

Kinnickinnic River Watershed Restoration Plan Fact Sheet

KK-10, Reach 806, RI-13, Kinnickinnic River Near the Upstream Limit of the Estuary (South 7th Street)

Data resulting from model runs:

Figure	Overall Project Team Assessment	Analysis
Flashiness index	Good to 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	Very Good	Typically, aquatic communities need 5 mg/l or more of dissolved oxygen to survive. Concentrations at this site consistently exceed this level as well as the variance standard of 2 mg/l.
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 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. As there is a variance that allows the fecal coliform to reach 2,000, another goal could be to find ways to decrease coliform loads in order to increase the number of days that have fewer than 2,000 counts.
Phosphorus v. days per year	Poor	Phosphorus is a nutrient that can lead to increased growth of algae. The concentrations on most days are above the 0.1 mg/l planning guideline and the concentrations exceed 0.5 mg/l on some days.
Suspended solids v. days per year	Good	Suspended solids cause water to become cloudy. This can clog the gills of fish and invertebrates, make feeding difficult, and lead to sediment deposition (poor habitat). The concentrations on most days fall below 25 mg/l.
Monthly chloride grab samples (CL not from models)	Inconclusive (no winter data)	These samples show chloride values below levels that are acutely toxic to fish and invertebrates. Concentrations in March often exceed the chronic toxicity threshold. However, a common source of chloride is road salt and there is no winter data. Winter chloride concentrations would be expected to exceed March's chloride concentrations.
Monthly dissolved oxygen	Very Good	Note the lower dissolved oxygen concentrations during the summer. This is normal due to the decreased solubility of oxygen in warmer water.
Monthly fecal coliform	Moderate to Poor	While the ranges of values are fairly consistent throughout the year, note that the medians decline during the summer swimming season. This may be related to the die-off of bacteria due to solar radiation. Also, the summer accounts for many of the 'below 400' days mentioned above while the winter and early spring have many of the 'above 5,000' days.
Monthly phosphorus	Poor	Phosphorus concentrations consistently exceed the planning guideline, though the upper extremes tend to decline during the late spring, summer, and early fall. This may be related to uptake by plants during the growing season.
Monthly suspended solids	Good	Suspended solids concentrations tend to be lower in the winter months. This is may be due to frozen conditions, decreased construction activity, and low-impact storms (snow doesn't pound the soil like rain).

Figure	Overall Project Team Assessment	Analysis
Chloride by flow (Cl not from models)	Inconclusive (no winter data)	It is difficult to assess chloride without data from the winter months; however, it appears that when chloride is not being actively applied, some amount is in a 'reservoir' that is gradually released and is particularly noticeable during mid-to-dry conditions. At high flow conditions, dilution takes over, lowering the chloride concentration.
Dissolved oxygen by flow	Good	Dissolved oxygen concentrations as shown here are consistent among the flow conditions.
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. Infrequent sewer overflows (once every 2-5 years) would only contribute during the high flows when a substantial non-point load is already present. Note that during periods with the highest flows, fecal coliform counts exceed the variance standard and during moist conditions, fecal coliform counts exceed the variance standard over 50% of the time. During dry conditions and low flows, the standard is met nearly all of the time. <u>These times would be the safest time for recreational uses (boating, wading, swimming).</u>
Phosphorus by flow	Poor	Concentrations of phosphorus are greatest at high and low flows, although concentrations exceed the planning guideline under all flow conditions. The higher concentrations at flow extremes suggests a background source that is particularly noticeable during low flows (perhaps due to inputs of non-contact cooling water) as well as non-point sources of phosphorus at high flows.
Suspended solids by flow	Good	Suspended solids increase with increased flows. This suggests a prevalence of non-point sources. The concentrations exceed the reference concentration predominantly during 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.