

Little Sandy Creek: Chamber Loop

SW SE SE

Section 28-4N-6E

Pontotoc County

N34.7829722

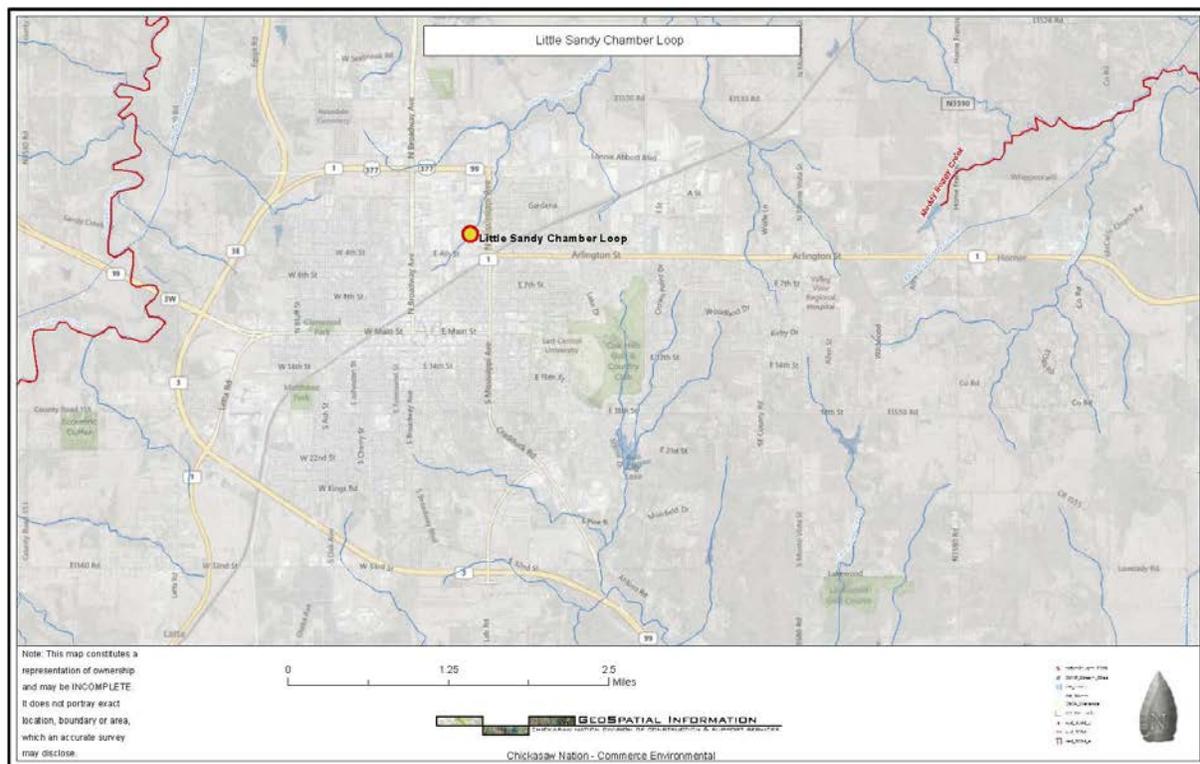
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Blue Thumb Volunteer Monitoring Data Review- October 2013

Written by Chickasaw Nation Staff Ambrie Johnson, Environmental Specialist



Description of Watershed and Monitoring Site:

Little Sandy Creek is located in southeast Oklahoma in the City of Ada. The creek starts in the north part of downtown Ada and flows northeast then makes a big curve to flow northwest and empties into the Canadian River. The monitoring site is in town on the Chickasaw Nation Headquarters campus at the Chamber Loop Street bridge and is very near the headwaters. This monitoring site gets runoff from about a 2 square mile area of a mix of residential and business city life. Little Sandy Creek is in the Cross Timbers ecoregion.

Stream Conditions & Habitat Overview:

The physical habitat of Little Sandy Creek at Chamber Loop Street was assessed on 9/20/2006 and 6/10/2010 for 400 meters starting from the bridge and going downstream. The first half of the 400 meters had been straightened, graded and trees and grasses removed and replaced with concrete rocks for erosion control. In 2006 part of this area was being worked on so the banks were bare dirt, in 2010 these bare banks were covered in either grass or riprap. In both years, the remaining half of the 400 meters was more natural and tree lined creating a shady canopy over the creek to help cool the water. These trees also help protect the banks from eroding, reducing the sediment load into the creek and help to filter out pollution from runoff. Little Sandy in general is a very shallow creek, in 2006 there were a couple of moderately deep pools. In-stream cover such as aquatic vegetation, woody debris and rocks were present in moderation to supply habitat and be a food source for fish and aquatic insects in the end sections of the assessment. There is very little flow and the bottom of the creek is quite sandy making it an unstable habitat for fish to spawn. All of these factors will hamper the development and overall health of the stream. In 2006 the overall habitat score was 61.8 and in 2010 the score increased to 77. The average of high quality streams in the Cross Timbers ecoregion scored 84. From 2006 to 2010 Little Sandy at Chamber Loop considerably increased in in-stream cover and the bottom of the creek was a lot more stable as a lot of the sand had washed away. In 2010 the deeper pools had filled in and were not present anymore. So it was good to see the habitat here increase in 2010 and the score be very close to the reference conditions in this ecoregion.

Biological Conditions:

Fish

Fish were collected on the same dates as the habitat assessments and for the same 400 meter section. Both 2006 and 2010 Little Sandy Chamber Loop collections scored 27%, an "E" grade (the lowest grade), when compared to the Cross Timbers ecoregion high quality streams. Two species were collected (mosquitofish and bullhead catfish) in 2006 and only 1 species (mosquitofish) was collected in 2010. This is really poor when compared to an average of 19 species from high quality streams. Both of these species are tolerant to pollutants and sediment. This collection receives the lowest score of an E due to lack of diversity and no sunfish or minnows nor sensitive species.

Benthic Macroinvertebrates (bugs)

Benthic macroinvertebrates (bugs) live on the stream bottom and on debris found in the creek. They are a link in the aquatic food chain as both a consumer of nutrients and food for fish. Some species are intolerant of pollution or poor water quality and, are indicators of stream condition.

Bugs were collected from rocky riffles at Little Sandy Chamber Loop every winter since 2004 and summer collections in 2004, 2007, 2009, 2010 (there was no flow in other summer years). The streams condition varies from a grade of “B” to “D” (like the normal grading scale in school). The average score for both the winter and summer collections was 27%, “C” grade. When compared to high quality streams in the same ecoregion Little Sandy supports half or less the number of species of macroinvertebrates. Only ¼ of all the collections had 1 sensitive bug species whereas the high quality streams averaged 6 sensitive species. Half of the collections had extremely low population diversity, very unbalanced. At least the bug collections are scoring better than the fish collections, but not by much.

Bacteria Testing:

Bacteria screening are performed to assess the amount of *E. coli* and Fecal Coliform that is in the water. Little Sandy was screened for bacteria during the summer of 2007 and had high amounts of bacteria (> 6,000 CFU/100 ml *E. coli*). People that get into the water should use caution. These types of bacteria are indicators for pathogens that could be harmful to humans.

Chemical Testing:

Chemical data were collected monthly between 11/25/2003 and 5/16/2012.

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| DO | Dissolved oxygen saturation shows when there are problems with the amount of oxygen available in the water for aquatic life. Too little or too much are indicators of problems. Chemical data show Little Sandy Creek mainly in normal levels (80%-130%) with a few readings in the caution level higher and lower than normal. |
| pH | pH is on a scale of 1-14 and measures the concentration of hydrogen ions. Low numbers are acidic, neutral is 7 and high numbers are basic. Little Sandy Creek is in normal range. |
| Nitrogen | Nitrogen is a nutrient and can be an indicator for such cases as fertilizers or pesticides being overused or leaking septic tanks running off into the streams. An estimate of soluble nitrogen is made by adding the amounts of ammonia, nitrate and nitrite nitrogen found in the water. Little Sandy Creek levels of soluble nitrogen are in the cautionary (0.8-1.5mg/L N) to poor (>1.5mg/L N) levels, with 5 high outliers ranging from 5.3mg/L N on 3/26/2010 to >12mg/L N on 6/3/2009. Soluble nitrogen has been increasing over the years; from 2003-2007 the median was 0.8mg/L N and it increased to 1.9mg/L N from 2008-2012. |
| Phosphorus | Little Sandy Creek is mostly in the cautionary level (0.05-1.0mg/L P) for phosphorous with several high outliers, the highest of 0.50mg/L P on 6/3/2009. |

This was also the date of the highest soluble nitrogen reading. Phosphorous can also be an indicator of fertilizer runoff. Further investigation is needed.

Chloride Chloride is the measure of the amount of salts in a creek. Little Sandy Creek is in a normal range for the area with a median value of 41mg/L Cl.

Synopsis:

Little Sandy Creek begins in the City of Ada and flows north eventually ending in the Canadian River. The sampling site at the Chickasaw Nation Headquarters campus has been altered greatly due to the bank stabilization technique where the trees and grasses that filter the water were removed and replaced with large cement rocks. These rocks are effective to hold the bank in place but the natural filters and shading for the water have disappeared. The loss of natural habitat will impact the already poor fish and bug population at Chamber Loop Street but there are signs that the habitat is healing since the habitat score increased in 2010. However, the biological collections are still showing signs of struggle and not improvement. The chemical nutrient levels are in the cautionary range and may indicate runoff from someplace. Further investigation is needed. This level of nutrients is what is supporting a large amount of algal growth here. Little Sandy Creek is a struggling creek in desperate need of some community care to give it a chance to try and heal itself.