Idaho Department of Water Resources

Open-File Report

Warm Springs Creek Seepage Survey

By
Dennis Owsley
July 2017

A seepage survey was conducted on the lower 2.2 miles of Warm Springs Creek on July 17, 2017. Warm Springs Creek is a tributary stream to the Big Wood River with a confluence near the town of Ketchum, Idaho (Figure 1). The purpose of the seepage survey was to determine and quantify any gains or losses that occur within this section of the creek.

Figure 1. Map showing the location of the seepage survey and measurement stations.

Three measurement crews were utilized to conduct the survey. All three crews operated a StreamPro Acoustic Doppler Current Profiler (ADCP) to measure flow rates. Each crew collected measurements at the pre-determined stations simultaneously to eliminate the potential that any differences in the measurements could be attributed to variable flow in Warm Springs Creek.

Station #1 was the furthest upstream measurement location and was measured first. The measurement site was a footbridge approximately 65 yards downstream from the Gates Road bridge across Warm Springs Creek. The site was a good location for measurements and a tag line was strung on the upstream side of the bridge and a measurement was also collected on the downstream side by traversing the bridge. Measured flow rates ranged from 129.8 to 133.9 cubic feet per second (cfs) at this location, with an average of the three measurements at 131.3 cfs (Table 1).

Table 1. Summary of measured flows in cfs.

Measurement Station	Hydrology ADCP	Planning ADCP	PivoTrack ADCP	Average
#1 - Gates Road	129.8	133.9	130.2	131.3
#2 - Aspen Drive	130.5	130	132	130.8
#3 - Bald Mtn (USGS Site)	133.3	136	132.1	133.8
#4 - Mouth	132.5	N/A	N/A	132.5

Station #2 was located on Aspen Drive, where the road crosses Warm Springs Creek, approximately 0.7 miles downstream from Station #1. Suitable measurement sections were not available from the bridge access, requiring the ADCP boats to be operated by tethering them across the channel approximately 10 yards upstream of the bridge. Measured flows at this site ranged from 130 to 132 cfs with an average of 130.8 cfs.

Station #3 was located at the USGS gage site on Warm Springs Creek approximately 0.7 miles downstream of Station #2. The USGS gage (Site No. 13137000) is located on the upstream side of an access bridge along the Bald Mountain Road. Measurements were taken directly adjacent to the gage equipment using taglines and tethered boats. Measured flows ranged from 132.1 to 136 cfs, with an average of 133.8. Flows at this station were the highest flows measured by each of the measurement crews throughout the day. At the time of the measurements, the USGS gage was reporting a flow of 69 cfs, indicating the reported flows from the USGS gage were incorrect.

Station #4 was at the mouth of Warm Springs Creek and the Big Wood River. Due to access to the site, only one measurement crew traversed across the Big Wood River to measure Warm Springs Creek. A good measurement site was located approximately 100 yards upstream of the mouth of the creek. The measurement site was approximately 0.8 miles downstream of Station #3. The measured flow at this location was 132.5 cfs.

Based on a review of the flows collected in the lower 2.2 miles of Warm Springs Creek, flows were similar at all four of the measurement stations (Figure 2). Therefore, a definitive net gain or loss could not be determined as the measured flows were within the estimated uncertainty of each of the measurements (Figure 3). A repeat of this seepage survey near the end of the irrigation season would be beneficial to observe any differences in flow conditions.

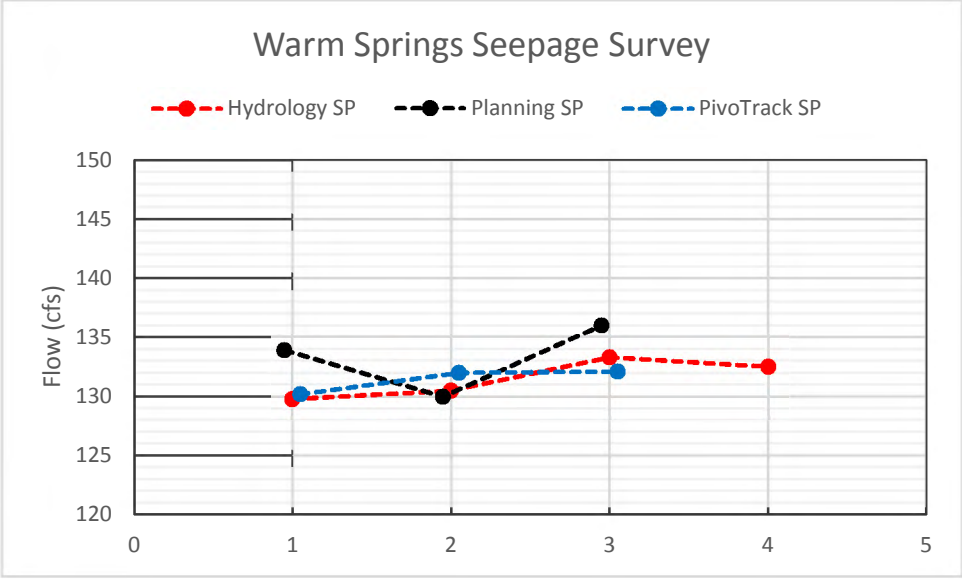

Figure 2. Graphic representation of measured flows.

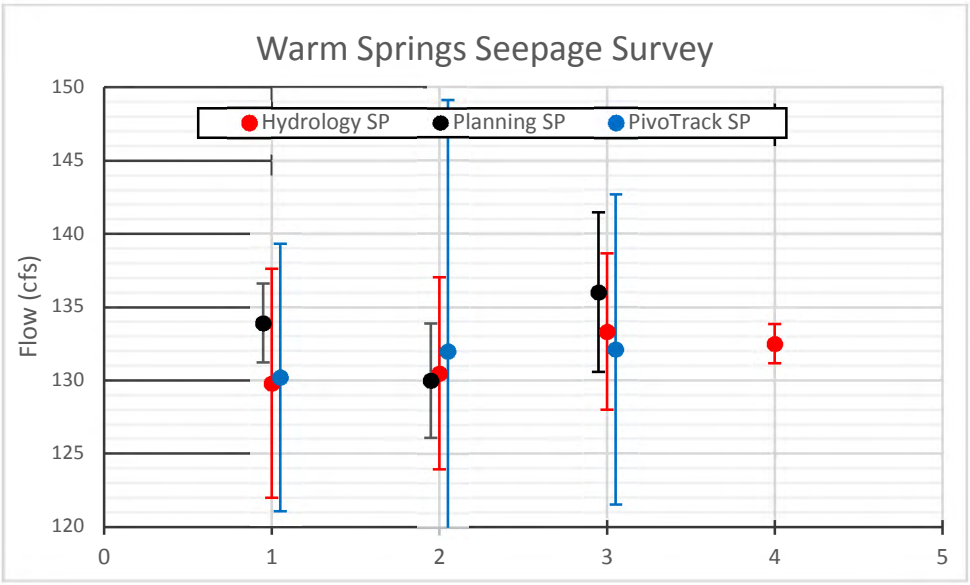

Figure 3. Graph of measured flows showing errors associated with each measurement.