

Riparian Notes

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A Difficult Journey

The traditional vacation season is almost here. Imagine taking a long driving trip with the entire family, including three kids and two dogs. What kind of trip comes to mind as you think about the following words: Rough; Difficult; Bumpy; Arduous; Slow; Sluggish; Complicated; Interrupted; Grueling; Time-Consuming; Laborious; Obstacles; Detours; Barriers; Blockages; Impediments; Obstructions; Diversions. In our fast-paced world, where waiting is considered a form of torture, these words probably do not bring pleasant thoughts of an enjoyable trip.

These words should, however, describe one of the most important things that happen on the land: the flow of water downhill. From the place where each raindrop hits, the journey of water to its destination should be slowed and impeded by as many obstacles and barriers as possible.

The law of gravity and our own common sense tells us that water runs downhill. Geometry teaches us that the shortest distance between two points is a straight line. But when it comes to land and water stewardship, the goal should normally be to upset these two truths as much as possible.

Land stewardship can either help or hinder this journey of water downhill. In rangeland and forestland areas, good land stewardship usually means slowing the movement of water. In this condition, the land serves more like a “water catchment”. Poor land stewardship usually results in a quick and efficient movement of water downhill. In this condition the land serves more like a “water shed”. The difference between these two is important.

As water flows downhill, the slower it moves, the longer it remains in contact with the soil, and the greater opportunity it has to soak in. Fast runoff means limited infiltration. Slow runoff means greater infiltration. A robust blanket of grass and plant litter on the soil surface provides the millions of small obstacles needed to slow the water down. Not only does this blanket of grass or plant litter allow good infiltration, but it also filters and intercepts soil particles that may have been detached by raindrop splash.

In this ideal trip downhill, much of the water soaks into the earth where it can be stored in the soil profile, used by plants, or percolate even more deeply into underground water tables. But during heavy rainstorms, all of the water cannot soak in and some of it continues downhill until it reaches a creek. By this time, the combined water from many acres of uplands may have formed quite a large flow. The continuing trip downhill still needs to be interrupted by a continuous matrix of obstructions and detours. As this flow gathers together and gains momentum, riparian obstacles are needed to dissipate energy and slow the erosive momentum of water.

Trees, bushes, logs, boulders and heavily vegetated banks all contribute to this effort to slow down the water. Dense upright riparian vegetation is crucial to help retard the flow. In the channel itself, meanders, bends, sinuosity and bars help slow the water. As floodwaters spread out from the channel on to the floodplains, energy can be dissipated and velocities slowed due to the surface area of the floodplain and the roughness caused by the vegetation. Sediment laden waters are allowed to drop some of their load thus enlarging and enriching the floodplain even more. Every ton of sediment that can be caught up and trapped by riparian vegetation is one ton that will not end up filling pools or covering riffles downstream.

The next time it rains hard, put on a raincoat, go outside, and watch what happens to water as it moves downhill. Consider how a properly grazed pasture, a well managed forest or a healthy riparian area protects the earth, filters sediment and processes the rainfall for maximum benefit. Truly amazing.