

Koch, Ken

0298

From: Dave McClure [DaveM@co.klickitat.wa.us]
Sent: Friday, December 17, 2004 4:59 PM
To: 303d
Cc: Schuler, Gregory A.
Subject: 0298-2002/2004 Water Quality Assessment (303[d]) List Information

Mr. Koch,

Please find attached Klickitat County's comments on the 2002/2004 Water Quality Assessment (303[d]) List. Thank you for the opportunity to comment.

David McClure
WRIA 30 Watershed Planning Coordinator

12/22/2004

Klickitat County's Comments regarding stream segments on Swale Creek, tributary to the Klickitat River, proposed for the 303(d) list

Swale Creek, a tributary to the Klickitat River has two segments on the proposed 303(d) list. The first is a segment located roughly 4 to 5 miles upstream of the confluence of Swale Creek with the Klickitat River (listing ID 7962). This segment is proposed as a category 5 stream segment, listed for temperature. The second stream segment is proposed as a category 4C stream segment (listing ID 6206). The segment is listed for instream flow.

The following information draws upon studies conducted in Swale Creek in 2003 and 2004 in support of the WRIA 30 Watershed Assessment conducted pursuant to Chapter 90.82 Revised Code of Washington. The referenced documents are appendices to the watershed assessment report. Ecology reviewed these reports and has copies available. If Ecology has questions regarding these studies, contact Klickitat County (Dave McClure) or John Kirk of Ecology (who reviewed the documents and accompanied the technical staff during some of the investigations). Additional copies of the reports can be provided if needed.

Background Information Regarding Segment 7962 (Listed for Temperature)

Summer flow in this stream segment is negligible. The segment goes largely dry in summer. Isolated pools are often present in some locations along the segment. On July 16, 1996, aerial photographs revealed the presence of 5 small pools along the segment (Figure 1), although a few others may be present in the shadows. The majority of the segment, however, was dry.

A survey of the stream conditions in Swale Creek was completed in the summer of 2003 (WPN and Aspect, 2004, Appendix E). The listed segment is largely confined to basalt pools (Figures 2 and 3), often with a narrow stream trickling between the pools. There are long stretches with little or no vegetation along stretches of dry bed of cobble. Vegetation is associated with moisture availability. Vegetation is most found most commonly adjacent to perennial pools but is absent where bedrock outcrops exist. A short distance downstream of the listed segment, water is present continuously throughout the year, but is disconnected from the Klickitat River at the mouth, where flow goes subsurface in alluvial deposits. Flow in this area is less than 0.5 cfs (too low to be measured with conventional techniques). Where the stream is continuously wetted, vegetation is present and is relatively dense.

A railroad runs parallel to Swale Creek in the vicinity of the listed stream segment and crosses the stream roughly 0.2 miles downstream of the upstream boundary of the segment. Aerial photographs and field visits indicate that the rail bed has constrained the flood plain in some places, but in general it does not encroach on the channel.

A review of aerial photographs taken since 1954 indicates that vegetation over the last 30 years has been influenced by a number of catastrophic flooding events that removed mature vegetation. There are also stretches that have been consistently barren over time as well.

The cadastral survey notes of the 1800s were also reviewed to identify available information regarding Swale Creek flow, channel conditions, and vegetation. In 1860, which was a year that was unusually wet, the channel was documented as dry at the boundary between townships, located near the southern boundary of the listed stream segment (WPN and Aspect, 2004, Appendix E). Downstream of this location, surveys were conducted early in the season during high flow; therefore summer flow conditions prior to development could not be ascertained. The presence of a dry stream at the upstream boundary of the segment suggests that water within the segment in 1860 was limited to seeps and springs located within the segment. Therefore, the water situation was likely similar to what is seen today. For further discussion regarding the hydrologic situation in Swale Creek, see the section on Swale Creek stream segment 6206 below. Studies of the local geology and groundwater flow in the area also indicate that it is highly unlikely that land use has affected the quantity of water in the segment (WPN and Aspect, 2004, Appendices B and C) (see the section on Swale Creek stream segment 6206 below).

The cadastral survey notes also provide some insight regarding the vegetation present in 1860. "Scattered pine and oak" were described in the general area surrounding the upper 2/3 of the listed segment. Along the lower 1/3 of the segment, the notes indicate the presence of pine and oak with some alder, cherry, and hazel. In most of this area, trees were less than 10 inches in diameter, although a couple of small pockets of larger trees were noted. At present, the vegetation is similar. The upper 2/3 of the segment has little vegetation along the stream, but vegetation increases along the lower 1/3 of the segment. Unfortunately, the notes do not provide specific information regarding the density of trees along the stream; therefore comparison of current conditions with conditions in 1860 can only be qualitative and very general.

Air temperatures in the area of the listed segment regularly reach 35°C (95°F) and can reach as high as 40°C (104°F) (Figure 4). These air temperatures have direct effects on the standing water in the few pools present in the reach. The corresponding water temperatures were not recorded since the stream went dry in summer within this reach.

Summary and Conclusions Regarding Segment 7962 (Listed for Temperature)

- The listed stream segment has negligible flow. Water is confined to isolated pools. Evidence indicates that flow was similar in 1860 and that land use has had little to no effect on flow.
- The listed stream segment currently has little vegetation along the upper 2/3 of the segment, but has fair to good vegetation along the lower 1/3. Vegetation is limited by the availability of moisture and the presence of bedrock. Descriptive information regarding vegetation in the 1860s suggests similar conditions. A horticulturist

completed a vegetation survey in the area and concluded that little change in vegetation was possible due to the paucity of water in the area.

- The factors that are likely to have the greatest effect on water temperature are flow and shading. The weight of evidence suggests that the flow and vegetation conditions in the reach are similar to the historic conditions and are unaffected by land use. Therefore, the water temperatures measured in the reach are also likely similar to historic natural conditions.
- Given that the stream is not affected by land use and the fact that conditions are similar to historic conditions, the stream segment should not be listed as a Category 5 stream. The stream segment should be listed as Category 1 (meets standards). The recommendation for a Category 1 classification is supported because it meets the clause in the standard pertaining to natural conditions:

“(i) When a water body's temperature is warmer than the criteria in Table 200(1)(c) (or within 0.3°C (0.54°F) of the criteria) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7-DADMax temperature of that water body to increase more than 0.3°C (0.54°F).”

The weight of evidence indicates that the water temperature situation in Swale Creek reflects natural conditions and there is no evidence that human actions have affected the situation.

Segment 6206 (Listed for Instream Flow)

The stream segment that is proposed of listing for instream flow in Swale Creek is located near the confluence of the stream with the Klickitat River. This area goes dry in summer (Figure 5). Upstream of the segment, flows are not measurable using conventional methods, but have been estimated at less than 0.5 cfs. The listed segment is a depositional area that is avulsed (Figure 6). Here, flows go subsurface in the deposited alluvium. This fan is subject to disturbance by major storm events (WPN and Aspect, Appendix E). The high flow channel has shifted dramatically over time due to such events.

At present, this segment is proposed for listing as a Category 4C stream (impaired by a non-pollutant by causes that cannot be addressed through a TMDL including low water flow). The basis for listing cites several low flows measured in the stream. Included in the description is a mention that the creek was dry from its mouth up to RM 3.5 many times. Ecology should note that the creek is wetted most of this length in all years. It does dry in the lower 0.2 miles of the stream near the confluence with the Klickitat River and in most areas upstream of river mile 3.5.

There are several natural processes that affect flow in lower Swale Creek. These include the following:

- East of Warwick (roughly RM 12), the Swale Valley is an alluvium-filled basin. The alluvium has depths greater than 200 feet near Centerville (near the center of the valley). Swale Creek between Highway 97 (east side of the valley) and Warwick is an expression of the water table in the alluvial aquifer. As such, it is ephemeral or of a season nature directed related to the groundwater level in the alluvium. In early spring, groundwater levels in the alluvium are generally high. Localized flooding of the low-lying area around Swale Creek occurs during particularly wet periods in late winter and early spring. This portion of the creek is generally dry by late spring/early summer after the groundwater levels in the alluvium decline (WPN and Aspect, Appendices B and C)
- The Warwick Fault, running northwest-southeast through Warwick, is an important structural control on groundwater flow in the basin. The fault forms a structural closure to the Swale Creek valley and creates an impoundment of groundwater to the east of the fault. The presence of the fault impedes westerly groundwater flow (WPN and Aspect, Appendices B and C).
- Water flow from a second aquifer located under the alluvial aquifer in the Swale Valley is also impeded by the Warwick fault (WPN and Aspect, Appendices B and C).
- Water flow from the upper basin to the portion Swale Creek downstream of Warwick ceases when groundwater levels drop to a level below the fault. Water present in Swale Creek in summer and fall downstream of Warwick is an expression of local seeps and springs located below the fault (WPN and Aspect, Appendices B and C).
- Flows from springs and seeps in the lower basin are negligible. In the summer of 2003, flows were measured (or estimated where flows were too low to measure) in the portion of the creek downstream of Warwick. Flow began at Stacker Canyon (roughly RM 9.2). A spring in Stacker Canyon provided approximately 0.5 cfs to Swale Creek. Downstream of Stacker Canyon, Swale Creek was spatially intermittent. Flow was observed in bedrock constrained reaches and was not present in alluvial reaches (WPN and Aspect 2004, Appendix C). Within the reach proposed for listing, the gradient is low and alluvium is common. As a result, most of this reach is dry, with the exception of a few isolated pools. Other seeps and springs located downstream of Warwick did not contribute much flow. The flow from Stacker Canyon or other springs did not change appreciable between spring and summer (WPN and Aspect 2004, Appendix C).

Given the presence of the Warwick Fault which hydrologically isolates the lower 12 miles of Swale Creek from the upper portion of the basin, water withdrawals potentially affecting the basin are limited to those located downstream of the fault. At present there are 10 water rights or certificates located within the Swale Creek basin downstream of the fault (WPN and Aspect 2004, Appendix A, Chapter 6). One of these is a surface water right for 0.01 cfs (irrigation and domestic use). All other rights are groundwater rights to support domestic use. There is only one water right (groundwater) in the Stacker Canyon

drainage (principle source of flow for the lower Swale Creek). Actual use of these rights is unknown.

Since flows in Stacker Canyon or the other springs in the lower basin did not change appreciably between spring (prior to the start of irrigation season) and summer, water use is not believed to be having a measurable affect on flow. This conclusion is further supported by the description of the presence of water in 1860 (WPN and Aspect, 2004, Appendix E). The cadastral survey notes suggest a pattern of wet and dry channels with standing water in pools that has a similar distribution to what was observed in 2003.

The weight of evidence strongly suggests that the low flow situation in Swale Creek is due to natural conditions and is unaffected by human activities. The Category 4C listing is therefore inappropriate and the stream segment in question should be placed in Category 1.

Additional Comments regarding the basis provided in the draft for listing Swale Creek segment 6206 for instream flow:

- The discussion in the basis does not adequately reflect the unique geological situation in Swale Creek basin.
- The water rights include rights that do not affect flow in the lower basin.
- The basis indicates that the stream is often dry up to river mile 3.5. This is not so. The stream is dry in the lower 0.2 miles and upstream of river mile 3.5.
- The note regarding Ecology's attempts to conduct an IFIM study on Swale Creek where "the stream [was] full of water miles upstream of the irrigation diversions" is confusing since such a situation does not exist in the basin.
- The Klickitat Subbasin Plan does not cite any data pertinent to the conclusions that low flows are due in part to irrigation withdrawals; hence those conclusions were speculative. The available data would indicate that conclusions in the Plan are incorrect.
- Few, if any, of the groundwater rights are in hydrologic continuity with the lower basin.



Figure 1. July 16, 1996 aerial photograph of the Swale Creek segment proposed for listing for temperature under category 5 (listing ID 7962). The blue lines correspond roughly to the boundaries of the segment. The red arrows indicate the locations of pools apparent in the photographs.



Figure 2. Photograph of dry channel in the subject reach (listing ID 7962).

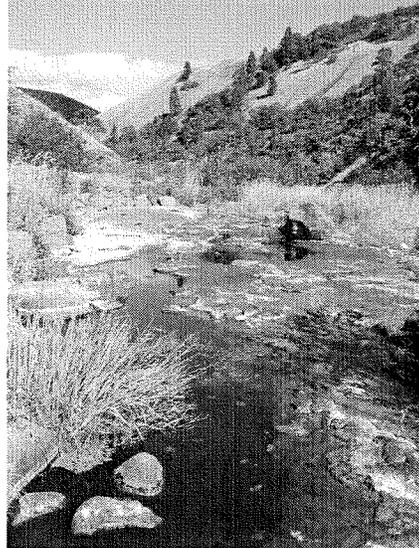


Figure 3. Photograph of one of the pools in the subject reach (listing ID 7962).

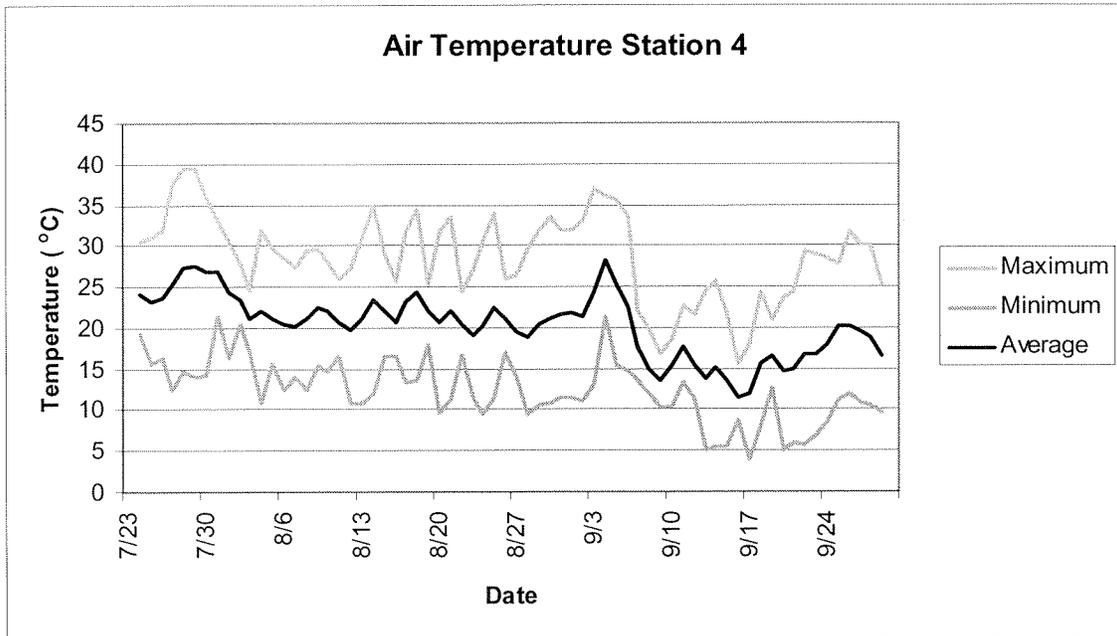


Figure 4. Air temperature recorded in 2003 near the downstream boundary of the listed segment (listing ID 7962).



Figure 5. Picture of the stream segment (ID 6206) of Swale Creek near the confluence with the Klickitat River.



Figure 6. July 16, 1976 aerial photograph of the segment of Swale Creek (ID 6206) listed for instream flows. Note the presence of an alluvial fan at the confluence with the Klickitat River. The blue line indicates the upstream boundary of the segment.

References

Watershed Professionals Network (WPN) and Aspect Consulting. 2004. WRIA 30 Phase II Watershed Assessment. Prepared for Klickitat County and the WRIA 30 Planning Unit. *(The report includes the following appendices referenced in these comments):*

- **Appendix A**, *WRIA 30 Level I Assessment*
- **Appendix B**, *WRIA 30 Multipurpose Water Storage Screening Assessment Report*,
- **Appendix C**, *Addendum to WRIA 30 Multipurpose Water Storage Screening Assessment Report*
- **Appendix E**, *WRIA 30 Swale Creek Water Temperature Study*

Contact Information

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