

What Does A Healthy Stream Look Like?

Oso Creek Watershed Meeting
Corpus Christi, Texas
June 2014

I. What Should a Healthy Stream Look Like?

- What Do We Value About a Stream?
- What Does a Properly Functioning Riparian Area Do?
- What are the Functions of a Stream?



What Do We Value About Healthy Streams?



- Clean Water
- Fish and Aquatic Habitat
- Natural Scenic Beauty
- Recreation
- Wildlife Habitat
- Abundant Forage for Livestock
- Reliable Water Source

Functions of a Stream

- Transport Water
- Transport and Deposit Sediment
- Provide Food, Shelter and Other Biological Functions for Fish and Wildlife

The Work of a Properly Functioning Riparian Area

- Dissipate Stream Energy
- Reduce Erosion
- Trap Sediment
- Store Water
- Retain Floodwater
- Recharge Groundwater
- Provide a Sustainable Base flow



II. Hindrances to a Healthy Stream

- Land Disturbances
- Excessive Concentration of Animals
- Artificial Manipulations
- Excessive Traffic
- Woody Removal
- Excessive Withdrawals

Land Disturbances

- Developing the Riparian Area.
- Landscaping the Riparian Area.
- Mowing and/or Spraying too close to the Stream.
- Farming too close to the Creek.



Excessive Animal Concentrations

- Wildlife (Feral Hogs, Deer, Exotics, Ducks, Bats etc..)
- Pets
- Overgrazing of Livestock Along the Edge of a Stream

Artificial Manipulation



- Bridges and Stream Crossings
- Manipulations to the Stream Bank
- Structures in the Riparian Area
- Stream Straightening
- Berms, Diversions Dams and Levee Systems

Excessive Traffic

- Vehicle Traffic
- Foot Traffic

Removal of Wood

- Removing and/or Thinning of Trees and Woody Vegetation in the Riparian Area
- Removing Woody Debris From the Stream Channel

Excessive Withdrawals

- Dams
- Diversions
- Alluvial Pumping



Healthy Riparian Areas improve Water Quality

Riparian Areas are our last line of defense. Thick vegetation helps to trap debris, sediments, nutrients, and other pollutants before they enter the stream.



Healthy Riparian Areas improve Water Quality

- The soils present in a healthy riparian area act like a sponge storing large amounts of water that will be filtered to the ground and then slowly released back into the stream as base flow or infiltrate into the underground aquifer.
- As flood waters spread over the riparian area and onto the floodplain, water velocities are reduced causing some of the sediments, nutrients and other pollutants to settle out of the water column.

Healthy Riparian Areas improve Water Quality

- Dense vegetation and trees in healthy riparian areas work to dissipate flood water energy, by slowing the flow of water and allowing more time for infiltration.
- Trees and grasses in riparian area stabilize stream banks and reduce bank erosion.

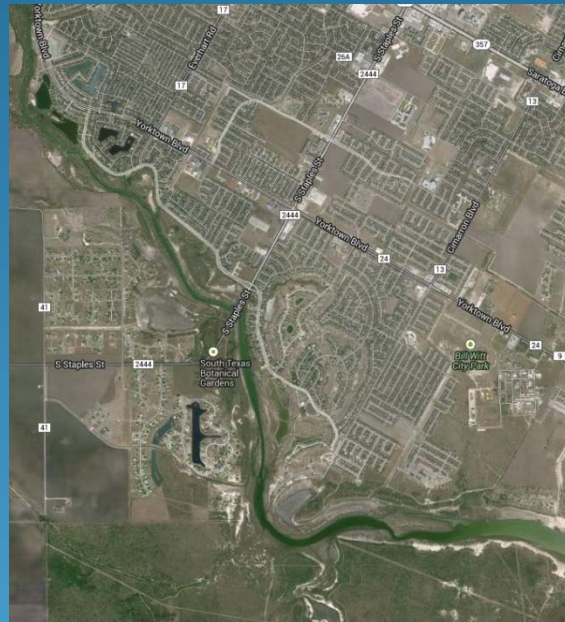


Healthy Uplands improve Water Quality

The vast majority of issues that affect water quality in the stream don't occur in the riparian area, but rather, further up the slope in the upland areas of the watershed.



Healthy Uplands improve Water Quality



Runoff that occurs on the uplands, is channeled into drainages along highways, and then runs into the stream at a crossing completely misses the filtering effects of the riparian buffer.

Healthy Uplands improve Water Quality

We just can't continue to do whatever we please on the uplands and expect the riparian area to filter and clean our runoff before it enters the stream.

Healthy Soils improve Water Quality

Healthy soil gives us clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife, and beautiful landscapes. Soil does all this by performing five essential functions:

- Regulating water - Soil helps control where rain, snowmelt, and irrigation water goes. Water and dissolved solutes flow over the land or into and through the soil.
- Sustaining plant and animal life - The diversity and productivity of living things depends on soil.

Healthy Soils improve Water Quality

- Filtering and buffering potential pollutants - The minerals and microbes in soil are responsible for filtering, buffering, degrading, immobilizing, and detoxifying organic and inorganic materials, including industrial and municipal by-products and atmospheric deposits.
- Cycling nutrients - Carbon, nitrogen, phosphorus, and many other nutrients are stored, transformed, and cycled in the soil.
- Physical stability and support - Soil structure provides a medium for plant roots. Soils also provide support for human structures and protection for archeological treasures.

Healthy Soils improve Water Quality



Healthy Soils improve Water Quality

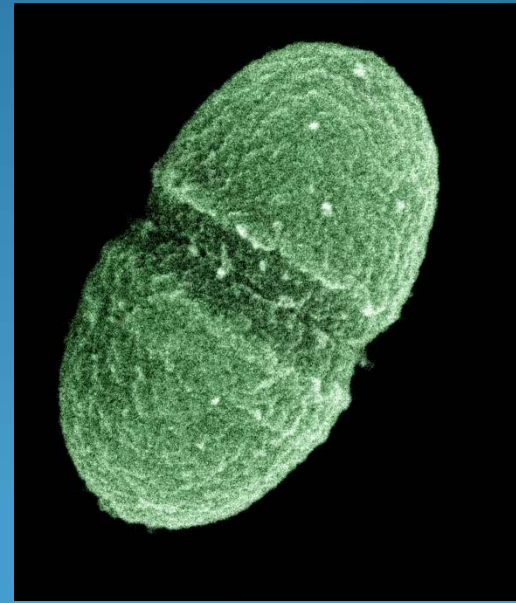
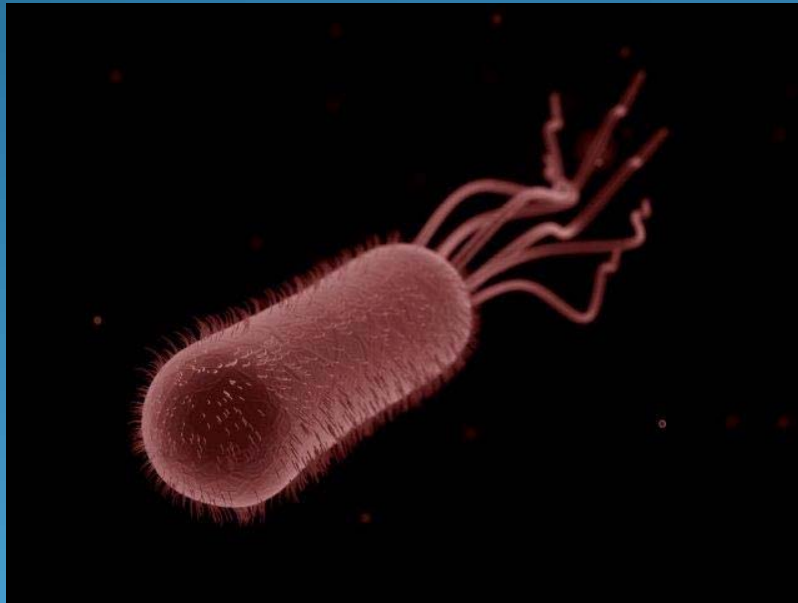
Healthy soils hold more available water.

- The soil's water-holding capacity reduces runoff that can cause flooding, and increases the availability of water to plants during droughts.
- Good infiltration and less need for fertilizers and pesticides keep nutrients and sediment from loading into lakes, rivers, and streams.
- Groundwater is also protected because there is less leaching from healthy soils.
- Additionally, fewer trips across fields with farm machinery mean fewer emissions and better air quality.

Considerations When Dealing with Bacteria

- The source of bacteria is fecal material from any warm-blooded animal.
- In agricultural areas, sources include wildlife, livestock manure, and malfunctioning septic systems.
- In urban areas the major sources are pet wastes, wildlife that may be present in high numbers (such as birds), septic systems, and sewage treatment plant discharges (which are considered a point source).

Considerations When Dealing with Bacteria



Considerations When Dealing with Bacteria

- Bacteria numbers often increase following a heavy storm or excessive runoff.
- Bacteria can remain in streambed sediments for long periods of time.
- Higher bacteria counts may be found in warmer waters because they survive more easily in these waters.
- Ultraviolet rays of sunlight, however, can also kill bacteria.

Questions?



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