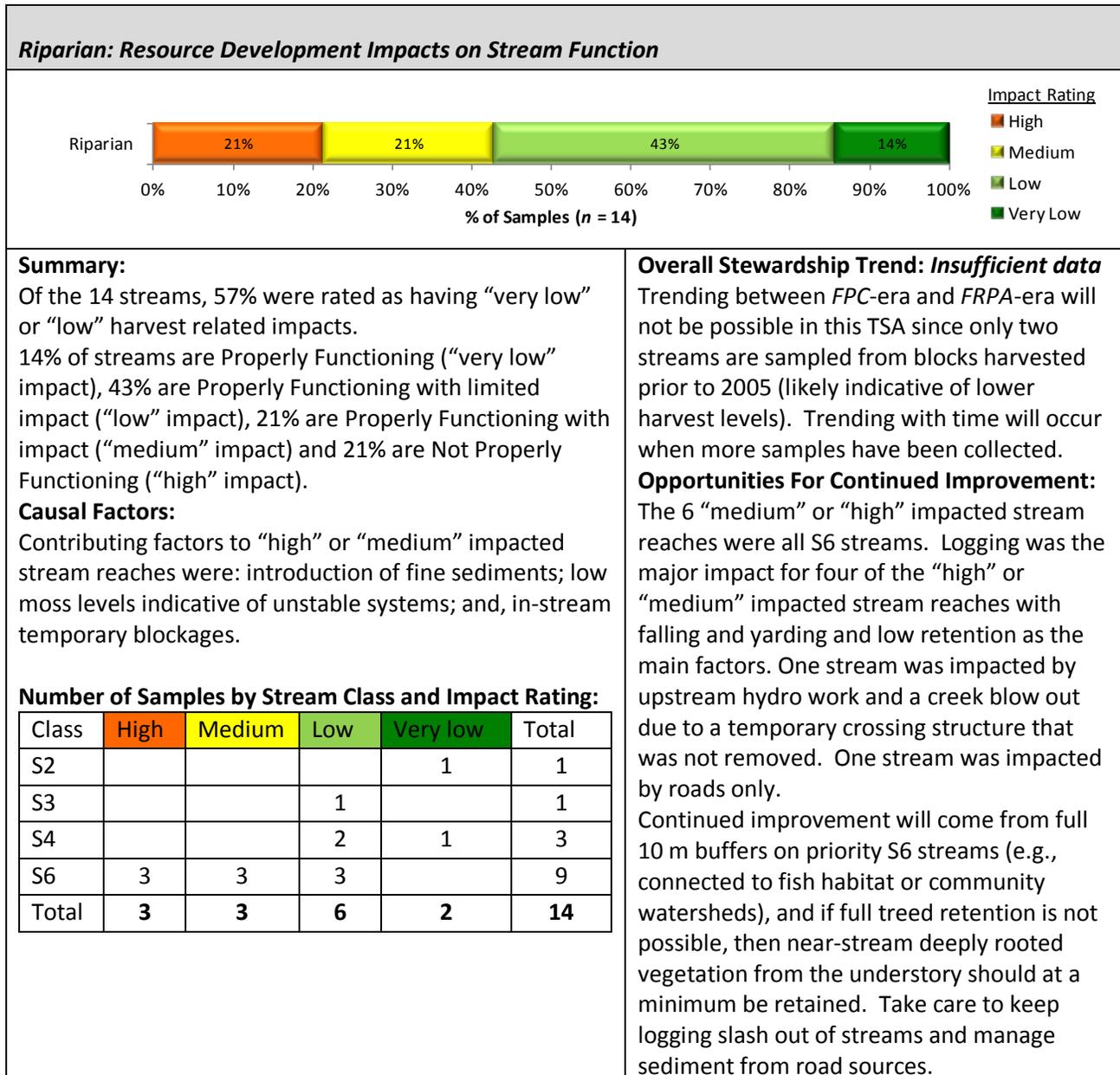
Figure 2: Robson Valley Timber Supply Area, showing FREP sample locations and results (see <http://www.for.gov.bc.ca/hfp/frep/publications/mrva.htm> for a high-resolution version of this map).



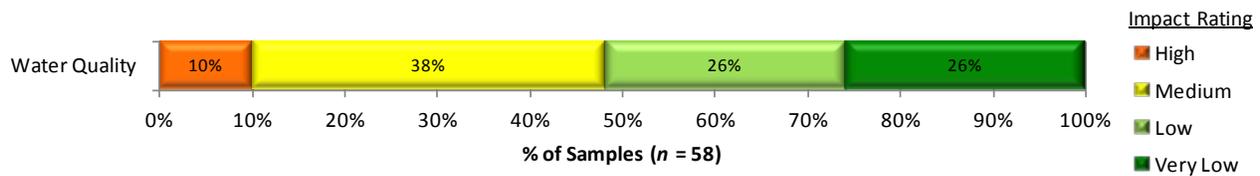
KEY RESULTS BY RESOURCE VALUE AND OPPORTUNITIES FOR CONTINUED IMPROVEMENT

Table 1 shows the resource values assessed for the Robson Valley TSA, and includes a summary of key findings, causal factors, trends, and opportunities for continued improvement. Data are presented for *FPC*-era samples at sites harvested before 2005 and *FRPA*-era samples at sites harvested in 2005 or later. This approximates the *Forest and Range Practices Act* (*FRPA*) era, and allows for a comparison between earlier and later stewardship practices. The impact rating indicates the effect of resource development on the resource value, from “very low” to “high” impact.

Table 1: Resource development impact rating, key findings, and opportunities for improvement by resource value for the Robson Valley TSA.



Water Quality (fine sediment): Resource Development Impacts on Water Quality



Summary:

Of the 58 road segments assessed, 52% were rated “very low” or “low” road related impact.

Site assessments show the range for potential sediment generation as 26% “very low” (“very low” impact), 26% “low” (“low” impact), 38% “moderate” (“medium” impact), 10% “high” (“high” impact).

Causal Factors:

See opportunities for improvement for “high” or “medium” impacted road segments. Some opportunities will apply to ongoing maintenance issues, while others mainly apply to new road construction.

Overall Stewardship Trend: *Insufficient data*

Trending for water quality is based on survey years, to capture impact of road traffic and maintenance. The 58 road segments assessed originate from 12 harvest openings. Trending will be done when further data is collected.

Opportunities For Improvement:

The most frequent suggested improvements are; to use good quality materials and crown roads, remove berms that channel sediment into water bodies, armour, seed and protect bare soil, and, avoid long gradients approaching streams.

Stand-level Biodiversity: Resource Development Impacts on Stand-Level Biodiversity

Summary:

Of the 13 ICHwk and SBSdh cutblocks assessed, 46% of sites were rated “very low” or “low” harvest related impact. (31% “very low” impact, 15% “low”, 15% “medium” and 38% “high” impact). There is another 19 blocks from ESSFmm and ICHmm however there was insufficient baseline on these subzones so MRVA scores are not possible. See further discussion below.

Causal Factors:

The ICHmm subzone has become the most sampled subzone in the FRPA-era within the Robson Valley at 14 of the 22 FRPA-era blocks. Very little baseline (digital cruise data) was available for this subzone, though if using the ICHmk as a surrogate baseline, the quality of retention in the ICHmm is low, with low levels of large snags, 50 cm plus dbh trees or tree species diversity. This low quality is somewhat balanced out by high retention level (average of 24%) though this comes often from very low (4 blocks <3.5%) or very high (5 blocks >30%) retention.

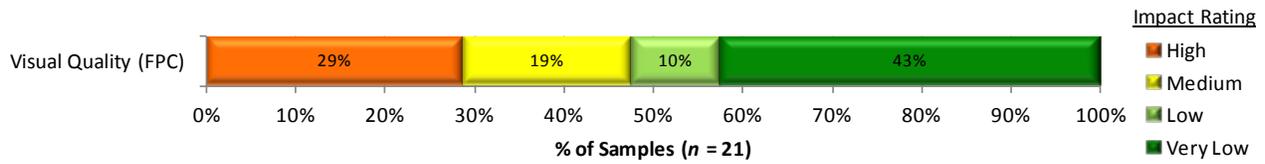
Overall Stewardship Trend: *unable to trend*

Trending for three of the four components is possible. Percent retention is slightly down due to small increase of blocks with very little retention (<3.5%) in the FRPA-era compared to FPC-era. There is slightly less coarse woody debris volume remaining on blocks compared to baseline in the FRPA era compared to the FPC, and coarse woody debris quality is down with fewer big pieces left on site.

Opportunities For Continued Improvement:

Leave at least low levels of tree retention on every cutblock with densities of large trees, snags and tree species similar to range found in pre-harvest conditions. Leave the full range of coarse woody debris volumes and big pieces of coarse woody debris over many blocks.

Visual Quality: Resource Development Impacts on Achievement of Visual Quality Objectives (VQO)



Summary:

All samples combined, of the 29 landforms assessed (21 FPC and 8 FRPA), 59% were rated “very low” or “low” harvest impact on achievement of the VQO. Of the 8 FRPA samples, 6 were “very low” impact, 1 was “medium” and 1 was “high” impact.

VQOs were “well met” (“very low” impact) on 52% of landforms, “met” (“low” impact) on 7%, “borderline” (“medium” impact) on 17%, “not met” on 7% and “clearly not met” on 17% (“high” impact).

Causal Factors:

48% of the openings contained visually effective levels of tree retention (> 22% by volume or stem count) and 59% had good visual quality design (cutblock shaping).

Number of Samples by VQO and Impact Rating:

VQO ¹	High	Medium	Low	Very Low	Total
M				6	6
PR	4	2	2	6	14
R	3	3		3	9
Total	7	5	2	15	29

¹ M = modification, PR = partial retention, R = retention

Overall Stewardship Trend: *Insufficient data*

There are currently 21 landforms harvested under the FPC and 8 landforms assessed that were harvested under FRPA. Trending will occur when further FRPA landforms are assessed.

Opportunities For Improvement:

Use existing visual design techniques to create more natural looking openings and better achieve VQOs. Use partial cutting to retain higher levels of volume/stems. Reduce opening size in retention and partial retention VQO areas.

Landscape-level Biodiversity: Is the forested matrix at the landscape-level providing the range of habitat understood as necessary for maintaining ecosystem function and old and mature forest dependant species?

This protocol is in development. The three primary landscape-level biodiversity indicators are: (1) site index by leading species (ecosystem representativeness); (2) percent of TSA by age class (young, mid-, mature, and old forest); and (3) percent interior habitat of old forest. Each indicator is categorized by percent in non-commercial land base, timber harvesting land base, and protected areas. Data for these indicators is derived from Hectares BC and other spatial databases.

RESOURCE VALUE STEWARDSHIP RESULTS COMPARISON

Table 2 provides ratings of stewardship effectiveness at varying scales. Effectiveness is determined by the percentage of samples with a “very low” or “low” resource development impact rating. Appendix 2 shows stewardship effectiveness results by resource value for the North, South and Coast Areas and the province as a whole.

Table 2: Stewardship effectiveness within the Omineca Region as determined by resource development impact rating (ID = Insufficient Data; sample sizes in brackets).

Resource Value	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Very low + Low Resource Development Impact Rating					
	Omineca Region Comparison					Omineca Region ^a
	Robson Valley TSA	Mackenzie District	Vanderhoof District	Fort St. James District	Prince George District	
Riparian – all data	57% (14)	73% (62)	70% (74)	64% (83)	74% (54)	69% (287)
FRPA-era data	ID (12)	60% (25)	74% (35)	72% (29)	ID (11)	70% (112)
FPC-era data	ID (2)	81% (37)	67% (39)	59% (54)	71% (42)	68% (174)
Water quality – all data	52% (58)	48% (82)	69% (127)	64% (133)	25% (48)	56% (448)
2010–2012 samples	41% (27)	39% (41)	74% (57)	41% (44)	19% (21)	48% (190)
2008–2009 samples	61% (31)	56% (41)	64% (70)	75% (89)	30% (27)	63% (258)
Stand-level biodiversity –all data	ID (32) ^b	22% (63)	8% (65)	71% (93)	59% (49)	43% (283)
FRPA-era data		25% (32)	5% (22)	88% (33)	64% (14)	46% (108)
FPC-era data		20% (31)	9% (43)	62% (60)	57% (35)	41% (175)
Visual Quality	ID (8)	ID (0)	85% (14)	75% (20)	ID (0)	79% (42)
FRPA	53% (21)	ID (0)	ID (0)	70% (10)	50% (12)	56% (43)
FPC						

^aIncludes the Prince George, Mackenzie, Fort St. James and Vanderhoof Natural Resource Districts.

^bThere is insufficient baseline for ESSFmm and ICHmm so ranking is not possible at this time for Robson Valley.

DISTRICT MANAGER COMMENTARY¹

The monitoring results presented in this document show that forest practices can be rated as “very low” or “low” impact (definitely sustainable) on half of the sites sampled for water quality and visual quality, and on slightly more than half of the sites sampled for riparian function.

I acknowledge that the environmental, social and economic conditions in Robson Valley provide many challenges for forest management. In particular, the mountain pine beetle epidemic has focused timber harvesting in the visually sensitive Rocky Mountain trench. However, there is significant room for improvement where resource impact ratings are “high” or “medium”.

Therefore, I expect licensees to:

- Riparian management - Leave full 10 m buffers on priority S6 stream (connected to fish habitat), or if not possible, leave at least the near-stream deeply rooted understory vegetation; keep logging slash out of streams and manage sediment from road sources
- Water quality management - Use good quality road materials and crown roads; remove berms that channel sediment into water bodies; armour, seed and protect bare soil, and avoid long gradients approaching streams
- Visual quality management - Use existing visual design techniques to create more natural looking openings and better achieve visual quality objectives (VQO); use partial cutting to retain higher levels of volume and/or stems; and reduce opening size in retention and partial retention VQO areas

There was insufficient baseline data to provide a MRVA score for stand-level biodiversity. However, monitoring results identify the following opportunities for improvement. I expect licensees to:

- Stand level biodiversity management - Leave at least low levels of retention on every cut block with densities of large trees, snags and tree species similar to the range found in pre-harvest conditions, and leave big pieces of coarse woody debris over many blocks

District staff should continue to monitor practices and complete sufficient samples to show trends for all values.

Forest professionals should review monitoring results, and use them when preparing, reviewing and implementing forest stewardship plans.

¹ Commentary supplied by Prince George Natural Resource District, District Manager, John Huybers

APPENDIX 1. SUMMARY DESCRIPTION OF RESOURCE DEVELOPMENT IMPACT RATING CRITERIA

Table A1.1 shows the criteria used to determine the resource development impact ratings for each resource value. Detailed rating criteria, methodology, and definition of terms used are described in the companion document *FREP Technical Note #6: Methodologies for Converting FREP Monitoring Results to Multiple Resource Value Assessment (MRVA) Resource Development Impact Ratings* (http://www.for.gov.bc.ca/ftp/HFP/external/!publish/frep/technical/FREP_Technical_Note_06.pdf). The ratings of “very low”, “low”, “medium”, and “high” are “technical ratings” based on best available science.

Table A1.1: Criteria for determining resource development impact rating outcomes for each resource value.

Resource Value	FREP Evaluation Question	Indicators	Resource Development Impact Rating Criteria	Very low	Low	Medium	High
Riparian	Are riparian forestry and range practices effective in maintaining the proper functioning of riparian areas?	Fifteen key questions (e.g., intact channel banks, fine sediments, riparian vegetation)	Number of “no” answers on assessment questions of channel and riparian conditions	0–2	3–4	5–6	> 6
Stand-level Biodiversity	Is stand-level retention providing the range of habitat and attributes understood as necessary for maintaining species dependant on wildlife trees and coarse woody debris?	Percent retention, retention quality from nine key attributes (e.g., big patches, density of large diameter trees), coarse woody debris volume, coarse woody debris quality from two key attributes (e.g., density of pieces \geq 10 m and 20 cm, and volume of large diameter pieces)	Cumulative score. A 60/40 weighting is used for tree retention versus coarse woody debris, recognizing the longer-term ecological value of standing retention.	> 70%	55–70%	40–55%	< 40%
Water Quality (sediment)	Are forest practices effective in protecting water quality?	Fine sediment potential	Fine sediment (m^3) due to expected surface erosion or past mass wasting	< 0.1	< 1	1–5	> 5
Soils	Are forest practices preventing site disturbance that is detrimental to soil productivity and hydrologic function?	Amount of access, restoration of natural drainage patterns, road side work area soil disturbance, amount of mature forest and coarse woody debris and restoration of natural drainage patterns	Overall assessment of practices on cutblock to maintain soil productivity and hydrologic function	Well	Moderately		Poor
Cultural Heritage	Are cultural heritage resources being conserved and where necessary protected for First Nations cultural and traditional activities?	Evidence and extent of damage to features, operational limitations, management strategies and type and extent of features	Combined overall cutblock assessment results with consideration of individual feature assessment results	See methodology report			
Timber: Stand Development Monitoring	What is the overall health and productivity of managed 20-40 year stands?	Impacts of forest health factors on stand stocking (ratio of total and well spaced)	Forest health damaging agent (% level of incidence) and level of stocking (well spaced stems per hectare)	\geq 1.7	0.8–1.69	0.3–0.79	0–0.29
Landscape-level Biodiversity	Is the forested matrix at the landscape-level providing the range of habitat understood as necessary for maintaining ecosystem function and old and mature forest dependant species?	Ecosystem representativeness, age class and interior old	Overall ranking: within protected and non-protected areas	Ranking under development			
Visual Quality	How are we managing views in scenic areas and achieving visual quality objectives?	Visual evaluation of block, design of block, percent of landform altered, impact of roads, tree retention and view point importance	Basic visual quality class (determined using the VQC definitions) is compared with the Adjusted VQC (derived using percent alteration measurements and adjustment factors) to determine if VQO is achieved.	VQO achieved, and % alteration low or mid-range	VQO achieved, but % alteration for one or both close to alteration limit	Only one method indicates VQO achieved	Both methods indicate VQO not achieved

APPENDIX 2. COMPARATIVE FREP RESULTS BY RESOURCE VALUE FOR OTHER AREAS

Table 2, in the main body of the document, describes overall ratings for the Robson Valley TSA as compared to adjacent TSAs or districts. Table A2.1 below describes the same results but by the North, South and Coast areas and the province as a whole. The three operational areas represent combined natural resource regions.

Table A2.1: FREP monitoring results by resource value for the North, South and Coast Areas and the province as a whole compared to the Robson Valley TSA.

Resource Value	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Very low + low resource development impact rating (sample size in brackets)				
	Robson Valley TSA	Forests, Lands and Natural Resource Operations Areas			Province
		North	South	Coast	
Riparian – all data	57% (14)	71% (654)	69% (678)	58% (451)	67% (1783)
FRPA-era data	ID (12)	71% (257)	68% (277)	62% (198)	67% (732)
FPC-era data	ID (2)	71% (394)	70% (401)	55% (253)	67% (1048)
Water quality – all data	52% (58)	66% (992)	70% (1515)	76% (1526)	71% (4033)
2010–2012 samples	41% (27)	67% (505)	70% (823)	79% (1021)	73%(2349)
2008–2009 samples	61% (31)	64% (487)	70% (692)	70% (505)	68% (1684)
Stand-level biodiversity all data	ID (32)^a	42% (655)	54% (780)	77% (455)	56% (1890)
FRPA-era data		49% (270)	61% (347)	84% (201)	63% (818)
FPC-era data		38% (385)	49% (433)	72% (254)	50% (1072)
Visual Quality					
FRPA	ID (8)	73% (122)	54% (136)	78% (153)	69% (411)
FPC	53% (21)	56% (96)	65% (85)	62% (68)	61% (249)

^a There is insufficient baseline for ESSFmm and ICHmm so ranking is not possible at this time for Robson Valley.