Sandy Creek: Propst

SE NW NE
Section 16-14N-9E
Creek County
Water Body Identification # OK520700-03-0040K
Latitude: 35.69508 Longitude: -96.35695
Blue Thumb Volunteer Monitoring Data Review - October 3, 2013
Written by: William DeShazo and Cheryl Cheadle

Description of Watershed and Monitoring Site

Sandy Creek in Creek County, OK just south of the small town of Bristow (mid-way between Oklahoma City and Tulsa) was a monitored Blue Thumb site 2009 through a portion of 2011. The site where monitoring had taken place is on land owned by Nowell Propst, and then his heirs. Land adjacent to the stream at and near the site is primarily grazed by cattle, with some land being hayed. The watershed (20 to 25 square miles in size) is in the Cross Timbers ecoregion. The stream is somewhat entrenched, and basically has a sandy bottom. Sandy Creek is a third order creek and generally flows north to south through grazed/farm land and empties into the Deep Fork River. Bill DeShazo, a long time Bristow resident, said that he has been told that locals used to remove gravel from streams within the Sandy Creek watershed for driveways. This was probably around 50 years ago. Sandy soil has evidently eroded from surrounding land, and very little gravel is visible now, although some point bars and one riffle area have some gravel exposed.

Two mounds are in the area of the stream monitoring site. The mounds might have been constructed by early people. When farming used to take place and the mounds were plowed, local people would come to the fields and find points and other Native American artifacts. Members of the Propst family have collected numerous points from their land and along Sandy Creek. Cotton was a major crop grown in the Bristow area years ago, and there was even a cotton gin in the watershed. While the cotton gin is defunct now, it does exist in the little historic community of Newby. Cattle and wild hogs have access to Sandy Creek.

In the early months of monitoring, stream team members walked across Propst property to a riffle. Later months saw the monitoring take place at another riffle a little closer to the bridge over the stream on West 321st Street South. This was within our 400 meters.

Stream Condition and Habitat Overview

On 7/29/2010 a habitat assessment was conducted on Sandy Creek, starting at the West 321st Street South bridge and going downstream 400 meters. The overall habitat score for Sandy Creek was 69.8 which is less than the average score of high quality creeks in the Cross Timbers ecoregion. Sandy Creek did not have a particularly wide riparian area, but the canopy over the water was very good. Shaded water remains cooler, and this cooler water can hold more dissolved oxygen, a plus for fish and other aquatic life. The good vegetation cover along the banks helps to minimize erosion and filter pollutants. Sandy Creek is fairly sinuous (curvy), which can bring to the plate additional depths and speeds of water. Sandy Creek had a medium score for in-stream cover, meaning places that fish (and other aquatic life) can find homes, hiding places, and something to eat. Woody debris, both large and small, was

somewhat plentiful. There were deep pools, and some smaller pools but the majority of the creek was ankle deep. While banks had reasonable cover, there appeared to be the opportunity for and evidence of erosion of very sandy soil. Some of the banks were raw and practically 90 degrees, an unnatural feature for a Cross Timbers stream.

A few areas where Sandy Creek scored low during the habitat assessment are: pool bottom substrate, channel alteration, presence of rocky runs or riffles, and flow.

Pool bottom substrate consisted primarily of sand and some hard pan clay. The clay areas had knobby holes which add up for decent habitat. Where the pool areas had primarily sand, the sand does not create a pool bottom that is very useful for fish. Sand is not good habitat, and would not have been such a large percent of the substrate before agriculture and other land development reached the watershed.

Due to all this sand, there were lots of newly formed point bars present which indicates *channel alteration* and an unstable streambed.

Rocky runs and riffles were nearly non-existent. The habitat assessment notes that sandy runs were the primary stream flow feature. Rocks of any size, even gravel, were minimal. This stream was primarily sand.

Even though three of eight monitoring episodes took place when the stream was slightly elevated, no summer macroinvertebrate collections were ever made due to low *flow* or no flow conditions. More consistent monthly monitoring would have provided a better look at the stream's flow regime.

Biological Collections

Fish

One fish collection was completed 7/29/2010 for Sandy Creek. A large crew of volunteers helped to make this collection. The fish community for Sandy Creek, as compared to an average of Cross Timbers reference streams, scored a "B". This is in the sense that a student might score an A, B, C, or D on a test, with the "A" being the best score. It is important to note that Sandy Creek conditions were far from optimal during the 2010 drought. The reference streams did not necessarily receive their collections during drought, but did receive them over a series of varying conditions and time.

The fish collected, 813 in all, is a good number of fish. One must draw in a little closer to understand how the fish community scored a "B". Fish that are tolerant to pollution and/or habitat changes made up nearly 90% of the collection. These include red shiners (37%), longear sunfish (32%), bullhead minnows (6%), and mosquito fish (5%), with 9 other species of tolerant fish. The fish that are moderately tolerant to pollution and habitat changes made up nearly 10% of the population, and were sand shiner (5%) along with a few central stonerollers, freckled madtoms, redear sunfish, and spotted bass. There was only 1 intolerant fish, redfin darter, found that made up 0.12% of the total collection. According to Oklahoma Conservation Commission information on Cross Timbers high quality streams, two species of intolerant fish are expected to be found and tolerant species should only be about 70% of the collection. The same amount of species was caught in Sandy Creek as the Cross Timbers reference but there were not many intolerant species found. Sandy Creek had 1 more sunfish species than the reference, so that was good to

see. For fish, Sandy Creek was found to be 82% as good as reference conditions. The volunteers who worked on this stream were very pleased that the fish collection was this good.

Benthic Macroinvertebrates (bugs)

Typically in the northeastern part of Oklahoma, benthic macroinvertebrates are collected in a rocky riffle. Since Sandy Creek was filled with sand, there were no rocky riffles. Woody debris samples were collected. This means that woody debris submerged in the water was scraped so to remove macroinvertebrates from their happy home. Two winter samples were collected, 2009 and 2010. Both collections scored *better* than Cross Timbers reference collections! Due to the low flow, no statements can be made concerning summer collections.

Water Chemistry

Stream monitoring for Sandy Creek in Creek County was sporadic. Eight monitoring episodes took place between 2/12/2009 and 8/30/2011. The stream was visited during high flow, base flow, and no flow conditions. Basic thoughts on the stream chemistry are:

- Dissolved oxygen – Typically oxygen saturation was good (between 80%-130%), but 8/30/2011 was only 30% saturated and the collection was from a pool.
- pH – Consistently good between 7 and 8.
- Available Nitrogen (ammonia, nitrate, nitrite) – Nitrogen was very very low (below 0.8mg/L N) and mostly in the form of ammonia.
- Phosphorous – Only once was orthophosphorous detected, 0.013mg/L P on 12/31/13, and was well below the caution mark of 0.05mg/L P.
- Chloride readings were inconsistent, but Creek County is a place of much historic oil/gas activity. Frequently these kinds of activities lend to higher salts in the water. No chloride readings were so high as to cause concern.
- Secchi disk readings were pretty good, with the greatest being .75 meters, with the disk NOT resting on the bottom of the stream. Both stream team members recall the stream water as being clear most of the time.

Synopsis

Sandy Creek as it flows through the Propst property is a typical looking stream for present-day Creek County. Volunteers who worked this site take pride in that the macroinvertebrate collections were better than reference collections, and the fish collection was good, although not quite as good as reference collections. With so much erosion and cattle access, there was concern for the creek. Currently, stream bank cover at the Propst site is good. There is very likely to still be erosion taking place upstream.

Sandy Creek of years gone by most likely enjoyed a gravel bottom and more runs and rocky riffles. The volunteers wonder if the site could regain something of a natural channel (adding in runs and rocky riffles) if cattle were excluded and riparian areas were protected. When the Creek County Conservation District and the Bristow Field Office of the USDA Natural Resources Conservation Service offers outreach meetings, the volunteers hope to offer additional information on Sandy Creek.