WASHINGTON DEPARTMENT OF ECOLOGY

ENVIRONMENTAL ASSESSMENT PROGRAM

FRESHWATER MONITORING UNIT

STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 01C070

STATION NAME: Hutchinson Creek near Acme

WATER YEAR: 2014

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Introduction

Watershed Description

Hutchinson Creek drains a forested basin in the North Cascades foothills that lies between Bowman Mountain on the east and its confluence with the South Fork Nooksack River on the west. The creek supports populations of steelhead, coho salmon, and cutthroat trout. Above the gage the basin ranges in elevation from 530 feet up to 4220 feet along the mountain ridges to the east. The mean elevation is 1750 feet. About 72 percent of the area is covered by forest canopy. Average annual precipitation is about 70 inches.

Gage Location

This stream gage is located on the left bank at an unmarked Washington State Department of Natural Resources bridge off Mosquito Lake Road in Whatcom County, WA.

Table 1. Basin Area and Legal Description

Drainage Area (square miles)	14.0
Latitude (degrees, minutes, seconds)	48° 43' 27.84" N
Longitude (degrees, minutes, seconds)	-122° 9' 7.90" W

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	53
Median Annual Discharge (cfs)	40
Maximum Daily Mean Discharge (cfs)	337
Minimum Daily Mean Discharge (cfs)	5.0
Maximum Instantaneous Discharge (cfs)	382
Minimum Instantaneous Discharge (cfs)	4.8
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	108
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	7.5
Number of Days Discharge is Greater Than Range of Ratings	2
Number of Days Discharge is Less Than Range of Ratings	6
Number of Un-Reported Days	8
Number of Days Qualified as Estimates	55
Number of Modeled Days	0

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Table 2 Discussion (Discharge Statistics)

Discharge at Hutchinson Creek near Acme gaging station reached its lowest point September 16, 2014. A similar low point was recorded October 30, 2013. Discharge in Hutchinson Creek peaked March 6, 2014.

Two days were greater than the range of rating. These rating exceedances correspond to a pair of storm events in March that happened only a few days apart. Six days were below the range of rating. These days correspond to a low flow period in early February. There were a total of eight unreported days in Water Year 2014.

Fifty-five days were qualified as estimates. These days qualified were qualified as estimates based on logger drift error assessment.

Due to a failing datalogger, short data gaps occurred in early October and early December. These gaps were filled using a regression based on a nearby station. A portion of the discharge data for this water year are based on this regressed data.

Table 3. Error Analysis Summary.

Potential Logger Drift Error (% of discharge)	6.7
Potential Weighted Rating Error (% of discharge)	11.1
Total Potential Error (% of discharge)	17.8

Table 3 Discussion (Error Analysis)

Most of the uncertainty in reported discharge for Water Year 2014 is from potential weighted rating error. Potential rating error is based on the difference between the discharge predicted by the rating table and the measured discharge that has been adjusted to the highest potential error based on the quality of the measurement.

All but one of the discharge measurements taken in Water Year 2014 were rated "good". The one exception was rated "fair".

Table 4. Stage Record Summary

Minimum Recorded Stage (feet)	1.25
Maximum Recorded Stage (feet)	3.80
Range of Recorded Stage (feet)	2.55

Table 4 Discussion (Stage Record)

Minimum stage occurred during summer low flow in September of 2014. Maximum stage occurred during high flow conditions caused by a storm event in March of 2014. Due to a failing datalogger, short data gaps occurred in early October and early December. These gaps were filled using a regression based on a nearby station. A portion of the discharge data for this water year are based on this regressed data.

Table 5. Rating Table Summary

Rating Table No.	121	13	122
Period of Ratings	10/1/13-1/7/14	12/1/13-3/7/14	3/7/14-5/9/14
Range of Ratings (cfs)	0-392	32-392	0-392
No. of Defining Measurements	29	4	29
Rating Error (%)	11.6	10.4	11.6

Rating Table No.	102		
Period of Ratings	3/31/14-9/30/14		
Range of Ratings (cfs)	0-292		
No. of Defining Measurements	11		
Rating Error (%)	11.1		

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Table 5 Discussion (Rating Tables)

Rating 121 is hold over in a stable rating period from Water Year 2013. A scour event led to Rating 13.

Filling of the gage pool over a large storm event and several small events in the spring, led to Rating 122 which is the second clone of Rating 12.

Rating 102 is the second clone of Rating 10. It represents the stage-discharge relationship following filling of the gage pool over several spring storm events.

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	+none
Range of Modeled Stage (feet)	none
Range of Modeled Discharge (cfs)	none
Valid Period for Model	none
Model Confidence	none

Table 6 Discussion (Modeled Data)

none

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
none	n/a

Table 7 Discussion (Surveys)

n/a

Activities Completed

None.

Appendix

None.