

## Where Does The Rainfall Go?

# WATERSHED MANAGEMENT

## A Demonstration

### What is a *watershed*?

A **watershed** is an area of land that channels rainfall downhill, above or below ground, to join with the outflow of another watershed or into a marsh, river, lake or underground aquifer.

**Watershed management** is an attempt to enhance the value of water in quantity and quality through proper management of soil, livestock, and vegetation. The rainfall simulator is useful in helping us to understand how management can be applied..



What is a Rainfall Simulator? A **rainfall simulator** simulates a rainfall event on a small specific area and allows water to either soak into the ground, through a porous soil layer and drain out the lower holes and into the container called “ground water”; or it runs off the top of the soil surface or impervious layer and out the top hole spilling into the container called “runoff water”.

**The goals of the rainfall simulator are to encourage:(the requirements of a wildlife habitat)**

- 1. increased water infiltration*
- 2. decreased sediment loss*
- 3. Enhanced livestock forage productivity*
- 4. Enhanced wildlife food, water and cover*
- 5. Protection of water from non-point pollution*
- 6. Management for sustainable watersheds*

### **PROBLEM:**

Historians tell us there were **10,000 springs that used to flow centuries ago in Texas. Today only 60% still flow.** There are **3 main reasons for the drop in water** in our aquifers that produced those springs.

The **first reason** for the loss of springs is because of the lowering of water tables by pumping out the water for human use. As our population grows we will use more water from underground aquifers. And as more wells are drilled, and the water tables will continue downward.

**Second, is the absence of fire in controlling the growth of woody plants.** An early account (1528) by the shipwrecked Cabaza de Vaca would suggest that Indians routinely and indiscriminately used fire as a management tool in Texas prior to European settlement. From his diary comes this quote: (Nunez 1905)

*“The Indians go about with a firebrand, setting fire to the plains and timber so as to drive off the mosquitos, and also to get the lizards and similar things they eat, to come out of the soil.”*



Raindrop on a Sideoats Grama (the State Grass of Texas) seed head.

As the result of this human activity as well as fires set by lightening, a vegetation dominated by mid and tall grasses extended over vast areas of Texas. In the hill Country

the cedars, which were easily killed by fire were limited to steep canyons. Liveoaks were scattered as large trees surviving the fires or in mottes, resprouting following burns. Other woody plants including mesquite, were restricted to areas in the canyons and along streams or in clusters of sprouts in an open grassland. As woody plants, especially cedar and mesquite increased, increased, less water moved into the underground aquifers to recharge springs..

**The third reason for the loss of our springs in the loss of better grasses which allow more water to infiltrate into the soil. Heavy grazing by livestock** has caused the replacement of mid-grasses with more resistant short grasses, woody plants, weeds, and occasionally, bare soil. Infiltration is best where the soil is covered with deep-rooted grasses such as Little bluestem, Big bluestem, Indiangrass, Switchgrass and Sideoats grama. As these plants are replaced, the water more readily moves over the ground surface instead of moving into the soil. Without vegetative cover the soil surface can heat up 30-50 degrees hotter than shaded ground to disrupt life in the soil and promote soil erosion when rain occurs. Loss of vegetative cover due to excessive grazing, drought, or fire results in increased erosion and sedimentation in rivers and lakes. As the amount of erosion increases the amount of water that infiltrates into the soil decreases. This in turn decreases the number of animals the land will support.

#### **THE SOLUTION:**

**1:** Manage woody plants and restrict cedars by using the technique called **“brush sculpting”** to increase forage for livestock, assist wildlife, care for endangered species, protect riparian areas and reduce soil erosion..

**2:** Do not overgraze. Reduce livestock numbers and **rotate livestock** among pastures and develop a good range. Use the rule of thumb of **“grazing half and leaving half”** when it comes to forage and provide an extended period of rest to allow plants a time to mature and strengthen its roots.

**3: Be wise water users. Xeriscaping** will reduce water and pesticide usage; Reduce the size of turf in the landscape and increase natural or “**wildscape**” areas; conserve water usage in and outside the home; and, use rainwater and gray water in supplementing the needs.

**4: Teach others** to be wise water users and good stewards of our natural resources. It takes an average of 500 years to rebuild 1" of soil so the things we do will have a long lasting effect. Be a good steward of the land under your care so you can pass it on to the next generation in better shape that was passed on to you.

### **Watershed Management Consequences**

**by Dr. Jake landers**

*Rain on hills in ages past  
Made the soil and grew the grass  
That fed the deer and buffalo  
Now cattle, sheep and goats, you know.*

*When the grass was over used  
Rocks appeared and soil diffused  
Into the river silt and sand  
The Pecos and the Rio Grande,  
And moved toward the end, you know,  
To fill the Gulf of Mexico.*

*Now if you have excessive stock  
And graze the hillsides down to rock  
The soil your heirs should get, you know  
Is in the Gulf of Mexico.*

*And your eternal price to pay  
May rest upon that judgement day  
When God commands: “You lay the track,  
Return the soil upon your back”.*

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