

Are Your Streams Healthy?

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Texas streams and lakes are an important water source for landowners and municipalities. It is just as important to monitor the health of the streams on your property as it is to know what plants you have. Water flows from your rangelands (watershed) through a series of channels before reaching streams and lakes. How much rainfall runs off, and how fast it runs off, are determined by the amount and type of vegetative cover on the land, the soil type, the slope of the land, the intensity and duration of rainfall, and your management of the land. A healthy watershed produces vegetation that stabilizes soils and stream channels and maintains high quality water for aquatic ecosystems, downstream users, and coastal wetlands and estuaries.

The Importance of Riparian Zones

Riparian areas are the margins of channels, streams, rivers and lakes. Riparian vegetation depends on runoff water from the watershed. It is in the flood plain of the stream. During a flood, riparian vegetation slows the flow of water, causing sediment and nutrients to be deposited in the riparian zone and along the stream channel.

Healthy riparian zones protect stream banks from erosion unless the water is flowing too rapidly. The more impediments such as trees, grass and brush there are within the flood plain, the more slowly the water moves and the greater the amount of sediment and nutrients deposited. Flood plain plants must have flooding to survive. Vegetation along the stream bank also provides shade and reduces water temperature, which is essential for some aquatic species. The riparian zone is also habitat for many kinds of wildlife. Texas Parks and Wildlife reports that an estimated 80 percent of all vertebrate species in the desert southwest depend on riparian areas during part of their life cycles.

Determining the Health of Your Streams

The following method was adapted from material published by the National Cattlemen's Association. Visually inspect all of your stream channels at least once per year, and again after heavy rainfall. Determine whether or not they have adequate vegetative cover and whether or not they are eroding. Then classify stream banks into one of four categories (Fig. 1).

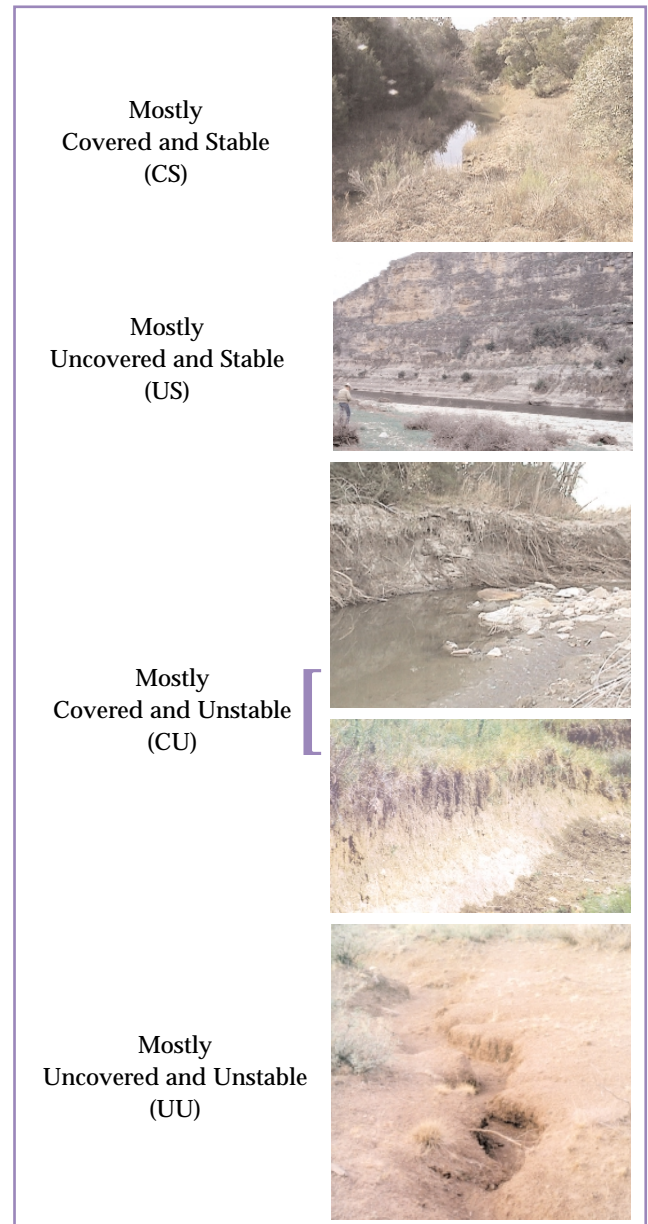


Figure 1. Stream bank stability and cover indicators.

Banks are covered if at least 50 percent of the bank area is covered by:

- perennial vegetation;
- roots of vegetation (e.g., willow and sedges);
- rocks of cobble size or larger; or
- logs 4 inches in diameter or larger.

If the stream bank is not at least 50 percent covered by one or more of these materials, it is considered uncovered.

Banks are unstable if they have any of the following features:

- breakdown (obvious blocks of soil broken away from the bank);
- slumping;
- fractures (visible cracks in the bank); or
- mostly uncovered (see above) and a vertical slope of more than 80 degrees from the horizontal.

If stream banks lack these features, they are considered stable.

Walk along the stream bank and visually estimate the percentage of the stream (in 10-percent increments) that falls into each of the four categories. Record your observations on a data sheet similar to the one in Figure 2. On a map, note the locations of stream sections that need special attention. Describe these locations on the data sheet. Note the dates of floods and the high water marks.

Improving the Health of Your Streams

If you find areas where stream banks are in poor condition, it is important to determine why. Move upstream or to the adjacent watershed to search for the source of excessive runoff. If the riparian vegetation is stable and yet the stream bank shows active cutting, the problem is upstream. Often managers construct dams to catch runoff and sediment. This does not solve the real problem and if heavy rain occurs the dam likely will be breached, which causes even more downstream damage. Most problems originate in the upland watershed, and are caused by roads, logging, improper grazing, cultivation, or other activities that disturb vegetation. Stream bank erosion also can occur if there is too much clearing of brush and debris within the riparian area, or loss of the riparian area itself. Any management practices that greatly increase the rate at which water flows across the watershed can lead to soil erosion and the breakdown of stream banks. The goal of upland watershed management is to increase the infiltration of water into the soil

Date	Site description	%CS	%US	%CU	%UU	Flood info.

Figure 2. Stream bank and cover evaluation form.

and reduce rapid runoff. Once a problem area is located, change your management to allow natural processes to heal the landscape. If livestock or wildlife are concentrating along the stream, you may need to fence them out and develop water sources for them elsewhere. If the land has been overgrazed, establish a new grazing system to give the land adequate rest. Seeding, pitting, contour furrowing, terracing, ripping, waterspreading, and building water control structures are some of the remedies that may be needed. You may have to work with upstream property owners to correct some situations. It is best to stop erosion and excessive runoff before it starts by maintaining good vegetative cover (with minimum bare ground) throughout the watershed and keeping riparian areas healthy.

Other publications in this series:

- L-5367, Increasing Bare Ground Indicates Poor Watershed Health
- L-5364, Know Your Plants to Protect Your Watershed
- L-5366, Reading Your Landscape: Are Your Pastures Healthy

For further information:

Hanselka, C. W. and L. D. White. 1986. Rangeland in dry years: drought effects on range, cattle, and management. In R.D. Brown (ed.), *Livestock and wildlife management during drought*. Cesar Kleberg Wildlife Research Institute, Texas A&I University, Kingsville, Texas.

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

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

Texas Parks and Wildlife. 1998. *Managing riparian habitats for wildlife*. PWD BR W7000-306, Austin, Texas.

L-5141, Do You Have Enough Forage? Texas Agricultural Extension Service.

Rainfall Analysis software. 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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