

# **Bird Creek Tributary: EW 136 Road (site #2)**

SE/4 SE/4 SW/4

Section 30, Township 7 North, Range 9 East

Hughes County, Oklahoma

Latitude N 35.04332°

Longitude W -96.39880°

WBID# OK520800-01-0150J

Blue Thumb Volunteer Monitoring Data Review – October 1, 2013

Written by: Andrea Jones

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

The headwaters of the Bird Creek Tributary start on the north side of West Main Street in the town of Holdenville, Oklahoma (about 78 miles ESE of Oklahoma City), between Bullitt Street and Burgess Street approximately 2 ½ miles upstream from the monitoring site. The Tributary runs through poor residential neighborhoods before leaving town and passing by the city landfill and sanitation department. Then it runs through a mixture of wooded and pasture lands and also runs close to a county road so it has sediment washed into the tributary from storm events. Beyond the monitoring site at EW 136 Road the tributary runs south about 1 ¼ miles into the main part of Bird Creek which empties into the Little River and eventually into the Canadian River about 5 miles SE of Holdenville.

## **Stream Condition and Habitat Overview**

The habitat assessment at Bird Creek Tributary site #2 on EW136 Road scored high/good in two areas: Canopy Cover Shading (that shading which still allows enough light through for plant growth while still reducing heat); and Streamside Cover (includes those plants, grasses, shrubs and trees along the stream banks that provide shade, energy and food). This site scored moderate in six categories: Instream Cover (which includes rocks, aquatic vegetation, woody debris in the water needed for small organisms to use as cover or protection from predators); Pool Variability (which requires a mixture of pool depths); Flow; Channel Alteration (the presence of point bars and islands); Bank Stability; and Bank Vegetation Stability (all of these factors are due to close proximity to county dirt road which easily washes sediment into the stream). There are three areas in which this site scored very low/poor: Pool Bottom Substrate (the bottom is very unstable sand, clay, mud); Presence of Rocky Runs or Riffles; and Channel Sinuosity (the tributary has very few curves). Some of these factors are due to the fact that this site is less than three miles from the beginning of the drainage area (headwaters) and that it is a tributary to a bigger creek. There was an overabundance of algae suggesting that this site receives a higher level of nitrogen and phosphorous from the city waste treatment facility and landfill located 1 mile upstream from the test site. The overall habitat score at this monitoring site (85.6) was slightly above the average score (84.0) of high quality creeks (reference conditions) in the same Cross Timbers ecoregion.

## **Biological Conditions**

### **Fish**

The fish sample was collected during the summer of 2010 by seining from the monitoring to a quarter mile upstream. Using the average of reference streams in the Cross Timbers ecoregion as a benchmark, Bird Creek Tributary site #2 ranks well below the average for this region, with significant decrease in variety and diversity and sensitivity. This site scored only 55% as good as reference conditions, a low D grade. Yet again, this is greatly due to the fact that there is very little headwater on this site. Only 258 total fish in seven species were found at this site: Mosquitofish (218), Green Sunfish (6), Orangespotted Sunfish (1), Bluegill Sunfish (3), Longear Sunfish (11), Spotted Bass (13) and Largemouth Bass (6). The bulk of the species collected were insectivores (93%) with only 7% being piscivores (eat mainly fish). Six species were in the tolerant to pollution category. Only the Spotted Bass was intermediate or somewhat tolerant. Cross Timbers Reference Conditions averaged 594 total fish from 19 species with 2 of the species being intolerant to pollution and the overall population had a good even distribution over the species.

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

Benthic Macroinvertebrates have been collected from the Bird Creek Tributary Site #2 during the winter of 2010 and the summers of 2009 and 2010.

Using the average of reference streams in the Cross Timbers ecoregion as a benchmark, Bird Creek Tributary site #2 ranks well below the average for the region; 31% winter, 7% summer 2009 and 20% summer 2010. All species collected were tolerant to pollution except for one sensitive species of Mayfly on 9/3/2010. In the July 2009 collection there were 158 bugs representing 5 varieties of worms and flies. In February 2010 there were 113 bugs collected representing 10 species of round/flat worms, snails and various flies. In June 2010 there were 114 bugs collected representing 7 species of round/flat worms, various flies and snails. There was a second summer collection on September 2010 where there were gathered 106 bugs of 12 species including: round/flat worms, flies and snails. The ecoregion reference conditions averaged in the summer 20 species with 7 species being sensitive to pollution and in the winter 16 species with 5 species being sensitive to pollution. The Bird Creek Tributary site #2 collections indicate that the water quality in this section of the stream was of very poor quality due to its proximity (1 mile) to the city waste treatment plant and landfill.

### **Chemical Condition**

Chemical data were collected 4/28/2008 and monthly between 7/14/2009 and 9/7/2010.

**Dissolved Oxygen.** The average oxygen saturation level was 72% which is in the low caution range (80%-50%) between normal and poor quality. Nearly all of the data points lie in this range.

**pH.** The pH level average was 7.65 which is well within the normal range.

**Nitrate/Nitrite.** The nitrate/nitrite nitrogen ranges from 0.5mg/L N on 9/9/2009 to 6.0mg/L N on 8/24/2009. All of the data, except for the low reading on 9/9/2009, were well above normal and in the poor range (above 1.5mg/L N). This yet again is most likely attributed to its proximity to the waste treatment plant and landfill.

**Ammonia.** The ammonia nitrogen level was well above normal and falls into the poor range (above 0.7mg/L N). There were only two months which reported BDL (Below Detectable Levels) and that was 9/9/2009 and 9/7/2010.

**Phosphorus.** The Orthophosphate Phosphorus level averaged 0.197mg/L P which is well within the caution range (greater than 0.05mg/L P). There was one collection of 3.0mg/L P on 7/14/2009 which is very poor quality. The range fluctuates from 0.067mg/L P to 3.0mg/L P with only one collection reporting BDL (Below Detectable levels) on 4/28/2008.

**Chloride.** The chloride levels range from 15mg/L Cl on 9/9/2009 to 60mg/L Cl on 7/14/2009, with an average of 40mg/L Cl, which is within the normal range.

### **Synopsis**

Bird Creek Tributary Site #2 runs south out of Holdenville, Oklahoma. The water drains from some of the poorer neighborhoods before entering wooded areas at Site #1. This site was selected so that the volunteers could monitor pollutants which enter this stream from the city waste treatment facility and landfill about 1 mile upstream. This location is the "after" picture of the stream and Site #1 is the "before" picture. This stream is well below the average for the Cross Timbers ecoregion in Biological and Chemical conditions but has a good physical habitat. There are also problems at the site associated with its close proximity to the waste treatment facility. The site is located two miles south of town and the stream continues to flow south into Bird Creek which flows into the South Canadian River. This tributary is in need of a lot of help.

The volunteer requested to stop monitoring on this site due to potential health concerns caused by the poor water quality.