Washita National Wildlife Refuge

Washita River-McClure
Legal: Custer SW NW SW Sec26 T14N R20W
Lat: N 35˚39'25.4"
Long: W 99˚18'21.4"
WBID#: OK310840-01-0010M

Blue Thumb Volunteer Monitoring Data Interpretation – February 2012
Written by Levi Feltman

Description of Watershed and Monitoring Site
The headwaters of the Washita River start in Eastern Roberts County, Texas near the town of Miami, Texas. The Washita River is 295 miles long flowing through 2 counties in Texas and 9 counties in Oklahoma before it ends in Lake Texoma in south central Oklahoma. The river meanders through open native prairie and developed farmland. The McClure monitoring site is located in western Oklahoma on the Washita National Wildlife Refuge in Custer County where the town of McClure was located along the river. Due to changing railroad lines and the flood of April 1934 the town has disappeared.

Stream Condition & Habitat Overview

A habitat assessment was performed in September 2004 and June 2009 on the McClure site. The Site received a rating of 41.3 in 2004 and a rating of 74.4 in 2009. The average of high quality streams in the Central Great Plains ecoregion rated 77.6. These assessments are based on a modified version of the EPA Rapid Bioassessment Protocols (RBP) (Plafkin et al., 1989) and use 11 components to score a stream site. In 2004 McClure scored high in 2 factors; canopy cover and streamside cover. In 2009 McClure scored high in 3 factors; canopy cover, flow, and streamside cover. Factors that have room for improvement are as follows, instream cover, bank stability, and bank vegetation stability. By raising these factors stream biodiversity may improve. Some of the scoring factors like pool bottom substrate, and presence of rocky runs or riffles would be hard to increase, since this portion of the Washita River does not typically have those types of habitats. The scores for instream cover and flow drastically increased from the 2004 assessment to the 2009 assessment. Pool bottom substrate also increased but still remains in the low category in the 2009 assessment.

Biological Conditions

Fish
The 2009 McClure site fish sample consisted of only 1 intolerant fish species; suckermouth minnow. Two fish species of intermediate tolerance were found; brook silverside and threadfin shad. Nine different species were represented in the collection. These results give a Shannon's diversity of 1.116 ranking it below the average of high quality at 1.62. The Washita River at McClure also ranks below average in number of sensitive benthic species, sunfish species, and insectivorous cyprinid individuals (minnows that eat bugs).

The September 2004 fish sample consisted of no intolerant species and only 1 intermediate species; walleye. Eleven species were collected and thus the Shannon's diversity was a bit higher than in 2009. In 2004 there was still the lack in sensitive benthic species, sunfish species and insectivorous cyprinid

individuals. The 2009 Sample netted 1 intolerant species, which might relate to the improved habitat conditions that were observed between 2004 (50%) and 2009 (67%).

Benthic Macroinvertabrates (Bugs)
Benthic macroinvertabrates have been collected once in the winter and once in the summer every year since 2004 from woody debris on the McClure site. Over the years winter time collecting has shown an improvement with the rating raising from a B to an A when compared to the high quality streams. The 2004 winter collection scored 80% due to fewer sensitive bugs making up a small population which also decreased the overall diversity. Winter 2005 showed a drastic increase and scored 160%, well above the high quality streams. The collection in 2007 showed a drastic drop in sensitive bugs with only 1 species present resulting in an overall score of 60% for the McClure site. Since 2007 the winter bug collections have scored at or above 100%. Perhaps the low score in 2007 was weather related. Summer collections have held an A for the entire project and many times scored above the high quality streams. The McClure site scores above the high quality streams for the number of different sensitive species and for their population of the entire sample.

Chemical Condition
The Washita River at McClure has been tested once a month almost every month since July 2, 2003.

Dissolved Oxygen:
The oxygen saturation at the McClure site averages 78.5% for the project which is just in the caution range on the low end of the scale. It can swing greatly from month to month depending on temperature and flow conditions. The lowest recorded oxygen saturation was in November 2007 at 20% saturation. This extremely low number might be attributed to low flow in the river.

pH:
The pH for the McClure site has ranged between 7.5 and 8.3. This is well within the normal pH found in this ecoregion.

Soluble Nitrogen (Nitrate, Nitrite and Ammonia combined):
The amount of estimated soluble nitrogen in the McClure site averages 0.68 mg/L N, which is in the normal range, with a peak of 6.30 mg/L N in July 2011. This rise could be attributed to upstream sources but a direct source would be hard to confirm. There were 11 other readings above the normal range for soluble nitrogen.

Orthophosphate Phosphorous:
The average reading for phosphorous at the McClure site is 0.033 mg/L P which is well within the normal range for this streams location. There have been high levels of phosphorous detected at the site. Most often these peaks are found in the spring/early summer and fall. These peaks could be related to agriculture practices like fertilizing crops. The highest reading was 1.53 mg/L P in November 2004 and June 2005.

Chloride:
The chloride levels at the McClure site range between 15 mg/L Cl and 75 mg/L Cl. The highest readings are in the winter and may be caused from road treatments. However no distinct pattern has been detected.

Synopsis:

The Washita River runs northwest to southeast across the Eastern Texas panhandle to south central Oklahoma and drains a wide array of landscape. Canopy cover varies from open to very covered and fast flowing to slow flowing depending on rainfall. This wide array of habitat types and weather extremes can cause a wide change in factors from season to season. With improved riparian/river bank protection along the Washita River the amount of siltation and nutrient loading could be reduced, allowing for a wider array of fish and benthic macroinvertabrates to inhabit it. These changes could result in raising its final assessment score and ultimately a healthier more productive water course.