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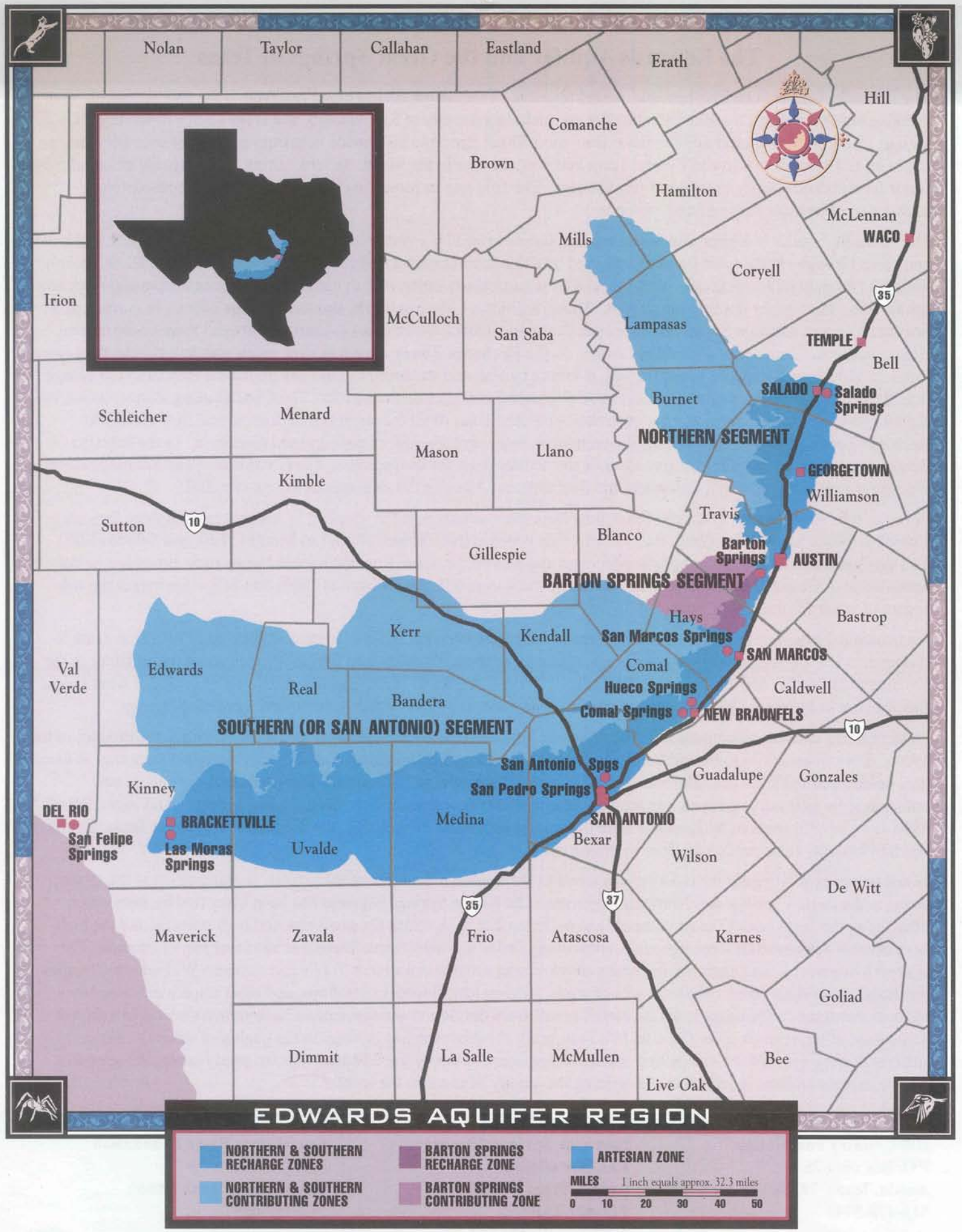
The Edwards Aquifer and the great springs of Texas Edwards Aquifer zone map

Hill Country Foundation



This map represents a slightly revised version of the Edwards Aquifer Zone map found on the Austin, Texas, Eco-Location Map. For a copy of the Eco-Location Map, with detailed information about the ecology of the Austin area, please contact the Hill Country Foundation, P.O. Box 685075, Austin, Texas 78768, (512) 478-5743.

The Edwards Aquifer and the Great Springs of Texas

The Edwards Aquifer is an irreplaceable natural resource. This natural underground reservoir is the sole source of drinking water for over 1.5 million Central Texans, including the city of San Antonio, and is the source of the largest springs in Texas. The aquifer and the flows from these Great Springs also provide necessary habitat for over fifty species of plants and animals that live in Central Texas and nowhere else in the world. In turn, spring flows provide essential fresh water for river and estuary ecosystems downstream. The first step in protecting these invaluable water resources is knowledge. Use this map as a handy reference.

The Edwards Aquifer is a **karst limestone** aquifer, characterized by a system of fractures, faults, open channels, sinkholes, and caves through which water flows rapidly, and by a thin to nonexistent soil cover. These characteristics allow for only minimal filtration of contaminants; thus the aquifer is particularly vulnerable to contamination from human activities on the surface. The aquifer has three **segments**. These segments—the **Northern, Barton Springs** (shown in purple), and **Southern or San Antonio Segments**—are hydrologically distinct; water is not exchanged between them under normal flow conditions. Each segment has three **zones**. In the **Recharge Zones,** shown in dark green and dark purple, the porous Edwards limestone is exposed to the surface, allowing rainfall and streamflows (and any pollutants they carry) to plunge directly into the subsurface system of caves and channels that makes up the aquifer. The **Contributing Zones,** shown in lighter green and purple, consist of the upstream watershed areas of all the streams that drain to and flow across the Recharge Zones. The **Artesian Zones**, shown in blue, make up the aquifer's underground reservoirs. In the Artesian Zones, overlaying geologic formations separate the aquifer from the land surface. The Contributing and Recharge Zones together compose the aquifer's watershed; the Recharge and Artesian Zones compose the aquifer itself.

Seven of the twelve largest springs in Texas flow from the Edwards Aquifer. Ranked by historic rates of flow, they are: Comal (largest), San Marcos (2nd), Barton (5th), San Antonio (6th), Hueco (7th), Las Moras (11th), and Salado (12th). The third- and fourth-largest springs, Goodenough and San Felipe, issue from the related Georgetown limestone in Val Verde county. Goodenough Springs was covered by the waters of Lake Amistad in 1968; San Felipe Springs is the sole source of water for the city of Del Rio.

Archeological evidence indicates that these large springs have been the focus of human activity since man first came to this area; cities and towns have now grown up around all of them. Proximity to Barton Springs was a major factor in the decision to locate the new capital of the Republic of Texas at Austin in 1839. Spanish missionaries settled at what is now San Antonio in the early 1700s because of the abundant water supplied by San Antonio and San Pedro Springs.

Unfortunately, excessive pumping from the Southern Edwards has severely reduced spring flows. Since the drought of the 1950s, flows from San Antonio and San Pedro Springs have been declining and erratic due to increased pumping; at times, they cease flowing altogether. The recreational value of Brackenridge Park and the San Antonio Riverwalk is now maintained by well water pumped into the San Antonio River downstream from San Antonio Springs. And in the fall of 1996, after several years of withdrawals from the aquifer exceeding its recharge, the two largest springs in Texas, Comal and San Marcos, came perilously close to drying up.

While pumping is currently the most serious threat to the Southern Segment of the aquifer, contamination is the greatest threat to the Barton Springs and Northern Segments. The Barton Springs Segment has been identified by state water officials as the Texas aquifer most vulnerable to pollution due to its relatively small size and high porosity and the high development activity in its Recharge and Contributing Zones in southwestern Travis and northern Hays Counties. The Northern Segment is also experiencing heavy development activity in northern Travis and southern Williamson Counties. Increased impervious cover—the total area of roads, parking lots, sidewalks, rooftops, and other impermeable surfaces—leads to increased contaminant loads in rainfall runoff from developed areas; scientists have shown that a relatively low percentage of impervious cover (10% to 15%) can bring about irreversible damage to the quality of streams. Since streams flowing across the Contributing and Recharge Zones resupply the Edwards Aquifer, preservation of high water quality in these streams is critical to maintaining the quality of water in the aquifer.

For more information, or to join in efforts to protect the aquifer, please contact the organizations listed below.

Hill Country Foundation
P.O. Box 685075
Austin, Texas 78768
512-478-5743

Save Our Springs Alliance
P.O. Box 684881
Austin, Texas 78768
512-477-2320
www.sosalliance.org

San Marcos River Foundation
P.O. Box 1393
San Marcos, Texas 78666
512-357-6897