

**WASHINGTON DEPARTMENT OF ECOLOGY**  
**ENVIRONMENTAL ASSESSMENT PROGRAM**  
**FRESHWATER MONITORING UNIT**  
**STREAM DISCHARGE TECHNICAL NOTES**

**STATION ID:** 46B060  
**STATION NAME:** Roaring Creek near Mouth  
**WATER YEAR:** 2010  
**AUTHOR:** Tyler W. Burks

**Introduction**

Watershed Description

Roaring Creek is a minor tributary, approximately 6% of the drainage area of the Entiat River, and enters the watershed at river mile 5.7. The watershed is bound at its headwaters by Chumstick Mountain (5820 ft) to the west, Roaring Ridge to the north, and Dinkleman Ridge to the south. Land cover above the gage consists of predominantly coniferous forest and shrub-steppe habitats, but also includes riparian woodlands and bedrock/talus slopes. Below the gage rangeland and fruit orchards predominate. Mean annual precipitation across the watershed above this gage location is 33 inches (U.S. Weather Bureau, 1965).

Gage Location

The telemetered stream gaging station on Roaring Creek was installed on September 27, 2002. The gage is located off Roaring Creek Road, approximately 0.80 miles upstream of its confluence with the Entiat River, on the left bank.

Table 1.

Drainage Area (square miles)	25 (USGS, 2015)
Latitude (degrees, minutes, seconds)	47°41'15" N
Longitude (degrees, minutes, seconds)	120°19'56" W

**Discharge**

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	6.4
Median Annual Discharge (cfs)	2.6
Maximum Daily Mean Discharge (cfs)	32
Minimum Daily Mean Discharge (cfs)	0.50
Maximum Instantaneous Discharge (cfs)	45
Minimum Instantaneous Discharge (cfs)	0.50
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	18
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	1.25
Number of Days Discharge is Greater Than Range of Ratings	0
Number of Days Discharge is Less Than Range of Ratings	0

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

**Narrative**

Eight discharge measurements were taken, ranging from 1.56 to 6.37 cfs. Snowmelt runoff began mid-April, and reached its peak on May 20, 2010, after a period of hot weather. The minimum discharge was recorded during baseflow conditions on October 2, 2009. Thanks to a colder and wetter than normal spring, statewide drought declaration discussions ended in early June.

## Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	9.9%
Weighted Rating Error (% of discharge)	17.5%
Total Potential Error (% of discharge)	27.4%

## Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	#10	#801	#101
Period of Ratings	10/01/2008-12/03/2009	10/28/2009-01/12/2010	12/03/2009-02/23/2010
Range of Ratings (cfs)	0.01-910	0.01-910	0.01-910
No. of Defining Measurements	7	23	7
Rating Error (%)	17.7%	17.4%	17.7%

Rating Table No.	#802		
Period of Ratings	1/12/2010-9/30/2010		
Range of Ratings (cfs)	0.01-910		
No. of Defining Measurements	23		
Rating Error (%)	17.4%		

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

## Narrative

The water year began with Table 10, carrying over from the previous water year. In late fall, scour gradually occurred resulting in the rating returning to Table 801 (a clone of Table 8). Shortly after, a gradual accumulation of sediment began in December resulting in a filling of the control, and return to Table 101 (a clone of Table 10). This table was briefly valid until the gradual onset of spring runoff again scoured the control, returning the rating to Table 802 (a clone of Table 8). Table 802 was valid for the remainder of the water year.

## Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	0.83
Maximum Recorded Stage (feet)	1.97
Range of Recorded Stage (feet)	1.14
Number of Un-Reported Days	10
Number of Days Qualified as Estimates	108
Number of Days Qualified as Unreliable Estimates	0

## Narrative

Unreported days were due to an ice-impacted channel in which the stage-discharge relationship was not valid. The stage record is considered an estimate for 108 days during the water year. Thirty-five of the days were qualified as estimates because the logger drift exceeded 20 percent, and the difference in reported discharge was greater than 0.50 cfs. The remaining 73 qualified days occurred following or in-between periods of ice-impacted data prior to the first ice-free gage index observation.

## Modeled Discharge

Table 6. Model Summary

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

## Surveys

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

Type	Date

## Activities Completed

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