Fourche Maline: Black Loop

SW/SW/SE
Section 8-5N-20E
Latimer County, Oklahoma
Lat: N 34.9184^0
Long: W -95.2174^0
WBID#: OK220100-40-0020P

Blue Thumb Volunteer Monitoring Data Review - December 9, 2014
Written By: Eddie Woods

Description of Watershed and Monitoring Site

This monitoring site is located on Fourche Maline Creek approximately 1.5 miles south of the southeastern Oklahoma town of Panola in Latimer County. The Fourche Maline is a third order stream in the Arkansas Valley ecoregion and flows from west to east through Latimer and LeFlore Counties. It eventually discharges into Wister Lake which supplies water for over 40,000 people in LeFlore County.

The creek is monitored on Black Loop Road. The watershed for this point is approximately 85 square miles in area and is located in the north central portion of Latimer County. The headwaters originate in the San Bois Mountains which are vegetated with oak-hickory-pine forests. From its headwaters the Fourche Maline flows south through Robbers Cave State Park and then turns east just north of Wilburton, the county seat of Latimer County with a population of approximately 2,800 residents.

Two major tributaries within the watershed are Bandy Creek and Cunneo Tubby Creek. Bandy Creek originates on the prairie west of and in the mountains south of Wilburton. The headwaters of Bandy Creek that originate in the mountains south of Wilburton flow into Lake Loyd Church which is the municipal water supply for Wilburton. Wilburton's waste water and sewage treatment plant discharges into Bandy Creek south of town and eventually flows through the monitoring site. The headwaters of Cunneo Tubby Creek originate in the mountains in the northeast portion of the watershed and flow into Cunneo Tubby Lake, a flood control lake maintained by the Latimer County Conservation District. Cunneo Tubby Creek joins the Fourche Maline north of Wilburton.

Other small lakes within this watershed include Lake Wayne Wallace, Lake Carlton, and Coon Creek, which are all located within the boundaries of Robbers Cave State Park north of Wilburton, and Double Falls Lake, also located north of Wilburton.

Major land use practices within the watershed include recreation at Robbers Cave State Park, urban Wilburton, forest management, pasture, and natural gas drilling activities. Logging and natural gas drilling activities have declined significantly in the last 5 to 6 years due to slow economic conditions; however logging activities have begun to rebound recently due to improved timber prices.

Stream Condition & Habitat Overview

A run of Fourche Maline Creek flows south and bends to the east at the monitoring site along Black Loop County Road. Rip-rap had been installed several years ago along the south bank of this bend to stabilize the bank and Black Loop Road. The run ends in a riffle that flows into a deep pool that flows around an old low water dam constructed many decades ago at the site. The pool terminates with a riffle as the creek bends north and east. A series of short runs and riffles follows. The substrate of the pool and runs are predominantly silt and sand while the riffles consist of coarse gravel and cobble. Woody debris and submerged logs are common particularly in the pool area east of the low water dam. The stream banks are moderately stable with a mix of bottomland hardwoods which provide an adequate canopy cover for the creek. Other vegetation consists of grasses, shrubs, and vines which also contribute to stream bank stability. Aquatic plants are abundant in the shallows and along the riffles of the creek which provides cover for a variety of aquatic organisms.

The habitat for this site (starting at the monitoring site and ending 400 meters, ¼ mile, downstream) has been assessed three times beginning in August 2000, then in June 2007, and again in July 2011. Results from these assessments indicate that the habitat conditions have generally remained fairly constant for 2000 (105 points) and 2007 (102.5 points) but a drop in 2011 (75 points); reference sites in the Arkansas Valley ecoregion averaged 103.9 points. During 2011 a severe drought was in progress at the time of that assessment. There was no stream flow with water only present in pools and deeper runs. Streamside vegetation was sparse providing little cover and lowered stream bank stability. Current conditions based on recent monitoring events indicate that the stream habitat conditions have rebounded considerably from 2011.

Biological Conditions

Fish

Fish were collected on the same dates as the habitat assessments in the summers of 2000, 2007, and 2011. Results indicate that the fish population has remained fairly constant for the time period involved, except for a slight decrease in 2011. A total of 24 species were found in 2000, 22 in 2007, and 21 in 2011. The results of the 2011, while slightly lower than the previous two collections, were collected during a severe drought in which there was no streamflow and water present only in pools and deeper runs. Water temperatures at that time were high and dissolved oxygen content was low. The creek received a score of C (73%) for the 2011 drought year and scores of B in 2000 (82%) and 2007 (91%) as compared with reference sites in the Arkansas Valley ecoregion. The lower score in 2011 was mainly due to only 1 intolerant specie (brindled madtom) found, as opposed to 3 intolerant species in the previous collections. The most common species collected included mosquitofish, central stoneroller, spotted bass, and 8 species of sunfish.

Benthic Macroinvertebrates (creek bugs)

Benthic macroinvertebrates have been collected from rocky riffles during summers and winters since 2000. Data from these collections indicate that conditions for Fourche Maline Creek have generally improved over time, until effects of drought started to show up in 2012 and 2013. Collections during summers and winters of 2000 to 2002 consistently graded B and C. Collections from summers and winters of 2009 to 2011 have consistently graded A and B. The number of species and number of sensitive species have remained fairly constant for winter collections from 2000 to 2012 but have increased significantly from summer collections from 2000 to 2013 indicating water quality and/or habitat quality has gotten better.

Chemical Testing

Chemical data for Fourche Maline at Black Loop Road has been, for the most part, collected monthly between 08/08/2001 and 10/24/2013.

DO Dissolved oxygen saturation for the monitoring period has consistently ranged from 50% to 80%; with some low readings ~30% and some high readings of ~110%. This is below the optimum range of 80% to 130% and indicates possible occasional problems with the amount of oxygen available for aquatic life probably attributed to periods of low flow. The monitoring period from 2009 to 2013 indicates an increase in percent oxygen saturation to closer to the optimum range with a median percentage of 76%.

pH pH has consistently been ~7.0, neutral, and in the normal range.

Nitrogen Soluble nitrogen is estimated by adding the ammonia nitrogen, nitrate nitrogen, and nitrite nitrogen. Fourche Maline has little to no detectable available nitrogen during the monitoring period with the exception of a few instances during the 2004-2008 monitoring period. Six data points were above the normal range of 0.8mg/L N with the highest reading of 1.35mg/L N. This could be partially due to agricultural fertilizer application or natural gas drilling activity. No recent problems have been detected.

Phosphorus In 2003 Wilburton wastewater treatment plant updated their system/equipment creating better quality of effluent into Bandy Creek, which flows in to Fourche Maline, and this really helped to decrease the orthophosphorous levels at our site on Fourche Maline. Prior to the plant's upgrades, the average orthophosphorous reading was 0.033mg/L P with many readings above the normal level of 0.05mg/L P. From 2004-2008 there were very few detections of orthophosphorous. From 2004-2013 there was an increase but was only above the normal range three times.

Chloride Chloride has remained consistently at 15-20mg/L Cl during the monitoring period. This is low and constitutes no water quality issues.

Synopsis

Based on the data from habitat assessments, biological community assessments, and water quality monitoring Fourche Maline Creek is a relative healthy stream and is nearly as good as the average high quality streams in the Arkansas Valley ecoregion. Water chemistry parameters indicate water quality to be good to excellent with the exception of occasional low dissolved oxygen levels. Stream habitat is good and supports a healthy and diverse biological community as indicated from fish and benthic aquatic invertebrate collections; however, there is a slight lower population of both sensitive fish and bug species.

The upgrades to the Wiburton waste water treatment plant in 2003 was perhaps part of the reason why both the fish and bug results improved after 2003 and was certainly the reason why the amount of orthophosphates really decreased. Fourche Maline did have a battle with severe drought around 2010-2012 but is hopefully recovering. Major concerns that could impact the health of the stream in the future include the proximity to Black Loop County Road and periodic trash and other problems associated with easy access by the general public. Land use practices by adjacent landowners and the impact on riparian areas could also have a major impact on the stream habitat and resultant stream health.