



Multiple Resource Value Assessment (MRVA)

Lakes Timber Supply Area

Nadina Natural Resource District

November 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.

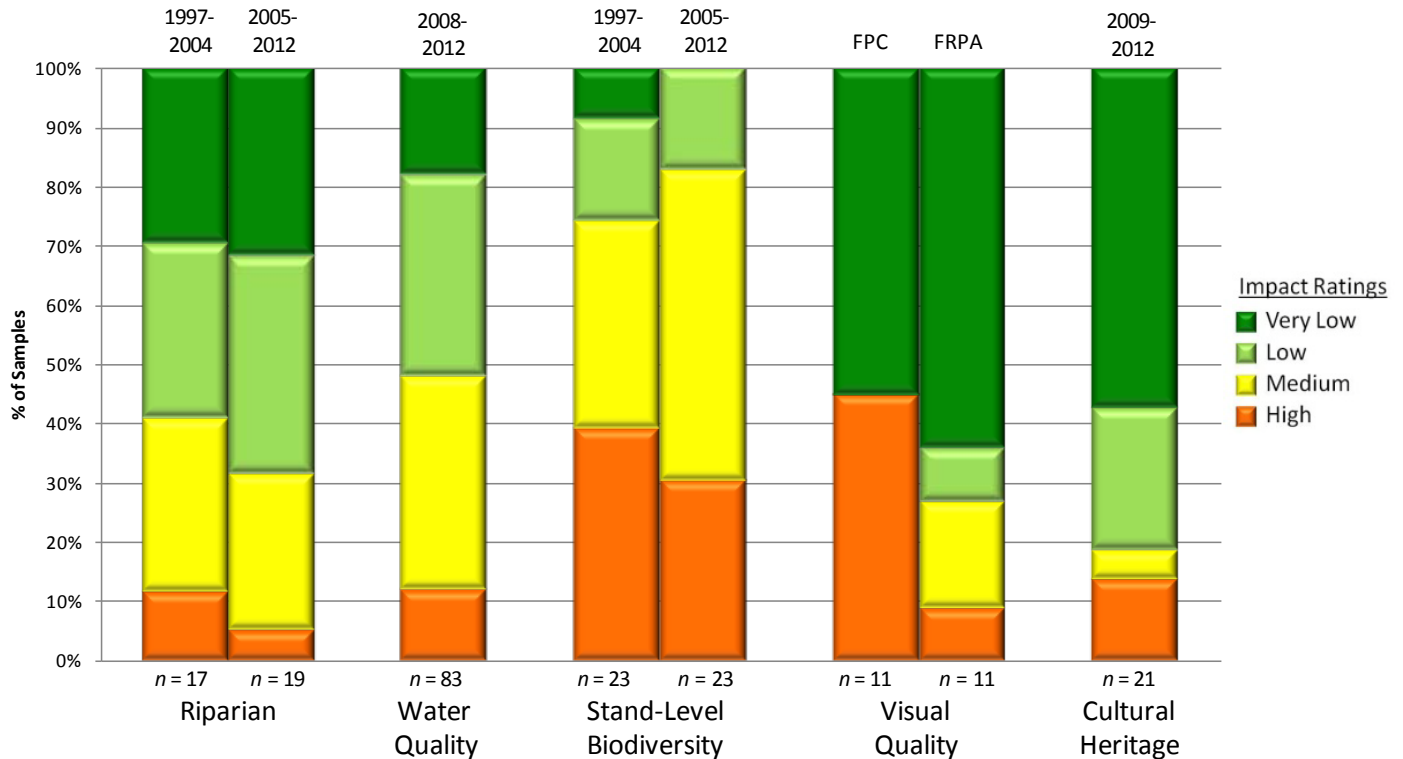
A handwritten signature in black ink, appearing to read 'Tom Ethier', is written over a light blue horizontal line.

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 and cultural heritage monitoring conducted in the Lakes 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: Lakes Timber Supply Area site-level stewardship impact rating by resource value with trend. (Riparian, stand-level biodiversity and visual quality trend by harvest year/era. Water quality and cultural heritage 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 a sustainable level of 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 Lakes 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 of 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.

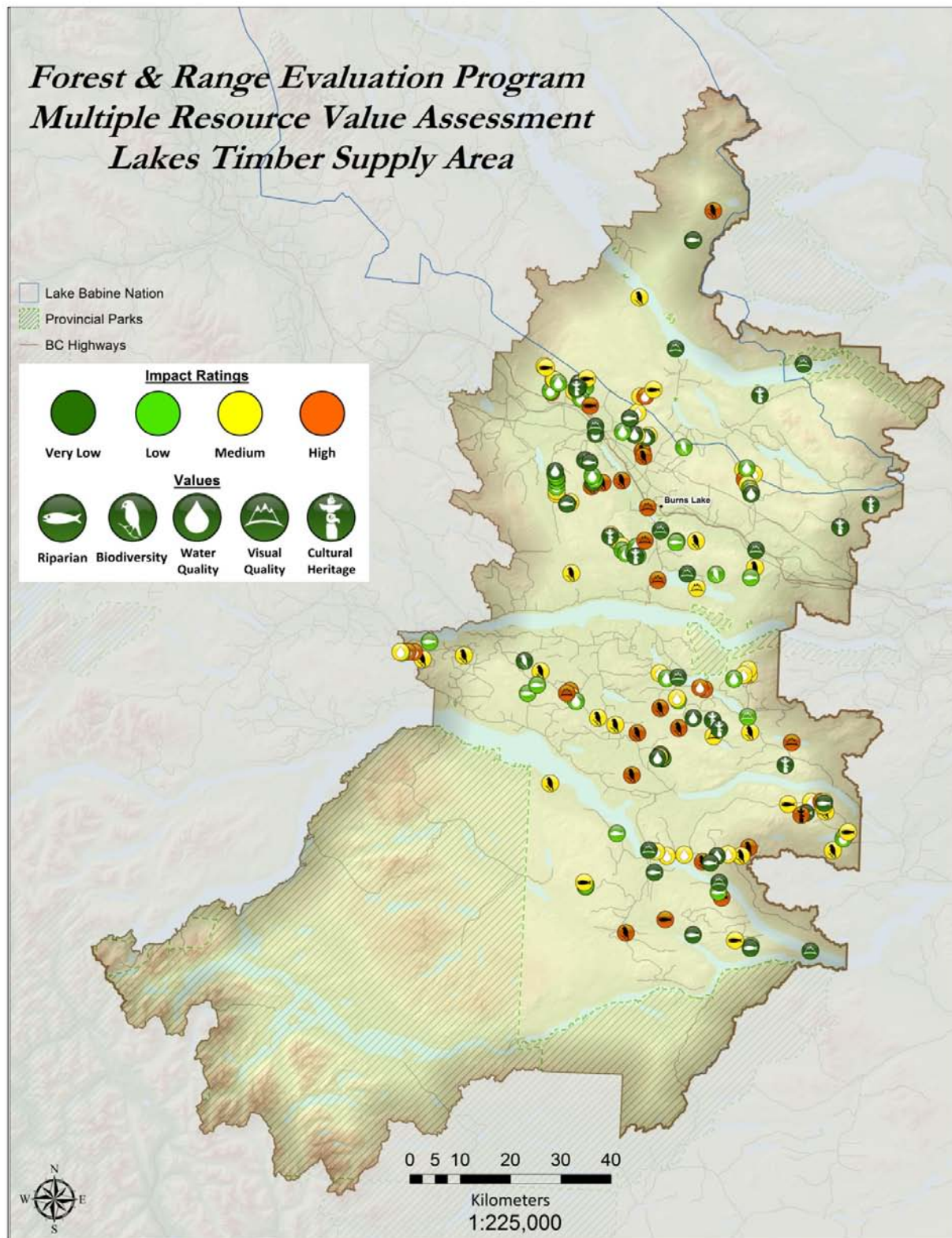
LAKES TIMBER SUPPLY AREA – ENVIRONMENTAL AND STEWARDSHIP CONTEXT

The Lakes TSA (figure 2), is located in north-central British Columbia and covers approximately 1.5 million hectares. About 35 percent of that area supports timber harvesting. The Village of Burns Lake (population 2,114) is the largest community in the Lakes TSA. The remainder of the TSA's residents are located in smaller communities including Decker Lake, François Lake, Grassy Plains, and Danskin. Most of the TSA residents are dependent on the forest sector for employment. There are also several Lake First Nations reserves and communities within the TSA, include the Cheslatta Carrier Nation, Burns Lake Band, Nee Tahi Buhn Band, Skin Tyee Nation, Wet'suwet'en First Nation and Lake Babine Nation. In addition, the Office of the Wet'suwet'en, Nadleh Whut'en First Nation, Stelat'en First Nation, Tl'azt'en First Nation, Ulkatcho First Nation and the Yekooche First Nation have asserted rights and titles that overlap the TSA.

Lodgepole pine stands dominate the TSA and these stands have been heavily affected by the mountain pine beetle (MPB) epidemic. Approximately 80 percent of the commercial pine volume in the TSA has been killed by the MPB. As the result, harvesting activities have focused on pine stands since the late 1990's. In addition to the requirements specified in the *FPC* and the *FRPA*, these harvesting activities must comply with land use objectives for caribou, seral stage distribution, old growth, habitat connectivity and wildlife tree retention.

It is estimated that by 2019 most of the MPB killed timber will be un-merchantable. This is expected to create several decades of significant timber supply shortfalls. Consequently, there is a considerable demand to harvest the pine inventory while it still retains economic value and there are high expectations regarding access to economic timber opportunities. This situation is putting pressure on non-timber values.

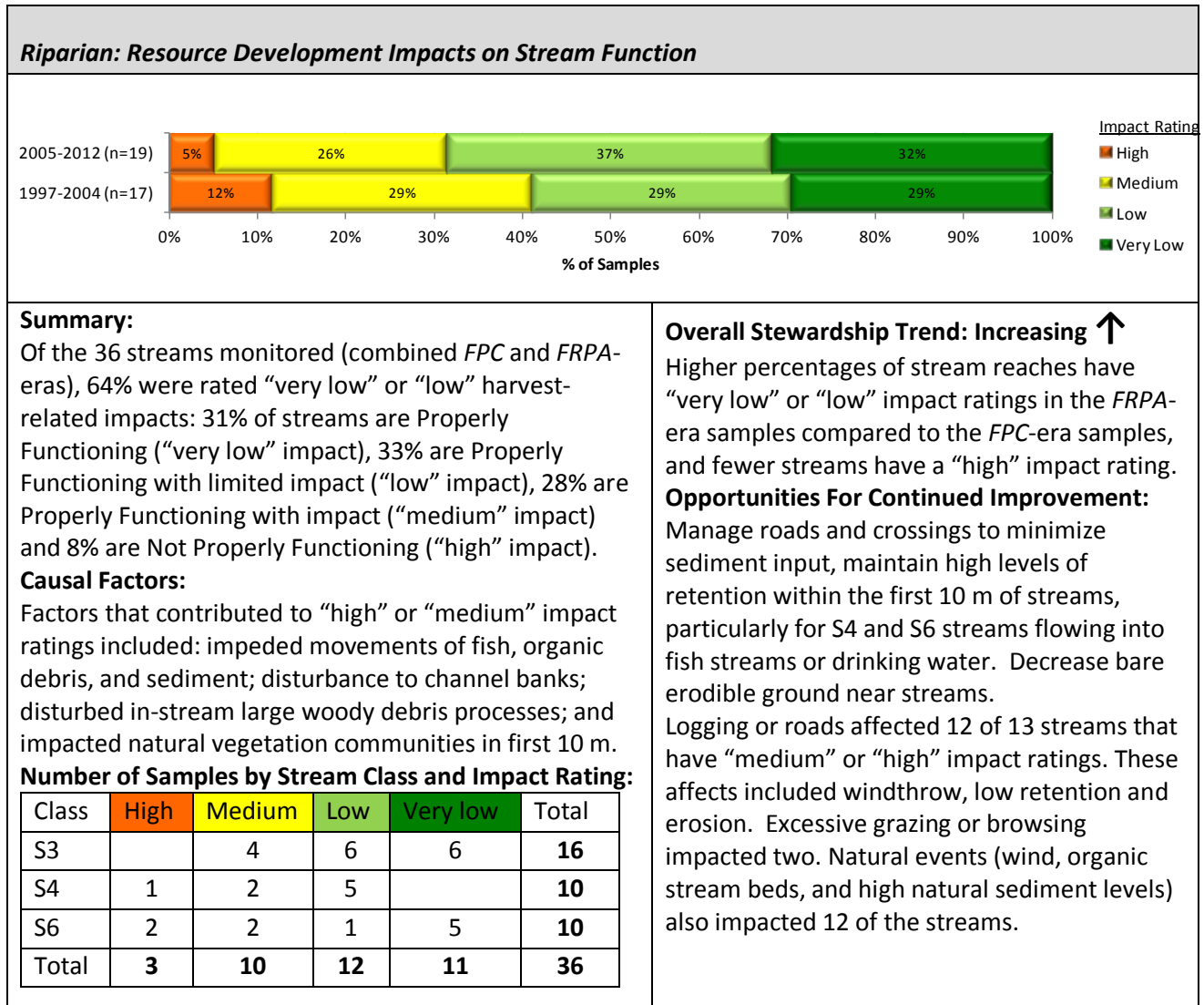
Figure 2: Lakes Timber Supply Area, showing FREP sample locations and results (see <http://www.for.gov.bc.ca/hfp/frep/publications/mrva.htm> for a high-resolution version of this map).



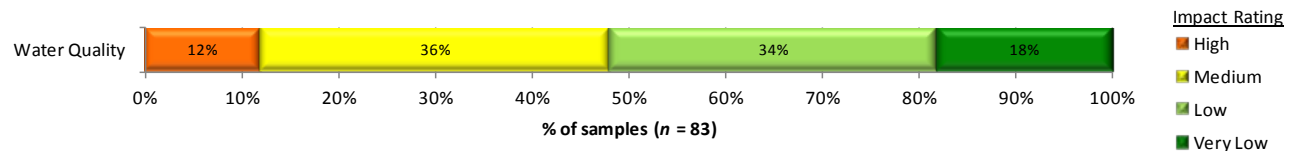
KEY RESULTS BY RESOURCE VALUE AND OPPORTUNITIES FOR CONTINUED IMPROVEMENT

Table 1 shows the resource values assessed for the Lakes Timber Supply Area, 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 Lakes Timber Supply Area.



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



Summary:

Of the 83 road segments assessed, 52% were rated as “very low” or “low” road-related impact. Site assessments show the range for potential sediment generation as 18% “very low” (“very low” impact), 34% “low” (“low” impact), 36% “moderate” (“medium” impact), 11% “high” and 1% “very high” (“high” impact).

Causal Factors:

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

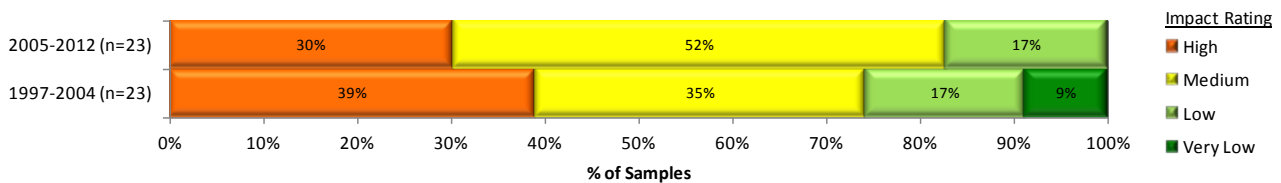
Overall Stewardship Trend: *Insufficient data*

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

Opportunities For Improvement:

Increase use of cross ditches and kick-outs. Increase armoring, seeding, and protection of bare soil during road construction. Increase the number of strategically placed culverts. Use good quality materials and crown roads.

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



Summary:

Of 46 cutblocks sampled (combined *FPC* and *FRPA*-eras), 22% of sites were rated as “very low” or “low” harvest-related impact. Considering total retention, retention quality, and coarse woody debris quantity and quality, 4% of sites are rated as “very low” impact on biodiversity, 17% as “low,” 43% as “medium,” and 35% as “high.”

Causal Factors:

Average retention for the 46 cutblocks is 16%. More than 22% of the sampled cutblocks in the Lakes Timber Supply Area had zero treed retention (<0.5%). Blocks sampled in the *FPC*- era were predominantly in the SBSdk biogeoclimatic zone (17 of 23 cutblocks), moving more into the SBSmc (17 of 23 cutblocks) in the *FRPA*-era, and representative of harvest trends.

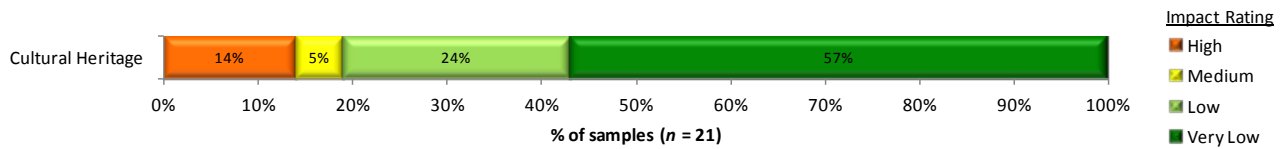
Overall Stewardship Trend: *Neutral*

There has been some improvement in stand-level biodiversity due to higher percentage of cutblocks containing retention in the *FRPA*-era compared to the *FPC*-era (52% in *FPC*-era have >0.5% retention versus 83% in *FRPA*-era). The amount and quality of coarse woody debris left on the harvested components of cutblocks decreased in the *FRPA*-era.

Opportunities For Continued Improvement:

Maintain retention on every cutblock and increase retention quality by retaining more large trees (e.g., ≥ 40 cm dbh) within retention areas. Retain more large pieces of coarse woody debris (≥10 m long and 20 cm diameter) in harvest areas.

Cultural Heritage: Resource development impacts on cultural heritage resources (CHR)



Summary:

Of the 21 cutblocks assessed, 81% were rated “very low” or “low” impact on cultural heritage resources. Overall, 67% of blocks were considered well to very well managed, 19% moderately and 15% poorly or very poorly managed. At the feature level, 85% showed no evidence of harvest-related damage while 15% showed evidence of damage. Twenty percent of damaged features showed irreversible damage and (or) were rendered unsuitable for continued use.

Causal Factors:

Primary causes of damage include removal of features and windthrow.

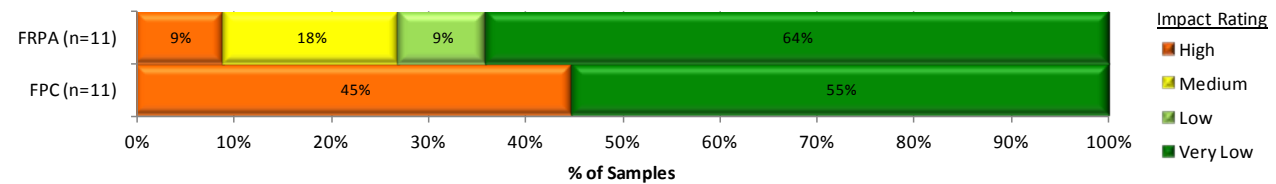
Overall Stewardship Trend: *Insufficient Data.*

There were only four FPC-era samples, therefore, no trends are available. Future trend analysis will use year of harvest.

Opportunities For Improvement:

Greater consideration of cultural heritage resource values in the planning phase such as discussions with First Nations to understand their perspectives, understand existing CHR information and pre-identify and describe on-site CHR values for site plans and logging plans. Communication of management actions (verbally and with maps) to operators before harvesting begins.

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



Summary:

Of the 22 landforms assessed (11 originating with openings harvested under forest development plans under the FPC, and 11 harvested under forest stewardship plans under FPRA), 64% were rated with “very low” or “low” harvest-related impacts on achieving the Visual Quality Objectives. VQOs were “well met” (“very low” impact) on 59% of landforms, “met” (“low” impact) on 5%, “borderline” (“medium” impact) on 9%, “not met” on 5%, and “clearly not met” (“high” impact) on 23%.

Causal Factors:

5% of the openings contained visually effective levels of tree retention (> 22% by volume or stem count) and 36% 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				1	1
PR	4	2		10	16
R	2		1	2	5
Total	6	2	1	13	22

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

Overall Stewardship Trend: *Insufficient data*

No data for FPC-era to allow for trending. Future trend analysis will use year of harvest.

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

There are currently only seven cutblock assessments in the Lakes Timber Supply Area. Analysis will be completed in subsequent years when more samples are available.

Soils: Resource Development Impacts on Soil Productivity and Hydrologic Function

Of the four cutblocks assessed, one was rated “objectives achieved”, one was rated “moderate achievement” and two were rated “objectives not achieved”.

Causal Factors:

Insufficient mature forest to provide inoculum for organisms re-colonizing the cutblock. Measures were not taken to restore natural drainage patterns.

Opportunities For Improvement:

Plan for soil conservation by designing access and skid trail patterns to reduce and minimize damage to natural drainage patterns, reducing soil disturbance associated with roadside processing, and increasing the level of coarse woody debris and mature forest inoculum to maintain long-term soil productivity. (Also see stand-level biodiversity)

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?

Rating system under 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

Tables 2 and 3 provide ratings of stewardship effectiveness at varying scales, with Table 2 presenting site-level results, and Table 3 landscape-level results. Effectiveness is determined by the percentage of samples with a “very low” or “low” resource development impact rating. 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. All other data is derived from FREP field assessments. Appendix 2 shows results by resource value for the North, South and Coast Areas and the province as a whole.

Table 2: Stewardship effectiveness within the Skeena 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									
	Skeena Region Comparison							Similar Ecosystems		Skeena Region ^a
	Lakes TSA	Kalum TSA	Morice TSA	Kispiox TSA	Nass TSA	Bulkley TSA	North Coast TSA	Vanderhoof District	Fort St. James District	
Riparian – all data	64% (36)	75% (53)	74% (42)	85% (27)	ID (9)	90% (31)	76% (45)	70% (74)	64% (83)	77% (243)
FRPA-era data	68% (19)	73% (15)	83% (18)	ID (9)		93% (14)	76% (21)	74% (35)	72% (29)	80% (100)
FPC-era data	59% (17)	81% (36)	67% (24)	83% (18)		88% (17)	75% (24)	67% (39)	59% (54)	75% (141)
Water quality – all data	52% (83)	84% ² (119)	46% (92)	93% (58)	ID (15)	100% (53)	ID (45)	69% (127)	64% (133)	73% (465)
2010–2012 samples	ID (35)	83% (103)	ID (46)	ID (32)		100% (46)		74%(57)	41% (44)	79% (291)
2008–2009 samples	48% (48)	ID (16)	43% (46)	ID (26)		ID (7)		64%(70)	75% (89)	63% (174)
Stand-level biodiversity –all data	28% (46)	52% (46)	38% (29)	76% (37)	36% (11)	33% (48)	74% (43)	8% (65)	71% (93)	48% (260)
FRPA-era data	17% (23)	87% (15)	50% (14)	83% (18)		30% (30)	95% (20)	5% (22)	88% (33)	55% (121)
FPC-era data	26% (23)	35% (31)	27% (15)	68% (19)		39% (18)	57% (23)	9% (43)	62% (60)	42% (139)
Cultural Heritage	81% (21)	ID (6)	84% (13)	91% (23)	ID (0)	ID (6)	ID (6)	ID (7)	54% (13)	82% (75)
Visual Quality										
FRPA	ID (11)	63% (38)	ID (7)	ID (3)	ID (3)	ID (8)	ID (5)	85% (14)	75% (20)	71% (75)
FPC	ID (11)	40% (25)	ID (7)	ID (1)	ID (0)	ID (0)	ID (9)	ID (0)	70% (10)	55% (53)

^a Includes the Nadina, Coast Mountain and Skeena-Stikine Natural Resource Districts.

Table 3: Landscape-level stewardship within the Skeena Region – in development.

Components of Landscape Biodiversity	Interim indicators without ranking ^a									
	Skeena Region Comparison							Similar Ecosystems		Skeena Region ^b
	Lakes TSA	Morice TSA	Kispiox TSA	Bulkley TSA	Nass TSA	North Coast TSA	Kalum TSA	Vanderhoof District	Fort St. James District	
% timber supply area old and mature	61	63	83	70	90	95	69	46	72	76
% timber supply area protected	39	12	18	4	7	24	15	7	15	20

^a Landscape-level ranking criteria are in development. Indicators above are an example without ranking.

^b Includes the Nadina, Coast Mountain and Skeena-Stikine Natural Resource Districts.

DESCRIPTION OF ASSESSMENT OF NON-FOREST INDUSTRY IMPACTS ON RESOURCE VALUES

Analysis has been initiated for several other resource sector impacts including mining (roads), recreation, linear developments (hydro and pipelines) and highways. The sample size for these non-forestry impacts is modest - nine riparian samples in the Lakes Timber Supply Area. While non-forestry riparian impacts for the nine samples in the Lakes Timber Supply Area are reported in tables 4 and 5, this is primarily for illustrative purposes (i.e., potential for using FREP protocols for broad resource sector impact monitoring).

Table 4: Example of non-forest industry impacts on resource values

Resource Value (stand level)	Sample Size <i>n</i>	Count of impact ratings (non-forestry)			
		Very low	low	Medium	High
Riparian (fish)	9	2	2	2	3

Table 5: Example of monitoring findings and opportunities for improvement by resource value for non-forest industry impacts

Resource Value	Key Findings	Opportunities for Improvement
Riparian	Of the nine non-forestry riparian samples, two were on streams associated with highways, two were hydro lines, and five were associated with mining activity (past or present). Each of these industrial categories has Not Properly Functioning (“high” impact) streams. In total three of nine samples were “high” impact, two “medium”, two “low” and two “very low” impact.	Avoid creation of in-stream blockages. Maintain natural forest elements in riparian areas. Minimize soil exposure in riparian areas.

DISTRICT MANAGER COMMENTARY¹

The monitoring results reported in this document contain a mix of stewardship ratings. In general forest practices for cultural heritage resources and riparian function can be rated as having “low” or “very low” impact on the values. Forest practices for stand-level biodiversity, visual quality and water quality sampled sites are generally rated as having “high” or “medium” impacts. I am however pleased to see that cutblocks harvested more recently have a greater proportion of “low” and “very low” stand-level biodiversity impacts compared to the older cutblocks. I expect forest professionals will continue to implement those practices that are rated as “very low” or “low” impact and I challenge them to achieve excellent resource management practices on all sites.

A “high” impact rating does not meet the government’s overall objective of sustainable resource management and should be avoided. Similarly, “medium” impact practices should be minimized to reduce risks. With that in mind, I expect licensees to:

- place a greater emphasis on cultural heritage resources during the planning phase
- minimize sediment delivery on all roads and stream crossings, increase retention levels along all streams and minimize areas of bare soil
- retain wildlife trees on all cutblocks and retain more large trees and large pieces of coarse woody debris in harvest areas
- increase effective levels of tree retention in scenic areas, use visual design techniques and reduce the opening size in areas where the objective is retention or partial retention.

District staff should continue to monitor practices for all values with an emphasis on those related to stand-level biodiversity, visual quality, and water quality.

Forest professionals should place a greater reliance on monitoring results while preparing, reviewing and implementing forest stewardship plans.

¹ Commentary supplied by Nadina Natural Resource District Manager, Josh Pressey.

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 Lakes Timber Supply Area 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 Lakes Timber Supply Area.

Resource Value	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Very low + low resource development impact rating (sample size in brackets)				
	Lakes TSA	Forests, Lands and Natural Resource Operations Areas			Province
		North	South	Coast	
Riparian – all data	64% (36)	71% (654)	69% (678)	58% (451)	67% (1783)
FRPA-era data	68% (19)	71% (257)	68% (277)	62% (198)	67% (732)
FPC-era data	59% (17)	71% (394)	70% (401)	55% (253)	67% (1048)
Water quality – all data	52% (83)	66% (992)	70% (1515)	76% (1526)	71% (4033)
2010–2012 samples	ID (35)	67% (505)	70% (823)	79% (1021)	73%(2349)
2008–2009 samples	48% (48)	64% (487)	70% (692)	70% (505)	68% (1684)
Stand-level biodiversity - all data	28% (46)	42% (655)	54% (780)	77% (455)	56% (1890)
FRPA-era data	17% (23)	49% (270)	61% (347)	84% (201)	63% (818)
FPC-era data	26% (23)	38% (385)	49% (433)	72% (254)	50% (1072)
Cultural Heritage	81% (21)	77% (95)	69% (35)	57% (14)	73% (144)
Visual Quality					
FRPA	73% (11)	73% (122)	54% (136)	78% (153)	69% (411)
FPC	55% (11)	56% (96)	65% (85)	62% (68)	61% (249)