Habitat Changes and Biological Consequences

Poor habitat, such as treeless banks with a continuous straight channel exposed to the sun, will allow streambanks to become heavily eroded. High stormwater flows carry sediments and smother the stream bottom. Sand or silt substrates replace larger rocks limiting aquatic life to those animals which tolerate such conditions. Few deep pools are usually present. Nutrients in unshaded stream segments are used by algae. Large growths of algae are produced in open canopy areas with highly fluctuating and lethally low DO concentrations.

Fish Community

Thirty-seven fish species were collected in Bokes Creek in 1999. Only 29 percent of these fish indicate good water quality. Few smallmouth bass live in Bokes Creek. Other sensitive fish in Bokes Creek include bluegill, golden redhorse, hog sucker, stonecat madtom and banded darters were present in low numbers. The sensitive longear sunfish was most common, meaning good pools exist in some areas.

Nutrients and Pollution

Excessive nutrients (nitrogen, phosphorus, fecal matter) from agricultural runoff, tilting, unsecured runoff, or some urban stormwater runoff overstimulate algal growth which causes daytime supersaturated dissolved oxygen (D.O.) conditions instream and disrupts the aquatic food web. Then the plant material decays at night and critically lowers dissolved oxygen (D.O.) concentrations at night. Nutrient concentrations in Bokes Creek and its tributaries are contributing to stream water quality degradation. D.O. concentrations less than 4 mg/l, which can limit aquatic diversity and/or be lethal, occurred periodically in: Bokes Creek (at RMs 36.3, 35.1, 31.8, 11.4, 5.5, and 0.2), North Fork West Mansfield Trib., West Fork West Mansfield Trib., Powderlick Run, & Smith Run (example @ left).

Bokes Creek Basin

North Fork W. Mansfield Creek RM 3.97

Nutrients

Wastewater Treatment

Some reaches of Bokes Creek watershed show some success attaining water quality criteria, but impacts to the mainstream and/or tributaries include:
1. Lack of riparian areas along the streams
2. Extreme hydromodification
3. Nutrient enrichment
4. Channelization / bank erosion
5. Siltation buries rockbottom
6. Low night DO concentrations

Some reaches of Bokes Creek pond areas do not show signs of aquatic life, and sediments are compacted.

Bokes Creek and its tributaries were surveyed in 1999. West Fork surveys were conducted in 1981, 1990, 1992, and 1993. The 1999 survey results are shown on this page.

Fair to poor conditions exist in most of the basin. Polluted runoff from farms, poor habitat, and modified drainage networks were driving factors behind the degraded water quality.

Ohio EPA tests stream water and the treated wastewater discharged by facilities. The amount of nutrients, oxygen-depleting substances, bacteria, metals and other pollutants in a sample can be used to identify pollution sources and evaluate water quality.