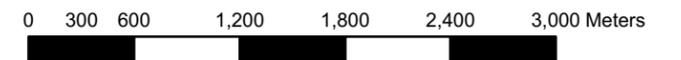


**BC Timber Sales
Mahood Lake Beetle Blocks
MW9MN, MW9MQ
Visual Assessment
RDI Resource Design Inc
December 18, 2018**

- MahoodLandformLines
- Contours
- Mahood2018Viewpoints
- TRIMROADS_CLIP
- Adjacent_blocks_to_MW9MN_&_MW9MQ
- Mahood_VQO_2018
- MW9MQ
- MW9MN
- Mahood_Waterlines
- A95986_&_A95987_Roads
- A95986_and_A95987_Block_Shapes
- Mahood_Lake
- Not Visible
- Visible



Key Map

1	Key Map
2	Contents
3	Summary
4	Viewpoint A Simulation and Percent Alteration
5	Viewpoint B Simulation and Percent Alteration
6	Viewpoint C Simulation and Percent Alteration
7	Viewpoint D Simulation and Percent Alteration

**Report of Dr. Kenneth B. Fairhurst, PhD, RPF, RDI Resource Design Inc,
Respecting the Proposed Visual Quality Effectiveness of Cutblocks MW9MN and MW9MQ**

RDI was requested by Ches Clem, RPF, Planning Forester, BC Timber Sales, Kamloops, to conduct a Visual Assessment of two “bark beetle” affected cutblocks under the 2018-2019 Visual Resources Contract PD18TEB007. The cutblocks MW9MN and MW9MQ are located on the south side of Mahood Lake approximately 6 km from the western end of the lake. The cutblocks are located in VSU 162 which has a VQO of Partial Retention. The foreshore has a separate VSU (142 - also PR). The cutblocks are at least 3 km to the west of the FLs A95986 and A95987 assessed by RDI in May of this year.

The cutblocks sit amongst recent nonVEG openings mainly from 2004 to 2008 harvesting. The visual condition of the current alteration is mainly non-Visually-Greened-up (nonVEG), exhibiting regrowth heights of from 0.5 m to possibly as tall as 4 m.

RDI tested and assigned 4 key observation points (viewpoints) on Mahood Lake for the assessment, covering a range of 5 kilometres in distance along the centerline of the lake. The new cutblocks are located in midground viewing distances from the 4 viewpoints (each closest at 3 km from all viewpoints, and furthest at 4 km (VPs B, C) and 5 km (VP A, VP D). Viewpoint C is comparable to the location of Viewpoint 1 in the May report, and Viewpoint D is comparable to the location of Viewpoint 2.

The 2016 photos from Viewpoint 1 shown on Viewpoint D page taken by Tyson Leudtke reveal considerable regrowth but heights are still under 5m, the average height of regrowth at which the average viewer begins to see a new forest. According to Tyson in his email of May 1, 2018, “While well stocked, this block is still less than 3m in height....Certainly the lower half of the block would meet that (VEG) definition but the upper slopes (cable section) might not yet have attained those attributes.” In response, I answered: “I have attached page 6 of the VEG document. 3m height is the starting point and 5m is the mid probability point of seeing VEG. (“A First Look at Visually Effective Green-up in British Columbia” -<https://www.for.gov.bc.ca/hfd/pubs/Docs/Mr/Rec/Rec008.pdf>).

The scale of the nonVEG openings suggest they will stand out longer than normal - it could take several years longer to fully achieve VEG. More information, a site visit, and/or updated photography was deemed warranted at that time. RDI has not made that visit.

Procedures

For purposes of this present assessment, RDI delineated Landform 3A, a fairly non-descript low, rolling topographic feature located between taller peaks to the east (Landform 1) and west (Landform 3B) and adjacent unlabeled landforms reaching towards the ends of the lake. RDI employed ArcMap to produce a composite viewshed from the four viewpoints which further confirmed the landform extent. The viewshed is shown in the key map on page 1.

Visual simulations were produced using 3D Nature's Visual Nature Studio, utilizing terrain contours provided by BCTS. Forest Cover was imported to assign forest stand heights for the renderings. BCTS also provided the shapefiles for the new and existing cutblocks, as well as roads and adjacent harvested areas.

The renderings were set to “panorama”, meaning that 360 degree full circle images based on 9 individual 40 degree field of view (48mm camera lens) images prepared automatically from each of the 4 viewpoints. These were later clipped to obtain coverage of the south-side of the lake only, and inserted into the CorelDraw project. The same images were used for calculation of Percent Alteration in ArcGIS from each viewpoint. The results are provided on each specific viewpoint page and summarized on this page. A key map was produced using ArcGIS.

Results

The beetle cutblocks are located amongst current nonVEG openings. The Visual Absorption Capability is moderate given the patterns created by the proposed and existing alteration together. Shape and scale of alteration meets Partial Retention by verbal definition (small to medium in scale, easy to see, natural and not rectilinear or geometric in shape). The patterns are respectful of visual forces, primarily those defined by the analysis landform itself. The FLNRO-RD Poster of the Categories of Altered Forest lends support to the appearance of the landform with current and proposed harvesting meeting Partial Retention:

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/visual-resource-mgmt/vrm_a_guide_to_visual_quality_objectives.pdf.

Percent Alteration varies from a low of 2% (Viewpoint A) and 4% (Viewpoint B) to 7.5% (Viewpoint C), and to just under 12% (Viewpoint D). The limits for Partial Retention range from 1.5% to 7.0%, so Viewpoint C is 0.5% in excess and Viewpoint D exhibits alteration 5% in excess of the standard. Viewpoint D looks somewhat obliquely towards the landform, causing perspective foreshortening which makes the perspective area of the landform relatively smaller than when it is seen more directly, such as from Viewpoints C and D. Cutblock MW9MN is seen most openly from this viewpoint, accounting for 2% of the total alteration, while MW9MQ is more subtle in shape, but also has 2% alteration. The range of views show the two cutblocks as easily blending in with existing patterns and character. The view from Viewpoint D is dominated by much greater alteration in the neighboring Landform 1 directly in view, significantly diminishing the effect of the scale of alteration in Landform 3A.

Determination and Recommendation

Given that Percent Alteration is within, or very close to the Partial Retention limit from 3 of the 4 viewpoints, and shape and blending is very good from all viewpoints, I consider that the intent of Partial Retention can be met overall in Landform 3A. The stark contrast of large-scale alteration in the neighbouring landforms lends support to this determination. Given the apparent poor health of the forest included in the beetle-block harvesting, I consider that limited leeway is justified, while still enabling the intent of the Partial Retention VQO be met.



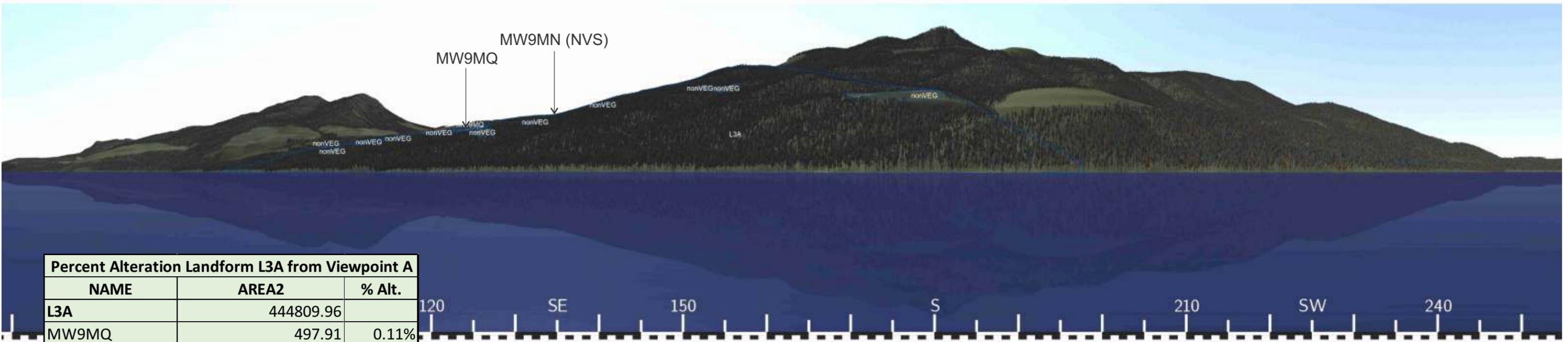
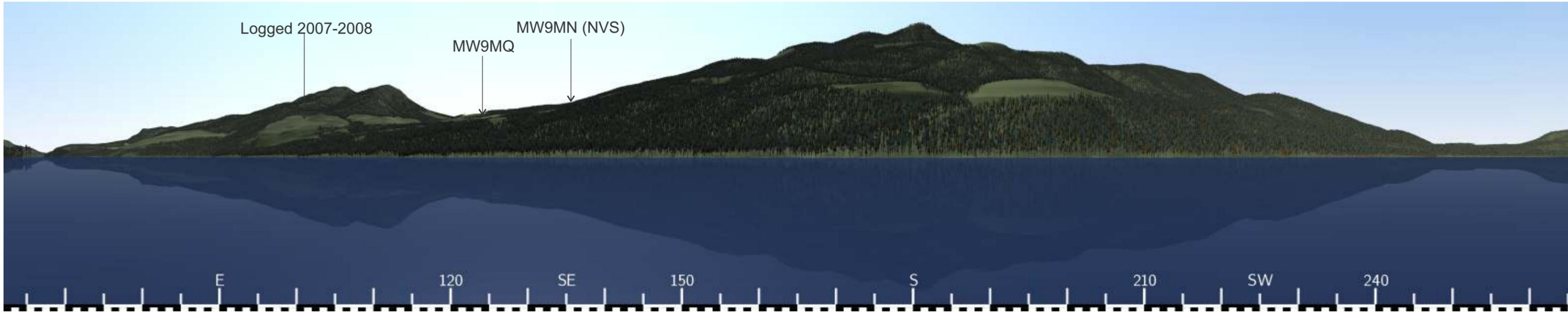
Dr. Kenneth B. Fairhurst, PhD, RPF
RDI Resource Design Inc
December 18, 2018

Percent Alteration Landform L3A from Viewpoint A		
NAME	AREA2	% Alt.
L3A	444809.96	
MW9MQ	497.91	0.11%
nonVEG	5777.41	1.30%
nonVEG	886.04	0.20%
nonVEG	112.92	0.03%
nonVEG	66.48	0.01%
nonVEG	92.44	0.02%
nonVEG	283.01	0.06%
nonVEG	289.36	0.07%
nonVEG	237.15	0.05%
nonVEG	95.79	0.02%
nonVEG	420.42	0.09%
nonVEG	795.78	0.18%
Sum Alt.	9554.69	2.15%

Percent Alteration Landform 3A from Viewpoint B		
NAME	AREA2	% Alt.
L3A	402853.97	
MW9MN	1901.38	0.47%
MW9MN	155.17	0.04%
MW9MN	32.34	0.01%
MW9MN	357.35	0.09%
MW9MQ	3454.51	0.86%
nonVEG	969.31	0.24%
nonVEG	169.48	0.04%
nonVEG	211.33	0.05%
nonVEG	80.26	0.02%
nonVEG	2687.60	0.67%
nonVEG	121.10	0.03%
nonVEG	613.28	0.15%
nonVEG	270.40	0.07%
nonVEG	4859.80	1.21%
Sum Alt.	15883.29	3.94%

Percent Alteration Landform 3A from Viewpoint C		
NAME	AREA2	% Alt.
Landform 3A	298523.51	
MW9MN	2698.69	0.90%
MW9MN	211.68	0.07%
MW9MN	23.86	0.01%
MW9MQ	3630.56	1.22%
nonVEG	5979.03	2.00%
nonVEG	92.36	0.03%
nonVEG	160.05	0.05%
nonVEG	514.60	0.17%
nonVEG	645.79	0.22%
nonVEG	1831.02	0.61%
nonVEG	459.33	0.15%
nonVEG	78.71	0.03%
nonVEG	440.00	0.15%
nonVEG	5533.52	1.85%
Sum Alt. L3A	22299.21	7.47%

Percent Alteration Landform 3A from Viewpoint D		
NAME	AREA2	% Alt.
L3A	135945.16	
MW9MN	2810.38	2.07%
MW9MQ	2407.29	1.77%
MW9MQ	526.90	0.39%
nonVEG	4103.13	3.02%
nonVEG	986.25	0.73%
nonVEG	569.92	0.42%
nonVEG	495.02	0.36%
nonVEG	41.76	0.03%
nonVEG	18.18	0.01%
nonVEG	205.84	0.15%
nonVEG	61.52	0.05%
nonVEG	649.73	0.48%
nonVEG	3250.25	2.39%
Sum Alt.	16126.17	11.86%



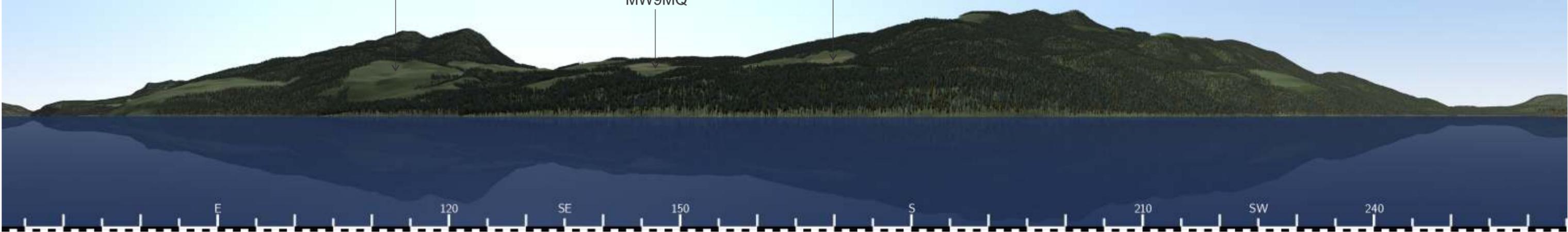
Percent Alteration Landform L3A from Viewpoint A

NAME	AREA2	% Alt.
L3A	444809.96	
MW9MQ	497.91	0.11%
nonVEG	5777.41	1.30%
nonVEG	886.04	0.20%
nonVEG	112.92	0.03%
nonVEG	66.48	0.01%
nonVEG	92.44	0.02%
nonVEG	283.01	0.06%
nonVEG	289.36	0.07%
nonVEG	237.15	0.05%
nonVEG	95.79	0.02%
nonVEG	420.42	0.09%
nonVEG	795.78	0.18%
Sum Alt.	9554.69	2.15%

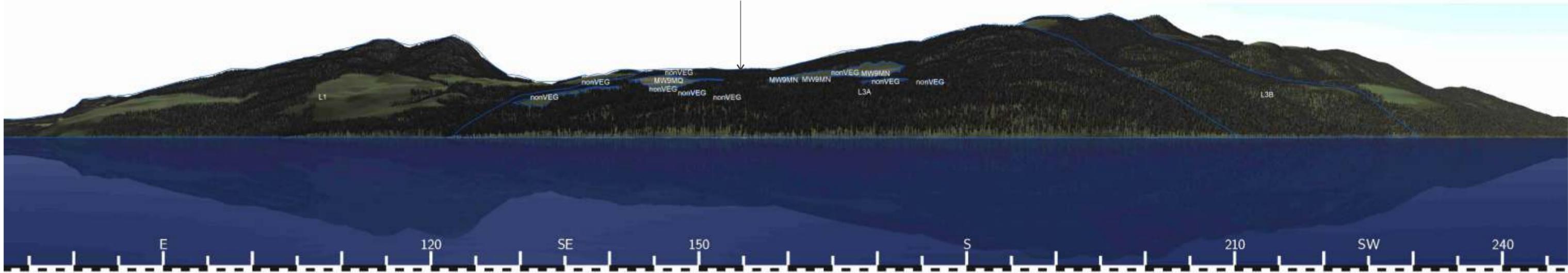
Logged 2007-2008

MW9MQ

MW9MN

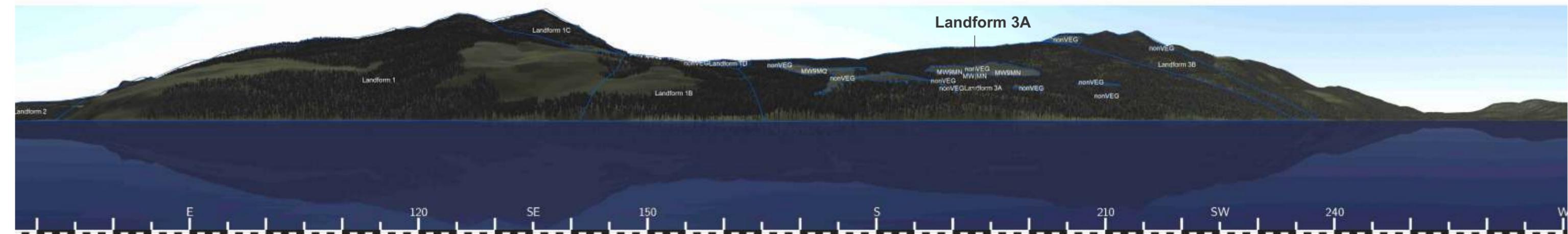
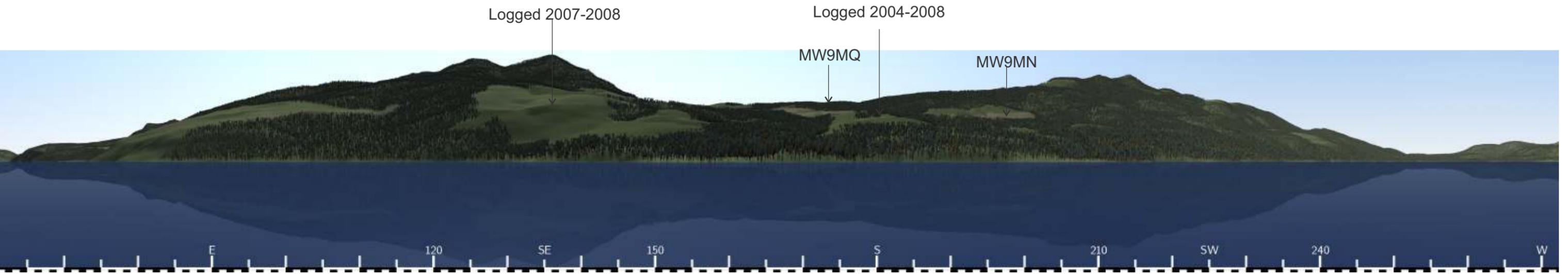


Landform 3A

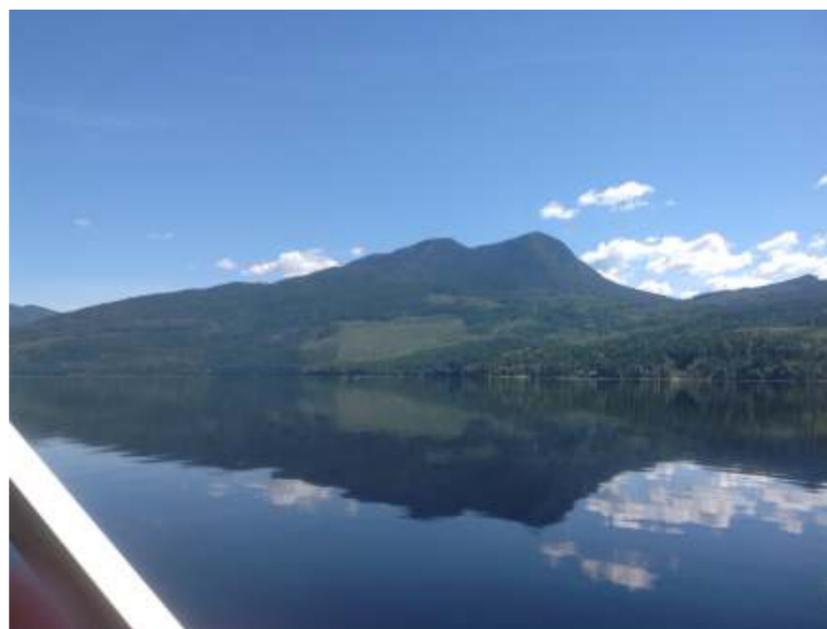


Percent Alteration Landform 3A from Viewpoint B		
NAME	AREA2	% Alt.
L3A	402853.97	
MW9MN	1901.38	0.47%
MW9MN	155.17	0.04%
MW9MN	32.34	0.01%
MW9MN	357.35	0.09%
MW9MQ	3454.51	0.86%
nonVEG	969.31	0.24%
nonVEG	169.48	0.04%
nonVEG	211.33	0.05%
nonVEG	80.26	0.02%
nonVEG	2687.60	0.67%
nonVEG	121.10	0.03%
nonVEG	613.28	0.15%
nonVEG	270.40	0.07%
nonVEG	4859.80	1.21%
Sum Alt.	15883.29	3.94%

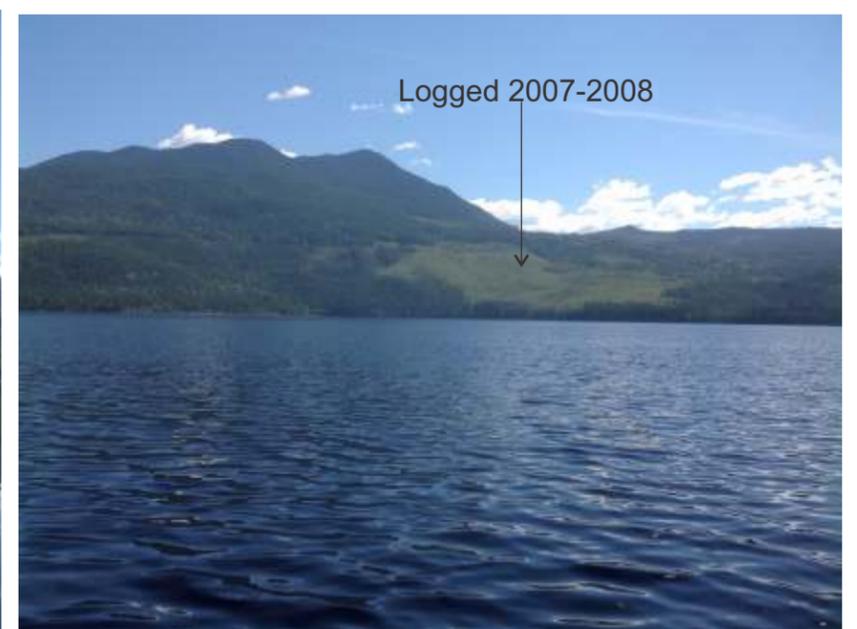
VP B



Percent Alteration Landform 3A from Viewpoint C		
NAME	AREA2	% Alt.
Landform 3A	298523.51	
MW9MN	2698.69	0.90%
MW9MN	211.68	0.07%
MW9MN	23.86	0.01%
MW9MQ	3630.56	1.22%
nonVEG	5979.03	2.00%
nonVEG	92.36	0.03%
nonVEG	160.05	0.05%
nonVEG	514.60	0.17%
nonVEG	645.79	0.22%
nonVEG	1831.02	0.61%
nonVEG	459.33	0.15%
nonVEG	78.71	0.03%
nonVEG	440.00	0.15%
nonVEG	5533.52	1.85%
Sum Alt. L3A	22299.21	7.47%

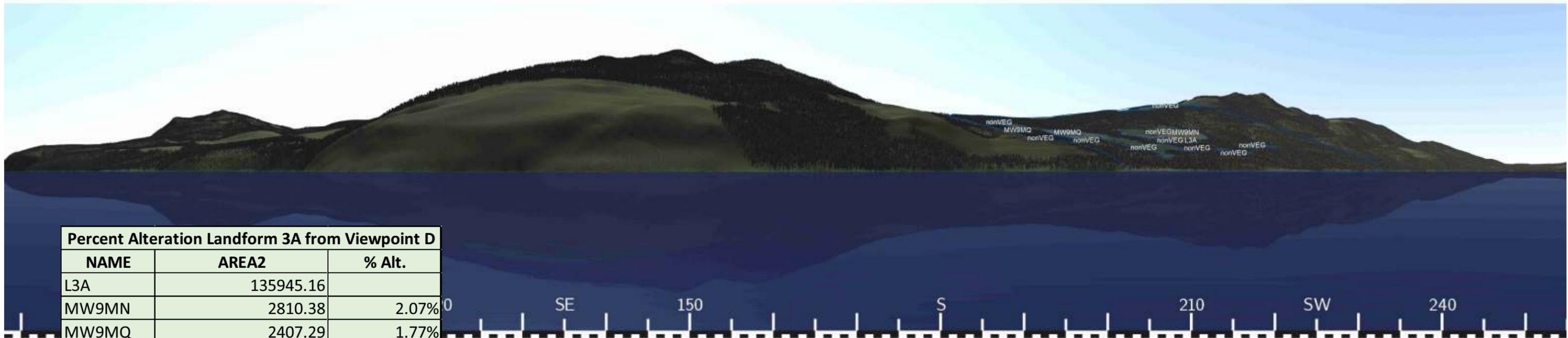
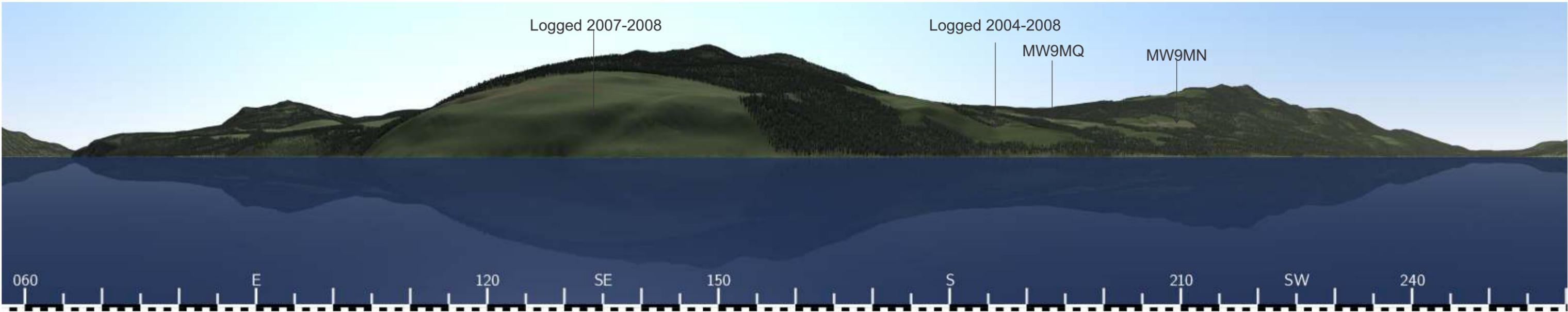


Tyson Leudtke Photo 2017



Tyson Leudtke Photo 2017

VP C



Percent Alteration Landform 3A from Viewpoint D

NAME	AREA2	% Alt.
L3A	135945.16	
MW9MN	2810.38	2.07%
MW9MQ	2407.29	1.77%
MW9MQ	526.90	0.39%
nonVEG	4103.13	3.02%
nonVEG	986.25	0.73%
nonVEG	569.92	0.42%
nonVEG	495.02	0.36%
nonVEG	41.76	0.03%
nonVEG	18.18	0.01%
nonVEG	205.84	0.15%
nonVEG	61.52	0.05%
nonVEG	649.73	0.48%
nonVEG	3250.25	2.39%
Sum Alt.	16126.17	11.86%

Perspective Foreshortening of Landform 3A from this Viewpoint Exaggerates Percent Alteration and should be Disregarded.