

## **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 Interpretation – February 2012

Written by Cynthia Williams

### **Description of Watershed and Monitoring Site**

The headwaters of East Cache Creek start on the north side of the Wichita Mountain Wildlife Refuge and flow north and then southeast into Lake Ellsworth and then South through Fort Sill Army Base and the City of Lawton. There is water from Medicine Creek, Lake Lawtonka and numerous other tributaries that empty into East Cache Creek. The creek continues south and eventually merges with the Red River. This water shed is large covering approximately 689 square miles. The land usage through this area 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 habitat assessment at East Cache Creek on July 15, 2009 scored better than the average of high quality reference streams in the Central Great Plains ecoregion in terms of instream cover, pool variability and streamside cover. There is a lot of woody debris and plant life in the creek and right along the water edge to provide habitat and food for aquatic life. There is a good mixture of deep pooled water and shallow water. However, there is room for improvement which will aid the biological diversity of the stream. For example, there could be better stream bank vegetation to help with some of the erosion. The canopy cover shading scored a little low due to the creek being wide and the trees and grasses on the stream bank can't create shade over the entire width of the creek. The low presence of rocky runs or riffles is just due to the natural soil type of the area. Additionally there is an unstable bottom with deposition of sediment and this creates a low score for channel alteration which means point bars are being made.

### **Biological Conditions**

#### **Fish**

Using the average of high quality reference streams in this ecoregion as the benchmark, East Cache Creek ranked right at the benchmark on July 15, 2009. East Cache Creek had 24 species of fish collected while the reference conditions averaged 13 species. Three of these species are intolerant to pollution and sediment; the Suckermouth Minnow, Redhorse Sucker and Channel Darter. Seven species with intermediate tolerance were found; Threadfin Shad, Blacktail Shiner, Sand Shiner, Golden Redhorse, Brook Silverside, Spotted Sunfish and Orangethroat Darter. Four sunfish species were found. The population diversity is very good at this location on East Cache Creek, better than the reference average.

#### **Benthic Macroinvertebrates (bugs)**

Benthic macroinvertebrates were collected from East Cache Creek in summer of 2009 from a rocky riffle. The collection scored just above the average reference stream conditions. Seventeen different types of organisms were identified. The bug population has very nice species diversity. Ephemeroptera (mayflies) and Trichoptera (caddisflies) were present which are more sensitive to pollution than other groups. The macroinvertebrate collection represented a balanced trophic and community structure for the stream.

## **Chemical Condition**

### **Dissolved Oxygen**

The oxygen saturation level generally remained in the low end of the caution range (50%-80%) with a median score of 65%. From February 2009 to October 2011, the percent oxygen saturation was below 80% 28 of the 33 times dissolved oxygen was tested. The lowest reading was 6% on October 26, 2010. Low dissolved oxygen saturation is an indicator of problems with the amount of oxygen available in the water for aquatic life.

### **pH**

Ranging between 7.25 and 8.6, all of the data was well within normal values.

### **Soluble Nitrogen**

An estimate of soluble nitrogen was made by adding the amounts of ammonia-nitrogen, nitrate-nitrogen and nitrite-nitrogen found in the water. Ideally, the level should remain below 0.8 mg/L nitrogen. It becomes a matter of concern when it is above 1.5 mg/L nitrogen. The soluble nitrogen in East Cache Creek was only below 0.8 mg/L nitrogen four times and was 1.5 mg/L nitrogen or more 54% of the times the creek was monitored between 2009 and 2011.

### **Phosphorus**

Phosphorous amounts in the stream were determined by detecting the level of orthophosphate. Normal conditions range between 0.00 mg/L P and 0.05 mg/L P, caution conditions range between 0.05 mg/L P and 0.1 mg/L P, and above 0.1 mg/L P is considered poor conditions. The levels of orthophosphate at the sampling site ranged between 0.04 mg/L P and 1.20 mg/L P, with the mean level at 0.449 mg/L P. Of the 32 times orthophosphate was tested on East Cache Creek, 84% of the readings were above 0.1 mg/L P.

### **Chloride**

The chloride readings ranged between 20 mg/L and 60 mg/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 comparable to the referenced high quality streams in this Central Great Plains ecoregion for its habitat, fish and bug populations. The water chemistry 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 East Cache Creek 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.