American Avalanche Association
Forest Service National Avalanche Center
Avalanche Incident Report: Long Form

Please send to: CAIC; 325 Broadway WS1; Boulder CO 80305; caic@qwest.net; Fax (303) 499-9618
and to the nearest Avalanche Center.

Occurrence Date: 20140330 **Time:** 1500

Report Author(s)

Name: Michael Maurer

Affiliation: Deschutes County Search and Rescue

Address: 20895 King Hezekiah Way, Bend OR 97702

Phone: 541-728-0405 Fax: Email: maurer@earthlink.net

Location:

State: OR County: Deschutes County Forest: Deschutes National Forest
Peak, Mtn Pass, or Drainage: Peak
Site Name: Paulina Peak
Lat/Lon or UTM: 10T 0641885E 4838364N

Summary	Caught	Partially Buried Not Critical	Partially Buried Critical	Completely Buried	Injured	Killed	Vehicles Damaged	Structures Damaged
Number	1	0	0	1	0	1	1	0

Weather	Fill in the weather chart of the five days prior to the accident. Use 24 hr trends for wind speed and direction.					
Weather station location(s): Mt. Bachelor Ski Resort			Lat/Lon or UTM:		Elevation: 7300 ☐m / ☒ft	
Date	20140325	20140326	20140327	20140328	20140329	20140330
Tmax	35° F	27° F	27° F	32° F	27° F	27° F
Tmin	22° F	21° F	21° F	24° F	22° F	19° F
HN24	3"	6"	9"	11"	6"	2"
HN24W	N/O	N/O	N/O	N/O	N/O	N/O
Wind Speed	18 MPH	20 MPH	20 MPH	15 MPH	15 MPH	15 MPH
Wind Dir	SW	NW	NW	NNW	W	NW

Avalanche Conditions	Attach most recent advisory (Section VII).	
Closest Avalanche Center: NWAC ☒ accident outside of forecast area Avalanche warning in effect? ☐ yes ☒ no	Avalanche Danger Rating ☐ Low ☐ Moderate ☒ Considerable ☐ High ☐ Extreme	Recent Avalanche Activity Natural and human triggered avalanches noted at Tam Rim on east, north and west aspects, primarily running on 2/24 FC layer.

Snowpack Describe the state of the snowpack. Include season history, snow profiles, and prominent features as necessary.

The local snowpack has been more variable this season than in the recent past. After a dry spell in January, significant storm cycles occurred throughout much of February creating volitile and widely variable conditions.Toward mid February and early March the cycles abated somewhat and the seasonal snowpack largely stabilized. Prior to this last storm cycle, a melt freeze crust dominated much of the local snowpack, with mixed wind hardened and ice surfaces in isolated areas. On northern shady aspects near/above treeline, isolated pockets of cold snow had faceted and remained at the surface. During the storm cycle that preceded this incident, these isolated near surface facets and then the arrival of cold new snow were buried by the first storms of this cycle. At roughly the cycle's mid point, temps warmed temporarily and a graupel layer covered the area, which was then buried by subsequent colder snow. These two weaknesses were the primary causes of the natural and human triggered avalanches noted locally during this storm cycle.

Section I: Group Information

Fill in the following tables. Some of the fields can be checked or left blank. Attach additional pages and reports from other agencies as necessary (Section VII).

Subject	Name	Age	Gender	Address	Phone
1	Kyle Thomas	28	M	La Pine, OR	
2					
3					
4					
5					

Skill Level	Activity	Years at Activity	Activity Skill Level	Accessed Local Avalanche Advisory?	Avalanche Education Level
1	Snomobile	several	__	unknown	none
2			__		
3			__		
4			__		
5			__		

Rescue Equipment Carried	Transceiver Make and Model	Shovel	Probe Pole	Releasable Bindings	Other	Snowmobile: Rescue Equipment Carried on Person
1	none	yes	no	NA		none
2						
3						
4						
5						

Injuries or Cause of Death	Unknown	None	First-Aid Needed	Doctor Care Needed	Hospital Stay Needed	Asphyxi-ation	Head Injury	Chest Injury	Spinal Injury	Hypo-thermia	Skeletal Fracture	Other	Fatal
1	☒	☐											☐
2	☐	☐											☐
3	☐	☐											☐
4	☐	☐											☐
5	☐	☐											☐

Comments	

Section II: Avalanche Path and Event Information

Fill in the following tables. Some of the fields can be checked or left blank. Attach additional pages, fracture line profiles, and reports as necessary (Section VII).

Avalanche Characteristics		
Type: SS	Trigger: AR	Size: R 4 \ D 2
Aspect: N	Elevation: 7200 ☐m / ☒ft	
Sliding surface (check one): ☐ In new ☒ New/old ☐ In old ☐ Ground		

Dimensions ☐m / ☐ft	Average	Maximum
Height of Crown Face	50-70 cm	78 cm
Width of Fracture	150-200 m	200 m
Vertical Fall	150 m	150 m

Snow	Hardness	Grain Type	Grain Size (mm)
Slab	1F-4F	RG/DF	1.5-3.0 mm
Weak Layer	F	FC	2.0
Bed Surface	1F-P	MF	2.0
Thickness of weak layer: 3.0 ☐mm / ☒cm / ☐in			

Start Zone	Ground Cover:	Location of Crown Face:	Snow Moisture
Elevation: 7250 ☐m / ☒ft	☐ Smooth	☐ Ridge	☒ Dry
Average Slope Angle: 45°	☒ Rocky	☐ Cornice	☐ Moist
Maximum Slope Angle: 50°	☐ Glacier	☐ Mid-Slope	☐ Wet
Aspect: N	☐ Dense Forest	☐ Convex Roll	
	☐ Open Forest	☒ Rocks	
	☐ Unknown	☐ Unknown	
Vegetation: Rock			

Track		Snow Moisture
☒ Open Slope	Average Slope Angle: 38°	☒ Dry
☐ Confined	Aspect: N	☐ Moist
☐ Gully		☐ Wet

Runout	Ground Cover:	Snow Moisture	Debris Type	α_i: °
Elevation: 7100 ☐m / ☒ft	☐ Smooth	☒ Dry	☐ Fine	α_e: °
Average Slope Angle: 25°	☒ Rocky	☐ Moist	☒ Blocks	Debris Density: kg m^{-3}
Aspect: N	☐ Glacier	☐ Wet	☐ Hard	Terrain Trap? ☒ no ☐ yes
	☐ Dense Forest		☒ Soft	Terrain Trap Type:
	☐ Open Forest		☐ Rocks	
	☐ Unknown		☐ Trees	
Vegetation:			☐	
			☐	

Comments
Open Slope with one rock outcrop approximately mid point of the slope

Section III: Accident Description

Fill in the following sections with available information. Attach additional pages, witness accounts, and other reports as necessary.

Events Leading Up to the Avalanche	Include objectives of the party, departure point, route taken, familiarity with area, encounters with other groups, location of the party at time of avalanche, etc.
Location of group in relation to start zone during avalanche: ☐ high ☐ middle ☐ low ☒ below ☐ all ☐ unknown	
Slope angle at approximate trigger site: 38°	

Avalanche Danger Evaluation			
Number of snowpit observations: 0		Stability Tests Preformed: ☐ yes ☒ no ☐ unknown	Test Results:
Signs of Instability Observed:			
☐ none ☐ some cracking ☒ whumphing ☐ recent avalanche activity	☒ unknown ☐ shooting cracks ☐ hollow sounds		

Comments
No tests conducted by subjects. See attached for post-mission snowpack/crown profile summary

Witness	Name	Address	Phone
1	Blake Mitchell		
2	Gary Davis		

Accident Diagram	On a separate page (Section VII) or photograph, draw a diagram of the accident scene. Include avalanche boundaries, prominent rocks and/or trees, the location of all party members before the avalanche, and the location of people, machines, and equipment after the avalanche.

Section IV: Rescue

Fill in the following sections with available information. Attach additional pages, witness accounts, and other reports as necessary.

Rescue Chronology

First Report	Response					
Reporting Party:	Agency	Time Dispatched	Time on Scene	Method of Travel	Number of Rescuers	Equipment
Report Method: Phone	DCSO SAR					
Time Reported:						

Recovery

Subject	Caught	Partially Buried—Not Critical	Partially Buried—Critical	Completely Buried	Depth to Face ☒m / ☐ft	Time Recovered	Length of Burial	Body Position	Head Position
1	☐	☐	☐	☒	1.5	approx 1730	approx 2 hours	___	___
2	☐	☐	☐	☐				___	___
3	☐	☐	☐	☐				___	___
4	☐	☐	☐	☐				___	___
5	☐	☐	☐	☐				___	___

Recovery Method For a transceiver recovery, include make and model of transceiver used by searcher. If an object on the surface was used as a clue, list object.

Subject	Self Rescue	Companion	Organized	Voice	Object	Transceiver	Spot Probe	Probe Line	Rescue Dog	Digging
1	☐	☒	☐	☐			☐	☐	☐	☒
2	☐	☐	☐	☐			☐	☐	☐	☐
3	☐	☐	☐	☐			☐	☐	☐	☐
4	☐	☐	☐	☐			☐	☐	☐	☐
5	☐	☐	☐	☐			☐	☐	☐	☐

Rescue Description List pertinent events that occurred during the rescue. Include additional pages of dispatch notes, statements, and agency reports as needed (Section VII).

Section V: Damage

Fill in the following sections with available information. Attach additional pages, witness accounts, and other reports as necessary.

Vehicles in Avalanche	Describe and/or estimate the cost of damage to each vehicle caught in the avalanche.		
Type	Partially Buried	Completely Buried	Damage
Snowmobile	☐	☒	Unknown
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	

Structures Damaged	Describe and/or estimate the cost of damage to each structure affected the avalanche.		
Type	Construction Type	Damage	Destroyed
			☐
			☐
			☐
			☐
			☐

Total Loss	Estimate the cost of damage caused by the avalanche: $

Rescue Cost	Estimate the cost of rescue: $

Economic Effects	List economic effects not included in the above tables (road closed, ski area closed, mine closed, change in policy, etc)

Section VI: Additional Comments and Recommendations

Mid afternoon on March 30th 2014 three snowmobile riders entered the Paulina Peak playground area from the east, near an area known as the Rollercoaster. As they gained the open north facing slope they traveled together as a group, staggered above one another across a North facing shady slope that averaged 35-38°, toward a notable rock outcrop. This visible rock had a convex roll feature below it on the slope. The first rider passed the rock outcrop and contineud west. As the two subsequent riders reached the outcrop, The stress bulb was sufficient at this trigger point to fracture a faceted layer beneath the current storm slab. The weak layer propagated outward and upslope and released an R4/D2 Persistent Slab. The second rider was able to outrun the avalanche and was not harmed. The third rider was caught mid slope while the slab was releasing and was subsequently fully buried.

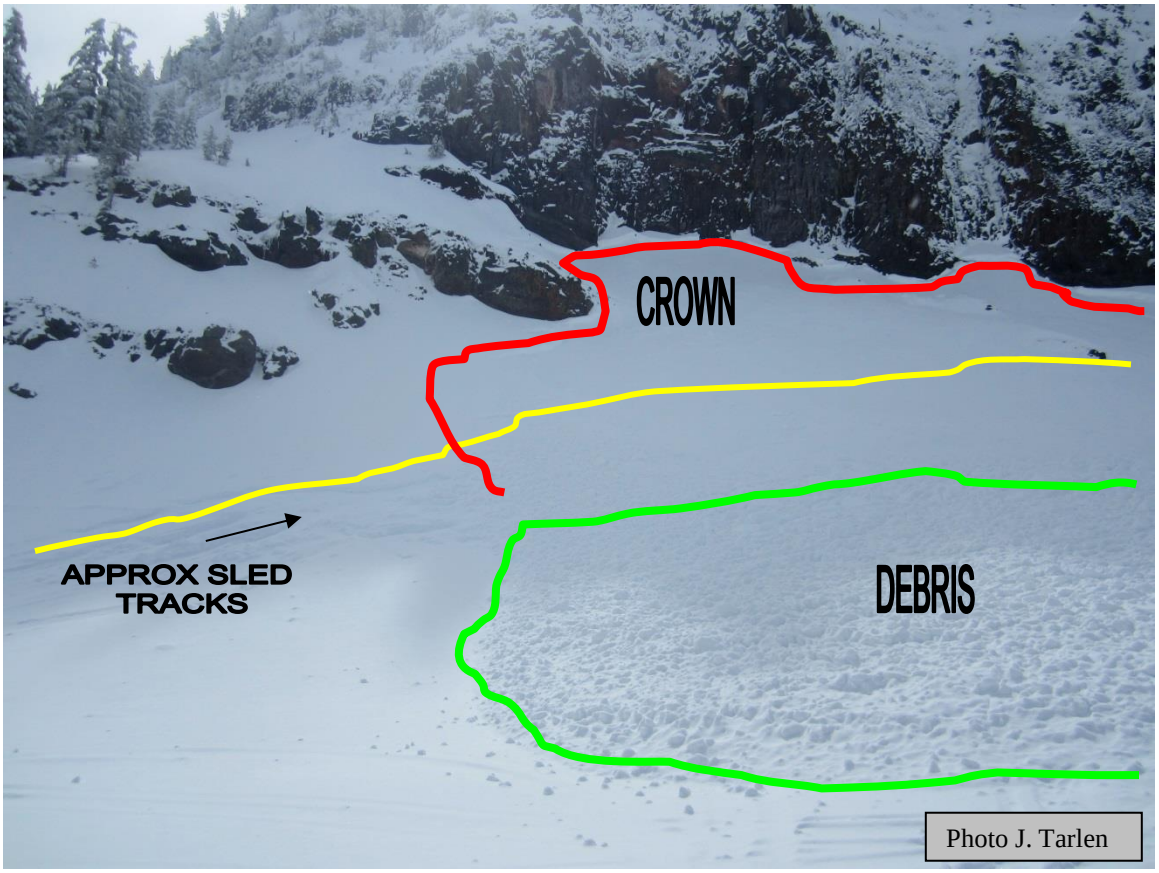
……..

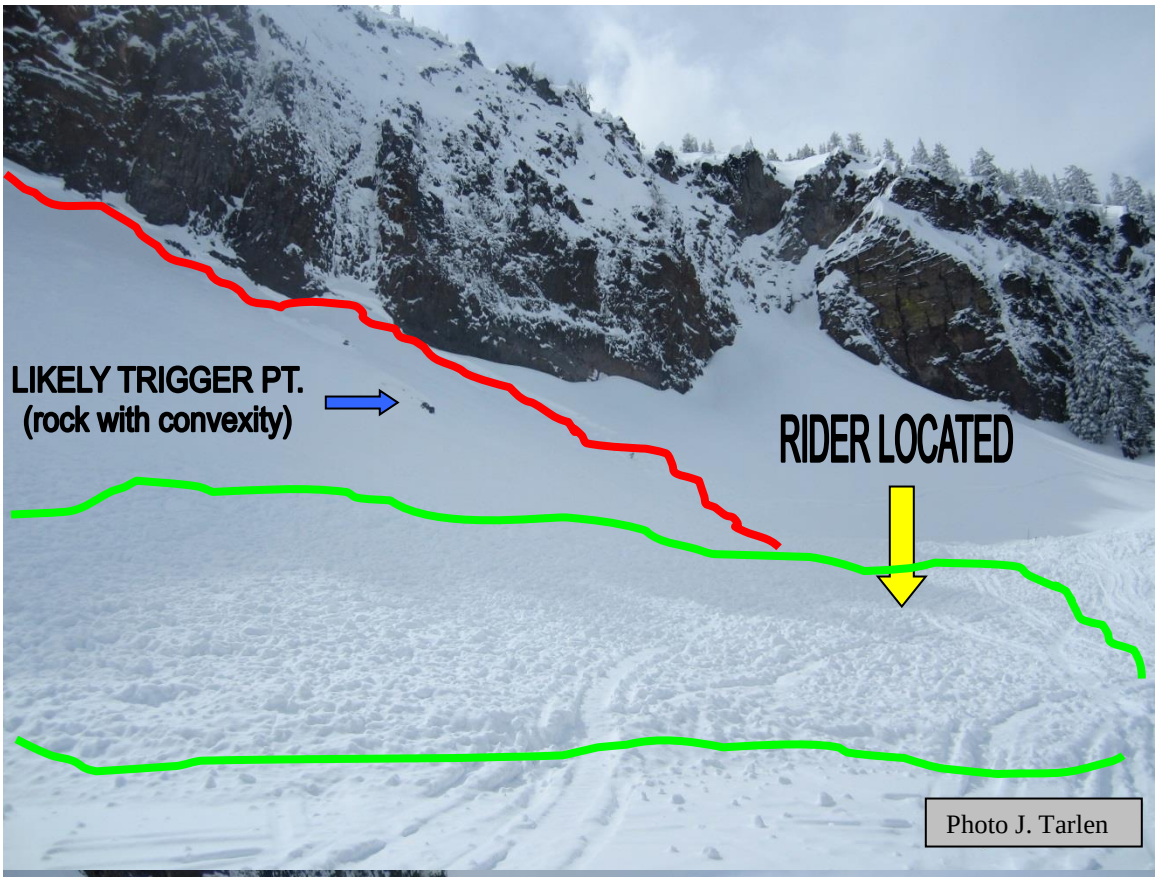
PAULINA PEAK AVALANCHE MARCH 3/30/2014

Crown Profile and Avalanche Observation recorded on 3/31/14

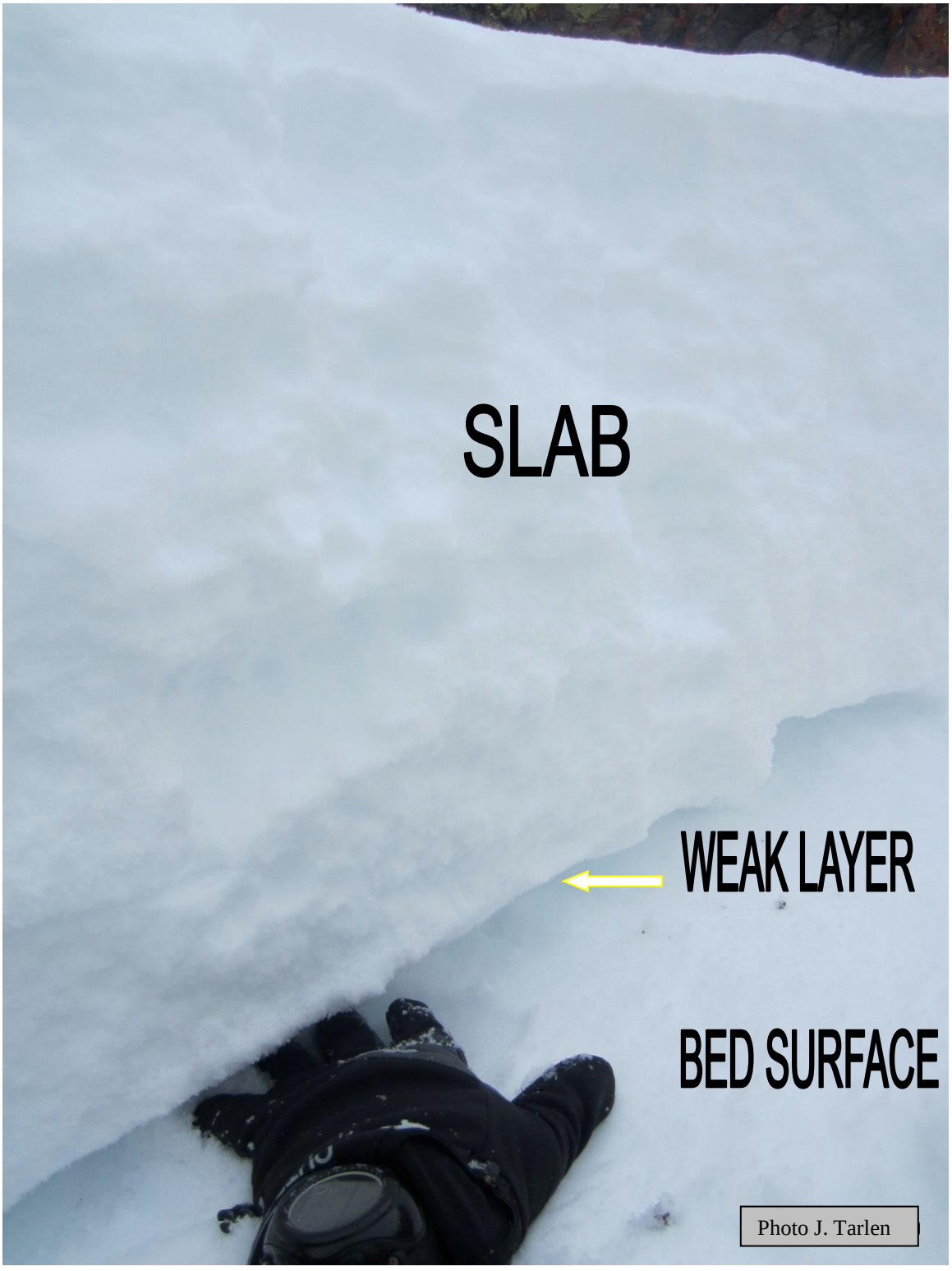
Mike Maurer and David Weil of Deschutes County SAR
Jonas Tarlen of Three Sisters Backcountry Inc.

- **2 snowmobilers caught, 1 buried 1.5 meters deep and killed.**
- **Soft slab - snowmobile trigger – size R4 D2**
- **Crown ht: 50-70cm, Path was 200m wide and ran 150m**
- **Average slope angle 38 degrees, 45 in start zone and near likely trigger point.**


CROWN
APPROX SLED TRACKS
DEBRIS
Photo J. Tarlen


LIKELY TRIGGER PT.
(rock with convexity)
RIDER LOCATED
Photo J. Tarlen


TERRAIN TRAP
Photo J. Tarlen


SLAB
WEAK LAYER
BED SURFACE
Photo J. Tarlen

Snow Pit Profile
Paulina Peak
Cascades, OR
Elevation (m) **7125**
Aspect: **0**

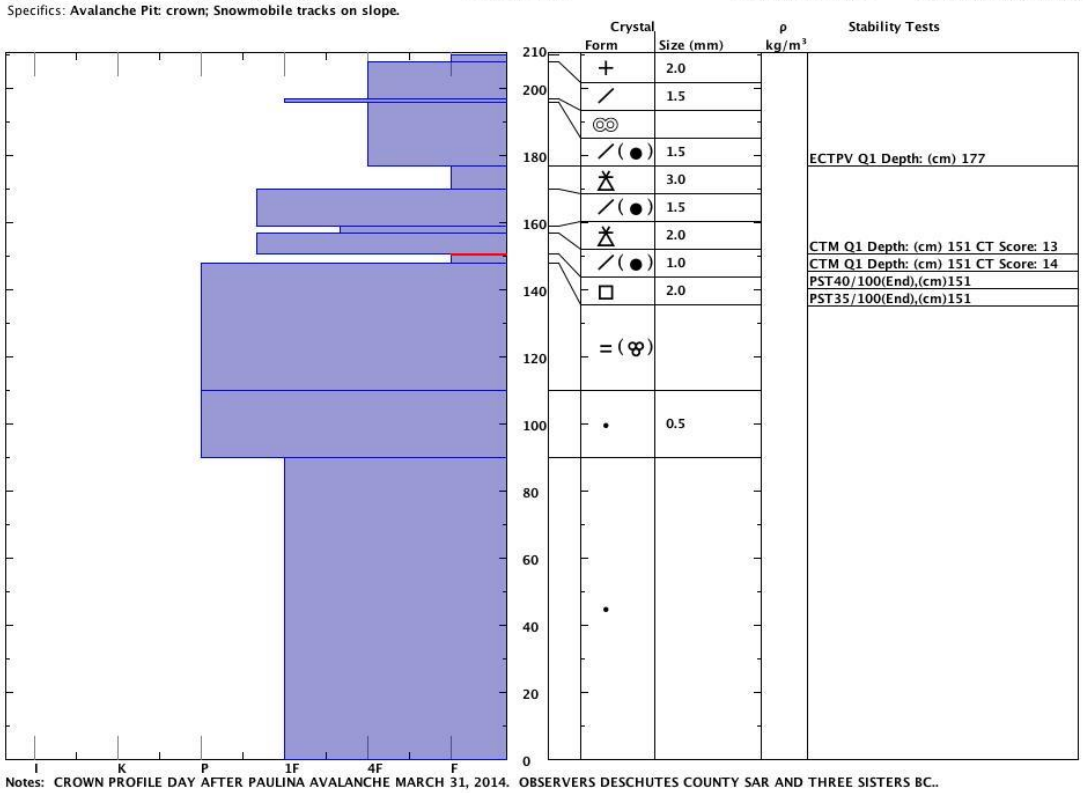
Observer: **jonas tarlen**
Mon Mar 31 14:00:00 PDT 2014
Co-ord: **43.41 N 121.14 W**
Slope: **38**
Wind loading: **previous**

Stability on similar slopes: **Poor**
Air Temperature: **-2.5 C**
Sky Cover: **sky 4/8 to 8/8 covered**
Precipitation: **Snow < 0.5 cm/hr**
Wind: **NE Calm**

PF10 HS210
Stability Test Notes:
177: Graupel Layer
151: Sudden Collapse
151: Sudden Collapse

Layer notes:
148-151: Problematic Layer
90-110: No obs below 90
0-90: Didn't dig to ground

Specifics: **Avalanche Pit: crown; Snowmobile tracks on slope.**



Notes: CROWN PROFILE DAY AFTER PAULINA AVALANCHE MARCH 31, 2014. OBSERVERS DESCHUTES COUNTY SAR AND THREE SISTERS BC..