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Increasing Bare Ground Indicates Poor Watershed Health

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Most of the water in Texas comes from a vast land resource called rangeland, which is the state's largest watershed. The rangeland watershed is composed of many land units and ecosystems that are managed in different ways. What happens on each section of the watershed affects the whole, and these effects are cumulative. So, it is important for each individual landowner to evaluate his or her rangeland and ensure that the way land is being managed contributes to a healthy watershed.

How Rangeland Affects Water Quality

The most important characteristic of healthy rangeland (watershed) is an adequate cover of vegetation. Bare ground causes rain to run off swiftly, carrying with it sediment and soil nutrients. The result is erosion, less productive rangeland, and lower water quality. Vegetation traps rainfall so that it has time to soak into the soil, lessens the force of raindrops on the soil, and slows and filters water flowing over the land so that less water and sediment run off. All of these actions improve the quality of water entering our surface and ground water supplies. A good plant cover also lowers soil temperature and protects the soil surface from animal and mechanical traffic, which increases the ability of the soil to absorb precipitation. Soil that holds water well produces higher quality forage and lessens the financial risk of drought.

Monitoring Your Rangeland

The wise land manager knows what is happening on his rangeland over time, so that if problems arise management practices can be changed to correct them. Estimating the percentage of your land that is bare of vegetation, and keeping track of that information over time, will tell you whether or not the health of your land and watershed are declining. The pace transect method is a simple way to determine the percent of bare ground and rock. (This method is adapted from material published by the National Cattlemen's Association. See reference at the end of this publication.)

Monitor each range management unit or pasture separately. Monitor smaller areas within a management unit separately also if they have been used differently or have different slopes, exposure, soils, erosion potential,vegetation, or management objectives. Within each monitoring area, establish several beginning points for transects (straight lines) through the pasture. Take a photograph of the landscape from each beginning point. Then, at each beginning point, pick a random point in the distance and walk toward it. After every ten paces stop and observe the ground at the tip of your right shoe (Fig. 1). On the record sheet (Fig. 2), record whether there is bare ground or rock, or whether there is vegetation. In the species column, record the kind of vegetation at the tip of your shoe. If there is no plant there, identify the nearest plant to that point. Continue until you have taken ten such readings along each transect.

Figure 1. At each stop in a transect, note the condition of the land at the tip of your right foot.

Calculate the percentage of bare ground for each transect (the number of stops where you recorded bare ground or rock, times ten). For example, three instances of bare ground or rock in 10 observations (100 paces) would equal 30 percent bare ground. Then calculate the percent bare ground average for the whole management area by averaging the percentages of all transects. For example, if you walked three transects and they showed 30, 20 and 50 percent bare ground, the average for the management area would be 33 percent. Be sure to use enough transects to adequately describe each management unit; the more variable the landscape within a unit, the more transects are needed. There will be obvious seasonal changes in vegetative cover because of plant growth and death

Date _____ Evaluator _____ Management Unit _____ Site _____ Transect# _____

Pace #	Bare ground	Rock	Litter	Plant	*Species	Description / Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Figure 2. Pace transect monitoring record.

*Record plant species in order to determine species composition.

and animal activity, so use the pace transect monitoring method at least twice each year–before the growing season begins and again after the first frost in the fall. Monitor at the same times each year so that your record will accurately reflect changes in bare ground over time. Use the photographs you take at each beginning point and the records of plant species to monitor species composition.

Recognizing and Solving Problems

Not all range sites have the potential for 100 percent vegetative cover. Some are naturally rocky or sparsely covered with plants. The importance of monitoring your rangeland is that you will know whether or not the percentage of bare ground is increasing. If it is, the range watershed is becoming less healthy and corrective actions are needed.

Other publications in this series:

L-5365, Are Your Streams Healthy?
L-5364, Know Your Plants to Protect Your Watershed
L-5366, Reading Your Landscape: Are Your Pastures Healthy?

For further information:

Natural Resource Desk Record. 1996. National Cattlemen's Association, Integrated Resource Management Committee, Denver, Colorado.

L-5216, "Range Monitoring with Photo Points," Texas Agricultural Extension Service.

"Healthy Range Watersheds Critical to the Future of Texas," available from the Extension Rangeland Ecology and Management group at (979) 845-2755.

For additional range information see: http://texnat.tamu.edu

For additional risk management information see: http://trmep.tamu.edu

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