



Multiple Resource Value Assessment Report

North Island/Central Coast Natural Resource District

Vancouver Island Land Use Plan Area

March 28th, 2019



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North Island Central Coast Natural Resource District

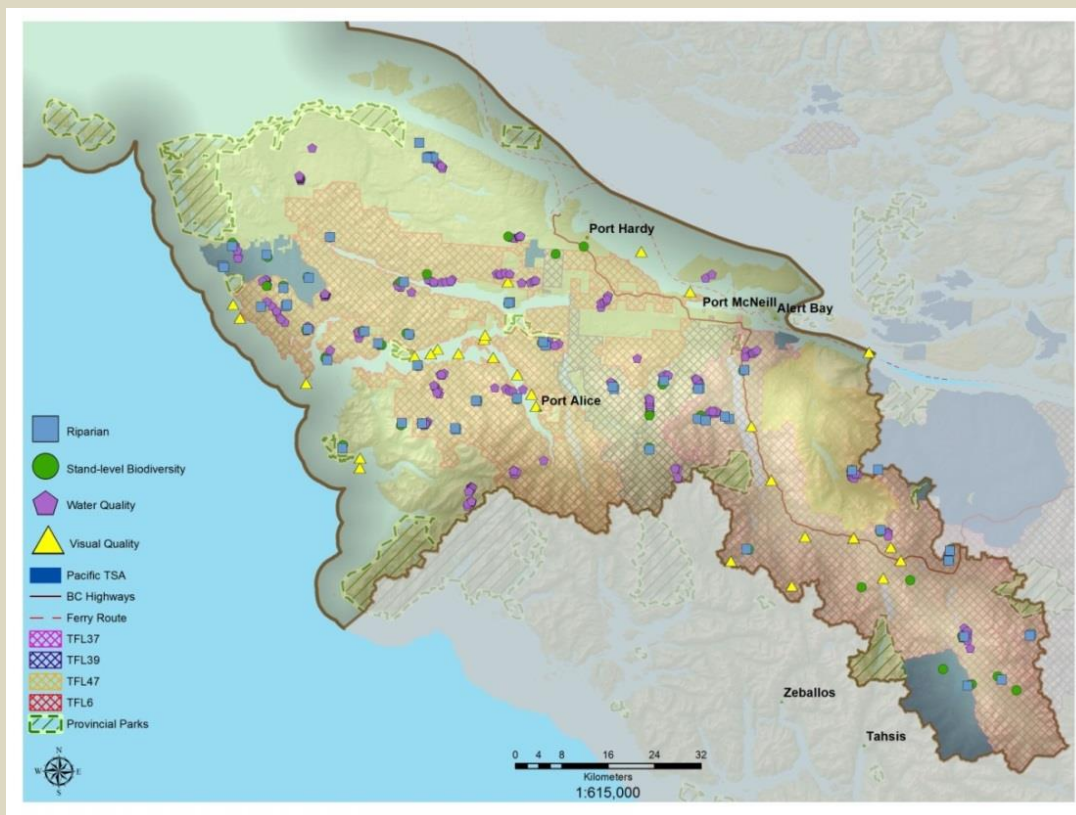
Ministry of Forests, Lands, Natural Resource Operations and Rural Development

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STEWARDSHIP CONTEXT VANCOUVER ISLAND NORTH

This report covers the geographical areas under the Vancouver Island Land Use Plan (VILUP) within the North Island-Central Coast Natural Resource District (NICCRD) where the Forest and Range Evaluation program (FREP) sampling has taken place. This area is located on northern Vancouver Island, north of Sayward to Cape Scott Provincial Park and includes Malcolm Island to Brooks Peninsula and is approximately 100 km wide and 210 km long as shown below.



The diverse landscape is characterized by Karst landforms of the Quatsino formation, rocky shorelines and coastal beaches to rugged mountains, inland ocean sounds, several first nation communities and territories, internationally recognized recreation and tourism opportunities including marine activities, a forestry sector, mining operations, an energy sector (windfarm and run of the river) and notable wildlife such as black bears, cougars, wolves, elk, deer, bald eagles, and other identified wildlife species such as Marbled Murrelets and Northern Goshawks.

The ecosystems in the Coastal Western Hemlock (CHW) zone range from the Very Dry Maritime (CWHxm2) in the Nimpkish valley to the southern very wet hyper maritime (CWHvh1) surrounding Cape Scott and the Brooks Peninsula. The main ecosystems in the area are the sub-montane very wet maritime CWHvm1 and montane very wet maritime CWHvm2 respectively. The Mountain Hemlock moist maritime (MHmm1) and Coastal Mountain-heather Alpine - Undifferentiated and Parkland (CMA unproductive) occur at the higher elevations. Tree species throughout range from Red Alder, Cascara, and Broadleaf Maple to Hemlock, Douglas Fir, Western White Pine, Western Red Cedar and Cypress, Sitka Spruce, Balsam Fir, and Yew trees are found across the ecosystem landscapes.

Protected old growth amounts to 46, 631 ha held within Parks, Wildlife Habitat Areas, Old Growth Management Areas, Recreation Sites, Ecological Reserves, and Ungulate Winter Ranges. An additional 137,921 ha of old growth can be found within the forested land base. While some of this area is part of the timber harvesting land base, there is a substantial area of old forest retained during operational planning to include wildlife tree retention areas, riparian reserve networks, cultural reserves to protect archaeological sites, karst or cave reserves, habitat features, bird nests, sensitive soils, terrain features, and active flood plains, all of which provide incremental protection for old growth forests.

Historically, wildfire activity within the VILUP area on the North Island has been considered infrequent. In 2009 this began to change and new records have been set in terms of wildfire impacts. In the 2018 season the total wildfire area burned was 2390 ha. Ongoing collaborative work is currently underway between FLNRORD and license holders to assess damaged stands while looking at salvage opportunities, reforestation, and rehabilitation activities where required.



VANCOUVER ISLAND LAND USE PLAN AND FREP MONITORING

The Vancouver Island Land Use Plan (VILUP) was established in 2000 as a higher level plan under the *Forest Practices Code Act* (1995), often referenced as the “CODE”. The FREP program was established in 2005 as part of the results based model of the *Forests and Range Practices Act (FRPA)* enacted in 2004. FREP has now monitored resource values both from CODE era and FRPA era cutblocks under VILUP and this provides the ability to compare the two eras, legislative frameworks, and management trends under professional reliance. The MRVA VILUP report highlights the last 5 years of monitoring data for specific resource values to provide the most current trends or a snapshot in time of practices.

There has also been some stratified random sampling completed specific to the Wanokana watershed to assess the potential for fisheries sensitive watershed status and the current overall health of the drainage. The report is not included in this publication but will be published by FLNRORD in the near future.

A minor amount of target sampling has occurred for a recent small streams project. A district manager commentary specific to this work is provided under the riparian resource value section.

This FREP report summarizes effectiveness evaluations since the inception of the program within the district VILUP boundary and is provided for the following reasons;

- 1) To communicate the opportunities for continuous improvement with respect to decision making and innovation within the non-legal context of FRPA under professional reliance and,
- 2) To complete a MRVA report for VILUP prior to the FREP integrated monitoring initiatives (cumulative effects).

FREP COLLABORATION UNDER PROFESSIONAL RELIANCE

The FREP program itself routinely demonstrates a balanced view of managing forest resources by publishing extension notes and reports, seeking input and feedback from all clients, adjusting protocols, and introducing new ones, such as wetlands. As part of the results-based regime and framework, FREP is a functioning effectiveness monitoring program providing essential feedback to qualified professionals and decision makers to support, adjust, or implementing innovative practices to sustain resource values.

Since 2006, the district stewardship team has met or communicated with licensees to discuss their FREP data and trends in resource effectiveness evaluations. Recently the stewardship team has increased communications by conducting joint effectiveness field evaluations with clients. Other groups of professionals have also participated in joint FREP training and mentoring sessions for identified FREP resource values including Karst and Water Quality.



Photo 1: All Licensees Karst FREP Checklist Development 2006



Photo 2: Water Quality Training with BCTS, WFP, C&E 2012

In 2011, the stewardship team hosted the Coast Regional Implementation Team (CRIT) “Making FREP Operational” themed field tour portion to review both *Forest Practices Code Act (FPC)* and *FRPA* results in the field. The participants included major licensees, forest contractors, and Provincial staff and resource specialists to discuss riparian, water quality, and stand level biodiversity.



Photo 3: 2011 CRIT/FREP Field Tour Riparian Discussion



Photo 4: 2011 CRIT/FREP Field Tour Biodiversity Discussion

Since 2014, FREP has become a regular discussion opportunity of interest for the local Forest Management Leadership Team (FMLT). The local FMLT, established in 2010, is comprised of licensees, BC Timber Sales (BCTS), contractors and FLNRORD staff who work in a professional team environment to resolve local forest sector issues, to communicate direction and guidance, and to provide a forum to voice local issues and to raise them. In addition to FREP presentations, the FMLT holds an annual field tour that frequently incorporates FREP into the field stops as topics for discussion among the professional membership.



Photo 5: 2015 FMLT field reviews a small S6 stream with Derek Tripp R.P.Bio.



Photo 6: Riparian Specialist Derek Tripp R.P.Bio reviews FREP data trends for small streams with FMLT in 2015.



Photo 7: In 2016 FMLT reviews small stream (S6) management and the FREP riparian indicators.



Photo 8: 2018 FMLT group walks a small stream (S6) with a focus on FREP riparian indicators and the management emphasis.

As District Manager, I am very encouraged by the interest in FREP and the level of professional engagement by the local FMLT.

In 2015, the district staff began to monitor cultural heritage resources (CHR) values annually. This includes registered archeological sites managed under the Heritage Conservation Act. The field work was completed with archaeologists, First Nations representatives, and often licensees participating in the assessments using the FREP CHR Protocol.



Photo 9: 2016 FREP CHR Monitoring



Photo 10: 2018 FREP CHR Monitoring

I am confident that there has been sufficient communication and collaboration at the District level between FREP and clients that have had blocks sampled. I am now eager to share this MRVA VILUP publication with clients, resource managers, and professionals.

The MRVA VILUP report itself is a summary of effectiveness evaluations of forestry practices that identify resource management trends. Where innovation has led to good outcomes, this knowledge is shared while opportunities for improvement are described to reduce harvest related impacts. I am encouraged by local professionals that have worked and demonstrated a level of enthusiasm and willingness towards improving practices.

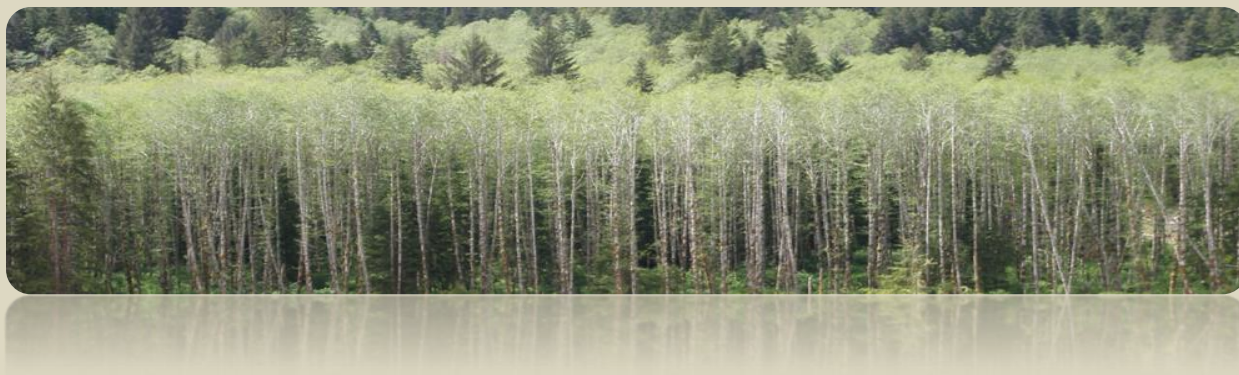
It is my perspective that professionals and resource managers working within NICC need to read this MRVA VILUP report to recognize successes, become aware of areas of concern, and consider opportunities for improvement. Overall, I believe this report represents another continuous improvement opportunity under FRPA which promotes the results based regime as intended while further embracing our local successes and recognizing challenging areas within the complex operating environment of the North Island.



Photo 11: Non-lethal Black Headed Budworm outbreak 2012



Photo 12: Roosevelt Elk Herd in the Nimpkish River 2017



CONTEXT FOR UNDERSTANDING THIS REPORT

All resource development will have an impact on ecosystem condition. The role of effectiveness evaluations is to assess the status and trends of British Columbia's natural resource values, and to identify related causal factors and opportunities for improvement. Effectiveness evaluations do not assess compliance with legal requirements. Instead, these evaluations assess the effects of development activities and natural influences on the condition of *FRPA* values.

The site-level "impact ratings" presented here are based on FREP protocol assessments conducted where resource development has taken place. The FREP monitoring has been conducted on forestry cut blocks, resource roads, or scenic areas since 2006. Where appropriate, impact ratings may reflect both resource development and the effects of natural impacts (if applicable). As such, these evaluations provide a stewardship assessment and indication of resource development practices and outcomes under the *FPRA* and the professional reliance model.

The ecological contributions of parks, protected areas, and other landscape level reserves areas are not covered in this report as these will be reported on in future [integrated monitoring](#) reporting (for cumulative effects).

The MRVA reports allow decision makers to communicate successes in sustainable resource management of public resources and identify opportunities to improve stewardship under *FRPA*. This report concludes with a district manager commentary on sharing key strengths and opportunities for improvement of natural resource management under *FRPA* and *VILUP*.⁸

RESOURCE VALUE ASSESSMENT CLASSIFICATIONS AND MEANINGS

Monitoring results are summarized using a colour scheme for the four impact ratings as follows;

1. **very low**
2. **low**
3. **medium**
4. **high**

As previously defined by FREP and resource value experts the "**very low**" and "**low**" impact ratings are considered consistent with the government's goal of sustainable management of the resource values under *FRPA*. The "**medium**" impact rating is considered reasonable with potential room for improvements while the "**high**" impact rating is generally considered not reasonable or unsustainable.

Resource value and management trends are illustrated by bar charts. Much of the information presented in this report is focused on the ecological state of the values and provides useful information on the outcomes of plans and practices (see Appendix 1 for ratings details).

MONITORING RESULTS SUMMARY FOR MRVA VILUP

This report summarizes monitoring conducted for key FRPA values in the North Island/Central Coast Natural Resource District on Vancouver Island including woodlots, BCTS, and major licensees during the period from 2005 to 2017 as summarized in Figure 2.

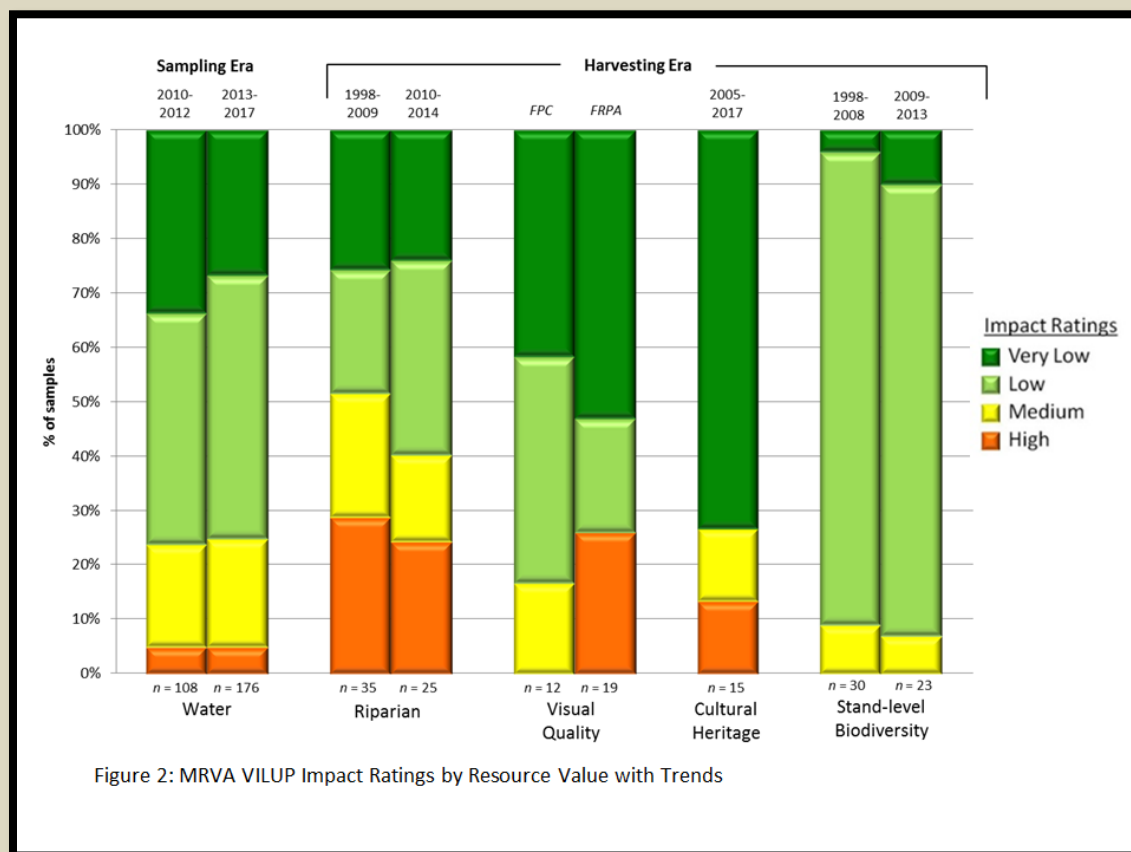
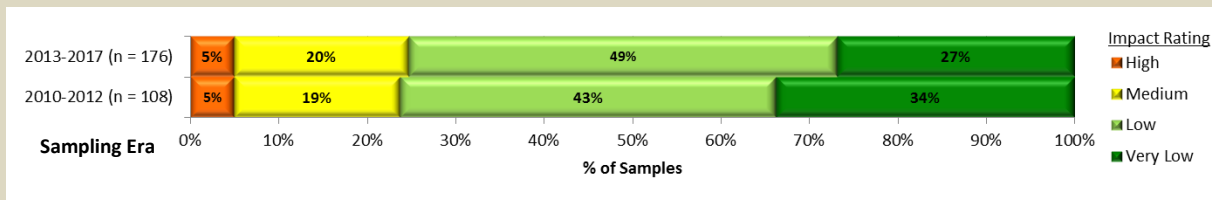


Figure 2: MRVA VILUP Impact Ratings by Resource Value with Trends

For the sample populations noted in Figure 2, a total of 30 samples is typically preferred if the intent is to complete a statistical analysis of the data. The MRVA VILUP bar charts represent the data for the last 5 year trend indicative of current practice (the exception is the VQO population which is FPC or FRPA era). In most cases, I consider these data trends or bar charts for sample populations ($n < 30$) to be valid as they are also consistent with trends of larger regional populations. For example, 146 streams¹ were sampled by FREP (under FRPA) on the west coast between 2007 – 2014 with very low and low impacts for 60% of the population and medium to high impacts to 40%. This larger population is almost identical to the NICC MRVA VILUP sampling for the last 5 years (2010-2014) which also represented a 60/40 split between very low/low and medium/high. Locally however, the riparian FREP data for the last 5 years (based on $n=25$) as a snap shot in time demonstrates that since 2010 there is approximately a 12% improvement in impact ratings moving from medium to high into the very low and low categories.

¹ https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/frep/frep-docs/reports/adm_resource_stewardship_report_frep_results_2016.pdf

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



Data Source: Data for water quality assessments was collected by FLNRO staff using the Forest and Range Evaluation Program water quality monitoring protocol between 2010 and 2017. The sampling sites for water quality originate at randomly selected and recently harvested openings to assess the potential for fine sediment generation from roads connected to lakes, streams, or fish habitat and/or logging related landslides that originate within recently harvested openings.

Summary:

In the 2013-2017 period of water quality sampling, 43 out of a total 176 assessments were found to have a moderate, high, or very high potential for fine sediment transport into streams (high and medium impact rating).

Causal Factors for 2013 to 2017 Sample Years

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

Opportunities for improvement and/or continuation of practices that help minimize sediment:

The most common recommendations for improvement for “medium” or “high” impact road segments were:

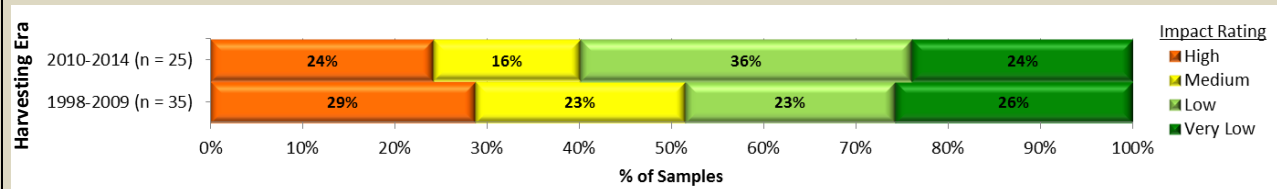
- Remove grader berms that channel water to stream crossings as part of ongoing management and maintenance of roads.
- Ensure machine operators are trained in water quality management for road grading and deactivation.
- If required, strategically locate culverts to reduce excess drainage of water prior to streams crossings or other water bodies.

DISTRICT MANAGER COMMENTARY: I find these results demonstrate a continued emphasis on water quality sustainability as it relates to mitigating and reducing turbidity and sediment inputs from resource roads and cut blocks to watercourses. License holders are encouraged to engage my staff when notified of moderate and high water quality ratings regarding opportunities for improvement. Any reduction in the road surface area being drained has the potential to significantly reduce water quality impacts. If grader operators have a good understanding of berm function, they can use berms where useful, eliminate them where they are not useful, and provide occasional strategic but critically placed kick outs that send water where it cannot reach a stream (onto the forest floor). Frequently re-educating (yearly refresher training) machine operators, especially new staff, on road maintenance options with respect to berms, kick-outs, and fine sediment delivery will lead to sustainable water quality management.

As a reminder, shot rock sources can be acidic, and acidic rock can impact fish and fish habitat if used in road construction. Refer to [FREP Extension Note #42 \(PDF\): Evaluation the Presence and Impact of Acid Drainage From Industrial Roads in British Columbia](#).

Road and bridge deactivation sites have generally received low and very low impact ratings during water quality sampling. I will therefore speak separately to a select few road deactivation concerns under the District Manager Commentary for the small streams project.

Riparian: Resource Development Impacts on Stream Function



Data Source: The data for riparian stream assessments was collected by FLNRO staff using the FREP riparian monitoring protocol. The sample population for stream assessments consists of randomly selected openings with streams in or adjacent to block boundaries.

The data was collected from blocks harvested between 1998 and 2009, and 2010 to 2014. The field sampling occurs from up to 3 years post-harvest to capture windthrow events and allow for one rainy season to pass in order to observe impacts (if any) from sediment mobilization.

Summary: Results from recent riparian stream assessments 2013-2017 from blocks harvested between 2010 to 2014 show that 10 out of the 25 stream reaches, or 40%, were not properly functioning, or functioning, but at high risk (high and medium impact ratings).

This is notably lower than the previous 11 years of results that show 52% of the reaches falling into the same bottom two condition categories.

The highest proportion of negative responses in the protocol were linked to logging-related factors, with specific impacts identified falling & yarding (slash and debris inputs) 61%, low retention 57%, and wind-throw related impacts 22%. Roads and old logging were also having various (legacy) impacts to stream reaches.

Samples and Impact Rating 2010-2014:

Class	High	Medium	Low	Very Low	Total
S2			1		1
S3	1		1	1	3
S4			1		1
S5	1		1		2
S6	4	4	5	5	18
Total	5	4	8	6	25

Causal Factors for 2010 to 2014 harvest era:

Factor	% of negative responses
Logging	70
Natural events	12
Roads	7
Upstream factors	10

Specific Impacts for 2010 to 2014 harvest era:

Factor	Specific Impact	% of sites with Specific Impact (n = 25)
Logging	Falling and Yarding	61
	Low Retention	57
	Wind-throw	22
	Old logging	9
Natural events	Wind	13
	Slides/sloughs	12
	Natural impacts	9
	High background sediment levels	4
Roads	Erosion	13
	Sediment traps inadequate	8
	Culvert plugged	4
Upstream Factors	Logging	13
	Roads	13
	Natural/unknown	12

Opportunities for improvement (and/or continuation):

Planning:

- Avoid stream impacts when planning cut blocks by:
 - Using streams as natural boundaries where possible and buffering them on the cut-block side.
 - Consider the distance and importance of headwater reaches that originate inside the block to downstream fish habitat.
 - For stream bank stability recognize that second growth stands can have a limited root network because of the lack of understory and shrubs.
 - Leaving a wind-firm treed buffer in second growth will provide greater structure for bank stability.
 - Anchoring wildlife tree patches or other treed retention next to streams.
 - Using qualified professionals to classify watercourses and identify fish barriers, and perennial/important S6 streams for strategic block placement.
- Provide training to machine operators about the importance of streams and best practices in riparian areas.

Operations:

- When harvesting the RMAs of S4, S5, and S6 class streams, minimize the amount of logging slash deposition from falling and yarding into the stream channel.
- Minimize sediment delivery into streams from exposed soils, roads, deactivation and cutblocks.
- Prioritize the management emphasis and where practical, increase (or maintain) wind firm buffers on small streams, especially the wider, perennial small streams that make significant contributions to downstream fish habitats and watershed function.
- Leave non-merchantable timber, understory and high stumps or other markers to help inform operators as to location of streams inside the block.
- Fall and yard away whenever possible.
- Monitor harvesting to ensure operators are utilizing the best methods to minimize disturbance.



Photo 13: Well managed S6 (tributary to S3) with minimal debris input with RMA understory vegetation retention



Photo 14: High stumping along S4 stream protecting the stream channel integrity from slash and debris inputs

Photo's 13 and 14 are good examples of minimizing impacts to small streams during harvest operations.

DISTRICT MANAGER COMMENTARY: I view the improvement in practices since 2010 onwards as a positive trend with approximately 12% improvement in the very low and low impact ratings (2010-2014). This trend can be continued with an ongoing emphasis on small stream (S6) management from forest tenure holders. With almost a third of the adverse impacts to small streams attributed to harvesting, I am optimistic there is more room for improvement and this is something I view professionals can influence and manage. With that in mind, I anticipate that harvest-related impacts will continue to decrease over time. To this end, the local FMLT reviewed coastal FREP data to identify trends and best management practices that were leading to positive outcomes for S6 and S5. Three distinct categories of “management emphasis” were identified and published based on the innovative practices in the management zone that were contributing to positive outcomes for S6 and S5 streams. The FMLT [Riparian Management Emphasis Field Guide 2016](#) publication was produced to share this information.

In addition, the FREP program held a “Small Streams Workshop” on January 31st, 2017 in Nanaimo that all major coastal licensees were invited to attend. The objectives were to discuss the following:

- Importance of Small Streams
- Government objectives and expectations for small stream outcomes in a results-based framework
- FREP results to date including monitoring, research project, extension notes to follow
- Harvest-related factors that impair stream processes and practices that may improve outcomes
- Thoughts on the watershed scale from a habitat perspective
- Licensee operational issues, challenges and perspectives on what is working well
- Working together on developing recommendations and guidance based on science and operational successes, realities and challenges

Since that time, as a follow up from the Nanaimo workshop and to assist professionals further, the FREP program itself has focused a great deal of resources to this topic of small streams to assist resource managers and professionals with the following published extension notes beginning in 2017:

- [FREP Extension Note 38: The Importance of Small Streams in British Columbia](#)
- [FREP Extension Note 39: Post-harvest Condition of Stream Channels, Fish Habitats, and Adjacent Riparian Areas: Resource Stewardship Monitoring to Evaluate the Effectiveness of Riparian Management 2005-2014](#)
- [FREP Extension Note 40: Post-harvest Condition of Stream Channels, Fish Habitats, and Adjacent Riparian Areas: Resource Stewardship Monitoring to Evaluate the Effectiveness of Riparian Management 2005-2014](#)
- [FREP Extension Note 41: Best Riparian Management Practices Leading to Good Outcomes for Small Streams](#)

Finally, building on the entire body of professional work above, district manager expectations regarding small stream management for S4, S5, and S6 were published to “**ALL LICENSEES**” in November 24, 2016 (Appendix 2). The intended audience was forest professionals and Forest Stewardship Plan preparers to further promote continuous improvement under FRPA and professional reliance. It is up to forest professionals to continue to demonstrate interest and improved outcomes to the functioning condition of small streams as the District staff continue to monitor streams and collaborate with our clients. I encourage licensees to utilize best management practices, innovation, FREP riparian recommendations, and the 2016 FMLT Riparian Management Emphasis Guide within riparian management areas to provide outcomes that avoid harvest-related impacts.

DISTRICT MANAGER COMMENTARY for the Small Stream Project (2016/17): I feel at this time it is very important to share my observations regarding a small streams project to assess best management practices on the coast that was conducted in 2016/17. This population is distinct from the randomly-selected FREP samples. Eligible sites, considered to be good examples, were volunteered by licensees on the coast that included streams within the District. The intent was for FREP to assess the best management practices and any recent innovation and share effective coastal riparian strategies in a FREP extension note. However, the monitoring results did not support the original hypothesis that the best management or innovative practices under FRPA were leading to properly functioning stream conditions in all cases. While there were some logging related impacts to the sampled streams, roads were found to be a leading cause (or major contributor) of negative impacts. Reviewers observed that deactivating crossing structures without revegetation of the erodible soils resulted in a steady supply of sediment materials directly eroding into the stream. It was also observed that reaches in second growth forests were more sensitive to harvest disturbance which was associated with a weaker rooting network and lack of a vigorous understory vegetation community when compared stream bank stability under old growth conditions.

A total of 17 streams were assessed, with 8 (47%) demonstrating very low and low impacts from harvesting, while 9 (53%) had high impacts (not properly functioning) and were found to be significantly impacted by roads and road deactivation operations.

While best management practices such as retaining non-merchantable retention, understory brush retention, 5 meter machine free zone, and high stumping were prescribed along the reaches sampled, the outcomes of the road or deactivation phase of the harvesting operation typically resulted in between 4 to 6 'No' answers alone (out of 15). The road crossing and/or deactivation phase remains critical to the outcome of riparian management. Ensuring that road related operations are managed to reduce erodible materials from entering the water is integral to the health of streams.



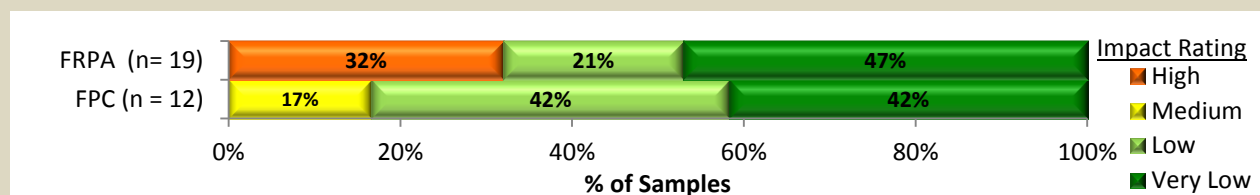
Photo 15: A deactivated road delivers sediment directly into the S6 stream 2016



Photo 16: S3 stream channel completely buried under new sediments downstream of a road crossing with exposed cut-banks 2016

The results of this project initiated an update to the FREP riparian protocol to include a water quality assessment above the riparian sample reach, to assess the influence of roads and crossings on streams.

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



Data Source: Data for visual quality assessments was collected by FLNRO field staff using the FREP protocol for visual quality between 2008 and 2017. The sampling population for visual quality is landforms with visual quality objectives, randomly selected based on recently harvest cut-blocks.

Summary: A total of 31 landforms were assessed, 12 harvested under the FPC and 19 under FRPA. There has been a significant increase in not meeting the objectives set by government for visual quality for 33% of the population under FRPA.

Number of FRPA Samples by VQO and Impact Rating:

VQO	High	Medium	Low	Very Low	Total
M			2	4	6
PR	6		2	5	13
Total	6	0	4	9	19

^a MM=maximum modification, M=modification, PR=partial retention, R=retention

Number of FPC Samples by VQO and Impact Rating:

VQO	High	Medium	Low	Very Low	Total
MM			1	2	3
M			2	2	4
PR		1	2	1	4
R		1			1
Total	0	2	5	5	12

Causal Factors in the FRPA years:

The 13 (68%) FRPA landforms in which the harvesting met the FRPA VQOs definition were based on ease of seeing, scale, and design of harvesting. The majority of blocks had a range of in-block tree retention. For all 13 landforms the percent alteration calculation did not exceed the recommended VQO limit.

The 6 (32%) FRPA landforms that did not meet the FRPA VQO definitions of partial retention (PR) were based on ease of seeing, scale, and design of harvesting. The recommended percent alteration for PR (1.6-7%) was exceeded and ranged from 8% to 23% on the landforms.

Opportunities for improvement to meet visual quality objectives:

- Ensure all those working on VQO's are sufficiently trained and qualified to employ visual design concepts and principles in the planning and design of cut block layout in scenic areas.
- Use qualified professionals for completing Visual Impact Assessments (VIA) and ensure the VQO analysis data inputs used for modelling reflect actual site conditions (tree heights, crowns).
- Meet internally with a group of qualified professionals to review the final VQO analysis prior to cutting permit submission. Document and sign off that the qualified professionals agree that based on the work completed the VQO objective will be achieved.
- Conduct post-harvest assessments to compare actual results to projected results and adjust practices as required. As a guide, ensure total landform percent alteration is within range recommended for the VQO.
- Understand how ease of seeing, scale, and cut block design impacts visual quality. Consider factors specific to block and landform such as design and in-block retention placement (for second pass).
- Use appropriate block size, natural shapes, lower/lateral location on landform, and strategic retention within blocks to limit visual impacts. Take advantage of local topography, and ensure openings appear in keeping with the natural landform characteristics.
- Avoid angular corners or creating skyline gaps.

DISTRICT MANAGER COMMENTARY: Given the FRPA trends during the monitoring period between 2008 and 2017, and as concerns were made known to me by my stewardship staff, I requested that they inform each client of the FREP monitoring outcomes on an ongoing basis. In 2015, I tasked my staff with developing a visual impact assessment workshop for forest professionals who work in the North Island Central Coast Resource District who prepare or review VIAs. The workshop had high attendance from a broad spectrum of forest professionals and included a representative from the Association of BC Forest Professionals. To improve the FRPA VQO outcomes, I recommend that visual impact assessments are thoroughly reviewed by a team of forest professionals responsible for operation planning. This review team needs to document (sign-off) that they are in agreement as professionals that the VQO will be achieved based on visual design and VIA work completed by qualified professionals.

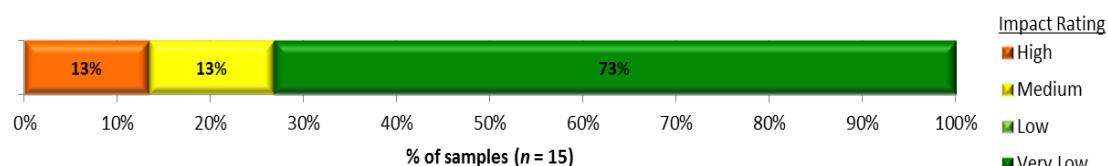
I have also received feedback during FSP reviews there have been circumstances where Licensees operating on a shared landform have maximized their planned development without any regard for other license holders harvest plans. Professionals managing for visual quality are reminded of the importance of collaboration, cooperation, and communication with other licensees, when working collectively to manage for landscape level objectives set by government. Professionals need to document communications and arrangements with other license holders when developing harvest plans to achieve shared objectives by using the best possible information available where harvest interests overlap.



Photo 17: Maximum Modification achieved in Partial Retention VQO landform by two licence holders in 2014

The FREP monitoring for visual quality objectives under FRPA indicates a need for improvement under professional reliance. The FRPA standards and requirements were intended ensure high levels of protection for all resource values. Visual quality is a known critical public and tourism resource that needs to be sustainably managed under FRPA as entrusted to forest professionals. Refer to the opportunities for improvement and the need for additional quality control measures (checks and balances) to implement within your organization. Avoid streamlining VQO planning processes with cut blocks and landforms. Regarding the use of qualified professionals, ensure they are sufficiently skilled, [trained](#), and possess the necessary experience in this area of practice to achieve the objectives for scenic areas. As forest professionals working in the NICC, we need to collectively improve our outcomes related to visual quality.

Cultural Heritage: Resource Development Impacts on Cultural Heritage Resources



Data Source: Cultural heritage assessment data was collected by ministry field staff, often with the assistance of local First Nations, archaeologists, and license holder's staff. Sampling sites consist of a minimum of 50% randomly selected sites and up to 50% targeted sites (First Nations and/or licensee requests) over time, with known cultural heritage resource or archaeological site values. Data presented was collected from 2010 through 2018 from cut blocks harvested from 2005 to 2017.

Summary: Of the 15 cut-blocks assessed, 73% were rated as "very low" harvest impact to cultural heritage features. The majority of these features were culturally modified trees (CMTs) but also included cedar bark stripped trees as traditional use areas and middens.

At the feature level, 65% showed no evidence of damage, while 35% did have damage. These features were mostly affected by wind-throw, but damage was also attributed to harvesting, road building, danger tree falling, and vandalism (cutting of CMT).

Of the eight blocks identified with damaged features, only one had irreversible damage to their features.

Causal Factors: The best outcomes for all cultural heritage features were associated with exclusion of cultural features from harvest areas, either through modifying block boundaries or ensuring features were located in wind-firm retention areas. Poorer outcomes were associated with small non-wind-firm retention buffers, trespass, and vandalism.

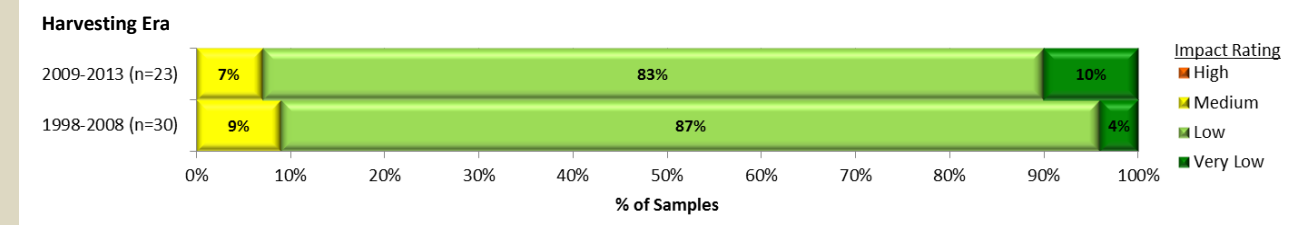
Opportunities for Improvement and (or) Continuation of Practices that Effectively Manage Cultural Heritage Resources:

- Continue strategies that have resulted in "well" to "very well" managed CHR values (as outlined in the causal factors section).
- Conduct a documented pre-work with all operators pre-harvest.
- Conduct post-harvest reviews to ensure CHR features or registered archeological sites have not been damaged during harvesting.
- Prior to any salvage operations, conduct a field documented pre-work with operators to confirm the condition and location of protected features and no harvest areas.
- Consider sufficiently buffering features so they are not visible from roads, and are wind-firm.

DISTRICT MANAGER COMMENTARY: The majority of featured sites monitored are found within registered archaeological sites. A large number (73%) of the sampled sites demonstrate management planning that conserves the sites, thus allowing for continued use. The remaining 26% of the sampled sites suggest that there is some room for improvement with respect to appropriate buffer size to minimizing damage from wind-throw or danger tree felling. Increased communication is required during operations to avoid inadvertent damage to features (trespass, vandalism) as stated in the opportunities for improvement above.

Given FREP CHR sampling is more recent, it is recommended that monitoring be continued with First Nations and license holders working towards improving the understanding of the cultural values, identifying successes, and sharing operational challenges for all parties involved.

Stand-level Biodiversity: Resource Development Impacts on Stand-Level Biodiversity (SLBD)



Data Source: The data for the SLBD assessments was collected by FLNRO staff using the FREP SLBD Protocol. The sample population for SLBD assessment consists of randomly selected cut blocks. The data was collected from 2006 to 2016 from blocks harvested from 1998 to 2013. Two eras of harvesting were analyzed—1998 to 2008 (old era, 30 blocks) and 2009 to 2013 (new era, 23 blocks).

Summary:

Quantity and Type of Retention: The percentage of recently harvested blocks in the low and very low impact categories have not substantively changed between the two harvest eras—91% (1998-2008) and 93% (2009-2013). The notable difference between harvest eras is the decline in the use of dispersed retention since 2009 from 17% (1998 – 2008) to 4% (2009 – 2013) of the blocks. Average patch size of 2 ha or greater remains unchanged for both eras.

Quality of Tree Retention: Large snag density within wildlife tree retention areas (WTRA) is comparable to pre-harvest conditions for both harvest eras. Large live tree density with WTRA's has declined to less than pre-harvest conditions since 2009.

Quality of Coarse Woody Debris (CWD) Retention: An assessment of CWD retention quality was also conducted in aggregate against a pre-harvest benchmark for each harvest era. The volume of large pieces (>30cm diameter) and density of large and long pieces (>20 cm diameter, >10 m long) in harvested areas were compared to retention patches. Large CWD volume and large and long CWD density have improved from the since 2009.

Opportunities for Improvement and/or Continuation of Practices to Manage Stand-level Biodiversity

- Continue to retain WTRA's ≥ 2 ha in size where practicable.
- Maintain or improve WTRA's tree retention quality by leaving densities of large live trees representative of pre-harvest conditions. Avoid WTRA placement for areas with small diameter trees.
- WTRA Retention quality; retain representative ecosystem areas compared to the harvest area of equal or higher ecosystem productivity (i.e.: harvest 01/ WTRA 01-05 complex versus harvest 01/05, WTRA 03(01) rocky knoll complex).
- If WTRA or reserves are not representative of the dominant ecosystem harvested ensure they are anchored around high wildlife values or resource features (i.e. den bear, eagles nest, CMT's, Karst).
- Consider tree species diversity (representation) within reserves across the range that exists within the planned harvest block boundary.
- For stand structural diversity consider retaining low dispersed retention levels (< 5 m²/ha) ranging from 0-5 stems per hectare. Less than 5m²/ha is not reported to RESULTS while maintaining even-aged management.
- Where possible retain long pieces (≥ 10 m) of CWD within harvested areas.

DISTRICT MANAGER COMMENTARY: I am pleased that the stand level biodiversity monitoring is indicating that retention levels are healthy and appropriate, based on ecological anchors, and has been effective. Opportunities to be considered for continued success for WTRA placement are noted above. Consider retaining < 5 m²/ha of dispersed retention to increase stand structural diversity and large CWD recruitment.

DISTRICT MANAGER COMMENTARY FOR KARST

A pilot testing of the 2010 version of the draft FREP karst field cards and routine monitoring protocol was undertaken on 18 cut blocks sampled in 2010-2012 on North Island Central Coast Resource District. The results were published in the [*FREP Extension Note 37: Preliminary Analysis of Surface Karst Feature Data from Northern Vancouver Island, June 2016*](#). As all of the karst samples were located within the North Island-Central Coast Natural Resource District, the results are relevant for inclusion in this MRVA report.

Overall, the results of this pilot indicated the following for karst areas:

- 60% of the surface karst features had retention areas.
- In general, it appeared that surface karst features with retention areas had lower total disturbance types as compared to those without retention areas. It was observed that retention limits disturbance and therefore helps maintain natural conditions of the surface karst feature.
- It was found that 80% of the retention areas surrounding surface karst features had undergone some level of wind-throw likely leading to or associated with increased disturbance occurrences and types (e.g. shade alteration, exposed bare soil and erosion, introduced materials).

Opportunities for Continued Improvement around surface karst features:

- Standing trees in retention areas around surface karst feature need to be of adequate size and carefully designed to limit the effects of potential wind-throw related impacts.

The blocks sampled under FREP in 2010 to 2012 were subject to the [*Government Actions Regulation \(GAR\) Order*](#) effective March 23, 2007, which identified surface or subsurface elements of a karst system within our Resource District as a **resource feature**. This includes karst caves, the important features within very high or high vulnerability karst, and significant surface karst features. Consequently, license holders are subject to Section 70(1) of the *Forest Planning and Practices Regulation (FPPR)* where they are required not to 'damage or render ineffective' the identified karst resource features.

The 2014 Forest Practices Board's Special Investigation "[*Management of Karst Resources Features on Northern Vancouver Island*](#)" determined that caves or significant karst features had not been damaged or rendered ineffective by forestry activities (above ground). However, the Board noted that the guidelines set out in the [*Karst Management Handbook \(KMH\) 2003*](#) were frequently not followed 70% of the time for karst resource features. The board found that only one karst field assessment followed the [*Karst Inventory Standards and Vulnerability Assessment Procedures for British Columbia \(KISVAP\)*](#). Where the karst management strategies were not consistent with the KMH, no professional rationales were provided why these best management practices were not prescribed or utilized. The Board also spoke to professional qualifications and recommended that assessors take the Resource Information Standards Committee (RISC) training to help orient them to the KISVAP and KMH procedures. The Board recommended that forest professionals take a cautious approach when addressing karst features, and use best available information when assessing karst features.

Based on the Board's observations above, and as karst is highly sensitive to disturbance and soil erosion, the KISVAP and KMH are still considered best available information at this time for forest professionals to utilize when working under the GAR order and non-GAR karst features. Therefore, my expectation is that forest professionals need to take ownership of the karst field assessment, harvest prescriptions, and any management decision adopted when deviating from the best management practices identified in the KMH including following KISVAP inventory procedures. It is my strong recommendation that forest professionals document their [rationale](#) for stand prescriptions that are not consistent KMH so it is available for future audits, FREP assessments, or Government oversight to assess the management of karst resources. This will aid in ensuring the forest professional has considered the KMH best management practices and is applying karst science for the achievement of continuing to meet the GAR order for Karst.

To clarify the above expectation, license holders may use a qualified professional to assess karst resource features. Karst science is comprised of a number of disciplines including geomorphology, forestry, biology, hydrogeology, paleontology, and archaeology. The 2007 GAR order interpretation aligns with Coast Regional Implementation Team (CRIT) 2006 [definition](#) that the qualified professional be a person that has both extensive karst experience and is registered in a professional association governing one of the above mentioned disciplines. Further to this, the GAR order was based on the expectation that the qualified professional will be RISC/KISVAP trained, and having completed the online KMH training for all inventories and vulnerability assessments to provide adequate and appropriate direction for interpreting and applying the Order. These are the minimum requirements to assist in prescribing practices to manage the karst as resource features. To clarify, as stated above and in concert with the CRIT messaging, when deviating from the KMH best management practices, ensure your site prescriptions are supported by a professional rationale.

I note that an article that was recently published in the November-December 2017 issue of the **BC Forest Professional** entitled "[Qualifications for Conducting Karst Field Assessments](#)" provides guidance regarding the use of qualified persons. It states that *"It is not necessary for persons conducting KFAs to be registered professionals. In fact, most registered professionals in BC are likely to lack substantive training and experience in karst management. Anyone conducting KFAs, including registered professionals, need to be qualified karst resource professionals with a solid understanding of karst landscapes and processes, experience conducting KFAs that meet RISC standards, a working knowledge of the province's recommended best management practices, and familiarity with BC's legislated requirements for karst."* I also find this approach of using a qualified person (or karstologist) acceptable for working under the GAR order, provided that the ethics, integrity, and standards of work lead to the desired result of commensurate KFA and management, conservation, and or protection of the resource feature. Using qualified persons also requires that deviations from the KMH are rationalized.

Lastly, there is a need to now further consider fuel hazard abatement and wildlife risk in karst areas. The KMH also provides guidelines regarding wildfire and fuel hazard management. Due to the increasing rarity of undisturbed karst systems on Vancouver Island, a fire prevention specialist conducted an examination of the KMH guidance in regard to fire produced the document [Wildfire & Fuel Hazard Management on Vancouver Island Karst Discussion/Opinion Paper – November 2015](#). Some of the recommendations from

this Paper are instructive to forest license holders:

- Fire and fire risk should be considered in the geomorphic assessment aspects of the Karst Field Assessment (KFA); and
- There may be other, contemporary methods for fuel hazard management that supplement the best management practices listed in KMH. For example, block design, alternate harvest systems, increased retention around karst features, and other fuel management practices could be considered in order to provide protection from unwanted fire.



Photo 18: Fire V90295 in 2014 over Karst terrain in Kinman Creek on Vancouver Island

Karst will continue to remain a critically important resource feature within the District under the GAR order and I hope this commentary provides sufficient clarification and expectations for successful karst field assessments, inventories, and procedures to promote sustainable management under FRPA.

A handwritten signature in black ink, appearing to read 'Andrew Ashford'.

Andrew Ashford, R.P.F.
District Manger
March 28, 2019

APPENDIX 1: SUMMARY OF FREP IMPACT RATING CRITERIA

Table A: Criteria for determining 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 dependent on wildlife trees and coarse woody debris?	% retention, retention quality (e.g., big patches, density of large diameter trees), coarse woody debris volume, four coarse woody debris qualities (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
Visual Quality	Are forest practices achieving established visual quality objectives in scenic areas?	Visiblensness of alteration, use of visual landscape design elements, percent of landform altered, visual impact of roads, percent of block with visible tree retention	Basic visual quality class (VQC) is determined using the ocular assessment method. Adjusted VQC is derived using the percent alteration assessment method, which includes adjustment factors. The two measures are combined to determine a final rating.	Both methods indicate VQO achieved and percent alteration is low or mid-range	Both methods indicate VQO achieved, but scale of alteration is close to upper limit	Only one method indicates VQO achieved	Both methods indicate VQO not achieved
Cultural Heritage Resources	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 cut-block assessment results with consideration of individual feature assessment results	Block rated well/very well & no features rated poor/very poor	Block rated well/very well & ≥ 1 feature rated poor/very poor OR Block rated moderate & no features rated poor/very poor	Block rated moderate & ≥ 1 feature rated poor/very poor	Block rated poor/very poor

APPENDIX 2: ALL LICENSEES LETTER



File: 102-20/Licensee

November 24, 2016

ALL LICENSEES NORTH ISLAND – CENTRAL COAST NATURAL RESOURCE DISTRICT

Dear Licensees;

Further to the Forest Management Leadership Team's document "Riparian Management Emphasis Field Guide", dated November 16, 2016, I would like to communicate my expectations to agreement-holders and FSP preparers in the North Island – Central Coast Natural Resource District, specific to S4, S5 and S6 stream management.

Background:

- 1) Forest practitioners are strongly encouraged to review provincial riparian monitoring results from the last 10 years including:
 - FREP reports and Extension Notes
 - District MRVA reports
 - Chief Forester and Assistant Deputy Minister Resource Stewardship Reports and
 - Other applicable reports.
- 2) In general, provincial monitoring results and small stream research indicates concerns or elevated risks to the functional condition of small streams in many locations around the province. This quantitative data provides a consistent reference point and scorecard on the condition of small streams in plan areas. It requires forest professionals to review the ongoing effectiveness and applicability of existing results and strategies, or the design of new or adapted FSP results and strategies to influence management practices for improved outcomes on small streams.
- 3) Under the ABCFP Professional reliance regime and the Forest and Range Practices Act (FRPA) construct, it is the collective responsibility of all forest professionals to seek improved outcomes to any resource value deemed to be at risk.
- 4) Forest Professionals are required to consider new and best information available in the development of FSP results and strategies and incorporate it into operational practices.

Page 1 of 2

Ministry of Forests, Lands and
Natural Resource Operations

North Island – Central Coast
Natural Resource District

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CANADA

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Tel: (250) 956-5000
Fax: (250) 956-5079

Licenses

Expectations specific to S4, S5 and S6 stream management:

Based on the above background information, my expectations to agreement-holders and FSP preparers in the North Island – Central Coast Resource District, specific to S4 and S6 stream management are:

- 1) riparian reserves or stem retention adjacent to S4, S5 and S6 streams will be considered as a management strategy when specific site conditions warrant retention.
- 2) Forest Stewardship Plans will contain results and strategies for S4, S5 and S6 streams that describe the factors considered by professionals which maintain riparian function and how the factors guide cutblock development, harvesting, roadbuilding and operational site plans. Results and strategies must clearly articulate management intent.
- 3) District MRVA and monitoring results for small streams will be made available by my staff (if requested) to be considered by forest practitioners when drafting FSP results and strategies.
- 4) FSP results and strategies for small streams consider methodologies and strategies which minimize sediment delivery and coarse woody debris inputs into streams as a priority area for improvement.
- 5) forest professionals are kept informed of upcoming small stream collaborative workshops to explore ways to achieve improved outcomes for small streams.
- 6) improved results will be observed on small streams, as per applicable existing FREP or MRVA results.
- 7) FSP results and strategies will be amended from time to time as new information is gained or new collaborative recommendations are developed between industry and government through the "Small Streams Team and Community of Practice".

As you all know, FRPA is structured to support the process of adaptive management and professional reliance. It is important for Forest Professionals to demonstrate improved outcomes to the functional condition of small streams to ensure that regulatory change is not necessary.

If you have any questions or require further information on the importance of updating FSP results and strategies for small streams management practices, please contact Murray Estlin, Stewardship Forester, at 250-956-5038 or by email at Murray.Estlin@gov.bc.ca.

Sincerely,



Signing on behalf of
Andrew Ashford, GM

Tim Chester,
Acting District Manager,

2016.11.24
16:42:10 -08'00'

North Island – Central Coast Natural Resource District

Attachment(s): FMLT Riparian Management Emphasis Field Guide