

Bandy Creek: Pleasant Hill Road

Center of E line of NE Section 16-5N-19E
Latimer County, Oklahoma
Latitude N 34° 54' 30.3''
Longitude W 95° 17' 46.7''
WBID#: OK 220100-04-0080G

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Written by: *Allen Davis*

Statistics based off of surveys taken between 2000 and 2009.

Throughout this paper, I will be comparing Bandy Creek to nine other creeks monitored by Blue Thumb volunteers and known high quality reference conditions in the Arkansas Valley Ecoregion.

Bandy Creek's Relative Location

Bandy Creek is located just south of Wilburton in southeastern Oklahoma. Wilburton is approximately fifteen miles south of Quinton, fifteen miles west of Red Oak, thirty miles east of McAlester, and about thirty miles north of Clayton.

Wilburton is a small community, having a population of just fewer than three thousand people. Wilburton gets its drinking water supply from Lloyd Church Lake located about three and a half miles upstream from the monitoring site. The waste from Wilburton gets dumped back into Bandy Creek after it has been treated, also upstream from the site. Downstream from the site, the creek runs into Fourche Maline Creek, eventually draining into Wister Lake.

Bandy Creek Habitat Overview

The habitat at Bandy Creek appears to be deteriorating. The overall score for the habitat was a 94 in 2002 and has dropped to an 86 in 2007. This means that we are doing something to the water system, which is harming it. Most of the land that surrounds the creek is pasture land that is used for cattle grazing. The banks of the stream at the site are stable and are covered with a mixture of grasses, forbs, shrubs, vines, saplings and large trees. This vegetation plays an important role in the stability of the creek by keeping the banks from contributing sediment and providing food sources and shade. This vegetation also provides a place for wildlife along the banks. The creek is good for fishing with a variety of deep and shallow parts in the creek providing different kinds of habitat for different species.

Bandy Creek does not meander in this area. The bottom of the creek has some soft sediment and there are point bars and islands developing. This shows that there is some erosion upstream from the site.

Overall the creek got a habitat rating of 86 compared to a 103 in the high quality reference conditions. So, the creek is not the best, but based on what you have read you can infer that it has an average habitat.

Bandy Creek's Fish

In June of 2007, sixteen different species of fish were collected, compared to the 25 that were collected from Arkansas Valley Ecoregion high quality sites. The total number of fish that were collected was 231 at Bandy Creek and 347 for the Arkansas Valley Ecoregion reference conditions.

The following shows the type of fish, the number that were caught and kept, and the number that were released back into the stream.

Central stoneroller: kept 2
Common carp: released 2 (photo)
Redfin shiner: kept 1
Suckermouth minnow: released 5
Yellow bullhead catfish: kept 1, released 2
Channel catfish: kept 1
Mosquitofish: kept 1, released 6
Brook silverside: kept 1
Green sunfish: kept 1
Warmouth sunfish: kept 1, released 2
Orangespotted sunfish: kept 5, released 144
Bluegill sunfish: kept 1, released 44
Longear sunfish: kept 1, released 2
Redear sunfish: kept 1
Largemouth bass: kept 1, released 4
White crappie: kept 1
Hybrid sunfish: kept 1

There are a total of nine different species of sunfish in Bandy Creek, which is excellent. Normally five different species of sunfish in a given creek make it a good creek. The average Arkansas Valley Ecoregion high quality stream has six different species of sunfish. Although this creek may have a high number of different species of sunfish, the number of benthic (bottom dwelling fish) is extremely low, as well as the number of intolerant (sensitive to the environment) fish species.

A fish collection from 2002 received an overall grade of 73% (a C.) That score had dropped down to a 55% (a D) by 2007. These scores represent grading on a curve against the Arkansas Valley Ecoregion high quality reference streams which got a 100% (an A.)

Benthic Macroinvertebrates

Benthic Macroinvertebrates are the things that live on the bottom of the stream, are large enough to see with the naked eye and have no backbone. We call them bottom dwelling bugs and creatures. They are important to have because they let you know what kind of condition your water system is in. If you have a low number of creatures living in the water or all of them are very tolerant, then that means that there is something going wrong with the health of the stream.

In the winters of 2000-2007, we made bug collections in Bandy Creek to look at stream health. The results showed that over that seven year period, we were able to collect between 10 and 16 different species of bugs with one or two sensitive species each collection. The average was 13 different species collected per year. The average for Arkansas Valley Ecoregion was 17 species with eight sensitive species. When you compare that to Bandy Creek, it shows that Bandy Creek receives a grade of C.

Bugs were also collected in the summers between 2000 and 2007 with similar results. The best collections are only 43% as good as the Arkansas Valley Ecoregion reference conditions and received a grade of C.

The reason that this is important to us is that the fewer intolerant species there are, the better the indication that the stream is not healthy. These bugs are important because they are basic components of the “animal food chain” and things that affect them will ultimately affect us.

Chemistry Testing

Chemical testing is looking at the creek’s chemical balance. The reason that this is important is that if the creek has a chemical imbalance, it can mean that the creek is not safe for fish or animals or even for humans. It can also give us hints about why there may be problems.

One of the first tests is the Oxygen Saturation test. This test shows the oxygen levels in the water and is then compared to other creeks around the area. This creek is compared to nine other creeks.

The oxygen saturation levels are usually in the 40%-60% range. The median value is 55%. These numbers are very low, and the lower that the numbers are the more likely you are to be having fish dying from low oxygen levels. This can be caused from low water flow, or even from algae. This particular creek is among the lowest on the chart. Most other creeks in the area average around 85%-100% oxygen levels in the water. The normal level of oxygen saturation should be above 80%.

Next is testing for pH levels in the water. pH ranges from 0-14. The lower the number, the more acidic it is. The higher the number the more alkaline it is. A pH of 7 is neutral.

In Oklahoma the normal pH value is between 6 and 9. Bandy Creek averaged around a 7.0-7.5 which is normal and not at all bad.

Third, *Soluble Nitrogen and Orthophosphate Phosphorus* measure nutrients in the water. Nutrients can come from fertilizer, manure that comes from animals, or human waste. The problem with nutrients is that the more of it that you have in the water, the more algae that you will have. And the problem with algae is that it can cause very low oxygen saturation in the water. The soluble nitrogen in Bandy Creek is in the caution zone with a median value of 1.075 mg/L. With levels in the caution zone, we should be worried about algae and its potential effects on the water. While the orthophosphate phosphorus was often high enough to qualify as poor, the median value was 0.035 mg/L, still normal.

Compared to other volunteer monitored creeks in the ecoregion, Bandy Creek is one of the worst.

Next is *Chloride testing*. The testing for chloride in Bandy Creek showed that the levels were very low. Compared with the nine other sites it is in the same range.

Bacteria Testing

Bacteria testing is the testing of whether or not certain bodies of water are safe for humans to swim in. The test mainly consists of testing for *E. coli* levels in the water. *E. coli* are a type of bacteria that actually help you by living in your stomach and aiding in digesting food properly. The problem with *E. coli* in the water is that there are different types of *E. coli*, and certain ones can make you sick. They are also indicators that other pathogens may be in the water.

Bacteria are tested in the months of May through September since people are most likely to be in the water in the summer. The tests at Bandy Creek show that *E. coli* levels in the water have been below 400 colony forming units per 100 ml of water since June 2007. This means that it is safe to swim in or be around Bandy Creek.

Conclusion

Data shows that Bandy Creek has been having problems and is not a healthy creek. The creek has had a sewage plant dumping effluent into it for years causing high nutrients. The effluent and animal manure runoff has been affecting the algae population. This in turn affects the oxygen levels in the water, which ultimately affects the fish population and bug population of the water.

The fish population of Bandy Creek is low and the number of intolerant species of fish is near zero. The number of bugs is also low, as well as the number of sensitive bugs. The chemistry of the water indicates high levels of nutrients and low amounts of oxygen saturation. The *E. coli* levels are low.

From everything that you have just read, you should have figured that this is a creek that has to have some big improvements made in order to become the “model creek”. There have been some improvements; like the sewage treatment plant being upgraded and people trying not to pollute as much.

Bandy Creek can be a nice, healthy creek, but it needs the people to think of it as a creek and not as a sewage ditch.