

Bluff Creek: Battiest

NW SW SW

Section 19-1S-23E

McCurtain County

N 34° 26' 56.9'' (34.4491388)

W94° 56' 24.6'' (-94.9401666)

WBID#: OK410210-09-0160K

Blue Thumb Volunteer Monitoring Data Review February 3, 2009

Written by Dennis Wilson

Description of Watershed

Bluff Creek: Battiest is located in northwestern McCurtain County in the extreme southeast corner of Oklahoma. The eight square mile watershed is located in the forested low mountains and hills of the western Ouachitas approximately 4 miles northwest of Battiest, Oklahoma. The stream runs from east to west before joining the West Fork of the Glover River. The immediate watershed area is riparian timber in commercial loblolly pine timberland. The area had historically been oak-hickory-pine forest largely underlain by sandstone and shale formed in the Paleozoic age. This humid ecosystem has rainfall that averages 48-55 inches per year. Logging and recreation are the main land uses. This stream has gravel, cobble, boulder, and bedrock substrates with a fairly steep stream gradient.

Stream Condition

The monitoring site on Bluff Creek is a research site installed by Oklahoma State University Department of Forestry as a comparison of mini watersheds and watershed dynamics with forestry practices on lands owned by the Weyerhaeuser Company. There is an overhead bridge and a flow platform installed at the site. There are step runs, runs, and riffles above the pool which is the sample site.

Habitat Assessment

Fish and habitat assessment was done on 6/11/2007. The total score for the habitat assessment is 102.7 which compares favorably with the 118.8 obtained from the Ouachita Mountains reference. The stream order is 2. High ratings were given for pool bottom substrate, bank stability, canopy cover shading, instream cover and streamside cover.

Pool bottom substrate describes the type of stream bed found in pools. Pools are depositional areas of the stream, and as such, are easily damaged by materials that settle. A loose shifting pool bottom will not provide substrate for burrowing organisms and will not allow bottom-spawning fish to successfully spawn. It will not provide habitat to the smaller vertebrates and invertebrates that are necessary to support many of the pool

dwelling fish. At least 80% of all pool bottoms must have stable substrate for a reach to be considered optimal for this habitat component.

The vegetative stability of the stream bank is an important component. Stream banks can be stabilized with a number of materials including rock, concrete, and fabric. Banks that are stabilized with vegetation benefit the aquatic community more than those stabilized with other materials. This is because vegetation offers several extra advantages beyond that of bank stability. The riparian plants of the stream bank offer a high quality source of food and shade to the aquatic community. Riparian vegetation stabilized point bars and contributes greatly to structure in the form of root wads and woody debris. Overall habitat quality improves as bank vegetative stability increases.

Canopy cover assesses the shading of the stream section. Plants lie at the base of almost all food chains. Since plants require light for growth and survival, a stream that is functioning well needs some amount of light. Moderation is optimal, however, because light is associated with heat, and most aquatic organisms are more stressed by the warmer waters and the lower oxygen solubility and higher metabolic rates that accompany the warming of the water.

Instream cover is the component of habitat that organisms hide behind, within, or under. High quality cover consists of things like submerged logs, cobbles and boulders, root wads, and beds of aquatic plants. Cover required by smaller members of the stream community will consist of gravel, cobbles, small woody debris, and dense beds of fine aquatic plants. At least 50% of the stream's area should be occupied by a mixture of stable cover types for this category to be considered optimal.

A large part of the energy and food input to the stream comes from streamside cover, the terrestrial vegetation along the banks. A mixture of grasses, forbs, shrubs, vines, saplings, and large trees transfer their necessities to the stream more effectively than does any single type of vegetation. Habitat quality increases as the form of bank vegetation increases in diversity.

Biological Conditions

Fish

Fish were collected on 6/11/2007. There were 5 species of fish collected by seining: 1 intolerant specie, 1 sunfish specie and 1 sensitive benthic specie. This sampling produced a score of C when compared with known high quality streams in this same ecoregion. Fish collected were grass pickerel, central stoneroller, bigeye shiner, creek chubsucker, and longear sunfish. Seventy three fish were caught.

Insects

The aquatic benthic macroinvertebrates showed a value better than the value of the reference stream for the winter sampling as good as the reference in the summer. The

condition received an A for both periods of time. This group included the mayflies, stone flies and caddis flies. All of these insects live in a good aquatic environment.

Chemical

The oxygen needed by the animals to sustain their life is measured as dissolved oxygen. The stream has maintained 115% of what the water could hold for oxygen. Phosphorus was minimal as was chloride. Soluble nitrogen showed up once after fertilization. The pH averaged 6.5, typical of a woodland stream with oaks and pines.

Bacteria

Coliform bacteria were tested and nothing was found abnormal.

Conclusions

The water in Bluff Creek is of good chemical quality. The diversity of habitat yields an abundance of fishes and benthic macro invertebrates that reflects on the overall good condition of the stream.