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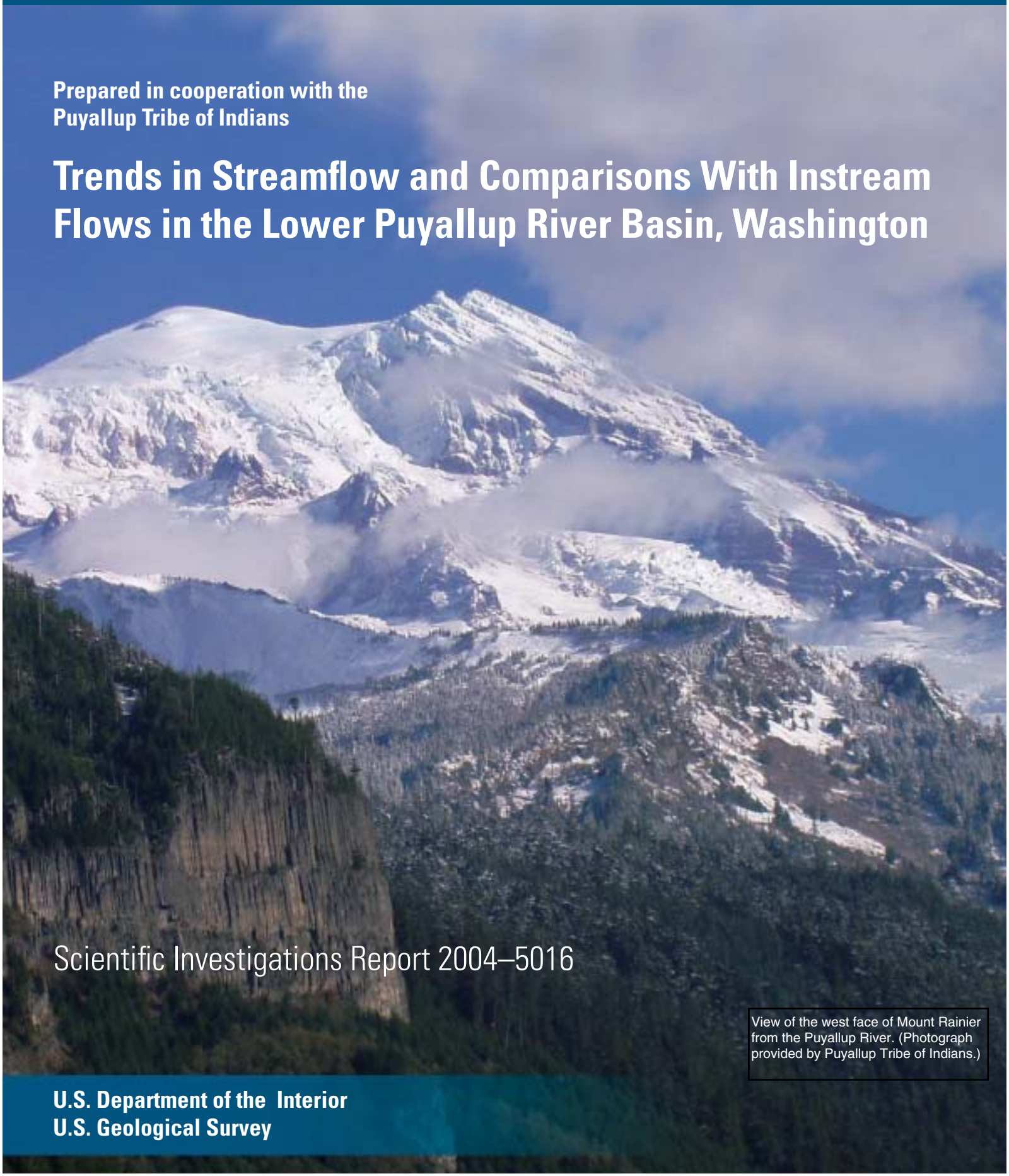
Trends in Streamflow and Comparisons With Instream Flows in the Lower Puyallup River Basin, Washington



Scientific Investigations Report 2004–5016

View of the west face of Mount Rainier from the Puyallup River. (Photograph provided by Puyallup Tribe of Indians.)

U.S. Department of the Interior
U.S. Geological Survey

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By Steve S. Sumioka

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Conversion Factors and Vertical Datum

Multiply	By	To obtain
acre	4,047	square meter
	0.4047	hectare
	0.4047	square hectometer
	0.004047	square kilometer
cubic foot (ft^3)	28.32	cubic decimeter
	0.02832	cubic meter
cubic foot per second (ft^3/s)	0.02832	cubic meter per second
inch (in.)	2.54	centimeter
	25.4	millimeter
foot (ft)	0.3048	meter
foot per mile (ft/mi)	0.1894	meter per kilometer
mile (mi)	1.609	kilometer
section (640 acres or 1 square mile)	259.0	square hectometer
square mile (mi^2)	259.0	hectare
	2.590	square kilometer
million gallons per day (Mgal/d)	0.04381	cubic meter per second

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

$$°C = (°F-32)/1.8.$$

Vertical coordinate information is referenced to NGVD29; horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Altitude, as used in this report, refers to distance above the vertical datum.

Trends in Streamflow and Comparisons With Instream Flows in the Lower Puyallup River Basin, Washington

By Steve S. Sumioka

Abstract

The Puyallup Tribe of Indians is interested in better understanding the water resources of the lower Puyallup River Basin in order to ensure sufficient water to meet Tribal and hatchery needs and make future water-resource decisions. The U.S. Geological Survey, in cooperation with the Puyallup Tribe, conducted a study to identify trends in streamflow in the lower Puyallup River Basin and to compare streamflows in the Puyallup River with regulatory minimum instream flows. Daily mean streamflow, monthly mean streamflow for October, and annual mean streamflow records from 1980 through 2001 for two gaging stations on the lower Puyallup River and one each on Clarks Creek and Swan Creek in the lower Puyallup River Basin were analyzed for temporal trends. Daily mean streamflow records were divided into data sets for the wet period (November through June) and the dry period (July through October) for analysis. Annual precipitation records from three National Weather Service stations and ground-water-level records from five wells in the lower Puyallup River Basin were analyzed to determine possible relations with streamflow. Daily mean streamflow, daily minimum streamflow, and unit-streamflow records for the Puyallup River for 1991 and 1992 were evaluated for the instream-flow analysis.

Significant temporal trends were not identified in daily mean streamflow records from the Puyallup River, Clarks Creek, or Swan Creek for the period of analysis. Trend analysis of monthly mean streamflow records for October at two gaging stations on the Puyallup River also indicated no significant trends for the period of analysis. Temporal trends were not evident in precipitation data from weather stations in the basin. A trend of decreasing depth to ground water with time (1995 through 1997) was identified in one well (20N/04E-34G01). This well is drilled to about 550 feet below land surface, and variations in water levels at this depth likely do not affect streamflow in the Puyallup River. Data limitations prevented the evaluation of possible correlations between streamflow in the Puyallup River and water use and land use in the study basin.

Daily mean, daily minimum, and unit-streamflow values were evaluated to determine how each measure of streamflow compared with instream-flow values. The occurrence of excursions (streamflow below the instream-flow value) was greatest when unit-streamflow values were compared with instream-flow values. The use of daily mean streamflow records may underestimate the occurrence of excursions under certain streamflow conditions.

The unit-streamflow hydrograph for the Puyallup River at Puyallup exhibits a distinct, regular pattern. The hydrograph closely mimics the hydrograph at Lake Tapps Diversion, on the White River, a tributary of the Puyallup River, which is the outflow from a power plant, suggesting that the power-plant outflow affects streamflow in the Puyallup River. Streamflow entering Lake Tapps through the White River Canal does not exhibit the same pattern as the Puyallup River or diversion. The influence of the White River Canal on streamflow in the Puyallup River appears to be obscured by operation of the Lake Tapps Diversion.

Introduction

The Puyallup Indian Reservation covers about 28 mi^2 (square miles) along the lower reaches of the Puyallup River, in Pierce County, Washington (fig. 1). Historically, much of the land within the reservation boundary was the delta of the river, but now, the lower reaches of the Puyallup River are channalized within dikes and much of the flood plain has been developed into heavy industrial, commercial, and agricultural areas, including the Port of Tacoma. Much of this development is within the boundary of the reservation. At the present time, little, if any, water from the Puyallup River is used for domestic supply. Some water is pumped from the river for agricultural irrigation, but no records are kept of the amounts pumped. The Puyallup River serves as a passageway for salmon and steelhead trout to their spawning areas farther upstream.

The Puyallup Tribe of Indians is interested in better understanding the water resources of the Puyallup River Basin, to ensure there is sufficient water to meet the needs of the reservation. Water-related needs of the Tribe include protecting the health and welfare of Tribal members and preserving and enhancing the Tribe's fishery. Understanding the water resources of the Puyallup River Basin also will provide insight into the management of water, for both economic development purposes and regulatory minimum instream flows for fish. The Tribe also needs such an understanding to make future water-resource decisions and to support negotiations with Federal, State, and local governments concerning their adoption of standards and plans required by the Puyallup Settlement Act and its implementing agreement for cross-boundary waters. The Tribe decided that assessing trends in streamflow in the Puyallup River and other streams in the lower Puyallup Basin over the past 10 to 20 years and determining possible reasons for the trends would be most useful to meet their needs. In addition, the Tribe wanted to compare flow in the Puyallup River with regulatory minimum instream flows for the river, established in the Washington Administrative Code (Chapter 173-510-030, WAC, accessed January 20, 2003 at URL http://www.leg.wa.gov/wac/).

The U.S. Geological Survey (USGS), in cooperation with the Puyallup Tribe of Indians, assessed trends in daily mean streamflow, monthly mean streamflow for October, and annual mean streamflow at four streamflow-gaging stations in the lower basin for the period 1980 through 2001. They also assessed trends in precipitation, ground-water levels, land use, and water use for possible association with streamflow trends. In addition, daily mean, daily minimum, and unit-streamflow records for the Puyallup River for 1991 and 1992 were compared with instream flow to determine the number of times streamflow fell below instream values and for how long.

The Washington Department of Ecology (WDOE) established minimum water flows or water levels for streams, lakes, or other public waters (instream flows) "for the purposes of protecting fish, game, birds or other wildlife resources, or recreational or aesthetic values of said public waters" (Chapter 90.010, Revised Code of Washington, accessed January 20, 2003, at URL http://www.leg.wa.gov/rcw/index.cfm).

The amount of water used for an instream-flow value is determined by considering the hydrology of the stream and the normal variations in flow over the course of the year. Thus, the instream flow of a river or stream may vary with time. In most cases, the WDOE and the Washington Department of Fish and Wildlife use the Instream Flow Incremental Methodology (IFIM) to determine what instream flows should be (Washington Department of Ecology, 2001). IFIM is a process that involves the use of computer models and other data to evaluate the amount of fish habitat at different flow levels in a river or stream (Bovee and others, 1998).

Instream-flow requirements have been established for the lower Puyallup River at river mile 6.6, the location of USGS gaging station 12101500 (Puyallup River at Puyallup). Instream flows also have been established for the Puyallup River near Alderton, about 3 mi (miles) east of Puyallup, and for the Carbon River near its confluence with the Puyallup River, about 11 mi upstream of station 12101500. Instream flows for the Puyallup River at Puyallup range in magnitude from 1,000 ft^3/s (cubic feet per second) for part of September, all of October, and part of November to 2,000 ft^3/s for all of May and June and part of July (table 1).

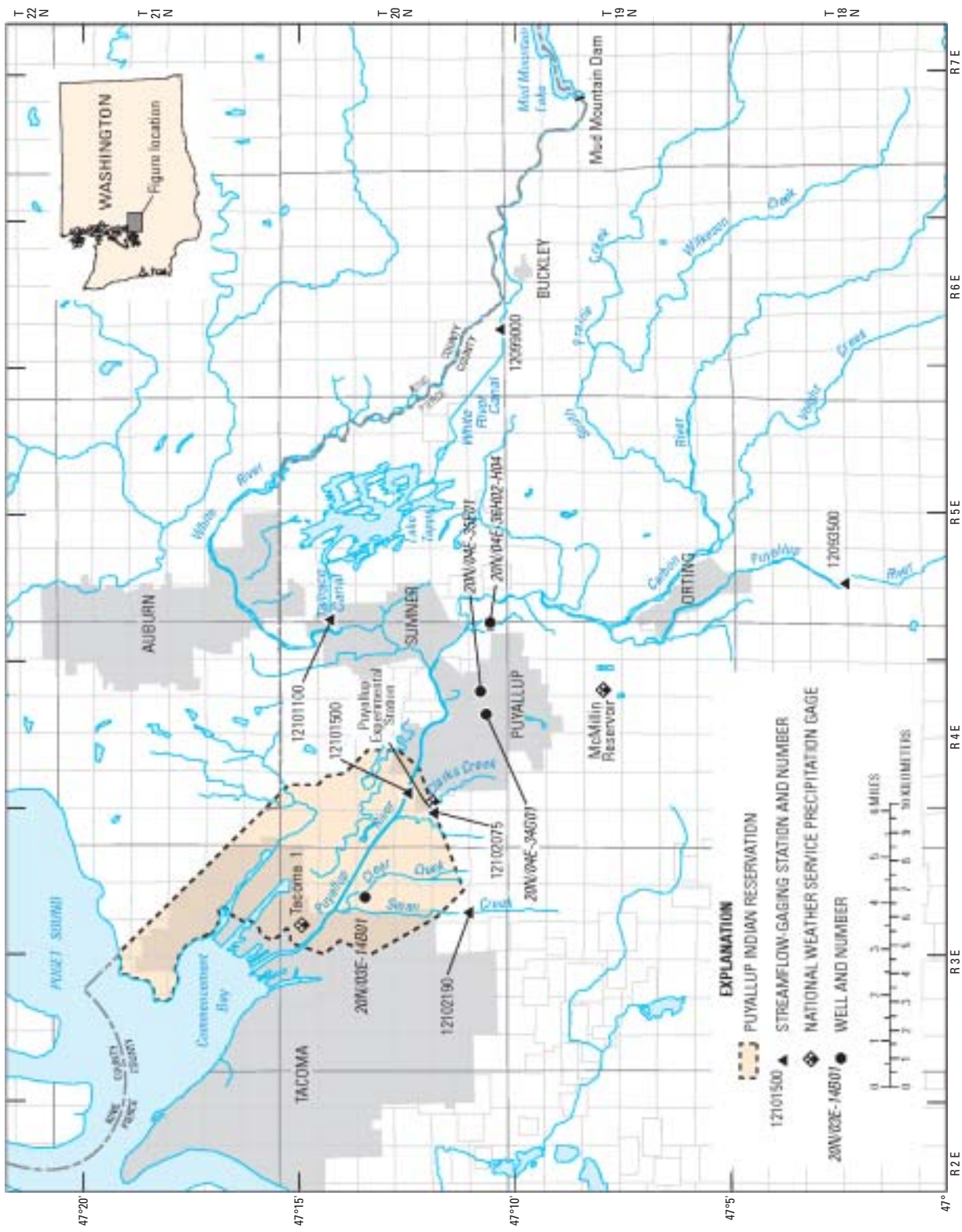

Figure 1. Map showing Locations of U.S. Geological Survey streamflow-gaging stations, National Weather Service precipitation gages, and wells used in analyses of streamflow trends and instream flow in the lower Puyallup River Basin, Washington.

Table 1. Instream flows established for the Puyallup River Basin, Washington

[Chapter 173-510 in the Washington Administrative Code, 1988, accessed January 22, 2003 at URL http://www.leg.wa.gov/wac/)]

Month	Day	Streamflow, in cubic feet per second		
		Puyallup River		Carbon River
		at Puyallup (12101500)	at Alderton (12096500)	
January	1	1,400	700	600
	15	1,400	700	550
February	1	1,400	750	550
	15	1,500	800	550
March	1	1,600	800	550
	15	1,700	850	550
April	1	1,800	900	600
	15	1,900	950	700
May	1	2,000	950	900
	15	2,000	1,000	900
June	1	2,000	1,050	600
	15	2,000	1,050	500
July	1	2,000	1,050	450
	15	1,750	1,050	400
August	1	1,500	900	350
	15	1,300	800	350
September	1	1,150	600	350
	15	1,000	500	350
October	1	1,000	500	350
	15	1,000	500	550
November	1	1,000	600	550
	15	1,100	700	600
December	1	1,200	700	700
	15	1,300	700	700

Purpose and Scope

This report presents the results of trend analyses of streamflow and the comparison of streamflow with regulatory minimum instream flow in the lower Puyallup River Basin. The trend analyses include assessing trends in streamflow at the Puyallup River at Puyallup (station 12101500), the Puyallup River near Orting (station 12093500), Clarks Creek at Tacoma Road near Puyallup (station 12102075), and Swan Creek at 80th Street East near Tacoma (station 12102190), and how trends in streamflow, if any, are related to any trends in precipitation and ground-water levels in the lower Puyallup River Basin. The available data did not allow estimating the effect of changes in water use and land use in the lower basin on streamflow. The instream-flow analysis included assessing the fraction of time streamflow in the Puyallup River at Puyallup does not meet instream-flow values.

The analysis of trends used streamflow records from January 1980 through September 2001 for the two Puyallup River gages, from March 1995 through September 2001 for Clarks Creek, and from October 1989 through April 2001 for Swan Creek. Precipitation records for three weather stations were obtained from the National Climatic Data Center, and ground-water levels were obtained from USGS databases. Water-use data compiled by the USGS in the State since 1975 and published at 5-year intervals were used, to the extent possible, to investigate temporal trends in water use.

Instream-flow assessments were made using daily mean, daily minimum, and unit (15-minute interval) streamflow values from station 12101500, Puyallup River at Puyallup. Selected unit-streamflow values from the Lake Tapps Diversion at Dieringer, Washington, (station 12101100) were used to assess the effects of releases from a power-generating dam on streamflow in the Puyallup River. Instream-flow assessments using unit values were conducted for calendar years 1991 and 1992, which represent average-flow and low-flow years, respectively.

Previous Studies

Konrad and Booth (2002) conducted hydrologic trend analyses on small lowland streams associated with urban development in the Puget Sound Basin. (The Puyallup River was not included in their study.) Several measures of streamflow were analyzed for trends, including annual mean, the fraction of time annual mean streamflow was exceeded, the annual 7-day low flow, and annual maximum streamflow. The results were mixed. Mean streamflow increased over time in two streams and decreased in one stream. The time annual mean streamflow was exceeded decreased over time in two streams. The annual, 7-day low flow increased over time in three streams but decreased in three others. Annual maximum streamflow increased over time in four streams.

A study by Mastin (1998) included trend analysis of flood data from South Prairie Creek, a tributary of the Carbon River. Analyzing annual peak flows, Mastin found no statistically significant trends in the peak-flow data.

Jones and others (1999) presented data on ground-water levels in the Puyallup River Basin, including five wells near the streams used in this study. Trends in ground-water levels were not readily apparent in those wells.

Kresch and Prych (1989) compiled streamflow statistics for streams on the Puyallup Indian Reservation, including Clarks and Swan Creeks. Their study presented values for low- and high-flow frequencies, mean monthly flows, mean annual flows, flow duration, and peak-flow frequencies.

Well-Numbering System

The USGS assigns numbers to wells in Washington that identify their location in a township, range, and section. Well number 20N/04E-36H02 indicates successively, the township (T. 20 N) and the range (R. 04 E) north and east of the Willamette Base Line and Meridian (fig. 2). The first number following the hyphen indicates the section (36) within the township, and the letter (H) following the section number gives the 40-acre subdivision of the section. The number (02) following the letter is the sequence number of the well within the 40-acre subdivision. This number indicates that the well was the second one inventoried by USGS personnel in that 40-acre subdivision.

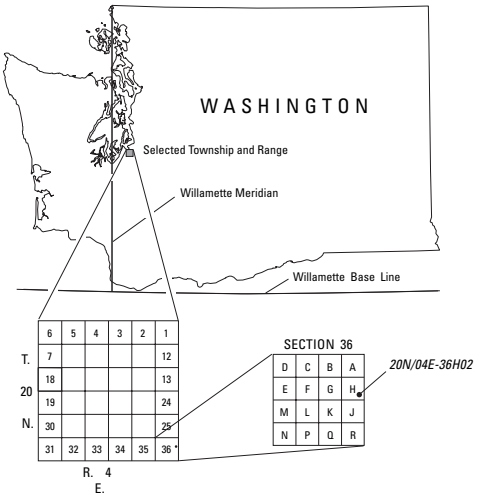

Figure 2. Diagram showing Well-numbering system used in Washington.

Description of Study Area

The Puyallup River originates from the Puyallup glacier of Mount Rainier, in the Cascade Range, and empties into Puget Sound at Commencement Bay. The study area consists primarily of the flood plain of the lower Puyallup River (fig. 1), where altitudes range from 0 to about 300 ft (feet) above NGVD 29 at streamflow-gaging station 12093500 (Puyallup River near Orting). Uplands bordering the flood plain, where Clarks and Swan Creeks originate, reach altitudes of about 500 ft above NGVD 29. In general, the lower Puyallup River Basin can be characterized as having a relatively flat flood plain, ranging in width from about 1 to 3 mi, with a gradient of about 8 ft/mi (feet per mile).

The Puyallup River has two major tributaries, the White and Carbon Rivers (fig. 1). The White River enters the Puyallup River near the city of Puyallup and the Carbon River enters about 18 river miles from the mouth of the Puyallup, between Puyallup and Orting. Mud Mountain Dam, at about river mile 28 on the White River, affects flow in the Puyallup River, and water is removed from the White River at about river mile 24 and stored in Lake Tapps for power generation, then returned to the White River at about river mile 4.

Most of the land within the boundary of the reservation, excluding the tide flats area, is classified as low- and high-density urban (44 percent), grass and other natural cover (25 percent), and agricultural (19 percent) (Jones and others, 1999).

The lower Puyallup River Basin has a temperate marine climate, with warm, dry summers and cool, wet winters. The mean annual temperature is about 52°F (degrees Fahrenheit). The warmest month is July, with an average temperature of about 64°F; the coolest month is January, with an average temperature of about 39°F (Western Regional Climate Center, 2003).

The long-term (1931-95) average annual precipitation at the Washington State University Experimental Station in Puyallup is 39.9 in., about 70 percent falling during the months of October through March (Western Regional Climate Center, 2003). Snow occasionally falls in the area, but it soon melts.

Data

The analyses of trends in streamflow included data on streamflow, precipitation, ground-water levels, water use, and land use. The streamflow data are from four USGS-operated gaging stations in the lower Puyallup Basin: Puyallup River near Orting (station 12093500), Puyallup River at Puyallup (station 12101500), Clarks Creek at Tacoma Road, near Puyallup (station 12102075), and Swan Creek at 80th Street East (station 12102190), near Tacoma.

Station 12093500 is located 600 ft downstream from the highway bridge crossing the river, about 4 mi south of Orting (fig. 1). It is equipped with a float-activated electronic data-logger (EDL) recording river stage at 15-minute intervals in a 3-ft-diameter corrugated metal pipe. The drainage area of the Puyallup River at this point is 172 mi^2.

Station 12101500 is located about 0.8 mi upstream from the confluence with Clarks Creek. It is equipped with a float-activated EDL recording river stage at 15-minute intervals in a 4×4-ft concrete well. River-stage data are sent to the USGS office in Tacoma by satellite telemetry. The drainage area of the Puyallup River at this point is 948 mi^2.

Station 12102075 is located at a private bridge at the end of Tacoma Road, 1.0 mi northwest of Puyallup. It is equipped with a float-activated EDL recording river stage at 15-minute intervals in an 18-in.-diameter corrugated metal pipe. The drainage area of Clarks Creek at this point is 13.0 mi^2.

Station 12102190 is located downstream from the 80th Street East highway bridge crossing Swan Creek, 5.1 miles south-southwest of Tacoma. It is equipped with a float-activated EDL recording river stage at 15-minute intervals in a 4-in.-diameter steel pipe. The drainage area of Swan Creek at this point is 2.35 mi^2.

The streamflow data used for the trend analysis included daily mean streamflows, mean streamflows for each October in the period of record—typically a month with low streamflow, and annual mean streamflows. A streamflow-gaging station records gage height (river stage) every 15 minutes, and the gage height is applied to a stage-discharge curve or rating table to compute streamflow. The stage-discharge curve is constructed by plotting individual instantaneous discharge measurements from the station with corresponding gage heights. From this curve, a rating table is prepared, from which the streamflow for any gage height within the range of measurements can be obtained.

Daily mean streamflow is the arithmetic mean of streamflow for a specified day. Daily mean streamflows for the period of record for gaging stations in Washington can be viewed and downloaded from the USGS Web site http://wa.water.usgs.gov/data/realtime/historical.html. Monthly mean streamflow for October is the arithmetic mean of daily mean streamflow for each October, computed for each year of the period of record. Annual mean streamflow is the arithmetic mean of daily mean streamflow values computed for each year, for this study from 1980 through 2001 (tables 7 and 8, at back of report).

Annual precipitation records are from National Weather Service stations located at the Puyallup Experimental Station, McMillin Reservoir, and Tacoma (Tacoma 1) (fig. 1). Precipitation records were obtained from a National Climatic Data Center data disk (Hydrosphere Data Products, 2002).

Ground-water-level data are from the USGS Ground-Water Site Inventory (GWSI) database. Water levels were measured periodically in the wells selected for this study. The periods of record for the wells range from 1995 through 1997 to 1938 through 1997, and those portions of the records corresponding to selected streamflow records were in the analysis.

Water-use data, compiled and published by the USGS every 5 years, are from the USGS Web site http://wa.water.usgs.gov/data/wuse/index.htm. The land-use data were derived from aerial photographs taken in the 1970s and from LANDSAT data collected in 1992.

The analysis of instream flow included daily mean and daily minimum streamflows and unit-streamflow values for station 12101500. Daily minimum streamflows were computed by applying the lowest gage height recorded for each day to the stage-discharge curve or rating table. Unit-streamflow values were computed from gage heights that, for station 12101500, were recorded at 15-minute intervals. Because of the large number of gage-height records generated, unit-value and daily minimum streamflow data are stored for a limited amount of time. For station 12101500, the earliest unit-value record is November 19, 1987.

To keep data-management tasks at a reasonable level, only 2 years of records—1991 and 1992—were used for the unit-values analysis in this study. These 2 years were selected on the basis of the long-term mean annual streamflow for station 12101500. The mean annual streamflow for this station for the period of record, calendar years 1915-2001, is 3,320 ft^3/s. The 2 years selected represent an average streamflow year (1991) and a year when streamflow was below average (1992). The annual mean streamflow for 1991 was 3,535 ft^3/s; the annual mean streamflow for 1992 was 2,330 ft^3/s (fig. 3).

Unit-streamflow values for October 26-November 10, 1992, for stations 12101500 and 12093500 and for Lake Tapps Diversion at Dieringer (12101100) and White River Canal at Buckley (12099000) were used to determine the origin of the distinct flow pattern at station 12101500. Station 12101100 is equipped with a float-activated data-collection platform and an EDL. River-stage data are sent to the USGS in Tacoma by satellite telemetry. Station 12099000 is equipped with a float-activated data-collection platform and an EDL.

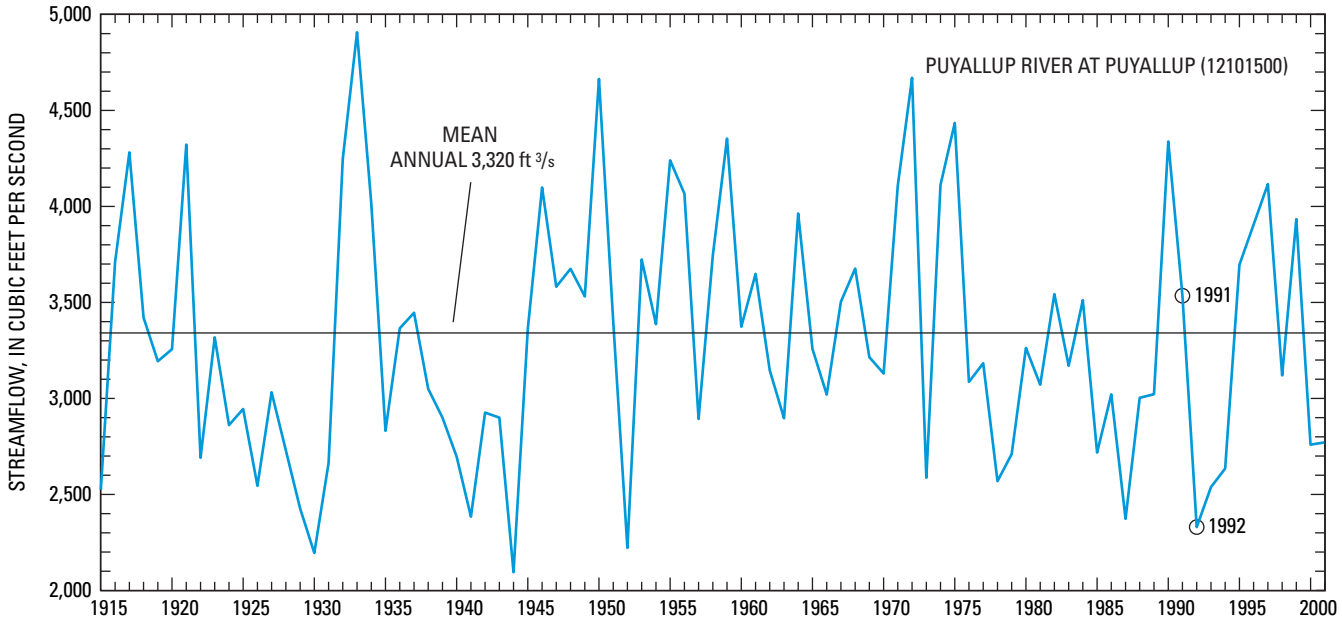

Figure 3. Graph showing Annual mean streamflow at gaging station Puyallup River at Puyallup (station 12101500), Washington, for the period 1915-2000.

Trend Analysis

The analysis of trends in streamflow in the lower Puyallup River Basin involved identifying changes in streamflow over time and relating them to possible changes in precipitation, ground-water levels, water use, and land use over time. To represent seasonal differences, daily mean streamflow for stations 12101500 and 12093500 on the Puyallup River and for 12102075 on Clarks and 12102190 on Swan Creeks were separated into a dry period (July 1 through October 31) and a wet period (November 1 through June 30) on the basis of streamflow differences. In addition, mean monthly streamflows for October, representing low flow, were computed for the two Puyallup River stations and assessed for trends. Mean monthly streamflows for October also were computed for the Clarks and Swan Creek records, but the resulting data sets were not long enough for trend analysis (six values for the Clarks Creek record and nine values for Swan Creek).

Temporal trends in streamflow data were assessed using Kendall's tau correlation coefficient (Helsel and Hirsch, 1993). Values of Kendall's tau may range from +1 to -1. A value of +1 indicates continuous increase in streamflow with time and a value of -1 indicates continuous decrease in streamflow with time. Values of tau reflect the relative strength of the monotonic association between streamflow and time. Kendall's tau is not an effective test for detecting trends that change direction during the period being investigated.

The statistical significance of trends was evaluated in terms of the probability (p) that observed trends in streamflow occurred by chance. A p-value of 0.05 indicates a 95-percent probability that an observed streamflow trend is not the result of chance occurrence. Streamflow trends with p-values of 0.05 or less are considered significant; streamflow trends with p-values greater than 0.05 are not considered significant.

Hydrologic Trends

No statistically significant temporal trends were identified in daily mean streamflow records from the Puyallup River gages (stations 12101500 and 12093500) and the gaging stations on Clarks (station 12102075) and Swan Creeks (station 12102190) for the period of analysis. For the wet period, Kendall's tau values ranged from –0.18 to 0.07 and p-values ranged from 0.14 to 0.86; for the dry period, they ranged from –0.05 to 0.14 and 0.45 to 0.88, respectively, (table 2). Kendall's tau for daily mean flows on Clarks Creek for the wet period was the greatest in magnitude (–0.18), indicating a slight downward trend, but the decrease in streamflow was not statistically significant (p-value of 0.14).

Table 2. Kendall's tau and *p*-values for streamflow records for a wet and a dry period for the Puyallup River and Clarks and Swan Creeks, lower Puyallup River Basin, Washington

Station No.	Station name	Period of record for analysis (calendar year)	Wet period (November–June)		Dry period (July–October)	
			Kendall's tau	*p*-value	Kendall's tau	*p*-value
12101500	Puyallup River at Puyallup	July 1980 - June 2001	0.02	0.86	0.02	0.87
12093500	Puyallup River near Orting	July 1980 - June 2001	.07	.44	-.05	.59
12102075	Clarks Creek at Tacoma Road	March 1995 - September 2001	-.18	.14	.03	.88
12102190	Swan Creek at 80th Street East, Tacoma	October 1989 - April 2001	-.06	.68	.14	.45

Trend analysis of monthly mean streamflows for October at the two stations on the Puyallup River (fig. 4) indicates no significant trends for the period of analysis. The Kendall's tau and *p*-value for station 12101500 were 0.25 and 0.12, respectively, and for station 12093500, 0.11 and 0.49, respectively (table 3). Trend analysis of annual mean streamflows at the two Puyallup River stations also showed no statistically significant trends (table 3).

Precipitation records corresponding as closely as possible to the period of analysis of streamflow records were examined for temporal trends. No statistically significant trends in precipitation were found (table 4).

The analysis of ground-water-level data showed a trend of rising ground-water levels with time (1995 through 1997) in well 20N/04E-34G01 (table 5 and fig. 5). This well is drilled to about 550 ft below land surface, and variations in water levels at this depth probably do not affect streamflow in the Puyallup River. Statistically significant trends were not identified in ground-water-level records (1995 through 1997) for the other wells in the study area.

Water Use

Local and State agencies have been collecting water-use data in the study area since 1965. Over the course of this period, categories of water use and reporting units (drainage basin, county, or hydrologic unit) have changed. Since 1985, data have been reported by hydrologic unit. The Puyallup River and its tributaries, including the White and Carbon Rivers, and the Puyallup Indian Reservation are included in one hydrologic unit.

In 1985, total water use for the hydrologic unit was estimated to be about 36 Mgal/d (million gallons per day) (http://wa.water.usgs.gov/data/wuse/main.huc8.85.txt). This estimate includes public and self-supplied domestic, industrial, and irrigation uses. In 2000, the estimated water use was about 42 Mgal/d (R.C. Lane, U.S. Geological Survey, written commun., 2003). However, these estimates cannot be related to streamflow in the Puyallup River, because much of the water used in the hydrologic unit comes from outside the Puyallup River Basin. This water is provided by the city of Tacoma from the Green River. The amount of water provided is not quantified, so it is not possible to determine what proportion of water used in the Puyallup River Basin originates from the Green River and what is supplied by the Puyallup River and its tributaries (R.C. Lane, U.S. Geological Survey, written commun., 2003).

Land Use

Two sets of land-use data were evaluated for use in assessing a relation between changing land use and streamflow trends in the Puyallup River Basin, one set derived from aerial photographs taken in the 1970s and the other from LANDSAT data collected in 1992. The two data sets use different land-use categories and are at different resolutions, therefore they could not be used to relate apparent changes in land use to streamflow. For example, comparison of the two data sets indicates a decrease in combined urban and suburban land use in the study area between 1970 and 1992, from about 16 to about 13 mi^2. However, this trend is unlikely, because population growth and an increase in associated urban and suburban development have been documented in the study area. The trend of decreasing urban and suburban land use is more likely the result of unquantifiable differences in methods used to select land-use categories and differences in resolution between the two data sets.

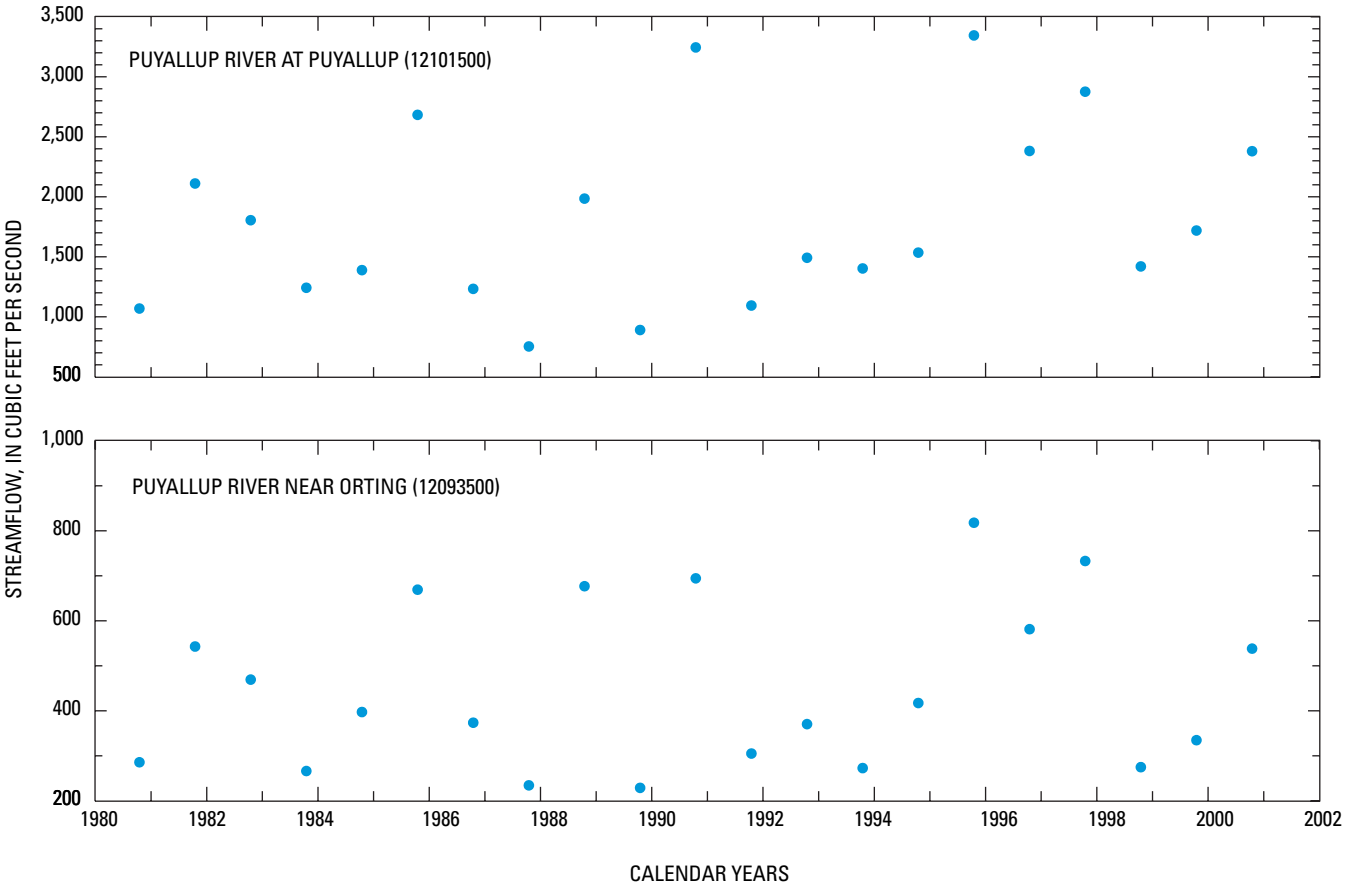

Figure 4. Graphs showing October mean streamflow at gaging stations Puyallup River at Puyallup (station 12101500) and Puyallup River near Orting (station 12093500) in the lower Puyallup River Basin, Washington, 1980 through 2001.

Table 3. Kendall's tau and *p*-values for October mean and annual mean streamflow records for the Puyallup River, Washington, 1980–2001

Station No.	Station name	Period of record for analysis (calendar year)	October mean		Annual mean	
			Kendall's tau	*p*-value	Kendall's tau	*p*-value
12101500	Puyallup River at Puyallup	1980-2001	0.25	0.12	0.03	0.87
12093500	Puyallup River near Orting	1980-2001	.11	.49	.03	.87

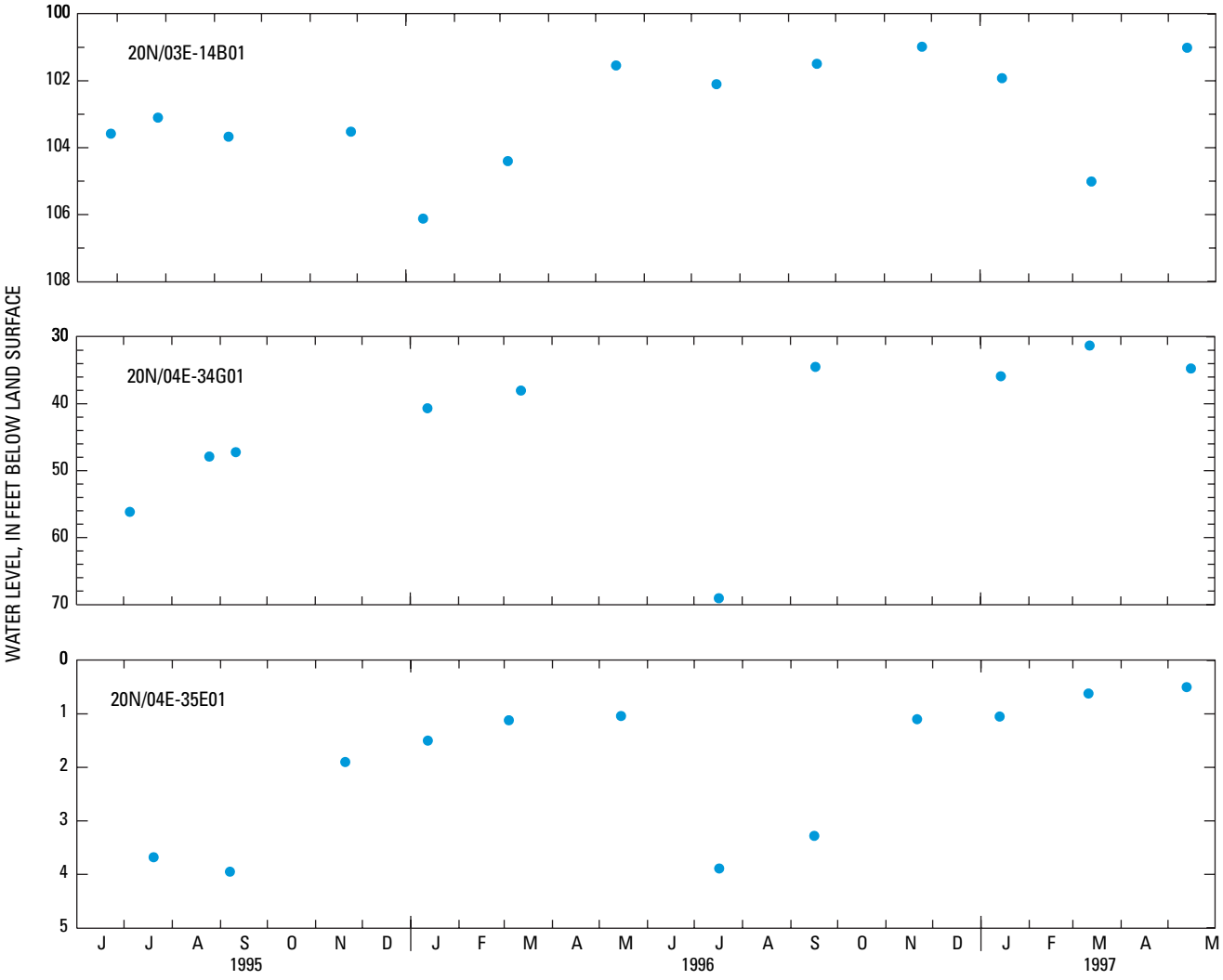

Figure 5. Graphs showing Ground-water levels in selected wells in the lower Puyallup River Basin, Washington, 1995 through 1997.

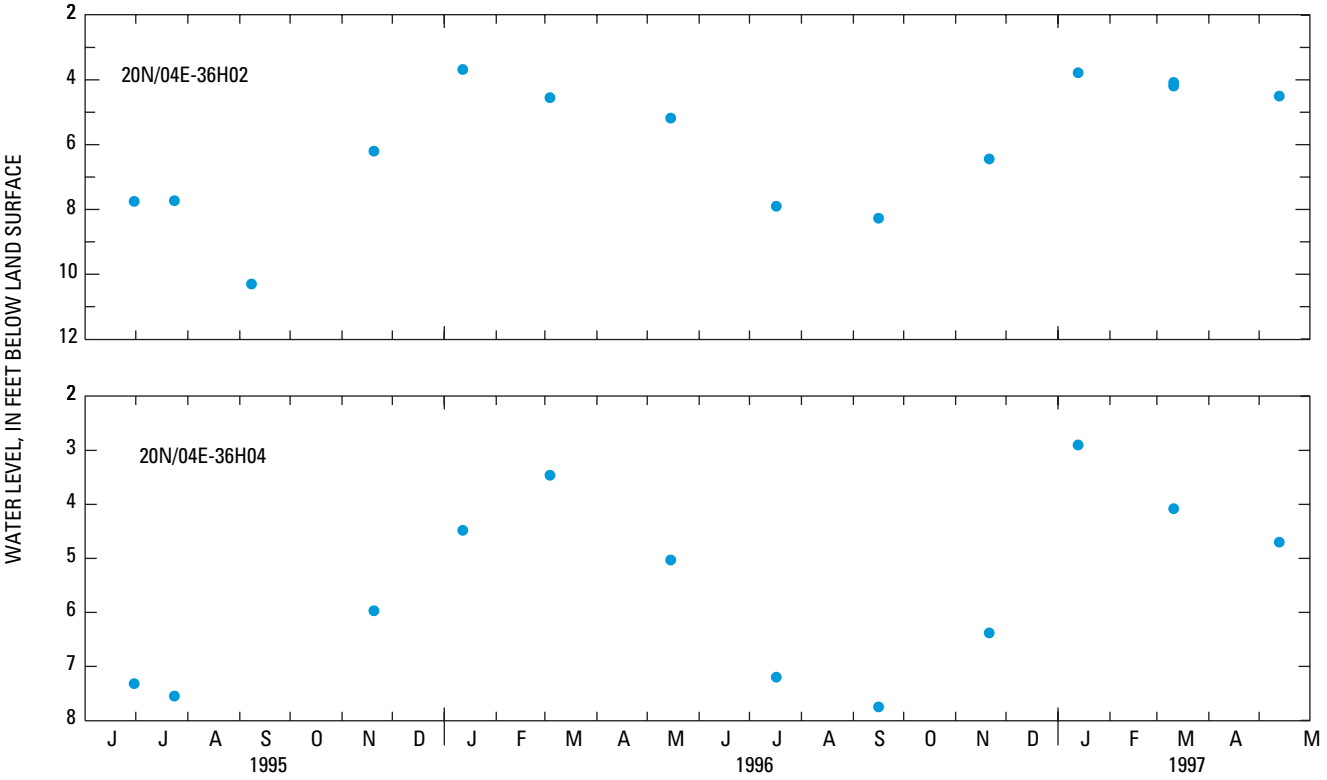

Figure 5.—*Continued.*

Table 4. Kendall's tau and *p*-values for annual precipitation recorded at National Weather Service stations in and near the lower Puyallup River Basin, Washington

Station name	Period of record for analysis (calendar year)	Kendall's tau	*p*-value
Puyallup Experimental Station	1980-1994	-0.21	0.32
McMillin Reservoir	1980-2000	.06	.72
Tacoma 1	1982-2001	.09	.69

Table 5. Kendall's tau and *p*-values for periodic ground-water-level measurements from wells in the lower Puyallup River Basin, Washington, 1995 through 1997

Well No.	Number of water-level measurements	Kendall's tau	*p*-value
20N/03E-14B01	13	0.33	0.11
20N/04E-34G01	10	.64	.01
20N/04E-35E01	12	.54	.13
20N/04E-36H02	13	.28	.18
20N/04E-36H04	12	.20	.39

Instream-Flow Analysis

The instream-flow analysis involved identifying daily mean, daily minimum, and unit-streamflow values that fell below regulatory minimum instream flows and the fraction of time that streamflow is below instream flow. (A streamflow value that falls below the instream flow is called an excursion.) The analysis used streamflow records for gaging station 12101500, Puyallup River at Puyallup, in the analysis because this station is most representative of conditions in the part of the lower Puyallup River within the reservation.

Instream flows are specifically set for the 1st and the 15th day of every month. Instream flows for non-specified days may be estimated visually from a plot of the set values (fig. 6) or determined by linear interpolation between the set values (Thomas Culhane, Washington Department of Ecology, oral commun., 2003), which was the method used for this study. Comparisons of unit-streamflow values (15-minute intervals) and instream flows are based on the use of a single instream-flow value for each day of comparison. Instream-flow values used in this study do not reflect variations resulting from linear interpolation within a given day (24-hour period).

For 1991, an average streamflow year, 19 of 365 daily mean streamflow values (about 5 percent) fell below the instream-flow value for that day (table 6, table 7, and fig. 7), 76 of 365 daily minimum streamflow values (about 21 percent) fell below the instream-flow value (table 6 and fig. 8), and 2,872 of 35,040 unit-streamflow values (about 8 percent) fell below the instream-flow value (table 6 and fig. 9).

For 1992, a below-average streamflow year, 74 of 366 daily mean streamflow values (about 20 percent) fell below the instream-flow value (fig. 7, table 6, and table 8), 181 of 366 daily minimum streamflow values (about 50 percent) fell below the instream-flow value (fig. 8 and table 6), and 7,900 of 35,136 unit-streamflow values (about 23 percent) fell below the instream-flow value (fig. 9 and table 6).

The amount of time that streamflow is below the instream-flow value can be determined by multiplying each unit-streamflow excursion (unit-streamflow value below instream-flow value) by 15 minutes. Comparisons of unit-streamflow values (15-minute intervals) and instream flows are based on the use of a single unit-streamflow value for each 15-minute interval of comparison. Although streamflow may change during a 15-minute interval, these changes are expected to be small compared to the total streamflow. On the basis of this assumption, streamflow during 1991 was below the instream-flow value a total of 718 hours, about 30 days.

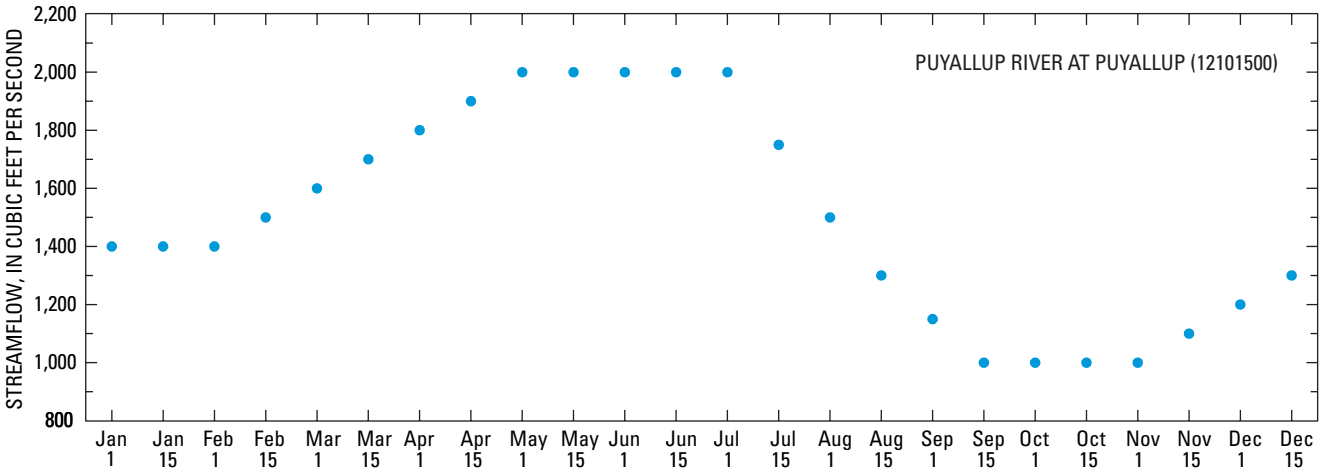

Figure 6. Graph showing Instream-flow values at gaging station Puyallup River at Puyallup (12101500) in the lower Puyallup River Basin, Washington.

Instream-flow values are listed in Chapter 173-510 of the Washington Administrative Code (accessed January 22, 2003 at URL http://www.leg.wa.gov/wac/).

Table 6. Comparison of daily mean, daily minimum, and unit-streamflow values with instream-flow values for gaging station Puyallup River at Puyallup (12101500), Washington, 1991 and 1992

	Streamflow, in cubic feet per second					
	1991			1992		
	Daily mean	Daily minimum	Unit	Daily mean	Daily minimum	Unit
Total number	365	365	35,040	366	366	35,136
Total number below instream flow	19	76	2,872	74	181	7,900
Percent below instream flow	5	21	8	20	50	23

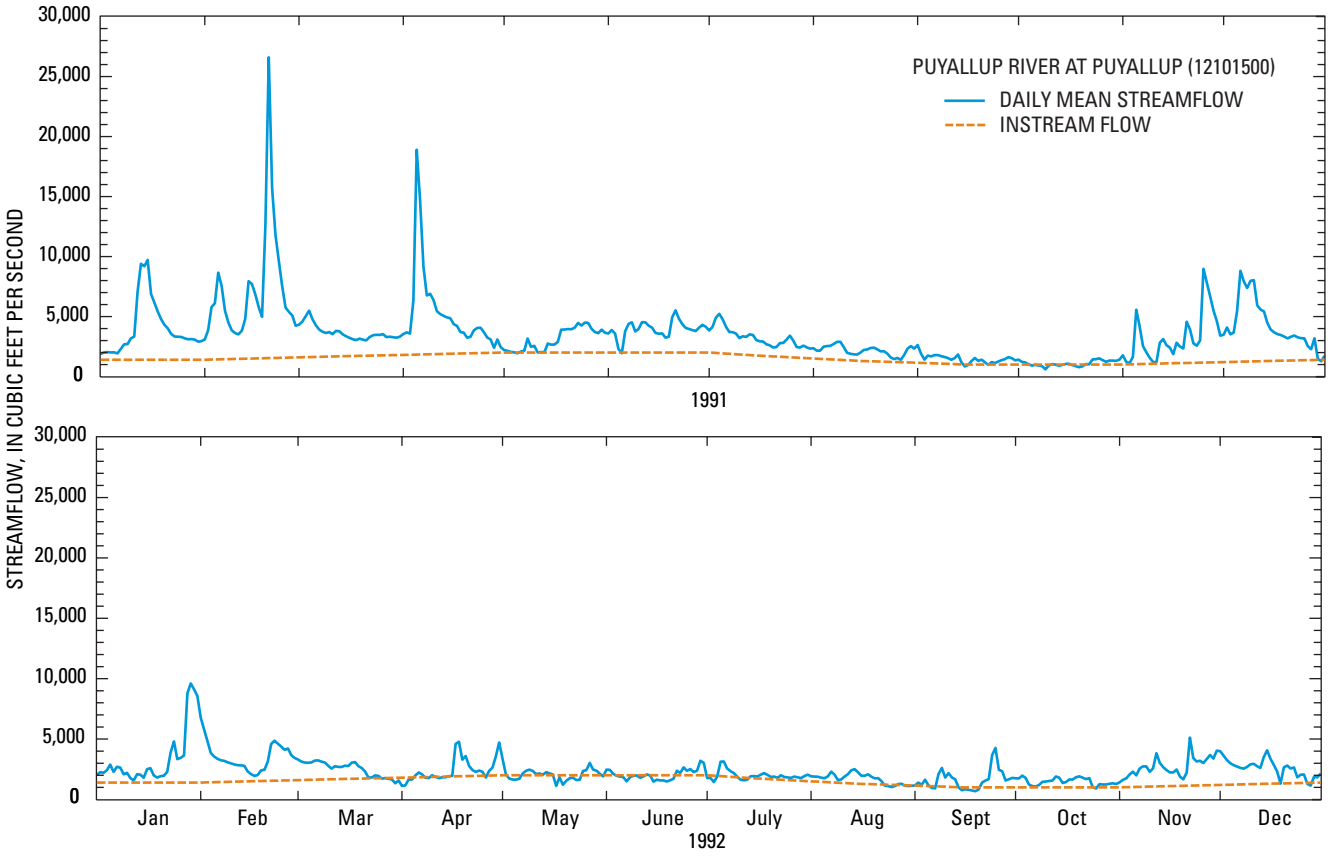

Figure 7. Graphs showing Daily mean streamflow and instream flow at gaging station Puyallup River at Puyallup (station 12101500) in the lower Puyallup River Basin, Washington, 1991 and 1992.

The largest excursion occurred on October 28, from 7:15 a.m. to 8:15 a.m., when streamflow (518 ft^3/s) was 482 ft^3/s below the instream-flow value of 1,000 ft^3/s. The daily value for October 28 was 1,330 ft^3/s, 300 ft^3/s above the instream-flow value. During 1992, streamflow was below the instream-flow value a total of 1,975 hours, about 82 days. The largest excursion occurred on June 16, from 4:00 a.m. to 8:30 a.m., when streamflow (884 ft^3/s) was 1,116 ft^3/s below the instream-flow value of 2,000 ft^3/s. The daily value for June 16 was 1,630 ft^3/s, 370 ft^3/s below the instream-flow value.

The duration of periods when streamflow is below instream-flow values was assessed by examining the unit-streamflow-value record. Of the 35,040 unit values recorded in 1991, the longest span of consecutive unit values below the instream-flow value occurred from 7:30 p.m. on October 18 to 3:30 p.m. on October 20 (fig. 9). During that period, 176 consecutive unit values were below the instream-flow value. For 1991, the average number of consecutive unit values below the instream-flow value was 41.

In 1992, the longest span of consecutive unit-streamflow values below the instream-flow value occurred from 3:30 p.m. on May 2 to 11:15 a.m. on May 7 (fig. 9). During that period 464 consecutive unit values were below the instream-flow value. The average number of consecutive unit values below the instream-flow value was 51.

A comparison of the hydrographs for daily mean streamflow and unit streamflow with the hydrograph for instream flow demonstrates that, under certain streamflow conditions, excursions below the instream-flow value may be identified only when unit-streamflow values are considered (fig. 10). For a 15-day period, October 26 through November 10, 1992 (table 9, at back of report), no daily mean streamflow values fell below the instream-flow value. However, during the same 15-day period, unit-streamflow values fell below the instream-flow value on 8 days (October 26 to November 1, and November 4).

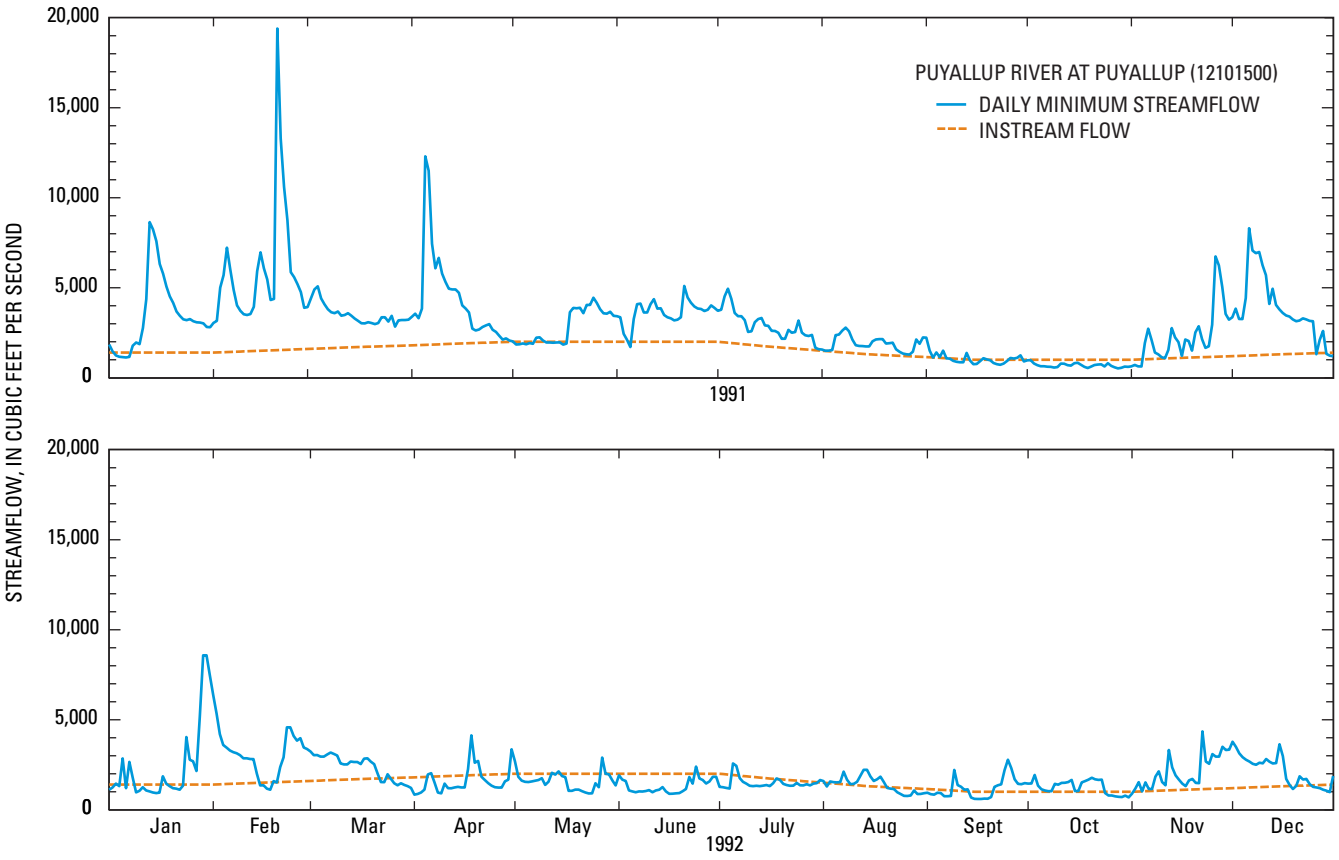

Figure 8. Graphs showing Daily minimum streamflow and instream flow at gaging station Puyallup River at Puyallup (station 12101500) in the lower Puyallup River Basin, Washington, 1991 and 1992.

The hydrograph of unit streamflow in the Puyallup River shows a pattern of rapid decrease, reaching a minimum at the start of a day (midnight), followed by a rapid increase to fairly uniform flow until the next midnight. An example of this pattern is shown in figure 10, for October 26 through November 10 but is still evident in the hydrograph from November 1 through November 9. Most unit-streamflow excursions below the instream-flow value occur during the low-flow part of this pattern. Very little rain (less than 0.1 in.) fell in the Puyallup River Basin during the 5 days preceding October 26, and the hydrograph of the Puyallup River from October 26 through October 29 most likely represents base-flow conditions (streamflow derived from ground-water discharge), melt water from Mt. Rainier, and the operation of Lake Tapps Diversion. Beginning on October 29 (and continuing to the end of the year), rain was recorded almost every day in the basin, increasing runoff to the river and disrupting the uniform pattern of streamflow evident in first part of the hydrograph. The hydrograph of daily mean streamflow does not exhibit the rapid decrease and increase observed in the unit-streamflow hydrograph because the data points used to construct the hydrograph represent the arithmetic mean of unit-streamflow values for each day, and therefore the full range of daily flows is not reflected in the hydrograph.

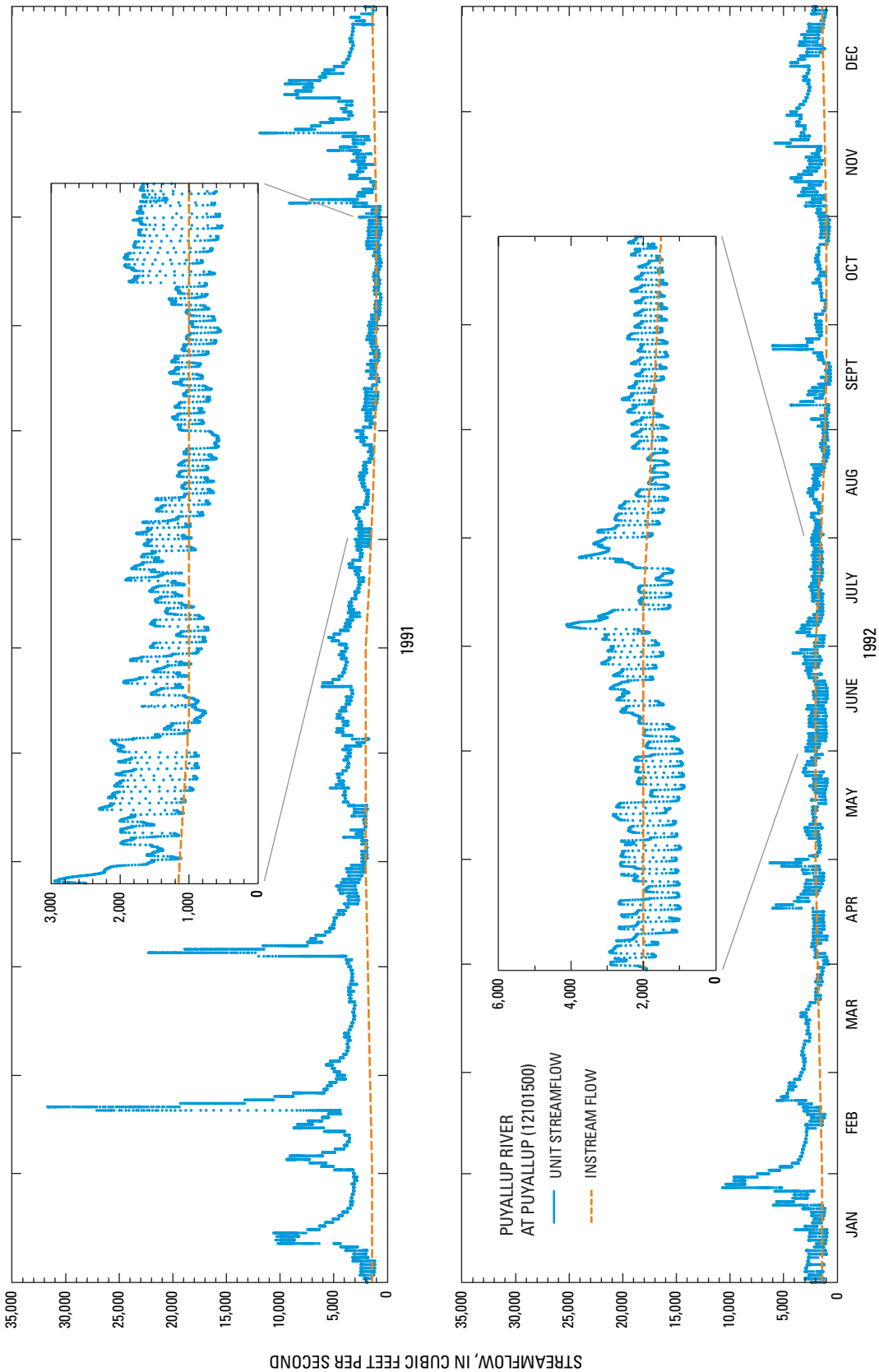

Figure 9. Graphs showing Unit-streamflow values and instream flow at gaging station Puyallup River at Puyallup (station 12101500) in the lower Puyallup River Basin, Washington, 1991 and 1992.

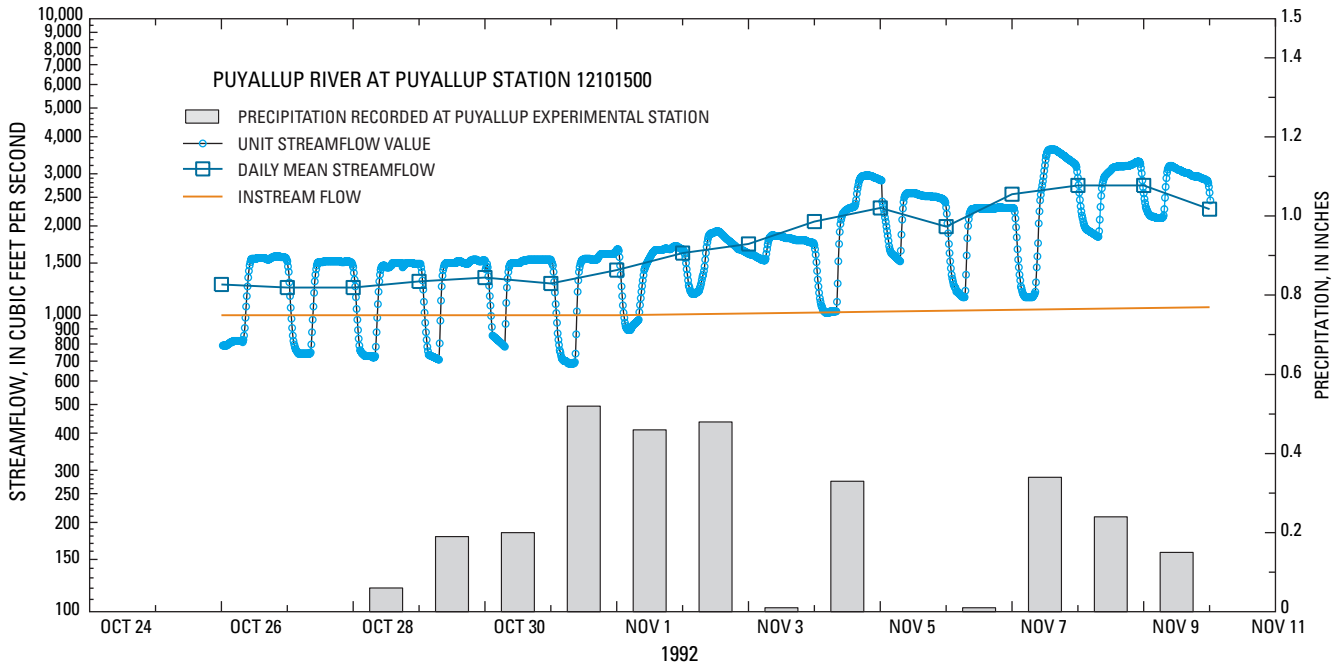

Figure 10. Graph showing Relation between daily mean streamflow, unit values, and instream flow at gaging station Puyallup River at Puyallup (12101500) in the lower Puyallup River Basin, Washington.

The unit-streamflow hydrograph for the Puyallup River at Puyallup has a distinct, regular pattern during low-flow periods that is similar to the Lake Tapps Diversion hydrograph. The hydrograph of unit-streamflow values for the Puyallup River at Puyallup was compared with those for the Puyallup River near Orting (station 12093500), White River Canal at Buckley (station 12099000), and Lake Tapps Diversion at Dieringer (station 12101100) for a 16-day period (October 26 through November 10, 1992) to determine the origin of the pattern (fig. 11). Station 12093500 represents flow in the Puyallup River before its confluence with the White River, station 12099000 represents flow that is diverted from the White River into Lake Tapps and the power plant, and station 12101100 represents flow from Lake Tapps back into the White River before its confluence with the Puyallup River. The hydrograph of Puyallup River streamflow closely mimics the hydrograph at Lake Tapps Diversion, which is the outflow from the power plant, suggesting that outflow from the power plant affects streamflow in the lower Puyallup River. Streamflow entering Lake Tapps by way of the White River Canal, even though completely regulated, does not have the same, or even a similar, pattern as the Puyallup River or diversion. The influence of White River Canal on streamflow in the Puyallup River appears to be obscured by operation of the Lake Tapps Diversion.

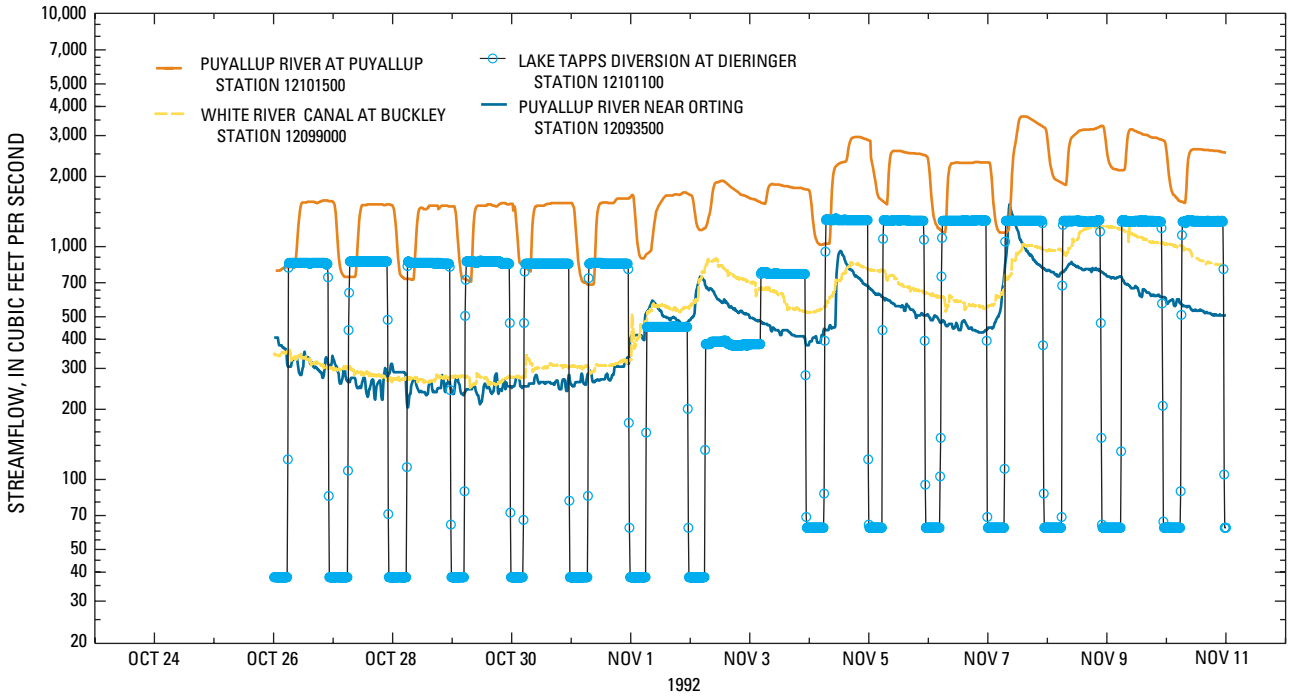

Figure 11. Graph showing Unit-streamflow values from gaging stations Puyallup River at Puyallup, Puyallup River near Orting, Lake Tapps Diversion, and White River Canal and precipitation recorded at the Puyallup Experimental Station in the Puyallup River Basin, October 26 through November 11, 1992.

Summary

The U.S. Geological Survey conducted a study, in cooperation with the Puyallup Tribe of Indians, to identify trends in streamflow in the lower Puyallup River Basin and to compare streamflows in the Puyallup River with regulatory minimum instream flows. Daily mean streamflow, monthly mean streamflow for October, and annual mean streamflow records from 1980 through 2001 for four gaging stations in the lower Puyallup River Basin were analyzed for temporal trends. Daily mean streamflow records were grouped into wet (November through June) and dry periods (July through October) data sets for analysis. Temporal trends in streamflow data were evaluated using Kendall's tau correlation coefficient. The statistical significance of trends was evaluated in terms of the probability (p) that observed trends in streamflow occurred by chance. Daily mean streamflow, daily minimum streamflow, and unit-streamflow records for the Puyallup River for 1991 and 1992 were evaluated for the instream-flow analysis.

Annual precipitation records from three National Weather Service stations in the lower Puyallup River Basin and groundwater level records from five wells in the basin were analyzed to determine possible relations with streamflow in the basin. Insufficient water-use and land-use data were available to calculate possible correlations with streamflow in the basin.

Daily mean streamflow records from the Puyallup River, Clarks Creek, and Swan Creek did not display any statistically significant temporal trends for the period of analysis. Kendall's tau values ranged from –0.18 to 0.07 and p-values ranged from 0.14 to 0.86 for the wet periods; Kendall's tau and p-values ranged from –0.05 to 0.14 and 0.45 to 0.88, respectively, for the dry periods. Trend analysis of monthly mean streamflows for October at the two stations on the Puyallup River indicate no significant trends for the period of analysis. The Kendall's tau and p-value for Puyallup River at Puyallup were 0.25 and 0.12, respectively, and for station Puyallup River at Orting were 0.11 and 0.49, respectively. Trend analysis of annual mean streamflows at the two Puyallup River stations also showed no statistically significant trends.

Precipitation records corresponding to the period of analysis of streamflow records did not indicate any statistically significant trends in precipitation. A trend of increasing ground-water levels with time (1995 through 1997) was identified in well 20N/04E-34G01. This well is drilled to about 550 feet below land surface, and variations in water levels at this depth probably do not affect streamflow in the Puyallup River. Statistically significant trends were not identified in ground-water level records for 1995 through 1997 for four other wells in the study area.

From 1985 to 2000, total water use for the hydrologic unit that includes the Puyallup Indian Reservation increased from about 36 to about 42 Mgal/d. However, this increase cannot be related to streamflow in the Puyallup River because much of the water used in the hydrologic unit originates from outside the Puyallup River Basin and is not quantified. Two sets of land-use data were evaluated in an attempt to relate changing land use to streamflow trends in the Puyallup River Basin, one derived from aerial photographs taken in the 1970s and the other derived from LANDSAT data collected in 1992. The two data sets use different land-use categories and have different data resolutions. Because of those differences, it was not possible to relate apparent changes in land use to streamflow.

Instream-flow values were compared with 2 years of streamflow data for the Puyallup River, a year of near-normal streamflow (1991) and a year of below normal streamflow (1992). Daily mean, daily minimum, and unit-streamflow values were evaluated to determine how each measure of streamflow compared with instream-flow values. The occurrence of excursions (streamflow below the instream-flow value) was greatest when unit-streamflow values were compared with instream-flow values for both years. The use of daily mean streamflow records may underestimate the occurrence of excursions under certain streamflow conditions. The average number of consecutive unit-value excursions was less in 1991 than in 1992 (41 and 51, respectively). During 1991, most unit-value excursions occurred in September and October; during 1992 most unit-value excursions occurred from March through September. The largest excursion in 1991 occurred on October 28, when the streamflow of 518 ft^3/s was 482 ft^3/s below the instream-flow value of 1,000 ft^3/s. In 1992, the largest excursion occurred on June 16, when the streamflow of 884 ft^3/s was 1,116 ft^3/s below the instream-flow value of 2,000 ft^3/s.

The unit-streamflow hydrograph for the Puyallup River at Puyallup has a distinct, regular pattern. Hydrographs of unit-streamflow values for the Puyallup River at Puyallup, Lake Tapps Diversion at Dieringer, and White River Canal at Buckley were evaluated to determine the origin of the pattern. The hydrograph of Puyallup River streamflow closely mimics the hydrograph at Lake Tapps Diversion, which is the outflow from a power plant, suggesting that the outflow from the power plant affects streamflow in the Puyallup River. Streamflow entering Lake Tapps through the White River Canal does not have the same pattern as the Puyallup River or diversion. The influence of White River Canal on streamflow in the Puyallup River appears to be obscured by operation of the Lake Tapps Diversion.

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Table 7. Daily mean streamflow and instream–flow values for gaging station Puyallup River at Puyallup (12101500) for 1991

[**Difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
01-01-91	1,880	1,400	480	No
01-02-91	2,010	1,400	610	No
01-03-91	2,040	1,400	640	No
01-04-91	2,010	1,400	610	No
01-05-91	2,020	1,400	620	No
01-06-91	1,930	1,400	530	No
01-07-91	2,300	1,400	900	No
01-08-91	2,690	1,400	1,290	No
01-09-91	2,700	1,400	1,300	No
01-10-91	3,180	1,400	1,780	No
01-11-91	3,330	1,400	1,930	No
01-12-91	7,080	1,400	5,680	No
01-13-91	9,400	1,400	8,000	No
01-14-91	9,190	1,400	7,790	No
01-15-91	9,720	1,400	8,320	No
01-16-91	6,880	1,400	5,480	No
01-17-91	6,160	1,400	4,760	No
01-18-91	5,420	1,400	4,020	No
01-19-91	4,780	1,400	3,380	No
01-20-91	4,310	1,400	2,910	No
01-21-91	4,010	1,400	2,610	No
01-22-91	3,550	1,400	2,150	No
01-23-91	3,340	1,400	1,940	No
01-24-91	3,320	1,400	1,920	No
01-25-91	3,300	1,400	1,900	No
01-26-91	3,190	1,400	1,790	No
01-27-91	3,110	1,400	1,710	No
01-28-91	3,120	1,400	1,720	No
01-29-91	3,080	1,400	1,680	No
01-30-91	2,910	1,400	1,510	No
01-31-91	2,950	1,400	1,550	No
02-01-91	3,090	1,400	1,690	No
02-02-91	3,870	1,407	2,463	No
02-03-91	5,790	1,414	4,376	No
02-04-91	6,110	1,421	4,689	No
02-05-91	8,660	1,429	7,231	No
02-06-91	7,570	1,436	6,134	No
02-07-91	5,500	1,443	4,057	No
02-08-91	4,480	1,450	3,030	No
02-09-91	3,850	1,457	2,393	No
02-10-91	3,620	1,464	2,156	No
02-11-91	3,520	1,471	2,049	No
02-12-91	3,830	1,479	2,351	No
02-13-91	4,810	1,486	3,324	No
02-14-91	7,950	1,493	6,457	No
02-15-91	7,710	1,500	6,210	No
02-16-91	6,850	1,507	5,343	No
02-17-91	5,800	1,514	4,286	No
02-18-91	4,980	1,521	3,459	No
02-19-91	12,600	1,529	11,071	No
02-20-91	26,600	1,536	25,064	No
02-21-91	15,700	1,543	14,157	No
02-22-91	11,800	1,550	10,250	No
02-23-91	9,620	1,557	8,063	No
02-24-91	7,520	1,564	5,956	No
02-25-91	5,750	1,571	4,179	No
02-26-91	5,390	1,579	3,811	No
02-27-91	5,090	1,586	3,504	No
02-28-91	4,240	1,593	2,647	No
03-01-91	4,320	1,600	2,720	No
03-02-91	4,580	1,607	2,973	No
03-03-91	5,030	1,614	3,416	No
03-04-91	5,490	1,621	3,869	No
03-05-91	4,790	1,629	3,161	No
03-06-91	4,280	1,636	2,644	No
03-07-91	3,920	1,643	2,277	No
03-08-91	3,740	1,650	2,090	No
03-09-91	3,630	1,657	1,973	No
03-10-91	3,710	1,664	2,046	No
03-11-91	3,530	1,671	1,859	No
03-12-91	3,810	1,679	2,131	No
03-13-91	3,770	1,686	2,084	No
03-14-91	3,520	1,693	1,827	No
03-15-91	3,360	1,700	1,660	No
03-16-91	3,230	1,706	1,524	No
03-17-91	3,110	1,712	1,398	No
03-18-91	3,040	1,718	1,322	No
03-19-91	3,160	1,724	1,436	No
03-20-91	3,080	1,729	1,351	No
03-21-91	3,010	1,735	1,275	No
03-22-91	3,290	1,741	1,549	No
03-23-91	3,440	1,747	1,693	No
03-24-91	3,480	1,753	1,727	No
03-25-91	3,470	1,759	1,711	No
03-26-91	3,540	1,765	1,775	No
03-27-91	3,290	1,771	1,519	No
03-28-91	3,320	1,776	1,544	No
03-29-91	3,280	1,782	1,498	No
03-30-91	3,240	1,788	1,452	No
03-31-91	3,320	1,794	1,526	No
04-01-91	3,540	1,800	1,740	No
04-02-91	3,680	1,807	1,873	No
04-03-91	3,580	1,814	1,766	No
04-04-91	6,310	1,821	4,489	No

Table 7. Daily mean streamflow and instream–flow values for gaging station Puyallup River at Puyallup (12101500) for 1991—*Continued*

[**Difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
04-05-91	18,900	1,829	17,071	No
04-06-91	14,700	1,836	12,864	No
04-07-91	9,160	1,843	7,317	No
04-08-91	6,760	1,850	4,910	No
04-09-91	6,900	1,857	5,043	No
04-10-91	6,370	1,864	4,506	No
04-11-91	5,450	1,871	3,579	No
04-12-91	5,210	1,879	3,331	No
04-13-91	5,060	1,886	3,174	No
04-14-91	4,930	1,893	3,037	No
04-15-91	4,860	1,900	2,960	No
04-16-91	4,370	1,906	2,464	No
04-17-91	4,220	1,913	2,308	No
04-18-91	3,710	1,919	1,791	No
04-19-91	3,660	1,925	1,735	No
04-20-91	3,240	1,931	1,309	No
04-21-91	3,310	1,938	1,373	No
04-22-91	3,850	1,944	1,906	No
04-23-91	4,050	1,950	2,100	No
04-24-91	4,070	1,956	2,114	No
04-25-91	3,690	1,963	1,728	No
04-26-91	3,250	1,969	1,281	No
04-27-91	3,090	1,975	1,115	No
04-28-91	2,400	1,981	419	No
04-29-91	3,090	1,988	1,103	No
04-30-91	2,450	1,994	456	No
05-01-91	2,210	2,000	210	No
05-02-91	2,140	2,000	140	No
05-03-91	2,060	2,000	60	No
05-04-91	2,020	2,000	20	No
05-05-91	1,940	2,000	-60	Yes
05-06-91	2,090	2,000	90	No
05-07-91	2,140	2,000	140	No
05-08-91	3,170	2,000	1,170	No
05-09-91	2,480	2,000	480	No
05-10-91	2,560	2,000	560	No
05-11-91	2,010	2,000	10	No
05-12-91	2,040	2,000	40	No
05-13-91	2,030	2,000	30	No
05-14-91	2,750	2,000	750	No
05-15-91	2,660	2,000	660	No
05-16-91	2,670	2,000	670	No
05-17-91	2,890	2,000	890	No
05-18-91	3,910	2,000	1,910	No
05-19-91	3,920	2,000	1,920	No
05-20-91	3,960	2,000	1,960	No
05-21-91	3,940	2,000	1,940	No
05-22-91	4,080	2,000	2,080	No
05-23-91	4,470	2,000	2,470	No
05-24-91	4,250	2,000	2,250	No
05-25-91	4,500	2,000	2,500	No
05-26-91	4,470	2,000	2,470	No
05-27-91	3,980	2,000	1,980	No
05-28-91	3,710	2,000	1,710	No
05-29-91	3,620	2,000	1,620	No
05-30-91	3,910	2,000	1,910	No
05-31-91	3,650	2,000	1,650	No
06-01-91	3,590	2,000	1,590	No
06-02-91	3,880	2,000	1,880	No
06-03-91	3,580	2,000	1,580	No
06-04-91	2,300	2,000	300	No
06-05-91	1,940	2,000	-60	Yes
06-06-91	3,780	2,000	1,780	No
06-07-91	4,380	2,000	2,380	No
06-08-91	4,520	2,000	2,520	No
06-09-91	3,760	2,000	1,760	No
06-10-91	3,970	2,000	1,970	No
06-11-91	4,530	2,000	2,530	No
06-12-91	4,520	2,000	2,520	No
06-13-91	4,240	2,000	2,240	No
06-14-91	4,080	2,000	2,080	No
06-15-91	3,640	2,000	1,640	No
06-16-91	3,570	2,000	1,570	No
06-17-91	3,600	2,000	1,600	No
06-18-91	3,240	2,000	1,240	No
06-19-91	3,320	2,000	1,320	No
06-20-91	4,940	2,000	2,940	No
06-21-91	5,520	2,000	3,520	No
06-22-91	4,820	2,000	2,820	No
06-23-91	4,370	2,000	2,370	No
06-24-91	4,060	2,000	2,060	No
06-25-91	3,960	2,000	1,960	No
06-26-91	3,870	2,000	1,870	No
06-27-91	3,790	2,000	1,790	No
06-28-91	4,080	2,000	2,080	No
06-29-91	4,310	2,000	2,310	No
06-30-91	4,150	2,000	2,150	No
07-01-91	3,840	2,000	1,840	No
07-02-91	4,140	1,982	2,158	No
07-03-91	4,910	1,964	2,946	No
07-04-91	5,230	1,946	3,284	No
07-05-91	4,780	1,929	2,851	No

Table 7. Daily mean streamflow and instream–flow values for gaging station Puyallup River at Puyallup (12101500) for 1991—*Continued*

[**Difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
07-06-91	4,150	1,911	2,239	No
07-07-91	3,710	1,893	1,817	No
07-08-91	3,700	1,875	1,825	No
07-09-91	3,580	1,857	1,723	No
07-10-91	3,200	1,839	1,361	No
07-11-91	3,360	1,821	1,539	No
07-12-91	3,300	1,804	1,496	No
07-13-91	3,520	1,786	1,734	No
07-14-91	3,460	1,768	1,692	No
07-15-91	3,040	1,750	1,290	No
07-16-91	2,940	1,735	1,205	No
07-17-91	2,920	1,721	1,199	No
07-18-91	2,690	1,706	984	No
07-19-91	2,600	1,691	909	No
07-20-91	2,420	1,676	744	No
07-21-91	2,460	1,662	798	No
07-22-91	2,790	1,647	1,143	No
07-23-91	2,800	1,632	1,168	No
07-24-91	3,080	1,618	1,462	No
07-25-91	3,410	1,603	1,807	No
07-26-91	2,990	1,588	1,402	No
07-27-91	2,460	1,574	886	No
07-28-91	2,420	1,559	861	No
07-29-91	2,580	1,544	1,036	No
07-30-91	2,430	1,529	901	No
07-31-91	2,330	1,515	815	No
08-01-91	2,360	1,500	860	No
08-02-91	2,160	1,486	674	No
08-03-91	2,160	1,471	689	No
08-04-91	2,490	1,457	1,033	No
08-05-91	2,540	1,443	1,097	No
08-06-91	2,560	1,429	1,132	No
08-07-91	2,710	1,414	1,296	No
08-08-91	2,890	1,400	1,490	No
08-09-91	2,900	1,386	1,514	No
08-10-91	2,470	1,371	1,099	No
08-11-91	1,980	1,357	623	No
08-12-91	1,900	1,343	557	No
08-13-91	1,850	1,328	522	No
08-14-91	1,840	1,314	526	No
08-15-91	2,000	1,300	700	No
08-16-91	2,220	1,291	929	No
08-17-91	2,260	1,282	978	No
08-18-91	2,380	1,274	1,106	No
08-19-91	2,410	1,265	1,145	No
08-20-91	2,270	1,256	1,014	No
08-21-91	2,100	1,247	853	No
08-22-91	2,110	1,238	872	No
08-23-91	1,910	1,229	681	No
08-24-91	1,590	1,221	369	No
08-25-91	1,460	1,212	248	No
08-26-91	1,550	1,203	347	No
08-27-91	1,400	1,194	206	No
08-28-91	1,800	1,185	615	No
08-29-91	2,330	1,176	1,154	No
08-30-91	2,540	1,168	1,372	No
08-31-91	2,330	1,159	1,171	No
09-01-91	2,630	1,150	1,480	No
09-02-91	1,920	1,139	781	No
09-03-91	1,410	1,129	281	No
09-04-91	1,750	1,118	632	No
09-05-91	1,680	1,107	573	No
09-06-91	1,790	1,096	694	No
09-07-91	1,790	1,086	704	No
09-08-91	1,700	1,075	625	No
09-09-91	1,630	1,064	566	No
09-10-91	1,540	1,054	486	No
09-11-91	1,400	1,043	357	No
09-12-91	1,540	1,032	508	No
09-13-91	1,840	1,021	819	No
09-14-91	1,190	1,011	179	No
09-15-91	837	1,000	-163	Yes
09-16-91	971	1,000	-29	Yes
09-17-91	1,290	1,000	290	No
09-18-91	1,550	1,000	550	No
09-19-91	1,300	1,000	300	No
09-20-91	1,410	1,000	410	No
09-21-91	1,190	1,000	190	No
09-22-91	962	1,000	-38	Yes
09-23-91	1,210	1,000	210	No
09-24-91	1,120	1,000	120	No
09-25-91	1,260	1,000	260	No
09-26-91	1,370	1,000	370	No
09-27-91	1,460	1,000	460	No
09-28-91	1,620	1,000	620	No
09-29-91	1,530	1,000	530	No
09-30-91	1,350	1,000	350	No
10-01-91	1,410	1,000	410	No
10-02-91	1,220	1,000	220	No
10-03-91	1,180	1,000	180	No
10-04-91	1,020	1,000	20	No
10-05-91	910	1,000	-90	Yes
10-06-91	962	1,000	-38	Yes
10-07-91	916	1,000	-84	Yes

Table 7. Daily mean streamflow and instream–flow values for gaging station Puyallup River at Puyallup (12101500) for 1991—*Continued*

[**Difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-08-91	863	1,000	-137	Yes
10-09-91	593	1,000	-407	Yes
10-10-91	917	1,000	-83	Yes
10-11-91	1,040	1,000	40	No
10-12-91	997	1,000	-003	Yes
10-13-91	900	1,000	-100	Yes
10-14-91	971	1,000	-29	Yes
10-15-91	1,050	1,000	50	No
10-16-91	1,070	1,000	70	No
10-17-91	957	1,000	-43	Yes
10-18-91	871	1,000	-129	Yes
10-19-91	778	1,000	-222	Yes
10-20-91	850	1,000	-150	Yes
10-21-91	1,040	1,000	40	No
10-22-91	1,020	1,000	20	No
10-23-91	1,420	1,000	420	No
10-24-91	1,450	1,000	450	No
10-25-91	1,520	1,000	520	No
10-26-91	1,370	1,000	370	No
10-27-91	1,230	1,000	230	No
10-28-91	1,330	1,000	330	No
10-29-91	1,330	1,000	330	No
10-30-91	1,310	1,000	310	No
10-31-91	1,410	1,000	410	No
11-01-91	1,770	1,000	770	No
11-02-91	1,230	1,007	223	No
11-03-91	1,100	1,014	086	No
11-04-91	1,650	1,021	629	No
11-05-91	5,570	1,029	4,541	No
11-06-91	4,180	1,036	3,144	No
11-07-91	2,540	1,043	1,497	No
11-08-91	2,020	1,050	970	No
11-09-91	1,570	1,057	513	No
11-10-91	1,210	1,064	146	No
11-11-91	1,190	1,071	119	No
11-12-91	2,810	1,079	1,731	No
11-13-91	3,130	1,086	2,044	No
11-14-91	2,610	1,093	1,517	No
11-15-91	2,410	1,100	1,310	No
11-16-91	1,870	1,106	0,764	No
11-17-91	2,820	1,113	1,708	No
11-18-91	2,500	1,119	1,381	No
11-19-91	2,340	1,125	1,215	No
11-20-91	4,570	1,131	3,439	No
11-21-91	3,920	1,138	2,783	No
11-22-91	2,770	1,144	1,626	No
11-23-91	2,570	1,150	1,420	No
11-24-91	3,010	1,156	1,854	No
11-25-91	8,980	1,163	7,818	No
11-26-91	7,820	1,169	6,651	No
11-27-91	6,670	1,175	5,495	No
11-28-91	5,490	1,181	4,309	No
11-29-91	4,590	1,188	3,403	No
11-30-91	3,410	1,194	2,216	No
12-01-91	3,480	1,200	2,280	No
12-02-91	4,090	1,207	2,883	No
12-03-91	3,520	1,214	2,306	No
12-04-91	3,660	1,221	2,439	No
12-05-91	5,460	1,229	4,231	No
12-06-91	8,810	1,236	7,574	No
12-07-91	7,930	1,243	6,687	No
12-08-91	7,380	1,250	6,130	No
12-09-91	7,980	1,257	6,723	No
12-10-91	8,030	1,264	6,766	No
12-11-91	5,940	1,271	4,669	No
12-12-91	5,580	1,279	4,301	No
12-13-91	5,430	1,286	4,144	No
12-14-91	4,480	1,293	3,187	No
12-15-91	3,920	1,300	2,620	No
12-16-91	3,680	1,306	2,374	No
12-17-91	3,540	1,312	2,228	No
12-18-91	3,460	1,318	2,142	No
12-19-91	3,330	1,324	2,006	No
12-20-91	3,180	1,329	1,851	No
12-21-91	3,320	1,335	1,985	No
12-22-91	3,420	1,341	2,079	No
12-23-91	3,270	1,347	1,923	No
12-24-91	3,200	1,353	1,847	No
12-25-91	3,180	1,359	1,821	No
12-26-91	2,540	1,365	1,175	No
12-27-91	2,280	1,371	909	No
12-28-91	3,190	1,376	1,814	No
12-29-91	1,470	1,382	088	No
12-30-91	1,280	1,388	-108	Yes
12-31-91	1,730	1,394	336	No

Table 8. Daily mean streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) for 1992

[**Difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion	Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
01-01-92	2,020	1,400	620	No	02-17-92	1,950	1,513	437	No
01-02-92	2,260	1,400	860	No	02-18-92	2,020	1,520	500	No
01-03-92	2,200	1,400	800	No	02-19-92	2,410	1,527	883	No
01-04-92	2,420	1,400	1020	No	02-20-92	2,450	1,533	917	No
01-05-92	2,890	1,400	1490	No	02-21-92	3,140	1,540	1600	No
01-06-92	2,280	1,400	880	No	02-22-92	4,600	1,547	3053	No
01-07-92	2,710	1,400	1310	No	02-23-92	4,860	1,553	3307	No
01-08-92	2,640	1,400	1240	No	02-24-92	4,620	1,560	3060	No
01-09-92	2,080	1,400	680	No	02-25-92	4,380	1,567	2813	No
01-10-92	2,200	1,400	800	No	02-26-92	4,110	1,573	2537	No
01-11-92	1,760	1,400	360	No	02-27-92	4,220	1,580	2640	No
01-12-92	1,580	1,400	180	No	02-28-92	3,660	1,587	2073	No
01-13-92	2,090	1,400	690	No	02-29-92	3,430	1,593	1837	No
01-14-92	2,050	1,400	650	No	03-01-92	3,300	1,600	1700	No
01-15-92	1,790	1,400	390	No	03-02-92	3,140	1,607	1533	No
01-16-92	2,510	1,400	1110	No	03-03-92	3,060	1,614	1446	No
01-17-92	2,590	1,400	1190	No	03-04-92	3,040	1,621	1419	No
01-18-92	1,980	1,400	580	No	03-05-92	3,070	1,629	1441	No
01-19-92	1,810	1,400	410	No	03-06-92	3,210	1,636	1574	No
01-20-92	1,920	1,400	520	No	03-07-92	3,230	1,643	1587	No
01-21-92	1,960	1,400	560	No	03-08-92	3,140	1,650	1490	No
01-22-92	2,290	1,400	890	No	03-09-92	3,060	1,657	1403	No
01-23-92	3,880	1,400	2480	No	03-10-92	2,800	1,664	1136	No
01-24-92	4,800	1,400	3400	No	03-11-92	2,550	1,671	879	No
01-25-92	3,330	1,400	1930	No	03-12-92	2,750	1,679	1071	No
01-26-92	3,440	1,400	2040	No	03-13-92	2,700	1,686	1014	No
01-27-92	3,640	1,400	2240	No	03-14-92	2,690	1,693	997	No
01-28-92	8,790	1,400	7390	No	03-15-92	2,800	1,700	1100	No
01-29-92	9,600	1,400	8200	No	03-16-92	2,770	1,706	1064	No
01-30-92	9,110	1,400	7710	No	03-17-92	3,050	1,712	1338	No
01-31-92	8,570	1,400	7170	No	03-18-92	3,100	1,718	1382	No
02-01-92	6,780	1,400	5380	No	03-19-92	2,760	1,724	1036	No
02-02-92	5,800	1,407	4393	No	03-20-92	2,600	1,729	871	No
02-03-92	4,830	1,414	3416	No	03-21-92	2,310	1,735	575	No
02-04-92	3,850	1,421	2429	No	03-22-92	1,810	1,741	69	No
02-05-92	3,550	1,429	2121	No	03-23-92	1,810	1,747	63	No
02-06-92	3,360	1,436	1924	No	03-24-92	1,990	1,753	237	No
02-07-92	3,240	1,443	1797	No	03-25-92	1,950	1,759	191	No
02-08-92	3,190	1,450	1740	No	03-26-92	1,720	1,765	-45	Yes
02-09-92	3,080	1,457	1623	No	03-27-92	1,760	1,771	-11	Yes
02-10-92	2,990	1,464	1526	No	03-28-92	1,700	1,776	-76	Yes
02-11-92	2,900	1,471	1429	No	03-29-92	1,660	1,782	-122	Yes
02-12-92	2,840	1,479	1361	No	03-30-92	1,340	1,788	-448	Yes
02-13-92	2,830	1,486	1344	No	03-31-92	1,580	1,794	-214	Yes
02-14-92	2,780	1,493	1287	No	04-01-92	1,120	1,800	-680	Yes
02-15-92	2,310	1,500	810	No	04-02-92	1,160	1,807	-647	Yes
02-16-92	2,090	1,507	583	No	04-03-92	1,660	1,814	-154	Yes

Table 8. Daily mean streamflow and instream–flow values for gaging station Puyallup River at Puyallup (12101500) for 1992—*Continued*

[**Difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
04-04-92	1,640	1,821	-181	Yes
04-05-92	1,990	1,829	161	No
04-06-92	2,230	1,836	394	No
04-07-92	2,070	1,843	227	No
04-08-92	1,790	1,850	-60	Yes
04-09-92	1,770	1,857	-87	Yes
04-10-92	2,000	1,864	136	Yes
04-11-92	1,870	1,871	-1	Yes
04-12-92	1,760	1,879	-119	Yes
04-13-92	1,830	1,886	-56	Yes
04-14-92	1,830	1,893	-63	Yes
04-15-92	1,920	1,900	20	No
04-16-92	1,950	1,906	44	No
04-17-92	4,600	1,913	2688	No
04-18-92	4,770	1,919	2851	No
04-19-92	3,290	1,925	1365	No
04-20-92	3,590	1,931	1659	No
04-21-92	2,780	1,938	843	No
04-22-92	2,440	1,944	496	No
04-23-92	2,280	1,950	330	No
04-24-92	2,390	1,956	434	No
04-25-92	2,290	1,963	328	No
04-26-92	1,810	1,969	-159	Yes
04-27-92	2,360	1,975	385	No
04-28-92	2,630	1,981	649	No
04-29-92	3,550	1,988	1563	No
04-30-92	4,720	1,994	2726	No
05-01-92	3,370	2,000	1370	No
05-02-92	2,070	2,000	70	No
05-03-92	1,730	2,000	-270	Yes
05-04-92	1,640	2,000	-360	Yes
05-05-92	1,640	2,000	-360	Yes
05-06-92	1,700	2,000	-300	Yes
05-07-92	2,150	2,000	150	No
05-08-92	2,370	2,000	370	No
05-09-92	2,470	2,000	470	No
05-10-92	2,360	2,000	360	No
05-11-92	2,090	2,000	90	No
05-12-92	2,150	2,000	150	No
05-13-92	2,040	2,000	40	No
05-14-92	2,260	2,000	260	No
05-15-92	2,160	2,000	160	No
05-16-92	2,070	2,000	70	No
05-17-92	1,120	2,000	-880	Yes
05-18-92	1,840	2,000	-160	Yes
05-19-92	1,210	2,000	-790	Yes
05-20-92	1,550	2,000	-450	Yes
05-21-92	1,750	2,000	-250	Yes
05-22-92	1,800	2,000	-200	Yes
05-23-92	1,610	2,000	-390	Yes
05-24-92	1,620	2,000	-380	Yes
05-25-92	2,360	2,000	360	No
05-26-92	2,430	2,000	430	No
05-27-92	3,030	2,000	1030	No
05-28-92	2,470	2,000	470	No
05-29-92	2,380	2,000	380	No
05-30-92	2,120	2,000	120	No
05-31-92	1,900	2,000	-100	Yes
06-01-92	2,470	2,000	470	No
06-02-92	2,450	2,000	450	No
06-03-92	2,130	2,000	130	No
06-04-92	1,960	2,000	-40	Yes
06-05-92	1,890	2,000	-110	Yes
06-06-92	1,850	2,000	-150	Yes
06-07-92	1,500	2,000	-500	Yes
06-08-92	1,840	2,000	-160	Yes
06-09-92	1,950	2,000	-50	Yes
06-10-92	1,990	2,000	-10	Yes
06-11-92	1,790	2,000	-210	Yes
06-12-92	1,900	2,000	-100	Yes
06-13-92	2,070	2,000	70	No
06-14-92	1,980	2,000	-20	Yes
06-15-92	1,480	2,000	-520	Yes
06-16-92	1,630	2,000	-370	Yes
06-17-92	1,580	2,000	-420	Yes
06-18-92	1,580	2,000	-420	Yes
06-19-92	1,490	2,000	-510	Yes
06-20-92	1,590	2,000	-410	Yes
06-21-92	1,710	2,000	-290	Yes
06-22-92	2,380	2,000	380	No
06-23-92	2,190	2,000	190	No
06-24-92	2,660	2,000	660	No
06-25-92	2,370	2,000	370	No
06-26-92	2,520	2,000	520	No
06-27-92	2,260	2,000	260	No
06-28-92	2,380	2,000	380	No
06-29-92	3,200	2,000	1200	No
06-30-92	3,030	2,000	1030	No
07-01-92	1,770	2,000	-230	Yes
07-02-92	1,780	1,982	-202	Yes
07-03-92	1,440	1,964	-524	Yes
07-04-92	1,890	1,946	-56	Yes

Table 8. Daily mean streamflow and instream–flow values for gaging station Puyallup River at Puyallup (12101500) for 1992—*Continued*

[**Difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
07-05-92	3,130	1,929	1201	No
07-06-92	3,150	1,911	1239	No
07-07-92	2,560	1,893	667	No
07-08-92	2,340	1,875	465	No
07-09-92	2,180	1,857	323	No
07-10-92	1,880	1,839	41	No
07-11-92	1,620	1,821	-201	Yes
07-12-92	1,590	1,804	-214	Yes
07-13-92	1,640	1,786	-146	Yes
07-14-92	1,920	1,768	152	No
07-15-92	1,930	1,750	180	No
07-16-92	1,900	1,735	165	No
07-17-92	2,050	1,721	329	No
07-18-92	2,180	1,706	474	No
07-19-92	2,030	1,691	339	No
07-20-92	1,860	1,676	184	No
07-21-92	1,890	1,662	228	No
07-22-92	1,770	1,647	123	No
07-23-92	2,000	1,632	368	No
07-24-92	1,860	1,618	242	No
07-25-92	1,820	1,603	217	No
07-26-92	1,780	1,588	192	No
07-27-92	1,890	1,574	316	No
07-28-92	1,830	1,559	271	No
07-29-92	1,760	1,544	216	No
07-30-92	1,930	1,529	401	No
07-31-92	2,050	1,515	535	No
08-01-92	1,910	1,500	410	No
08-02-92	1,890	1,486	404	No
08-03-92	1,880	1,471	409	No
08-04-92	1,800	1,457	343	No
08-05-92	1,750	1,443	307	No
08-06-92	1,910	1,429	482	No
08-07-92	2,300	1,414	886	No
08-08-92	2,050	1,400	650	No
08-09-92	1,600	1,386	214	No
08-10-92	1,650	1,371	279	No
08-11-92	1,890	1,357	533	No
08-12-92	2,090	1,343	747	No
08-13-92	2,410	1,328	1082	No
08-14-92	2,510	1,314	1196	No
08-15-92	2,260	1,300	960	No
08-16-92	1,960	1,291	669	No
08-17-92	1,960	1,282	678	No
08-18-92	2,080	1,274	806	No
08-19-92	1,880	1,265	615	No
08-20-92	1,740	1,256	484	No
08-21-92	1,760	1,247	513	No
08-22-92	1,520	1,238	282	No
08-23-92	1,140	1,229	-89	Yes
08-24-92	1,110	1,221	-111	Yes
08-25-92	1,030	1,212	-182	Yes
08-26-92	1,110	1,203	-93	Yes
08-27-92	1,270	1,194	76	No
08-28-92	1,300	1,185	115	No
08-29-92	1,150	1,176	-26	Yes
08-30-92	1,110	1,168	-58	Yes
08-31-92	1,130	1,159	-29	Yes
09-01-92	1,160	1,150	10	No
09-02-92	1,400	1,139	261	No
09-03-92	1,210	1,129	81	No
09-04-92	1,630	1,118	512	No
09-05-92	1,170	1,107	63	No
09-06-92	947	1,096	-149	Yes
09-07-92	921	1,086	-165	Yes
09-08-92	2,100	1,075	1025	No
09-09-92	2,610	1,064	1546	No
09-10-92	1,810	1,054	756	No
09-11-92	2,180	1,043	1137	No
09-12-92	1,810	1,032	778	No
09-13-92	1,670	1,021	649	No
09-14-92	995	1,011	-16	Yes
09-15-92	765	1,000	-235	Yes
09-16-92	842	1,000	-158	Yes
09-17-92	799	1,000	-201	Yes
09-18-92	740	1,000	-260	Yes
09-19-92	683	1,000	-317	Yes
09-20-92	828	1,000	-172	Yes
09-21-92	1,400	1,000	400	No
09-22-92	1,570	1,000	570	No
09-23-92	1,680	1,000	680	No
09-24-92	3,670	1,000	2670	No
09-25-92	4,270	1,000	3270	No
09-26-92	2,450	1,000	1450	No
09-27-92	2,340	1,000	1340	No
09-28-92	1,570	1,000	570	No
09-29-92	1,670	1,000	670	No
09-30-92	1,780	1,000	780	No
10-01-92	1,750	1,000	750	No
10-02-92	1,730	1,000	730	No
10-03-92	1,970	1,000	970	No
10-04-92	1,780	1,000	780	No

Table 8. Daily mean streamflow and instream–flow values for gaging station Puyallup River at Puyallup (12101500) for 1992—*Continued*

[**Difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Daily mean streamflow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-05-92	1,230	1,000	230	No
10-06-92	1,110	1,000	110	No
10-07-92	1,070	1,000	70	No
10-08-92	1,200	1,000	200	No
10-09-92	1,460	1,000	460	No
10-10-92	1,490	1,000	490	No
10-11-92	1,530	1,000	530	No
10-12-92	1,570	1,000	570	No
10-13-92	1,900	1,000	900	No
10-14-92	1,800	1,000	800	No
10-15-92	1,370	1,000	370	No
10-16-92	1,440	1,000	440	No
10-17-92	1,650	1,000	650	No
10-18-92	1,640	1,000	640	No
10-19-92	1,830	1,000	830	No
10-20-92	1,910	1,000	910	No
10-21-92	1,800	1,000	800	No
10-22-92	1,680	1,000	680	No
10-23-92	1,760	1,000	760	No
10-24-92	1,020	1,000	20	No
10-25-92	904	1,000	-96	Yes
10-26-92	1,270	1,000	270	No
10-27-92	1,240	1,000	240	No
10-28-92	1,240	1,000	240	No
10-29-92	1,300	1,000	300	No
10-30-92	1,340	1,000	340	No
10-31-92	1,280	1,000	280	No
11-01-92	1,420	1,000	420	No
11-02-92	1,620	1,007	613	No
11-03-92	1,740	1,014	726	No
11-04-92	2,070	1,021	1049	No
11-05-92	2,300	1,029	1271	No
11-06-92	1,990	1,036	954	No
11-07-92	2,560	1,043	1517	No
11-08-92	2,740	1,050	1690	No
11-09-92	2,740	1,057	1683	No
11-10-92	2,280	1,064	1216	No
11-11-92	2,580	1,071	1509	No
11-12-92	3,830	1,079	2751	No
11-13-92	3,030	1,086	1944	No
11-14-92	2,680	1,093	1587	No
11-15-92	2,430	1,100	1330	No
11-16-92	2,240	1,106	1134	No
11-17-92	2,230	1,113	1118	No
11-18-92	2,480	1,119	1361	No
11-19-92	1,890	1,125	765	No
11-20-92	1,660	1,131	529	No
11-21-92	2,220	1,138	1083	No
11-22-92	5,120	1,144	3976	No
11-23-92	3,420	1,150	2270	No
11-24-92	3,150	1,156	1994	No
11-25-92	3,200	1,163	2038	No
11-26-92	3,020	1,169	1851	No
11-27-92	3,340	1,175	2165	No
11-28-92	3,680	1,181	2499	No
11-29-92	3,380	1,188	2193	No
11-30-92	4,040	1,194	2846	No
12-01-92	4,000	1,200	2800	No
12-02-92	3,630	1,207	2423	No
12-03-92	3,260	1,214	2046	No
12-04-92	3,010	1,221	1789	No
12-05-92	2,840	1,229	1611	No
12-06-92	2,730	1,236	1494	No
12-07-92	2,620	1,243	1377	No
12-08-92	2,550	1,250	1300	No
12-09-92	2,690	1,257	1433	No
12-10-92	2,900	1,264	1636	No
12-11-92	2,960	1,271	1689	No
12-12-92	2,760	1,279	1481	No
12-13-92	2,610	1,286	1324	No
12-14-92	3,490	1,293	2197	No
12-15-92	4,070	1,300	2770	No
12-16-92	3,370	1,306	2064	No
12-17-92	2,860	1,312	1548	No
12-18-92	2,320	1,318	1002	No
12-19-92	1,310	1,324	-14	Yes
12-20-92	2,660	1,329	1331	No
12-21-92	2,810	1,335	1475	No
12-22-92	2,560	1,341	1219	No
12-23-92	2,650	1,347	1303	No
12-24-92	1,830	1,353	477	No
12-25-92	2,050	1,359	691	No
12-26-92	2,060	1,365	695	No
12-27-92	1,290	1,371	-81	Yes
12-28-92	1,150	1,376	-226	Yes
12-29-92	1,870	1,382	488	No
12-30-92	1,830	1,388	442	No
12-31-92	2,140	1,394	746	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-26-92	15	790	1,000	-210	Yes
10-26-92	30	790	1,000	-210	Yes
10-26-92	45	790	1,000	-210	Yes
10-26-92	60	790	1,000	-210	Yes
10-26-92	75	790	1,000	-210	Yes
10-26-92	90	790	1,000	-210	Yes
10-26-92	105	790	1,000	-210	Yes
10-26-92	120	790	1,000	-210	Yes
10-26-92	135	797	1,000	-203	Yes
10-26-92	150	797	1,000	-203	Yes
10-26-92	165	804	1,000	-196	Yes
10-26-92	180	804	1,000	-196	Yes
10-26-92	195	811	1,000	-189	Yes
10-26-92	210	811	1,000	-189	Yes
10-26-92	225	811	1,000	-189	Yes
10-26-92	240	811	1,000	-189	Yes
10-26-92	255	819	1,000	-181	Yes
10-26-92	270	819	1,000	-181	Yes
10-26-92	285	819	1,000	-181	Yes
10-26-92	300	819	1,000	-181	Yes
10-26-92	315	819	1,000	-181	Yes
10-26-92	330	819	1,000	-181	Yes
10-26-92	345	819	1,000	-181	Yes
10-26-92	360	819	1,000	-181	Yes
10-26-92	375	819	1,000	-181	Yes
10-26-92	390	819	1,000	-181	Yes
10-26-92	405	819	1,000	-181	Yes
10-26-92	420	819	1,000	-181	Yes
10-26-92	435	819	1,000	-181	Yes
10-26-92	450	819	1,000	-181	Yes
10-26-92	465	811	1,000	-189	Yes
10-26-92	480	826	1,000	-174	Yes
10-26-92	495	854	1,000	-146	Yes
10-26-92	510	906	1,000	-94	Yes
10-26-92	525	981	1,000	-19	Yes
10-26-92	540	1,070	1,000	70	No
10-26-92	555	1,160	1,000	160	No
10-26-92	570	1,250	1,000	250	No
10-26-92	585	1,340	1,000	340	No
10-26-92	600	1,410	1,000	410	No
10-26-92	615	1,470	1,000	470	No
10-26-92	630	1,510	1,000	510	No
10-26-92	645	1,540	1,000	540	No
10-26-92	660	1,550	1,000	550	No
10-26-92	675	1,550	1,000	550	No
10-26-92	690	1,550	1,000	550	No
10-26-92	705	1,550	1,000	550	No
10-26-92	720	1,550	1,000	550	No
10-26-92	735	1,550	1,000	550	No
10-26-92	750	1,550	1,000	550	No
10-26-92	765	1,550	1,000	550	No
10-26-92	780	1,560	1,000	560	No
10-26-92	795	1,560	1,000	560	No
10-26-92	810	1,560	1,000	560	No
10-26-92	825	1,560	1,000	560	No
10-26-92	840	1,560	1,000	560	No
10-26-92	855	1,560	1,000	560	No
10-26-92	870	1,560	1,000	560	No
10-26-92	885	1,560	1,000	560	No
10-26-92	900	1,560	1,000	560	No
10-26-92	915	1,560	1,000	560	No
10-26-92	930	1,560	1,000	560	No
10-26-92	945	1,560	1,000	560	No
10-26-92	960	1,550	1,000	550	No
10-26-92	975	1,550	1,000	550	No
10-26-92	990	1,550	1,000	550	No
10-26-92	1,005	1,540	1,000	540	No
10-26-92	1,020	1,540	1,000	540	No
10-26-92	1,035	1,540	1,000	540	No
10-26-92	1,050	1,550	1,000	550	No
10-26-92	1,065	1,550	1,000	550	No
10-26-92	1,080	1,560	1,000	560	No
10-26-92	1,095	1,560	1,000	560	No
10-26-92	1,110	1,570	1,000	570	No
10-26-92	1,125	1,570	1,000	570	No
10-26-92	1,140	1,570	1,000	570	No
10-26-92	1,155	1,580	1,000	580	No
10-26-92	1,170	1,580	1,000	580	No
10-26-92	1,185	1,580	1,000	580	No
10-26-92	1,200	1,580	1,000	580	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion	Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-26-92	1,215	1,580	1,000	580	No	10-27-92	390	742	1,000	-258	Yes
10-26-92	1,230	1,580	1,000	580	No	10-27-92	405	742	1,000	-258	Yes
10-26-92	1,245	1,580	1,000	580	No	10-27-92	420	742	1,000	-258	Yes
10-26-92	1,260	1,580	1,000	580	No	10-27-92	435	742	1,000	-258	Yes
10-26-92	1,275	1,580	1,000	580	No	10-27-92	450	742	1,000	-258	Yes
10-26-92	1,290	1,570	1,000	570	No	10-27-92	465	742	1,000	-258	Yes
10-26-92	1,305	1,570	1,000	570	No	10-27-92	480	742	1,000	-258	Yes
10-26-92	1,320	1,570	1,000	570	No	10-27-92	495	742	1,000	-258	Yes
10-26-92	1,335	1,570	1,000	570	No	10-27-92	510	749	1,000	-251	Yes
10-26-92	1,350	1,570	1,000	570	No	10-27-92	525	797	1,000	-203	Yes
10-26-92	1,365	1,570	1,000	570	No	10-27-92	540	876	1,000	-124	Yes
10-26-92	1,380	1,570	1,000	570	No	10-27-92	555	966	1,000	-34	Yes
10-26-92	1,395	1,560	1,000	560	No	10-27-92	570	1,070	1,000	70	No
10-26-92	1,410	1,560	1,000	560	No	10-27-92	585	1,190	1,000	190	No
10-26-92	1,425	1,540	1,000	540	No	10-27-92	600	1,300	1,000	300	No
10-26-92	1,440	1,520	1,000	520	No	10-27-92	615	1,370	1,000	370	No
10-27-92	15	1,460	1,000	460	No	10-27-92	630	1,430	1,000	430	No
10-27-92	30	1,400	1,000	400	No	10-27-92	645	1,470	1,000	470	No
10-27-92	45	1,290	1,000	290	No	10-27-92	660	1,500	1,000	500	No
10-27-92	60	1,160	1,000	160	No	10-27-92	675	1,510	1,000	510	No
10-27-92	75	1,060	1,000	60	No	10-27-92	690	1,510	1,000	510	No
10-27-92	90	973	1,000	-27	Yes	10-27-92	705	1,510	1,000	510	No
10-27-92	105	906	1,000	-94	Yes	10-27-92	720	1,510	1,000	510	No
10-27-92	120	854	1,000	-146	Yes	10-27-92	735	1,510	1,000	510	No
10-27-92	135	819	1,000	-181	Yes	10-27-92	750	1,510	1,000	510	No
10-27-92	150	797	1,000	-203	Yes	10-27-92	765	1,510	1,000	510	No
10-27-92	165	783	1,000	-217	Yes	10-27-92	780	1,510	1,000	510	No
10-27-92	180	769	1,000	-231	Yes	10-27-92	795	1,520	1,000	520	No
10-27-92	195	762	1,000	-238	Yes	10-27-92	810	1,520	1,000	520	No
10-27-92	210	756	1,000	-244	Yes	10-27-92	825	1,520	1,000	520	No
10-27-92	225	749	1,000	-251	Yes	10-27-92	840	1,520	1,000	520	No
10-27-92	240	742	1,000	-258	Yes	10-27-92	855	1,520	1,000	520	No
10-27-92	255	742	1,000	-258	Yes	10-27-92	870	1,520	1,000	520	No
10-27-92	270	742	1,000	-258	Yes	10-27-92	885	1,520	1,000	520	No
10-27-92	285	742	1,000	-258	Yes	10-27-92	900	1,520	1,000	520	No
10-27-92	300	742	1,000	-258	Yes	10-27-92	915	1,520	1,000	520	No
10-27-92	315	742	1,000	-258	Yes	10-27-92	930	1,520	1,000	520	No
10-27-92	330	742	1,000	-258	Yes	10-27-92	945	1,520	1,000	520	No
10-27-92	345	742	1,000	-258	Yes	10-27-92	960	1,520	1,000	520	No
10-27-92	360	742	1,000	-258	Yes	10-27-92	975	1,520	1,000	520	No
10-27-92	375	742	1,000	-258	Yes	10-27-92	990	1,520	1,000	520	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-27-92	1,005	1,520	1,000	520	No
10-27-92	1,020	1,520	1,000	520	No
10-27-92	1,035	1,520	1,000	520	No
10-27-92	1,050	1,520	1,000	520	No
10-27-92	1,065	1,520	1,000	520	No
10-27-92	1,080	1,520	1,000	520	No
10-27-92	1,095	1,520	1,000	520	No
10-27-92	1,110	1,520	1,000	520	No
10-27-92	1,125	1,520	1,000	520	No
10-27-92	1,140	1,520	1,000	520	No
10-27-92	1,155	1,520	1,000	520	No
10-27-92	1,170	1,520	1,000	520	No
10-27-92	1,185	1,510	1,000	510	No
10-27-92	1,200	1,510	1,000	510	No
10-27-92	1,215	1,510	1,000	510	No
10-27-92	1,230	1,510	1,000	510	No
10-27-92	1,245	1,510	1,000	510	No
10-27-92	1,260	1,520	1,000	520	No
10-27-92	1,275	1,520	1,000	520	No
10-27-92	1,290	1,520	1,000	520	No
10-27-92	1,305	1,520	1,000	520	No
10-27-92	1,320	1,520	1,000	520	No
10-27-92	1,335	1,520	1,000	520	No
10-27-92	1,350	1,520	1,000	520	No
10-27-92	1,365	1,510	1,000	510	No
10-27-92	1,380	1,510	1,000	510	No
10-27-92	1,395	1,510	1,000	510	No
10-27-92	1,410	1,500	1,000	500	No
10-27-92	1,425	1,480	1,000	480	No
10-27-92	1,440	1,450	1,000	450	No
10-28-92	15	1,390	1,000	390	No
10-28-92	30	1,320	1,000	320	No
10-28-92	45	1,250	1,000	250	No
10-28-92	60	1,150	1,000	150	No
10-28-92	75	1,050	1,000	50	No
10-28-92	90	966	1,000	-34	Yes
10-28-92	105	891	1,000	-109	Yes
10-28-92	120	833	1,000	-167	Yes
10-28-92	135	790	1,000	-210	Yes
10-28-92	150	762	1,000	-238	Yes
10-28-92	165	756	1,000	-244	Yes
10-28-92	180	749	1,000	-251	Yes
10-28-92	195	742	1,000	-258	Yes
10-28-92	210	742	1,000	-258	Yes
10-28-92	225	735	1,000	-265	Yes
10-28-92	240	735	1,000	-265	Yes
10-28-92	255	728	1,000	-272	Yes
10-28-92	270	728	1,000	-272	Yes
10-28-92	285	728	1,000	-272	Yes
10-28-92	300	728	1,000	-272	Yes
10-28-92	315	728	1,000	-272	Yes
10-28-92	330	728	1,000	-272	Yes
10-28-92	345	728	1,000	-272	Yes
10-28-92	360	728	1,000	-272	Yes
10-28-92	375	728	1,000	-272	Yes
10-28-92	390	728	1,000	-272	Yes
10-28-92	405	728	1,000	-272	Yes
10-28-92	420	721	1,000	-279	Yes
10-28-92	435	721	1,000	-279	Yes
10-28-92	450	721	1,000	-279	Yes
10-28-92	465	721	1,000	-279	Yes
10-28-92	480	728	1,000	-272	Yes
10-28-92	495	783	1,000	-217	Yes
10-28-92	510	876	1,000	-124	Yes
10-28-92	525	981	1,000	-19	Yes
10-28-92	540	1,090	1,000	90	No
10-28-92	555	1,200	1,000	200	No
10-28-92	570	1,300	1,000	300	No
10-28-92	585	1,370	1,000	370	No
10-28-92	600	1,420	1,000	420	No
10-28-92	615	1,450	1,000	450	No
10-28-92	630	1,460	1,000	460	No
10-28-92	645	1,470	1,000	470	No
10-28-92	660	1,470	1,000	470	No
10-28-92	675	1,470	1,000	470	No
10-28-92	690	1,470	1,000	470	No
10-28-92	705	1,460	1,000	460	No
10-28-92	720	1,450	1,000	450	No
10-28-92	735	1,450	1,000	450	No
10-28-92	750	1,450	1,000	450	No
10-28-92	765	1,450	1,000	450	No
10-28-92	780	1,450	1,000	450	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-28-92	795	1,450	1,000	450	No
10-28-92	810	1,460	1,000	460	No
10-28-92	825	1,470	1,000	470	No
10-28-92	840	1,470	1,000	470	No
10-28-92	855	1,500	1,000	500	No
10-28-92	870	1,500	1,000	500	No
10-28-92	885	1,500	1,000	500	No
10-28-92	900	1,500	1,000	500	No
10-28-92	915	1,500	1,000	500	No
10-28-92	930	1,500	1,000	500	No
10-28-92	945	1,500	1,000	500	No
10-28-92	960	1,500	1,000	500	No
10-28-92	975	1,500	1,000	500	No
10-28-92	990	1,500	1,000	500	No
10-28-92	1,005	1,500	1,000	500	No
10-28-92	1,020	1,500	1,000	500	No
10-28-92	1,035	1,500	1,000	500	No
10-28-92	1,050	1,500	1,000	500	No
10-28-92	1,065	1,500	1,000	500	No
10-28-92	1,080	1,450	1,000	450	No
10-28-92	1,095	1,460	1,000	460	No
10-28-92	1,110	1,470	1,000	470	No
10-28-92	1,125	1,480	1,000	480	No
10-28-92	1,140	1,490	1,000	490	No
10-28-92	1,155	1,500	1,000	500	No
10-28-92	1,170	1,500	1,000	500	No
10-28-92	1,185	1,500	1,000	500	No
10-28-92	1,200	1,500	1,000	500	No
10-28-92	1,215	1,500	1,000	500	No
10-28-92	1,230	1,500	1,000	500	No
10-28-92	1,245	1,500	1,000	500	No
10-28-92	1,260	1,500	1,000	500	No
10-28-92	1,275	1,500	1,000	500	No
10-28-92	1,290	1,500	1,000	500	No
10-28-92	1,305	1,500	1,000	500	No
10-28-92	1,320	1,490	1,000	490	No
10-28-92	1,335	1,490	1,000	490	No
10-28-92	1,350	1,490	1,000	490	No
10-28-92	1,365	1,490	1,000	490	No
10-28-92	1,380	1,490	1,000	490	No
10-28-92	1,395	1,490	1,000	490	No
10-28-92	1,410	1,490	1,000	490	No
10-28-92	1,425	1,490	1,000	490	No
10-28-92	1,440	1,490	1,000	490	No
10-29-92	15	1,490	1,000	490	No
10-29-92	30	1,490	1,000	490	No
10-29-92	45	1,450	1,000	450	No
10-29-92	60	1,400	1,000	400	No
10-29-92	75	1,310	1,000	310	No
10-29-92	90	1,220	1,000	220	No
10-29-92	105	1,110	1,000	110	No
10-29-92	120	1,020	1,000	20	No
10-29-92	135	943	1,000	-57	Yes
10-29-92	150	876	1,000	-124	Yes
10-29-92	165	826	1,000	-174	Yes
10-29-92	180	783	1,000	-217	Yes
10-29-92	195	756	1,000	-244	Yes
10-29-92	210	735	1,000	-265	Yes
10-29-92	225	733	1,000	-267	Yes
10-29-92	240	731	1,000	-269	Yes
10-29-92	255	730	1,000	-270	Yes
10-29-92	270	728	1,000	-272	Yes
10-29-92	285	726	1,000	-274	Yes
10-29-92	300	724	1,000	-276	Yes
10-29-92	315	722	1,000	-278	Yes
10-29-92	330	721	1,000	-279	Yes
10-29-92	345	719	1,000	-281	Yes
10-29-92	360	717	1,000	-283	Yes
10-29-92	375	715	1,000	-285	Yes
10-29-92	390	713	1,000	-287	Yes
10-29-92	405	712	1,000	-288	Yes
10-29-92	420	710	1,000	-290	Yes
10-29-92	435	708	1,000	-292	Yes
10-29-92	450	804	1,000	-196	Yes
10-29-92	465	958	1,000	-42	Yes
10-29-92	480	1,120	1,000	120	No
10-29-92	495	1,250	1,000	250	No
10-29-92	510	1,360	1,000	360	No
10-29-92	525	1,420	1,000	420	No
10-29-92	540	1,450	1,000	450	No
10-29-92	555	1,480	1,000	480	No
10-29-92	570	1,490	1,000	490	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-29-92	585	1,500	1,000	500	No
10-29-92	600	1,500	1,000	500	No
10-29-92	615	1,500	1,000	500	No
10-29-92	630	1,500	1,000	500	No
10-29-92	645	1,500	1,000	500	No
10-29-92	660	1,500	1,000	500	No
10-29-92	675	1,500	1,000	500	No
10-29-92	690	1,500	1,000	500	No
10-29-92	705	1,500	1,000	500	No
10-29-92	720	1,500	1,000	500	No
10-29-92	735	1,500	1,000	500	No
10-29-92	750	1,500	1,000	500	No
10-29-92	765	1,500	1,000	500	No
10-29-92	780	1,500	1,000	500	No
10-29-92	795	1,500	1,000	500	No
10-29-92	810	1,500	1,000	500	No
10-29-92	825	1,520	1,000	520	No
10-29-92	840	1,520	1,000	520	No
10-29-92	855	1,520	1,000	520	No
10-29-92	870	1,520	1,000	520	No
10-29-92	885	1,520	1,000	520	No
10-29-92	900	1,520	1,000	520	No
10-29-92	915	1,520	1,000	520	No
10-29-92	930	1,510	1,000	510	No
10-29-92	945	1,510	1,000	510	No
10-29-92	960	1,500	1,000	500	No
10-29-92	975	1,500	1,000	500	No
10-29-92	990	1,500	1,000	500	No
10-29-92	1,005	1,500	1,000	500	No
10-29-92	1,020	1,490	1,000	490	No
10-29-92	1,035	1,490	1,000	490	No
10-29-92	1,050	1,490	1,000	490	No
10-29-92	1,065	1,490	1,000	490	No
10-29-92	1,080	1,500	1,000	500	No
10-29-92	1,095	1,510	1,000	510	No
10-29-92	1,110	1,520	1,000	520	No
10-29-92	1,125	1,530	1,000	530	No
10-29-92	1,140	1,530	1,000	530	No
10-29-92	1,155	1,530	1,000	530	No
10-29-92	1,170	1,540	1,000	540	No
10-29-92	1,185	1,540	1,000	540	No
10-29-92	1,200	1,540	1,000	540	No
10-29-92	1,215	1,540	1,000	540	No
10-29-92	1,230	1,540	1,000	540	No
10-29-92	1,245	1,540	1,000	540	No
10-29-92	1,260	1,540	1,000	540	No
10-29-92	1,275	1,530	1,000	530	No
10-29-92	1,290	1,530	1,000	530	No
10-29-92	1,305	1,520	1,000	520	No
10-29-92	1,320	1,520	1,000	520	No
10-29-92	1,335	1,520	1,000	520	No
10-29-92	1,350	1,520	1,000	520	No
10-29-92	1,365	1,520	1,000	520	No
10-29-92	1,380	1,530	1,000	530	No
10-29-92	1,395	1,530	1,000	530	No
10-29-92	1,410	1,530	1,000	530	No
10-29-92	1,425	1,530	1,000	530	No
10-29-92	1,440	1,530	1,000	530	No
10-30-92	15	1,430	1,000	430	No
10-30-92	30	1,460	1,000	460	No
10-30-92	45	1,490	1,000	490	No
10-30-92	60	1,450	1,000	450	No
10-30-92	75	1,353	1,000	353	No
10-30-92	90	1,257	1,000	257	No
10-30-92	105	1160	1,000	160	No
10-30-92	120	1,078	1,000	78	No
10-30-92	135	995	1,000	-5	Yes
10-30-92	150	913	1,000	-87	Yes
10-30-92	165	854	1,000	-146	Yes
10-30-92	180	850	1,000	-150	Yes
10-30-92	195	846	1,000	-154	Yes
10-30-92	210	842	1,000	-158	Yes
10-30-92	225	838	1,000	-162	Yes
10-30-92	240	835	1,000	-165	Yes
10-30-92	255	831	1,000	-169	Yes
10-30-92	270	827	1,000	-173	Yes
10-30-92	285	823	1,000	-177	Yes
10-30-92	300	819	1,000	-181	Yes
10-30-92	315	815	1,000	-185	Yes
10-30-92	330	811	1,000	-189	Yes
10-30-92	345	807	1,000	-193	Yes
10-30-92	360	803	1,000	-197	Yes

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-30-92	375	799	1,000	-201	Yes
10-30-92	390	795	1,000	-205	Yes
10-30-92	405	791	1,000	-209	Yes
10-30-92	420	787	1,000	-213	Yes
10-30-92	435	783	1,000	-217	Yes
10-30-92	450	935	1,000	-65	Yes
10-30-92	465	1,100	1,000	100	No
10-30-92	480	1,240	1,000	240	No
10-30-92	495	1,330	1,000	330	No
10-30-92	510	1,400	1,000	400	No
10-30-92	525	1,450	1,000	450	No
10-30-92	540	1,470	1,000	470	No
10-30-92	555	1,490	1,000	490	No
10-30-92	570	1,490	1,000	490	No
10-30-92	585	1,500	1,000	500	No
10-30-92	600	1,500	1,000	500	No
10-30-92	615	1,500	1,000	500	No
10-30-92	630	1,500	1,000	500	No
10-30-92	645	1,500	1,000	500	No
10-30-92	660	1,500	1,000	500	No
10-30-92	675	1,500	1,000	500	No
10-30-92	690	1,500	1,000	500	No
10-30-92	705	1,500	1,000	500	No
10-30-92	720	1,500	1,000	500	No
10-30-92	735	1,500	1,000	500	No
10-30-92	750	1,500	1,000	500	No
10-30-92	765	1,500	1,000	500	No
10-30-92	780	1,510	1,000	510	No
10-30-92	795	1,520	1,000	520	No
10-30-92	810	1,520	1,000	520	No
10-30-92	825	1,520	1,000	520	No
10-30-92	840	1,530	1,000	530	No
10-30-92	855	1,530	1,000	530	No
10-30-92	870	1,530	1,000	530	No
10-30-92	885	1,530	1,000	530	No
10-30-92	900	1,530	1,000	530	No
10-30-92	915	1,530	1,000	530	No
10-30-92	930	1,540	1,000	540	No
10-30-92	945	1,540	1,000	540	No
10-30-92	960	1,540	1,000	540	No
10-30-92	975	1,540	1,000	540	No
10-30-92	990	1,540	1,000	540	No
10-30-92	1,005	1,540	1,000	540	No
10-30-92	1,020	1,540	1,000	540	No
10-30-92	1,035	1,540	1,000	540	No
10-30-92	1,050	1,540	1,000	540	No
10-30-92	1,065	1,540	1,000	540	No
10-30-92	1,080	1,540	1,000	540	No
10-30-92	1,095	1,540	1,000	540	No
10-30-92	1,110	1,540	1,000	540	No
10-30-92	1,125	1,540	1,000	540	No
10-30-92	1,140	1,540	1,000	540	No
10-30-92	1,155	1,540	1,000	540	No
10-30-92	1,170	1,540	1,000	540	No
10-30-92	1,185	1,540	1,000	540	No
10-30-92	1,200	1,540	1,000	540	No
10-30-92	1,215	1,540	1,000	540	No
10-30-92	1,230	1,540	1,000	540	No
10-30-92	1,245	1,540	1,000	540	No
10-30-92	1,260	1,540	1,000	540	No
10-30-92	1,275	1,540	1,000	540	No
10-30-92	1,290	1,540	1,000	540	No
10-30-92	1,305	1,540	1,000	540	No
10-30-92	1,320	1,540	1,000	540	No
10-30-92	1,335	1,540	1,000	540	No
10-30-92	1,350	1,540	1,000	540	No
10-30-92	1,365	1,540	1,000	540	No
10-30-92	1,380	1,540	1,000	540	No
10-30-92	1,395	1,540	1,000	540	No
10-30-92	1,410	1,540	1,000	540	No
10-30-92	1,425	1,540	1,000	540	No
10-30-92	1,440	1,540	1,000	540	No
10-31-92	15	1,517	1,000	517	No
10-31-92	30	1,493	1,000	493	No
10-31-92	45	1470	1,000	470	No
10-31-92	60	1400	1,000	400	No
10-31-92	75	1,297	1,000	297	No
10-31-92	90	1,193	1,000	193	No
10-31-92	105	1090	1,000	90	No
10-31-92	120	1,016	1,000	16	No
10-31-92	135	943	1,000	-57	Yes
10-31-92	150	869	1,000	-131	Yes

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-31-92	165	826	1,000	-174	Yes
10-31-92	180	794	1,000	-206	Yes
10-31-92	195	762	1,000	-238	Yes
10-31-92	210	749	1,000	-251	Yes
10-31-92	225	728	1,000	-272	Yes
10-31-92	240	715	1,000	-285	Yes
10-31-92	255	708	1,000	-292	Yes
10-31-92	270	708	1,000	-292	Yes
10-31-92	285	701	1,000	-299	Yes
10-31-92	300	701	1,000	-299	Yes
10-31-92	315	701	1,000	-299	Yes
10-31-92	330	701	1,000	-299	Yes
10-31-92	345	698	1,000	-302	Yes
10-31-92	360	695	1,000	-305	Yes
10-31-92	375	688	1,000	-312	Yes
10-31-92	390	688	1,000	-312	Yes
10-31-92	405	688	1,000	-312	Yes
10-31-92	420	688	1,000	-312	Yes
10-31-92	435	688	1,000	-312	Yes
10-31-92	450	688	1,000	-312	Yes
10-31-92	465	688	1,000	-312	Yes
10-31-92	480	688	1,000	-312	Yes
10-31-92	495	688	1,000	-312	Yes
10-31-92	510	688	1,000	-312	Yes
10-31-92	525	695	1,000	-305	Yes
10-31-92	540	742	1,000	-258	Yes
10-31-92	555	862	1,000	-138	Yes
10-31-92	570	1,030	1,000	30	No
10-31-92	585	1,200	1,000	200	No
10-31-92	600	1,310	1,000	310	No
10-31-92	615	1,400	1,000	400	No
10-31-92	630	1,450	1,000	450	No
10-31-92	645	1,490	1,000	490	No
10-31-92	660	1,510	1,000	510	No
10-31-92	675	1,530	1,000	530	No
10-31-92	690	1,540	1,000	540	No
10-31-92	705	1,540	1,000	540	No
10-31-92	720	1,540	1,000	540	No
10-31-92	735	1,550	1,000	550	No
10-31-92	750	1,550	1,000	550	No
10-31-92	765	1,550	1,000	550	No
10-31-92	780	1,550	1,000	550	No
10-31-92	795	1,550	1,000	550	No
10-31-92	810	1,550	1,000	550	No
10-31-92	825	1,550	1,000	550	No
10-31-92	840	1,550	1,000	550	No
10-31-92	855	1,550	1,000	550	No
10-31-92	870	1,540	1,000	540	No
10-31-92	885	1,540	1,000	540	No
10-31-92	900	1,540	1,000	540	No
10-31-92	915	1,540	1,000	540	No
10-31-92	930	1,540	1,000	540	No
10-31-92	945	1,540	1,000	540	No
10-31-92	960	1,540	1,000	540	No
10-31-92	975	1,540	1,000	540	No
10-31-92	990	1,540	1,000	540	No
10-31-92	1,005	1,540	1,000	540	No
10-31-92	1,020	1,550	1,000	550	No
10-31-92	1,035	1,560	1,000	560	No
10-31-92	1,050	1,580	1,000	580	No
10-31-92	1,065	1,590	1,000	590	No
10-31-92	1,080	1,600	1,000	600	No
10-31-92	1,095	1,610	1,000	610	No
10-31-92	1,110	1,610	1,000	610	No
10-31-92	1,125	1,610	1,000	610	No
10-31-92	1,140	1,610	1,000	610	No
10-31-92	1,155	1,610	1,000	610	No
10-31-92	1,170	1,610	1,000	610	No
10-31-92	1,185	1,610	1,000	610	No
10-31-92	1,200	1,610	1,000	610	No
10-31-92	1,215	1,610	1,000	610	No
10-31-92	1,230	1,610	1,000	610	No
10-31-92	1,245	1,610	1,000	610	No
10-31-92	1,260	1,610	1,000	610	No
10-31-92	1,275	1,610	1,000	610	No
10-31-92	1,290	1,610	1,000	610	No
10-31-92	1,305	1,610	1,000	610	No
10-31-92	1,320	1,610	1,000	610	No
10-31-92	1,335	1,610	1,000	610	No
10-31-92	1,350	1,610	1,000	610	No
10-31-92	1,365	1,610	1,000	610	No
10-31-92	1,380	1,610	1,000	610	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
10-31-92	1,395	1,630	1,000	630	No
10-31-92	1,410	1,630	1,000	630	No
10-31-92	1,425	1,640	1,000	640	No
10-31-92	1,440	1,660	1,000	660	No
11-01-92	15	1,670	1,000	670	No
11-01-92	30	1,670	1,000	670	No
11-01-92	45	1,650	1,000	650	No
11-01-92	60	1,570	1,000	570	No
11-01-92	75	1,470	1,000	470	No
11-01-92	90	1,370	1,000	370	No
11-01-92	105	1,250	1,000	250	No
11-01-92	120	1,160	1,000	160	No
11-01-92	135	1,080	1,000	80	No
11-01-92	150	1,020	1,000	20	No
11-01-92	165	981	1,000	-19	Yes
11-01-92	180	943	1,000	-57	Yes
11-01-92	195	920	1,000	-80	Yes
11-01-92	210	906	1,000	-94	Yes
11-01-92	225	898	1,000	-102	Yes
11-01-92	240	891	1,000	-109	Yes
11-01-92	255	891	1,000	-109	Yes
11-01-92	270	891	1,000	-109	Yes
11-01-92	285	891	1,000	-109	Yes
11-01-92	300	891	1,000	-109	Yes
11-01-92	315	900	1,000	-100	Yes
11-01-92	330	910	1,000	-91	Yes
11-01-92	345	919	1,000	-81	Yes
11-01-92	360	928	1,000	-72	Yes
11-01-92	375	932	1,000	-68	Yes
11-01-92	390	936	1,000	-65	Yes
11-01-92	405	939	1,000	-61	Yes
11-01-92	420	943	1,000	-57	Yes
11-01-92	435	949	1,000	-51	Yes
11-01-92	450	955	1,000	-46	Yes
11-01-92	465	960	1,000	-40	Yes
11-01-92	480	966	1,000	-34	Yes
11-01-92	495	1,025	1,000	25	No
11-01-92	510	1,083	1,000	83	No
11-01-92	525	1,142	1,000	142	No
11-01-92	540	1,200	1,000	200	No
11-01-92	555	1,255	1,000	255	No
11-01-92	570	1,310	1,000	310	No
11-01-92	585	1,365	1,000	365	No
11-01-92	600	1,420	1,000	420	No
11-01-92	615	1,440	1,000	440	No
11-01-92	630	1,460	1,000	460	No
11-01-92	645	1,480	1,000	480	No
11-01-92	660	1,500	1,000	500	No
11-01-92	675	1,515	1,000	515	No
11-01-92	690	1,530	1,000	530	No
11-01-92	705	1,545	1,000	545	No
11-01-92	720	1,560	1,000	560	No
11-01-92	735	1,575	1,000	575	No
11-01-92	750	1,590	1,000	590	No
11-01-92	765	1,605	1,000	605	No
11-01-92	780	1,620	1,000	620	No
11-01-92	795	1,630	1,000	630	No
11-01-92	810	1,640	1,000	640	No
11-01-92	825	1,650	1,000	650	No
11-01-92	840	1,660	1,000	660	No
11-01-92	855	1,660	1,000	660	No
11-01-92	870	1,660	1,000	660	No
11-01-92	885	1,660	1,000	660	No
11-01-92	900	1,660	1,000	660	No
11-01-92	915	1,660	1,000	660	No
11-01-92	930	1,660	1,000	660	No
11-01-92	945	1,660	1,000	660	No
11-01-92	960	1,660	1,000	660	No
11-01-92	975	1,660	1,000	660	No
11-01-92	990	1,660	1,000	660	No
11-01-92	1,005	1,660	1,000	660	No
11-01-92	1,020	1,670	1,000	670	No
11-01-92	1,035	1,673	1,000	673	No
11-01-92	1,050	1,677	1,000	677	No
11-01-92	1,065	1,680	1,000	680	No
11-01-92	1,080	1,680	1,000	680	No
11-01-92	1,095	1,678	1,000	678	No
11-01-92	1,110	1,676	1,000	676	No
11-01-92	1,125	1,674	1,000	674	No
11-01-92	1,140	1,672	1,000	672	No
11-01-92	1,155	1,670	1,000	670	No
11-01-92	1,170	1,670	1,000	670	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-01-92	1,185	1,680	1,000	680	No
11-01-92	1,200	1,680	1,000	680	No
11-01-92	1,215	1,690	1,000	690	No
11-01-92	1,230	1,700	1,000	700	No
11-01-92	1,245	1,700	1,000	700	No
11-01-92	1,260	1,710	1,000	710	No
11-01-92	1,275	1,710	1,000	710	No
11-01-92	1,290	1,710	1,000	710	No
11-01-92	1,305	1,710	1,000	710	No
11-01-92	1,320	1,710	1,000	710	No
11-01-92	1,335	1,700	1,000	700	No
11-01-92	1,350	1,695	1,000	695	No
11-01-92	1,365	1,690	1,000	690	No
11-01-92	1,380	1,685	1,000	685	No
11-01-92	1,395	1,680	1,000	680	No
11-01-92	1,410	1,670	1,000	670	No
11-01-92	1,425	1,670	1,000	670	No
11-01-92	1,440	1,670	1,000	670	No
11-02-92	15	1,660	1,007	653	No
11-02-92	30	1,650	1,007	643	No
11-02-92	45	1,610	1,007	603	No
11-02-92	60	1,560	1,007	553	No
11-02-92	75	1,500	1,007	493	No
11-02-92	90	1,430	1,007	423	No
11-02-92	105	1,370	1,007	363	No
11-02-92	120	1,310	1,007	303	No
11-02-92	135	1,260	1,007	253	No
11-02-92	150	1,240	1,007	233	No
11-02-92	165	1,210	1,007	203	No
11-02-92	180	1,200	1,007	193	No
11-02-92	195	1,190	1,007	183	No
11-02-92	210	1,180	1,007	173	No
11-02-92	225	1,180	1,007	173	No
11-02-92	240	1,180	1,007	173	No
11-02-92	255	1,180	1,007	173	No
11-02-92	270	1,180	1,007	173	No
11-02-92	285	1,185	1,007	178	No
11-02-92	300	1,190	1,007	183	No
11-02-92	315	1,200	1,007	193	No
11-02-92	330	1,200	1,007	193	No
11-02-92	345	1,200	1,007	193	No
11-02-92	360	1,210	1,007	203	No
11-02-92	375	1,230	1,007	223	No
11-02-92	390	1,250	1,007	243	No
11-02-92	405	1,280	1,007	273	No
11-02-92	420	1,315	1,007	308	No
11-02-92	435	1,350	1,007	343	No
11-02-92	450	1,370	1,007	363	No
11-02-92	465	1,410	1,007	403	No
11-02-92	480	1,460	1,007	453	No
11-02-92	495	1,540	1,007	533	No
11-02-92	510	1,620	1,007	613	No
11-02-92	525	1,700	1,007	693	No
11-02-92	540	1,760	1,007	753	No
11-02-92	555	1,810	1,007	803	No
11-02-92	570	1,850	1,007	843	No
11-02-92	585	1,870	1,007	863	No
11-02-92	600	1,880	1,007	873	No
11-02-92	615	1,890	1,007	883	No
11-02-92	630	1,890	1,007	883	No
11-02-92	645	1,890	1,007	883	No
11-02-92	660	1,890	1,007	883	No
11-02-92	675	1,900	1,007	893	No
11-02-92	690	1,900	1,007	893	No
11-02-92	705	1,910	1,007	903	No
11-02-92	720	1,910	1,007	903	No
11-02-92	735	1,920	1,007	913	No
11-02-92	750	1,920	1,007	913	No
11-02-92	765	1,920	1,007	913	No
11-02-92	780	1,920	1,007	913	No
11-02-92	795	1,910	1,007	903	No
11-02-92	810	1,910	1,007	903	No
11-02-92	825	1,900	1,007	893	No
11-02-92	840	1,890	1,007	883	No
11-02-92	855	1,880	1,007	873	No
11-02-92	870	1,870	1,007	863	No
11-02-92	885	1,860	1,007	853	No
11-02-92	900	1,850	1,007	843	No
11-02-92	915	1,840	1,007	833	No
11-02-92	930	1,830	1,007	823	No
11-02-92	945	1,820	1,007	813	No
11-02-92	960	1,810	1,007	803	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-02-92	975	1,802	1,007	795	No
11-02-92	990	1,795	1,007	787	No
11-02-92	1,005	1,787	1,007	780	No
11-02-92	1,020	1,779	1,007	772	No
11-02-92	1,035	1,772	1,007	764	No
11-02-92	1,050	1,764	1,007	757	No
11-02-92	1,065	1,756	1,007	749	No
11-02-92	1,080	1,748	1,007	741	No
11-02-92	1,095	1,741	1,007	734	No
11-02-92	1,110	1,733	1,007	726	No
11-02-92	1,125	1,725	1,007	718	No
11-02-92	1,140	1,718	1,007	711	No
11-02-92	1,155	1,710	1,007	703	No
11-02-92	1,170	1,700	1,007	693	No
11-02-92	1,185	1,690	1,007	683	No
11-02-92	1,200	1,680	1,007	673	No
11-02-92	1,215	1,670	1,007	663	No
11-02-92	1,230	1,670	1,007	663	No
11-02-92	1,245	1,670	1,007	663	No
11-02-92	1,260	1,670	1,007	663	No
11-02-92	1,275	1,660	1,007	653	No
11-02-92	1,290	1,660	1,007	653	No
11-02-92	1,305	1,660	1,007	653	No
11-02-92	1,320	1,650	1,007	643	No
11-02-92	1,335	1,650	1,007	643	No
11-02-92	1,350	1,640	1,007	633	No
11-02-92	1,365	1,640	1,007	633	No
11-02-92	1,380	1,630	1,007	623	No
11-02-92	1,395	1,630	1,007	623	No
11-02-92	1,410	1,620	1,007	613	No
11-02-92	1,425	1,620	1,007	613	No
11-02-92	1,440	1,610	1,007	603	No
11-03-92	15	1,610	1,014	596	No
11-03-92	30	1,610	1,014	596	No
11-03-92	45	1,600	1,014	586	No
11-03-92	60	1,600	1,014	586	No
11-03-92	75	1,600	1,014	586	No
11-03-92	90	1,600	1,014	586	No
11-03-92	105	1,600	1,014	586	No
11-03-92	120	1,590	1,014	576	No
11-03-92	135	1,590	1,014	576	No
11-03-92	150	1,580	1,014	566	No
11-03-92	165	1,580	1,014	566	No
11-03-92	180	1,570	1,014	556	No
11-03-92	195	1,570	1,014	556	No
11-03-92	210	1,560	1,014	546	No
11-03-92	225	1,560	1,014	546	No
11-03-92	240	1,560	1,014	546	No
11-03-92	255	1,550	1,014	536	No
11-03-92	270	1,540	1,014	526	No
11-03-92	285	1,540	1,014	526	No
11-03-92	300	1,540	1,014	526	No
11-03-92	315	1,540	1,014	526	No
11-03-92	330	1,530	1,014	516	No
11-03-92	345	1,530	1,014	516	No
11-03-92	360	1,530	1,014	516	No
11-03-92	375	1,550	1,014	536	No
11-03-92	390	1,610	1,014	596	No
11-03-92	405	1,670	1,014	656	No
11-03-92	420	1,730	1,014	716	No
11-03-92	435	1,780	1,014	766	No
11-03-92	450	1,810	1,014	796	No
11-03-92	465	1,830	1,014	816	No
11-03-92	480	1,840	1,014	826	No
11-03-92	495	1,850	1,014	836	No
11-03-92	510	1,860	1,014	846	No
11-03-92	525	1,860	1,014	846	No
11-03-92	540	1,860	1,014	846	No
11-03-92	555	1,860	1,014	846	No
11-03-92	570	1,850	1,014	836	No
11-03-92	585	1,850	1,014	836	No
11-03-92	600	1,850	1,014	836	No
11-03-92	615	1,850	1,014	836	No
11-03-92	630	1,850	1,014	836	No
11-03-92	645	1,850	1,014	836	No
11-03-92	660	1,850	1,014	836	No
11-03-92	675	1,850	1,014	836	No
11-03-92	690	1,850	1,014	836	No
11-03-92	705	1,850	1,014	836	No
11-03-92	720	1,840	1,014	826	No
11-03-92	735	1,840	1,014	826	No
11-03-92	750	1,840	1,014	826	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-03-92	765	1,830	1,014	816	No
11-03-92	780	1,830	1,014	816	No
11-03-92	795	1,830	1,014	816	No
11-03-92	810	1,820	1,014	806	No
11-03-92	825	1,820	1,014	806	No
11-03-92	840	1,820	1,014	806	No
11-03-92	855	1,820	1,014	806	No
11-03-92	870	1,820	1,014	806	No
11-03-92	885	1,820	1,014	806	No
11-03-92	900	1,820	1,014	806	No
11-03-92	915	1,820	1,014	806	No
11-03-92	930	1,810	1,014	796	No
11-03-92	945	1,810	1,014	796	No
11-03-92	960	1,810	1,014	796	No
11-03-92	975	1,800	1,014	786	No
11-03-92	990	1,800	1,014	786	No
11-03-92	1,005	1,800	1,014	786	No
11-03-92	1,020	1,800	1,014	786	No
11-03-92	1,035	1,790	1,014	776	No
11-03-92	1,050	1,790	1,014	776	No
11-03-92	1,065	1,790	1,014	776	No
11-03-92	1,080	1,790	1,014	776	No
11-03-92	1,095	1,790	1,014	776	No
11-03-92	1,110	1,790	1,014	776	No
11-03-92	1,125	1,790	1,014	776	No
11-03-92	1,140	1,790	1,014	776	No
11-03-92	1,155	1,790	1,014	776	No
11-03-92	1,170	1,790	1,014	776	No
11-03-92	1,185	1,790	1,014	776	No
11-03-92	1,200	1,790	1,014	776	No
11-03-92	1,215	1,790	1,014	776	No
11-03-92	1,230	1,790	1,014	776	No
11-03-92	1,245	1,790	1,014	776	No
11-03-92	1,260	1,780	1,014	766	No
11-03-92	1,275	1,777	1,014	762	No
11-03-92	1,290	1,773	1,014	759	No
11-03-92	1,305	1,770	1,014	756	No
11-03-92	1,320	1,767	1,014	752	No
11-03-92	1,335	1,763	1,014	749	No
11-03-92	1,350	1,760	1,014	746	No
11-03-92	1,365	1,760	1,014	746	No
11-03-92	1,380	1,760	1,014	746	No
11-03-92	1,395	1,760	1,014	746	No
11-03-92	1,410	1,755	1,014	741	No
11-03-92	1,425	1,750	1,014	736	No
11-03-92	1,440	1,720	1,014	706	No
11-04-92	15	1,670	1,021	649	No
11-04-92	30	1,600	1,021	579	No
11-04-92	45	1,510	1,021	489	No
11-04-92	60	1,410	1,021	389	No
11-04-92	75	1,320	1,021	299	No
11-04-92	90	1,250	1,021	229	No
11-04-92	105	1,190	1,021	169	No
11-04-92	120	1,140	1,021	119	No
11-04-92	135	1,110	1,021	89	No
11-04-92	150	1,080	1,021	59	No
11-04-92	165	1,070	1,021	49	No
11-04-92	180	1,050	1,021	29	No
11-04-92	195	1,040	1,021	19	No
11-04-92	210	1,030	1,021	9	No
11-04-92	225	1,030	1,021	9	No
11-04-92	240	1,020	1,021	-1	Yes
11-04-92	255	1,020	1,021	-1	Yes
11-04-92	270	1,020	1,021	-1	Yes
11-04-92	285	1,020	1,021	-1	Yes
11-04-92	300	1,020	1,021	-1	Yes
11-04-92	315	1,020	1,021	-1	Yes
11-04-92	330	1,020	1,021	-1	Yes
11-04-92	345	1,030	1,021	9	No
11-04-92	360	1,030	1,021	9	No
11-04-92	375	1,030	1,021	9	No
11-04-92	390	1,030	1,021	9	No
11-04-92	405	1,030	1,021	9	No
11-04-92	420	1,030	1,021	9	No
11-04-92	435	1,030	1,021	9	No
11-04-92	450	1,030	1,021	9	No
11-04-92	465	1,030	1,021	9	No
11-04-92	480	1,030	1,021	9	No
11-04-92	495	1,110	1,021	89	No
11-04-92	510	1,280	1,021	259	No
11-04-92	525	1,520	1,021	499	No
11-04-92	540	1,740	1,021	719	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-04-92	555	1,910	1,021	889	No
11-04-92	570	2,030	1,021	1,009	No
11-04-92	585	2,100	1,021	1,079	No
11-04-92	600	2,150	1,021	1,129	No
11-04-92	615	2,190	1,021	1,169	No
11-04-92	630	2,210	1,021	1,189	No
11-04-92	645	2,220	1,021	1,199	No
11-04-92	660	2,240	1,021	1,219	No
11-04-92	675	2,250	1,021	1,229	No
11-04-92	690	2,260	1,021	1,239	No
11-04-92	705	2,270	1,021	1,249	No
11-04-92	720	2,280	1,021	1,259	No
11-04-92	735	2,280	1,021	1,259	No
11-04-92	750	2,290	1,021	1,269	No
11-04-92	765	2,300	1,021	1,279	No
11-04-92	780	2,300	1,021	1,279	No
11-04-92	795	2,300	1,021	1,279	No
11-04-92	810	2,310	1,021	1,289	No
11-04-92	825	2,310	1,021	1,289	No
11-04-92	840	2,310	1,021	1,289	No
11-04-92	855	2,320	1,021	1,299	No
11-04-92	870	2,320	1,021	1,299	No
11-04-92	885	2,330	1,021	1,309	No
11-04-92	900	2,380	1,021	1,359	No
11-04-92	915	2,450	1,021	1,429	No
11-04-92	930	2,570	1,021	1,549	No
11-04-92	945	2,670	1,021	1,649	No
11-04-92	960	2,750	1,021	1,729	No
11-04-92	975	2,820	1,021	1,799	No
11-04-92	990	2,860	1,021	1,839	No
11-04-92	1,005	2,900	1,021	1,879	No
11-04-92	1,020	2,920	1,021	1,899	No
11-04-92	1,035	2,940	1,021	1,919	No
11-04-92	1,050	2,944	1,021	1,923	No
11-04-92	1,065	2,948	1,021	1,927	No
11-04-92	1,080	2,952	1,021	1,931	No
11-04-92	1,095	2,956	1,021	1,935	No
11-04-92	1,110	2,960	1,021	1,939	No
11-04-92	1,125	2,960	1,021	1,939	No
11-04-92	1,140	2,960	1,021	1,939	No
11-04-92	1,155	2,960	1,021	1,939	No
11-04-92	1,170	2,960	1,021	1,939	No
11-04-92	1,185	2,960	1,021	1,939	No
11-04-92	1,200	2,960	1,021	1,939	No
11-04-92	1,215	2,960	1,021	1,939	No
11-04-92	1,230	2,950	1,021	1,929	No
11-04-92	1,245	2,950	1,021	1,929	No
11-04-92	1,260	2,940	1,021	1,919	No
11-04-92	1,275	2,940	1,021	1,919	No
11-04-92	1,290	2,920	1,021	1,899	No
11-04-92	1,305	2,920	1,021	1,899	No
11-04-92	1,320	2,910	1,021	1,889	No
11-04-92	1,335	2,910	1,021	1,889	No
11-04-92	1,350	2,900	1,021	1,879	No
11-04-92	1,365	2,900	1,021	1,879	No
11-04-92	1,380	2,890	1,021	1,869	No
11-04-92	1,395	2,880	1,021	1,859	No
11-04-92	1,410	2,880	1,021	1,859	No
11-04-92	1,425	2,860	1,021	1,839	No
11-04-92	1,440	2,860	1,021	1,839	No
11-05-92	15	2,850	1,029	1,821	No
11-05-92	30	2,850	1,029	1,821	No
11-05-92	45	2,420	1,029	1,391	No
11-05-92	60	2,349	1,029	1,320	No
11-05-92	75	2,278	1,029	1,249	No
11-05-92	90	2,207	1,029	1,178	No
11-05-92	105	2,136	1,029	1,107	No
11-05-92	120	2,065	1,029	1,036	No
11-05-92	135	1,994	1,029	965	No
11-05-92	150	1,923	1,029	894	No
11-05-92	165	1,852	1,029	823	No
11-05-92	180	1,781	1,029	752	No
11-05-92	195	1,710	1,029	681	No
11-05-92	210	1,670	1,029	641	No
11-05-92	225	1,640	1,029	611	No
11-05-92	240	1,620	1,029	591	No
11-05-92	255	1,612	1,029	584	No
11-05-92	270	1,605	1,029	576	No
11-05-92	285	1,597	1,029	568	No
11-05-92	300	1,589	1,029	561	No
11-05-92	315	1,582	1,029	553	No
11-05-92	330	1,574	1,029	545	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-05-92	345	1,566	1,029	538	No
11-05-92	360	1,558	1,029	530	No
11-05-92	375	1,551	1,029	522	No
11-05-92	390	1,543	1,029	515	No
11-05-92	405	1,535	1,029	507	No
11-05-92	420	1,528	1,029	499	No
11-05-92	435	1,520	1,029	491	No
11-05-92	450	1,650	1,029	621	No
11-05-92	465	1,870	1,029	841	No
11-05-92	480	2,100	1,029	1,071	No
11-05-92	495	2,290	1,029	1,261	No
11-05-92	510	2,410	1,029	1,381	No
11-05-92	525	2,490	1,029	1,461	No
11-05-92	540	2,530	1,029	1,501	No
11-05-92	555	2,550	1,029	1,521	No
11-05-92	570	2,570	1,029	1,541	No
11-05-92	585	2,580	1,029	1,551	No
11-05-92	600	2,580	1,029	1,551	No
11-05-92	615	2,580	1,029	1,551	No
11-05-92	630	2,580	1,029	1,551	No
11-05-92	645	2,580	1,029	1,551	No
11-05-92	660	2,580	1,029	1,551	No
11-05-92	675	2,580	1,029	1,551	No
11-05-92	690	2,580	1,029	1,551	No
11-05-92	705	2,580	1,029	1,551	No
11-05-92	720	2,580	1,029	1,551	No
11-05-92	735	2,580	1,029	1,551	No
11-05-92	750	2,580	1,029	1,551	No
11-05-92	765	2,580	1,029	1,551	No
11-05-92	780	2,570	1,029	1,541	No
11-05-92	795	2,570	1,029	1,541	No
11-05-92	810	2,570	1,029	1,541	No
11-05-92	825	2,550	1,029	1,521	No
11-05-92	840	2,550	1,029	1,521	No
11-05-92	855	2,550	1,029	1,521	No
11-05-92	870	2,540	1,029	1,511	No
11-05-92	885	2,540	1,029	1,511	No
11-05-92	900	2,540	1,029	1,511	No
11-05-92	915	2,530	1,029	1,501	No
11-05-92	930	2,530	1,029	1,501	No
11-05-92	945	2,530	1,029	1,501	No
11-05-92	960	2,530	1,029	1,501	No
11-05-92	975	2,520	1,029	1,491	No
11-05-92	990	2,520	1,029	1,491	No
11-05-92	1,005	2,520	1,029	1,491	No
11-05-92	1,020	2,520	1,029	1,491	No
11-05-92	1,035	2,520	1,029	1,491	No
11-05-92	1,050	2,520	1,029	1,491	No
11-05-92	1,065	2,520	1,029	1,491	No
11-05-92	1,080	2,520	1,029	1,491	No
11-05-92	1,095	2,520	1,029	1,491	No
11-05-92	1,110	2,520	1,029	1,491	No
11-05-92	1,125	2,510	1,029	1,481	No
11-05-92	1,140	2,510	1,029	1,481	No
11-05-92	1,155	2,510	1,029	1,481	No
11-05-92	1,170	2,510	1,029	1,481	No
11-05-92	1,185	2,510	1,029	1,481	No
11-05-92	1,200	2,510	1,029	1,481	No
11-05-92	1,215	2,510	1,029	1,481	No
11-05-92	1,230	2,510	1,029	1,481	No
11-05-92	1,245	2,500	1,029	1,471	No
11-05-92	1,260	2,500	1,029	1,471	No
11-05-92	1,275	2,490	1,029	1,461	No
11-05-92	1,290	2,490	1,029	1,461	No
11-05-92	1,305	2,480	1,029	1,451	No
11-05-92	1,320	2,480	1,029	1,451	No
11-05-92	1,335	2,480	1,029	1,451	No
11-05-92	1,350	2,470	1,029	1,441	No
11-05-92	1,365	2,470	1,029	1,441	No
11-05-92	1,380	2,450	1,029	1,421	No
11-05-92	1,395	2,450	1,029	1,421	No
11-05-92	1,410	2,430	1,029	1,401	No
11-05-92	1,425	2,400	1,029	1,371	No
11-05-92	1,440	2,310	1,029	1,281	No
11-06-92	15	2,200	1,036	1,164	No
11-06-92	30	2,040	1,036	1,004	No
11-06-92	45	1,890	1,036	854	No
11-06-92	60	1,740	1,036	704	No
11-06-92	75	1,620	1,036	584	No
11-06-92	90	1,520	1,036	484	No
11-06-92	105	1,440	1,036	404	No
11-06-92	120	1,370	1,036	334	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-06-92	135	1,330	1,036	294	No
11-06-92	150	1,300	1,036	264	No
11-06-92	165	1,270	1,036	234	No
11-06-92	180	1,250	1,036	214	No
11-06-92	195	1,240	1,036	204	No
11-06-92	210	1,230	1,036	194	No
11-06-92	225	1,200	1,036	164	No
11-06-92	240	1,200	1,036	164	No
11-06-92	255	1,200	1,036	164	No
11-06-92	270	1,190	1,036	154	No
11-06-92	285	1,180	1,036	144	No
11-06-92	300	1,180	1,036	144	No
11-06-92	315	1,170	1,036	134	No
11-06-92	330	1,160	1,036	124	No
11-06-92	345	1,160	1,036	124	No
11-06-92	360	1,150	1,036	114	No
11-06-92	375	1,150	1,036	114	No
11-06-92	390	1,150	1,036	114	No
11-06-92	405	1,150	1,036	114	No
11-06-92	420	1,210	1,036	174	No
11-06-92	435	1,370	1,036	334	No
11-06-92	450	1,590	1,036	554	No
11-06-92	465	1,820	1,036	784	No
11-06-92	480	2,000	1,036	964	No
11-06-92	495	2,110	1,036	1,074	No
11-06-92	510	2,190	1,036	1,154	No
11-06-92	525	2,230	1,036	1,194	No
11-06-92	540	2,250	1,036	1,214	No
11-06-92	555	2,280	1,036	1,244	No
11-06-92	570	2,280	1,036	1,244	No
11-06-92	585	2,283	1,036	1,247	No
11-06-92	600	2,286	1,036	1,250	No
11-06-92	615	2,289	1,036	1,253	No
11-06-92	630	2,291	1,036	1,256	No
11-06-92	645	2,294	1,036	1,259	No
11-06-92	660	2,297	1,036	1,261	No
11-06-92	675	2,300	1,036	1,264	No
11-06-92	690	2,300	1,036	1,264	No
11-06-92	705	2,300	1,036	1,264	No
11-06-92	720	2,300	1,036	1,264	No
11-06-92	735	2,290	1,036	1,254	No
11-06-92	750	2,290	1,036	1,254	No
11-06-92	765	2,290	1,036	1,254	No
11-06-92	780	2,290	1,036	1,254	No
11-06-92	795	2,290	1,036	1,254	No
11-06-92	810	2,290	1,036	1,254	No
11-06-92	825	2,290	1,036	1,254	No
11-06-92	840	2,290	1,036	1,254	No
11-06-92	855	2,290	1,036	1,254	No
11-06-92	870	2,290	1,036	1,254	No
11-06-92	885	2,290	1,036	1,254	No
11-06-92	900	2,290	1,036	1,254	No
11-06-92	915	2,290	1,036	1,254	No
11-06-92	930	2,290	1,036	1,254	No
11-06-92	945	2,290	1,036	1,254	No
11-06-92	960	2,290	1,036	1,254	No
11-06-92	975	2,290	1,036	1,254	No
11-06-92	990	2,290	1,036	1,254	No
11-06-92	1,005	2,290	1,036	1,254	No
11-06-92	1,020	2,290	1,036	1,254	No
11-06-92	1,035	2,290	1,036	1,254	No
11-06-92	1,050	2,290	1,036	1,254	No
11-06-92	1,065	2,290	1,036	1,254	No
11-06-92	1,080	2,290	1,036	1,254	No
11-06-92	1,095	2,300	1,036	1,264	No
11-06-92	1,110	2,300	1,036	1,264	No
11-06-92	1,125	2,310	1,036	1,274	No
11-06-92	1,140	2,310	1,036	1,274	No
11-06-92	1,155	2,310	1,036	1,274	No
11-06-92	1,170	2,310	1,036	1,274	No
11-06-92	1,185	2,310	1,036	1,274	No
11-06-92	1,200	2,310	1,036	1,274	No
11-06-92	1,215	2,310	1,036	1,274	No
11-06-92	1,230	2,310	1,036	1,274	No
11-06-92	1,245	2,300	1,036	1,264	No
11-06-92	1,260	2,300	1,036	1,264	No
11-06-92	1,275	2,300	1,036	1,264	No
11-06-92	1,290	2,300	1,036	1,264	No
11-06-92	1,305	2,300	1,036	1,264	No
11-06-92	1,320	2,300	1,036	1,264	No
11-06-92	1,335	2,300	1,036	1,264	No
11-06-92	1,350	2,300	1,036	1,264	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-06-92	1,365	2,300	1,036	1,264	No
11-06-92	1,380	2,300	1,036	1,264	No
11-06-92	1,395	2,300	1,036	1,264	No
11-06-92	1,410	2,300	1,036	1,264	No
11-06-92	1,425	2,300	1,036	1,264	No
11-06-92	1,440	2,300	1,036	1,264	No
11-07-92	15	2,300	1,043	1,257	No
11-07-92	30	2,300	1,043	1,257	No
11-07-92	45	2,290	1,043	1,247	No
11-07-92	60	2,230	1,043	1,187	No
11-07-92	75	2,120	1,043	1,077	No
11-07-92	90	1,980	1,043	937	No
11-07-92	105	1,830	1,043	787	No
11-07-92	120	1,670	1,043	627	No
11-07-92	135	1,540	1,043	497	No
11-07-92	150	1,450	1,043	407	No
11-07-92	165	1,370	1,043	327	No
11-07-92	180	1,310	1,043	267	No
11-07-92	195	1,250	1,043	207	No
11-07-92	210	1,230	1,043	187	No
11-07-92	225	1,200	1,043	157	No
11-07-92	240	1,180	1,043	137	No
11-07-92	255	1,170	1,043	127	No
11-07-92	270	1,160	1,043	117	No
11-07-92	285	1,150	1,043	107	No
11-07-92	300	1,150	1,043	107	No
11-07-92	315	1,150	1,043	107	No
11-07-92	330	1,150	1,043	107	No
11-07-92	345	1,150	1,043	107	No
11-07-92	360	1,150	1,043	107	No
11-07-92	375	1,150	1,043	107	No
11-07-92	390	1,150	1,043	107	No
11-07-92	405	1,150	1,043	107	No
11-07-92	420	1,150	1,043	107	No
11-07-92	435	1,150	1,043	107	No
11-07-92	450	1,150	1,043	107	No
11-07-92	465	1,160	1,043	117	No
11-07-92	480	1,170	1,043	127	No
11-07-92	495	1,180	1,043	137	No
11-07-92	510	1,200	1,043	157	No
11-07-92	525	1,290	1,043	247	No
11-07-92	540	1,450	1,043	407	No
11-07-92	555	1,580	1,043	537	No
11-07-92	570	1,750	1,043	707	No
11-07-92	585	2,040	1,043	997	No
11-07-92	600	2,240	1,043	1,197	No
11-07-92	615	2,440	1,043	1,397	No
11-07-92	630	2,550	1,043	1,507	No
11-07-92	645	2,650	1,043	1,607	No
11-07-92	660	2,740	1,043	1,697	No
11-07-92	675	2,830	1,043	1,787	No
11-07-92	690	2,940	1,043	1,897	No
11-07-92	705	3,070	1,043	2,027	No
11-07-92	720	3,200	1,043	2,157	No
11-07-92	735	3,340	1,043	2,297	No
11-07-92	750	3,450	1,043	2,407	No
11-07-92	765	3,530	1,043	2,487	No
11-07-92	780	3,580	1,043	2,537	No
11-07-92	795	3,600	1,043	2,557	No
11-07-92	810	3,620	1,043	2,577	No
11-07-92	825	3,620	1,043	2,577	No
11-07-92	840	3,620	1,043	2,577	No
11-07-92	855	3,620	1,043	2,577	No
11-07-92	870	3,620	1,043	2,577	No
11-07-92	885	3,620	1,043	2,577	No
11-07-92	900	3,620	1,043	2,577	No
11-07-92	915	3,620	1,043	2,577	No
11-07-92	930	3,620	1,043	2,577	No
11-07-92	945	3,620	1,043	2,577	No
11-07-92	960	3,600	1,043	2,557	No
11-07-92	975	3,590	1,043	2,547	No
11-07-92	990	3,580	1,043	2,537	No
11-07-92	1,005	3,560	1,043	2,517	No
11-07-92	1,020	3,550	1,043	2,507	No
11-07-92	1,035	3,540	1,043	2,497	No
11-07-92	1,050	3,530	1,043	2,487	No
11-07-92	1,065	3,510	1,043	2,467	No
11-07-92	1,080	3,500	1,043	2,457	No
11-07-92	1,095	3,490	1,043	2,447	No
11-07-92	1,110	3,470	1,043	2,427	No
11-07-92	1,125	3,460	1,043	2,417	No
11-07-92	1,140	3,450	1,043	2,407	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-07-92	1,155	3,440	1,043	2,397	No
11-07-92	1,170	3,420	1,043	2,377	No
11-07-92	1,185	3,400	1,043	2,357	No
11-07-92	1,200	3,390	1,043	2,347	No
11-07-92	1,215	3,370	1,043	2,327	No
11-07-92	1,230	3,360	1,043	2,317	No
11-07-92	1,245	3,350	1,043	2,307	No
11-07-92	1,260	3,350	1,043	2,307	No
11-07-92	1,275	3,320	1,043	2,277	No
11-07-92	1,290	3,310	1,043	2,267	No
11-07-92	1,305	3,300	1,043	2,257	No
11-07-92	1,320	3,290	1,043	2,247	No
11-07-92	1,335	3,270	1,043	2,227	No
11-07-92	1,350	3,260	1,043	2,217	No
11-07-92	1,365	3,250	1,043	2,207	No
11-07-92	1,380	3,240	1,043	2,197	No
11-07-92	1,395	3,210	1,043	2,167	No
11-07-92	1,410	3,160	1,043	2,117	No
11-07-92	1,425	3,050	1,043	2,007	No
11-07-92	1,440	2,910	1,043	1,867	No
11-08-92	15	2,750	1,050	1,700	No
11-08-92	30	2,590	1,050	1,540	No
11-08-92	45	2,450	1,050	1,400	No
11-08-92	60	2,330	1,050	1,280	No
11-08-92	75	2,240	1,050	1,190	No
11-08-92	90	2,170	1,050	1,120	No
11-08-92	105	2,120	1,050	1,070	No
11-08-92	120	2,060	1,050	1,010	No
11-08-92	135	2,020	1,050	970	No
11-08-92	150	1,990	1,050	940	No
11-08-92	165	1,970	1,050	920	No
11-08-92	180	1,950	1,050	900	No
11-08-92	195	1,944	1,050	894	No
11-08-92	210	1,938	1,050	888	No
11-08-92	225	1,931	1,050	881	No
11-08-92	240	1,925	1,050	875	No
11-08-92	255	1,919	1,050	869	No
11-08-92	270	1,913	1,050	863	No
11-08-92	285	1,906	1,050	856	No
11-08-92	300	1,900	1,050	850	No
11-08-92	315	1,893	1,050	843	No
11-08-92	330	1,887	1,050	837	No
11-08-92	345	1,880	1,050	830	No
11-08-92	360	1,873	1,050	823	No
11-08-92	375	1,867	1,050	817	No
11-08-92	390	1,860	1,050	810	No
11-08-92	405	1,853	1,050	803	No
11-08-92	420	1,847	1,050	797	No
11-08-92	435	1,840	1,050	790	No
11-08-92	450	1,840	1,050	790	No
11-08-92	465	1,920	1,050	870	No
11-08-92	480	2,100	1,050	1,050	No
11-08-92	495	2,320	1,050	1,270	No
11-08-92	510	2,530	1,050	1,480	No
11-08-92	525	2,680	1,050	1,630	No
11-08-92	540	2,780	1,050	1,730	No
11-08-92	555	2,850	1,050	1,800	No
11-08-92	570	2,900	1,050	1,850	No
11-08-92	585	2,940	1,050	1,890	No
11-08-92	600	2,957	1,050	1,907	No
11-08-92	615	2,973	1,050	1,923	No
11-08-92	630	2,990	1,050	1,940	No
11-08-92	645	3,007	1,050	1,957	No
11-08-92	660	3,023	1,050	1,973	No
11-08-92	675	3,040	1,050	1,990	No
11-08-92	690	3,050	1,050	2,000	No
11-08-92	705	3,070	1,050	2,020	No
11-08-92	720	3,080	1,050	2,030	No
11-08-92	735	3,100	1,050	2,050	No
11-08-92	750	3,130	1,050	2,080	No
11-08-92	765	3,140	1,050	2,090	No
11-08-92	780	3,150	1,050	2,100	No
11-08-92	795	3,160	1,050	2,110	No
11-08-92	810	3,160	1,050	2,110	No
11-08-92	825	3,160	1,050	2,110	No
11-08-92	840	3,160	1,050	2,110	No
11-08-92	855	3,180	1,050	2,130	No
11-08-92	870	3,180	1,050	2,130	No
11-08-92	885	3,180	1,050	2,130	No
11-08-92	900	3,180	1,050	2,130	No
11-08-92	915	3,180	1,050	2,130	No
11-08-92	930	3,180	1,050	2,130	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-08-92	945	3,180	1,050	2,130	No
11-08-92	960	3,180	1,050	2,130	No
11-08-92	975	3,180	1,050	2,130	No
11-08-92	990	3,180	1,050	2,130	No
11-08-92	1005	3,180	1,050	2,130	No
11-08-92	1020	3,180	1,050	2,130	No
11-08-92	1035	3,190	1,050	2,140	No
11-08-92	1050	3,190	1,050	2,140	No
11-08-92	1065	3,190	1,050	2,140	No
11-08-92	1080	3,190	1,050	2,140	No
11-08-92	1095	3,190	1,050	2,140	No
11-08-92	1110	3,190	1,050	2,140	No
11-08-92	1125	3,200	1,050	2,150	No
11-08-92	1140	3,200	1,050	2,150	No
11-08-92	1155	3,210	1,050	2,160	No
11-08-92	1170	3,210	1,050	2,160	No
11-08-92	1185	3,230	1,050	2,180	No
11-08-92	1200	3,230	1,050	2,180	No
11-08-92	1215	3,240	1,050	2,190	No
11-08-92	1230	3,250	1,050	2,200	No
11-08-92	1245	3,260	1,050	2,210	No
11-08-92	1260	3,270	1,050	2,220	No
11-08-92	1275	3,290	1,050	2,240	No
11-08-92	1290	3,290	1,050	2,240	No
11-08-92	1305	3,300	1,050	2,250	No
11-08-92	1320	3,300	1,050	2,250	No
11-08-92	1335	3,300	1,050	2,250	No
11-08-92	1350	3,290	1,050	2,240	No
11-08-92	1365	3,240	1,050	2,190	No
11-08-92	1380	3,140	1,050	2,090	No
11-08-92	1395	3,010	1,050	1,960	No
11-08-92	1410	2,850	1,050	1,800	No
11-08-92	1425	2,700	1,050	1,650	No
11-08-92	1440	2,580	1,050	1,530	No
11-09-92	15	2,470	1,057	1,413	No
11-09-92	30	2,390	1,057	1,333	No
11-09-92	45	2,320	1,057	1,263	No
11-09-92	60	2,280	1,057	1,223	No
11-09-92	75	2,250	1,057	1,193	No
11-09-92	90	2,220	1,057	1,163	No
11-09-92	105	2,200	1,057	1,143	No
11-09-92	120	2,190	1,057	1,133	No
11-09-92	135	2,170	1,057	1,113	No
11-09-92	150	2,160	1,057	1,103	No
11-09-92	165	2,160	1,057	1,103	No
11-09-92	180	2,150	1,057	1,093	No
11-09-92	195	2,150	1,057	1,093	No
11-09-92	210	2,150	1,057	1,093	No
11-09-92	225	2,150	1,057	1,093	No
11-09-92	240	2,140	1,057	1,083	No
11-09-92	255	2,140	1,057	1,083	No
11-09-92	270	2,130	1,057	1,073	No
11-09-92	285	2,130	1,057	1,073	No
11-09-92	300	2,130	1,057	1,073	No
11-09-92	315	2,130	1,057	1,073	No
11-09-92	330	2,130	1,057	1,073	No
11-09-92	345	2,130	1,057	1,073	No
11-09-92	360	2,130	1,057	1,073	No
11-09-92	375	2,130	1,057	1,073	No
11-09-92	390	2,130	1,057	1,073	No
11-09-92	405	2,130	1,057	1,073	No
11-09-92	420	2,140	1,057	1,083	No
11-09-92	435	2,170	1,057	1,113	No
11-09-92	450	2,280	1,057	1,223	No
11-09-92	465	2,490	1,057	1,433	No
11-09-92	480	2,710	1,057	1,653	No
11-09-92	495	2,900	1,057	1,843	No
11-09-92	510	3,030	1,057	1,973	No
11-09-92	525	3,100	1,057	2,043	No
11-09-92	540	3,150	1,057	2,093	No
11-09-92	555	3,180	1,057	2,123	No
11-09-92	570	3,190	1,057	2,133	No
11-09-92	585	3,190	1,057	2,133	No
11-09-92	600	3,190	1,057	2,133	No
11-09-92	615	3,190	1,057	2,133	No
11-09-92	630	3,180	1,057	2,123	No
11-09-92	645	3,165	1,057	2,108	No
11-09-92	660	3,150	1,057	2,093	No
11-09-92	675	3,140	1,057	2,083	No
11-09-92	690	3,140	1,057	2,083	No
11-09-92	705	3,130	1,057	2,073	No
11-09-92	720	3,120	1,057	2,063	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion	Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-09-92	735	3,100	1,057	2,043	No	11-09-92	1,350	2,860	1,057	1,803	No
11-09-92	750	3,100	1,057	2,043	No	11-09-92	1,365	2,860	1,057	1,803	No
11-09-92	765	3,090	1,057	2,033	No	11-09-92	1,380	2,850	1,057	1,793	No
11-09-92	780	3,090	1,057	2,033	No	11-09-92	1,395	2,840	1,057	1,783	No
11-09-92	795	3,080	1,057	2,023	No	11-09-92	1,410	2,790	1,057	1,733	No
11-09-92	810	3,080	1,057	2,023	No	11-09-92	1,425	2,710	1,057	1,653	No
11-09-92	825	3,070	1,057	2,013	No	11-09-92	1,440	2,590	1,057	1,533	No
11-09-92	840	3,050	1,057	1,993	No	11-10-92	15	2,440	1,064	1,376	No
11-09-92	855	3,040	1,057	1,983	No	11-10-92	30	2,290	1,064	1,226	No
11-09-92	870	3,040	1,057	1,983	No	11-10-92	45	2,160	1,064	1,096	No
11-09-92	885	3,030	1,057	1,973	No	11-10-92	60	2,030	1,064	966	No
11-09-92	900	3,030	1,057	1,973	No	11-10-92	75	1,940	1,064	876	No
11-09-92	915	3,020	1,057	1,963	No	11-10-92	90	1,860	1,064	796	No
11-09-92	930	3,020	1,057	1,963	No	11-10-92	105	1,800	1,064	736	No
11-09-92	945	3,020	1,057	1,963	No	11-10-92	120	1,750	1,064	686	No
11-09-92	960	3,020	1,057	1,963	No	11-10-92	135	1,720	1,064	656	No
11-09-92	975	3,010	1,057	1,953	No	11-10-92	150	1,690	1,064	626	No
11-09-92	990	3,010	1,057	1,953	No	11-10-92	165	1,670	1,064	606	No
11-09-92	1,005	2,990	1,057	1,933	No	11-10-92	180	1,670	1,064	606	No
11-09-92	1,020	2,980	1,057	1,923	No	11-10-92	195	1,660	1,064	596	No
11-09-92	1,035	2,970	1,057	1,913	No	11-10-92	210	1,650	1,064	586	No
11-09-92	1,050	2,960	1,057	1,903	No	11-10-92	225	1,630	1,064	566	No
11-09-92	1,065	2,950	1,057	1,893	No	11-10-92	240	1,620	1,064	556	No
11-09-92	1,080	2,950	1,057	1,893	No	11-10-92	255	1,620	1,064	556	No
11-09-92	1,095	2,940	1,057	1,883	No	11-10-92	270	1,600	1,064	536	No
11-09-92	1,110	2,940	1,057	1,883	No	11-10-92	285	1,580	1,064	516	No
11-09-92	1,125	2,940	1,057	1,883	No	11-10-92	300	1,580	1,064	516	No
11-09-92	1,140	2,940	1,057	1,883	No	11-10-92	315	1,570	1,064	506	No
11-09-92	1,155	2,940	1,057	1,883	No	11-10-92	330	1,570	1,064	506	No
11-09-92	1,170	2,940	1,057	1,883	No	11-10-92	345	1,560	1,064	496	No
11-09-92	1,185	2,940	1,057	1,883	No	11-10-92	360	1,560	1,064	496	No
11-09-92	1,200	2,940	1,057	1,883	No	11-10-92	375	1,560	1,064	496	No
11-09-92	1,215	2,920	1,057	1,863	No	11-10-92	390	1,560	1,064	496	No
11-09-92	1,230	2,920	1,057	1,863	No	11-10-92	405	1,550	1,064	486	No
11-09-92	1,245	2,910	1,057	1,853	No	11-10-92	420	1,550	1,064	486	No
11-09-92	1,260	2,900	1,057	1,843	No	11-10-92	435	1,540	1,064	476	No
11-09-92	1,275	2,890	1,057	1,833	No	11-10-92	450	1,540	1,064	476	No
11-09-92	1,290	2,890	1,057	1,833	No	11-10-92	465	1,600	1,064	536	No
11-09-92	1,305	2,890	1,057	1,833	No	11-10-92	480	1,750	1,064	686	No
11-09-92	1,320	2,880	1,057	1,823	No	11-10-92	495	1,980	1,064	916	No
11-09-92	1,335	2,880	1,057	1,823	No	11-10-92	510	2,200	1,064	1,136	No

Table 9. Unit-streamflow and instream-flow values for gaging station Puyallup River at Puyallup (12101500) from October 26 through November 10, 1992—*Continued*

[**Time** is the number of minutes past midnight; **difference** is streamflow minus instream flow; **excursion** indicates streamflow is less than instream flow value for that day; ft^3/s, cubic feet per second]

Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion	Date	Time	Unit stream-flow (ft^3/s)	Instream flow (ft^3/s)	Difference (ft^3/s)	Excursion
11-10-92	525	2,360	1,064	1,296	No	11-10-92	990	2,600	1,064	1,536	No
11-10-92	540	2,450	1,064	1,386	No	11-10-92	1,005	2,600	1,064	1,536	No
11-10-92	555	2,520	1,064	1,456	No	11-10-92	1,020	2,600	1,064	1,536	No
11-10-92	570	2,550	1,064	1,486	No	11-10-92	1,035	2,590	1,064	1,526	No
11-10-92	585	2,580	1,064	1,516	No	11-10-92	1,050	2,590	1,064	1,526	No
11-10-92	600	2,600	1,064	1,536	No	11-10-92	1,065	2,590	1,064	1,526	No
11-10-92	615	2,600	1,064	1,536	No	11-10-92	1,080	2,590	1,064	1,526	No
11-10-92	630	2,610	1,064	1,546	No	11-10-92	1,095	2,590	1,064	1,526	No
11-10-92	645	2,620	1,064	1,556	No	11-10-92	1,110	2,590	1,064	1,526	No
11-10-92	660	2,620	1,064	1,556	No	11-10-92	1,125	2,590	1,064	1,526	No
11-10-92	675	2,620	1,064	1,556	No	11-10-92	1,140	2,580	1,064	1,516	No
11-10-92	690	2,620	1,064	1,556	No	11-10-92	1,155	2,580	1,064	1,516	No
11-10-92	705	2,620	1,064	1,556	No	11-10-92	1,170	2,580	1,064	1,516	No
11-10-92	720	2,620	1,064	1,556	No	11-10-92	1,185	2,580	1,064	1,516	No
11-10-92	735	2,620	1,064	1,556	No	11-10-92	1,200	2,580	1,064	1,516	No
11-10-92	750	2,620	1,064	1,556	No	11-10-92	1,215	2,580	1,064	1,516	No
11-10-92	765	2,620	1,064	1,556	No	11-10-92	1,230	2,580	1,064	1,516	No
11-10-92	780	2,620	1,064	1,556	No	11-10-92	1,245	2,570	1,064	1,506	No
11-10-92	795	2,620	1,064	1,556	No	11-10-92	1,260	2,570	1,064	1,506	No
11-10-92	810	2,620	1,064	1,556	No	11-10-92	1,275	2,570	1,064	1,506	No
11-10-92	825	2,620	1,064	1,556	No	11-10-92	1,290	2,570	1,064	1,506	No
11-10-92	840	2,620	1,064	1,556	No	11-10-92	1,305	2,570	1,064	1,506	No
11-10-92	855	2,610	1,064	1,546	No	11-10-92	1,320	2,550	1,064	1,486	No
11-10-92	870	2,610	1,064	1,546	No	11-10-92	1,335	2,550	1,064	1,486	No
11-10-92	885	2,610	1,064	1,546	No	11-10-92	1,350	2,550	1,064	1,486	No
11-10-92	900	2,600	1,064	1,536	No	11-10-92	1,365	2,540	1,064	1,476	No
11-10-92	915	2,600	1,064	1,536	No	11-10-92	1,380	2,540	1,064	1,476	No
11-10-92	930	2,600	1,064	1,536	No	11-10-92	1,395	2,540	1,064	1,476	No
11-10-92	945	2,600	1,064	1,536	No	11-10-92	1,410	2,540	1,064	1,476	No
11-10-92	960	2,600	1,064	1,536	No	11-10-92	1,425	2,530	1,064	1,466	No
11-10-92	975	2,600	1,064	1,536	No	11-10-92	1,440	2,530	1,064	1,466	No

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USGS Publishing staff
Judith A. Wayenberg
Bill Gibbs
Bob Crist
Linda Rogers

For more information concerning the research in this report, contact the
Washington Water Science Center Director,
U.S. Geological Survey,1201 Pacific Avenue – Suite 600
Tacoma, Washington 98402
http://wa.water.usgs.gov

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