



Multiple Resource Value Assessment (MRVA)

Fort St. James Natural Resource District

Prince George Timber Supply Area

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.

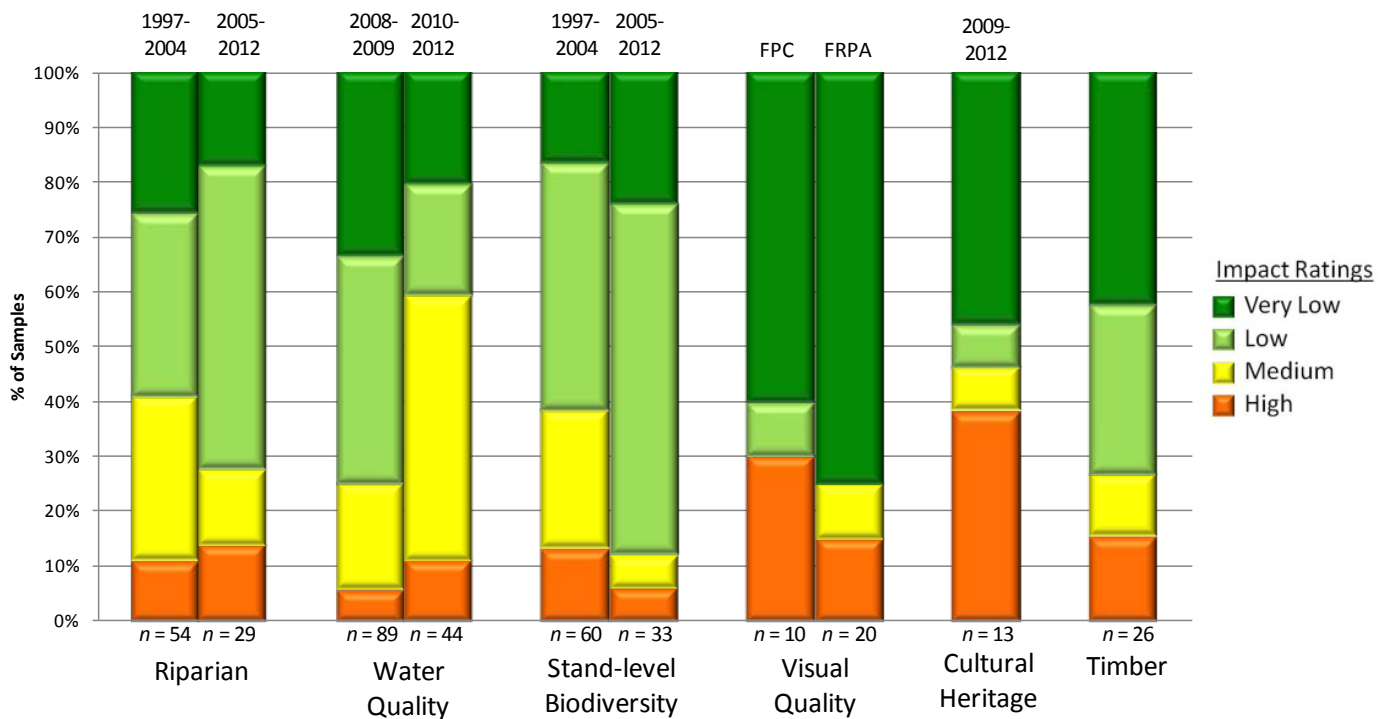
I encourage readers to review the full report and direct any questions or comments to the appropriate district office.

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), visual quality, cultural heritage, and timber (stand development) monitoring conducted in the Fort St. James 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: Fort St. James Natural Resource District site-level resource development impact ratings by resource value with trend (Riparian, stand-level biodiversity and visual quality by harvest year/era. Water quality and cultural heritage 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 Fort St. James 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.

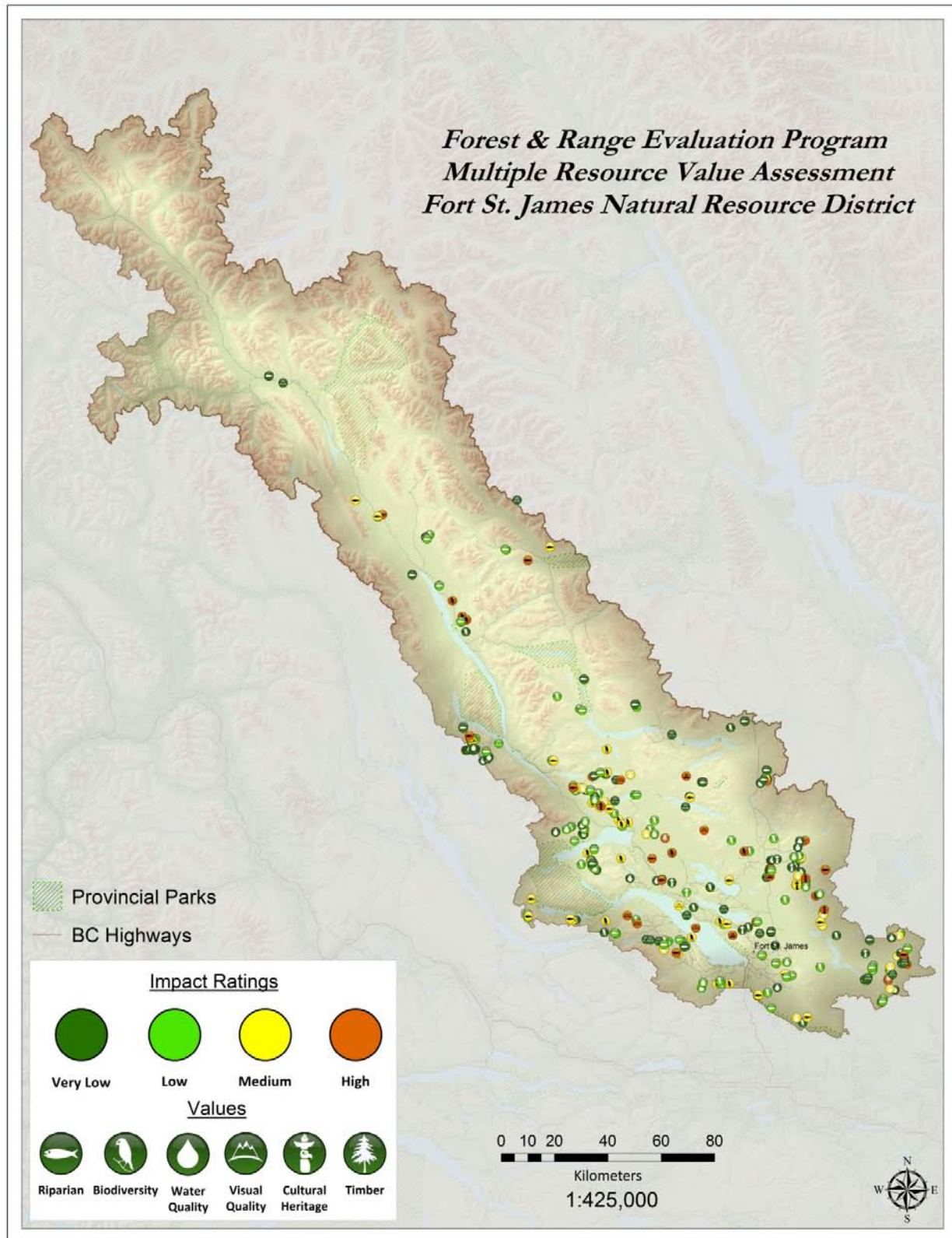
FORT ST. JAMES NATURAL RESOURCE DISTRICT – ENVIRONMENTAL AND STEWARDSHIP CONTEXT

This report covers the Fort St. James Natural Resource District, one of three districts that make up the Prince George TSA (figure 2). The Fort St. James Forest District comprises 3.18 million hectares, which represents approximately 40 percent of the Prince George timber supply area. Of this area, 2.01 million hectares are provincial Crown forest land. The Fort St. James Forest District presents a diversity of landscapes, from the rolling plateau in the southern portion of the district to the extremely mountainous and largely roadless landscapes of the north. Large lake systems include Takla, Trembleur, Stuart, Inzana, Pinchi, Tezzeron and Nation (Tsayta, Indata, Tchentlo, and Chuchi) Lakes. The Fort St. James Forest District covers parts of the headwaters of three major river basins: the Skeena, the Fraser, and the Peace. The first two drain to the Pacific Ocean while the Peace River flows, via the Mackenzie River, to the Arctic Ocean. Forests are mostly lodgepole pine and spruce, with balsam at higher elevations and scattered patches of aspen. There are some areas of Douglas-fir, particularly along the shores of Stuart Lake. A history of frequent wildfires has left a mosaic of forest ages. Old- and mature-balsam stands predominate in the northern portion of the district. Timber harvesting to date has concentrated on the southern portion of the district, in areas around the larger lakes, and along valley bottoms in old spruce stands, with increasing emphasis on lodgepole pine-dominated stands. Historical lack of access, mountainous terrain and a predominance of less-preferred commercial tree species, such as balsam, have limited harvesting in the north.



Neal Gooding photo-Kazchek Falls

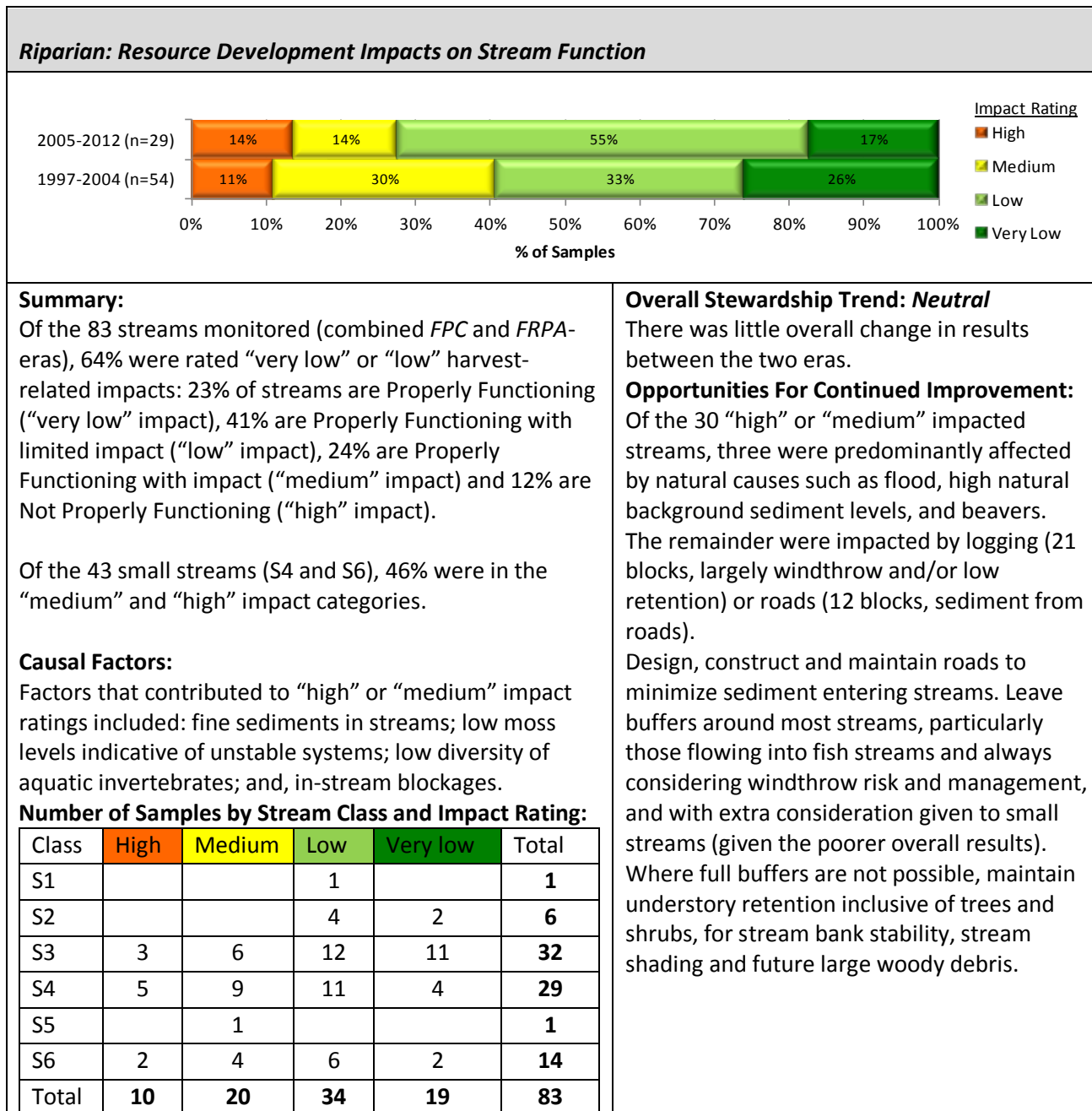
Figure 2: Fort St. James Natural Resource District, showing FREP sample locations and results (see <http://www.for.gov.bc.ca/hfp/frep/publications/mrva.htm> for a high-resolution version of this map).



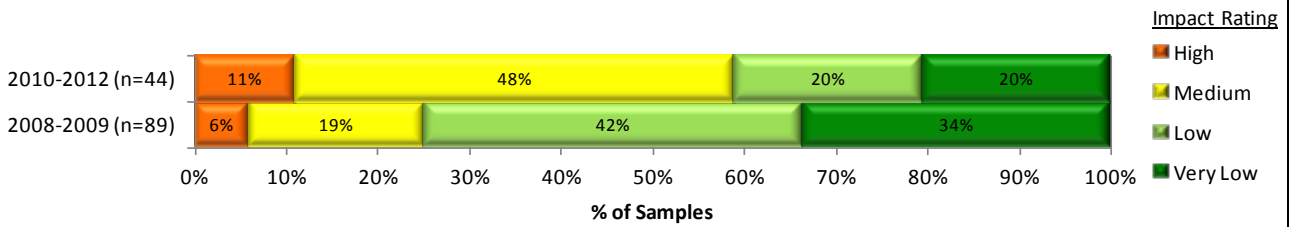
KEY RESULTS BY RESOURCE VALUE AND OPPORTUNITIES FOR CONTINUED IMPROVEMENT

Table 1 shows the resource values assessed for the Fort St. James 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 Fort St. James Natural Resource District.



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



Summary:

Of the 133 road segments assessed from 2008 to 2012, 64% were rated as “very low” or “low” road-related impact. Site assessments show the range for potential sediment generation as 29% “very low” (“very low” impact), 35% “low” (“low” impact), 35% “moderate” (“medium” impact), 29% “high” and 8% “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 would mainly apply to new road construction.

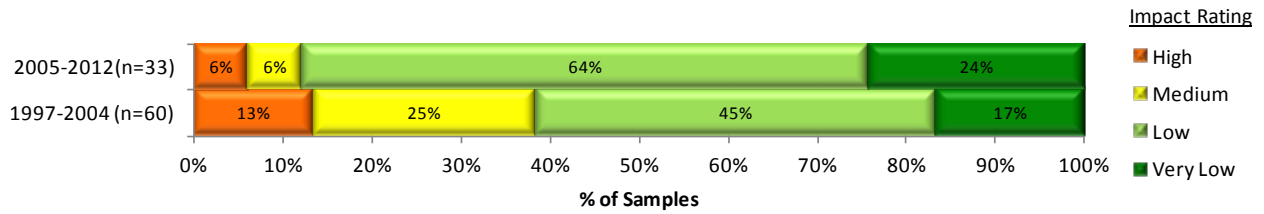
Overall Stewardship Trend: Declining ↓

Trending for water quality is based on survey years, to capture impact of road traffic and maintenance. There is higher percentage of “high” and “medium” impacted road segments in the FRPA-era.

Opportunities For Improvement:

The most frequent suggested solutions to improve “high” or “medium” impacted segments are: increase the number of strategically placed culverts (with appropriate ditch blocks and runouts); armour, seed and protect bare soil; and avoid deep ditches in proximity to streams.

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



Summary:

Of 93 cutblocks sampled (combined *FPC* and *FRPA*-eras), 71% of sites were rated as “very low” or “low” harvest-related impact. Considering total retention, retention quality, and coarse woody debris quantity and quality, 19% sites are rated as “very low” impact on biodiversity, 52% as “low”, 18% as “medium”, and 11% as “high” impact.

Causal Factors:

The positive results are largely due to three factors: percentage of tree retention per cutblock, retention quality and coarse woody debris volume. 87% of cutblocks had greater than 3.5% treed retention and that increased to 91% in the *FRPA*-era. Retention quality in terms of large snag density, big diameter tree density (generally ≥ 40 cm dbh) and number of tree species is very similar to the baseline. The range of coarse woody debris volume over many cutblocks is meeting baseline levels, although coarse woody debris volume from ≥ 20 cm pieces and coarse woody debris pieces/ha (≥ 20 cm and ≥ 10 m) has decreased.

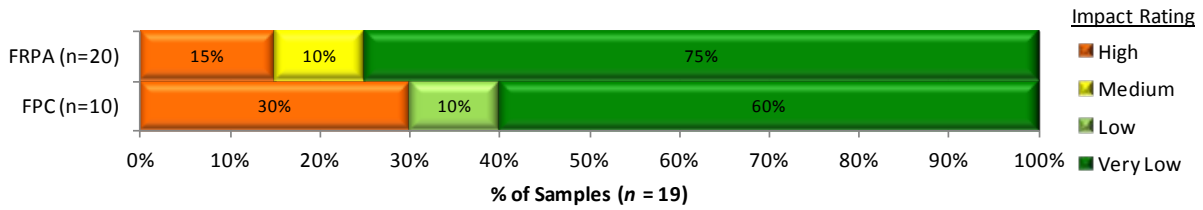
Overall Stewardship Trend: Improving ↑

Retention increased from an average 15.0% in the *FPC*- to 17.5% in *FRPA*-era, and as described previously, average tree retention quality improved.

Opportunities For Continued Improvement:

Continue trend to leave at least low levels of retention on every cutblock. Have a range of retention (e.g., 3 to 30%) over many blocks. Continue leaving big diameter trees and full range of tree species compared to baseline. Improve the amount of large coarse woody debris (≥ 20 cm and ≥ 10 m pieces) left dispersed across the harvest area.

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



Summary:

Of the 19 landforms assessed (10 originating from openings harvested under the *FPC* and 20 originating from openings harvested under the *FRPA*), 73% were rated with “very low” or “low” harvest-related impacts on achieving the Visual Quality Objectives. VQOs were “well met” (“very low” impact on achieving VQO) on 70% of landforms, “met” (“low” impact) on 3%, “borderline” (“medium” impact) on 7%, and “clearly not met” (“high” impact) on 20%.

Causal Factors:

37% of the openings contained visually effective levels of tree retention (> 22% by volume or stem count) and 27% of landforms sampled had good visual quality design (cutblock shaping).

Number of Samples by VQO and Impact Rating:

VQO ¹	High	Medium	Low	Very Low	Total
M	4	2	2	10	16
PR	2		1	10	13
R				1	1
Total	6	2	1	21	30

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

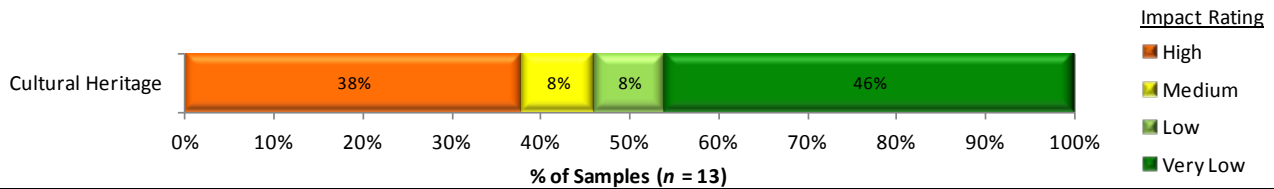
Overall Stewardship Trend: Improving ↑

There were a greater number of “very low” impacted landforms during the *FRPA* years and less “high” impact rated samples. There was a greater amount of tree retention in the *FRPA* harvested landforms.

Opportunities For Improvement:

Reduce opening size in retention and partial retention VQO areas. Use existing visual design techniques to create more natural looking openings and better achieve VQOs. Increase use of strategic tree retention patches within openings to reduce apparent block size (tree retention >22% considered “good” design strategy).

Cultural Heritage: Resource Development Impacts on Cultural Heritage Resources (CHR)



Summary:

Of the 13 cutblocks assessed, 55% were rated “very low” or “low” harvest related impact. 50% of blocks were considered “well” to “very well” managed, 7% “moderately” and 43% blocks were “poorly” managed. At the feature level, 59% showed no evidence of harvest-related damage while 41% showed evidence of damage. 29% of damaged features showed irreversible damage and (or) were rendered unsuitable for continued use.

Causal Factors:

Primary cause of damage was removal of features.

Overall Stewardship Trend: Insufficient data

No data for Code years to allow for trending. Future trend analysis will use year of harvest.

Opportunities For Continued Improvement:

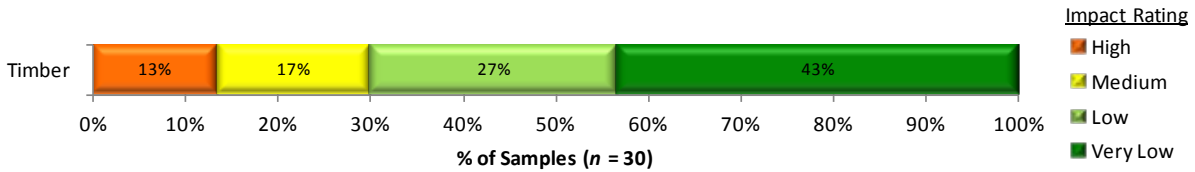
Exercise careful consideration of cultural heritage resource values in the planning phase. Engage in discussions between licensees and First Nations to enhance understanding of perspectives, ensure existing CHR information is shared and increase the potential for effectively identifying on-site CHR values. Put CHR features on site plans and logging plans.

Communication of management actions (verbally and with maps) to operators before harvesting begins.

Soils: Resource Development Impacts on Soil Productivity and Hydrologic Function

There are currently only four Soils samples in the Fort St. James Natural Resource District. Analysis will be completed in future years when more samples are available.

Timber Resource Value: Resource development impacts on the overall health and stocking of managed 20-40 year stands



Summary:

Of the 30 polygons sampled in the Ft. St. James District up to 2012, 70% were rated “very low” or “low” impact to health and stocking, 17% “medium”, and 13% “high”. The weighted average well spaced density for the SBS biogeoclimatic ecosystem classification (BEC) zone achieved 84% of target stocking standard (TSS).

No detailed analysis has been done for the Ft. St. James District to include 2011 to 2013 data. It is anticipated than once the SDM data base is complete analysis will be conducted on all 45 samples completed to date in the Fort St James District.

A preliminary analysis was conducted only using 2009-10 data (38 samples) for the entire Prince George TSA (Prince George, Ft. St. James and Vanderhoof Districts). The mean age of all polygons sampled was 26.1 years. The top four leading stand agents identified in the plots were; Western gall rust (DSG), tree competition (VT), stem forking (K), and Commandra blister rust (DSC).

Agent	DSG	VT	K	DSC
380 plots	168/380	122/380	106/380	99/380

In 90% of the polygons sampled there was no change in leading species

As of 2013, each of the three districts mentioned have more data that can be analyzed.

Causal factors:

For the Ft. St. James district, the “medium” and “high” impact rated polygons were a result of low total (≤ 1900 sph) at the time of the stand development monitoring survey. These stands were not spaced; therefore, they had either low stocking at declaration or lost significant stocking between declaration and the stand development monitoring assessment.

Overall Stewardship Trend:

No trend can be established at this time

Opportunities For Continued Improvement:

For the Ft. St. James district, the majority of the polygons sampled were relatively healthy. For the “medium” and “high” impacted stands some general recommendations are:

- Avoid low density monocultures of pine
- Utilize mixed species plantations wherever possible
- Avoid logging wet spruce sites where regeneration will be difficult

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 (sample size in brackets)					
	Omineca Region Comparison					Omineca Region ^a
	Fort St. James District	Prince George District	Vanderhoof District	Mackenzie District	Robson Valley TSA	
Riparian – all data	64% (83)	74% (54)	70% (74)	73% (62)	57% (14)	69% (287)
FRPA-era data	72% (29)	ID (11)	74% (35)	60% (25)	ID (12)	70% (112)
FPC-era data	59% (54)	71% (42)	67% (39)	81% (37)	ID (2)	68% (174)
Water quality – all data	64% (133)	25% (48)	69% (127)	48% (82)	52% (58)	56% (448)
2010–2012 samples	41% (44)	19% (21)	74%(57)	39%(41)	41% (27)	48% (190)
2008–2009 samples	75% (89)	30% (27)	64%(70)	56% (41)	61% (31)	63% (258)
Stand-level biodiversity –all data	71% (93)	59% (49)	8% (65)	22% (63)	ID (32) ^b	43% (283)
FRPA-era data	88% (33)	64% (14)	5% (22)	25% (32)		46% (108)
FPC-era data	62% (60)	57% (35)	9% (43)	20% (31)		41% (175)
Visual Quality						
FRPA	75% (20)	ID (0)	85% (14)	ID (0)	ID (8)	79% (42)
FPC	70% (10)	50% (12)	ID (0)	ID (0)	53% (21)	56% (43)
Cultural Heritage	52% (13)	ID (0)	ID (7)	ID (0)	ID (0)	55% (20)
Timber (stand development monitoring)	73% (26)	64% (14)	73% (30)	56% (30)	ID (0)	67% (100)

^a Includes the Prince George, Mackenzie, Fort St. James and Vanderhoof Districts

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

DISTRICT MANAGER COMMENTARY¹

With a significant amount of monitoring now complete across multiple resource values, I have taken the opportunity to fully consider previous annual district reports on the FREP results and this current report on multiple resource value assessments. At the same time, I am fully aware of the significantly increased harvesting level within the Fort St. James Natural Resource District. Given that the majority of existing and expected harvesting and road building within the next 5 years will be primarily concentrated within a few major watersheds within the southern third of the district, I recognize that there is an elevated likelihood of undesirable impacts to multiple natural resource values. As such, I find that the timing is very appropriate to encourage improvements to forest and range practices, and to express my future expectations for the Fort St. James Natural Resource District.

Riparian and Water Quality

The results for riparian monitoring indicate a “medium” to “high” impact rating for 36% of streams, most of which are small S4 and S6 streams. This report and previous annual district reports indicate that a major causal factor is the introduction of sediment into streams. Supporting this riparian monitoring finding, I note that 36% of water quality sampling (measure of stream sediment loading) is also in the “medium” to “high” impact rating. Considering the existing and impending pressure from harvesting and road-building on individual watersheds, I recognize that it is a very high priority to improve sediment control during forest and range practices. Upon further consideration of riparian study results from previous FREP publications, I also find that multiple key causal factors for “medium” and “high” impact ratings within riparian areas are strongly associated with the size of riparian reserves and the type of vegetative cover retained.

To improve the management of riparian areas, stream channels and water quality, I am strongly encouraging the implementation of the riparian and water quality recommendations communicated in previous annual, district reports as well as the soil conservation measures discussed under FREP Extension Note #23 (http://www.for.gov.bc.ca/hfp/frep/publications/extension_notes.htm). I will also be evaluating the need for revised riparian results and strategies within future, approved forest stewardship plans (FSP), since many FSPs applicable to the district will expire within 3 years.

Stand-level Biodiversity

I am satisfied with results of stand level biodiversity, which is indicating that 72% of the cutblocks have “very low” to “low” impact on cutblock biodiversity. I am also satisfied with an average of 17.5% retention in recent years, particularly considering that a substantial amount of additional non-prescribed forested areas and terrestrial habitat near existing and future cutblocks is also likely to be maintained over time. I must, however, clearly state that there has been multiple recommendations communicated regarding improving the retention of large coarse woody debris (CWD) across cutblocks. I am expecting the result on CWD to improve, and will take this into consideration when evaluating future FSP results and strategies applicable to stand level biodiversity.

Cultural Heritage

Cultural Heritage Resources is another value that is under significant risk considering the continued forest development pressures and considering that 46% of the sample sites were determined to be “medium” to “high” impact on the cultural heritage resources. As above, I highly recommend reviewing the practice recommendations in previous annual district reports, and I will be closely considering the need for revisions to future FSP results and strategies to better protect and conserve cultural heritage resource given the local, social importance and considering my duty to uphold continuing aboriginal rights and interests.

¹ Commentary supplied by Fort St. James Natural Resource District Manager, Lynda Currie.

Visual Quality

I am encouraged by the current results of visual quality monitoring showing that 73% of the sampled landscapes that fully meet the VQOs. Regardless, there is significant room for improvement as there is a notable portion of the samples that clearly do not meet the visual quality objectives. I am further concerned that as a greater percentage of the harvesting must shift to landscapes that are more visually sensitive and as more modification accumulates in sensitive areas, the current standard of cutblock design will not meet visual quality objectives. I will continue to observe visual quality monitoring results closely in the near future to verify if my concerns are valid or not.

Timber (Stand Development)

I am continuing to observe the results from stand development monitoring, which assesses reforestation productivity. Again, I am encouraged by the overall health and productivity of the reforestation sampled, but concerned with the possibility that stocking levels are often (30%) below expected standards. Regardless of the results, I expect that over time this is valuable timber inventory information will better inform future prescribed stocking and will improve the accuracy of timber growth modeling.

I appreciate the information and recommendations derived as a result of the existing FREP monitoring, but I must state that I am lacking critical information about the current and expected future condition of terrestrial and aquatic habitats across the district. This is particularly troubling considering the current increase in development and the concentrated impacts of forest harvesting and road building expected over the next 5 years. I am therefore strongly advising development of appropriate indicators and measures to evaluate the quality and quantity of differing habitats and differing forest seral stages necessary to sustain the diversity of fauna, fish and wildlife supported by our forested lands. I am seeking collaboration, as soon as possible, between the government, industry, and First Nations to address the development of better monitoring protocols and tools, to improve resource development decision-making. If we are to effectively and quickly improve results in this regard, it must begin by forest tenures holders immediately improving their collaboration on planning for biodiversity and habitat maintenance, consistent with existing land-use planning and local social direction.

I recommend observing the following FREP communications and reports:

- 2012 and 2013 FREP Update for the Fort St James Forest District:
www.for.gov.bc.ca/ftp/DJA/external!/publish/FREP
- FREP Extension Note #23 - Soil Conservation:
http://www.for.gov.bc.ca/hfp/frep/publications/extension_notes.htm#e23
- Water Quality Effectiveness Evaluation Results (2008-2012): Results and Opportunities for Continued Improvement
http://www.for.gov.bc.ca/ftp/hfp/external!/publish/FREP/extension/FREP_Extension_Note_29.pdf
- State of Stream Channels, Fish Habitats, and Adjacent Riparian Areas: Resource Stewardship Monitoring to Evaluate the Effectiveness of Riparian Management, 2005–2008
http://www.for.gov.bc.ca/ftp/hfp/external!/publish/FREP/extension/FREP_Extension_Note_17.pdf

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 Fort St. James Natural Resource District 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 Fort St. James Resource District.

Resource Value	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Very low + low resource development impact rating (sample size in brackets)				
	Fort St. James District	Forests, Lands and Natural Resource Operations Areas			Province
		North	South	Coast	
Riparian – all data	64% (83)	71% (654)	69% (678)	58% (451)	67% (1783)
FRPA-era data	72% (29)	71% (257)	68% (277)	62% (198)	67% (732)
FPC-era data	59% (54)	71% (394)	70% (401)	55% (253)	67% (1048)
Water quality – all data	64% (133)	66% (992)	70% (1515)	76% (1526)	71% (4033)
2010–2012 samples	41% (44)	67% (505)	70% (823)	79% (1021)	73%(2349)
2008–2009 samples	75% (89)	64% (487)	70% (692)	70% (505)	68% (1684)
Stand-level biodiversity all data	71% (93)	42% (655)	54% (780)	77% (455)	56% (1890)
FRPA-era data	88% (33)	49% (270)	61% (347)	84% (201)	63% (818)
FPC-era data	62% (60)	38% (385)	49% (433)	72% (254)	50% (1072)
Visual Quality					
FRPA	75% (20)	73% (122)	54% (136)	78% (153)	69% (411)
FPC	70% (10)	56% (96)	65% (85)	62% (68)	61% (249)
Cultural Heritage	52% (13)	77% (95)	69% (35)	57% (14)	73% (144)