Deep Fork River: Hwy 56

NW SW SE
Section 10-13N-12E
Okmulgee County
Latitude N 35° 36' 47.6"
Longitude W 96° 01' 25.7"
WBID#: OK 520700-02-0010R

Blue Thumb Volunteer Monitoring Data Review – October 2007
Written by: Roger Wyrick & Tony Cheatwood

Description of Watershed and Monitoring Site:

The Deep Fork River headwaters originate in central Oklahoma City and it flows generally east into Lake Eufaula where it joins with the North Canadian River to flow further south, eventually ending in the Gulf of Mexico. The Deep Fork River passes through Lake Arcadia and several small Lincoln County communities, including Wellston, south of Chandler and north of Sparks, and continuing east through rural Creek County where you will find several Deep Fork Wildlife Management Areas. From Creek County it travels along the northeast edge of Okfuskee County, again through Deep Fork Wildlife Management Areas. The river passes into Okmulgee County just west of Nuyaka into the Okmulgee Wildlife Management Area. The Highway 56 monitoring site is here. Below the site, the Deep Fork River passes south of Okmulgee, crosses Highway 75 north of Schulter, still passing through the Deep Fork National Wildlife Refuge, continuing on to Lake Eufaula.

The Deep Fork River watershed above the site consists of several thousand square miles of land in both the Northern Cross Timbers and the Central Irregular Plains ecoregions of Oklahoma. The monitoring site is located where Highway 56 crosses the Deep Fork River in Okmulgee County.

Stream Condition & Habitat Overview
Monitoring sites are assessed and compared to reference streams of known high quality within the same ecoregion and the Deep Fork River is among the higher ranking streams with a score of 87.8. The site has steep banks and is covered in vegetation that includes trees, grasses and woody shrubs that help with the control of erosion. There are a few rocky riffles and runs at the monitoring site where the water samples are taken. Within the 400 meter reach of the habitat assessment and fish collection the in-stream cover, channel alteration, bank stability and streamside cover were all good. These indicate the aquatic, as well as the terrestrial, inhabitants are provided good cover and a good food source. The substrate in the bottom of the pools appeared to be rather sandy and somewhat unstable and the pool variability between deep and shallow pools was weighted to deep pools. Canopy cover to help shade the pools is somewhat lacking because of the width of the water. The channel in this part of the Deep Fork River is

quite straight with no major bends and the river is mostly pooled with few rocky runs and riffles. The amount of flow was low due to the lack of rainfall during the year.

Biological Conditions

Fish

Fish were collected from the Deep Fork River on August 11, 2006 and the collection was 82% of the average high quality reference site for the ecoregion. The water was well over 2 meters deep for much of the 400 meter reach so seining was quite difficult and this collection did not account for all of the species present in the river.

Of the 346 total fish seined 18 species were identified with intolerant, intermediate and tolerant species. Having the intolerant species in the mix says a lot about the stream and its health. The fish that were collected include: gizzard shad; red, ghost, and golden shiners; flathead and channel catfish; sucker-mouth and bullhead minnows; smallmouth buffalo; freckled madtom; mosquitofish; orangespotted, bluegill, longear and redear sunfish; white crappie; slenderhead darter and freshwater drum. The presence of the darter and the madtom help indicate the quality of the benthic (below the surface) habitat since both of these species are intolerant of increased silt and low oxygen. To find these fish means that the river is healthy.

Benthic Macroinvertebrates (bugs)

The number of taxa found in the river during the winter and summer collection dates of 2004 through 2006 were above average except for the drought period of late 2005 and early 2006 when the flow was low and the temperatures extreme. The percentage of the sensitive Ephemeroptera, Plecoptera, and Trichoptera, (EPT) was well above what was found in the average high quality stream for most of the collection periods. The EPT is determined by the amount and diversity of mayflies, stoneflies and caddisflies respectively. With condition scores of A's and B's for the stream it fell well within limits (sometimes above) as compared to the Cross Timbers reference sites. The benthic macroinvertebrates in the Deep Fork River were comparable to the best situation expected within the ecoregion.

Bacteria Testing

The few tests that we were able to conduct on the river for *E. coli* resulted in more than 300 colonies in 5 ml of water so they were reported as Too Numerous To Count (TNTC). Since bacteria are usually reported as colony forming units in 100 ml of water (CFUs/100 ml), we know that the samples from the Deep Fork River contained more than 6000 CFUs/100 ml.

Chemical Testing

Chemical data were collected monthly between 12/11/2003 and 04/27/2007.

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 the median oxygen level is 91% of saturation for the test period; well within the normal range. Of course during times of low flow and extreme temperatures the DO levels would be down somewhat but the overall result is good.

pH — pH results were normal in the 7 – 8 range consistently.

Nitrogen — An estimate of soluble nitrogen is made by adding the amounts of ammonia-nitrogen and nitrate/nitrite-nitrogen found in the water. Levels of soluble nitrogen were always within the normal range with the median result below the detection levels of the tests.

Phosphorus — Phosphorus is another nutrient found in streams and rivers that can cause excessive algal growth. The Deep Fork River site had a normal amount of phosphorus with a median of 0.05 mg/L P.

Chloride — ***SALT!*** Chloride is not something you want to find in abundance in fresh water body but sometimes the levels can reach extreme levels during winter months when the roads are salted for ice. It can also be abnormal during oil drilling explorations when saltwater is allowed to spill out onto the landscape and runoff gets to the water body. The Deep Fork site had a few times that the amount of chloride exceeded the benchmark and that was mostly during the winter months when cities upstream spread salt and sand for the ice problems on the roads. Most of the time the chloride levels were tolerable.

Synopsis

The health of a river is determined by the physical habitat, the water chemistry and the biological community that lives in it. The habitat of the Deep Fork River at Highway 56 is better than the average habitat of known high quality streams in the Cross Timbers ecoregion. The field screening chemistry indicates very low levels of nutrients and an occasional spike of chloride associated with salting icy streets and roads upstream. The amount of oxygen in the water is excellent. The biological community in the river is excellent. The fish collection was not quite as good as expected, but the challenges of the deep water and using only seining meant that there were species seen that were not collected. The benthic macroinvertebrate collections are as good or better than the average high quality site in the ecoregion. The Deep Fork River at Highway 56 is a healthy river.

The volunteers that work to monitor the Deep Fork River at Highway 56 also work for the **Okmulgee & Dripping Springs State Parks** and are concerned about the quality of water in the watershed, both in the river and at the lakes that are under our care. We found that the river is actually in a much better condition than we first thought it would be when we took over the monitoring of this site. We attempt to monitor on a regular basis but the river is somewhat unpredictable in the spring and summer during high rainfall times. Thorough continued efforts by the volunteers and Oklahoma Conservation Commission Blue Thumb offices the river should prove to be a viable asset to the state of Oklahoma for years to come. If we continue to keep the public informed as to the state of the river and what they can do to help with situations that arise from neglect or environmental spills, then hopefully future generations can enjoy our water for years to come.