



# Multiple Resource Value Assessment (MRVA)

Quesnel 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 the Multiple Resource Value Assessment (MRVA) report 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.

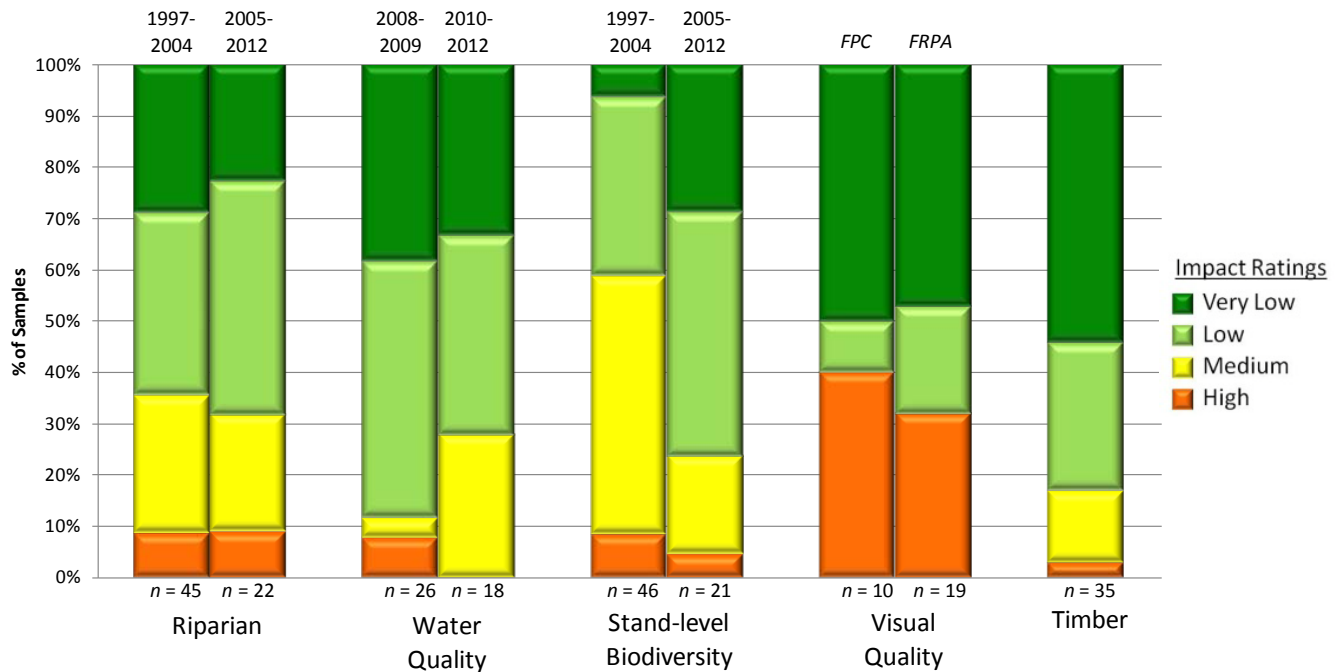
A handwritten signature in black ink, appearing to read "Tom Ethier". The signature is stylized and cursive.

Tom Ethier  
Assistant Deputy Minister  
Resource Stewardship Division  
Ministry of Forest, 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, water quality (sediment), biodiversity, visual quality monitoring and timber (stand development monitoring) conducted in the Quesnel Natural Resource District 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: Quesnel Natural Resource District site-level resource development impact ratings by resource value with trend (Riparian, stand-level biodiversity and visual quality trend by harvest year/era. Water quality trends by evaluation year. Timber samples are all post-free growing).**



### 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 Quesnel Natural Resource District. 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.

## **QUESNEL NATURAL RESOURCE DISTRICT – ENVIRONMENTAL AND STEWARDSHIP CONTEXT**

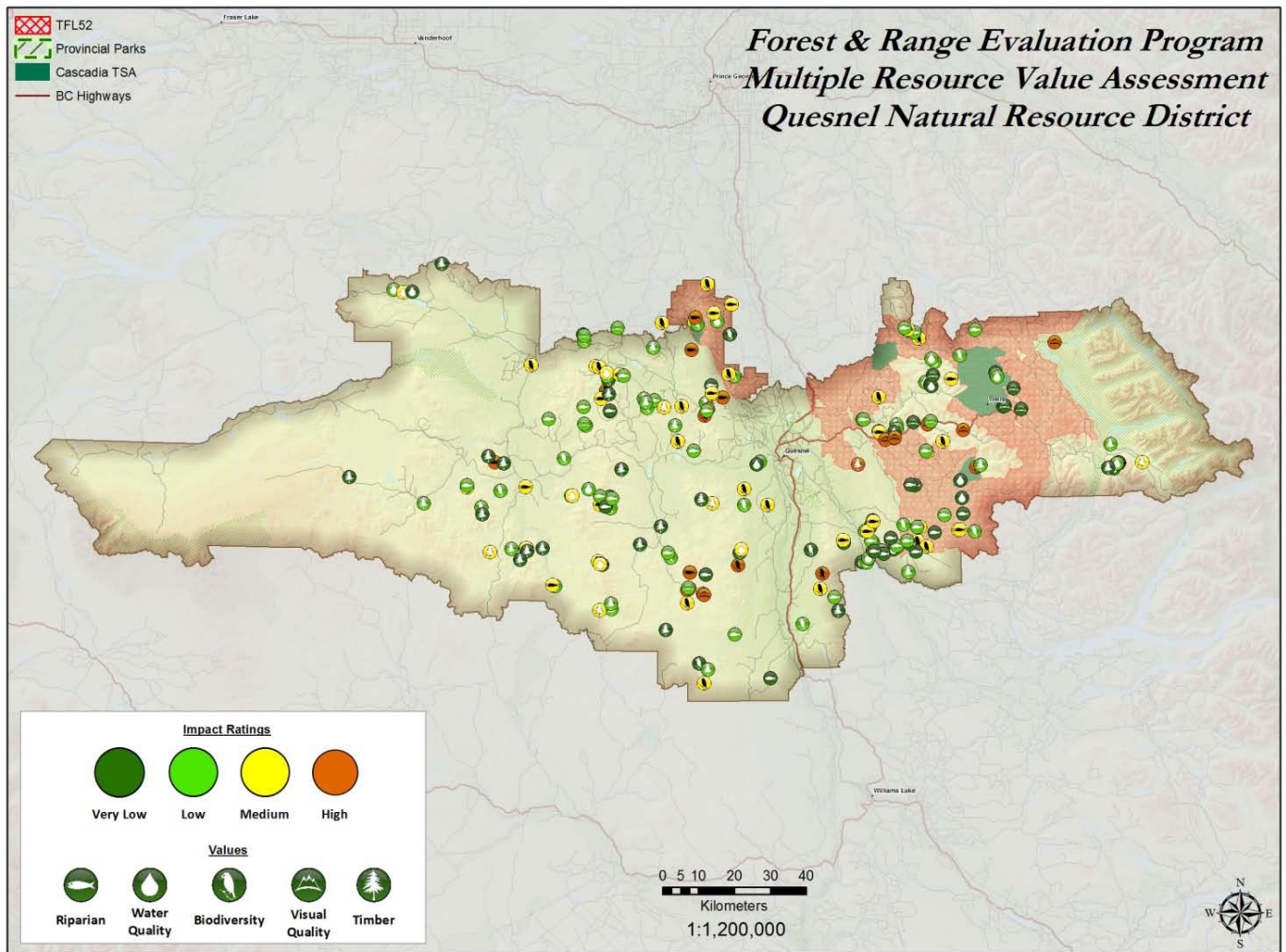
The Quesnel Natural Resource District includes the Quesnel TSA, a portion of the Cascadia TSA and Tree Farm Licence 52 (Figure 2). To the west the district includes the Itcha-Ilgachuz mountain ranges and the intervening gently rolling terrain encompassing the Blackwater and Nazko river systems. To the east lie the Fraser and Cottonwood river systems, Quesnel Highlands, Barkerville and the Cariboo River and mountains.

The diverse forests host a range of wildlife species, of which some are considered to be endangered or threatened. Examples in the Quesnel timber supply area include woodland caribou (northern and mountain subspecies), the American white pelican and northern goshawk. Species considered to be potentially threatened by human activities or natural events include bull trout, sandhill crane, grizzly bear, mule deer, mountain goat and fisher.

The economies of the communities in the district are largely resource-based and the majority is dependent on the local forest industry. Ranching, mining and tourism are also integral to the communities in the district. Resource development is guided by the Cariboo Chilcotin Land Use Plan, which has been in effect since 1995 and the subsequent Land Act Order (2010).

Despite the forest diversity most of the mature and regenerating pine-dominated forests experienced heavy mortality by large-scale wildfire and the mountain pine beetle epidemic that peaked in 2005. Harvesting activities have been focussed on pine beetle suppression and salvage for the past 13 years at a short term accelerated rate. The impacts to biodiversity, streams and other environmental values from large scale salvage logging and road construction continue to be assessed through monitoring and research. As well, the impacts on the mountain pine beetle epidemic and climate change on midterm timber supply is a concern.

Figure 2: Quesnel Natural Resource District, 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).

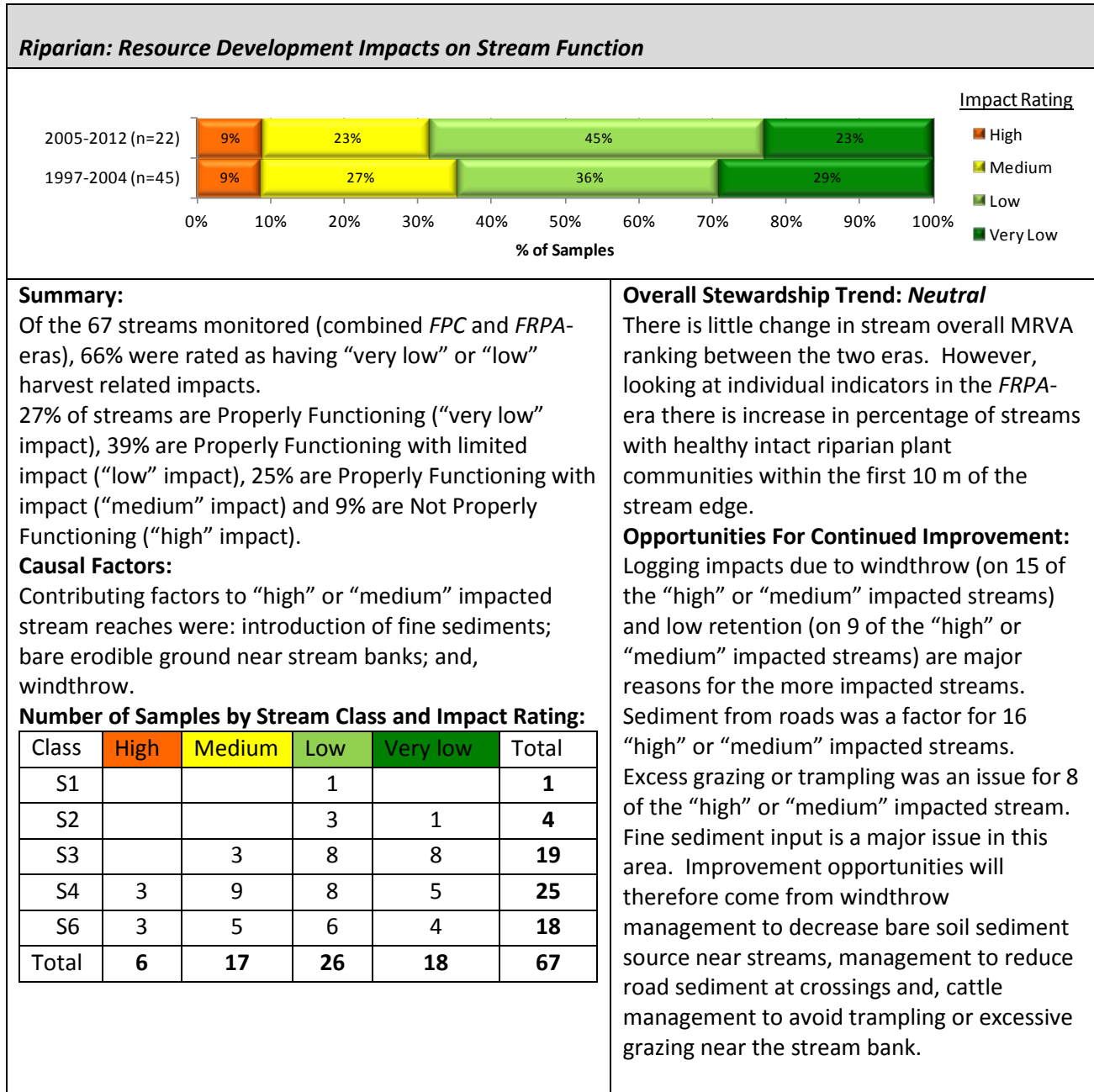




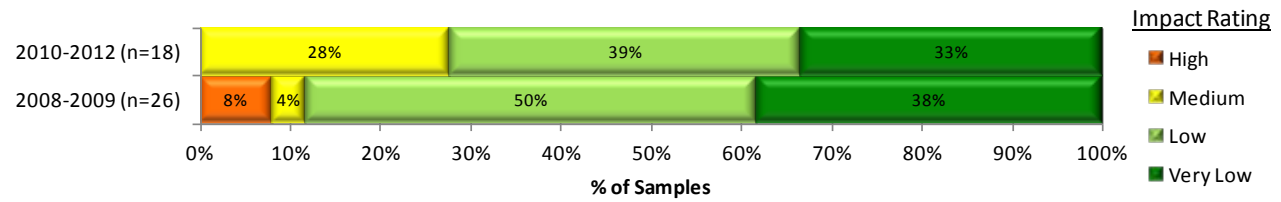
## KEY RESULTS BY RESOURCE VALUE AND OPPORTUNITIES FOR CONTINUED IMPROVEMENT

Table 1 shows the resource values assessed for the Quesnel Natural Resource District, 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 Quesnel Natural Resource District.**



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



**Summary:**

Of the 44 road segments assessed from 2008 to 2012, 82% were rated as “very low” or “low” road-related impact. Site assessments show the range for potential sediment generation as 47% “very low” (“very low” impact), 34% “low” (“low” impact), 15% “moderate” (“medium” impact), 3% “high” or “very 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.

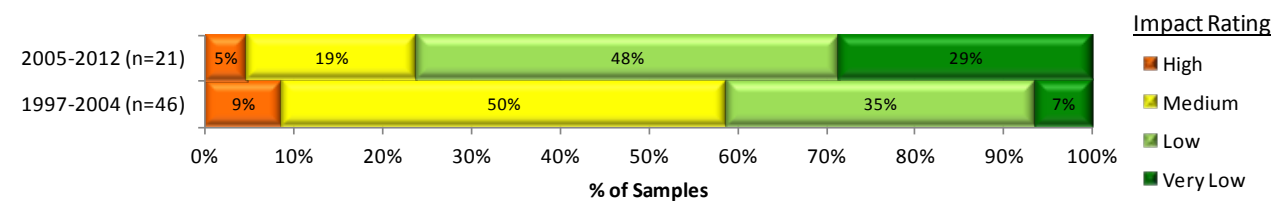
**Overall Stewardship Trend: Neutral**

Trending for water quality is based on survey years, to capture impact of road traffic and maintenance.

**Opportunities For Improvement:**

The most frequent suggested maintenance issues are to: use cross ditches, kickouts etc; avoid long gradients approaching streams; and construct sediment traps.

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



**Summary:**

Of 67 cutblocks sampled (combined *FPC* and *FRPA*-eras), 52% of sites were rated as “very low” or “low” harvest-related impact. Considering total retention, retention quality, and coarse woody debris quantity and quality, 13% sites are rated as “very low” impact on biodiversity, 39% as “low”, 40% as “medium”, and 7% as “high”. One additional block was sampled but cannot be ranked since a plot was not established in the patch, likely due to a safety issue.

**Causal Factors:**

90% of all blocks had more than 3.5% tree retention. Retention increased from an average 12.6% in the *FPC* to 14.4% in the *FRPA*-era. Large snag density has increased, particularly in the SBS blocks and overall is closer to the expected range (over many blocks) as seen in the baseline. Large tree density ( $\geq 40$  cm dbh) is similar to baseline range as is the number of tree species retained. Coarse woody debris volume increased from an average of 106 m<sup>3</sup>/ha in the *FPC*-era to 161m<sup>3</sup>/ha in the *FRPA*-era.

Coarse woody debris quality in terms of big pieces (volume from  $>20$  cm pieces and, density of big pieces  $>20$  cm and  $>10$  m) has increased.

**Overall Stewardship Trend: Improving ↑**

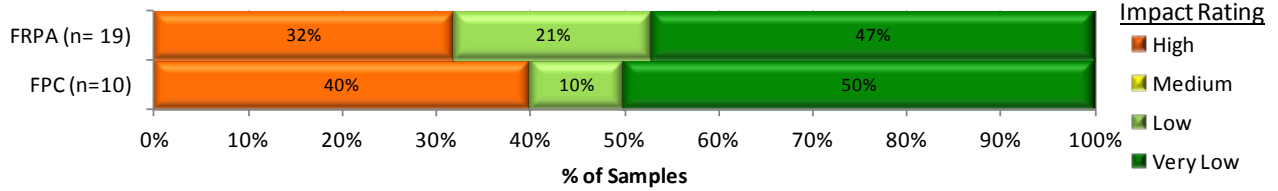
There are small improvements in amount of retention, retention quality, and coarse woody debris quality.

**Opportunities For Continued Improvement:**

Continue trend to leaving treed retention on every cutblock, with a range of retention (e.g., 3% to 30%) over many blocks. Continue having large snags, big tree density and tree species diversity similar or better to pre-harvest conditions. Continue trend to good quality coarse woody debris (i.e., big pieces  $\geq 20$  cm and  $\geq 10$  m).



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



**Summary:**

Of the 29 landforms assessed (10 harvested under the *FPC* and 19 under the *FRPA*), 65% were rated with “very low” or “low” harvest-related impacts on achieving the Visual Quality Objectives.

VQOs were “well met” (“very low” impact) on 48% of landforms, “met” (“low” impact) on 17%, “borderline” (“medium” impact) on 0%, “not met” on 3%, and “clearly not met” (“high” impact) on 31%.

**Causal Factors:**

18% of the openings contained visually effective levels of tree retention (> 22% by volume or stem count) and 48% of landforms sampled had good visual quality design (cutblock shaping).

**Number of Samples by VQO and Impact Rating:**

VQO <sup>1</sup>	High	Medium	Low	Very Low	Total
M	2		1	8	<b>11</b>
PR	7		4	6	<b>17</b>
R	1				<b>1</b>
<b>Total</b>	<b>10</b>	<b>0</b>	<b>5</b>	<b>14</b>	<b>29</b>

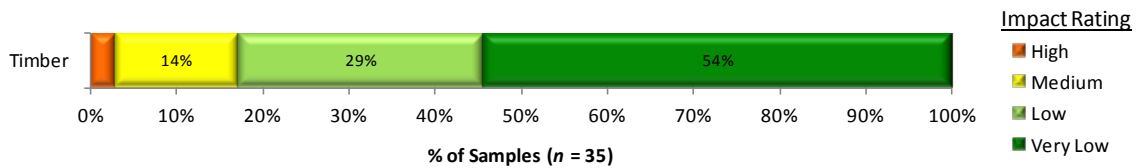
<sup>1</sup> M = modification, PR = partial retention, R = retention

**Overall Stewardship Trend: *Neutral***

**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.

**Timber Resource Value (stand development monitoring): Resource development impacts on the overall health and productivity of managed 20-40 year stands.**



**Summary:**

Of the 35 polygons sampled (2010-2012) the weighted average well spaced density over the five biogeoclimatic ecological classification (BEC) zones (SBS, MS, ICH, ESSF, SBPS) achieved 85% of target stocking standard (TSS).

**Percent of target stocking standard by BEC**

BEC	SBS	MS	ICH	ESSF	SBPS	Average
TSS	80%	95%	89%	87%	84%	85%

83% of the polygons were rated having a “very low” or “low” impact to overall health and productivity; 14% “medium” and 3% “high” impact. Eight polygons were spaced and received either a “very low” or “low” impact rating. One polygon rated “high” impact was due to low total and well spaced stems/ha. The draft Stand Development Monitoring TSA Data Summary Report (based on data from 10 polygons collected in 2010 and 2011) reported the mean polygon age of 28.8 years. The top four stand damaging agents were western gall rust (DSG); tree competition (VT); cooley spruce gall adelgid (IAG), and mountain pine beetle (IBM).

Agent	DSG	VT	IAG	IBM
Plots 100	56/100	28/100	25/100	18/100

The average total stems/ha (all BECs) at the time of stand development monitoring was 2913 sph with well spaced stands at 1000 sph. There was no change in leading species in the polygons sampled (6 of 10 polygons with available data). An update of this report will include the data from 25 polygons sampled in 2012 that will be reflected in the Stand Development Monitoring TSA Summary Report for the Quesnel TSA.

**Causal Factors:**

The one polygon rated “high” impact was due to low total and well spaced stems/ha. The stand was significantly older (34 years) with thinning due to mountain pine beetle (IBM) occurring on a very productive site. This stand may be a candidate for mid-rotation timber supply, however, due to the stocking being reduced from IBM and the continued impact of rust present it was decided to keep the rating at “high”. Of the polygons assessed to-date the stands appear to be relatively healthy and productive.

**Overall Stewardship Trend:**

No trend can be established at this time

**Opportunities For Improvement:**

**Soils: Resource Development Impacts on Soil Productivity and Hydrologic Function**

There are currently only eight soils samples in the Quesnel Natural Resource District. Analysis will be completed in subsequent years when more samples are available.

**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 Cariboo 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 (sample size in brackets)				
	Cariboo Region Comparison				Cariboo Region <sup>a</sup>
	Quesnel District	100 Mile House District	Central Cariboo District (part of Williams Lake TSA)	Chilcotin District (part of Williams Lake TSA)	
Riparian – all data	<b>66%</b> (67)	<b>83%</b> (54)	<b>75%</b> (69)	<b>80%</b> (59)	<b>76%</b> (249)
FRPA-era data	68% (22)	ID (13)	71% (35)	74%(23)	75% (93)
FPC-era data	64%(45)	78% (41)	79% (34)	83%(36)	76% (156)
Water quality – all data	<b>82%</b> (44)	<b>82%</b> (119)	<b>80%</b> (160)	<b>81%</b> (21)	<b>81%</b> (343)
2010–2012 samples	ID (18)	80% (54)	77% (91)	ID (9)	78% (171)
2008–2009 samples	ID(26)	83% (65)	84% (69)	ID (12)	84% (172)
Stand-level biodiversity –all data	<b>52%</b> (67)	<b>75%</b> (60)	<b>81%</b> (73)	<b>68%</b> (66)	<b>69%</b> (266)
FRPA-era data	76% (21)	87% (23)	94% (36)	61% (31)	80% (89)
FPC-era data	41% (46)	68% (37)	68% (37)	74% (35)	61% (95)
Visual Quality					
FRPA	<b>68%</b> (19)	ID (0)	<b>59%</b> (17)	ID (0)	<b>64%</b> (36)
FPC	<b>60%</b> (10)	<b>62%</b> (21)	<b>ID</b> (0)	<b>ID</b> (0)	<b>62%</b> (31)
Timber (stand development monitoring)	<b>83%</b> (35)	<b>74%</b> (27)	<b>62%</b> (42)	<b>76%</b> (34)	<b>73%</b> (138)

<sup>a</sup>Includes the 100 Mile House TSA, Quesnel TSA, and Williams Lake TSA (reported as former Central Cariboo and Chilcotin districts)

## DISTRICT MANAGER COMMENTARY<sup>1</sup>

While the overall ratings for the values considered in this report are positive, indicating that in the majority of cases sustainable forest management is occurring, a number of trends are concerning and worth pointing out. In British Columbia the management of our natural resources is conducted by a community of forest professionals. As professionals we should be learning from our successes and failures and continually striving for improvement. While the trends in this report are either neutral or increasing, there is still room for improvement.

I applaud the good work that has been done to date and it is not my intention here to diminish that effort, but here are my areas of concern where extra effort should be applied to gain improvement in the future:

**Stand-level Biodiversity** While there has been small improvement in stem retention and coarse woody debris (CWD) quality, I am unconvinced that this is not simply due to the forced implementation of enhanced retention because of the trend to larger cut block size and the economic choices made during the harvest phase. Retention of stems, patches and CWD to enhance stand-level biodiversity has been with us for nearly 20 years and my expectation is that prescribing professionals take these requirements to heart and not simply accept the residue from harvesting to meet this objective.

**Visual Quality** The high number of blocks clearly not meeting the VQO (32%) in the *FRPA* sample is particularly disheartening. Management of the visual resource is a unique and specialized practice and therefore one of the most prescriptive areas of forest resource management. This sizable failure can only be seen in terms of carelessness or operating beyond one's scope of practice. My expectation is that prescribing professionals will either employ experts or go to greater lengths to follow accepted practices when proposing disturbances in visually sensitive areas.

**Riparian and Water Quality** The neutral trend in ranking for riparian function hides the fact that there is an increase in the amount of fine sediment sources in riparian areas due to wind throw, stream bank disturbance from cattle, and stream crossings. Ministry staff have been, and will continue, working with range tenure holders to mitigate excessive cattle damage near streams. My expectation is that professionals tasked with developing prescriptions for riparian areas will allow adequate retention widths, and stabilize stand edges, to ensure proper stream function and lessen wind throw in riparian areas. Likewise, techniques for minimizing or trapping sediments at road crossings are well established and those professionals tasked with planning and building roads and stream crossing structures should apply due diligence in their work to minimize the introduction of sediments into streams.

Further, I expect that prescribing professionals will use this document as well as implementing their own monitoring of resource development activities they are involved with to close the continuous improvement loop.

---

<sup>1</sup> Commentary supplied by Quesnel Natural Resource District Manager, Steve Dodge.

## 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](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 describes overall ratings for the Quesnel Natural Resource District as compared to adjacent TSAs or districts. The table 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 Quesnel Natural Resource District.**

Resource Value	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Very low + low resource development impact rating (sample size in brackets)				
	Quesnel District	Forests, Lands and Natural Resource Operations Areas			Province
		North	South	Coast	
Riparian – all data	<b>66%</b> (67)	<b>71%</b> (654)	<b>69%</b> (678)	<b>58%</b> (451)	<b>67%</b> (1783)
FRPA-era data	68% (22)	71% (257)	68% (277)	62% (198)	67% (732)
FPC-era data	64%(45)	71% (394)	70% (401)	55% (253)	67% (1048)
Water quality – all data	<b>82%</b> (44)	<b>66%</b> (992)	<b>70%</b> (1515)	<b>76%</b> (1526)	<b>71%</b> (4033)
2010–2012 samples	ID (17)	67% (505)	70% (823)	79% (1021)	73%(2349)
2008–2009 samples	ID(26)	64% (487)	70% (692)	70% (505)	68% (1684)
Stand-level biodiversity all data	<b>52%</b> (67)	<b>42%</b> (655)	<b>54%</b> (780)	<b>77%</b> (455)	<b>56%</b> (1890)
FRPA-era data	76% (21)	49% (270)	61% (347)	84% (201)	63% (818)
FPC-era data	41% (46)	38% (385)	49% (433)	72% (254)	50% (1072)
Visual Quality					
FRPA	<b>68%</b> (19)	<b>73%</b> (122)	<b>54%</b> (136)	<b>78%</b> (153)	<b>69%</b> (411)
FPC	<b>60%</b> (10)	<b>56%</b> (96)	<b>65%</b> (85)	<b>62%</b> (68)	<b>61%</b> (249)