

Rooster Comb Ridge Cornice Incident

April 3, 2011

Date/time: Sunday, April 3, 2011 / ~12:45pm PDT

Submitted by: Patty Morrison—Stevens Pass Winter Resort Snow Safety; Mark Moore—NWAC

Place: High point of NW end of Rooster Comb Ridge to the south of Stevens Pass, north-central WA Cascades

Aspect/Elevation/Slope Angle: NE/5,450'/50+degrees

Avalanche Type: L-ACu-R1-D2-S; 25-30'wide /400-500'vertical path

State: WA

Country: USA

Fatalities / Injured: 0 / 1

Summary: 2 snowboarders triggered and were caught by cornice collapse and resulting loose avalanche; one boarder was partially buried (lost board), unable to self rescue but found and dug out by second snowboarder who was not buried (but sustained an arm injury)

Accident narrative: On April 3, 2011, two snowboarders left the back side of the Stevens Pass Winter Resort to climb a ridge called Rooster Comb. They got to the high point of the NW end of the Rooster Comb Ridge, at approximately 12:45. They estimated that they were about six feet from the edge when they heard a large crack sound and realized the cornice had broken behind them. They both fell approximately 400-500 feet. One snowboarder remained on the surface the whole ride, while the other was tumbled and partially buried. The snowboarder that remained on the surface lost his board and sustained an injury to his arm. When he had finally stopped, his board also came to rest...within a few feet of him. He was able to get his board on and start looking for his friend. He heard his friend yelling below him, and found him partially buried with his unburied head pointing downhill. Although his feet were also unburied, the rest of his body was buried and he could not extract himself. He was uninjured, but had lost his snowboard. They both made their way back to the ski area, and contacted the ski patrol.

Weather: 3/31- 4/1/11- rain event-4.08"HN24W, high 36F/low 29F, SW wind-moderate to strong

4/2/11 - 3"HN24, 0.55"HN24W, high 33F/low 24F, SW wind-moderate to strong

4/3/11 – 4"HN24, 0.45"HN24W, high 28F/low23F, SW wind –light to moderate

Snowpack: Large, sensitive cornices on NE/E sides of Ridges, with variable wind blown snow on top of melt-freeze crust from previous rain event. No slab structure in this area, however soft wind slabs were produced within area during cornice control that was done the same day.

Ancillary Snowpack Information:

As the following April 2nd NWAC forecast (issued on April 2 for the weekend) indicates, an increasing considerable danger was forecast on NE aspects above 6000 feet on Sunday with increasing moderate danger elsewhere. With any sun or warming in the spring, it was expected that any new wind slabs (and/or cornices) would become increasingly unstable owing to the effects of daytime warming and some sun breaks...*"making them more likely to trigger by ski, board, boot or snowmobile"*. In fact, the snowpack analysis below stated that: *"It should be stressed that whenever new snow is received in the spring, it may be initially somewhat stable due to a good bond with the old wet snow surface. However, subsequent sun or just daytime warming and radiation effects may quickly warm, melt or weaken the snow surface, requiring little or no additional disturbance to slide. In short, with longer days and a higher sun angle, stability of new snow in the spring is very fleeting...and rapidly increasing danger is often the rule during subsequent daytime warming or even brief sun breaks."* A subsequent forecast issued around noon on Sunday indicated an even greater danger in the Stevens Pass vicinity, calling the danger "considerable below 7000 feet".

It should be noted that the heavy rain and high freezing levels of the previous week had probably already significantly weakened many cornices, and produced generally increasing stresses within the overhanging structure, which may have needed little or no additional disturbance to slide.

1026 AM PDT Sat Apr 02 2011

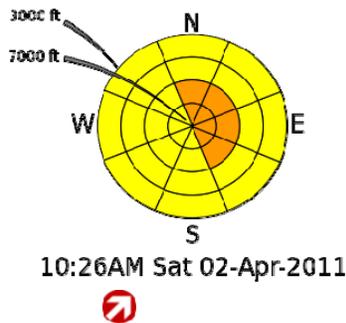
This forecast applies to back country avalanche terrain below 7000 feet and does not apply to developed ski areas or highways.

WAZ513-518-519-019-042-520-521-ORZ011

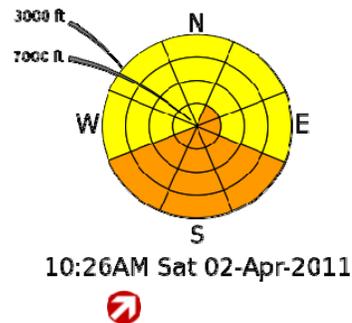
Zone Avalanche Forecasts

Stevens Pass

Danger Rose for Saturday



Danger Rose for Sunday



Click [here](#) for complete definitions of the avalanche danger scale.

Forecast

Saturday: Gradually increasing considerable danger on lee slopes above 5000 feet with increasing moderate danger elsewhere.

Saturday night: Briefly decreasing avalanche danger becoming considerable above 6000 feet and moderate below.

Sunday: Increasing avalanche danger on sun exposed slopes later morning and afternoon hours, becoming considerable or greater on slopes receiving sunshine and on lee slopes above 6000 feet and increasing moderate elsewhere.

Sunday night: Gradually increasing avalanche danger becoming considerable above 5000 feet and moderate below with a further increase likely Monday.

Snowpack Analysis

The warm and wet storms last Wednesday and Thursday produced high to extreme danger and a widespread natural avalanche cycle. With rain or wet heavy snow reaching higher elevations for the first time since mid-February, some very large avalanches released down to the MLK crust region formed in mid-late January into about mid-February.

This warm wet period was followed by a frontal system on Friday that brought cooling and gradually increasing snowfall to lower elevations along with further slow and somewhat limited snowpack settlement. While this has begun to shift the current danger from the old wet and weak snowpack to newly forming wind slab layers or new snow over a thin crust...especially at higher elevations...significant areas of wet weak snow remain in the upper part of the snowpack beneath a thin crust...especially below about 4 to 5000 feet. Also, while the gradual cooling during precipitation allowed a good bond to form between the new snow and the old wet snowpack, avalanches beginning within the new snow should be able to easily break through the crust and entrain considerable amounts of wet weak snow. In fact, early morning avalanche control with large explosives in the Crystal Mt ski area Saturday morning produced some relatively deep slides involving the recent wet and weak upper part of the snowpack, with slab depths ranging from 3 to 4 feet up to 5-10 feet. Also some larger natural slides released within the past 24 hours on steep smooth rock faces within the ski area. While it is possible that a human trigger could have released these large slabs if stress were applied in just the right spot, it is more likely that a smaller human triggered slide would apply more stress.

Light to moderate showers overnight added further shallow wind deposits on lee slopes above about 5000 feet where considerable danger exists. Elsewhere, despite the low freezing levels on Saturday, from 2 to about 7 inches of new snow from Friday should be relatively easy to push and get to slide by skis or board during daytime warming. Any resulting loose or wet loose slides may grow significantly as they descend due to the continuing wet and weak snowpack structure under a thin or very weak near surface crust.

It should be stressed that whenever new snow is received in the spring, it may be initially somewhat stable due to a good bond with the old wet snow surface. However, subsequent sun or just daytime warming and radiation effects may quickly warm, melt or weaken the snow surface, requiring little or no additional disturbance to slide. In short, with longer days and a higher sun angle, stability of new snow in the spring is very fleeting...and rapidly increasing danger is often the rule during subsequent daytime warming or even brief sun breaks.

Detailed Forecasts

Saturday and Saturday night

Moderate westerly pass and ridge top winds and increasing light to moderate snow or snow showers are expected Saturday, especially along the west slope areas of the central WA Cascades and near the volcanic peaks. This should build further wind deposited layers on lee slopes mainly northeast to southeast facing at higher elevations where a considerable danger and dangerous avalanche conditions should persist. In other areas at lower and mid elevations, increasing

amounts of damp snow should produce an increasing moderate danger with further loose or wet loose slides possible...and some of these may involve large amounts of wet and weak snow within the upper 2 to 4 feet of the surface.

Decreasing winds and decreasing light showers overnight should allow for a slow decrease in the avalanche danger as recent wind deposits begin to settle and strengthen and further crust formation occurs near the top of the previously wet old snowpack.

Sunday and Sunday night

Partly sunny skies Sunday morning should be followed by increasing high clouds mid-day and more generally increasing clouds with light showers developing Sunday afternoon. Along with light winds and the recent snowfall from Saturday, some sun breaks should produce dangerous avalanche conditions on southeast through southwest facing slopes during later morning and afternoon hours when the potential for both natural or human triggered loose or wet loose slides should significantly increase. Also, daytime warming and the increasingly strong early April sunshine should warm and increase the cohesion of any recent wind slabs, making them more likely to trigger by ski, board, boot or snowmobile. Such slides should release on the recent crust, but may break thru the crust to involve wet and weak layers below the crust. Due to the recent very wet upper snowpack in most areas, any wet snow avalanches beginning on sun exposed slopes could entrain large amounts of wet snow becoming quite dangerous. In any case, these dangerous early spring snowpack conditions will require conservative decision making, careful snowpack evaluation and cautious routefinding to help ensure safe travel. In general it is recommended that travelers avoid exposure to steep southerly facing slopes receiving strong sunshine, especially during the late morning to afternoon hours.

Increasing winds should accompany light to moderate snow spreading over the Olympics during the evening hours and the Cascades overnight. This weather should produce gradually increasing danger, especially on higher elevation lee slopes where gradually thickening wind slabs are expected.