

Field Assessment for Soil Conservation Effectiveness Evaluations

Table 1. Estimating lost soil productivity due to access construction.

Variable				Value
1.1 Percent of the cutblock area in un-rehabilitated roads, landings, and borrow pits (determined from aerial photo, vehicle or walk-through traverse - as per the Soil Conservation Surveys Guidebook)				<u>% of Cutblock</u> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Structure (eg, Landing A)	Length	Width	Area	
1.2 Indicate on the map and calculate how much of the un-rehabilitated access appears to belong in the Temporary Access definition? (determined from access plans, aerial photo, vehicle or walk-through traverse - as per the soil conservation surveys guidebook)				<u>% of Cutblock</u> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Structure (eg, Landing A)	Length	Width	Area	
1.3 For rehabilitated access, evaluate any areas where rehabilitation treatments were insufficient to fully restore productivity (percent cutblock area in rehabilitated access) x (1- ER*)				% of Cutblock
Total permanent lost production (% of cutblock) caused by access (sum of the above)				

“ER (effectiveness of rehab) ranges from 0 (unproductive ground) to 1 (fully restored soil conditions), and is determined according to the following method [partial scores possible for all], where:

$$ER = A+B+C$$

A) Was the rehabilitated area decompacted as necessary? yes = .5; no = 0

B) Was topsoil and/or burnpile debris, and woody debris re-spread with minimal mixing of subsoil ? yes = .3; no = 0

C) Has the site been reforested, or is there a reasonable likelihood that natural revegetation and reforestation will occur as a result of natural ingress from the surrounding area? yes .2; no = 0

Questions:

1) Does the total amount of permanent access seem appropriate given the site conditions? Provide specifics and rationale.

2) Do any individual access structures seem larger than necessary? Provide specifics and rationale.

Table 2: Estimating in-block area affected or potentially affected by landslides, drainage diversion or significant erosion from roads, landings or trails.

Variable				Value
Landslides				
2.1 Delineate and measure cutblock areas in new failures outside the road prism including dry ravel				
Failure	Length	Width	Area	<u>Area affected (m²)</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
2.2 Delineate and measure cutblock areas that could be affected by road construction or maintenance practices, or roadcuts through material and/or slope conditions known to have stability problems in the local area (eg, often clay textured materials on wet slope locations)				
Failure	Length	Width	Area	<u>Area affected (m²)</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Total area affected or potentially affected by landslides (sum of above)				
2.3 Are there areas of water diversion into non-channel areas (eg, evidence of overland flow onto slopes that normally would not receive that much water – estimate average width and length of runoff evidence) Note: If yes, estimate size and specify potential concerns regarding stability and/or erosion that may be expected to occur. When considering potential concerns, take into account slope steepness/topography involved, other values at risk, etc. Water diversion may not be a concern on flat land.				Yes or No If yes, estimate size (m ²) If yes, potential concerns
Erosion*				
2.4 Delineate and measure eroded areas, which are typically devoid of vegetation, in the cutblock (deposits are not counted)				
Eroded area	Length	Width	Area	<u>Area (m²)</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Questions:

Are there any potential or existing off-site effects evident during your field or office review? Provide specifics and rationale.

Table 3. Estimating percent of the NAR area affected by disturbance to natural drainage patterns as a result of forestry operations

Variable	Percent of cutblock area
3.1 Delineate and measure cutblock areas experiencing, or at risk of experiencing, altered drainage or standing water as a result of construction of roads, landings, trails, or concentrated soil disturbance (e.g. areas with evidence of saturated soils, drowned vegetation or regeneration problems due to raised water table; or areas expected to experience these problems due to evident drainage problems)	

Table 4. Calculating percent of the cutblock area affected by concentrated and dispersed soil disturbance in a cutblock NAR.

4.1 Determine the soil disturbance hazards for each SU	SU__	SU__	SU__
Compaction			
Displacement			
Forest floor displacement			
Erosion			
Mass wasting			
Were the hazards rated correctly?			
Were the SU's mapped correctly?			
4.2 Delineate and measure areas of concentrated disturbance greater than 0.2 ha Do not include roadside work areas	<u>Area (m²)</u>	<u>Area (m²)</u>	<u>Area (m²)</u>
Length Width Area			
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
4.3 Delineate and measure roadside work areas	<u>Area (m²)</u>	<u>Area (m²)</u>	<u>Area (m²)</u>
Length Width Area			
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4.4 Percent area of dispersed disturbance in remainder of each SU. Use Table 4.aa to summarize field tallies. Do not double-count concentrated disturbance areas above.			
Counted Disturbance Based On Sensitivity How is this determined?			
Total Machine Traffic Disturbance Sum of 4.2, 4.3, and 4.4.			
Adjustment calculation for NAR rehabilitated areas = (% SU in rehabilitated disturbance) x (1-ER) , see example in Table 1):			
Prorated Total Disturbance In SU How is this determined?			
Total adjusted concentrated and dispersed SU disturbance: How is this determined?			

Questions:

1. Do the sensitivity ratings appear to be correct; have complexes been recognized?
2. Were these roadside work areas of an appropriate width for the harvesting system used and was an attempt made to minimize disturbance within the roadside work area?
3. Were skid trails and temporary access structures designed/ constructed to minimize the amount of area occupied by these structures while keeping in mind there may be other factors to consider such as safety or efficiency?

Table 4a. Summary of dispersed disturbance categories in the NAR.

Carry out a soil disturbance transect (100-300 points across representative areas of the block), then record the percentage of each category below:

Disturbance type Record the percentage of dispersed disturbance over the entire standards unit	SU__	SU__	RWAs by SU
Wheel or track ruts:			
> 5-15 cm*			
> 15 cm			
Deep gouges			
Long gouges			
Wide gouges			
Wide scalps*			
Very wide scalps			
Main trails/compacted (repeated traffic, etc.) Survey all, compile and asterisk number for use in lower total if not counting on SU			
Unrehabilitated compacted areas			
Total “counted” disturbance in the NAR Sum of areas of all disturbances above.			
Other forest floor displacement Refer to calc/survey methods. Indicate if forest floor is displaced during survey by circling all displaced points regardless of disturbance type, tally these to indicate forest floor displacement total percent.			
Rehabilitated TAS and compacted areas			
Perceptible impressions/ruts 0.3 x 2 m and < 5 cm			
Light trails/light compaction (not meeting criteria)			
Grazing related Bare ground, pugging, and hummocking with dimensions equal to wide scalps.			
Continuous gouge			
Total disturbance in the NAR (all categories)			
Total Forest Floor Displacement in the SU			

Table 5a. Estimating refugia for mature forest soil organisms

Distance from cutblock to nearest mature forest	distance in km
Number of green trees retained on cutblock per ha	number of trees per ha
Percent of original species retained as green trees on cutblock	number of tree species ____ / preharvest number of tree species = _____
Age classes of green trees* 1. Original dominant or co-dominant trees 2. Sub-canopy trees 3. Shrub layer trees	estimated approximate percentage 1. 2. 3.

*See Land Management Handbook 25

Question:

Was a mixture of species planted? List the species:

Table 5b. Estimating amount and diversity of habitat for dead wood-occupying soil biota

Amount of woody debris	Field data
Depth and percent cover of pieces under 7.5 cm diameter Based on overview of each transect, slash loading photos will be available as examples.	Depth: TrA ____ TrB ____ Tr C ____ Percent cover < 25, 25 – 50, > 50 TrA ____ TrB ____ Tr C ____
Number of pieces over 7.5 cm diameter Based on 3 randomly located 30m transects.	TrA ____ TrB ____ Tr C ____
Average length of larger pieces on each transect	TrA ____ TrB ____ Tr C ____
Average diameter of larger pieces on each trans.	TrA ____ TrB ____ Tr C ____
Percent of original species retained as CWD	number of tree species as CWD ____ / preharvest number of living tree species

Amount of woody debris estimated based on three 30 m transects located randomly in NAR and using method for CWD in *A Field Estimation Procedure for Downed Coarse Woody Debris*, Taylor 1997, and for slash in *Field Handbook for Prescribed Fire Assessments in British Columbia: Logging Slash Fuels*, Trowbridge et al. 1989.

Questions:

1. Was the site whole tree harvested and do you perceive any problems due to this practice? If yes, provide specifics and rationale.
2. Is there opportunity for recruitment of CWD during the rotation?
3. Are there concerns regarding these opportunities? If so, provide specifics and rationale.