

West Cache Creek: Boulder Picnic Area

SE NE SW
Section 28-3N-14W
Comanche County
Lat N 34° 42' 0.1"
Long W 98° 40' 39.6"
WBID OK311310-02-0140T

Blue Thumb Volunteer Monitoring Data Review - December 13, 2006

Description of Watershed and Monitoring Site:

Starting in the Wichita Mountains National Wildlife Refuge from Comanche Lake and Kiowa Lake (in the Special Use Area), flowing south into the public use area under highway 49 just north of the Refuge Headquarters, West Cache Creek travels through rural wildlife area to the monitoring site at Boulder Picnic Area. From there it continues its southeast flow through the refuge, through Ft. Sill's Quanah Range, through the small town of Cache, and then more rural land to eventually meet with the Red River. The monitored site is located in the Central Great Plains ecoregion of Oklahoma, but is considered to be a subset because the streams have courser substrates, higher gradients, and less turbidity than elsewhere in the area (resulting in a distinctive group of fish species including the logperch, Oklahoma's largest darter.)

Stream Condition & Habitat Overview

This part of the state has been in drought conditions for several years and the site on West Cache Creek consisted of one large pool for the entire 400 m of habitat assessment. Even with no flow and no rocky runs or riffles, this stream had better habitat than the average high quality stream in the Central Great Plains ecoregion. There was plenty of stable instream cover (rocks and woody debris) and the banks are covered with vegetation alternating with bare rock. There is not much canopy cover because the creek is so wide in this reach that though the edges are shaded, the middle of the stream gets direct sun most of the day.

Biological Conditions

Fish

A fish collection on 9/27/2005 yielded many fish (708) but few species (7). The collection was missing sensitive benthic species (like darters), intolerant species, and insectivorous minnows. There were six different sunfish species: green sunfish, warmouth sunfish, bluegill sunfish, longear sunfish, redear sunfish, and largemouth bass. This is partially due to the difficulty of seining in rocks and woody debris in clear water and partially due to the fact that there was only one habitat – a pool. The missing species dropped the metric score for West Cache Creek to 50% of reference conditions.

Benthic Macroinvertebrates (bugs)

Because of the drought and the fact that macroinvertebrates must be collected in flowing water, they have been collected only twice from West Cache Creek. The summer 2003 collection was made from streamside vegetation. The winter 2005 collection was made from a rocky riffle. In both cases, the collections are comparable to the best situation expected within the Central Great Plains ecoregion.

Chemical Testing

Oxygen Dissolved oxygen saturation changes with the temperature of the water. By looking at the percent saturation, we can see when there are problems with the amount of oxygen available in the water for aquatic life. Too little oxygen can cause aquatic animals to die. Too much oxygen is an indicator that there are wide swings in the amount of oxygen available during a 24 hour period. Generally the oxygen saturation level in West Cache Creek is good. It follows the natural summer/winter undulation, yet several readings (listed below) are lower than ideal. Drought conditions alter water depth and flow, contributing to the low readings.

10/29/2003	64%
11/25/2003	73%
1/27/2004	79%
9/29/2004	35%
7/27/2005	140%
10/26/2005	70%
12/1/2005	54%
12/28/2005	55%
1/26/2005	70%
2/23/2006	67%

pH pH in the state of Oklahoma is normally between 6.5 and 9. All the readings are within that range with no drastic surges. Two readings are at the top end of that range (9.0) and one falls at the bottom (6.75). Others fall within the mid range.

Nitrogen An estimate of soluble nitrogen is made by adding the amounts of ammonia nitrogen and nitrate/nitrite nitrogen found in the water. Ideally nitrogen should be below 0.08 mg/L. Only one reading (11/25/03) is above 1.5 mg/L N, but no conclusions can be drawn from it.

11/25/2003	4.0 mg/L N
1/27/2004	0.10 mg/L N
2/23/2005	0.20 mg/L N
8/22/2005	0.20 mg/L N
9/29/2005	0.20 mg/L N
12/1/2005	0.20 mg/L N
12/28/2005	0.20 mg/L N

- Ammonia Twice in the latter part of the reviewed data have readings been above the detection level of our test. These readings are well within an acceptable range, but it would be interesting to follow up and see where the readings went from there.
- Phosphorus Orthophosphate phosphorus levels are all very low.
- Chloride There are very low amount of chloride. The readings are well within the acceptable range.

Synopsis

West Cache Creek flows through predominately rural areas. Much of the watershed is in federal government land that is protected from population growth or habitat alteration. The remainder of the watershed is rural. The habitat is excellent. The fish collection is missing several species, but they are not often found in pooled areas. The benthic macroinvertebrate collections indicate West Cache Creek is comparable to the best situation expected in the Central Great Plains ecoregion. Drought conditions the last few years have had effects on flow and vegetation, but overall the stream appears to be healthy.