



FREP
Forest & Range
Evaluation Program

Multiple Resource Value Assessments (MRVA)

Morice Timber Supply Area – Nadina Natural Resource District
July 26, 2013

MRVA in Brief

This document reports monitoring results for riparian, biodiversity (stand and landscape), water quality (sediment), soils, cultural heritage, timber (stand development monitoring) and visual quality monitoring that has taken place in the District or TSA. Where there is sufficient data, results have been categorized into stewardship ratings of “good, fair, borderline, and poor” (Figure 1). Good and fair outcomes are considered to be consistent with society’s goal of sustainable resource management. MRVA is designed to inform decision making at multiple levels including; on-the-ground management practices, statutory decision maker approvals and, data for assessing cumulative effects. MRVA results can be used to help decision makers clarify expectations for sustainable resource management of public resources and communicate opportunities for continued improvement. This report is focused on forestry impacts; other resource sectors will be included as more non-forestry data (e.g., mining, hydro, pipelines and highways) is collected. This document includes a district manager commentary of key strengths and weaknesses, including issues calling for licensee or ministry action.

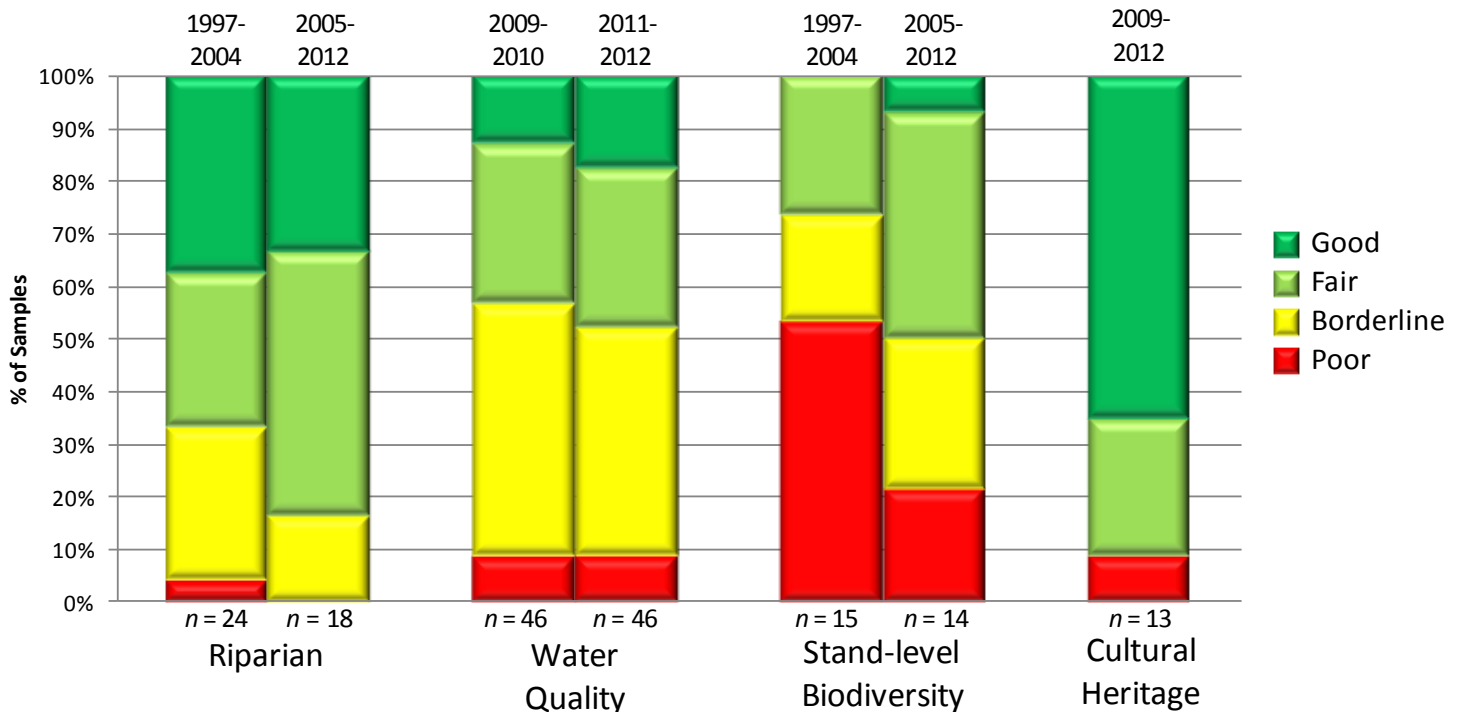


Figure 1: Morice TSA site-level stewardship rating by resource value with trend¹

See table 2, page 8 for results within Skeena Region and table 2, Appendix III, for results by Area and Province

¹Riparian and stand-level biodiversity trend by harvest year. Water quality and cultural heritage trend by evaluation year.

Introduction

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

- Simplify the forest management legal framework;
- Reducing operational costs to both industry and government;
- Creating a “freedom to manage” environment; and
- Maintaining the Forest Practices Code’s (FPC) high environmental standards.

As part of the results-based FRPA framework, government committed to conducting, and, publically reporting out on the results of effectiveness evaluations. The science-based information from these evaluations will be used to determine if FRPA is achieving government’s objective of maintaining high environmental standards and ensuing sustainable management of public resources. Where this is not the case, 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. Details on the FREP program can be found at: <http://www.for.gov.bc.ca/hfp/frep/>.

Multiple Resource Value Assessment (MRVA) reports document the results of stand and landscape-level monitoring carried out under the Forest and Range Evaluation Program (FREP). FREP stand-level monitoring is, for the most part, done on logging blocks, resource roads or other areas disturbed by industrial activity. As such, these evaluations are a stewardship assessment of resource development practices; rather than an assessment of the landscape as a whole. Landscape-level biodiversity, visual quality and wildlife monitoring is more broadly an assessment of the overall landscape.

Resource values being monitored under FREP include: biodiversity, riparian, water quality (sediment), cultural heritage, forage, visual quality, wildlife, resource features (karst) and recreation. MRVA reports are designed to inform decision making at multiple levels including; on-the-ground management practices, statutory decision maker approvals and, data for assessing cumulative effects.

This report is a summary of the Forest and Range Evaluation Program (FREP) monitoring results for the Morice Timber Supply Area (see Appendix I for a description of the TSA and FREP sample locations). MRVA reports are intended to support government decision making and clarification of resource stewardship expectations; and to promote the open and transparent discussion needed to achieve short- and long-term sustainable resource management in British Columbia. This report covers four of the 11 FRPA resource values: riparian, biodiversity (landscape and stand-level), water quality (sediment generation) and cultural heritage.

The target audience for MRVA reports is natural resource managers and professionals, government decision makers and First Nations interested in the status and trends of resource values at the TSA or resource district scale. These reports can also be used to communicate resource management outcomes to the public.

Government managers and decision makers are encouraged to consider these results, and use them for:

- Discussing district or TSA-level resource stewardship with staff, licensed stakeholders and/or 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 Type 4 Silviculture Strategies
- Assessing Timber Supply Reviews and the supporting rationales
- Informing decision making at multiple levels (e.g. on the ground management practices, statutory decision maker approvals, data for assessing cumulative effects).

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 are managing on behalf of the public
- Inform professional recommendations and decisions, particularly where these involve a balancing of environmental, social, and economic values
- Enhance resource management, consultation and treaty rights discussions between First Nations, government and licensees.

Detailed findings for each resource value have been published in FREP Reports and Extension Notes; these documents can be found 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 preparation of licensee-specific MRVA report.

While this report is at the district or TSA level, MRVA is scalable. For example, reports for individual licensees, treaty settlement areas or landscape units can be produced where there is sufficient monitoring data. Reports can also be prepared at the regional or provincial levels. The resource values that can currently be assessed using MRVA are: biodiversity (stand and landscape), riparian, water quality (sediment), soils, visual quality, cultural heritage, forage, timber and wildlife (e.g., effectiveness of wildlife habitat areas and ungulate winter ranges). Other resource values and (or) assessment data (FREP and non-FREP), at both the site and landscape-levels can be added over time.

This report provides site-level assessments with an indication of trends comparing blocks harvested before 2005 to those harvested 2005 or later where there is sufficient data. Site assessment (e.g. cutblock) results categorize effectiveness of management practices as good, fair, borderline or poor based on the FREP monitoring results. This categorization is done with respect to how well site-level resource management practices achieved government's overall goal of sustainable resource management. Individual site-level practices that fall into the good or fair category are considered fully consistent with sustainable management objectives. Poor practices are seen as not being consistent with government's sustainability objectives. The borderline category falls between fair and poor. For a detailed description of the MRVA methodology and a description of terms used in this report, please go to: *(insert web link when available)*. A brief description of the MRVA scoring methodology is described in Appendix II.

While the primary focus of this report is on forestry-related activities, the field and analysis methodologies have been tested on several other resource industry-related impacts including mining (roads) and linear developments (hydro and pipelines).

Stewardship/Environmental Context for the Morice Timber Supply Area:

The Morice TSA, situated on the western limit of British Columbia's interior plateau, is about 1.5 million hectares in size. 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. These include salmon, grizzly bear and 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.

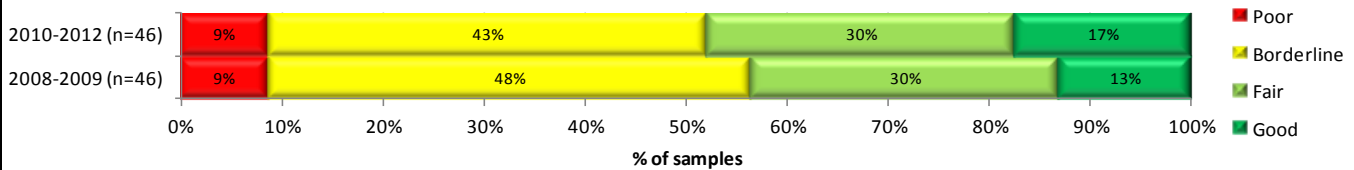
Key MRVA Findings Results by Resource Value and Stewardship Opportunities for improvement (forestry-related impacts)

Table 1 describes the resource values and the associated evaluation questions covered in this report; including a summary of key findings, causal factors, trends and continued improvement opportunities. Reference to Code era samples are sites harvested prior to 2005 while FRPA era sites are those harvested 2005 or later, only approximating the *Forest and Range Practices Act* (FRPA) era, but allowing for a comparison between earlier and later stewardship practices.

Table 1: Monitoring question, key findings and opportunities for improvement by resource value for the Morice TSA.

Riparian: Are riparian forestry and range practices effective in maintaining the proper functioning of riparian areas?																																									
<p>2005-2012 (n=18): 17% Poor, 50% Borderline, 33% Good</p> <p>1997-2004 (n=24): 4% Poor, 29% Borderline, 38% Good</p> <p>% of Samples</p>																																									
<p>Summary: Of the 42 streams, 74% were rated good + fair. 36% of streams are Properly Functioning (good), 38% are Properly Functioning with limited impact (fair), 26% are Properly Functioning with impact (borderline) and 2% are Not Properly Functioning (poor).</p> <p>Causal Factors: Contributing factors to poor or borderline streams were: introduction of fine sediments, insufficient riparian vegetation to provide bank shade, low invertebrate population, bare erodible ground in the riparian area, and, impacted riparian vegetation in first 10 metres.</p> <p>Count of sampled streams by stream class and category:</p> <table border="1"> <thead> <tr> <th>Class</th><th>Poor</th><th>Borderline</th><th>Fair</th><th>Good</th><th>Total</th></tr> </thead> <tbody> <tr> <td>S2</td><td></td><td>1</td><td></td><td></td><td>1</td></tr> <tr> <td>S3</td><td></td><td>2</td><td>8</td><td>11</td><td>21</td></tr> <tr> <td>S4</td><td></td><td>2</td><td>5</td><td>1</td><td>8</td></tr> <tr> <td>S6</td><td>1</td><td>5</td><td>3</td><td>3</td><td>12</td></tr> <tr> <td>Total</td><td>1</td><td>10</td><td>16</td><td>15</td><td>42</td></tr> </tbody> </table>						Class	Poor	Borderline	Fair	Good	Total	S2		1			1	S3		2	8	11	21	S4		2	5	1	8	S6	1	5	3	3	12	Total	1	10	16	15	42
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<p>Overall Stewardship Trend: Increasing ↑ There are higher percentages of good plus fair stream reaches in the FRPA era compared to the Code.</p> <p>Opportunities For Continued Improvement: Erosion from roads impacted stream condition for 8 of the 11 poor or borderline streams. 9 of the 11 streams were impacted due to logging, i.e. low retention (9 streams) and windthrow (5 streams).</p> <p>An S2 stream with full RMA retention was in borderline condition due to a beaver dam. An S3 stream with full RMA retention was in borderline condition largely due to road sediment.</p> <p>Improvement opportunities are likely from management of erosion issues from roads, and use of riparian retention considering windthrow risk. More riparian retention from understory trees and shrubs would likely have improved condition of 6 of the 11 poor or borderline streams.</p>																																									

Water Quality (fine sediment): Are forest practices effective in protecting water quality?



Summary:

Of the 92 road segments assessed, 46% were rated good + fair. Site assessments show the range for potential sediment generation as 15% very low (good), 30% low (fair), 46% moderate (borderline), 9% high or very high (poor).

Causal Factors:

See opportunities for improvement for moderate or poor road segments. Some opportunities will apply to ongoing maintenance issues, while others would mainly apply to new road construction.

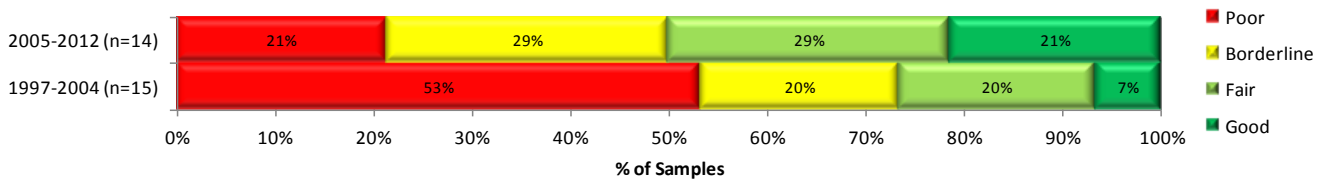
Overall Stewardship Trend: Increasing ↑

Trending for water quality is based on survey years, to capture impact of road traffic and maintenance. There has been small improvement in recent 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: 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?



Summary:

Of the 29 cutblocks, 38% of sites were rated good+fair. Considering total retention, retention quality and CWD quantity and quality, 3% have good biodiversity, 34% fair, 24% borderline and 38% poor.

Causal Factors:

72% of all blocks had more than 3.5% treed retention. Retention increased from an average 9.3% in the Code to 19.8% in 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. CWD quality in terms of big pieces has decreased.

Overall Stewardship Trend: Increasing ↑

The amount of retention and retention quality increased from Code to FRPA era though the quality of CWD decreased, particularly in terms of CWD 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 CWD quality in terms of volume from big diameter (>20 cm) and density of big pieces.

Visual Quality: <i>How are we managing views in scenic areas and achieving visual quality objectives?</i>											
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 Code (5 "Good", 1 "Fair" and 1 "Poor"). The other 7 were harvested under Forest Stewardship Plans under FRPA (4 "Good", 2 "Borderline" and 1 "Poor"). Analysis will be completed in subsequent years when more samples are available.											
Cultural Heritage: <i>Are cultural heritage resources being conserved and where necessary protected for First Nations cultural and traditional activities?</i>											
<p>Cultural Heritage</p> <table border="1"> <caption>Cultural Heritage Sample Distribution (n = 13)</caption> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Poor</td> <td>8%</td> </tr> <tr> <td>Borderline</td> <td>8%</td> </tr> <tr> <td>Fair</td> <td>15%</td> </tr> <tr> <td>Good</td> <td>69%</td> </tr> </tbody> </table> <p>% of samples (n = 13)</p>		Category	Percentage	Poor	8%	Borderline	8%	Fair	15%	Good	69%
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<p><u>Summary:</u> Of the 13 cutblocks assessed, 84% were rated good+fair. 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. <u>Causal Factors:</u> Most damage to features came from harvesting activities (removal of features and/or permanent damage to features). Windthrow and fire were also contributing factors.</p>	<p><u>Overall Stewardship Trend:</u> Insufficient Data Future trend analysis will use year of harvest <u>Opportunities For Continued Improvement:</u> Continue careful consideration of cultural heritage resource 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. Communication of management actions (verbally and with maps) to operators before harvesting begins.</p>										
Soils: <i>Are forest practices preventing site disturbance that is detrimental to soil productivity and hydrologic function?</i>											
There is currently only 1 Soils sample in the Morice TSA. Analysis will be completed in subsequent years when more samples are available.											
Timber Resource Value: <i>What is the overall health and stocking of managed 15-40 year stands?</i>											
There is currently only 8 Timber samples in the Morice TSA. Analysis will be completed in subsequent years when more samples are available.											
Landscape-Level Biodiversity: <i>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?</i>											
Under development											

Resource Value Stewardship Results by TSA

Tables 2A and 2B provide ratings of stewardship effectiveness at varying scales; Table 2A is focused on site-level results, while table 2B is landscape-level related. The three primary Landscape-level Biodiversity (LLBD) indicators are: site index by leading species (ecosystem representativeness), percent of TSA by age class (young, mid, mature and old forest) and percent interior habitat of old forest. Each indicator will be categorized by percent in non-commercial land base, timber harvesting landbase and protected areas. LLBD data is derived from Hectares BC and other spatial databases. All other data is derived from FREP field assessments. Appendix III shows results by value for the North, South Area and Coast Areas and province.

Table 2A: Stewardship effectiveness within the Skeena Region.

ID = Insufficient Data.

Resource Value	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Good + Fair (sample size in brackets)							
	TSA's within the Skeena Region							Skeena Region ¹
	Morice	Lakes	Kalum	Kispiox	Nass	North Coast	Bulkley	
Riparian	74% (42)	64% (36)	75% (53)	85% (27)	ID (9)	76% (45)	90% (31)	77% (243)
Stand level Biodiversity	38% (29)	28% (46)	52% (46)	76% (37)	36% (11)	74% (43)	33% (48)	46% (260)
Water Quality (sediment)	46% (92)	52% (83)	84% (119)	93% (58)	87% (15)	73% (45)	100% (53)	73% (465)
Cultural Heritage	84% (13)	81% (21)	ID (6)	ID (6)	ID (0)	ID (6)	91% (23)	82% (75)

¹Nadina, Coast Mountains and Skeena-Stikine Natural Resource Districts

Table 2B: Landscape-level stewardship within the Skeena Region.

Resource Value	Interim indicators without ranking									
	TSA's within the West Coast Region							Similar Ecosystems		West Coast Region ¹
Landscape Biodiversity ² % TSA old & mature % TSA Protected										

¹ Nadina, Skeena Stikine, and Coast Mountains Resource Districts

² Landscape-level ranking criteria are in development. Indicators above are an example without ranking.

District Manager Commentary:

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 fair or good. 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 poor or borderline. I am however pleased to see that cutblocks harvested more recently have a greater proportion of fair and good stand-level biodiversity ratings than older cutblocks. I expect forest professionals will continue to implement those practices that are rated as good and fair and I challenge them to achieve excellent resource management practices on all sites.

A poor rating is not meeting government's overall objective of sustainable resource management and should be avoided. Similarly, borderline 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.

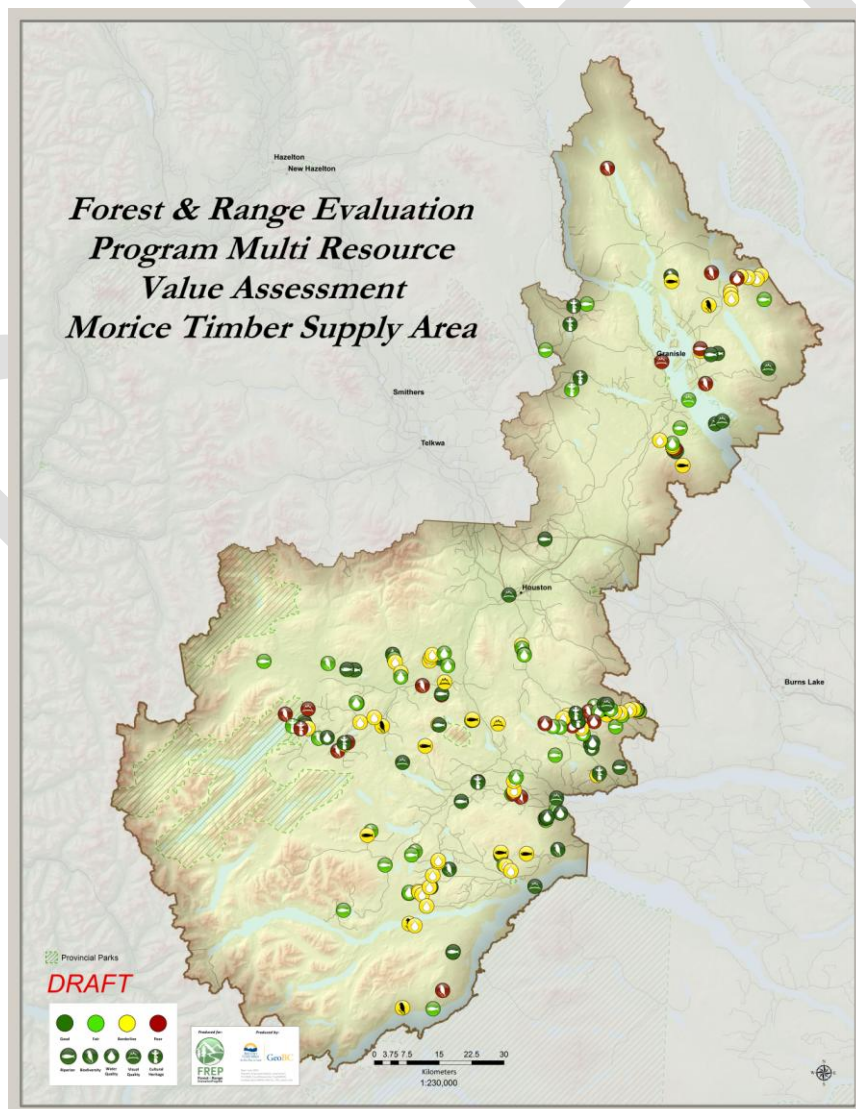
Appendix I

Description of the Morice Timber Supply Area:

This report covers the Morice Timber Supply Area (figure 1). 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 diverse forests and landscapes of the Morice TSA are home to a wide variety of wildlife species. 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. More than half of employment within the Morice TSA is associated with the forest sector. The Morice TSA is within the traditional territories of eight First Nation groups including Cheslatta Carrier Nation, Nee Tahi 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.

Coloured dots represent FREP sample locations and results. This map can also be found at the web link (insert web address when available).

Figure 1: Map of Morice TSA (approximate scale 1:230,000)



Appendix II

Summary description of resource stewardship evaluation rating criteria

Table 1 shows the criteria for rating stewardship outcomes for each resource value as “good, fair, borderline and poor”. Detailed rating criteria and methods and definitions of terms used are described in the companion document *MRVA Resource Stewardship Methodology, 2012* (*insert link to methodology paper when available*). The ratings of good, fair, borderline and poor are “technical ratings” based on best available science. These ratings provide an overview of monitoring results, further details are available.

Table 1: Criteria for rating stewardship outcomes for each resource value

Resource Value	Indicators	Stewardship Rating Criteria	Good	Fair	Borderline	Poor
Riparian	15 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	1. % retention 2. Retention quality from 9 key attributes e.g. big patches, density of large diameter trees 3. CWD volume 4. CWD quality from 2 key attributes e.g. density of CWD ($\geq 10\text{m}$ & 20cm) and volume of large diam. CWD.	Cumulative score. A 60/40 weighting is used for the tree retention versus CWD, recognizing the longer term ecological value of standing retention.	>70%	55-70%	40-55%	<40%
Water quality (sediment)	Fine sediment potential.	Fine sediment (m^3) due to expected surface erosion or past mass wasting	<0.1	<1	1-5	>5
Soils	Amount of access. Restoration of natural drainage patterns. Road side work area soil disturbance. Amount of mature forest and CWD. Restoration of natural drainage patterns.	Overall assessment of practices on block to maintain soil productivity and hydrologic function	Well	Moderately		Poor
Cultural Heritage	Evidence and extent of damage to features. Operational limitations. Management strategies. Type and extent of features.	Combined overall block assessments results with consideration of individual feature assessment results	See methodology report			
Timber: Stand Density Monitoring	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/ha)	≥ 1.7	0.8-1.69	0.3-0.79	0-0.29
Landscape-level Biodiversity	Ecosystem representativeness Age class Interior old	Overall ranking: within protected and non-protected areas	Ranking under development			
Visual Quality	Visual evaluation of block Design of block % of landform altered Impact of roads Tree retention View point importance	Basic visual quality class (determined using the VQC definitions) is compared with the Adjusted VQC (derived using % 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 III

Table 2a, page 8 describes overall ratings for the Kalum Resource District as compared to adjacent TSAs and similar ecosystems. The table below describes the same results, but by the North, South and Coast areas and province. Areas are combined regions; there are three provincial areas.

Table 2: FREP results by value for the North, South, Coast Area and province as compared to the Morice TSA

Resource Value	Effectiveness of Practices: % Good + Fair (sample size in brackets)				
	Morice	FLNRO Areas			Province
		North	South	Coast	
Riparian	74% (42)	71% (654)	70% (678)	58% (451)	67% (1783)
Stand-level Biodiversity	38% (29)	42% (655)	55% (780)	77% (455)	56% (1890)
Water Quality (sediment)	46% (92)	66% (992)	70% (1515)	76% (1526)	71% (4033)
Cultural Heritage	84% (13)	77% (95)	69% (35)	57% (14)	73% (144)
Landscape-level Biodiversity					