

# Haskill Creek Stream Flow Monitoring Project



**Submitted to:**  
**Flathead Conservation District**  
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## Introduction

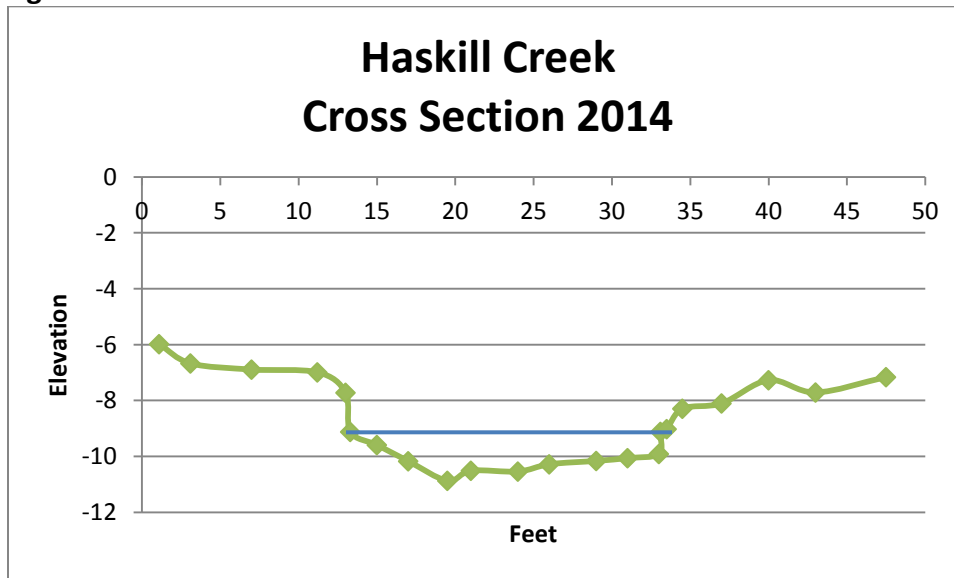
Pursuant to Flathead Conservation District (FCD) Contract 2014-001, the Whitefish Lake Institute (WLI) installed a staff gage and stilling on Haskill Creek at the Monegan Road Crossing near Whitefish. A Hobo U20 pressure transducer that records temperature and water level at 30 minute increments was deployed in the stilling well. In addition, a stilling well and U20 unit was installed in the Averill's Viking Creek Wetland Preserve, which is owned and managed by WLI, for the purpose of calibrating the Haskill Creek in-stream U20 unit to atmospheric pressure.

FCD secured a Flathead County Encroachment Permit to install the monitoring device in the Haskill Creek stream channel. WLI secured permission from Dale Duff on the east side of the stream and from Klaus and Joaquenia Heinrich on the west side of the stream to access the site for monitoring purposes.

## Results

A long-term stream cross section (*Figure 1*) was established with a primary and secondary benchmark located just downstream of the staff gage and stilling well. A cross sectional survey will be conducted each spring to determine if geomorphic changes (e.g. aggradation or bank cutting) over time will require the creation of a new rating curve.

**Figure 1. Haskill Creek Cross Section.**



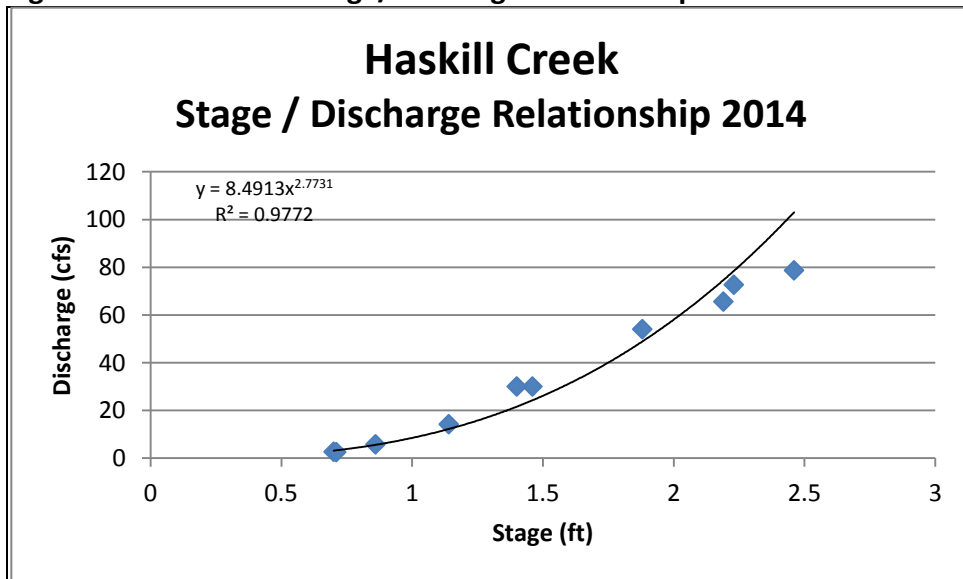
Ten stream-flow measurements (Q) were taken from 4-16-14 to 10-16-14 (*Table 1 and Figure 2*) representing various hydrograph conditions from near peak flow to base flow. Statistical analysis using a power curve of the flow measurements yielded an excellent  $r^2$  value of 0.9772. The high  $r^2$  value indicates that the site selection was good, stream-flow measurements were collected in a consistent manner, and a solid stage/discharge relationship was developed.

**Table 1. Haskill Creek 2014 Stage and Flow Information.**

DATE	Stage (ft)	Q (cfs)*
4/16/2014	1.46	30.09
5/13/2014	1.88	54.13
5/20/2014	2.23	72.74
5/27/2014	2.46	78.77
6/10/2014	2.19	65.67
7/9/2014	1.40	30.10
7/24/2014	1.14	14.29
8/12/2014	0.86	5.85
9/11/2014	0.70	2.74
10/16/2014	0.71	2.59

\*cfs= Cubic Feet per Second.

**Figure 2. Haskill Creek Stage/Discharge Relationship.**



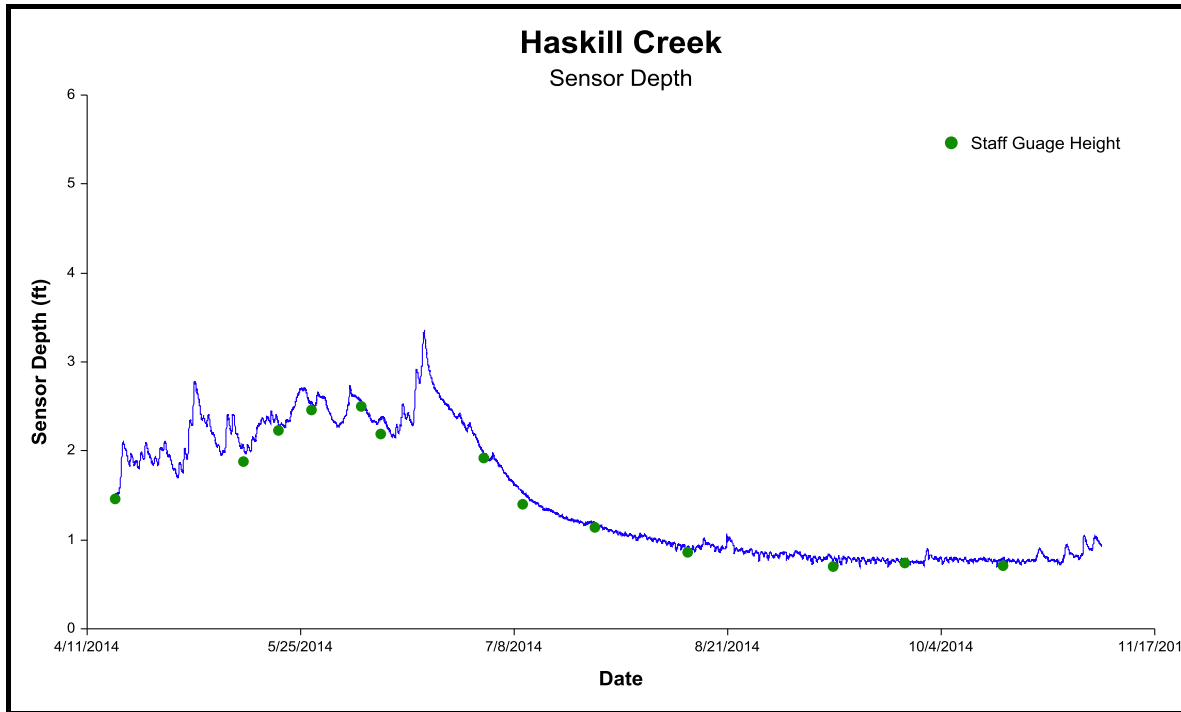
The U20 pressure transducer (*Figure 3*) shows a continual (30 minute increment) readout beginning 4-15-14 and ending 11-5-14. *Figure 3* shows the pressure sensor depth with staff gauge height data points. Data shows peak flow on June 19<sup>th</sup> and the stream returned to base flow conditions in September. Unseasonably cold weather occurred in mid-November causing ice accumulation in the stilling well which influenced the pressure transducer level. As a result, pressure transducer data was evaluated only through November 5.

U20 temperature data (*Figure 4*) shows a range from 35.76F at 0930 on 4-19-14 to 66.02 at 2000 on 8-13-14. All temperatures recording within the sampling window were within the life history requirements for all salmonid life stages.

Now that the U20 pressure transducer has been and provided there are no geomorphic changes to the stream channel from spring runoff, additional stage and discharge data points will further define Haskill Creek stream conditions. In addition, volumetric loading for the

sample periods will be determined to assist in loading (lbs) calculations for nutrients using water chemistry data collected by WLI. All future data types generated for Haskill Creek by using information obtained through this contract will be forwarded to the Flathead Conservation District, City of Whitefish, and the Haskill Basin Watershed Council.

**Figure 3. Haskill Creek Pressure Transducer Water Level and Staff Height Readings.**



**Figure 4. Haskill Creek Temperature Data.**

