

Riparian Notes

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Myth Number 3 – Vertical eroding cut-banks are bad

Recent issues of Riparian Notes have been discussing some common myths and misperceptions about creeks and rivers. These myths help perpetuate misunderstandings of important riparian truths and may undermine good riparian management.

Myth Number 3 is pervasive. Everyone “knows” that erosion is bad and that extreme erosion is especially bad. We go to great effort and expense to control erosion and repair the damage. In most cases, this desire to reduce erosion is good and proper, and efforts to control soil erosion are usually justified.

One of the most blatant and offensive forms of erosion is actively eroding vertical banks on creeks. These cut-banks vary in height from only a few feet to 30 feet or more. Creekside landowners are especially alarmed when banks start caving off. Precious soil is lost; large trees fall over; property value is diminished. It is demoralizing to watch, and there is usually little that can be done to effectively and practically combat such erosion.

The good news is that vertical eroding cut banks are not always bad. Often time they are beneficial. Cut banks normally occur on outside bends where energy and stress is greater. During high flow events, the force of water against these banks inevitably creates some erosion. When banks become wet and saturated, their weight increases and their cohesive strength decreases. This combination allows banks to slough and erode. In addition, layers of weak, non-cohesive material, such as sand or gravel, are more easily eroded away, undermining the material above. Furthermore, trees, often act as large levers to hasten failure of saturated weak banks. Erosion on outside bends may be ugly, but is natural, and should usually not be a cause for concern (except as noted below).

Erosion on cut banks is “good” when the eroded soil material is carried downstream and deposited on the opposite side, forming point bars on inside bends. Point bars are the crescent shaped sediment deposits normally seen on the inside bends of creeks and rivers. On inside bends, water velocity and energy is reduced, allowing some sediment to drop out. This erosion / deposition process, taking place along creeks and rivers is what creates the familiar meandering pattern of many creeks and rivers. As this sinuosity increases, the slope of the channel necessarily decreases. This decrease in slope reduces the velocity and erosive forces of floodwater.

We must learn to grit our teeth and let the ugly work of bank erosion do its job. Think of the high vertical banks on outside bends as the source of soil material to be used downstream to build new floodplains, new point bars and increased sinuosity. Think of high flows as the mechanism to transport that sediment to the new location. When the erosion / building process is working in a balanced manner, the width of the channel does not increase – erosion on one side is counterbalanced by constructing new bank on the opposite side. This process is analogous to the cutting and filling that is required during construction and earthwork projects. Soil is taken from one place and transported to another place for a beneficial purpose. This is what happens naturally on many creek and river banks, especially when there is good riparian vegetation to help trap and hold the sediment in place.

However, there are at least two situations where vertical eroding cut-banks are indeed bad and indicative of serious riparian problems. First, when vertical eroding cut-banks are found along straight segments, this usually indicates problem of excess stream energy and a lack of stabilizing and energy dissipating features. Secondly, when erosion of cut-banks is taking place without a corresponding building of point bars on the opposing inside bends. This kind of bank erosion without the deposition of eroded material is a sign that the channel is out of balance. Addressing such large scale issues is challenging and emphasizes the need for cooperative riparian management over many miles and across many ownership boundaries.

It goes against what most of us have been taught – to observe erosion and let it continue. But in the case of vertical cut banks on outside bends, this is exactly what we need to in most cases. Efforts to slow this kind of natural erosion may actually hinder the riparian recovery process.

For previous issues of *Riparian Notes*: <http://texasriparian.org/riparian-education-program/riparian-lessons/>. The author is indebted to Wayne Elmore who compiled the original list of myths and uses them to teach riparian principles.