

# Himes Creek Instream Flow Recommendation Report and Expert Testimony

Ellen Wohl

Department of Geosciences  
Colorado State University

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Colorado Water Institute

**Colorado**  
**State**  
University

**Himes Creek Instream Flow Recommendation  
Report and Expert Testimony regarding hydrologic and geomorphologic processes that form  
and maintain habitat in steep-pool channels.**

**Statement of Work**

**Background**

The Colorado Water Conservation Board has received a recommendation from the United States Forest Service (USFS) San Juan National Forest for the appropriation of an Instream Flow Water Right on Himes Creek, tributary to the West Fork San Juan River located approximately 11.5 miles northwest of Pagosa Springs. Himes Creek is being recommended by the USFS because the natural environment of the stream contains a Core Conservation population of pure-strain Colorado River cutthroat trout. This particular species shares a number of genetic markers with the San Juan lineage Colorado River cutthroat trout, a subspecies of Colorado River cutthroat trout that was once thought to be extinct.

Colorado’s Instream Flow Program requires the Colorado Water Conservation Board (CWCB) to appropriate the minimum amount of water necessary to preserve the natural environment to a reasonable degree. On many streams, the CWCB relies upon the R2Cross methodology to quantify the minimum amount of water necessary for appropriation. This methodology assumes that low gradient riffles are the limiting and critical habitat feature for fish.

However, Himes Creek is a cold-water, high gradient step-pool mountain stream and low gradient riffles are rare or absent. Further, biologist from both USFS and Colorado Parks and Wildlife (CPW) have determined that the most limiting critical habitat feature to the Himes Creek cutthroat trout is pool habitat. Pool habitat, created through natural fluvial geomorphic processes and natural flow ranges must be maintained in order to ensure that this critical habitat feature will continue to persist over time.

In addition, these biologist maintain that the entire natural hydrograph is important to support all life stages of this rare trout species as the reduction of flow or change in timing of the flow regime would be limiting and jeopardize their survival. The following table summarizes the various flow periods and their importance to this unique fishery.

<b>Flow Period</b>	<b>Ecological / Fishery Function</b>
<b>Base Flows (typically check August to March)</b>	Support macro-invertebrate life cycles, maintenance of temperature regime, juvenile rearing habitat, overwintering adult and juvenile habitat, prevention of pools from freezing.
<b>Snow Melt Runoff Flows (typically March through July)</b>	Recharge of aquifer for support of riparian vegetation; cutthroat spawning; removal of fine sediment, maintenance of pool depth and volume, and deposition and maintenance of spawning gravels.
<b>Short Duration Peak Flows (Storm-driven events typically July through October)</b>	Entrainment of large woody debris, scouring and formation of new pools, maintenance of riparian corridor and floodplain areas.

As a result of the forgoing information, the USFS has determined that all the unappropriated flow in Himes Creek is the minimum amount of water needed to preserve the natural environment of Himes Creek to a reasonable degree. The USFS believes that any specific methodology that could be used in an attempt to quantify the minimum amount of water required on this stream would be prone to significant error. Therefore, any withdrawal of water from Himes Creek may affect the viability of this species by reducing flow, reducing the extent and depth of pools, impacting riparian habitat, and negatively affecting the macroinvertebrate food source this species relies upon. The USFS posits that the risk of extirpation of this species from Himes Creek is too great to try to quantify specific flow rates and therefore maintains that the natural flows that have existed over time without anthropogenic changes are the required minimum necessary flows for appropriation on this stream.

**Purpose**

Multiple stakeholders have expressed concerns over the lack of a specific quantification methodology to quantify the minimum amount of flow necessary to preserve the natural environment on Himes Creek. However, CWCB has relied upon subject matter experts in the past to help them understand the flow needs of natural systems and to determine minimum flows based on the available science rather than a specific hydraulic or geomorphologic model. CWCB staff therefore believes that it would be beneficial to have a subject matter expert review the USFS’s recommendation and provide a report on the scientific knowledge regarding fluvial geomorphology on step-pool streams such as Himes Creek. In addition, this subject matter expert may also need to review documents and proposals, and possibly participate in the CWCB’s hearing proceedings if needed.

**Tasks**

Task	Time	Cost	
1	Review of the USFS Instream Flow recommendation and supporting data	<u>10 hours</u>	<u>\$500</u>
2	Prepare a report on the state of knowledge regarding relations among flow regime, channel morphology, and channel substrate on step-pool channels and provide a synthesis explaining the importance of the natural range of flows to maintaining step-pool form and geomorphic function & the likely effects on channel morphology of altering the natural range of flows. <sup>1</sup>	<u>40 hours</u>	<u>\$2000</u>
3	Attend a stakeholder meeting in Denver to hear and reply to arguments by potential opposition to the USFS recommendation. This task may also require a review and opinion on quantification methodologies by opposing entities.	<u>12 hours</u> <u>120 mi rt</u>	<u>\$600</u> <u>\$61</u>
4	Site visit to Himes Creek in the Summer of 2018	<u>24 hours</u>	<u>\$1200</u>

		<u>900 mi rt</u> <u>3 days</u> <u>camping &amp;</u> <u>per diem</u> <u>(\$90/day)</u> <u>24 hours</u>	<u>\$459</u> <u>\$270</u>
5	Review formal written statements submitted to the CWCB in opposition to the USFS recommendation and provide written rebuttal of those statements should this recommendation move forward to a hearing before the CWCB	<u>30 hours</u>	<u>\$1500</u>
6	Attend a CWCB Board Meeting (Potentially in South West Colorado <sup>2</sup> ) and provide testimony to the CWCB to rebut arguments from opposers' experts should this recommendation mover forward to a hearing.	<u>30 hours</u> <u>900 mi rt</u> <u>2 nt hotel</u> <u>(\$100/nt)</u> <u>3 days per</u> <u>diem</u> <u>(\$59/day)</u>	<u>\$1500</u> <u>\$459</u> <u>\$200</u> <u>\$177</u>
7	CSU administrative fee: 15% of \$8926 = 1338.90		
		<u>Total</u>	<u>\$10,265</u>

<sup>1</sup>Task 2 should include as much specific information as possible about the Himes Creek step-pool environment and the San Juan geomorphology and hydrology such as erodible rock, monsoon events and the resultant impacts on the channel. A draft report could be prepared based on the provided field photos with a final report prepared after the Task 4 site visit.

<sup>2</sup>The CWCB holds meetings every other month in various river basins throughout the state. If this recommendation is contested it is possible that the contested parties will request that the meeting be held in Durango, Pagosa Springs or another southwest Colorado town.