

Stillwater Creek: S. Sangre Road
SE SE SE
Section 17-19N-2E
Payne County
Lat 36.11808
Long. W 97.10511
WBID OK 620900-04-0700P

Blue Thumb Volunteer Monitoring Data Interpretation – February 2012
Written by Samuel Wallace

Description of Watershed and Monitoring Site

The headwaters of Stillwater Creek originate in north central Oklahoma, just west of interstate 35 and north of state highway 51. The stream flows generally in an eastern direction before it turns southeast just west of Stillwater, OK and eventually runs into the Cimarron River. Along its path, Stillwater Creek runs through Lake Carl Blackwell, the main water source for Oklahoma State University (OSU) and source of many activities including boating, some fishing, and even research purposes. It has also been noted that Lake Carl Blackwell has an unusually high salt content, which may skew the results of Chloride tests downstream. On its way through the city of Stillwater, the stream skirts residential areas, agriculture, and even the OSU botanical gardens, with little to no development immediately alongside the stream banks. The monitoring site for this report is located just north of state highway 51, as Stillwater Creek passes under Sangre Road, downstream of Lake Carl Blackwell and before it passes through most of the city of Stillwater. A portion of Oklahoma States University farms are located just to the northeast of the stream and cattle are present in the pasture immediately southwest of the stream and have been known to venture into the creek bed.

Stream Condition and Habitat Overview

Stillwater Creek scores slightly higher in habitat assessment than the reference average for the Central Great Plains eco-region. The stream scores high with in-stream cover and canopy cover shading, which lead to cooler temperatures and less variation in temperatures, benefiting stream organisms with habitat in the creek. The stream also scores high in channel alteration and streamside cover meaning that the creek channel is stable due to hard clay and the plants along the edge of the creek aid in food source for bugs/fish as well as creek stability and shading. Stillwater Creek scores in the medium category for pool variability, as there are limited differences in the depths of water across the stream. Attributes in the low category include pool bottom substrate, presence of rocky runs or riffles, flow, bank stability, bank vegetation stability, and channel sinuosity. Stillwater Creek at its monitoring site is relatively straight with steep banks with little to no stream bank vegetation. The surface of the creek is generally placid with no runs or riffles, stream flow is fairly slow, and there are no rocks present in the stream to provide additional habitat to bugs.

Biological Conditions

Fish

Stillwater Creek's fish population ranks much lower than the average condition for the Central Great Plains eco-region, with grades of 'D' and 'A' respectively. While the diversity of species in Stillwater Creek was greater than the region's average, no pollution sensitive benthic species or intolerant species were found at the one fish count, taken June 29, 2009. The entire fish population caught this day was tolerant to pollution. During that collection, 256 individual fish were caught, with a majority of those being sunfish species (about 77%). A large number of the fish found at the stream were also insectivores, meaning that they feed primarily on insects. A total of 24 piscivores (feeding on other fish) were found at Stillwater Creek, 23 of which were White Crappie.

Benthic Macroinvertebrates (bugs)

While there are benthic macroinvertebrates present in Stillwater Creek, to date no collections have taken place due to the lack of flow needed for collection of bugs into nets. Therefore, nothing can be said as to the health of the bug population of Stillwater Creek.

Chemical Condition

DO.

The dissolved oxygen content of Stillwater creek displays lower saturation levels in the late summer months and throughout the fall. The average of all records was at 61% oxygen content. In 2009 readings from February to October were all in the cautionary and into the poor condition with the lowest saturation at 4% on September 22, 2009. The readings of early 2010 showed normal saturation levels until the late summer months at which the saturation level declined to the mid-fifties range by October. The last five readings of 2011 from July to November are all within the poor range for oxygen level content. It should be noted that over the past three years of testing seventy-three percent of the readings were in the cautionary to poor range.

pH

The pH ranged from 7.5 to 8.5 with an average of 7.8 and a mode of 8 indicating a slight basic condition.

Soluble Nitrogen (Nitrate, Nitrite and Ammonia combined)

Soluble Nitrogen levels have remained stable/low over the past three years with an average of 0.68 mg/L. Though in 2011 there was an extreme outlier reading of 1.6 mg/L on May 14th along with two subsequently high readings of 0.85 mg/L and 0.98 mg/L in June and August respectively. It is also to note that the July reading was below the average at 0.53 mg/L.

Ammonia

Ammonia levels since November of 2008 have been consistent around 0.1 mg/L to 0.2 mg/L with the exception of the reading on May 14, 2011 with an Ammonia level at 0.8 mg/L.

Phosphorous

Orthophosphate phosphorous levels had an average reading of 0.033 mg/L over the past three years. It is important to note however that there is a large range of readings that fell within the cautionary to poor conditions. In the late summer months of August and September of 2010 the orthophosphate level rose to 0.060 mg/L, 0.067 mg/L respectively. Even of more concern however is that all of the readings since May 14, 2011 have been in the poor condition with the highest level of 0.2 mg/L on June 13th, with a steady decrease to 0.127 mg/L through November.

Chloride

Chloride levels had an average of 35 mg/L with no readily emerging pattern with the seasons.

Synopsis

Stillwater Creek flows east within the Central Great Plains eco-region in north-central Oklahoma, passing through little development other than farmland and rangeland. The stream contains several good attributes including good cover for temperature regulation, streamside cover for food and habitat for stream organisms, and little to no channel alteration, indicating a relatively natural, undisturbed stream. While no pollution sensitive fish species were found in Stillwater Creek, a large number of both individual fish and species of fish were found in the one fish collection. While no bugs could be counted at the creek due to the lack of flow, benthic macroinvertebrates must certainly be present in the stream due to the presence of a large number of insectivorous fish species. Chemical composition of the creek is relatively unremarkable notwithstanding some outliers and regular cautionary and poor orthophosphate and dissolved oxygen readings. Outliers might be associated with pesticides, fertilizers, or cattle excrement entering the stream from adjacent agricultural lands.