



Multiple Resource Value Assessment (MRVA)

Morice Timber Supply Area – Nadina 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.

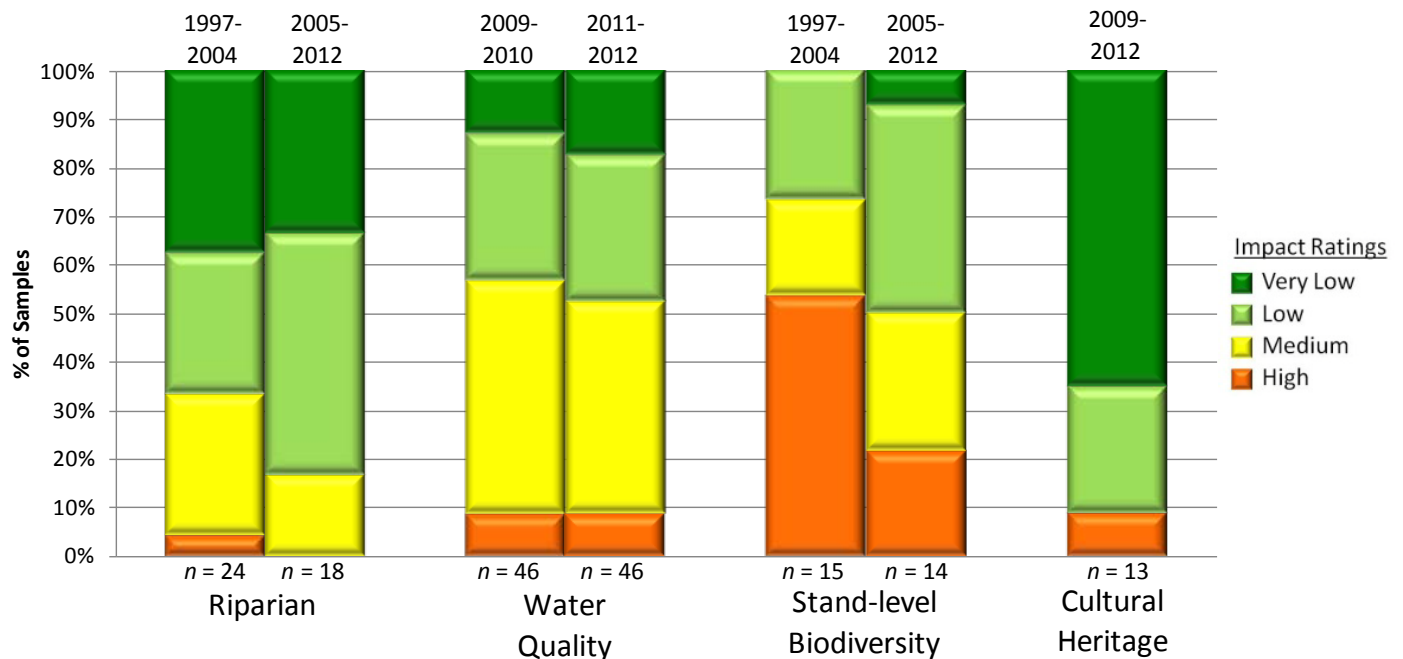
A handwritten signature in black ink, appearing to read 'Tom Ethier', is written over a light blue horizontal line.

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, water quality (sediment), biodiversity, cultural heritage, and visual quality monitoring conducted in the Morice 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: Morice Timber Supply Area site-level resource development impact ratings by resource value with trend. (Riparian and stand-level biodiversity trend by harvest year/era. Water quality and cultural heritage trend by evaluation year.)



Important Context for Understanding this Assessment

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

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

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

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

INTRODUCTION

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

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

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

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

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

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

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

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

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

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

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

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

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

MORICE TIMBER SUPPLY AREA – ENVIRONMENTAL AND STEWARDSHIP CONTEXT

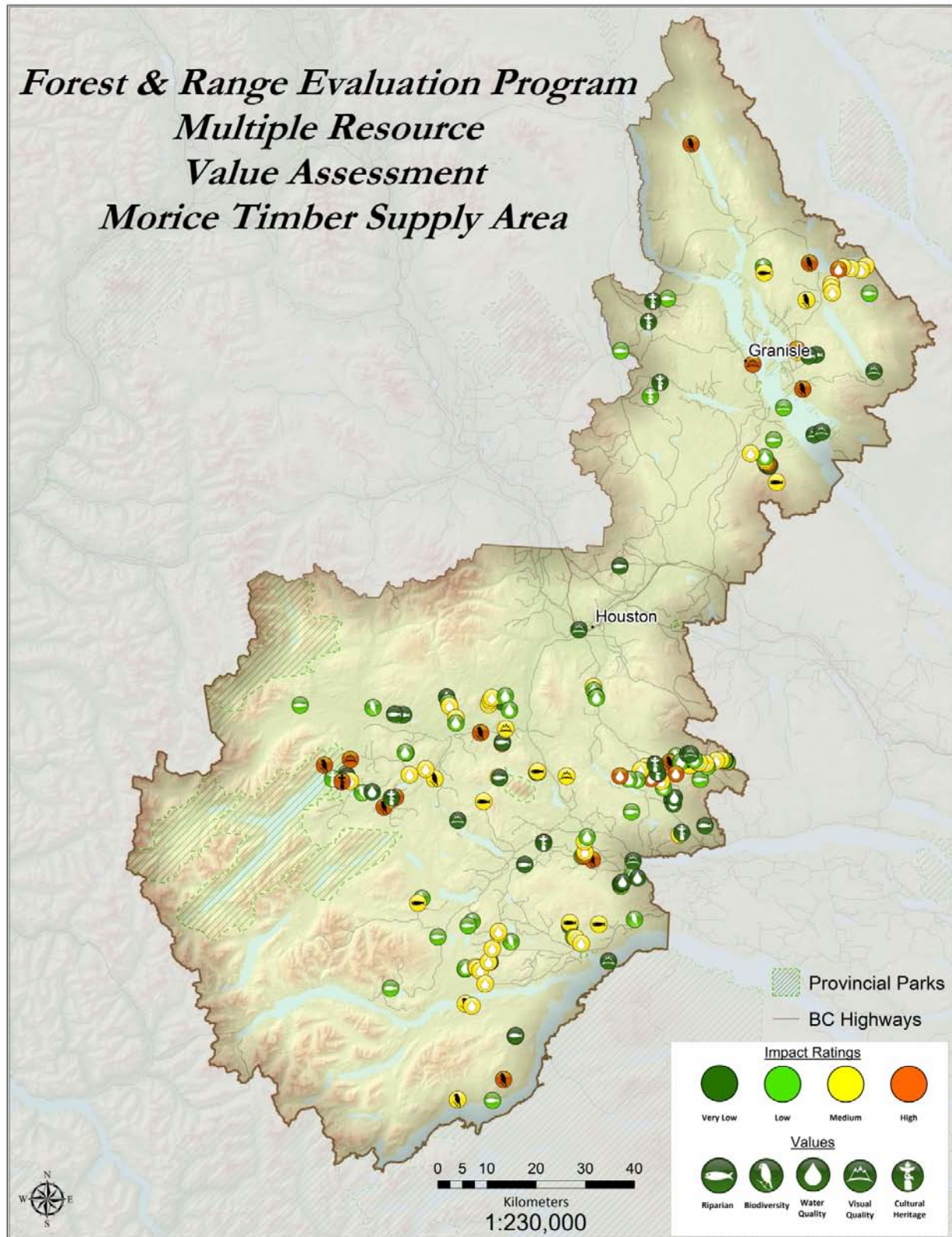
This report covers the Morice Timber Supply Area (figure 2). The Morice TSA is situated on the western edge of British Columbia's central interior plateau and covers approximately 1.5 million hectares of the Northern Interior Forest Region. The TSA extends from the most northerly tip of Babine Lake in the north to Ootsa and Whitesail lakes in the south. Provincial parks in the region include Tazdliwyiez Bin/Burnie-Shea Park, Atna River Park, Neneikekh/Nanika-Kidprice Park, Morice Lake Park, and Nadina Mountain Park. The Morice TSA is within the traditional territories of eight First Nation groups including Cheslatta Carrier Nation, Nee Tahí Buhn Band, Skin Tyee Band, Wet'suwet'en First Nation, Lake Babine Nation, Moricetown Band Council, Tl'azt'en First Nation and Yekooche First Nation.

The TSA is home to about 4,000 residents who are predominantly dependent on the forest sector for employment. The residents are also outdoor enthusiasts who value their cultural heritage as well as the hunting, fishing, recreation, and tourism opportunities available in the area.

The TSA encompass a wide range of geographic and climatic conditions that reflects a transition between the interior to the north and east and the coast in the southwest. As a result, tree species diversity ranges from lower elevation deciduous and mixed forests through conifer dominated pine, spruce and balsam forests at higher elevations. These forests, and the major tributaries to the Skeena and Fraser river systems that are present in the area, provide habitat for numerous species of fish and wildlife. Although best known for its moose population, the TSA also supports mule deer and to a lesser degree, whitetail deer, grizzly and black bear, mountain goat, wolves, coyotes and small herds of caribou.

Despite the tree species diversity of the TSA, lodgepole pine accounts for about half of the commercial conifer volume available. About half of the pine volume has been killed by the mountain pine beetle (MPB) and as the MPB-killed timber becomes un-merchantable, reduced harvest levels are anticipated in the future. There are limited opportunities for economic diversification within the TSA and considerable expectations regarding access to economic timber opportunities. There are also high expectations regarding ecosystem values and long-term sustainability.

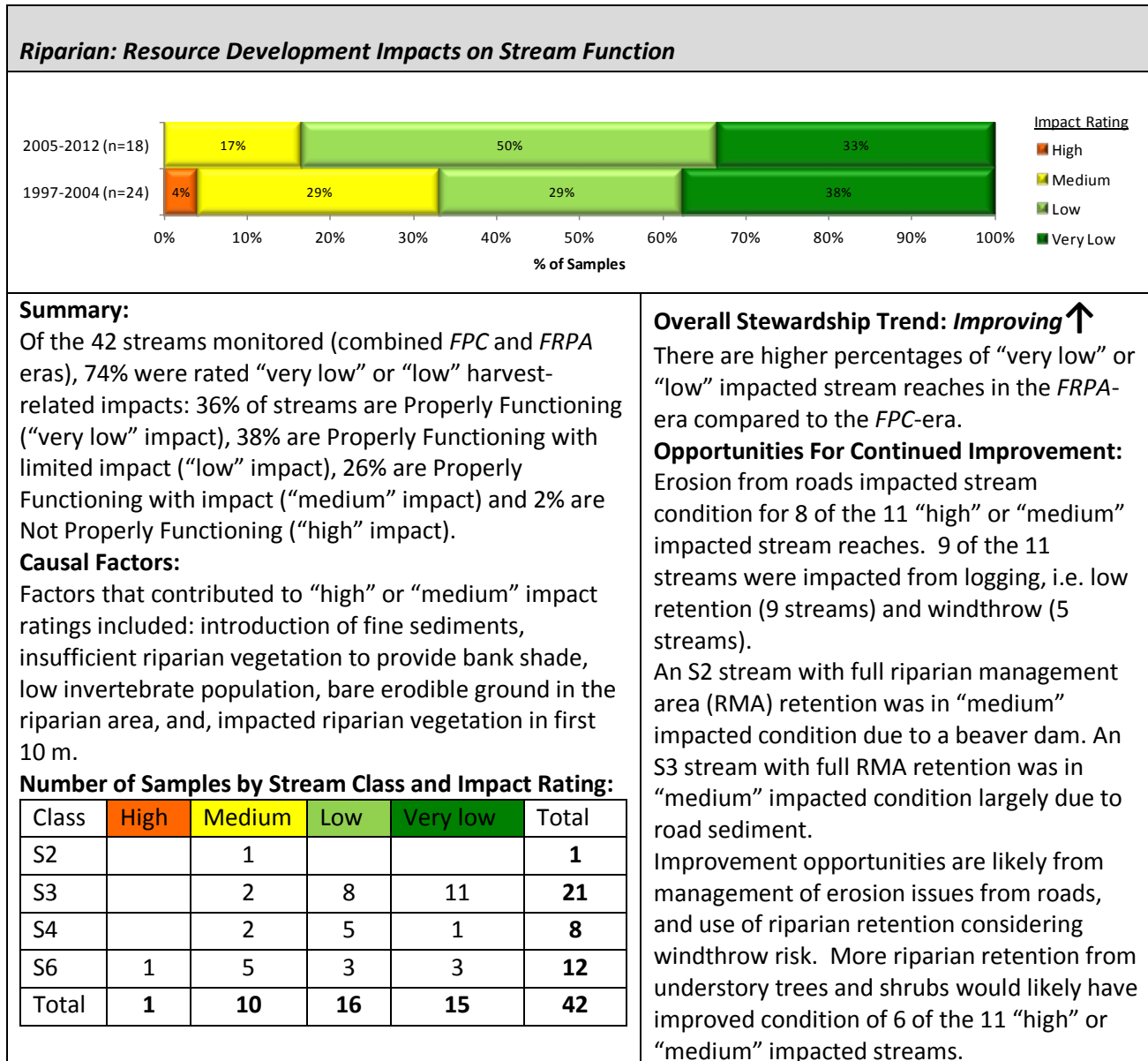
Figure 2: Morice Timber Supply Area, showing FREP sample locations and results (see <http://www.for.gov.bc.ca/hfp/frep/publications/mrva.htm> for a high-resolution version of this map).



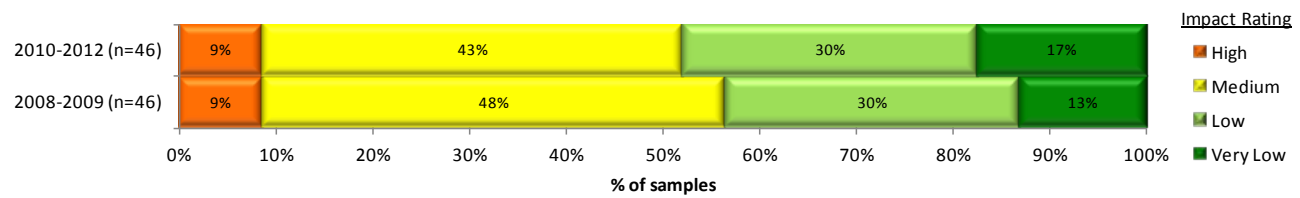
KEY RESULTS BY RESOURCE VALUE AND OPPORTUNITIES FOR CONTINUED IMPROVEMENT

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



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



Summary:

Of the 92 road segments assessed from 2008 to 2012, 46% were rated as “very low” or “low” road-related impact. Site assessments show the range for potential sediment generation as 15% “very low” (“very low” impact), 30% “low” (“low” impact), 46% “moderate” (“medium” impact), 9% “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.

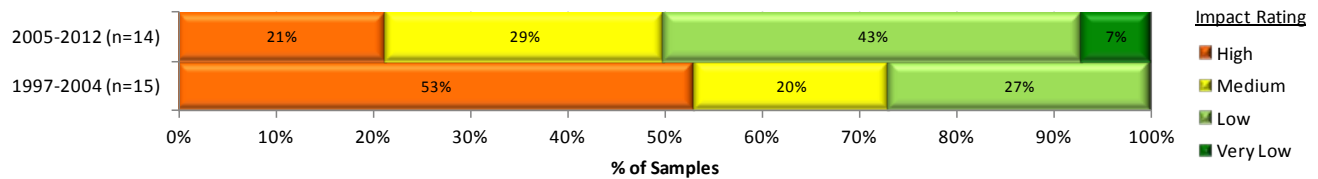
Overall Stewardship Trend: Neutral

Trending for water quality is based on survey years, to capture impact of road traffic and maintenance. There may be small improvement in recent years, however take caution with this trending due to only 8 cutblocks as the origins for the road segments in the later years.

Opportunities For Improvement:

The most frequent suggested maintenance issues are: to use cross ditches and kickouts; armour, seed and protect bare soil; avoid long gradients approaching streams; and, increase the number of strategically placed culverts.

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



Summary:

Of 29 cutblocks sampled (combined FPC and FRPA-eras), 70% of sites were rated as “very low” or “low” harvest-related impact. Considering total retention, retention quality, and coarse woody debris quantity and quality, 3% sites are rated as “very low” impact on biodiversity, 34% as “low”, 24% as “medium”, and 38% as “high”.

Causal Factors:

72% of all blocks had more than 3.5% tree retention. Retention increased from an average 9.3% in the FPC- to 19.8% in the FRPA-era. Cutblock size also increased from 24 to 42 hectares. Large snag retention in FRPA-era is similar to expected baseline densities. Big diameter tree density (≥40 cm dbh) has increased to a level equal or above that expected from baseline. The number of tree species retained has also improved in FRPA-era to be similar to expected. Coarse woody debris quality in terms of big pieces has decreased.

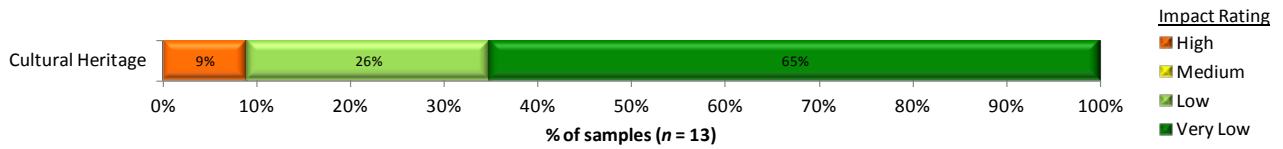
Overall Stewardship Trend: Improving ↑

The amount of retention and retention quality increased from FPC- to FRPA-era though the quality of coarse woody debris decreased, particularly in terms of volume from large diameter (≥20 cm) pieces.

Opportunities For Continued Improvement:

Leave at least low levels of retention on every cutblock. Continue trend to big diameter tree density and tree species diversity similar (or better) to pre-harvest or baseline conditions. Improve coarse woody debris quality in terms of volume from big diameter (>20 cm) and density of big pieces (≥20 cm and 10 m).

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



Summary:

Of the 13 cutblocks assessed, 84% were rated “very low” or “low” impact on the cultural heritage resource. 69% of blocks were considered well to very well managed, 23% moderately and 8% were poorly managed.

At the feature level, 38% showed no evidence of harvest-related damaged while 63% showed evidence of damage. 10% of damaged features showed irreversible damage and (or) were rendered unsuitable for continued use.

Causal Factors:

Most damage to features came from harvesting activities (removal of features and/or permanent damage to features). Windthrow and fire were also contributing factors.

Overall Stewardship Trend: *Insufficient data*

Future trend analysis will use year of harvest.

Opportunities For Continued Improvement:

Continue careful consideration of CHR values in the planning phase. Continue 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. Communicate management actions (verbally and with maps) to operators before harvesting begins.

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

Summary:

There are currently 14 Visual Quality samples in the Morice TSA. Seven of these samples originated from openings harvested using Forest Development Plan under the FPC (5 “very low” impact, 1 “low” and 1 “high” impact to achieving the VQO). The other 7 were harvested under Forest Stewardship Plans under FRPA (4 “very low” impact, 2 “medium” and 1 “high” impact). Analysis will be completed in subsequent years.

Soils: Resource Development Impacts on Soil Productivity and Hydrologic Function

There is currently only one Soils sample in the Morice TSA. Analysis will be completed in subsequent years when more samples are available.

Timber (stand development monitoring): Resource development impacts on the overall health and stocking of managed 15-40 year stands.

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

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

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 “very low” or “low” impact on the stream reach or cultural heritage resource. The same rating appears to apply to visual resources, although the sampling size is still too small to draw a conclusion. Forest practices for stand-level biodiversity and water quality sampled sites are generally rated as having a “high” or “medium” impact. I am however pleased to see that cutblocks harvested more recently have a greater proportion of “low” or “very low” impact on stand-level biodiversity than the older cutblocks. I expect forest professionals will continue to implement those practices that are rated as “very low” and “low” impact and I challenge them to achieve excellent resource management practices on all sites.

A “high” impact rating is not meeting 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; and
- retain a wide range of wildlife trees on all cutblocks and retain more large pieces of coarse woody debris in harvest areas.

District staff should continue to monitor practices for all value 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 Morice 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 Morice Timber Supply Area.

Resource Value	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Very low + low resource development impact rating (sample size in brackets)				
	Morice TSA	Forests, Lands and Natural Resource Operations Areas			Province
		North	South	Coast	
Riparian - all data	74% (42)	71% (654)	69% (678)	58% (451)	67% (1783)
FRPA-era data	83% (18)	71% (257)	68% (277)	62% (198)	67% (732)
FPC-era data	67% (24)	71% (394)	70% (401)	55% (253)	67% (1048)
Water quality - all data	46% (92)	66% (992)	70% (1515)	76% (1526)	71% (4033)
2010–2012 samples	ID (46)	67% (505)	70% (823)	79% (1021)	73%(2349)
2008–2009 samples	43% (46)	64% (487)	70% (692)	70% (505)	68% (1684)
Stand-level biodiversity - all data	38% (29)	42% (655)	54% (780)	77% (455)	56% (1890)
FRPA-era data	50% (14)	49% (270)	61% (347)	84% (201)	63% (818)
FPC-era data	27% (15)	38% (385)	49% (433)	72% (254)	50% (1072)
Cultural Heritage	84% (13)	77% (95)	69% (35)	57% (14)	73% (144)