

Bluff Creek: NW 150th Data Report

SE SW SW

Section 2-13N-4W

Oklahoma County

Lat N 35° 37' 25.7"

Long W 97° 35' 58.2"

WBID OK 620910-04-0140G

Blue Thumb Volunteer Monitoring Data Review - December 13, 2006

Description of Watershed and Monitoring Site:

The headwaters of Bluff Creek start on the north side of Lake Overholser and flow through an open area to the west of the mid-sized Wiley Post Airport. Bluff Creek dips south prior to turning due north approximately one-quarter mile west of Lake Hefner. It runs for about three miles through a dense upscale residential community, then turns northeast for about three-quarters of a mile through open country turning north again to run along the east side of Martin Park Nature Center. Bluff Creek continues north through open country until a quarter of a mile before the monitoring site where a housing development has been built on the east side of the creek about a hundred feet from the creek bank. There is another housing development being built approximately a quarter mile to the west on the south side of 150th Street. Bluff Creek continues north of 150th Street through ranchland turning abruptly west within sight of the 150th Street Bridge. Bluff Creek flows into Deer Creek about 3 miles north of the monitoring site.

Stream Condition & Habitat Overview

The habitat assessment at Bluff Creek scores better than the average of high quality reference streams in the Central Great Plains ecoregion in terms of flow, variable water depths, the stability of the banks, canopy cover overhead and grassy cover along the banks. However, there is some room for improvement which will aid the biological diversity of the stream. For example, although the banks show a high degree of stability there is not a lot of vegetation. Additionally there are limited places in the stream for fish to nest or find cover such as rocks and submerged branches and there is an unstable bottom with deposition of sediment.

Biological Conditions

Fish

Using the average of high quality reference streams in this ecoregion as the benchmark, Bluff Creek ranks slightly below the average with decreased fish species richness, especially the intolerant species. Although there is a range of fish species represented in 2004, including six species of sunfish, the majority (82%) fall toward the tolerant end of the scale. Only one intolerant species was found, the suckermouth minnow, and four species with intermediate tolerance were found (central stoneroller, sand shiner, brook

silverside, and logperch.) The presence of only one darter, the logperch, indicates increasing siltation. A full 56% of the most recent sample, collected 9/17/2004, are fish which feed on insects ranging from the most to the least tolerant with a few predator species also in residence.

When compared with a fish collection at the same site from 9/21/1998, the summer 2004 collection receives the same metric score, rating Bluff Creek 83% as good as the average high quality collection in this ecoregion. In 2004 the total number of species increased, the number of sensitive benthic species increased, the number of sunfish species increased, the number of species required to make up 75% of the sample increased and the total number of fish collected increased. However, the number of tolerant individuals also increased and the proportion of insectivorous cyprinid individuals decreased. Insectivorous cyprinids are the dominant minnows in North American streams are replaced by either omnivorous or herbivorous minnows as the quality of the food base deteriorates. These last two numbers may indicate that the density of aquatic invertebrates is decreasing and the quality of the food base is deteriorating.

Benthic Macroinvertebrates (bugs)

Benthic macroinvertebrates have been collected from Bluff Creek in both summers and winters since 1998. Over the years the summer collections have shown decreasing quality with an average of the last five years of 43% of the “reference” sites. The winter collections from Bluff Creek are consistently better than reference conditions. Although there is a fairly high degree of diversity with insects of the more tolerant species, Bluff Creek lacks those intolerant species which need to be present for it to be considered a high quality stream. Bluff Creek is missing the most sensitive species possibly due to the conformation of the creek bed or chemical runoff. Since the winter collections are better than the summer collections, it could be that people in the urban areas in the watershed are using chemicals during the growing season that are running into Bluff Creek.

Chemical Condition

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| DO | The oxygen saturation level generally follows the summer/winter undulation with few dips into the caution range. The percent oxygen saturation was below 80% nine times of 36 times the water was tested since August, 2001. The lowest value was 70% on 1/5/2003 and again on 11/6/2005. |
| pH | Ranging between 7.00 and 8.00, all of the data are well within normal values. |
| Nitrate | Since 2001, nitrate nitrogen was 0.8 mg/L on 8/4/2002. Otherwise, it has been unremarkable. |
| Ammonia | Only since May of 2005 has an ammonia nitrogen reading been detectable at all, and then at very low levels. |

- Phosphorus Although there is quite a range of readings, a closer examination of data reveals a pattern which generally follows the spring/summer/fall/winter growing season. This pattern becomes even more apparent when paired with the nitrate readings leading one to speculate that fertilizer and pesticides may be registering in the testing. For example, on 8/4/2002 the orthophosphate phosphorus was 0.15 mg/L and the nitrate nitrogen was 0.8 mg/L. Orthophosphate phosphorus readings were 0.1 mg/L or above twelve times of the 36 times the water was tested and all of those are clustered in the late spring and summer months.
- Chloride The chloride readings range between 50 mg/L and 160 mg/L. The highest readings are in the winter months indicating that salt from the roads treated during winter storms may be the cause of elevated readings. However, no pattern can be easily detected in the chloride levels.

Synopsis

Bluff Creek runs north out of Oklahoma City and the watershed drains some very affluent neighborhoods. It is a picturesque stream with large, overhanging trees and reddish, slowly moving water which runs through several densely populated areas as well as large fields of open country. Although Bluff Creek does not completely measure up to the reference streams in this ecoregion and there are some specific matters which could be addressed, overall, the stream falls well within satisfactory parameters. The physical habitat of Bluff Creek is better than the average high quality stream in the Central Great Plains ecoregion, though there is sediment deposition on the bottom of the creek. The fish collections indicate a stream that is pretty healthy, but is losing some of the most intolerant species. Benthic macroinvertebrate collections from the summer season show a loss of most intolerant forms, though winter collections are comparable to the best situation expected within the ecoregion. Water chemistry is about what would be expected from an urban area. It appears that during the growing season Bluff Creek may be getting some additional nutrients, and perhaps also pesticides, from urban lawns. These chemicals might explain the loss of sensitive bugs during the summer season. Protecting the existing riparian area and plantings on the banks of the stream and control of the runoff by local residents might improve the final score in the future.