

7.0 Instream Flows

Instream flows were established by rule in 1983 for three reaches on the Wenatchee River, one reach on Icicle Creek and one reach on Mission Creek. The instream flows are set in Chapter 173-545 WAC. Future consumptive Water Rights for diversion of surface water from the main stem of the Wenatchee River and perennial tributaries are subject to these instream flows as measured at the appropriate stream gage, preferably the nearest one downstream. Chapter 173-545 WAC also stipulates that Peshastin Creek is subject to a June 15 to October 15 closure for protection of instream values. These instream flows do not affect water rights that were in existence prior to 1983. Single domestic and stockwater use are exempt, and nonconsumptive uses that are compatible with the purposes of the instream flows may be approved.

Table 7-1 lists the five stream reaches (called stream management units) affected by the instream flow criteria set in Chapter 173-545 WAC. Control stations are USGS streamflow gaging stations. Instream flow rates for each reach are tabulated in Table 7-2.

Control Station	Stream Gage	River Mile	Stream Management Reach
Wenatchee River at Plain	12-457000	46.2	From Plain Road Bridge RM 46.2, to headwaters
Icicle Creek near Leavenworth	12-458500	1.5	From headwaters to Icicle Creek to its mouth
Wenatchee River at Peshastin	12-459000	21.5	From confluence of Derby Creek to Plain Road Bridge, RM 46.2 excluding Derby Creek and Icicle Creek
Wenatchee River at Monitor	12-462500	7.0	From mouth to confluence of Derby Creek, including Derby Creek and excluding Mission Creek
Mission Creek near Cashmere	12-462000	1.5	From Mission Creek headwaters to its mouth

Table 7-2
WAC Instream Flow Requirements in Wenatchee River Watershed

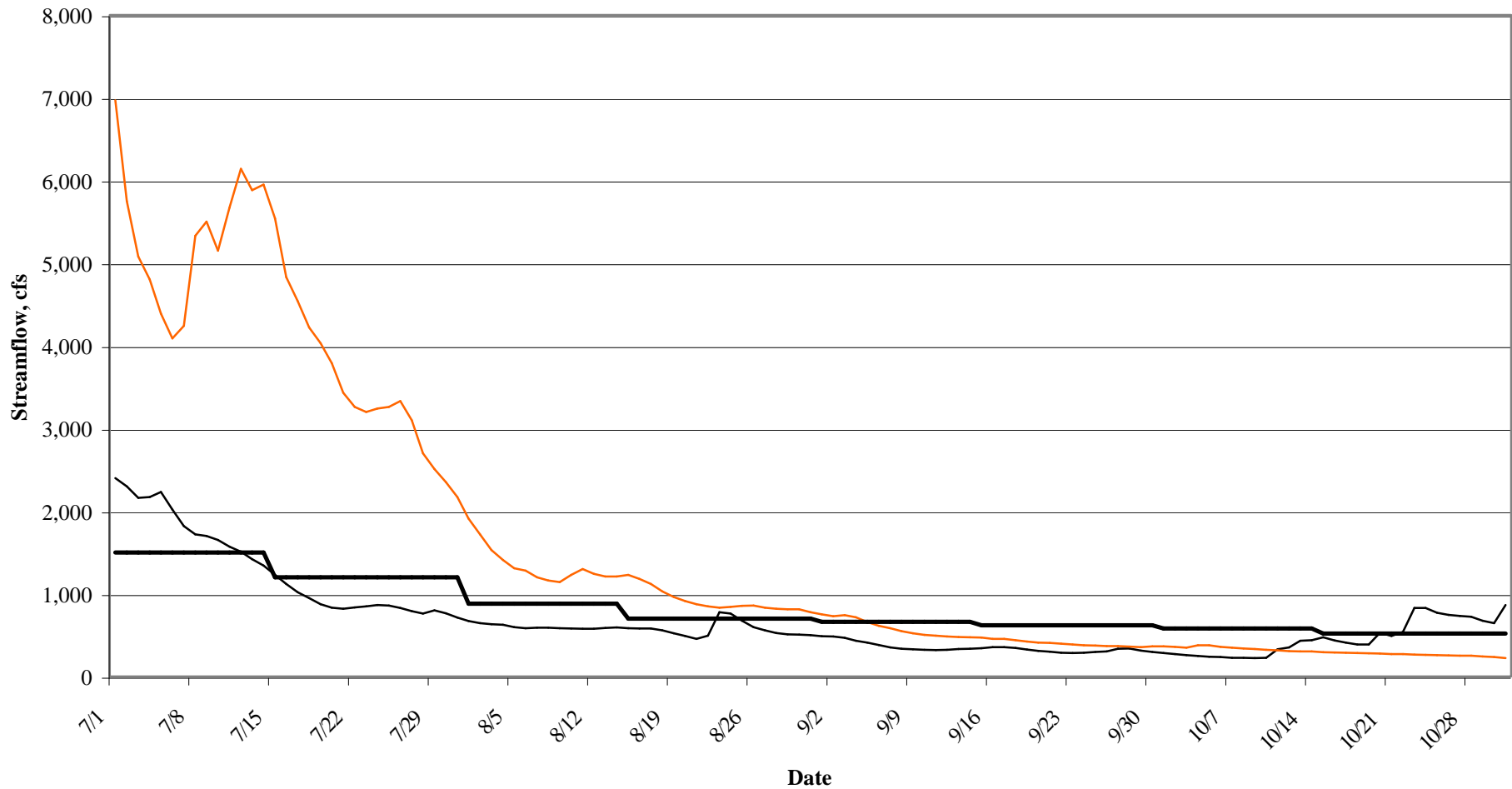
Month	Day	Instream Flow from WAC (cfs)				
		12-457000 Wenatchee River at Plain	12-458000 Icicle Creek near Leavenworth	12-459000 Wenatchee River at Peshastin	12-462000 Mission Creek near Cashmere	12-462500 Wenatchee River at Monitor
Jan	1	550	120	700	6	820
	15	550	120	700	6	820
Feb	1	550	120	700	6	820
	15	550	120	700	6	800
Mar	1	550	150	750	6	800
	15	700	170	940	11	1040
Apr	1	910	200	1300	22	1350
	15	1150	300	1750	40	1750
May	1	1500	450	2200	40	2200
	15	2000	660	2800	40	2800
Jun	1	2500	1000	3500	28	3500
	15	2000	660	2600	20	2400
Jul	1	1500	450	1900	14	1700
	15	1200	300	1400	10	1200
Aug	1	880	200	1000	7	800
	15	700	170	840	5	700
Sep	1	660	130	820	4	700
	15	620	130	780	4	700
Oct	1	580	130	750	4	700
	15	520	130	700	5	700
Nov	1	550	150	750	6	800
	15	550	150	750	6	800
Dec	1	550	150	750	6	800
	15	550	150	750	6	800

Figures 4.1, 4.2, 4.6, 4.10, 4.11 and 4.13 present statistical analyses of streamflow compared to the IRPP flows for gaging stations in the Wenatchee Watershed. The IRPP flows generally fall between the 50% and 90% exceedence values for streamflow on the affected streams except in September when the IRPP flows exceed the 50% exceedence flow values.

Figures 7.1 and 7.2 show a comparison of Wenatchee River flow at Plain and Monitor to IRPP flows for the last two July-October time periods. The flow volume which Wenatchee River flows are less than IRPP flows are listed in the figures. In 2002, the Wenatchee River flows were 15,700 – 24,700 ac-ft below IRPP flows. In 2001, the Wenatchee River flows were

46,100 – 50,400 ac-ft below the IRPP flows. 2001 was a drought year with an extended period of low streamflow. In 2002, the annual runoff was average but a late summer dry period caused streamflow to decline to 2001 levels.

Analyses presented in the *Lake Wenatchee Water Storage Feasibility Study* (MWH/MWG, 2003) show that, on average, there are 87 days per year that the IRPP flows are not met at the Wenatchee River at Plain gaging station and 78 days per year at the Peshastin gaging station. During the low flow periods of August through October, the IRPP flows are not met almost one-half of the time. In dry years, it appears that IRPP flows are not met for almost one-half of the entire year.



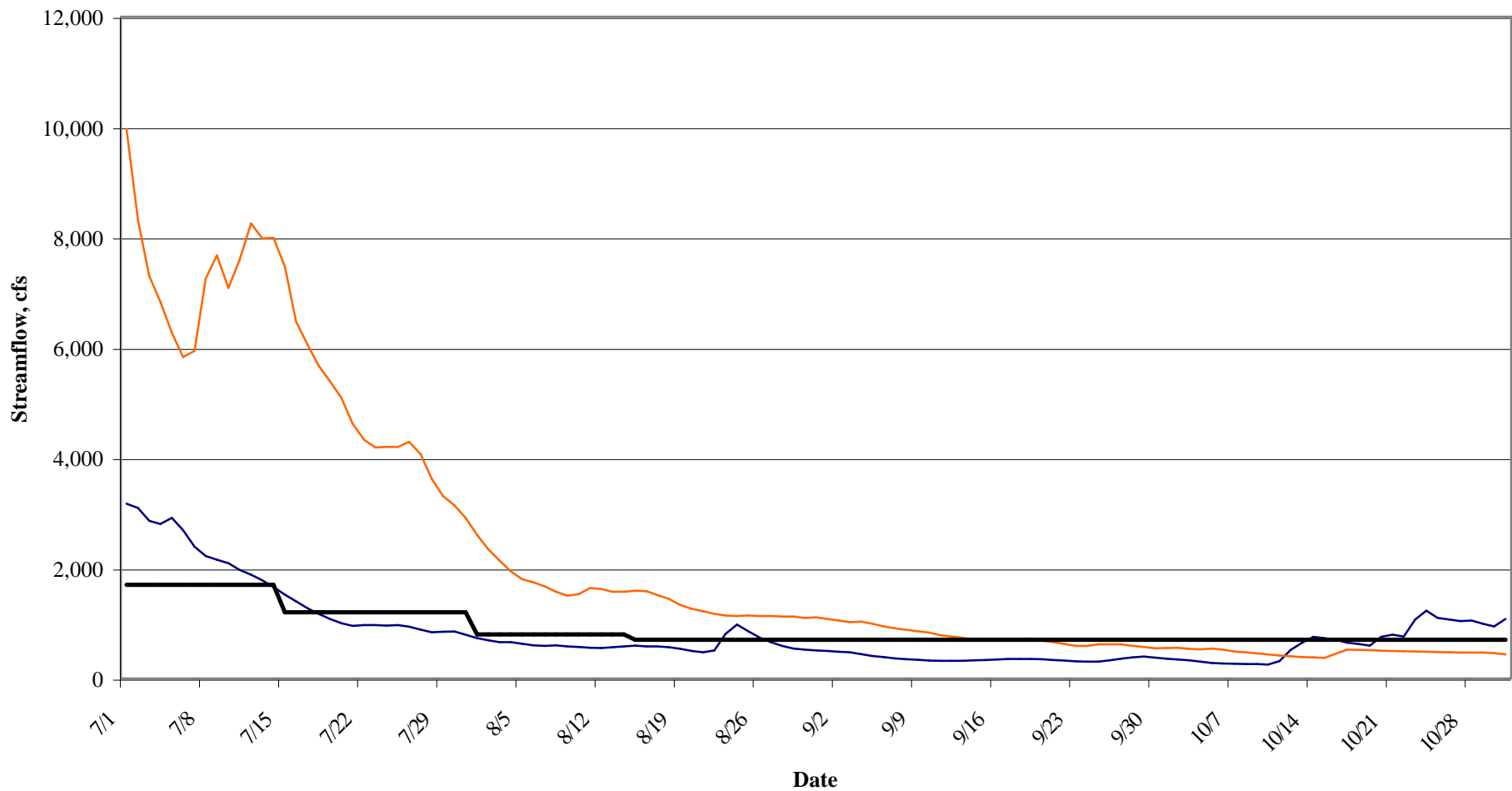
USGS Gage 12457000

- 2001 Wenatchee River Flow
- 2002 Wenatchee River Flow
- IRPP

**Figure 7.1 Comparison of 2001/2002 Flows to IRPP
Wenatchee River at Plain, WA**

Wenatchee River Basin Watershed Assessment





USGS Gage 12462500

- 2001 Wenatchee River Flow
- 2002 Wenatchee River Flow
- IRPP

**Figure 7.2 Comparison of 2001/2002 Flows to IRPP
Wenatchee River at Monitor, WA**

Wenatchee River Basin Watershed Assessment



8.0 DATA GAPS AND RECOMMENDED STUDIES

Based on water quantity data presented in this report, we have identified the following data gaps with corresponding recommendations for ongoing study effort of the Watershed Management Plan:

- Water rights data may not be complete and water right claims data is likely not representative of actual use. Additional work is required to ensure all water rights data is correct within the GWIS database by verifying quantities and place of use. Claims data would also need verification by comparing water rights and use on a parcel-by-parcel basis.
- It is unknown how well water rights data represents water use. Additional data will need to be compiled to prepare more accurate estimates of water use. Water use variations on a seasonal and annual basis are also not represented by water rights data.
- The irrigated acreage and cropping patterns are not well documented. Additional mapping of crops is warranted to help determine water use patterns.
- The extent and quantity of unauthorized water uses is not known.
- The readily available groundwater data are insufficient to accurately estimate water available, water present, and water available for further appropriation. Data gaps for ground water resources include information on aquifer properties (e.g., dimensions, transmissivity, vertical hydraulic conductivity, storativity, and specific yield), seasonal variations in water levels and the relationship between surface water and groundwater. Periodic ground water level measurements in aquifers on are needed to assess seasonal changes due to recharge and discharge (e.g., ground water withdrawals and contribution to surface water). Hydraulic relationships between the aquifers in and adjacent to the basin and the hydraulic relationships between aquifers and surface water bodies need to be understood so that the quantity of water exchanged between aquifers and between the aquifers and surface water can be estimated.
- Information on the long-term patterns of surface water sources is not available as sufficient stream gaging data is not yet available. Chelan County has recently installed stream gaging stations at a number of locations. The data collected from those stations will be valuable in assessing and managing water resources in the Wenatchee Watershed. However, the streamflow record at this time is short preventing much use of the data collected to date in estimates of long-term streamflow patterns. The County should maintain the stations for as long as possible to ensure adequate data is compiled.

The distribution of water use and availability is not well known in the watershed. A method to assess that is through the preparation of a water budget. A water budget compares two quantities: input to the hydrologic system via precipitation and recharge, and output

(withdrawals) from the system via groundwater and surface use, surface water flow out of the area, and evapotranspiration. We recommend that the Watershed Planning Unit prioritize areas for additional in-depth, site-specific analyses of water rights, recharge, water use and streamflow through a water budget approach. These studies should focus on collecting and analyzing information required to refine water budget estimates in areas where:

- Existing or future demand exceeds local groundwater recharge
- Water right allocations exceed local ground-water recharge
- Water quality problems pose a risk to human health
- Streamflow is low or affected by groundwater withdrawals
- Areas of high interest by habitat, instream flow and water quality groups within the Watershed Planning Unit.

9.0 References

- Hamlet, Alan F. "Climate Change in the Columbia River Basin". JISAO Climate Impacts Group, University of Washington.
http://www.ce.washington.edu/~hamleaf/Hyd_and_Wat_Res_Climate_Change.html
- Hindes, R.. Wenatchee River Watershed Ranking Project. Watershed Characterization and Ranking Report. Chelan County Conservation District. Wenatchee, Washington, 1994
- Klohn Leonoff. Icicle Irrigation District Comprehensive Water Conservation Plan, 1993.
- Klohn Leonoff. Peshastin Irrigation District Comprehensive Water Conservation Plan, 1993.
- MWH/Montgomery Water Group, Inc. Lake Wenatchee Water Storage Feasibility Study, 2003.
- Montgomery Water Group, Inc. Greater Wenatchee Irrigation District Water Conservation Plan, 2000.
- Mote, Philip; Hamlet, Alan; Mantua, Nathan; Whitely-Binder, Lara. "Scientific Assessment of Climate Change: Global and Regional Scales". JISAO Climate Impacts Group, University of Washington. July 3, 2001.
- Mote, Philip; Holmberg, Molly; Mantua, Nathan. "Summary: Impacts of Climate Change in Pacific Northwest". Joint Institute for the Study of the Atmosphere and Ocean. November 1999.
- Scott, M. J.; Vail, L. W.; Jaksch, J.A., Anderson, K.K., Stockle, C. O.; "Climate Forecasts and Water for Regional Irrigated Agriculture Battelle Pacific Northwest Division, Washington State University, Pacific Northwest Regional Economic Conference. April 27-29, 2000.
- U.S. Department of Agriculture, 1992 Agricultural Census. From
<http://www.nass.usda.gov/census/census92/agrimenu.htm>.
- U.S. Department of Agriculture, Washington Agricultural Statistics Service, 2001 Washington 2001 Tree Fruit Survey, <http://www.nass.usda.gov/wa/wfstoc01.htm>
- U.S. Geological Survey and Washington Department of Ecology. Open-file Report 89-380, Miscellaneous Streamflow Measurements in the State of Washington, January 1961 to September 1985. 1989.
- U.S. Geological Survey, Historical Streamflow Data. From:
<http://wa.water.usgs.gov/data/realtime/historical.html>
- Washington Department of Ecology. Letter from Bob Barwin to Chumstick Creek Technical File. September 22, 1983.

Wildrick, Linton. Hydrogeology and Ground-Water Conditions in the Chumstick Drainage Basin. Washington State Department of Ecology, 1979.

Personal Communications

Beale, Perry. Washington Department of Agriculture, May 2003

Hoselton, Anna. Washington Department of Ecology, June-July 2003

Pobst, Dennis. Chiwawa Irrigation District, 2003

Smith, Rick. Wenatchee Reclamation District, April 2003

Teeley, Joel. Icicle and Peshastin Irrigation District April 2003