Texas Watch Volunteer Water Quality Monitoring Program
2007 Panther Hollow Creek above Lake Austin Data Summary

This data summary report includes general basin volunteer monitoring activity, general water quality descriptive statistics, tables and graphs, and comparisons to stream standards as related to "aquatic life use" criteria.

In alignment with Texas Watch's core mission, monitors attempt to collect data that can be used in decision-making processes, to promote a healthier and safer environment for people and aquatic inhabitants. While many assume it is the responsibility of Texas Watch to serve as the main advocate for volunteer monitor data use, it has become increasingly important for monitors to be accountable for their monitoring information and how it can be infused into the decision-making process, from "backyard" concerns to state or regional issues. To assist with this effort, Texas Watch is coordinating with monitoring groups and government agencies to propagate numerous data use options.

Among these options, volunteer monitors can directly participate by communicating their data to various stakeholders. Some options include: participating in the Clean Rivers Program (CRP) Steering Committee Process (see box insert on this page); providing information during "public comment" periods; attending city council and advisory panel meetings; developing relations with local Texas Commission on Environmental Quality and river authority water specialists; and, if necessary, filing complaints with environmental agencies; contacting elected representatives and media; or starting organizing local efforts to address areas of concern.

The Texas Clean Rivers Act established a way for the citizens of Texas to participate in building the foundation for effective statewide watershed planning activities. Each CRP partner agency has established a steering committee to set priorities within its basin. These committees bring together the diverse interests in each basin and watershed. Steering committee participants include representatives from the public, government, industry, business, agriculture, and environmental groups. The steering committee is designed to allow local concerns to be addressed and regional solutions are recommended. For more information about participating in these steering committee meetings and to contribute your views about water quality, contact the appropriate CRP partner agency for your river basin at: http://www.tnrcc.state.tx.us/water/quality/data/wmt/contract.html.

Currently, Texas Watch is working with various public and private organizations to facilitate data and information sharing. One component of this process includes interacting with watershed stakeholders at CRP steering committee meetings. A major function of these meetings is to discuss water quality issues and to obtain input from the general public. While participation in this process may not bring about instantaneous results, it is a great place to begin making institutional connections and to learn how to "work" the assessment and protection system that Texas agencies use to keep water resources healthy and sustainable.

In general, Texas Watch efforts to use volunteer data may include the following:

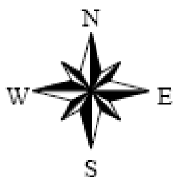
1. Assist monitors with data analysis and interpretation
2. Analyze watershed-level or site-by-site data for monitors and partners
3. Screen all data annually for values outside expected ranges
4. Network with monitors and pertinent agencies to communicate data
5. Attend meetings and conferences to communicate data
6. Participate in CRP stakeholder meetings
7. Provide a data viewing forum via the Texas Watch Data Viewer
8. Participate in professional coordinated monitoring processes to raise awareness of areas of concern

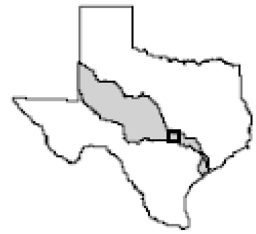
Information collected by Texas Watch volunteers utilizes a TCEQ and EPA approved quality assurance project plan (QAPP) to ensure data are correct and accurately reflects the environmental conditions being monitored. All data are screened for completeness, precision and accuracy where applicable, and scrutinized with data quality objective and data validation techniques. Sample results are intended to be used for education and research, baseline, local decision making, problem identification, and others uses deemed appropriate by the data user. Graphs are compiled and situated to assist the data user in obtaining information from the collected data. Where applicable, "time" is located on the "x" or horizontal axis and is chronologically listed from oldest to most recent sampling. The "y1" or "y2" axes contain the constituent(s) of interest. Note: pH values were not transformed for graphing purposes or for developing mean statistics; data collection events may not be evenly distributed over time (through seasons and years); sampling events may occur at different times of the day; sample collection and results documentation may have been completed by different monitors over time at each site; data collected by school groups should undergo additional scrutiny before use; data summary information is subject to change.

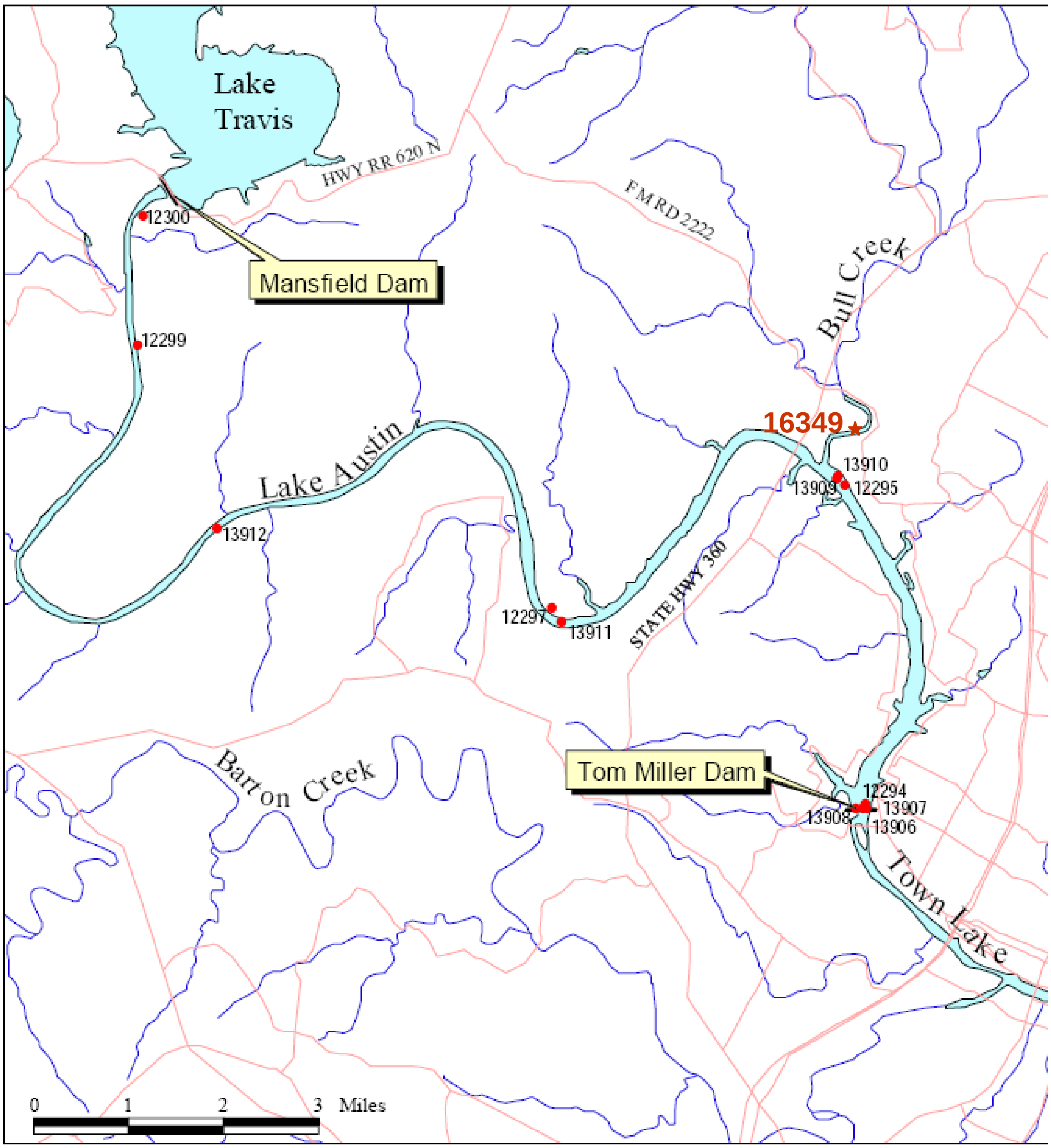
Site Description and Background Summary

Panther Hollow Creek is a tributary to stream segment 1403 on the Colorado River. This river segment is from the confluence of Lake Austin to the upstream end south of the intersection of FM 2222 and Bull Creek Road in Travis County. Panther Hollow Creek is a fresh water stream about 4 miles in length. Designated water body uses are aquatic life, contact recreation and fish consumption. These different types of uses were not assessed by TCEQ. The monitoring site (Site Id: 16349) is on Panther Hollow Creek about 300 m downstream of Big View Rd. crossing. The site, which is located near the north shore of Lake Austin, is 1 Km west of Lake Austin Municipal Park.

16349- Panther Hollow Creek above Lake Austin







This picture indicates the location of Panther Hollow Creek with respect to Lake Austin.

Data Assessment

All data included in this report was collected and analyzed by LCRA CRWN volunteer monitors. In this report, data from 16 sampling events (2005-2007) on Panther Hollow Creek, are compiled and assessed. The subsequent information summarizes each water quality parameter collected and its significance to surface water quality. Data collected by CRWN volunteer monitors include: pH, specific conductivity, water and air temperature, dissolved oxygen, total depth, and secchi depth. Each parameter is followed by a set of graphs illustrating trends, exceedences and relationships within the data. The following tables show the summary of the data used for this report.

Table 1: Summary of descriptive statistics for the monitoring site, Panther Hollow Creek

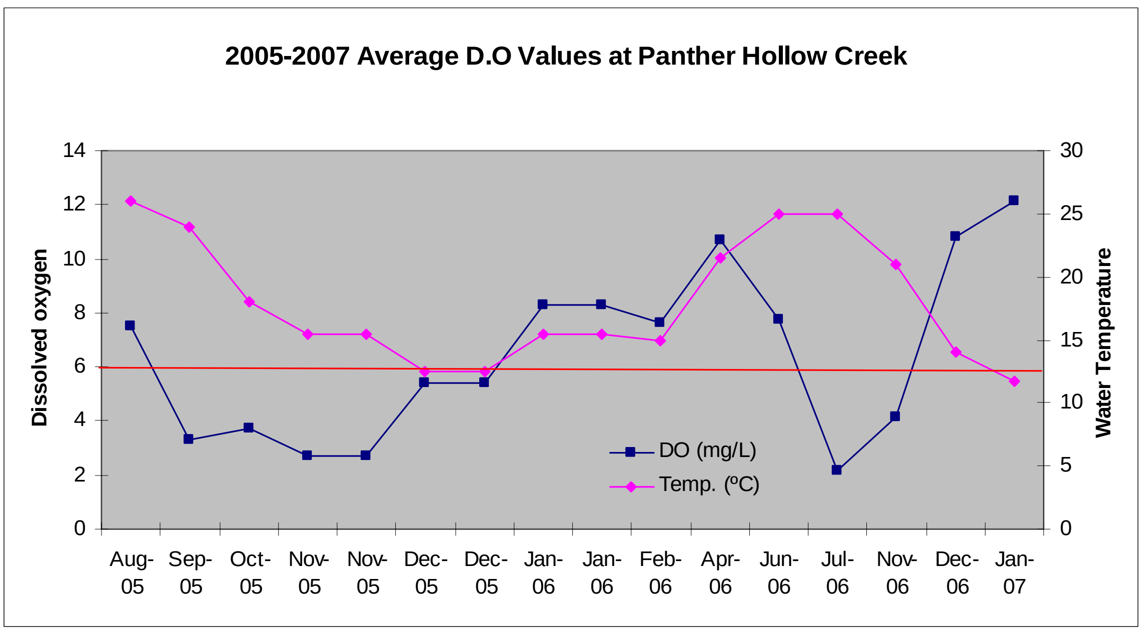
Panther Hollow Creek above Lake Austin					
Site ID # 16349	**N**	**% complete**	**min**	**mean**	**max**
Sample Time	16	100%	8:45 AM		3:00:00 PM
Sample Depth (m)	16	100%	0.2	0.2	0.2
Total Depth (m)	16	100%	0.5	0.968	1
Secchi Disk (m)	16	62.50%	0.3	0.823	1.17
Conductivity (µS)	16	100%	420	670	800
Air Temperature (°C)	16	100%	10.75	22.6	34
Water Temp. (°C)	16	100%	11.75	18.1	26
Dissolved Oxygen (mg/L)	16	100%	2.15	6.42	12.15
pH (Su)	16	93.75%	7.1	7.48	8
DO exceedence (<6 mg/L)		50%			

Data Analysis

Dissolved Oxygen

Dissolved oxygen (DO) is an important indicator of the water body's overall ability to support aquatic life. DO are microscopic bubbles found in water and are measured in mg/L. Fish breath by absorbing this dissolved oxygen. So a certain level of it is necessary in order to support aquatic life. Oxygen enters the water by aeration and plant photosynthesis and leaves the system by respiration and decomposition of organic matter. Characteristics of the water body affecting dissolved oxygen include velocity of water flow, climate/season, and variety of organisms in the water, dissolved solids, and the amount of nutrients in the water. In addition, dissolved oxygen has an inversely proportionate relationship with water temperature. This is because more oxygen can be dissolved in colder water. In dissolved oxygen comparison graphs, the red line indicates the dissolved oxygen exceedence of 6.0 mg/L needed for a fully supporting water body according to the designated "excellent" aquatic life use.

Chart 1: This chart shows dissolved oxygen values and water temperature found at Panther Hollow Creek

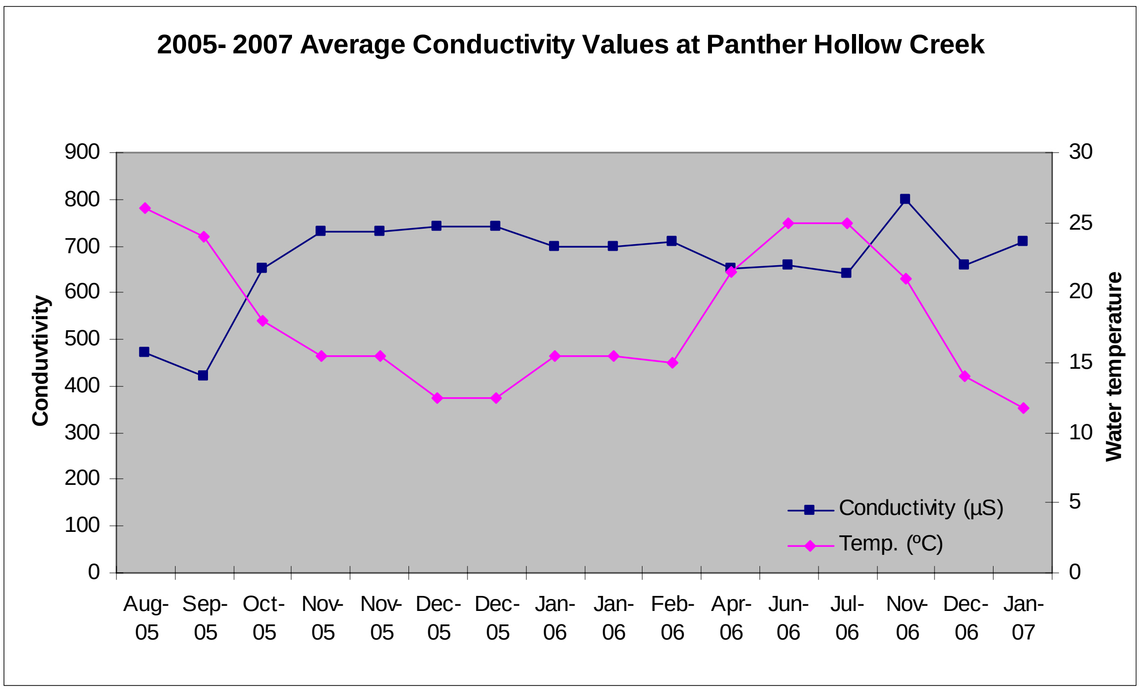


During Aug- 2005 to Jan- 2007, in the Panther Hollow Creek, the dissolved oxygen values range from 2.15mg/L to 12.15mg/L, with an average of 6.42 mg/L. Half of the total monitoring events conducted (8 events) during 2005 to 2007, have exceeded their D.O. values than 6 mg/L. Two of these eight monitoring events occurred during the summer -2005. The remaining two events occurred during Jul and Nov- 2006. They have inverse relationship with water temperature (R^2 = 0.3358).

Specific Conductivity

Conductivity is a measure of how well water can conduct electrical currents. It is measured in micro Siemens (µS). When dissolved solids, such as chloride, sulfate, nitrate, phosphate, sodium, magnesium, calcium and iron, are present in water, the conductivity increases. The breakdown of these ionic compounds allows the water to conduct electricity because positive and negative charges exist between the particles (ions). Factors causing a variation in conductivity levels include: geology and soils of the water shed: mine tailings and runoff from roads and/or agricultural lands. Also important to consider is the amount of rainfall affecting the stream. During dry periods, when less water is present, the concentration of ions in the water increase, thus increasing the conductivity.

Chart 2: This chart shows inverse relationship between Specific conductivity and water Temp. of the Panther Hollow Creek

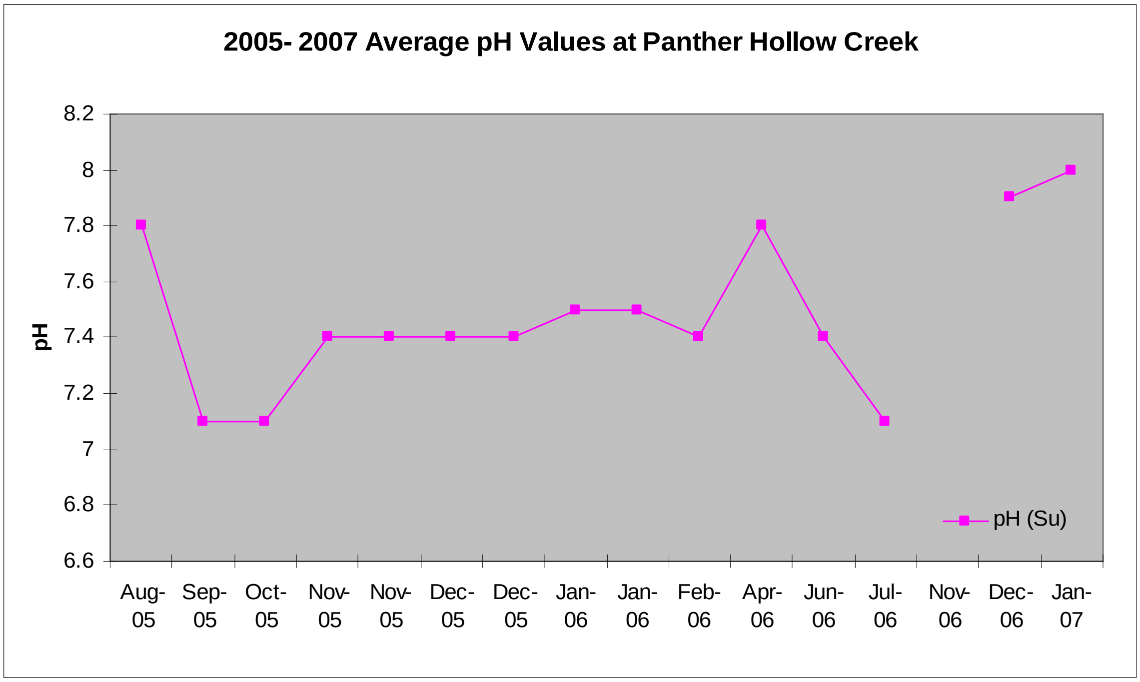


At Panther Hollow Creek, specific conductivity values range from 420 µS to 740 µS with an average of 670 µS. The specific conductivity shows a slight inverse relationship with water temperature (R^2 = 0.4021).

pH

pH measures the concentration of hydrogen ions in water. Fluctuations in pH are a result of algal photosynthetic processes, the concentration of carbon dioxide in the water, the geology of the watershed and air pollution. Generally, pH levels decrease during the night and increase during daylight hours when photosynthesis peaks within the plants due to sunlight. Correspondingly, dissolved carbon dioxide (CO_2), which has lower concentrations during the day, forms a weak acid changing the pH of the system. Furthermore, acidic and alkaline compounds from different types of rock and soil release minerals into the surrounding water, that also affect the pH of a water body. Lastly, air pollution from car exhaust and power plant emissions increase the concentrations of nitrates (NO3) and sulfides (SO2) in the air that react with the atmosphere and rain to form acids. When it rains, these acidic compounds combine with moisture in the air and fall into our streams and lakes.

Chart 3: This chart shows variation of pH at the Panther Hollow Creek

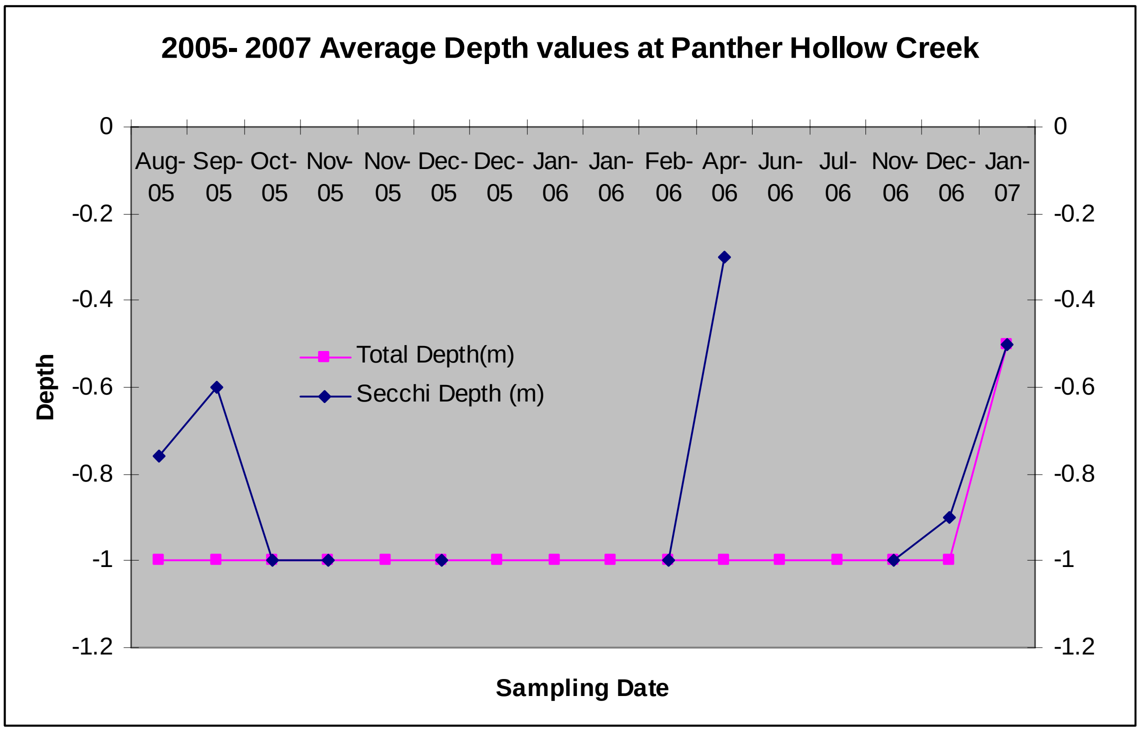


At Panther Hollow Creek, pH values range from 7.1 Su to 8.0 Su with an average of 7.48 Su throughout the period of Aug. 2005 to Jan. 2007.

Secchi Depth and Total Water Depth

Total Water depth is a measurement of how deep the water is where the sample was taken. Secchi depth is a measure of the clarity of the water. Higher Secchi depth reading indicates a greater clarity in the water, and thus, more sunlight is able to infiltrate down to greater depths. Lower Secchi depth readings indicate turbidity in the water which may identify water pollution or result of a rainfall episode. For Plum Creek sites, both the Secchi depths and total depths remain low because the creek is typically shallow with low flow.

Chart 4: This chart shows variation of Secchi depth and total depth at the Panther Hollow Creek



In above chart all the depth values have converted to negative values in order to represent them more clearly. During summer- 2005 period the stream is deeper and cloudier, after Nov-2005 it became clearer. During Nov- 2006 to Jan- 2007 there is an apparent decrease in water level.