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: 2016

AUTHOR: Paul D. Anderson

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)	43
Median Annual Discharge (cfs)	26
Maximum Daily Mean Discharge (cfs)	337
Minimum Daily Mean Discharge (cfs)	3.8
Maximum Instantaneous Discharge (cfs)	377
Minimum Instantaneous Discharge (cfs)	3.6
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	98
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	5.6
Number of Days Discharge is Greater Than Range of Ratings	11
Number of Days Discharge is Less Than Range of Ratings	0
Number of Un-Reported Days	11
Number of Days Qualified as Estimates	48
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 August 25, 2016 and peaked November 17, 2015.

Eleven days were greater than the range of ratings. These rating exceedences correspond to a pair of storm events in mid November and another storm event that occurred in mid February. The peak discharge for Water Year 2016 occurred during the second mid-November storm event. There were a total of 11 unreported days in Water Year 2016.

Forty-eight days were qualified as estimates. These days were qualified as estimates based on logger drift error assessment.

Table 3. Error Analysis Summary.

Potential Logger Drift Error (% of discharge)	8.6
Potential Weighted Rating Error (% of discharge)	10.5
Total Potential Error (% of discharge)	19.1

Table 3 Discussion (Error Analysis)

Most of the uncertainty in reported discharge for Water Year 2016 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.

Table 4. Stage Record Summary

Minimum Recorded Stage (feet)	0.66
Maximum Recorded Stage (feet)	4.73
Range of Recorded Stage (feet)	4.07

Table 4 Discussion (Stage Record)

Minimum stage occurred in late August 2016 prior to the typical end of the summer low flow period. The maximum recorded stage occurred during a high-flow storm event in mid November 2017.

Table 5. Rating Table Summary

Rating Table No.	14	124	16
Period of Ratings	10/01/2015-11/2/2015	10/31/2015-02/01/2016	01/28/2016-09/30/2016
Range of Ratings (cfs)	2.0-163	0-392	0.38-203
No. of Defining Measurements	6	29	17
Rating Error (%)	9.9	11.6	10.2

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

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

Table 5 Discussion (Rating Tables)

Rating 14 is a hold over in a stable period from Water Year 2015.

Scouring of the gage pool during a moderate storm event in early November 2015 led to Rating 124. Rating 124 is the fourth clone of Rating Table 12.

Further scouring of the gage pool lead to the creation of Rating 16.

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
Station	07/06/2016

Table 7 Discussion (Surveys)

A station survey was conducted in early July. The stadia rod was not able to be placed completely plumb on the laser level pad. Despite this issue, the survey loop was able to meet the acceptable error of closure.

Activities Completed

None.

Appendix

None.