

# Legler School Branch and Pioneer Valley Branch Water Chemistry

May – October, 2012 In fulfillment of Project SCR\_03\_CMP13

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EGAD #3200-2013-05

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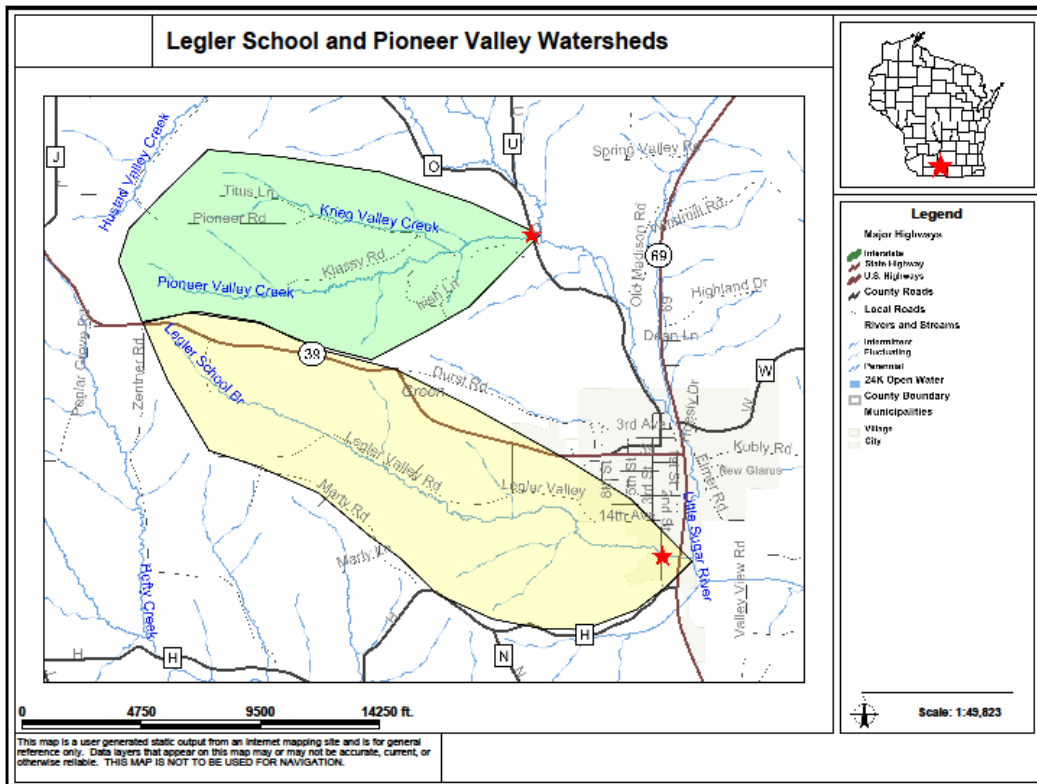
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## Location

Legler School Branch and Pioneer Valley Creek are two streams that originate west of the Village of New Glarus and flow through north central Green County to join the Little Sugar River (Figure 1). **Figure 1:** Legler School Branch and Pioneer Valley Creek Watersheds



## About Legler School Branch and Pioneer Valley Creek

Both creeks have similar sized watersheds and land uses (Table 1). Both are currently on the state's 303(d) list of impaired waters because of habitat loss due to sedimentation. In 2010, the Green County Land Conservation Department approached the department about conducting projects to address issues within the riparian corridor and the sub-watersheds as a whole. They applied for, and received, a state Targeted Runoff Management (TRM) grant address issues in the watersheds. They also received a companion grant from the Environmental Protection Agency to address nutrient loading to both systems.

**Table 1:** Land Use Data

Watershed	Total Area	Agriculture	Grassland/Pasture	Forest
Legler School	2584 acres	24%	48%	21%
Pioneer Valley	2163 acres	20%	47%	29%

## Constituents Monitored

As part of the project, the department agreed to monitor nutrient concentrations at the pour points of each subwatershed prior to, and after, implementation of best management practices (BMPs). Grab water chemistry samples were taken at CTH O on Pioneer Valley and 2<sup>nd</sup> Street in the Village of New Glarus on Legler School Branch. The site on Legler School was chosen because it is near the confluence with the Little Sugar River, but upstream from a riparian stream project which was underway. Biologists decided suspended sediments and nutrients from the stream project might influence the data. Samples were collected bi-monthly beginning in the middle of May until the end of October. This meets and exceeds the requirements for determining phosphorus impairment as outlined in the most recent draft of the Wisconsin Consolidated Assessment and Listing Methodology (WisCALM). Flow data was not collected for this study.

## Results

Results of the sampling are shown in Table 2 and 3. It is imperative to note that an area wide drought occurred during the summer of 2012. Cumulative rainfall for the study period was as approximately 8 inches below average. Because of this there were few opportunities for runoff, and thus nutrient loads were suppressed. One problem this presents is that the pre-implementation concentrations may not represent a normal situation, thereby making comparisons with post-implementation measurements difficult. In other words, although implementation of BMPs will possibly improve water quality over the long-term, concentration based data may not reflect these improvements because of differences in flow.

It would have been desired to collect multiple years of pre-implementation data to establish a better baseline and increase the statistical robustness of the dataset. Unfortunately, because implementation of BMPs began during 2012, this was not possible. Any future monitoring should include instantaneous flow data at a minimum in addition to the chemical data.

**Table 2:** Legler School Branch Water Chemistry Results: May – October, 2012

Date	Temp (°C)	Total P (mg/l)	NH3 (mg/l)	NO3/NO2 (mg/l)	TKN (mg/l)	D.O. (mg/l)	Transp (cm)	Conductivity (umhos/cm)
05/15/2012	11.7	0.063	-	-	-	10.9	53	618
06/01/2012	13.3	0.063	-	-	-	11.5	>120.0	579
06/14/2012	12.2	0.055	-	-	-	10.7	>120.0	473
06/27/2012	14.2	0.066	-	-	-	10.1	105	601
07/16/2012	17.2	0.065	-	-	-	9.6	61	627
07/27/2012	20.2	0.087	-	-	-	8.9	100	659
08/06/2012	15.1	0.061	ND	4.18	*ND	10.7	>120.0	622
08/27/2012	17.4	0.06	0.022	3.87	*0.27	10	>120.0	650
09/17/2012	11.5	0.054	0.015	2.92	*0.16	10.3	>120.0	614
09/26/2012	11.8	0.053	0.025	4.07	*ND	10.5	-	570
10/16/2012	9.6	0.081	0.037	4.18	0.41	9.6	80	622
10/30/2012	7.3	0.054	0.026	4.23	0.27	12	-	-

Average P concentration = 0.064 mg/l

Median P concentration = 0.062 mg/l

**Table 3:** Pioneer Valley Creek Water Chemistry Results: May – October, 2012

Date	Temp (°C)	Total P (mg/l)	NH3 (mg/l)	NO3/NO2 (mg/l)	TKN (mg/l)	D.O. (mg/l)	Transp (cm)	Conductivity (umhos/cm)
05/15/2012	11.7	0.144	-	-	-	10.9	34	553
06/01/2012	10.9	0.086	-	-	-	11.5	67	523
06/14/2012	11.8	0.089	-	-	-	10.8	50	536
06/27/2012	13.5	0.084	-	-	-	10	63	565
07/16/2012	15.1	0.075	-	-	-	9.3	96	600
07/27/2012	17.1	0.081	-	-	-	8.5	>120.0	622
08/06/2012	13.5	0.066	0.017	2.78	*ND	9.52	>120.0	567
08/27/2012	14.4	0.062	0.024	2.9	*0.38	9.4	>120.0	534
09/17/2012	10.8	0.059	0.016	4.01	*0.16	10.1	>120.0	588
09/26/2012	10.9	0.057	0.021	3.06	*0.26	10.2	-	-
10/16/2012	8.9	0.076	0.052	2.96	0.44	10	>120.0	122
10/30/2012	7.2	0.059	0.029	3.02	0.17	12	-	-

Average P concentration = 0.078 mg/l

Median P concentration = 0.076 mg/l