

Gilleland Creek Watershed

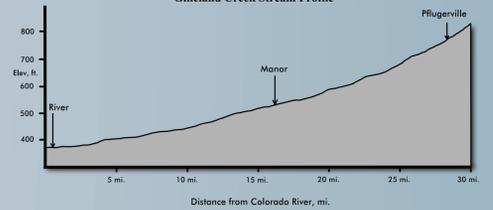
Gilleland Creek Watershed Summary

- Gilleland Creek is a tributary to Segment 1428 of the Colorado River below Austin. In 2004, the Texas Commission on Environmental Quality determined the creek to have impaired water quality due to bacteria levels in excess of state standards. A Total Maximum Daily Load (TMDL) study of flow and bacteria levels in Gilleland Creek was conducted by the LCRA and TCEQ in 2006. The TMDL study found that elevated bacteria levels correlated with higher flow in the creek from stormwater runoff.
- The Gilleland Creek watershed is within the Blackland Prairie physiographic ecoregion of Texas, characterized by dark, clayey soils suitable for agricultural use but with severe construction limitations due to poor soil drainage and highly expansive soil properties.
- The watershed contains a multitude of varied land uses, including high-traffic corridors along Interstate 35, State Highway 290, the new State Highway 130 as well as many heavily used two-lane roads on the outskirts of Austin; dense suburban development in the headwaters within the City of Pflugerville; separate developments in Manor, Harris Branch and Hornsby Bend; industrial areas; rangeland agricultural use; irrigated and non irrigated farmland.
- The watershed also contains unique features including the Decker Power Plant cooling reservoir fed by pumping from the Colorado River; numerous municipal areas with day-use parks and flood detention ponds along Gilleland Creek; several active and inactive waste water treatment facilities; commercial horse-racing track and stables; a large county park with many sports fields; sand and gravel mines in the Colorado River floodplain; and many stock ponds.
- Gilleland Creek has sufficient channel slope to provide efficient drainage in headwater areas, but the gradient becomes more flat as the creek enters the Colorado River floodplain, where the creek is braided and choked with vegetation. Landowners in the lower reaches of Gilleland Creek have observed overbank flooding from moderate rain events in recent years.
- The ability to move water downstream on Gilleland Creek is currently being studied by the City of Austin for possible revision of Federal Emergency Management Agency (FEMA) flood insurance rate maps.

Gilleland Creek Hydrology

- Gilleland Creek has distinct hydrologic regimes, related to watershed characteristics, land use and stream profile as shown in the graph below.
- The upper watershed is nearly 20 percent impervious cover overall, with some parts of the City of Pflugerville having near 40 percent impervious cover. Between the impervious cover and moderate stream gradient (0.75 percent) in the headwaters, upper Gilleland Creek is prone to flash flooding and has evidence of channel erosion. Several flood detention structures exist within greenbelt areas in Pflugerville.
- Southeast of Pflugerville, the watershed is rural and has almost no impervious cover. In that area, Gilleland Creek has a stable stream channel with an established wooded riparian zone.
- Near the City of Manor, Gilleland Creek receives drainage from the Harris Branch watershed which is moderately urbanized, plus runoff and wastewater discharge from Manor.
- Downstream from Manor, the stream gradient changes to almost flat. At the LCRA Hydromet gauge at FM 973, Gilleland Creek is a braided stream with split channels, accumulated sediment and dense vegetation. These conditions lead to poor drainage and excessive flooding during moderate runoff events. The City of Austin is performing a floodplain study in this area.
- Walter E. Long Lake (Decker Lake) is a power plant cooling reservoir with internal circulation. It captures runoff from the contributing watershed, and is supplemented by pumping from the Colorado River. Water is lost to evaporation. The dam has floodgates for emergency use but discharge is generally minimal.
- Along FM 969 in the floodplain of the Colorado River, Gilleland Creek and its tributaries (Decker Creek and Elm Creek) are commonly backwatered by the Colorado River when it is at high flow, further reducing the carrying capacity of these streams and making flooding more problematic.

Gilleland Creek Stream Profile



State Highway 130 Issues

- State Highway 130 is a newly constructed four-lane toll road east of Austin, from IH 35 near Georgetown to U.S. 183 near Mustang Ridge (eventually to Interstate 10 near Seguin). Bridge crossings are planned at Gilleland Creek, Decker Creek, Elm Creek and the Colorado River. According to the Texas Department of Transportation (TxDOT), SH 130 could be expanded to a six lane tollway in the right-of-way.
- The area along SH 130 has two landforms: Blackland Prairie (slopes less than 5 percent, deep clayey soils, low infiltration, high shrink-swell potential, high corrosivity), and Alluvial Floodplain (slopes near 0 percent, deep silt/sand loam soils, high infiltration, low shrink-swell potential, moderate corrosivity).
- Construction of SH 130 has already sparked increased production of sand and gravel aggregate in the floodplain of the Colorado River. New pits have been opened and existing operations have expanded. Since no state-owned resources are being extracted from the streambed of navigable waterways, no permits or registrations for these mining operations have been issued by the Texas Parks and Wildlife Department.
- According to TxDOT, SH 130 is designed to relieve congestion on IH 35, specifically as an alternative for truck traffic. As such, SH 130 will attract commercial and industrial development. The potential for large areas of impervious cover (buildings and paved lots) is present in areas accessible by frontage roads along the highway. Development of residential subdivisions has also begun near SH 130 along FM 969 and FM 973.
- Water quality of Gilleland Creek and other tributaries of the Colorado River may be affected by development in the SH 130 corridor. Impacts on water quality may be more acute in tributaries than in the Colorado River itself, because the river has a much higher flow regime. City of Austin studies have shown that tributaries are more susceptible to stormwater pollution and erosion.

GILLELAND CREEK WATERSHED FACTS

Drainage area: 48,600 acres (76 square miles)
 Stream length: 30 miles
 Stream gradient: 0.75 percent in Pflugerville area, 0 percent in lower reaches near Colorado River
 Watershed slopes: 0 to 5 percent
 Soil types: clay, clayey loam
 Ground cover: pasture grasses, trees and shrubs
 Land uses supported by native soils: rangeland, farming, wildlife habitat
 Soil limitations: severe building limitations due to poor drainage and expansive soils
 Typical groundwater chemistry: highly variable depending on flow geology



Photo 1. Stormwater outfall into wooded common area near headwaters of Gilleland Creek, upstream of Picadilly Drive in Pflugerville.



Photo 4. City of Austin property containing Gilleland Creek and Ward Spring, off Parkway Drive in Pflugerville.



Photo 5. Staggered overflow tubes in embankment of flood detention pond in Moose Park in Pflugerville.



Photo 11. LCRA staff monitoring water quality in Gilleland Creek. As part of the Total Maximum Daily Load study, flow duration curves for Gilleland Creek were used to evaluate water quality data.



Photo 12. Walter E. Long dam operated by the City of Austin near FM973, Decker Creek flows into Gilleland Creek.



Photo 13. Sediment-laden runoff from SH130 road construction near Hornsby Bend.



Photo 14. View of Forest Bluff subdivision, one of several new housing developments near SH130.



Photo 2. Riparian area under construction from bridge on Swenson Park Boulevard in Pflugerville.



Photo 3. Concrete weir in Gilleland Creek downstream from Swenson Park Boulevard in Pflugerville.



Photo 6. Embankment of Creekside Park flood detention pond in Pflugerville.



Photo 7. Channel erosion in Gilleland Creek in wooded common area downstream from Bohl Park in Pflugerville.



Photo 8. City of Manor wastewater treatment plant on the banks of Gilleland Creek on West Parsons Street in Manor, now inactive.



Photo 9. Sanitary sewer near Gilleland Creek in Ben E. Fisher Park in Manor.



Photo 10. Automated sewage lift station in Wild Horse Ranch subdivision in Manor.

Area of Detail Gilleland Creek Watershed Travis County, Texas



Legend

- Photo Location and Direction
- Major Roads
- State Highway 130 - Currently Open
- State Highway 130 - To Open September 2007

CORRELATION OF PHOTOGRAPHS TO THE MAP

The red arrows on the watershed map are at the location and direction of a photograph. For example, the red arrow with 2 on the map relates to photo 2. The arrow orientation indicates the direction the photograph was taken, such as 2 is looking upstream (northwest). The photographs were taken in May 2007.



Data Sources: Aerial Photography - Capital Area Council of Governments (CAPOG), 2006;
 Watersheds - City of Austin, Roads - Texas Natural Resources Information System (TNRIS);
 Water bodies - U.S. Geological Survey (USGS)
 This map has been produced in September 2007 by LCRA for its own use. Accordingly, certain information, features or details may have been emphasized over others. LCRA does not warrant the accuracy of this map as to scale, accuracy or completeness.