Deep Fork River: Britton Rd.

By: Mary Jones

NE NE NE
Section 31-13N-2W
Oklahoma County
N 35.56572°; W 97.44539°
WBID #: OK520710-02-0060R

Deep Fork River is located in Central Oklahoma and flows northeast from Oklahoma City into Lake Arcadia. It drains about 30 square miles with the headwaters in the part of Oklahoma City called Nichols Hills. The land draining to this site is mostly urban which means it is draining city businesses, homes, streets, and yards. Deep Fork is in the Cross Timbers ecoregion which runs from Southeastern Kansas across Central Oklahoma to Central Texas.

The habitat in the Deep Fork River was evaluated by wading through the water for 400 meters and measuring a variety of parameters. It has a fairly even mix of deep and shallow pools with depths from ankle to waist deep. There is a moderate amount of things like submerged logs, cobbles and boulders that provide places for aquatic animals to hide behind, within, or under. The banks of the Deep Fork are eroding in places and while the river's flow was not very swift the day of the assessment, during a storm it floods quickly because of all of the streets draining into it. The bottom has a lot of soft and shifting sand. This part of the river is straight and has very little shade. The total habitat score for the Deep Fork River was 56.4. That compares with a score of 84.0 for the average high quality stream in the Cross Timbers ecoregion.

On July 23, 2008, fish were collected from the Deep Fork River by seining (pulling a net) through the same 400 meters where the habitat was assessed. A total of 601 fish were collected from 11 different species. Eighty-four percent of them were fish tolerant of poor habitat and water quality; no intolerant fish were collected. More than half of the fish collected (342) were red shiners, and there were 110 longear sunfish. Both of these fish are tolerant to pollution and changes to habitat. Some of the other fish include channel catfish, white bass, bluegill sunfish, largemouth bass and white crappie. This site was missing the sensitive species that live on the bottom of the river. This indicates that there is increasing sedimentation and probably not enough oxygen for these weak swimmers that don't travel up or down stream very well. In comparison, a high quality stream should have 19 species , 4 sensitive species that live on the bottom and 2 intolerant species. When graded, the stream received 55% (D) out of 100% (A).

Benthic macroinvertebrates (bugs) are aquatic organisms without a backbone. They were collected from three, one meter squared kicknet samples in areas of rocky riffle. The sample was preserved in alcohol, sub-sampled and sent to a professional taxonomist for identification. When compared with the high quality streams in the ecoregion, the winter

collections have fewer species and have only one taxon of the most sensitive species making up about 5% of the total, while the average high quality stream has 5 sensitive taxa representing almost 40% of the total individuals. The winter collections scored a B in 2007 and a C in 2008. The summer collection from 2008 had only 9 species represented; two of them were sensitive and made up 4% of the individuals. In a high quality stream you would expect to find 20 species; 7 of them sensitive and making up 34% of the individuals. The summer 2008 collection scored a C.

The macroinvertebrate collections from Deep Fork River at Britton Road show that aquatic animals are having trouble; most of the species sensitive to pollution and habitat loss are gone.

Water chemistry has been tested from this site using field screening techniques since the summer of 2006. Oxygen saturation is usually in the normal range, though it dropped to dangerous levels (as low as 35% saturation on 12/8/2008) in the spring of 2008 and the winter of 2008-2009. The pH has always been normal. The median value for chloride is 110 mg/L Cl and is consistent with other streams in this part of the state with the exception that occasionally during winter storm events the chloride levels spike to around 400 mg/L when the streets and highways of Oklahoma City have been de-iced. The nutrients, nitrogen and phosphorus, are consistently high. It is not clear what is causing this problem. An urban area could have fertilizer runoff, pet waste washed or dumped into storm drains, malfunctioning septic systems, or other unknown sources.

The water chemistry does indicate that the Deep Fork River is definitely draining an urban area. The high nutrients can cause algae growth, which in turn can cause low levels of dissolved oxygen.

During the summers of 2006 to 2009 the bacteria was tested in the Deep Fork River and *E. coli* was detected in very high amounts. On May 3, 2008, it was greater than 10,000 colony forming units per 100 mL of stream water. It was never once at a level considered safe for swimming. *E. coli* is one of the fecal coliforms that come from the intestines of warm blooded animals which could include horses, cows, ducks, geese, beavers, deer, humans, dogs, or cats.

A healthy stream must have good physical habitat, good water chemistry and the aquatic life that should be there. Habitat in the Deep Fork River is not as good as it could be. There are a good variety of deep and shallow pools, but the bottom of the river is soft and shifting dirt coming from bank erosion and urban effects like construction. There is not much shade to help keep the water cool and the water level rises quickly during storm events because of runoff from the urban area. Water chemistry shows a stream that is in trouble. Oxygen saturation is low and nutrients are high. High nutrients can cause excess algae growth which can lower the amount of oxygen in the water. The source for the nutrients is unclear, but an urban area can have fertilizer, pet waste, sewer leaks or leaky septic systems. The fish and bugs also tell us that this stream is in trouble; most of the species sensitive to habitat and water chemistry are missing. The shifting dirt on the bottom of the stream and the high nutrient levels could be causing this problem. The

bacteria levels are high and could indicate the problem could be pet waste, sewer leaks or leaky septic systems.

The Deep Fork River is a river with a few problems that can be fixed to make the stream healthier. There should be an education effort in the area that drains to this site to teach citizens the importance of picking up pet waste, proper fertilization, sewer and septic system maintenance. If they knew what really lives in the water, they would start to care.