Multiple Resource Value Assessment (MRVA)

Sunshine Coast Natural Resource District

January 2014

FOREWORD

Forest management in British Columbia is governed by a hierarchy of legislation, plans and resource management objectives. For example, federal and provincial acts and regulations, Land Use and Forest Stewardship plans, and protected areas and reserves collectively contribute to achieving balanced environmental, social and economic objectives. Sustainable forest management is key to achieving this balance and a central component of forest management certification programs. The purpose of the Multiple Resource Value Assessment (MRVA) report is to provide resource professionals and decision makers with information about the environmental component of this 'balance' so that they can assess the consistency of actual outcomes with their expectations.

The Forest and Range Practices Act (FRPA) lists 11 resource values essential to sustainable forest management in the province; biodiversity, cultural heritage, fish/riparian and watershed, forage and associated plant communities, recreation, resource features, soils, timber, visual quality, water, and wildlife. The MRVA report is a summary of the available field-based assessments of the conditions of these values. Field assessments are generally conducted on or near recently harvested cut blocks and therefore are only evaluating the impact of industrial activity and not the condition of the value overall (e.g. they don't take into account protected areas and reserves). Most of the information is focused on the ecological state of the values and provides useful information to resource managers and professionals on the outcomes of their plans and practices. This information is also valuable for communicating resource management outcomes to stakeholders, First Nations and the public, and as a foundation for refining government's expectations for sustainable resource management in specific areas of the province.

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

Tom Ethier
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Resource Stewardship Division
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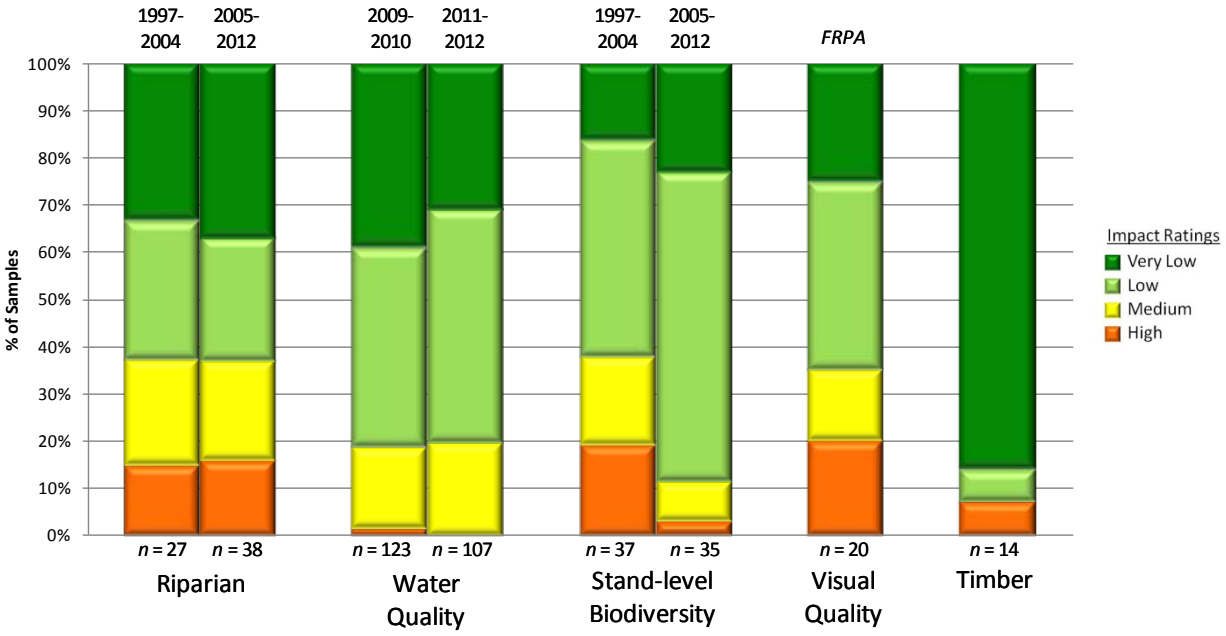
MULTIPLE RESOURCE VALUE ASSESSENTS—IN BRIEF

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 timber (stand development) monitoring conducted in the Sunshine Coast Natural Resource District from 2006 to 2012, 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: Sunshine Coast Natural Resource District site-level stewardship impact rating by resource value with trend (Riparian, stand-level biodiversity and visual quality trend by harvest year/era. Water quality trends by evaluation year. Timber samples are all post-free growing.)



Important Context for Understanding this Assessment

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

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

The resource development impact ratings contained in this report are based on assessments conducted within the areas where resource development 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 Sunshine Coast Natural Resource District. MRVA reports clarify resource stewardship expectations, and promote the open and transparent discussion needed to achieve short- and long-term sustainable resource management in British Columbia.

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

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

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

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

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

Published FREP reports and extension notes contain detailed findings for each resource value. These documents are available on the FREP website at: http://www.for.gov.bc.ca/hfp/frep/publications/reports.htm. Licensees can request data collected on their operating areas. FREP staff will assist licensees with the analysis of their data and the preparation of licensee-specific MRVA reports.

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

SUNSHINE COAST NATURAL RESOURCE DISTRICT – ENVIRONMENTAL AND STEWARDSHIP CONTEXT

This report covers the Sunshine Coast Natural Resource District encompassing the Sunshine Coast TSA, and portions of the Pacific TSA and Tree Farm Licenses 43 and 39 (figure 2). This district extends from Howe Sound in the south to the head of Bute Inlet in the north. The district covers approximately 1.9 million hectares. The mountainous topography and associated high rainfall in the Sunshine Coast District produce a diverse climate and ecology. The landscape ranges from rocky shorelines and coastal plains to rugged ice-capped mountains. The Coast Mountains dominate the District, with nutrient-rich, moist floodplains in valley bottoms and alpine meadows at higher elevations. Several significant coastal fjords, most notably Bute, Toba and Jervis inlets occur in the District.

The forests and landscapes of the Sunshine Coast District are home to a wide variety of wildlife species, including grizzly and black bear, black-tailed deer, Roosevelt elk, mountain goat, cougar and wolf, as well as isolated populations of moose. Currently, eight species identified as 'at risk' may be found in the Sunshine Coast TSA, including the Northern goshawk, marbled murrelet and Keen's long-eared myotis.

Fourteen First Nations have asserted traditional territory in the Sunshine Coast TSA. They are the Shíshálh Nation, Sliammon First Nation, Xwémalhkwu First Nation, Klahoose First Nation Squamish Nation, We Wai Kai First Nation, Wei Wai Kum First Nation, Kwiakah First Nation, the Snaw-Naw-As First Nation, K'omoks First Nation, Qualicum First Nation, Líl̓wat First Nation, Tsleil-Waututh First Nation, and the Ulkatcho First Nation.

Within the land base currently considered available for timber harvesting, Douglas-fir, hemlock western redcedar and balsam are the major tree species, while, yellow cedar, spruce, pine, red alder, cottonwood and maple also occur. The district has a long history of harvesting activity, resulting in younger forests on better quality, more accessible growing sites, and older forests on the poorer and less accessible areas. As a result of this harvesting the majority of forest stands are younger than 150 years.

Historically, forest health issues in the district have included bear damage, Douglas-fir bark beetle, mountain pine beetle, root diseases, spruce beetle and western hemlock looper. Currently the agents of most concern are Phellinus weirii root disease, *Armillaria* root disease and Douglas fir bark beetle. By far the most significant losses are from *Phellinus* in the CDF and CWHxm subzones

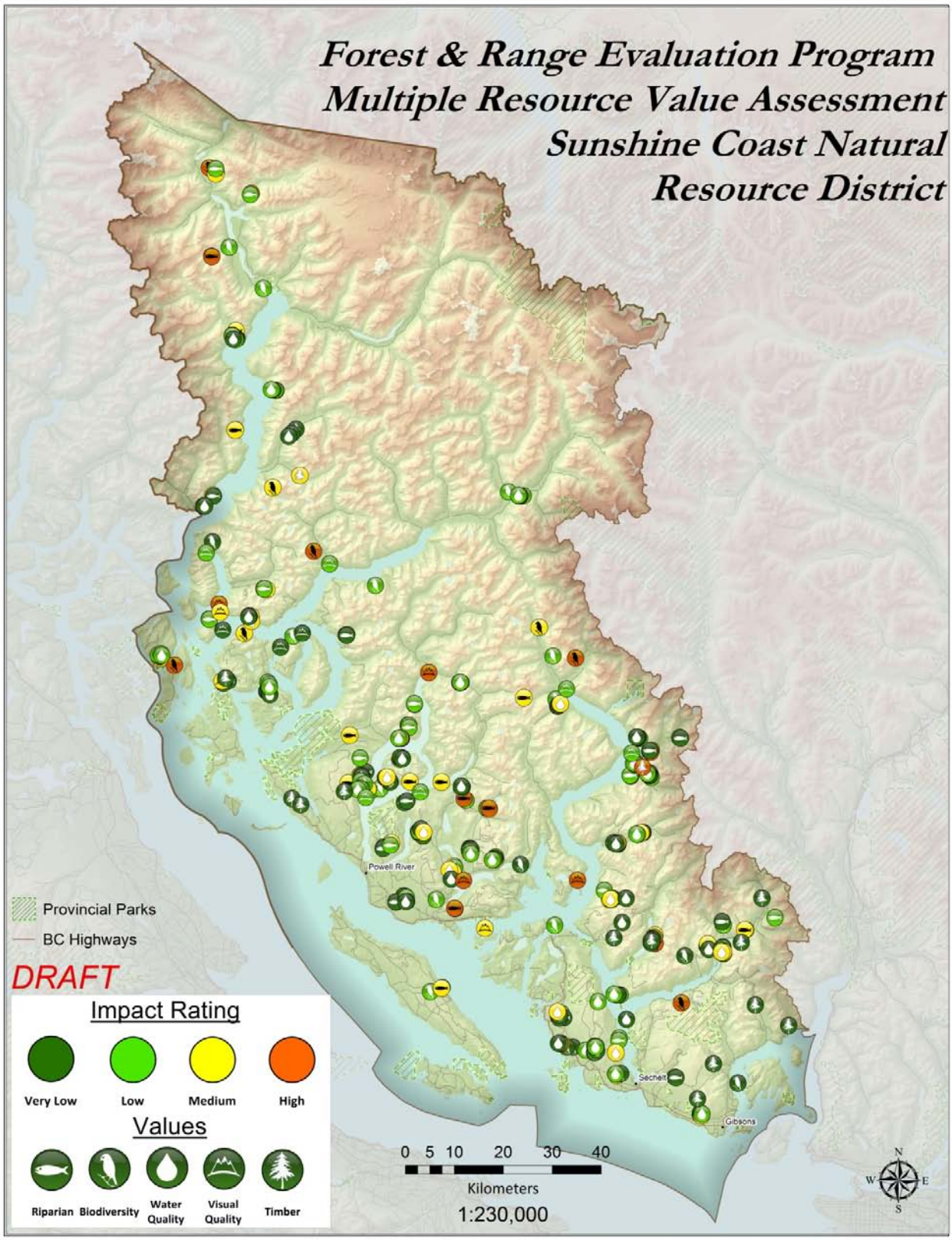
The district has a diverse array of forest tenures including 12 Woodlot Licenses, 5 Community Forest Agreements, several Forest Licenses, portions of 2 Tree Farm Licenses and a vibrant BCTS program.

The forests of the Sunshine Coast District provide a wide range of forest land resources, including forest products (timber and non-timber, such as wild mushrooms), recreation and tourism amenities, and a variety of fishery and wildlife habitats.

There are currently 26 community watersheds within the Sunshine Coast District.

Residents and visitors make extensive use of the forests of the district for recreational activities. Parks, recreation sites and trails, and roaded and non-roaded areas in the district provide opportunities for numerous outdoor activities such as hiking, camping, skiing, mountain biking, , mountaineering, angling, hunting, canoeing and kayaking, as well as more passive activities such as wildlife or forest viewing.

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

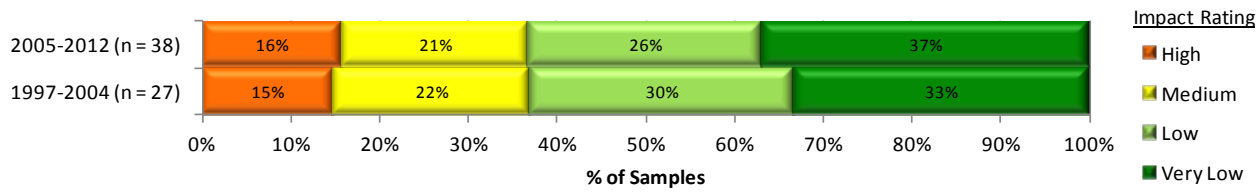


KEY RESULTS BY RESOURCE VALUE AND OPPORTUNITIES FOR CONTINUED IMPROVEMENT

Table 1 shows the resource values assessed for the Sunshine Coast Natural Resource District, and includes a summary of key findings, causal factors, trends, and opportunities for continued improvement. Data are presented for *FPC*-era samples at sites harvested before 2005 and *FRPA*-era samples at sites harvested in 2005 or later. This approximates the *Forest and Range Practices Act* (FRPA) era, and allows for a comparison between earlier and later stewardship practices. The impact rating indicates the effect of resource development on the resource value, from "very low" to "high" impact.

Table 1: Resource development impact rating, key findings, and opportunities for improvement by resource value for the Sunshine Coast Natural Resource District.

Riparian: Resource Development Impacts on Stream Function



Summary:
Of the 65 streams monitored (combined *FPC* and *FRPA*-eras), 63% were rated as "very low" or "low" harvest-related impacts: 35% of streams are Properly Functioning ("very low" impact), 28% are Properly Functioning with limited impact ("low" impact), 22% are Properly Functioning with impact ("medium" impact) and 15% are Not Properly Functioning ("high" impact).

Causal Factors:
Factors that contributed to "high" or "medium" impact ratings included: insufficient vegetation near stream banks for adequate root network and large woody debris; impacted riparian vegetation in first 10 m; low moss levels indicative of unstable systems, and excessive amounts of in-stream slash.

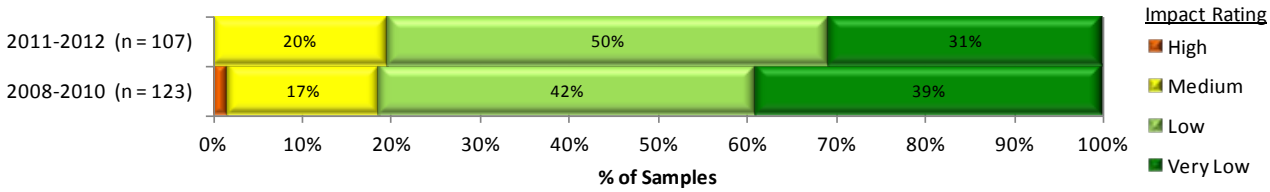
Number of Samples by Stream Class and Impact Rating:

Class	High	Medium	Low	Very low	Total
S2		1		1	**2**
S3		1	1	8	**10**
S4	2	1	1	1	**5**
S5		1	2	7	**10**
S6	8	10	14	6	**38**
Total	**10**	**14**	**18**	**23**	**65**

Overall Stewardship Trend: *Neutral*
Overall there is no change in impact rating. For individual riparian questions however, there are variations between the eras.

Opportunities For Continued Improvement:
Use full 10 m windfirm treed buffer where possible, particularly on high-priority S6 streams that flow into fish streams or community watersheds. Where the full buffers are not possible, maintain vegetation (e.g., understory, shrubs, non-merchantable trees) to the fullest extent possible within the first 5 m of the channel bank to keep an adequate root network and large woody debris supply. Minimize sediment source from roads.

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



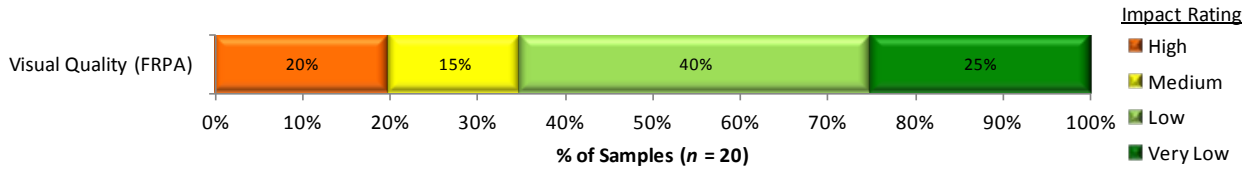
Summary:
Of the 230 road segments assessed from 2008 to 2012, 81% were rated as "very low" or "low" road-related impact. Site assessments show the range for potential sediment generation as 35% "very low" (same as "very low" impact on water quality), 46% "low" ("low" impact) 18% "moderate" ("medium" impact), 1% "high" ("high" impact).

Causal Factors:
See opportunities for improvement for "high" or "medium" impacted road segments.

Overall Stewardship Trend: *Neutral*
Trending for water quality is based on survey years, to capture impact of road traffic and maintenance. There is little change between samples in the two time frames.

Opportunities For Improvement:
The most frequent suggested maintenance issues are: armour seed and protect bare soil; use cross ditches and kickouts; and use better quality materials for road building.

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



Summary:
Of the 20 landforms assessed (all originating from openings harvest under *FRPA*), 65% were rated with "very low" or "low" harvest-related impacts on achieving the VQO.
VQOs were "well met" ("very low" impact to achieving objective) on 25% of landforms, "met" ("low" impact) on 40%, "borderline" ("medium" impact) on 15%, "not met" on 5% and "clearly not met ("high" impact includes two categories) on 15%.

Causal Factors:
5% of the openings contained visually effective levels of tree retention (>22% by volume or stem count) and 20% of landforms sampled had good visual quality design (cutblock shaping).

Number of Samples by VQO and Impact Rating:

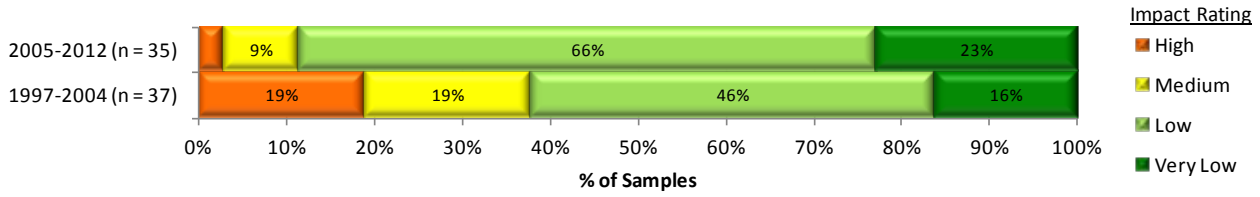
VQO[1]	High	Medium	Low	Very Low	Total
M	1		4	1	**6**
PR	3	2	4	4	**13**
R		1			**1**
Total	**4**	**3**	**8**	**5**	**20**

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

Overall Stewardship Trend: *Insufficient data*
No data for *FPC* cutblocks 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.

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



Summary:

Of 72 cutblocks (combined *FPC* and *FRPA*-eras), 68% of sites were rated as "very low" or "low" harvest-related impact. Considering total retention, retention quality, and coarse woody debris quantity and quality, 17% of sites are rated as "very low" impact on biodiversity, 51% as "low," 21% as "medium," and 11% as "high" impact. Another 14 blocks were sampled and assessed for some indicators but could not be ranked since there was no patch plot data for 10 blocks where patches existed (likely due to safety issues) and no baseline was available on four in biogeoclimatic ecosystem classification subzones with insufficient baseline.

Causal Factors:

Large snag retention density in both eras is less than expected from baseline. Big tree density (≥ 70 cm dbh) has increased and is at an average density in *FRPA*-era similar to expected from baseline. Tree species numbers also improved and is similar to expected. Range of coarse woody debris volume over many blocks is skewed to higher amounts compared to baseline (that found in retention patches). Coarse woody debris quality (volume from ≥30 cm pieces and pieces/ha of ≥20 cm and ≥ 10 m) has improved.

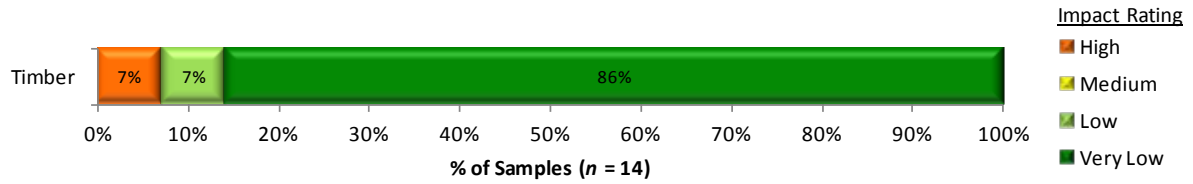
Overall Stewardship Trend: *Improving* ↑

Retention increased from an average 13.6% in the *FPC* to 16.5% in the *FRPA*-era. 91% of all blocks had more than 3.5% treed retention, increasing to 96% considering only the *FRPA*-era blocks.

Opportunities For Continued Improvement:

Continue trend to leave at least low levels of retention on every cutblock with a larger range of retention (e.g., 3 to 30%) over many blocks. Improve retention quality by leaving higher densities of large dead trees.

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



Summary:

Of the 14 polygons sampled in 2011 and 2012 the weighted average well-spaced density over the 3 biogeoclimatic ecosystem classification (BEC) zones achieved 93% of target stocking standard (TSS).

Percent of target stocking standard by BEC

BEC	CDF	CWH	MH	Average
WS/TSS	84%	94%	100%	93%

93% of the polygons were rated "very low" or "low" impact to health and stocking and 7% "high".

91% of all trees sampled (all BEC's) were acceptable, with no serious stand damage. The top stand damaging agents for all BEC's are: tree competition (29/120); unknown (28/120); snow press (21/120); and armillaria (9/120).

Causal Factors:

From only 14 polygons sampled to-date it appears that the stands in the Sunshine Coast TSA are very healthy and productive. The majority of stand damage is due to abiotic tree competition and snow press.

Overall Stewardship Trend: ***Insufficient data***

Opportunities For Improvement:

Spacing of young productive stands would decrease the inter-tree competition and snow press.

Soils: Resource Development Impacts on Soil Productivity and Hydrologic Function

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

Landscape-level Biodiversity: Is the forested matrix at the landscape-level providing the range of habitat understood as necessary for maintaining ecosystem function and old and mature forest dependant species?

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 results by resource value for the North, South and Coast Areas and the province as a whole.

Table 2: Stewardship effectiveness within the South Coast Region as determined by resource development impact rating (ID = Insufficient Data; sample sizes in brackets).

	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Very low + low resource development impact rating			
	South Coast Region Comparison			
Resource Value	**Sunshine Coast District**	**Chilliwack District**	**Sea to Sky District**	**South Coast Region[1]**
Riparian – all data	**63%** (65)	**59%** (66)	**59%** (66)	**62%** (186)
FRPA-era data	63% (38)	69% (26)	69% (26)	69% (80)
FPC-era data	63% (27)	53% (40)	53% (40)	58% (106)
Water quality – all data	**81%** (230)	**55%** (212)	**55%** (212)	**66%** (578)
2011–2012 samples	83% (157)	55% (133)	55% (133)	70% (351)
2008–2010 samples	77% (73)	54% (79)	54% (79)	60% (227)
Stand-level biodiversity –all data	**75%** (72)	**81%** (58)	**81%** (58)	**82%** (182)
FRPA-era data	89% (35)	86% (22)	86% (22)	91% (74)
FPC-era data	62% (37)	78% (36)	78% (36)	77% (108)
Visual Quality				
FRPA	**65%** (20)	**100%** (20)	**100%** (20)	**86%** (52)
FPC	**ID**[2] (0)	**73%** (22)	**73%** (22)	**73%** (40)

[1]Sunshine Coast, Squamish and Chilliwack Natural Resource Districts

[2]No *FPC* sampling

DISTRICT MANAGER COMMENTARY[1]

The evaluation criteria in this report are based upon stewardship objectives (e.g., sustainable resource management practices) which do not always correspond with the minimum standards set in legislation. A high resource development impact rating does not necessarily mean that a practice has not met legislation or the results and strategies contained within a licensee's forest stewardship plan.

It is expected and accepted that development of natural resources will result in some level of environmental impact. However these impacts are expected to be within the parameters set down in legislation and forest stewardship plans. FREP resource value assessments help determine whether these impacts are consistent with expected outcomes and/or achieve sustainable levels of resource stewardship.

Generally, assessments indicate there has been no significant change in the results under the *FRPA* from the *Forest Practices Code* era. However, one exception is stand-level biodiversity assessment results which indicate an improvement under the *FRPA* over the *FPC*-era. This is definitely a positive trend.

I am pleased to see that forest stewardship values have generally been well met in the Sunshine Coast District.

The results of the water quality assessments are particularly encouraging with 81% of the samples rated as "very low" or "low" for sediment generation potential. This is significantly better than coastal or provincial averages.

Initial stand development monitoring assessment results indicate stewardship quality is well met. While only 14 of the proposed 30 polygons have been sampled to date; 86% of these polygons were rated as "very low" or "low" impact to achieving overall health and stand productivity. These results are very encouraging and indicate our 20-40 year old stands are progressing well.

Riparian assessments indicate that stewardship quality has generally been well met. However, there appears to be room for improvement with respect to S6 streams as 8 of the 38 S6 streams sampled were classified as highly impacted.

Areas within the Sunshine Coast District are important for destination tourism e.g., Desolation Sound/ Discovery Islands. Licensees are encouraged to use existing visual design techniques to improve the overall conformance with the Visual Quality Objectives throughout the district. Updates are being completed on Visual inventories to confirm VQO's.

I encourage forest professionals to consider the resource value results and opportunities for improvement identified in this document, along with other FREP monitoring results, when preparing, reviewing, and implementing forest stewardship plans and operational plans.

[1] Commentary supplied by Sunshine Coast Natural Resource District Manager, Mark Anderson.

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 ≥ 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)	≥ 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 report describes overall ratings for the Sunshine Coast Natural Resource District as compared to adjacent TSAs or districts. The table below describes the same results but by the North, South and Coast areas and the province as a whole. The three operational areas represent combined natural resource regions.

Table A2.1: FREP monitoring results by resource value for the North, South, and Coast Areas and the province as a whole compared to the Sunshine Coast Natural Resource District.

	Effectiveness of Practices in Achieving Resource Stewardship Objectives: % Very low + low resource development impact rating (sample size in brackets)				
		Forests, Lands and Natural Resource Operations Areas			
Resource Value	**Sunshine Coast District**	**North**	**South**	**Coast**	**Province**
Riparian – all data	**63%** (65)	**71%** (654)	**69%** (678)	**58%** (451)	**67%** (1783)
FRPA-era data	63% (38)	71% (257)	68% (277)	62% (198)	67% (732)
FPC-era data	63% (27)	71% (394)	70% (401)	55% (253)	67% (1048)
Water quality – all data	**81%** (230)	**66%** (992)	**70%** (1515)	**76%** (1526)	**71%** (4033)
2011–2012 samples	83% (157)	67% (505)	70% (823)	79% (1021)	73%(2349)
2008–2010 samples	77% (73)	64% (487)	70% (692)	70% (505)	68% (1684)
Stand-level biodiversity –all data	**75%** (72)	**42%** (655)	**54%** (780)	**77%** (455)	**56%** (1890)
FRPA-era data	89% (35)	49% (270)	61% (347)	84% (201)	63% (818)
FPC-era data	62% (37)	38% (385)	49% (433)	72% (254)	50% (1072)
Visual Quality					
FRPA	**65%** (20)	**73%** (122)	**54%** (136)	**78%** (153)	**69%** (411)
FPC	**ID** (0)	**56%** (96)	**65%** (85)	**62%** (68)	**61%** (249)