

Visual Landscape Management Integrated Visual Design of Larger Landscapes



Nadina Lake Photo by Jaret van der Giessen, Houston Forest Products 2007

**Ken Fairhurst, R.P.F., RDI Resource Design Inc.
and
Ph.D. Candidate, Faculty of Forestry, University of British Columbia
presented February 14, 2008, Forest Operations Course**

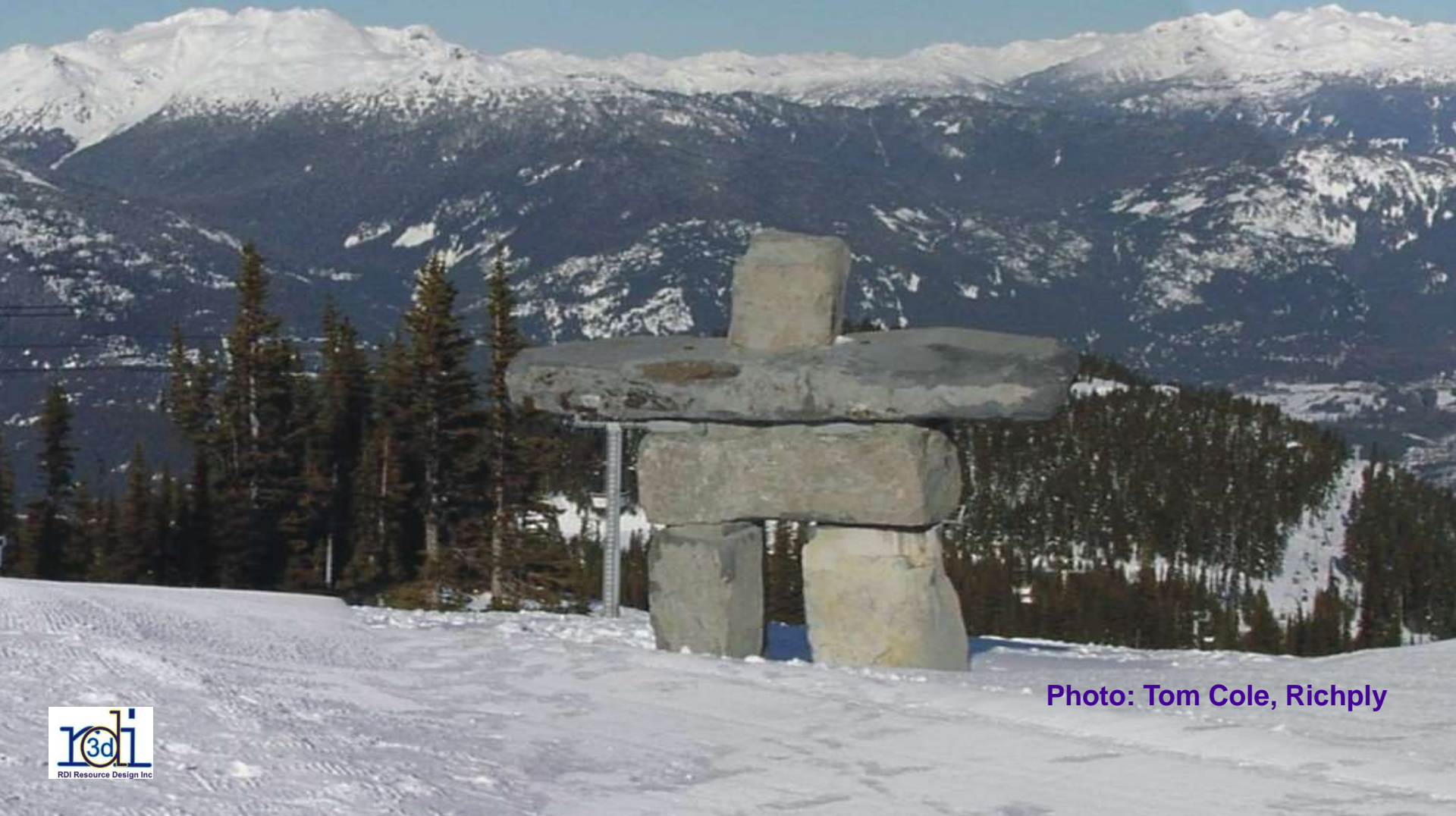


Photo: Tom Cole, Richply

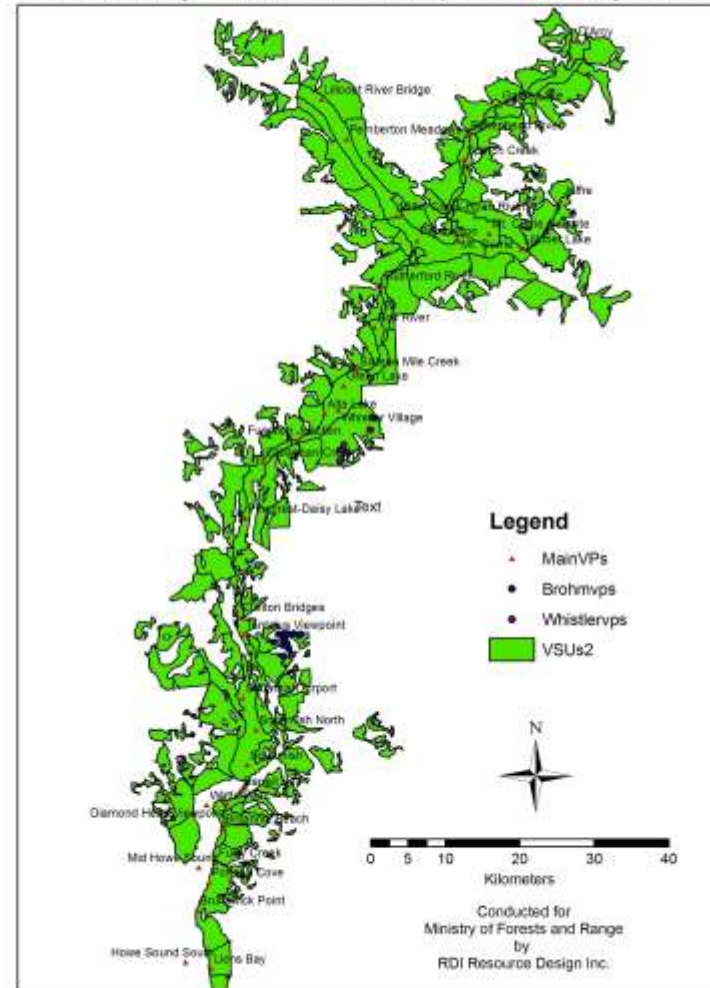
- Key VRM Procedures
 - Inventory and Analysis
 - Design and Assessment
 - Implementation and Monitoring



Inventory and Analysis

- VSUs identified
- Rated for Sensitivity
- Assigned Visual Quality Objectives

Sea-To-Sky Visual Landscape Inventory 2006



Visual Sensitivity Unit Classification Form - Page 1

- 1. Forest District: DSQ
- 2. Rated by: K. B. Fairhurst
- 3. Date: 2006/02
- 4. Project: 2006-02: S2S Frontcountry Zone VLI Update
- 5. VSA #: 2. Westside Howe Sound Squamish - Tantalus Range
- 7. VSG #
- 8. Cross Mapsheet YSE #:

Ministry of Forests and Range
R.D.I. Resource Design Inc.
 Forest and Land Planning Services

2006-02: S2S Frontcountry Zone VLI Update
 2. Westside Howe Sound Squamish - Tantalus Range
 2.1 Westside Howe Sound - Tantalus Range - Woodfibre



6. VSU #		201	
M			
M	H	H	M
2		PR	
VSU Label & Legend			
EVC			
VAC	BR	VC	VR
VSC		rVQC	

9. BCGS Map # 092G064
 ##

Electronic VSU Classification Form produced by RDI Resource Design Inc 2006 using MOFR 1997 Standard

Existing Visual						Scores		Type	EVC Rationale:
11 Scale of Existing Alteration	0%	0.1-1.5	1.6-7.0	7.1-18.0	18.1-30.0	>30	12		hydroline at base; pulp mill
EVC Initial Value	P	R	PR	M	MM	EM		M	upper blocks white in winter
12 Influence of Visual Landscape Design		H		M		L	N/A	Type: 1	Type of Alteration (TA) - see p. 3 and VLI Standards: 12
13 Influence of Site Disturbance		H		M		L	N/A		H
14 Influence of Vegetative Colour & Texture		H		M		L	N/A	Type: LB	Vegetative influence type: see VLI Standards: 14
15 EVC Final Value	P	R	PR	M	MM	EM		M	enter final EVC value in VSU label (automatic on e-form)

Visual Absorption Capability (VAC)				Scores		Type	VAC Rationale:
16 Slope	H (3)	M (2)	L (1)	1			also SW and NE aspects
17 Aspect	H (3)	M (2)	L (1)	2			(if N/A assign 0)
18 Surface Variation	H (3)	M (2)	L (1)	3			
19 Rock/Soil/Vegetative Variety	H (3)	M (2)	L (1)	2	Type: M-C		Variety type: see VLI Standards: 19
20a VAC Initial Value	H (10-12)	M (7-9)	L (3-6)				select within range
20b VAC Final Value	H (3)	M (2)	L (1)		2	M	enter final VAC value in VSU label (automatic on e-form)

Biophysical Rating (BR)				Scores		Type	BR Rationale:
21 Slope	H (3)	M (2)	L (1)	3			
22 Aspect	H (3)	M (2)	L (1)	2			(if N/A assign 0)
23 Edge	H (3)	M (2)	L (1)	3	Type: A		water / landform
24 Topographic Variety	H (3)	M (2)	L (1)	3	Type: H-C		variety type: see VLI Standards: 24
25 Vertical Relief	H (3)	M (2)	L (1)	3			
26 Vegetative Variety	H (3)	M (2)	L (1)	3	Type: H-B		
BR Initial Value	H (15-18)	M (10-14)	L (5-9)	17			select within range
(BR Modifying Factors - add only)							
27 Influence of Rock/Soil	H	M	L	N/A	Type: N/A		Type: see VLI Standards: 27
28 Influence of Water	H	M	L	N/A	Type: H-A		Type: see VLI Standards: 28
29 Influence of Adjacent Scenery	H	M	L	N/A		M	
30 BR Final Value	H (3)	M (2)	L (1)	3		H	enter final BR value in VSU label (automatic on e-form)

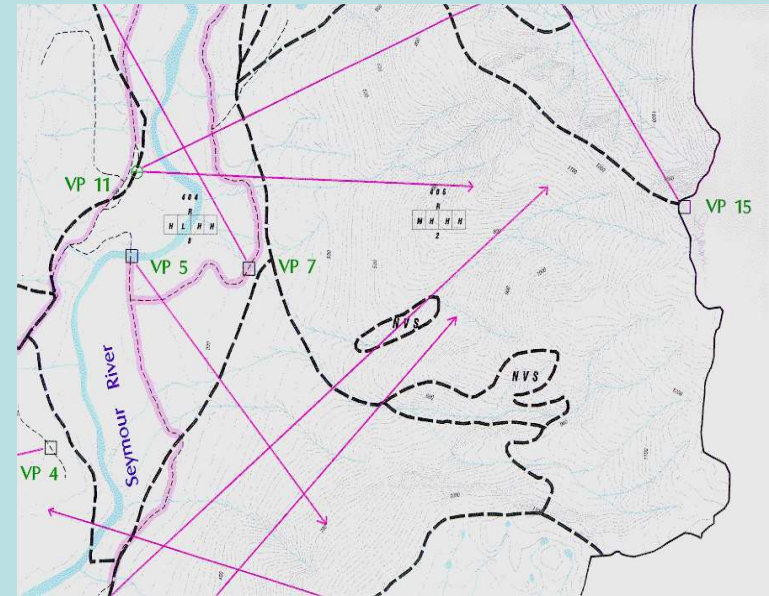
Legend

L-A Type selector drop down

Rating selector



Visual Landscape Inventory: Visual Sensitivity Unit Classification Form



VLI provides the means to delineate, describe, and rate the visual landscape

Visual Sensitivity Unit Classification Form - Page 2



Ministry of Forests and Range

VSU #	201
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Electronic VSU Classification Form produced by RDI Resource Design Inc. 2006 using MOFR 1997 Standard

Viewing Condition (VC)				Scores		Type	VC Rationale:
31 Viewing Distance	H (3)	M (2)	L (1)	▲	2		
32 Viewing Frequency	H (3)	M (2)	L (1)	▲	3	VPs:	117-122
33 Viewing Duration	H (3)	M (2)	L (1)	▲	3	Type: H-B	Duration: see VLI Standards: 33
34 Viewing Angle	H (3)	M (2)	L (1)	▲	3		
VC Initial Value	H (10-12)	M (7-9)	L (4-6)	▲	11		select within range
35 VC Final Value	H (3)	M (2)	L (1)	▲	3	H	enter final VC value in VSU label (automatic on e-form)

Viewer Rating (VR)				Scores		Type	VR Rationale:
36 Number of Viewers	H (3)	M (2)	L (1)	▲	3	Viewer #s: H-B	Viewer Numbers: see VLI Standards: 36
37 Viewer Expectations	H (3)	M (2)	L (1)	▲	2	Type: M-B	See VLI Standards: 37
VR Initial Value	H (6)	M (4-5)	L (2-3)	▲	5		select within range
38 VR Final Value	H (3)	M (2)	L (1)	▲	2	M	enter final VR value in VSU label (automatic on e-form)

Visual Sensitivity Class (VSC) Scores						
Component Scores	BR	VC	VR	VAC	VSCI Score	VSC Score Formula
	3	3	2	2	6	BR+VC+VR-VAC=VSCI Score

Visual Sensitivity Class (VSC)						FSC Rationale: use page 4
using VSCI Score:	3+	3 to 7	3 to 5	1 to 2	0	5
VSC Initial Value:	VSC 1	VSC 2	VSC 3	VSC 4	VSC 5	2
39 VSC Final Value	VSC 1	VSC 2	VSC 3	VSC 4	VSC 5	▲

Other (Optional)						Type	Other Rationale:
40 Years to VEG	< 5 years	5-10 years	> 10 years	N/A	N/A		See VLI Standards: 40
41 Visual Recovery	H	M	L			M-A	See VLI Standards: 41
42 Reh./Enh.	RH	EH	N/A	N/A			

Recommended Visual Quality Class (rVQC)							rVQC Rationale:
43 rVQC	Typical Initial rVQC Range						FSC
VSC (final)	P	R	PR	M	MM		Initial rVQC: PR
1	<----->						select initial rVQC within appropriate range in matrix
2		<----->					enter rationale for final rVQC selection on page 4
3			<----->				
4				<----->			enter final rVQC value in VSU label (automatic on e-form)
5					<----->		Final rVQC: PR

Legend

<-----> indicates most common part of range for rVQC selection

< > indicates less common part of range for rVQC selection

lower-end (most restrictive) upper-end (less restrictive)




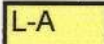

(terms apply both within a given rVQC and across rVQCs in FSC range)

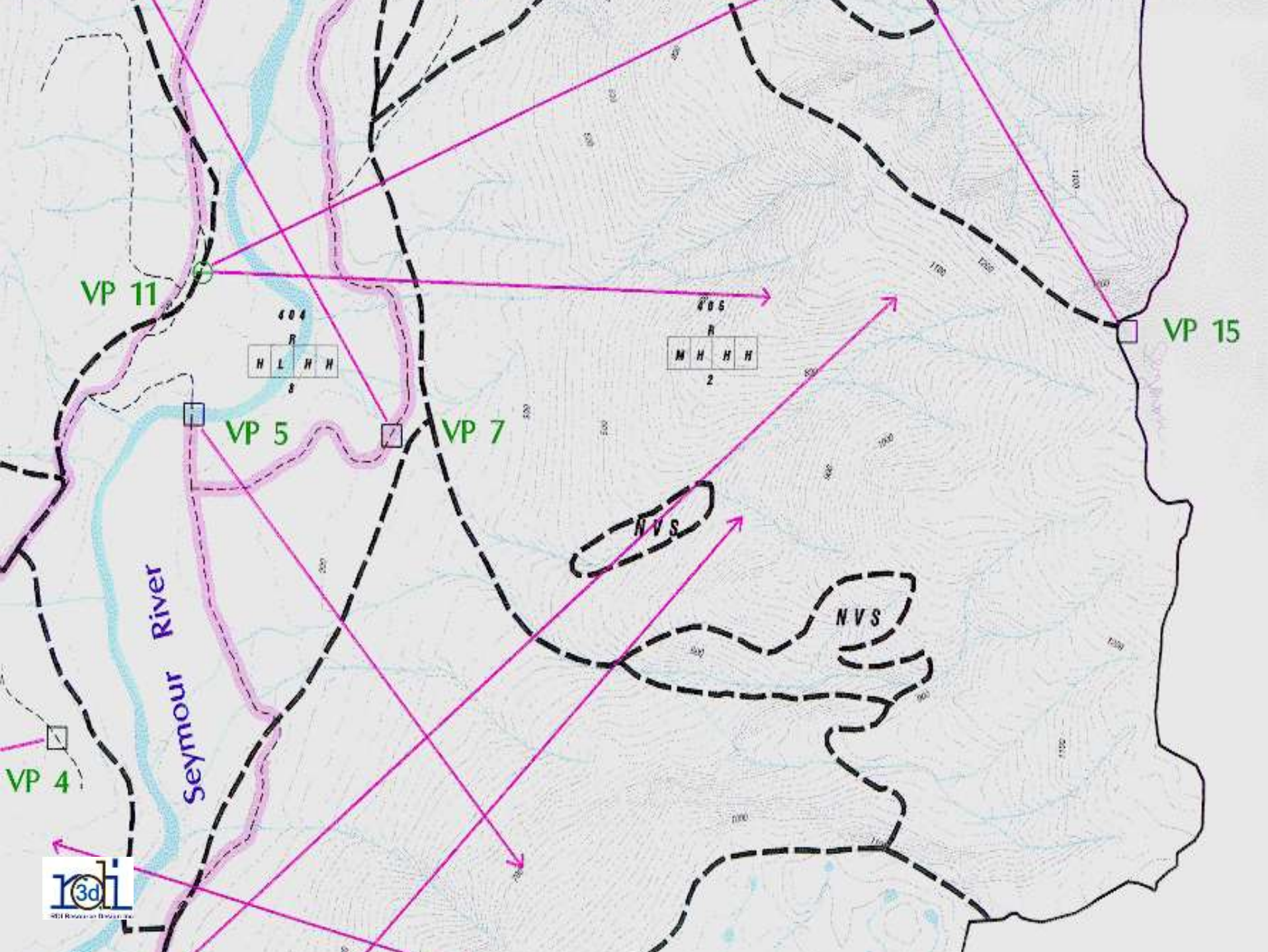
L-A Type selector drop down ▲ Rating selector

the Forest and Range Practices Act (FRPA) identifies scenery as one of the 11 forest values to be managed and includes provisions to establish visual quality objectives (VQOs). The Minister or designate will establish VQOs. **rVQCs are just the first step.**

Recommended Visual Quality Class (rVQC)						rVQC Rationale:	
VSC (final)	Typical Initial rVQC Range					VSC	2
	P	R	PR	M	MM	initial rVQC:	PR
1	←-----→					select initial rVQC within appropriate range in matrix	
2		←-----→				enter rationale for final rVQC selection on page 4	
3			←-----→				
4				←-----→		enter final rVQC value in VSU label (automatic on e-form)	
5				←-----→		Final rVQC:	PR

Legend

 indicates most common part of range for rVQC selection
 < >  indicates less common part of range for rVQC selection
 lower-end (most restrictive) upper-end (less restrictive) (terms apply both within a given VQC and across VQCs in VSC range)
 Type selector drop down  Rating selector



Visual Sensitivity Unit



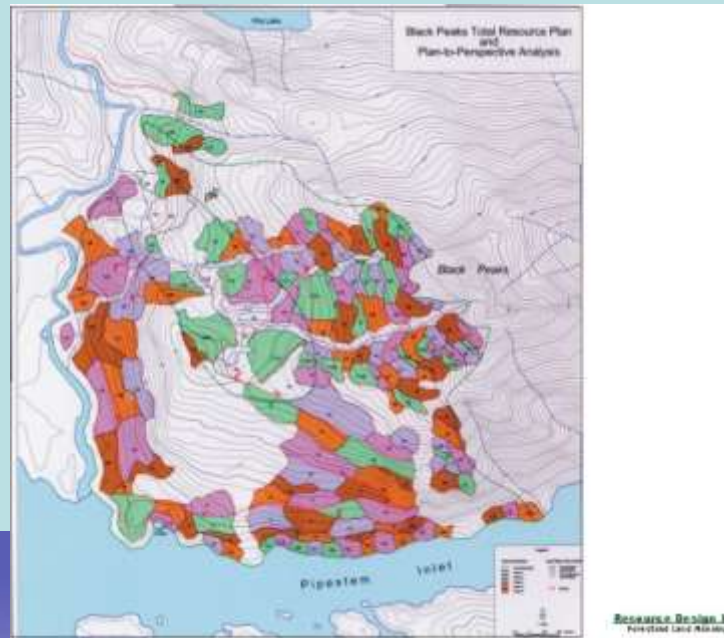
- EVC – Existing Visual Condition
- VAC – Visual Absorption Capability
- BR – Biophysical rating
- VC – Viewing Condition
- VR – Viewer Rating
- VSC – Visual Sensitivity Class

405
R
M H H H
2

VSU#
EVC
VAC BR VC VR
VSC

Design and Assessment





Design plans are prepared as part of the Forest Stewardship Plan, signed by a Register Professional Forester; not submitted for review by agencies unless requested.

The evaluation is conducted at all important viewpoints. In addition, the existing non-visually effective greened-up (non-VEG) alterations within, and immediately adjacent to, the unit must be considered in this evaluation. Three variables are used to assess the visual simulation(s):

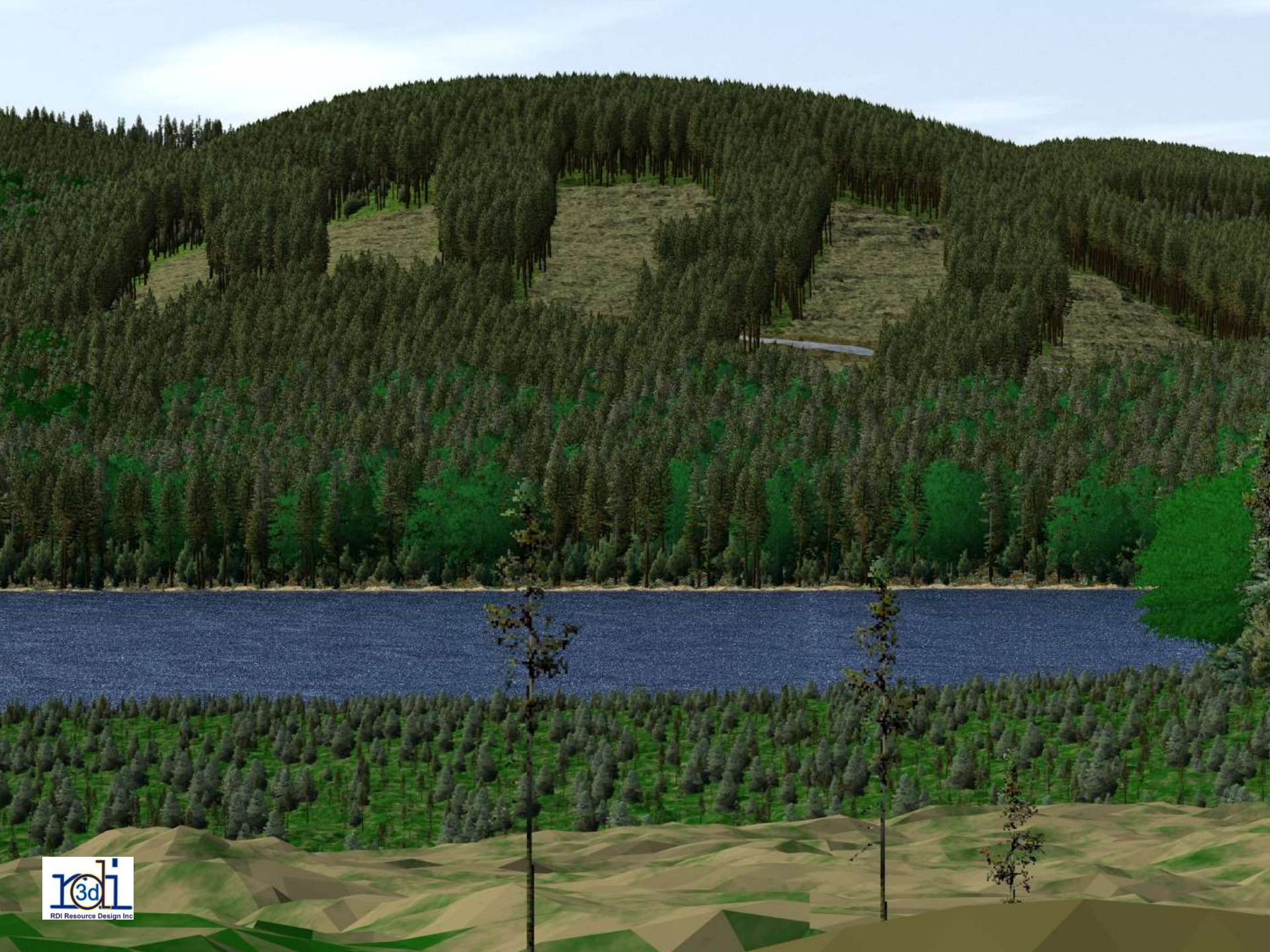
- 1. Basic VQO definition**
- 2. Visual design**
- 3. Numerical assessment**

1. **Basic VQO definition:** Does a proposed operation meet the basic visual quality objective definition?
2. **Visual design:** Does a proposed operation exhibit elements of good visual design?
3. **Numerical assessment:** In perspective view, what proportions of the landform or unit are represented by existing non-visually effective green-up alterations and a proposed operation?

What percent volume or stems will be left in the block?

What level of site disturbance will be present?

In order to receive approval, it is imperative that all existing and proposed operations meet the basic VQO definition and exhibit elements of good visual design. The numerical assessment should be used only as a yardstick to help determine into which class the cumulative alterations on a landscape fall.



FOREST PLANNING AND PRACTICES REGULATION

1.1 Categories of Visually Altered Landscape

- P – **Preservation**: very small in scale, not easily distinguished
- R – **Retention**: difficult to see, small in scale , natural appearance
- PR – **Partial Retention**: easy to see, small to medium scale, natural shape
- M – **Modification**: very easy to see, large scale and natural appearance or small but rectangular
- MM – **Maximum Modification**: very large scale, rectilinear, may be both

See: Procedures for Effectiveness Evaluation of Visual Quality Management

http://www.for.gov.bc.ca/HFP/frep/repository/vis_procedure.pdf

VQO Percent Alteration

Visual Quality Objective (VQO)

Preservation	0
Retention	0–1.5
Partial Retention	1.6–7.0
Modification	7.1–18.0
Maximum Modification	18.1–30.0

Percentages apply to the visible green portion of the landscape in perspective view

Rock and permanent ice are excluded from the calculation.

Predictions based on percent alteration in perspective view.

Percent Alteration of Visual Landscape or Landform in non-vegetated state



Allowances and Exceptions

Forest Stewardship Plan Category of Alteration Definitions for Visual Quality

FSP Sections 4.6.1 to 4.6.5 address constraints affecting areas with the Categories of Alteration of Partial Retention and Modification. Sections 4.6.4 and 4.6.5 describe allowances and exceptions. These are discussed when assessing the definition, design, and percent alteration of the proposed alteration in relation to existing alteration in the following sections of the VIA.



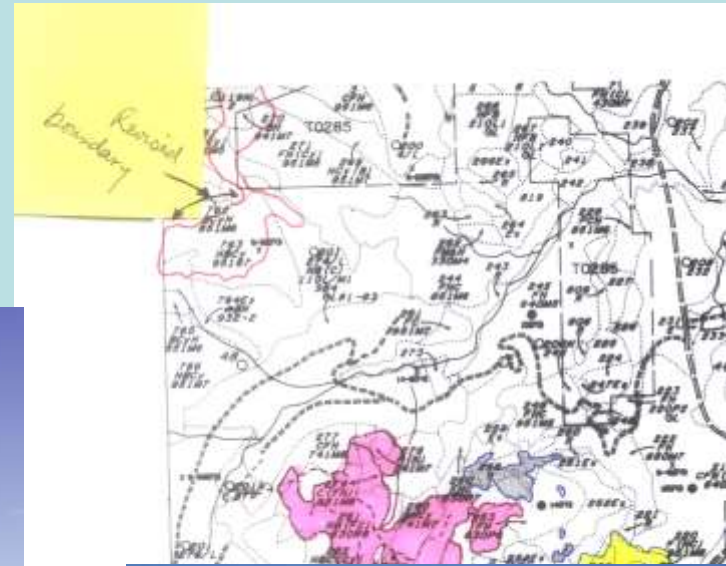
Allowances and Exceptions

Section 4.6.4 allows for a road or cutblock within a Category of Alteration that may be rectilinear or geometric in shape or have angular characteristics and not appear natural in shape where and to the extent: (a) the cutblock or road borders a: (i) previously harvested cutblock in which stumps and coarse woody debris created by that harvesting are no longer visible from the viewpoint; (ii) road; (iii) structure; (iv) other disturbance; or (v) natural feature, that is rectilinear, geometric in shape, or otherwise does not appear natural; or (b) there is no other practicable option having regard to: (i) the size, topography or engineering constraints of the cutblock or road; or (ii) the safety of workers or road users.

Allowances and Exceptions (cont'd)

Section 4.6.5 provides exceptions where alternative characteristics are permitted. if (a)(i) the timber is under immediate threat from: (A) insects; (B) disease; or (C) decay due to blowdown; or (ii) it is not practicable to apply the result or strategy in Paragraph 4.6.2 to such harvesting or construction, the FSP holder (c) may design a road or cutblock consistent with characteristics of alteration different from those that would otherwise apply under Paragraph 4.6.2; and (d) will, if it applies subparagraph (c), design a road or cutblock to be consistent with the characteristics of alteration that, under Paragraph 4.6.2, apply to the **first Category of Alteration in the table in Paragraph 4.6.2 below** the Category of Alteration that would otherwise apply that will enable the harvesting of timber or road construction in a **practicable** manner.

- Implementation and Monitoring

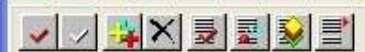


Under FRPA, professional accountability is relied upon. Compliance and Enforcement staff review on-ground results.

A 3D computer simulation model of a natural landscape. The scene features rolling hills and mountains covered in dense green forest. A large, dark blue lake is situated in the middle ground, with a smaller peninsula or island in the foreground. The terrain is rendered with varying shades of green and brown, suggesting different vegetation types and soil conditions. The overall appearance is that of a detailed digital environment.

Building a 3-d Computer Simulation Model

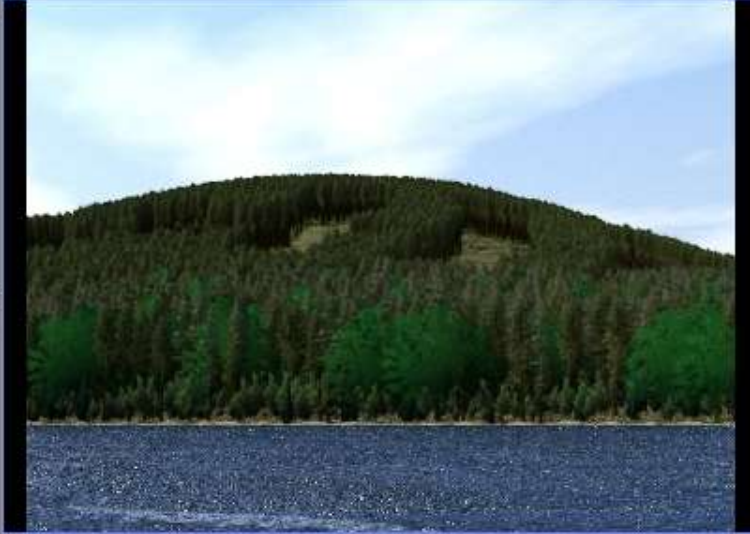
- Visual Nature Studio



- Color Maps
- Ecosystems
- Environments
- Foliage Effects
- Ground Effects
- Image Objects
- Snow Effects
- Thematic Maps

- 3D Materials
- 3D Objects
- Area Terrafactors
- Atmospheres
- Cameras
- Celestial Objects
- Cloud Models
- Color Maps
- Control Points
- Coordinate Systems
- DEM Mergers
- DEMs
- Ecosystems
- Environments
- Foliage Effects
- Ground Effects
- Image Objects
- Labels
- Lakes
- Lights
- Planet Options
- Post Processes
- Render Jobs
- Render Options
- Render Scenarios
- Search Queries
- Shadows

LakeViewpointCamera - SilvaeGavin Preview Options



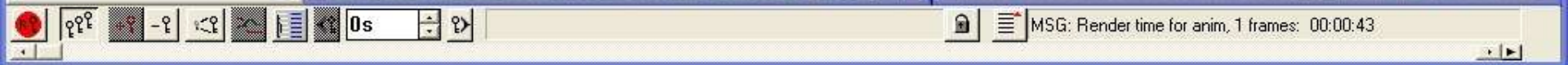
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ViewpointCamera1010 - 50mm - SilvaeGavin Preview Options



SilvaeGavin PlanimetricClose - SilvaeGavin Preview Options

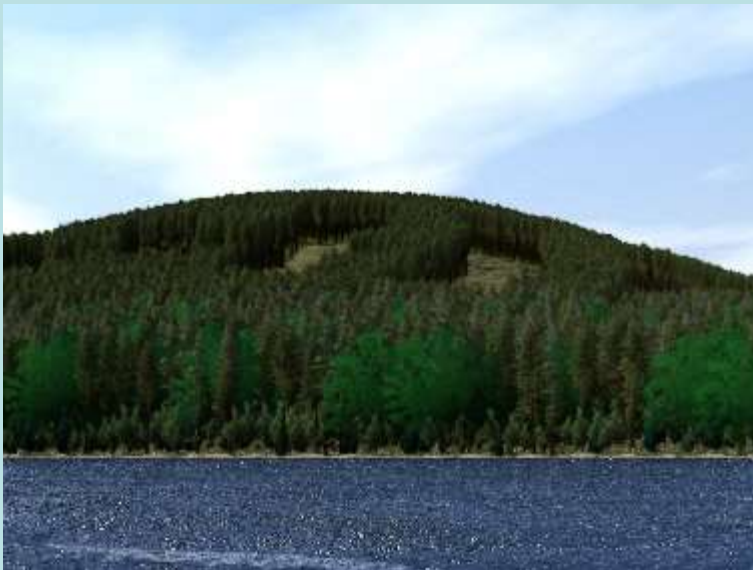


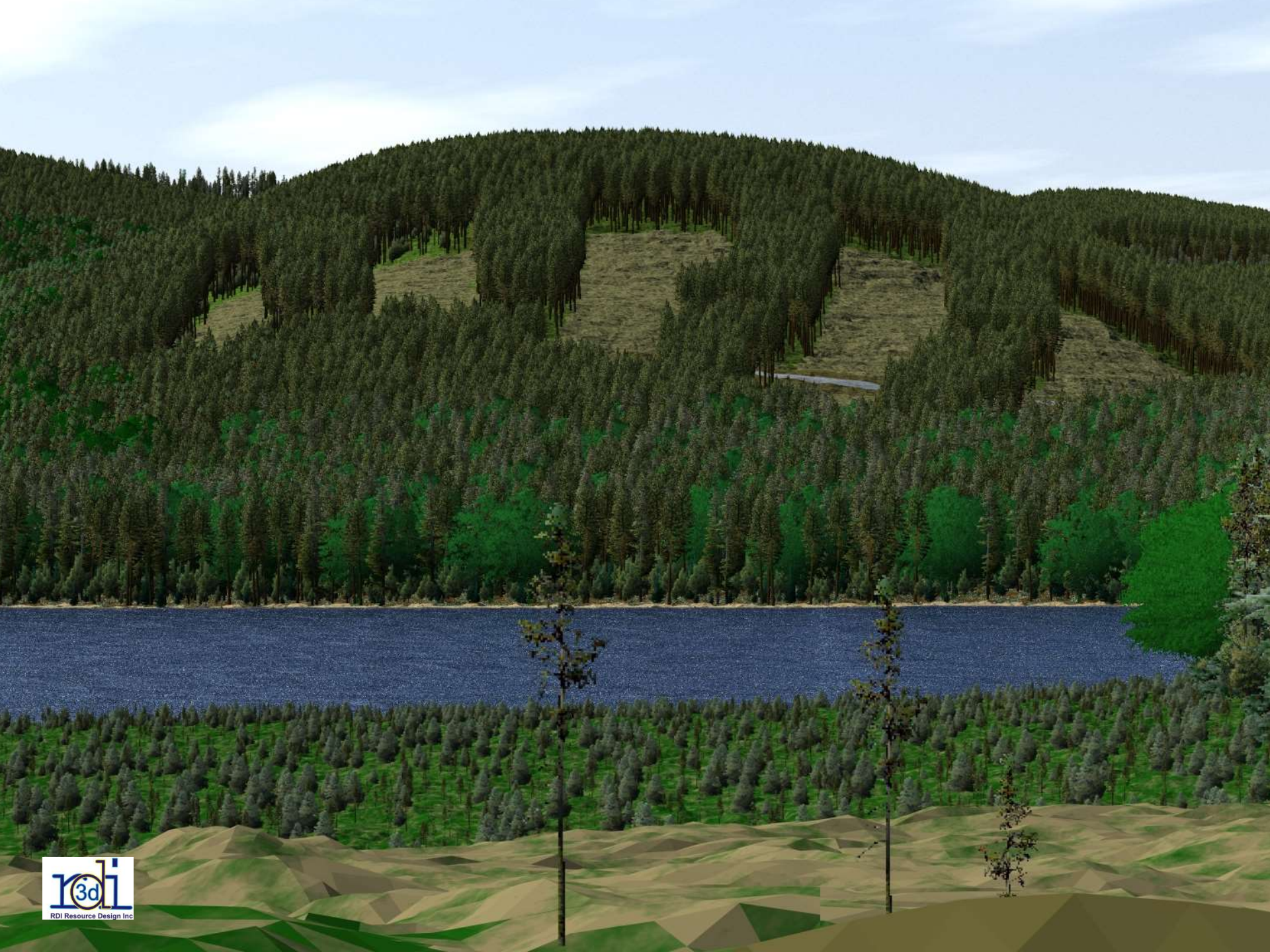
MSG: Render time for anim, 1 frames: 00:00:43



VNS Data Requirements

- 1. Terrain - contours in shapefile format (attribute: ELEVATION) or DEM points and breaklines. Needs to be big enough to include viewpoint locations, block locations and Visual Sensitivity Unit(s).**
 - 2. Forest VRI - shapefile format with attributes for Stand_Ht or Projected Stand Ht, Species and species type_group, non-productive codes (need not be limited to these but should include these attributes).**
 - 3. Blocks - new, existing (approx. regen. height)**
 - 4. Roads - new and from TRIM SHAPEFILE**
 - 5. Other TRIM - hydro, rail, etc. SHAPEFILE**
 - 5. Creeks and Lakes from TRIM, MARINE SHORELINE SHAPEFILE**
 - 6. Viewpoints - SHAPEFILE**
- NO ELEVATIONS NEEDED EXCEPT FOR CONTOURS AND LAKES (IF AVAIL)**





Integrated Visual Design Planning (IVDP)

- Integrated Visual Design is a BC Ministry of Forests and Range planning method for visually sensitive landscapes that incorporates environmental, operational and economic constraints and opportunities to sequentially plan a full rotation (at least 100 years) while meeting the visual Quality Objectives (VQOs) established for a Scenic Area.

more info at <http://www.for.gov.bc.ca/hfp/publications/00040/FIA-Standards-Final.pdf>



Nadina Lake Integrated Visual Design Plan Area

**Mountain Pine Beetle Invasion in Northern British Columbia
Expected Loss: of 14,000,000 hectares (32,000,000 acres)**

Nadina Lake Scenic Area IVDP

- RDI used conventional ArcGIS to produce viewshed and times seen mapping, slope analysis, and environmental constraints and opportunities analyses.
- RDI further stratified the landscape based on cumulative apparency (visual risk) from a set of viewpoints using Ken Fairhurst's UBC Faculty of Forestry Ph.D. Dissertation Research Model called **GEOptics**.
- **GEOptics**, and all visual prediction simulations, modeled in **Visual Nature Studio**.
- more info at www.GEOptics.com

Innovative Approach to IVDP

- The GEOptics GIS layer is produced in Visual Nature Studio by producing cumulative surface illumination from light sources located at each key observation point.
- The greater the illumination, the greater the visual risk.
- GEOptics thereby accounts for much of the variability in how elements in the landscape are seen from multiple viewing locations.

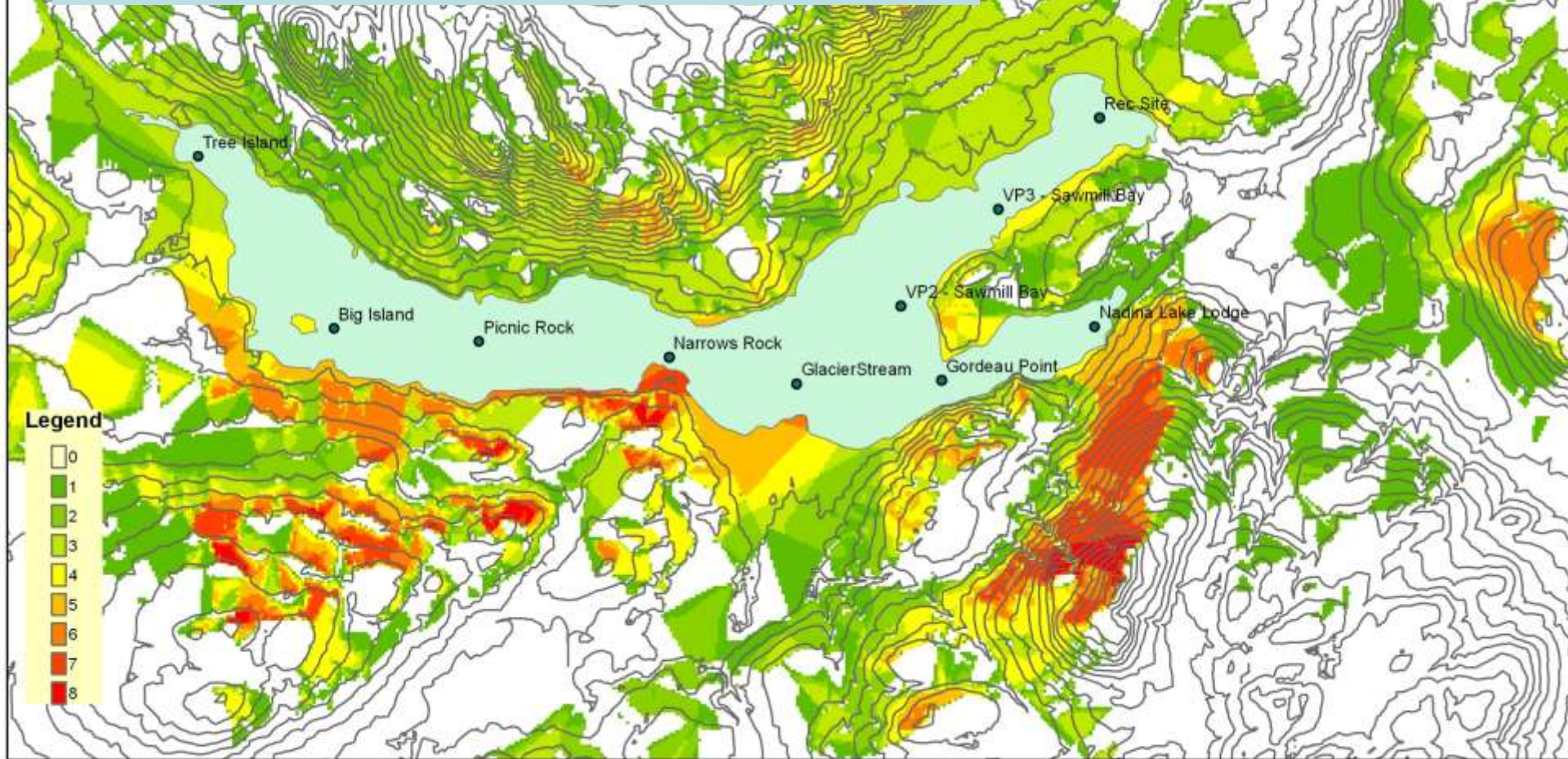
more info at www.GEOptics.com

Nadina Integrated Visual Design Plan Composite Viewshed – Forest Height Adjusted

GEOptics



**Typical Cumulative Viewshed – Times Seen Map
Highlights most seen areas but not how they
are seen.**

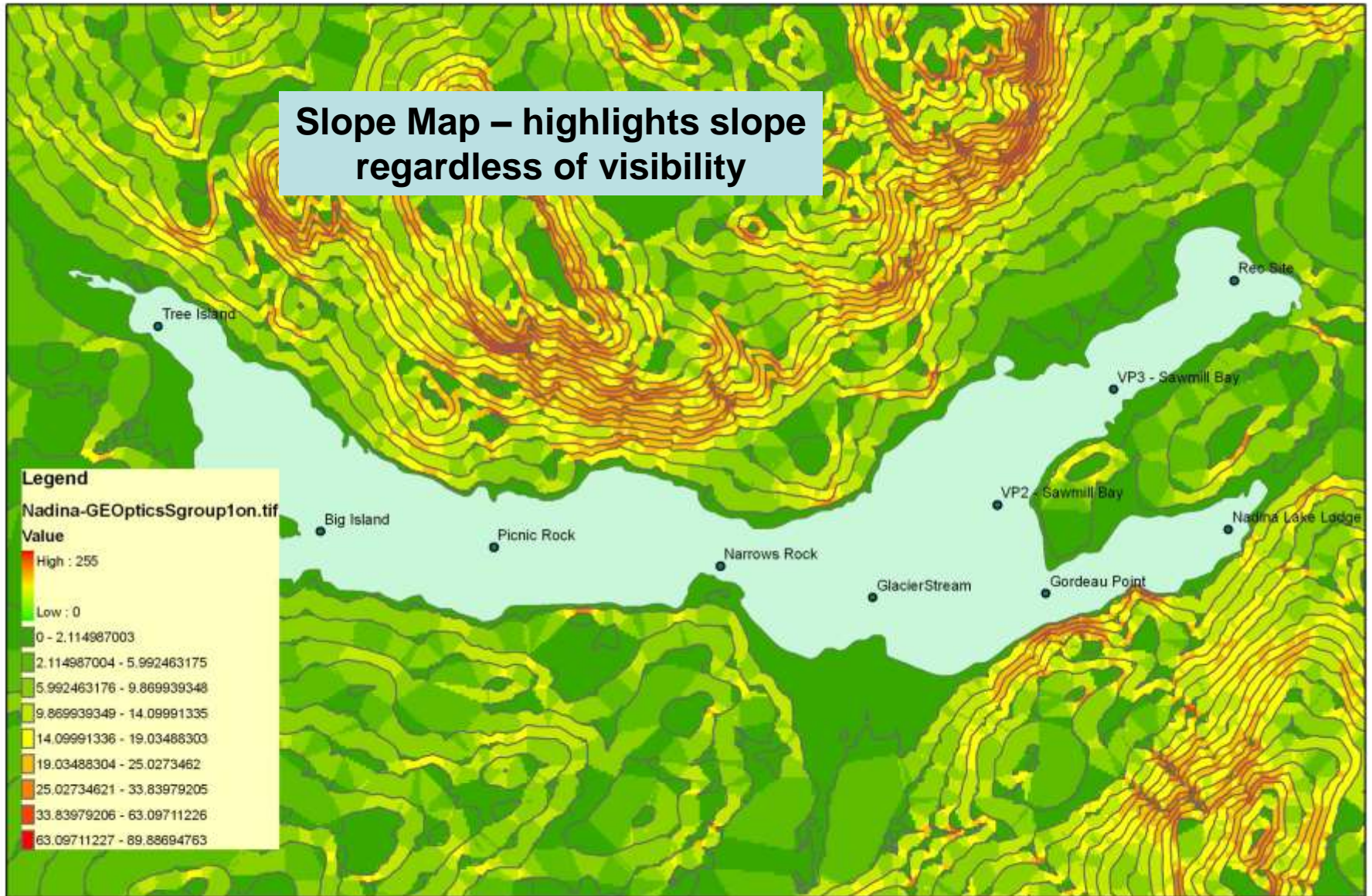


West Fraser Mills Ltd.

Nadina Integrated Visual Design - Cumulative Viewshed (times seen)

Produced by:
RDI Resource Design Inc
February 7, 2007

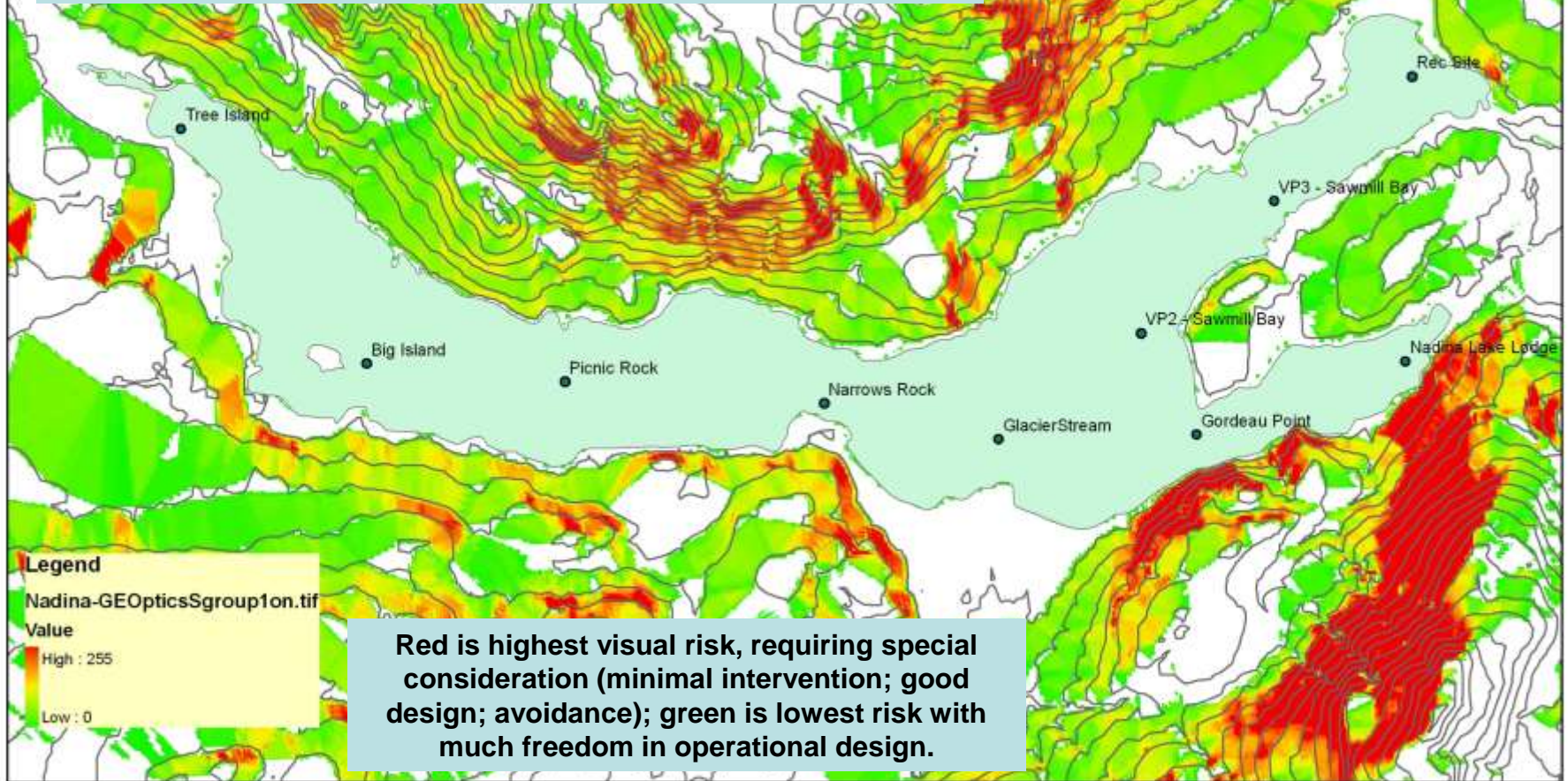
**Slope Map – highlights slope
regardless of visibility**



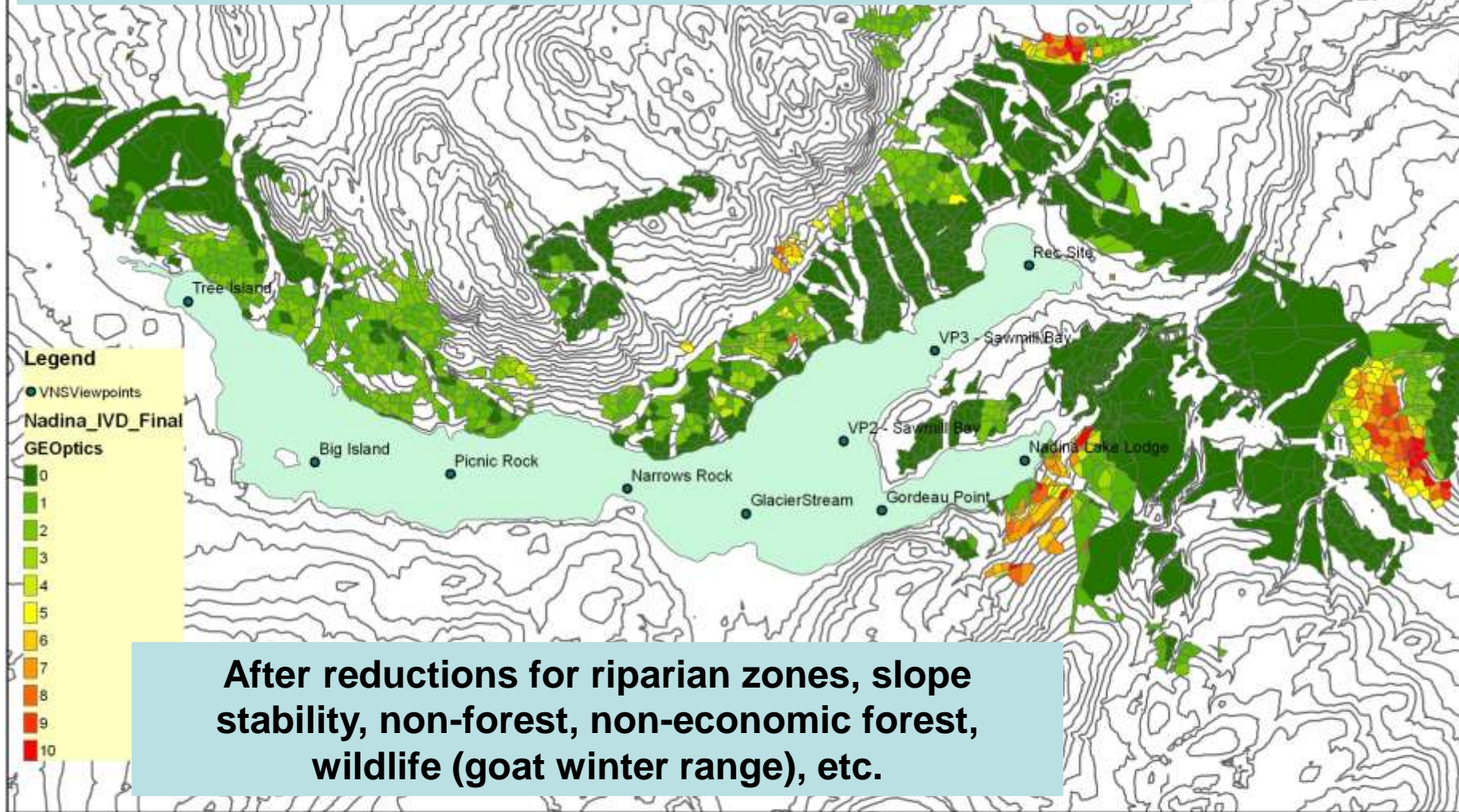
West Fraser Mills Ltd.
Nadina Integrated Visual Design - Slope Map (20m)

Produced by:
RDI Resource Design Inc
February 7 2007

**GEOptics Apparency (Visual Risk)
Ken Fairhurst's Research into Cumulative Angle of
Visual Incidence at each landplane from multiple
viewpoints.**



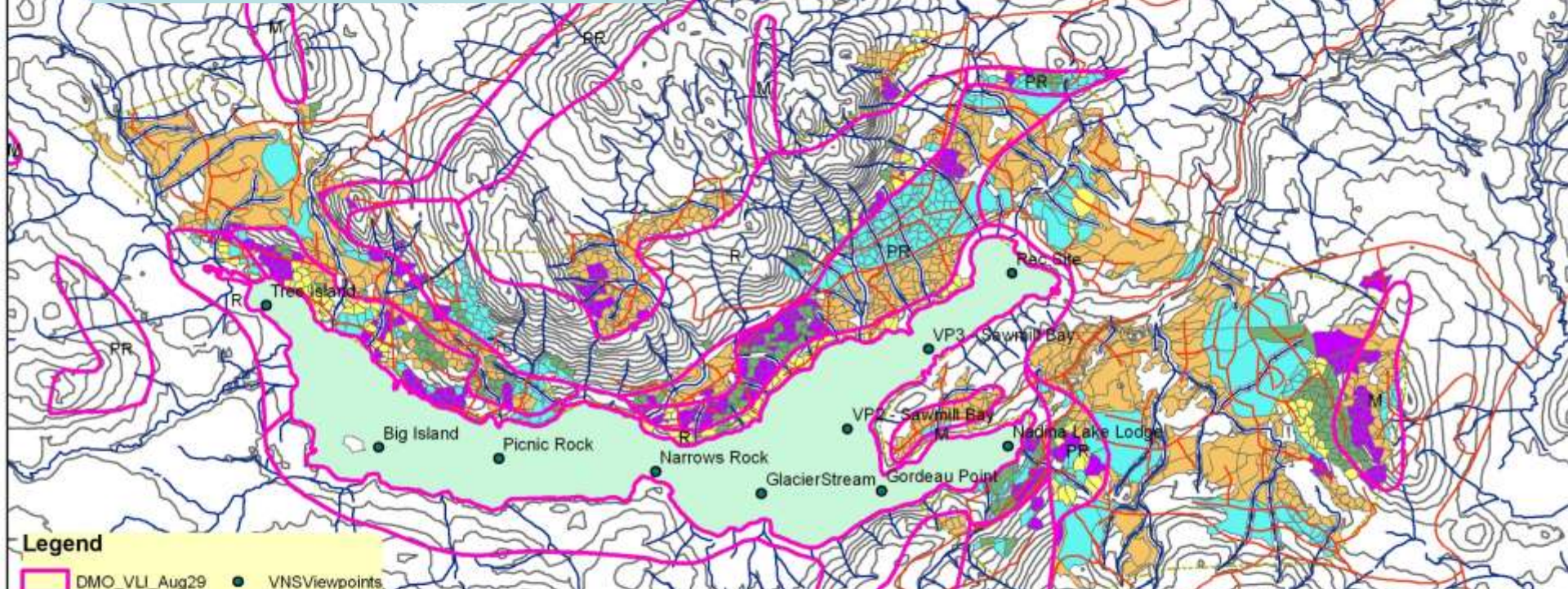
GEOptics Apparency in each Planning Cell
Class 0 – non-visible; no vulnerability (dark green) –
Class 10 - greatest vulnerability (red)



After reductions for riparian zones, slope stability, non-forest, non-economic forest, wildlife (goat winter range), etc.



4-Phase 100 Year Schedule Assisted by GEOptics



Legend

- DMO_VLI_Aug29
- VNSViewpoints
- Nadina_IVD_Final
- PHASE_F
- 1
- 2
- 3
- 4
- 99
- Export_streams

Each phase will be 18-25 years, sufficient to achieve visually effective green-up (VEG) where the average viewer can see a new forest growing, bare ground, stumps and logging debris are covered over. Phase 99 is unallocated.



Results

In all, 1957 individual harvestable planning units comprising 2052 hectares (5071 acres @ 2.2 acres/hectare) were assigned to phases using visual design principles:

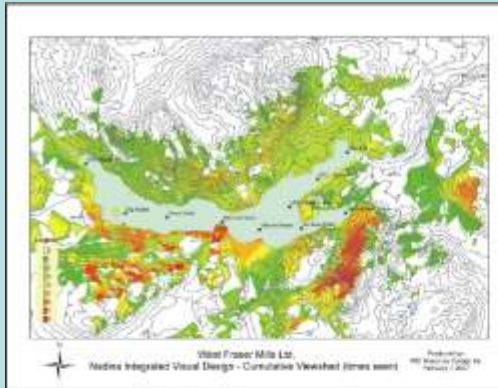
Phase Units Area (ha.) Volume (m3)

1	899	1006	265,905
2	314	216	56,987
3	195	159	44,606
4	373	526	174,925
99	176	145	43,079
Total	1957	2052	585,502 (1,381,668 mfbm)

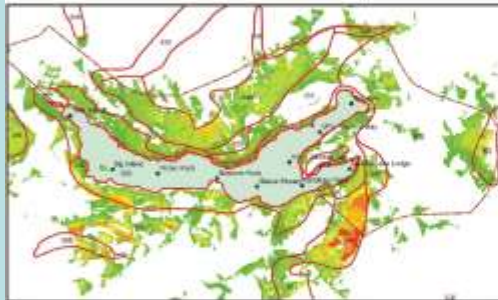
1MFBM = 2.3598 m3

Note: Phase 99 is unallocated.

Nadina Integrated Visual Design Plan



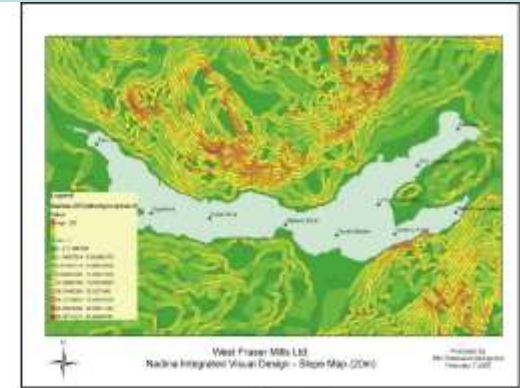
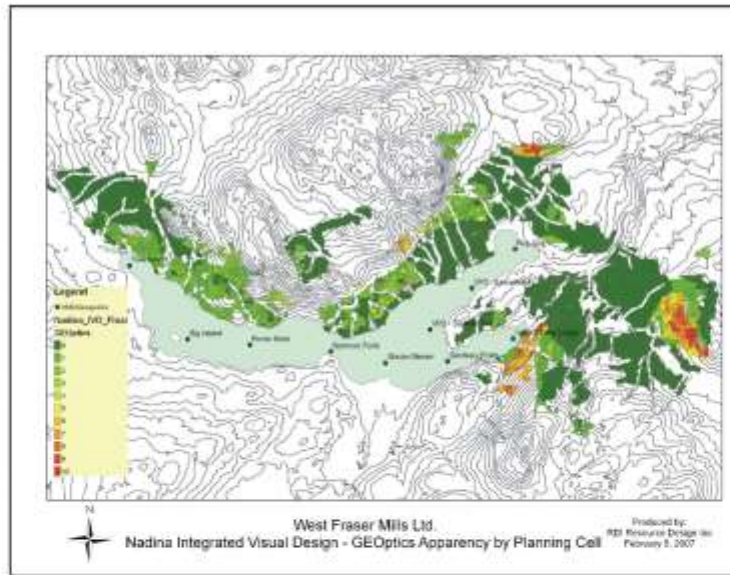
Viewshed - Times-seen Map



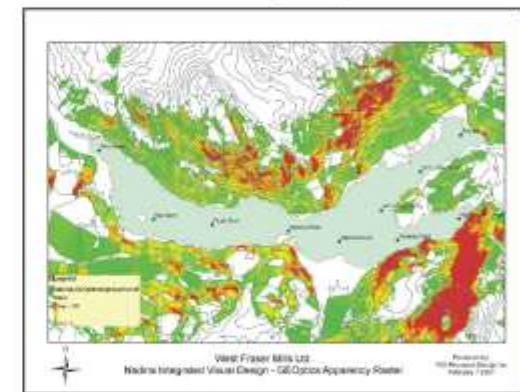
Viewshed - Times-seen Map - Forest Height Adjusted with VSU and Scenic Area Overlays

Composites viewshed analysis was conducted in ArcMap 9.1 3D Analyst. The representation provides a relative importance weighting based on the number of times each pixel is seen from the array of viewpoints which were assigned an elevation of 2m above lake level. The top viewshed was produced with bare terrain; the lower viewshed was adjusted for forest height. The adjusted viewshed can be compared with the Visual Sensitivity Units created in the Visual Landscape Inventory. The key units are:

- 355 (R) - shoreline around most of Nadina Lake
- 349 (R) - main north hill
- 351 (PR) - north-east flats in Sawmill Bay
- 348 (PR) - small north-east hill in Sawmill Bay
- 282 (M) - knob on Gordaue Bay peninsula
- 280 (PR) - south-east portion of south hill, Gordaue Bay
- 285 (R) - south hill, Gordaue Bay
- 362 (M) - far east hill
- 303 (NV/S) - area below 349, not visually sensitive
- 682 (NV/S) - area below 348 and all other NV/S



Slope Map



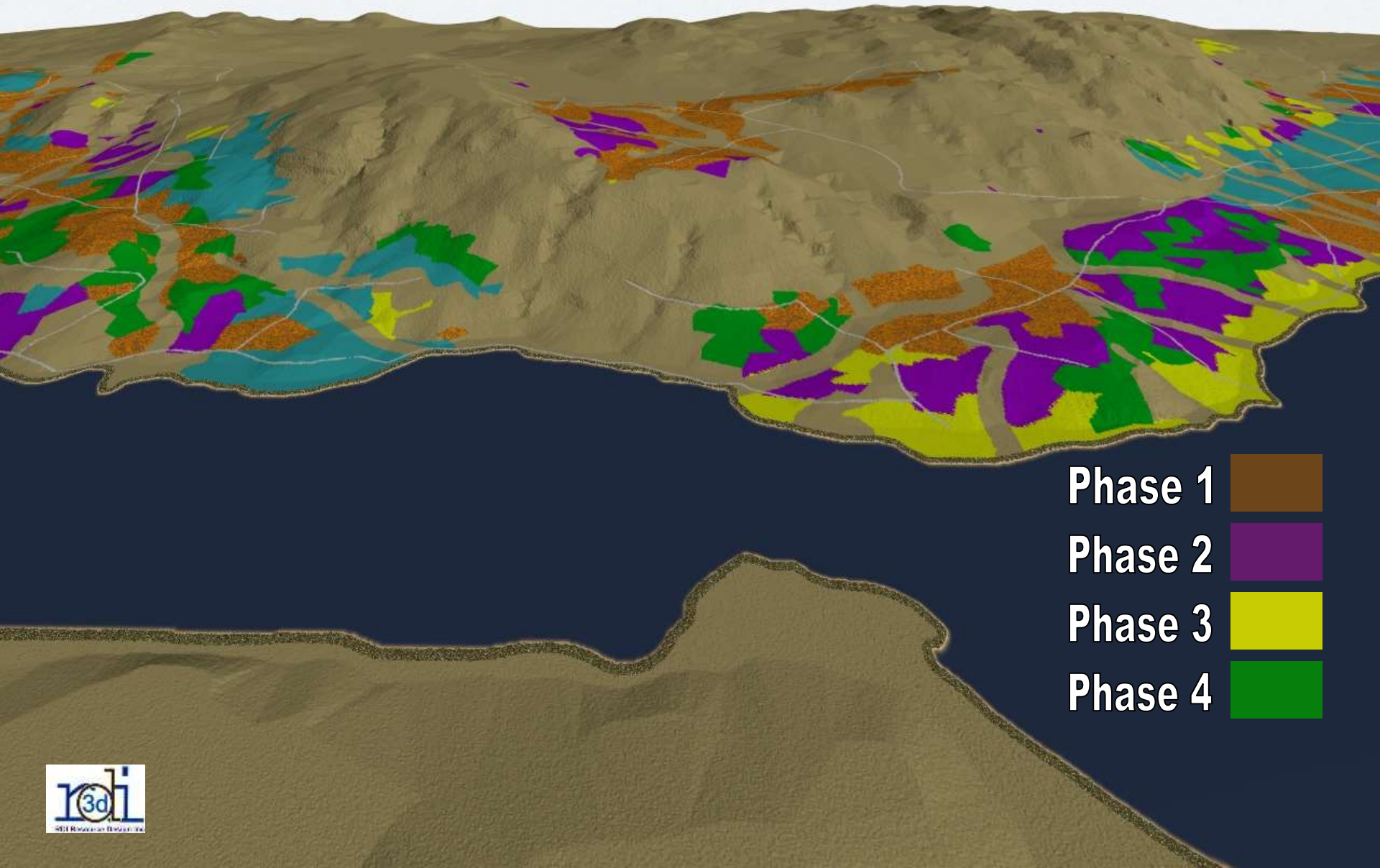
GEOptics Apperency

GEOptics Apperency is the term assigned to K.B. Fairhurst's Ph.D. Dissertation research model that gathers cumulative visual incidence angles from landscape control points. When each planning cell is classified by GEOptics rating (0-10), the relative visual vulnerability across the entire planning area is known. Class 0 has no apperency. Planning cells in this category may be scheduled at any time without influence on visual quality. As apperency increases, visual vulnerability increases, and meeting the VGO is more difficult, requiring detailed design and scheduling over time. Eight LCPs were used in the GEOptics analysis, covering all VNS viewpoints except Glacier Stream and Gordaue Point which were derived for additional plan checking after the GEOptics analysis was completed. More information about GEOptics is available at www.GEOptics.com.

Nadina Integrated Visual Design Plan – Aerial Overview

All Phases

using Visual Nature Studio

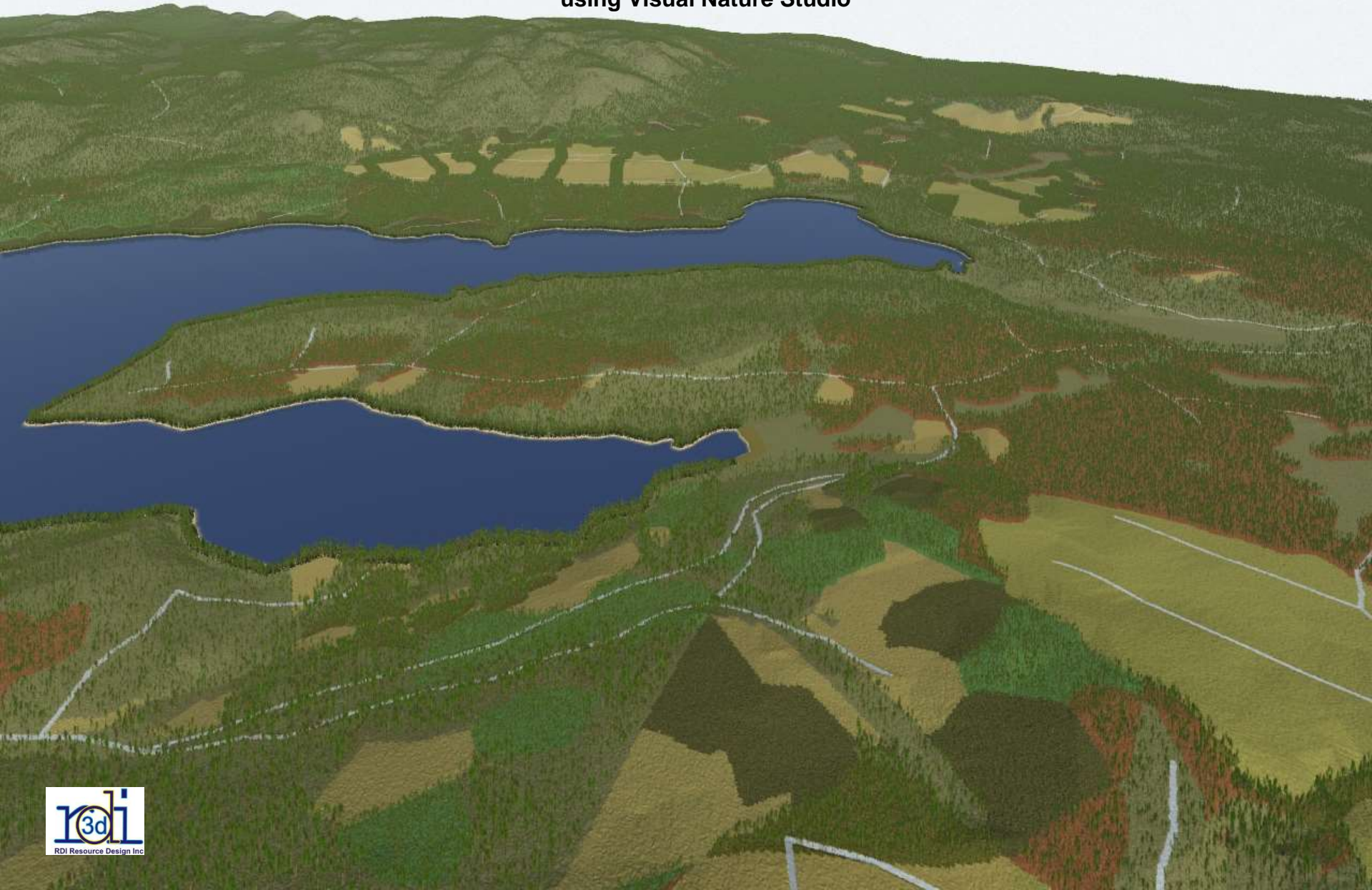


- Phase 1 
- Phase 2 
- Phase 3 
- Phase 4 

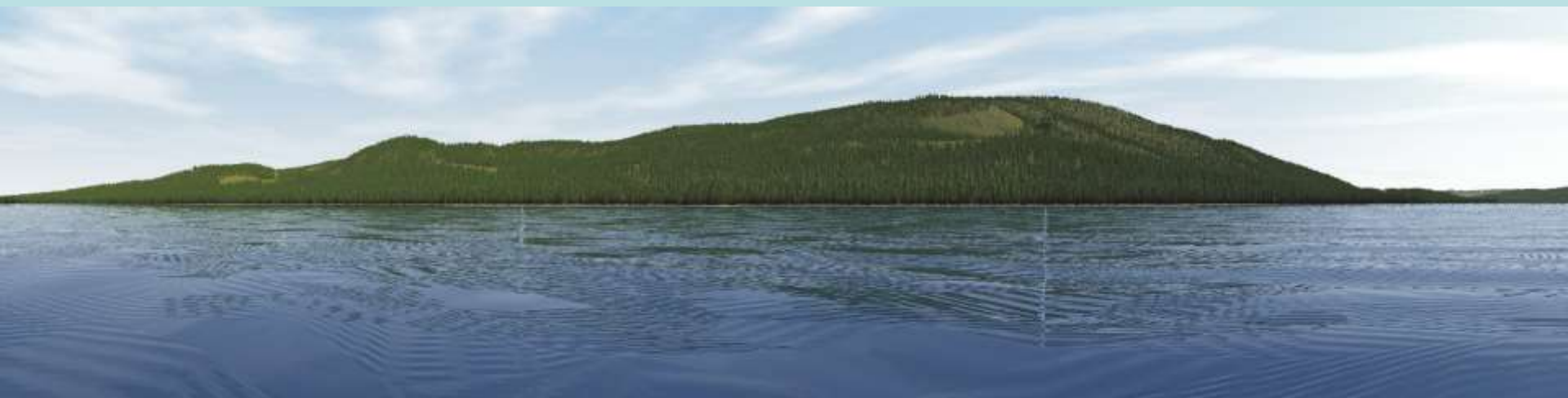
Nadina Integrated Visual Design Plan – Aerial Overview with Green-up in Early Phases using Visual Nature Studio



Nadina Integrated Visual Design Plan – Aerial Overview with Green-up in Early Phases using Visual Nature Studio



Nadina Integrated Visual Design Plan using Visual Nature Studio



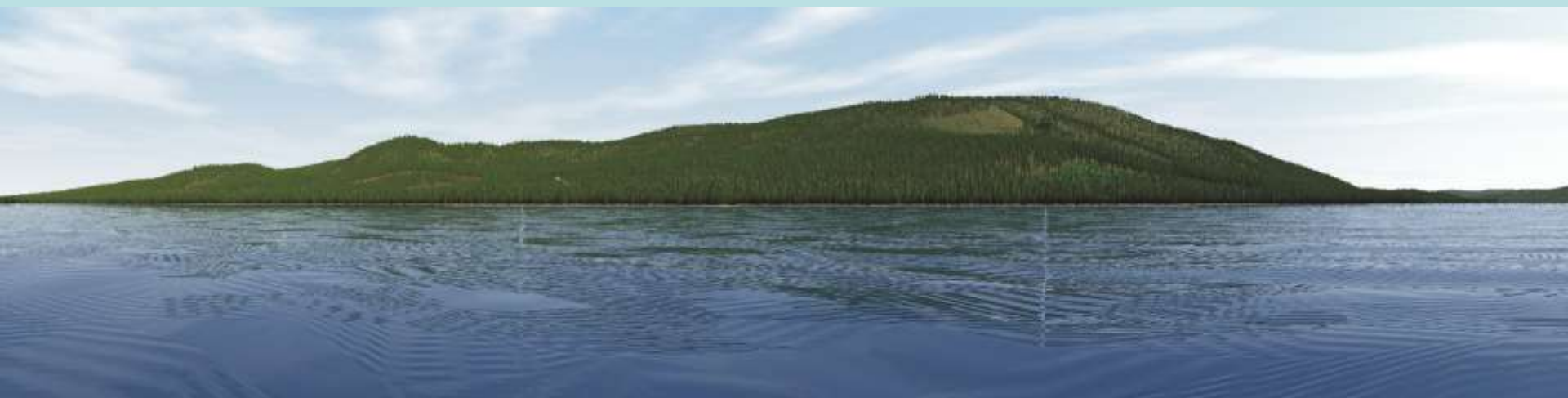
Phase 1

Nadina Integrated Visual Design Plan using Visual Nature Studio



Phase 2

Nadina Integrated Visual Design Plan using Visual Nature Studio



Phase 3

Nadina Integrated Visual Design Plan using Visual Nature Studio



Phase 4

Meeting Visual Quality Objectives with GEOptics IVDP

Assisted by GEOptics, the Nadina 100 year plan succeeded in meeting the Visual Quality Objectives of Retention and Partial Retention in each and every Phase , according to BC Forest and Range Act Visual Quality Class Descriptions:

Procedures for Effectiveness Evaluation of Visual Quality Management

http://faculty.forestry.ubc.ca/sheppard/frst491/FRST491_2006_files/BCMOF-EffectivenessEvaluationProcedure.pdf

(See next frame for descriptions)

Table 1. Definition of Visual Quality Classes

P "preservation"

the alteration is (a) very small in scale, and
(b) designed to be indistinguishable from the
pre-harvest landscape;

R "retention"

the alteration (a) is difficult to see,
(b) is small in scale, and
(c) has a design that mimics natural occurrences;

PR "partial retention"

the alteration (a) is easy to see,
(b) is small to moderate in scale, and
(c) has a design that appears natural and is not angular or geometric;

M "modification"

the alteration is very easy to see and is either (a) large in scale
with a design that is natural in its appearance, or
(b) small to moderate in scale but with a design that has some
angular characteristics.

Nadina Integrated Visual Design Plan using Visual Nature Studio

Phase 1

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Phase 2

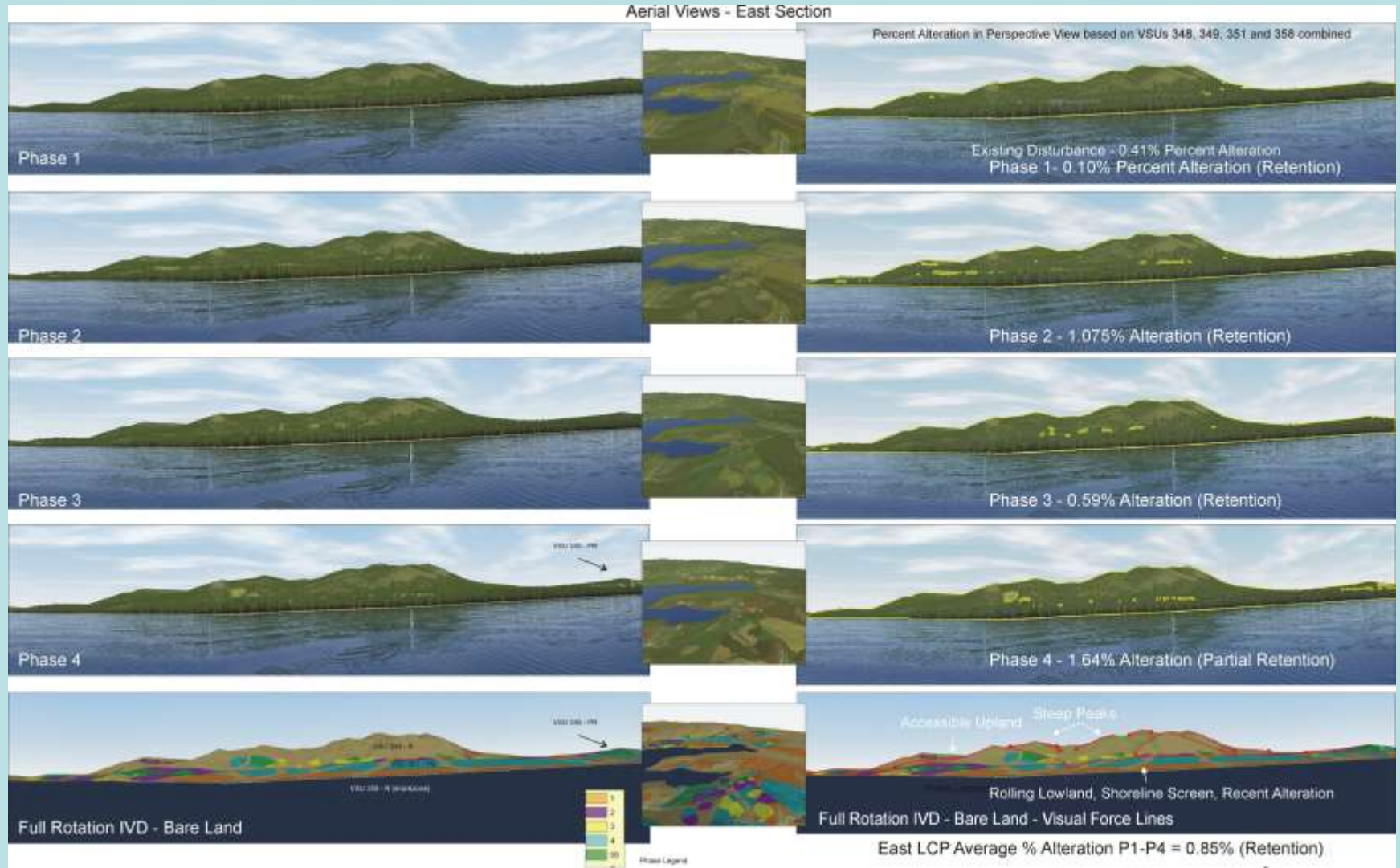
Nadina Integrated Visual Design Plan using Visual Nature Studio

Phase 3

Nadina Integrated Visual Design Plan using Visual Nature Studio

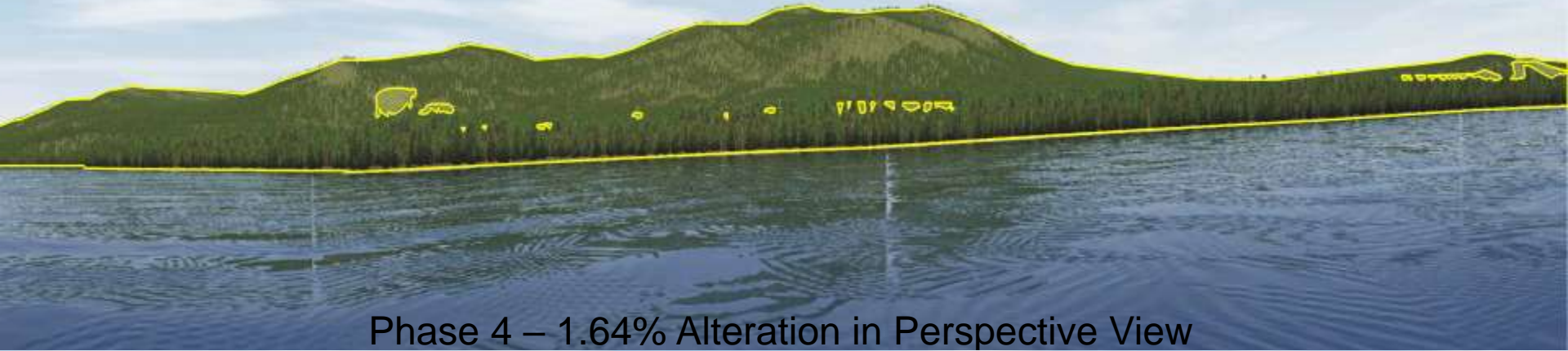
Phase 4

Nadina Integrated Visual Design Plan

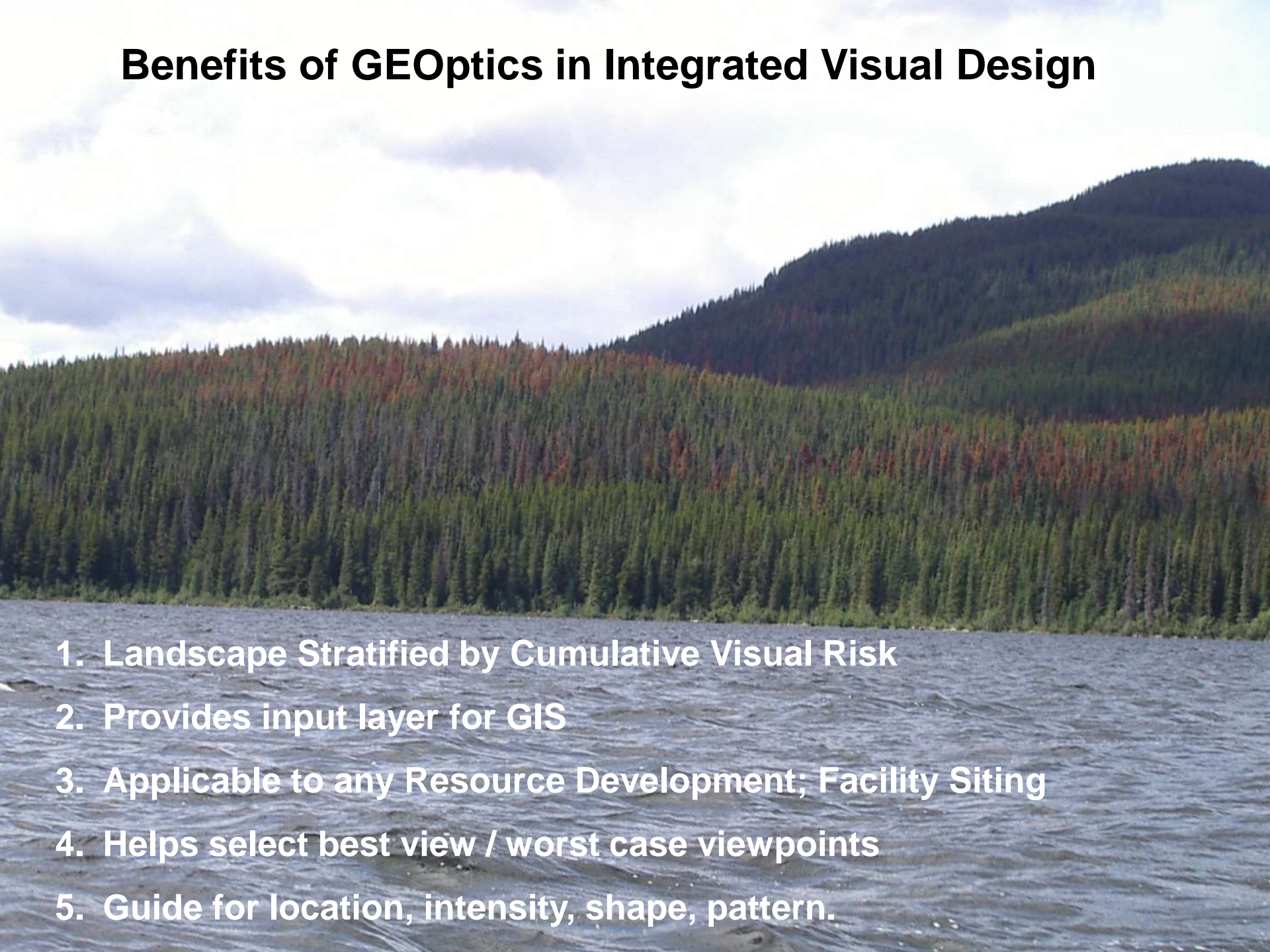


Nadina Lake Integrated Visual Design Plan
East Viewpoint (Sawmill Bay VP 3) Simulations, by Phase

Nadina Integrated Visual Design Plan



Benefits of GEOptics in Integrated Visual Design

- 
1. Landscape Stratified by Cumulative Visual Risk
 2. Provides input layer for GIS
 3. Applicable to any Resource Development; Facility Siting
 4. Helps select best view / worst case viewpoints
 5. Guide for location, intensity, shape, pattern.

Conclusions



- **Integrated Visual Design Planning supports Visual Quality Objectives over the long-term while meeting environmental, operational and economic objectives.**
- **GEOptics Landscape Apparency modeling provides cumulative visual risk assessment and rating for a full set of viewpoints.**

Glossary of VRM Terms

DTM	Digital terrain model — a three-dimensional topographic model or simulation created by a computer using digital data such as TRIM.
EVC	Existing Visual Condition — is a component of the visual landscape inventory that represents the level of human-made landscape alteration caused by resource development activities in a visual sensitivity unit; expressed as visual quality classes.
M	Modification — is a visual condition or objective where activities are visually dominant, but have characteristics that appear natural
MM	Maximum Modification — is a visual condition or objective where activities are dominant and out of scale, but appear natural in the background
non-VEG	Non-Visually Greened-up — is the stage at which regeneration on a cutblock is not yet perceived by the public as a newly established forest; and forest cover on the cutblock is not of sufficient height to block stumps, logging debris, and bare ground from view; once VEG is achieved, an adjacent stand of timber is available for harvest.
PR	Partial Retention — is a visual condition or objective where activities are visible, but remain subordinate
rVQC	Recommended Visual Quality Class — is a specialist's recommendation describing the level of alteration that would be appropriate for a visual sensitivity unit; this recommendation considers visual and other resource values.
VAC	Visual Absorption Capability — is a component of the visual landscape inventory that rates the relative capacity of a landscape to absorb visual alterations and still maintain its visual integrity.
VEG	Visually Effective Green-up — is the stage at which regeneration on a cutblock is perceived by the public as a newly established forest; forest cover on the cutblock should be of sufficient height to block stumps, logging debris, and bare ground from view; once achieved, an adjacent stand of timber is available for harvest.
VIA	Visual Impact Assessment — is an assessment required under the Operational Planning Regulation or Forest Road Regulation that is carried out to demonstrate that timber harvesting operations or road work are consistent with the established visual quality objective for a scenic area. A visual impact assessment simulates, in perspective view, the visual effects on the landscape of proposed timber harvesting operations and road construction or modification operations.

Glossary of VRM Terms (cont'd)

VLI	Visual Landscape Inventory — is the identification, classification, and recording of the location and quality of visual resources; these non-forest resources may be problematic if not managed to the concepts, principles, and practices set out in the visual landscape management process.
VQO	Visual Quality Objective — is a resource management objective established by the district manager or contained in a higher-level plan; these objectives reflect the desired level of visual quality based on the physical characteristics and social concern for the area.
VRM	Visual Resource Management — is a planning and management process for visual values and resources.
VSC	Visual Sensitivity Class — is a component of the visual landscape inventory that rates the sensitivity of the landscape to visual alteration based on biophysical characteristics, as well as viewing and viewer-related factors.
VSU	Visual Sensitivity Unit — is a distinct topographical unit as viewed from one or more viewpoints; its delineation is based on the homogeneity of the landform and of biophysical elements.
	Visual Force — is an illusion or sensation of movement created by a static image, object, or position of a number of elements in the landscape.
	Visual Force Analysis — is an analysis of landform structure to identify primary, secondary, and tertiary ridge lines and hollows in the landscape for use in visual landscape design.



Forestry 491 at UBC

Ken Fairhurst co-teaches Forestry 491, Visualization and Forest Design, with Dr. Stephen Sheppard. The course website is a substantial resource for Visual Resource Management research, literature, and case studies:

http://faculty.forestry.ubc.ca/sheppard/frst491/FRST491_2007.htm

Google search: FRST491



RDI is a full service consulting firm specializing in:

- Visual Landscape Systems Development
- Visual Landscape Inventory
- Integrated Visual Design / Total Resource Planning
- Visual Impact Assessment / Environmental Impact Assessment
- Information and Technology Transfer
- 3-D Visualization and Animation Applications
- Visual Landscape Research
- Contributions to VRM Development
- Visual Nature Studio Reseller
- Custom Visual Nature Studio Training