

Bird Creek Tributary: NS371/EW134 (Dump Ground Road)

(site #1)

NE/4 NE/4 NE/4

Section 24, Township 7 North, Range 8 East

Hughes County, Oklahoma

Latitude N 35.07176°

Longitude W -96.40621°

WBID# OK520800-01-0150Y

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 1 mile upstream from the monitoring site. The Tributary runs through residential neighborhoods before flowing through the monitoring site at Dump Ground Road. There is usually little water at this site, mostly due to its close proximity to the beginnings of the drainage area. However, during storm events, the site collects all the runoff from the nonporous roads, driveways and drainage ditches. The stream also flows past a newly constructed housing development. This housing development has a lift station located approximately 12 feet from the stream and approximately 100 yards upstream from the monitoring site. There have been at least two occasions where the lift station failed and the raw sewage overflowed and entered the stream. The monitoring site sits approximately 10 feet from the county dirt road. The stream flow was temporarily restricted by a landowner who built an earthen dam just before the site until the city made him remove the obstruction. The Tributary continues to run south out of town, passing by the city landfill and sanitation department, through some wooded and pasture land before emptying into the main part of Bird Creek about 2-3 miles south of Holdenville. The main part of Bird Creek empties into the Little River which shortly empties into the Canadian River about 5 miles SE of Holdenville.

Stream Condition and Habitat Overview

The habitat assessment at Bird Creek Tributary site #1 on Dump Ground Road scored high/good in three areas: Instream Cover (which includes rocks, aquatic vegetation, woody debris in the water needed for small organisms to use as cover or protection from predators); 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 three categories: Pool Bottom Substrate (not as stable due to sediment/dirt eroding into the stream channel that covers up the rocks); 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 five areas in which this site scored very low/poor: Pool Variability (the tributary here is mainly ankle deep); Presence of Rocky Runs or Riffles; Flow; Channel Alteration (there was a presence of many point bars which means the channel less stable); and Channel Sinuosity (there are very few curves). Some of these factors are due to the fact that this site is less than one mile from the beginning of the drainage area (headwaters) and that it is a tributary to a bigger creek. The overall habitat score at this monitoring site (71.8) was below 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 downstream. Using the average of reference streams in the Cross Timbers ecoregion as a benchmark, Bird Creek Tributary site #1 ranks well below the average for this region, with significant decrease in variety and diversity. This site scored only 36%

as good as reference conditions, an E grade on a scale of A to E. Yet again, this is greatly due to the fact that there is very little headwater on this site. Only 106 total fish in five species were found at this site: Spotted Bass (35), Largemouth Bass (34), Mosquitofish (31), Green Sunfish (4) and Golden Shiner (2). Over 65% of the species collected were piscivores (eat mainly fish); with 33% being insectivores and 2% as omnivores (eats both plants and animals). Four 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 #1 during the winter of 2010, 2011, and 2012. Summer collections were not conducted due to lack of flow or lack of water, drought conditions. As stated several times, this site is located less than a mile from the headwaters so there is very little water present unless there is a storm event.

Using the average of reference streams in the Cross Timbers ecoregion as a benchmark, Bird Creek Tributary site #1 ranks below the average for the region; 31% in 2010, 77% in 2011, and 54% in 2012. All species collected were tolerant to pollution except for one sensitive species of Mayfly on 3/8/2011. In February 2010, there were 123 bugs collected representing 8 species of round/flat worms and various flies. In March 2011, there were 120 bugs collected representing 16 species of round/flat worms, springtails, crane fly, horse/black flies, crayfish, water penny, beetles, biting/non-biting midges, mayflies and snails. The February 2012 collections included 139 bugs of 10 species including: round/flat worms, springtails, water penny, black fly, crane fly and snails. The ecoregion reference conditions averaged 16 species with 5 species being sensitive to pollution. Bird Creek Tributary site #1 averages a low B grade for the winter bug collections.

Chemical Condition

Chemical data were collected monthly between 7/14/2009 and 6/30/2012.

Dissolved Oxygen. The average oxygen saturation level was 46% which is in the poor range (below 50%). Nearly all of the data points lie in the poor range or the caution range (80%-50%). This is attributed to the limited water and aquatic plants found at the site. There is little opportunity for the water to flow over riffles to provide more oxygen.

pH. The pH level average was 7.5 for this site which is well within the normal range.

Nitrate/Nitrite. The nitrate level was usually below 0.8mg/L N which is within the normal range except for four times it was 1.0mg/L N in October 2009, December 2009 and 2010, and May 2012. Nitrite was always below detection.

Ammonia. The ammonia level fluctuated but seemed to be increasing. The range was from below detection to greater than 1.0mg/L N. There seemed to be no pattern.

Phosphorus. The Orthophosphate Phosphorus level averaged 0.053mg/L P which is just higher than the normal range. . The data points fluctuate from, the poor range (> 0.1 mg/L P), 0.260mg/L P on 8/19/2009 to 0.033mg/L P on 10/15/2010 with several months reporting BDL (Below Detectable levels). There is a correlation between the dates of the housing development lift station failures and the amount of time it took for the sewage to affect the chemical samples taken from the site. With each rain, the sewage was picked up and deposited a little farther down the stream. In each documented case, it took more than 5 months for the majority of the sewage to flow the 100 yards downstream. This was due to little rainfall during this time period. It appears that there was at least one occasion just before volunteers began monitoring the site that the lift station also failed.

Chloride. The chloride levels range from 10mg/L Cl to 35mg/L Cl which is well within the normal range. The higher levels were during the winter months indicating that salt applied to the roads had washed into the stream.

Synopsis

Bird Creek Tributary Site #1 (Dump Ground road) runs south out of Holdenville, Oklahoma. The water drains from some of the poorer neighborhoods. The site is not well suited for a monitoring site with the limited amount of headwater but it was selected so that the monitoring volunteers could compare this upstream site to the downstream site #2 which gets pollutants from the sanitation department. This site #1 is the “before” picture of the tributary and site #2 is the “after” picture. This tributary also passes by the city landfill, downstream of site #1. This tributary is well below the average for the Cross Timbers region in all areas: Physical Habitat, Biological and Chemical conditions. There are also problems at the site associated with septic problems at the newly constructed housing development. This tributary is at the edge of town and continues to flow south into Bird Creek which continues on in to the South Canadian River. Who knows what problems this tiny tributary is creating downstream in Bird Creek?