

Best Management

Practices

Medina|River
Watershed



Resource Matrix

Small Landowner Practices

Agencies to look to for help and support with the practice

Xeriscaping /
Wildscaping

Texas Cooperative Extension
Texas Parks & Wildlife Department

Yard Buffers

Natural Resource Conservation Service (NRCS)
Texas Cooperative Extension
Texas Forest Service
Texas Parks & Wildlife Department

Rain Catchment

Texas Water Development Board
Local River Authorities, Water Utilities, and
Water Districts

Large Landowner Practices

Agencies to look to for help and support with the practice

Vegetative Buffers

Natural Resource Conservation Service (NRCS)
Texas Cooperative Extension
Local Conservation Districts
Agricultural Trade and Education Associations

Grazing
Management

Natural Resource Conservation Service (NRCS)
Texas Cooperative Extension
Livestock Associations

Brush Control

Natural Resource Conservation Service (NRCS)
Texas Cooperative Extension



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Medina River Watershed

The Medina River is a key agricultural, recreational, and natural resource for South Central Texas. From its use by Native Americans as a food, water, and transportation source, through its initial commercial development by Spanish settlers, to the exploitation of its forestry resources by other European colonizers and on to its contributions to a complex agricultural irrigation effort in the 20th Century, the Medina River has made major contributions to human history and success in the region. No less important, its waters, riparian zones, geologic features, and floodplain have supported the abundant flora and fauna of the region and brought life to the land.

Today the Medina River and its 1,337 square mile watershed are rapidly rising in importance as a source for both drinking and irrigation water for the burgeoning San Antonio metropolitan area. The dramatic population rise over the past 100 years places new demands on the Medina as a resource, and as such requires careful monitoring of both the quality and quantity of water it contains. This same population increase is dramatically changing the traditional uses of the River and surrounding lands. Where once the overwhelming demand for water and land in the region was for agricultural uses such as ranching in the area near the headwaters and farming in the lush lowlands near its confluence with the San Antonio River, today farmland is being converted into smaller and smaller parcels.

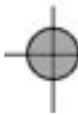
Medina Lake, created in the early 1900's to support an ambitious irrigation system for large scale agriculture, is more and more seen as an important recreational and outdoor resource for those in the region. As population growth has put increasing demands on the Edwards Aquifer, the region's primary source for drinking water, the waters of the Medina have begun to be used as an alternative to the Edwards, the importance of agriculture must be considered as these changes take place.

Changes in agricultural practices also introduce new stressors to the watershed. Fertilizers and pesticides change the chemical nature of the land, and through runoff, of the river. Grazing, plowing, and clearing change the nature and patterns of runoff, and inhibit the natural filtration of contaminants from runoff. Livestock watering, predator control, and exploding game (especially White Tailed Deer) populations have altered the demands and impacts on the watershed.

As the area surrounding the Medina lake and River experiences more land use changes, proper land management principles coupled with appropriate water quantity and quality monitoring become even more important than in the past.

Still the resilience of Nature maintains the beauty of the Medina River Watershed, an abundance of wildlife, other fauna, and the flora of the valley and provides for the water needs of those in the region. This guide suggests a few practices which, if followed by the people who live in and use the waters and land of the Watershed, can enhance the quality and quantity of water available, and contribute to the ongoing availability of the Medina River as a key resource for the region for many years to come.

The guide provides only the briefest of introductions to six practices which experts in many fields acknowledge as the “Best” in land management. While some of these “Best” Management Practices are primarily applicable to agriculture, many of them can be applied whether you own $\frac{1}{4}$ or 4,000 acres. Each practice includes references to more information and to experts whose jobs are to help landowners utilize their land efficiently and conserve the resources of the region for all its inhabitants now and in the future.



Small Landowner Best Practices

Whether you own a $\frac{1}{4}$ acre lot in a subdivision, or a 20 acre ranchette, the way you use your land and water has an impact on the River and the watershed. You likely have landscaped your yard, at least to the point of planting grass, you have a roof on your house, you drive a vehicle, and have a driveway, possibly a sidewalk, and small outbuildings for your lawnmower or recreational equipment.

You have some common maintenance issues to address around your home as well: termites and other pests in your house and yard, perhaps a spot where runoff is causing erosion that is impacting your or your neighbors' land value, the challenge of keeping your landscaping (a major investment in itself) healthy, the expense of water (whether you pump it with electricity from your own well or

buy it from a water utility), protecting your well-head from contamination, maintaining your septic system, and the day-to-day challenge and costs of maintaining man-made structures and grounds.

The “best” practices for you are the practices which make addressing these issues not only easier but cheaper, and that help you be a good neighbor and good steward of the land. Consider some of the opportunities presented on the following pages...

Xeriscaping

What is it?

Xeriscaping, the conservation of water through creative landscaping, is a display of Texas pride and a genuine expression of concern for our most precious natural resource. Xeriscaping utilizes plants that are native or adaptive to the area and as such are very water efficient. Plant selection alone does not save water. Xeriscaping incorporates seven basic principles:

1. Proper planning and design
2. Appropriate use of turf areas
3. Efficient and effective watering
4. Soil improvements
5. Use of mulches
6. Use of low water demanding plants
7. Appropriate maintenance

By incorporating these principles into your home or commercial landscape, you will be applying common sense landscaping to protect water quality and quantity.

Similar to xeriscaping, Wildscaping is a program initiated by the Texas Parks and Wildlife Department wherein landowners maintain a part of their property with the intention of providing habitat for native plants and animals.

Why should I do it?

The primary goal of all xeriscaping is to reduce the use of water to maintain plants. Native xeriscaping may require some watering during times of extreme heat, but remember that these plants are adapted to the local environment, and will generally survive with the barest minimum of human intervention. Another important advantage of xeriscaping is a reduction in maintenance time and

costs. Native plants often are at their most beautiful when left uncut through their growing seasons, and mown only when dormant. The hardiness of the plants used in xeriscaping also guarantees a lesser need for fertilizers to maintain plant vigor, and fewer pesticides to protect plant health.

What does it cost?

As with any new landscaping installation, up-front costs can be a major expense. You may desire professional design and/or installation of your rock or native gardens, and as with any type of landscape, soil preparation to minimize weeds and other invasives and maximize the first season survival opportunities of new plantings is the key to success. While maintenance time and costs should steadily reduce as the new plantings take hold, the battle against weeds, pests, and the ravages of time and weather ensure that maintenance at some level is always required. Whenever possible, avoid the use of fertilizers and herbicides. Remember that the herbicide that kills the weed can be just as dangerous to your \$50 shrub, and with the next rain gets washed away into the river to continue poisoning the fish. By the same token, the fertilizer which invigorates your plant often also invigorates a weed, and causes algae to bloom in the river, choking off oxygen and further degrading the quality of the water.

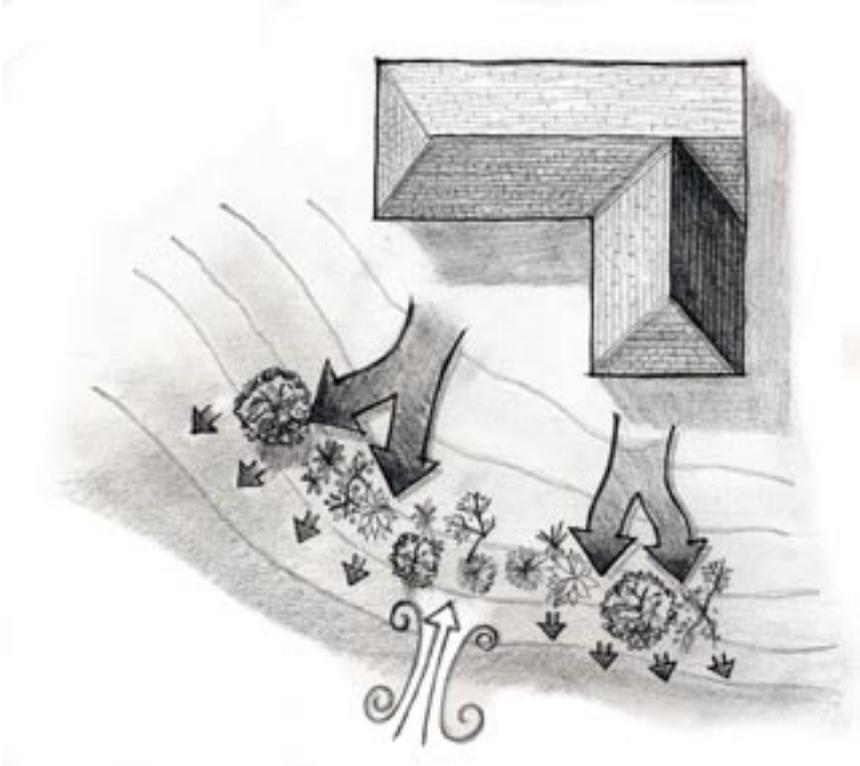
Where can I find out more?

The Texas Cooperative Extension offers extensive help in xeriscaping. Visit their website at http://agpublications.tamu.edu/catalog/topics/Lawns_and_Gardens.html. Or call your local agent listed in the “Local Contacts, Local Solutions” section of this publication. For more information on the Wildscaping program, contact your local Texas Parks and Wildlife office or visit their website at <http://www.tpwd.state.tx.us/>.

Yard Buffers

What are they?

Buffers are areas of dense vegetation which serve as filters for water runoff. They are also used to provide privacy around your home and screen land from the effects of wind. Buffers along streams or water drainages help to stabilize and protect banks, and provide riparian habitat for many plants and animals. Properly placed, buffers help control erosion and can greatly enhance the beauty of your property. Around residences buffers generally take the form of native grasses allowed to grow freely, shrubs (preferably native) to provide mid-level screening, and trees to provide shade and wind screening.



Why should I use them?

Buffers can be used to greatly enhance the beauty and value of your property. In addition to adding or enhancing privacy, they can reduce or prevent property damage by slowing runoff and controlling water and wind erosion. The natural filtering effects of buffers improve the quality of water leaving your land for streams or your neighbors' land, and because the water flows more slowly, more of it can percolate into the ground to recharge your well and aquifer.

What do they cost?

Buffers can be extremely cost effective. Unlike xeriscapes or other landscaping, buffers require relatively little design. Buffer installation is often left to a natural process, in which the landowner sows a few seeds or plants a few saplings, and lets nature take her course. Again, because they are meant to be natural, maintenance is kept to the minimum to control dead brush build-up as a potential fire hazard, maintain views, or control the amount of your yard taken over by the buffer.

Where can I find out more?

The Natural Resource Conservation Service, The Texas Cooperative Extension, the Texas Forest Service, and Texas Parks and Wildlife Department all have excellent publications and knowledgeable experts concerning buffering. The Connecticut River Joint Commissions has published a series of outstanding circulars on Buffering. Circular #2, "Backyard Buffers" is written specifically for the small landowner, and is available at no cost at www.crjc.org.

Rain Catchment

What is it?

Rain catchment is the practice of capturing rainwater from your roof for use either as drinking water or for irrigating your landscape. Widespread among the early settlers of the region, rain catchment fell off in popularity as dependable deep water wells were dug with electric pumps to provide pressure. One way to think of your roof is as your own personal watershed. As demand on domestic water wells has grown, and the cost of producing water from wells or buying it from utilities has increased, more and more people are looking to rain catchment to supplement or even replace their current water source. It is important to note that rain catchment can take a broad range of forms, from a simple barrel placed under your gutter downspout that you use to water your patio plants, to a complex system of gutter, pipes, cisterns, and treatment equipment to produce thousands of gallons of water for human consumption. Rain catchment can also provide a water source for plants and animals on your property.

Why should I do it?

During a one inch rain a 1000 square foot roof can produce approximately 550 gallons of water. If you simply capture that water and use it to water your lawn, shrubs, houseplants, or garden you will have saved the cost of producing ground water and decreased the demand on your well and the aquifers most people in the region depend upon. If you wish to drink the water you will have to treat it to meet current state standards for purity, but you will still have reduced your dependence upon groundwater or your bill from your water utility. Water captured from rain does not contain the hardening limes and iron that groundwater picks up deep within the Earth, and thus is better for pipes, and eliminates the potential costs of a water softener. Rain water is a great source of water for your plants and animals, and makes a wonderful addition to a Wildscape.

What does it cost?

As stated above, rain catchment systems vary from a simple barrel under a downspout to a complex system. Drinking water treatment adds significantly to the cost, and can cost \$15,000 to \$30,000 for the average home. While no complex mechanical parts are required, and materials are simple and widely available, professional design of all but the simplest of systems will help you reduce long term maintenance challenges and costs. Some counties in Texas provide property tax incentives for the installation of rain catchment systems, and many river authorities, water districts, and water utilities are studying ways to lower or subsidize the costs of design and installation.

Where can I find out more?

The Texas Water Development Board publishes an excellent introductory guide to rain catchment, entitled “Texas Guide to Rainwater Harvesting.” This guide includes a listing of private firms who specialize in the design and installation of catchment systems. It is available online at www.twdb.state.tx.us/publications/pub.htm listed as “Rainwater Harvesting” in the Brochures section.

The San Antonio River Authority, Edwards Aquifer Authority, Guadalupe-Blanco River Authority, Lower Colorado River Authority, Bexar Metropolitan Water System, and San Antonio Water System along with all of the various water districts of the region provide information and references on rain catchment.





Large Landowner/ Agricultural Best Practices

Every farmer and rancher desires to maintain his or her land at the peak of its productive capacity, and large landowners who do not depend on agriculture for their primary income wish to maintain the beauty and recreational usefulness of their property. Erosion, whether by water or wind, changes in soil chemistry, overgrazing, and limited opportunity for crop rotation all conspire against the agricultural productivity of the land.

Invasive plants, changes in surrounding land uses, and other pressures brought by economic growth threaten the beauty and quality of life of all lands.

The following practices not only address the threats listed above, but can greatly enhance water quality and quantity throughout the Medina River Watershed.

Vegetative Buffers

What are they?

Since the Dustbowl days in Oklahoma extensive research combined with practical experience have shown the value of vegetative buffers in agricultural applications. Vegetative buffers are strips of dense grasses, shrubs and trees which are used to control the effects of either water or wind on fields, pastures, and crops.

Why should I use them?

Buffers offer many benefits to agriculture, including erosion control, water infiltration enhancement, provision of shade for livestock, and protection of livestock from harsh weather. Beneficial side effects include the provision of habitat for pollinating insects and birds, habitat for potentially profitable game animals, and, along streams and water courses, stream bank stabilization and riparian zone habitat. Properly installed and maintained buffers enhance the beauty, recreational value, and value of your property. Buffers act as filters to trap sediment, fertilizers, pesticides, and other potential contaminant from running off into streams, stock ponds, other water bodies, and well heads, and even enhance air quality.

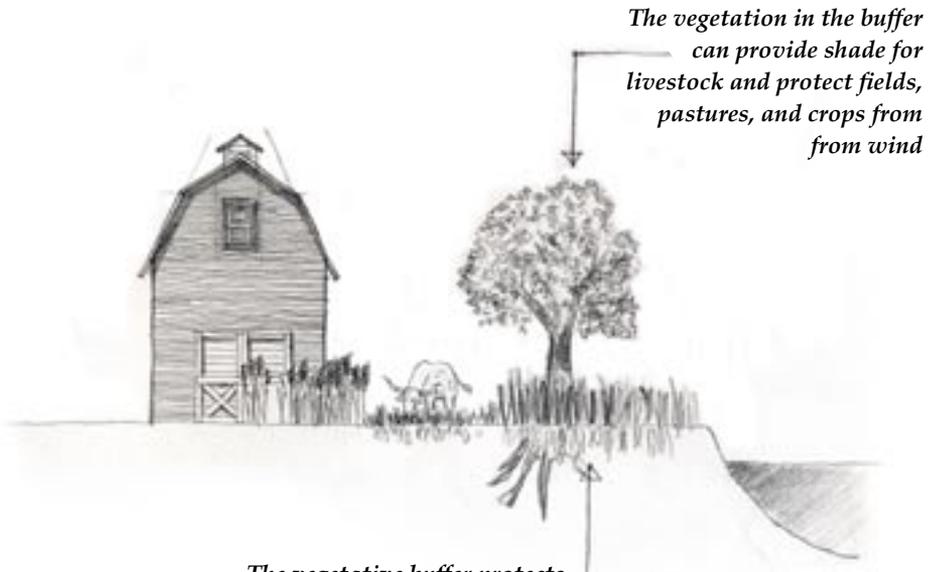
What do they cost?

The costs of buffering vary depending on the type and purpose of the buffer. The simplest of buffers may simply be grass strips, preferably of native grasses adapted to growing near streams and water bodies, which require a one-time plowing and seeding, with controlled burns every few years. More complex buffers such as perennial vegetation strips established along the contours of a field and alternated with strips of crops can be more difficult to install and require regular maintenance to control.

There are a number of popular federal, state, and local government programs available to help with the costs of buffering, including the Stewardship Incentive Program, Wildlife Habitat Incentives Program, Wetlands Reserve Program, Environmental Quality Incentives Program, Conservation Reserve Program, and others.

Where can I find out more?

The US Department of Agriculture, Natural Resources Conservation Service, your local conservation district, Texas Forest Service, Texas Cooperative Extension, and most agricultural trade and educational associations all participate in and provide a wealth of resources for planning, implementing, and maintaining buffer systems.



The vegetation in the buffer can provide shade for livestock and protect fields, pastures, and crops from wind

The vegetative buffer protects against erosion at stream banks. It also reduces the contamination of the stream by filtering runoff.

Grazing Management

What is it?

Grazing management is a key concern for all ranchers and farmers who produce at least part of their income through livestock. It takes on new implications when you realize that the health and vigor of the grasses in your pasture can equate to lowered feed costs, more productive livestock, and improved water quality and quantity.

Depending upon the livestock species you produce, competition from wildlife, soil and hydrology conditions, and other factors, the number of animal units per acre, length of time your herd grazes a given pasture, and number of pastures needed to rotate herds can vary widely. However, the end goal of prescribed grazing is to ensure that the grasses in a pasture are healthy and vigorous, that they recover quickly from grazing, and that they do their all-important jobs of securing the soil from wind and erosion, completing the cycle of regeneration of nutrients in the soil with minimum fertilization, and out-competing invasive weeds and less productive grasses.

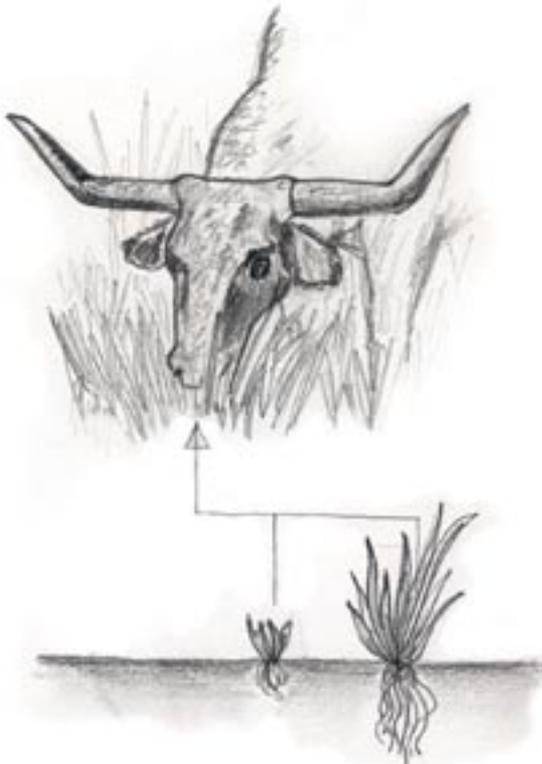
In order to accomplish these ends, grasses must not be grazed too short. A good, general rule of thumb for many grass species is “eat half, leave half;” in other words, only allow animals to graze about half of the length of a stalk of grass.

Why should I do it?

Many studies have shown the advantages of careful grazing management, including the reduction of fertilizer and herbicide costs, control of soil erosion, improvement of individual livestock weights and productivity, and other economic advantages. In addition, properly managed pastures become their own buffers by filtering potential water contaminants, provide ample browse for wildlife with a reduced concern over competition with stock, and enhance the book value of your property.

Where can I find out more?

The Texas Cooperative Extension, Natural Resources Conservation Service, various livestock associations, and other state, federal, local, and non-governmental entities are all good sources for guidance in determining your soil types, species of grasses most suited to your soil and your livestock, and the carrying capacity in animal units of a given pasture.



Careful grazing management to help grasses stay healthier allows them to establish good root structures. This will pay many benefits, such as reducing soil erosion and filtering water contaminants.

Brush Control

What is it?

Controlling brush, especially the juniper commonly known as "cedar," has long been one of the basics of land management in South Central Texas. Given the rising concern in the depletion of groundwater resources, brush control is rapidly emerging as a leading strategy to improve water infiltration and protect the human and irrigation water supply. Brush control takes many forms, including prescribed burn, deep root plowing, brush cutting, chemical application, and bulldozing. Controlled burns and cutting are by far the most widely preferred methods, since they minimize soil disturbance and often allow for quicker regeneration of grasses.

Why should I do it?

A number of ongoing studies show that brush control carries great promise for increasing groundwater supplies. The two most common forms of brush trees which require aggressive management procedures are mountain juniper, commonly known as cedar, and mesquite. A mature mountain cedar can use as much as 16 gallons of water per day. During rain events, the canopy of a Cedar tree captures 60 to 70% of the rainfall, never letting the water reach the ground. Overgrazing and suppression of natural wildfire in the 19th and 20th centuries allowed this aggressive native to spread over vast areas of what were once lush grasslands, and along with increases in human population place great demands on groundwater. Cedar significantly changes the chemical composition of the soil beneath its canopy, and shades out sunlight, thus choking out grasses which secure the soil and control erosion. Brush control can also return pastures to productivity if appropriate native grasses are given time to reestablish and develop healthy root structures before the reintroduction of grazing.

All this is not to say that Cedar should be eradicated. It is a native plant with many benefits, not the least of which is the provision of habitat for game and protected species of birds. The goal of Cedar management should be to restore the balance that existed prior to overgrazing. The same is true of Mesquite. Consult with your local experts to determine the proper amount of control required.

What does it cost?

The Texas Cooperative Extension estimates costs for chemical control of brush ranging from just over \$6.00 to in excess of \$50.00 per acre, depending upon the density of the brush and other factors. Prescribed burns can also vary widely in cost, ranging from as little as \$0.50 to \$10.00 per acre, and often require professional planning. See your local Texas Cooperative Extension agent for references and more information. Mechanical brush control such as deep root plowing, bulldozing, and shredding also range widely in costs, and keep in mind that some of these methods result in extreme soil disturbance which may require further management to achieve desired results.

Where can I find out more?

The US Department of Agriculture, Natural Resources Conservation Service (NRCS), your local conservation district, and the Texas Cooperative Extension maintain various expertise and references to help you with your brush control planning and implementation. Of particular note in the Medina River region is the Seco Creek Water Quality Demonstration Project, managed by Phillip Wright of the NRCS in Hondo. See Local Contacts, Local Solutions below.

Texas Cooperative Extension

Agency Homepage: <http://agextension.tamu.edu/>

Local Contacts: <http://county-tx.tamu.edu/>

Atascosa County: Matthew Myers (830) 769-3066;
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Wilson County: Charles E. Pfluger, Jr. (830) 393-7357;
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Texas Parks & Wildlife

Agency Homepage: www.tpwd.state.tx.us

Local Contacts

Judit Green (210) 348-6350; juditg@aol.com
(San Antonio Urban Biologist)

Max Traweek (830) 896-78028
(District Leader, Hill Country Wildlife District)

Rick Taylor (830) 278-9151 ext. 142
(District Biologist, South Texas Wildlife District)

Texas Forest Service

Agency Homepage: <http://txforestsERVICE.tamu.edu>

Local Contacts

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USDA Natural Resource Conservation Service

Agency Homepage: www.nrcs.usda.gov

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Bandera County: Billy Griffin, Jr. (830) 796-3334;

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Glossary

Herbicide: A chemical pesticide designed to control or destroy plants, weeds, or grasses

Insecticide: A pesticide compound specifically used to kill or prevent the growth of insects.

Pesticide: Substances or mixture there of intended for preventing, destroying, repelling, or mitigating any pest. Also, any substance or mixture intended for use as a plant regulator, defoliant, or desiccant.

Recharge Zone: Where rainwater soaks through the earth to reach an aquifer.

Riparian: Areas adjacent to rivers and streams with a differing density, diversity, and productivity of plant and animal species relative to nearby uplands. e.g. often home to ducks, water-loving reptiles and plant species, and other similar plants and animals.

Watershed: The land area that drains into a stream; the watershed for a major river may encompass a number of smaller watersheds that ultimately combine at a common point.

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SAN ANTONIO
RIVER AUTHORITY
Water Brings Us Together

