



# KIAP-TU-WISH CHAPTER TROUT UNLIMITED

*Conserving, protecting, and restoring cold water fisheries and their watersheds in Polk, Pierce, and St. Croix Counties, Wisconsin.*

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February 24, 2018

River Falls City Council  
City of River Falls  
222 Lewis St  
River Falls WI 54022

Dear Mayor Toland and Council Members,

I am writing on behalf of the Kiap-TU-Wish Chapter of Trout Unlimited concerning your upcoming decision on the relicensing of the hydroelectric facility on the Kinnickinnic River in River Falls. We applaud your efforts to make an informed decision on the future of the hydroelectric dams by forming and funding the Kinni Corridor Planning Project Committee. As you know, that Committee's recommendation on the future of the Kinnickinnic River dams was presented to you at the February 13<sup>th</sup> Council meeting. Our chapter signed this resolution, because we respect the committee process and because we remain committed to supporting the City of River Falls concerning the health of the Kinnickinnic River. However, the Kiap-TU-Wish Chapter of Trout Unlimited does not believe that all portions of the committee's recommendation support the long-term health of the Kinnickinnic River and its temperature-dependent trout fishery. We would like to offer the following concerns for your consideration.

Our Chapter has been very active in Kinnickinnic River protection efforts for the last 30 years. We worked closely with the City of River Falls to develop a stormwater management plan, including passage of the current stormwater management ordinance. As part of this effort, we began monitoring river temperatures above, below, and through River Falls, to document potential stormwater impacts. Information from our monitoring network has also proven useful for evaluating the temperature impacts of Lakes George and Louise. Our data show that these two lakes have a significant warming influence on the lower Kinni for much of the year. Additionally the Wisconsin Department of Natural Resources has analyzed our data and documented that the Kinnickinnic River has slowly been warming during the past 20 years. We have attached a summary of this monitoring data, which shows the river temperature trending toward the critical threshold for Brown Trout of 22°C (72°F) below the impoundments.

For these reasons, we were very pleased to see the Kinni Corridor Committee's recommendation for removal of the lower Powell Falls Dam and associated river restoration by 2026. We believe this dam removal will provide some temperature relief for the Kinni by restoring the river corridor and allowing cold water from the South Fork to partially relieve the warmer Kinni water temperatures created by Lake George. What is uncertain, and therefore concerning, is the potential future rate of warming of the river and the 2048 date for removal of the upper Junction Falls Dam. Our members were encouraged to hear Council Member Watson's statement that a 30-year license for the Junction Falls Dam is too long. We strongly believe that the City should take necessary steps to target removal of the Junction Falls facilities and complete associated river restoration by 2035.



As you may know, our mission is to conserve, protect, and restore cold-water fisheries and their watersheds in Polk, St. Croix, and Pierce Counties. We have a long history of supporting river and stream restoration projects within our chapter area, and we are committed to working with the City on a public/private partnership to help fund Kinni dam removal and river restoration. Working together, we can ensure the future health of the beautiful Kinnickinnic River.

Sincerely,

Tom Schnadt  
President

Gary Horvath  
Vice President

Kent Johnson  
Chapter Member

Kiap-TU-Wish Chapter of Trout Unlimited

# Evaluating the Thermal and Hydrological Impacts of Kinnickinnic River Hydropower Impoundments in River Falls, WI

## Summary of Monitoring Results

### Thermal:

Since 1992, the Kiap-TU-Wish Chapter of Trout Unlimited has been conducting temperature monitoring of the Kinnickinnic River and three tributaries (Sumner Creek, South Fork of the Kinnickinnic River, and Rocky Branch Creek) in the vicinity of River Falls, Wisconsin (Figure 1).

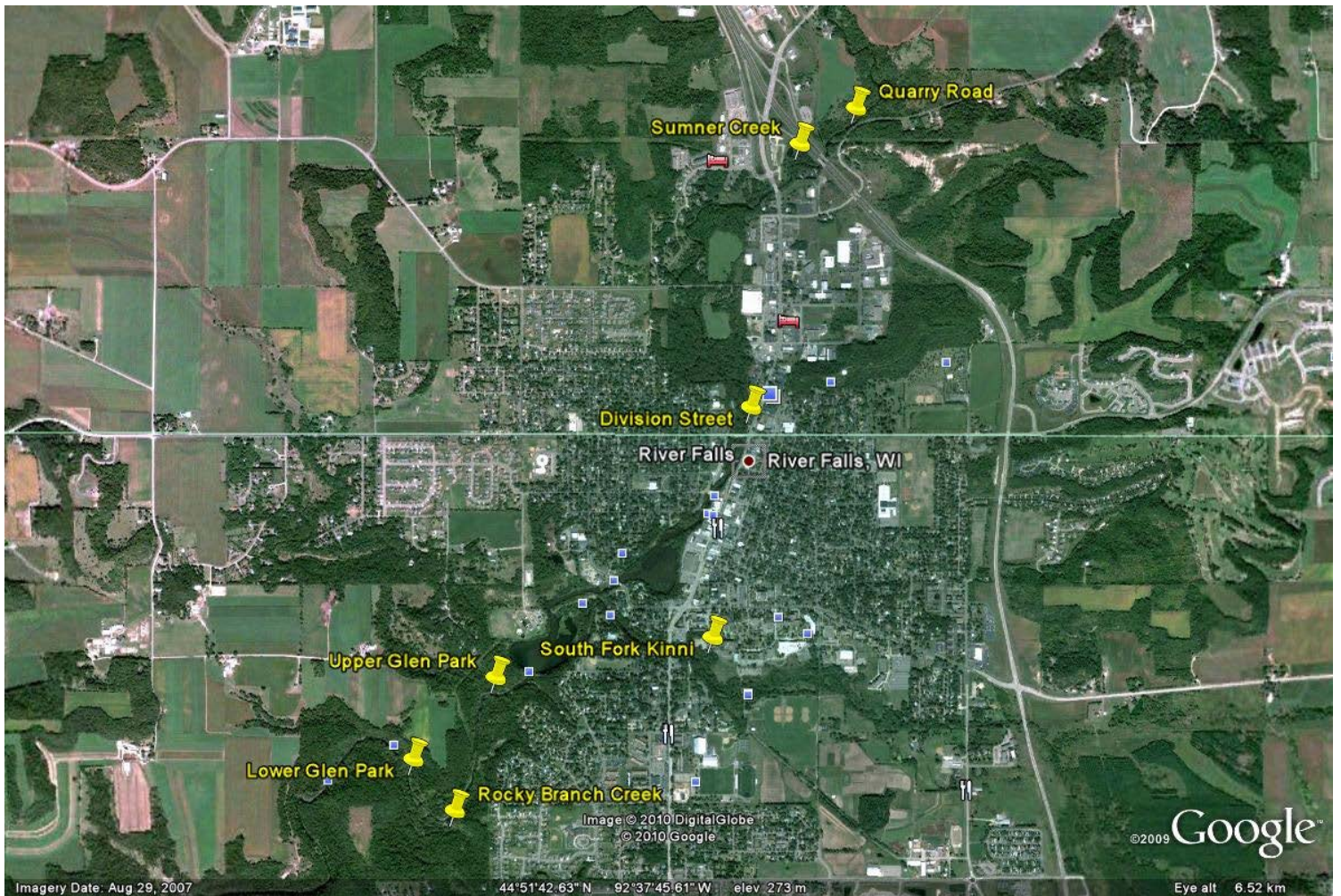


Figure 1. Kiap-TU-Wish temperature monitoring sites on the Kinnickinnic River and tributaries in River Falls, WI.



Temperature monitoring at these eight sites has typically been conducted during the mid-April to mid-October period each year, using electronic instrumentation that continuously measures river temperatures at 10-minute intervals. The temperature data obtained at each monitoring site can be compared to critical temperature thresholds that must be maintained to support healthy coldwater communities in the Kinnickinnic River and its tributaries. These thresholds<sup>1</sup> are as follows:

Temperatures  $\leq 17^{\circ}$  C = river temperatures optimal for macroinvertebrate survival

Temperatures  $\leq 19^{\circ}$  C = river temperatures optimal for brown trout growth

Temperatures  $\leq 20^{\circ}$  C = river temperatures optimal for brown trout survival

Temperatures  $> 19^{\circ}$  C = river temperatures exceed physiological limit for brown trout

Temperatures  $> 22^{\circ}$  C = river temperatures exceed the survival tolerance threshold and upper metabolic limit for brown trout

Temperatures  $> 25^{\circ}$  C = river temperatures exceed the lethal threshold for brown trout

The temperature monitoring data obtained at four Kinnickinnic River monitoring sites can be used to evaluate the thermal impacts of the two impoundments (Lake George and Lake Louise) created by the City of River Falls hydropower facilities. The two monitoring sites at Quarry Road and Division Street are reference or control sites located upstream from the two hydropower impoundments. The two monitoring sites at Upper and Lower Glen Park are possible impact sites situated downstream from the two hydropower impoundments.

A preliminary assessment by Kiap-TU-Wish of the temperature monitoring data obtained at the Quarry Road, Division Street, and Upper and Lower Glen Park monitoring sites indicates that summer (June-August) river temperatures are notably higher downstream from the two hydropower impoundments. On average during the 1993-2013 period of record, downstream summer average temperatures at Upper and Lower Glen Park are 2.2-2.4 $^{\circ}$  C (4.0-4.4 $^{\circ}$  F) warmer than the upstream summer average temperatures at Quarry Road and Division Street. This temperature differential is even greater in July (the warmest summer month), with downstream temperatures 2.3-2.8 $^{\circ}$  C (4.3-4.9 $^{\circ}$  F) higher than upstream temperatures. Furthermore, throughout the summer period, the downstream temperatures at Upper and Lower Glen Park more frequently exceed the critical temperature thresholds that support healthy coldwater macroinvertebrate and brown trout communities in the Kinnickinnic River. For instance, during the summer of 2012, the temperature threshold of 19 $^{\circ}$  C was exceeded for a cumulative total of 8.8 days (10% of the summer period) at Division Street. In comparison, this threshold was exceeded for a cumulative total of 38.9 days (42% of the summer period) at Upper Glen Park, thereby posing a much greater thermal risk to the downstream coldwater community.

The Wisconsin Department of Natural Resources has conducted assessments of Kiap-TU-Wish's Kinnickinnic River temperature monitoring data in 2011<sup>2</sup> and 2017 (Figure 2). Both assessments have noted that a warming trend in water temperature has been occurring at the Quarry Road and

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<sup>1</sup> Bell, J.M. 2006. The assessment of thermal impacts on habitat selection, growth, reproduction, and mortality in brown trout (*Salmo trutta* L): A review of the literature. Report prepared for the Vermillion River Watershed Joint Powers Board, by Applied Ecological Services, Inc. Brodhead, WI. 23 p.

<sup>2</sup> Mitro, M., J. Lyons, and S. Sharma 2011. Wisconsin Initiative on Climate Change Impacts: Coldwater Fish and Fisheries Working Group Report. 31 p.

Upper and Lower Glen Park monitoring sites, consistent with the observed warming trend in Wisconsin air temperature during the same time periods. However, the warming trends at the Upper and Lower Glen Park monitoring sites begin at a much higher baseline temperature, indicating that these downstream monitoring sites will be much more sensitive to any future impacts of climate change.

## Kinnickinnic River, Wisconsin Maximum 21-day mean temperature

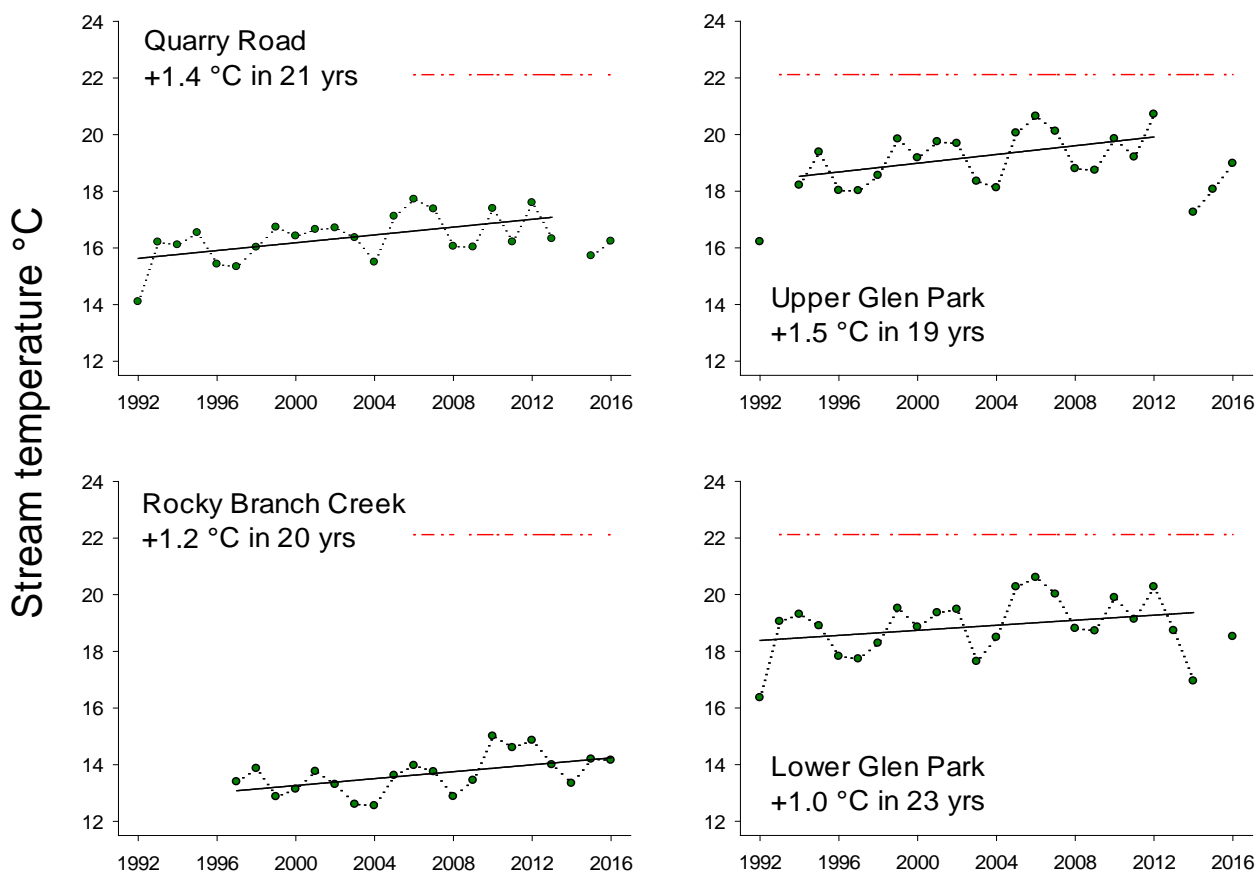


Figure 2. Maximum 21-day mean temperature by year (1992-2016) at three Kinnickinnic River sites (Quarry Road, Upper Glen Park, and Lower Glen Park) and one Rocky Branch Creek site. The regression line (solid line) for each river site shows the extent of river warming during the monitoring period, with a comparison to the critical temperature threshold for brown trout<sup>3</sup> (dashed red line).

<sup>3</sup> Wehrly, K., L. Wang, and M. Mitro. 2007. Field-based estimates of thermal tolerance limits for trout: Incorporating exposure time and temperature fluctuation. *Transactions of the American Fisheries Society* 136: 365-374.

The increased sensitivity of downstream water temperatures to air temperature has also been documented by a Kiap-TU-Wish regression analysis of April-September 2012 water temperatures vs. April-September 2012 air temperatures at the four upstream and downstream Kinnickinnic River monitoring sites.

**Hydrological:**

The United States Geological Survey (USGS) operates a [Kinnickinnic River monitoring station](#) (number 05342000) at County Highway F, near Kinnickinnic State Park, approximately five miles west of River Falls. The station measures river stage (water height) and flow at 15-minute intervals, and 15-minute precipitation amounts in 0.01-inch increments. The City of River Falls, Kinnickinnic River Land Trust, and the Kiap-TU-Wish Chapter of Trout Unlimited provide annual cost-share funding to help support the operation of this USGS monitoring station, which has been operating continuously since July 2002.

During periods of stable river flow (baseflow), when precipitation and runoff are not occurring, the Kinnickinnic River hydrograph can be examined to determine whether the City of River Falls hydropower facilities are operating in a “run-of-river” mode, as required by the FERC Permit. The “run-of-river” condition is critical for maintaining the Kinnickinnic River habitats that support healthy coldwater macroinvertebrate and brown trout communities. Sudden decreases in water flow can de-water macroinvertebrate habitats and trout redds, while sudden increases in water flow can de-stabilize the river channel, thereby increasing bank erosion, decreasing water clarity, and damaging in-stream habitat.

On a number of occasions, recreational users along the lower Kinnickinnic River (downstream from River Falls) have noted sudden flow fluctuations that are likely attributed to irregular operation of the City of River Falls hydropower facilities. For instance, a Kiap-TU-Wish Chapter member observed a dramatic decrease in Kinnickinnic River flow (from 126 cfs to 53 cfs) on July 11, 2008, during the 15:00-18:45 CDT time period. The Wisconsin Department of Natural Resources (WDNR) subsequently linked this flow irregularity to a gate malfunction at the lower hydropower facility. Given these observations of irregular flows, the Kiap-TU-Wish Chapter of Trout Unlimited recommends that a thorough assessment be conducted (using USGS Kinnickinnic River flow data) of the extent to which the City of River Falls hydropower facilities have maintained a “run-of-river” condition during the 2002-2013 period.



Prepared by:

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