Slope Angle and Snow Stability

Two key factors in safe backcountry riding

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When venturing into the backcountry, answering these two questions is essential when assessing a slope to ride:

**Is the terrain capable of producing an avalanche?**

-and-

**Can the snow slide?**

Avalanches happen when four ingredients are present: a slab, a weak layer, a trigger and a **slope steep enough to slide**. A key problem when assessing slope angle is that most slopes have varying degrees of steepness. It is critical for riders to assess slope angle frequently.

The most common slope angle range on which avalanches occur is between 36-38 degrees - though it is important to note that not all avalanches start on slopes with these precise angles. If a gentle slope of 25 degrees or less is connected to a larger, steeper slope, it is still possible to trigger a slide from below without ever getting on the steepest part of the slope. In addition, areas that are convex, where slope angles go from low to high in a short distance or steep sections near ridgelines are high probability zones for triggering avalanches.

This brings up the challenge of how to effectively and safely assess slope angle. The easiest way to assess slope angle is to use an inclinometer. One issue with basic inclinometers is that riders have to venture on to the slope they are trying to assess, to get an accurate reading. One way to overcome this issue is to measure angles on smaller slopes with less consequence that have a similar aspect and angle as the slope you want to ride. It is vital to assess the entire slope since slope angles change frequently.

Assessing snow stability is equally as important as assessing slope angle. Reading the daily avalanche advisory, digging snowpits and watching for signs of instability such as recent avalanche activity, shooting cracks and large collapses are valuable tools for assessing snow stability.

If the snowpack is stable it’s perfectly acceptable to ride in avalanche terrain. If the snowpack is unstable, it’s best to avoid slopes steeper than 30 degrees or lower angle slopes attached to larger, steeper slopes above. Triggering slopes from low angle or flat terrain is called remote triggering and is a common way riders get in trouble. When traveling in terrain that requires the crossing of avalanche paths it is imperative to cross one at a time and always keep a watchful eye on one another.

Understanding slope angle and snow stability are important factors in safe backcountry riding. Taking time to frequently practice with an inclinometer is the best way to become skilled at assessing slope angle. Consistently reading the daily avalanche advisory, watching for signs of instability such as cracking-collapsing and recent avalanche activity along with digging snowpits is a sure fire way to stay informed on snow stability. Using these two key factors in conjunction with one another is necessary for making safe and accurate decisions in the backcountry.