

Protocol for Visual Quality Effectiveness Evaluation Procedures and Standards

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FREP
FOREST AND RANGE EVALUATION PROGRAM

Protocol for Visual Quality Effectiveness Evaluations Procedures and Standards

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1.0 Introduction

This document explains procedures and standards for evaluating whether forestry operations are meeting established visual quality objectives in designated scenic areas.

The main focus of these procedures is on measuring viewing conditions for clearcut, patch-retention and partial cut alterations in mid-distance view, i.e. 1–8 km from the viewpoint, which account for the majority of current alterations in scenic areas in British Columbia.

These procedures may be used in several ways:

- at the operational level to monitor individual openings;
- at the TSA or TFL level to audit particular licensees; and
- rolled up, at the regional or provincial level to give a broad indication of recent success in managing and conserving visual quality.

Note: The quantitative measurements described in this document have not been calibrated to assess foreground views of alterations immediately adjacent to the viewpoint. The latter type of alterations (e.g., those located adjacent to a highway) must instead be assessed on a case-by-case basis using professional judgment and recognized design techniques, such as the ones described in the Visual Landscape Design Training Manual (BC Ministry of Forests 1994b).

1.1 Forest and Range Practices Act replaces the Forest Practices Code

The Forest and Range Practices Act (FRPA) became law in British Columbia in 2004. It replaced the Forest Practices Code of British Columbia Act (“the Code”) over a two-year transition period. During the transition, FRPA eased planning requirements and put greater reliance on forest professionals. Forest practices must now be assessed based on results rather than on adherence to prescriptions.

The transition from the Code to FRPA has not changed existing land use designations or existing management objectives within designated areas.

The Ministry of Forests and Range, the Ministry of Environment, and the Forest Practices Board are now responsible for evaluating the effectiveness of recent forest management activities. Effectiveness in achieving goals is to be evaluated for the 11 resource values listed in FRPA (Section 149). One of those legislated resource values is visual quality.

1.2 Visual quality objectives and designated scenic areas

Visual quality is a resource value that is managed in designated scenic areas. All scenic area designations and visual quality objectives (VQOs) in effect on December 31, 2004 were grandparented into the new legislative framework and are continued under FRPA (Sections 180-181).

The three types of pre-FRPA scenic area designations are:

- Scenic areas with Recommended Visual Quality Classes assumed to be “current management” by district managers;
- Scenic areas with VQOs established by the district manager under the Code; and
- Scenic areas with VQOs designated as part of higher level plans, such as Land and Resource Management Plans.

New scenic areas are established under authority of FRPA, through the Government Actions Regulation (GAR). The Minister responsible for the Land Act is responsible for the designation of scenic areas. However, where the establishment (including amendment and repealing) of scenic area polygons is part of an update, refinement or revision of an existing visual landscape inventory, the Ministry of Forests and Range has the authority to do that. The ministry can also establish scenic areas outside a visual landscape inventory up to a maximum of 1000 hectares in each forest district.

Responsibility for setting the VQOs within designated scenic areas rests with the Minister of Forests and Range.

1.3 The purposes of Effectiveness Evaluations

Effectiveness evaluations are performed in order to determine whether:

1. forest practices are meeting desired objectives; and
2. existing policies and guidelines are resulting in desired objectives being met.

Effectiveness evaluations are meant to be broad in scope. Ocular estimates are the preferred method for assessing visual quality, although field measurements may also be necessary in some situations.

Focus group studies have shown that although people’s perceptions of the landscape often vary because of differences in their background, experiences and occupation, positive and negative impressions overall are well correlated. Thus, according to research, among all groups surveyed there is:

- less preference for larger alterations and alterations with visible roads or sidecast; and
- greater preference for alterations with significant tree retention and alterations designed to fit well with the landscape.

The Effectiveness Evaluation for visual quality seeks to answer the general question “How well are we managing and conserving views in designated scenic areas?” and also the more specific question “Did recently harvested units achieve the established visual quality objective?” The evaluation is not intended to answer questions such as “Were the pre-harvest visual impact assessments accurate?” or “Were the planned and approved prescriptions carried out?” The latter two are compliance and enforcement questions.

Evaluators must visit viewpoints to inspect the visual impact of a post-harvest forest alteration. They must also take photographs and site notes at each viewpoint. There is normally no need for the evaluator to visit the harvested unit.

2.0 Procedures for Conducting Visual Quality Effectiveness Evaluations

Figure 1 illustrates the recommended step-by-step procedure for conducting a visual quality Effectiveness Evaluation.

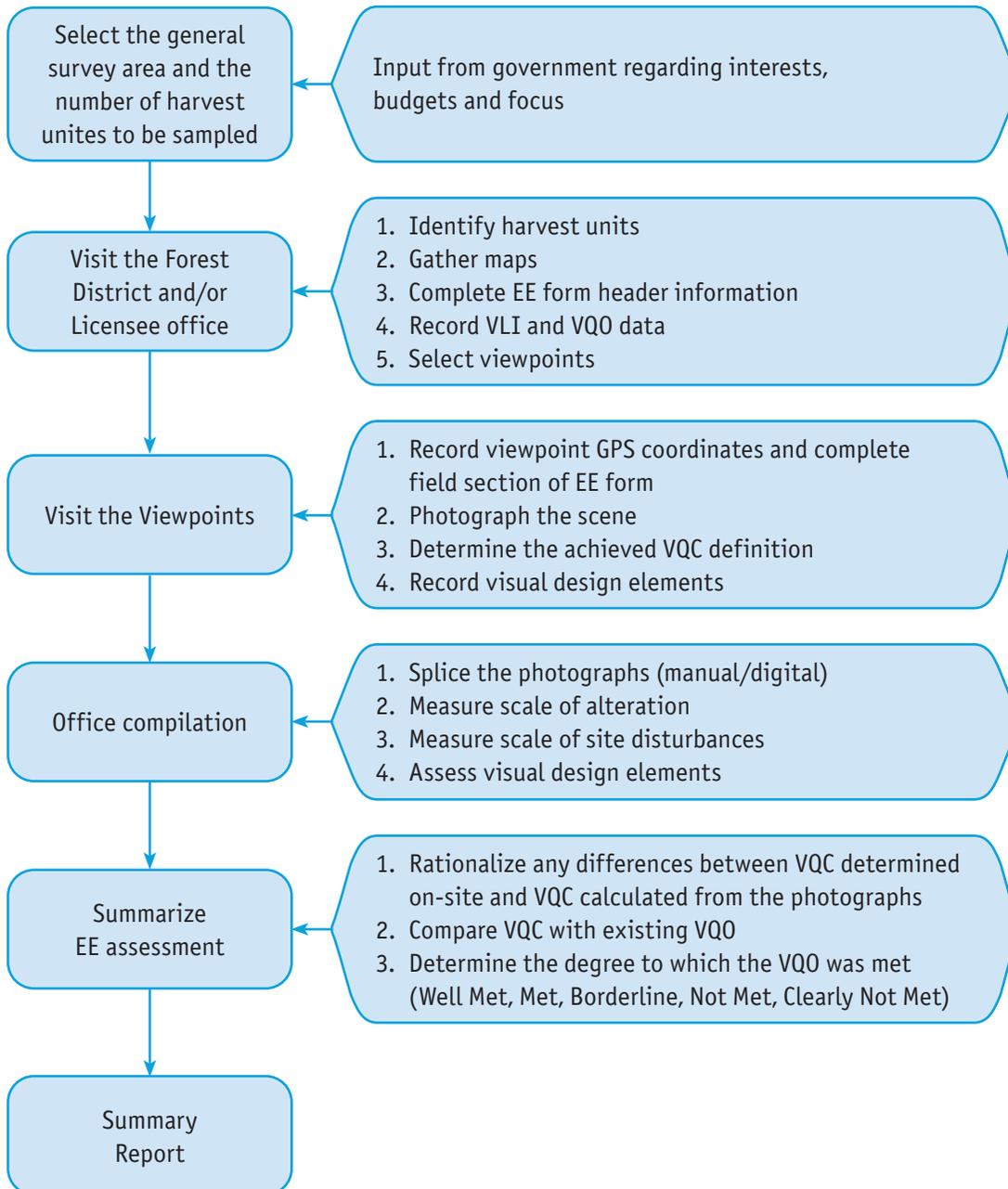
Phase 1 is the responsibility of the Ministry of Forests and Range or the Forest Practices Board: to specify the area to be evaluated and the number of samples to be collected, after consulting with district staff.

The focus in this section is on phases 2 to 4. These involve:

- Phase 2:** Visiting the Forest District office, the licensee office, or both;
- Phase 3:** Visiting locations (viewpoints) from which the harvested units may be best viewed; and
- Phase 4:** Compiling the findings.

Phase 5 (assembling a visual Effectiveness Evaluation package) and Phase 6 (summarizing the effectiveness evaluation ratings for a sample area) are discussed below in sections 3.0 and 4.0.

Figure 1. Recommended procedure for conducting a visual quality Effectiveness Evaluation



Points to keep in mind:

- Visual quality effectiveness is generally evaluated at the landscape level and may involve multiple cutblocks, viewpoints and licensees. Examples of evaluation areas: a long stretch of highway corridor, an entire valley, a lakeshore, a coastal inlet or channel.
- The evaluation must be conducted at all important viewpoints. New and older alterations not yet greened-up in the subject landscape must be included in the evaluation. Alterations are considered “greened-up” when the public would perceive what they see to be a regenerating forest and when the new forest cover is sufficiently tall to obscure stumps, logging debris and bare ground. For more information, see A First Look at Visually Effective Green-up in British Columbia (BC Ministry of Forests 1994a).
- Each view must be assessed according to whether it meets:
 - (1) the basic visual quality class (VQC) definition (discussed below in section 2.2.3); and
 - (2) the percent perspective landform alteration criteria (discussed below in section 2.3.2), which include consideration of the quality of visual landscape design.
- The final Effectiveness Evaluation rating combines the result of the above two independent measures. The achieved VQC under the basic definition is compared with the VQC determined using perspective measurement and adjustment for the scene attributes. The final rating for each landform is determined by reconciling any differences between the two assessments from each viewpoint in a brief written rationale.

2.1 Office Visit (Phase 2)

The evaluator’s role begins with a visit to the Forest District office, the licensee office, or both, where records for the area of interest are maintained.

Point to keep in mind:

- If you notify the district or licensee contact ahead of time, the contact can have the following materials ready before your arrival at the office.

2.1.1 Gather maps

- For each alteration of interest, acquire a copy of:
 1. the silviculture prescription map (pre-FRPA) or the site plan map available from licensees once they prepare a Forest Stewardship Plan;
 2. a topographic map of the landform, showing the location of the harvested unit;
 3. an area overview map showing highways, waterways, and viewpoints; and
 4. the visual landscape inventory (VLI) map for the area at an appropriate scale (typically 1:50,000 or larger).

The VLI map will show the base data considered in the establishment of VQOs. It will also show key viewpoints, screening type and location, and viewing opportunities that a licensee would have considered in planning the alteration.

2.1.2 *Complete the Effectiveness Evaluation form header information*

- Complete one evaluation form for each of the viewpoints selected.

(See Appendix 1 for the form to use.)

- In the first section of the form, record the general information about the alterations selected for evaluation while you are still at the office. Remember to record the licence number, cutting permit number, and cutblock number to identify the opening. If you have used the RESULTS application to identify an opening, enter the RESULTS opening ID in this section of the form as well.

2.1.3 *Record VLI and VQO data on the Effectiveness Evaluation form*

- Determine for each alteration and then record on the Effectiveness Evaluation form the:
 - base VLI data,
 - update date of the VLI,
 - established VQO, and
 - date of VQO establishment.
- Confirm the established VQO and date of establishment by checking the source documents – for example, the VLI database, a district manager letter, a higher level plan, or the Forest Development Plan or Forest Stewardship Plan in effect.
- In the absence of established VQOs, record the recommended visual quality class (RVQC) considered current management.

Important Note:

- Ensure that you record the VLI and RVQC or established VQO information that would have been in effect at the time the opening was approved.

2.1.4 *Select viewpoints*

- You will confirm the final selection of the viewpoints to be used for the evaluation in the next phase by traveling through the areas of interest to photograph and assess the visual impact of the harvested units. However, the office visit gives you an opportunity to tentatively select the location (or locations) from which each harvested unit is most visible. The viewpoints you choose can be those indicated on the VLI map or they can reflect other view locations that were chosen by the licensee at the pre-harvest design phase. District staff familiar with the areas of interest may recommend additional or better viewpoints.

Examples of viewpoints selected for evaluation (those with significant public use):

- a long stretch of highway leading toward the harvest unit
- a rest stop
- a recreation site
- a group of homes
- a settlement
- a tourist-related commercial enterprise

Points to keep in mind:

- Visual Impact Assessment (VIA) packages were a pre-harvest requirement for operations in scenic areas with established VQOs since 1995. These documents, accessible from licensees, may assist you in selecting key viewpoints. The packages contain maps showing important viewpoint locations. They also show the output from computer or manual simulations of the proposed alteration, overlaid on a perspective view of the landform, from each viewpoint location.
- The intent of the visual quality Effectiveness Evaluation is to efficiently obtain a general answer to the question of whether VQOs are being met in a scenic area. To that end, it is not necessary to select every viewpoint that may be shown on a VLI map or chosen in the VIA package for the pre-harvest design phase. Most alterations are assessed from primary and representative key viewpoints. This is often the location offering the best view or most direct view of the alteration.

2.2 Field visit (Phase 3)

Following the assembly of information at the office, the next step of the evaluation procedure is to visit each key viewpoint in the field to observe the alteration, take photographs and conduct the assessment.

Points to keep in mind:

- Weather should be clear (90% cloud free) and the scene well illuminated for optimal photography. Illumination is strongest in the summer months. East-facing units are best viewed in the morning and west-facing units are best viewed in the afternoon.
- Evaluators should wear bright safety vests and use traffic cones when stopped and working along busy highways.
- District staff who assisted in information assembly may benefit by participating in the field visit.

2.2.1 Fill in the field section of the Effectiveness Evaluation form

- On the Effectiveness Evaluation form (Appendix 1), record information about the viewpoint location, including GPS co-ordinates, elevation, viewing direction, and distance to the alteration (or alterations).

Viewpoint number – It may be necessary to complete an evaluation form from several viewpoints. If this is the case, record the viewpoint number out of the total number of viewpoint used for the evaluation – 1 of 4, 2 of 4, etc.

Viewpoint coordinates – Identify the viewpoint location using a GPS unit and record the position using longitude and latitude coordinates (i.e., record degrees, minutes, and decimal seconds).

Viewing direction – Record viewing direction using a compass bearing (0–360°) from the viewpoint to the centre of landscape being assessed.

Viewing distance – Measure the distance from each viewpoint to the centre of the landscape that contains the cutblock (or cutblocks). The best way to do this is to use a scale ruler on a hardcopy map. This can also be done within the GIS environment or by going online and using the Mapview measuring tool to determine a distance.

2.2.2 Photograph the scene

- Record the perspective view of the alteration from the viewpoint. Use high-resolution digital photography (e.g., TIFF or Fine JPEG format), 35 mm print film, or video imaging. Mount cameras on a stable tripod to ensure the clearest possible image of the landscape.
- Use a 50- to 55-mm lens or equivalent to photograph the setting and landform of the alteration (human eye equivalency is 57 mm). This may necessitate a series of overlapping photographs (25% overlap minimum) to capture the entire scene. The photographs will later be spliced or stitched together to provide a broad panorama.
- As well, photograph the alteration at a zoomed-in scale to show any within-block visual influences such as roads, tree retention, or feathered edges.

Viewpoint importance – Record the importance of the viewpoint on the evaluation form using a five-point scale calibrated to the viewing duration:

- (1) glimpse view, less than 10 seconds;
- (2) sustained side view;
- (3) sustained focal view or traveling toward the alteration for more than 1 minute;
- (4) viewpoint at a rest stop, campsite, or other static short-term view location;
- (5) viewpoint at the location of a community, commercial tourist-related enterprise, or other static long-term view site.

Viewpoint importance is used to weight the Effectiveness Evaluation ratings obtained from multiple viewpoints in the event that individual evaluation ratings differ. Viewpoint importance may also be used to weight the aggregated Effectiveness Evaluation survey results for a complete scenic area or travel corridor.

Viewpoint description – Record what the viewpoint is (i.e., rest stop, boat launch, highway pullout, etc.).

Field of view (width) – Take a compass bearing to the right side of the landform being assessed and then to the left side of the landform. Record the difference between the two angles. (Example: If the two bearings were 100° and 180°, the width of view would be 80 (180 – 100)).

Field of view (height) – Take a clinometer reading, using the degree scale, to the base of the landscape and to the top of the landscape. Where both numbers are positive, subtract the low number from the higher number to determine the field of view height. If the base number is negative, add this to the top measure to get the total field of view height. (Example: If the two readings were $+5^\circ$ and -2° , the height of view would be 7° ($5 + 2$)).

2.2.3 Determine the Basic VQC definition

- Use the written definitions of visual quality classes (Table 1) to determine the visual quality class achieved on the landform.
- Refine the determination as being toward the low, mid, or upper range for the class. For example, if an alteration is rated as Partial Retention (PR), decide whether it is closer to Retention (R), Modification (M), or somewhere in between.
- Circle the location along the scale line on the evaluation form that best represents what is seen.
- Record on the form aspects of the scale and/or design of the alteration and its surroundings that caused it to meet the low or high end of a particular VQC.

Note that any other existing non-green alterations on the landform must also be considered in this determination.

Point to keep in mind:

- The definitions in Table 1 come directly from the Forest and Range Practices Regulation (section 1.1) and must be used as is. There is no legal tolerance for personal judgments or interpretations.

Table 1. Basic definitions of Visual Quality Classes (VQCs)

Visual Quality Class	Symbol	Basic Definition
Preservation	P	<p>“preservation” means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration is</p> <ul style="list-style-type: none"> (a) very small in scale, and (b) designed to be indistinguishable from the pre-harvest landscape;
Retention	R	<p>“retention” means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration</p> <ul style="list-style-type: none"> (a) is difficult to see, (b) is small in scale, and (c) has a design that mimics natural occurrences;
Partial Retention	PR	<p>“partial retention” means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that, when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration</p> <ul style="list-style-type: none"> (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;
Modification	M	<p>“modification” means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that, when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration is very easy to see and is either</p> <ul style="list-style-type: none"> (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;
Maximum Modification	MM	<p>“maximum modification” means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that, when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration is extremely easy to see and one or both of the following apply:</p> <ul style="list-style-type: none"> (a) the alteration is very large in scale; (b) the alteration is angular and geometric.

2.2.4 Assess and record visual design elements

The viewpoint visit provides an opportunity to assess the visual design of the alteration.

- Answer the following questions by providing a Good, Moderate, or Poor rating on the Effectiveness Evaluation form. For reference, see the description of key design concepts and principles in the Visual Landscape Design Training Manual (BC Ministry of Forests, 1994b, pp. 49–63) and the Visual Impact Assessment Guidebook (BC Ministry of Forests 2001). Table 2 provides a summary of the design elements to assess.
- 1. Does the alteration respond to the major lines of force?** Opening boundaries should respond to topography by pushing up in hollows and dropping down on ridges. Lines of force should be rated Good if there is a strong response or Poor if there is little or no response. If visual force lines are not apparent on the landform (i.e., because of a lack of undulation or the topography is being obscured by residual trees), the rating should be neutral, or Moderate. To answer this question, complete a lines of force analysis.
 - 2. Does the alteration borrow from the natural character of the landscape?** Does the shape of the alteration reflect the quality of shapes found in the natural landscape (rounded curvilinear shapes on rounded landforms; spiky more jagged shapes in more rugged terrain), and does the opening respond to natural vegetation patterns and openings in both in scale and shape? For example, if the landscape is forested with small discrete rock outcrops, do the harvest operations mimic this pattern?
 - 3. Have edge treatments been incorporated?** Edge treatments include two aspects: use of feathering to soften the transition between the alteration and the unaltered forest, and the use of irregular or wavy boundaries. If both aspects are present, the rating is Good; if one aspect is present, the rating is Moderate; and if neither aspect is present, the rating is Poor.
 - 4. How far is the alteration from the viewpoint?** The distance from the viewpoint can significantly influence public perception of an opening. Foreground openings are difficult to integrate because all the detail is visible. Distant openings are much easier to integrate because less detail is visible. The distance factor is rated Poor if it is less than 1 km, Moderate if 1–8 km, and Good if more than 8 km distant.
 - 5. What position does the alteration occupy on the landform?** If an opening occupies the centre of a landscape in direct view, it should be rated Poor for position. Openings located lower down and to one side of a landform are often less conspicuous and are rated Good. Larger openings low down or small openings higher up are more comfortable to the eye and should be rated Moderate or Good. Large openings high on the landscape should be rated Poor.
- Each design component should then be assigned a score of –1 if Good; 0 if Moderate; or +1 if Poor (see Table 2). Enter the sum of the five components in section 2.3.3(f) on the evaluation form.

Point to keep in mind:

- The assessment of design elements considers five primary attributes. Other design elements include factors such as the visibility of tree boles, texture and colour contrast, and the presence of water bodies. These factors are addressed largely by the inclusion of “distance from the viewpoint” as a modifying attribute.

Table 2. Design observations

Design Elements	Good (-1)	Moderate (0)	Poor (+1)
1. Response to major lines of force	Strong	Force lines not apparent	Weak or no response
2. Borrowing from natural character	Fully	Partially	Isolated or not at all
3. Incorporating edge treatment	Feathering AND irregular boundaries present	Either feathering OR irregular boundaries present	Neither aspect present
4. Distance between alteration and viewpoint	> 8 km	>1 and <8 km	<1 km
5. Position of opening on the landform	Lower down and to one side	Small opening near centre	High on the landscape or large near centre

2.3 Office compilation of the results (Phase 4)

Following the field visit, the photographs taken from each viewpoint are further analyzed to confirm the field ratings and used to measure the percent alteration of the visual unit. This measurement is necessary to confirm the decision about the VQC achieved using the basic definitions in Table 1.

If multiple overlapping shots were taken to capture the entire scene from a given viewpoint, the prints (at least 8 in. X 10 in.) need to be spliced together. In the case of digital photographs, they can be stitched together and printed on a colour printer to provide the broad panorama and landscape context necessary to carry out the following steps.

2.3.1 Confirm the visual design

- Having assessed the five components of the design of the alteration during the viewpoint visit, make adjustments to the initial ratings by analyzing the panoramic and zoomed-in photographs.

2.3.2 Assess the Initial VQC rating

Assessing the Initial VQC rating involves first mapping the landform and alterations on the photographs, second measuring the scale of alteration on the landform and then comparing the result with the percent alteration ranges in Table 3.

Appendix 4 provides a synopsis of mapping, measuring and calculating percent alteration in perspective view.

Mapping landform and alteration(s)

- On the panoramic print, define and outline the visual unit or landform.
 - When mapping landforms adjacent to water bodies, map to the top of the foreground trees if you are 1 km or less from the landform. If you are greater than 1 km from the landform, map to the shoreline.
- Define and outline on the photographs the recent alteration(s) and also any older alterations that have not met visually effective green-up.
 - When outlining alterations, map only the visible portions of the ground disturbed. Portions of the alterations screened by vegetation are excluded from the measurement.
 - As well, map the extent of site disturbance such as roads, landings, sidecast, and mass wasting outside the alteration(s).
- Finally outline any natural non-green areas such as mountain tops, ice, and rock outcrops.

Measuring percent alteration – *The goal is to compare the amount of visible alterations without visually effective green-up to the “total green” portion of the landform. This means that natural non-green areas such as mountain tops, ice, rock outcrops, and portions of the landscape screened by vegetation, are excluded from the landform measurement.*

Scale of alteration is expressed as the percentage of the visual unit or the landform occupied by the alteration(s) (as assessed on the photographs showing the perspective view from the viewpoint). Percent perspective alteration is calculated relative to an identifiable visual unit of distinct topographical landform as defined in the preceding steps.

Points to keep in mind:

- Scale of alteration is not to be assessed relative to a broad scene or entire viewscape.
- There are three vegetation components in an alteration in perspective view: the green forest canopy, tree trunks, and bare ground. The current definition of “altered area” only considers bare ground. Exposed tree trunks are excluded from the alteration measurement.

Using a computer GIS system or a planimeter (manual method), determine the relative area of:

- landform or visual unit (remember to exclude the “non-green” portions of the landform);
- recent alteration(s) on the landform;
- site disturbances outside the alteration(s).

Note: The use of a digital planimeter or computer-GIS functionality is the preferred method. Dot grid estimates are not accurate and should not be used for Effectiveness Evaluation.

- Measure other existing alterations on the landform that have not achieved visually effective green-up and add them to the subject alteration area to assess the overall visual condition of the view.
- In some cases, older openings on the landform will have achieved only partial visual green-up because some roads, site disturbances, and patches of bare ground may be visible within the opening). As these opening still contribute significantly to the visual impact on the landscape they have to be accounted for in the percent alteration calculation. A “suspect block” (partially greened-up) should be measured like any other opening and a percent alteration proportion calculated. Following this, an ocular assessment would be made in terms of the level of recovery achieved.

Example: If an older block was a 10% alteration initially and it is estimated that on average 60% of the block is visually greened-up, this would mean that 40% has not greened-up yet. The 10% would then be multiplied by the 40%, indicating that the block still contributes 4% of alteration to the overall landform. Adding this partial green-up figure to the new alterations would increase the measured scale of alteration and make it more in line with the initial ocular assessment of the basic definition.

- Calculate the percent alterations from the photographs and enter the measurements in section 2.3.2 on the Effectiveness Evaluation form, including:
 - a) percent of the landform altered by recent openings and any older openings without visually effective green-up in place;
 - b) percent of the landform showing site disturbances outside the openings; and
 - c) percent of non visual green-up contribution of old openings.
- Add the percentages together. This total will be used in the next step to determine an Initial VQC rating.

Comparing percent alteration with that in Table 3

Table 3 lists the scale of alteration that generally achieves a specified VQC (according to past experience and visual quality studies done in British Columbia).

- Compare the percent alteration figure obtained in the step above (“Measuring percent alteration”) with the figures in Table 3. Then enter the resulting “Initial VQC” on the evaluation form (section 2.3.2).

Table 3. Percent alteration ranges for Visual Quality Classes (VQCs)

Visual Quality Class	Alteration percent of landform in perspective view (clearcut)
P - Preservation	0
R - Retention	0–1.5
PR - Partial Retention	1.6–7.0
M - Modification	7.1–18.0
MM - Maximum Modification	18.1–30.0

2.3.3 Assess the Adjusted VQC rating

The numbers in Table 3 provide average results from public perception studies and do not explicitly account for site disturbance, tree retention, or design features. These other attributes of the scene also contribute to the overall visual impact, either negatively or positively.

Negative visual influences include visible roads and sidecast. Positive visual influences include good design and tree retention. If an alteration has good design and tree retention of up to 25%, it may occupy as much as 10–11% of a landform and yet still achieve Partial Retention in a public perception survey. On the other hand, if an alteration has visible roads, landings, sidecast, or mass wasting, even though it may occupy only 4–5% of the landform, it may still be given a Modification rating by the public.

The “Adjusted VQC” calculated on the evaluation form accounts for these influences. Making this calculation involves adjusting the initial percent alteration value, as measured from the photographs, up or down depending on the degree of positive and negative visual influences. The steps are as follows.

- Assess the following three aspects of the visual scene on a qualitative scale and assign “adjustment factor” points:

To account for roads, landings, and site disturbance within the opening:	
	Adjustment Factor
If no roads or sidecast are visible	0
If roads or sidecast are visible, but subordinate in the scene	+1
If roads or sidecast are significantly visible, but small in scale	+2
If roads are sidecast dominate the scene	+3

To account for tree retention:	
	Adjustment Factor
Less than 15% tree retention (rated Poor)	0
Tree retention levels between 15 and 22% (rated Moderate)	+1
Greater than 22% tree retention (rated Good)	+3

To account for design:	
The sum of the scores for the five components of design (rated in section 2.2.4 of the form and assigned a score of -1, 0, or +1 for Good, Moderate, and Poor, respectively) is used as the Adjustment Factor for design.	

- Sum the “Adj. Factors” on the form to derive a total adjustment point score. This sum is referred to as Y on the form. The percent alteration measured from the photographs (section 2.3.2) is referred to as X.
- Insert the two figures in the formula: $X*(1 + 0.14*Y)$ to determine an “adjusted” percent alteration figure.
- Refer to the average percent alteration values shown in Table 3 to obtain the Adjusted VQC.
- Record the Adjusted VQC by circling on the VQC scale line (in section 2.3.3 of the evaluation form) the location of the adjusted percent alteration value. The result will usually be close to that determined using the Basic VQC definition in section 2.2.3.

Note: The purpose of the formula is to scale the adjustment across the range of alteration percents. The adjustment factors are calibrated to adjust correctly (according to recent studies) for site disturbance, tree retention, and visual design influences at an alteration level of approximately 7% of the landform (the transition between partial retention and modification VQCs, as shown in Table 2). The formula uses the number 0.14, the reciprocal of 7, to increase the adjustment at higher alteration levels and decrease the adjustment at lesser levels of alteration.

2.3.4 Procedures for partial cut alterations

Partial cut alterations are those with a distributed residual forest canopy that has less density than the unaltered forest does. The visual impact of the alteration is dependent on the volume or number of trees retained on site, the size of residual tree crowns, and the height of the residual trees. The procedure for evaluating partial cut alterations is similar to that used for clearcut or variable retention alterations.

- To determine the Basic VQC for partial cut alterations, use the written definitions in Table 1. Record your visual impression on the scale line in section 2.2.3 of the form, as described in the standard procedure above.
- To determine the Adjusted VQC for partial cut alterations, follow the two-step “visual equivalent to clearcut” procedure below:

Step 1: Determining visual percent volume removal

- Using the set of calibrated colour photographs from Appendix 3, make an ocular estimate of the percentage of volume that was removed during harvesting by comparing texture and permeability of the residual canopy with what the photographs show (to the nearest 10%). This estimate will sometimes vary from the data in a post-harvest timber cruise because of the visual effects of slope, canopy conditions, species, and other factors. Record this figure on the evaluation form.
- Estimate residual tree height, to the nearest 5 m, and record this figure on the form.

Step 2: Determining the “visual equivalent to clearcut” percent alteration number

– Table 4 provides a grid of percent alteration numbers that are based on research regarding the likelihood of achieving a target VQO using a partial retention harvesting system. The table represents a 50% confidence level that the alteration will be visually equivalent to a clearcut with the specified level of alteration.

The shading in Table 4 highlights VQCs. The un-shaded portion represents expected achievement of Retention, the mid-shade represents expected achievement of Partial Retention, and darkest shade represents expected achievement of Modification.

- Using the values obtained from step 1 and Table 4, determine the “visual equivalent to clearcut” percent alteration and enter this value in section 2.3.4 and 2.3.2a of the evaluation form.

Table 4. “Visual equivalent to clearcut” percent alteration numbers for partial cut alterations

		Mean height (m) of residual trees									
		5	10	15	20	25	30	35	40	45	50
Volume removed (%)	10	0.1	0.2	0.4	0.6	0.7	0.8	1.0	1.2	1.8	2.2
	20	0.3	0.4	0.7	1.0	1.2	1.4	1.8	2.2	3.3	4.4
	30	0.7	0.9	1.2	1.4	2.0	2.4	3.3	4.2	5.0	6.5
	40	1.2	1.4	2.0	2.4	3.4	4.3	5.2	6.1	6.7	7.8
	50	1.8	2.3	3.4	4.3	5.2	6.2	6.8	7.7	8.4	9.0
	60	3.5	4.3	5.0	6.2	6.7	7.7	8.4	9.2	10.0	11.5
	70	4.9	5.5	6.5	7.7	8.4	9.2	10.0	11.4	12.7	14.0
	80	6.0	6.6	8.3	9.2	10.0	11.0	12.0	13.2	14.4	15.5
	90	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0

Retention	
Partial Retention	
Modification	

2.3.5 *Partial and clear cuts on the same landform*

In some circumstances, evaluators will be faced with hillsides on which both clear cutting and partial cutting activities are present. The procedures described so far address one or the other system on a hillside, but not the two together used on the same hillside. For these cases, the following procedures apply:

- For the clearcut openings, determine the clearcut percent alteration as described above.
- For the partial cuts, determine whether the partial cut opening is visible. If the answer is no, simply use the clearcut percent alteration values. If the answer is yes, estimate the percent volume removed and residual tree height and use the partial cutting/clearcut equivalency table (Table 4) to determine the percent alteration impact that the partial cutting contributes to the landscape. At very low retention levels (<15%), also consider the scale of the alteration.
- Add the number generated from the equivalency table to the clearcut percent alteration to get a total percent alteration impact and enter the value in section 2.3.2a of the evaluation form.
- Continue with the remaining assessments in section 2.3.2 to come up with the Initial VQC;
- Adjust the Initial VQC using the factors described in section 2.3.3 of this guide.
- Record the resulting Adjusted VQC using the numeric position on the scale line, as described above in the procedure for clearcut alterations.

2.3.6 *Determine the visual quality effectiveness evaluation rating for the landform*

Compare the Basic VQC (determined using the VQC definitions) with the Adjusted VQC (derived using percent alteration measurements and adjustment factors). The two evaluation methods will usually result in similar ratings, although they may lie on either side of a class boundary.

- Use the following five-point scale to rate the effectiveness of achieving the visual quality objective for the subject landform:
 - 5 = well met
 - 4 = met
 - 3 = borderline
 - 2 = not met
 - 1 = clearly not met
- Select the rating as follows:
 - If both evaluation methods indicate achievement of the VQO, then the evaluation rating is 5 (if both scores in the middle to lower end of the alteration range for the class) or 4 (if one or both methods score in the upper end of the range for the class).
 - If results using the two methods straddle a class boundary (e.g., one method achieves the high end of PR the other the low end of M, then the evaluation rating is 3, borderline.

- If both methods indicate non-achievement of the VQO, then the evaluation rating is 2 or 1, depending on how far outside the objective class the percent alteration is rated.

2.3.7 Allowance for over-ride

In cases of significant conflict between results from the two evaluation methods, the Basic VQC should take precedence. For example, an alteration that occupies only 4–5% of a landform (mid- PR Initial VQC) may be so angular or geometric that it is rated high M or even MM for the Basic VQC. In this case, if the VQO were Partial Retention, the result would indicate that the objective was clearly not met – yet, with the ratings straddling a class boundary, the procedures would indicate borderline.

- If you feel it is necessary to over-ride the evaluation rating determined by the procedures, do so in the final section of the evaluation form and provide a rationale.

3.0 Assembling a Visual Effectiveness Evaluation Package (Phase 5)

The recommended visual quality effectiveness evaluation package format and content is described below. Using this format will ensure that there is consistency in the way that packages are submitted and will accelerate the quality assurance process. It will also provide district managers and the public with consistent sets of information in a standard format.

Ensure that each evaluation package is self-contained by including the following basic information:

- a topographic map (1:50 000 or larger scale) showing the evaluation viewpoint (or viewpoints), the viewing directions, and the landscape being evaluated. (A Mapview product with contours, water features, roads, and VQO layer and tenure layers turned on is sufficient);
- a post-operation photograph (or photographs) showing the complete landscape being assessed. As well, the landform, non-contributing rock, snow, and ice, and alterations should be identified;
- a lines-of-force analysis; and
- a visual quality Effectiveness Evaluation form completed in its entirety.

4.0 Summarizing the Effectiveness Evaluation Ratings for a Sample Area (Phase 6)

Phases 2-5 described the procedure for assessing the degree to which VQOs have been met on a specific landform and from individual viewpoints. In those procedures, alterations that have been assessed from multiple viewpoints are reconciled, based on viewpoint importance, to derive an overall Effectiveness Evaluation rating for each landform. Once this is done and each landform in a scenic area has been individually rated, the final step in the evaluation process is to aggregate results across the sample area (e.g. District, Timber Supply Area, Tree Farm Licence or other unit) to determine the degree to which objectives are being achieved/not achieved.

The simplest accounting to determine success is to determine how many samples within the sample area have achieved the VQO versus those that did not.

This may be accomplished by combining the number of met/well met samples and comparing this total against all samples. For example, let say we have a total of 22 samples in a district of which, 15 samples are rated “met/well met”, 2 are “borderline” and 5 are “not met/clearly not met”. The overall rate of success for that district would be 68% (15 divided by 22 X 100).

The resulting score is like a report card providing an indication of how well we are doing at meeting VQOs generally. Scores can also be summarized by licensees, forest districts, forest regions, or for the province as a whole.

Over time we can monitor the scores achieved to determine whether visual management is improving or slipping within a given work unit. In those situations where improvement is required, actions can be taken to correct the problem(s) which is the ultimate goal of the Effectiveness Evaluation program.

References

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Appendix 1: Visual Quality Effectiveness Evaluation Form



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2.1.2 Site Information (Office)			
Forest District _____	Sample Code _____		
Licensee _____	Date of Field Evaluation <input type="text" value="MM/DD/YYYY"/>		
Licence No. _____ CP No. _____	Block _____		
General Location _____	Results Opening ID _____		
2.1.3 VLI Information (Office)			
Date of Update <input type="text" value="MM/DD/YYYY"/> VAC _____	Established VQO _____		
Polygon No. _____ VSC _____	Date of Establishment <input type="text" value="MM/DD/YYYY"/>		
EVC _____ Recommended VQC _____	Source Document _____		
2.2.1 Viewpoint (Field)			
Viewpoint No. _____	GPS Latitude _____ Viewing Direction _____		
GPS Longitude _____	Elevation (m) _____ Viewing Distance _____		
2.2.2 Photography (Field)			
Roll No. _____ ID Nos. _____	Viewpoint Importance (low) 1 2 3 4 5 (high) _____		
Digital Photo ID Nos _____	Viewpoint Description _____		
	Field of View Width(degrees) _____		
	Field of View Height(degrees) _____		
2.2.3 Assess Basic VQC (Field)			
Alterations meet with Basic VQC definition? Circle where in the range for that VQC. Notes:			
Basic VQC <input type="checkbox"/> P <input type="checkbox"/> R <input type="checkbox"/> PR <input type="checkbox"/> M <input type="checkbox"/> MM <input type="checkbox"/> →			
2.2.4 Design Observations (Field)			
Design Elements	G (-1)	M (0)	P (+1)
Response to visual force lines	_____	_____	_____
Borrows from natural character	_____	_____	_____
Edge treatments incorporated	_____	_____	_____
Distance from the viewpoint	_____	_____	_____
Position on the landform	_____	_____	_____
Total Design	_____	_____	_____
2.3.2 Assess Initial VQC (Office)			
a) % of landform altered by recent openings _____			
b) % of landform with site disturbance outside openings _____			
c) % non veg contribution of old openings _____			
X = (a+b+c) = _____ % alteration	Initial VQC _____		
2.3.3 Assess Adjusted VQC (Office)			
d) Impact of roads, side cast, etc. (within openings) _____			
<input type="checkbox"/> None <input type="checkbox"/> Subordinate <input type="checkbox"/> Significant <input type="checkbox"/> Dominant Adj. Factor _____			
e) Tree retention			
<input type="checkbox"/> Good <input type="checkbox"/> Moderate <input type="checkbox"/> Poor Adj. Factor _____			
f) Design (enter total from 2.2.4 above) Adj. Factor _____			
Total adjustment Y = (d+e+f) Adj. Total _____			
Calculate adjusted % alteration $X \times (1 + 0.14 \times Y) =$ _____			
Adjusted VQC			
Adjusted % alt <input type="checkbox"/> P <input type="checkbox"/> R <input type="checkbox"/> PR <input type="checkbox"/> M <input type="checkbox"/> MM <input type="checkbox"/> →			
Adjusted % alt 0 1.5 4 7 12 18 24 30 +++			
Evaluated by _____			
Signature _____			
2.3.4 Partial Cut Alterations			
Partial cutting			
% removed _____			
Average tree height (m) _____			
Clearcut equivalent _____% alteration as read from Table 4.			
Record this value on line 2.3.2 a.			
2.3.6 Determining EE Rating for the Landform by Comparing Basic VQC with Adjusted VQC (Office)			
1 <input type="checkbox"/> Clearly not met (Neither method indicates VQO achievement, both are far from class boundary)			
2 <input type="checkbox"/> Not met (Neither method indicates VQO achievement, but both are close to class boundary)			
3 <input type="checkbox"/> Borderline (One method indicates VQO achievement, one does not)			
4 <input type="checkbox"/> Met (Both methods indicate VQO achievement, but one or both are close to the high end "maximum % alteration limit.")			
5 <input type="checkbox"/> Well met (Both methods indicate VQO achievement and are on the lower % alteration limit or mid-range for the class)			
2.3.7 Allowance for Over-ride			
Over-ride EE _____			
Rationale for over-ride _____			

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Appendix 2: Field Notes to Accompany the Effectiveness Evaluation Form



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2.2.2 Viewpoint Importance																																																																																																																													
(1) glimpse view, less than 10 seconds (2) sustained side view (3) sustained focal view, travelling toward the alteration for more than one minute (4) viewpoint is at a rest stop, campsite, or other static short-term view location (5) viewpoint is the location of a community, commercial tourist-related enterprise, or other static long-term view location																																																																																																																													
2.2.3 Table 1 – Definitions of Visual Quality Classes																																																																																																																													
Visual Quality (Class Symbol)	Basic Definition																																																																																																																												
Preservation (P)	"preservation" means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration (a) is very small in scale, and (b) is designed to be indistinguishable from the pre-harvest landscape.																																																																																																																												
Retention (R)	"retention" means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration (a) is difficult to see, (b) is small in scale, and (c) has a design that mimics natural occurrences.																																																																																																																												
Partial Retention (PR)	"partial retention" means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that, when assessed from a viewpoint that is representative of significant public viewing opportunities, 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.																																																																																																																												
Modification (M)	"modification" means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that, when assessed from a viewpoint that is representative of significant public viewing opportunities, 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.																																																																																																																												
Maximum Modification (MM)	"maximum modification" means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that, when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration is extremely easy to see and one or both of the following apply (a) the alteration is very large in scale, or (b) the alteration is angular and geometric.																																																																																																																												
2.2.4 Table 2 – Design Observations (Field)	2.3.2 Table 3 – Percent Alteration Ranges for Visual Quality Classes																																																																																																																												
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	70	4.9	5.5	6.5	7.7	8.4	9.2	10.0	11.4	12.7	14.0																																																																																																																		
	80	6.0	6.6	8.3	9.2	10.0	11.0	12.0	13.2	14.4	15.5																																																																																																																		
	90	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0																																																																																																																		

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Appendix 3: Photo Samples of Partial Cut Alterations



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Partial Cutting Photos Showing Removal Levels and Resulting Texture



Tree Ht 20M Vol Rem 44% Stems 45%



Tree Ht 34M Vol Rem 64% Stems 71%



Tree Ht 25M Vol Rem 73% Stems 7%



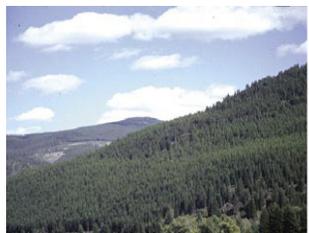
Tree Ht 27M Vol Rem 46% Stems 7%



Tree Ht 24M Vol Rem 64% Stems 86%



Tree Ht 21M Vol Rem 80% Stems 81%



Tree Ht 23M Vol Rem 50% Stems 53%



Tree Ht 30M Vol Rem 65% Stems 91%



Tree Ht 23M Vol Rem 88% Stems 91%



Tree Ht 28M Vol Rem 56% Stems 67%



Tree Ht 31M Vol Rem 72% Stems 77%



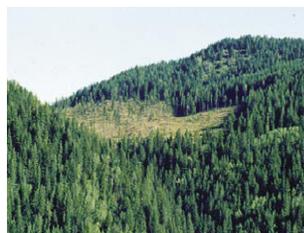
Tree Ht 20M Vol Rem 88% Stems 96%



Tree Ht 28M Vol Rem 60% Stems 80%



Tree Ht 28M Vol Rem 72% Stems 85%



Tree Ht 29M Vol Rem 88% Stems 96%

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Appendix 4: Calculating Percent Alteration in Perspective View



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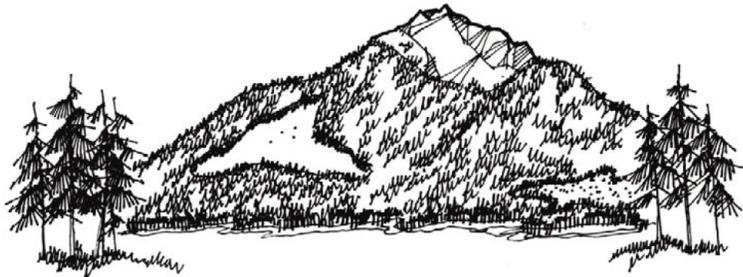
Forest and Range
Evaluation Program

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Resource Stewardship Monitoring

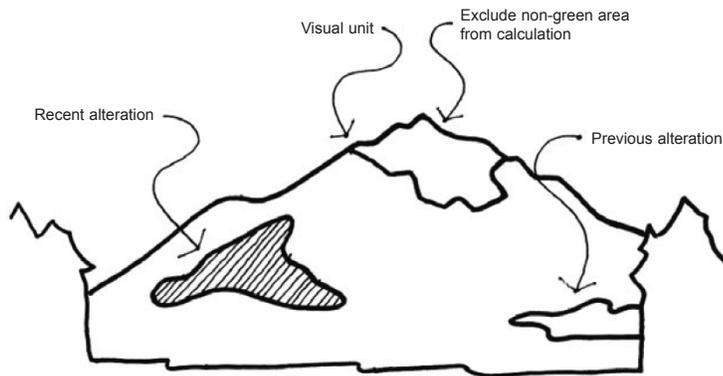
Page 4

Calculating Percent Alteration in Perspective View

Example of site photograph showing altered landscape



- Step 1** On an enlarged version of the site photograph, define and outline the visual unit or landform. Exclude those portions of the landform screened by vegetation and non-green areas, such as mountain tops, rock, snow, and ice.
- Step 2** Measure the visible unit or landform using a manual or electronic planimeter or a GIS application (e.g., middle ground visual unit = 37.5 cm²).
- Step 3** Measure visible ground area of previous alteration that have not yet achieved visually effective green-up (e.g., current alteration = 1.8 cm²).



- Step 4** Measure visible ground area of recent alteration (e.g., = 4.7 cm²)
- Step 5** Add previous non-VEG alteration and recent alteration figures together to get total area altered. Divide this figure by the visual unit figure to get percentage of unit altered (e.g., [(1.8 + 4.7) ÷ 37.5] x 100 = 17.3%).
- Note:** Repeat the above calculation for each of the viewpoints selected for evaluation. Enter the percent alteration figure derived from each viewpoint on the Visual Quality Effectiveness Evaluation form (Page 2).

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