

Kinnickinnic River Watershed Restoration Plan Fact Sheet

KK-6, Reach 820, Villa Mann Creek

Data resulting from model runs:

Figure	Overall Project Team Assessment	Analysis
Flashiness index	Moderate	The Flashiness Index quantifies the frequency and rapidity of short-term changes in stream flow. The index ranges from 0 to 2, with 0 being constant flow. The flashiness is slightly high at this location.
Dissolved oxygen v. days per year	Moderate to Poor	Typically, aquatic communities need 5 mg/l or more of dissolved oxygen to survive. Concentrations at this site fall below this level about 25% of the time.
Fecal coliform v. days per year	Variable (some good, some bad)	For recreational uses, lower fecal coliform counts (a measure of bacteria) are better (preferably under 400 counts / 100ml). The counts on majority of the days are either 'below 400' or 'above 5,000'. A potential goal in this case may be to determine the conditions that create the 'above 5,000' days and discourage recreational use on days that meet these conditions. An additional goal could be to find ways to decrease fecal coliform loads in order to increase the number of days that are 'below 400'.
Phosphorus v. days per year	Good to Moderate	Phosphorus is a nutrient that can lead to increased growth of algae. The phosphorus concentrations on most days are at or below the 0.1 mg/l planning guideline. The concentrations do not exceed 0.45 mg/l on any day.
Suspended solids v. days per year	Very Good	Suspended solids cause water to become cloudy and aesthetically unpleasant. They can clog the gills of fish and invertebrates, make feeding difficult, and lead to sediment deposition (poor habitat). The vast majority of days are less than 25 mg/l and the concentration did not exceed 100 mg/l on any day.
Monthly dissolved oxygen	Poor	Dissolved oxygen concentrations are highly variable in the spring. This variability suggests that either there is excessive algal growth or organic enrichment and biochemical oxygen demand within the ecosystem. The decline in concentrations during the summer is typical due to the decreased solubility of oxygen in warmer water. However, the concentrations during the summer decline more than would be expected or desired.
Monthly fecal coliform	Moderate	While the ranges of values are fairly consistent throughout the year, notice that the median and 75 th percentile values decline during the summer swimming season. This may be related to the die-off of bacteria due to solar radiation. Also note that the summer and fall account for many of the 'below 400' days mentioned above while the winter and early spring have many of the 'above 5,000' days. Conditions are particularly poor in March and are likely related to snow melt.
Monthly phosphorus	Good to Moderate	Phosphorus concentrations peak in March, then decline through the late spring, summer, and early fall. The decline may be related to uptake by plants during the growing season.
Monthly suspended solids	Very Good	Suspended solids concentrations fall below the reference concentration most of the time. The majority of the higher concentrations are likely related to larger rain or snow melt events that disturb bare soil. As this is a concrete-lined channel, there is little sediment to re-suspend from the stream bed.

Figure	Overall Project Team Assessment	Analysis
Dissolved oxygen by flow	Moderate	During mid to low flows, dissolved oxygen concentrations decline more relative to the other flow conditions. The decline at the lowest flow is likely related to a lack of water agitation (which would allow greater diffusion of oxygen into the water) and high temperatures (low flow conditions are often associated with summer which has higher temperatures and lower oxygen solubility).
Fecal coliform by flow	Moderate to Poor	Generally, a pollutant that is present at high concentrations during high flows and low concentrations during low flows (fecal coliform, in this case) is attributed primarily to non-point sources. Note that during any period with the highest flows, fecal coliform counts exceed the regulatory standard. During low flows and dry conditions, the standard is met nearly all of the time. During these low flows would be the safest time for recreational uses (boating, wading, swimming), although the amount of water in the stream may limit recreational use to wading.
Phosphorus by flow	Moderate	Phosphorus concentrations are greatest at high flows. This suggests that the sources are primarily non-point source pollution. Concentrations exceed the 0.1 mg/l planning guideline over 50% of the time at the highest flows and over 25% of the time under moist conditions.
Suspended solids by flow	Good	Suspended solids concentrations increase with increased flows. This suggests a prevalence of non-point sources. All of the instances when the concentration exceeds the reference condition occur at the high flow condition. These conditions most often occur following large storms or major snow-melt events. The suspended solids may come from runoff that carries a sediment load, from stream bank erosion, or re-suspended stream sediments. Note that this site is located downstream of some concrete-lined reaches within the watershed. As a result, upstream activities such as stream bank erosion and re-suspension of stream sediments likely make less of a contribution to suspended sediment loads at this site compared to sites that are situated downstream of natural reaches that experience these activities.