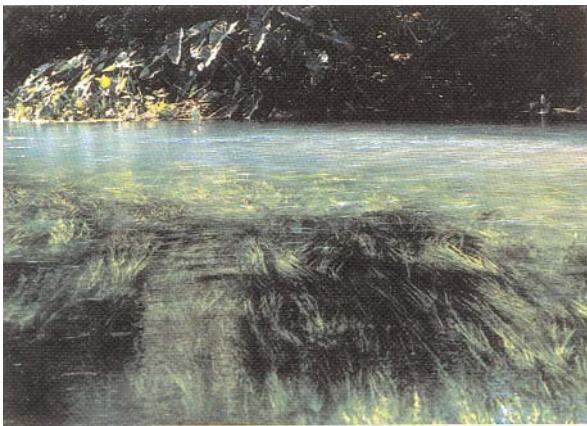


Management Guidelines for Endangered and Threatened Species of the Edwards Aquifer

Conserve Water

Do what you can as an individual to conserve water, particularly during drought periods. In the home, you can save water by installing fixtures, appliances, and toilets designed to use less water, repairing leaky faucets, and turning off the tap while brushing teeth or doing dishes. Landscaping with native, drought tolerant plants (xeriscaping), watering lawns in the early morning or evening to reduce evaporation, and installing a rainwater collection system for your home are other effective ways to conserve water.



Texas wild-rice in the San Marcos River
© Jackie M. Poole

Prevent Water Pollution

Some herbicides, insecticides, and other chemicals can impact water quality and adversely affect the listed species. Alternatives, such as integrated pest management, organic gardening, and the use and proper management of native vegetation reduce reliance on chemicals. These practices help reduce the risks of environmental contamination and can often save money. When insecticide or herbicide treatments must be used, label directions must be carefully followed. Help prevent contamination of the Comal and San Marcos rivers and their tributaries by avoiding the use of these products near them. Avoid contamination of rivers, streams, and other natural wetlands by limiting use of these products near

them. Dispose of rinse water and empty containers in strict accordance with label directions. Contact the Texas Department of Agriculture or the USDA Natural Resources Conservation Service for guidance on ways to minimize the environmental effects of agricultural chemicals.

On-site sewage disposal systems (septic systems, cesspools, and sewage disposal wells) have been documented to have caused groundwater contamination in 47 separate counties in Texas. Improperly treated household waste water contains viruses, bacteria, and a variety of organic and inorganic contaminants. The life of a septic drain field varies depending on the soil's capability to filter and remove impurities. Check your septic system regularly and pump out solids every 3 to 5 years to help prevent overflows. Do not pour toxic chemicals down household or storm water drains. Leaking sewer lines should be rehabilitated or replaced as soon as possible, especially in the Edwards aquifer recharge zone.

If you have caves or sinkholes on your property or in your neighborhood, protect them from development, dumping and vandalism. Remember that these areas harbor sensitive underground species and are direct conduits to your water supply. If you graze livestock on your property, keep them out of creeks and streams by providing permanent, clean water sources away from natural waterways. This not only prevents water pollution but can also improve animal health and management.

Urban and suburban homeowners can help prevent water pollution by reducing the use of chemicals in lawn and landscape care. Landscaping with native plants requires much less water and little or no fertilizers or pesticides. Using native plants saves you money on water bills and lawn chemicals, and fewer chemicals means a healthier home environment for children, pets, and backyard wildlife. Contact a native plant nursery or organic gardening center near you for more information on chemical-free lawn and garden care.

Motor oil, gasoline, and radiator and brake fluids all contain toxic compounds. These compounds tend to stick to porous limestone, releasing polluting chemicals over a long period of time. Many common household items such as paints, paint thinners, cleaning fluids, drain cleaners, tires, and batteries also contain hazardous compounds which can pollute the aquifer if disposed of improperly. Never dump these materials down the drain or on the ground. Used automotive fluids and hazardous household wastes should be stored until they can be recycled or disposed of properly. Most service stations and auto maintenance businesses will take used motor oil to be recycled. Many cities and towns have designated collection facilities for hazardous waste products. Residents in the Austin area can contact the Household Hazardous Waste Collection Facility at (512) 416-8998 for more information. For additional information on ways to prevent water pollution, call the Clean Texas 2000 Hotline of the Texas Commission on Environmental Quality at (800) 64-TEXAS, or the Lower Colorado River Authority (LCRA) at (800) 776-5272. Also, contact the Texas Water Development Board (512) 463-7847 for water conservation tips or the Edwards Aquifer Authority (800) 292-1047 for specific information concerning the Edwards aquifer.

Prevent Damage To Streambed Vegetation or Bottom Substrates

The Fountain Darter and San Marcos Salamander, in particular, are dependent on bottom vegetation to provide food and protection from predators. Do not pull up, trim, or otherwise damage streambed vegetation. You could be damaging Fountain Darter habitat, including the endangered Texas wild-rice.

The type of substrate is also an important habitat component. For example, the San Marcos Gambusia prefers mud but not silt, whereas the San Marcos Salamander inhabits vegetated areas of sand and gravel. Avoid any activity that alters the bottom sediments, such as removing or adding fill material, or scraping/trampling the bottom.

Avoid Introduction of Non-native Plants or Animals

Because of similarities in habitat and diet, predatory effects, and habitat modifications, exotic species pose a significant threat to the listed species. Do not release snails, fish, or other aquatic animals or plants into our lakes, creeks, or rivers. Aquarium releases have already resulted in the establishment of a number of harmful non-native plants, mollusks, and fish species in the Comal and San Marcos spring systems.

Manage Surface Vegetation to Prevent Erosion and Runoff

Siltation and pollution from urban and rural runoff is a serious threat to water quality and a healthy aquatic ecosystem. On agricultural land, management of surface vegetation is

the key to preventing soil erosion and runoff, and encouraging rainfall infiltration and aquifer recharge.

Vegetation cover is important in preventing nonpoint source pollution because of its impact on falling raindrops and surface runoff. Raindrops falling on the soil surface dislodge soil particles and can move them a considerable distance. This splash erosion creates a suspension of soil and water which is moved in surface runoff. Suspended soil particles also plug soil pores, reducing the downward movement of water into the soil (infiltration). Standing vegetation and mulch on the soil surface intercept raindrops and reduce their splash effect.

Proper grazing management, which includes moderate stocking and rotational grazing, maintains rangelands with good vegetative cover and soil surface conditions, thus minimizing erosion and runoff. Research has shown that central Texas rangelands with abundant cover of deep-rooted tall and mid-height bunchgrasses, such as little bluestem, Indiangrass and sideoats grama, are better able to absorb rainfall and hold soil than rangelands dominated by shallow-rooted short-grasses, such as common curly-mesquite and buffalograss.

References

Texas Water Commission. 1989. *Ground-water quality of Texas - an overview of natural and man-affected conditions*. Report 89-01. 197 pp.

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