

CANYON LAKE



Canyon Lake

Segments

Segment 1805 - Canyon Lake

Segment Summary

Segment 1805 represents Canyon Lake, a manmade impoundment on the main stem of the Guadalupe River. Canyon Lake has a 1,432-square-mile drainage area. Construction of the Canyon Lake Dam was completed in 1964; this lake has a normal maximum operating level of 909 feet above mean sea level (msl) and a conservation storage capacity of 382,000 acre-feet. Canyon Lake has roughly 80 miles of shoreline and a surface area of 8,240 acres. Substrate in this segment is mostly limestone with areas of dark loam

to loam with clay, which is typical of the Edwards Plateau ecoregion. The primary uses of this lake are water storage, flood control, and recreation. Most of the land around the banks of the lake is privately owned, and homes dot the hillsides.

Canyon Lake is operated by two governmental entities. The United States Army Corps of Engineers (USACE) owns the dam and controls the release of flood waters when the pool is above 909 msl. GBRA has the rights to the use and release of water in the conservation pool when the level is



Photo 5: Zebra Mussels

between 775 msl to 909 msl. The water is used to supply municipalities, industries, agriculture, and hydroelectric power generation.

The presence of invasive species zebra mussels (Photo 5) was confirmed in Canyon Lake in 2017, after an infested boat was found parked at Crane's Mill Marina. After this discovery, additional plankton monitoring was conducted in the lake by TPWD and microscopic zebra mussel larvae were found at several locations, confirming a reproducing population. Zebra mussels are highly prolific, and exceedingly efficient filter feeders; one adult zebra mussel can process up to one

gallon of water per day. Adult zebra mussels form dense clusters and are able to attach to nearly any surface which can lead to clogged water intake pipes, and hull fouling on boats. Additionally, they are able to outcompete native mussel species for resources. Water clarity tends to increase in lakes that are infested with zebra mussels due to the decrease in plankton. Increased water clarity in Canyon Lake could result in more available habitat for another invasive species found in Canyon Lake: hydrilla. Hydrilla has been a popular aquatic ornamental species since the 1960s. In the natural environment, this invasive species occurs at depths up to 15 meters, can grow up to one inch per day, and forms dense mats that crowd out other species and can clog boat propellers.

Station ID	Dissolved Oxygen	Biologicals	Bacteria	Temperature	Nutrients	Chlorophyll a
12597	М	I	М	М	М	М
12598	М	I	М	М	М	М
12600	М	I	М	М	М	М
12601	М	I	М	М	М	М

Segment 1805 is monitored at one station by GBRA and three stations by TCEQ:

M - Meets water quality criteria

I - Impaired for water quality criteria

Table 8: Summary of the 2022 Texas Integrated Report / Segment 1805

Data from TCEQ stations 12597, 12600, and 12601 was not analyzed due to a significant data gap during the assessed period. No significant trends were found at GBRA station 12598.

Canyon Lake has no impairments or concerns for water quality, however there is an impairment for fish consumption in the segment. In 2005, Texas Parks and Wildlife Department (TPWD) collected fish tissue samples from three largemouth bass from Canyon Lake. Results indicated that the samples had a mercury concentration of 0.7 milligrams per kilogram (mg/kg) which is above the human health screening criteria of 0.525 mg/kg. Subsequently, an additional 30 samples were collected from several sport fish species in the lake. All samples collected had detectable levels of total mercury. The mean concentrations for mercury in longnose gar and striped bass were 0.772 mg/kg and 1.149 mg/kg, respectively. As a result of this study, the impairment for mercury in edible fish tissue was added in 2006. The source of the mercury in Canyon Lake has not been confirmed; however, atmospheric deposition from emissions produced by coal-fired power plants and other industries remain the most likely source.

Canyon Lake is monomitic, meaning it experiences one thermal stratification event each year. During the winter months, temperatures throughout the entire depth of the lake are consistent; in the summer months, the lake becomes thermally stratified with a noticeable thermocline between 8 to 10 meters down. When the lake is stratified, water in the epilimnion, or upper layer, becomes warmer and less dense and is unable to mix with the water in the hypolimnion, or lower layer, which is colder and denser. Water in the hypolimnion also tends to become anoxic as organic matter is broken down by bacteria, depleting the available dissolved oxygen. This decline in dissolved oxygen below the thermocline is observed at all monitoring stations in Canyon Lake, trends from station 12601 are shown on the next page:



Figure 14: Winter DO at Station 12601