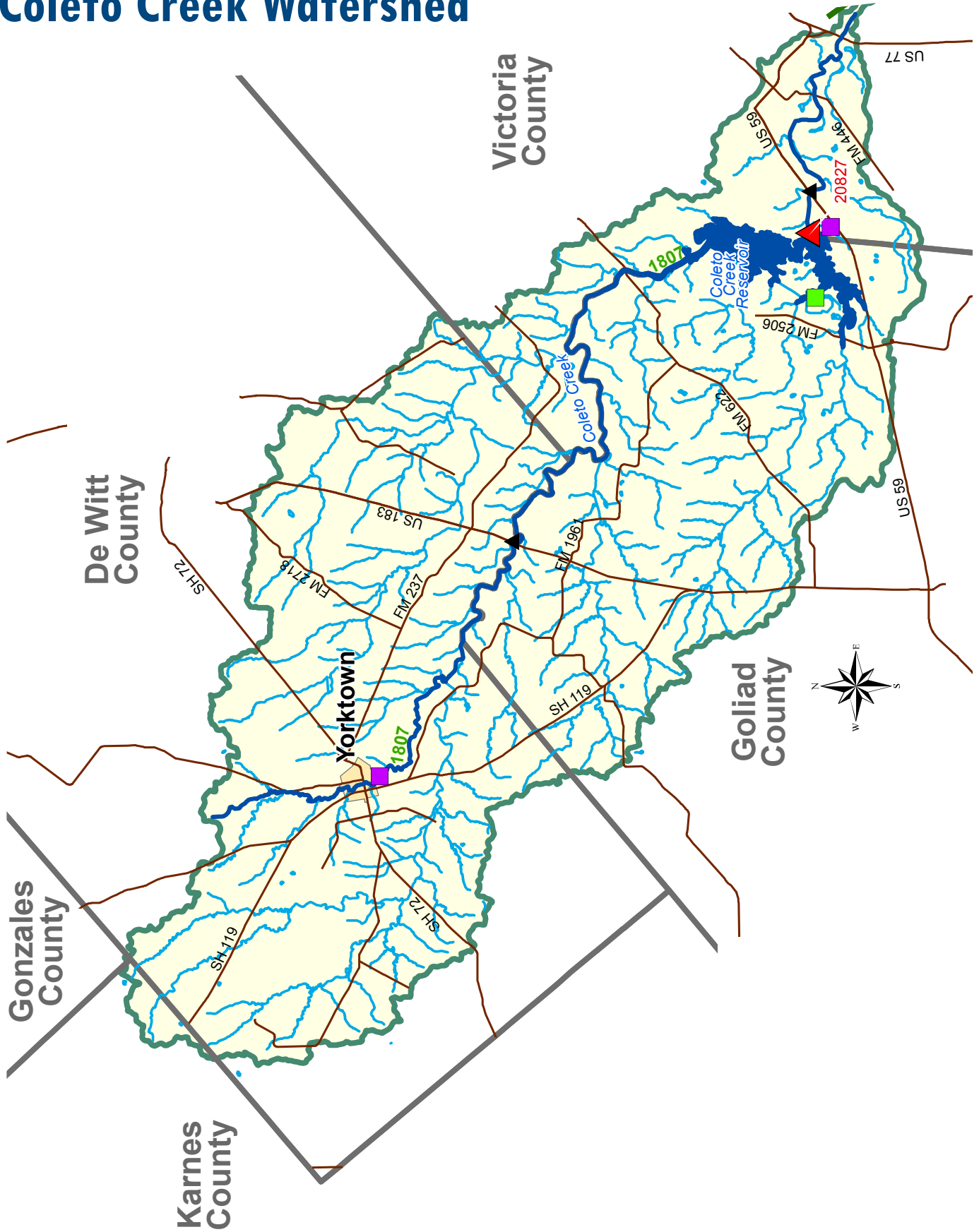


# Coletto Creek Watershed



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## River Segments, Descriptions and Concerns

**Segment 1807 (Coletto Creek):** Coletto Creek extends 27 miles beginning in DeWitt County, through Goliad and Victoria Counties, including the 3,100-acre Coletto Creek Reservoir to the confluence with the Guadalupe River in Victoria County. Because of the size of Coletto's drainage basin, this normally slow moving creek can become a fast, flowing river during a typical South Texas rainstorm. Much of the creek bottom is made up of sand with typical vegetation ranging from mesquite and huisache to large live oaks and anaque trees. Because of its rural setting and limited development you can still find a wide range of Texas wildlife along its shores ranging from turkey and deer, to red fox and bobcats. With the completion of the Coletto Creek Reservoir, it now supports over 100 different species of birds with the most noted being the Southern Bald Eagle, Osprey, and Roseate Spoonbills.

**Drainage Area:** 558 square miles

**Streams and Rivers:** Guadalupe River, Coletto Creek, Perdido Creek, Twelve Mile Creek, Thomas Creek

**Aquifer:** Gulf Coast

**River Segments:** 1807

**Cities:** Yorktown

**Counties:** DeWitt, Goliad, Victoria

**EcoRegions:** Texas Blackland Prairies, Gulf Coastal Plains

**Vegetation Cover:** Pasture/Hay 15.3%, Shrublands 9.7%, Grass/Herbaceous 33.2%, Deciduous Forest 18.7%, Row Crops 5.0%

**Climate:** Average annual rainfall 30 inches, Average annual temperature January 41°, July 95°

**Land Uses:** Agricultural crops (sorghum, rice, cotton and corn), beef, hogs and poultry productions and oil and gas production

**Water Body Uses:** Aquatic life, contact recreation, fish consumption, public water supply and power plant cooling

**Soils:** Sandy, sandy loam and clay loam

**Permitted Wastewater Treatment Facilities:** Domestic 2, Land Application 0, Industrial 1



Photo by John Snyder

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### Coletto Creek and Reservoir

The **Coletto Creek**, Segment 1807, flows through DeWitt, Goliad and Victoria counties. The land uses in the watershed include farming and ranching, oil and gas production and recently, in-situ uranium mining. The only urbanized area is the small community of Yorktown located in DeWitt County in the upper watershed. The segment is divided into two assessment units: from the confluence with the Guadalupe River to the Coletto Creek Reservoir Dam; and, the remaining portion of the segment. The upper part of the segment includes Coletto Creek Reservoir. The segment summary will be separated into two sections, the reservoir and the creek.

### Coletto Creek Reservoir

Coletto Creek Reservoir began impounding water in 1980, and is primarily used as a cooling pond for the coal-fired Coletto Creek power plant located in Goliad County. The power plant discharges 360,000 gallons per minute of water per year to the reservoir. The temperature of the discharge cannot exceed 108°F. In addition to cooling capacity, the 3,100 surface acre reservoir is used for recreation, including swimming, boating, skiing and fishing. The reservoir is one of the best fishing sites in the Guadalupe River Basin because of the warm water and excellent fish habitat. The reservoir has 61 miles of shoreline, with a sandy substrate and an average depth of eleven feet (2.5 meters).

The reservoir is fed by four major creeks, Coletto Creek, Perdido Creek, Turkey Creek and Sulphur Creek. The reservoir is maintained at a constant level. In times of drought, water can be pumped from the Guadalupe River to maintain lake levels, under a water right permit held by the power company. As evidence to the severity of the recent drought, the power plant's water right was used on July 14, 2011. Pumping of water from the Guadalupe River continued through February 2013 in order to maintain a volume sufficient to maintain the temperature required in their discharge permit.

The warm water in the reservoir creates ideal conditions for the growth of several species of aquatic vegetation, including non-native stands of Eurasian milfoil,



waterhyacinth and the dominant species, hydrilla. These aquatic plants provide excellent fish habitat but have been known to grow to excessive amounts that can restrict cooling water flow and public access in several areas of the reservoir.

GBRA has a program to maintain the appropriate level of vegetation by controlling the plants with biological, chemical and mechanical means. The park staff has established a lake stakeholder group that is consulted each year that a vegetation management treatment program is needed. The stakeholder group includes TPWD, fishermen, members of local landowner associations and representatives of the recreation industry.

GBRA moved its historical monitoring station which was located at the park on the Coletto Creek Reservoir (station no. 12623) to a station located at the dam in September 2010. TCEQ had maintained two monitoring locations in the reservoir but discontinued monitoring on Coletto Creek Reservoir when GBRA moved their monitoring station to the dam. The monitoring station at the dam was established in order to collect enough data to establish a water quality standard for nutrients in reservoirs, as represented by chlorophyll *a*. Additionally, quarterly depth profiles are performed at the station.

Nutrient enrichment from nitrogen and phosphorus can cause excessive growth of macrophytes, algal blooms in the open waters as well as attached to the substrate and floating in mats. The Texas Water Quality Standards have numerical nutrient criteria for reservoirs, as represented by chlorophyll *a*. Coletto Creek is not listed on the Appendix F (Chapter 301.10) of the Texas Water Quality Standards that lists site-specific nutrient criteria for reservoirs and lakes in Texas. Criteria formulations were based on selected sampling stations that represent the deep pool near the dam for each reservoir, represent average conditions with an allowance for statistical variability, and are calculated as the upper confidence interval of the mean with the assumption that a sample size of 10 is used. Based on these criteria, a nutrient standard cannot be calculated on Coletto Creek Reservoir because the data set collected at the sampling station at the dam is not large enough.

## Coletto Creek Watershed

### River Segments, Descriptions and Concerns

The original GBRA station on the reservoir would have a sufficient amount of data but the station is not located in the main pool. The GBRA station is located at the boat ramp in a cove, very near a swimming station on the reservoir. The station was originally established to assess the water quality for contact recreation. The median **chlorophyll a** concentration at the GBRA dam station on the reservoir is 2.6 micrograms per liter (ug/L), with no data points exceeding the screening criteria of 14.4 ug/L. The data set for chlorophyll a on Coletto Creek at the dam location is very limited with only 23 data points. A factor that may play into the development of nutrient criteria for Coletto Creek Reservoir will be if the reservoir will be designated as “impacted” due to the warm water discharge from the power plant that utilizes the water body for cooling purpose. There are no other domestic or industrial discharges to the reservoir or upstream tributaries.

The depth at the dam location is approximately 11 meters. Reviewing the limited data set that GBRA has collected at the station at the dam, the lake begins to stratify at the dam during the spring and summer months. The **temperature** change through the depth profile was 6.9°C and 4.4°C from surface to bottom respectively by season. The **conductivity** changed, on average, less than 23.5 micromhos per centimeter (umhos/cm) from surface to bottom.

The **dissolved oxygen** measured at the bottom went to less than one milligram per liter at the dam consistently during the warmer months. In the limited historical data set, there were no surface measurements that dropped below the stream standard of 4.0 mg/L.

The difference in **pH** from surface to bottom at both reservoir locations averaged a change of 0.98 pH units. No surface or profile sample fell outside the pH standard range of 6.5 to 9.0.

GBRA collected nutrients and dissolved constituents at the surface at the location monitored at the dam. The data set was too small to do trend analyses.

### Coletto Creek

The lower assessment unit is approximately 15 miles in length with a median flow of 5.6 cubic feet per second (cfs). Because very little of the watershed is below the Coletto Creek Reservoir, the flow in the lower assessment

unit is dependent on releases from the reservoir. The upper assessment unit has the majority of the watershed for the Coletto Creek and its tributaries. Guadalupe River Basin stakeholders have voiced concerns about the impacts from oil and gas production and most recently, the possible impacts from the exploration and in-situ mining for uranium on the water quality in the Coletto Creek, upstream of the reservoir. In response to this concern GBRA established two stream stations upstream of the reservoir on Coletto Creek at Arnold Road (station no. 18594), Perdido Creek (station no. 18595) and sampled over two years. The data sets for each station are very limited and not appropriate for trends over time analyses but the systematic monitoring does record baseline conditions for comparison in future years. The mining has not been started, as of January 2013. After the mining begins, GBRA will discuss periodic monitoring in these watersheds to assess impacts, if any.

The TCEQ has a stream monitoring (station no. 12622) located downstream of the reservoir that was discontinued in November 2010. The TCEQ station below the reservoir has an extensive data set, from 1991 to 2010, but only data from 2003 through 2010 was evaluated for trends. The median **flow** was 5.5 cfs. The median **temperature** was 25.3°C, ranging from 13°C to 33.7°C. The **dissolved oxygen** ranged from 4.8 mg/L to 12.5 mg/L, with a median concentration of 8.29 mg/L.

The median **specific conductance** was 774 umhos/cm, ranging from 274 umhos/cm to 927 umhos/cm. The **chloride** contributes the most to the conductivity, with a median concentration of 119 mg/L but the stream did not exceed the stream standard of 250 mg/L in the historical data set.

Continuing with the evaluation of the historical data at the TCEQ station downstream of the reservoir, the **E. coli** geometric mean concentration was 8 MPN/100 mL, well below the stream standard for primary contact recreation. Based on the 2012 Texas Water Quality Inventory, the dissolved nutrient concentrations, ammonia nitrogen, nitrate nitrogen and orthophosphate never exceeded the stream screening concentrations for each respective nutrient. **Total phosphorus** had only one exceedence of the screening criteria of 0.69 mg/L, out of 105 measurements assessed. 🐾