Blue Thumb Program

East Cache Creek: Big Green

SE SE NE
Section 5-1N-11W
Comanche County, OK
Lat 34.586917
Long -98.370667
WBID# OK311300-02-0010H

Blue Thumb Volunteer Monitoring Data Review – August 10, 2015
Written by: Cynthia Williams

Description of Watershed and Monitoring Site

The headwaters of East Cache Creek start in Kiowa and Caddo Counties about 7 miles north of the Wichita Mountains Wildlife Refuge. East Cache Creek starts with northerly flow then turns southeast into Lake Ellsworth (just south of Apache) and then continues flowing south through Fort Sill Army Base and the east side of the City of Lawton. Water from Medicine Creek, Lake Lawtonka and numerous other creeks and tributaries empty into East Cache Creek. The creek continues flowing south and eventually merges with the Red River. This watershed/drainage area is large; covering approximately 689 square miles. The land usage through this area in the Central Great Plains Ecoregion is diversified and includes agricultural, residential, military, and tribal. The monitoring site is located at the Big Green Soccer Fields off State Highway 7 on the east side of Lawton, Oklahoma.

Stream Condition & Habitat Overview

The physical habitat of East Cache Creek starting at the Big Green Soccer Fields and going about 1/4 mile upstream has been assessed twice (7/15/2009 and 6/26/2013) and both assessments scored better than the average of high quality reference streams in the Central Great Plains Ecoregion. Both assessments scored well in terms of instream cover, pool variability and streamside cover. In 2009 East Cache Creek was not moving enough to measure the flow thus received a zero score; however in 2013 the flow was enough to receive a good score. However, there is room for improvement which will aid the biological diversity of the stream. For example, both assessments had a medium amount of bank vegetation, canopy cover shading and bank stability. Even though the overall stream condition score has slightly increased since the last assessment in 2009, the creek bottom has become more unstable with deposition of sediment. The increased silt and reduction of rocky runs and riffles reduces the habitat stability for the microorganisms and egg laying fish.

Biological Conditions

Fish
Fish collections were conducted on the same dates as the physical habitat assessments and through the same 1/4 mile section of East Cache Creek. Using the average of high quality

reference streams in this ecoregion as the benchmark, East Cache Creek overall score in 2009 equaled the benchmark and in 2013 was slightly better than the benchmark. East Cache Creek both years has been above average with increased fish species richness, especially the intolerant species. Reference streams averaged 13 fish species while East Cache had 24 species in 2009 and increased to 26 species in 2013. Both years there were three intolerant species (reference averaged 1) found, the Suckermouth Minnow, Redhorse sucker and Channel darter. From 2009 to 2013 the number of sunfish species increased from 4 species to 7 species (reference averaged 4 species). The fish population at this site on East Cache Creek was more equally distributed, more diverse and evenly spread out in 2013 than the 2009 assessment; better than ecoregion reference average. Amazingly enough, there was a very harsh and long drought in Oklahoma (especially this SW area) starting the end of 2010 through 2014 and yet the fish assessment score for East Cache Creek still outscored the ecoregion high quality streams.

Benthic Macroinvertebrates (bugs)
Nine benthic macroinvertebrates collections (5 winter and 4 summer) were performed at East Cache Creek since 2009. The collections were very close to reference stream conditions; ranged from 90% to 150% with one low score of 79% in the summer of 2011. During the collections, as many as 19 different types of organisms were identified in the winter when reference averaged just 11 species and the summer was a bit harsher on East Cache Creek bug species with a range of 18-12 while reference averaged 16 bug species. The number of sensitive bug species generally increased during the summer collections while the winter collections had a bit of a drop then stabilized. The macroinvertebrate collections represent a nicely balanced and diversified community meaning that East Cache Creek's water quality is quite good.

Chemical Condition

East Cache Creek at Big Green Soccer Fields has been chemically monitored monthly from 2/24/2009 thru 11/25/2014, this includes high flow, base flow and low flow conditions.

Dissolved Oxygen. The oxygen saturation level generally remained in the low caution range (80-50%) and was only in the normal range (80-130%) 36% of the time. Low dissolved oxygen saturation is an indicator of problems with the amount of oxygen available in the water for aquatic life.

pH. Ranging between 7.3 and 8.7, all of the data was well within normal values.

Nitrogen. An estimate of soluble nitrogen was made by adding the amounts of ammonia-nitrogen, nitrite-nitrogen and nitrate-nitrogen found in the water. Ideally, the level should remain below 0.8mg/L nitrogen. It becomes a matter of concern for the fish and creek bugs when it is above 1.5mg/L nitrogen. The soluble nitrogen in East Cache Creek was only below 0.8mg/L nitrogen 15% of the time and was above 1.5mg/L nitrogen 59% of the time. Nitrate nitrogen is the main type of nitrogen being found with several low ammonia readings and very few nitrite detections. Nitrate nitrogen was the highest of 10mg/L on 10/25/2011 and 9/30/2014.

Phosphorus. Phosphorous amounts in the stream were determined by detecting the level of orthophosphate. Normal conditions for good biological life are orthophosphate below 0.05mg/L. The levels of orthophosphate at the sampling site on East Cache Creek ranged between 0.04mg/L and 1.66mg/L, with the median reading at 0.556 mg/L, so very high above normal conditions.

Chloride. The chloride readings ranged between 20mg/L and 70mg/L with a mean level of 40mg/L. All readings were in the normal category.

Synopsis

East Cache Creek is a picturesque stream with large, overhanging trees and slow moving water. This creek is better than the referenced high quality streams in this Central Great Plains Ecoregion as far as physical habitat and fish, is comparable to ecoregion reference conditions for the creek bugs. The water chemistry is a bit different story; it was concerning and showed elevated levels of nutrients present. Through continued efforts, the creek should prove to be a viable asset to the state of Oklahoma for years to come. If we continue to keep the public informed as to the state of the river and what they can do to help with situations that arise from pollution, then hopefully future generations can enjoy this water for years to come.